

## Submittal item detail

## 224-230900-0: Controls Materials



Status	Created on	Due date
Closed	13 Nov 2022	
Responsible party	<b>Katelyn Kalberer</b> (McKinstry Co., LLC - 10063381)	
Manager	<b>Katie Glover</b> (DPR Construction)	
Responsible contractor	<b>Katelyn Kalberer</b> (McKinstry Co., LLC - 10063381)	
Watchers	<b>Tristan LeCuyer</b> (Westlake Consulting Group, LLC. - 10087787) <b>Arthur Furukawa</b> (SABArchitects, Inc. - 10087726) <b>Laura Taylor</b> (SABArchitects, Inc. - 10087726) <b>Efrain Bastida</b> (DPR Construction) <b>Alex Kim</b> (DPR Construction) <b>William Kennedy</b> (DPR Construction) <b>Brian Olson</b> (Prime Electric LLC - 10109316) <b>Emily Blair</b> (DPR Construction) <b>Emma Parks</b> (Westlake Consulting Group, LLC. - 10087787) <b>Katie Glover</b> (DPR Construction) <b>Kelly Pratt</b> (DPR Construction) <b>Peter Richmond</b> (Prime Electric LLC - 10109316) <b>Sri Sundaram</b> (DPR Construction)	
Spec section	230900 Instrumentation and Control for HVAC	
Spec subsection		
Description		
Final Response	Approved	
Final Response Attachments	<a href="#">224 - VARIANT_CONTROLS MATERIALS_PRODUCT DATA_FR.PDF</a> , 7 Dec 2022, 19:07 UTC <a href="#">224 - VARIANT_CONTROLS MATERIALS_PRODUCT DATA_DR ENGR_AAN.PDF</a> , 7 Dec 2022, 19:06 UTC	
Final Response Comments	SABA: Refer to engineer's review.	

DBE:  
approve NET per DBE tenant review not required

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**Package** [230900-002 INSTRUMENTATION AND CONTROL FOR HVAC](#)

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Responsible party	Sent	Due	Returned	Response/Action	Attachments
<b>Submitted</b>					
<b>Katelyn Kalberer</b> (McKinstry Co., LLC - 10063381) Submitted by Katie Glover	12 Nov 2022	11 Nov 2022	12 Nov 2022	Submitted	<a href="#">230900-005.00-Variant Controls Materials_NET 11.7.22.pdf</a>
<b>Comments</b> -					
<b>Sent for review</b>					
<b>Katie Glover</b> (DPR Construction) Sent by Katie Glover	12 Nov 2022	-	12 Nov 2022	Sent for review	<a href="#">224 - Variant_Controls Materials_Product Data_DPR Reviewed.pdf</a>
<b>Comments</b> -					
<b>Review Step 1</b>					
<b>Clayton Richenberg</b> (SABAArchitects, Inc. - 10087726) Reviewed by Katie Glover	5 Dec 2022	18 Dec 2022	5 Dec 2022	For Record Only	<a href="#">224 - Variant_Controls Materials_Product Data_DPR Reviewed_SABA reviewed 22-11-28.pdf</a>
<b>Comments</b>					
<b>Emma Parks</b> (Westlake Consulting Group, LLC. - 10087787) Reviewed by Emma Parks	5 Dec 2022	18 Dec 2022	7 Dec 2022	Approved	<a href="#">224 - Variant_Controls Materials_Product</a>

Responsible party	Sent	Due	Returned	Response/Action	Attachments
					Data_DR ENGR_Reviewed.pdf
Comments	approve NET per DBE tenant review not required				

Built-in cover page

## 224-230900-0:Controls Materials



Status	<span style="background-color: orange; color: white; padding: 2px 5px;">Open</span> Submitted
Spec section	230900 Instrumentation and Control for HVAC
Manager	<b>Kathryn Glover</b> (DPR Construction)
Responsible contractor	<b>Katelyn K</b> (McKinstry Co., LLC - 10063381)
Reviewers step 01	<b>Clayton Richenber</b> (SABArchitects, Inc. - 10087726) <b>Emma Parks</b> (Westlake Consulting Group, LLC. - 10087787)



# Submittal Package Approval Sheet

DPR Construction, A General Partnership

<b>DPR Construction, A General Partnership</b>	
 <p>1000 1st Ave S Suite 400 Seattle, WA 98104 Phone: 608-212-5217</p>	<p>Reviewed for general conformance to the contract documents. This review does not relieve the subcontractor of the responsibility of making the work conform to the contract requirements. The subcontractor is responsible for all dimensions, correct fabrication, and accurate fit with the work of other trades.</p> <p>Reviewed By: Katie Glover</p>
<b>Architect</b>	
<p><b>SABA Submittal Review</b></p> <div style="border: 2px solid red; padding: 5px;"><ul style="list-style-type: none"><li><input type="checkbox"/> Approved as Submitted</li><li><input type="checkbox"/> Approved as Noted</li><li><input type="checkbox"/> Resubmit Noted Portions Only</li><li><input type="checkbox"/> Not Approved, Resubmit</li><li><input type="checkbox"/> Reviewed Only/No Approval Action Required</li><li><input checked="" type="checkbox"/> Review not required by Contract Documents</li></ul><p>Reviewed only for general conformance with design concept and information given in the Contract Documents. Corrections or comments by reviewer on the submittal do not relieve the contractor from compliance with requirements of the Contract Documents. Approval of a specific item shall not infer approval of an assembly of which the item is a component. The contractor is responsible for all dimensions, field conditions, coordination with other trades, and information that pertains solely to the fabrication process.</p><p>By: <u>Clayton Richenberg</u> Date: <u>11/28/2022</u> SABA Architects, Inc. <small>Refer to engineer's review.</small></p></div>	

<b>Consultant</b>	<b>Consultant</b>
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5005 3rd Ave South

Seattle, WA 98134

Phone: 206.762.3311

1150 Eastlake Variant Bio  
McKinstry Job #: 121993-001

Date: 11.7.22

Reference:  
Section: N/A

Description: 230900-005.00 Variant Controls Materials

Supplier: ATS

Manufacturer: Various

Section # :

This submittal contains the controls materials for 1150 Eastlake Variant.

Remarks:

- No Exceptions Taken
- Approved as Noted
- Rejected, Revise and Resubmit

Review is only for general conformance with the design concept and general compliance with the contract documents. Any action shown is subject to the requirements of the plans and specifications. The contractor is responsible for dimensions, which shall be confirmed and correlated at the job site; the fabrication process and techniques of construction; of his work with that of the other trades and the satisfactory performance of his work.

*McKinstry Engineering*

Date: 11/8/2022 By: \_\_\_\_\_



*Mechanical Engineer:*

Company Name: McKinstry  
Contact: Andrew Robenalt

*General Contractor:*

Company Name: DPR  
Contact:

*Mechanical Contractor:*

Company Name: McKinstry  
Contact: John King

1150 Eastlake - L10 Variant Bio TI

ATS Job Number: **1122505**

**ATS Contact:**

*Project Manager:* Michael Beattie

Phone: 206-713-0154  
Fax: 425-251-0949



ATS Automation Inc.  
450 Shattuck Ave South  
Renton, WA 98057

425-251-9680

Fax #: 425-251-0949

Material Submittal TOC  
1150 Eastlake  
Job#: 1122505

11/1/2022

ATS ID #	MANUFACTURER	DESCRIPTION	PART #
<a href="#">TSB-05</a>	Alerton Tech-ACI	Temp Sensor,SS Wall Plate,10K	TS-1101-WA-10-AA
<a href="#">ACM</a>	Alerton Technologies	ACM, w/power, Dual MS/TP, TCP/IP, BACnet/Enet & IP	ACM
<a href="#">ACM-1</a>	Alerton Technologies	Expansion I/O module for VLX, 10 in, 4 bo's, 8 ao's	AXM-10-4-8
<a href="#">ACM-BATT</a>	Alerton Technologies	External battery pack for ACM.	ACM-BATT
<a href="#">ACM-OC1</a>	Alerton Technologies	ACM OC, Dual Port EIA-485/MSTP Option card	ACM-OC-2X485
<a href="#">MS-4TH</a>	Alerton Technologies	Microset 4 BAConet Digital Temp (H option) Sensor	MS-4TH
<a href="#">VL03-E</a>	Alerton Technologies	VLC 853-E Programmable Controller with 8 univ in, 5 Hot Switched BO,3 AO, 15va (maximum 97va with loads), 20VDC AT 100MA	VLC-853-E
<a href="#">VL06-E</a>	Alerton Technologies	VLC 550-E Programmable Controller with 5 univ in, 5 Hot Switched BO, 12va (maximum 72va with loads), 20VDC AT 100MA	VLC-550-E
<a href="#">VL07A-E</a>	Alerton Technologies	VAV SD2A-E Programmable Controller with 4 univ in, 5 BO, 2 AO and filter, 12va (maximum 72va with loads)	VAV-SD2A-E-F
<a href="#">TSB-02B</a>	Alerton Technologies-ACI	Temp Sensor,Duct,4",Flange,6" Plenum,10K	TS-2004-FB-10-AA
<a href="#">TSB-09B</a>	Alerton Technologies-ACI	Temp Sensor,Duct,8",Flange,6" Plenum,10K	TS-2008-FB-10-AA
<a href="#">DM-B02T</a>	Belimo	45 in-lb, non spring, 2-10vdc, terminal, bulk, 1.5W, 8 sq ft	LMB24-SR-T.1
<a href="#">DM-B02TA</a>	Belimo	45 in-lb, non-spr, floating, term, bulk, 1.5W, 8 sq ft	LMB24-3-T.1
<a href="#">DM-B11</a>	Belimo	35 in-lb, spring, 2-10vdc, 2.5W, 8 sq ft	LF24-SR
<a href="#">V-10</a>	Belimo	Belimo_B310_TR24-SR-T_US_assembly_en-us 1.2cv	B310+TR24-SR-T US
<a href="#">V-11</a>	Belimo	Belimo_B213_TR24-SR-T_US_assembly_en-us 4.7cv	B213+TR24-SR-T US
<a href="#">V-12</a>	Belimo	Belimo_B213_TR24-3-T_US_assembly_en-us 4.7cv	B213+TR24-3-T US
<a href="#">V-14</a>	Belimo	Belimo_B211_TR24-3-T_US_assembly_en-us 1.9cv	B211+TR24-3-T US
<a href="#">V-15</a>	Belimo	Belimo_B209_TR24-3-T_US_assembly_en-us 0.8cv	B209+TR24-3-T US
<a href="#">V-16</a>	Belimo	Belimo_B212_TR24-3-T_US_assembly_en-us 3cv	B212+TR24-3-T US
<a href="#">V-18</a>	Belimo	Belimo_B208_TR24-3-T_US_assembly_en-us 0.46cv	B208+TR24-3-T US
<a href="#">V-19</a>	Belimo	Belimo_B210_TR24-3-T_US_assembly_en-us 1.2cv	B210+TR24-3-T US
<a href="#">V-2</a>	Belimo	Belimo_B312_TR24-SR-T_US_assembly_en-us 3cv	B312+TR24-SR-T US
<a href="#">V-3</a>	Belimo	Belimo_B207_TR24-SR-T_US_assembly_en-us 0.3cv	B207+TR24-SR-T US
<a href="#">V-4</a>	Belimo	Belimo_B211_TR24-SR-T_US_assembly_en-us 1.9cv	B211+TR24-SR-T US
<a href="#">V-5</a>	Belimo	Belimo_B209_TR24-SR-T_US_assembly_en-us 0.8cv	B209+TR24-SR-T US
<a href="#">V-6</a>	Belimo	Belimo_B212_TR24-SR-T_US_assembly_en-us 3cv	B212+TR24-SR-T US
<a href="#">V-7</a>	Belimo	Belimo_B313_TR24-SR-T_US_assembly_en-us 4.7cv	B313+TR24-SR-T US
<a href="#">V-8</a>	Belimo	Belimo_B208_TR24-SR-T_US_assembly_en-us 0.46cv	B208+TR24-SR-T US
<a href="#">V-9</a>	Belimo	Belimo_B210_TR24-SR-T_US_assembly_en-us 1.2cv	B210+TR24-SR-T US
<a href="#">ETH-2B</a>	CTR-Link	5 Port 10/100/1000 Ethernet Switch DIN-rail Mount, bulk	EISK5-GT
<a href="#">MSX-W12-IN-LCD</a>	Dwyer	Press Trans 0-1/2' 3", Panel, LCD Display	MSX-W12-IN-LCD
<a href="#">PT-999</a>	Dwyer	Press Trans 0-1/25.5" UniDirect., Panel, No Display	MS2-W101
<a href="#">PT-9LCD</a>	Dwyer	Press Trans 0-1/25.5" BiDirect., Panel, LCD Display	MS2-W20-IN-LCD
<a href="#">PT-DM</a>	Dwyer	Press Trans 0-1/2/3' 5", Panel, No Display	MS2-W12-IN-WO
<a href="#">LED-998</a>	Federal Signal	LED Audible/Visual Signal - Wall Bracket	LWMB2
<a href="#">LED-999</a>	Federal Signal	LED Audible/Visual Signal (Platt #0089499)	AV1-LED-024R
<a href="#">RIB-1N4</a>	Functional Devices	SPDT, 24-120vac in,10amp,Encl Relay,1/3 HP@120, Nema 4	RIBU1C-N4
<a href="#">UPS-B</a>	Functional Devices	UPS Interface Module	PSM2RB10
<a href="#">XF-C5</a>	Functional Devices	100 VA, 120-24vac Transformer	TR100VA002
<a href="#">XF-C70</a>	Functional Devices	500va Transformer 480/277/240/120 (5) Separated 24vac Secondaries	PSH500A10-LVC
<a href="#">XF-C700</a>	Functional Devices	500va Transf 480/277/240/120 (5) 24vac Circuits, No Encl	PSMN500A
<a href="#">XF-C91</a>	Functional Devices	24vac Input, 300ma 24vac Output - Power Supply	PSM24A2DAS
<a href="#">EN-03A</a>	Hoffman	8X6X4 Small Enclosure, Hinge, No Backplate (xfrm)	A-HE 8X6X4
<a href="#">EN-08</a>	Hoffman	12X12X8 Small Encl, Hinge, No Backplate (frg cltr, 4Xfmr)	A-HE12X12X4
<a href="#">EN-990</a>	Hoffman	Nema 4 20x20x8 Hinged Door, No Backplate	A-20H20BLP
<a href="#">EN-991</a>	Hoffman	Nema 4 Back Panel 17x17	A-20P20
<a href="#">EN-992</a>	Hoffman	Nema 4 20x24x8 Hinged Door, No Backplate	A-20H24BLP
<a href="#">EN-993</a>	Hoffman	Nema 4 Back Panel 21x17	A-24P20
<a href="#">EN-994</a>	Hoffman	Nema 4 60x36x8 Hinged Door, No Backplate	A-60H36BLP
<a href="#">EN-995</a>	Hoffman	Nema 4 Back Panel 57X33	A-60P36
<a href="#">GRN-01</a>	Hoffman	Large Grounding Kit	LLGK
<a href="#">DIN-R1</a>	Kele & Associates	Relay Track - Steel, three ft section	DIN-3F
<a href="#">Panel-5</a>	Kele & Associates	End section (one required), gray	Fem6
<a href="#">Panel-9</a>	Kele & Associates	Top mount, blank white strips for terminal marking, 19.7"	RTM7
<a href="#">TBM-16</a>	Kele & Associates	DIN Rail Single Terminal Block, 25A, 600VAC/DC, narrow	M4/6
<a href="#">TBM-938</a>	Kele & Associates	DIN Rail Terminal End Stop	BAM4
<a href="#">TBM-915</a>	Kele & Associates	Jumper bar for M4/6,D2, 10 poles per bar	BJS61_1SNA168485R2700
<a href="#">TBM-916</a>	Kele & Associates	Jumper Bar Hardware, Package of 10	EV6D_1SNA168400R600
<a href="#">SPP-990</a>	Mamac/Dynacon	Static Pressure Probe - 4" Stainless Steel	520-1B-1
<a href="#">Q2-999</a>	MSA	Ultima X5000 4-20ma=25% O2 with alarm relay	Ultima X5000
<a href="#">LGPANDUIT2</a>	Panduit	2" PANDUIT Cover, 6' long	C2LG6
<a href="#">LGPANDUIT2-4</a>	Panduit	2" PANDUIT 4" high, 6' long	F2X4LG6
<a href="#">LGPANDUIT3</a>	Panduit	3" PANDUIT Cover, 6' long	C3LG6
<a href="#">LGPANDUIT3-4</a>	Panduit	3" PANDUIT 4" high, 6' long	F3X4LG6
<a href="#">LGPANDUIT4</a>	Panduit	4" PANDUIT Cover, 6' long	C4LG6
<a href="#">LGPANDUIT4-4</a>	Panduit	4" PANDUIT 4" high, 6' long	F4X4LG6
<a href="#">PCI-999</a>	Phoenix	Phoenix Integrator	PCI8010-LNND-DIS-OPL
<a href="#">UPS-999</a>	Schneider Electric	APC DIN rail panel mount UPS Standard Battery 500VA - 120V	SUA500PDR-S
<a href="#">PT-VAV</a>	Setra Systems, Inc.	0-1.5 Differential Pressure Transducer 4-20ma	2641-1R5WD-11-T1-C

## Product Data

### *Stainless Plate Sensor*



### **TS-1101-WA-10-AA**

#### *Features*

- \* Temperature Only
- \* Brushed Stainless Plate
- \* High Accuracy
- \* High Durability
- \* 2-year Warranty
- \* ROHS Compliant

### Product Description

The **TS-1101-WA-10-AA** stainless plate is a single point temperature sensor with an output of 10K Ohms at 77°F (**25°C**). The temperature sensor has an overall accuracy of  $\pm 0.36^{\circ}\text{F}$  (**0.2°C**) over the range of 32 to 158°F (**0 to 70°C**).

The **TS-1101-WA-10-AA** stainless plate temperature should be mounted on an interior wall away from windows, heating and cooling supply vents, doors, and sunlight. All of the sensors have a 1/8" integral foam insulation pad to eliminate any thermal effects on the sensor from within the wall itself.

Each **TS-1101-WA-10-AA** sensor shall have two (2) 22 AWG yellow Etched Teflon lead wires for making all connections. The sensor is encapsulated to the stainless steel plate with the use of a thermally conductive epoxy. The normal operating temperature of these sensors should be from -40 to 212°F (**-40 to 100°C**).

The **TS-1101-WA-10-AA** wall plate is both non-polarity and non-position sensitive.

There are a number of applications in which the **TS-1101-WA-10-AA** sensors may be used to monitor and control the building temperature. A few of the most common applications include:

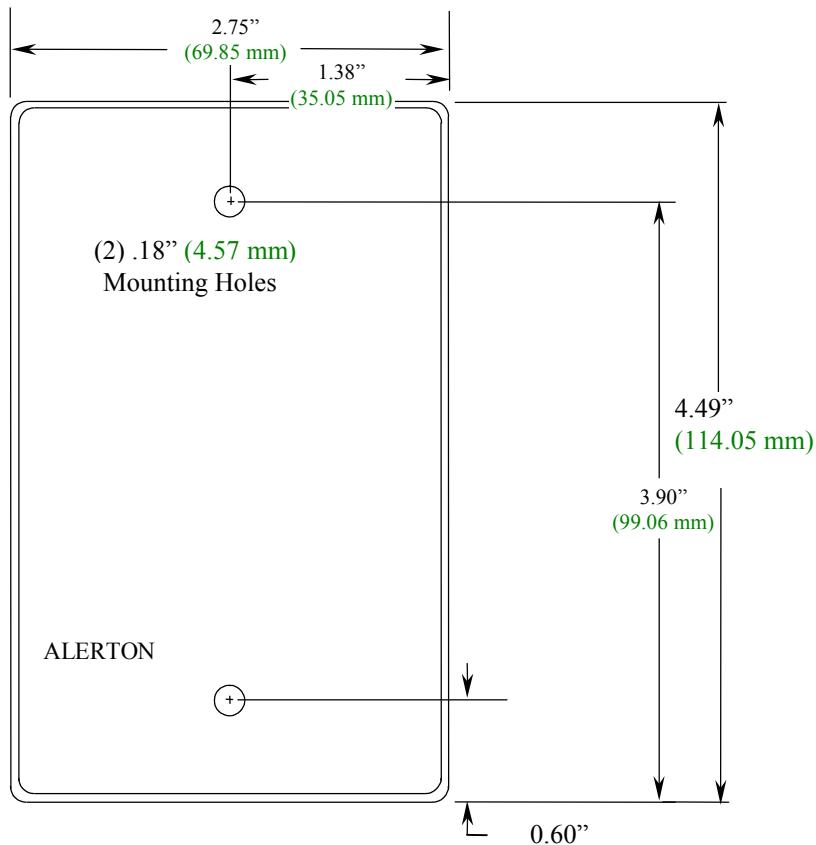
- Office Buildings
- Schools
- Locations where durability is essential
- Applications in which a traditional thermostat is not acceptable

All of these units come with a two-year warranty. For more information regarding these products, please contact ACI at the numbers listed below, or visit our website address at [www.workaci.com](http://www.workaci.com) for all of the up to date product literature.

### Product Specifications

<b>Sensor Output</b>	10K Ohms @ 77°F ( <b>25°C</b> )	<b>Operating Temperature Range</b>	-40 to 212°F ( <b>-40 to 100°C</b> )
<b>Sensor Accuracy</b>	$\pm 0.36^{\circ}\text{F}$ ( <b>0.2°C</b> ) 32 to 158°F ( <b>0 to 70°C</b> )	<b>Operating Humidity Range</b>	0 to 90% RH non-condensing
<b>Sensor Interchangeability</b>	$\pm 0.36^{\circ}\text{F}$ ( <b>0.2°C</b> ) 32 to 158°F ( <b>0 to 70°C</b> )	<b>Environmental Compliance</b>	RoHS-Directive 2002/95/EC
<b>Dissipation Constant</b>	3mW / °C nominal (Still Air)		

## Dimensions



Temp. C	Temp. F	10K(TypeII) (R Ohms)
0	32	32,692.05
5	41	25,418.83
10	50	19,915.94
15	59	15,719.62
16	60.8	15,005.91
17	62.6	14,328.62
18	64.4	13,685.69
19	66.2	13,075.22
20	68	12,495.39
21	69.8	11,944.51
22	71.6	11,420.98
23	73.4	10,923.32
24	75.2	10,450.10
25	77	10,000.00
26	78.8	9,571.78
27	80.6	9,164.26
28	82.4	8,776.33
29	84.2	8,406.96
30	86	8,055.16
31	87.8	7,720.01
32	89.6	7,400.64
33	91.4	7,096.22
34	93.2	6,805.98
35	95	6,529.19
40	104	5,324.13
45	113	4,366.54
50	122	3,601.05

## Ordering Information

Alerton Model #	Sensor Type	Wire Colors
→ TS-1101-WA-10-AA	10K Ohms	Yellow / Yellow

*These units are manufactured for Alerton by Automation Components, Inc.*



## ACM GLOBAL CONTROLLER

The backbone of Alerton's BACtalk™ Ascent product line, the Ascent Control Module (ACM) is the industry's most agile controller in its class. It combines Alerton's pioneering and proven BACnet® capability with Tridium's® Niagara Framework® flexibility.

It provides a powerful assortment of features such as multiple global controller instances, and multiple communication networks.

The ACM can incorporate up to six (6) global controller instances and supports up to six (6) MS/TP trunks or EIA-485 LANs, consolidating the functionality of these controllers into a single configurable platform, and exceeding the functionality of six individual devices.

Two onboard Ethernet ports support 10/100/1000 Mbps Ethernet connections to the BACnet network, Modbus TCP or for NiagaraAX integration protocols such as LON IP and SNMP.

Easy to add option cards offer scalability for additional communication trunks as needed using the two slots available on the ACM. For example, you can use one option card slot for additional BACnet communication and the second card slot for LON communication by simply adding a dual 485 card and a LON card, respectively. Or you can use up to four card slots to support applications with large point count requirements for a central plant.

The ACM's quad-core processor future-proofs the system by providing high DDC execution speed for all the computing power you need. Two-direction DIN channel and direct panel mount options enable you to mount the ACM in different positions for the best fit.

The ACM hosts automation features such as schedules, trendlogs, alarms, zones and demand limiting.

## FEATURES AND HIGHLIGHTS

### SCALABLE

- Supports up to six EIA-485 LANs; two EIA-232 connections; two LON LANs; four TUX trunks; or 4 EXP trunks.

### INTEROPERABLE

- Supports the BACnet Protocol on Ethernet, BACnet IP, and MS/TP; Modbus TCP and RTU (EIA-485 and EIA-232); Alerton TUX, Alerton EXP, as well as many Niagara supported protocols.

### ENTERPRISE READY

- Supports BACnet/IP and can operate as a BACnet broadcast management device (BBMD) with NAT support for integration on enterprise and wide-area networks.

### POWERFUL

- Advanced processor and extended memory provide a fast, reliable platform for running DDC programming and global automation routines.

### SEGMENTED DDC CODE

- Allows multiple DDC program instances to run within a single controller, providing the ability to logically group sub-systems, improve uptime by enabling service on one system without impacting another, and maximizing flexibility in programming configuration.

## TECHNICAL DATA: ACM

**POWER** 20-30 VAC @ 40 VA, 47–63 Hz, full-wave rectified, with optional battery backup (see other side).

**DATA BACKUP/STORAGE** One removable microSD card.

**PROCESSOR AND MEMORY** Efficient, high-speed, quad-core CPU based on the ARM® Cortex™-A9 architecture (Freescale i.MX6Quad); 1GB DDR3 SDRAM, 64-bit-wide, 533 MHz (1066 MT/s).

**REAL-TIME CLOCK** Provides system date and time.

**BACNET/IP** IP support for interoperability on enterprise and WANs. Functions as up to four BACnet broadcast management devices (BBMDs) in accordance with Annex J BACnet/IP. Supports both Alerton and BACnet Standard network address translation (NAT) implementations.

**MS/TP** Supports two onboard networks that can be used for BACnet MS/TP or EIA-485 and up to two expansion cards (two networks each) for a maximum of six BACnet MS/TP networks per ACM.

**MODBUS** supports both TCP and RTU (EIA-485 and EIA-232) protocols; configuration supports up to 384 Modbus devices.

**TUX** Supports up to four Alerton TUX trunks for connection of up to 64 TUXs per trunk communicating at 4800/9600 baud or up to 32 TUXs per trunk communicating at 1200 baud. Each TUX Option Card has two TUX trunks.

**VLX/EXP** Supports up to four instances of the VLX application; one instance is included with the ACM.

**EXPANSION** Supports up to two expansion cards for interface adapters, such as EIA-485, EIA-232, LON, and TUX.

**COMMUNICATIONS** Provides two Ethernet ports, two onboard EIA-485 networks, two expansion card slots give the ability to add up to four additional EIA-485 networks (for a total of six), or two EIA-232 connections, or two LONworks networks, or up to four TUX Trunks.

**MOUNTING** 35mm DIN rail, either vertical or horizontal orientation.

**DIMENSIONS** 7-1/4 W x 8-9/16 H x 1-11/16 D (inches)

185 W x 220 H x 44 D (millimeters); fits 12 x 12 x 4 (inch) panel enclosure.

**ENVIRONMENTAL** Without battery:

-4 to 149 °F (-20 to 65 °C), 0 to 95% RH, non-condensing.

Storage Temperature:

-4 to 185 °F (-20 to 85 °C), 0 to 95% RH, non-condensing.

**PLATFORM** Linux.

**ETHERNET** Two integrated 8P8C modular connectors for use with two 10Base-T, 100Base-TX, and 1000Base-T Ethernet networks.

**SOFTWARE** Programming interface is Alerton Compass operator workstation software. Niagara AX 3.8.

#### CERTIFICATIONS AND STANDARDS

- RoHS compliant
- CE (EN 60730-1)
- FCC Part 15 Class B
- ICES-003
- C-Tick listed
- UL 916 for open energy management equipment.

#### TECHNICAL DATA: ACM BATTERY

The ACM has an optional 12 volt NiMH battery, which provides backup power that allows for orderly shutdown should power remain OFF for more than 60 seconds.

**POWER** 12 VDC supply voltage

#### ENVIRONMENTAL

Operational temperature and humidity:

32 to 122 °F (0 to 50 °C), 0 to 95% RH, non-condensing

Recommended storage temperature and humidity (to extend life):

41 to 77 °F (5 to 25°C), RH 65%  $\pm$ 5% non-condensing

Allowed storage temperature and humidity:

32 to 122 °F (0 to 50 °C), RH 5 to 95% non-condensing

#### CERTIFICATIONS AND STANDARDS

- UL 2054 ed 2 rev 2011-09-14
- EN 62133 ed 1 (2002), ed 2 (2012)

#### TECHNICAL DATA: TUX OPTION CARD

Each card has two TUX trunks - a total of four TUX trunks can be added in an ACM.

#### ENVIRONMENTAL

Operational temperature and humidity:

-4 to 149 °F (-20 to 65 °C), 5 to 95% RH, non-condensing

Storage temperature and humidity:

-40 to 149 °F (-40 to 65 °C), 5 to 95% RH, non-condensing

#### CERTIFICATIONS AND STANDARDS

- (Same as ACM)

#### ORDERING INFORMATION\*

##### ITEM NUMBER

ACM	Ascent Control Module
ACM-BATT	Optional ACM battery
ACM-OC-2X485	Dual EIA-485 option card
ACM-OC-232	EIA-232 option card
ACM-OC-LON	78kbps FTT10A LON option card
ACM-OC-2XTUX	Dual TUX Trunk option card
ACM-MDBS-DR-TCP	Alerton Modbus TCP protocol driver
ACM-MDBS-DR-RTU	Alerton Modbus RTU protocol driver
ACM-DR-VLX	Alerton VLX driver

\***IMPORTANT!** Requires at least one base device license, Alerton (ACM032, ACM064, ACM128, ACM256, ACM384) or Niagara AX (AX016, AX032, AX064, AX128, AX256). Add-on Device packs also available for both Alerton and Niagara AX base licenses.

For a list of supported Niagara AX protocols, please consult your local Alerton authorized dealer.

*Specifications subject to change without notice.*

INNOVATIVE  
GLOBAL  
CONTROLLER  
WITH EXTENSIVE  
FLEXIBILITY.



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# AXM DATA SHEET

ATS BOM Tag: ACM-1, Manufacture's P/N: AXM-10-4-8



## EXPANSION MODULES (AXMS) PROVIDE I/O CAPABILITY FOR THE ASCENT ACM.

The versatile ACM/AXM configuration is the ideal choice for applications that put a premium on versatility, reliability, and performance—large air handling units, central plant systems, motor control centers, and other applications with numerous, interdependent control points.

AXMs connect to the ACM over a simple, twisted-pair, multi-drop AXM communications bus. The ACM supervises automation locally and provides connection to a BACnet internetwork. Combine a maximum of 8 AXMs per ACM for the I/O count your application requires.

Each AXM output has a Hand-Off-Auto (H-O-A) switch for manual override at the controller. Analog outputs also include a potentiometer to manually adjust the output when the switch is in Hand mode.

AXMs feature a high-speed microprocessor with flash memory for non-volatile program storage. The 12-bit universal inputs are software configurable to accept virtually any input type. CMOS circuitry, a four-layer circuit board with separate ground plane, and extensive hardware, software, and power-supply filtering ensure reliable and stable operation. The CMOS processor uses an internal watchdog, and power supply voltage is monitored to provide automatic shutdown and data backup.

	Universal Inputs	Binary Outputs	Analog Outputs
AXM-10-12-0	10	12	0
AXM-10-4-8	10	4	8
AXM-22-0-0	22	0	0



### FEATURES

#### Scalable

Combine up to 8 AXM modules with a single ACM to create versatile control solutions.

#### Versatile

Onboard Hand-Off-Auto (H-O-A) switches and potentiometers enable manual override of outputs. Binary triac outputs and analog outputs are designed for complex applications.

#### Accurate

12-bit universal inputs accept a variety of industry-standard inputs, enabling wide application flexibility.

## Technical Data

**Power** - Unit requires 24 VAC, 50-60 Hz, 20 VA minimum. Half-wave rectified. Output loads powered separately.

**Inputs** - Jumper-selectable, 12-bit universal inputs accept thermistor, dry contact, 0-5VDC, 4-20 mA, or 0-10 VDC signals. Inputs 1, 2, and 3 support pulsed inputs with 10 msec minimum pulse length. No external resistor is required for 4-20 mA.

**Binary Outputs** - Binary outputs rated 24 VAC @ 0.5 A with Hand-Off-Auto (H-O-A) switches for manual override. H-O-A status can be monitored in software. Power source isolated from AXM power.

**Analog Outputs** - Analog outputs are driven by precision D/A converter. DIP-switch configurable to provide 0-10 VDC or 0-20 mA. Each analog output has an H-O-A switch and potentiometer for manual override. H-O-A and potentiometer status can be monitored in software.

**Max Dimensions** - 6.95" (176.5 mm) H X 4.95" (125.7 mm) W X 1.6" (40.5 mm) D.

**Terminations** - Removable header-type screw terminals simplify field wiring

**Environmental** - 32-131°F (0-55°C). 0-95% RH, non-condensing

**Communications** - Twisted-pair, multi-drop AXM communications bus to ACM base unit.

### Ratings

- Listed Underwriters Laboratory for Energy Management Equipment (PAZX) under the UL Standard for Safety 916. Listing includes both U.S. and Canadian certification.
- EN 60730-1 (European CE Mark).
- ICES-003 Issue 6.
- FCC Part 15, Subpart B, Section 15.107 & 15.109, Class B.



## Ordering Information

# ALERTON

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Item Number	Description
<b>AXM-10-12-0</b>	I/O expansion module with 10 inputs and 12 binary outputs
<b>AXM-10-4-8</b>	I/O expansion module with 10 inputs, 4 binary outputs, and 8 analog outputs
<b>AXM-22-0-0</b>	I/O expansion module with 22 inputs

## Installation Instructions

**WARNING!** Install all equipment in accordance with the National Electric Code and in a manner acceptable to the local authority having jurisdiction. Read these instructions and the ACM Installation & Operations Guide (LT-ACMIOG) carefully before installing equipment. Failure to follow all instructions may result in equipment damage or a hazardous condition.

**ATTENTION!** Installez tout le matériel en conformité avec le Code national de l'électricité et d'une manière acceptable pour l'autorité locale compétente. Lisez ces instructions et le guide d'installation et fonctionnement de l'ACM (LT-ACMIOG) avant l'installation du matériel. Le non respect des instructions peut entraîner des dommages matériels ou une situation dangereuse.

## Overview

This document covers installation of the optional 12 volt NiMH battery, which provides backup power that ensures data retention and orderly shutdown. Replace only with ACM Battery.

**Note** Installing the ACM Battery changes the ambient temperature range of the ACM to 32 °F (0 °C) to 122 °F (50 °C).

## Specifications

**Supply Voltage:** 12VDC

**Operating Temperature:** 0°C to 50°C (0°F to 122°F)

**Operating Humidity:** RH 5% to 95%, non-condensing

**Storage Temperatures:** 5°C to 25°C (41°F to 77°F)

recommended storage temperature to extend life;

0°C to 50°C (32°F to 122°F) allowed storage temperature

**Storage Humidities:** RH 65% ±5% non-condensing

recommended storage humidity to extend life;

RH 5% to 95%, non-condensing allowed storage humidity

**Dimensions (L x W x H):** See Fig. 1

**Weight:** 0.80 lbs. (0.36 Kg)

**Agency Listing:** UL 2054 ed 2 rev 2011-09-14;

EN 62133 ed 1 (2002), ed 2 (2012)

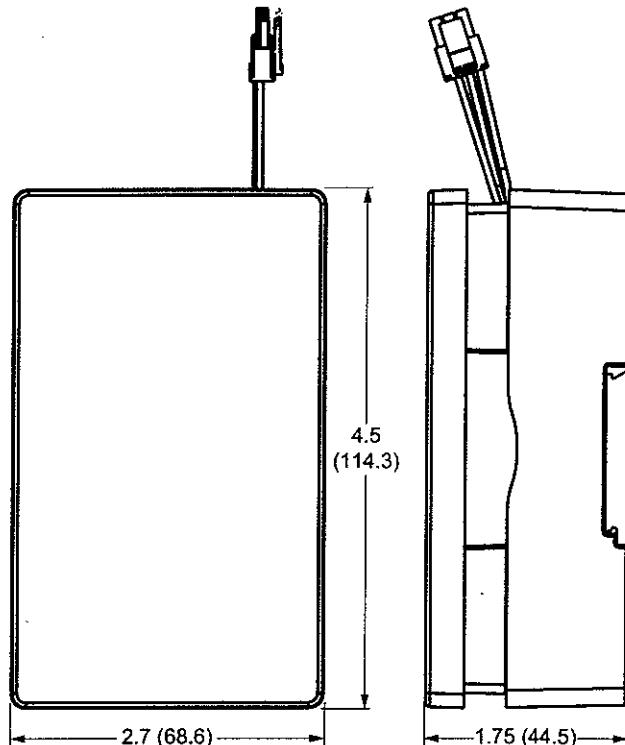
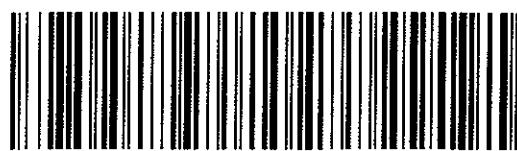


Fig. 1 ACM Battery dimensions in in. (mm).

## Installation

The ACM Battery can be mounted on EN50022 standard 7.5mm x 35mm DIN rail or panel mount.

- **To connect the ACM Battery to an ACM:**
  - 1 Open the lid covering the ACM's terminals (left side lid).
  - 2 Plug the Molex connector shell into the ACM Battery port. See Fig. 2.
  - 3 Choose either DIN rail or panel mounting.

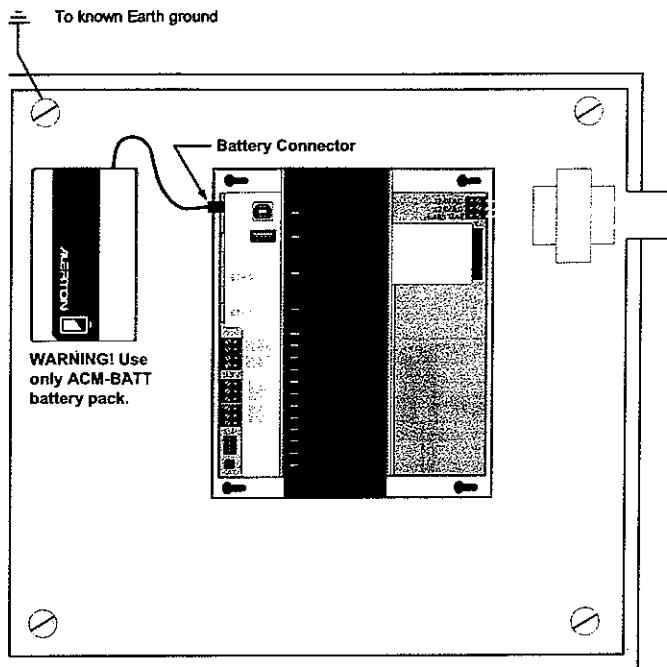


Fig. 2 ACM Battery connection.

**4 For DIN rail Mounting:**

- Holding the ACM Battery with its top tilted in toward the DIN rail, hook the two retaining tabs on the back of the ACM Battery onto the top of the DIN rail.
- Push down and in to latch the two bottom latching tabs of the ACM Battery onto the DIN rail

—OR—

**4 For Panel Mounting:**

- Remove the ACM Battery cover and battery pack.
- Use the mounting holes in the back cover to attach it to the panel with appropriate fasteners (not included). See Fig. 3.
- Replace the battery pack and cover.

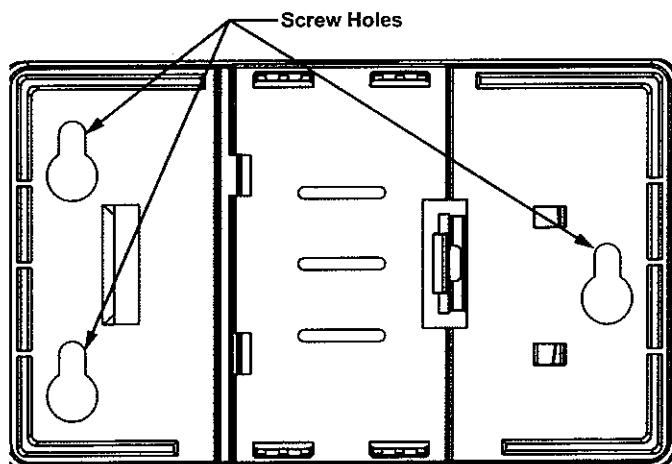


Fig. 3 ACM Battery screw holes.

- Close the ACM lid and restore power to the ACM, if necessary.

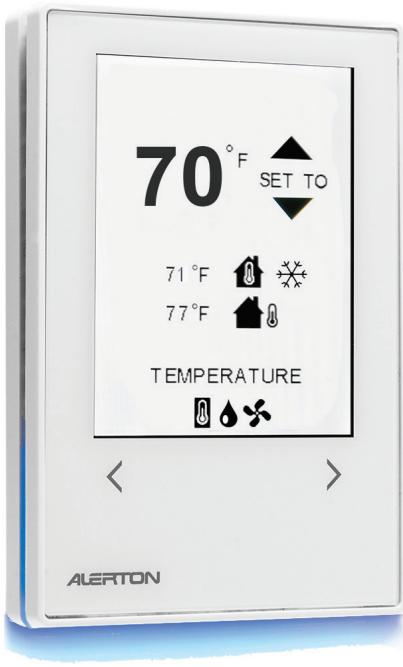
## Charging

The ACM Battery is charged by the ACM controller.

## Servicing

The ACM Battery is installed or replaced as a single unit, and cannot be field serviced. The cover should only be removed to access screw holes for panel installation.

Part Number	Description
ACM	Ascent Control Module (ACM) global controller base unit, including power, BACnet MS/TP, TCP/IP, BACnet/Ethernet, and BACnet/IP
<b>Licenses: Alerton*</b>	
ACM032	Licenses the ACM for capacity of 32 directly connected devices
ACM064	Licenses the ACM for capacity of 64 directly connected devices
ACM128	Licenses the ACM for capacity of 128 directly connected devices
ACM256	Licenses the ACM for capacity of 256 directly connected devices
ACM384	Licenses the ACM for capacity of 384 directly connected devices
<b>Licenses: NiagaraAX</b>	
AX016	Licenses the ACM with device capacity of 16 AX devices
AX032	Licenses the ACM with device capacity of 32 AX devices
AX064	Licenses the ACM with device capacity of 64 AX devices
AX128	Licenses the ACM with device capacity of 128 AX devices
AX256	Licenses the ACM with device capacity of 256 AX devices
<b>Device Packs: Alerton**</b>	
AL-DP-4	Increases Alerton device capacity on the ACM by 4
AL-DP-32	Increases Alerton device capacity on the ACM by 32
AL-DP-64	Increases Alerton device capacity on the ACM by 64
AL-DP-128	Increases Alerton device capacity on the ACM by 128
AL-DP-256	Increases Alerton device capacity on the ACM by 256
<b>Device Packs: AX***</b>	
AX-DP-32	Increases AX device capacity on the ACM by 32
AX-DP-64	Increases AX device capacity on the ACM by 64
AX-DP-128	Increases AX device capacity on the ACM by 128
<b>Drivers: AX</b>	
I-WP-AX-WEB	Alerton Embedded Workbench version 3.8. The ACM has an "OPEN" NIC Statement by default, but can be closed by the dealer through Niagara Central
I-DR-BACNET-AX	BACnet IP Client over Ethernet (discover and map BACnet devices into AX)
I-DR-BAC-SR-AX	BACnet Server (includes BACnet IP Client driver) – (discover, map, create BACnet objects into AX) Enterprise Driver (Note: When using this driver, there is no need to purchase the I-DR-BACNET-AX driver)
I-DR-BAC-SR-EXP-AX	BACnet Server only; add IP Server (must order BACnet Client driver separately) – (Create BACnet objects) Enterprise Driver (Note: For connectivity to MS/TP devices, you must use the I-DR-MSTP-AX driver)
I-DR-ILON-AX	LON® over IP, using CEA-852, communicates through IP/LON router
I-DR-LON-AX	LON® over twisted pair
I-DR-MDB-RTU-AX	Modbus RTU over RS-232 or RS-485
I-DR-MDB-TCP-AX	Modbus TCP over Ethernet
I-DR-SNMP-AX	SNMP over Ethernet
<b>Option Cards: AX</b>	
ACM-OC-2X485	Dual Port EIA-485 Option Card
ACM-OC-232	Single Port EIA-232 Option Card
ACM-OC-LON	78 Kbps FTT 10 A LON® adapter. Uses one of the two option card slots on the ACM.



## MICROSET 4

Alerton's Microset 4 wall sensor offers a sleek, modern look that is a perfect fit in any building. Its strengthened glass touchscreen user interface has the capability to display the setpoint, room, and outside air temperatures. Relative humidity and fan status can also be displayed. A configurable LED Status Light indicator displays heating or cooling status at a glance. The Microset 4 sensor offers several options to meet precise job specifications.

The Microset 4 is fully backward compatible with Alerton's BACtalk™ system, providing users with a tenant control interface, test and balance tool, and field service tool, while enabling them to leverage their existing Alerton devices.

The Microset 4 line of wall sensors includes a model with a carbon dioxide (CO<sub>2</sub>) sensor as well as one with MS/TP capability.

The flexible Microset 4 displays information and allows occupant control according to the application.

Customizable and intuitive operation enables occupants to turn zone HVAC equipment ON or OFF in 30-minute increments for sporadically occupied areas, such as conference rooms, to set window blinds to open or closed, and offers optional control of lights and fan. This makes saving energy easy and supports green standards of building construction and operation.

With its sleek edge-to-edge hardened glass, capacitive touch backlit display, and polished finish, Alerton's Microset 4 wall sensor offers a full complement of features and looks good on any wall.

## FEATURES AND HIGHLIGHTS

### VERSATILE

- Occupants can view setpoint, room, and outside air temperatures, indoor and outdoor humidity (if enabled in programming), select fan status, and change room temperature setpoints. Data and functions are selectable.

### ENERGY EFFICIENT

- Occupants can select after-hours operation in 30-minute increments or turn zone equipment ON and OFF.

### FLEXIBLE

- Robust and easy-to-use test and balance and field service modes allow maintenance personnel to monitor and adjust parameters.

### ATTRACTIVE

- Modern styling enhances any interior, and functional design makes operation intuitive.

## TECHNICAL DATA

### THERMISTOR

The thermistors are integrated with the device. The thermistors and humidity sensors are processed by an onboard microcontroller.

**TYPE** - NTC.

**RESISTANCE** - 100K Ohm at 77 °F (25 °C).

**STABILITY\*** - Maximum 0.036 °F (0.02 °C) drift per year.

**ACCURACY\*** -  $\pm 0.36$  °F over range of 32 to 116 °F (0 to 47 °C);  $\pm 0.19$  °F at 72 °F (22 °C).

\*Based on normal operating conditions.

**POWER** - 24VAC from an energy limited Class 2 transformer.

**POWER CONSUMPTION** - Each Microset 4 requires 3 VA. The sum of all devices should not exceed 85% of the nameplate rating of the transformer.

**PROCESSOR & MEMORY** - ARM Cortex-M4 processor with onboard flash memory.

**DIMENSIONS** - 4.5" H x 3" W x .875" D (114.9mm H x 76.6mm W x 22mm D).

MS4-THC: 4.54" H x 3.04" W x 1.25" D (115.2mm H x 77.2mm W x 31.6mm D).

**ENVIRONMENTAL** - 32 to 140 °F (0 to 60 °C); 0 to 90% RH, non-condensing.

Specifications subject to change without notice.

## CO<sub>2</sub> SENSOR

**OPERATING TEMPERATURE RANGE** - 32 to 122 °F (0 to 50 °C).

**POWER CONSUMPTION** - 1.5 mA for measurement every 30s; 0.74 mA for measurement every 60s; 86 µA for measurement every 15 min; 52 µA for measurement every 60 min.

**MEASUREMENT RANGE** - 0 to 5000 ppm.

**ACCURACY** - ± 30 ppm, ± 3% of reading.

## HUMIDITY SENSOR

**OPERATING TEMPERATURE RANGE** - 50 to 113 °F (10 to 45 °C).

**REPEATABILITY** - Minimum ± 0.5% RH.

**ACCURACY** - ± 3% at 10 to 90% RH,  
± 5% at 0 to 10% and 90% to 100%RH.

**RATINGS** - UL Standard for Safety 916;  
EMC Directive 89/336/EEC (European CE Mark)  
FCC Part 15.107 & 109, Class B, CFR47-15.

## ORDERING INFORMATION

### ITEM NUMBER

MS4-TH	Microset 4 with temperature and humidity sensors
MS4-TH-NL	Microset 4 with temperature and humidity sensors and no logo
MS4-TH-MSTP	MS/TP Microset 4 with temperature and humidity sensors
MS4-THC	Microset 4 with temperature, humidity, and CO <sub>2</sub> sensors

**STYLISH  
TOUCHSCREEN  
WALL SENSOR WITH  
TEMPERATURE AND  
HUMIDITY SENSING.**



The Alerton® VisualLogic® VLC-853-E is a versatile, BACnet-compliant, fully programmable field controller designed for central plant systems, air handling units, clean rooms, fume hoods, large terminal units, and similar control and process equipment. As a native BACnet controller, it integrates seamlessly with your BACnet system, communicating at up to 115 Kbps on a BACnet MS/TP LAN.

The VLC-853-E supports the Alerton Microtouch™, as well as the BACtalk® Microset, Microset II, and Microset 4 intelligent wall sensors, which offer convenient data display, setpoint adjustment, and technician access to equipment setup parameters.

All VLC-853-E control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic™. Programming and setup data are stored in non-volatile flash memory, ensuring stable and reliable operation.

High-resolution 16-bit universal inputs are auto-selectable for thermistor, dry contact, pulse, 0-5 V, 0-10 V, or 4-20 mA.

High-resolution 16-bit analog outputs are auto-selectable for 0-10 V or 0-20 mA.

## VISUALLOGIC® UNITARY FIELD CONTROLLER

### FEATURES AND HIGHLIGHTS

- Fully BACnet-compliant on MS/TP LAN at up to 115.2 Kbps.
- Programmable control logic can be field-modified.
- Downloadable operating code to allow for future software improvements.
- 32-bit processor architecture with all program data backed up in nonvolatile flash memory.
- High-speed processing of DDC program, with an internal logical loop time of 100 msec.
- Backwards compatible with older VLC-853 and VLC-853C3 models.

### APPLICATIONS

Recommended for central plant systems, air handling units, large terminal units, and similar control and process equipment.



### VLC-853-E

UI	HBO	GBO	RO	AO	AF	F
UNIVERSAL INPUTS	HOT SWITCHED TRIAC BINARY OUTPUTS	GROUND SWITCHED BINARY OUTPUTS	RELAY OUTPUT	ANALOG OUTPUTS	AIR-FLOW SENSOR	FILTER

**TECHNICAL DATA**

**POWER** – 24 VAC @ 50-60 Hz. 15 VA minimum (maximum 97VA with loads). Half-wave rectified.

**INPUTS** – 16-bit universal inputs accept 3k (Ibex) or 10k thermistor (type II), dry contact, 0-20 mA, 0-10 V, 0-5V, or dry-contact pulse. External 250-ohm resistor required for 0-20 mA inputs. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5mS ON / 5mS OFF (pulse input not supported on IN-0).

**POWER OUTPUT FOR EXTERNAL SENSORS** – 20 VDC  $\pm 10\%$  @100 mA maximum

**BINARY OUTPUTS** – Triacs rated 24 VAC @ 50/60 Hz, 500 mA continuous and 800 mA (AC rms) for 60 milliseconds.

**ANALOG OUTPUTS** – 16-bit universal analog outputs support Voltage Mode: 0-10 VDC @ 10 mA maximum (1k ohm minimum); Current Mode: 4-20 mA @ 550 ohms Maximum.

**MICROSET** – Supports BACtalk® Microset, Microset II, or Microset 4 on input 0 (IN-0).

**INPUT/OUTPUT TERMINATIONS** – Removable header-type screw terminals accept 14-24 AWG wire.

**MAX DIMENSIONS** – 4.9" (125mm) H x 5.4" (137mm) W x 1.4" (36mm) D

**MOUNTING** – Screw mounting

**ENVIRONMENTAL** – 0 to 158°F (-17 to 70°C) / 5 to 95%RH, non-condensing

**COMMUNICATIONS** – EIA-485 (RS-485) over twisted shielded-pair (TSP); auto-baud switching (9.6kbps, 19.2kbps, 38.4kbps, 76.8kbps, or 115.2kbps); communication status LED.

**PROTOCOLS** – BACnet MS/TP (master)

**PROGRAMMING** – Supports Alerton's BD4 DDC file format using Alerton's VisualLogic® toolset.

**MICROPROCESSOR** – 32-bit ARM Cortex-M4F, 80 MHz

**MEMORY** – 512 MB non-volatile flash.

**SECURITY** – Integrated secure boot prevents loading of tampered firmware.

**ORDERING INFORMATION****ITEM NUMBER**

VLC-853-E ALERTON VISUALLOGIC  
CONTROLLER BACNET

**CERTIFICATION AND CONFORMANCE**

**BACNET CONFORMANCE** – An application specific controller (ASC) level device; tested and approved by BTL. See Protocol Implementation Conformance Statement (PICS). BTL Listing and compliance is pending.

**UL** – Listed Underwriters Laboratory for Open Energy Management Equipment (PAZX) under the UL Standard for Safety 916; listing includes both U.S. and Canadian certification.

**EMC** – EMC Directive 89/336/EEC (European CE Mark).

**FCC** – This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



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The Alerton® VisualLogic® VLC-550-E is a versatile, BACnet-compliant, fully programmable field controller designed for fan coils, a/c-units, heat pumps, and other terminal unit applications. As a native BACnet controller, it integrates seamlessly with your BACnet system, communicating at up to 115 Kbps on a BACnet MS/TP LAN.

The VLC-550-E supports the Alerton Microtouch™, as well as the BACtalk® Microset, Microset II, and Microset 4 intelligent wall sensors, which offer convenient data display, setpoint adjustment, and technician access to equipment setup parameters.

All VLC-550-E control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic™. Programming and setup data are stored in non-volatile flash memory, ensuring stable and reliable operation.

High-resolution 16-bit universal inputs are auto-selectable for thermistor, dry contact, pulse, 0-5 V, 0-10 V, or 4-20 mA.

## VISUALLOGIC® UNITARY FIELD CONTROLLER

### FEATURES AND HIGHLIGHTS

- Fully BACnet-compliant on MS/TP LAN at up to 115.2 Kbps.
- Programmable control logic can be field-modified.
- Downloadable operating code to allow for future software improvements
- 32-bit processor architecture with all program data backed up in nonvolatile flash memory.
- High-speed processing of DDC program, with an internal logical loop time of 100 msec.
- Backwards compatible with older VLC-550 and VLC-550C3 models.

### APPLICATIONS

Recommended for unit ventilator and fan-coil applications, or any application that requires multi-speed fan or motor control.

#### VLC-550-E

UI UNIVERSAL INPUTS	HBO HOT SWITCHED TRIAC BINARY OUTPUTS	GBO GROUND SWITCHED BINARY OUTPUTS	RO RELAY OUTPUT	AO ANALOG OUTPUTS	AF AIR-FLOW SENSOR	F FILTER
5	5	0	0	0	-	-

**TECHNICAL DATA**

**POWER** – 24 VAC @ 50-60 Hz. 9 VA minimum (maximum 90 VA with loads). Half-wave rectified.

**INPUTS** – 16-bit universal inputs accept 3k (Ibex) or 10k thermistor (type II), dry contact, 0-20 mA, 0-10 V, 0-5V, or dry-contact pulse. External 250-ohm resistor required for 0-20 mA inputs. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5mS ON / 5mS OFF (pulse input not supported on IN-0).

**POWER OUTPUT FOR EXTERNAL SENSORS** – 20

VDC ±10% @ 100 mA maximum

**BINARY OUTPUTS** – Triacs rated 24 VAC @ 50/60 Hz, 500 mA continuous and 800 mA (AC rms) for 60 milliseconds.

**MICROSET** – Supports BACtalk® Microset, Microset II, or Microset 4 on input 0 (IN-0).

**INPUT/OUTPUT TERMINATIONS** – Removable header-type screw terminals accept 14-24 AWG wire.

**MAX DIMENSIONS** – 4.9" (125mm) H x 5" (127mm) W x 1.4" (36mm) D

**MOUNTING** – Screw mounting

**ENVIRONMENTAL** – 0 to 158°F (-17 to 70°C) / 5 to 95%RH, non-condensing

**COMMUNICATIONS** – EIA-485 (RS-485) over twisted shielded-pair (TSP); auto-baud switching (9.6kbps, 19.2kbps, 38.4kbps, 76.8kbps, or 115.2kbps); communication status LED.

**PROTOCOLS** – BACnet MS/TP (master)

**PROGRAMMING** – Supports Alerton's BD4 DDC file format using Alerton's VisualLogic® toolset.

**MICROPROCESSOR** – 32-bit ARM Cortex-M4F, 80 MHz

**MEMORY** – 512 MB non-volatile flash.

**SECURITY** – Integrated secure boot prevents loading of tampered firmware.

**ORDERING INFORMATION****ITEM NUMBER**

VLC-550-E ALERTON VISUALLOGIC  
CONTROLLER BACNET

**CERTIFICATION AND CONFORMANCE**

**BACNET CONFORMANCE** – An application specific controller (ASC) level device; tested and approved by BTL. See Protocol Implementation Conformance Statement (PICS). BTL Listing and compliance is pending.

**UL** – Listed Underwriters Laboratory for Open Energy Management Equipment (PAZX) under the UL Standard for Safety 916; listing includes both U.S. and Canadian certification.

**EMC** – EMC Directive 89/336/EEC (European CE Mark).

**FCC** – This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



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## SINGLE-DUCT VARIABLE AIR VOLUME FIELD CONTROLLER

### FEATURES AND HIGHLIGHTS

- Fully BACnet-compliant on MS/TP LAN at up to 115.2 Kbps.
- Programmable control logic can be field-modified.
- Downloadable operating code to allow for future software improvements.
- 32-bit processor architecture with all program data backed up in nonvolatile flash memory.
- High-speed processing of DDC program, with an internal logical loop time of 100 msec.
- Backwards compatible with older VAV-SD2A model.

### APPLICATIONS

Recommended for pressure-independent control of any single-duct variable air volume (VAV) box and fan boxes equipped with a variable speed fan.

The Alerton® VisualLogic® VAV-SD2A-E is a versatile, BACnet-compliant field controller that provides pressure-independent control of any single-duct variable air volume (VAV) box. It is particularly suited for controlling VAV series fan boxes equipped with a variable speed fan. As a native BACnet controller, the VAV-SD2A-E integrates seamlessly with your BACnet system, communicating at up to 115.2 Kbps on a BACnet MS/TP LAN.

The VAV-SD2A-E includes a filter to reduce dust contamination. The VAV-SD2A-E eliminates the need for expensive products and external pressure sensors to control VAV boxes equipped with variable speed fans or analog valves. It features two analog outputs, auto-selectable as either 0–10V or 0–20mA, to control either a variable speed fan, an analog heating valve, or another analog device.

The VAV-SD2A-E supports the Alerton Microtouch™, as well as the BACtalk® Microset, Microset II, and Microset 4 intelligent wall sensors, which offer convenient data display, setpoint adjustment, and technician access to equipment setup parameters.

All VAV-SD2A-E control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic®. Programming and setup data are stored in non-volatile flash memory, ensuring stable and reliable operation. The VAV-SD2A-E contains an integral airflow sensor to provide pressure independent operation of the VAV box. The airflow sensor is factory calibrated at multiple velocity points and is field-adjustable during balancing. Minimum, maximum, and reheat airflows can be entered using a Microset wall unit or compatible operator workstation software.

### VAV-SD2A-E-F

UI UNIVERSAL INPUTS	HBO HOT SWITCHED TRIAC BINARY OUTPUTS	GBO GROUND SWITCHED BINARY OUTPUTS	RO RELAY OUTPUT	AO ANALOG OUTPUTS	AF AIR-FLOW SENSOR	F FILTER
<b>4</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>

## TECHNICAL DATA

**POWER REQUIREMENTS** – 24 VAC @ 50-60 Hz. 12 VA minimum (maximum 72 VA with loads). Half-wave rectified.

**INPUTS** – 16-bit universal inputs accept 3k (Ibex) or 10k thermistor (type II), dry contact, 0-20 mA, 0-10 V, 0-5V, or dry-contact pulse. External 250-ohm resistor required for 0-20 mA inputs. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5mS ON / 5mS OFF (pulse input not supported on IN-0).

**BINARY OUTPUTS** – Triacs rated 24 VAC @ 50/60 Hz, 500 mA continuous and 800 mA (AC rms) for 60 milliseconds.

**ANALOG OUTPUTS** – 16-bit universal analog outputs support Voltage Mode: 0-10VDC @ 10 mA maximum (1k ohm minimum); Current Mode: 4-20 mA @ 550 ohms Maximum.

**MICROSET** – Supports BACtalk® Microset, Microset II, or Microset 4 on input 0 (IN-0).

**INPUT/OUTPUT TERMINATIONS** – Removable header-type screw terminals accept 14-24 AWG wire.

**PRESSURE SENSOR** – 16-bit polarity insensitive pressure sensor. 0-2 in.w.c. (500 Pa) range. 0.0004 in.w.c. (0.1 Pa) zero-point accuracy. 0.5% span repeatability. 1/8-inch x 3/8-inch long barb-fitting.

**FILTER** – In-line filter for pressure sensor included to enhance long-term stability.

**MAX DIMENSIONS** – 4.9" (125mm) H x 5" (127mm) W x 1.4" (36mm) D

**MOUNTING** – Screw mounting

**ENVIRONMENTAL** – 0 to 158°F (-17 to 70°C) / 5 to 95%RH, non-condensing

**COMMUNICATIONS** – EIA-485 (RS-485) over twisted shielded-pair (TSP); auto-baud switching (9.6kbps, 19.2kbps, 38.4kbps, 76.8kbps, or 115.2kbps); communication status LED

**PROTOCOLS** – BACnet MS/TP (master)

**PROGRAMMING** – Supports Alerton's BD4 DDC file format using Alerton's VisualLogic® toolset.

**MICROPROCESSOR** – 32-bit ARM Cortex-M4F, 80 MHz

**MEMORY** – 512 MB non-volatile flash.

**SECURITY** – Integrated secure boot prevents loading of tampered firmware.

## ORDERING INFORMATION

### ITEM NUMBER

VAV-SD2A-E-F ALERTON VAV SINGLE-DUCT  
BACNET CONTROLLER AND FILTER

## CERTIFICATION AND CONFORMANCE

**BACNET CONFORMANCE** – An application specific controller (ASC) level device; BTL Listing and compliance is pending.

**UL** – Listed Underwriters Laboratory for Open Energy Management Equipment (PAZX) under the UL Standard for Safety 916; listing includes both U.S. and Canadian certification.

**CE MARK** – EMC Directive 2014/30/EU.

**RoHS** – RoHS Directive 2011/65/EU.

**FCC** – This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

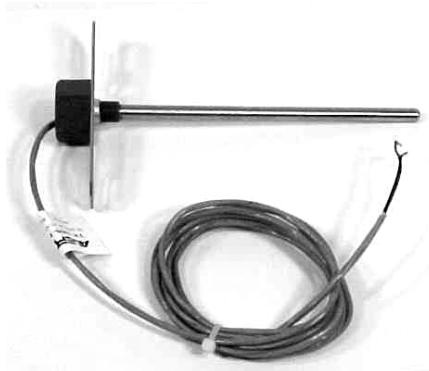


Contents subject to change without notice. \* Pending.

16201 25th Avenue W, Lynnwood, WA 98087  
Telephone: (425) 921-4900 / Fax: (425) 921-4872  
alerton.com / sales@alerton.com

## Product Data

### Duct Sensor w/ Flange and 6 Foot Plenum Cable



#### Product Description

The **TS-2000-FB Series** duct temperature sensors have an output of 3K Ohms at 77°F (**25°C**) and 10K Ohms (Type II) at 77°F (**25°C**). The temperature sensors have an overall accuracy of  $\pm 0.36^{\circ}\text{F}$  (**0.2°C**) for the standard sensors or  $\pm 0.18^{\circ}\text{F}$  (**0.1°C**) for the **TS-2004 FB-10-AA-HI** sensors over the range of 32 to 158°F (**0 to 70°C**).

Each of the sensors is encapsulated in a 0.250" (**6.35 mm**) stainless steel probe with a thermally conductive epoxy. The **TS-2000-FB Series** temperature sensors can be used in environments where the operating temperature is between –40 to 302°F (**-40 to 150°C**).

The **TS-2000-FB Series** duct temperature sensors are both non-polarity and non-position sensitive. Each single point Thermistor sensor is encapsulated in a thermally conductive epoxy that will withstand high

#### Features

### TS-2000-FB Series

- \* **Stainless Steel Probe**
- \* **Fast Response Time**
- \* **High Accuracy**
- \* **6' Teflon Plenum Rated Cable**
- \* **2-year Warranty**
- \* **ROHS Compliant**

operating temperatures and protect the sensor from condensation or moisture.

All of these sensors should be used in environments where the normal operating temperature will be between –40 to 302°F (**-40 to 150°C**).

There are a number of applications in which the **TS-2000-FB Series** may be used to monitor and control the building temperature. A few of the most common applications include:

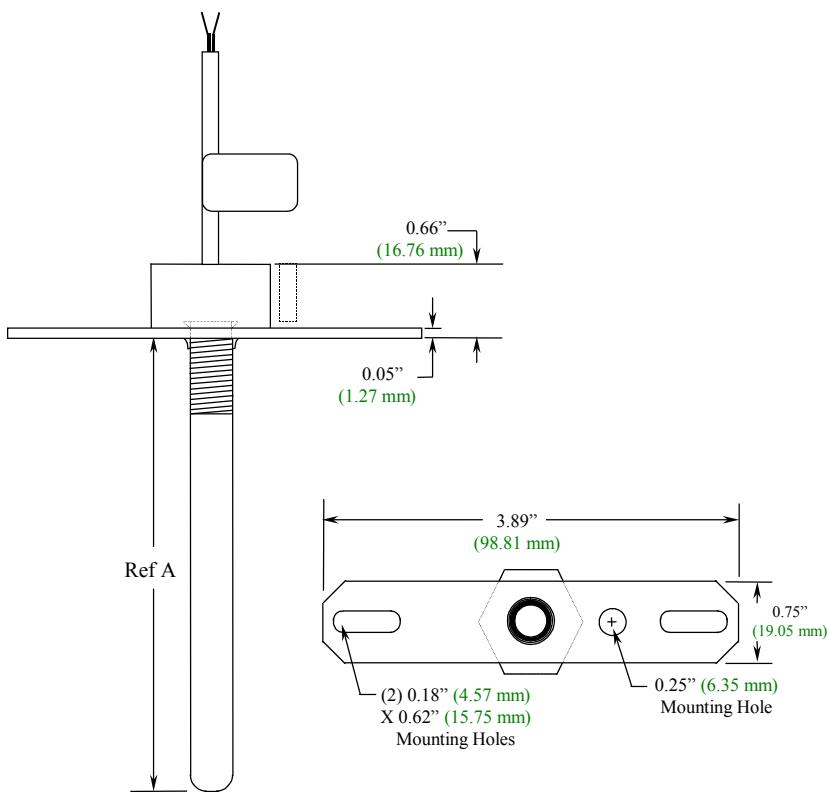
- Return Air Temperature in a Duct or Plenum
- Mixed Air Temperature in a Duct or Plenum
- Monitoring Discharge (Supply) Air Temp.

All of these units come with a two-year warranty. For more information regarding these products, please contact ACI at the numbers listed below, or visit our website address at [www.workaci.com](http://www.workaci.com) for all of the up to date product literature.

#### Product Specifications

<b>Output</b>	3K Ohms @ 77°F ( <b>25°C</b> ) 10K Ohms (Type II) @ 77°F ( <b>25°C</b> )	<b>TS-2000-FB Series Sensor Accuracy</b>	$\pm 0.36^{\circ}\text{F}$ ( <b><math>\pm 0.2^{\circ}\text{C}</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Operating Temperature Range</b>	–40 to 302°F ( <b>-40 to 150°C</b> )	<b>TS-2004-FB-10-AA-HI Sensor Accuracy</b>	$\pm 0.18^{\circ}\text{F}$ ( <b><math>\pm 0.1^{\circ}\text{C}</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Sensor Interchangeability</b>	<b><math>\pm 0.2^{\circ}\text{C}</math> (0 to 70°C)</b>	<b>Operating Humidity Range</b>	0 to 90% RH non-condensing
<b>Dissipation Constant</b>	3mW / °C nominal (Still Air)	<b>Environmental Compliance</b>	RoHS-Directive 2002/95/EC

## Dimensions



Temp. C	Temp. F	3K (R Ohms)	10K(TypeII) (R Ohms)
-40	-40	100,935.00	336,450.00
-30	-22	53,164.50	177,207.53
-20	-4	29,172.86	97,236.73
-10	14	16,623.95	55,409.40
0	32	9,808.20	32,692.05
10	50	5,975.03	19,915.94
20	68	3,748.67	12,495.39
30	86	2,416.51	8,055.16
40	104	1,597.15	5,324.13
50	122	1,080.22	3,601.05
60	140	746.30	2,488.00
70	158	525.85	1,753.13
80	176	377.32	1,258.03
90	194	275.36	918.12
100	212	204.13	680.64
110	230	153.54	511.99
120	248	117.07	390.39
130	266	90.40	301.46
140	284	70.63	235.56
150	302	55.80	186.10

## Ordering Information

Alerton Model #	Sensor Type	Wire Colors	Ref A
TS-2004-FB-03-AA	3K Ohms	Red / Black	3.87" (98.3 mm)
TS-2004-FB-10-AA	10K Ohms	Red / Black	3.87" (98.3 mm)
TS-2004-FB-10-AA-HI	10K HI	Orange / Orange	3.87" (98.3 mm)
TS-2006-FB-03-AA	3K Ohms	Red / Black	5.75" (146.05 mm)
TS-2006-FB-10-AA	10K Ohms	Red / Black	5.75" (146.05 mm)
TS-2008-FB-03-AA	3K Ohms	Red / Black	7.87" (199.9 mm)
TS-2008-FB-10-AA	10K Ohms	Red / Black	7.87" (199.9 mm)
TS-2012-FB-03-AA	3K Ohms	Red / Black	11.84" (300.74 mm)
TS-2012-FB-10-AA	10K Ohms	Red / Black	11.84" (300.74 mm)



These units are manufactured for Alerton by Automation Components, Inc.

2305 Pleasant View Rd. • Middleton Industrial Park • Middleton, WI 53562

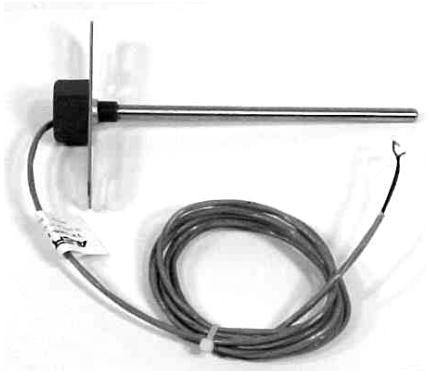
PH: (608) 831-2585 • FAX (608) 831-7407

[www.workaci.com](http://www.workaci.com)

Filename: C0000025 Rev 3.Doc

## Product Data

### Duct Sensor w/ Flange and 6 Foot Plenum Cable



#### Product Description

The **TS-2000-FB Series** duct temperature sensors have an output of 3K Ohms at 77°F (**25°C**) and 10K Ohms (Type II) at 77°F (**25°C**). The temperature sensors have an overall accuracy of  $\pm 0.36^{\circ}\text{F}$  (**0.2°C**) for the standard sensors or  $\pm 0.18^{\circ}\text{F}$  (**0.1°C**) for the **TS-2004 FB-10-AA-HI** sensors over the range of 32 to 158°F (**0 to 70°C**).

Each of the sensors is encapsulated in a 0.250" (**6.35 mm**) stainless steel probe with a thermally conductive epoxy. The **TS-2000-FB Series** temperature sensors can be used in environments where the operating temperature is between –40 to 302°F (**-40 to 150°C**).

The **TS-2000-FB Series** duct temperature sensors are both non-polarity and non-position sensitive. Each single point Thermistor sensor is encapsulated in a thermally conductive epoxy that will withstand high

#### Features

### TS-2000-FB Series

- \* **Stainless Steel Probe**
- \* **Fast Response Time**
- \* **High Accuracy**
- \* **6' Teflon Plenum Rated Cable**
- \* **2-year Warranty**
- \* **ROHS Compliant**

operating temperatures and protect the sensor from condensation or moisture.

All of these sensors should be used in environments where the normal operating temperature will be between –40 to 302°F (**-40 to 150°C**).

There are a number of applications in which the **TS-2000-FB Series** may be used to monitor and control the building temperature. A few of the most common applications include:

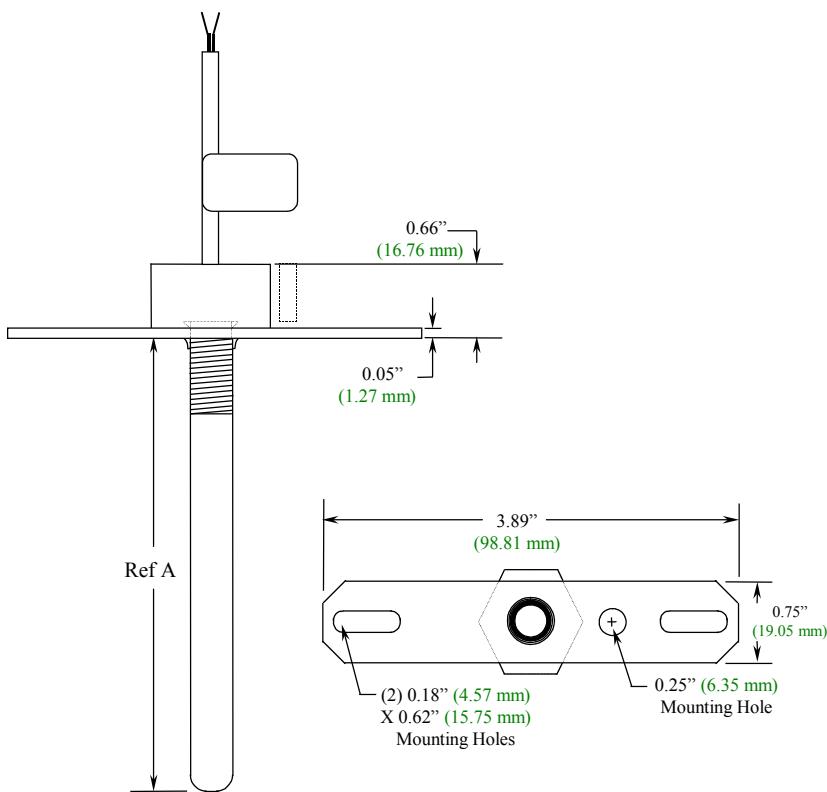
- Return Air Temperature in a Duct or Plenum
- Mixed Air Temperature in a Duct or Plenum
- Monitoring Discharge (Supply) Air Temp.

All of these units come with a two-year warranty. For more information regarding these products, please contact ACI at the numbers listed below, or visit our website address at [www.workaci.com](http://www.workaci.com) for all of the up to date product literature.

#### Product Specifications

<b>Output</b>	3K Ohms @ 77°F ( <b>25°C</b> ) 10K Ohms (Type II) @ 77°F ( <b>25°C</b> )	<b>TS-2000-FB Series Sensor Accuracy</b>	$\pm 0.36^{\circ}\text{F}$ ( <b><math>\pm 0.2^{\circ}\text{C}</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Operating Temperature Range</b>	–40 to 302°F ( <b>-40 to 150°C</b> )	<b>TS-2004-FB-10-AA-HI Sensor Accuracy</b>	$\pm 0.18^{\circ}\text{F}$ ( <b><math>\pm 0.1^{\circ}\text{C}</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Sensor Interchangeability</b>	<b><math>\pm 0.2^{\circ}\text{C}</math> (0 to 70°C)</b>	<b>Operating Humidity Range</b>	0 to 90% RH non-condensing
<b>Dissipation Constant</b>	3mW / °C nominal (Still Air)	<b>Environmental Compliance</b>	RoHS-Directive 2002/95/EC

## Dimensions



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TS-2006-FB-10-AA	10K Ohms	Red / Black	5.75" (146.05 mm)
TS-2008-FB-03-AA	3K Ohms	Red / Black	7.87" (199.9 mm)
TS-2008-FB-10-AA	10K Ohms	Red / Black	7.87" (199.9 mm)
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[www.workaci.com](http://www.workaci.com)

Filename: C0000025 Rev 3.Doc



<b>Technical Data</b>		<b>LMB24-SR</b>
Power Supply	24 VAC ± 20% 50/60 Hz	
	24 VDC ± 10%	
Power Consumption	1.5 W (0.4 W)	
Transformer Sizing	3 VA (Class 2 power source)	
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector	
Overload Protection	electronic throughout 0 to 95° rotation	
Operating Range Y	2 to 10 VDC, 4 to 20 mA	
Input Impedance	100 kΩ (0.1 mA), 500Ω	
Angle of Rotation	max. 95°, adjust. with mechanical stop	
Torque	45 in-lb [5 Nm]	
Direction of Rotation	reversible with ↗/↖ switch. Actuator will move: ↗ =CCW with decreasing control signal (10→2V) ↖ =CW with decreasing control signal (10→2V)	
Position Indication	reflective visual Indicator (snap-on)	
Manual Override	external push button	
Running Time	95 seconds, constant independent of load	
Humidity	5 to 95% RH non condensing (EN 60730-1)	
Ambient Temperature	-22°F to +122°F [-30°C to +50°C]	
Storage Temperature	-40°F to +176°F [-40°C to +80°C]	
Housing	NEMA 2/IP54	
Housing Material	UL94-5VA	
Agency Listings	cULus acc. to UL 60730-1/-2-14 and CAN/CSA C22.2 No.24, CE according to 73 / 23 / EEC	
Noise Level	<35dB(A)	
Servicing	maintenance free	
Quality Standard	ISO 9001	
Weight	1.1 lbs [0.5 Kg]	
<b>LMB24-SR-T</b>		
Electrical connection	Screw terminal (for 26 to 14 GA wire)	
Housing	NEMA 1/IP20	

**Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.**

LMB24-SR  
LMB24-SR-T

LMB24-SR 1 (bulk)  
LMB24-SR-T.1 (bulk)

### Application

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner.

### Operation

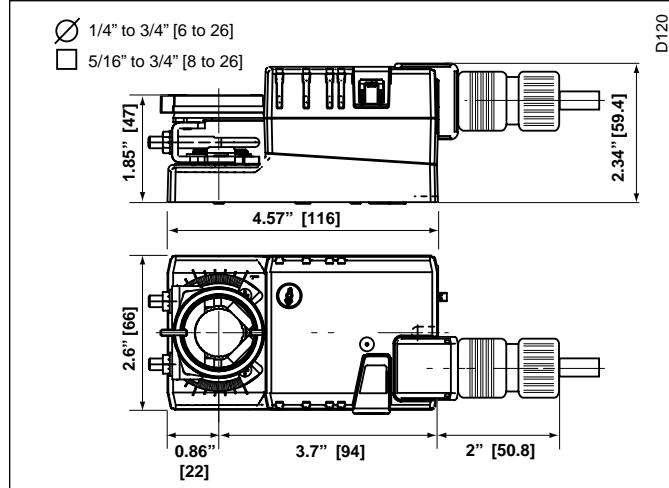
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMB series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.

The LMB24-SR... actuators use a sensorless Brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

Add on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions

### Dimensions (All numbers in brackets are in millimeters.)



## Accessories

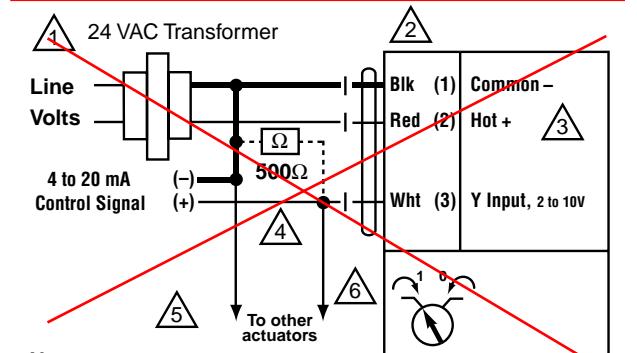
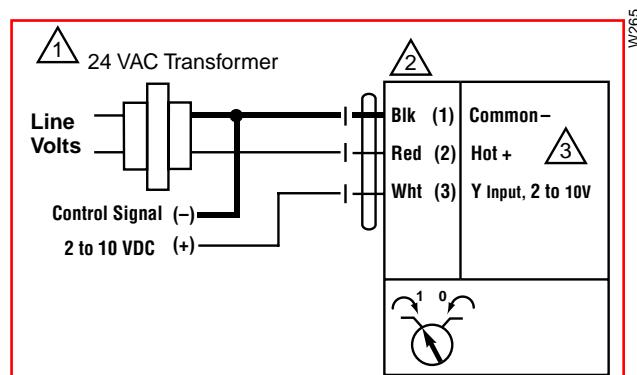
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
PTA-250	Pulse Width Modulation Interface
IRM-100	Input Rescaling Module
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module
ES-M10	...

**Note:** When using LMB24-SR... actuators, only use accessories listed on this page.

LMB24-SR... - Typical Specification

Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodated with an accessory clamp. Actuators must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators shall have Brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. If required, actuator will be provided with screw terminal strip for electrical connections (LMB24-SR-T). Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

## Wiring

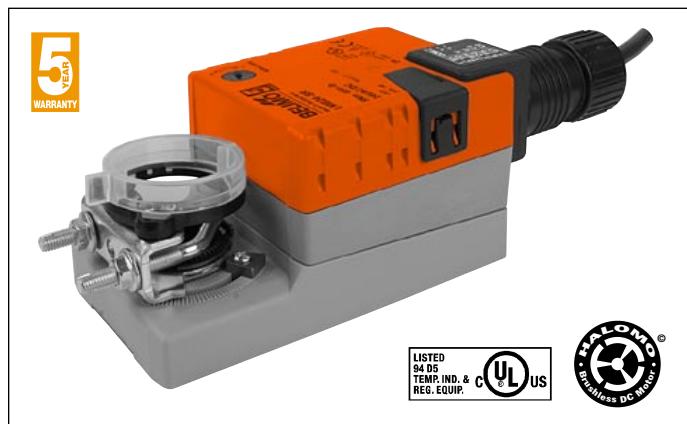


## Notes:

- 1 Provide overload protection and disconnect as required.
  - 2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.
  - 3 Actuator may also be powered by 24 VDC.
  - 4 The ZG-R01 500 $\Omega$  resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.
  - 5 Only connect common to neg. (-) leg of control circuits.
  - 6 Feedback for "X" models only.

**LMB24-3**

## On/Off-Floating Point Control, Non-Spring Return, Direct Coupled, 24 V



## Technical Data

## LMB24-3... on/off-floating

Power Supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power Consumption	1.5 W (0.2 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector
Overload Protection	electronic throughout 0 to 95° rotation
Control	on/off, floating point
Input Impedance	600Ω
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with $\curvearrowleft/\curvearrowright$ switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	95 seconds, constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to +122°F [-30°C to +50°C]
Storage Temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA 2/IP54
Housing Material	UL94-5VA
Agency Listings	cULus acc. to UL 60730-1/-2-14 and CAN/CSA C22.2 No.24, CE according to 73 / 23 / EEC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1lbs [0.5 Kg],
<b>LMB24-3-S</b>	
Auxiliary switch	Adj. 0° to 100°, SPDT 3 A (0.5A) @ 250 VAC
Weight	1.4lbs [0.6 Kg]
<b>LMB24-3-P10-T</b>	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Feedback	10 kΩ, 1W potentiometer
<b>LMB24-3-P5-T (bulk pack only)</b>	
Feedback	5 kΩ, 1W potentiometer
Housing	NEMA 1/IP20
<b>LMB24-3-T</b>	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Housing	NEMA 1/IP20

**Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.**

LMB24-3 LMB24-3.1 (bulk) LMB24-3-P10-T  
LMB24-3-T → LMB24-3-T.1 (bulk) LMB24-3-S  
LMB24-3-P5-1 LMB24-3-P5-T.1 (bulk)

## Application

For on-off and floating point control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 1/4" up to 5/8" in diameter by means of its standard universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## Operation

The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

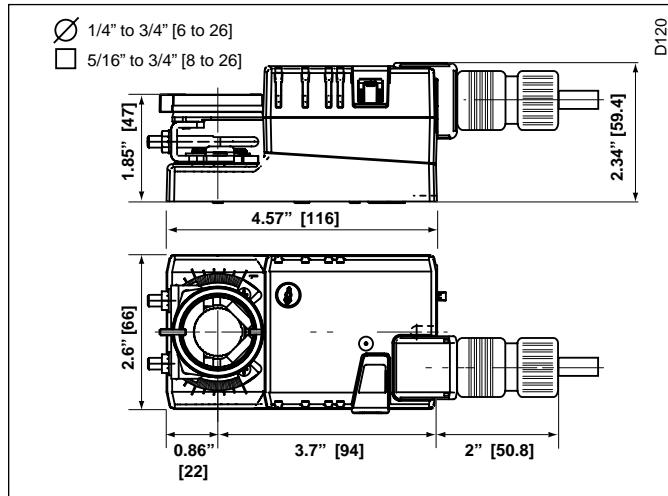
The LMB series provides 95° of rotation and a visual indicator which indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be disengaged with manual release on the actuator cover.

The LMB24-3... actuators use a sensorless Brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

The LMB24-3-S version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable 0 to 95°. The auxiliary switch is double insulated so an electrical ground connection is not necessary.

Add on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.

**Dimensions** (All numbers in brackets are in millimeters.)



## Accessories

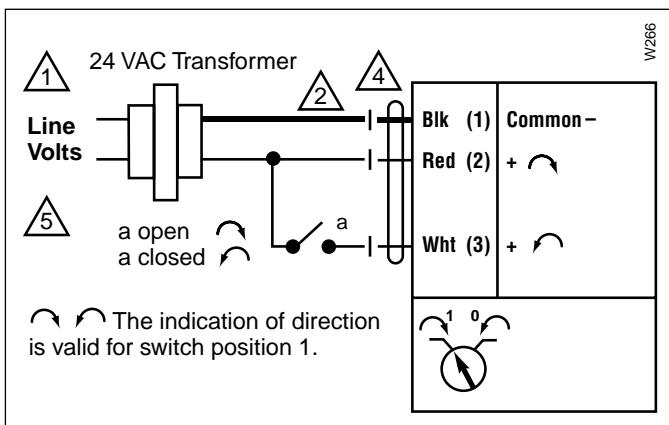
K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

**Note:** When using LMB24-3... actuators, only use accessories listed on this page.

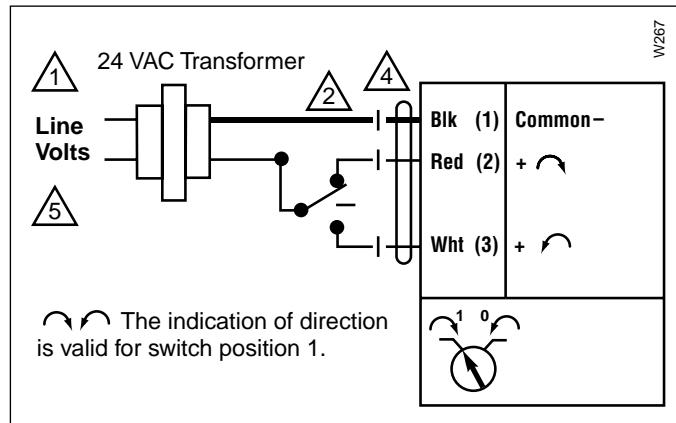
## LMB24-3 - Typical Specification:

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. Actuators shall have Brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. If required, actuator will be provided with screw terminal strip for electrical connections (LMB24-3-T). If required, actuators shall be provided with one adjustable SPDT auxiliary switch. Actuators with auxiliary switches must be constructed to meet the requirements for double insulation so an electrical ground is not required to meet agency listings. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

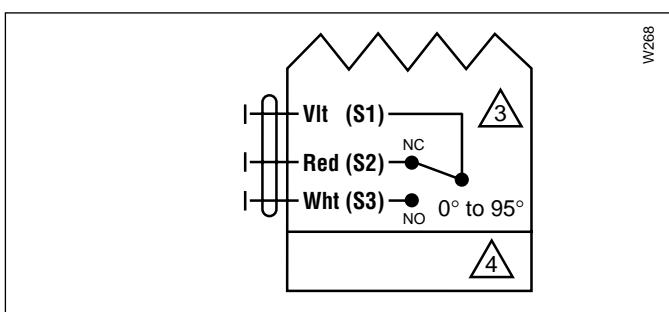
## Wiring



## On/Off



## Floating Point or On/Off control



## Auxiliary Switch of LMB24-3-S

## Notes:

- 1 Provide overload protection and disconnect as required.
- 2 Actuators may also be powered by 24 VDC.
- 3 For end position indication, interlock control, fan startup, etc., xMB24-3-S incorporates one built-in auxiliary switches: 1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°.
- 4 Meets cULus requirements without the need of an electrical ground connection.

**LF24-SR (-S) US** ←

Proportional damper actuator, spring return safety, 24 V for 2 to 10 VDC, or 4 to 20 mA control signal.  
Output signal of 2 to 10 VDC for position indication.



Technical Data	LF24-SR (-S) US
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running: 2.5 W; holding: 1 W
Transformer sizing	5 VA (class 2 power source)
Electrical connection	LF24-SR US 3 ft, plenum rated cable LF24-SR-S US 3 ft, 18 GA appliance cables (2) 1/2" conduit connector
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20mA
Input impedance	100 k $\Omega$ (0.1 mA), 500 $\Omega$
Feedback output U	2 to 10 VDC (max. 0.7 mA) for 95°
Angle of rotation	max. 95°, adjust. with mechanical stop
Torque	35 in-lb [4 Nm]
Direction of rotation	spring return reversible with cw/ccw mounting control direction selected by switch: CW=CW with a decrease in signal CCW=CCW with a decrease in signal
Position indication	visual indicator, 0° to 95° (0° is spring return position)
Auxiliary switch (LF24-SR-S US)	1 x SPDT 6A (1.5A) @ 250 VAC, UL listed adjustable 0° to 95° (double insulated)
Running time (nominal)	motor: 150 sec constant, independent of load spring: < 25 sec @ -4°F to +122°F [-20°C to +50°C] < 60 sec @ -22°F [-30°C]
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA type 2 / IP54
Housing material	zinc coated metal
Agency listings	UL 873 listed; CSA C22.2 No. 24 certified, CE
Noise level	max: running < 30 db (A) spring return 62 dB (A)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	LF24-SR 3.1 lbs (1.40 kg.) LF24-SR-S 3.2 lbs (1.45 kg.)

**Torque min. 35 in-lb, for control of air dampers****Application**

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 3/8" up to 1/2" in diameter by means of its universal clamp, 1/2" shaft centered at delivery. For shafts up to 3/4" use K6-1 accessory. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

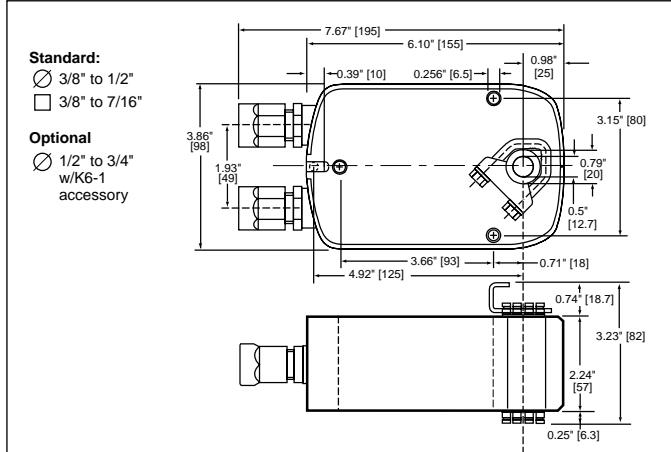
The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500 $\Omega$  resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

**Operation**

The LF series actuators provide true spring return operation for reliable fail-safe application and positive close-off on air tight dampers. The spring return system provides consistent torque to the damper with, and without, power applied to the actuator. The LF series provides 95° of rotation and is provided with a graduated position indicator showing 0 to 90°.

The LF24-SR (-S) US uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor. The microprocessor provides the intelligence to the ASIC to provide a constant rotation rate and to know the actuator's exact fail-safe position. The ASIC monitors and controls the brushless DC motor's rotation and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. Power consumption is reduced in holding mode.

The LF24-SR-S US version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable between 0° and 95°. The auxiliary switch in the LF24-SR-S US is double insulated so an electrical ground is not necessary.

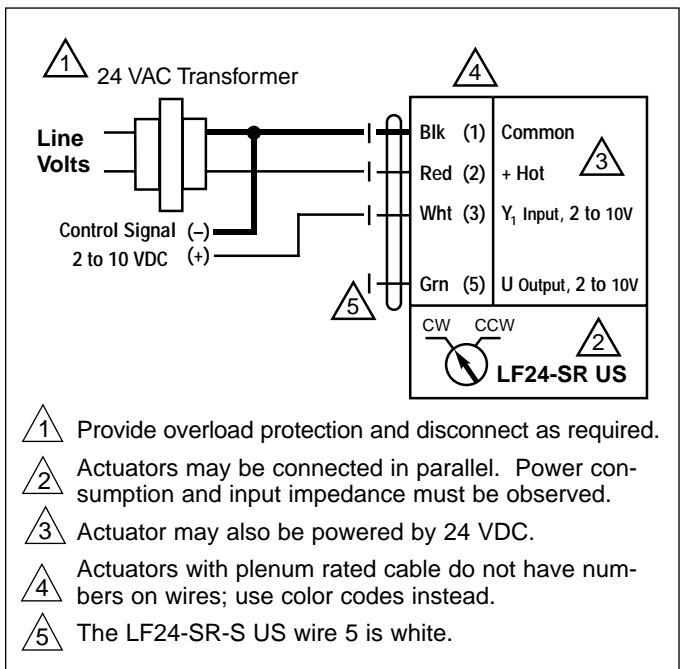
**Dimensions** (All numbers in brackets are metric.)

### Accessories

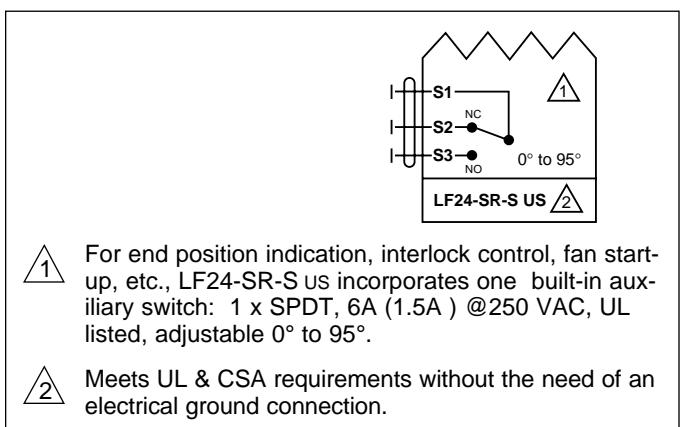
AV 10-18	Shaft extension (K6-1 is required)
IND-LF	Damper position indicator
K6-1	Universal clamp for up to 3/4" diameter shafts
KH-LF	Crankarm for up to 1/2" round shaft
SGA24	Min. and/or man. positioner in NEMA 4 housing
SGF24	Min. and/or man. positioner for flush panel mounting
Tool-01	10 mm wrench
ZG-LF2	Crankarm adaptor kit for LF
ZG-112	Mounting bracket for Honeywell Mod IV, M6415 type actuators, and new installations
ZG-LF112	Crankarm adaptor kit for Honeywell Mod IV, M6415 type actuators, and new installations
ZG-R01	500Ω resistor for 0 to 20 mA control signal
ZS-100	Weather shield (metal)
ZS-150	Weather shield (polycarbonate)
ZS-260	Explosion-proof housing

**Note: When using LF24-SR (-S) US actuators, only use accessories listed on this page.**

### Wiring diagrams



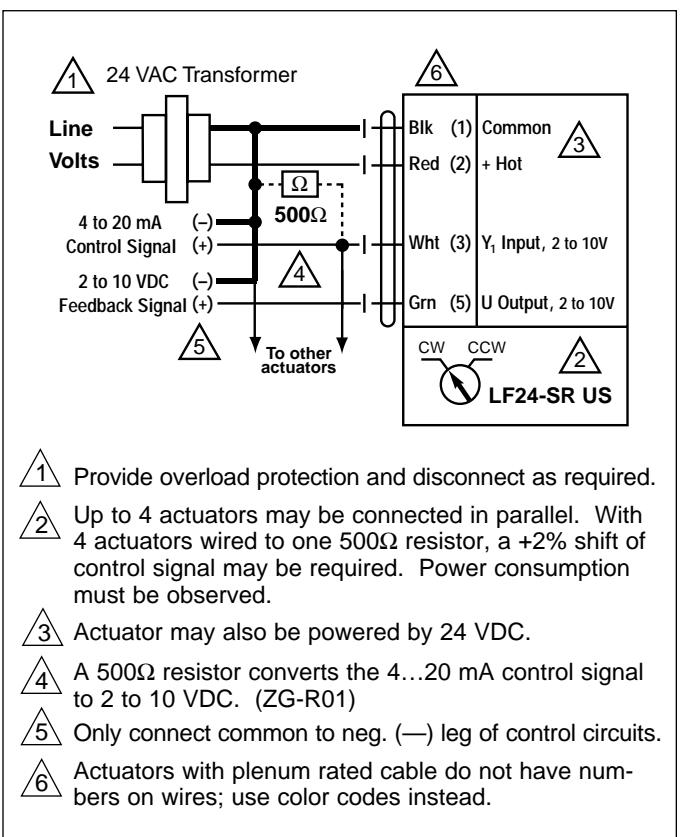
### 2 to 10 VDC control of LF24-SR (-S) US



### Auxiliary switch of LF24-SR-S US

### LF24-SR (-S) US Typical Specification

Spring return control damper actuators shall be direct coupled type which require no crankarm and linkage and be capable of direct mounting to a shaft up to a 3/4" diameter and center a 1/2" shaft. The actuator must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback or master-slave applications. If required, 1 SPDT auxiliary switch shall be provided having the capability of being adjustable. Actuators with auxiliary switch must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be UL listed and CSA certified, have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.



### 4 to 20 mA control of LF24-SR (-S) US with 2 to 10 VDC feedback output



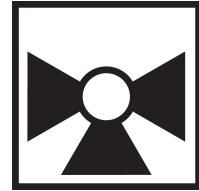
Stainless Steel Ball and Stem

## Technical data sheet

B310



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0% for A – AB, <2.0% for B – AB
Controllable flow range	75°
Cv	1.2
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NRB(X) N4

## Safety notes

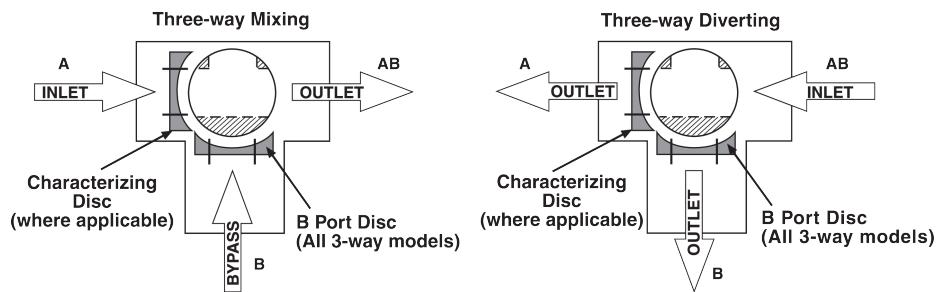


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

## Flow/Mounting details

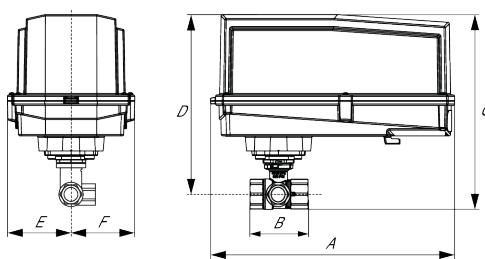


## Dimensions

## Dimensional drawings

Dimensional drawings							
A	B	C	D	E	F	H1	H2
LRB, LRX	8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]
LRQB, LRQX	8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]
TR	3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]	
LF	7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]	

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

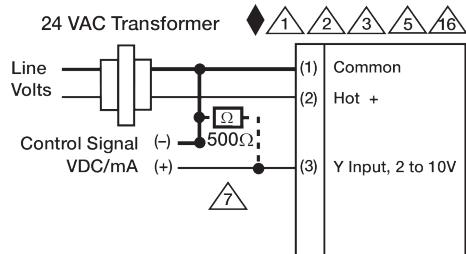
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

**Warning! Live Electrical Components!**

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control



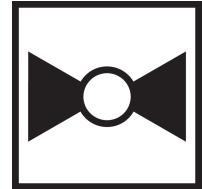
Stainless Steel Ball and Stem

## Technical data sheet

B213



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

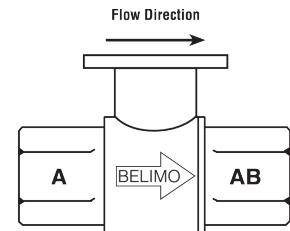
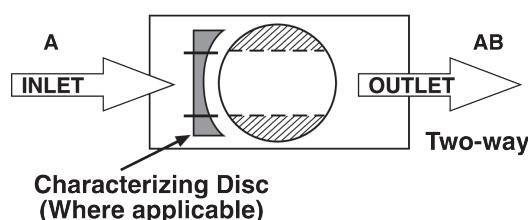
## Safety notes

- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

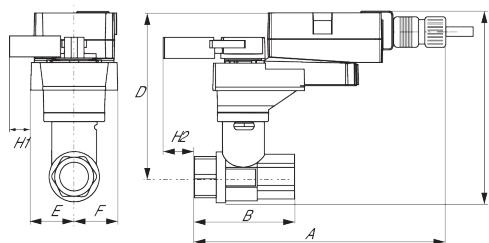
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
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## Flow/Mounting details

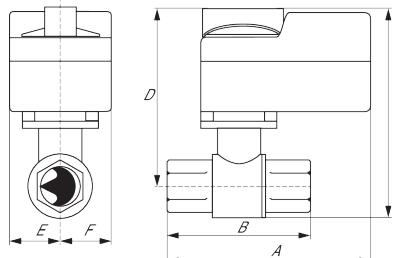


## Dimensions

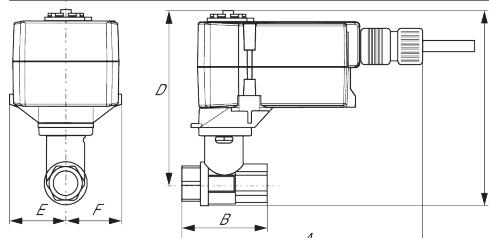
## Dimensional drawings



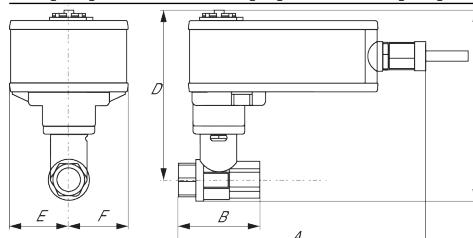
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



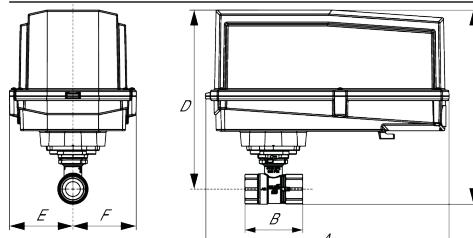
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



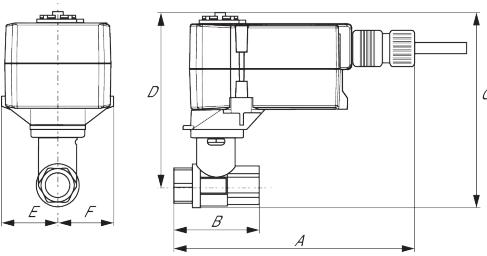
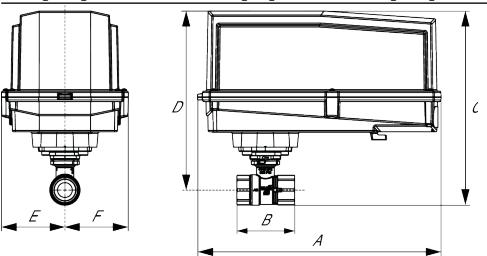
A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

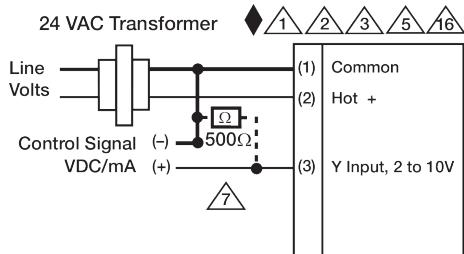
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

**Warning! Live Electrical Components!**

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2...10 V / 4...20 mA Control



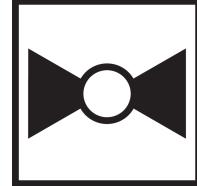
Stainless Steel Ball and Stem

## Technical data sheet

B213



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

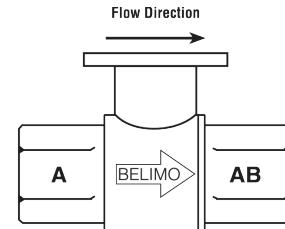
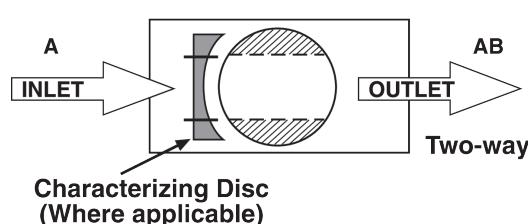
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)



## Product features

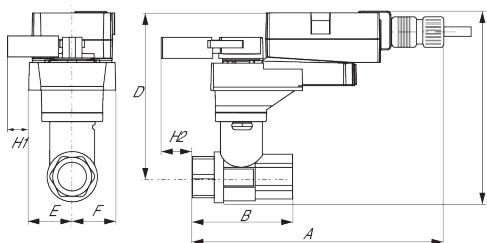
**Application** This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details

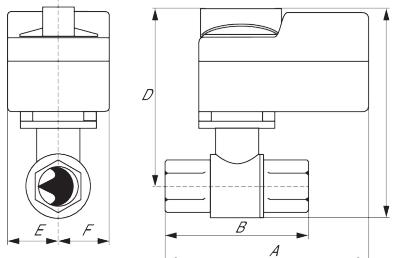


## Dimensions

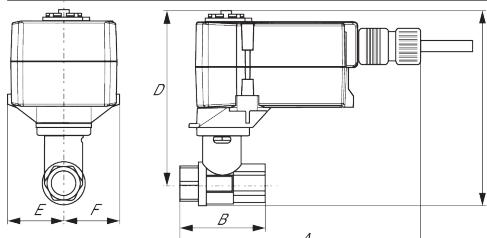
## Dimensional drawings



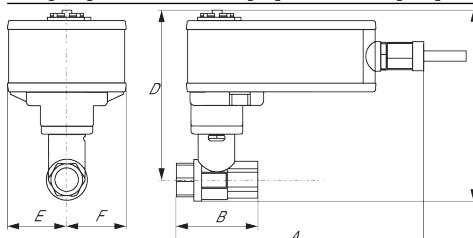
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



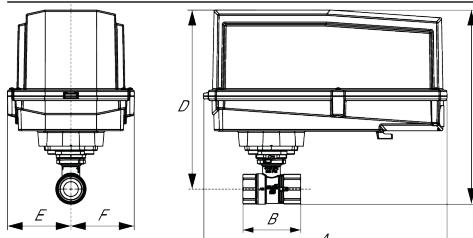
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



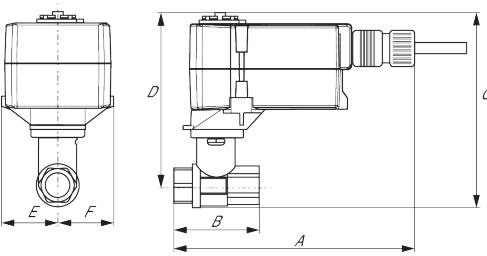
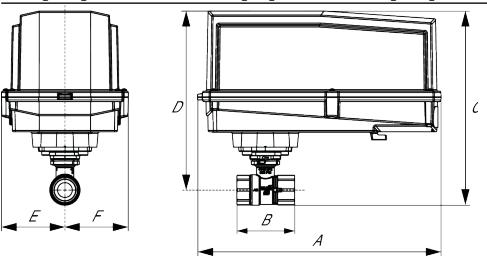
A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7-10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

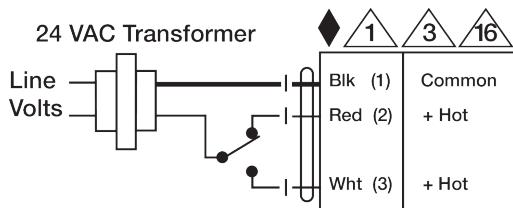


► Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

**Warning: Live Electrical Components**  
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### On/Off AC 24 V Transformer



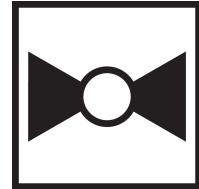
Stainless Steel Ball and Stem

## Technical data sheet

B211



5-year warranty



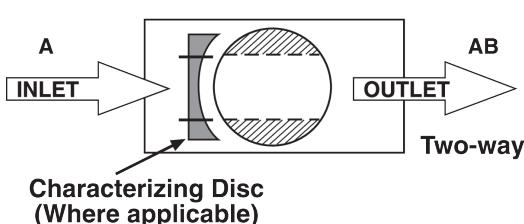
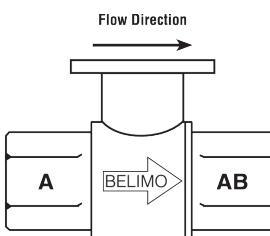
## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.9
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

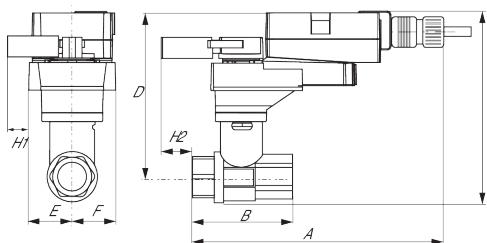
- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	 

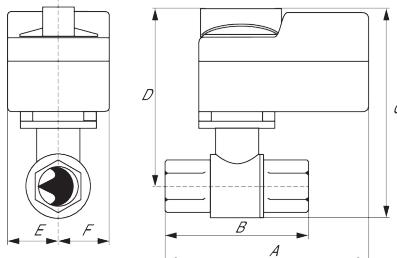
## Dimensions

## Dimensional drawings



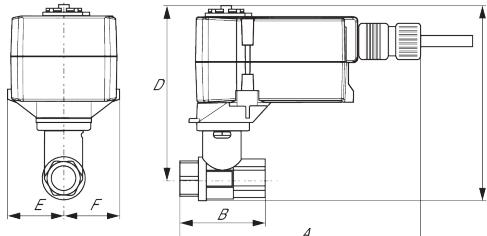
LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



TR

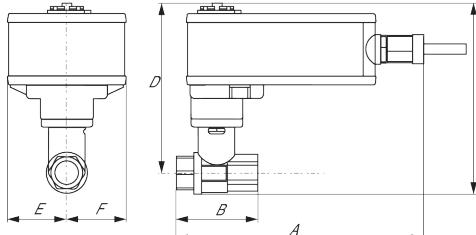
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



TFRB, TFRX

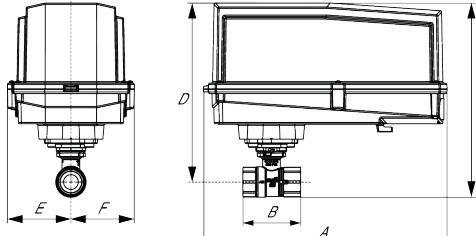
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF



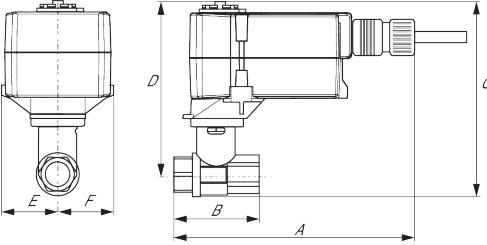
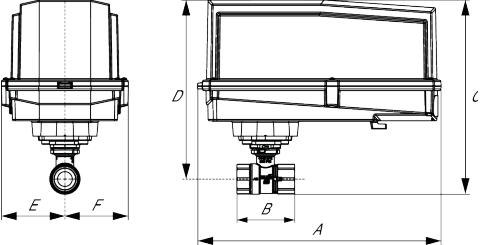
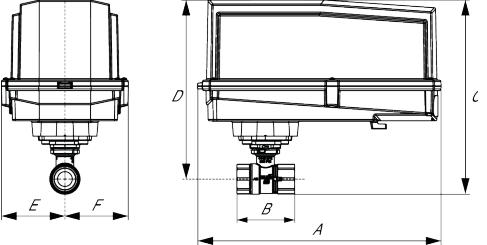
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4, NRB N4, NRX N4



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

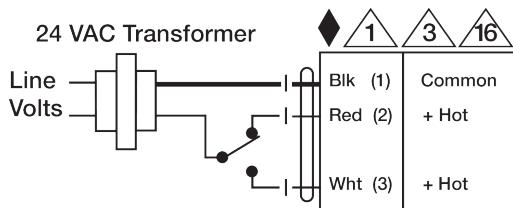


► Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

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### On/Off AC 24 V Transformer



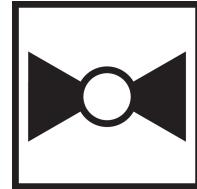
Stainless Steel Ball and Stem

## Technical data sheet

B209



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.8
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



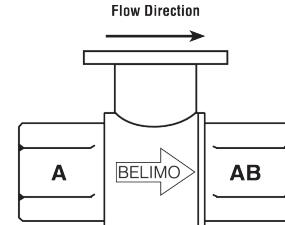
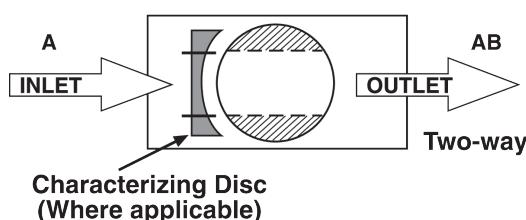
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

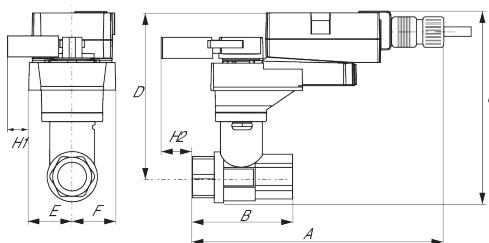
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details



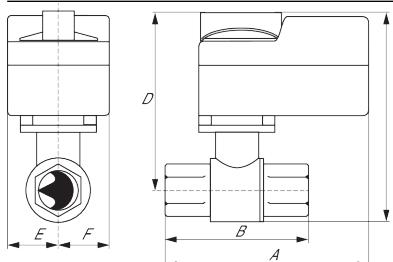
## Dimensions

## Dimensional drawings



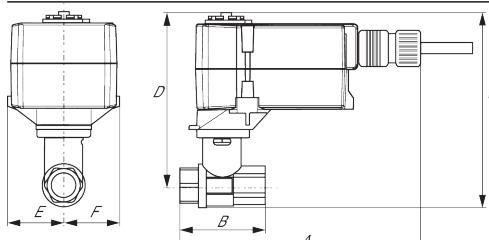
LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



TR

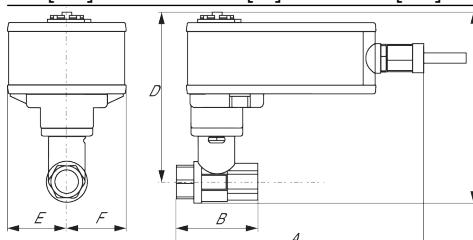
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



TFRB, TFRX

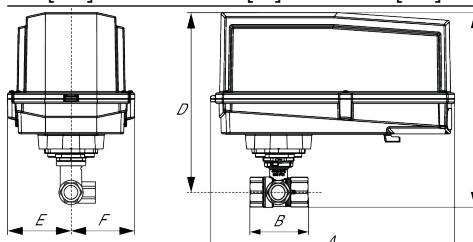
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF



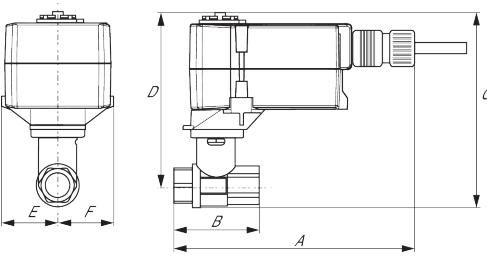
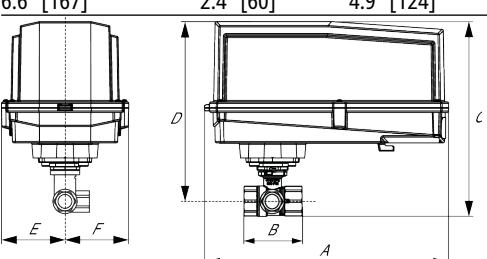
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

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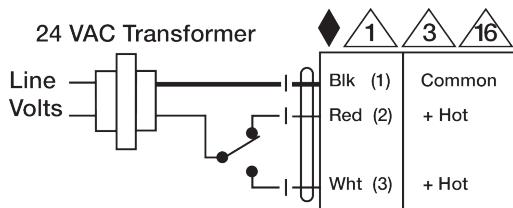


- Meets cULus requirements without the need of an electrical ground connection.



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## On/Off AC 24 V Transformer



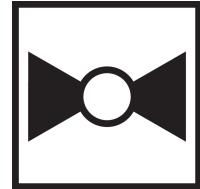
Stainless Steel Ball and Stem

## Technical data sheet

B212



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



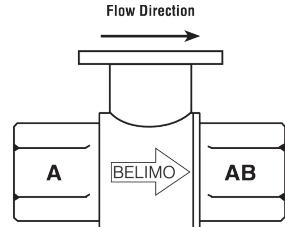
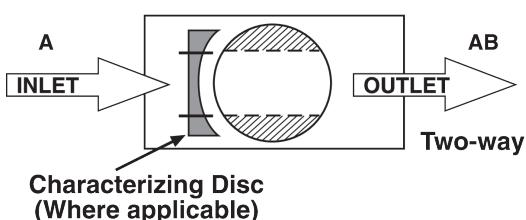
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

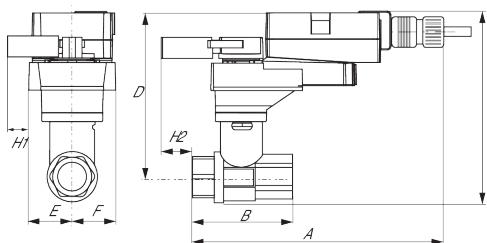
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details

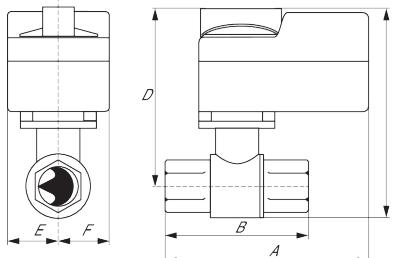


## Dimensions

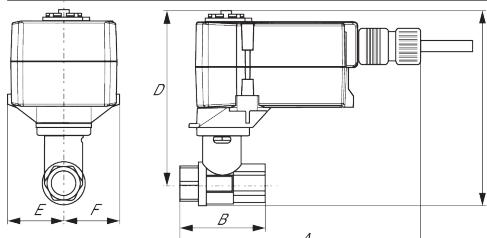
## Dimensional drawings



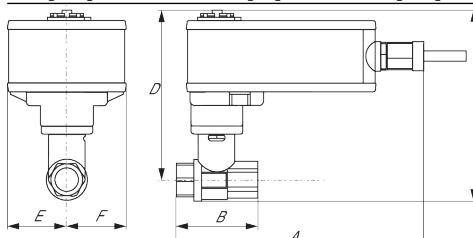
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



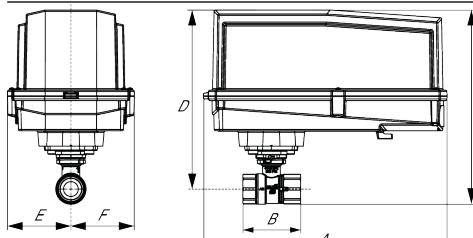
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



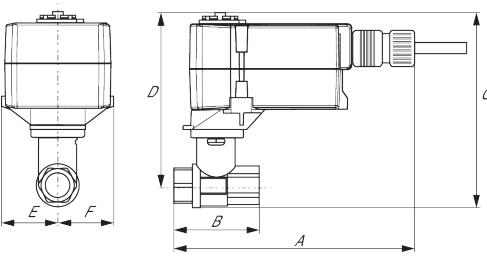
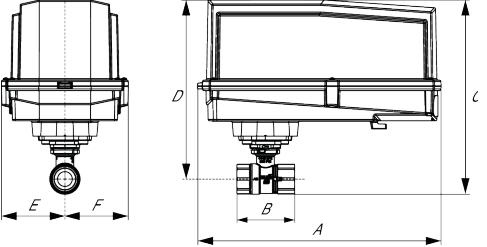
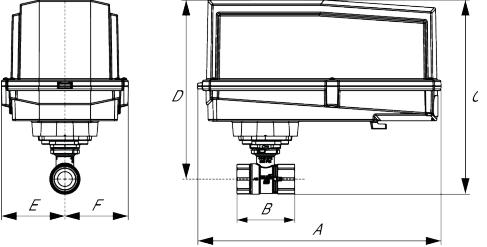
A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 5.5" [139]	<b>D</b> 4.7" [120]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

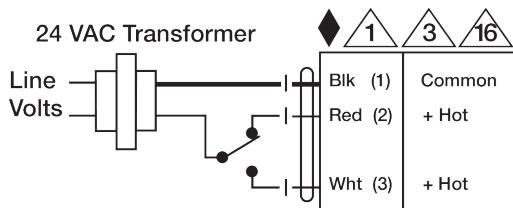


- Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



## On/Off AC 24 V Transformer



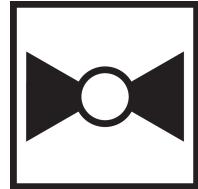
Stainless Steel Ball and Stem

## Technical data sheet

B208



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.46
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

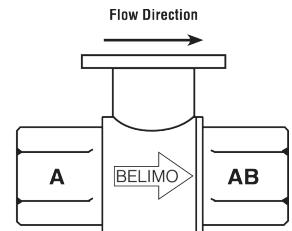
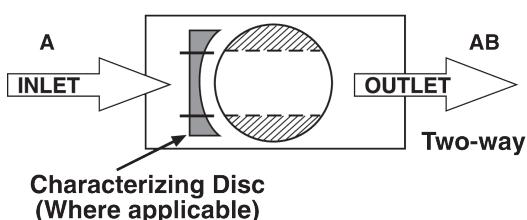


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

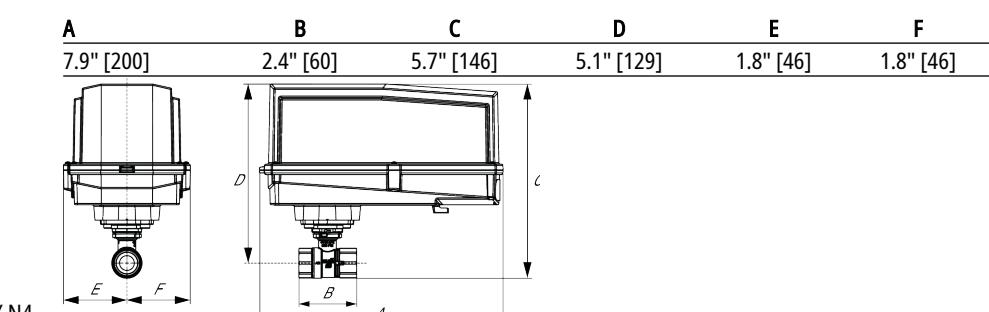
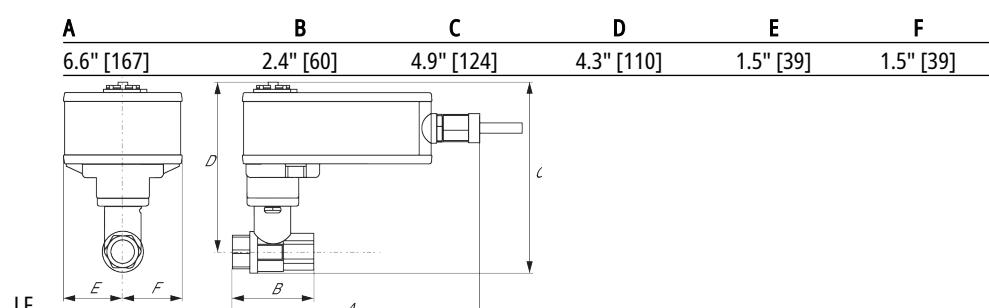
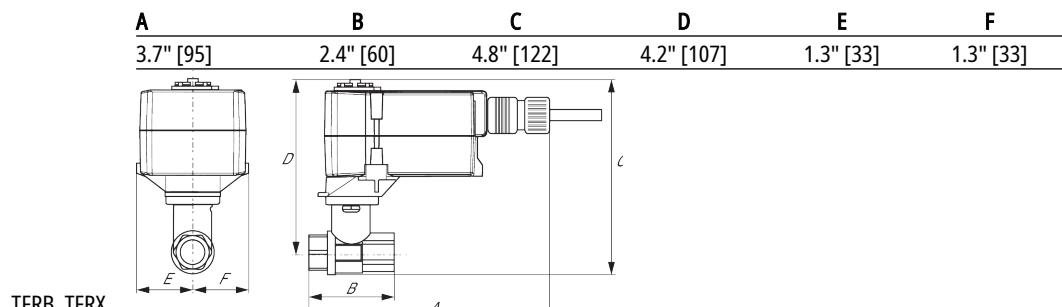
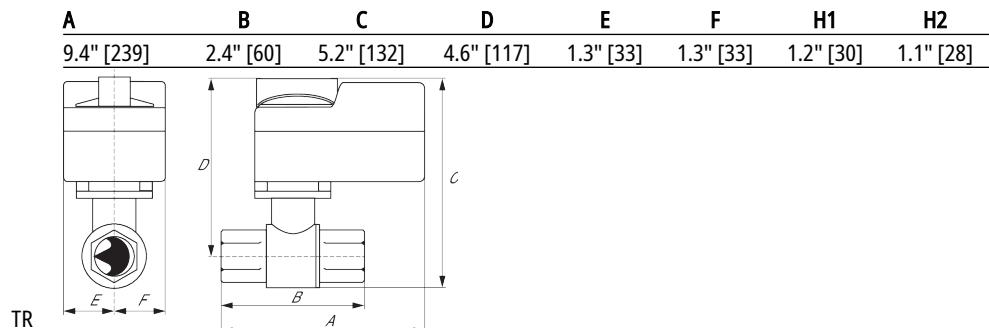
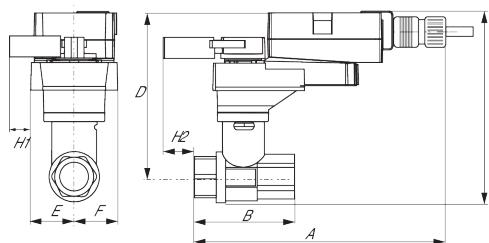
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
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## Flow/Mounting details

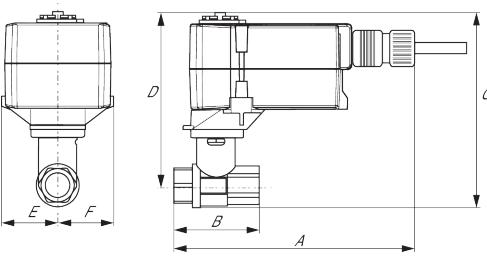
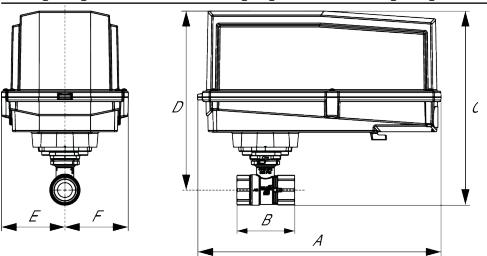


## Dimensions

## Dimensional drawings



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

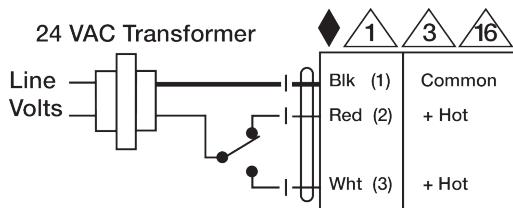


► Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

**Warning: Live Electrical Components**  
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## On/Off AC 24 V Transformer



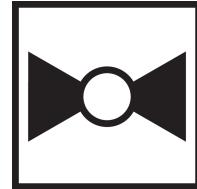
Stainless Steel Ball and Stem

## Technical data sheet

B210



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.2
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



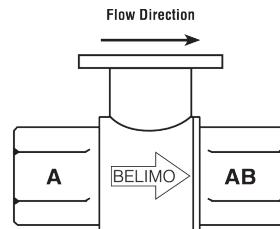
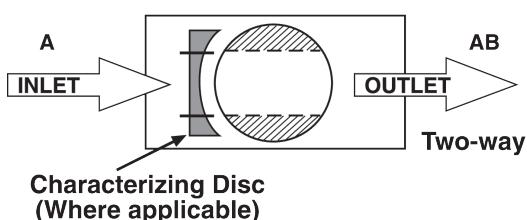
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

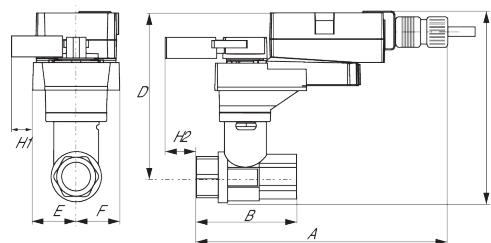
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details

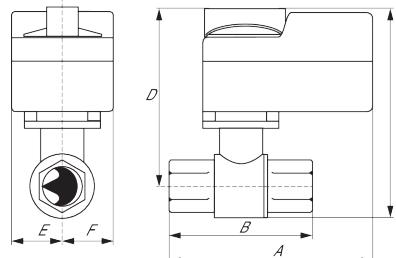


## Dimensions

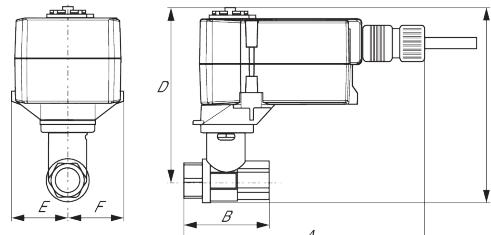
## Dimensional drawings



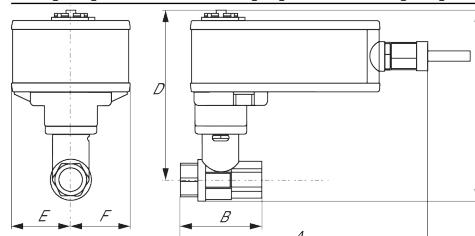
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



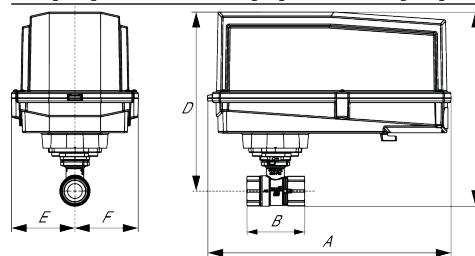
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



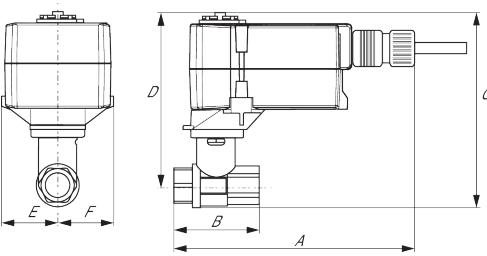
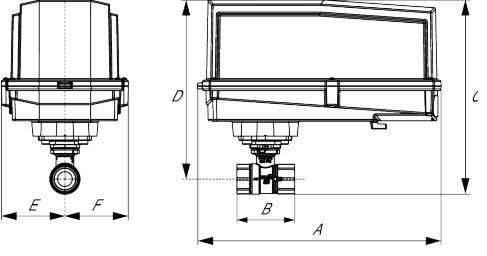
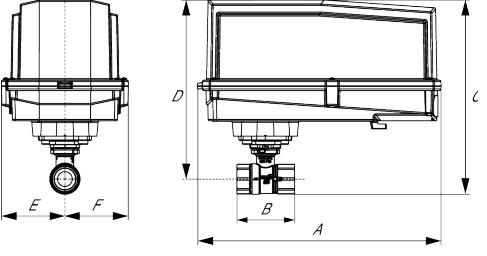
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7-10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

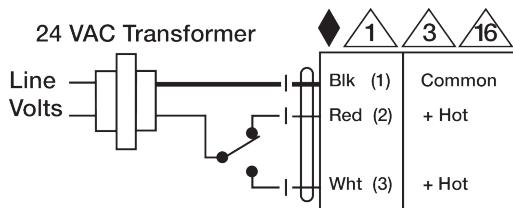


- Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

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## On/Off AC 24 V Transformer



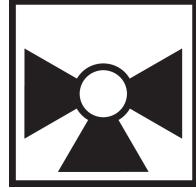
Stainless Steel Ball and Stem

## Technical data sheet

B312



5-year warranty



## Technical data

Functional data	Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol	
Fluid Temp Range (water)	0...250°F [-18...120°C]	
Body Pressure Rating	600 psi	
Close-off pressure $\Delta$ ps	200 psi	
Flow characteristic	A-port equal percentage, B-port modified for constant common port flow	
Servicing	maintenance-free	
Flow Pattern	3-way Mixing/Diverting	
Leakage rate	0% for A – AB, <2.0% for B – AB	
Controllable flow range	75°	
Cv	3	
Body pressure rating note	600 psi	
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv	
Materials	Valve body	Nickel-plated brass body
	Stem seal	EPDM (lubricated)
	Seat	PTFE
	Pipe connection	NPT female ends
	O-ring	EPDM (lubricated)
	Ball	stainless steel
Suitable actuators	Non-Spring	TR LRB(X) NRB(X) N4

## Safety notes

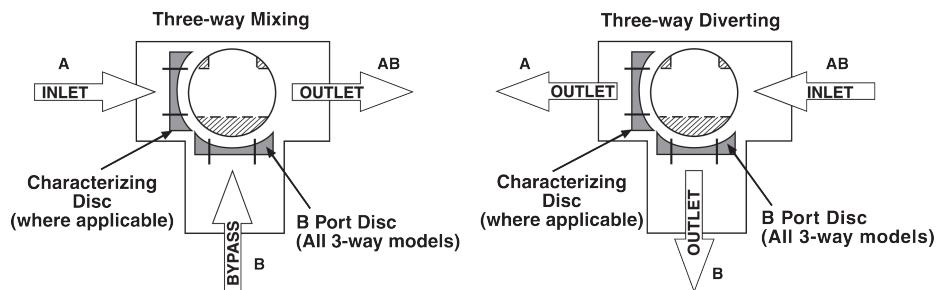


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.
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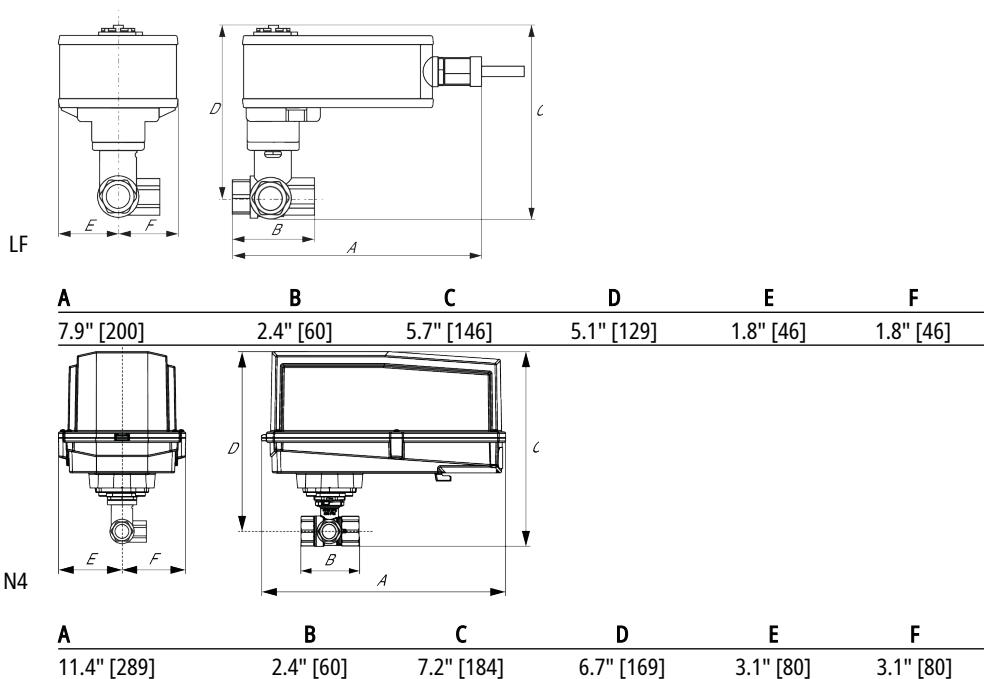
## Flow/Mounting details



## Dimensions

## Dimensional drawings

	A	B	C	D	E	F	H1	H2
LRB, LRX	8.5" [216]	2.4" [60]	5.2" [132]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]
LRQB, LRQX	8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]
TR	3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]		
TFRB, TFRX	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]		





5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

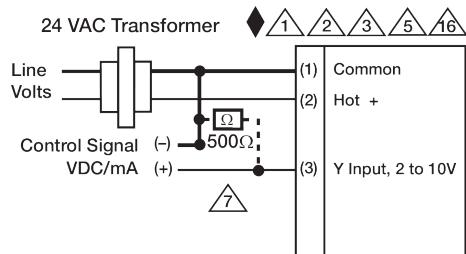
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

**Warning! Live Electrical Components!**

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2...10 V / 4...20 mA Control



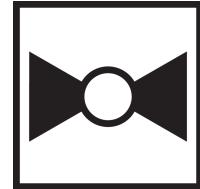
Stainless Steel Ball and Stem

## Technical data sheet

B207



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

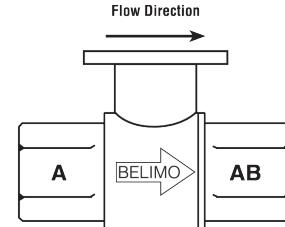
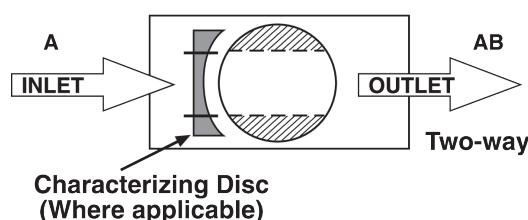
## Safety notes

- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

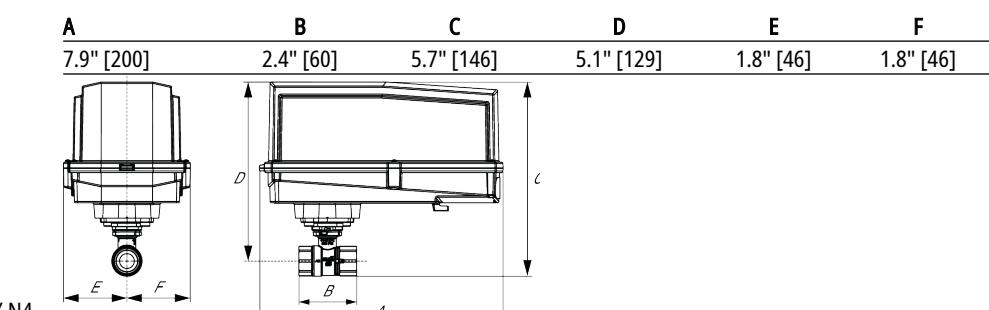
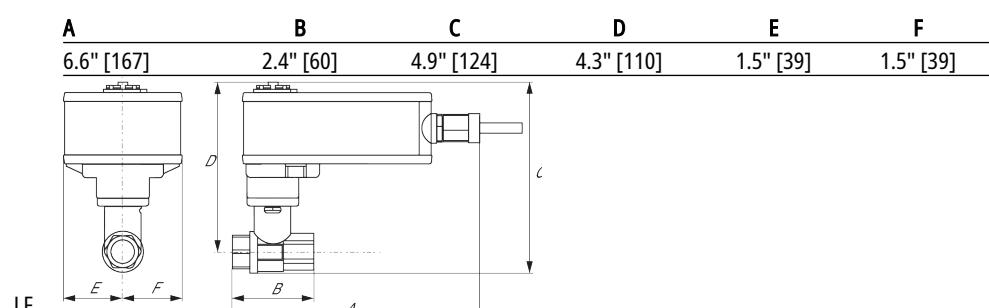
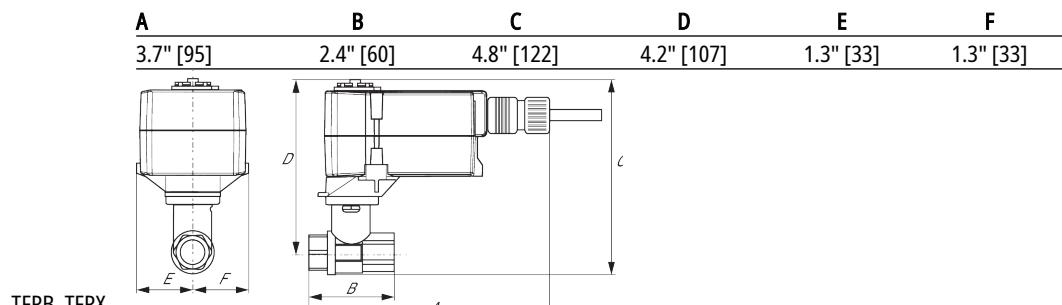
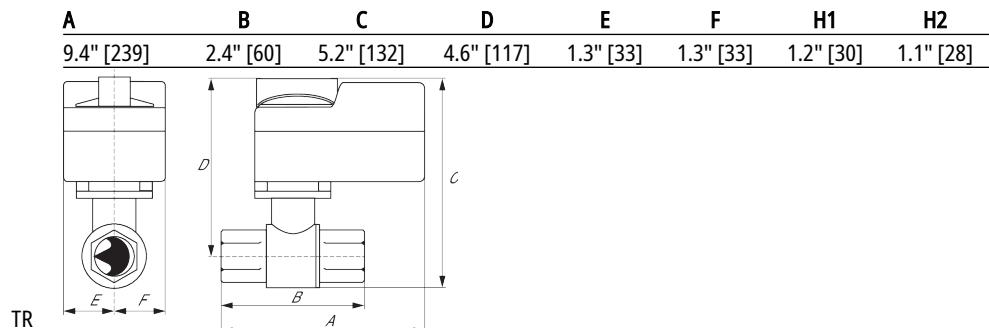
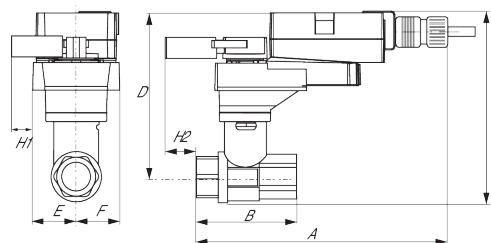
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
-------------	--

## Flow/Mounting details

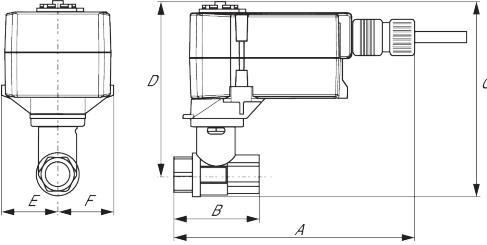
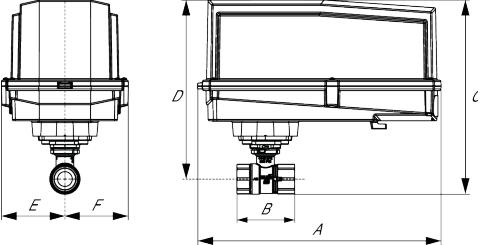
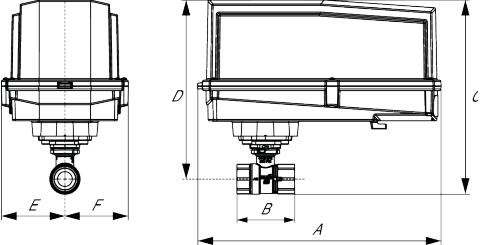


## Dimensions

## Dimensional drawings



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

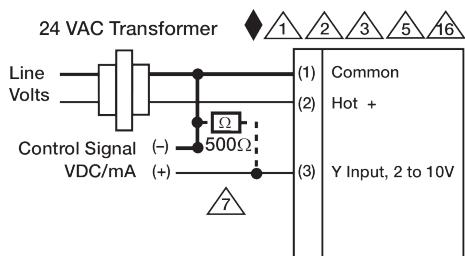
Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.
- Meets cULus requirements without the need of an electrical ground connection.
- Warning! Live Electrical Components!**

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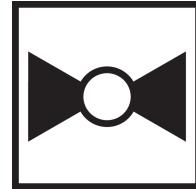
Stainless Steel Ball and Stem

## Technical data sheet

B211



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.9
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



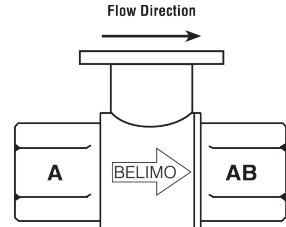
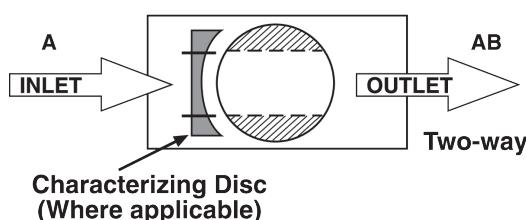
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

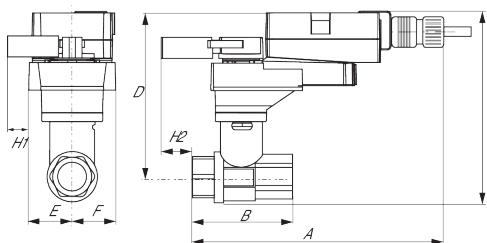
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details



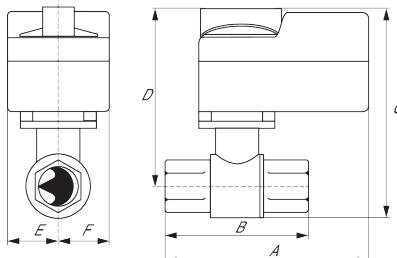
## Dimensions

## Dimensional drawings



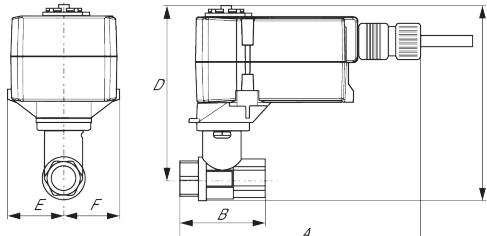
LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



TR

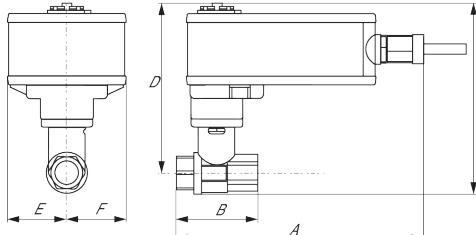
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



TFRB, TFRX

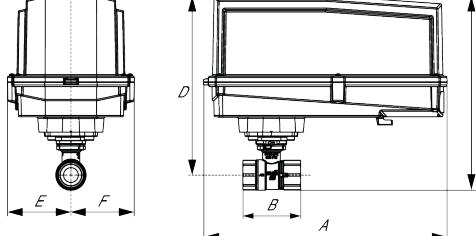
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF

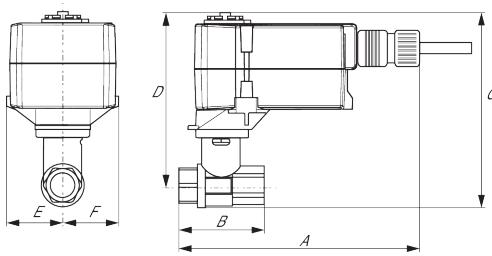
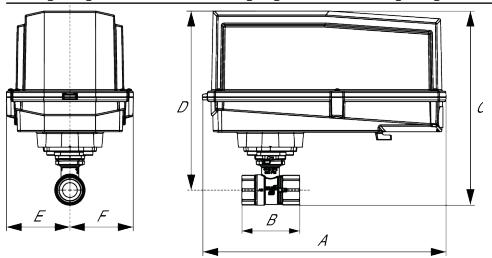


A	B	C	D	E	F
7.9" [200]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

ARB N4, ARX N4, NRB N4, NRX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

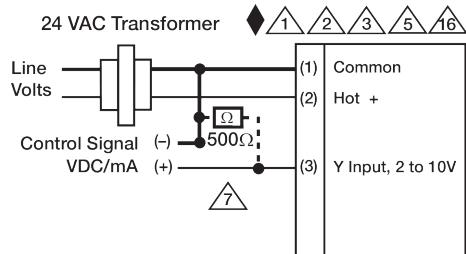
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
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- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
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2...10 V / 4...20 mA Control



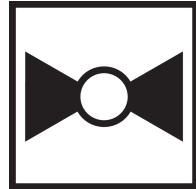
Stainless Steel Ball and Stem

## Technical data sheet

B209



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.8
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



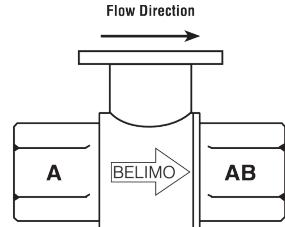
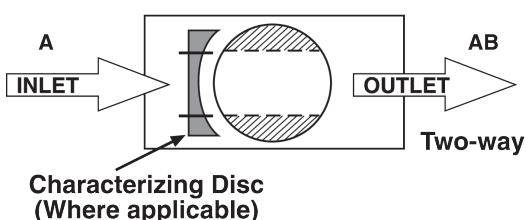
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

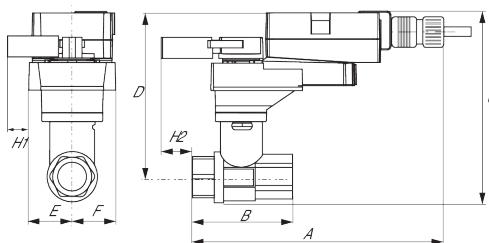
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details



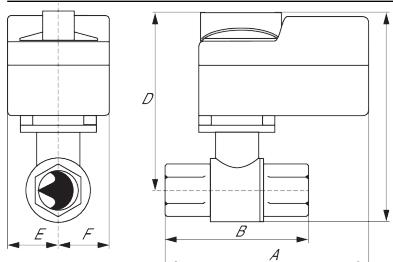
## Dimensions

## Dimensional drawings



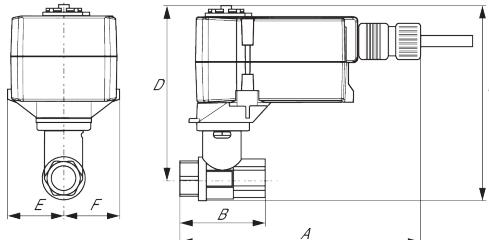
LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



TR

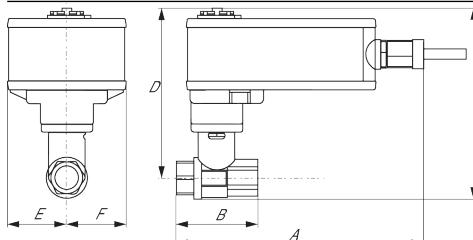
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



TFRB, TFRX

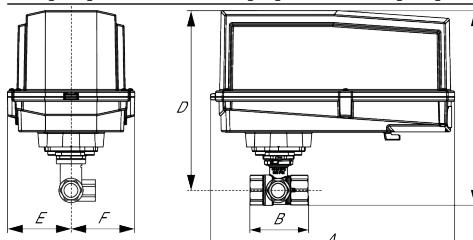
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF



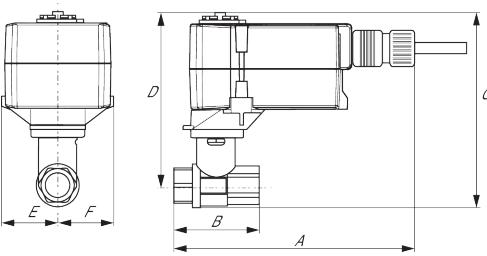
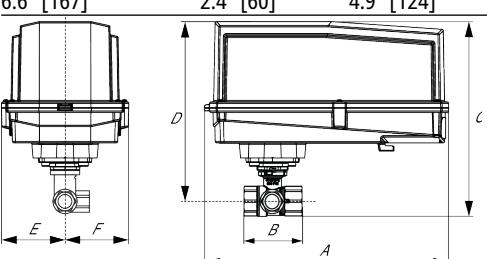
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
Nominal voltage frequency	50/60 Hz	
Power consumption in operation	0.5 W	
Transformer sizing	1 VA (class 2 power source)	
Electrical Connection	Screw terminal (for 26 to 14 GA wire)	
Overload Protection	electronic throughout full rotation	
Functional data	Operating range Y	2...10 V
Operating range Y note	4...20 mA w/ ZG-R01 (500 $\Omega$ , 1/4 W resistor)	
Input Impedance	100 k $\Omega$ for 2...10 V (0.1 mA), 500 $\Omega$ for 4...20 mA	
Direction of motion motor	selectable with switch	
Manual override	push down handle	
Angle of rotation	90°	
Running Time (Motor)	90 s / 90°	
Noise level, motor	35 dB(A)	
Position indication	Mechanically, pluggable	
Safety data	Degree of protection IEC/EN	IP40
Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1	
Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC	
Quality Standard	ISO 9001	
Ambient temperature	-22...122°F [-30...50°C]	
Storage temperature	-40...176°F [-40...80°C]	
Ambient humidity	max. 95% r.H., non-condensing	
Servicing	maintenance-free	
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

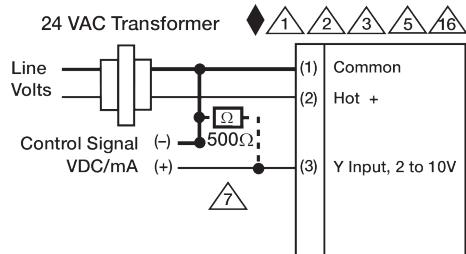
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

**Warning! Live Electrical Components!**

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2...10 V / 4...20 mA Control



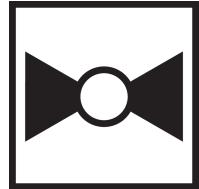
Stainless Steel Ball and Stem

## Technical data sheet

B212



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

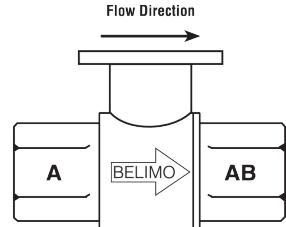
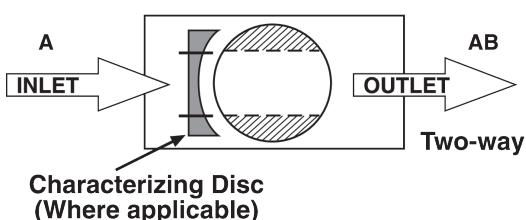


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

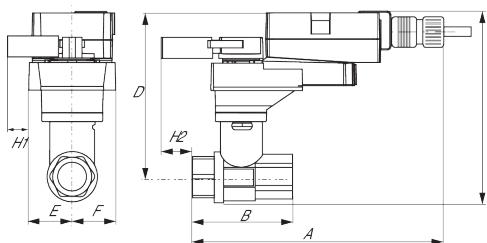
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	<p><b>Characterizing Disc (Where applicable)</b></p>

## Flow/Mounting details

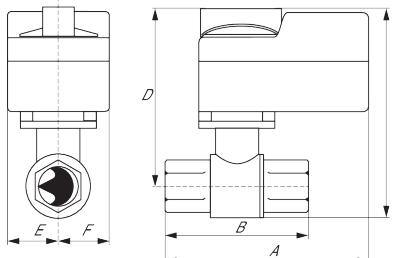


## Dimensions

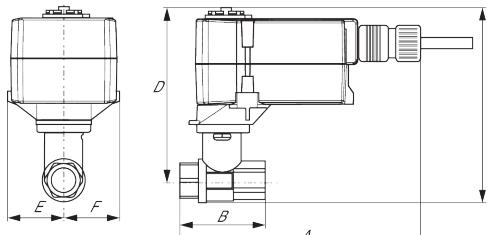
## Dimensional drawings



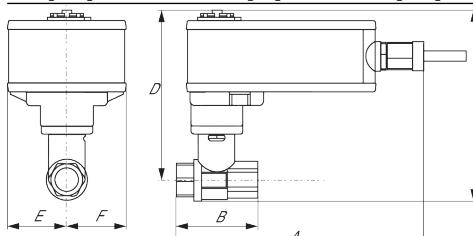
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



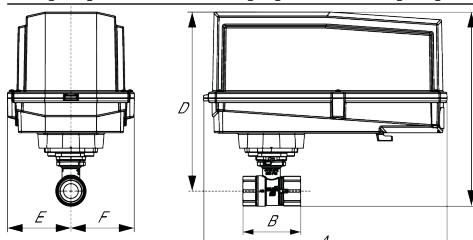
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



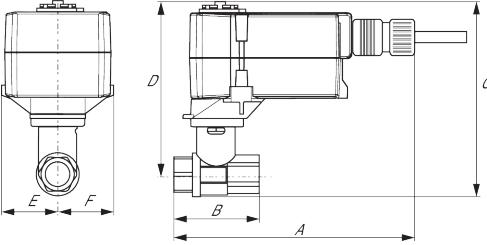
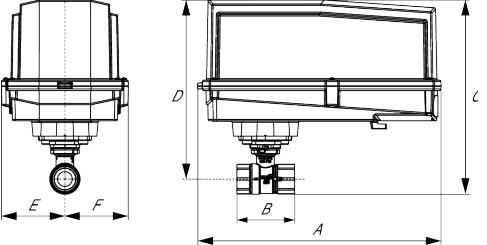
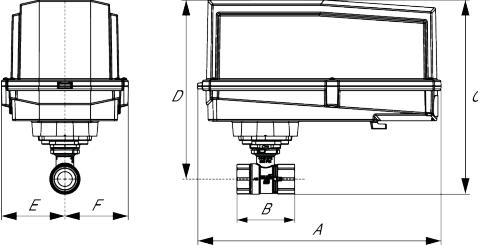
A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 5.5" [139]	<b>D</b> 4.7" [120]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

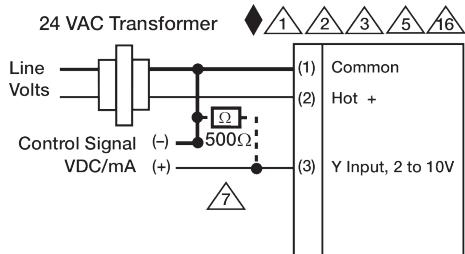
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

◆ Meets cULus requirements without the need of an electrical ground connection.

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2...10 V / 4...20 mA Control



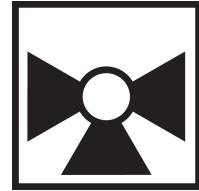
Stainless Steel Ball and Stem

## Technical data sheet

B313



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0% for A – AB, <2.0% for B – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

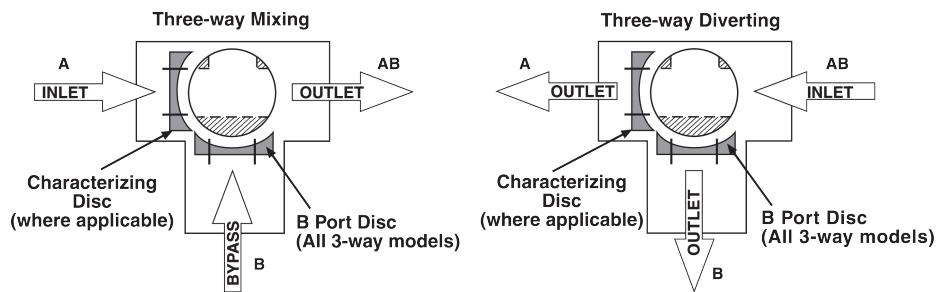


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

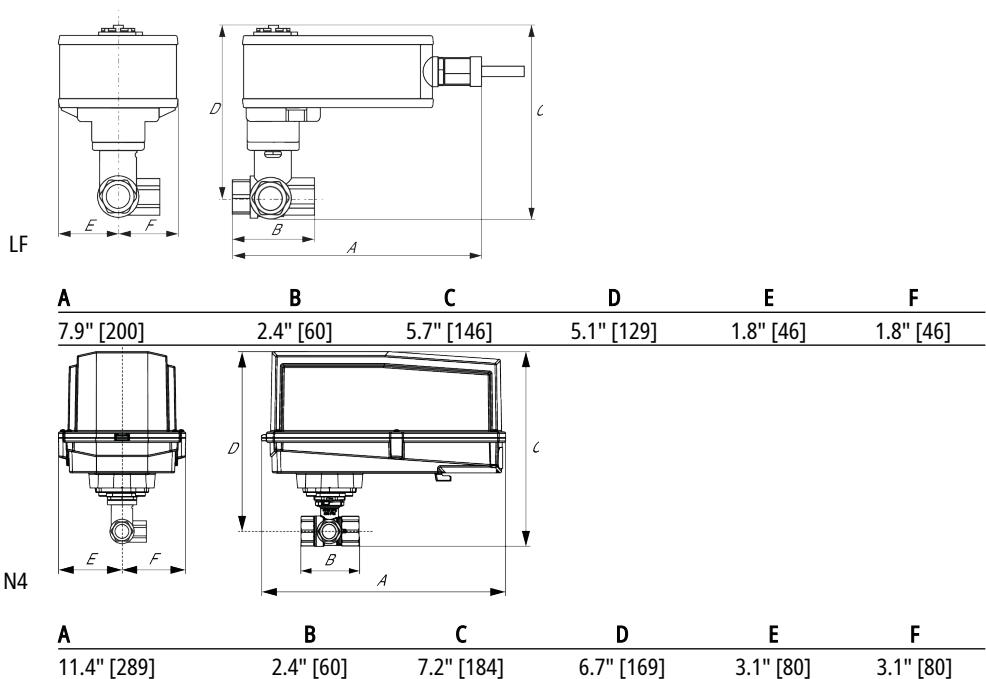
## Flow/Mounting details



## Dimensions

## Dimensional drawings

	A	B	C	D	E	F	H1	H2
LRB, LRX	8.5" [216]	2.4" [60]	5.2" [132]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]
LRQB, LRQX	8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.3" [33]	
TR	3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]		
TFRB, TFRX	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]		





5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

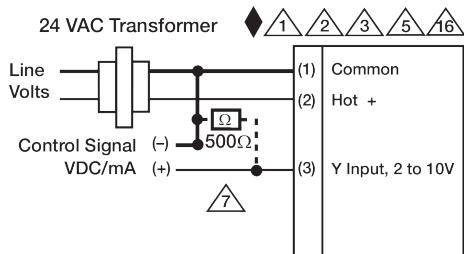
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

**Warning! Live Electrical Components!**

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2...10 V / 4...20 mA Control



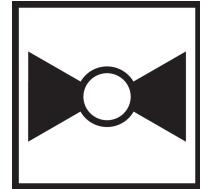
Stainless Steel Ball and Stem

## Technical data sheet

B208



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.46
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

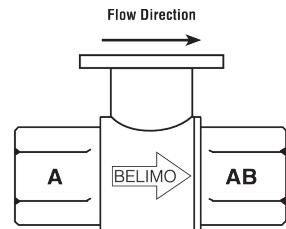
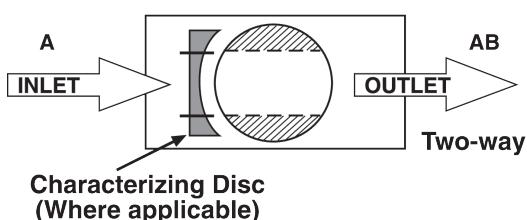
## Safety notes

- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

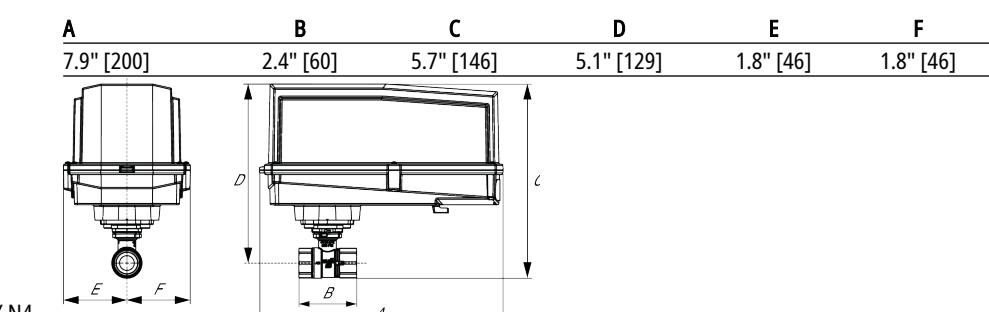
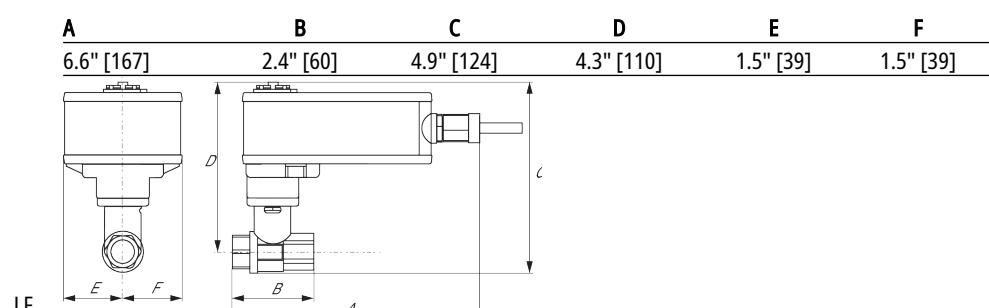
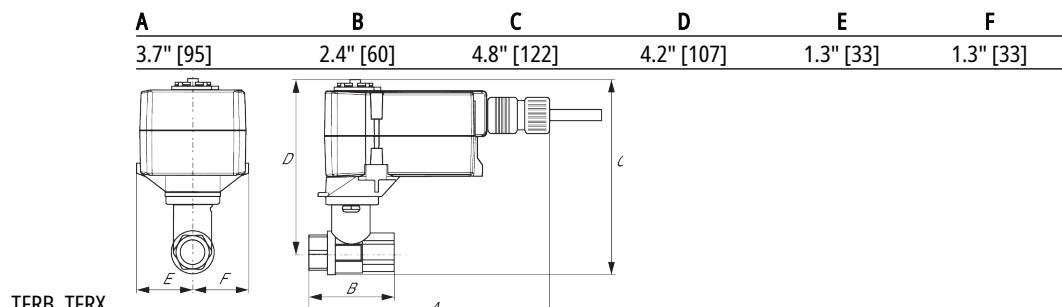
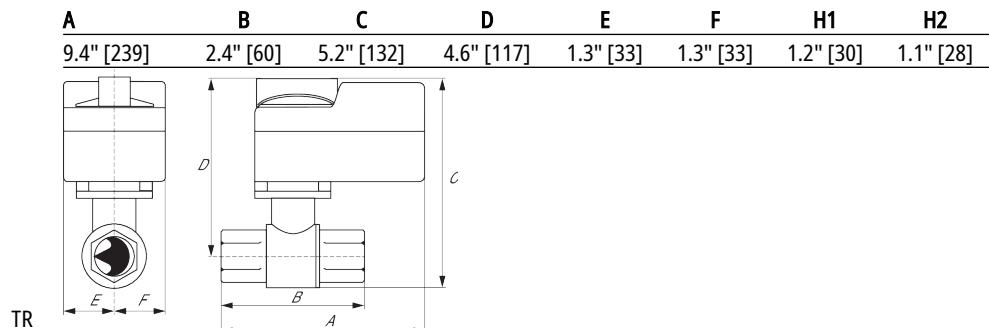
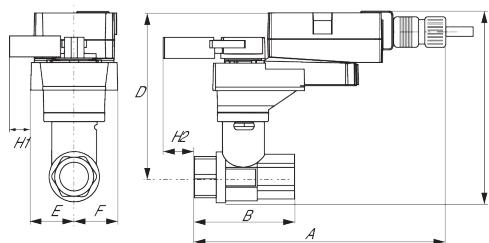
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
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## Flow/Mounting details

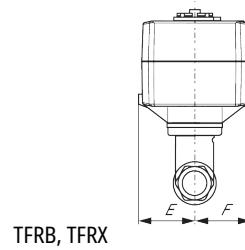


## Dimensions

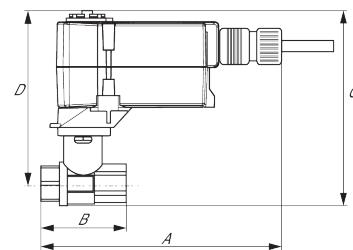
## Dimensional drawings



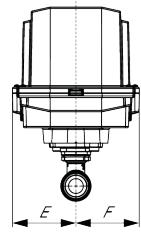
A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



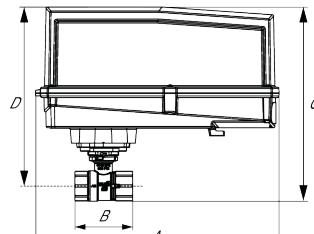
TFRB, TFRX



A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]



ARB N4, ARX N4, NRB N4, NRX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

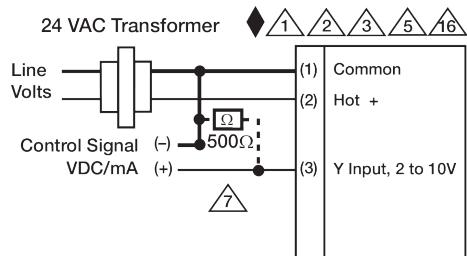
### INSTALLATION NOTES

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- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
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Meets cULus requirements without the need of an electrical ground connection.

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2...10 V / 4...20 mA Control



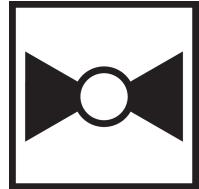
Stainless Steel Ball and Stem

## Technical data sheet

B210



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.2
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

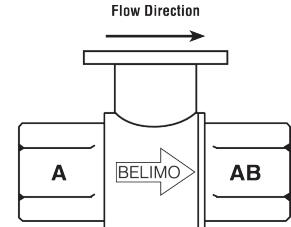
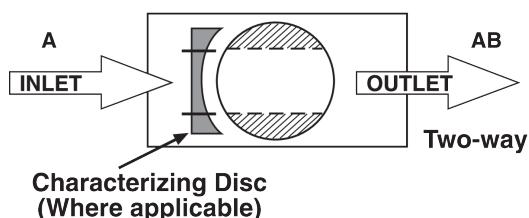


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

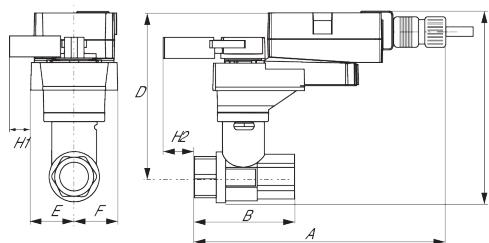
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
-------------	--

## Flow/Mounting details

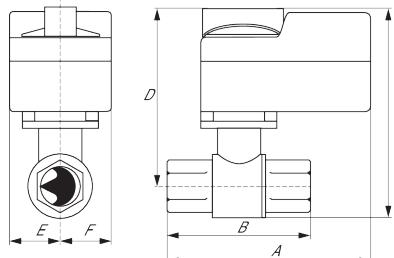


## Dimensions

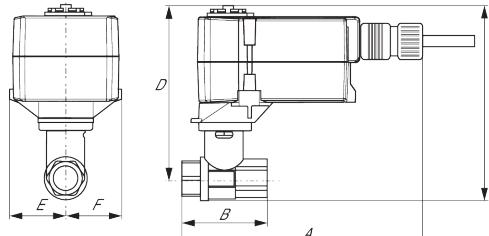
## Dimensional drawings



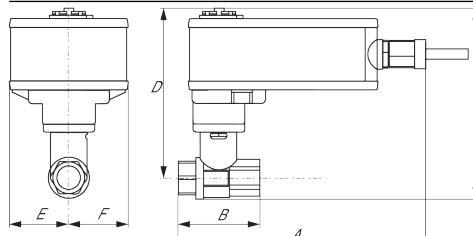
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



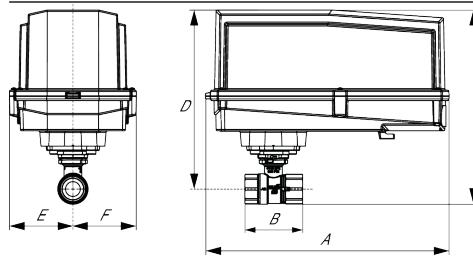
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



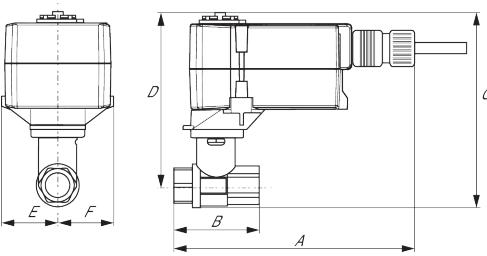
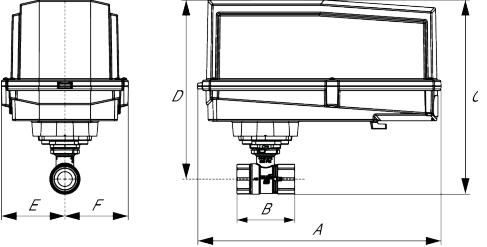
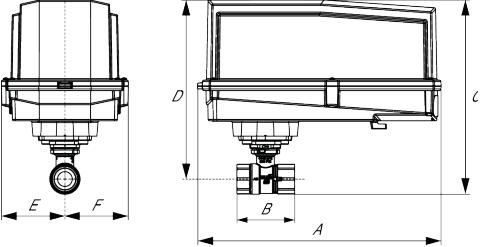
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

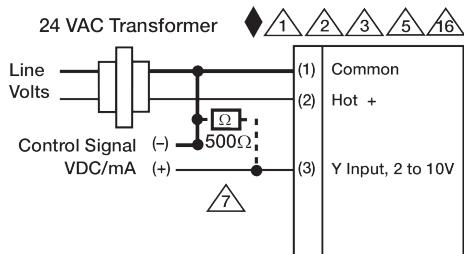
## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
  - 2 Actuators may also be powered by 24 VDC.
  - 3 Only connect common to negative (-) leg of control circuits.
  - 4 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
  - 5 Actuators are provided with a numbered screw terminal strip instead of a cable.
  - 6 Meets cULus requirements without the need of an electrical ground connection.

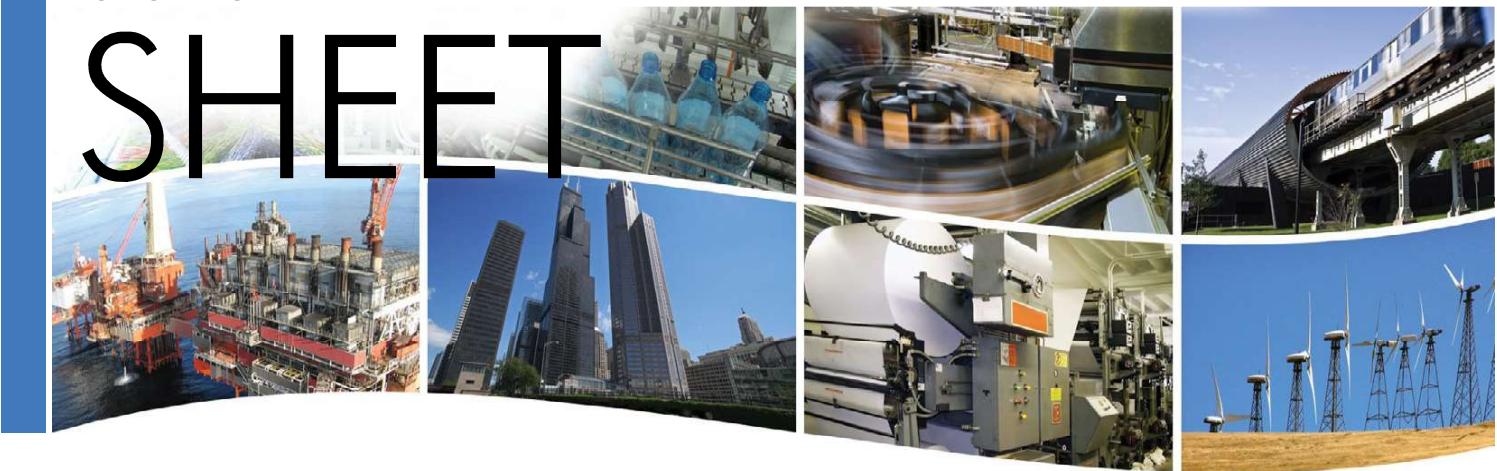
## Warning! Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control

# data SHEET



## 5-Port Skorpion Gigabit Switch *Cost Effective, High-speed — Compact Size*

The EISK5-GT Skorpion Gigabit Switch is a five-port unmanaged Ethernet switch that provides Gigabit Ethernet (GigE) performance on all ports in order to accommodate high-speed devices such as IP cameras and modern workstations. In addition, GigE jumbo frames up to 9216 bytes are supported for the highest possible system performance. For 10/100 Mbps legacy devices, the switch will automatically reduce its port-speed accordingly, thereby accommodating the needs of just about any Ethernet automation system. This low-cost compact unit utilizes a rugged metal enclosure and is intended for installation in control panels using DIN-rail mounting.

This is a plug-and-play Ethernet switch requiring no configuration. All ports automatically configure their data rate and duplex using the Auto-negotiation protocol. Depending on the capability of the link partner, communication is set at 10, 100 or 1000 Mbps and at either half- or full-duplex. Each port will accommodate either a straight-through or crossover cable by using the Auto-MDIX protocol.

The unit is powered from a choice of low-voltages (AC or DC). Redundant power connections are provided for back-up power schemes. LED indicators assist in troubleshooting network issues.

- Plug-and-Play operation
- 10BASE-T/100BASE-TX/1000BASE-T
- Shielded RJ-45 connectors
- Auto-negotiation of speed and duplex
- Auto-MDIX supports cable inversion



- DIN-rail mounting
- Rugged metal enclosure
- Diagnostic LEDs
- Enhanced EMC compliance
- UL 508 listed, c-UL listed, CE mark
- 24 VAC/VDC powered

**CTRLink®**

## Overview

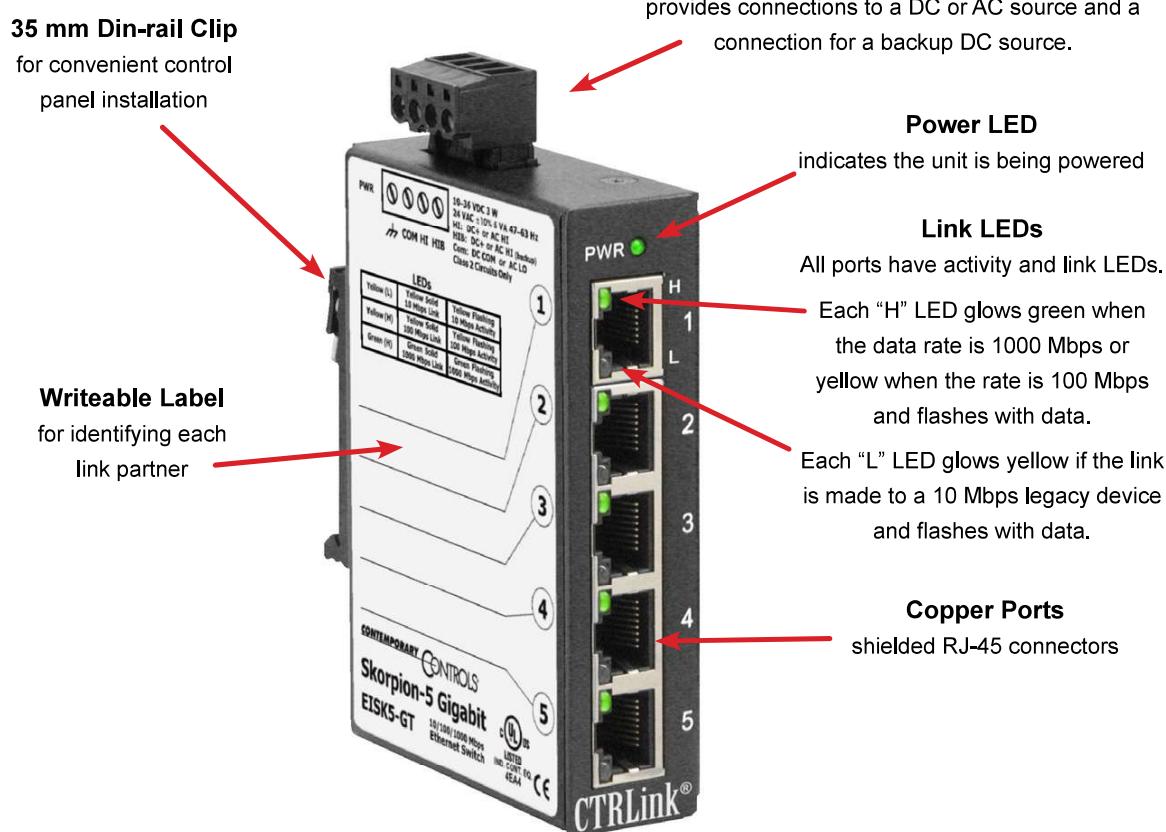
The Skorpion Gigabit Switch is intended for control panel installations where DIN-rail space is at a premium by requiring a width of only one inch (26 mm) of rail space. A metal DIN-rail clip attached to the aluminium enclosure can survive the toughest installation. A writable side label allows the installer an opportunity to document field cabling locations right on the unit.

The switch can be powered from either a 10–36 VDC or 24 VAC ( $\pm 10\%$ ) source. Its half-wave rectified low-voltage power supply allows the sharing of power with other 24 VAC/VDC control devices from a common power supply. With redundant power connections, a

backup power scheme can be supported. A removable power connector facilitates the servicing of the unit.

LEDs built into the connector indicate data rate and activity on each of the five ports. For each port, the data rate will be indicated along with port activity thereby greatly assisting in troubleshooting connection issues.

The switch is UL 508 Listed and c-UL Listed for Industrial Control Equipment. It is RoHS compliant, complies with CFR 47 Part 15 Class A, and carries the CE Mark.



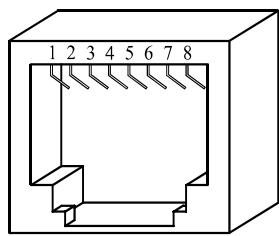
## Specifications

<b>Power Requirements</b>	10–36 VDC 3 W or 24 VAC $\pm 10\%$ 5 VA 47–63 Hz								
<b>Operating Temperature</b>	0°C to 60°C								
<b>Storage Temperature</b>	–40°C to 85°C								
<b>Relative Humidity</b>	10–95%, non-condensing								
<b>Protection</b>	IP30								
<b>Mounting</b>	TS-35 DIN-rail								
<b>Shipping Weight</b>	1 lb (0.45 kg)								
<b>Ethernet Communications</b>	IEEE 802.3 10/100/1000 Mbps data rate using RJ-45 connectors, 100 m (max) Supports jumbo frames up to 9216 bytes								
<b>LEDs</b>	<table> <tr> <td>Power</td> <td>Green = power OK</td> </tr> <tr> <td>“H” LEDs</td> <td>Green = 1000 Mbps communication established Yellow = 100 Mbps communication established</td> </tr> <tr> <td>“L” LEDs</td> <td>Yellow = 10 Mbps communication established</td> </tr> <tr> <td>“H” or “L” LEDs</td> <td>Flashing = data transmissions occurring</td> </tr> </table>	Power	Green = power OK	“H” LEDs	Green = 1000 Mbps communication established Yellow = 100 Mbps communication established	“L” LEDs	Yellow = 10 Mbps communication established	“H” or “L” LEDs	Flashing = data transmissions occurring
Power	Green = power OK								
“H” LEDs	Green = 1000 Mbps communication established Yellow = 100 Mbps communication established								
“L” LEDs	Yellow = 10 Mbps communication established								
“H” or “L” LEDs	Flashing = data transmissions occurring								
<b>Regulatory Compliance</b>	CE Mark; CFR 47, Part 15 Class A; RoHS; UL 508 Industrial Control Equipment								

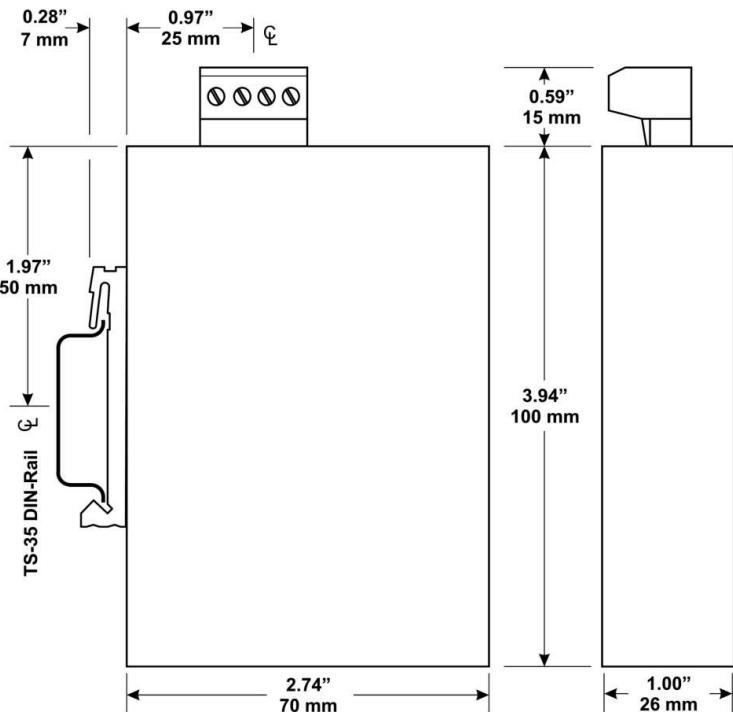


### RJ-45 Connector Pin Assignments

Pin	Function
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD-

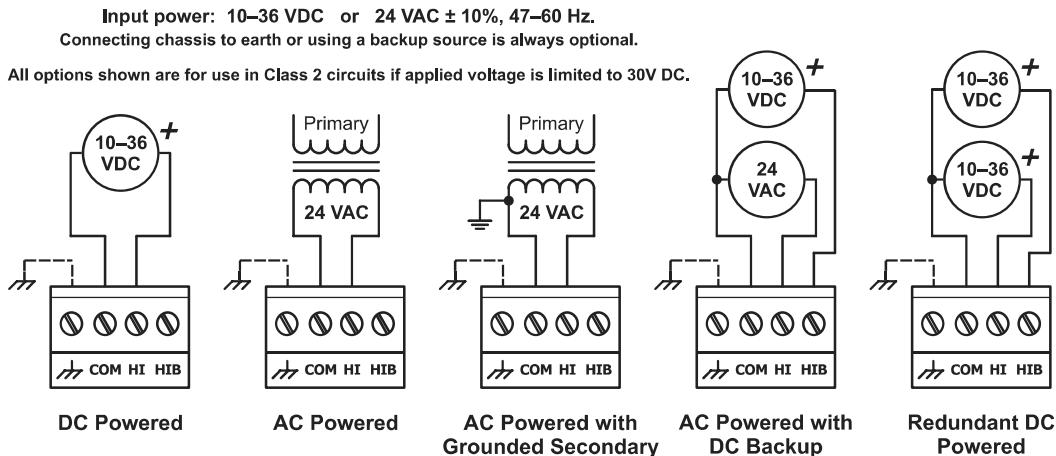


### Mechanical Drawing

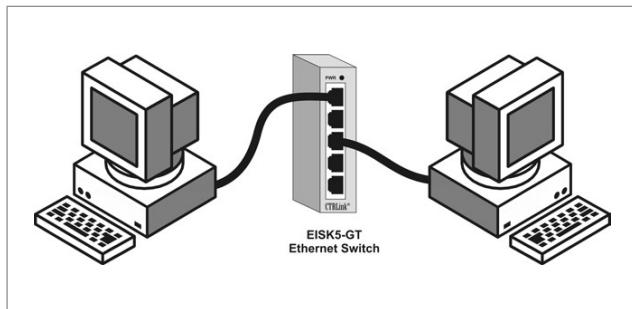


## Power Considerations

Applied voltage must be 10–36 VDC or 24 VAC  $\pm 10\%$  and deliver a current commensurate with power consumption. The recommended size for solid power conductors is 16–20 AWG; and for stranded conductors use 16–18 AWG. Zero volts (COM) is isolated from chassis (earth). Input connections are reverse-polarity protected.



## Typical Switch Installation



## Ordering Information

Model	Description
EISK5-GT	5 ports 10/100/1000 Mbps Skorpion switch

### United States

Contemporary Control  
Systems, Inc.  
2431 Curtiss Street  
Downers Grove, IL 60515  
USA

Tel: +1 630 963 7070  
Fax: +1 630 963 0109

[info@ccontrols.com](mailto:info@ccontrols.com)  
[www.ccontrols.com](http://www.ccontrols.com)

### China

Contemporary Controls  
(Suzhou) Co. Ltd  
11 Huoju Road  
Science & Technology  
Industrial Park  
New District, Suzhou  
PR China 215009

Tel: +86 512 68095866  
Fax: +86 512 68093760

[info@ccontrols.com.cn](mailto:info@ccontrols.com.cn)  
[www.ccontrols.asia](http://www.ccontrols.asia)

### United Kingdom

Contemporary Controls Ltd  
14 Bow Court  
Fletchworth Gate  
Coventry CV5 6SP  
United Kingdom

Tel: +44 (0)24 7641 3786  
Fax: +44 (0)24 7641 3923

[info@ccontrols.co.uk](mailto:info@ccontrols.co.uk)  
[www.ccontrols.eu](http://www.ccontrols.eu)

### Germany

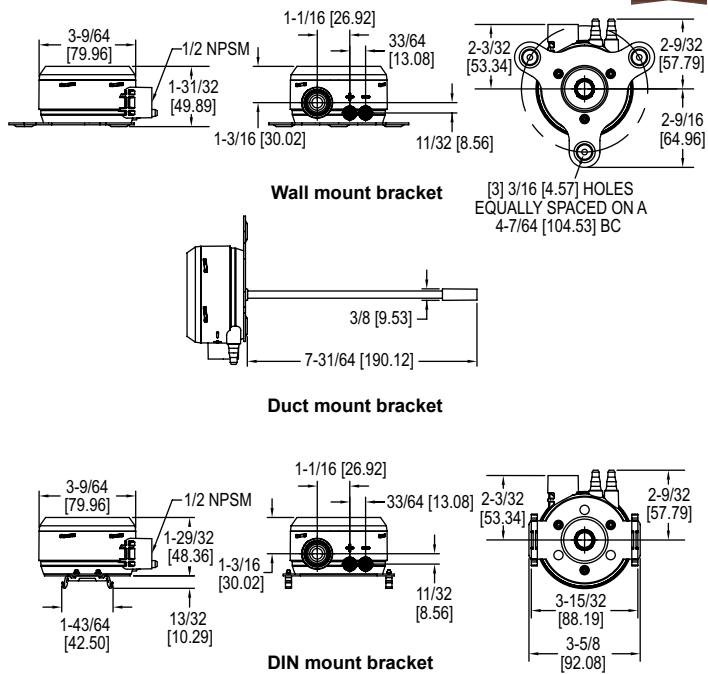
Contemporary Controls  
GmbH  
Fuggerstraße 1 B  
04158 Leipzig  
Germany

Tel: +49 341 520359 0  
Fax: +49 341 520359 16

[info@ccontrols.de](mailto:info@ccontrols.de)  
[www.ccontrols.eu](http://www.ccontrols.eu)

# MAGNESENSE® DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Differential Pressure, Air Velocity, and Volumetric Flow



The **Series MSX MagneSense® Differential Pressure Transmitter** combines the stability and versatility of the original Series MS2 MagneSense® II transmitter for use in building control applications. The MSX simplifies the ordering process to deliver the desired configuration, which reduces product setup time. Pressure ranges are available in Pa, mm w.c., and in w.c. All pressure ranges can be configured in unidirectional or bidirectional modes, providing a total of 32 ranges. The MSX transmitter can provide a linear pressure output or a linear velocity output with the square root extraction from the transmitter. Additional parameters have been included to expand the square root capability for calculating flow. Dual voltage and milliamp output signals can be used to provide both control and equipment output signal verification.

#### BENEFITS/FEATURES

- Read LCD values easier with rotatable 180° display
- Quick and easy wiring via the optional toolless terminal block
- Add safety to variety of applications with UL94 V-0 and plenum ratings

#### APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical/semiconductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

#### SPECIFICATIONS

<b>Service:</b> Air and non-combustible, compatible gases.	<b>Loop Resistance:</b> Current output: 0-2100 Ω max; Voltage output: min. load resistance 1 kΩ.
<b>Wetted Materials:</b> Consult factory.	<b>Current Consumption:</b> 21 mA max continuous.
<b>Accuracy:</b> ±1% FSO.	<b>Electrical Connections:</b> 4-wire removable European style terminal block for 16 to 26 AWG.
<b>Stability:</b> ±1% FSO/year.	<b>Electrical Entry:</b> 1/2" NPS thread.
<b>Temperature Limits:</b> -4 to 158°F (-20 to 70°C).	<b>Display (optional):</b> 4 digit LCD.
<b>Pressure Limits:</b> Ranges 0 and 1: 3.6 psi max operation, 6 psi burst; Ranges 2 and 3: 6 psi max operation, 6 psi burst.	<b>Process Connections:</b> 1/8", 3/16", 1/4", 5 mm, and 6 mm ID flexible tubing.
<b>Power Requirements:</b> 10-36 VDC (2-wire), 17-36 VDC or isolated 21.6-33 VAC (3-wire).	<b>Enclosure Rating:</b> NEMA 4X (IP66), UL 2043 (Plenum), UL94 V-0.
<b>Output Signals:</b> 4-20 mA (2-wire); 0-10 V or 0-5 V selectable (3-wire).	<b>Mounting Orientation:</b> Pressure sensor measurement unaffected by orientation.
<b>Response Time:</b> Instantaneous (default) or 3 s (selectable).	<b>Weight:</b> 8.0 oz (230 g).
<b>Zero and Span Adjustments:</b> Digital push-button.	<b>Agency Approvals:</b> CE.

#### MODEL CHART

Example	MSX	-W	1	3	-IN	-LCD	MSX-W13-IN-LCD
Series	MSX						MagneSense® differential pressure transmitter
Mounting		W U N					Wall mount Universal (wall or duct) mount DIN rail mount
Direction		1 2					Unidirectional Bidirectional
Range		0 1 2 3					.5 in w.c., 125 Pa, 12.5 mm w.c. 1 in w.c., 250 Pa, 25 mm w.c. 5 in w.c., 1250 Pa, 125 mm w.c. 28 in w.c., 7000 Pa, 700 mm w.c.
Pressure Unit			IN PA MM				Inches water column Pascal Millimeters water column
Options				A481 FC FP GLD LCD NIST STX TT WO			Installer kit, includes 2 plastic static pressure tips and 7 ft (2.1m) of PVC tubing Factory calibration certificate Filtered pickup with barb Liquid tight cable gland fitting Liquid crystal display NIST traceable calibration certificate Two (2) plastic static pressure tips Toolless terminal block LCD cover without LCD display

#### OPTIONS

Range	in w.c.	Pa low	Pa high	mm w.c.
Range 0	0.1	25	60	2.5
	0.15	30	75	5
	0.25	40	100	10
	0.5*	50	125*	12*
Range 1	0.1	25	100	2.5
	0.25	40	150	5
	0.5	50	160	10
	1*	60	250*	25*
Range 2	1	250	600	25
	2	300	750	50
	3	400	1000	100
	5*	500	1250*	125*
Range 3	10	1000	3000	250
	15	1500	4000	350
	25	2000	5000	500
	28*	2500	7000*	700*

\*Indicated values are the positive full scale output values per range.

**Note:** Ranges indicated in the table are the high end of the set range.

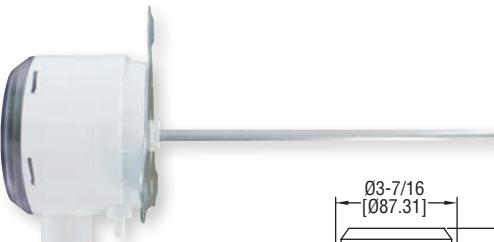
All ranges have a low end pressure value of 0.

#### ACCESSORIES

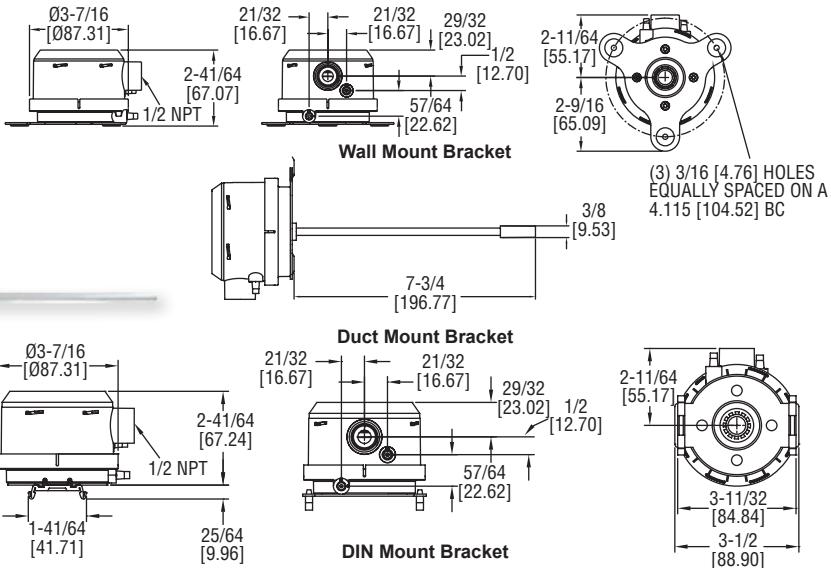
Model	Description
A-480	Plastic static pressure tip
A-481	Installer kit, includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-MSX-LCD	Replacement display for the Series MSX

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications



Scan here  
to watch  
product video



The **SERIES MS2** Magnesense® II Differential Pressure Transmitter combines the proven stable Hall Effect sensing technology of our original Series MS with additional features to reduce installation time and simplify ordering. Like the original Series MS, the second generation transmitter can be used as a linear pressure output or a linear velocity output with the square root extraction done in the transmitter. Additional parameters have been included to expand the square root capability to include flow measurements.

## FEATURES/BENEFITS

- Field selectable ranges and output signal reduce inventory and the chances of ordering an incorrect part
- BACnet or Modbus serial communications reduce wiring cost by daisy-chaining the transmitters
- Our integral field-upgradeable display or plug-in remote display tool save upfront material cost and allow for local viewing of measurements

## APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical-semi-conductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

## MODEL CHART

Model	in w.c.	Pa	mm w.c.	kPa
MS2-W101	0.10, 0.15, 0.25, 0.50	25, 40, 50, 125	2.5, 4, 6, 10	0.025, 0.04, 0.05, 0.125
MS2-W111	±0.10, ±0.15, ±0.25, ±0.50	±25, ±40, ±50, ±125	±2.5, ±4, ±6, ±10	±0.025, ±0.04, ±0.05, ±0.125
MS2-W102	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
MS2-W103	10, 15, 25, 28	2500, 3500, 5000, 6975	250, 350, 500, 697.5	2.5, 3.5, 5.0, 6.975

### Note:

For duct mount static probe change W to D. **Example:** MS2-D101  
For DIN rail mounting change W to N. **Example:** MS2-N101

## OPTIONS

To order add suffix:	Description
-LCD	Units with display
Example: MS2-W101-LCD	
-BC	BACnet Communications
Example: MS2-W101-BC	
-MC	Modbus® Communications
Example: MS2-W101-MC	
-NIST	NIST traceable calibration certificate
Example: MS2-W101-NIST	
-FC	Factory calibration certificate
Example: MS2-W101-FC	

## SPECIFICATIONS

**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, 115200.

**Data Size:** 8.

**Parity:** None.

**Stop Bits:** 1.

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Typical Accuracy:** ±1% FS for 0.15 in w.c. (40 Pa), 0.25 in w.c. (50 Pa), 0.5 in w.c. (100 Pa), 2 in w.c. (500 Pa), 3 in w.c. (750 Pa), 5 in w.c. (1250 Pa), 10 in w.c. (2 kPa), 15 in w.c. (3 kPa), 25 in w.c. (5 kPa), 28 in w.c. (6.975 kPa); ±2% FS for 0.1 in w.c. (25 Pa), 1 in w.c. (250 Pa), and all bi-directional ranges.

**Stability:** ±1% / year FSO.

**Temperature Limits:** 0 to 150°F (-18 to 66°C).

**Pressure Limits:** 1 psi max., operation; 10 psi burst.

**Power Requirements:** 10 to 35 VDC (2-wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).

**Output Signals:** 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).

**Response Time:** Adjustable: 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.

**Zero & Span Adjustments:** Digital push buttons.

**Loop Resistance:** Current output: 0 to 1250 Ω max; Voltage output: Min. load resistance 1 kΩ.

**Current Consumption:** 40 mA max.

**Display (Optional):** 5 digit LCD.

**Electrical Connections:** 3-wire removable European style terminal block for 16 to 22 AWG.

**Electrical Entry:** 1/2" NPS thread.

**Process Connection:** 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

**Enclosure Rating:** IP66.

**Mounting Orientation:** Diaphragm in vertical position.

**Weight:** 8.0 oz (230 g).

**Agency Approvals:** BTL, CE.

## ACCESSORIES

Model	Description
A-151	Cable gland for 5 to 10 mm diameter cable
A-MS2-LCD	Field upgradeable display
A-435-A	Remote display tool
A-480	Plastic static pressure tip
A-481	Installer kit; includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-489	4" 303 SS straight static pressure tip with flange
A-302F-A	4" 303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing
SCD-PS	100 to 240 VAC/VDC to 24 VDC power supply

Modbus® is a registered trademark of Schneider Automation, Inc.

**Process Tubing Options:** See page 443 (Gage Tubing Accessories)

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications

**Field Upgradeable LCD.** No need to order two separate transmitters. Simply stock a transmitter and display and you can satisfy any customer's requests. Simply remove cover and snap the LCD onto the board.

**Large Integral LCD.** Second generation MagneSense® has a larger LCD that includes the engineering units. Display also has 5 digits allowing measurements up to 99,999 to be displayed directly.

**Remote Display Tool** reduces instrument cost by eliminating need for each transmitter to have its own display. The buttons on the display tool also provide a means to zero and span the units without reaching into the transmitter.

**Removable Terminal Block** ease installation by allowing for the wiring to be done outside of the housing where the installer has more room.



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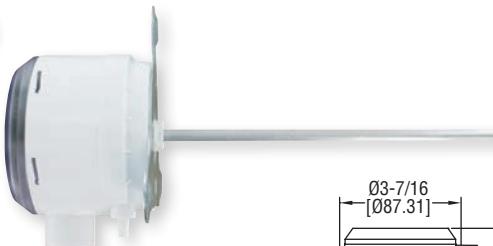
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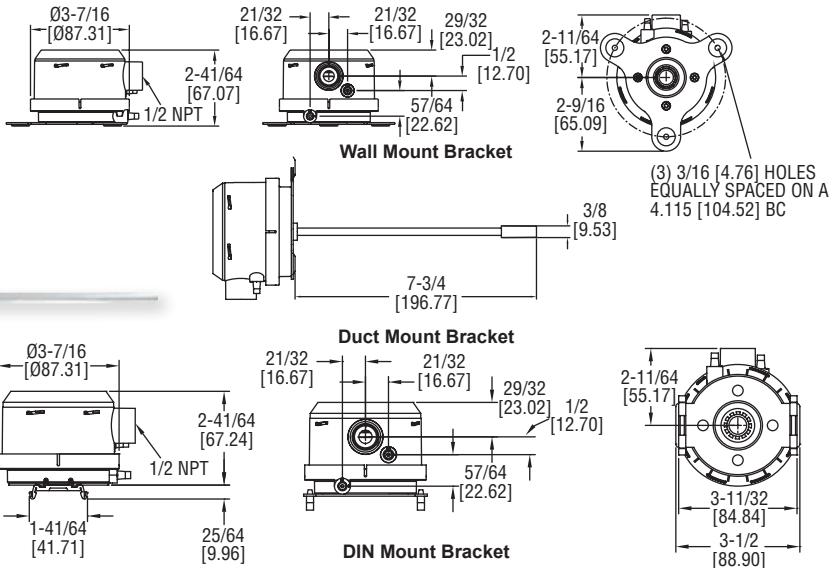
**Simultaneous Current/Voltage Output** reduces inventory by combining 0 to 10 V, 0 to 5 V and 4 to 20 mA models into one model. Both outputs are always present allowing field selection of which signal to use and the other signal can be used for local diagnostic without interrupting system.

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications



Scan here  
to watch  
product video



The **SERIES MS2** Magnesense® II Differential Pressure Transmitter combines the proven stable Hall Effect sensing technology of our original Series MS with additional features to reduce installation time and simplify ordering. Like the original Series MS, the second generation transmitter can be used as a linear pressure output or a linear velocity output with the square root extraction done in the transmitter. Additional parameters have been included to expand the square root capability to include flow measurements.

## FEATURES/BENEFITS

- Field selectable ranges and output signal reduce inventory and the chances of ordering an incorrect part
- BACnet or Modbus serial communications reduce wiring cost by daisy-chaining the transmitters
- Our integral field-upgradeable display or plug-in remote display tool save upfront material cost and allow for local viewing of measurements

## APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical-semi-conductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

## MODEL CHART

Model	in w.c.	Pa	mm w.c.	kPa
<b>MS2-W101</b>	0.10, 0.15, 0.25, 0.50	25, 40, 50, 125	2.5, 4, 6, 10	0.025, 0.04, 0.05, 0.125
<b>MS2-W111</b>	±0.10, ±0.15, ±0.25, ±0.50	±25, ±40, ±50, ±125	±2.5, ±4, ±6, ±10	±0.025, ±0.04, ±0.05, ±0.125
<b>MS2-W102</b>	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
<b>MS2-W103</b>	10, 15, 25, 28	2500, 3500, 5000, 6975	250, 350, 500, 697.5	2.5, 3.5, 5.0, 6.975

### Note:

For duct mount static probe change W to D. **Example:** MS2-D101  
For DIN rail mounting change W to N. **Example:** MS2-N101

## OPTIONS

To order add suffix:	Description
<b>-LCD</b>	Units with display
<b>Example:</b> MS2-W101-LCD	
<b>-BC</b>	BACnet Communications
<b>Example:</b> MS2-W101-BC	
<b>-MC</b>	Modbus® Communications
<b>Example:</b> MS2-W101-MC	
<b>-NIST</b>	NIST traceable calibration certificate
<b>Example:</b> MS2-W101-NIST	
<b>-FC</b>	Factory calibration certificate
<b>Example:</b> MS2-W101-FC	

## SPECIFICATIONS

**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, 115200.

**Data Size:** 8.

**Parity:** None.

**Stop Bits:** 1.

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Typical Accuracy:** ±1% FS for 0.15 in w.c. (40 Pa), 0.25 in w.c. (50 Pa), 0.5 in w.c. (100 Pa), 2 in w.c. (500 Pa), 3 in w.c. (750 Pa), 5 in w.c. (1250 Pa), 10 in w.c. (2 kPa), 15 in w.c. (3 kPa), 25 in w.c. (5 kPa), 28 in w.c. (6.975 kPa); ±2% FS for 0.1 in w.c. (25 Pa), 1 in w.c. (250 Pa), and all bi-directional ranges.

**Stability:** ±1% / year FSO.

**Temperature Limits:** 0 to 150°F (-18 to 66°C).

**Pressure Limits:** 1 psi max., operation; 10 psi burst.

**Power Requirements:** 10 to 35 VDC (2-wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).

**Output Signals:** 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).

**Response Time:** Adjustable: 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.

**Zero & Span Adjustments:** Digital push buttons.

**Loop Resistance:** Current output: 0 to 1250 Ω max; Voltage output: Min. load resistance 1 kΩ.

**Current Consumption:** 40 mA max.

**Display (Optional):** 5 digit LCD.

**Electrical Connections:** 3-wire removable European style terminal block for 16 to 22 AWG.

**Electrical Entry:** 1/2" NPS thread.

**Process Connection:** 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

**Enclosure Rating:** IP66.

**Mounting Orientation:** Diaphragm in vertical position.

**Weight:** 8.0 oz (230 g).

**Agency Approvals:** BTL, CE.

## ACCESSORIES

Model	Description
<b>A-151</b>	Cable gland for 5 to 10 mm diameter cable
<b>A-MS2-LCD</b>	Field upgradeable display
<b>A-435-A</b>	Remote display tool
<b>A-480</b>	Plastic static pressure tip
<b>A-481</b>	Installer kit; includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
<b>A-489</b>	4" 303 SS straight static pressure tip with flange
<b>A-302F-A</b>	4" 303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing
<b>SCD-PS</b>	100 to 240 VAC/VDC to 24 VDC power supply

Modbus® is a registered trademark of Schneider Automation, Inc.

**Process Tubing Options:** See page 443 (Gage Tubing Accessories)

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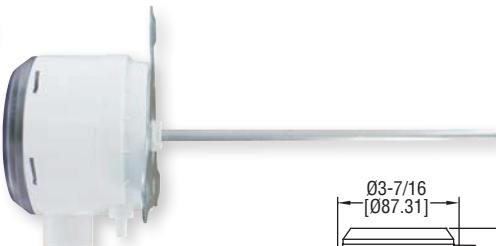
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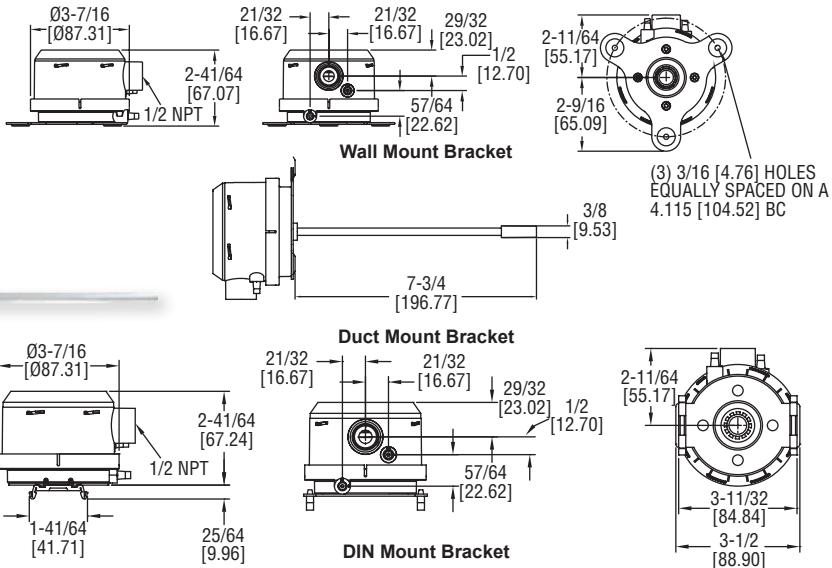
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<b>MS2-W102</b>	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
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**Current Consumption:** 40 mA max.

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**Electrical Connections:** 3-wire removable European style terminal block for 16 to 22 AWG.

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**Process Connection:** 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

**Enclosure Rating:** IP66.

**Mounting Orientation:** Diaphragm in vertical position.

**Weight:** 8.0 oz (230 g).

**Agency Approvals:** BTL, CE.

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## CUSTOM MOUNTING BRACKETS

- Heavy-duty construction
- Easy installation
- For walls and outside corners
- Replaces unsightly and hazardous makeshift supports
- 1/2-inch, 3/4-inch and 1-inch NPT pipe mount
- Indoor and outdoor use
- Type 3R

# Mounting Kits

Models **LWMB2** and **LCMB2**

Federal Signal's Models LWMB2 and LCMB2 mounting brackets are specifically designed for use with Federal Signal's stationary warning lights to provide an easy and consistent means of mounting lights throughout a facility.

Federal Signal's Models LWMB2 and LCMB2 are constructed of durable cast aluminum and sealed with gray powder coat paint. Easy to install, these units can be wired through the back of the bracket for electrical box mounting or through the threaded hole in the base for external 1/2-inch conduit connection. Each kit includes a bracket, plate and mounting screws.

Easy installation, heavy-duty construction and a professional appearance make the brackets suitable for use in commercial, institution and industrial environments.

These brackets are suitable for any Type 3R application in ordinary (non Division 1/Division 2) environments.

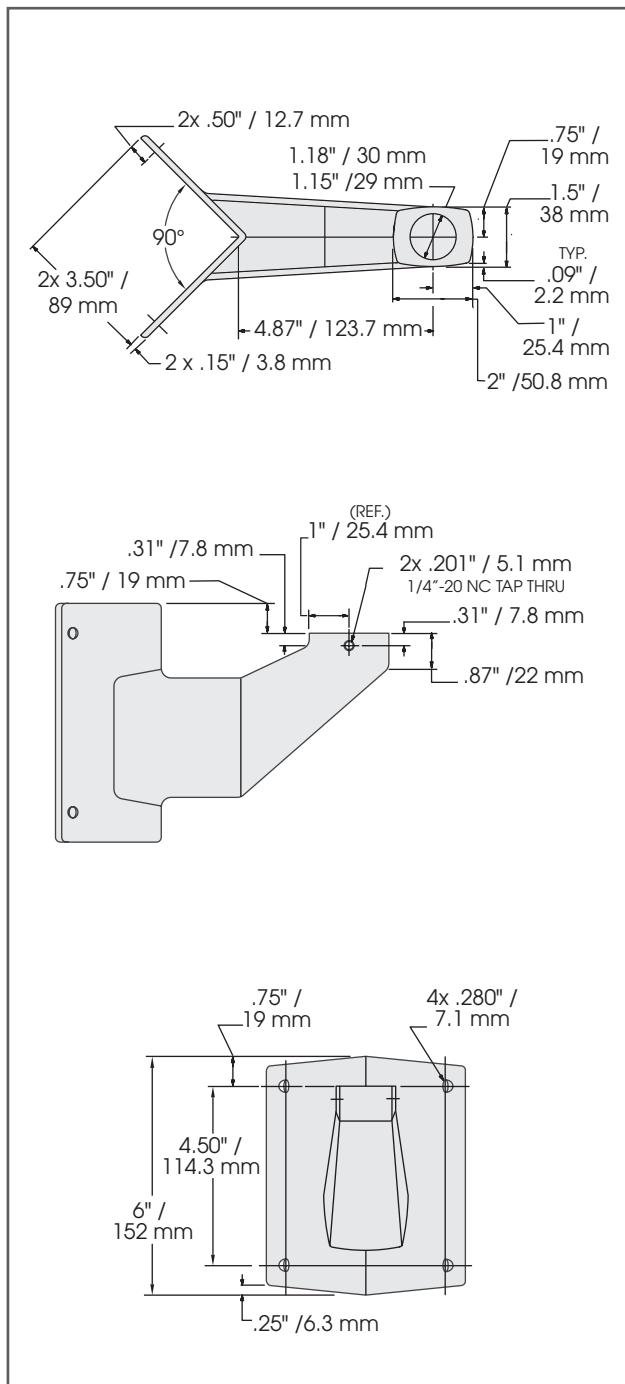
The LCMB2 and LWMB2 mounting kits may be used with the following Federal Signal models: 121S, 131ST, 131DST, 131C, 141(120V), 141ST, 225, 371, 371L, 371ST, 371DST, AV1, AV1ST, FB2PST and the FB24ST.

Model	Height	Width	Extension	Net Weight	Shipping Weight
<b>LWMB2</b>	6.0"	6.375"	5.875"	2.6 lbs.	2.95 lbs.
<b>LCMB2</b>	6.0"	5.000"	5.750"	2.3 lbs.	2.50 lbs.

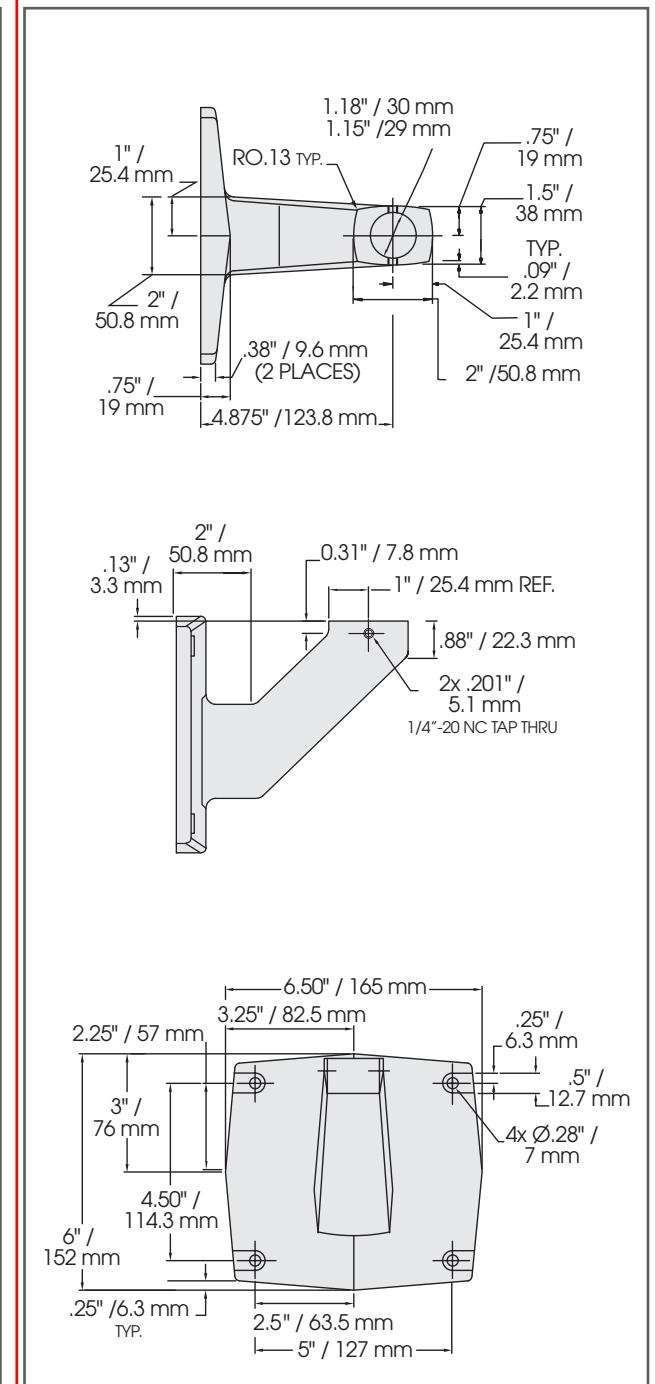


## MOUNTING KITS (LWMB2/LCMB2)

### LCMB2 - Corner Mount



### LWMB2 - Wall Mount



### HOW TO ORDER

- Specify model

Corner Bracket (LCMB2)  
Wall Bracket (LWMB2)



► Model AV1-LED

## LED Flashing Combination Audible/Visual Signal

**A** **B** **C** **G** **R**

Model AV1-LED is a combination audible/visual signal. The AV1-LED features a 100% polycarbonate housing that is rated for Type 3R rain-tight applications.

All AV1-LED units feature a unique twist-and-lock dome design to allow for tool-free access to the LED. The fresnel lensing provides superior visibility in all directions.

The integrated buzzer provides 85 dBA output @ 10 feet (95 dBA @ 1 meter). The unit is capable of independent flashing light and sounder operation. The LED can be field adjusted to two flash patterns, 60 FPM or 75 FPM, via a jumper on the PC board.

Each unit is factory assembled with two color-coded leads. If desired, the user can remove the leads and connect directly to the terminal block located in the base of the unit.

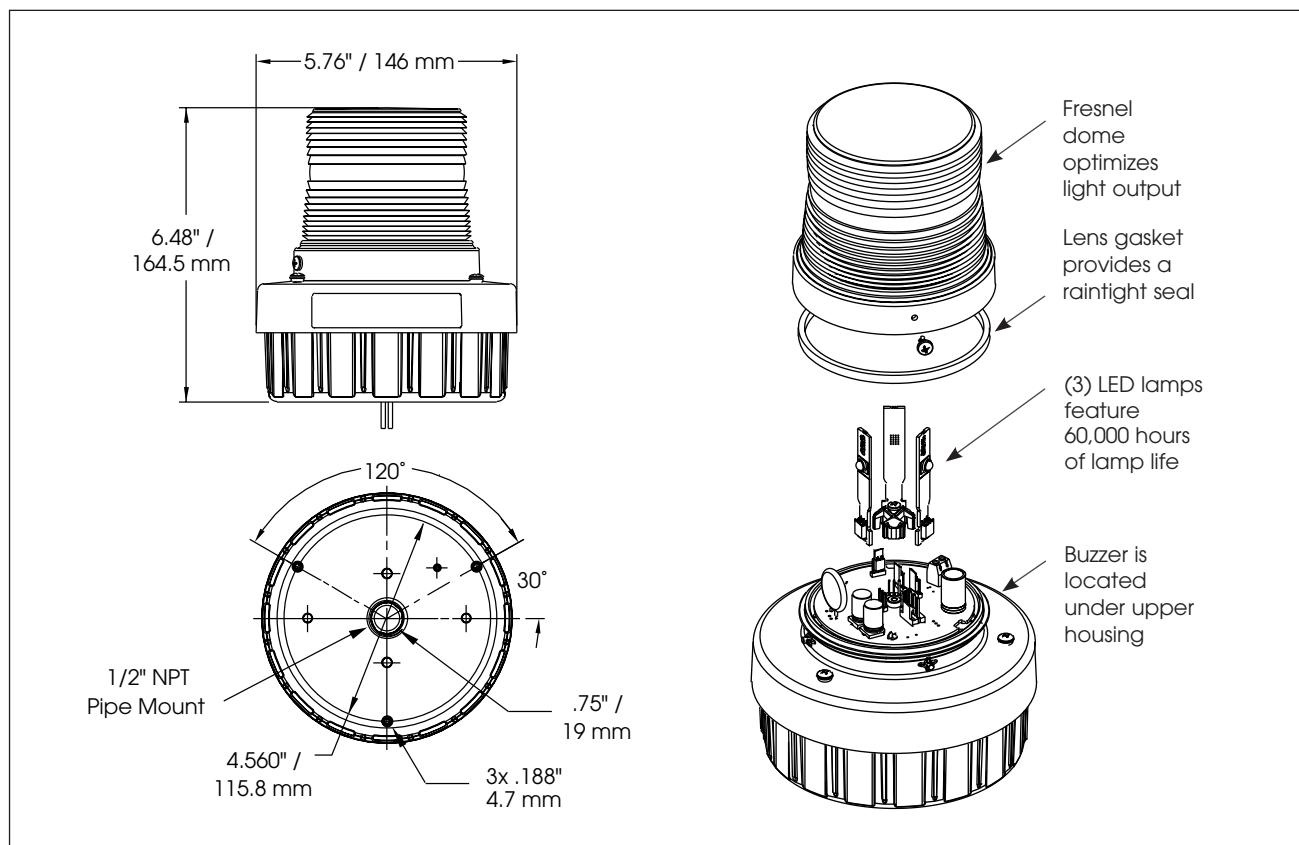
### FEATURES

- Available in 24VDC and 120VAC
- 50,000 hour LED light source
- Surface mount, integrated 1/2-inch NPT pipe mount, and 4-inch electrical box mount
- Five lamp/lens colors: Amber, Blue, Clear, Green and Red
- Twist-off lens for easy access
- Internal buzzer produces 85 dBA at 10' (95 dBA @ 1m)
- PLC compatible
- Type 3R enclosure
- UL and cUL Listed

MODEL	VOLTAGE	OPERATING CURRENT	FLASH RATE/ MINUTE	DECIBELS 10'	DECIBELS 1M	MOUNT
<b>AV1-LED-024 *</b>	24VDC	0.27 amps	60/75	85	95	1/2" NPT Pipe/Surface
<b>AV1-LED-120 *</b>	120VAC	0.03 amps	60/75	85	85	1/2" NPT Pipe/Surface

\* Indicates color: (A) Amber, (B) Blue, (C) Clear, (G) Green or (R) Red

## Audible/Visual Signaling Device (AV1-LED)



## S P E C I F I C A T I O N S

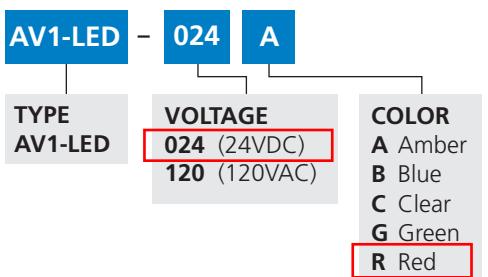
Lamp Life:	50,000 Hours	
Light Source:	LED	
Operating Temperature:	-31°F to 150°F	-35°C to 66°C
Net Weight:	1.25 lbs	0.57 kg
Shipping Weight:	1.75 lbs	0.8 kg
Height:	6.48"	164.5 mm
Diameter:	5.76"	146 mm

## R E P L A C E M E N T P A R T S

Description	Part Number
Dome Kit, Amber <sup>1</sup>	K8550292A-02
Dome Kit, Blue <sup>1</sup>	K8550292A-01
Dome Kit, Clear <sup>1</sup>	K8550292A
Dome Kit, Green <sup>1</sup>	K8550292A-04
Dome Kit, Red <sup>1</sup>	K8550292A-03
Buzzer, 24VDC	K8591002A-03
Buzzer, 120VAC	K8591002A
Amber LED	K2005633A-A
Blue LED	K2005633A-B
Green LED	K2005633A-G
Red LED	K2005633A-R
White LED	K2005633A-W

<sup>1</sup> Includes 1 lens gasket and 1 surface mount gasket

## H O W T O O R D E R



## O P T I O N A L A C C E S S O R I E S

Description	Part Number
Corner Bracket	LCMB2*
Wall Bracket	LWMB2*
Hazardous Location Mounting Bracket	LHWB

\* Rated for NEMA 3R installations

Mounting Brackets shown on pages 128-131



Functional Devices, Inc.  
310 South Union Street  
Russiaville, IN 46979  
www.FunctionalDevices.com

Office 765.883.5538  
Sales 800.888.5538  
Fax 765.883.7505  
Email sales@functionaldevices.com

## RIBU1C | Enclosed Relay 10 Amp SPDT with 10-30 Vac/dc/120 Vac Coil



### SPECIFICATIONS

# Relays & Contact Type: One (1) SPDT Continuous Duty Coil  
Expected Relay Life: 10 million cycles minimum mechanical  
Operating Temperature: -30 to 140° F  
Operate Time: 20ms  
Relay Status: LED On = Activated  
Dimensions: 1.70" x 2.80" x 1.50" with .50" NPT nipple  
Wires: 16", 600V Rated  
Approvals: UL Listed, UL916, UL864, C-UL  
California State Fire Marshal, CE  
Housing Rating: Plenum, NEMA 1  
Gold Flash: Yes  
Override Switch: No

### Contact Ratings:

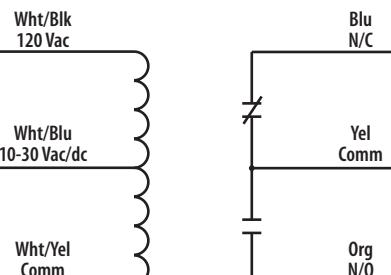
10 Amp Resistive @ 120-277 Vac  
10 Amp Resistive @ 28 Vdc  
480 VA Pilot Duty @ 240-277 Vac  
480 VA Ballast @ 277 Vac  
600 Watt Tungsten @ 120 Vac N/O  
240 Watt Tungsten @ 120 Vac N/C  
1/3 HP for N/O @ 120-240 Vac  
1/6 HP for N/C @ 120-240 Vac  
1/4 HP for N/O @ 277 Vac  
1/8 HP for N/C @ 277 Vac

### Coil Current:

30 mA @ 10 Vac	12 mA @ 10 Vdc
32 mA @ 12 Vac	14 mA @ 12 Vdc
42 mA @ 24 Vac	16 mA @ 24 Vdc
50 mA @ 30 Vac	18 mA @ 30 Vdc
25 mA @ 120 Vac	

### Coil Voltage Input:

10-30 Vac/dc ; 120 Vac ; 50-60 Hz  
Drop Out = 2.1 Vac / 2.8 Vdc  
Pull In = 9 Vac / 10 Vdc



## NOTES



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[www.FunctionalDevices.com](http://www.FunctionalDevices.com)  
sales@FunctionalDevices.com



Made in USA  
Meets  
"Buy American"  
of ARRA 2009

#### SPECIFICATIONS

Operating Temperature: -30 to 140° F  
Humidity Range: 5 to 95% (noncondensing)  
Circuit Breaker: 10 Amp Max.  
Dimensions: 4.000" x 3.250" x 1.750"  
Track Mount: 3.250" x 4.000"  
MT4-4N Mounting Track Included  
Approvals: UL Listed, UL916, C-UL, CE, RoHS

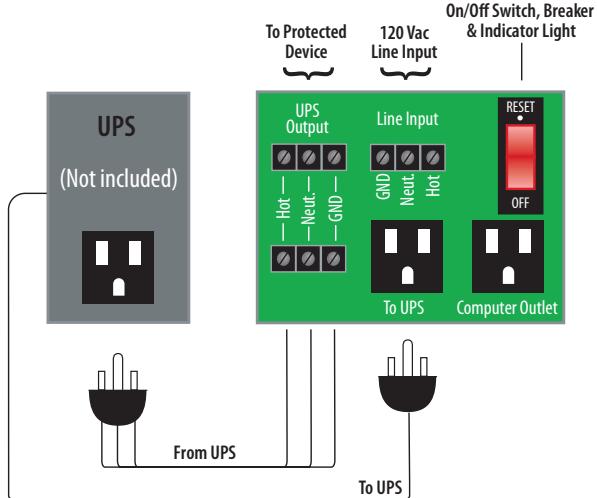
#### Notes:

- » Circuit breaker for short protection.
- » 14/3 Line Cord included (6').
- » Use with UPS devices rated 1000 VA or less.
- » UPS is not included.

### UPS Interface Module

#### PSM2RB10

4.00" Track Mount Power Control Center, with 10 Amp Switch / Circuit Breaker, Two (2) 120 Vac Outlets, Terminals, 120 Vac Input. (No Status Contacts)



### Notes



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## → TR100VA002

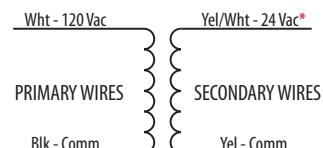
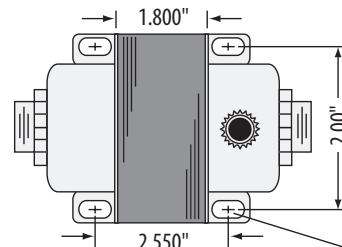
### TRANSFORMER

Transformer 100 VA, 120 to 24 Vac, Circuit Breaker, Foot and Dual Threaded Hub Mount



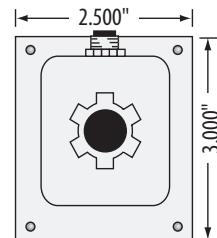
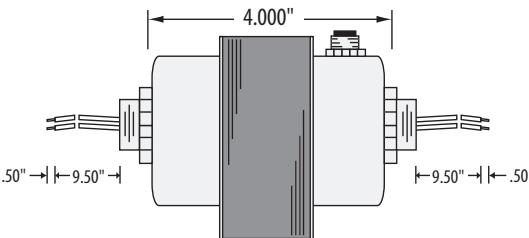
#### ■ SPECIFICATIONS

VA Rating: 100  
Frequency: 50/60 Hz  
Mounting: Foot & Dual Threaded Hubs  
Over Current Protection: Circuit Breaker  
Dimensions: 3.000" x 2.500" x 4.000"  
(w/.500" NPT Hubs)  
Wire Length: 9.5' Typical w/.5" Strip  
Operating Temperature: -30 to 140° F  
MTBF: 100,000 Hours @ 77° F  
Construction: Split-Bobbin  
Weight: 4.13 lbs.  
Approvals: Class II UL1585 Listed, C-UL, CE, RoHS



\*Secondary Yel/Wht wire in phase with Primary Blk wire.

Mounting Hole = .350" x .175"



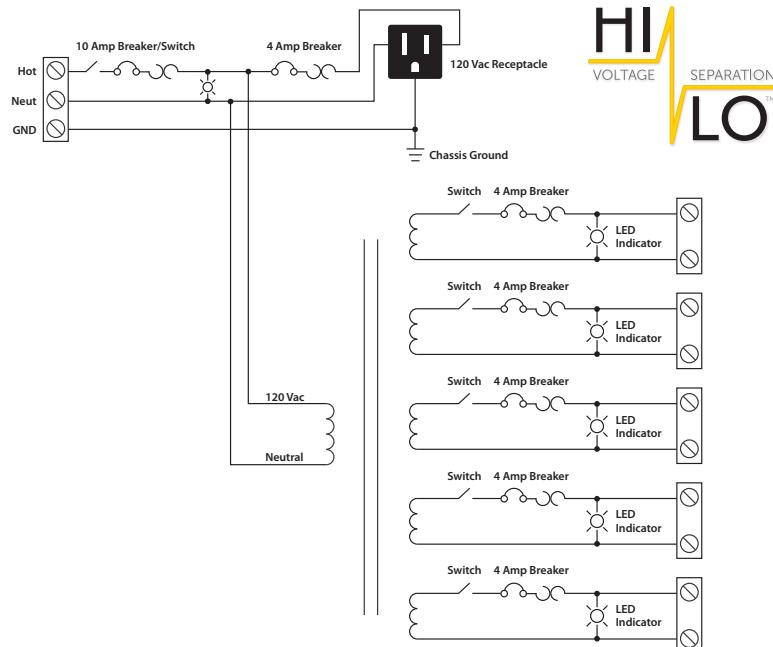
## NOTES



## AC POWER SUPPLY

### → PSH500AB10-LVC

Enclosed 500VA Power Supply, **High/Low Voltage Separation** with Five 100VA Class 2 Outputs, 120 Vac to 24 Vac with 120 Vac Receptacle



**UL** LISTED Class 2

**Made in USA**  
Meets  
"Buy American"  
of ARRA 2009

**POWER SUPPLIES**



PSH500AB10-LVC  
Shown With High Voltage  
Cover & Low Voltage  
Access Plate

## SPECIFICATIONS

**Transformer:** One (1) 500 VA  
**Over Current Protection:** Circuit Breaker  
**Primary:** 120 Vac  
**Frequency:** 50/60 Hz  
**Main Breaker ON/OFF:** Switch / Breaker (10 Amp)  
(Kills power to entire unit:  
1 Outlet & Transformer)  
**Approvals:** Class 2 (UL Approved UL5085-3),  
UL916, C-UL  
**Dimensions:** 12.125" x 12.125" x 6.000"  
**Housing:** NEMA1 Metal Enclosure with  
high/low separation  
**Weight:** 32.30 lbs.

**5 Secondaries:**  
24 Vac, with LED Indicators  
4 Amp breaker for each output

**24 Vac ON/OFF:**  
On / Off Switch & Breaker

**Input:**  
120 Vac **Finger-Safe Terminals**, 8-18 AWG

**Output:**  
5 Ungrounded, Isolated, 100 VA Class 2,  
24 Vac Outputs. Removable Terminals  
accept 16-22 AWG wire.

**Ambient Temperature Derating:**  
4A up to 40° C; 3A up to 50° C; 2A up to 55° C  
(When All 5 Outputs Operated Simultaneously)

**Standby Wattage:**  
48.515 W @ 120 Vac

**Full Load Primary Current:**  
4.66 A @ 120 Vac

**Secondary Output Voltage vs. Load:**  
24.0 V @ 1 Amp  
23.0 V @ 2 Amp  
21.8 V @ 3 Amp  
21.1 V @ 4 Amp

- When all 5 outputs operated simultaneously, at room temperature

**Notes:**  
• 4A (Breaker protected) Convenience  
Receptacle Provided

**Functional  
Devices, Inc.**



**Functional Devices, Inc.**

310 South Union Street  
Russiaville, IN 46979  
www.FunctionalDevices.com

Office 765.883.5538

Sales 800.888.5538

Fax 765.883.7505

Email sales@FunctionalDevices.com



LISTED  
Class 2



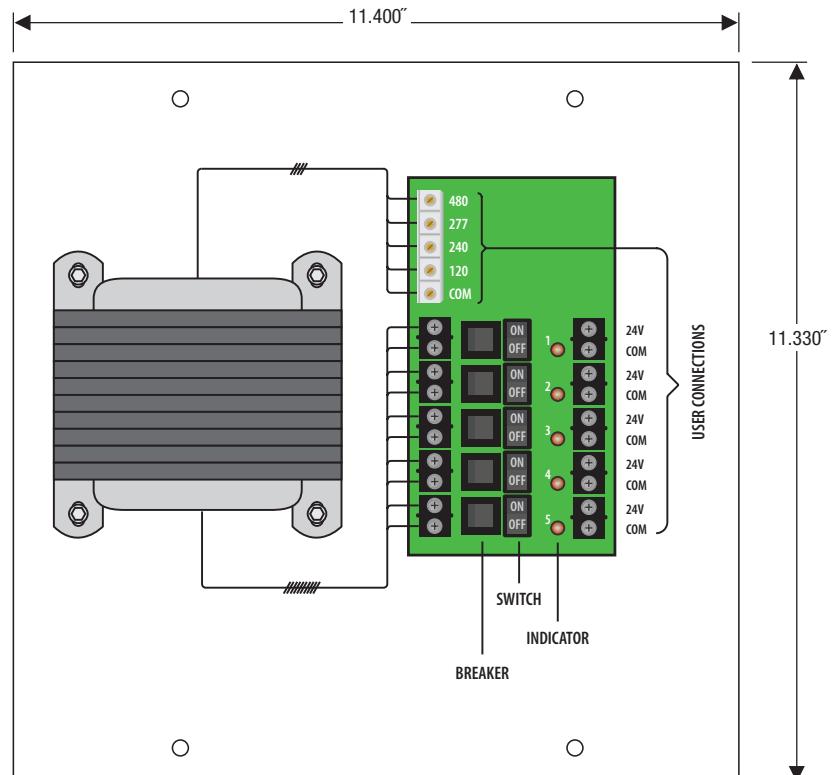
MADE IN USA



### AC Power Supply

#### PSH500A

Enclosed 500VA Power Supply with Five 100VA Class 2 Outputs, 480/277/240/120 Vac to 24 Vac



### SPECIFICATIONS

Transformer: One (1) 500 VA	5 Secondaries:	Standby Wattage:
Over Current Protection: Circuit Breaker	24 Vac, with LED Indicators	48.515 W @ 120 Vac
Primary: 480/277/240/120 Vac		48.699 W @ 240 Vac
Frequency: 50/60 Hz	24 Vac ON/OFF:	49.564 W @ 277 Vac
Dimensions: 12.125" x 12.125" x 6.000" (PSH500A)	On / Off Switch & Breaker	48.255 W @ 480 Vac
11.330" x 11.400" x 5.000" (PSMN500A)		
Approvals: Class 2 UL Listed, UL916, UL508, C-UL, CE, RoHS	Input:	Full Load Primary Current:
Sub-Panel: Plenum Rated Polymetal Sub-Panel	480/277/240/120 Vac Finger-Safe Terminals, 10-26 AWG	4.66 A @ 120 Vac
Housing: NEMA1 Metal Enclosure	Output:	2.41 A @ 240 Vac
Weight: 30.16 lbs. (PSH500A)	5 Isolated 100 VA Class 2 24 Vac Terminals, 12-26 AWG	2.06 A @ 277 Vac
20.60 lbs. (PSMN500A)	Notes:	1.17 A @ 480 Vac
	» To order UL508, add "-IC" to end of model number.	Ambient Temperature Derating:
		4A up to 40° C ; 3A up to 50° C ; 2A up to 55° C
		(When All 5 Outputs Operated Simultaneously)

**Great for VAV Applications**



Functional Devices, Inc.  
310 South Union Street  
Russiaville, IN 46979  
www.FunctionalDevices.com

Office 765.883.5538  
Sales 800.888.5538  
Fax 765.883.7505  
Email sales@functionaldevices.com

## PSM24A24DAS | 4.00" & 2.75" Track Mount Isolated Linear DC Power Supply, 24 Vac to 1.5-28 Vdc, 300 mA Adjustable Output



### ■ SPECIFICATIONS

**Voltage Input:** 24 Vac  
**Voltage Output:** 1.5 - 28 Vdc Isolated  
**Frequency:** 50/60 Hz  
**Overload Protection:** Electrical and Thermal, Auto-Reset  
**Operating Temperature:** -30 to 140° F  
**Status:** LED On = Activated  
**Dimensions:** 1.625" x 2.750" x 4.000"  
**Track Mount:** 4.000" and 2.750"  
 MT212-4 Mounting Track Supplied  
**Weight:** 1.10 lbs.  
**ON/OFF Switch:** 2 Position Toggle  
**Approvals:** Class II UL Listed, UL916, C-UL, CE

### Output Current Ratings:

116 mA @ 10 Vdc  
 125 mA @ 12 Vdc  
 300 mA @ 24 Vdc

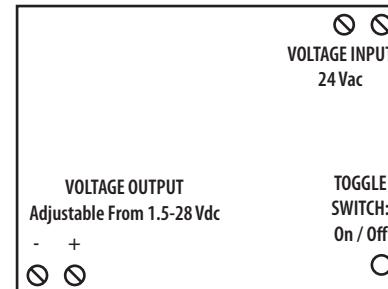
### Input Current Rating:

950 mA Maximum

### Percent Ripple:

0.0016%, 24 Vdc @ 300 mA

**Regulation:**  
 Load: 0.04% No Load to Full Load  
 Line: 0.0080 mV/V



## NOTES

**Small Enclosure, Hinge, No Backplate**

ATS BOM Tag	MAN PART #
EN-03A	A-HE 8X6X4
EN-06	A-HE10X10X4
EN-08	A-HE12X12X4
EN-09	A-HE16X12X4

## Hinged Cover Cutout Boxes



### Application

Designed for use as a surface-mounted junction box, service box, switch box, and cutout box.

### Features

- Various sizes of easily-removable concentric knockouts on all four sides

### Construction

- 16 gauge or 14 gauge steel
- Butt hinges
- Mounting holes on back of box
- Provision for grounding

### Finish

ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces.

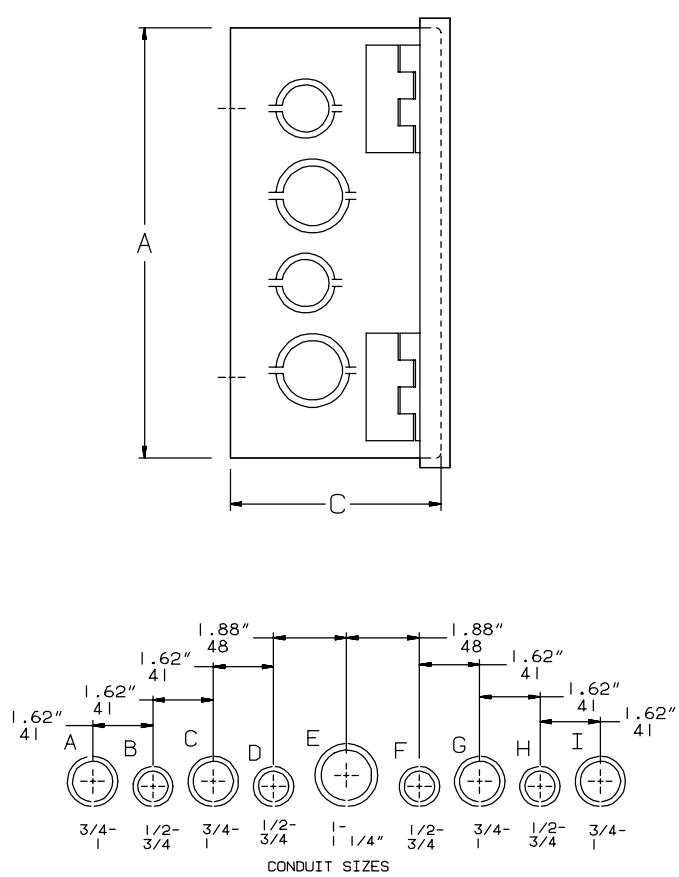
Unless otherwise specified, all custom cutout boxes are finished with ANSI 61 gray polyester paint.

### Industry Standards

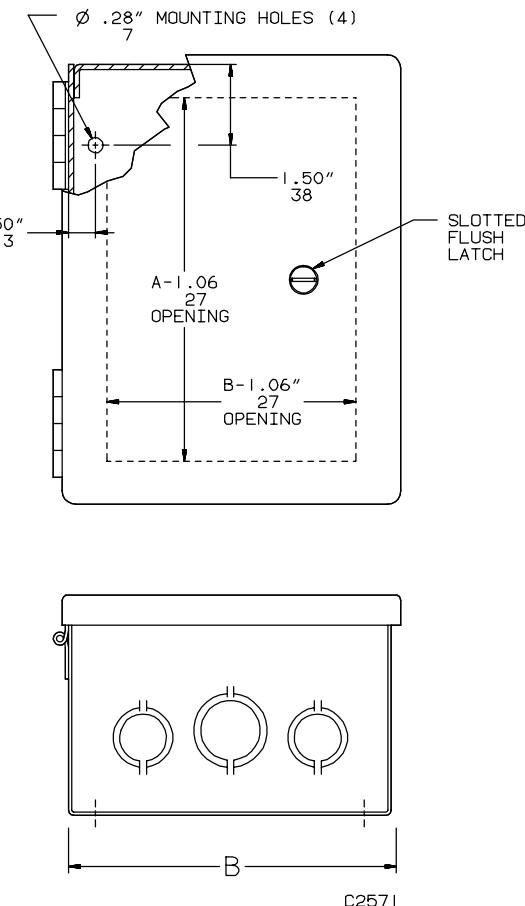
- UL 50, File No. E27567: Type I  
 NEMA/EEMAC Type I  
 CSA, File No. LL42184: Type I  
 IEC 60529, IP30

### Accessories

- Cylinder Lock Kit  
 Grounding Device  
 Padlock Kit  
 "T" Handle Latch Kit  
 Touch-Up Paint (ATPPY61)



**Knockout Pattern**  
 (from outside of box)



NOTE: Refer to Table for applicable knockout pattern.

**Hinged Cover Cutout Boxes****Standard Sizes Hinged Cover Cutout Boxes**

Catalog Number	Box Size A x B x C inch	Box Size A x B x C mm	Knockout Pattern along "A" Sides      "B" Sides	
AHE6X6X4	6.00 x 6.00 x 4.00	152 x 152 x 102	BCD	BCD
AHE6X4X4	6.00 x 4.00 x 4.00	152 x 102 x 102	BCD	BCD
AHE8X6X4	8.00 x 6.00 x 4.00	203 x 152 x 102	FGHI	BCD
AHE8X8X4	8.00 x 8.00 x 4.00	203 x 203 x 102	FGHI	FGHI
AHE10X8X4	10.00 x 8.00 x 4.00	254 x 203 x 102	FGHI	FGHI
AHE10X10X4	10.00 x 10.00 x 4.00	254 x 254 x 102	FGHI	CDEFG
AHE12X8X4	12.00 x 8.00 x 4.00	305 x 203 x 102	CDEFG	FGHI
AHE12X10X4	12.00 x 10.00 x 4.00	305 x 254 x 102	CDEFG	CDEFG
AHE12X12X4	12.00 x 12.00 x 4.00	305 x 305 x 102	CDEFG	CDEFG
AHE16X12X4	16.00 x 12.00 x 4.00	406 x 305 x 102	BCDEFGH	CDEFG
AHE18X12X4	18.00 x 12.00 x 4.00	457 x 305 x 102	ABCDEFHGI	CDEFG
AHE6X6X6	6.00 x 6.00 x 6.00	152 x 152 x 152	BCD	BCD
AHE8X8X6	8.00 x 8.00 x 6.00	203 x 203 x 152	FGHI	FGHI
AHE10X8X6	10.00 x 8.00 x 6.00	254 x 203 x 152	FGHI	FGHI
AHE10X10X6	10.00 x 10.00 x 6.00	254 x 254 x 152	FGHI	CDEFG
AHE12X10X6	12.00 x 10.00 x 6.00	305 x 254 x 152	CDEFG	CDEFG
AHE12X12X6	12.00 x 12.00 x 6.00	305 x 305 x 152	CDEFG	CDEFG
AHE16X12X6	16.00 x 12.00 x 6.00	406 x 305 x 152	BCDEFGH	CDEFG
AHE16X16X6	16.00 x 16.00 x 6.00	406 x 406 x 152	BCDEFGH	BCDEFGH
AHE18X12X6	18.00 x 12.00 x 6.00	457 x 305 x 152	ABCDEFHGI	CDEFG
AHE18X18X6	18.00 x 18.00 x 6.00	457 x 457 x 152	ABCDEFHGI	ABCDEFHGI
AHE24X18X6	24.00 x 18.00 x 6.00	610 x 457 x 152	ABCDEFHGI	ABCDEFHGI
AHE24X24X6	24.00 x 24.00 x 6.00	610 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE30X24X6	30.00 x 24.00 x 6.00	762 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE36X24X6	36.00 x 24.00 x 6.00	914 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE36X24X8	36.00 x 24.00 x 8.00	914 x 610 x 203	ABCDEFHGI	ABCDEFHGI

**Small Enclosure, Hinge, No Backplate**

ATS BOM Tag	MAN PART #
EN-03A	A-HE 8X6X4
EN-06	A-HE10X10X4
EN-08	A-HE12X12X4
EN-09	A-HE16X12X4

## Hinged Cover Cutout Boxes



### Application

Designed for use as a surface-mounted junction box, service box, switch box, and cutout box.

### Features

- Various sizes of easily-removable concentric knockouts on all four sides

### Construction

- 16 gauge or 14 gauge steel
- Butt hinges
- Mounting holes on back of box
- Provision for grounding

### Finish

ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces.

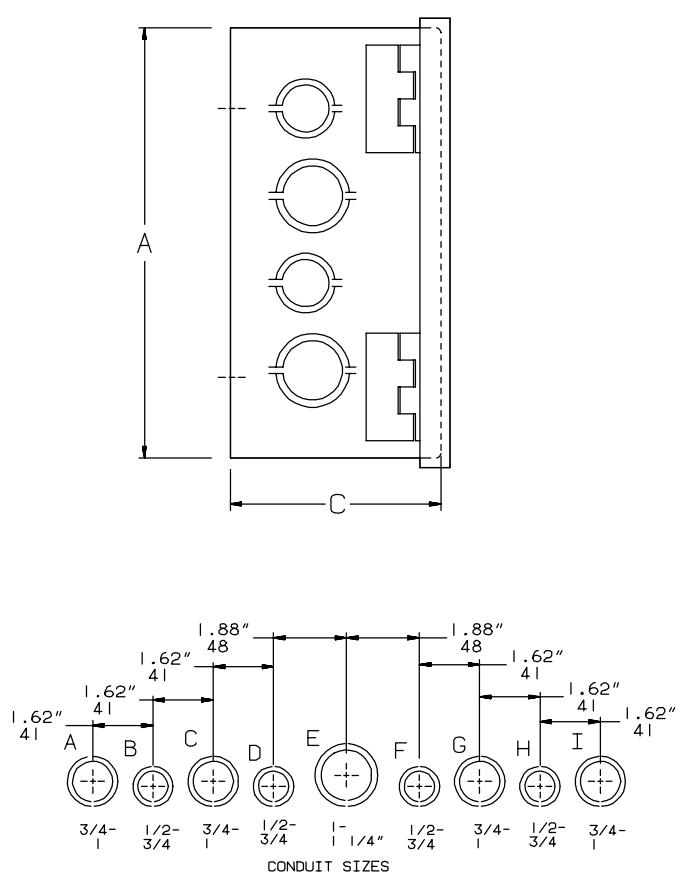
Unless otherwise specified, all custom cutout boxes are finished with ANSI 61 gray polyester paint.

### Industry Standards

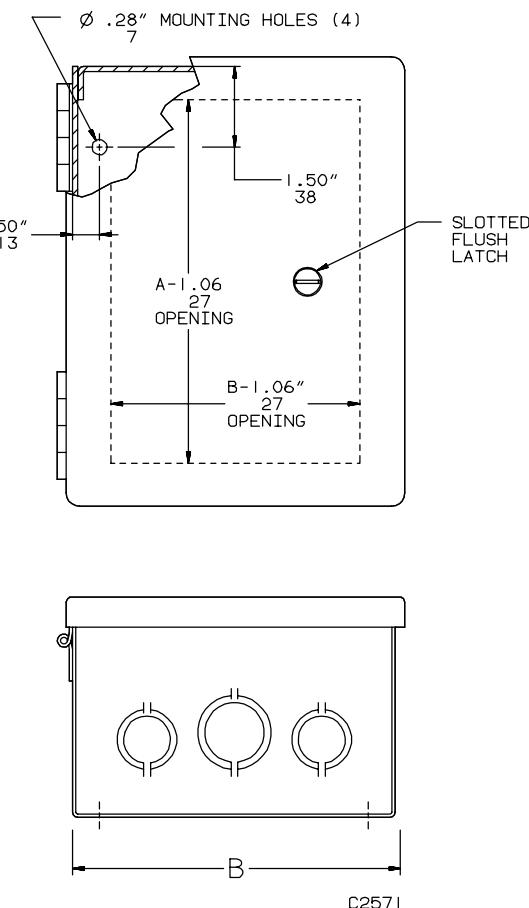
- UL 50, File No. E27567: Type I  
 NEMA/EEMAC Type I  
 CSA, File No. LL42184: Type I  
 IEC 60529, IP30

### Accessories

- Cylinder Lock Kit  
 Grounding Device  
 Padlock Kit  
 "T" Handle Latch Kit  
 Touch-Up Paint (ATPPY61)



**Knockout Pattern**  
 (from outside of box)



NOTE: Refer to Table for applicable knockout pattern.

**Hinged Cover Cutout Boxes****Standard Sizes Hinged Cover Cutout Boxes**

Catalog Number	Box Size A x B x C inch	Box Size A x B x C mm	Knockout Pattern along "A" Sides      "B" Sides	
AHE6X6X4	6.00 x 6.00 x 4.00	152 x 152 x 102	BCD	BCD
AHE6X4X4	6.00 x 4.00 x 4.00	152 x 102 x 102	BCD	BCD
AHE8X6X4	8.00 x 6.00 x 4.00	203 x 152 x 102	FGHI	BCD
AHE8X8X4	8.00 x 8.00 x 4.00	203 x 203 x 102	FGHI	FGHI
AHE10X8X4	10.00 x 8.00 x 4.00	254 x 203 x 102	FGHI	FGHI
AHE10X10X4	10.00 x 10.00 x 4.00	254 x 254 x 102	FGHI	CDEFG
AHE12X8X4	12.00 x 8.00 x 4.00	305 x 203 x 102	CDEFG	FGHI
AHE12X10X4	12.00 x 10.00 x 4.00	305 x 254 x 102	CDEFG	CDEFG
AHE12X12X4	12.00 x 12.00 x 4.00	305 x 305 x 102	CDEFG	CDEFG
AHE16X12X4	16.00 x 12.00 x 4.00	406 x 305 x 102	BCDEFGH	CDEFG
AHE18X12X4	18.00 x 12.00 x 4.00	457 x 305 x 102	ABCDEFHGI	CDEFG
AHE6X6X6	6.00 x 6.00 x 6.00	152 x 152 x 152	BCD	BCD
AHE8X8X6	8.00 x 8.00 x 6.00	203 x 203 x 152	FGHI	FGHI
AHE10X8X6	10.00 x 8.00 x 6.00	254 x 203 x 152	FGHI	FGHI
AHE10X10X6	10.00 x 10.00 x 6.00	254 x 254 x 152	FGHI	CDEFG
AHE12X10X6	12.00 x 10.00 x 6.00	305 x 254 x 152	CDEFG	CDEFG
AHE12X12X6	12.00 x 12.00 x 6.00	305 x 305 x 152	CDEFG	CDEFG
AHE16X12X6	16.00 x 12.00 x 6.00	406 x 305 x 152	BCDEFGH	CDEFG
AHE16X16X6	16.00 x 16.00 x 6.00	406 x 406 x 152	BCDEFGH	BCDEFGH
AHE18X12X6	18.00 x 12.00 x 6.00	457 x 305 x 152	ABCDEFHGI	CDEFG
AHE18X18X6	18.00 x 18.00 x 6.00	457 x 457 x 152	ABCDEFHGI	ABCDEFHGI
AHE24X18X6	24.00 x 18.00 x 6.00	610 x 457 x 152	ABCDEFHGI	ABCDEFHGI
AHE24X24X6	24.00 x 24.00 x 6.00	610 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE30X24X6	30.00 x 24.00 x 6.00	762 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE36X24X6	36.00 x 24.00 x 6.00	914 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE36X24X8	36.00 x 24.00 x 8.00	914 x 610 x 203	ABCDEFHGI	ABCDEFHGI

## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

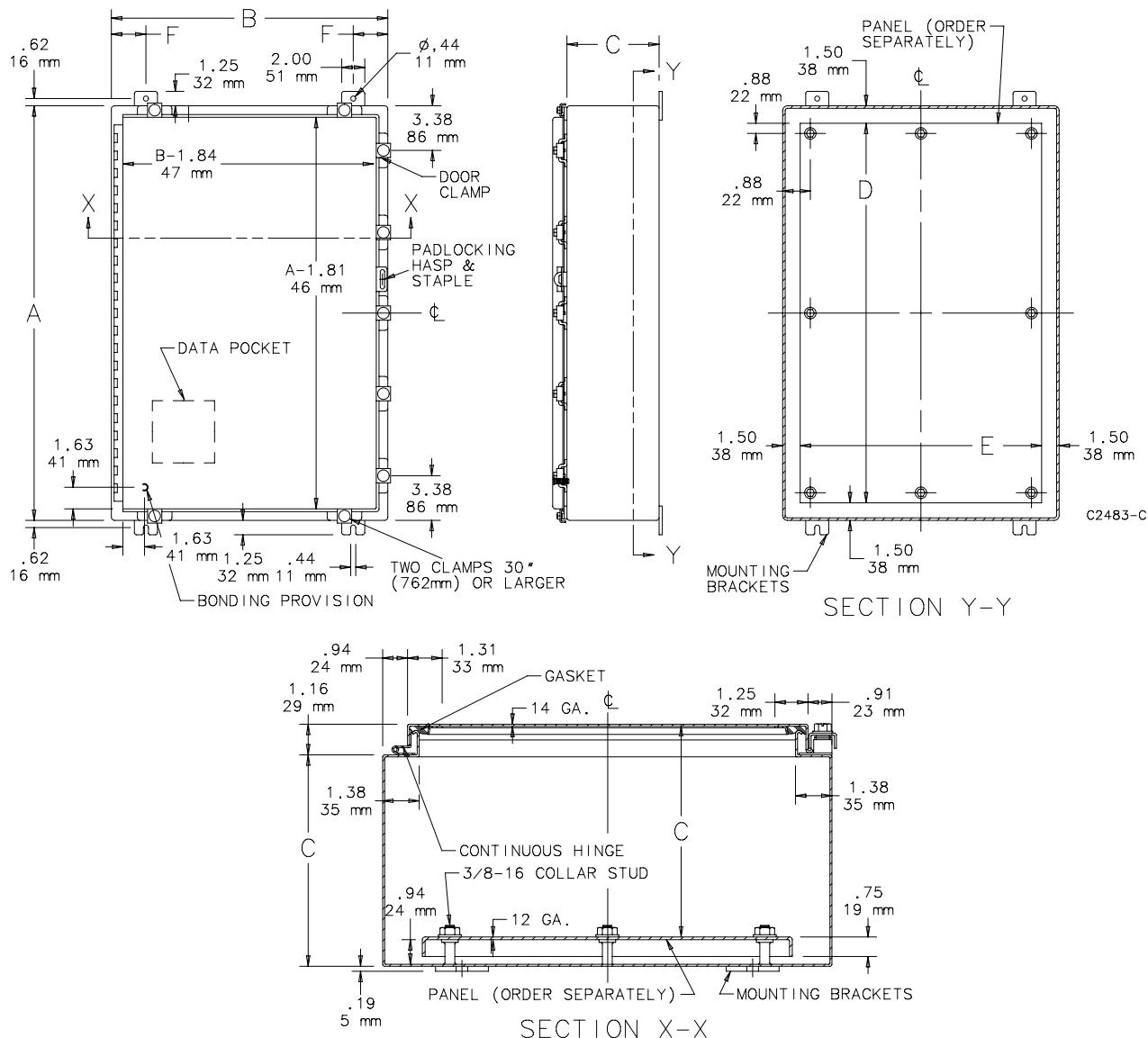
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

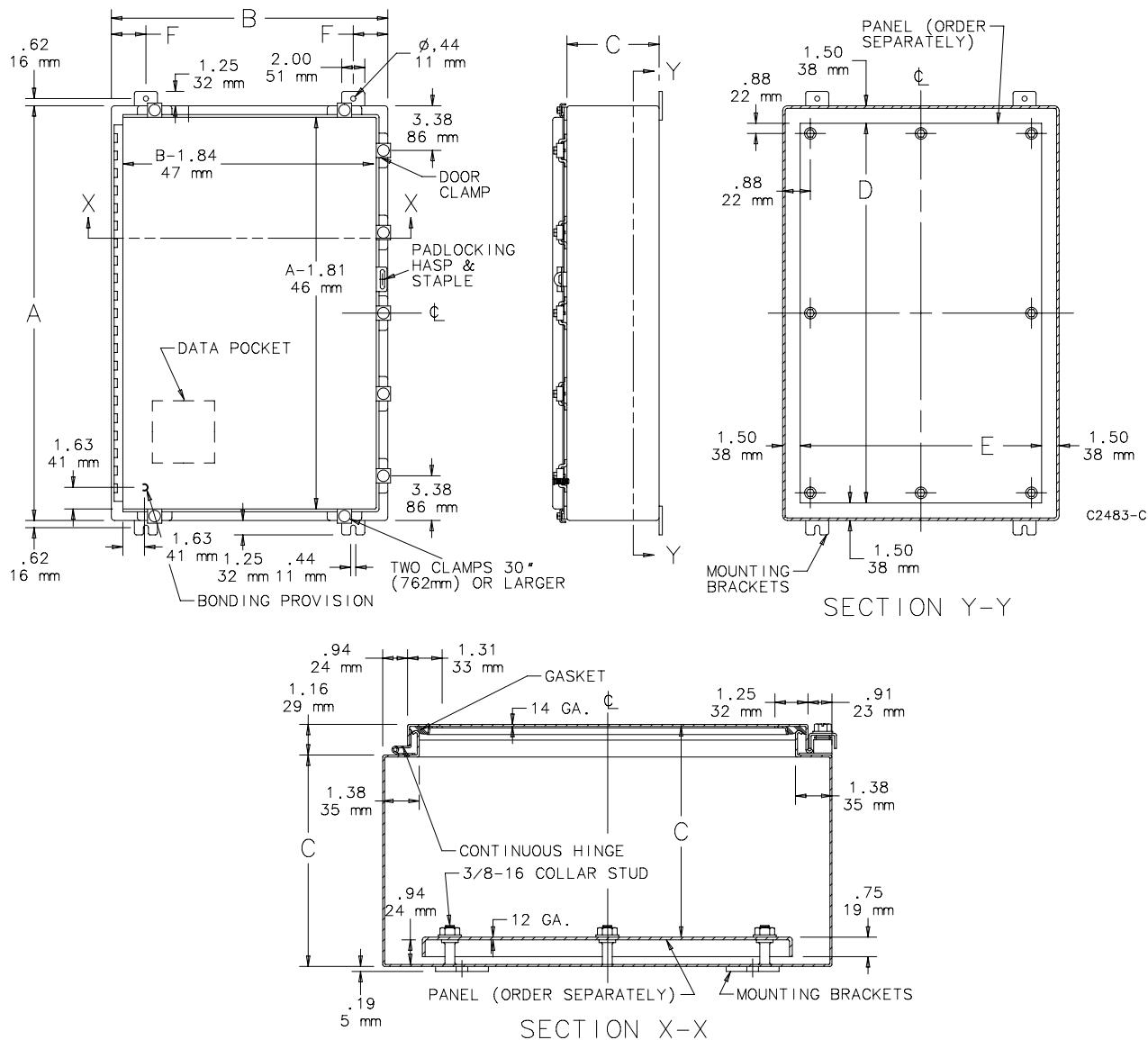
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

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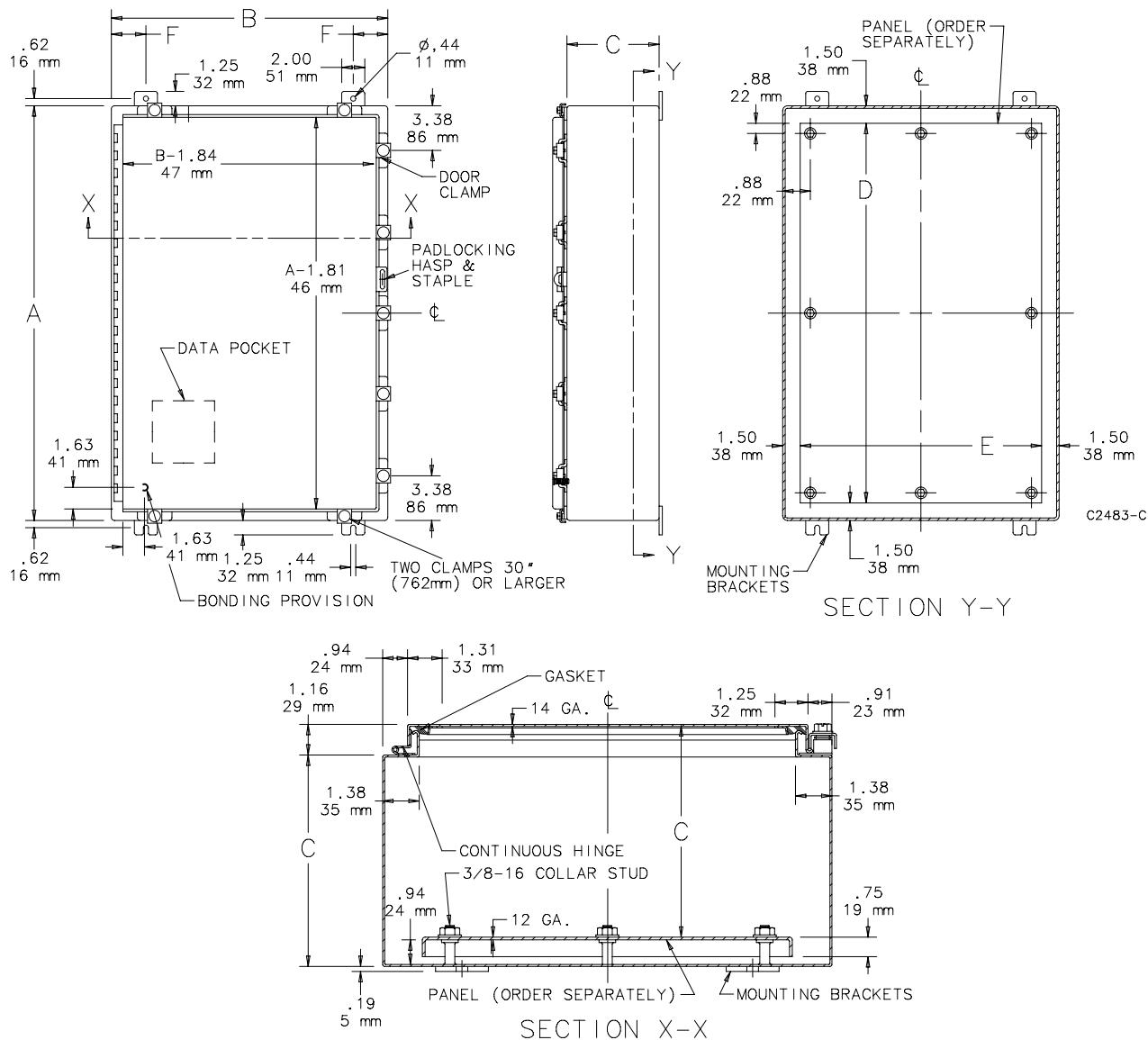
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

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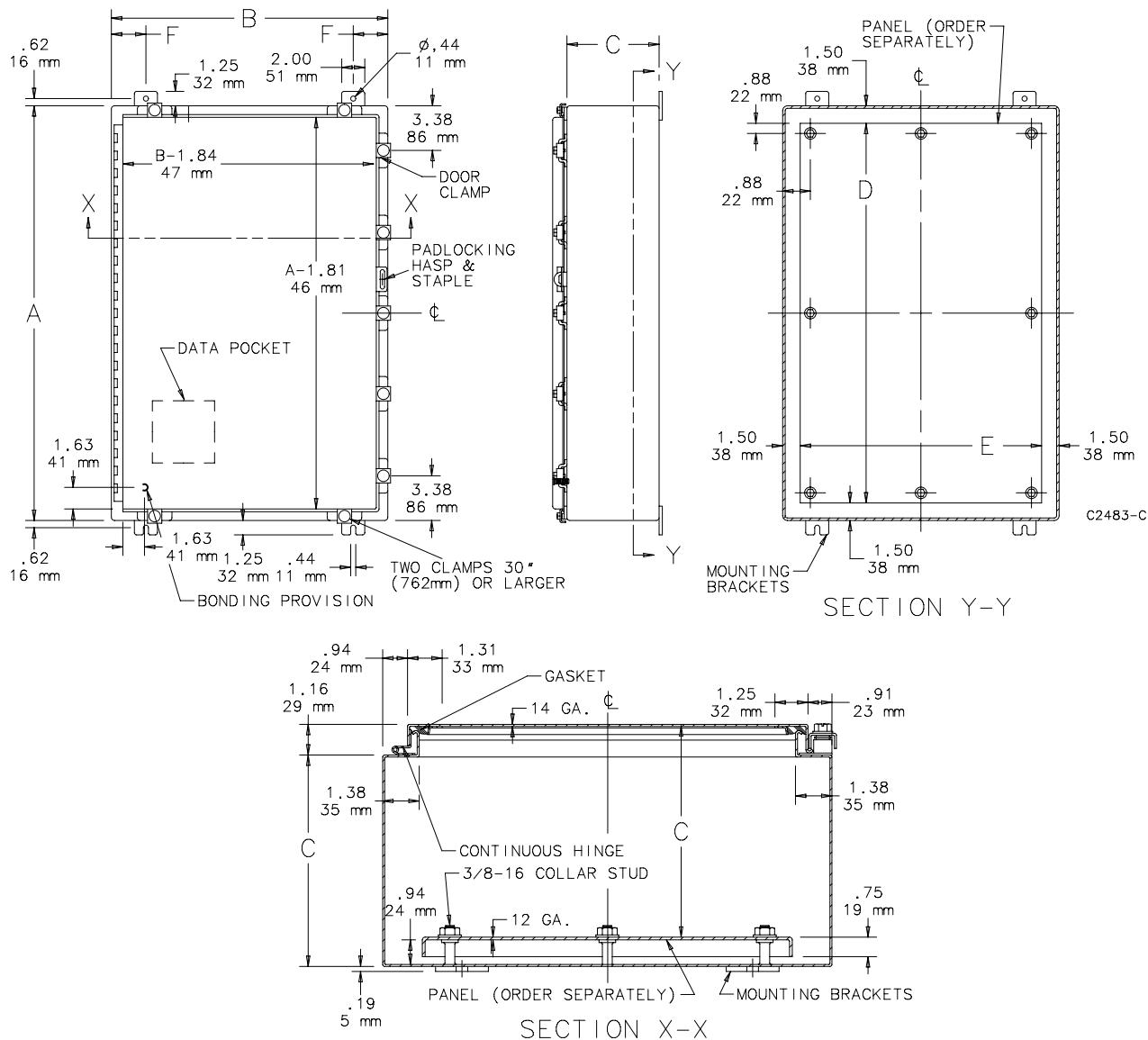
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	→ A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

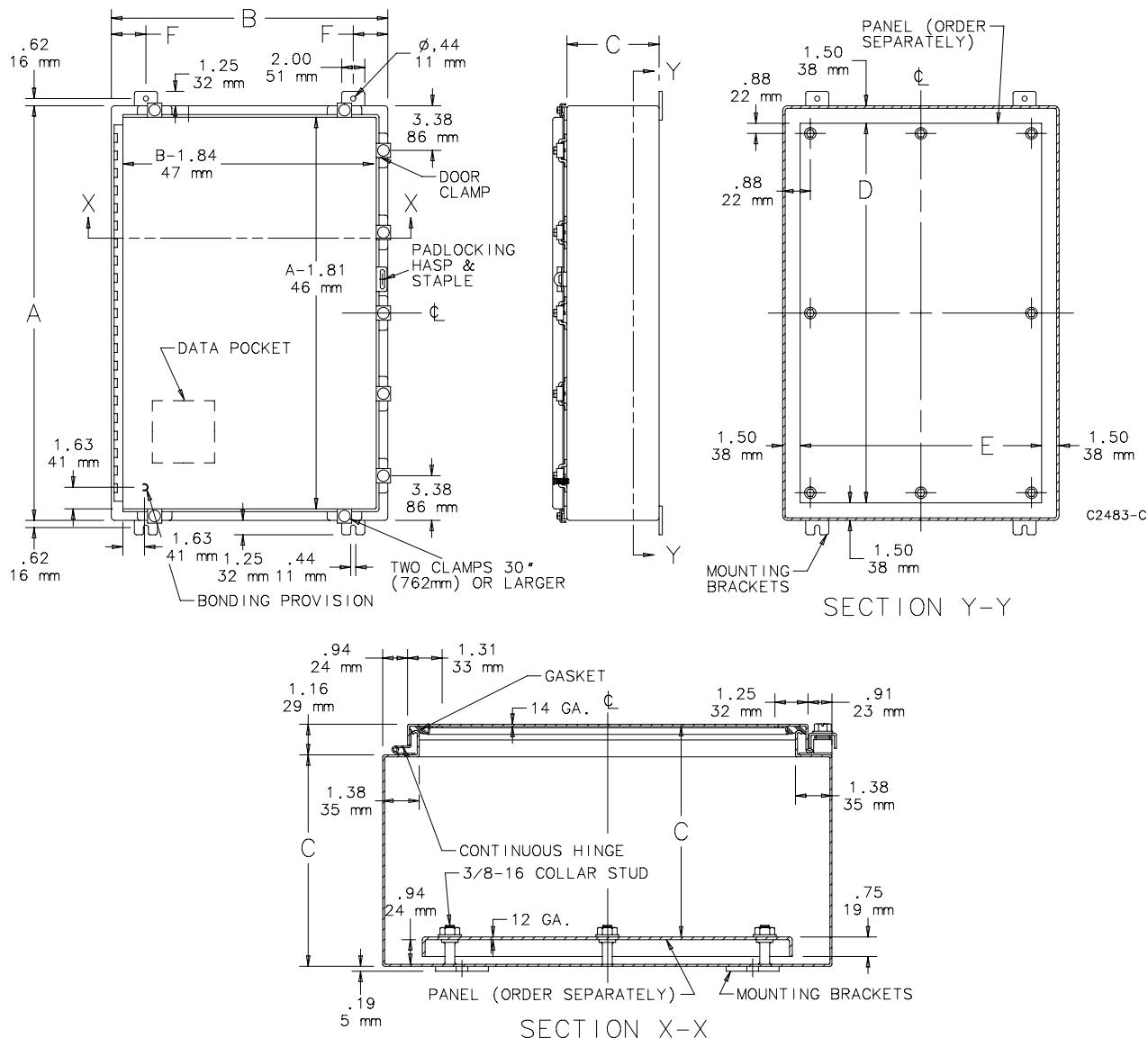
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

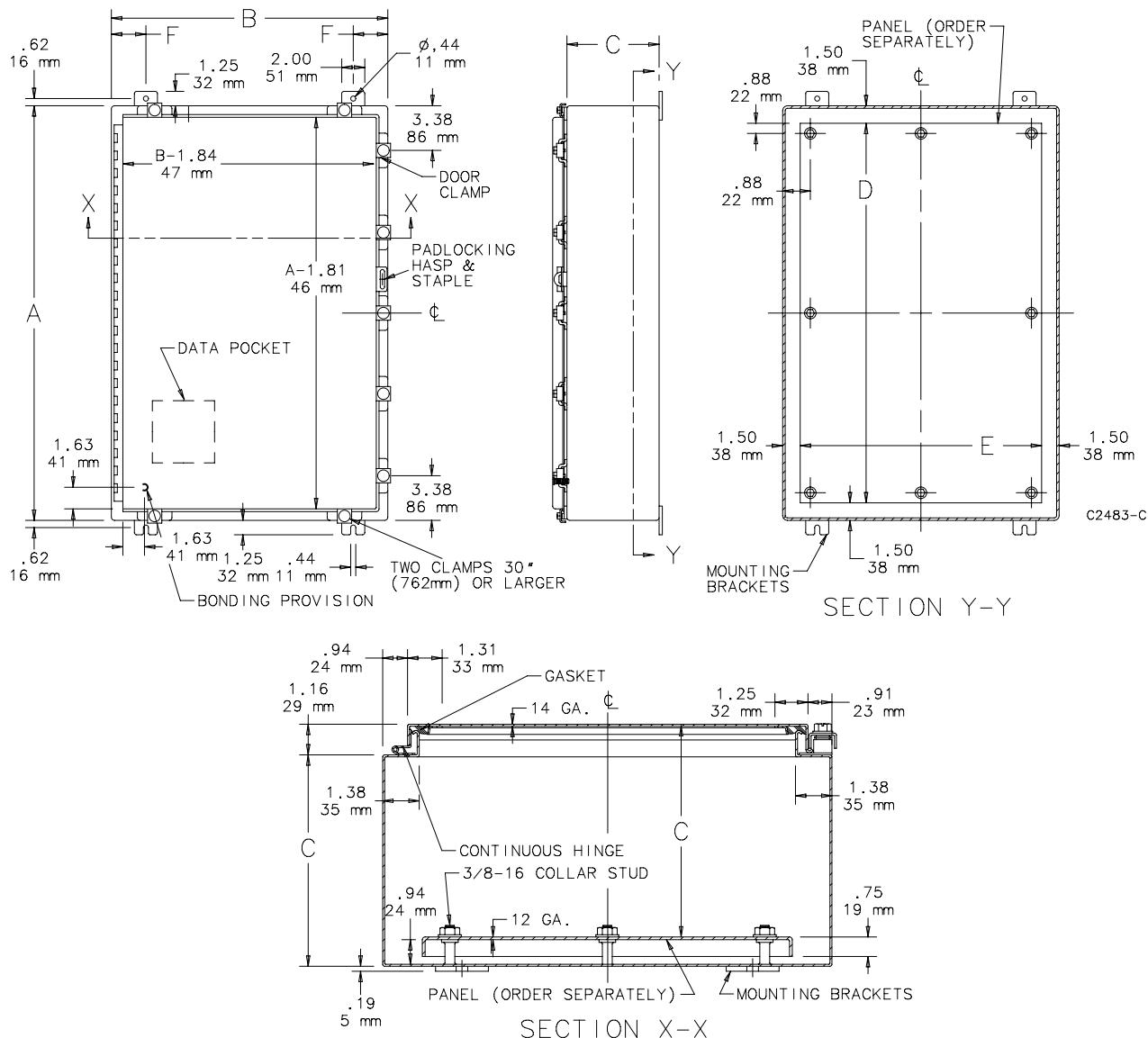
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## WING KNOB LATCH



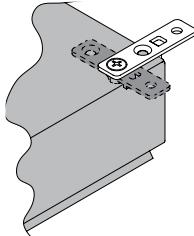
Wing Knob Latch can replace the standard slotted, quarter-turn latch on all hinged-cover and window-cover enclosures. Latch is black die-cast zinc. Includes two keys and installation instructions.

BULLETIN: A54Y

Catalog Number	Product Weight
LLKWK	0.2 lb.

Reduces UL Type rating from 4 or 4X to 12.

## MOUNTING BRACKET KIT, PLATED AND 316



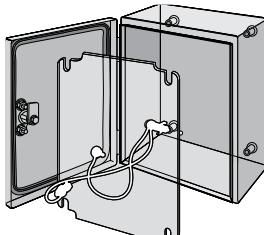
Kit is field-installable on all solid-back-body enclosures. Hardware included. Four brackets per kit.

BULLETIN: A54SY, A54Y

Catalog Number	Description
LMFK	Plated steel mounting-bracket kit
LMFKSS	Type 316L stainless steel mounting-bracket kit

Use of LMFKSS recommended to maintain Type 4X rating.

## GROUNDING KIT



Grounding Kit provides means to attach a grounding conductor to the enclosure. Kit includes two insulated copper wires with a ring terminal at each end, all installation hardware and instructions.

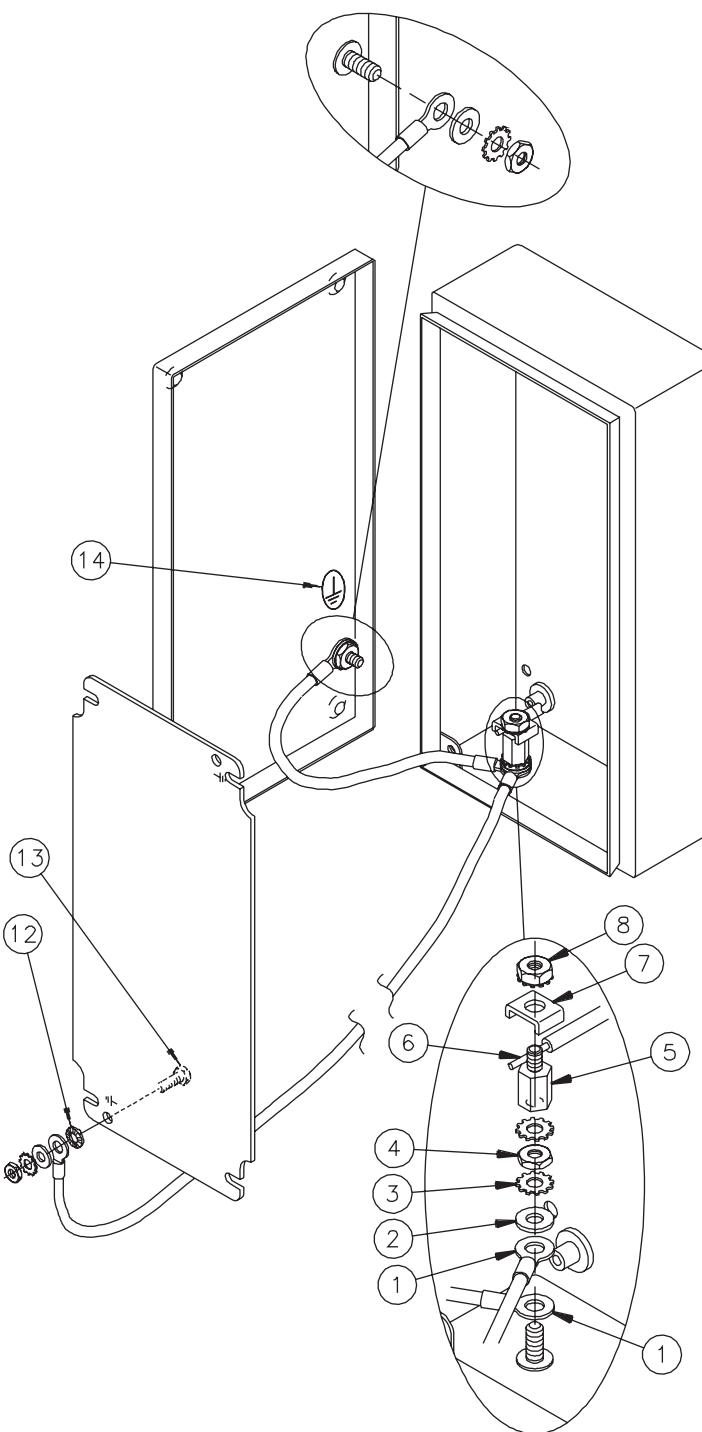
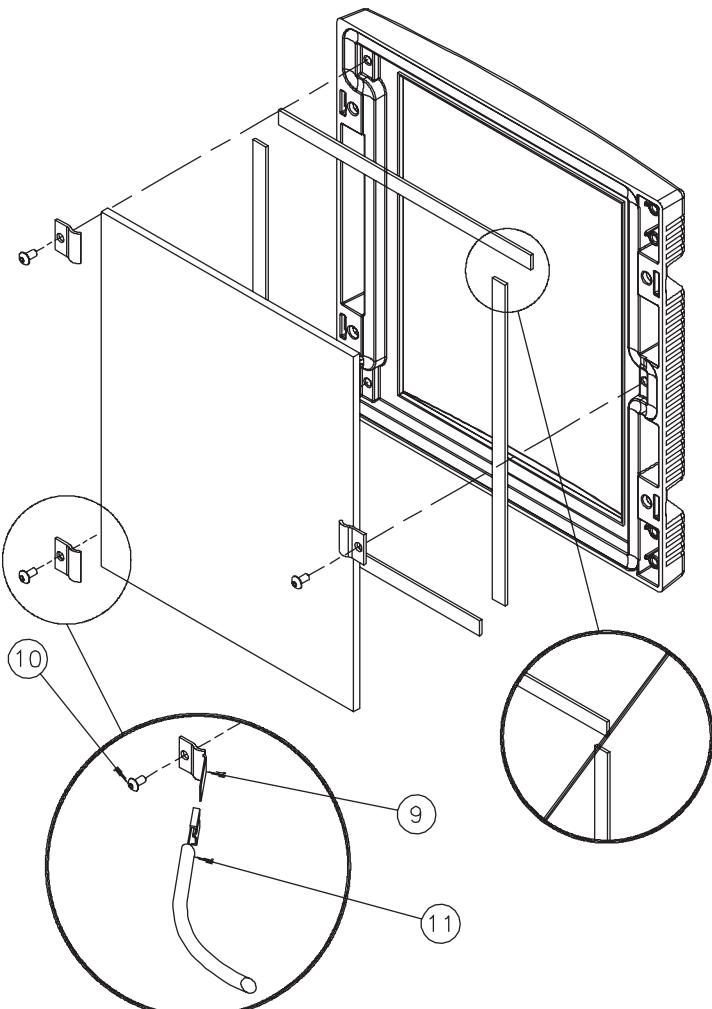
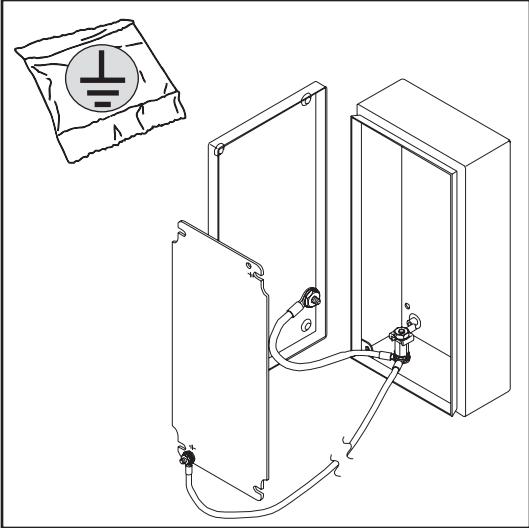
BULLETIN: A54Y

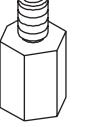
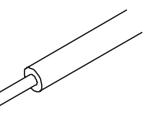
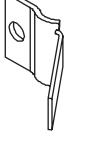
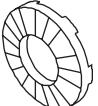
Catalog Number	Product Weight
LLGK	0.2 lb.

INLINE®

INLINE®

INLINE® OI



1	2	3
		
(2x)	(3x)	(4x)
4 M6-1	5 M6-1	6
		
(3x)	(1x)	(0x)
7	8 M6-1	9
		
(1x)	(1x)	(1x)
10 M4x8	11	12
		
(1x)	(1x)	(1x)
13 M6-1	14	
		
(1x)	(2x)	



# PANEL & INSTALLATION MATERIALS

## DIN RAIL TERMINAL BLOCKS MODELS M4/6, M6/8

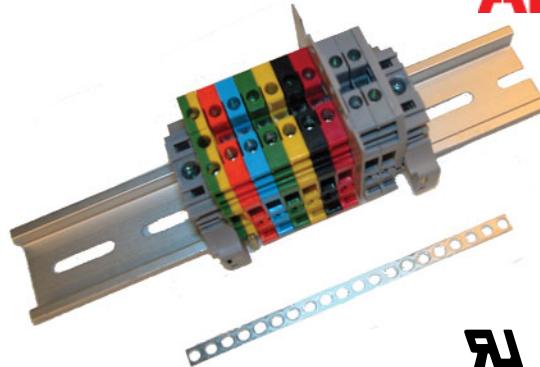
ABB

### DESCRIPTION

Models **M4/6** and **M6/8** DIN Rail Terminal Blocks offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top- or side-mount marking capability. The **Model M4/6** offers maximum circuit density while the **Model M6/8** offers the convenience of larger screws for conventional screwdriver installation.

### FEATURES

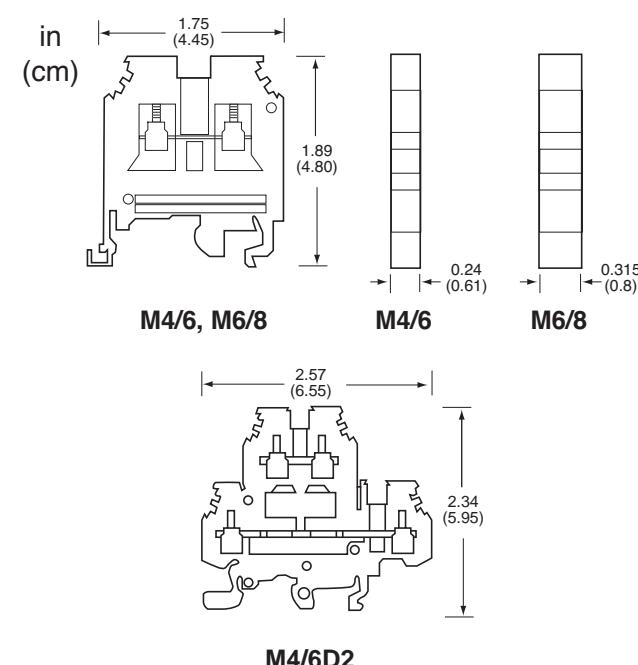
- Wire secured by ribbed compression clamp
- Universal DIN rail mounting
- Reduced installation time
- Block removable without displacing adjacent blocks
- Various marking options



### SPECIFICATIONS

<b>Rated voltage</b>	600 VAC/VDC
<b>Rated current</b>	30A UL, 25A CSA
<b>Rated wire size</b>	22-10 AWG
<b>Agency approvals</b>	UL-recognized component, File #E60645, E72667; CSA certified

### DIMENSIONS



ORDERING INFORMATION	
<b>MODEL</b>	<b>DESCRIPTION</b>
<b>SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6	DIN rail terminal block, gray
M4/6-BK	DIN rail terminal block, black
M4/6-BL	DIN rail terminal block, blue
M4/6-GR	DIN rail terminal block, green
M4/6-RD	DIN rail terminal block, red
M4/6-OR	DIN rail terminal block, orange
M4/6-YW	DIN rail terminal block, yellow
M4/6P	Grounding block, green and yellow
<b>SINGLE 8 mm TERMINAL BLOCKS (use M4/6 accessories)</b>	
M6/8	8 mm DIN rail terminal block, gray
M6/8P	8 mm grounding block, green and yellow
<b>ACCESSORIES</b>	
DIN-3F	35 mm steel DIN mounting rail, 39.4" L(1m)
BAM-1000	35 mm aluminum DIN mounting rail, 39.4" L(1m)
BAM2	End stop (two required), gray
FEM6	End section (one required), gray
SCF6	Circuit separator, gray
BJS6	Jumper bar for M4/6, 20 poles per bar
BJS6-2	Jumper bar for M4/6, two poles per bar
BJS6-3	Jumper bar for M4/6, three poles per bar
BJS6-4	Jumper bar for M4/6, four poles per bar
BJS6-5	Jumper bar for M4/6, five poles per bar
BJS6-10	Jumper bar for M4/6, 10 poles per bar
BJS8	Jumper bar for M6/8, 20 poles per bar
EV6	Jumper bar hardware (screw and post, package 20)
<b>DOUBLE STACK 6 mm TERMINAL BLOCKS</b>	
M4/6D2	Double stack terminal block, gray
FEM6D	Double stack end section, gray
BAMH	Double stack end stop, gray
SCF6D	Double stack circuit separator, gray
<b>BEIGE SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6-BG	DIN rail terminal block, beige
FEM6-BG	End section, beige
BAM2-BG	End stop, beige
SCF6-BG	Circuit separator, beige
<b>MARKERS</b>	
RC610B	Blank strips
RC610/1-10	10 strips of 1-10
RC610/1-50	Two strips of 1-50
RC610/1-100	One strip of 1-100
RC610/X01-X00	One strip of 100 numbers (fill in range, i.e., 201-300)
RC610-G	Ground marker strip
RC610-L	Line marker strip
RC610-N	Neutral marker strip
RC610-CUSTOM	Custom markers printed at Kele
RTM7	Top mount, blank, 19.7" (50 cm)

# INSTALLATION MATERIALS

ATS BOM Tag:Panel-5, Manufacture's P/N:FEM6

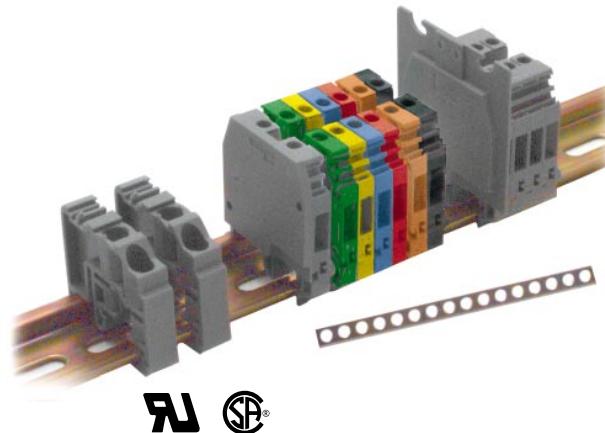
## DIN RAIL TERMINAL BLOCKS MODEL M4/6

### DESCRIPTION

The **M4/6 DIN Rail Terminal Blocks** offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top or side mount marking capability. These blocks can be used with the **M10/16SFL** fuse holder.

### FEATURES

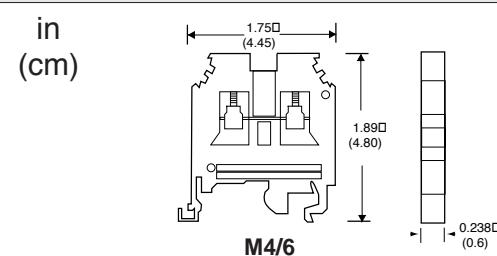
- *Wire secured by ribbed compression clamp*
- *Universal DIN rail mounting*
- *Reduced installation time*
- *Block can be removed without displacing adjacent blocks*
- *Various marking options*



### SPECIFICATIONS

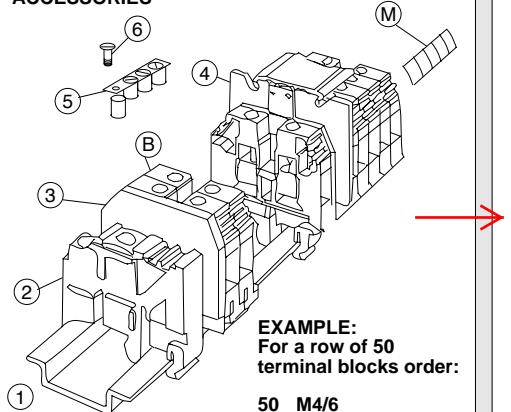
Rated voltage	600 VAC/DC
Rated current	30 amps UL, 25 amps CSA
Rated wire size	22-10 AWG
Spacing	0.238" (0.60cm)
Circuits per ft	50
Approvals	UL recognized file #E60645, E72667 CSA Certified

### DIMENSIONS



### ORDERING INFORMATION

#### ACCESSORIES



EXAMPLE:  
For a row of 50  
terminal blocks order:  
50 M4/6  
1 FEM6  
2 BAM  
1 DIN-3F

MODEL	DESCRIPTION
M4/6	DIN Rail Terminal Block - Gray
M4/6-BK	DIN Rail Terminal Block - Black
M4/6-BL	DIN Rail Terminal Block - Blue
M4/6-GR	DIN Rail Terminal Block - Green
M4/6-RD	DIN Rail Terminal Block - Red
M4/6-OR	DIN Rail Terminal Block - Orange
M4/6-YW	DIN Rail Terminal Block - Yellow
M4/6.P	DIN Rail Grounding Block - Green & Yellow
① DIN-3F	35 mm steel DIN Mounting Rail length: 39.4 in (1 meter)
② BAM	End Stop (2 required)
③ FEM6	End Section (1 required)
④ SCF6	Circuit Separator
⑤ BJS6	Jumper Bar - 20 poles/bar
⑥ EV6	Jumper Bar Hardware (screw & post, pkg. 20)
⑦ MARKERS (Side mount, individually scored)	
RC610B	Blank Strips
RC610/1-10	10 strips of 1-10
RC610/1-50	2 strips of 1-50
RC610/1-100	1 strip of 1-100
RC610/101-200	1 strip of 101-200
RC610/201-300	1 strip of 201-300
RC610/301-400	1 strip of 301-400
RC610/401-500	1 strip of 401-500
RTM7	Top Mount - Blank length: 19.7 in (50 cm)

# INSTALLATION MATERIALS

ATS BOM Tag:Panel-9, Manufacturer's P/N:RTM7

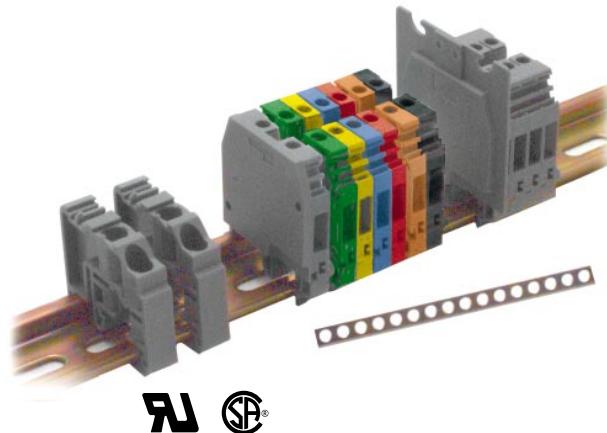
## DIN RAIL TERMINAL BLOCKS MODEL M4/6

### DESCRIPTION

The **M4/6 DIN Rail Terminal Blocks** offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top or side mount marking capability. These blocks can be used with the **M10/16SFL** fuse holder.

### FEATURES

- *Wire secured by ribbed compression clamp*
- *Universal DIN rail mounting*
- *Reduced installation time*
- *Block can be removed without displacing adjacent blocks*
- *Various marking options*

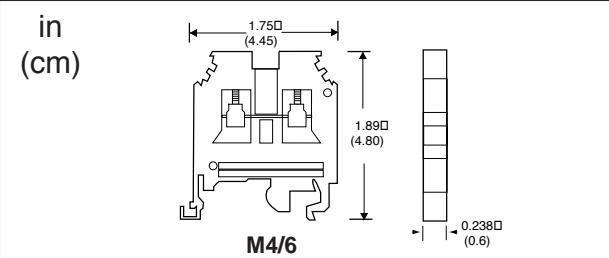


UL CSA

### SPECIFICATIONS

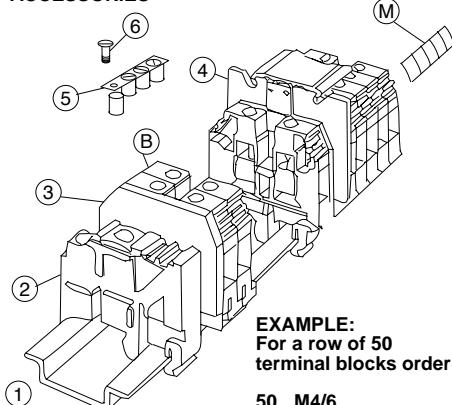
Rated voltage	600 VAC/DC
Rated current	30 amps UL, 25 amps CSA
Rated wire size	22-10 AWG
Spacing	0.238" (0.60cm)
Circuits per ft	50
Approvals	UL recognized file #E60645, E72667 CSA Certified

### DIMENSIONS



### ORDERING INFORMATION

#### ACCESSORIES



EXAMPLE:  
For a row of 50  
terminal blocks order:  
50 M4/6  
1 FEM6  
2 BAM  
1 DIN-3F

MODEL	DESCRIPTION
M4/6	DIN Rail Terminal Block - Gray
M4/6-BK	DIN Rail Terminal Block - Black
M4/6-BL	DIN Rail Terminal Block - Blue
M4/6-GR	DIN Rail Terminal Block - Green
M4/6-RD	DIN Rail Terminal Block - Red
M4/6-OR	DIN Rail Terminal Block - Orange
M4/6-YW	DIN Rail Terminal Block - Yellow
M4/6.P	DIN Rail Grounding Block - Green & Yellow
① DIN-3F	35 mm steel DIN Mounting Rail length: 39.4 in (1 meter)
② BAM	End Stop (2 required)
③ FEM6	End Section (1 required)
④ SCF6	Circuit Separator
⑤ BJS6	Jumper Bar - 20 poles/bar
⑥ EV6	Jumper Bar Hardware (screw & post, pkg. 20)
⑦ MARKERS (Side mount, individually scored)	
RC610B	Blank Strips
RC610/1-10	10 strips of 1-10
RC610/1-50	2 strips of 1-50
RC610/1-100	1 strip of 1-100
RC610/101-200	1 strip of 101-200
RC610/201-300	1 strip of 201-300
RC610/301-400	1 strip of 301-400
RC610/401-500	1 strip of 401-500
RTM7	Top Mount - Blank length: 19.7 in (50 cm)

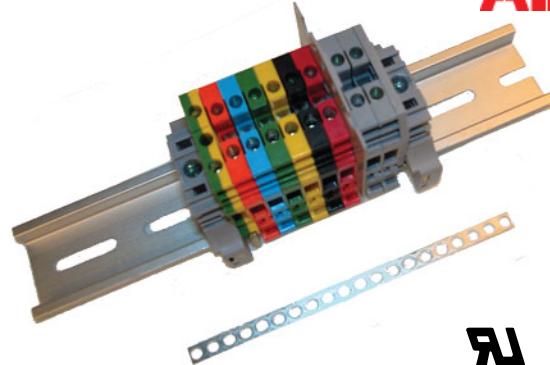


# PANEL & INSTALLATION MATERIALS

## DIN RAIL TERMINAL BLOCKS MODELS M4/6, M6/8

### DESCRIPTION

Models M4/6 and M6/8 DIN Rail Terminal Blocks offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top- or side-mount marking capability. The **Model M4/6** offers maximum circuit density while the **Model M6/8** offers the convenience of larger screws for conventional screwdriver installation.



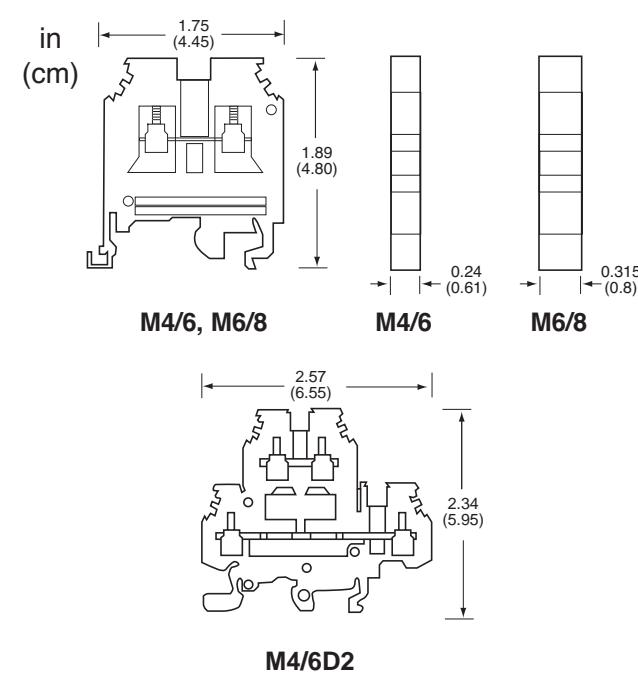
### FEATURES

- Wire secured by ribbed compression clamp
- Universal DIN rail mounting
- Reduced installation time
- Block removable without displacing adjacent blocks
- Various marking options

### SPECIFICATIONS

<b>Rated voltage</b>	600 VAC/VDC
<b>Rated current</b>	30A UL, 25A CSA
<b>Rated wire size</b>	22-10 AWG
<b>Agency approvals</b>	UL-recognized component, File #E60645, E72667; CSA certified

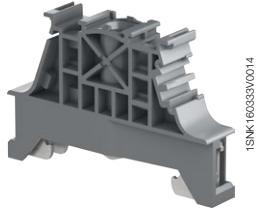
### DIMENSIONS



ORDERING INFORMATION	
<b>MODEL</b>	<b>DESCRIPTION</b>
<b>SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6	DIN rail terminal block, gray
M4/6-BK	DIN rail terminal block, black
M4/6-BL	DIN rail terminal block, blue
M4/6-GR	DIN rail terminal block, green
M4/6-RD	DIN rail terminal block, red
M4/6-OR	DIN rail terminal block, orange
M4/6-YW	DIN rail terminal block, yellow
M4/6P	Grounding block, green and yellow
<b>SINGLE 8 mm TERMINAL BLOCKS (use M4/6 accessories)</b>	
M6/8	8 mm DIN rail terminal block, gray
M6/8P	8 mm grounding block, green and yellow
<b>ACCESSORIES</b>	
DIN-3F	35 mm steel DIN mounting rail, 39.4" L(1m)
BAM-1000	35 mm aluminum DIN mounting rail, 39.4" L(1m)
BAM2	End stop (two required), gray
FEM6	End section (one required), gray
SCF6	Circuit separator, gray
BJS6	Jumper bar for M4/6, 20 poles per bar
BJS6-2	Jumper bar for M4/6, two poles per bar
BJS6-3	Jumper bar for M4/6, three poles per bar
BJS6-4	Jumper bar for M4/6, four poles per bar
BJS6-5	Jumper bar for M4/6, five poles per bar
BJS6-10	Jumper bar for M4/6, 10 poles per bar
BJS8	Jumper bar for M6/8, 20 poles per bar
EV6	Jumper bar hardware (screw and post, package 20)
<b>DOUBLE STACK 6 mm TERMINAL BLOCKS</b>	
M4/6D2	Double stack terminal block, gray
FEM6D	Double stack end section, gray
BAMH	Double stack end stop, gray
SCF6D	Double stack circuit separator, gray
<b>BEIGE SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6-BG	DIN rail terminal block, beige
FEM6-BG	End section, beige
BAM2-BG	End stop, beige
SCF6-BG	Circuit separator, beige
<b>MARKERS</b>	
RC610B	Blank strips
RC610/1-10	10 strips of 1-10
RC610/1-50	Two strips of 1-50
RC610/1-100	One strip of 1-100
RC610/X01-X00	One strip of 100 numbers (fill in range, i.e., 201-300)
RC610-G	Ground marker strip
RC610-L	Line marker strip
RC610-N	Neutral marker strip
RC610-CUSTOM	Custom markers printed at Kele
RTM7	Top mount, blank, 19.7" (50 cm)

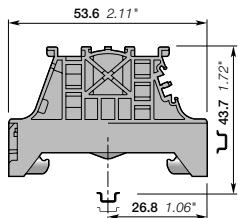
# BAM4 screw end stops

## Common terminal block accessories



1SNK160333V0214

BAM4



10 mm 0.394 in spacing

### Description

- Give efficient support to the SNK terminal blocks assemblies thanks to the BAM4 double gripping rail contact,
- Ease the assemblies identification with the BAM4 marking location compatible with all SNK markers and labels.

### Ordering details

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) <b>g</b>
10 mm 0.394 in spacing	Dark grey <input checked="" type="checkbox"/>	BAM4	1SNK900001R0000	50	14.00

### Main technical data

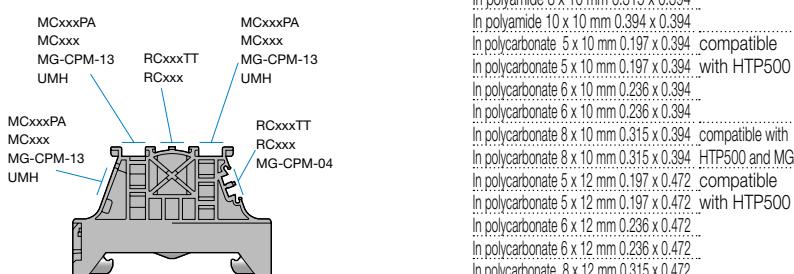
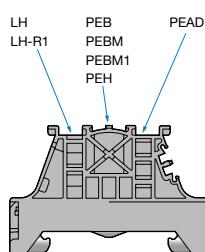
Material specifications	Insulating material	Polyamide	Rail		TH 35-7.5, TH 35-15
Flammability	VO		Tool		Flat screwdriver
NF F 16 101	I2F2				Ø 5.5 mm
Ambient temperature min/max	Service IEC 60068-2-1	-55 ... +110 °C	-67 ... +230 °C		Ø 0.217 in
	Storage	-55 ... +110 °C	-67 ... +230 °C		
	Installing	-5 ... +40 °C	+23 ... +104 °C	Torque	1.3 N.m ± 0.1 11.4 lb.in ± 0.88

All the main technical data provided are "manufacturer" values

### Mounting instructions

	RoHS				
	<input checked="" type="checkbox"/> RoHS				

### Mounting instructions



### Accessories

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) <b>g</b>	
Mounting rail		Symmetrical complying with IEC60715, TH35-7.5	PR3.Z2	1SNA174300R1700	2	
		Prepunched symmetrical	PR30	1SNA173220R0500	2	
		Symmetrical complying with IEC60715, TH35-15	PR4	1SNA168500R1200	2	
		Prepunched symmetrical	PR50	1SNA178529R0400	2	
		Symmetrical	PR3.G2	1SNA164800R0300	2	
		Symmetrical	PR5	1SNA168700R2200	2	
	<input checked="" type="checkbox"/>	LH	1SNK900605R0000	50	0.60	
	<input type="checkbox"/>	PEB	1SNA113077R1100	50	1.70	
	<input checked="" type="checkbox"/>	LH-R1	1SNK900607R0000	50	1.10	
	<input type="checkbox"/>	PEB	1SNA195077R1400	50	1.70	
	<input type="checkbox"/>	PEAD	1SNA399719R1000	20	682.00	
		Transparent	PEH	1SNA163211R2600	10	382.00
	<input checked="" type="checkbox"/>	PEBM1	1SNA113079R2300	50	2.80	
	<input type="checkbox"/>	PEBM	1SNA113084R0100	50	2.80	
		Blank marker	MC512PA	1SNK149999R0000	20	10.00
		In polyamide 5 x 12 mm 0.197 x 0.472, Compatible	MC612PA	1SNK159999R0000	20	11.00
		In polyamide 6 x 12 mm 0.236 x 0.472, with AMS	MC812PA	1SNK169999R0000	20	14.00
		In polyamide 8 x 12 mm 0.315 x 0.472	RC510-YL	1SNA103890R2100	50	5.50
		In polyamide 5 x 10 mm 0.197 x 0.394	RC610	1SNA206230R1100	45	6.70
		In polyamide 6 x 10 mm 0.236 x 0.394	RC610	1SNA206223R0600	45	6.70
		In polyamide 6 x 10 mm 0.236 x 0.394	RC610	1SNA206232R0700	45	6.70
		In polyamide 6 x 10 mm 0.236 x 0.394	RC610	1SNA206233R0000	45	6.70
		In polyamide 6 x 10 mm 0.236 x 0.394	RC610	1SNA206235R0200	45	6.70
		In polyamide 6 x 10 mm 0.157 x 0.394	RC410	1SNA229000R1500	50	5.20
		In polyamide 5 x 10 mm 0.197 x 0.394	RC510	1SNA231000R0700	50	5.20
		In polyamide 6 x 10 mm 0.236 x 0.394	RC610	1SNA233000R100	45	7.50
		In polyamide 8 x 10 mm 0.315 x 0.394	RC810	1SNA234000R0200	35	8.20
		In polyamide 10 x 10 mm 0.394 x 0.394	RC1010	1SNA238000R1600	35	1.30
		In polycarbonate 5 x 10 mm 0.197 x 0.394 compatible	RC510TT	1SNA231600R1500	22	12.00
		In polycarbonate 5 x 10 mm 0.197 x 0.394 with HTP500	RC510TT-YL	1SNA231700R1100	22	12.00
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610TT	1SNA233600R1700	22	12.00
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610TT-YL	1SNA233700R1300	22	12.00
		In polycarbonate 8 x 10 mm 0.315 x 0.394, compatible with HTP500 and MG3	RC810TT	1SNA234600R1000	22	12.00
		In polycarbonate 8 x 10 mm 0.315 x 0.394	RC810TT-YL	1SNA234700R1400	22	12.00
		In polycarbonate 5 x 12 mm 0.197 x 0.472, compatible	MC512	1SNK140000R0000	22	9.00
		In polycarbonate 5 x 12 mm 0.197 x 0.472 with HTP500	MC512-YL	1SNK140004R0000	22	9.00
		In polycarbonate 6 x 12 mm 0.236 x 0.472	MC612	1SNK150000R0000	22	10.00
		In polycarbonate 6 x 12 mm 0.236 x 0.472	MC612-YL	1SNK150004R0000	22	10.00
		In polycarbonate 6 x 12 mm 0.315 x 0.472	MC812	1SNK160000R0000	22	10.00
		In polycarbonate 8 x 12 mm 0.315 x 0.472	MC812-YL	1SNK160004R0000	22	10.00
		In polycarbonate 8 x 12 mm 0.315 x 0.472	MG-CPM 13.41790	1SNB041790R0512	1960	0.23
		In polycarbonate 6 x 12 mm 0.236 x 0.472 with MG3	MG-CPM 13.41791	1SNB041791R0612	1680	0.27
		In polycarbonate 5 x 12 mm 0.197 x 0.472	MG-CPM 13.41740	1SNB041740R0512	1960	0.23
		In polycarbonate 6 x 12 mm 0.236 x 0.472	MG-CPM 13.41741	1SNB041741R0612	1680	0.27
		In polycarbonate 5 x 10 mm 0.197 x 0.394	MG-CPM-04.41390	1SNB041390R0510	1120	0.34
		In polycarbonate 6 x 10 mm 0.236 x 0.394	MG-CPM-04.41391	1SNB041391R0610	1344	0.24
		In polycarbonate 6 x 10 mm 0.236 x 0.394	MG-CPM-04.41396	1SNB041396R0810	1120	0.45
		In polycarbonate 5 x 10 mm 0.197 x 0.394	MG-CPM-04.41340	1SNB041340R0510	1120	0.36
		Universal wire makers holder 5.2 mm 0.205 in spacing	UMH	1SNK900611R0000	10	0.20

All the technical data for UL/CSA standard and dimensions in inches are in italic.

Technical data valid for copper conductors only.

## Double-deck terminal blocks

### Screw clamp

 DIN 1 - 3



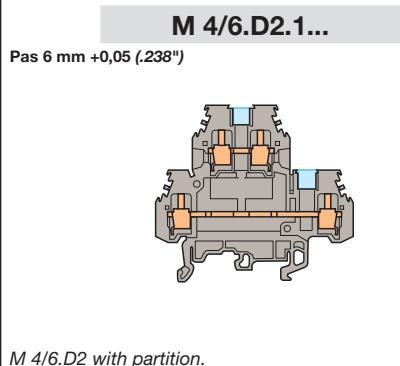
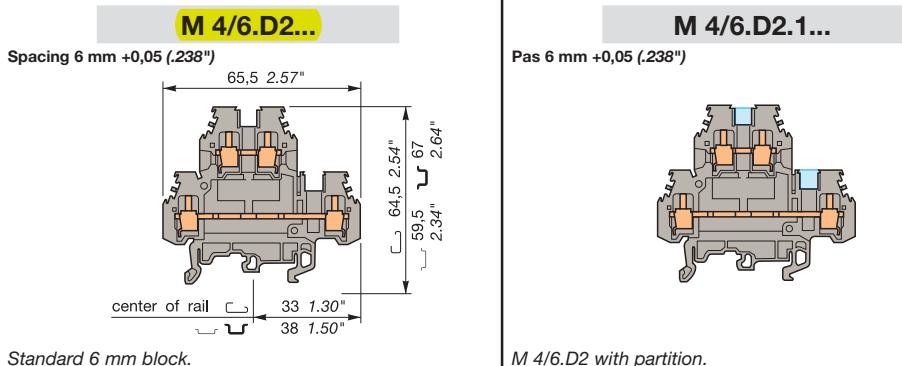
 refer to the section "Special Applications" for part numbers and characteristics.

End stop		th. 12 mm	BADH	1SNA 116 900 R2700
End stop		th. 9,1 mm	BAMH	1SNA 114 836 R0000
End stop		th. 9,1 mm	BAMH	1SNA 194 836 R0100
Rail		35 x 7,5 x 1	PR3.Z2	1SNA 174 300 R1700
Rail		35 x 15 x 2,3	PR4	1SNA 168 500 R1200
Rail		35 x 15 x 1,5	PR5	1SNA 168 700 R2200
Rail		32 x 15 x 1,5	PR1.Z2	1SNA 163 050 R0400

Other end stops, rails and accessories : see section on accessories.

### Notes

The use of some accessories may decrease the block's voltage rating. For more information, consult us.



M 4/6.D2 with partition.

UL			CE		
Colour	Type	Part numbers	Colour	Type	Part numbers
Grey	 M 4/6.D2	1SNA 115 271 R2200	Grey	 M 4/6.D2.1	1SNA 115 126 R0100
Green	 M 4/6.D2	1SNA 105 044 R2100	Blue	 M 4/6.D2.1.N	1SNA 125 126 R0300
Yellow	 M 4/6.D2	1SNA 105 045 R2200	Beige	 M 4/6.D2.1	1SNA 195 126 R0200
White	 M 4/6.D2	1SNA 105 046 R2300			
Black	 M 4/6.D2	1SNA 105 047 R2400			
Red	 M 4/6.D2	1SNA 105 048 R0500			
Orange	 M 4/6.D2	1SNA 105 049 R0600			
Blue	 M 4/6.D2.N	1SNA 125 271 R2400			
Beige	 M 4/6.D2	1SNA 195 271 R2300			

Characteristics				Characteristics			
Wire size		Wire size		Wire size		Wire size	
		IEC NFC DIN	UL	IEC NFC DIN	UL	IEC NFC DIN	UL
Screw	Rigid	0,2-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG		Screw	Rigid
clamp	Flexible	0,22-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG		clamp	Flexible
Voltage				Voltage			
Rated		800 V	300 V(5)	600 V		Rated	800 V
Impulse withstand		8 kV				Impulse withstand	8 kV
Pollution degree		3				Pollution degree	3
Current				Current			
Rated		32 A	20 A	25 A		Rated	32 A
Wire size				Wire size			
Rated / Gauge		4 mm <sup>2</sup> / A4	12 AWG	12 AWG		Rated / Gauge	4 mm <sup>2</sup> / A4
Wire strip length		Recomm. Screwdriver	Recomm. torque	Protection		Wire strip length	Recomm. Screwdriver
8,5 mm		4 mm	0,5-0,8 Nm	IP20		8,5 mm	4 mm
.33"		.157"	4.4-7.1 lb.in	NEMA 1		.33"	.157"
Voltage				Voltage			
Rated		800 V	300 V(5)	600 V		Rated	800 V
Impulse withstand		8 kV				Impulse withstand	8 kV
Pollution degree		3				Pollution degree	3
Current				Current			
Rated		32 A	20 A	25 A		Rated	32 A
Wire size				Wire size			
Rated / Gauge		4 mm <sup>2</sup> / A4	12 AWG	12 AWG		Rated / Gauge	4 mm <sup>2</sup> / A4
Wire strip length		Recomm. Screwdriver	Recomm. torque	Protection		Wire strip length	Recomm. Screwdriver
8,5 mm		4 mm	0,5-0,8 Nm	IP20		8,5 mm	4 mm
.33"		.157"	4.4-7.1 lb.in	NEMA 1		.33"	.157"

Type			Part numbers			Type			Part numbers		
1 End section	grey	FEM6D	th. 1,0 mm	1SNA 118 499 R2300		FEM6D	th. 1,0 mm	1SNA 118 499 R2300			
	blue	FEM6D	th. 1,0 mm	1SNA 128 499 R2500		FEM6D	th. 1,0 mm	1SNA 128 499 R2500			
	beige	FEM6D	th. 1,0 mm	1SNA 198 499 R2400		FEM6D	th. 1,0 mm	1SNA 198 499 R2400			
2 Circuit separator	grey	SCM6D	th. 1,0 mm	1SNA 113 482 R0500		SCM6D	th. 1,0 mm	1SNA 113 482 R0500			
	beige	SCM6D	th. 1,0 mm	1SNA 193 482 R0600		SCM6D	th. 1,0 mm	1SNA 193 482 R0600			
3 Separator end section	grey	SCF6D	th. 1,0 mm	1SNA 118 495 R1700		SCF6D	th. 1,0 mm	1SNA 118 495 R1700			
	beige	SCF6D	th. 1,0 mm	1SNA 198 495 R1000		SCF6D	th. 1,0 mm	1SNA 198 495 R1000			
4 Test socket		AL2	(1)	DIA. 2,0 mm	1SNA 163 070 R0000	AL2	DIA. 2,0 mm	1SNA 163 070 R0000			
		AL3	(1)	DIA. 3,0 mm	1SNA 163 261 R0000	AL3	DIA. 3,0 mm	1SNA 163 261 R0000			
5 Test device		DCG		grey	1SNA 163 218 R0500	DCG		grey	1SNA 163 218 R0500		
6 Test plug		FC2	(3)	DIA. 2,0 mm	1SNA 007 865 R2600	FC2	(3)	DIA. 2,0 mm	1SNA 007 865 R2600		
7 Assembled jumper bar (with IP 20 protection)	32 A	BJMI6D	(1)	2 poles	1SNA 179 668 R2000	BJMI6D	(2)	2 poles	1SNA 179 668 R2000		
	32 A	BJMI6D	(1)	3 poles	1SNA 179 669 R2100	BJMI6D	(2)	3 poles	1SNA 179 669 R2100		
	32 A	BJMI6D	(1)	4 poles	1SNA 179 670 R2600	BJMI6D	(2)	4 poles	1SNA 179 670 R2600		
	32 A	BJMI6D	(1)	5 poles	1SNA 179 671 R1300	BJMI6D	(2)	5 poles	1SNA 179 671 R1300		
	32 A	BJMI6D	(1)	10 poles	1SNA 179 672 R1400	BJMI6D	(2)	10 poles	1SNA 179 672 R1400		
8 Connector plate	35 A	EL6			1SNA 173 627 R2100	EL6			1SNA 173 627 R2100		
9 Jumper bar not assembled	32 A	BJS61	(1)(4)	10 poles	1SNA 168 485 R2700	BJS61	(2)(4)	10 poles	1SNA 168 485 R2700		
		EV6D			1SNA 168 400 R1600	EV6D			1SNA 168 400 R1600		
10 Pivoting jumper bar	35 A	BJP61			1SNA 167 225 R2000	BJP61			1SNA 167 225 R2000		
11 Comb type jumper bar	35 A	PC61		10 poles	1SNA 163 311 R2200	PC61		10 poles	1SNA 163 311 R2200		
12 IDC jumper	24 A	AD2,5			1SNA 114 205 R2000	AD2,5			1SNA 114 205 R2000		
13 Vertical interconnection		ITV6			1SNA 168 962 R0400	ITV6			1SNA 168 962 R0400		
14 Shield connector		CBM5D		th. 0,5 mm	1SNA 173 530 R2400	CBM5D		th. 0,5 mm	1SNA 173 530 R2400		
R See section on markers marking method											
RC65 - RC610 Sides of block			RCT610 - RTM7 Top of block			RC65 - RC610 Sides of block			RCT610 - RTM7 Top of block		

Note : (1) A circuit separator SC may be required with the use of these accessories. (2) Use of these accessories requires the user to cut out the partition. (3) For block equipped with test socket AL2. (4) See section accessories for other configuration of poles. (5) 600 V with end section.

## Double-deck terminal blocks

### Screw clamp

 DIN 1 - 3



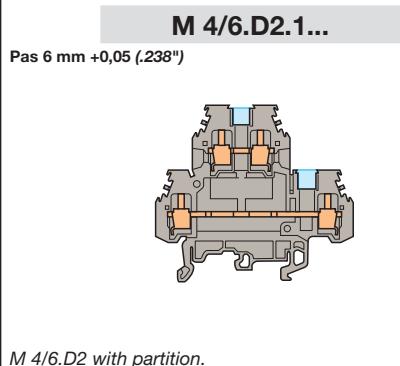
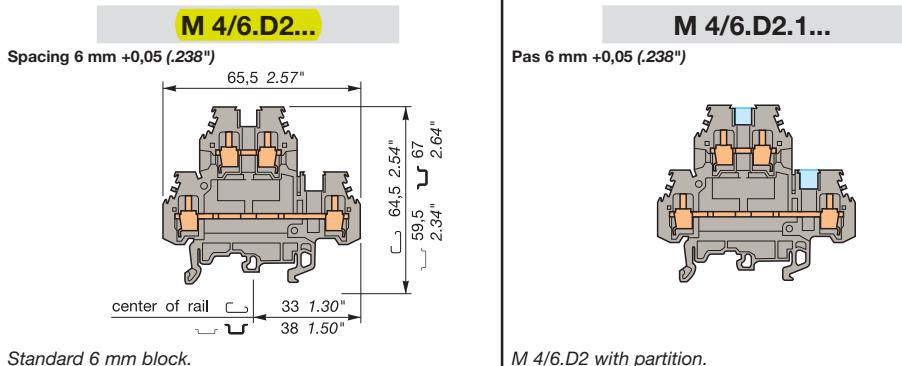
 refer to the section "Special Applications" for part numbers and characteristics.

End stop		th. 12 mm	BADH	1SNA 116 900 R2700
End stop		th. 9,1 mm	BAMH	1SNA 114 836 R0000
End stop		th. 9,1 mm	BAMH	1SNA 194 836 R0100
Rail		35 x 7,5 x 1	PR3.Z2	1SNA 174 300 R1700
Rail		35 x 15 x 2,3	PR4	1SNA 168 500 R1200
Rail		35 x 15 x 1,5	PR5	1SNA 168 700 R2200
Rail		32 x 15 x 1,5	PR1.Z2	1SNA 163 050 R0400

Other end stops, rails and accessories : see section on accessories.

### Notes

The use of some accessories may decrease the block's voltage rating. For more information, consult us.



M 4/6.D2 with partition.

UL			CE		
Colour	Type	Part numbers	Colour	Type	Part numbers
Grey	 M 4/6.D2	1SNA 115 271 R2200	Grey	 M 4/6.D2.1	1SNA 115 126 R0100
Green	 M 4/6.D2	1SNA 105 044 R2100	Blue	 M 4/6.D2.1.N	1SNA 125 126 R0300
Yellow	 M 4/6.D2	1SNA 105 045 R2200	Beige	 M 4/6.D2.1	1SNA 195 126 R0200
White	 M 4/6.D2	1SNA 105 046 R2300			
Black	 M 4/6.D2	1SNA 105 047 R2400			
Red	 M 4/6.D2	1SNA 105 048 R0500			
Orange	 M 4/6.D2	1SNA 105 049 R0600			
Blue	 M 4/6.D2.N	1SNA 125 271 R2400			
Beige	 M 4/6.D2	1SNA 195 271 R2300			

Characteristics				Characteristics			
Wire size		Wire size		Wire size		Wire size	
		IEC NFC DIN	UL	IEC NFC DIN	UL	IEC NFC DIN	UL
Screw	Rigid	0,2-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG	22-12 AWG	0,2-4 mm <sup>2</sup>	24-12 AWG
clamp	Flexible	0,22-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG	22-12 AWG	0,22-4 mm <sup>2</sup>	24-12 AWG

Voltage				Voltage			
Rated	800 V	300 V(5)	600 V	Rated	800 V	300 V(5)	600 V
Impulse withstand	8 kV			Impulse withstand	8 kV		
Pollution degree	3			Pollution degree	3		

Current				Current			
Rated	32 A	20 A	25 A	Rated	32 A	20 A	25 A

Wire size				Wire size			
Rated / Gauge	4 mm <sup>2</sup> / A4	12 AWG	12 AWG	Rated / Gauge	4 mm <sup>2</sup> / A4	12 AWG	12 AWG
Wire strip. length	Recomm. Screwdriver	Recomm. torque	Protection	Wire strip. length	Recomm. Screwdriver	Recomm. torque	Protection
8,5 mm	4 mm	0,5-0,8 Nm	IP20	8,5 mm	4 mm	0,5-0,8 Nm	IP20
.33"	.157"	4.4-7.1 lb.in	NEMA 1	.33"	.157"	4.4-7.1 lb.in	NEMA 1

Accessories				Type				Part numbers					
		Type											
1	End section	grey blue beige	FEM6D	th. 1,0 mm	1SNA 118 499 R2300	FEM6D	th. 1,0 mm	1SNA 118 499 R2300	FEM6D	th. 1,0 mm	1SNA 128 499 R2500		
2	Circuit separator	grey beige	FEM6D	th. 1,0 mm	1SNA 128 499 R2500	FEM6D	th. 1,0 mm	1SNA 198 499 R2400	SCM6D	th. 1,0 mm	1SNA 113 482 R0500		
3	Separator end section	grey beige	SCM6D	th. 1,0 mm	1SNA 198 482 R0600	SCM6D	th. 1,0 mm	1SNA 193 482 R0600	SCM6D	th. 1,0 mm	1SNA 113 482 R0500		
4	Test socket	beige	SCF6D	th. 1,0 mm	1SNA 118 495 R1700	SCF6D	th. 1,0 mm	1SNA 118 495 R1700	SCF6D	th. 1,0 mm	1SNA 198 495 R1000		
5	Test device		SCF6D	th. 1,0 mm	1SNA 198 495 R1000	AL2	DIA. 2,0 mm	1SNA 163 070 R0000	AL2	DIA. 2,0 mm	1SNA 163 070 R0000		
6	Test plug		AL2	(1)	DIA. 2,0 mm	1SNA 163 261 R0000	AL3	DIA. 3,0 mm	1SNA 163 261 R0000	DCG	grey	1SNA 163 218 R0500	
7	Assembled jumper bar (with IP 20 protection)	32 A	DCG	grey	1SNA 163 218 R0500	FC2	(3)	DIA. 2,0 mm	1SNA 007 865 R2600	FC2	(3)	DIA. 2,0 mm	1SNA 007 865 R2600
8	Connector plate	35 A	EL6	1SNA 173 627 R2100	EL6	1SNA 173 627 R2100							
9	Jumper bar not assembled	32 A	BJS61	(1)(4)	10 poles	1SNA 168 485 R2700	BJS61	(2)(4)	10 poles	1SNA 168 485 R2700			
10	Pivoting jumper bar	35 A	BJS61	(1)(4)	10 poles	1SNA 168 400 R1600	BJS61	(2)(4)	10 poles	1SNA 168 400 R1600			
11	Comb type jumper bar	35 A	BJP61	1SNA 167 225 R2000	BJP61	1SNA 167 225 R2000							
12	IDC jumper	24 A	PC61	1SNA 163 311 R2200	PC61	1SNA 163 311 R2200							
13	Vertical interconnection		AD2,5	1SNA 114 205 R2000	AD2,5	1SNA 114 205 R2000							
14	Shield connector		ITV6	1SNA 168 962 R0400	ITV6	1SNA 168 962 R0400							
R	See section on markers marking method		CBM5D	th. 0,5 mm	1SNA 173 530 R2400	CBM5D	th. 0,5 mm	1SNA 173 530 R2400					

RC65 - RC610 Sides of block RCT610 - RTM7 Top of block

RC65 - RC610 Sides of block RCT610 - RTM7 Top of block

Note : (1) A circuit separator SC may be required with the use of these accessories. (2) Use of these accessories requires the user to cut out the partition. (3) For block equipped with test socket AL2. (4) See section accessories for other configuration of poles. (5) 600 V with end section.

# Static Pressure Probe

## Model A-520



- Unique dual orifice design to eliminate air flow error
- Gasketed flange for ease of installation
- 1/4" brass hose barb connection for transducer/switch
- Available in 4" and 8" probe lengths
- 6061T-6 aluminum alloy
- Gasketed mounting flange, brass connector and mounting holes guarantee quick and easy installation

The A-520 Static Pressure Probe is designed to pick up static pressure in a duct, plenum, air handler or other HVAC equipment. The Probe has two orifices vertically opposite each other to cancel out any air flow induced errors. If a bent tube with a single orifice at the end is used to pick up static pressure in a duct, the air flowing across the probe may cause a small low pressure within the probe. This low pressure acts against the duct static pressure and hence induces an error which is exponentially proportional to the air flow. As the air flow increases, this error will increase also and as the flow decreases, the error decreases in an exponential relationship.

The engineers at MAMAC Systems resolved this problem with a unique design which incorporates two orifices diametrically opposing each other in a vertical plane. When the air flows across an orifice, it creates a suction towards that orifice. Similarly, when the same air flows across the other orifice, it creates an opposing suction which cancels out the first pressure drop. Regardless of the velocity, the flow error is constantly cancelled out and the A-520 provides an accurate,

The A-520 Static Pressure Probe is available in 6061T-6 aluminum alloy or 304 stainless steel material. In this way, for standard HVAC applications, the aluminum probe can be used. However, in exhaust applications where corrosive gases are present, the 304 stainless steel is recommended. The A-520 is available in two probe length options: 1) 4" aluminum/stainless steel; 2) 8" aluminum/ stainless steel. The Probe is attached to a 2" O.D. flange with two conveniently located mounting holes for ease of attachment to the sheet metal. The flange also has a neoprene gasket to seal off the mounting holes. An industry standard 1/4" hose barb or 1/8" NPT female swivel brass fitting is provided for PVC/copper tubing connection. The A-520 is designed to substantially reduce the installation time required and to provide a convenient method to pick up static pressure in HVAC equipment.

Installation is completed by drilling a 1/4" hole in the sheet metal, inserting the Probe and securing the assembly by using the mounting flange as a template to mark and drill two holes for the self tapping sheet metal screws. A label is provided to correctly position the mounting holes during installation to insure that the two orifices are perpendicular to the air flow.



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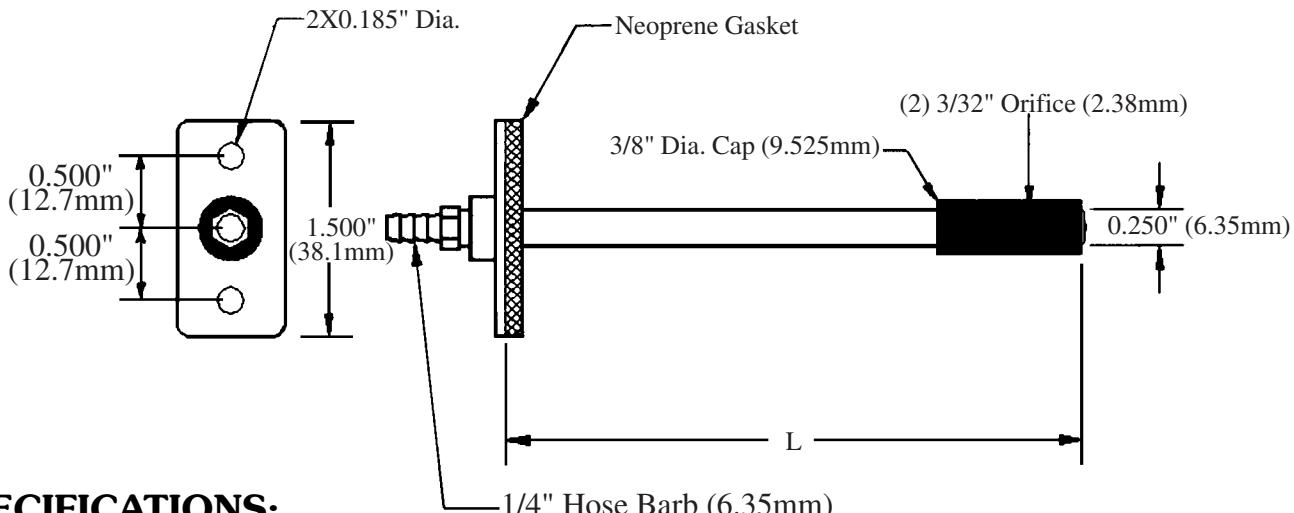
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# A-520

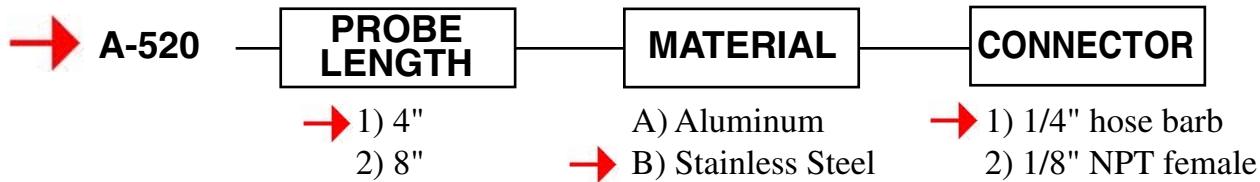


## SPECIFICATIONS:

**Material:** 6061T-6 Aluminum Alloy or 304 Stainless Steel  
**Port Connections:** 1/4" brass hose barb or 1/8" NPT female  
**Gasket Material:** Neoprene  
**Maximum Pressure:** 10 psig

**Maximum Temperature:** 250° C  
**Maximum Air Flow:** Unlimited  
**Weight:** 1.5 oz.

## ORDERING INFORMATION:



The MAMAC Systems warranty covers parts and labor for 2 years from date of shipment. MAMAC Systems reserves the right to change any specifications without notice to improve performance, reliability, or function of our products.

## A Complete Line of Control Peripherals From a Single Source

**MAMAC Systems** is the only manufacturer offering more than fifty products to satisfy all temp, humidity, pressure, flow, light, speed or any other DDC controls application. MAMAC's complete line of control peripherals is available in over two thousand different configurations of supply voltage, output, range and enclosure type to make our products guaranteed compatible to all HVAC controls, industrial automation and COGEN systems worldwide.

Single source accountability, liberal 2 year warranty, worldwide service and technical support, competitive pricing, accumulated experience of more than 10,000 installations are some of the benefits offered by MAMAC Systems which are second to none in the HVAC DDC controls industry.



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# ULTIMA® X5000 Gas Monitor

The future looks bright.



Simple retrofits have identical footprint and wiring to ULTIMA X Gas Monitor series.

Bluetooth® wireless technology allows mobile device to act as HMI screen and controller.



Reduce setup time by at least 50% with the X/S Connect App.



Intuitive display features new design equipped with organic LED (OLED) display, with full word text in 9 languages. Bright green, yellow, and red status LEDs for extreme visibility.

Industry-first, touch-button interface provides intuitive, tool-free user experience.

Instrument status indicators illuminate power, fault, and alarm conditions.

## Advanced Sensor Technology

POWERED BY



WITH



- Patented XCell Sensors with TruCal technology\* extend calibration cycles for as long as 18 months, actively monitor sensor integrity and compensate for environmental factors and electrochemical sensor drift.
- Diffusion Supervision** sends acoustic signal every 6 hours to check that sensor inlet isn't obstructed so gas can reach the sensor.
- Worry-free operation; automatically self-checks four times per day.
- Three-year warranty and five-year expected life for XCell Sensors.
- Dual sensor capability** doubles sensing power with half the footprint of a single gas sensor transmitter.
- SafeSwap** enables safe and quick XCell Sensor replacement without powering off gas detector.



## Applications

- |               |                 |                    |
|---------------|-----------------|--------------------|
| • Chemical    | • Petrochemical | • Wastewater       |
| • Oil and gas | • Utilities     | • General industry |

\* Only CO & H<sub>2</sub>S XCell Sensors

WE KNOW WHAT'S AT STAKE.

# ULTIMA X5000 Gas Monitor

## Specifications



Product Specifications		
<b>COMBUSTIBLE GAS SENSOR TYPE</b>	Catalytic Bead (XCell combustible) Infrared (XIR Plus)	
<b>TOXIC GAS &amp; OXYGEN SENSOR TYPE</b>	<b>XIR PLUS</b>	Carbon Dioxide (CO <sub>2</sub> )
	<b>XCell Toxic</b>	Carbon Monoxide (CO) Carbon Monoxide (CO) H <sub>2</sub> -resistant Hydrogen Sulfide (H <sub>2</sub> S) Chlorine (Cl <sub>2</sub> )
	<b>XCell O<sub>2</sub></b>	Oxygen (O <sub>2</sub> )
	<b>XCell SO<sub>2</sub></b>	Sulfur Dioxide (SO <sub>2</sub> )
	<b>Electrochem.</b>	Hydrogen (H <sub>2</sub> ) Nitrogen Dioxide (NO <sub>2</sub> )
<b>SENSOR MEASURING RANGES</b>	<b>Combustible</b>	0-100% LEL
	<b>CO<sub>2</sub></b>	0-2%, 0-5% Vol
	<b>CO</b>	0-100, 0-500, 0-1000 ppm
	<b>CO, H<sub>2</sub>-resistant</b>	0-100 ppm
	<b>Cl<sub>2</sub></b>	0-5, 0-10, 0-20 ppm
	<b>H<sub>2</sub></b>	0-1000 ppm
	<b>H<sub>2</sub>S</b>	0-10, 0-50, 0-100, 0-500 ppm
	<b>NO<sub>2</sub></b>	0-10 ppm
	<b>O<sub>2</sub></b>	0-25%
	<b>SO<sub>2</sub></b>	0-25 ppm
<b>TYPICAL SENSOR LIFE</b>	<b>XCell Sensors</b>	5 years
	<b>Infrared</b>	10 years
<b>SENSOR PERFORMANCE*</b>	<b>T90 (typical)</b>	<b>Repeatability</b>
XIR PLUS COMB.	< 2 sec.	< ± 1% LEL
XIR PLUS CO <sub>2</sub>	< 6 sec.	< ± 1% Vol
XCELL COMB.	< 22 sec.	< ± 3% LEL
XCELL CO	< 9 sec.	< ± 1%
XCELL Cl <sub>2</sub>	< 12 sec.	± 1%
H <sub>2</sub>	< 185 sec.	< ± 10%
XCELL H <sub>2</sub> S	< 23 sec.	< ± 1%
NO <sub>2</sub>	< 60 sec.	< ± 10%
<b>XCELL O<sub>2</sub></b>	< 11 sec.	< ± 1% Vol
XCELL SO <sub>2</sub>	< 6 sec.	± 1%
<b>APPROVALS CLASSIFICATION</b>	Markings vary by component. See manual for specific component markings.	
DIVISIONS (US/CAN)	Class I, II, III; Div 1 & 2, T4/T5/T6	
ZONES (GLOBAL)	Ex db nA IIC T5 Gb (Class I, Zone 1/Zone2) Ex tb IIIC T85°C Db (Class II, Zone 21)	
ENCLOSURE RATING	Type 4X, IP66	
<b>WARRANTY</b>	<b>X5000 transmitter</b>	2 years
	<b>XIR PLUS</b>	10 years source, 5 years electronics
	<b>XCell Sensors</b>	3 years
	<b>Electrochemical Sensors</b>	Varies by gas
<b>APPROVALS</b>	CSA, ATEX, IECEx, INMETRO, DNV-GL Marine, CE Marking. Complies with C22.2 No. 152, FM 6320 RED, FCC, Suitable for SIL 2	

\*Typical response at standard temperature and pressure test conditions

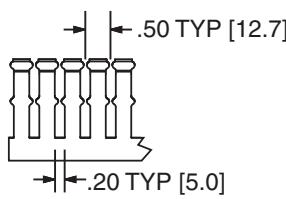
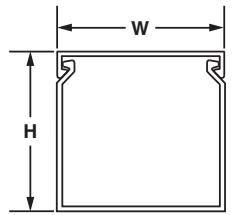
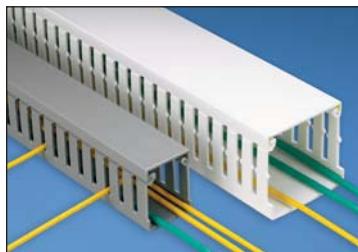
Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice.

Environmental Specifications**		
<b>OPERATING TEMPERATURE RANGE</b>	<b>XCell</b>	** May differ by gas type, see manual -40°C to +60°C
	<b>XIR PLUS</b>	-40°C to +60°C
<b>STORAGE TEMPERATURE RANGE</b>	-40°C to +60°C	
Mechanical Specifications		
<b>INPUT POWER</b>	11 to 30 VDC, 3 wire, <5 W nominal	
<b>SIGNAL OUTPUT</b>	Dual 4-20 mA current source, HART	
<b>BLUETOOTH (OPTIONAL)</b>	Bluetooth Low Energy (BLE) v4.3 or higher	
<b>RELAY RATINGS</b>	5 A @ 30 VDC; 5 A @ 220 VAC (3X) SPDT - fault, warn, alarm	
<b>RELAY MODES</b>	Common, discrete, horn	
<b>NORMAL MAX POWER RELAYS</b>	<b>XIR PLUS</b>	6.7 W
	<b>XCell combustible</b>	4.9 W
	<b>XCell Toxic &amp; O<sub>2</sub></b>	2.8 W
	<b>XIR PLUS &amp; XCell combustible</b>	10.9 W
	<b>XIR PLUS &amp; XCell toxic or O<sub>2</sub></b>	7.0 W
	<b>Dual XIR PLUS</b>	11.6 W
	<b>Dual XCell toxic &amp; O<sub>2</sub></b>	3.6 W
	<b>Dual XCell combustible</b>	10.6 W
	<b>Dual XCell comb. &amp; XCell toxic or O<sub>2</sub></b>	5.3 W
<b>EMC DIRECTIVE</b>	Complies with EN 50270, EN 61000-6-4, EN 61000-6-3	
<b>DISPLAY</b>	Organic LED (multi-lingual) with contrast ratio of 2000:1 and view angel of 160°	
<b>HART</b>	HART 7, HART device description language available	
<b>FAULTS MONITORED</b>	Low supply voltage, RAM checksum error, flash checksum error, EEPROM error, internal circuit error, relay, invalid sensor configuration, sensor faults, general system	
<b>WIRING REQUIREMENTS</b>	3-wire (single sensor) or 4-wire (dual sensor) shielded cable. Refer to manual for mounting distances and wire gauge.	
Dimensions		
<b>HOUSING (W x H)</b>	5.88" x 5.71" (150 x 145 mm)	
W/XCELL SENSOR	5.88" x 10.15" (150 x 258 mm)	
W/XCELL & XIR SENSORS	13.42" x 10.15" (341 x 258 mm)	
<b>LID (DEPTH)</b>	4.86" (123 mm)	
W/RELAY BOARD	3.86" (98 mm)	
<b>WEIGHT</b>	8.8 lb. (4 kg), 316 SS	

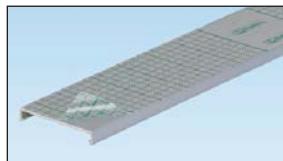
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	<b>2.25 x 3.12</b>	<b>57.2 x 79.2</b>	<b>0.20</b>	<b>5.0</b>	<b>C2LG6</b>	<b>6</b>	<b>60</b>	<b>120</b>
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48.

Base and cover sold separately.

\*"H" dimension includes duct and cover.

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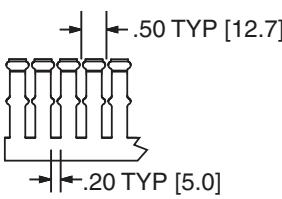
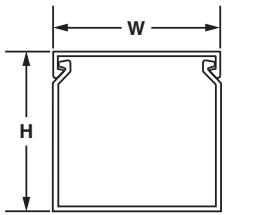
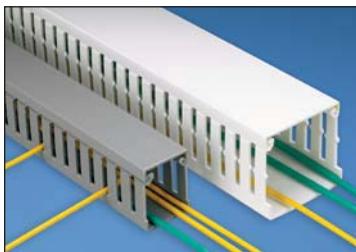
E4.  
Permanent  
Identification

E5.  
Lockout/  
Tagout  
& Safety  
Solutions

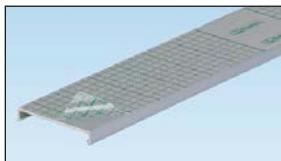
F.  
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	<b>2.25 x 4.10</b>	<b>57.2 x 104.1</b>	<b>0.20</b>	<b>5.0</b>	<b>C2LG6</b>	<b>6</b>	<b>60</b>	<b>120</b>
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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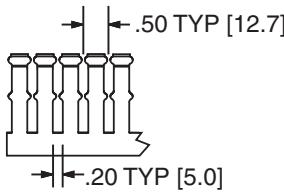
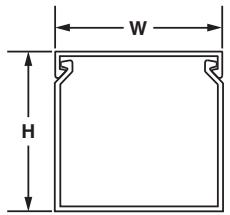
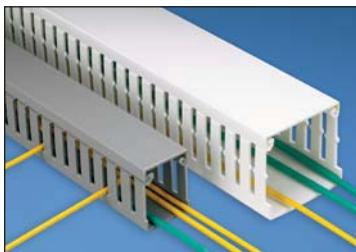
E4.  
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& Safety  
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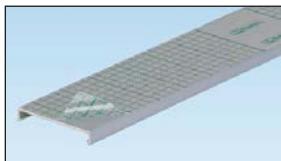
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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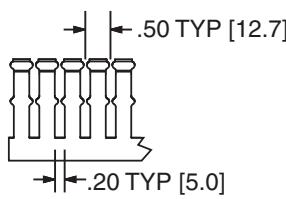
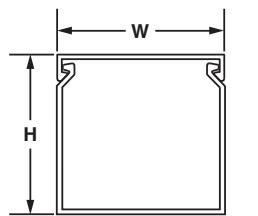
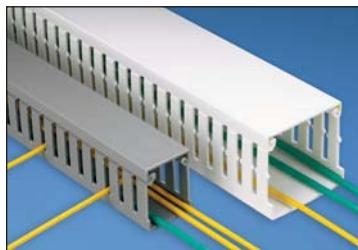
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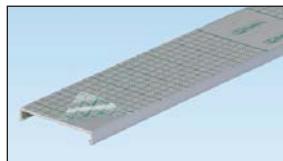
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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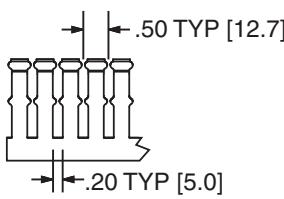
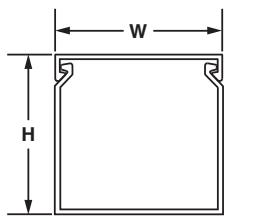
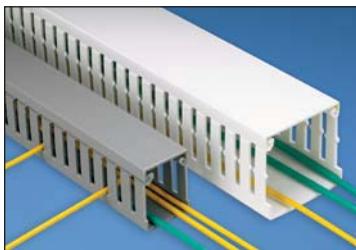
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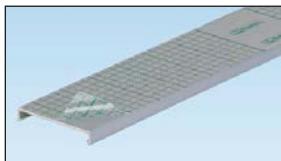
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**Panduit® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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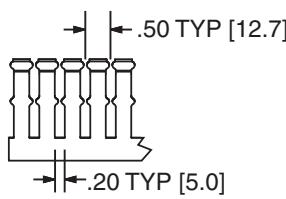
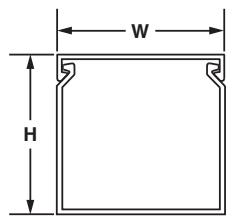
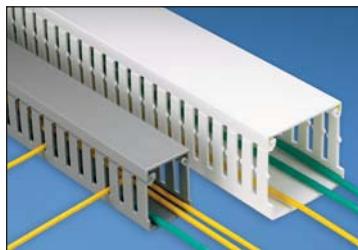
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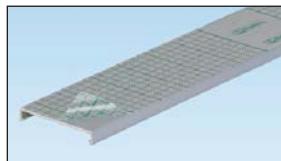
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48.

Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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PCI8000

Phoenix Controls PCI8000 is a multi-purpose solution seamlessly integrating critical airflow control devices to building automation networks while providing a platform for custom control logic. It performs:

- Protocol translation and data integration between the company's environmental control systems to BACnet®-capable Building Automation Systems (BAS).
- Bidirectional translation between room-level devices using LonWorks® technology and the BAS utilizing either BACnet over IP or MS/TP to manage read requests and write commands.

The PCI8000 offers a graphical programming environment and configurable inputs and outputs to extend control functions provided by on-site valve controllers. Using optional remote I/O modules, it can also be used to provide local control for hard-wired third party devices - typically room-level lighting control, advanced temperature control sequences, or integrating air quality sensors to the building's front-end visualization system.

A web server is included with functions for troubleshooting and commissioning devices available through web pages. Diagnostic displays can be used to assess problems on the room devices, room network, or device itself. If remote access is provided, many troubleshooting tasks can be performed off-site, saving the time and expense of travel to fix a potentially minor issue.

The PCI8000 can be ordered with Wi-Fi radio enabled. Technicians can wirelessly connect their Workbench to analyze diagnostics or make changes to valves. Or they can stream to a PC web browser to view the health and diagnostics web pages. These wirelessly performed technician tasks reduce labor for difficult to access valves.

The Lab Verification feature is a set of web pages that field technicians use to perform field acceptance testing for one pressurization zone at a time. It temporarily overrides the airflow to min and max settings as well as occupied/unoccupied set points, then captures the readings for reporting and archiving.

The Test and Balance (TAB) feature is also a set of web pages that is used by third party verification experts to measure all airflows to ensure valves are flowing as intended. The TAB function can place several spaces in full heating or cooling so the balancer can check out the hot water and air handling systems. Balancers can enter the measured field data for adjustments and save the data in a .csv format for use in their own reporting tool.



PCI8000 with Communication Module

## FEATURES

- Support for Niagara 4 with Phoenix Controls Workbench 3.0 or later.
- Optional support for Niagara AX: Phoenix Controls Workbench 2.5 or later.
- Web User interface for device, network, and platform diagnostics.
- Supports up to 4 optional communications modules.
- Includes 2 on-board RS-485 BACnet® MS/TP ports.
- Up to 49\* LON devices with 20 fume hoods maximum per channel. 197 devices maximum per PCI8000.  
\*First LON module supports 50 devices.
- Data Recovery Services prevent data loss during power interruptions.
- Lab Verification function for field acceptance testing via password protected web pages.
- Test and Balance function for third party balancers to verify valves work as intended via password protected web pages.
- Support for remote I/O modules connected by BACnet MS/TP. Refer to *PCI I/O Module Product Data Sheet (MKT-0431)*.

## SPECIFICATIONS

### Platform

- ARM® Cortex™-A8 1Ghz processor
- 1GB DDR3 SDRAM
- 2Mb (megabit) Serial FRAM
- Up to 4GB microSD Flash memory
- Removable micro-SD card with 4GBflash total storage; 2GB user storage
- Real-time clock

### Operating System

Niagara 4.4 or later  
Niagara 3.8 (Optional)

### On-Board Communications

- Two 10/100Mbit Ethernet ports
- Two electrically isolated RS485 ports with selectable bias and termination
- USB Type A connector (backup and restore support)

### Integration Points

25 points per device (e.g; 20 devices = 500 points)

### Power

- 24 VAC, 50/60Hz @ 24 VA minimum
  - Dedicated UL listed Class 2 transformer
- 24 Vdc from Linear Power Supply (LPS) providing at least 1A (24W)
- Wall-mount, Class 2 universal AC power adapter; Input = 90-264 Vac, 47-63 Hz; Output = 24 Vdc, 1.25 A (30W) maximum
  - PCI option WPS
  - Supplies 24 Vdc via barrel-connector plugs, all ungrounded for US, UK, EU, and Australian outlets
  - Intended for office use only; excluded from agency testing
- Internal battery backup is neither required nor available.

### Optional Communication Modules

- LON Modules: One LON network port per module (ANSI 709.1 LonTalk Protocol)
  - Up to four LON modules per PCI
- BACnet MS/TP Module: Two RS485 ports, 3 Pin Connector (up to 115,200 baud)
  - Up to two BACnet modules per PCI
- Refer to *Communication Module Ordering Considerations* section

### Network Limitations

- First LON module supports up to 50 devices (LVC + LRC + PUL + PTC + LDU + FHD) with 20 fume hoods maximum. Subsequent modules limited to 49 LON devices with 20 hood maximum per channel. Up to 4 LON modules per PCI8xxx with up to 197 devices.
- BACnet MS/TP: Smaller of 32 Unit Loads or 50 Devices per network segment

### BACnet Unit Loads

These components each exert the following unit load on the MS/TP network.

- PCI8000 COM-1 = 1/8
- PCI8000 COM-2 = 1/8
- Each PCI8000 BACnet Communication Module = 1/4 (1/8 for each port)

### Optional Remote I/O Modules

- 16- and 34-point modules available
- Connect to PCI via RS485 and are ordered separately from PCI
- Refer to *PCI I/O Module Product Data Sheet*

### Dimensions

- PCI8000: 6.38" (162 mm) L x 4.33" (110 mm) W x 2.4" (61 mm) H
- Optional Communication Module (LON or BACnet): 2.07" (52.5 mm) L x 4.33" (110 mm) W x 2.4" (61 mm) H
- Optional Wall-mount Power Adapter (option -WPS): 3.56" (90.3 mm) L x 1.97" (50.0 mm) W x 1.50" (38.15 mm) H, excluding AC plug; add 0.25" (6.35 mm) to 1.00" (25.4 mm) to height, excluding prongs, based on which style plug is used

### Approximate Weight

- PCI8000: 13.2 oz (0.37kg)
- Optional Communication Module (LON, BACnet): 4.75 oz (0.13 kg)
- Optional Wall-mount Power Adapter (option -WPS): 8.00 oz (0.23 kg)

### Environmental Requirements

- Storage Temperature Range  
-40 - 185 °F (-40 - 85 °C)
- Operating Temperature Range  
-4 - 140 °F (-20 - 60 °C)
- Operating Humidity Range  
5 - 95% RH, non-condensing
- Product is for indoor use only, altitude to 6,562 ft (2,000 m).

### WiFi

For DIS region only:

- No Wi-Fi capability, not upgradable

For ROW and USA regions only:

- IEEE802.11a/b/g/n
- IEEE802.11n HT20 @ 2.4GHz
- IEEE802.11n HT20/HT40 @ 5GHz
- Configurable radio (Off, WAP, or Client)
- WPAPSK/WPA2PSK supported

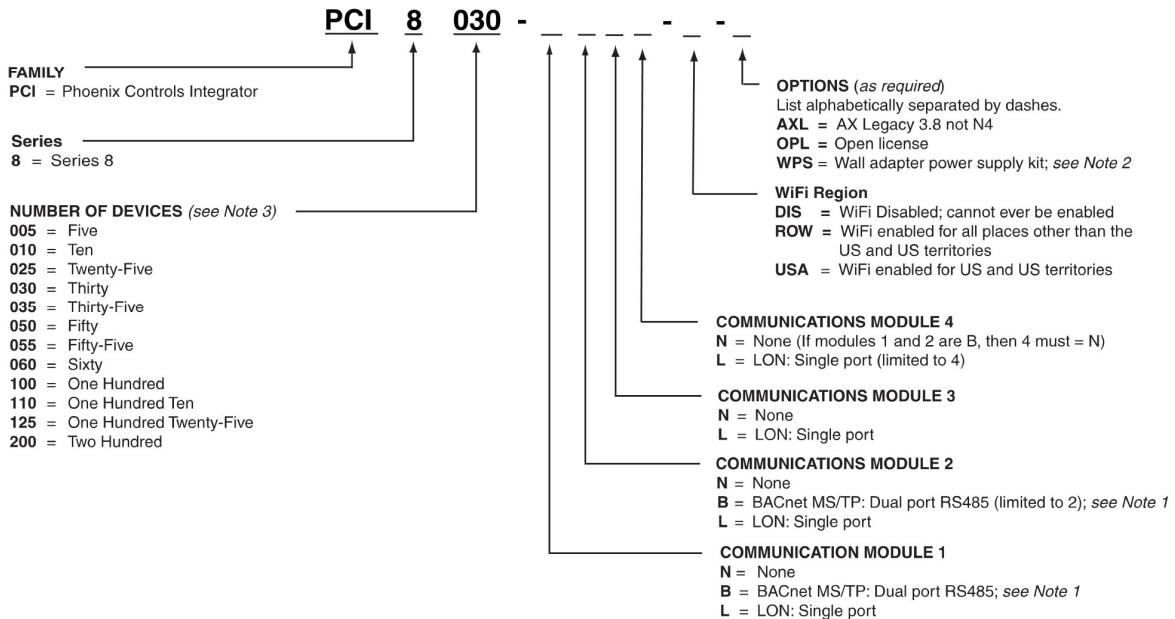
### Agency Listings\*



- UL 916
- CE EN 61326-1
- FCC Part 15 Subpart B, Class B
- FCC Part 15 Subpart C
- C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 Signal Equipment"
- 1999/5/EC R&TTE Directive
- CCC
- SRRC
- RSS
- ROHS
- ICES-003, Class B - Industry Canada Interference-Causing Equipment Standard
- CE Declaration of Conformity (Council Directive 004-108-EC)
- WEEE

\*Excludes Option WPS - Wall Adapter Power Supply kit.

## ORDERING GUIDE



### NOTES:

1. Communication Modules terminate BACnet MSTP room networks when more than the two on-board ports are needed.
2. 100-240 Vac, 50/60 Hz Wall Adapter – Connects to the 2.5 mm barrel plug 24 V input on the PCI8000 and includes US, EU, UK, and AU style plugs.
3. Maximum Device Count = Total LON Devices + Total BACnet Devices; refer to the *Maximum Number of Devices, Points, and Communications Modules* section.

### Communication Module Ordering Considerations

The PCI8000 controller supports a maximum of four communication modules in certain combinations. The following chart details the possible combinations. Note that if you use two RS485 option modules, you are limited to one additional LON module for a total of three.

Communication Module	Module Types								
1	BACnet	BACnet	BACnet	BACnet	LON	LON	LON	LON	
2	None	BACnet	BACnet	LON	LON	LON	LON	None	
3	None	None	LON	LON	LON	LON	None	None	
4	None	None	None	LON	LON	None	None	None	

### Maximum Integration Channels

The maximum number of channels that can be integrated per PCI are shown in the following table, assuming they also meet the maximum allowable devices and points. Refer to the *Maximum Devices, Points, and LON Communications Modules* section.

Maximum On-Board Channels	Maximum Optional Communication Modules			Maximum Ports/Channels		Maximum Integration Channels
	BACnet	BACnet	LON	BACnet	LON	
2	2	2	1	4	1	7
2	1	1	3	2	3	7
2	0	0	4	0	4	6



## Overview

Lead time	Usually in Stock
-----------	------------------

## General

Provided equipment	CD with software Documentation CD Installation guide Smart UPS signalling RS-232 cable
Number of tare power	15 W
Number of power module free slots	0
Number of power module filled slots	0
Redundant	No
UPS size	WS

## Physical

Depth	6.73 in (17.1 cm)
Height	5.83 in (14.8 cm)
Mounting preference	No preference
Net Weight	28.35 lb(US) (12.86 kg)
Mounting mode	Not rack-mountable
Two post mountable	0
USB compatible	No
Width	14.25 in (36.2 cm)

## Input

Input Frequency	50/60 Hz +/- 3 Hz auto-sensing
Number of input connectors	1 Hard Wire 3-wire (1PH+N+G)
Efficiency at full load	75...154 V adjustable

Nominal Input Voltage	120 V
-----------------------	-------

## Output

Rated power in W	325 W
Max Configurable Power (Watts)	325 W
Harmonic distortion	Less than 5%
Output Frequency (sync to mains)	47...53 Hz for 50 Hz nominal sync to mains 57...63 Hz for 60 Hz nominal sync to mains
Topology	Line Interactive
Waveform Type	Sine wave
Output connector type	Hard Wire 3-wire (H N + E) 1
Curve equation	Efficiency
Curve load maximum	100 %
Curve X-axis maximum	100 %
Curve X-axis minimum	0 %
Curve X-axis title	Load
Curve X-axis units	Percentage
Curve Y-axis maximum	100 %
Curve Y-axis minimum	50 %
Curve Y-axis title	Efficiency
Curve Y-axis units	Percentage
Efficiency at full load	94 % full load)
Graph display	1
Output voltage	120 V
Maximum configurable power in VA	500 VA
Rated power in VA	500 VA

## Conformance

Product certifications	UL Recognized
------------------------	---------------

## Environmental

Ambient air temperature for operation	32...104 °F (0...40 °C)
Relative humidity	0...95 %
Operating altitude	0...10000 ft
Ambient air temperature for storage	5...113 °F (-15...45 °C)
Storage Relative Humidity	0...95 %
Storage altitude	0...50000 ft (0.00...15240.00 m)
Acoustic level	55 dBA
Online Thermal Dissipation	90 Btu/h
Show note OP temperature	No
IP degree of protection	IP20

## Batteries & Runtime

Battery type	Lead-Acid battery
Included Battery Modules	1
Battery Slots Empty	1
Typical recharge time	2 h
RBC Quantity	1
Liquid Electrolyte Value	0
Battery curve	B
Battery Charge Power (Watts)	60 W rated

Battery power in VAH	120 VAh runtime
Battery life	3...5 year(s)
Extendable Run Time	0

### Communications & Management

Free slots	1
Control panel	LED status display with load and battery bar-graphs and On Line : On Battery : Replace Battery : and Overload Indicators
Audible Alarm	Alarm when on battery : distinctive low battery alarm : overload continuous tone alarm
Emergency Power Off (EPO)	Yes

### Surge Protection and Filtering

Surge energy rating	540 J
Filtering	Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : m

### Ordering and shipping details

Package weight(Lbs)	29.37 lb(US) (13.32 kg)
---------------------	-------------------------

### Packing Units

Package 1 Height	11.69 in (29.7 cm)
Package 1 width	11.69 in (29.7 cm)
Package 1 Length	18.94 in (48.1 cm)

### Offer Sustainability

Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>
REACH Regulation	<a href="#">REACH Declaration</a>
EU RoHS Directive	Compliant <a href="#">EU RoHS Declaration</a>
Mercury free	Yes
RoHS exemption information	<a href="#">Yes</a>
Environmental Disclosure	<a href="#">Product Environmental Profile</a>
Circularity Profile	<a href="#">End of Life Information</a>
Optimized Energy Efficiency	Energy efficient product

### Contractual warranty

Warranty	2 years repair or replace
----------	---------------------------



## Model 264

Low Differential Pressure Transducer

### Features

- Industry standard for very low differential pressure
- $\pm 0.25\%$ ,  $\pm 0.4\%$ ,  $\pm 1\%$  FS accuracy
- 3 year unconditional warranty
- Up to 10 PSI overpressure (range dependent)
- Installation time minimized w/ mounting options
- Reverse wiring protection
- Internal regulation permits use with unregulated DC power supplies
- Fire retardant case (UL 94 V-0 approved)
- CE & RoHS compliant

### Applications

- HVAC/R systems
- Room pressurization for critical environments
- Energy management systems
- Variable air volume and fan control (VAV)
- Environmental pollution control
- Lab & fume hood control

With millions of sensors installed world wide, Setra's 264 is the "standard" for low differential pressure measurement in HVAC building automation. The 264 very low differential pressure transducer uses a dead-ended stainless steel welded capacitive sensing element that requires minimal amplification and delivers excellent accuracy and longterm stability in critical installations. The 264 has a 3 year, unconditional warranty, giving the end-user peace of mind well beyond the initial commissioning phase and guarantees performance well after the BAS warranty. The 264 utilizes a robust design that offers brass barbed fittings, and an optional conduit cover for easy and consistent installation.

### The industry standard

The 264 has been a consistent and trusted HVAC sensor for over two decades. The reputation of reliability and quality with exceptional delivery time has helped the 264 remain the trusted choice for any low differential pressure applications.

### Convenient installation

The 264 is available in both a wall and conduit versions providing the installer with flexible mounting options. The base mount allows the sensor to be installed anywhere, allowing for a simple installation.

### The Setra sensor

The core technology of the 264 is the all stainless steel capacitive sensing element. Setra designs and manufactures all of their sensing elements resulting in full control over the process and quality of every single sensor. The welded dead-ended capacitive sensors requires minimal amplification and delivers excellent accuracy and longterm stability. Setra's technology has been used in over 8 million installations and has the highest field acceptance rate in the industry.



# Specifications

## Performance data

Accuracy RSS <sup>1</sup> (at constant temp)	±1.0% FS (standard); ±0.4% FS, ±0.25% FS (optional)
---	--

Non-linearity, BFSL	±0.96% FS (standard); ±0.38% FS, ±0.22% FS (optional)
---------------------	--

Hysteresis	0.10% FS
------------	----------

## Thermal effects<sup>2</sup>

Compensated range °F (°C)	0 to +150 (-18 to +65)
---------------------------	------------------------

Zero shift %FS/100°F(50°C)	±0.033 (±0.06)
----------------------------	----------------

Span shift %FS/100°F(50°C)	±0.033 (±0.06)
----------------------------	----------------

Max. line pressure	10 PSI
--------------------	--------

Overpressure	Up to 10 PSI (range dependent)
--------------	--------------------------------

Long term stability	0.5% FS/YR
---------------------	------------

## Environmental data

Operating temperature °F (°C) <sup>3</sup>	0 to +175 (-18 to +79)
--	------------------------

Storage temperature °F (°C)	-65 to +250 (-54 to +121)
-----------------------------	---------------------------

## Position effect<sup>4</sup>

Range	Zero offset (%FS/G)
0.1" W.C.	2.3
0.25" W.C.	1
0.5" W.C.	0.5
1.0" W.C.	0.3
2.5" W.C.	0.2
10" W.C.	0.15

<sup>1</sup>RSS of Non-Linearity, Hysteresis, and Non-Repeatability.

<sup>2</sup>Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.

<sup>3</sup>Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher.

<sup>4</sup>Unit is factory calibrated at 0g effect in the vertical position.

<sup>5</sup>Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.

<sup>6</sup>Zero output factory set to within ±50mV (±25 mV for optional accuracies).

## Physical description

Case	Fire-retardant glass filled polyester (UL 94 V-0 Approved)
------	--

Electrical Connection	Screw terminal strip
-----------------------	----------------------

Mounting	4 screw holes on removable zinc plated steel base (designed for 2.75" snap track)
----------	---

Pressure Fittings	3/16" O.D. barbed brass for 1/4" push on tubing
-------------------	---

Zero and Span Adjustments	Accessible on top of case
---------------------------	---------------------------

Weight (approx.)	10 Ounces
------------------	-----------

## Electrical data (voltage)

Circuit	3-Wire (Com, Out, Exc)
---------	------------------------

Excitation/output <sup>5</sup>	9 to 30 VDC / 0 to 5 VDC <sup>6,7</sup>
--------------------------------	---

Output impedance	100 ohms
------------------	----------

Bidirectional output at zero pressure	2.5 VDC <sup>6,7</sup>
---------------------------------------	------------------------

## Electrical data (current)

Circuit	2-wire
---------	--------

Output <sup>8</sup>	4 to 20 mA <sup>9,10</sup>
---------------------	----------------------------

External load	0 to 800 ohms
---------------	---------------

Min. loop supply voltage (VDC)	9 + 0.02 x (resistance of receiver plus line)
--------------------------------	---

Max. loop supply voltage (VDC)	30 + 0.004 x (resistance of receiver plus line)
--------------------------------	---

Bidirectional output at zero pressure	12 mA <sup>9,10</sup>
---------------------------------------	-----------------------

## Pressure media

Clean air or similar non-conducting gases.

<sup>7</sup> Span (Full Scale) output factory set to within ±50mV. (±25 mV for optional accuracies).

<sup>8</sup> Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.

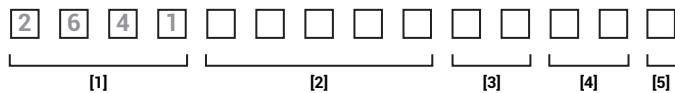
<sup>9</sup> Zero output factory set to within ±0.16mA (±0.08 mA for optional accuracies).

<sup>10</sup> Span (Full Scale) output factory set to within ±0.16mA (±0.08 mA for optional accuracies).

Specifications subject to change without notice.

## Ordering information

Example part number: 26412R5WD11T1C; Model 264, 0 to 2.5 in. W.C. Range, 4 to 20 mA Output, Terminal Strip Electrical Connection, and  $\pm 1\%$  Accuracy:



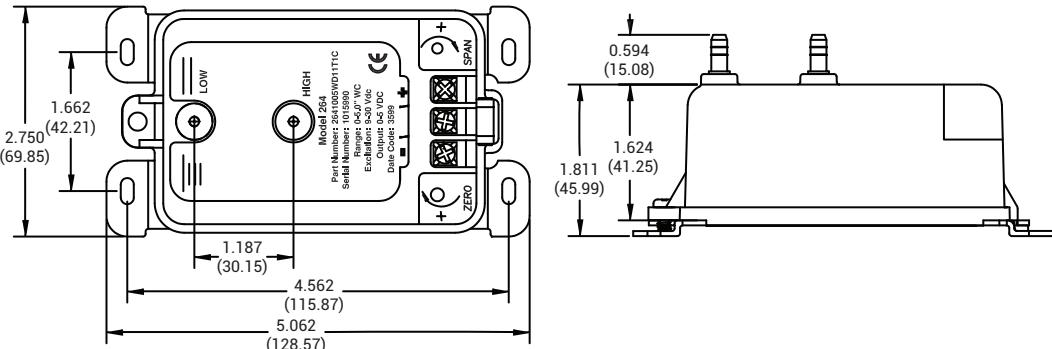
[1]	[2]	[2]	[3]	[4]	[5]
<b>Model</b>					
<b>2641</b> Model 264					
<b>Unidirectional ranges</b>		<b>Bidirectional ranges</b>		<b>Output</b>	
<b>0R1WD</b> 0 to 0.1" W.C.		<b>R05WB</b> $\pm 0.05$ W.C.		<b>11</b> 4 to 20 mA	
<b>R25WD</b> 0 to 0.25" W.C.		<b>0R1WB</b> $\pm 0.1$ W.C.		<b>2D</b> 0 to 5 VDC	
<b>0R5WD</b> 0 to 0.5" W.C.		<b>R25WB</b> $\pm 0.25$ W.C.			
<b>001WD</b> 0 to 1" W.C.		<b>0R5WB</b> $\pm 0.5$ W.C.			
<b>1R5WD</b> 0 to 1.5" W.C.		<b>001WB</b> $\pm 1$ W.C.			
<b>2R5WD</b> 0 to 2.5" W.C.		<b>1R5WB</b> $\pm 1.5$ W.C.			
<b>003WD</b> 0 to 3" W.C.		<b>2R5WB</b> $\pm 2.5$ W.C.			
<b>005WD</b> 0 to 5" W.C.		<b>005WB</b> $\pm 5$ W.C.			
<b>010WD</b> 0 to 10" W.C.		<b>7R5WB</b> $\pm 7.5$ W.C.			
<b>015WD</b> 0 to 15" W.C.		<b>010WB</b> $\pm 10$ W.C.			
<b>025WD</b> 0 to 25" W.C.		<b>025WB</b> $\pm 25$ W.C.			
<b>050WD</b> 0 to 50" W.C.		<b>050WB</b> $\pm 50$ W.C.			
<b>100WD</b> 0 to 100" W.C.		<b>025LB</b> $\pm 25$ Pa			
<b>025LD</b> 0 to 25 Pa		<b>050LB</b> $\pm 50$ Pa			
<b>050LD</b> 0 to 50 Pa		<b>100LB</b> $\pm 100$ Pa			
<b>100LD</b> 0 to 100 Pa		<b>250LB</b> $\pm 250$ Pa			
<b>250LD</b> 0 to 250 Pa		<b>500LB</b> $\pm 500$ Pa			
<b>500LD</b> 0 to 500 Pa		<b>10CLB</b> $\pm 1000$ Pa			
<b>10CLD</b> 0 to 1000 Pa					

<sup>1</sup> Optional accuracy codes E, F, G, include calibration certificate.

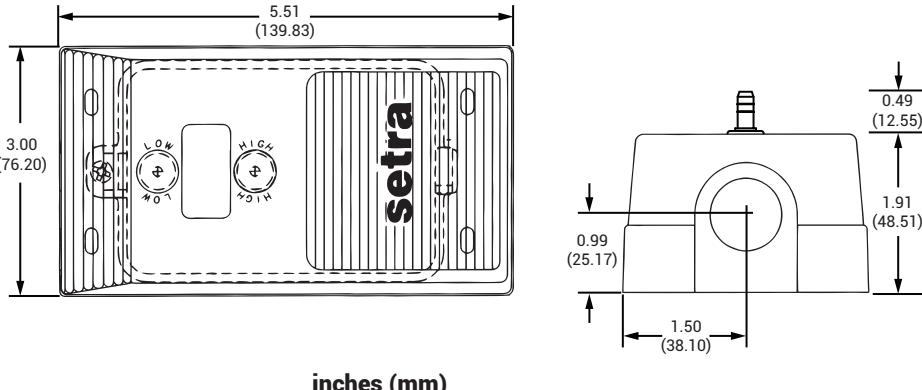
Contact Setra for versions not shown here.

## Dimensions

Electrical termination  
"T1"



Electrical termination  
"A1"





**Setra Systems, Inc.**  
159 Swanson Road  
Boxborough, MA 01719  
800.257.3872  
[www.setra.com](http://www.setra.com)

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Built-in cover page

## 224-230900-0:Controls Materials



Status	<span style="background-color: orange; color: white; padding: 2px 5px;">Open</span> Submitted
Spec section	230900 Instrumentation and Control for HVAC
Manager	<b>Kathryn Glover</b> (DPR Construction)
Responsible contractor	<b>Katelyn K</b> (McKinstry Co., LLC - 10063381)
Reviewers step 01	<b>Clayton Richenber</b> (SABArchitects, Inc. - 10087726) <b>Emma Parks</b> (Westlake Consulting Group, LLC. - 10087787)



## Submittal Package Approval Sheet

DPR Construction, A General Partnership

<b>DPR Construction, A General Partnership</b>	
 <p>1000 1st Ave S Suite 400 Seattle, WA 98104 Phone: 608-212-5217</p>	<p>Reviewed for general conformance to the contract documents. This review does not relieve the subcontractor of the responsibility of making the work conform to the contract requirements. The subcontractor is responsible for all dimensions, correct fabrication, and accurate fit with the work of other trades.</p> <p>Reviewed By: Katie Glover</p>
<b>Architect</b>	

<b>Consultant</b>																
<table border="1"><tr><td><b>DB ENGINEERING</b></td><td></td></tr><tr><td colspan="2"><b>SUBMITTAL REVIEW</b></td></tr><tr><td colspan="2"><input checked="" type="checkbox"/> <b>APPROVED AS NOTED</b></td></tr><tr><td colspan="2"><input type="checkbox"/> <b>APPROVED / NO EXCEPTIONS TAKEN</b></td></tr><tr><td colspan="2"><input type="checkbox"/> <b>REJECTED / REVISE AND RESUBMIT</b></td></tr><tr><td colspan="2"><input type="checkbox"/> <b>FOR INFORMATION ONLY</b></td></tr><tr><td colspan="2"><hr/><p>THIS SUBMITTAL/SHOP DRAWING REVIEW SHALL NOT BE CONSTRUED AS A COMPLETE CHECK AND INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH THE CONTRACT DOCUMENTS. IN NO CASE IS A CONTRACTOR RELIEVED OF FULL RESPONSIBILITY FOR ADHERENCE TO THE CONTRACT DOCUMENTS. ANY SUBSTITUTIONS MUST BE RESUBMITTED FOR REVIEW.</p><hr/></td></tr><tr><td><b>BY</b> KelseyGabel</td><td><b>DATE</b> 11/16/2022</td></tr></table>	<b>DB ENGINEERING</b>		<b>SUBMITTAL REVIEW</b>		<input checked="" type="checkbox"/> <b>APPROVED AS NOTED</b>		<input type="checkbox"/> <b>APPROVED / NO EXCEPTIONS TAKEN</b>		<input type="checkbox"/> <b>REJECTED / REVISE AND RESUBMIT</b>		<input type="checkbox"/> <b>FOR INFORMATION ONLY</b>		<hr/> <p>THIS SUBMITTAL/SHOP DRAWING REVIEW SHALL NOT BE CONSTRUED AS A COMPLETE CHECK AND INDICATES ONLY THAT INFORMATION PRESENTED CONFORMS GENERALLY WITH THE CONTRACT DOCUMENTS. IN NO CASE IS A CONTRACTOR RELIEVED OF FULL RESPONSIBILITY FOR ADHERENCE TO THE CONTRACT DOCUMENTS. ANY SUBSTITUTIONS MUST BE RESUBMITTED FOR REVIEW.</p> <hr/>		<b>BY</b> KelseyGabel	<b>DATE</b> 11/16/2022
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<b>BY</b> KelseyGabel	<b>DATE</b> 11/16/2022															
<b>Consultant</b>																



5005 3rd Ave South

Seattle, WA 98134

Phone: 206.762.3311

1150 Eastlake Variant Bio  
McKinstry Job #: 121993-001

Date: 11.7.22

Reference:  
Section: N/A

Description: 230900-005.00 Variant Controls Materials

Supplier: ATS

Manufacturer: Various

Section # :

This submittal contains the controls materials for 1150 Eastlake Variant.

Remarks:

- No Exceptions Taken
- Approved as Noted
- Rejected, Revise and Resubmit

Review is only for general conformance with the design concept and general compliance with the contract documents. Any action shown is subject to the requirements of the plans and specifications. The contractor is responsible for dimensions, which shall be confirmed and correlated at the job site; the fabrication process and techniques of construction; of his work with that of the other trades and the satisfactory performance of his work.

*McKinstry Engineering*

Date: 11/8/2022 By: \_\_\_\_\_



*Mechanical Engineer:*

Company Name:  
Contact:

McKinstry  
Andrew Robenalt

*General Contractor:*

Company Name:  
Contact:

DPR

*Mechanical Contractor:*

Company Name:  
Contact:

McKinstry  
John King

1150 Eastlake - L10 Variant Bio TI

ATS Job Number: **1122505**

**ATS Contact:**

*Project Manager:* Michael Beattie

Phone: 206-713-0154  
Fax: 425-251-0949



ATS Automation Inc.  
450 Shattuck Ave South  
Renton, WA 98057

425-251-9680

Fax #: 425-251-0949

Material Submittal TOC  
1150 Eastlake  
Job#: 1122505

11/1/2022

ATS ID #	MANUFACTURER	DESCRIPTION	PART #
<a href="#">TSB-05</a>	Alerton Tech-ACI	Temp Sensor,SS Wall Plate,10K	TS-1101-WA-10-AA
<a href="#">ACM</a>	Alerton Technologies	ACM, w/power, Dual MS/TP, TCP/IP, BACnet/Enet & IP	ACM
<a href="#">ACM-1</a>	Alerton Technologies	Expansion I/O module for VLX, 10 in, 4 bo's, 8 ao's	AXM-10-4-8
<a href="#">ACM-BATT</a>	Alerton Technologies	External battery pack for ACM.	ACM-BATT
<a href="#">ACM-OC1</a>	Alerton Technologies	ACM OC, Dual Port EIA-485/MSTP Option card	ACM-OC-2X485
<a href="#">MS-4TH</a>	Alerton Technologies	Microset 4 BAConet Digital Temp (H option) Sensor	MS4-TH
<a href="#">VL03-E</a>	Alerton Technologies	VLC 853-E Programmable Controller with 8 univ in, 5 Hot Switched BO,3 AO, 15va (maximum 97va with loads), 20VDC AT 100MA	VLC-853-E
<a href="#">VL06-E</a>	Alerton Technologies	VLC 550-E Programmable Controller with 5 univ in, 5 Hot Switched BO, 12va (maximum 72va with loads), 20VDC AT 100MA	VLC-550-E
<a href="#">VL07A-E</a>	Alerton Technologies	VAV SD2A-E Programmable Controller with 4 univ in, 5 BO, 2 AO and filter, 12va (maximum 72va with loads)	VAV-SD2A-E-F
<a href="#">TSB-02B</a>	Alerton Technologies-ACI	Temp Sensor,Duct,4",Flange,6" Plenum,10K	TS-2004-FB-10-AA
<a href="#">TSB-09B</a>	Alerton Technologies-ACI	Temp Sensor,Duct,8",Flange,6" Plenum,10K	TS-2008-FB-10-AA
<a href="#">DM-B02T</a>	Belimo	45 in-lb, non spring, 2-10vdc, terminal, bulk, 1.5W, 8 sq ft	LMB24-SR-T.1
<a href="#">DM-B02TA</a>	Belimo	45 in-lb, non-spr, floating, term, bulk, 1.5W, 8 sq ft	LMB24-3-T.1
<a href="#">DM-B11</a>	Belimo	35 in-lb, spring, 2-10vdc, 2.5W, 8 sq ft	LF24-SR
<a href="#">V-10</a>	Belimo	Belimo_B310_TR24-SR-T_US_assembly_en-us 1.2cv	B310+TR24-SR-T US
<a href="#">V-11</a>	Belimo	Belimo_B213_TR24-SR-T_US_assembly_en-us 4.7cv	B213+TR24-SR-T US
<a href="#">V-12</a>	Belimo	Belimo_B213_TR24-3-T_US_assembly_en-us 4.7cv	B213+TR24-3-T US
<a href="#">V-14</a>	Belimo	Belimo_B211_TR24-3-T_US_assembly_en-us 1.9cv	B211+TR24-3-T US
<a href="#">V-15</a>	Belimo	Belimo_B209_TR24-3-T_US_assembly_en-us 0.8cv	B209+TR24-3-T US
<a href="#">V-16</a>	Belimo	Belimo_B212_TR24-3-T_US_assembly_en-us 3cv	B212+TR24-3-T US
<a href="#">V-18</a>	Belimo	Belimo_B208_TR24-3-T_US_assembly_en-us 0.46cv	B208+TR24-3-T US
<a href="#">V-19</a>	Belimo	Belimo_B210_TR24-3-T_US_assembly_en-us 1.2cv	B210+TR24-3-T US
<a href="#">V-2</a>	Belimo	Belimo_B312_TR24-SR-T_US_assembly_en-us 3cv	B312+TR24-SR-T US
<a href="#">V-3</a>	Belimo	Belimo_B207_TR24-SR-T_US_assembly_en-us 0.3cv	B207+TR24-SR-T US
<a href="#">V-4</a>	Belimo	Belimo_B211_TR24-SR-T_US_assembly_en-us 1.9cv	B211+TR24-SR-T US
<a href="#">V-5</a>	Belimo	Belimo_B209_TR24-SR-T_US_assembly_en-us 0.8cv	B209+TR24-SR-T US
<a href="#">V-6</a>	Belimo	Belimo_B212_TR24-SR-T_US_assembly_en-us 3cv	B212+TR24-SR-T US
<a href="#">V-7</a>	Belimo	Belimo_B313_TR24-SR-T_US_assembly_en-us 4.7cv	B313+TR24-SR-T US
<a href="#">V-8</a>	Belimo	Belimo_B208_TR24-SR-T_US_assembly_en-us 0.46cv	B208+TR24-SR-T US
<a href="#">V-9</a>	Belimo	Belimo_B210_TR24-SR-T_US_assembly_en-us 1.2cv	B210+TR24-SR-T US
<a href="#">ETH-2B</a>	CTR-Link	5 Port 10/100/1000 Ethernet Switch DIN-rail Mount, bulk	EISK5-GT
<a href="#">MSX-W12-IN-LCD</a>	Dwyer	Press Trans 0-1/2' 3", Panel, LCD Display	MSX-W12-IN-LCD
<a href="#">PT-999</a>	Dwyer	Press Trans 0-1/25.5" UniDirect., Panel, No Display	MS2-W101
<a href="#">PT-9LCD</a>	Dwyer	Press Trans 0-1/25.5" BiDirect., Panel, LCD Display	MS2-W20-IN-LCD
<a href="#">PT-DM</a>	Dwyer	Press Trans 0-1/2/3' 5", Panel, No Display	MS2-W12-IN-WO
<a href="#">LED-998</a>	Federal Signal	LED Audible/Visual Signal - Wall Bracket	LWMB2
<a href="#">LED-999</a>	Federal Signal	LED Audible/Visual Signal (Platt #0089499)	AV1-LED-024R
<a href="#">RIB-1N4</a>	Functional Devices	SPDT, 24-120vac in,10amp,Encl Relay,1/3 HP@120, Nema 4	RIBU1C-N4
<a href="#">UPS-B</a>	Functional Devices	UPS Interface Module	PSM2RB10
<a href="#">XF-C5</a>	Functional Devices	100 VA, 120-24vac Transformer	TR100VA002
<a href="#">XF-C70</a>	Functional Devices	500va Transformer 480/277/240/120 (5) Separated 24vac Secondaries	PSH500A10-LVC
<a href="#">XF-C700</a>	Functional Devices	500va Transf 480/277/240/120 (5) 24vac Circuits, No Encl	PSMN500A
<a href="#">XF-C91</a>	Functional Devices	24vac Input, 300ma 24vac Output - Power Supply	PSM24A2DAS
<a href="#">EN-03A</a>	Hoffman	8X6X4 Small Enclosure, Hinge, No Backplate (xfrm)	A-HE 8X6X4
<a href="#">EN-08</a>	Hoffman	12X12X8 Small Encl, Hinge, No Backplate (frg cltr, 4Xfmr)	A-HE12X12X4
<a href="#">EN-990</a>	Hoffman	Nema 4 20x20x8 Hinged Door, No Backplate	A-20H20BLP
<a href="#">EN-991</a>	Hoffman	Nema 4 Back Panel 17x17	A-20P20
<a href="#">EN-992</a>	Hoffman	Nema 4 20x24x8 Hinged Door, No Backplate	A-20H24BLP
<a href="#">EN-993</a>	Hoffman	Nema 4 Back Panel 21x17	A-24P20
<a href="#">EN-994</a>	Hoffman	Nema 4 60x36x8 Hinged Door, No Backplate	A-60H36BLP
<a href="#">EN-995</a>	Hoffman	Nema 4 Back Panel 57X33	A-60P36
<a href="#">GRN-01</a>	Hoffman	Large Grounding Kit	LLGK
<a href="#">DIN-R1</a>	Kele & Associates	Relay Track - Steel, three ft section	DIN-3F
<a href="#">Panel-5</a>	Kele & Associates	End section (one required), gray	Fem6
<a href="#">Panel-9</a>	Kele & Associates	Top mount, blank white strips for terminal marking, 19.7"	RTM7
<a href="#">TBM-16</a>	Kele & Associates	DIN Rail Single Terminal Block, 25A, 600VAC/DC, narrow	M4/6
<a href="#">TBM-938</a>	Kele & Associates	DIN Rail Terminal End Stop	BAM4
<a href="#">TBM-915</a>	Kele & Associates	Jumper bar for M4/6,D2, 10 poles per bar	BJS61_1SNA168485R2700
<a href="#">TBM-916</a>	Kele & Associates	Jumper Bar Hardware, Package of 10	EV6D_1SNA168400R600
<a href="#">SPP-990</a>	Mamac/Dynacon	Static Pressure Probe - 4" Stainless Steel	520-1B-1
<a href="#">Q2-999</a>	MSA	Ultima X5000 4-20ma&-25% O2 with alarm relay	Ultima X5000
<a href="#">LGPANDUIT2</a>	Panduit	2" PANDUIT Cover, 6' long	C2LG6
<a href="#">LGPANDUIT2-4</a>	Panduit	2" PANDUIT 4" high, 6' long	F2X4LG6
<a href="#">LGPANDUIT3</a>	Panduit	3" PANDUIT Cover, 6' long	C3LG6
<a href="#">LGPANDUIT3-4</a>	Panduit	3" PANDUIT 4" high, 6' long	F3X4LG6
<a href="#">LGPANDUIT4</a>	Panduit	4" PANDUIT Cover, 6' long	C4LG6
<a href="#">LGPANDUIT4-4</a>	Panduit	4" PANDUIT 4" high, 6' long	F4X4LG6
<a href="#">PCI-999</a>	Phoenix	Phoenix Integrator	PCI8010-LNNDN-DIS-OPL
<a href="#">UPS-999</a>	Schneider Electric	APC DIN rail panel mount UPS Standard Battery 500VA - 120V	SUA500PDR-S
<a href="#">PT-VAV</a>	Setra Systems, Inc.	0-1.5 Differential Pressure Transducer 4-20ma	2641-1R5WD-11-T1-C

## Product Data

### Stainless Plate Sensor



### TS-1101-WA-10-AA

#### Features

- \* Temperature Only
- \* Brushed Stainless Plate
- \* High Accuracy
- \* High Durability
- \* 2-year Warranty
- \* ROHS Compliant

### Product Description

The **TS-1101-WA-10-AA** stainless plate is a single point temperature sensor with an output of 10K Ohms at 77°F (**25°C**). The temperature sensor has an overall accuracy of  $\pm 0.36^{\circ}\text{F}$  (**0.2°C**) over the range of 32 to 158°F (**0 to 70°C**).

The **TS-1101-WA-10-AA** stainless plate temperature should be mounted on an interior wall away from windows, heating and cooling supply vents, doors, and sunlight. All of the sensors have a 1/8" integral foam insulation pad to eliminate any thermal effects on the sensor from within the wall itself.

Each **TS-1101-WA-10-AA** sensor shall have two (2) 22 AWG yellow Etched Teflon lead wires for making all connections. The sensor is encapsulated to the stainless steel plate with the use of a thermally conductive epoxy. The normal operating temperature of these sensors should be from -40 to 212°F (**-40 to 100°C**).

The **TS-1101-WA-10-AA** wall plate is both non-polarity and non-position sensitive.

There are a number of applications in which the **TS-1101-WA-10-AA** sensors may be used to monitor and control the building temperature. A few of the most common applications include:

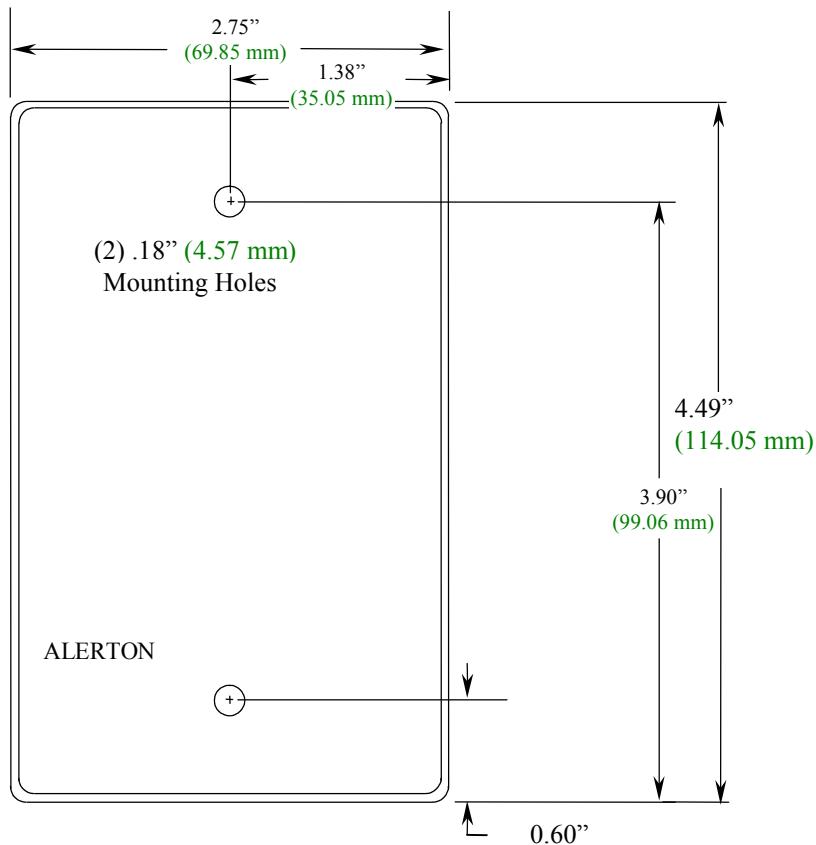
- Office Buildings
- Schools
- Locations where durability is essential
- Applications in which a traditional thermostat is not acceptable

All of these units come with a two-year warranty. For more information regarding these products, please contact ACI at the numbers listed below, or visit our website address at [www.workaci.com](http://www.workaci.com) for all of the up to date product literature.

### Product Specifications

<b>Sensor Output</b>	10K Ohms @ 77°F ( <b>25°C</b> )	<b>Operating Temperature Range</b>	-40 to 212°F ( <b>-40 to 100°C</b> )
<b>Sensor Accuracy</b>	$\pm 0.36^{\circ}\text{F}$ ( <b>0.2°C</b> ) 32 to 158°F ( <b>0 to 70°C</b> )	<b>Operating Humidity Range</b>	0 to 90% RH non-condensing
<b>Sensor Interchangeability</b>	$\pm 0.36^{\circ}\text{F}$ ( <b>0.2°C</b> ) 32 to 158°F ( <b>0 to 70°C</b> )	<b>Environmental Compliance</b>	RoHS-Directive 2002/95/EC
<b>Dissipation Constant</b>	3mW / °C nominal (Still Air)		

## Dimensions



Temp. C	Temp. F	10K(TypeII) (R Ohms)
0	32	32,692.05
5	41	25,418.83
10	50	19,915.94
15	59	15,719.62
16	60.8	15,005.91
17	62.6	14,328.62
18	64.4	13,685.69
19	66.2	13,075.22
20	68	12,495.39
21	69.8	11,944.51
22	71.6	11,420.98
23	73.4	10,923.32
24	75.2	10,450.10
25	77	10,000.00
26	78.8	9,571.78
27	80.6	9,164.26
28	82.4	8,776.33
29	84.2	8,406.96
30	86	8,055.16
31	87.8	7,720.01
32	89.6	7,400.64
33	91.4	7,096.22
34	93.2	6,805.98
35	95	6,529.19
40	104	5,324.13
45	113	4,366.54
50	122	3,601.05

## Ordering Information

Alerton Model #	Sensor Type	Wire Colors
→ TS-1101-WA-10-AA	10K Ohms	Yellow / Yellow

*These units are manufactured for Alerton by Automation Components, Inc.*

2305 Pleasant View Rd. • Middleton Industrial Park • Middleton, WI 53562  
[www.workaci.com](http://www.workaci.com)

PH: (608) 831-2585 • FAX (608) 831-7407

Filename: C0000017 Rev 1.Doc



## ACM GLOBAL CONTROLLER

The backbone of Alerton's BACtalk™ Ascent product line, the Ascent Control Module (ACM) is the industry's most agile controller in its class. It combines Alerton's pioneering and proven BACnet® capability with Tridium's® Niagara Framework® flexibility.

It provides a powerful assortment of features such as multiple global controller instances, and multiple communication networks.

The ACM can incorporate up to six (6) global controller instances and supports up to six (6) MS/TP trunks or EIA-485 LANs, consolidating the functionality of these controllers into a single configurable platform, and exceeding the functionality of six individual devices.

Two onboard Ethernet ports support 10/100/1000 Mbps Ethernet connections to the BACnet network, Modbus TCP or for NiagaraAX integration protocols such as LON IP and SNMP.

Easy to add option cards offer scalability for additional communication trunks as needed using the two slots available on the ACM. For example, you can use one option card slot for additional BACnet communication and the second card slot for LON communication by simply adding a dual 485 card and a LON card, respectively. Or you can use up to four card slots to support applications with large point count requirements for a central plant.

The ACM's quad-core processor future-proofs the system by providing high DDC execution speed for all the computing power you need. Two-direction DIN channel and direct panel mount options enable you to mount the ACM in different positions for the best fit.

The ACM hosts automation features such as schedules, trendlogs, alarms, zones and demand limiting.

## FEATURES AND HIGHLIGHTS

### SCALABLE

- Supports up to six EIA-485 LANs; two EIA-232 connections; two LON LANs; four TUX trunks; or 4 EXP trunks.

### INTEROPERABLE

- Supports the BACnet Protocol on Ethernet, BACnet IP, and MS/TP; Modbus TCP and RTU (EIA-485 and EIA-232); Alerton TUX, Alerton EXP, as well as many Niagara supported protocols.

### ENTERPRISE READY

- Supports BACnet/IP and can operate as a BACnet broadcast management device (BBMD) with NAT support for integration on enterprise and wide-area networks.

### POWERFUL

- Advanced processor and extended memory provide a fast, reliable platform for running DDC programming and global automation routines.

### SEGMENTED DDC CODE

- Allows multiple DDC program instances to run within a single controller, providing the ability to logically group sub-systems, improve uptime by enabling service on one system without impacting another, and maximizing flexibility in programming configuration.

## TECHNICAL DATA: ACM

**POWER** 20-30 VAC @ 40 VA, 47–63 Hz, full-wave rectified, with optional battery backup (see other side).

**DATA BACKUP/STORAGE** One removable microSD card.

**PROCESSOR AND MEMORY** Efficient, high-speed, quad-core CPU based on the ARM® Cortex™-A9 architecture (Freescale i.MX6Quad); 1GB DDR3 SDRAM, 64-bit-wide, 533 MHz (1066 MT/s).

**REAL-TIME CLOCK** Provides system date and time.

**BACNET/IP** IP support for interoperability on enterprise and WANs. Functions as up to four BACnet broadcast management devices (BBMDs) in accordance with Annex J BACnet/IP. Supports both Alerton and BACnet Standard network address translation (NAT) implementations.

**MS/TP** Supports two onboard networks that can be used for BACnet MS/TP or EIA-485 and up to two expansion cards (two networks each) for a maximum of six BACnet MS/TP networks per ACM.

**MODBUS** supports both TCP and RTU (EIA-485 and EIA-232) protocols; configuration supports up to 384 Modbus devices.

**TUX** Supports up to four Alerton TUX trunks for connection of up to 64 TUXs per trunk communicating at 4800/9600 baud or up to 32 TUXs per trunk communicating at 1200 baud. Each TUX Option Card has two TUX trunks.

**VLX/EXP** Supports up to four instances of the VLX application; one instance is included with the ACM.

**EXPANSION** Supports up to two expansion cards for interface adapters, such as EIA-485, EIA-232, LON, and TUX.

**COMMUNICATIONS** Provides two Ethernet ports, two onboard EIA-485 networks, two expansion card slots give the ability to add up to four additional EIA-485 networks (for a total of six), or two EIA-232 connections, or two LONworks networks, or up to four TUX Trunks.

**MOUNTING** 35mm DIN rail, either vertical or horizontal orientation.

**DIMENSIONS** 7-1/4 W x 8-9/16 H x 1-11/16 D (inches)

185 W x 220 H x 44 D (millimeters); fits 12 x 12 x 4 (inch) panel enclosure.

**ENVIRONMENTAL** Without battery:

-4 to 149 °F (-20 to 65 °C), 0 to 95% RH, non-condensing.

Storage Temperature:

-4 to 185 °F (-20 to 85 °C), 0 to 95% RH, non-condensing.

**PLATFORM** Linux.

**ETHERNET** Two integrated 8P8C modular connectors for use with two 10Base-T, 100Base-TX, and 1000Base-T Ethernet networks.

**SOFTWARE** Programming interface is Alerton Compass operator workstation software. Niagara AX 3.8.

#### CERTIFICATIONS AND STANDARDS

- RoHS compliant
- CE (EN 60730-1)
- FCC Part 15 Class B
- ICES-003
- C-Tick listed
- UL 916 for open energy management equipment.

#### TECHNICAL DATA: ACM BATTERY

The ACM has an optional 12 volt NiMH battery, which provides backup power that allows for orderly shutdown should power remain OFF for more than 60 seconds.

**POWER** 12 VDC supply voltage

#### ENVIRONMENTAL

Operational temperature and humidity:

32 to 122 °F (0 to 50 °C), 0 to 95% RH, non-condensing

Recommended storage temperature and humidity (to extend life):

41 to 77 °F (5 to 25°C), RH 65%  $\pm$ 5% non-condensing

Allowed storage temperature and humidity:

32 to 122 °F (0 to 50 °C), RH 5 to 95% non-condensing

#### CERTIFICATIONS AND STANDARDS

- UL 2054 ed 2 rev 2011-09-14
- EN 62133 ed 1 (2002), ed 2 (2012)

#### TECHNICAL DATA: TUX OPTION CARD

Each card has two TUX trunks - a total of four TUX trunks can be added in an ACM.

#### ENVIRONMENTAL

Operational temperature and humidity:

-4 to 149 °F (-20 to 65 °C), 5 to 95% RH, non-condensing

Storage temperature and humidity:

-40 to 149 °F (-40 to 65 °C), 5 to 95% RH, non-condensing

#### CERTIFICATIONS AND STANDARDS

- (Same as ACM)

#### ORDERING INFORMATION\*

##### ITEM NUMBER

ACM	Ascent Control Module
ACM-BATT	Optional ACM battery
ACM-OC-2X485	Dual EIA-485 option card
ACM-OC-232	EIA-232 option card
ACM-OC-LON	78kbps FTT10A LON option card
ACM-OC-2XTUX	Dual TUX Trunk option card
ACM-MDBS-DR-TCP	Alerton Modbus TCP protocol driver
ACM-MDBS-DR-RTU	Alerton Modbus RTU protocol driver
ACM-DR-VLX	Alerton VLX driver

**\*IMPORTANT!** Requires at least one base device license, Alerton (ACM032, ACM064, ACM128, ACM256, ACM384) or Niagara AX (AX016, AX032, AX064, AX128, AX256). Add-on Device packs also available for both Alerton and Niagara AX base licenses.

For a list of supported Niagara AX protocols, please consult your local Alerton authorized dealer.

*Specifications subject to change without notice.*

INNOVATIVE  
GLOBAL  
CONTROLLER  
WITH EXTENSIVE  
FLEXIBILITY.



16201 25th Avenue W, Lynnwood, WA 98087  
Telephone: (425) 921-4900 / Fax: (425) 921-4872  
alerton.com / sales@alerton.com

# AXM DATA SHEET

ATS BOM Tag: ACM-1, Manufacture's P/N: AXM-10-4-8



## EXPANSION MODULES (AXMS) PROVIDE I/O CAPABILITY FOR THE ASCENT ACM.

The versatile ACM/AXM configuration is the ideal choice for applications that put a premium on versatility, reliability, and performance—large air handling units, central plant systems, motor control centers, and other applications with numerous, interdependent control points.

AXMs connect to the ACM over a simple, twisted-pair, multi-drop AXM communications bus. The ACM supervises automation locally and provides connection to a BACnet internetwork. Combine a maximum of 8 AXMs per ACM for the I/O count your application requires.

Each AXM output has a Hand-Off-Auto (H-O-A) switch for manual override at the controller. Analog outputs also include a potentiometer to manually adjust the output when the switch is in Hand mode.

AXMs feature a high-speed microprocessor with flash memory for non-volatile program storage. The 12-bit universal inputs are software configurable to accept virtually any input type. CMOS circuitry, a four-layer circuit board with separate ground plane, and extensive hardware, software, and power-supply filtering ensure reliable and stable operation. The CMOS processor uses an internal watchdog, and power supply voltage is monitored to provide automatic shutdown and data backup.

	Universal Inputs	Binary Outputs	Analog Outputs
AXM-10-12-0	10	12	0
AXM-10-4-8	10	4	8
AXM-22-0-0	22	0	0



### FEATURES

#### Scalable

Combine up to 8 AXM modules with a single ACM to create versatile control solutions.

#### Versatile

Onboard Hand-Off-Auto (H-O-A) switches and potentiometers enable manual override of outputs. Binary triac outputs and analog outputs are designed for complex applications.

#### Accurate

12-bit universal inputs accept a variety of industry-standard inputs, enabling wide application flexibility.

## Technical Data

**Power** - Unit requires 24 VAC, 50-60 Hz, 20 VA minimum. Half-wave rectified. Output loads powered separately.

**Inputs** - Jumper-selectable, 12-bit universal inputs accept thermistor, dry contact, 0-5VDC, 4-20 mA, or 0-10 VDC signals. Inputs 1, 2, and 3 support pulsed inputs with 10 msec minimum pulse length. No external resistor is required for 4-20 mA.

**Binary Outputs** - Binary outputs rated 24 VAC @ 0.5 A with Hand-Off-Auto (H-O-A) switches for manual override. H-O-A status can be monitored in software. Power source isolated from AXM power.

**Analog Outputs** - Analog outputs are driven by precision D/A converter. DIP-switch configurable to provide 0-10 VDC or 0-20 mA. Each analog output has an H-O-A switch and potentiometer for manual override. H-O-A and potentiometer status can be monitored in software.

**Max Dimensions** - 6.95" (176.5 mm) H X 4.95" (125.7 mm) W X 1.6" (40.5 mm) D.

**Terminations** - Removable header-type screw terminals simplify field wiring

**Environmental** - 32-131°F (0-55°C). 0-95% RH, non-condensing

**Communications** - Twisted-pair, multi-drop AXM communications bus to ACM base unit.

### Ratings

- Listed Underwriters Laboratory for Energy Management Equipment (PAZX) under the UL Standard for Safety 916. Listing includes both U.S. and Canadian certification.
- EN 60730-1 (European CE Mark).
- ICES-003 Issue 6.
- FCC Part 15, Subpart B, Section 15.107 & 15.109, Class B.



## Ordering Information

# ALERTON

16201 25th Avenue W.  
Lynnwood, WA 98087  
(425) 921-4900  
Fax: (425) 921-4872  
sales@alerton.com

[ALERTON.COM](http://ALERTON.COM)

Item Number	Description
<b>AXM-10-12-0</b>	I/O expansion module with 10 inputs and 12 binary outputs
<b>AXM-10-4-8</b>	I/O expansion module with 10 inputs, 4 binary outputs, and 8 analog outputs
<b>AXM-22-0-0</b>	I/O expansion module with 22 inputs

## Installation Instructions

**WARNING!** Install all equipment in accordance with the National Electric Code and in a manner acceptable to the local authority having jurisdiction. Read these instructions and the ACM Installation & Operations Guide (LT-ACMIOG) carefully before installing equipment. Failure to follow all instructions may result in equipment damage or a hazardous condition.

**ATTENTION!** Installez tout le matériel en conformité avec le Code national de l'électricité et d'une manière acceptable pour l'autorité locale compétente. Lisez ces instructions et le guide d'installation et fonctionnement de l'ACM (LT-ACMIOG) avant l'installation du matériel. Le non respect des instructions peut entraîner des dommages matériels ou une situation dangereuse.

## Overview

This document covers installation of the optional 12 volt NiMH battery, which provides backup power that ensures data retention and orderly shutdown. Replace only with ACM Battery.

**Note** Installing the ACM Battery changes the ambient temperature range of the ACM to 32 °F (0 °C) to 122 °F (50 °C).

## Specifications

**Supply Voltage:** 12VDC

**Operating Temperature:** 0°C to 50°C (0°F to 122°F)

**Operating Humidity:** RH 5% to 95%, non-condensing

**Storage Temperatures:** 5°C to 25°C (41°F to 77°F)

recommended storage temperature to extend life;

0°C to 50°C (32°F to 122°F) allowed storage temperature

**Storage Humidities:** RH 65% ±5% non-condensing

recommended storage humidity to extend life;

RH 5% to 95%, non-condensing allowed storage humidity

**Dimensions (L x W x H):** See Fig. 1

**Weight:** 0.80 lbs. (0.36 Kg)

**Agency Listing:** UL 2054 ed 2 rev 2011-09-14;

EN 62133 ed 1 (2002), ed 2 (2012)

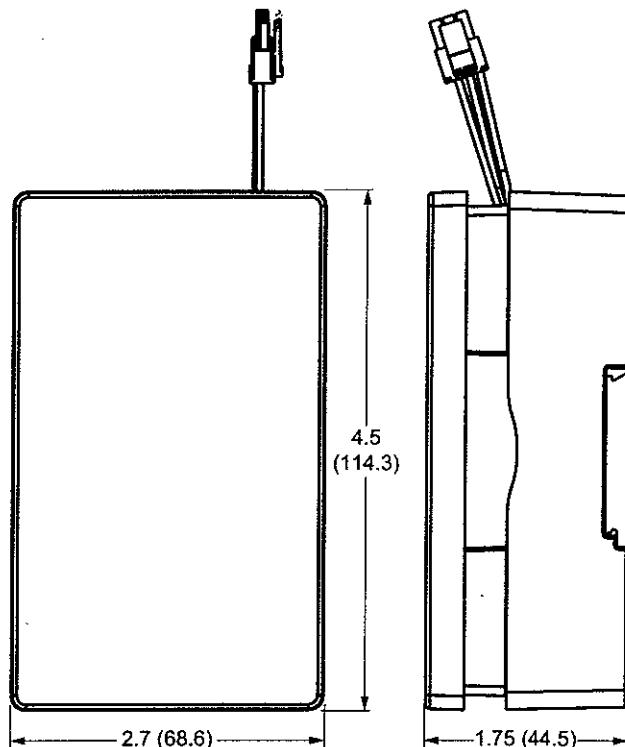
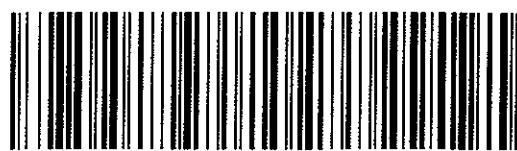


Fig. 1 ACM Battery dimensions in in. (mm).

## Installation

The ACM Battery can be mounted on EN50022 standard 7.5mm x 35mm DIN rail or panel mount.

- **To connect the ACM Battery to an ACM:**
  - 1 Open the lid covering the ACM's terminals (left side lid).
  - 2 Plug the Molex connector shell into the ACM Battery port. See Fig. 2.
  - 3 Choose either DIN rail or panel mounting.

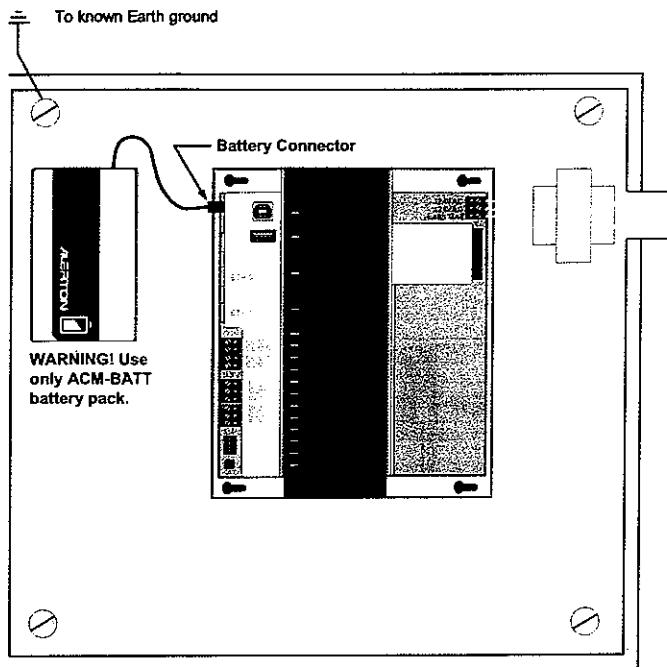


Fig. 2 ACM Battery connection.

**4 For DIN rail Mounting:**

- Holding the ACM Battery with its top tilted in toward the DIN rail, hook the two retaining tabs on the back of the ACM Battery onto the top of the DIN rail.
- Push down and in to latch the two bottom latching tabs of the ACM Battery onto the DIN rail

—OR—

**4 For Panel Mounting:**

- Remove the ACM Battery cover and battery pack.
- Use the mounting holes in the back cover to attach it to the panel with appropriate fasteners (not included). See Fig. 3.
- Replace the battery pack and cover.

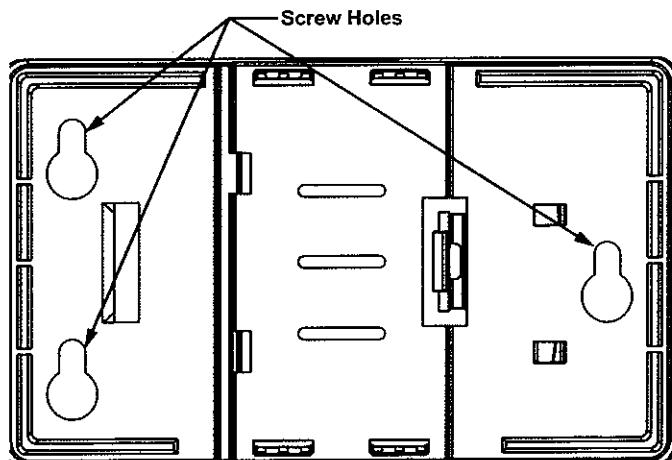


Fig. 3 ACM Battery screw holes.

- Close the ACM lid and restore power to the ACM, if necessary.

## Charging

The ACM Battery is charged by the ACM controller.

## Servicing

The ACM Battery is installed or replaced as a single unit, and cannot be field serviced. The cover should only be removed to access screw holes for panel installation.

Part Number	Description
ACM	Ascent Control Module (ACM) global controller base unit, including power, BACnet MS/TP, TCP/IP, BACnet/Ethernet, and BACnet/IP
<b>Licenses: Alerton*</b>	
ACM032	Licenses the ACM for capacity of 32 directly connected devices
ACM064	Licenses the ACM for capacity of 64 directly connected devices
ACM128	Licenses the ACM for capacity of 128 directly connected devices
ACM256	Licenses the ACM for capacity of 256 directly connected devices
ACM384	Licenses the ACM for capacity of 384 directly connected devices
<b>Licenses: NiagaraAX</b>	
AX016	Licenses the ACM with device capacity of 16 AX devices
AX032	Licenses the ACM with device capacity of 32 AX devices
AX064	Licenses the ACM with device capacity of 64 AX devices
AX128	Licenses the ACM with device capacity of 128 AX devices
AX256	Licenses the ACM with device capacity of 256 AX devices
<b>Device Packs: Alerton**</b>	
AL-DP-4	Increases Alerton device capacity on the ACM by 4
AL-DP-32	Increases Alerton device capacity on the ACM by 32
AL-DP-64	Increases Alerton device capacity on the ACM by 64
AL-DP-128	Increases Alerton device capacity on the ACM by 128
AL-DP-256	Increases Alerton device capacity on the ACM by 256
<b>Device Packs: AX***</b>	
AX-DP-32	Increases AX device capacity on the ACM by 32
AX-DP-64	Increases AX device capacity on the ACM by 64
AX-DP-128	Increases AX device capacity on the ACM by 128
<b>Drivers: AX</b>	
I-WP-AX-WEB	Alerton Embedded Workbench version 3.8. The ACM has an "OPEN" NIC Statement by default, but can be closed by the dealer through Niagara Central
I-DR-BACNET-AX	BACnet IP Client over Ethernet (discover and map BACnet devices into AX)
I-DR-BAC-SR-AX	BACnet Server (includes BACnet IP Client driver) – (discover, map, create BACnet objects into AX) Enterprise Driver (Note: When using this driver, there is no need to purchase the I-DR-BACNET-AX driver)
I-DR-BAC-SR-EXP-AX	BACnet Server only; add IP Server (must order BACnet Client driver separately) – (Create BACnet objects) Enterprise Driver (Note: For connectivity to MS/TP devices, you must use the I-DR-MSTP-AX driver)
I-DR-ILON-AX	LON® over IP, using CEA-852, communicates through IP/LON router
I-DR-LON-AX	LON® over twisted pair
I-DR-MDB-RTU-AX	Modbus RTU over RS-232 or RS-485
I-DR-MDB-TCP-AX	Modbus TCP over Ethernet
I-DR-SNMP-AX	SNMP over Ethernet
<b>Option Cards: AX</b>	
ACM-OC-2X485	Dual Port EIA-485 Option Card
ACM-OC-232	Single Port EIA-232 Option Card
ACM-OC-LON	78 Kbps FTT 10 A LON® adapter. Uses one of the two option card slots on the ACM.



## MICROSET 4

Alerton's Microset 4 wall sensor offers a sleek, modern look that is a perfect fit in any building. Its strengthened glass touchscreen user interface has the capability to display the setpoint, room, and outside air temperatures. Relative humidity and fan status can also be displayed. A configurable LED Status Light indicator displays heating or cooling status at a glance. The Microset 4 sensor offers several options to meet precise job specifications.

The Microset 4 is fully backward compatible with Alerton's BACtalk™ system, providing users with a tenant control interface, test and balance tool, and field service tool, while enabling them to leverage their existing Alerton devices.

The Microset 4 line of wall sensors includes a model with a carbon dioxide (CO<sub>2</sub>) sensor as well as one with MS/TP capability.

The flexible Microset 4 displays information and allows occupant control according to the application.

Customizable and intuitive operation enables occupants to turn zone HVAC equipment ON or OFF in 30-minute increments for sporadically occupied areas, such as conference rooms, to set window blinds to open or closed, and offers optional control of lights and fan. This makes saving energy easy and supports green standards of building construction and operation.

With its sleek edge-to-edge hardened glass, capacitive touch backlit display, and polished finish, Alerton's Microset 4 wall sensor offers a full complement of features and looks good on any wall.

## FEATURES AND HIGHLIGHTS

### VERSATILE

- Occupants can view setpoint, room, and outside air temperatures, indoor and outdoor humidity (if enabled in programming), select fan status, and change room temperature setpoints. Data and functions are selectable.

### ENERGY EFFICIENT

- Occupants can select after-hours operation in 30-minute increments or turn zone equipment ON and OFF.

### FLEXIBLE

- Robust and easy-to-use test and balance and field service modes allow maintenance personnel to monitor and adjust parameters.

### ATTRACTIVE

- Modern styling enhances any interior, and functional design makes operation intuitive.

## TECHNICAL DATA

### THERMISTOR

The thermistors are integrated with the device. The thermistors and humidity sensors are processed by an onboard microcontroller.

**TYPE** - NTC.

**RESISTANCE** - 100K Ohm at 77 °F (25 °C).

**STABILITY\*** - Maximum 0.036 °F (0.02 °C) drift per year.

**ACCURACY\*** -  $\pm 0.36$  °F over range of 32 to 116 °F (0 to 47 °C);  $\pm 0.19$  °F at 72 °F (22 °C).

\*Based on normal operating conditions.

**POWER** - 24VAC from an energy limited Class 2 transformer.

**POWER CONSUMPTION** - Each Microset 4 requires 3 VA. The sum of all devices should not exceed 85% of the nameplate rating of the transformer.

**PROCESSOR & MEMORY** - ARM Cortex-M4 processor with onboard flash memory.

**DIMENSIONS** - 4.5" H x 3" W x .875" D (114.9mm H x 76.6mm W x 22mm D).

MS4-THC: 4.54" H x 3.04" W x 1.25" D (115.2mm H x 77.2mm W x 31.6mm D).

**ENVIRONMENTAL** - 32 to 140 °F (0 to 60 °C); 0 to 90% RH, non-condensing.

Specifications subject to change without notice.

## CO<sub>2</sub> SENSOR

**OPERATING TEMPERATURE RANGE** - 32 to 122 °F (0 to 50 °C).

**POWER CONSUMPTION** - 1.5 mA for measurement every 30s; 0.74 mA for measurement every 60s; 86 µA for measurement every 15 min; 52 µA for measurement every 60 min.

**MEASUREMENT RANGE** - 0 to 5000 ppm.

**ACCURACY** - ± 30 ppm, ± 3% of reading.

## HUMIDITY SENSOR

**OPERATING TEMPERATURE RANGE** - 50 to 113 °F (10 to 45 °C).

**REPEATABILITY** - Minimum ± 0.5% RH.

**ACCURACY** - ± 3% at 10 to 90% RH,  
± 5% at 0 to 10% and 90% to 100%RH.

**RATINGS** - UL Standard for Safety 916;  
EMC Directive 89/336/EEC (European CE Mark)  
FCC Part 15.107 & 109, Class B, CFR47-15.

## ORDERING INFORMATION

### ITEM NUMBER

MS4-TH	Microset 4 with temperature and humidity sensors
MS4-TH-NL	Microset 4 with temperature and humidity sensors and no logo
MS4-TH-MSTP	MS/TP Microset 4 with temperature and humidity sensors
MS4-THC	Microset 4 with temperature, humidity, and CO <sub>2</sub> sensors

**STYLISH  
TOUCHSCREEN  
WALL SENSOR WITH  
TEMPERATURE AND  
HUMIDITY SENSING.**



The Alerton® VisualLogic® VLC-853-E is a versatile, BACnet-compliant, fully programmable field controller designed for central plant systems, air handling units, clean rooms, fume hoods, large terminal units, and similar control and process equipment. As a native BACnet controller, it integrates seamlessly with your BACnet system, communicating at up to 115 Kbps on a BACnet MS/TP LAN.

The VLC-853-E supports the Alerton Microtouch™, as well as the BACtalk® Microset, Microset II, and Microset 4 intelligent wall sensors, which offer convenient data display, setpoint adjustment, and technician access to equipment setup parameters.

All VLC-853-E control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic™. Programming and setup data are stored in non-volatile flash memory, ensuring stable and reliable operation.

High-resolution 16-bit universal inputs are auto-selectable for thermistor, dry contact, pulse, 0-5 V, 0-10 V, or 4-20 mA.

High-resolution 16-bit analog outputs are auto-selectable for 0-10 V or 0-20 mA.

## VISUALLOGIC® UNITARY FIELD CONTROLLER

### FEATURES AND HIGHLIGHTS

- Fully BACnet-compliant on MS/TP LAN at up to 115.2 Kbps.
- Programmable control logic can be field-modified.
- Downloadable operating code to allow for future software improvements.
- 32-bit processor architecture with all program data backed up in nonvolatile flash memory.
- High-speed processing of DDC program, with an internal logical loop time of 100 msec.
- Backwards compatible with older VLC-853 and VLC-853C3 models.

### APPLICATIONS

Recommended for central plant systems, air handling units, large terminal units, and similar control and process equipment.



### VLC-853-E

UI	HBO	GBO	RO	AO	AF	F
UNIVERSAL INPUTS	HOT SWITCHED TRIAC BINARY OUTPUTS	GROUND SWITCHED BINARY OUTPUTS	RELAY OUTPUT	ANALOG OUTPUTS	AIR-FLOW SENSOR	FILTER

**TECHNICAL DATA**

**POWER** – 24 VAC @ 50-60 Hz. 15 VA minimum (maximum 97VA with loads). Half-wave rectified.

**INPUTS** – 16-bit universal inputs accept 3k (Ibex) or 10k thermistor (type II), dry contact, 0-20 mA, 0-10 V, 0-5V, or dry-contact pulse. External 250-ohm resistor required for 0-20 mA inputs. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5mS ON / 5mS OFF (pulse input not supported on IN-0).

**POWER OUTPUT FOR EXTERNAL SENSORS** – 20 VDC  $\pm 10\%$  @100 mA maximum

**BINARY OUTPUTS** – Triacs rated 24 VAC @ 50/60 Hz, 500 mA continuous and 800 mA (AC rms) for 60 milliseconds.

**ANALOG OUTPUTS** – 16-bit universal analog outputs support Voltage Mode: 0-10 VDC @ 10 mA maximum (1k ohm minimum); Current Mode: 4-20 mA @ 550 ohms Maximum.

**MICROSET** – Supports BACtalk® Microset, Microset II, or Microset 4 on input 0 (IN-0).

**INPUT/OUTPUT TERMINATIONS** – Removable header-type screw terminals accept 14-24 AWG wire.

**MAX DIMENSIONS** – 4.9" (125mm) H x 5.4" (137mm) W x 1.4" (36mm) D

**MOUNTING** – Screw mounting

**ENVIRONMENTAL** – 0 to 158°F (-17 to 70°C) / 5 to 95%RH, non-condensing

**COMMUNICATIONS** – EIA-485 (RS-485) over twisted shielded-pair (TSP); auto-baud switching (9.6kbps, 19.2kbps, 38.4kbps, 76.8kbps, or 115.2kbps); communication status LED.

**PROTOCOLS** – BACnet MS/TP (master)

**PROGRAMMING** – Supports Alerton's BD4 DDC file format using Alerton's VisualLogic® toolset.

**MICROPROCESSOR** – 32-bit ARM Cortex-M4F, 80 MHz

**MEMORY** – 512 MB non-volatile flash.

**SECURITY** – Integrated secure boot prevents loading of tampered firmware.

**ORDERING INFORMATION****ITEM NUMBER**

VLC-853-E ALERTON VISUALLOGIC  
CONTROLLER BACNET

**CERTIFICATION AND CONFORMANCE**

**BACNET CONFORMANCE** – An application specific controller (ASC) level device; tested and approved by BTL. See Protocol Implementation Conformance Statement (PICS). BTL Listing and compliance is pending.

**UL** – Listed Underwriters Laboratory for Open Energy Management Equipment (PAZX) under the UL Standard for Safety 916; listing includes both U.S. and Canadian certification.

**EMC** – EMC Directive 89/336/EEC (European CE Mark).

**FCC** – This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



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The Alerton® VisualLogic® VLC-550-E is a versatile, BACnet-compliant, fully programmable field controller designed for fan coils, a/c-units, heat pumps, and other terminal unit applications. As a native BACnet controller, it integrates seamlessly with your BACnet system, communicating at up to 115 Kbps on a BACnet MS/TP LAN.

The VLC-550-E supports the Alerton Microtouch™, as well as the BACtalk® Microset, Microset II, and Microset 4 intelligent wall sensors, which offer convenient data display, setpoint adjustment, and technician access to equipment setup parameters.

All VLC-550-E control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic™. Programming and setup data are stored in non-volatile flash memory, ensuring stable and reliable operation.

High-resolution 16-bit universal inputs are auto-selectable for thermistor, dry contact, pulse, 0-5 V, 0-10 V, or 4-20 mA.

## VISUALLOGIC® UNITARY FIELD CONTROLLER

### FEATURES AND HIGHLIGHTS

- Fully BACnet-compliant on MS/TP LAN at up to 115.2 Kbps.
- Programmable control logic can be field-modified.
- Downloadable operating code to allow for future software improvements
- 32-bit processor architecture with all program data backed up in nonvolatile flash memory.
- High-speed processing of DDC program, with an internal logical loop time of 100 msec.
- Backwards compatible with older VLC-550 and VLC-550C3 models.

### APPLICATIONS

Recommended for unit ventilator and fan-coil applications, or any application that requires multi-speed fan or motor control.

#### VLC-550-E

UI UNIVERSAL INPUTS	HBO HOT SWITCHED TRIAC BINARY OUTPUTS	GBO GROUND SWITCHED BINARY OUTPUTS	RO RELAY OUTPUT	AO ANALOG OUTPUTS	AF AIR-FLOW SENSOR	F FILTER
5	5	0	0	0	-	-

## TECHNICAL DATA

**POWER** – 24 VAC @ 50-60 Hz. 9 VA minimum (maximum 90 VA with loads). Half-wave rectified.

**INPUTS** – 16-bit universal inputs accept 3k (Ibex) or 10k thermistor (type II), dry contact, 0-20 mA, 0-10 V, 0-5V, or dry-contact pulse. External 250-ohm resistor required for 0-20 mA inputs. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5mS ON / 5mS OFF (pulse input not supported on IN-0).

### POWER OUTPUT FOR EXTERNAL SENSORS – 20

VDC ±10% @ 100 mA maximum

**BINARY OUTPUTS** – Triacs rated 24 VAC @ 50/60 Hz, 500 mA continuous and 800 mA (AC rms) for 60 milliseconds.

**MICROSET** – Supports BACtalk® Microset, Microset II, or Microset 4 on input 0 (IN-0).

**INPUT/OUTPUT TERMINATIONS** – Removable header-type screw terminals accept 14-24 AWG wire.

**MAX DIMENSIONS** – 4.9" (125mm) H x 5" (127mm) W x 1.4" (36mm) D

**MOUNTING** – Screw mounting

**ENVIRONMENTAL** – 0 to 158°F (-17 to 70°C) / 5 to 95%RH, non-condensing

**COMMUNICATIONS** – EIA-485 (RS-485) over twisted shielded-pair (TSP); auto-baud switching (9.6kbps, 19.2kbps, 38.4kbps, 76.8kbps, or 115.2kbps); communication status LED.

**PROTOCOLS** – BACnet MS/TP (master)

**PROGRAMMING** – Supports Alerton's BD4 DDC file format using Alerton's VisualLogic® toolset.

**MICROPROCESSOR** – 32-bit ARM Cortex-M4F, 80 MHz

**MEMORY** – 512 MB non-volatile flash.

**SECURITY** – Integrated secure boot prevents loading of tampered firmware.

## ORDERING INFORMATION

### ITEM NUMBER

VLC-550-E ALERTON VISUALLOGIC  
CONTROLLER BACNET

## CERTIFICATION AND CONFORMANCE

**BACNET CONFORMANCE** – An application specific controller (ASC) level device; tested and approved by BTL. See Protocol Implementation Conformance Statement (PICS). BTL Listing and compliance is pending.

**UL** – Listed Underwriters Laboratory for Open Energy Management Equipment (PAZX) under the UL Standard for Safety 916; listing includes both U.S. and Canadian certification.

**EMC** – EMC Directive 89/336/EEC (European CE Mark).

**FCC** – This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



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## SINGLE-DUCT VARIABLE AIR VOLUME FIELD CONTROLLER

### FEATURES AND HIGHLIGHTS

- Fully BACnet-compliant on MS/TP LAN at up to 115.2 Kbps.
- Programmable control logic can be field-modified.
- Downloadable operating code to allow for future software improvements.
- 32-bit processor architecture with all program data backed up in nonvolatile flash memory.
- High-speed processing of DDC program, with an internal logical loop time of 100 msec.
- Backwards compatible with older VAV-SD2A model.

### APPLICATIONS

Recommended for pressure-independent control of any single-duct variable air volume (VAV) box and fan boxes equipped with a variable speed fan.

The Alerton® VisualLogic® VAV-SD2A-E is a versatile, BACnet-compliant field controller that provides pressure-independent control of any single-duct variable air volume (VAV) box. It is particularly suited for controlling VAV series fan boxes equipped with a variable speed fan. As a native BACnet controller, the VAV-SD2A-E integrates seamlessly with your BACnet system, communicating at up to 115.2 Kbps on a BACnet MS/TP LAN.

The VAV-SD2A-E includes a filter to reduce dust contamination. The VAV-SD2A-E eliminates the need for expensive products and external pressure sensors to control VAV boxes equipped with variable speed fans or analog valves. It features two analog outputs, auto-selectable as either 0–10V or 0–20mA, to control either a variable speed fan, an analog heating valve, or another analog device.

The VAV-SD2A-E supports the Alerton Microtouch™, as well as the BACtalk® Microset, Microset II, and Microset 4 intelligent wall sensors, which offer convenient data display, setpoint adjustment, and technician access to equipment setup parameters.

All VAV-SD2A-E control logic is programmed using Alerton's easy-to-learn graphical programming language, VisualLogic®. Programming and setup data are stored in non-volatile flash memory, ensuring stable and reliable operation. The VAV-SD2A-E contains an integral airflow sensor to provide pressure independent operation of the VAV box. The airflow sensor is factory calibrated at multiple velocity points and is field-adjustable during balancing. Minimum, maximum, and reheat airflows can be entered using a Microset wall unit or compatible operator workstation software.

### VAV-SD2A-E-F

UI UNIVERSAL INPUTS	HBO HOT SWITCHED TRIAC BINARY OUTPUTS	GBO GROUND SWITCHED BINARY OUTPUTS	RO RELAY OUTPUT	AO ANALOG OUTPUTS	AF AIR-FLOW SENSOR	F FILTER
<b>4</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>

## TECHNICAL DATA

**POWER REQUIREMENTS** – 24 VAC @ 50-60 Hz. 12 VA minimum (maximum 72 VA with loads). Half-wave rectified.

**INPUTS** – 16-bit universal inputs accept 3k (Ibex) or 10k thermistor (type II), dry contact, 0-20 mA, 0-10 V, 0-5V, or dry-contact pulse. External 250-ohm resistor required for 0-20 mA inputs. Pulse input maximum frequency of 100 Hz. Pulse input minimum duty cycle 5mS ON / 5mS OFF (pulse input not supported on IN-0).

**BINARY OUTPUTS** – Triacs rated 24 VAC @ 50/60 Hz, 500 mA continuous and 800 mA (AC rms) for 60 milliseconds.

**ANALOG OUTPUTS** – 16-bit universal analog outputs support Voltage Mode: 0-10VDC @ 10 mA maximum (1k ohm minimum); Current Mode: 4-20 mA @ 550 ohms Maximum.

**MICROSET** – Supports BACtalk® Microset, Microset II, or Microset 4 on input 0 (IN-0).

**INPUT/OUTPUT TERMINATIONS** – Removable header-type screw terminals accept 14-24 AWG wire.

**PRESSURE SENSOR** – 16-bit polarity insensitive pressure sensor. 0-2 in.w.c. (500 Pa) range. 0.0004 in.w.c. (0.1 Pa) zero-point accuracy. 0.5% span repeatability. 1/8-inch x 3/8-inch long barb-fitting.

**FILTER** – In-line filter for pressure sensor included to enhance long-term stability.

**MAX DIMENSIONS** – 4.9" (125mm) H x 5" (127mm) W x 1.4" (36mm) D

**MOUNTING** – Screw mounting

**ENVIRONMENTAL** – 0 to 158°F (-17 to 70°C) / 5 to 95%RH, non-condensing

**COMMUNICATIONS** – EIA-485 (RS-485) over twisted shielded-pair (TSP); auto-baud switching (9.6kbps, 19.2kbps, 38.4kbps, 76.8kbps, or 115.2kbps); communication status LED

**PROTOCOLS** – BACnet MS/TP (master)

**PROGRAMMING** – Supports Alerton's BD4 DDC file format using Alerton's VisualLogic® toolset.

**MICROPROCESSOR** – 32-bit ARM Cortex-M4F, 80 MHz

**MEMORY** – 512 MB non-volatile flash.

**SECURITY** – Integrated secure boot prevents loading of tampered firmware.

## ORDERING INFORMATION

### ITEM NUMBER

VAV-SD2A-E-F ALERTON VAV SINGLE-DUCT  
BACNET CONTROLLER AND FILTER

## CERTIFICATION AND CONFORMANCE

**BACNET CONFORMANCE** – An application specific controller (ASC) level device; BTL Listing and compliance is pending.

**UL** – Listed Underwriters Laboratory for Open Energy Management Equipment (PAZX) under the UL Standard for Safety 916; listing includes both U.S. and Canadian certification.

**CE MARK** – EMC Directive 2014/30/EU.

**RoHS** – RoHS Directive 2011/65/EU.

**FCC** – This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

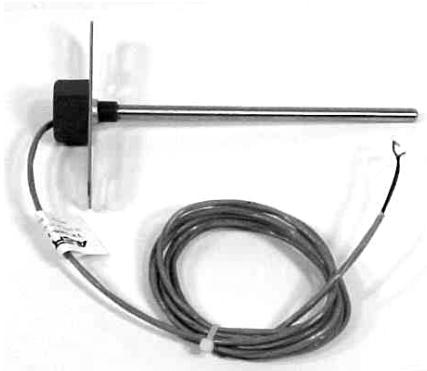


Contents subject to change without notice. \* Pending.

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## Product Data

### Duct Sensor w/ Flange and 6 Foot Plenum Cable



#### Product Description

The **TS-2000-FB Series** duct temperature sensors have an output of 3K Ohms at 77°F (**25°C**) and 10K Ohms (Type II) at 77°F (**25°C**). The temperature sensors have an overall accuracy of  $\pm 0.36°F$  (**0.2°C**) for the standard sensors or  $\pm 0.18°F$  (**0.1°C**) for the **TS-2004 FB-10-AA-HI** sensors over the range of 32 to 158°F (**0 to 70°C**).

Each of the sensors is encapsulated in a 0.250" (**6.35 mm**) stainless steel probe with a thermally conductive epoxy. The **TS-2000-FB Series** temperature sensors can be used in environments where the operating temperature is between –40 to 302°F (**-40 to 150°C**).

The **TS-2000-FB Series** duct temperature sensors are both non-polarity and non-position sensitive. Each single point Thermistor sensor is encapsulated in a thermally conductive epoxy that will withstand high

#### Features

### TS-2000-FB Series

- \* **Stainless Steel Probe**
- \* **Fast Response Time**
- \* **High Accuracy**
- \* **6' Teflon Plenum Rated Cable**
- \* **2-year Warranty**
- \* **ROHS Compliant**

operating temperatures and protect the sensor from condensation or moisture.

All of these sensors should be used in environments where the normal operating temperature will be between –40 to 302°F (**-40 to 150°C**).

There are a number of applications in which the **TS-2000-FB Series** may be used to monitor and control the building temperature. A few of the most common applications include:

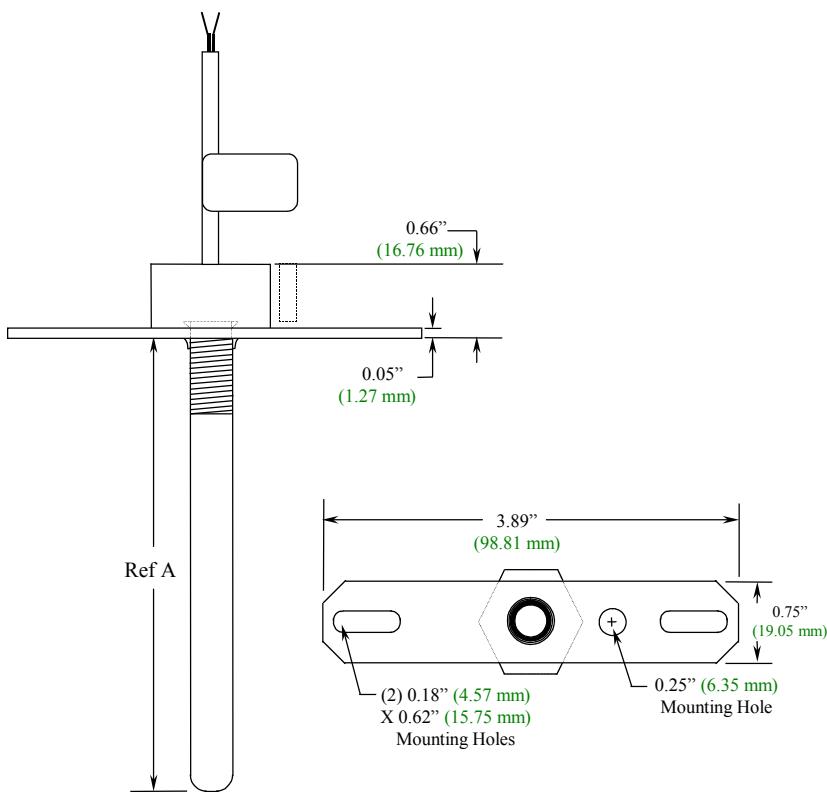
- Return Air Temperature in a Duct or Plenum
- Mixed Air Temperature in a Duct or Plenum
- Monitoring Discharge (Supply) Air Temp.

All of these units come with a two-year warranty. For more information regarding these products, please contact ACI at the numbers listed below, or visit our website address at [www.workaci.com](http://www.workaci.com) for all of the up to date product literature.

#### Product Specifications

<b>Output</b>	3K Ohms @ 77°F ( <b>25°C</b> ) 10K Ohms (Type II) @ 77°F ( <b>25°C</b> )	<b>TS-2000-FB Series Sensor Accuracy</b>	$\pm 0.36°F$ ( <b><math>\pm 0.2°C</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Operating Temperature Range</b>	–40 to 302°F ( <b>-40 to 150°C</b> )	<b>TS-2004-FB-10-AA-HI Sensor Accuracy</b>	$\pm 0.18°F$ ( <b><math>\pm 0.1°C</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Sensor Interchangeability</b>	<b><math>\pm 0.2°C</math> (0 to 70°C)</b>	<b>Operating Humidity Range</b>	0 to 90% RH non-condensing
<b>Dissipation Constant</b>	3mW / °C nominal (Still Air)	<b>Environmental Compliance</b>	RoHS-Directive 2002/95/EC

## Dimensions



Temp. C	Temp. F	3K (R Ohms)	10K(TypeII) (R Ohms)
-40	-40	100,935.00	336,450.00
-30	-22	53,164.50	177,207.53
-20	-4	29,172.86	97,236.73
-10	14	16,623.95	55,409.40
0	32	9,808.20	32,692.05
10	50	5,975.03	19,915.94
20	68	3,748.67	12,495.39
30	86	2,416.51	8,055.16
40	104	1,597.15	5,324.13
50	122	1,080.22	3,601.05
60	140	746.30	2,488.00
70	158	525.85	1,753.13
80	176	377.32	1,258.03
90	194	275.36	918.12
100	212	204.13	680.64
110	230	153.54	511.99
120	248	117.07	390.39
130	266	90.40	301.46
140	284	70.63	235.56
150	302	55.80	186.10

## Ordering Information

Alerton Model #	Sensor Type	Wire Colors	Ref A
TS-2004-FB-03-AA	3K Ohms	Red / Black	3.87" (98.3 mm)
TS-2004-FB-10-AA	10K Ohms	Red / Black	3.87" (98.3 mm)
TS-2004-FB-10-AA-HI	10K HI	Orange / Orange	3.87" (98.3 mm)
TS-2006-FB-03-AA	3K Ohms	Red / Black	5.75" (146.05 mm)
TS-2006-FB-10-AA	10K Ohms	Red / Black	5.75" (146.05 mm)
TS-2008-FB-03-AA	3K Ohms	Red / Black	7.87" (199.9 mm)
TS-2008-FB-10-AA	10K Ohms	Red / Black	7.87" (199.9 mm)
TS-2012-FB-03-AA	3K Ohms	Red / Black	11.84" (300.74 mm)
TS-2012-FB-10-AA	10K Ohms	Red / Black	11.84" (300.74 mm)



These units are manufactured for Alerton by Automation Components, Inc.

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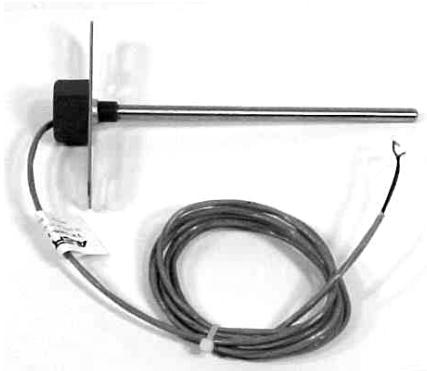
PH: (608) 831-2585 • FAX (608) 831-7407

[www.workaci.com](http://www.workaci.com)

Filename: C0000025 Rev 3.Doc

## Product Data

### Duct Sensor w/ Flange and 6 Foot Plenum Cable



#### Product Description

The **TS-2000-FB Series** duct temperature sensors have an output of 3K Ohms at 77°F (**25°C**) and 10K Ohms (Type II) at 77°F (**25°C**). The temperature sensors have an overall accuracy of  $\pm 0.36^{\circ}\text{F}$  (**0.2°C**) for the standard sensors or  $\pm 0.18^{\circ}\text{F}$  (**0.1°C**) for the **TS-2004 FB-10-AA-HI** sensors over the range of 32 to 158°F (**0 to 70°C**).

Each of the sensors is encapsulated in a 0.250" (**6.35 mm**) stainless steel probe with a thermally conductive epoxy. The **TS-2000-FB Series** temperature sensors can be used in environments where the operating temperature is between –40 to 302°F (**-40 to 150°C**).

The **TS-2000-FB Series** duct temperature sensors are both non-polarity and non-position sensitive. Each single point Thermistor sensor is encapsulated in a thermally conductive epoxy that will withstand high

#### Features

### TS-2000-FB Series

- \* **Stainless Steel Probe**
- \* **Fast Response Time**
- \* **High Accuracy**
- \* **6' Teflon Plenum Rated Cable**
- \* **2-year Warranty**
- \* **ROHS Compliant**

operating temperatures and protect the sensor from condensation or moisture.

All of these sensors should be used in environments where the normal operating temperature will be between –40 to 302°F (**-40 to 150°C**).

There are a number of applications in which the **TS-2000-FB Series** may be used to monitor and control the building temperature. A few of the most common applications include:

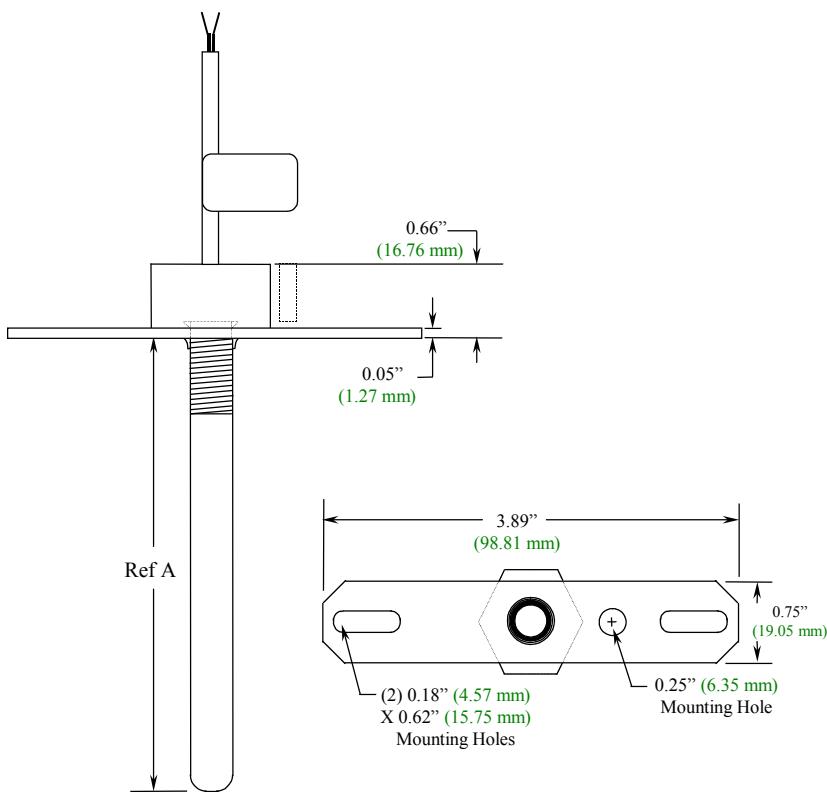
- Return Air Temperature in a Duct or Plenum
- Mixed Air Temperature in a Duct or Plenum
- Monitoring Discharge (Supply) Air Temp.

All of these units come with a two-year warranty. For more information regarding these products, please contact ACI at the numbers listed below, or visit our website address at [www.workaci.com](http://www.workaci.com) for all of the up to date product literature.

#### Product Specifications

<b>Output</b>	3K Ohms @ 77°F ( <b>25°C</b> ) 10K Ohms (Type II) @ 77°F ( <b>25°C</b> )	<b>TS-2000-FB Series Sensor Accuracy</b>	$\pm 0.36^{\circ}\text{F}$ ( <b><math>\pm 0.2^{\circ}\text{C}</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Operating Temperature Range</b>	–40 to 302°F ( <b>-40 to 150°C</b> )	<b>TS-2004-FB-10-AA-HI Sensor Accuracy</b>	$\pm 0.18^{\circ}\text{F}$ ( <b><math>\pm 0.1^{\circ}\text{C}</math></b> ) 32 to 158°F ( <b>0 to 70°C</b> )
<b>Sensor Interchangeability</b>	<b><math>\pm 0.2^{\circ}\text{C}</math> (0 to 70°C)</b>	<b>Operating Humidity Range</b>	0 to 90% RH non-condensing
<b>Dissipation Constant</b>	3mW / °C nominal (Still Air)	<b>Environmental Compliance</b>	RoHS-Directive 2002/95/EC

## Dimensions



Temp. C	Temp. F	3K (R Ohms)	10K(TypeII) (R Ohms)
-40	-40	100,935.00	336,450.00
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-20	-4	29,172.86	97,236.73
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130	266	90.40	301.46
140	284	70.63	235.56
150	302	55.80	186.10

## Ordering Information

Alerton Model #	Sensor Type	Wire Colors	Ref A
TS-2004-FB-03-AA	3K Ohms	Red / Black	3.87" (98.3 mm)
TS-2004-FB-10-AA	10K Ohms	Red / Black	3.87" (98.3 mm)
TS-2004-FB-10-AA-HI	10K HI	Orange / Orange	3.87" (98.3 mm)
TS-2006-FB-03-AA	3K Ohms	Red / Black	5.75" (146.05 mm)
TS-2006-FB-10-AA	10K Ohms	Red / Black	5.75" (146.05 mm)
TS-2008-FB-03-AA	3K Ohms	Red / Black	7.87" (199.9 mm)
TS-2008-FB-10-AA	10K Ohms	Red / Black	7.87" (199.9 mm)
TS-2012-FB-03-AA	3K Ohms	Red / Black	11.84" (300.74 mm)
TS-2012-FB-10-AA	10K Ohms	Red / Black	11.84" (300.74 mm)



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[www.workaci.com](http://www.workaci.com)

Filename: C0000025 Rev 3.Doc



<b>Technical Data</b>		<b>LMB24-SR</b>
Power Supply	24 VAC ± 20% 50/60 Hz	
	24 VDC ± 10%	
Power Consumption	1.5 W (0.4 W)	
Transformer Sizing	3 VA (Class 2 power source)	
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector	
Overload Protection	electronic throughout 0 to 95° rotation	
Operating Range Y	2 to 10 VDC, 4 to 20 mA	
Input Impedance	100 kΩ (0.1 mA), 500Ω	
Angle of Rotation	max. 95°, adjust. with mechanical stop	
Torque	45 in-lb [5 Nm]	
Direction of Rotation	reversible with ↗/↖ switch. Actuator will move: ↗ =CCW with decreasing control signal (10→2V) ↖ =CW with decreasing control signal (10→2V)	
Position Indication	reflective visual Indicator (snap-on)	
Manual Override	external push button	
Running Time	95 seconds, constant independent of load	
Humidity	5 to 95% RH non condensing (EN 60730-1)	
Ambient Temperature	-22°F to +122°F [-30°C to +50°C]	
Storage Temperature	-40°F to +176°F [-40°C to +80°C]	
Housing	NEMA 2/IP54	
Housing Material	UL94-5VA	
Agency Listings	cULus acc. to UL 60730-1/-2-14 and CAN/CSA C22.2 No.24, CE according to 73 / 23 / EEC	
Noise Level	<35dB(A)	
Servicing	maintenance free	
Quality Standard	ISO 9001	
Weight	1.1 lbs [0.5 Kg]	
<b>LMB24-SR-T</b>		
Electrical connection	Screw terminal (for 26 to 14 GA wire)	
Housing	NEMA 1/IP20	

**Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.**

LMB24-SR  
LMB24-SR-T

LMB24-SR 1 (bulk)  
LMB24-SR-T.1 (bulk)

### Application

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 1/4" up to 5/8" in diameter by means of its universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner.

### Operation

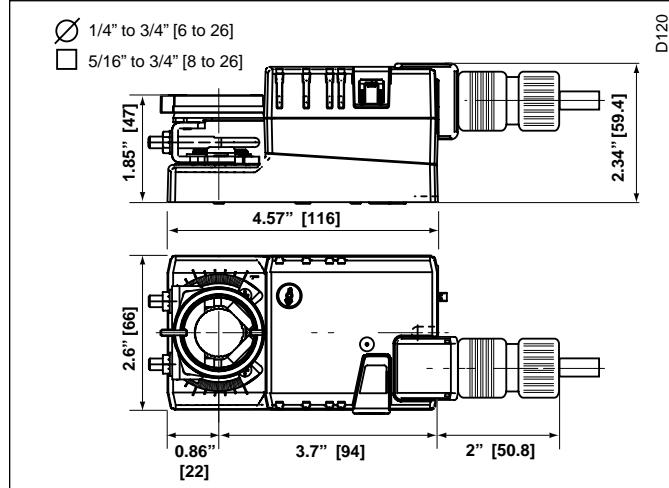
The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

The LMB series provides 95° of rotation and a visual indicator indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be manually disengaged with a button on the actuator cover.

The LMB24-SR... actuators use a sensorless Brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

Add on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions

### Dimensions (All numbers in brackets are in millimeters.)



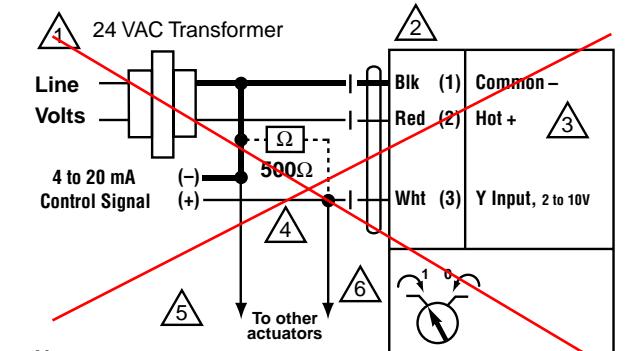
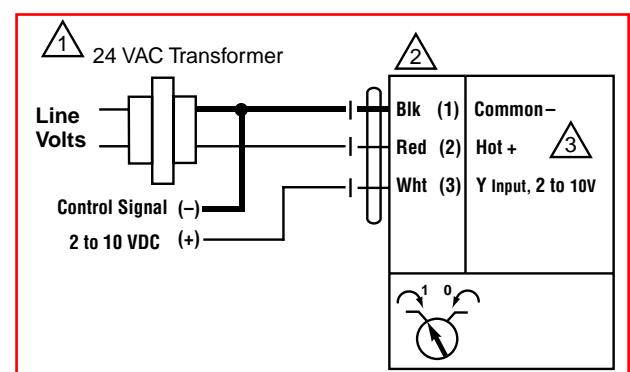
**Accessories**

K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers
SGA24	Min positioners in NEMA 4 housing
SGF24	Min positioners for flush panel mounting
PTA-250	Pulse Width Modulation Interface
IRM-100	Input Rescaling Module
ADS-100	Analog to Digital Switch
ZG-R01	Resistor for 4 to 20 mA Conversion
NSV24 US	Battery Back-Up Module
ZG-X40	Transformer

**Note:** When using LMB24-SR... actuators, only use accessories listed on this page.

**LMB24-SR... - Typical Specification:**

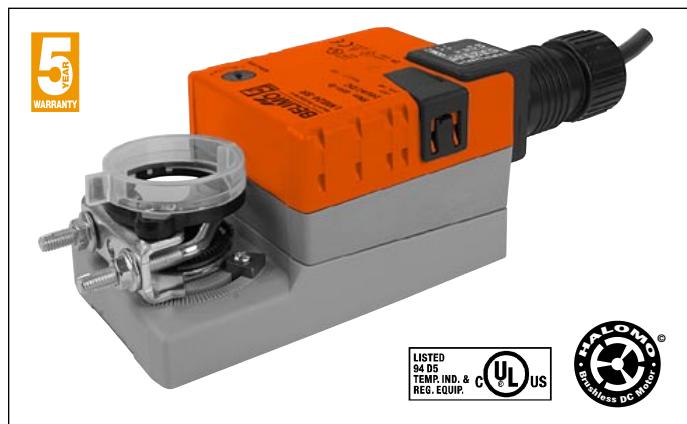
Proportional control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodated with an accessory clamp. Actuators must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. Actuators shall have Brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. If required, actuator will be provided with screw terminal strip for electrical connections (LMB24-SR-T). Run time shall be constant and independent of torque. Actuators shall be cULUS listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

**Wiring****Notes:**

- 1 Provide overload protection and disconnect as required.
- 2 Actuators may be connected in parallel. Power consumption and input impedance must be observed.
- 3 Actuator may also be powered by 24 VDC.
- 4 The ZG-R01 500Ω resistor converts the 4 to 20 mA control signal to 2 to 10 VDC, up to 2 actuators may be connected in parallel.
- 5 Only connect common to neg. (-) leg of control circuits.
- 6 Feedback for "X" models only.

**LMB24-3**

**On/Off-Floating Point Control, Non-Spring Return, Direct Coupled, 24 V**



## Technical Data

### LMB24-3... on/off-floating

Power Supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power Consumption	1.5 W (0.2 W)
Transformer Sizing	3 VA (Class 2 power source)
Electrical Connection	3 ft, 18 GA plenum rated cable 1/2" conduit connector
Overload Protection	electronic throughout 0 to 95° rotation
Control	on/off, floating point
Input Impedance	600Ω
Angle of Rotation	max. 95°, adjust. with mechanical stop
Torque	45 in-lb [5 Nm]
Direction of Rotation	reversible with $\curvearrowleft/\curvearrowright$ switch
Position Indication	reflective visual indicator (snap-on)
Manual Override	external push button
Running Time	95 seconds, constant independent of load
Humidity	5 to 95% RH non condensing (EN 60730-1)
Ambient Temperature	-22°F to +122°F [-30°C to +50°C]
Storage Temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA 2/IP54
Housing Material	UL94-5VA
Agency Listings	cULus acc. to UL 60730-1/-2-14 and CAN/CSA C22.2 No.24, CE according to 73 / 23 / EEC
Noise Level	<35dB(A)
Servicing	maintenance free
Quality Standard	ISO 9001
Weight	1.1lbs [0.5 Kg],
<b>LMB24-3-S</b>	
Auxiliary switch	Adj. 0° to 100°, SPDT 3 A (0.5A) @ 250 VAC
Weight	1.4lbs [0.6 Kg]
<b>LMB24-3-P10-T</b>	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Feedback	10 kΩ, 1W potentiometer
<b>LMB24-3-P5-T (bulk pack only)</b>	
Feedback	5 kΩ, 1W potentiometer
Housing	NEMA 1/IP20
<b>LMB24-3-T</b>	
Electrical connection	Screw terminal (for 26 to 14 GA wire)
Housing	NEMA 1/IP20

**Torque min. 45 in-lb for control of damper surfaces up to 11 sq ft.**

LMB24-3 LMB24-3.1 (bulk) LMB24-3-P10-T  
LMB24-3-T → LMB24-3-T.1 (bulk) LMB24-3-S  
LMB24-3-P5-1 LMB24-3-P5-T.1 (bulk)

## Application

For on-off and floating point control of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 1/4" up to 5/8" in diameter by means of its standard universal clamp. Shafts up to 3/4" diameter can be accommodated by an accessory clamp.

## Operation

The actuator is not provided with and does not require any limit switches, but is electronically protected against overload. The anti-rotation strap supplied with the actuator will prevent lateral movement.

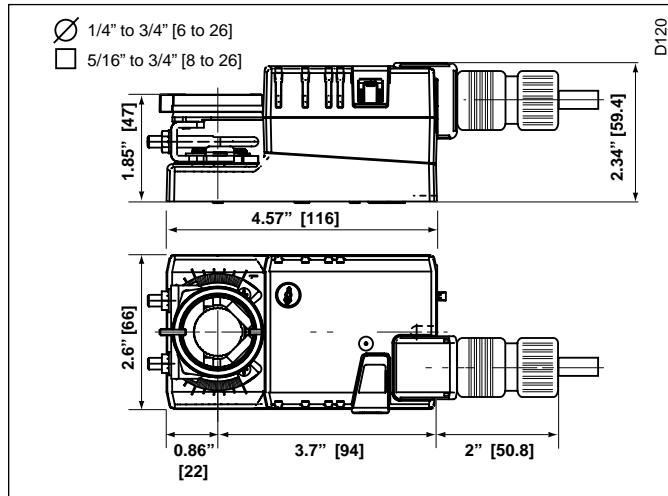
The LMB series provides 95° of rotation and a visual indicator which indicates position of the actuator. When reaching the damper or actuator end position, the actuator automatically stops. The gears can be disengaged with manual release on the actuator cover.

The LMB24-3... actuators use a sensorless Brushless DC motor, which is controlled by an Application Specific Integrated Circuit (ASIC). The ASIC monitors and controls the actuator's rotation and provides a digital rotation sensing (DRS) function to prevent damage to the actuator in a stall condition. Power consumption is reduced in holding mode.

The LMB24-3-S version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable 0 to 95°. The auxiliary switch is double insulated so an electrical ground connection is not necessary.

Add on auxiliary switches or feedback potentiometers are easily fastened directly onto the actuator body for signaling and switching functions.

**Dimensions** (All numbers in brackets are in millimeters.)



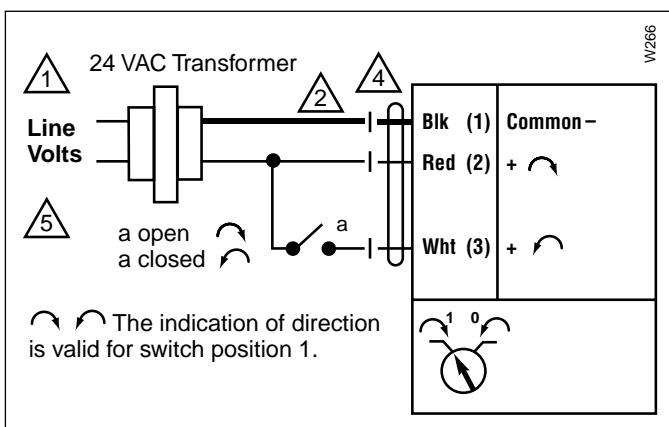
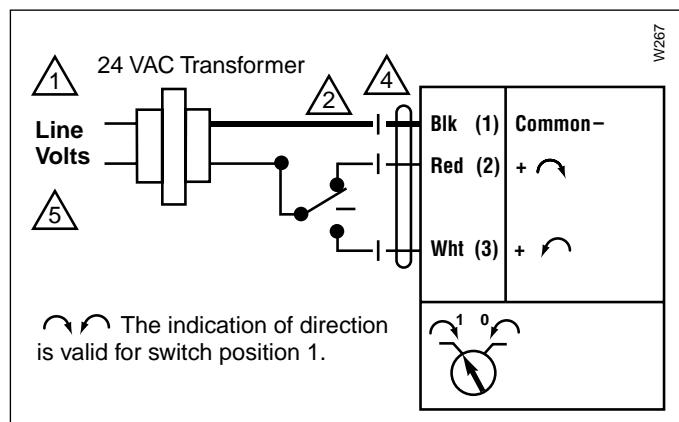
**Accessories**

K-LM20	3/4" [20 mm] Shaft Clamp
AV6-20	Shaft Extension
ZG-LMSA	Shaft Adaptor for 1/2" Diameter Shafts
ZG-LMSA-1	Shaft Adaptor for 3/8" Diameter Shafts
ZS-T	Terminal Cover for NEMA 2
ZS-100	Weather Shield - Steel
ZS-150	Weather Shield - Polycarbonate
Tool-06	8 mm & 10 mm Wrench
S1A, S2A	Auxiliary Switch (es)
P370	Shaft Mount Auxiliary Switch
P...A	Feedback Potentiometers

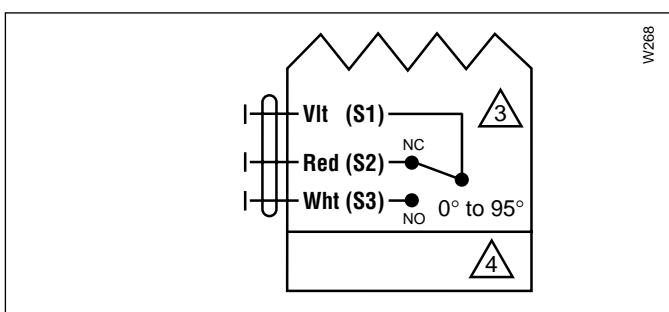
**Note:** When using LMB24-3... actuators, only use accessories listed on this page.

**LMB24-3 - Typical Specification:**

Floating point, on/off control damper actuators shall be electronic direct-coupled type, which require no crankarm and linkage and be capable of direct mounting to a shaft from 1/4" to 5/8". Shafts up to 3/4" diameter can be accommodate with an accessory clamp. Actuators shall have Brushless DC motor technology and be protected from overload at all angles of rotation. Actuators shall have reversing switch and manual override on the cover. If required, actuator will be provided with screw terminal strip for electrical connections (LMB24-3-T). If required, actuators shall be provided with one adjustable SPDT auxiliary switch. Actuators with auxiliary switches must be constructed to meet the requirements for double insulation so an electrical ground is not required to meet agency listings. Run time shall be constant and independent of torque. Actuators shall be cULus listed, have a 5-year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.

**Wiring****On/Off****Floating Point or On/Off control****Notes:**

- 1 Provide overload protection and disconnect as required.
- 2 Actuators may also be powered by 24 VDC.
- 3 For end position indication, interlock control, fan startup, etc., xMB24-3-S incorporates one built-in auxiliary switches: 1 x SPDT, 3A (0.5A) @250 VAC, UL listed, adjustable 0° to 95°.
- 4 Meets cULus requirements without the need of an electrical ground connection.

**Auxiliary Switch of LMB24-3-S**

**LF24-SR (-S) US** ←

Proportional damper actuator, spring return safety, 24 V for 2 to 10 VDC, or 4 to 20 mA control signal.  
Output signal of 2 to 10 VDC for position indication.



Technical Data	LF24-SR (-S) US
Power supply	24 VAC $\pm$ 20% 50/60 Hz 24 VDC $\pm$ 10%
Power consumption	running: 2.5 W; holding: 1 W
Transformer sizing	5 VA (class 2 power source)
Electrical connection	LF24-SR US 3 ft, plenum rated cable LF24-SR-S US 3 ft, 18 GA appliance cables (2) 1/2" conduit connector
Overload protection	electronic throughout 0 to 95° rotation
Operating range Y	2 to 10 VDC, 4 to 20mA
Input impedance	100 k $\Omega$ (0.1 mA), 500 $\Omega$
Feedback output U	2 to 10 VDC (max. 0.7 mA) for 95°
Angle of rotation	max. 95°, adjust. with mechanical stop
Torque	35 in-lb [4 Nm]
Direction of rotation	spring return reversible with cw/ccw mounting control direction selected by switch: CW=CW with a decrease in signal CCW=CCW with a decrease in signal
Position indication	visual indicator, 0° to 95° (0° is spring return position)
Auxiliary switch (LF24-SR-S US)	1 x SPDT 6A (1.5A) @ 250 VAC, UL listed adjustable 0° to 95° (double insulated)
Running time (nominal)	motor: 150 sec constant, independent of load spring: < 25 sec @ -4°F to +122°F [-20°C to +50°C] < 60 sec @ -22°F [-30°C]
Humidity	5 to 95% RH non-condensing
Ambient temperature	-22°F to +122°F [-30°C to +50°C]
Storage temperature	-40°F to +176°F [-40°C to +80°C]
Housing	NEMA type 2 / IP54
Housing material	zinc coated metal
Agency listings	UL 873 listed; CSA C22.2 No. 24 certified, CE
Noise level	max: running < 30 db (A) spring return 62 dB (A)
Servicing	maintenance free
Quality standard	ISO 9001
Weight	LF24-SR 3.1 lbs (1.40 kg.) LF24-SR-S 3.2 lbs (1.45 kg.)

**Torque min. 35 in-lb, for control of air dampers****Application**

For proportional modulation of dampers in HVAC systems. Actuator sizing should be done in accordance with the damper manufacturer's specifications.

The actuator is mounted directly to a damper shaft from 3/8" up to 1/2" in diameter by means of its universal clamp, 1/2" shaft centered at delivery. For shafts up to 3/4" use K6-1 accessory. A crank arm and several mounting brackets are available for applications where the actuator cannot be direct coupled to the damper shaft.

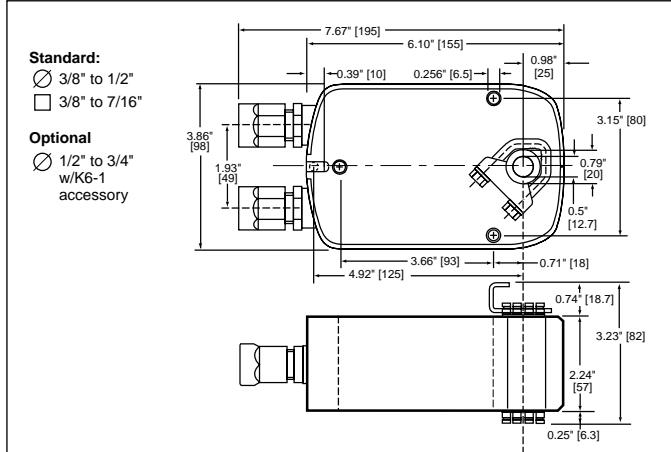
The actuator operates in response to a 2 to 10 VDC, or with the addition of a 500 $\Omega$  resistor, a 4 to 20 mA control input from an electronic controller or positioner. A 2 to 10 VDC feedback signal is provided for position indication or master-slave applications.

**Operation**

The LF series actuators provide true spring return operation for reliable fail-safe application and positive close-off on air tight dampers. The spring return system provides consistent torque to the damper with, and without, power applied to the actuator. The LF series provides 95° of rotation and is provided with a graduated position indicator showing 0 to 90°.

The LF24-SR (-S) US uses a brushless DC motor which is controlled by an Application Specific Integrated Circuit (ASIC) and a microprocessor. The microprocessor provides the intelligence to the ASIC to provide a constant rotation rate and to know the actuator's exact fail-safe position. The ASIC monitors and controls the brushless DC motor's rotation and provides a digital rotation sensing function to prevent damage to the actuator in a stall condition. The actuator may be stalled anywhere in its normal rotation without the need of mechanical end switches. Power consumption is reduced in holding mode.

The LF24-SR-S US version is provided with 1 built-in auxiliary switch. This SPDT switch is provided for safety interfacing or signaling, for example, for fan start-up. The switching function is adjustable between 0° and 95°. The auxiliary switch in the LF24-SR-S US is double insulated so an electrical ground is not necessary.

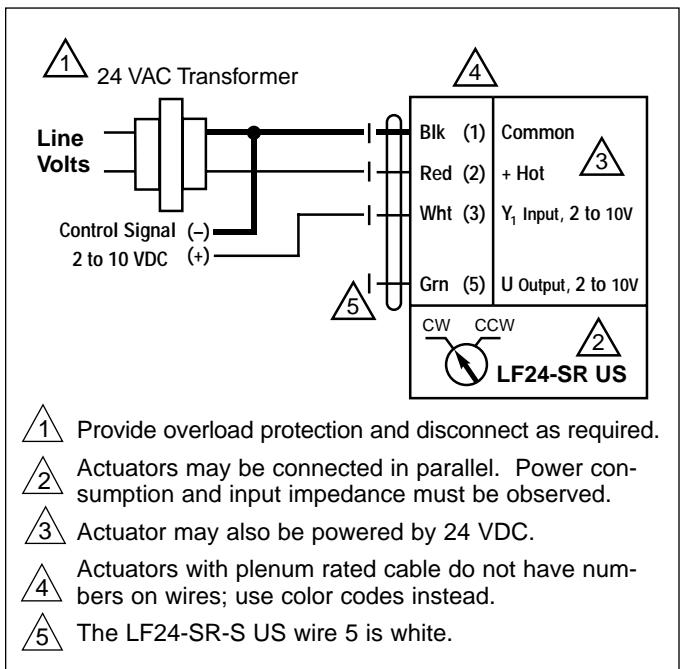
**Dimensions** (All numbers in brackets are metric.)

### Accessories

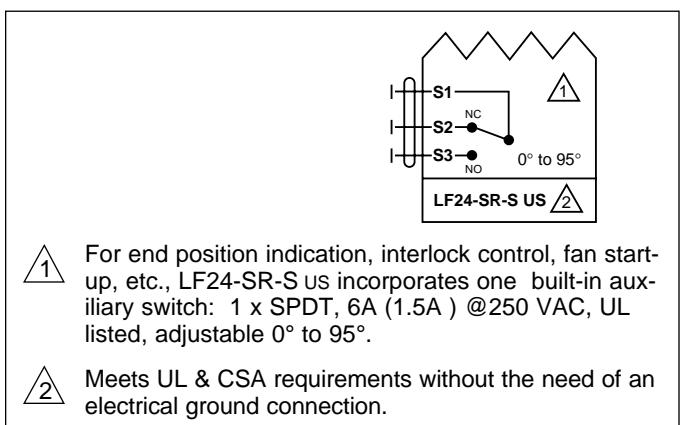
AV 10-18	Shaft extension (K6-1 is required)
IND-LF	Damper position indicator
K6-1	Universal clamp for up to 3/4" diameter shafts
KH-LF	Crankarm for up to 1/2" round shaft
SGA24	Min. and/or man. positioner in NEMA 4 housing
SGF24	Min. and/or man. positioner for flush panel mounting
Tool-01	10 mm wrench
ZG-LF2	Crankarm adaptor kit for LF
ZG-112	Mounting bracket for Honeywell Mod IV, M6415 type actuators, and new installations
ZG-LF112	Crankarm adaptor kit for Honeywell Mod IV, M6415 type actuators, and new installations
ZG-R01	500Ω resistor for 0 to 20 mA control signal
ZS-100	Weather shield (metal)
ZS-150	Weather shield (polycarbonate)
ZS-260	Explosion-proof housing

**Note: When using LF24-SR (-S) US actuators, only use accessories listed on this page.**

### Wiring diagrams



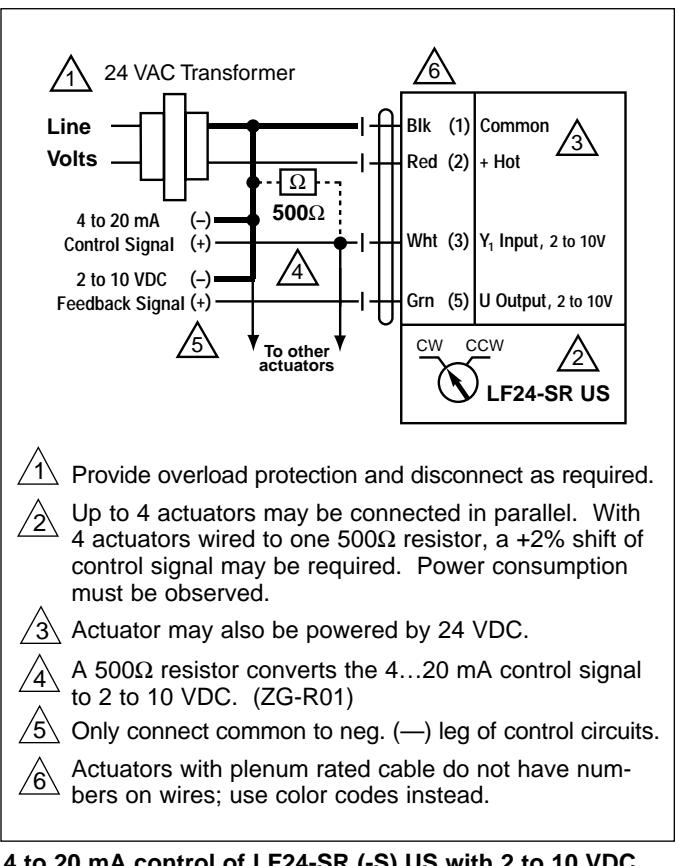
### 2 to 10 VDC control of LF24-SR (-S) US



### Auxiliary switch of LF24-SR-S US

### LF24-SR (-S) US Typical Specification

Spring return control damper actuators shall be direct coupled type which require no crankarm and linkage and be capable of direct mounting to a shaft up to a 3/4" diameter and center a 1/2" shaft. The actuator must provide proportional damper control in response to a 2 to 10 VDC or, with the addition of a 500Ω resistor, a 4 to 20 mA control input from an electronic controller or positioner. The actuators must be designed so that they may be used for either clockwise or counterclockwise fail-safe operation. Actuators shall use a brushless DC motor controlled by a microprocessor and be protected from overload at all angles of rotation. Run time shall be constant, and independent of torque. A 2 to 10 VDC feedback signal shall be provided for position feedback or master-slave applications. If required, 1 SPDT auxiliary switch shall be provided having the capability of being adjustable. Actuators with auxiliary switch must be constructed to meet the requirements for Double Insulation so an electrical ground is not required to meet agency listings. Actuators shall be UL listed and CSA certified, have a 5 year warranty, and be manufactured under ISO 9001 International Quality Control Standards. Actuators shall be as manufactured by Belimo.



### 4 to 20 mA control of LF24-SR (-S) US with 2 to 10 VDC feedback output



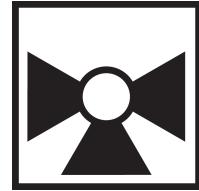
Stainless Steel Ball and Stem

## Technical data sheet

B310



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0% for A – AB, <2.0% for B – AB
Controllable flow range	75°
Cv	1.2
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NRB(X) N4

## Safety notes

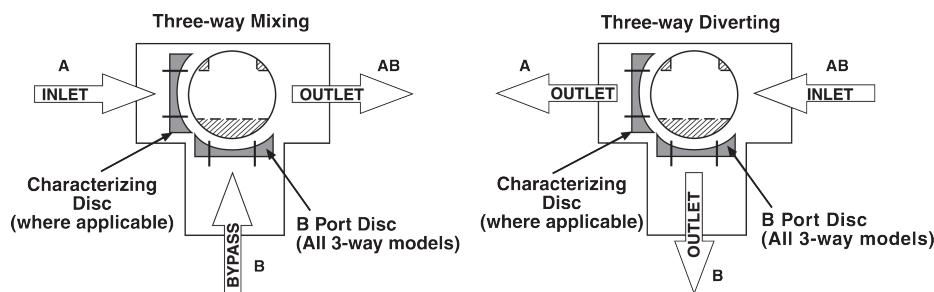


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.
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## Flow/Mounting details

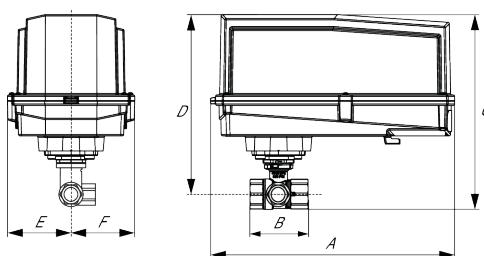


## Dimensions

## Dimensional drawings

Dimensional drawings							
A	B	C	D	E	F	H1	H2
LRB, LRX	8.5" [216]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]
LRQB, LRQX	8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]
TR	3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]	
LF	7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]	

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.2" [184]	6.7" [169]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

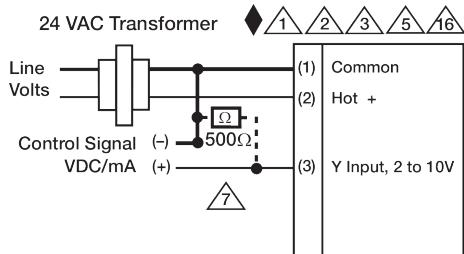
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

◆ Meets cULus requirements without the need of an electrical ground connection.

! **Warning! Live Electrical Components!**

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control



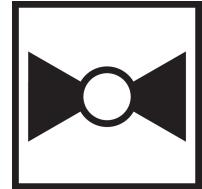
Stainless Steel Ball and Stem

## Technical data sheet

B213



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

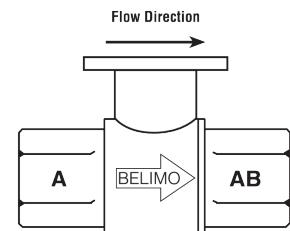
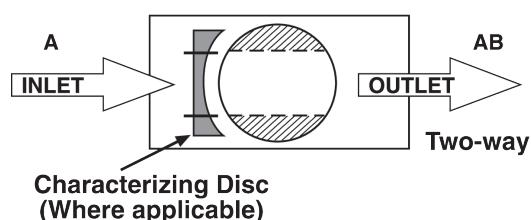
## Safety notes

- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

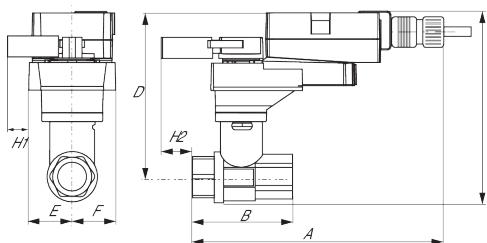
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
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## Flow/Mounting details

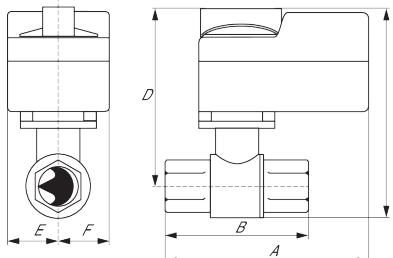


## Dimensions

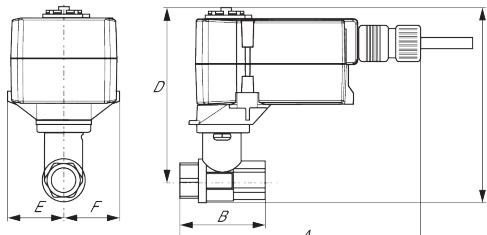
## Dimensional drawings



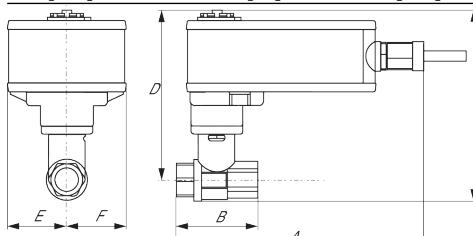
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



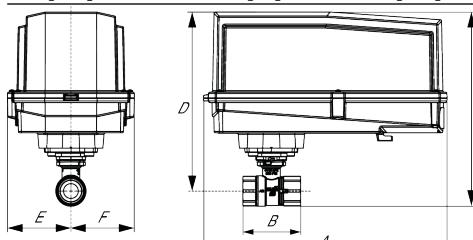
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



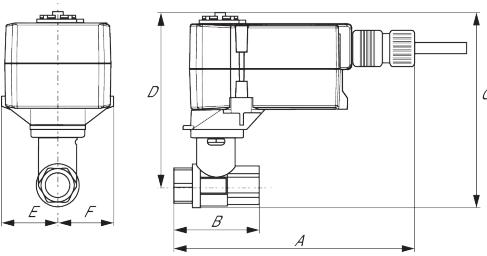
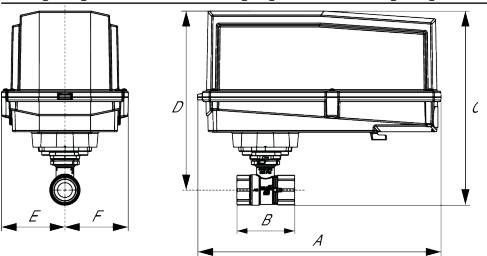
A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

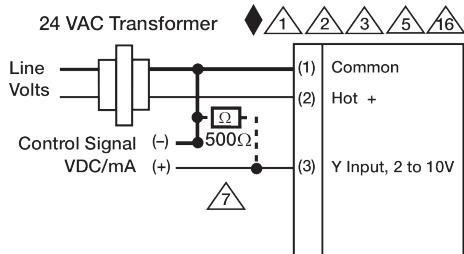
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

◆ Meets cULus requirements without the need of an electrical ground connection.

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2...10 V / 4...20 mA Control



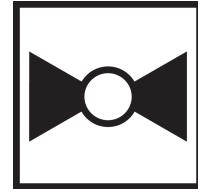
Stainless Steel Ball and Stem

## Technical data sheet

B213



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



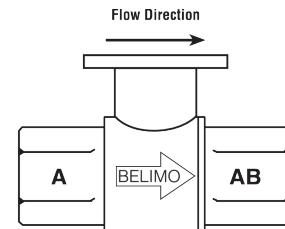
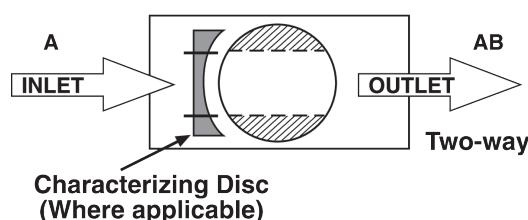
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## Product features

## Application

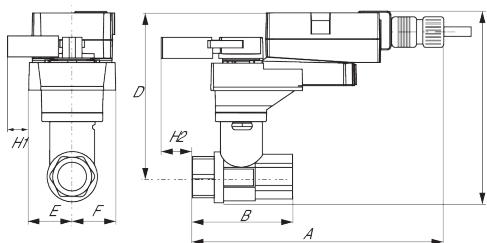
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details

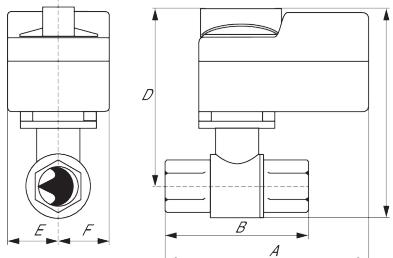


## Dimensions

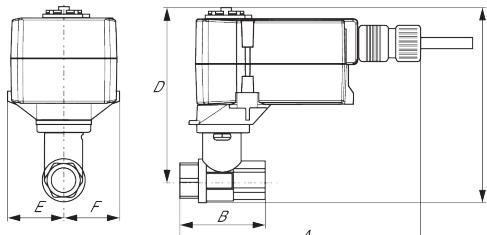
## Dimensional drawings



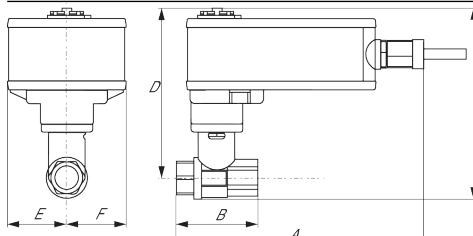
A	B	C	D	E	F	H1	H2
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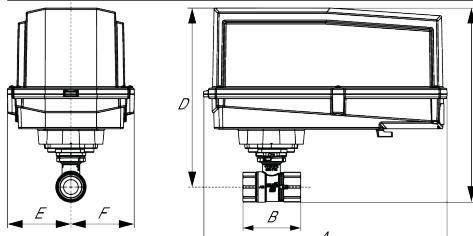
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



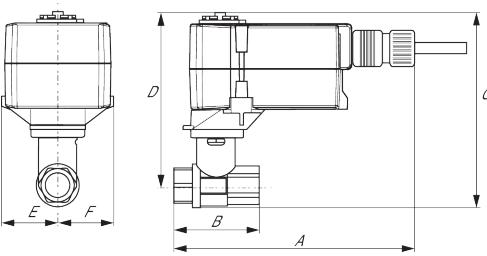
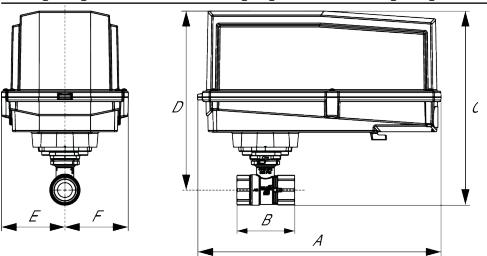
A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.

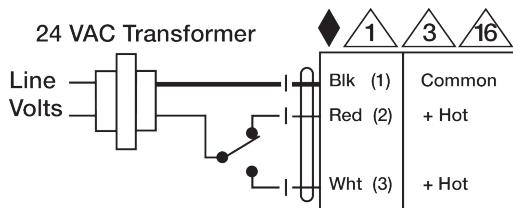


Actuators cannot be wired in parallel.

Meets cULus requirements without the need of an electrical ground connection.

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On/Off AC 24 V Transformer



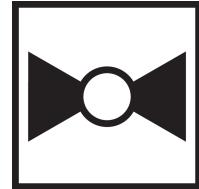
Stainless Steel Ball and Stem

## Technical data sheet

B211



5-year warranty



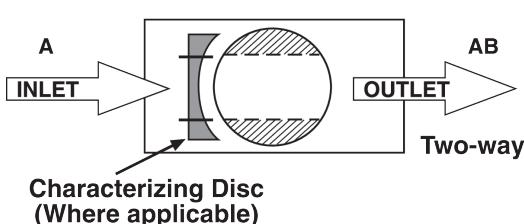
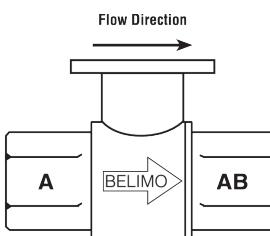
## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.9
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

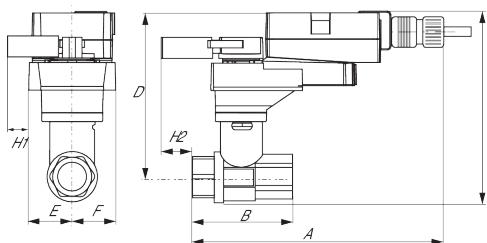
- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

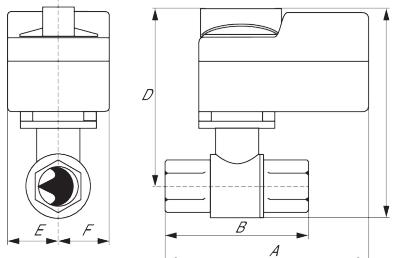
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	 

## Dimensions

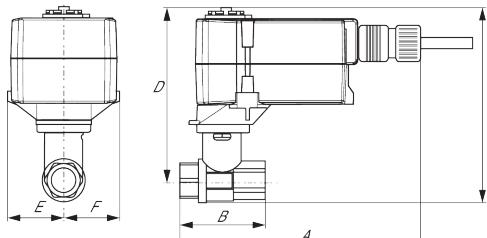
## Dimensional drawings



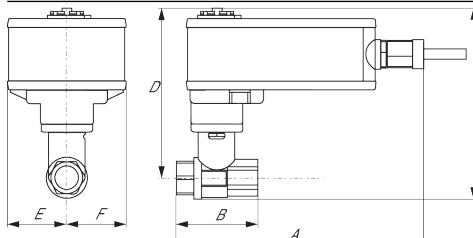
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



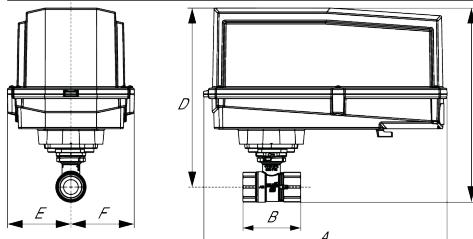
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



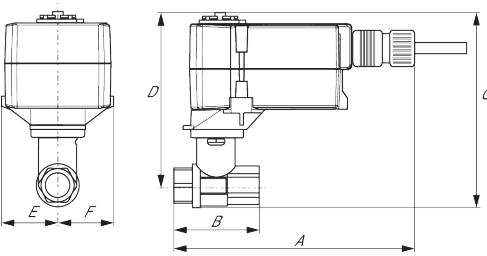
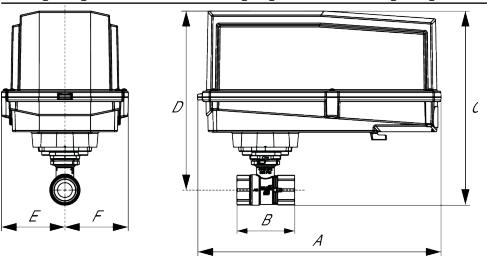
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

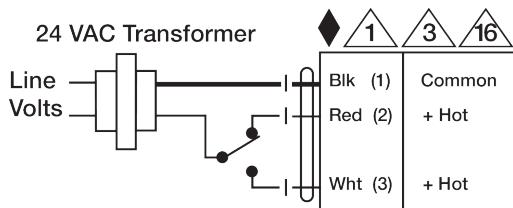


► Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

**Warning: Live Electrical Components**  
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## On/Off AC 24 V Transformer



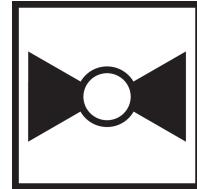
Stainless Steel Ball and Stem

## Technical data sheet

B209



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.8
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



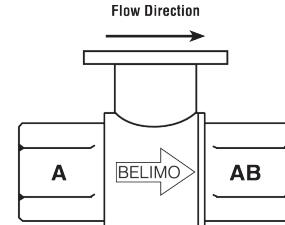
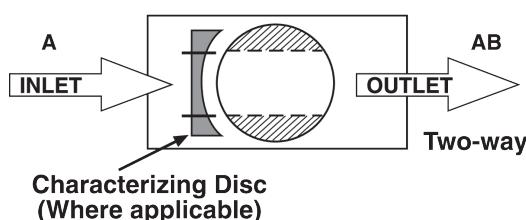
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

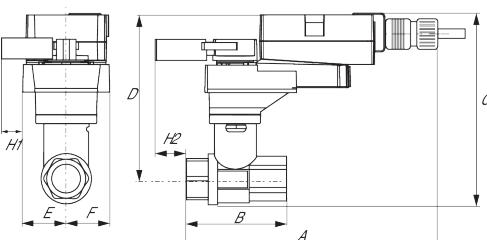
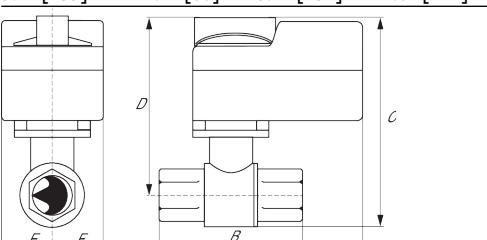
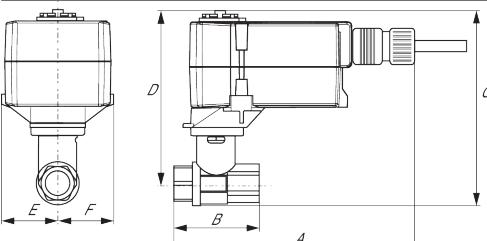
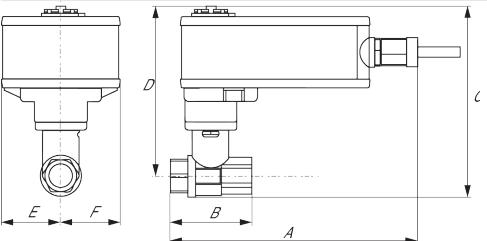
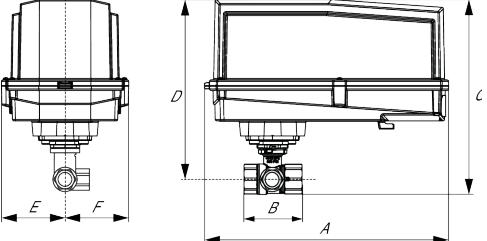
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

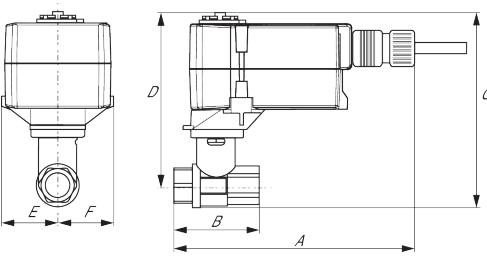
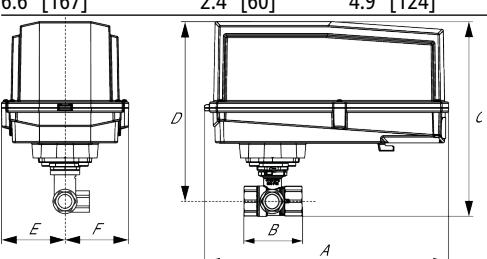
## Flow/Mounting details



## Dimensions

## Dimensional drawings

LRB, LRX							
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]
							
TR							
A	B	C	D	E	F		
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]		
							
TFRB, TFRX							
A	B	C	D	E	F		
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]		
							
LF							
A	B	C	D	E	F		
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]		
							
ARB N4, ARX N4							
A	B	C	D	E	F		
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]		
							
A	B	C	D	E	F		
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]		

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

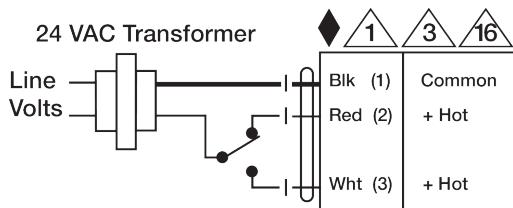


- Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

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## On/Off AC 24 V Transformer



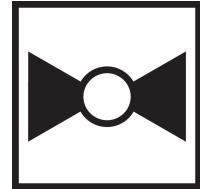
Stainless Steel Ball and Stem

## Technical data sheet

B212



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



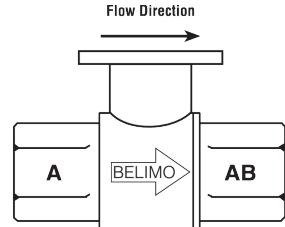
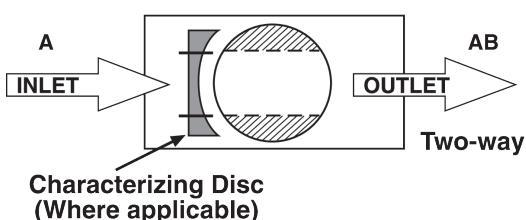
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## Product features

## Application

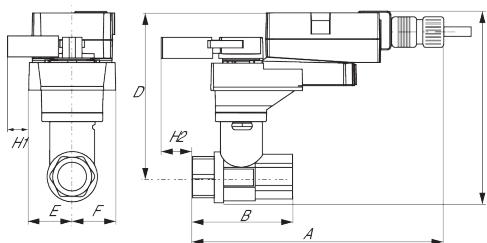
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details

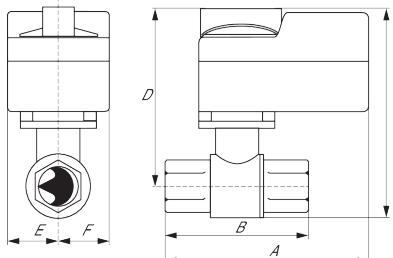


## Dimensions

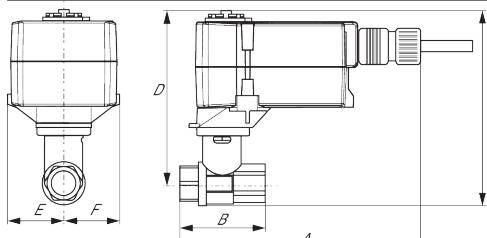
## Dimensional drawings



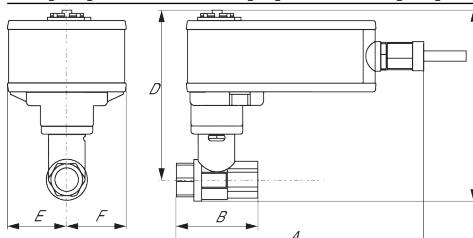
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



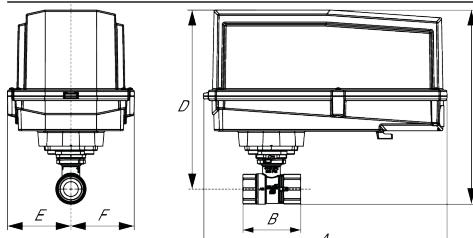
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



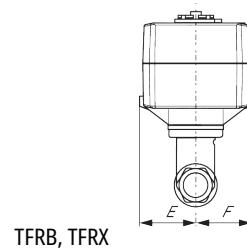
A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



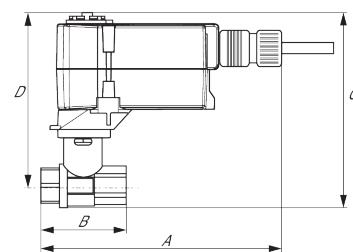
A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



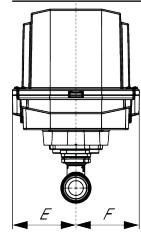
A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



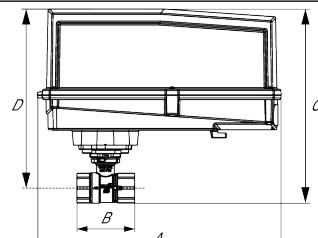
TFRB, TFRX



A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



ARB N4, ARX N4, NRB N4, NRX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7-10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

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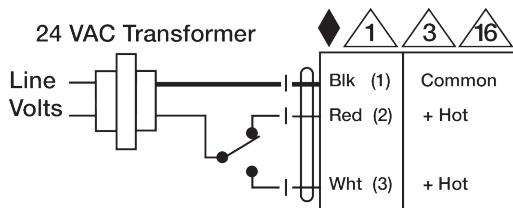


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On/Off AC 24 V Transformer



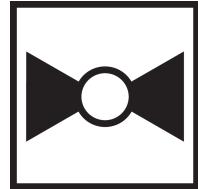
Stainless Steel Ball and Stem

## Technical data sheet

B208



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.46
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

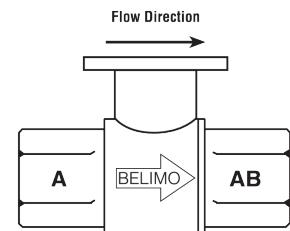
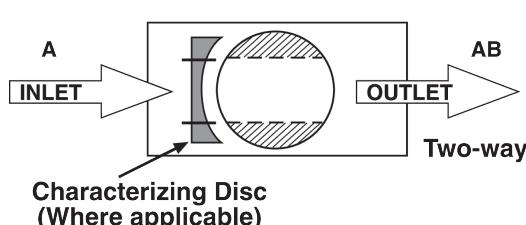
## Safety notes



- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

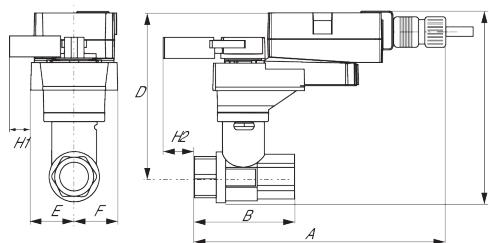
## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	<p><b>Characterizing Disc (Where applicable)</b></p>

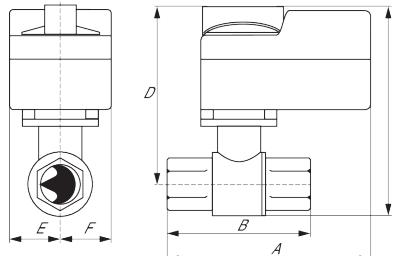


## Dimensions

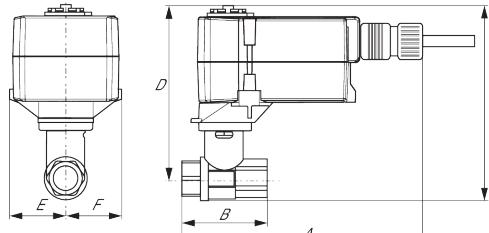
## Dimensional drawings



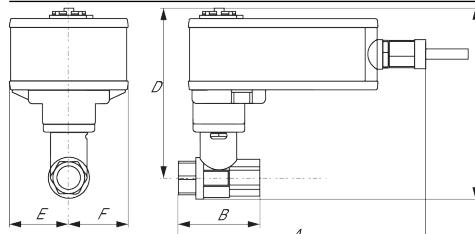
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



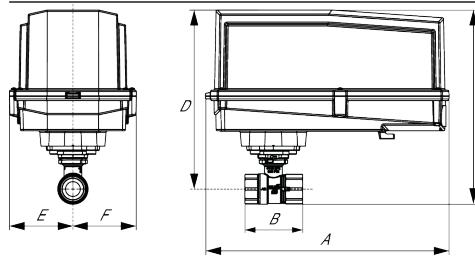
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

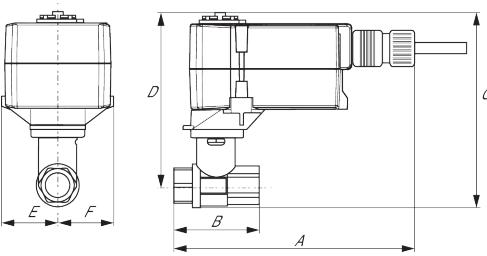
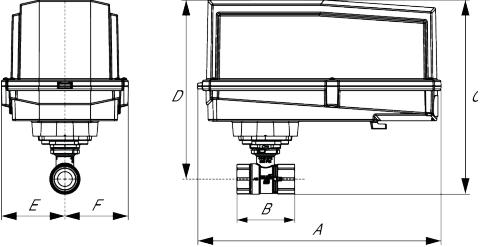


A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

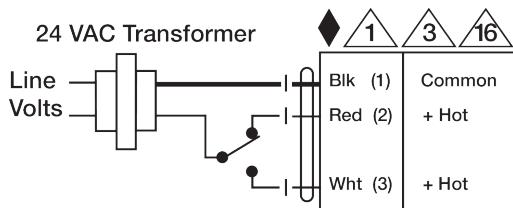


► Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



## On/Off AC 24 V Transformer



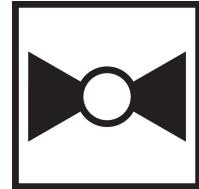
Stainless Steel Ball and Stem

## Technical data sheet

B210



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.2
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

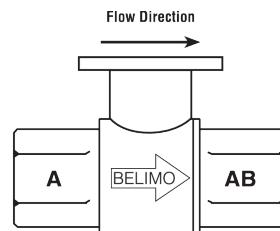
## Safety notes



- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

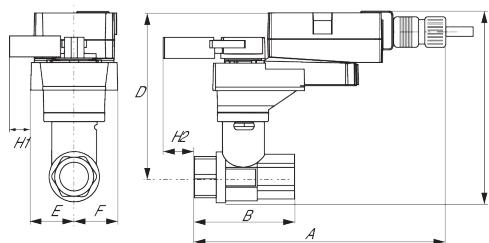
## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	<p><b>Characterizing Disc (Where applicable)</b></p>

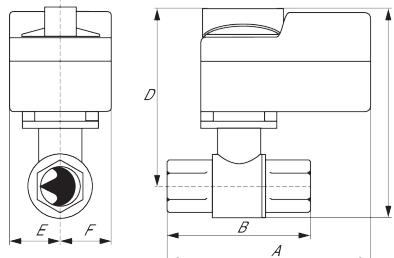


## Dimensions

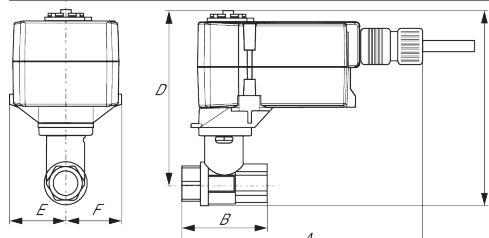
## Dimensional drawings



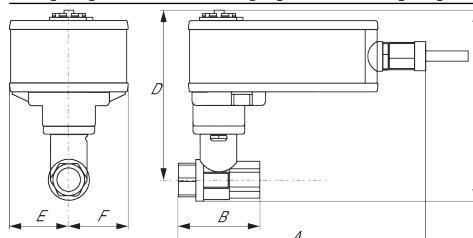
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



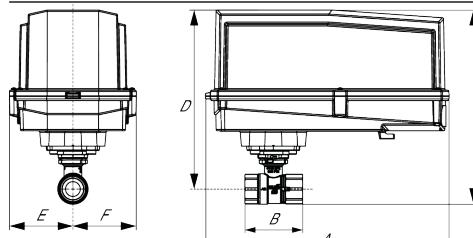
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



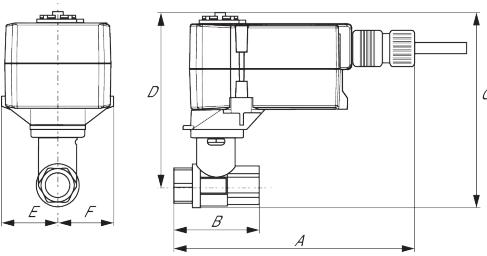
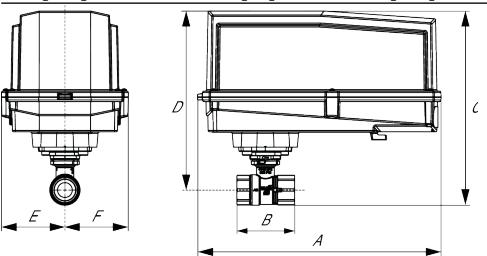
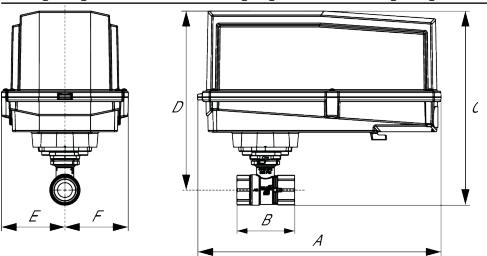
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	1 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Input Impedance	0.36 kΩ
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.62 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

### INSTALLATION NOTES

Provide overload protection and disconnect as required.

Actuators may also be powered by 24 VDC.

Actuators are provided with a numbered screw terminal strip instead of a cable.



Actuators cannot be wired in parallel.

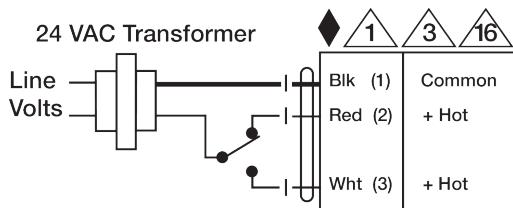


► Meets cULus requirements without the need of an electrical ground connection.



## Warning! Live Electrical Components!

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## On/Off AC 24 V Transformer



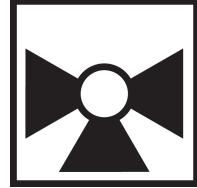
Stainless Steel Ball and Stem

## Technical data sheet

B312



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0% for A – AB, <2.0% for B – AB
Controllable flow range	75°
Cv	3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NRB(X) N4

## Safety notes

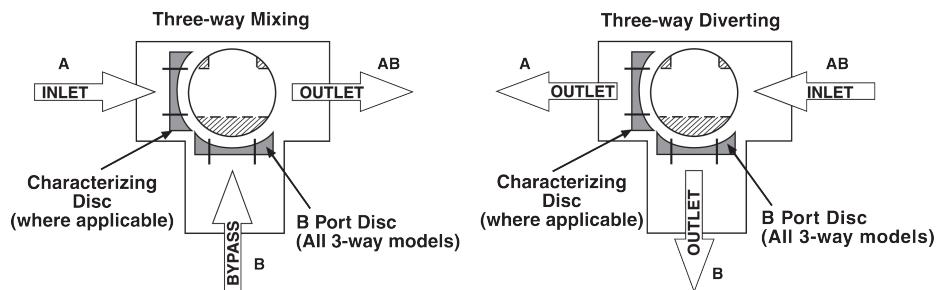


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.
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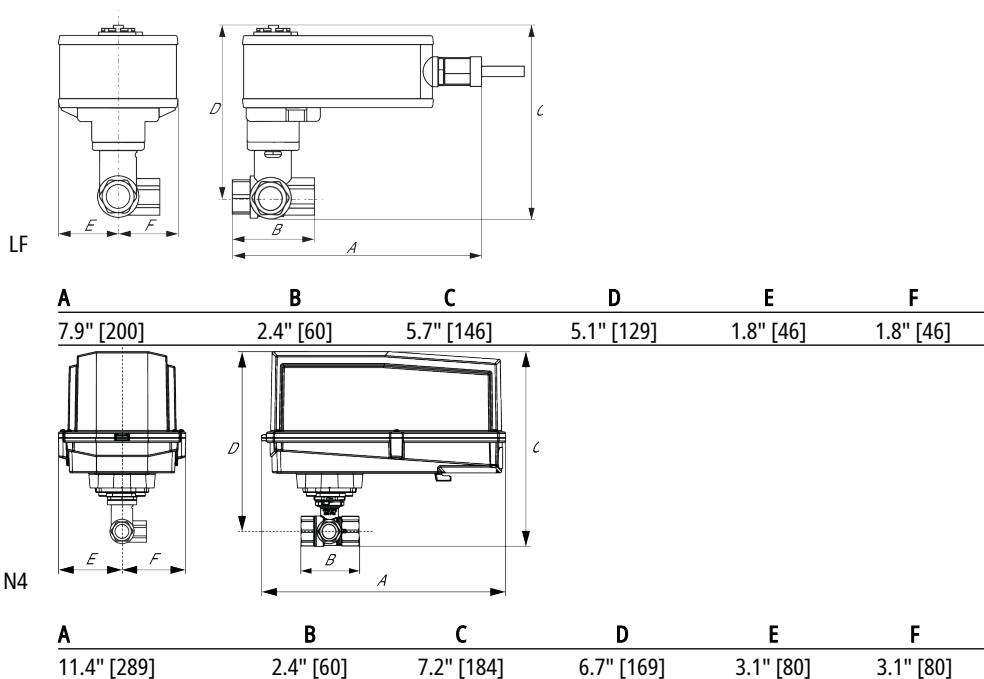
## Flow/Mounting details



## Dimensions

## Dimensional drawings

	A	B	C	D	E	F	H1	H2
LRB, LRX	8.5" [216]	2.4" [60]	5.2" [132]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]
LRQB, LRQX	8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.2" [30]	1.3" [33]
TR	3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]		
TFRB, TFRX	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]		





5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

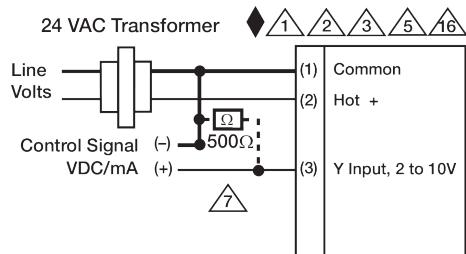
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

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2...10 V / 4...20 mA Control



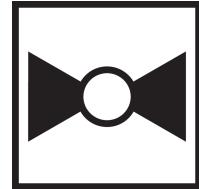
Stainless Steel Ball and Stem

## Technical data sheet

B207



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

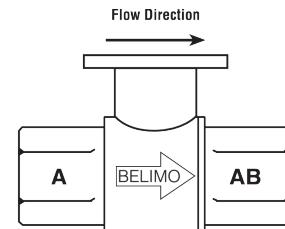
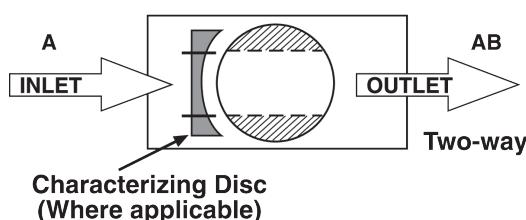
## Safety notes

- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

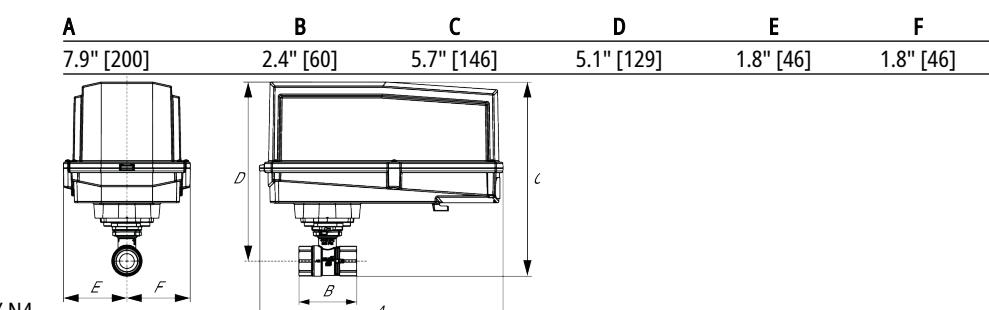
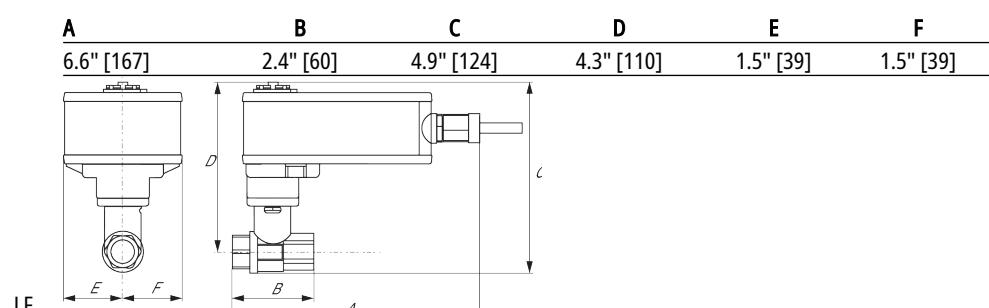
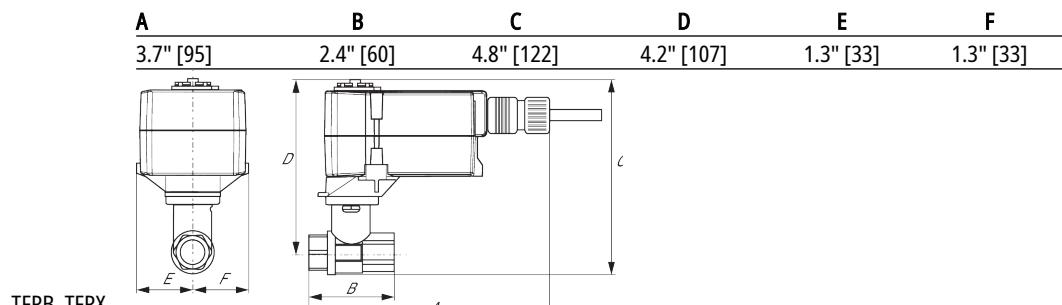
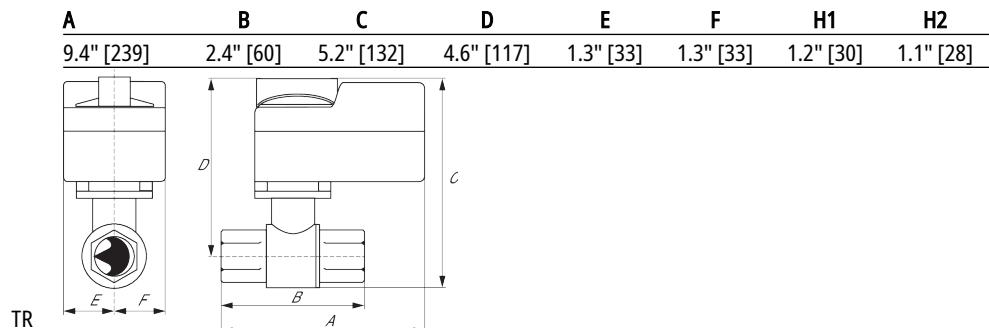
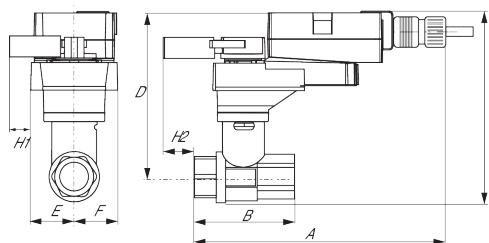
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
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## Flow/Mounting details

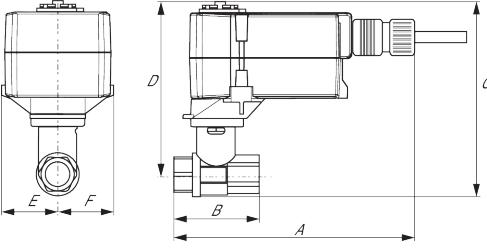
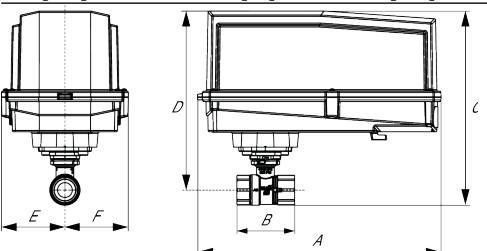


## Dimensions

## Dimensional drawings



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

	TFRB, TFRX					
	<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
	ARB N4, ARX N4, NRB N4, NRX N4					
	<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

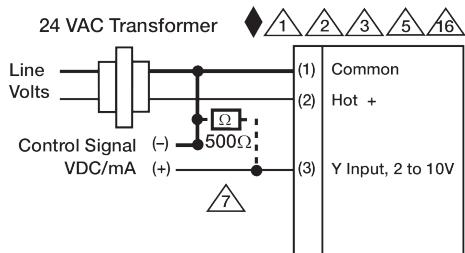
Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500 Ω resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.
- Meets cULus requirements without the need of an electrical ground connection.
- Warning! Live Electrical Components!**

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control



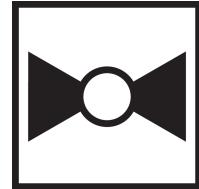
Stainless Steel Ball and Stem

## Technical data sheet

B211



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.9
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



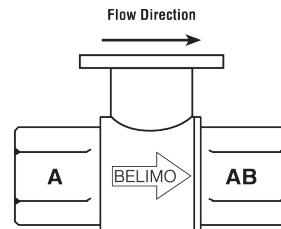
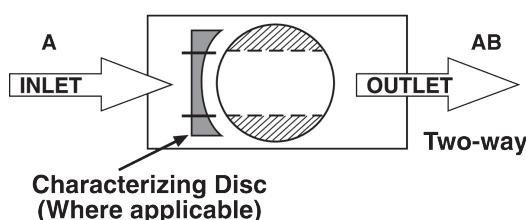
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

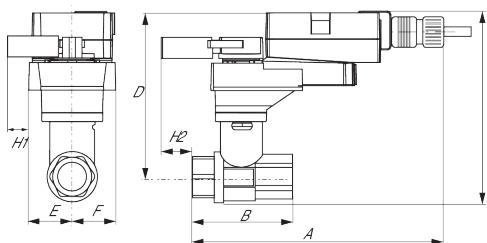
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details



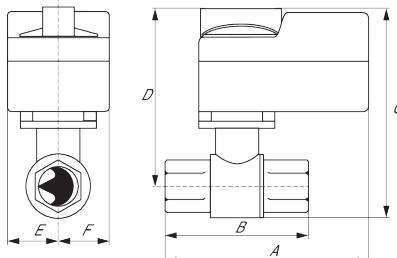
## Dimensions

## Dimensional drawings



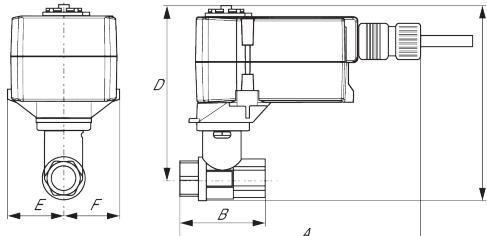
LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



TR

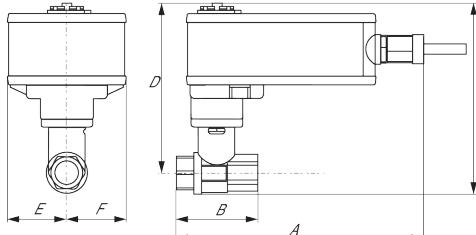
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



TFRB, TFRX

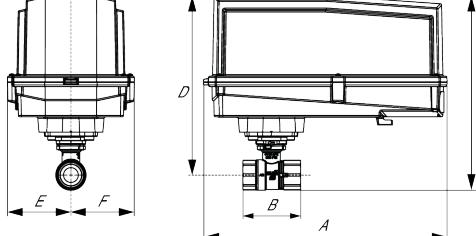
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF

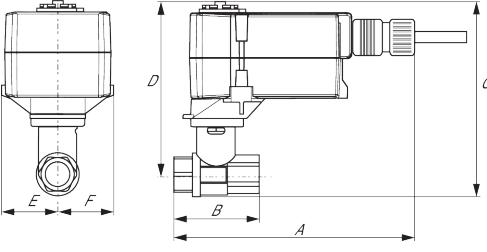
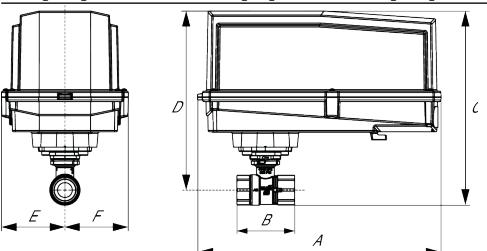


A	B	C	D	E	F
7.9" [200]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

ARB N4, ARX N4, NRB N4, NRX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

	TFRB, TFRX					
	<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
	ARB N4, ARX N4, NRB N4, NRX N4					
	<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

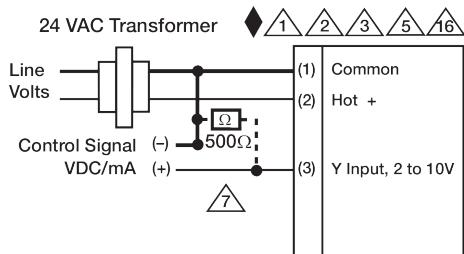
## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
  - 3 Actuators may also be powered by 24 VDC.
  - 5 Only connect common to negative (-) leg of control circuits.
  - 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
  - 16 Actuators are provided with a numbered screw terminal strip instead of a cable.
  - ◆ Meets cULus requirements without the need of an electrical ground connection.

## Warning! Live Electrical Components!

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2...10 V / 4...20 mA Control



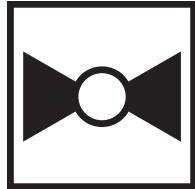
Stainless Steel Ball and Stem

## Technical data sheet

B209



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.8
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes



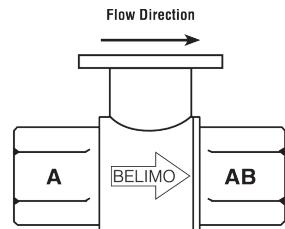
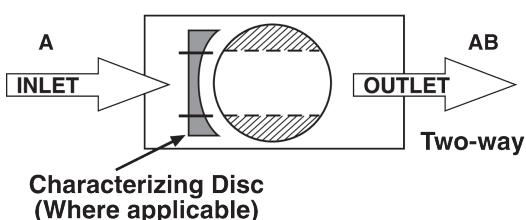
- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

## Application

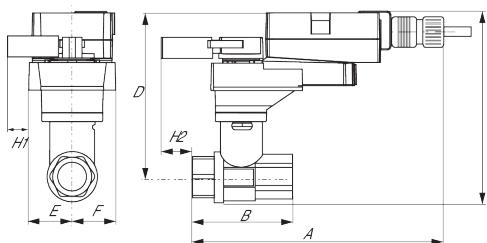
This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.

## Flow/Mounting details



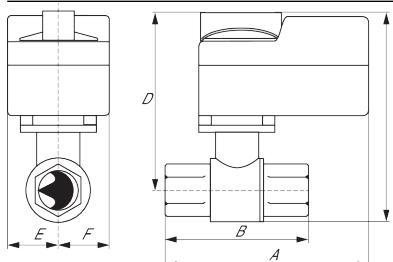
## Dimensions

## Dimensional drawings



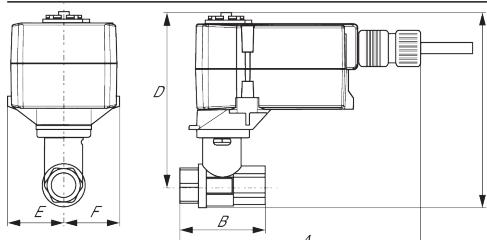
LRB, LRX

A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



TR

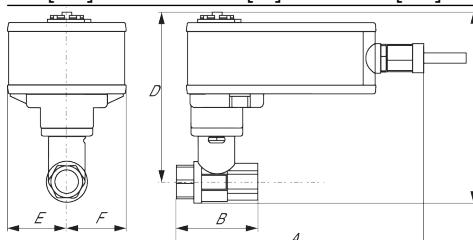
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



TFRB, TFRX

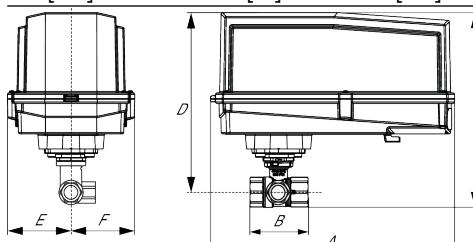
A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

LF



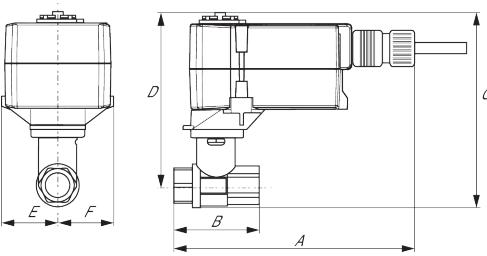
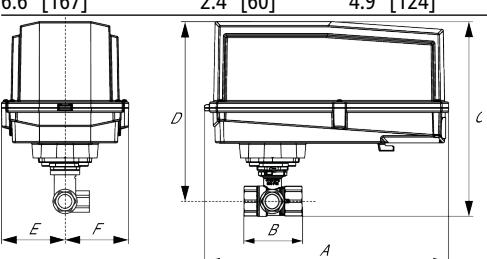
A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

ARB N4, ARX N4



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

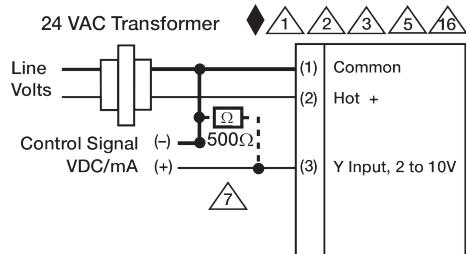
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

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2...10 V / 4...20 mA Control



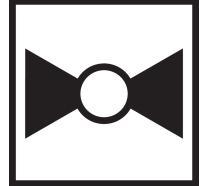
Stainless Steel Ball and Stem

## Technical data sheet

B212



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	3
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

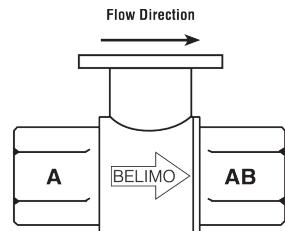
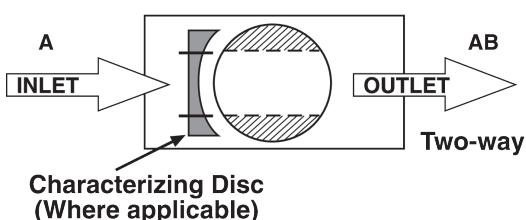


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## Product features

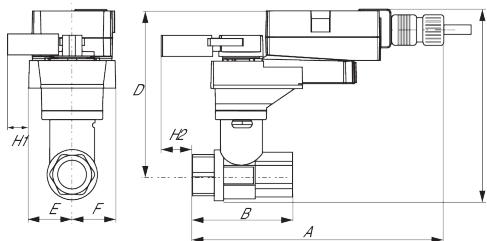
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	<p><b>Characterizing Disc (Where applicable)</b></p>

## Flow/Mounting details

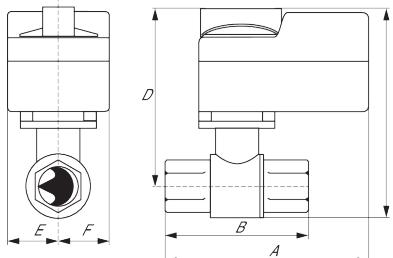


## Dimensions

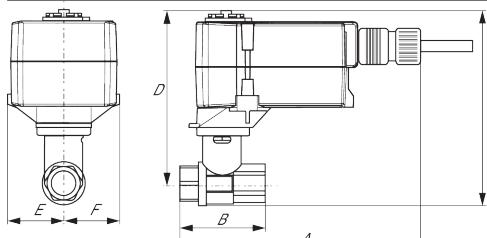
## Dimensional drawings



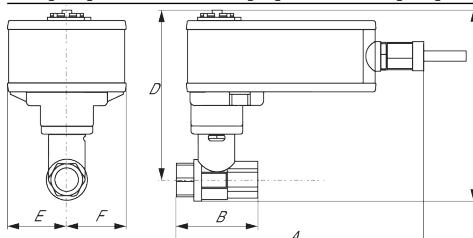
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.6" [141]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



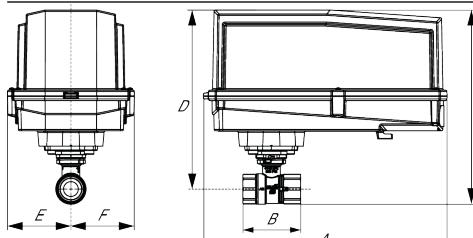
A	B	C	D	E	F
3.7" [95]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]



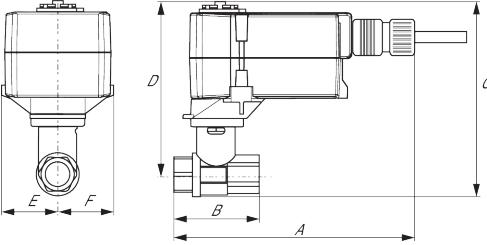
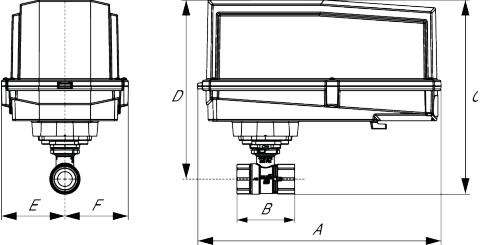
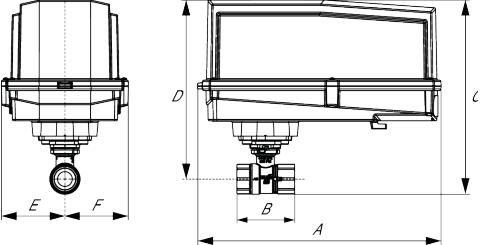
A	B	C	D	E	F
6.6" [167]	2.4" [60]	5.5" [139]	4.7" [120]	1.5" [39]	1.5" [39]



A	B	C	D	E	F
7.9" [200]	2.4" [60]	6.1" [154]	5.5" [140]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 5.5" [139]	<b>D</b> 4.7" [120]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
Nominal voltage frequency	50/60 Hz	
Power consumption in operation	0.5 W	
Transformer sizing	1 VA (class 2 power source)	
Electrical Connection	Screw terminal (for 26 to 14 GA wire)	
Overload Protection	electronic throughout full rotation	
Functional data	Operating range Y	2...10 V
Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)	
Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA	
Direction of motion motor	selectable with switch	
Manual override	push down handle	
Angle of rotation	90°	
Running Time (Motor)	90 s / 90°	
Noise level, motor	35 dB(A)	
Position indication	Mechanically, pluggable	
Safety data	Degree of protection IEC/EN	IP40
Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1	
Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC	
Quality Standard	ISO 9001	
Ambient temperature	-22...122°F [-30...50°C]	
Storage temperature	-40...176°F [-40...80°C]	
Ambient humidity	max. 95% r.H., non-condensing	
Servicing	maintenance-free	
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

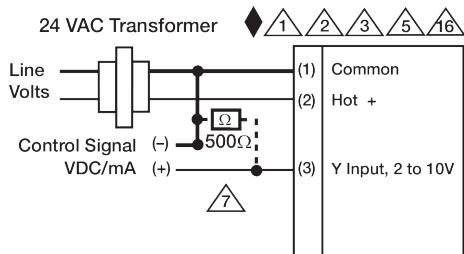
## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
  - 3 Actuators may also be powered by 24 VDC.
  - 5 Only connect common to negative (-) leg of control circuits.
  - 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
  - 16 Actuators are provided with a numbered screw terminal strip instead of a cable.
  - ◆ Meets cULus requirements without the need of an electrical ground connection.

## Warning! Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control



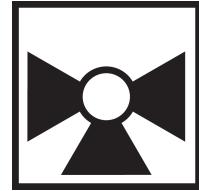
Stainless Steel Ball and Stem

## Technical data sheet

B313



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	A-port equal percentage, B-port modified for constant common port flow
Servicing	maintenance-free
Flow Pattern	3-way Mixing/Diverting
Leakage rate	0% for A – AB, <2.0% for B – AB
Controllable flow range	75°
Cv	4.7
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

## Safety notes

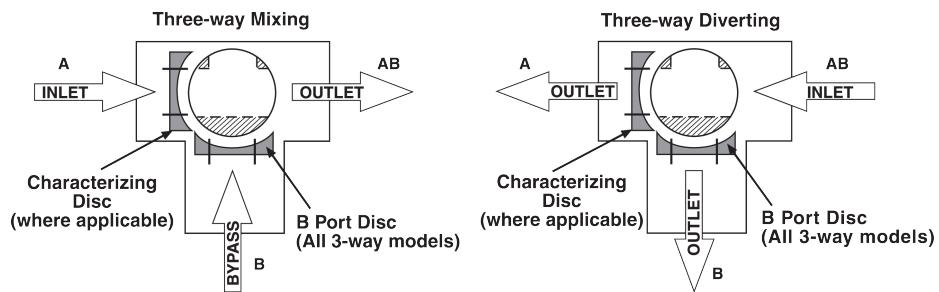


- WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable or constant flow.

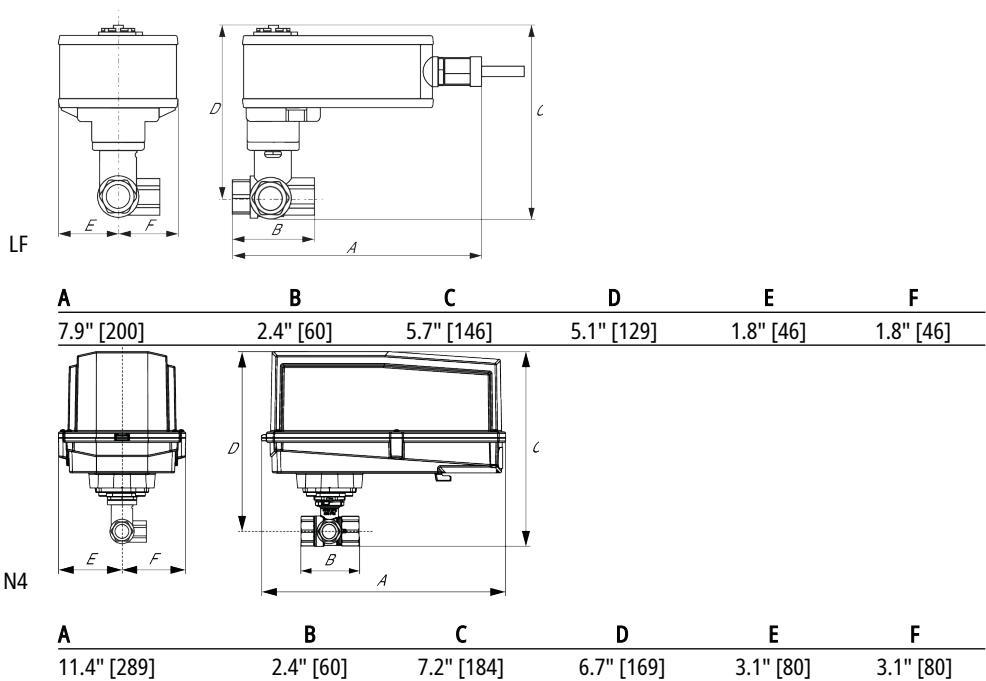
## Flow/Mounting details



## Dimensions

## Dimensional drawings

	A	B	C	D	E	F	H1	H2
LRB, LRX	8.5" [216]	2.4" [60]	5.2" [132]	5.0" [127]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]
LRQB, LRQX	8.9" [226]	2.4" [60]	5.7" [146]	5.2" [131]	1.6" [40]	1.6" [40]	1.3" [33]	
TR	3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.2" [31]		
TFRB, TFRX	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]		





5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

## Electrical installation

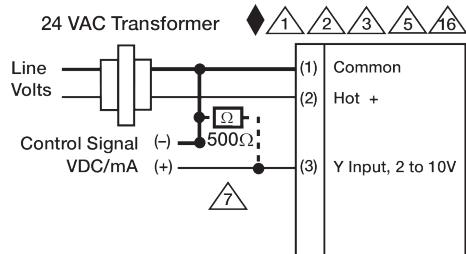
### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
- 3 Actuators may also be powered by 24 VDC.
- 5 Only connect common to negative (-) leg of control circuits.
- 7 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
- 16 Actuators are provided with a numbered screw terminal strip instead of a cable.

Meets cULus requirements without the need of an electrical ground connection.

**Warning! Live Electrical Components!**

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2...10 V / 4...20 mA Control



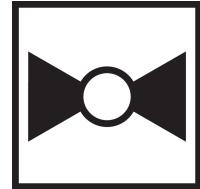
Stainless Steel Ball and Stem

## Technical data sheet

B208



5-year warranty



## Technical data

Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	0.46
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

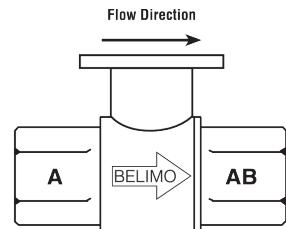
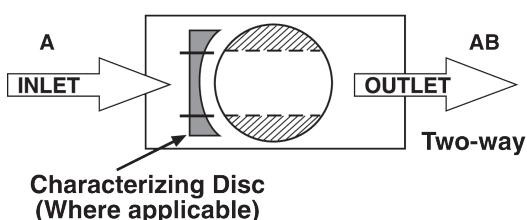
## Safety notes

- ! • WARNING: This product can expose you to lead which is known to the State of California to cause cancer and reproductive harm. For more information go to [www.p65warnings.ca.gov](http://www.p65warnings.ca.gov)

## Product features

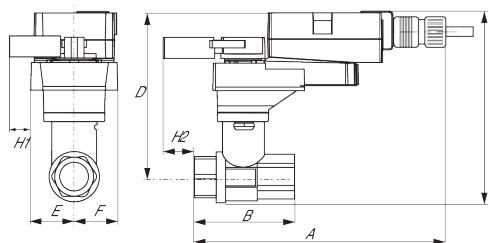
Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
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## Flow/Mounting details

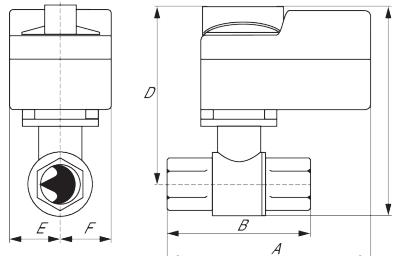


## Dimensions

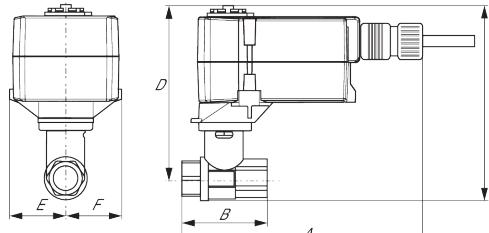
## Dimensional drawings



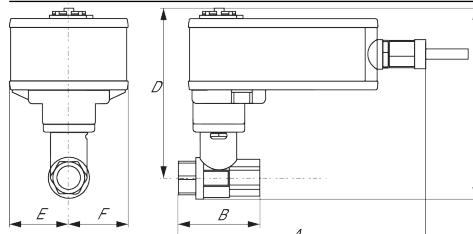
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



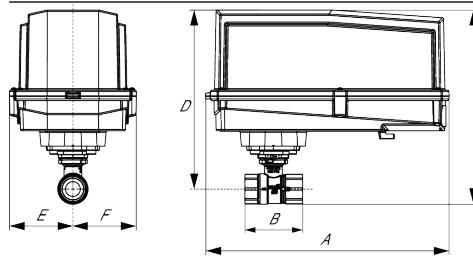
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



A	B	C	D	E	F
6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]

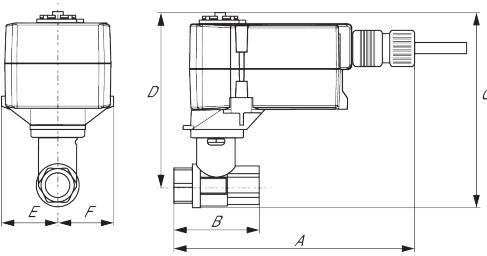
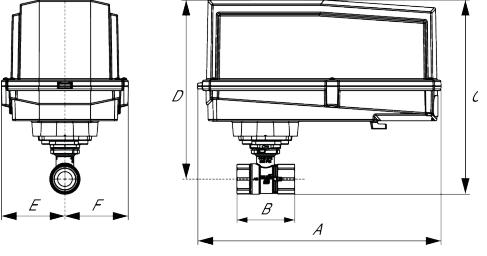


A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]

A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

 TFRB, TFRX	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	6.6" [167]	2.4" [60]	4.9" [124]	4.3" [110]	1.5" [39]	1.5" [39]
 ARB N4, ARX N4, NRB N4, NRX N4	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>F</b>
	11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

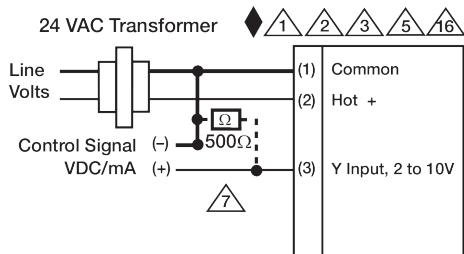
## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
  - 2 Actuators may also be powered by 24 VDC.
  - 3 Only connect common to negative (-) leg of control circuits.
  - 4 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
  - 5 Actuators are provided with a numbered screw terminal strip instead of a cable.
  - 6 Meets cULus requirements without the need of an electrical ground connection.

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2...10 V / 4...20 mA Control



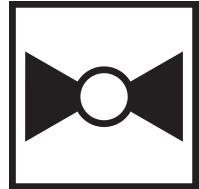
Stainless Steel Ball and Stem

## Technical data sheet

B210



5-year warranty



## Technical data

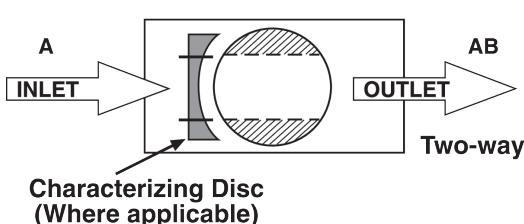
Functional data	
Valve Size	0.5" [15]
Fluid	chilled or hot water, up to 60% glycol
Fluid Temp Range (water)	0...250°F [-18...120°C]
Body Pressure Rating	600 psi
Close-off pressure $\Delta$ ps	200 psi
Flow characteristic	equal percentage
Servicing	maintenance-free
Flow Pattern	2-way
Leakage rate	0% for A – AB
Controllable flow range	75°
Cv	1.2
Body pressure rating note	600 psi
Cv Flow Rating	A-port: as stated in chart B-port: 70% of A – AB Cv
Materials	
Valve body	Nickel-plated brass body
Stem seal	EPDM (lubricated)
Seat	PTFE
Pipe connection	NPT female ends
O-ring	EPDM (lubricated)
Ball	stainless steel
Suitable actuators	
Non-Spring	TR LRB(X) NR

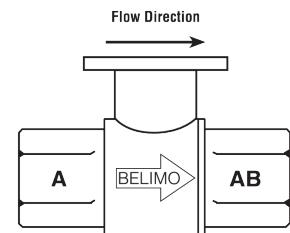
## Safety notes



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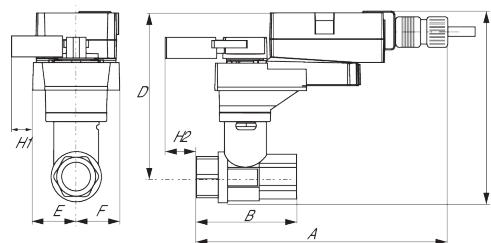
## Product features

Application	This valve is typically used in air handling units on heating or cooling coils, and fan coil unit heating or cooling coils. Some other common applications include Unit Ventilators, VAV box re-heat coils and bypass loops. This valve is suitable for use in a hydronic system with variable flow.
Flow/Mounting details	

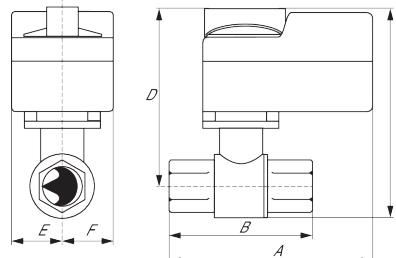


## Dimensions

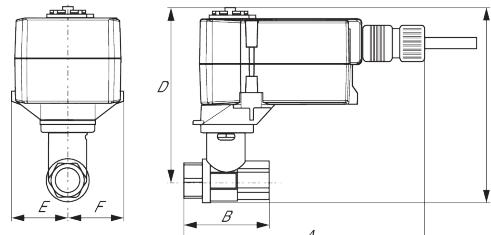
## Dimensional drawings



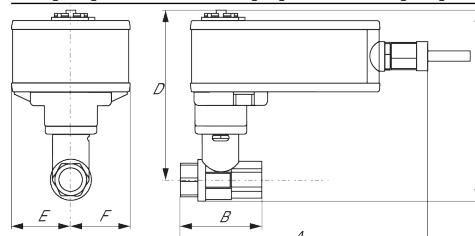
A	B	C	D	E	F	H1	H2
9.4" [239]	2.4" [60]	5.2" [132]	4.6" [117]	1.3" [33]	1.3" [33]	1.2" [30]	1.1" [28]



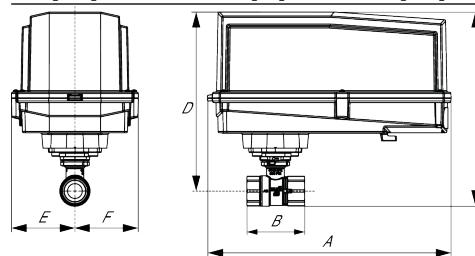
A	B	C	D	E	F
3.7" [95]	2.4" [60]	4.8" [122]	4.2" [107]	1.3" [33]	1.3" [33]



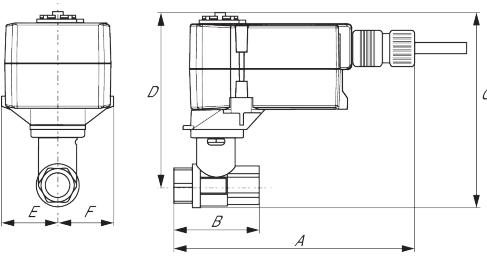
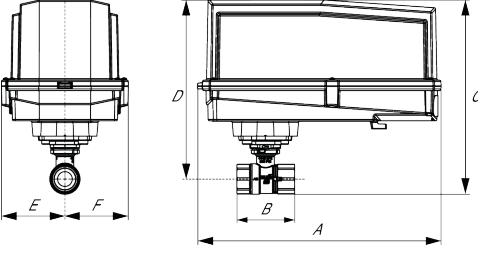
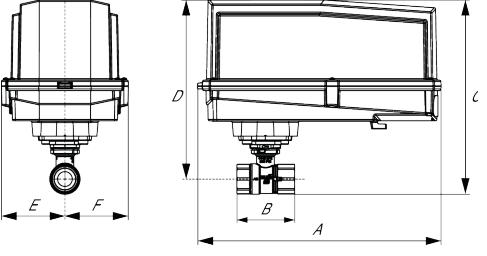
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A	B	C	D	E	F
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]



A	B	C	D	E	F
11.4" [289]	2.4" [60]	7.7" [196]	7.0" [179]	3.1" [80]	3.1" [80]
7.9" [200]	2.4" [60]	5.7" [146]	5.1" [129]	1.8" [46]	1.8" [46]

TFRB, TFRX							
		<b>A</b> 6.6" [167]	<b>B</b> 2.4" [60]	<b>C</b> 4.9" [124]	<b>D</b> 4.3" [110]	<b>E</b> 1.5" [39]	<b>F</b> 1.5" [39]
ARB N4, ARX N4, NRB N4, NRX N4		<b>A</b> 11.4" [289]	<b>B</b> 2.4" [60]	<b>C</b> 7.7" [196]	<b>D</b> 7.0" [179]	<b>E</b> 3.1" [80]	<b>F</b> 3.1" [80]



5-year warranty



## Technical data

Electrical data	Nominal voltage	AC/DC 24 V
	Nominal voltage frequency	50/60 Hz
	Power consumption in operation	0.5 W
	Transformer sizing	1 VA (class 2 power source)
	Electrical Connection	Screw terminal (for 26 to 14 GA wire)
	Overload Protection	electronic throughout full rotation
Functional data	Operating range Y	2...10 V
	Operating range Y note	4...20 mA w/ ZG-R01 (500 Ω, 1/4 W resistor)
	Input Impedance	100 kΩ for 2...10 V (0.1 mA), 500 Ω for 4...20 mA
	Direction of motion motor	selectable with switch
	Manual override	push down handle
	Angle of rotation	90°
	Running Time (Motor)	90 s / 90°
	Noise level, motor	35 dB(A)
	Position indication	Mechanically, pluggable
Safety data	Degree of protection IEC/EN	IP40
	Degree of protection NEMA/UL	NEMA 1 UL Enclosure Type 1
	Agency Listing	cULus acc. to UL60730-1A/-2-14, CAN/CSA E60730-1:02, CE acc. to 2014/30/EU and 2014/35/EU; Listed to UL 2043 - suitable for use in air plenums per Section 300.22(c) of the NEC and Section 602.2 of the IMC
	Quality Standard	ISO 9001
	Ambient temperature	-22...122°F [-30...50°C]
	Storage temperature	-40...176°F [-40...80°C]
	Ambient humidity	max. 95% r.H., non-condensing
	Servicing	maintenance-free
Weight	Weight	0.61 lb [0.28 kg]

## Safety notes



- NEMA 4X, 316L stainless steel enclosure.
- Battery Back Up System for SY(7~10)-110
- ZS-300 without brackets.
- NEMA 4X, 304 stainless steel enclosure.
- MFT95 resistor kit for 4 to 20 mA control applications.

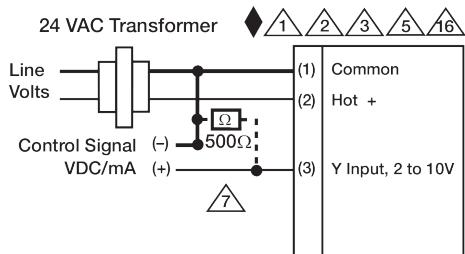
## Electrical installation

### INSTALLATION NOTES

- 1 Provide overload protection and disconnect as required.
  - 2 Actuators may also be powered by 24 VDC.
  - 3 Only connect common to negative (-) leg of control circuits.
  - 4 A 500  $\Omega$  resistor (ZG-R01) converts the 4...20 mA control signal to 2...10 V.
  - 5 Actuators are provided with a numbered screw terminal strip instead of a cable.
  - 6 Meets cULus requirements without the need of an electrical ground connection.

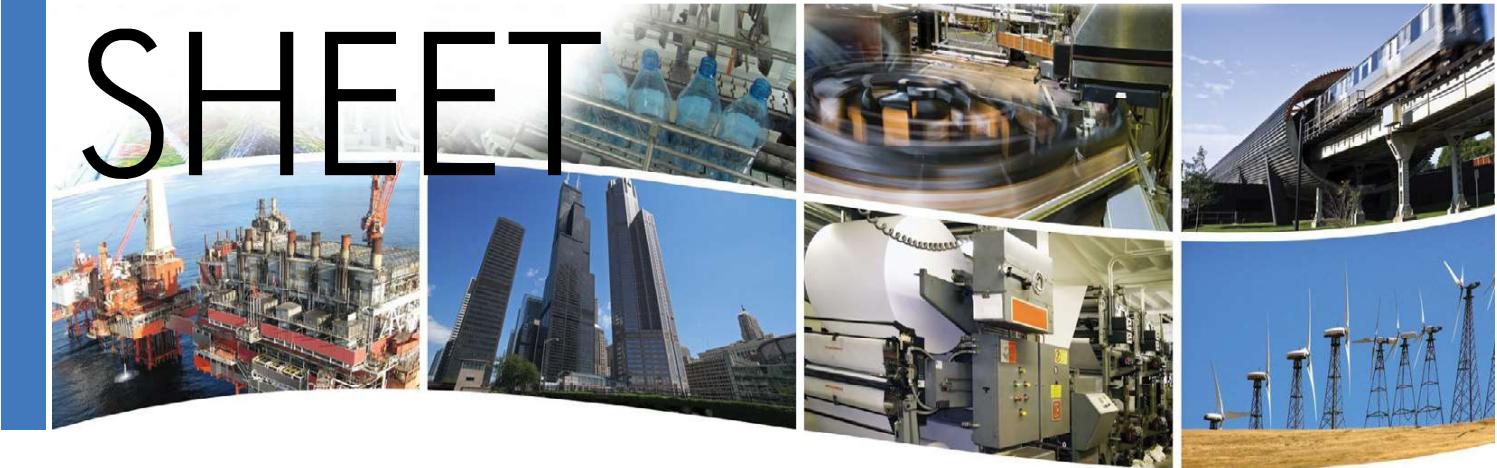
## Warning! Live Electrical Components!

During installation, testing, servicing and troubleshooting of this product, it may be necessary to work with live electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform these tasks. Failure to follow all electrical safety precautions when exposed to live electrical components could result in death or serious injury.



2...10 V / 4...20 mA Control

# data SHEET



## 5-Port Skorpion Gigabit Switch *Cost Effective, High-speed — Compact Size*

The EISK5-GT Skorpion Gigabit Switch is a five-port unmanaged Ethernet switch that provides Gigabit Ethernet (GigE) performance on all ports in order to accommodate high-speed devices such as IP cameras and modern workstations. In addition, GigE jumbo frames up to 9216 bytes are supported for the highest possible system performance. For 10/100 Mbps legacy devices, the switch will automatically reduce its port-speed accordingly, thereby accommodating the needs of just about any Ethernet automation system. This low-cost compact unit utilizes a rugged metal enclosure and is intended for installation in control panels using DIN-rail mounting.

This is a plug-and-play Ethernet switch requiring no configuration. All ports automatically configure their data rate and duplex using the Auto-negotiation protocol. Depending on the capability of the link partner, communication is set at 10, 100 or 1000 Mbps and at either half- or full-duplex. Each port will accommodate either a straight-through or crossover cable by using the Auto-MDIX protocol.

The unit is powered from a choice of low-voltages (AC or DC). Redundant power connections are provided for back-up power schemes. LED indicators assist in troubleshooting network issues.

- Plug-and-Play operation
- 10BASE-T/100BASE-TX/1000BASE-T
- Shielded RJ-45 connectors
- Auto-negotiation of speed and duplex
- Auto-MDIX supports cable inversion



- DIN-rail mounting
- Rugged metal enclosure
- Diagnostic LEDs
- Enhanced EMC compliance
- UL 508 listed, c-UL listed, CE mark
- 24 VAC/VDC powered

**CTRLink®**

## Overview

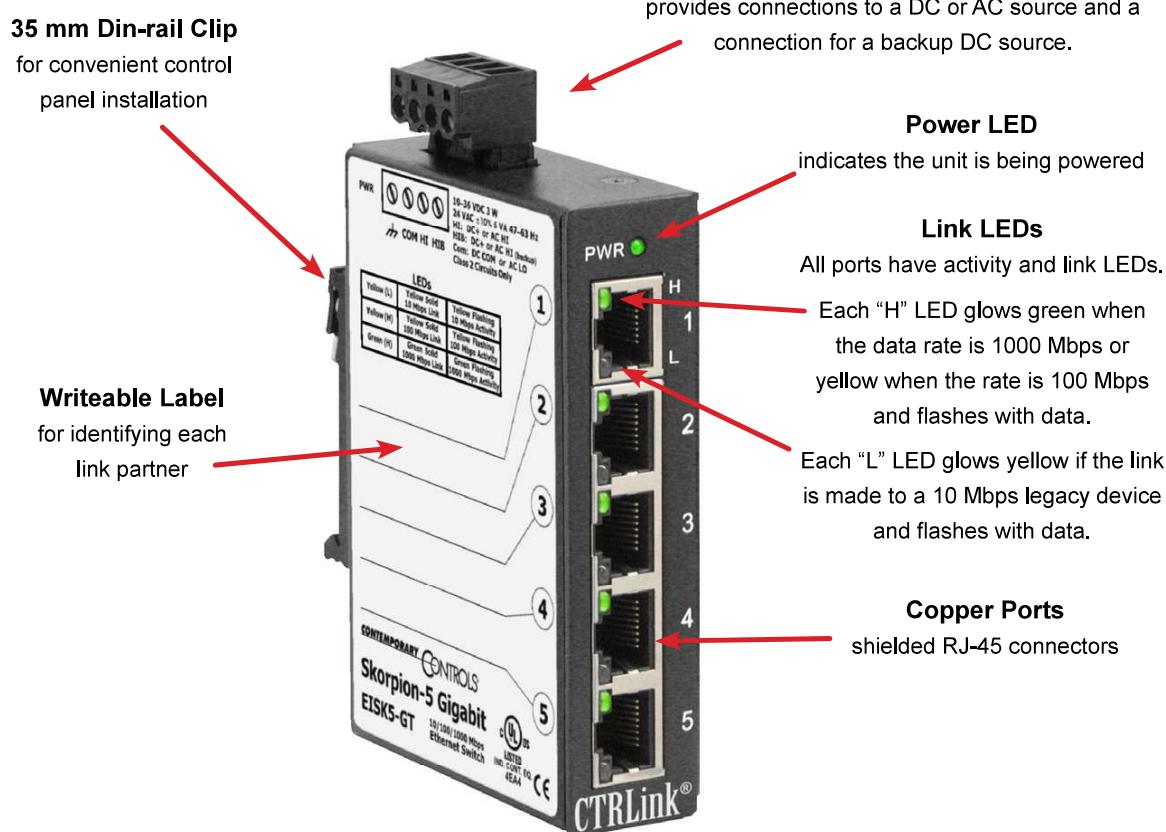
The Skorpion Gigabit Switch is intended for control panel installations where DIN-rail space is at a premium by requiring a width of only one inch (26 mm) of rail space. A metal DIN-rail clip attached to the aluminium enclosure can survive the toughest installation. A writable side label allows the installer an opportunity to document field cabling locations right on the unit.

The switch can be powered from either a 10–36 VDC or 24 VAC ( $\pm 10\%$ ) source. Its half-wave rectified low-voltage power supply allows the sharing of power with other 24 VAC/VDC control devices from a common power supply. With redundant power connections, a

backup power scheme can be supported. A removable power connector facilitates the servicing of the unit.

LEDs built into the connector indicate data rate and activity on each of the five ports. For each port, the data rate will be indicated along with port activity thereby greatly assisting in troubleshooting connection issues.

The switch is UL 508 Listed and c-UL Listed for Industrial Control Equipment. It is RoHS compliant, complies with CFR 47 Part 15 Class A, and carries the CE Mark.



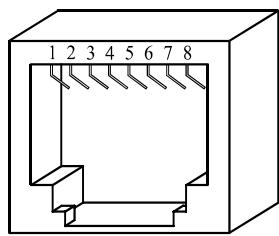
## Specifications

<b>Power Requirements</b>	10–36 VDC 3 W or 24 VAC $\pm 10\%$ 5 VA 47–63 Hz								
<b>Operating Temperature</b>	0°C to 60°C								
<b>Storage Temperature</b>	–40°C to 85°C								
<b>Relative Humidity</b>	10–95%, non-condensing								
<b>Protection</b>	IP30								
<b>Mounting</b>	TS-35 DIN-rail								
<b>Shipping Weight</b>	1 lb (0.45 kg)								
<b>Ethernet Communications</b>	IEEE 802.3 10/100/1000 Mbps data rate using RJ-45 connectors, 100 m (max) Supports jumbo frames up to 9216 bytes								
<b>LEDs</b>	<table> <tr> <td>Power</td> <td>Green = power OK</td> </tr> <tr> <td>“H” LEDs</td> <td>Green = 1000 Mbps communication established Yellow = 100 Mbps communication established</td> </tr> <tr> <td>“L” LEDs</td> <td>Yellow = 10 Mbps communication established</td> </tr> <tr> <td>“H” or “L” LEDs</td> <td>Flashing = data transmissions occurring</td> </tr> </table>	Power	Green = power OK	“H” LEDs	Green = 1000 Mbps communication established Yellow = 100 Mbps communication established	“L” LEDs	Yellow = 10 Mbps communication established	“H” or “L” LEDs	Flashing = data transmissions occurring
Power	Green = power OK								
“H” LEDs	Green = 1000 Mbps communication established Yellow = 100 Mbps communication established								
“L” LEDs	Yellow = 10 Mbps communication established								
“H” or “L” LEDs	Flashing = data transmissions occurring								
<b>Regulatory Compliance</b>	CE Mark; CFR 47, Part 15 Class A; RoHS; UL 508 Industrial Control Equipment								

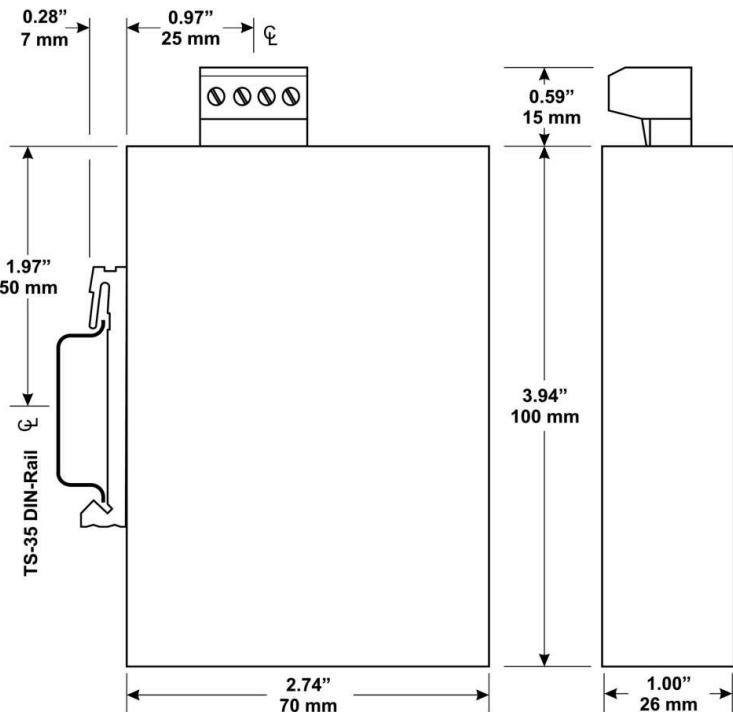


### RJ-45 Connector Pin Assignments

Pin	Function
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD-

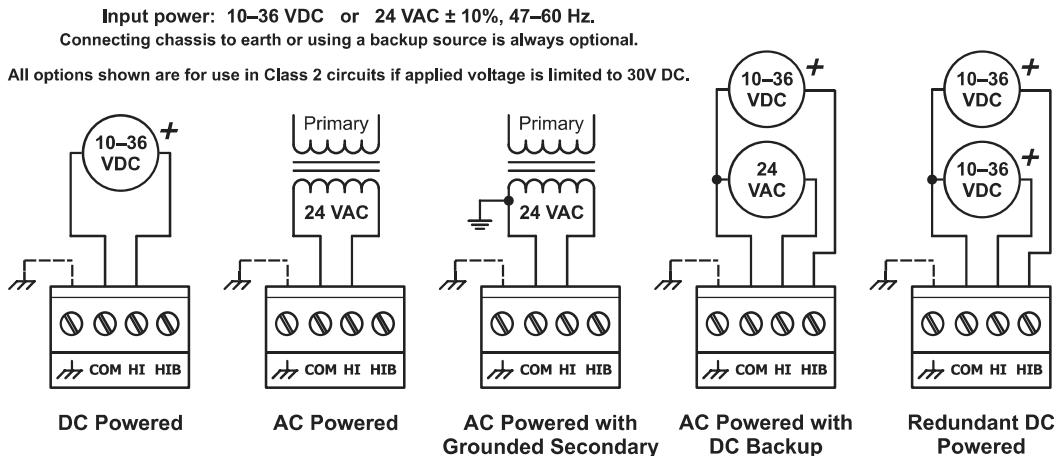


### Mechanical Drawing

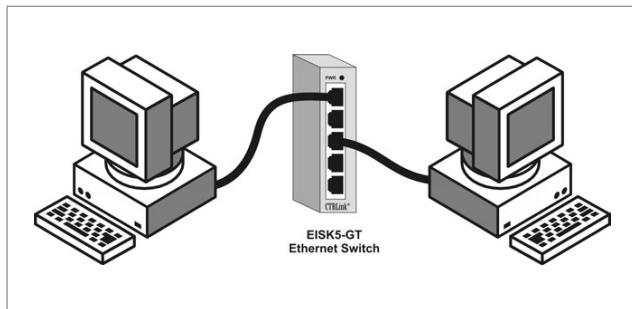


## Power Considerations

Applied voltage must be 10–36 VDC or 24 VAC  $\pm 10\%$  and deliver a current commensurate with power consumption. The recommended size for solid power conductors is 16–20 AWG; and for stranded conductors use 16–18 AWG. Zero volts (COM) is isolated from chassis (earth). Input connections are reverse-polarity protected.



## Typical Switch Installation



## Ordering Information

Model	Description
EISK5-GT	5 ports 10/100/1000 Mbps Skorpion switch

### United States

Contemporary Control  
Systems, Inc.  
2431 Curtiss Street  
Downers Grove, IL 60515  
USA

Tel: +1 630 963 7070  
Fax: +1 630 963 0109

[info@ccontrols.com](mailto:info@ccontrols.com)  
[www.ccontrols.com](http://www.ccontrols.com)

### China

Contemporary Controls  
(Suzhou) Co. Ltd  
11 Huoju Road  
Science & Technology  
Industrial Park  
New District, Suzhou  
PR China 215009

Tel: +86 512 68095866  
Fax: +86 512 68093760

[info@ccontrols.com.cn](mailto:info@ccontrols.com.cn)  
[www.ccontrols.asia](http://www.ccontrols.asia)

### United Kingdom

Contemporary Controls Ltd  
14 Bow Court  
Fletchworth Gate  
Coventry CV5 6SP  
United Kingdom

Tel: +44 (0)24 7641 3786  
Fax: +44 (0)24 7641 3923

[info@ccontrols.co.uk](mailto:info@ccontrols.co.uk)  
[www.ccontrols.eu](http://www.ccontrols.eu)

### Germany

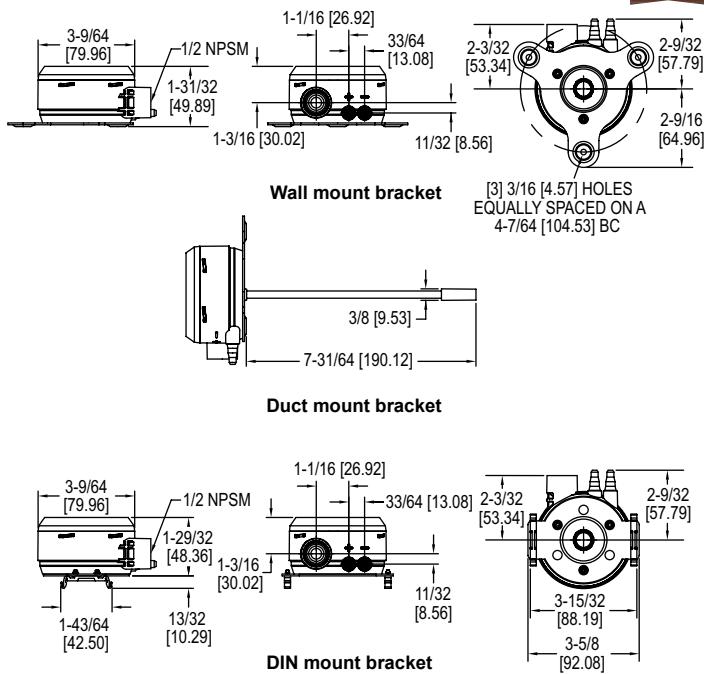
Contemporary Controls  
GmbH  
Fuggerstraße 1 B  
04158 Leipzig  
Germany

Tel: +49 341 520359 0  
Fax: +49 341 520359 16

[info@ccontrols.de](mailto:info@ccontrols.de)  
[www.ccontrols.eu](http://www.ccontrols.eu)

# MAGNESENSE® DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Differential Pressure, Air Velocity, and Volumetric Flow



The **Series MSX MagneSense® Differential Pressure Transmitter** combines the stability and versatility of the original Series MS2 MagneSense® II transmitter for use in building control applications. The MSX simplifies the ordering process to deliver the desired configuration, which reduces product setup time. Pressure ranges are available in Pa, mm w.c., and in w.c. All pressure ranges can be configured in unidirectional or bidirectional modes, providing a total of 32 ranges. The MSX transmitter can provide a linear pressure output or a linear velocity output with the square root extraction from the transmitter. Additional parameters have been included to expand the square root capability for calculating flow. Dual voltage and milliamp output signals can be used to provide both control and equipment output signal verification.

#### BENEFITS/FEATURES

- Read LCD values easier with rotatable 180° display
- Quick and easy wiring via the optional toolless terminal block
- Add safety to variety of applications with UL94 V-0 and plenum ratings

#### APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical/semiconductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

#### SPECIFICATIONS

<b>Service:</b> Air and non-combustible, compatible gases.	<b>Loop Resistance:</b> Current output: 0-2100 Ω max; Voltage output: min. load resistance 1 kΩ.
<b>Wetted Materials:</b> Consult factory.	<b>Current Consumption:</b> 21 mA max continuous.
<b>Accuracy:</b> ±1% FSO.	<b>Electrical Connections:</b> 4-wire removable European style terminal block for 16 to 26 AWG.
<b>Stability:</b> ±1% FSO/year.	<b>Electrical Entry:</b> 1/2" NPS thread.
<b>Temperature Limits:</b> -4 to 158°F (-20 to 70°C).	<b>Display (optional):</b> 4 digit LCD.
<b>Pressure Limits:</b> Ranges 0 and 1: 3.6 psi max operation, 6 psi burst; Ranges 2 and 3: 6 psi max operation, 6 psi burst.	<b>Process Connections:</b> 1/8", 3/16", 1/4", 5 mm, and 6 mm ID flexible tubing.
<b>Power Requirements:</b> 10-36 VDC (2-wire), 17-36 VDC or isolated 21.6-33 VAC (3-wire).	<b>Enclosure Rating:</b> NEMA 4X (IP66), UL 2043 (Plenum), UL94 V-0.
<b>Output Signals:</b> 4-20 mA (2-wire); 0-10 V or 0-5 V selectable (3-wire).	<b>Mounting Orientation:</b> Pressure sensor measurement unaffected by orientation.
<b>Response Time:</b> Instantaneous (default) or 3 s (selectable).	<b>Weight:</b> 8.0 oz (230 g).
<b>Zero and Span Adjustments:</b> Digital push-button.	<b>Agency Approvals:</b> CE.

#### MODEL CHART

Example	MSX	-W	1	3	-IN	-LCD	MSX-W13-IN-LCD
Series	MSX						MagneSense® differential pressure transmitter
Mounting		W U N					Wall mount Universal (wall or duct) mount DIN rail mount
Direction		1 2					Unidirectional Bidirectional
Range		0 1 2 3					.5 in w.c., 125 Pa, 12.5 mm w.c. 1 in w.c., 250 Pa, 25 mm w.c. 5 in w.c., 1250 Pa, 125 mm w.c. 28 in w.c., 7000 Pa, 700 mm w.c.
Pressure Unit			IN PA MM				Inches water column Pascal Millimeters water column
Options				A481 FC FP GLD LCD NIST STX TT WO			Installer kit, includes 2 plastic static pressure tips and 7 ft (2.1m) of PVC tubing Factory calibration certificate Filtered pickup with barb Liquid tight cable gland fitting Liquid crystal display NIST traceable calibration certificate Two (2) plastic static pressure tips Toolless terminal block LCD cover without LCD display

#### OPTIONS

Range	in w.c.	Pa low	Pa high	mm w.c.
Range 0	0.1	25	60	2.5
	0.15	30	75	5
	0.25	40	100	10
	0.5*	50	125*	12*
Range 1	0.1	25	100	2.5
	0.25	40	150	5
	0.5	50	160	10
	1*	60	250*	25*
Range 2	1	250	600	25
	2	300	750	50
	3	400	1000	100
	5*	500	1250*	125*
Range 3	10	1000	3000	250
	15	1500	4000	350
	25	2000	5000	500
	28*	2500	7000*	700*

\*Indicated values are the positive full scale output values per range.

**Note:** Ranges indicated in the table are the high end of the set range.

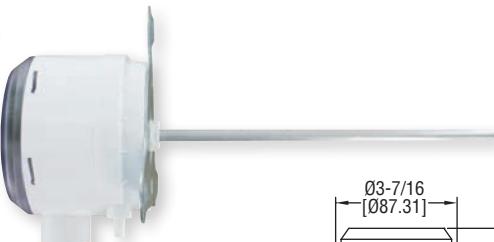
All ranges have a low end pressure value of 0.

#### ACCESSORIES

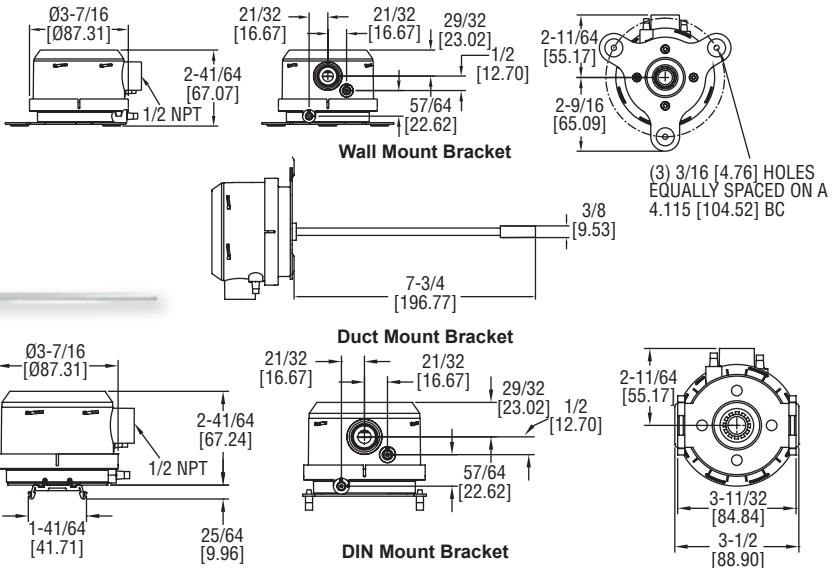
Model	Description
A-480	Plastic static pressure tip
A-481	Installer kit, includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-MSX-LCD	Replacement display for the Series MSX

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications



Scan here  
to watch  
product video



The **SERIES MS2** Magnesense® II Differential Pressure Transmitter combines the proven stable Hall Effect sensing technology of our original Series MS with additional features to reduce installation time and simplify ordering. Like the original Series MS, the second generation transmitter can be used as a linear pressure output or a linear velocity output with the square root extraction done in the transmitter. Additional parameters have been included to expand the square root capability to include flow measurements.

## FEATURES/BENEFITS

- Field selectable ranges and output signal reduce inventory and the chances of ordering an incorrect part
- BACnet or Modbus serial communications reduce wiring cost by daisy-chaining the transmitters
- Our integral field-upgradeable display or plug-in remote display tool save upfront material cost and allow for local viewing of measurements

## APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical-semi-conductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

## MODEL CHART

Model	in w.c.	Pa	mm w.c.	kPa
MS2-W101	0.10, 0.15, 0.25, 0.50	25, 40, 50, 125	2.5, 4, 6, 10	0.025, 0.04, 0.05, 0.125
MS2-W111	±0.10, ±0.15, ±0.25, ±0.50	±25, ±40, ±50, ±125	±2.5, ±4, ±6, ±10	±0.025, ±0.04, ±0.05, ±0.125
MS2-W102	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
MS2-W103	10, 15, 25, 28	2500, 3500, 5000, 6975	250, 350, 500, 697.5	2.5, 3.5, 5.0, 6.975

### Note:

For duct mount static probe change W to D. **Example:** MS2-D101  
For DIN rail mounting change W to N. **Example:** MS2-N101

## OPTIONS

To order add suffix:	Description
-LCD	Units with display
Example: MS2-W101-LCD	
-BC	BACnet Communications
Example: MS2-W101-BC	
-MC	Modbus® Communications
Example: MS2-W101-MC	
-NIST	NIST traceable calibration certificate
Example: MS2-W101-NIST	
-FC	Factory calibration certificate
Example: MS2-W101-FC	

## SPECIFICATIONS

**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, 115200.

**Data Size:** 8.

**Parity:** None.

**Stop Bits:** 1.

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Typical Accuracy:** ±1% FS for 0.15 in w.c. (40 Pa), 0.25 in w.c. (50 Pa), 0.5 in w.c. (100 Pa), 2 in w.c. (500 Pa), 3 in w.c. (750 Pa), 5 in w.c. (1250 Pa), 10 in w.c. (2 kPa), 15 in w.c. (3 kPa), 25 in w.c. (5 kPa), 28 in w.c. (6.975 kPa); ±2% FS for 0.1 in w.c. (25 Pa), 1 in w.c. (250 Pa), and all bi-directional ranges.

**Stability:** ±1% / year FSO.

**Temperature Limits:** 0 to 150°F (-18 to 66°C).

**Pressure Limits:** 1 psi max., operation; 10 psi burst.

**Power Requirements:** 10 to 35 VDC (2-wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).

**Output Signals:** 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).

**Response Time:** Adjustable: 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.

**Zero & Span Adjustments:** Digital push buttons.

**Loop Resistance:** Current output: 0 to 1250 Ω max; Voltage output: Min. load resistance 1 kΩ.

**Current Consumption:** 40 mA max.

**Display (Optional):** 5 digit LCD.

**Electrical Connections:** 3-wire removable European style terminal block for 16 to 22 AWG.

**Electrical Entry:** 1/2" NPS thread.

**Process Connection:** 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

**Enclosure Rating:** IP66.

**Mounting Orientation:** Diaphragm in vertical position.

**Weight:** 8.0 oz (230 g).

**Agency Approvals:** BTL, CE.

## ACCESSORIES

Model	Description
A-151	Cable gland for 5 to 10 mm diameter cable
A-MS2-LCD	Field upgradeable display
A-435-A	Remote display tool
A-480	Plastic static pressure tip
A-481	Installer kit; includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
A-489	4" 303 SS straight static pressure tip with flange
A-302F-A	4" 303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing
SCD-PS	100 to 240 VAC/VDC to 24 VDC power supply

Modbus® is a registered trademark of Schneider Automation, Inc.

**Process Tubing Options:** See page 443 (Gage Tubing Accessories)

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications

**Field Upgradeable LCD.** No need to order two separate transmitters. Simply stock a transmitter and display and you can satisfy any customer's requests. Simply remove cover and snap the LCD onto the board.

**Large Integral LCD.** Second generation MagneSense® has a larger LCD that includes the engineering units. Display also has 5 digits allowing measurements up to 99,999 to be displayed directly.

**Remote Display Tool** reduces instrument cost by eliminating need for each transmitter to have its own display. The buttons on the display tool also provide a means to zero and span the units without reaching into the transmitter.

**Removable Terminal Block** ease installation by allowing for the wiring to be done outside of the housing where the installer has more room.



**Field Selectable Ranges** in metric or English. Lowers stock and inventory requirements. You'll always have the right transmitter for every job.

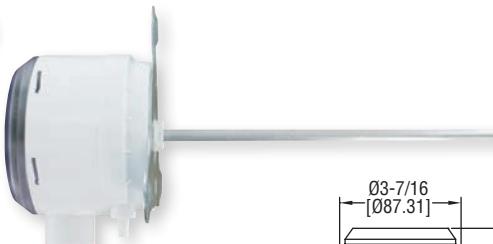
**Digital Push Button Zero and Span.** Reduces calibration time significantly over other transmitters that utilize potentiometers. Lowers maintenance time and costs.

**Field Selectable Air Velocity and Flow Modes** for fan and blower applications. Unit provides square root output that accurately tracks fpm or m/s for velocity measurements. Now area can be programmed to directly display cfm or m<sup>3</sup>/hr for volumetric flow measurements. No need for a smart programmable indicator or PLC to convert pressure to air flow. Reduces components and installation time lowering overall costs.

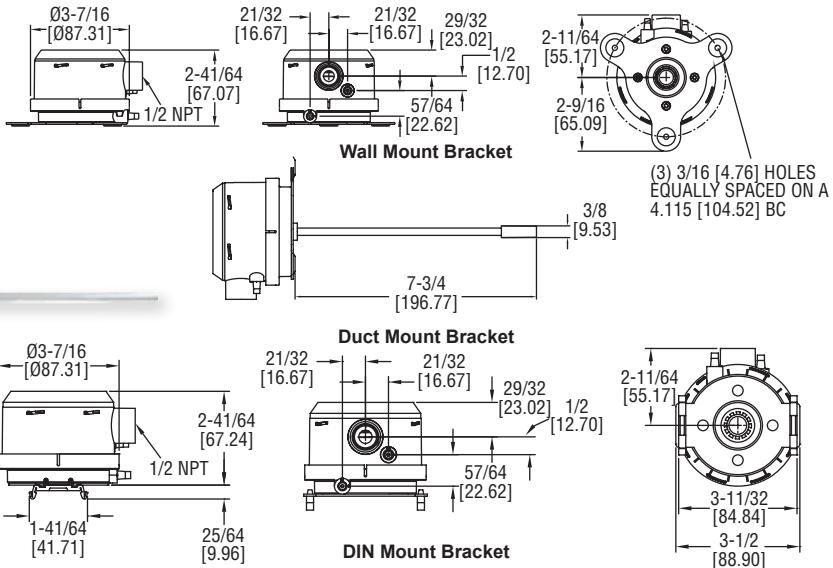
**Simultaneous Current/Voltage Output** reduces inventory by combining 0 to 10 V, 0 to 5 V and 4 to 20 mA models into one model. Both outputs are always present allowing field selection of which signal to use and the other signal can be used for local diagnostic without interrupting system.

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications



Scan here  
to watch  
product video



The **SERIES MS2** Magnesense® II Differential Pressure Transmitter combines the proven stable Hall Effect sensing technology of our original Series MS with additional features to reduce installation time and simplify ordering. Like the original Series MS, the second generation transmitter can be used as a linear pressure output or a linear velocity output with the square root extraction done in the transmitter. Additional parameters have been included to expand the square root capability to include flow measurements.

## FEATURES/BENEFITS

- Field selectable ranges and output signal reduce inventory and the chances of ordering an incorrect part
- BACnet or Modbus serial communications reduce wiring cost by daisy-chaining the transmitters
- Our integral field-upgradeable display or plug-in remote display tool save upfront material cost and allow for local viewing of measurements

## APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical-semi-conductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

## MODEL CHART

Model	in w.c.	Pa	mm w.c.	kPa
<b>MS2-W101</b>	0.10, 0.15, 0.25, 0.50	25, 40, 50, 125	2.5, 4, 6, 10	0.025, 0.04, 0.05, 0.125
<b>MS2-W111</b>	±0.10, ±0.15, ±0.25, ±0.50	±25, ±40, ±50, ±125	±2.5, ±4, ±6, ±10	±0.025, ±0.04, ±0.05, ±0.125
<b>MS2-W102</b>	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
<b>MS2-W103</b>	10, 15, 25, 28	2500, 3500, 5000, 6975	250, 350, 500, 697.5	2.5, 3.5, 5.0, 6.975

### Note:

For duct mount static probe change W to D. **Example:** MS2-D101  
For DIN rail mounting change W to N. **Example:** MS2-N101

## OPTIONS

To order add suffix:	Description
<b>-LCD</b>	Units with display
<b>Example:</b> MS2-W101-LCD	
<b>-BC</b>	BACnet Communications
<b>Example:</b> MS2-W101-BC	
<b>-MC</b>	Modbus® Communications
<b>Example:</b> MS2-W101-MC	
<b>-NIST</b>	NIST traceable calibration certificate
<b>Example:</b> MS2-W101-NIST	
<b>-FC</b>	Factory calibration certificate
<b>Example:</b> MS2-W101-FC	

## SPECIFICATIONS

**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, 115200.

**Data Size:** 8.

**Parity:** None.

**Stop Bits:** 1.

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Typical Accuracy:** ±1% FS for 0.15 in w.c. (40 Pa), 0.25 in w.c. (50 Pa), 0.5 in w.c. (100 Pa), 2 in w.c. (500 Pa), 3 in w.c. (750 Pa), 5 in w.c. (1250 Pa), 10 in w.c. (2 kPa), 15 in w.c. (3 kPa), 25 in w.c. (5 kPa), 28 in w.c. (6.975 kPa); ±2% FS for 0.1 in w.c. (25 Pa), 1 in w.c. (250 Pa), and all bi-directional ranges.

**Stability:** ±1% / year FSO.

**Temperature Limits:** 0 to 150°F (-18 to 66°C).

**Pressure Limits:** 1 psi max., operation; 10 psi burst.

**Power Requirements:** 10 to 35 VDC (2-wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).

**Output Signals:** 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).

**Response Time:** Adjustable: 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.

**Zero & Span Adjustments:** Digital push buttons.

**Loop Resistance:** Current output: 0 to 1250 Ω max; Voltage output: Min. load resistance 1 kΩ.

**Current Consumption:** 40 mA max.

**Display (Optional):** 5 digit LCD.

**Electrical Connections:** 3-wire removable European style terminal block for 16 to 22 AWG.

**Electrical Entry:** 1/2" NPS thread.

**Process Connection:** 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

**Enclosure Rating:** IP66.

**Mounting Orientation:** Diaphragm in vertical position.

**Weight:** 8.0 oz (230 g).

**Agency Approvals:** BTL, CE.

## ACCESSORIES

Model	Description
<b>A-151</b>	Cable gland for 5 to 10 mm diameter cable
<b>A-MS2-LCD</b>	Field upgradeable display
<b>A-435-A</b>	Remote display tool
<b>A-480</b>	Plastic static pressure tip
<b>A-481</b>	Installer kit; includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
<b>A-489</b>	4" 303 SS straight static pressure tip with flange
<b>A-302F-A</b>	4" 303 SS static pressure tip with mounting flange; for 3/16" ID rubber or plastic tubing
<b>SCD-PS</b>	100 to 240 VAC/VDC to 24 VDC power supply

Modbus® is a registered trademark of Schneider Automation, Inc.

**Process Tubing Options:** See page 443 (Gage Tubing Accessories)

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications

**Field Upgradeable LCD.** No need to order two separate transmitters. Simply stock a transmitter and display and you can satisfy any customer's requests. Simply remove cover and snap the LCD onto the board.

**Large Integral LCD.** Second generation MagneSense® has a larger LCD that includes the engineering units. Display also has 5 digits allowing measurements up to 99,999 to be displayed directly.

**Remote Display Tool** reduces instrument cost by eliminating need for each transmitter to have its own display. The buttons on the display tool also provide a means to zero and span the units without reaching into the transmitter.

**Removable Terminal Block** ease installation by allowing for the wiring to be done outside of the housing where the installer has more room.



**Field Selectable Ranges** in metric or English. Lowers stock and inventory requirements. You'll always have the right transmitter for every job.

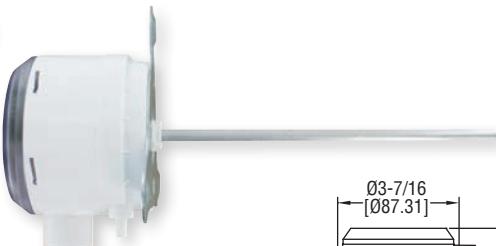
**Digital Push Button Zero and Span.** Reduces calibration time significantly over other transmitters that utilize potentiometers. Lowers maintenance time and costs.

**Field Selectable Air Velocity and Flow Modes** for fan and blower applications. Unit provides square root output that accurately tracks fpm or m/s for velocity measurements. Now area can be programmed to directly display cfm or m<sup>3</sup>/hr for volumetric flow measurements. No need for a smart programmable indicator or PLC to convert pressure to air flow. Reduces components and installation time lowering overall costs.

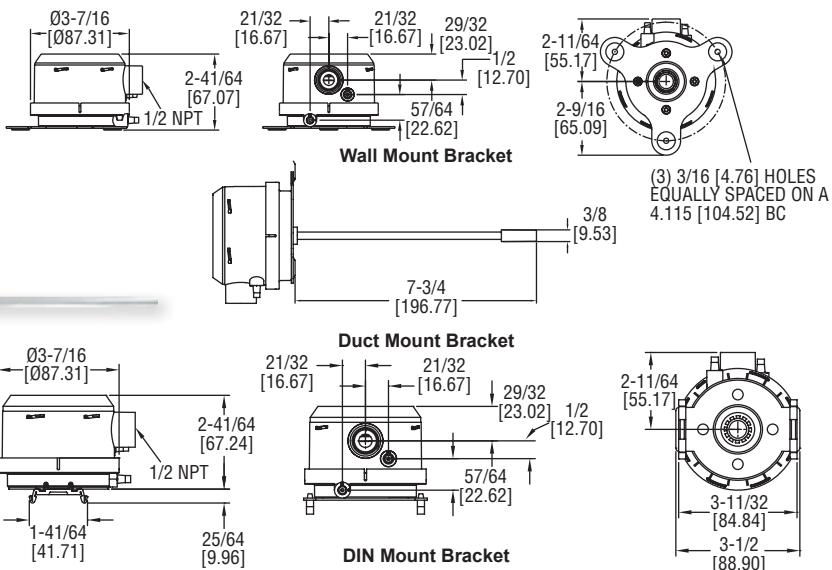
**Simultaneous Current/Voltage Output** reduces inventory by combining 0 to 10 V, 0 to 5 V and 4 to 20 mA models into one model. Both outputs are always present allowing field selection of which signal to use and the other signal can be used for local diagnostic without interrupting system.

# MAGNESENSE® II DIFFERENTIAL PRESSURE TRANSMITTER

Monitors Pressure, Air Velocity & Air Flow, BACnet/Modbus® Communications



Scan here  
to watch  
product video



The **SERIES MS2** Magnesense® II Differential Pressure Transmitter combines the proven stable Hall Effect sensing technology of our original Series MS with additional features to reduce installation time and simplify ordering. Like the original Series MS, the second generation transmitter can be used as a linear pressure output or a linear velocity output with the square root extraction done in the transmitter. Additional parameters have been included to expand the square root capability to include flow measurements.

## FEATURES/BENEFITS

- Field selectable ranges and output signal reduce inventory and the chances of ordering an incorrect part
- BACnet or Modbus serial communications reduce wiring cost by daisy-chaining the transmitters
- Our integral field-upgradeable display or plug-in remote display tool save upfront material cost and allow for local viewing of measurements

## APPLICATIONS

- Filter monitoring in air handler units
- Building pressure in pharmaceutical-semi-conductor clean rooms
- Duct static pressure in commercial buildings
- Air velocity/flow in VAV systems

## MODEL CHART

Model	in w.c.	Pa	mm w.c.	kPa
<b>MS2-W101</b>	0.10, 0.15, 0.25, 0.50	25, 40, 50, 125	2.5, 4, 6, 10	0.025, 0.04, 0.05, 0.125
<b>MS2-W111</b>	±0.10, ±0.15, ±0.25, ±0.50	±25, ±40, ±50, ±125	±2.5, ±4, ±6, ±10	±0.025, ±0.04, ±0.05, ±0.125
<b>MS2-W102</b>	1, 2, 3, 5	250, 500, 750, 1250	25, 50, 75, 125	0.25, 0.5, 0.75, 1.25
<b>MS2-W103</b>	10, 15, 25, 28	2500, 3500, 5000, 6975	250, 350, 500, 697.5	2.5, 3.5, 5.0, 6.975

### Note:

For duct mount static probe change W to D. **Example:** MS2-D101  
For DIN rail mounting change W to N. **Example:** MS2-N101

## OPTIONS

To order add suffix:	Description
-LCD	Units with display
Example: MS2-W101-LCD	
-BC	BACnet Communications
Example: MS2-W101-BC	
-MC	Modbus® Communications
Example: MS2-W101-MC	
-NIST	NIST traceable calibration certificate
Example: MS2-W101-NIST	
-FC	Factory calibration certificate
Example: MS2-W101-FC	

## SPECIFICATIONS

**Supported Baud Rates:** 9600, 19200, 38400, 57600, 76800, 115200.

**Data Size:** 8.

**Parity:** None.

**Stop Bits:** 1.

**Service:** Air and non-combustible, compatible gases.

**Wetted Materials:** Consult factory.

**Typical Accuracy:** ±1% FS for 0.15 in w.c. (40 Pa), 0.25 in w.c. (50 Pa), 0.5 in w.c. (100 Pa), 2 in w.c. (500 Pa), 3 in w.c. (750 Pa), 5 in w.c. (1250 Pa), 10 in w.c. (2 kPa), 15 in w.c. (3 kPa), 25 in w.c. (5 kPa), 28 in w.c. (6.975 kPa); ±2% FS for 0.1 in w.c. (25 Pa), 1 in w.c. (250 Pa), and all bi-directional ranges.

**Stability:** ±1% / year FSO.

**Temperature Limits:** 0 to 150°F (-18 to 66°C).

**Pressure Limits:** 1 psi max., operation; 10 psi burst.

**Power Requirements:** 10 to 35 VDC (2-wire), 17 to 36 VDC or isolated 21.6 to 33 VAC (3-wire).

**Output Signals:** 4 to 20 mA (2-wire), 0 to 5 VDC, 0 to 10 VDC (3-wire).

**Response Time:** Adjustable: 0.5 to 15 sec. time constant. Provides a 95% response time of 1.5 to 45 seconds.

**Zero & Span Adjustments:** Digital push buttons.

**Loop Resistance:** Current output: 0 to 1250 Ω max; Voltage output: Min. load resistance 1 kΩ.

**Current Consumption:** 40 mA max.

**Display (Optional):** 5 digit LCD.

**Electrical Connections:** 3-wire removable European style terminal block for 16 to 22 AWG.

**Electrical Entry:** 1/2" NPS thread.

**Process Connection:** 3/16" ID tubing (5 mm ID); Max. OD 9 mm.

**Enclosure Rating:** IP66.

**Mounting Orientation:** Diaphragm in vertical position.

**Weight:** 8.0 oz (230 g).

**Agency Approvals:** BTL, CE.

## ACCESSORIES

Model	Description
<b>A-151</b>	Cable gland for 5 to 10 mm diameter cable
<b>A-MS2-LCD</b>	Field upgradeable display
<b>A-435-A</b>	Remote display tool
<b>A-480</b>	Plastic static pressure tip
<b>A-481</b>	Installer kit; includes 2 plastic static pressure tips and 7 ft (2.1 m) of PVC tubing
<b>A-489</b>	4" 303 SS straight static pressure tip with flange
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**Process Tubing Options:** See page 443 (Gage Tubing Accessories)

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## CUSTOM MOUNTING BRACKETS

- Heavy-duty construction
- Easy installation
- For walls and outside corners
- Replaces unsightly and hazardous makeshift supports
- 1/2-inch, 3/4-inch and 1-inch NPT pipe mount
- Indoor and outdoor use
- Type 3R

# Mounting Kits

Models **LWMB2** and **LCMB2**

Federal Signal's Models LWMB2 and LCMB2 mounting brackets are specifically designed for use with Federal Signal's stationary warning lights to provide an easy and consistent means of mounting lights throughout a facility.

Federal Signal's Models LWMB2 and LCMB2 are constructed of durable cast aluminum and sealed with gray powder coat paint. Easy to install, these units can be wired through the back of the bracket for electrical box mounting or through the threaded hole in the base for external 1/2-inch conduit connection. Each kit includes a bracket, plate and mounting screws.

Easy installation, heavy-duty construction and a professional appearance make the brackets suitable for use in commercial, institution and industrial environments.

These brackets are suitable for any Type 3R application in ordinary (non Division 1/Division 2) environments.

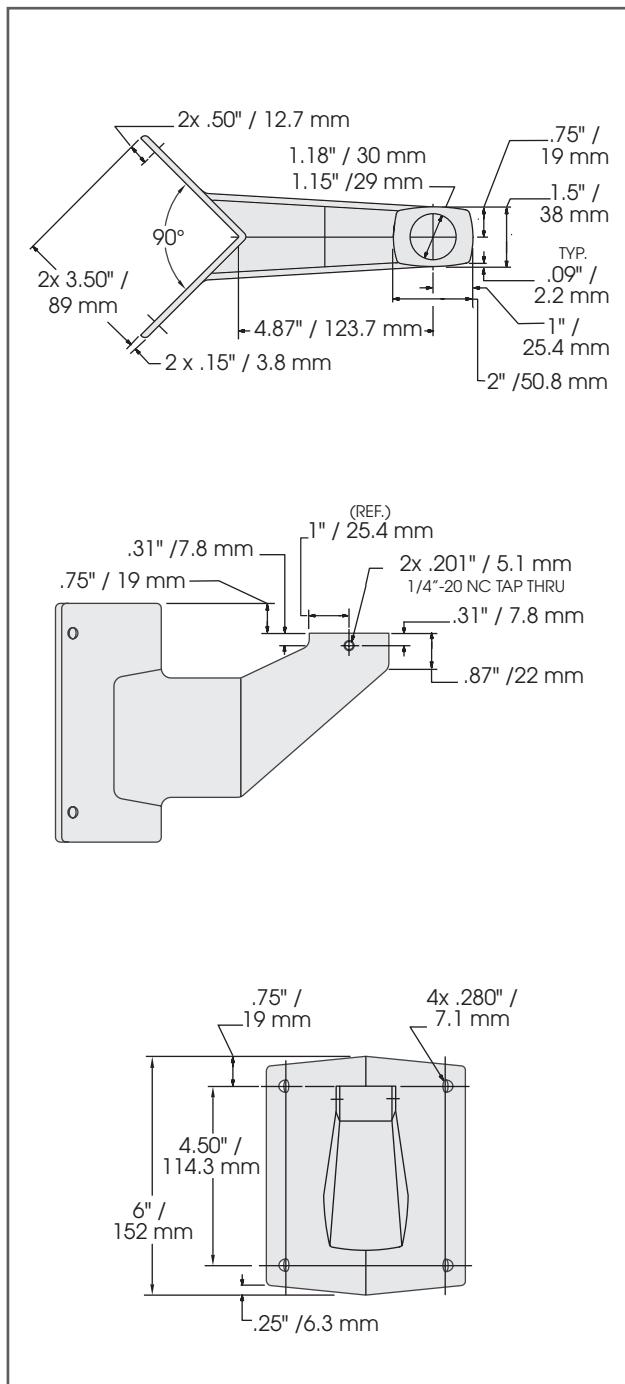
The LCMB2 and LWMB2 mounting kits may be used with the following Federal Signal models: 121S, 131ST, 131DST, 131C, 141(120V), 141ST, 225, 371, 371L, 371ST, 371DST, AV1, AV1ST, FB2PST and the FB24ST.

Model	Height	Width	Extension	Net Weight	Shipping Weight
<b>LWMB2</b>	6.0"	6.375"	5.875"	2.6 lbs.	2.95 lbs.
<b>LCMB2</b>	6.0"	5.000"	5.750"	2.3 lbs.	2.50 lbs.

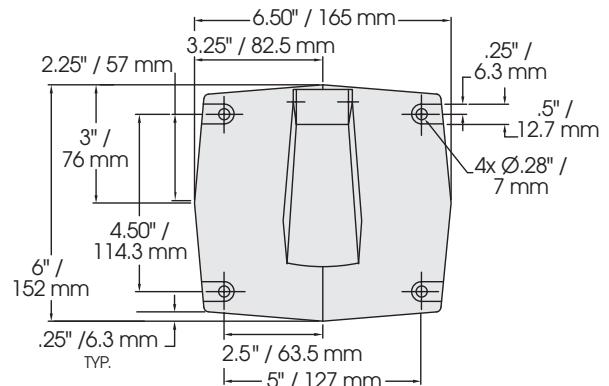
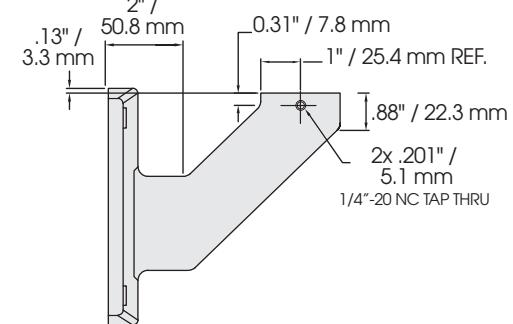
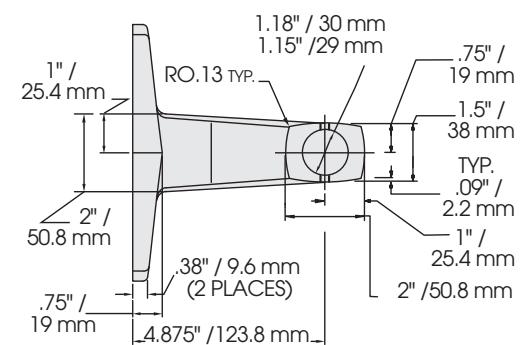


## MOUNTING KITS (LWMB2/LCMB2)

### LCMB2 - Corner Mount



### LWMB2 - Wall Mount



### HOW TO ORDER

- Specify model
  - Corner Bracket (LCMB2)
  - Wall Bracket (LWMB2)



► Model AV1-LED

## LED Flashing Combination Audible/Visual Signal

**A** **B** **C** **G** **R**

Model AV1-LED is a combination audible/visual signal. The AV1-LED features a 100% polycarbonate housing that is rated for Type 3R rain-tight applications.

All AV1-LED units feature a unique twist-and-lock dome design to allow for tool-free access to the LED. The fresnel lensing provides superior visibility in all directions.

The integrated buzzer provides 85 dBA output @ 10 feet (95 dBA @ 1 meter). The unit is capable of independent flashing light and sounder operation. The LED can be field adjusted to two flash patterns, 60 FPM or 75 FPM, via a jumper on the PC board.

Each unit is factory assembled with two color-coded leads. If desired, the user can remove the leads and connect directly to the terminal block located in the base of the unit.

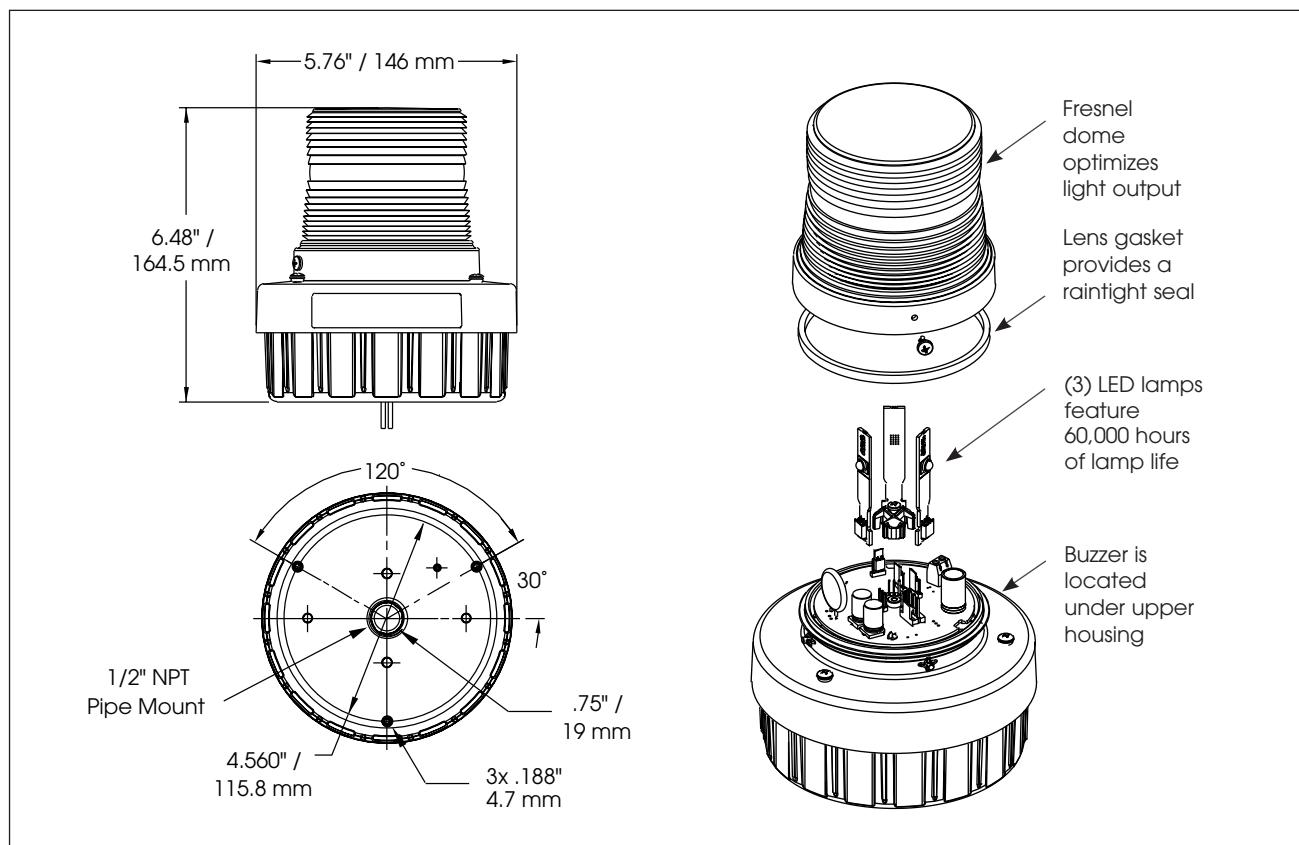
### FEATURES

- Available in 24VDC and 120VAC
- 50,000 hour LED light source
- Surface mount, integrated 1/2-inch NPT pipe mount, and 4-inch electrical box mount
- Five lamp/lens colors: Amber, Blue, Clear, Green and Red
- Twist-off lens for easy access
- Internal buzzer produces 85 dBA at 10' (95 dBA @ 1m)
- PLC compatible
- Type 3R enclosure
- UL and cUL Listed

MODEL	VOLTAGE	OPERATING CURRENT	FLASH RATE/ MINUTE	DECIBELS 10'	DECIBELS 1M	MOUNT
<b>AV1-LED-024 *</b>	24VDC	0.27 amps	60/75	85	95	1/2" NPT Pipe/Surface
<b>AV1-LED-120 *</b>	120VAC	0.03 amps	60/75	85	85	1/2" NPT Pipe/Surface

\* Indicates color: (A) Amber, (B) Blue, (C) Clear, (G) Green or (R) Red

## Audible/Visual Signaling Device (AV1-LED)



## S P E C I F I C A T I O N S

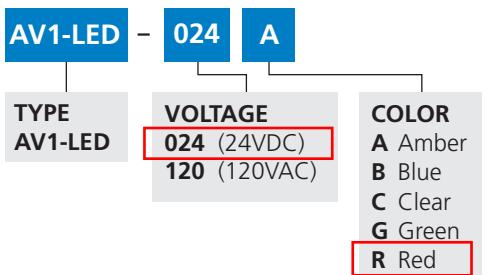
Lamp Life:	50,000 Hours	
Light Source:	LED	
Operating Temperature:	-31°F to 150°F	-35°C to 66°C
Net Weight:	1.25 lbs	0.57 kg
Shipping Weight:	1.75 lbs	0.8 kg
Height:	6.48"	164.5 mm
Diameter:	5.76"	146 mm

## R E P L A C E M E N T P A R T S

Description	Part Number
Dome Kit, Amber <sup>1</sup>	K8550292A-02
Dome Kit, Blue <sup>1</sup>	K8550292A-01
Dome Kit, Clear <sup>1</sup>	K8550292A
Dome Kit, Green <sup>1</sup>	K8550292A-04
Dome Kit, Red <sup>1</sup>	K8550292A-03
Buzzer, 24VDC	K8591002A-03
Buzzer, 120VAC	K8591002A
Amber LED	K2005633A-A
Blue LED	K2005633A-B
Green LED	K2005633A-G
Red LED	K2005633A-R
White LED	K2005633A-W

<sup>1</sup> Includes 1 lens gasket and 1 surface mount gasket

## H O W T O O R D E R



## O P T I O N A L A C C E S S O R I E S

Description	Part Number
Corner Bracket	LCMB2*
Wall Bracket	LWMB2*
Hazardous Location Mounting Bracket	LHWB

\* Rated for NEMA 3R installations

Mounting Brackets shown on pages 128-131



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Russiaville, IN 46979  
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## RIBU1C | Enclosed Relay 10 Amp SPDT with 10-30 Vac/dc/120 Vac Coil



### SPECIFICATIONS

# Relays & Contact Type: One (1) SPDT Continuous Duty Coil  
Expected Relay Life: 10 million cycles minimum mechanical  
Operating Temperature: -30 to 140° F  
Operate Time: 20ms  
Relay Status: LED On = Activated  
Dimensions: 1.70" x 2.80" x 1.50" with .50" NPT nipple  
Wires: 16", 600V Rated  
Approvals: UL Listed, UL916, UL864, C-UL  
California State Fire Marshal, CE  
Housing Rating: Plenum, NEMA 1  
Gold Flash: Yes  
Override Switch: No

### Contact Ratings:

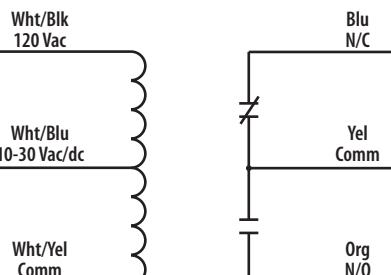
10 Amp Resistive @ 120-277 Vac  
10 Amp Resistive @ 28 Vdc  
480 VA Pilot Duty @ 240-277 Vac  
480 VA Ballast @ 277 Vac  
600 Watt Tungsten @ 120 Vac N/O  
240 Watt Tungsten @ 120 Vac N/C  
1/3 HP for N/O @ 120-240 Vac  
1/6 HP for N/C @ 120-240 Vac  
1/4 HP for N/O @ 277 Vac  
1/8 HP for N/C @ 277 Vac

### Coil Current:

30 mA @ 10 Vac	12 mA @ 10 Vdc
32 mA @ 12 Vac	14 mA @ 12 Vdc
42 mA @ 24 Vac	16 mA @ 24 Vdc
50 mA @ 30 Vac	18 mA @ 30 Vdc
25 mA @ 120 Vac	

### Coil Voltage Input:

10-30 Vac/dc ; 120 Vac ; 50-60 Hz  
Drop Out = 2.1 Vac / 2.8 Vdc  
Pull In = 9 Vac / 10 Vdc



## NOTES



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[www.FunctionalDevices.com](http://www.FunctionalDevices.com)  
sales@FunctionalDevices.com



Made in USA  
Meets  
"Buy American"  
of ARRA 2009

#### SPECIFICATIONS

Operating Temperature: -30 to 140° F  
Humidity Range: 5 to 95% (noncondensing)  
Circuit Breaker: 10 Amp Max.  
Dimensions: 4.000" x 3.250" x 1.750"  
Track Mount: 3.250" x 4.000"  
MT4-4N Mounting Track Included  
Approvals: UL Listed, UL916, C-UL, CE, RoHS

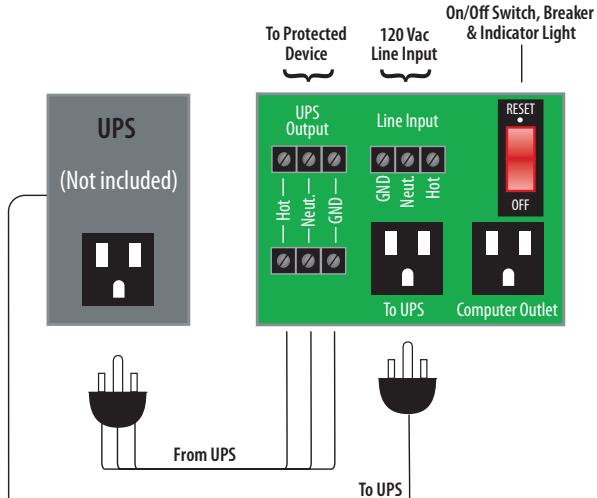
#### Notes:

- » Circuit breaker for short protection.
- » 14/3 Line Cord included (6').
- » Use with UPS devices rated 1000 VA or less.
- » UPS is not included.

### UPS Interface Module

#### PSM2RB10

4.00" Track Mount Power Control Center, with 10 Amp Switch / Circuit Breaker, Two (2) 120 Vac Outlets, Terminals, 120 Vac Input. (No Status Contacts)



### Notes



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## → TR100VA002

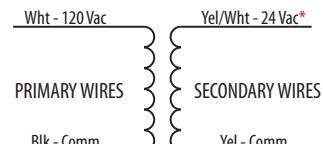
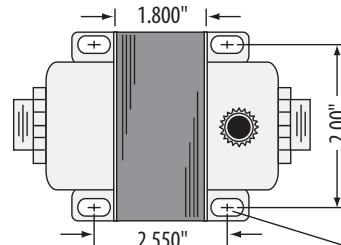
### TRANSFORMER

Transformer 100 VA, 120 to 24 Vac, Circuit Breaker, Foot and Dual Threaded Hub Mount



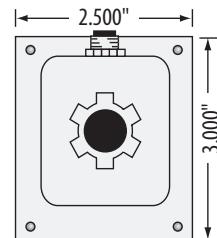
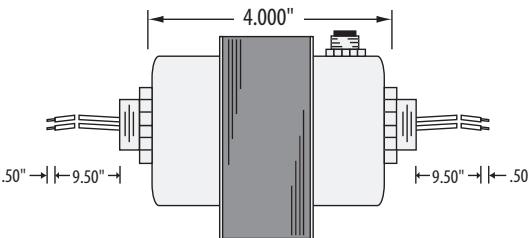
#### ■ SPECIFICATIONS

VA Rating: 100  
Frequency: 50/60 Hz  
Mounting: Foot & Dual Threaded Hubs  
Over Current Protection: Circuit Breaker  
Dimensions: 3.000" x 2.500" x 4.000"  
(w/.500" NPT Hubs)  
Wire Length: 9.5' Typical w/.5" Strip  
Operating Temperature: -30 to 140° F  
MTBF: 100,000 Hours @ 77° F  
Construction: Split-Bobbin  
Weight: 4.13 lbs.  
Approvals: Class II UL1585 Listed, C-UL, CE, RoHS



\*Secondary Yel/Wht wire in phase with Primary Blk wire.

Mounting Hole = .350" x .175"



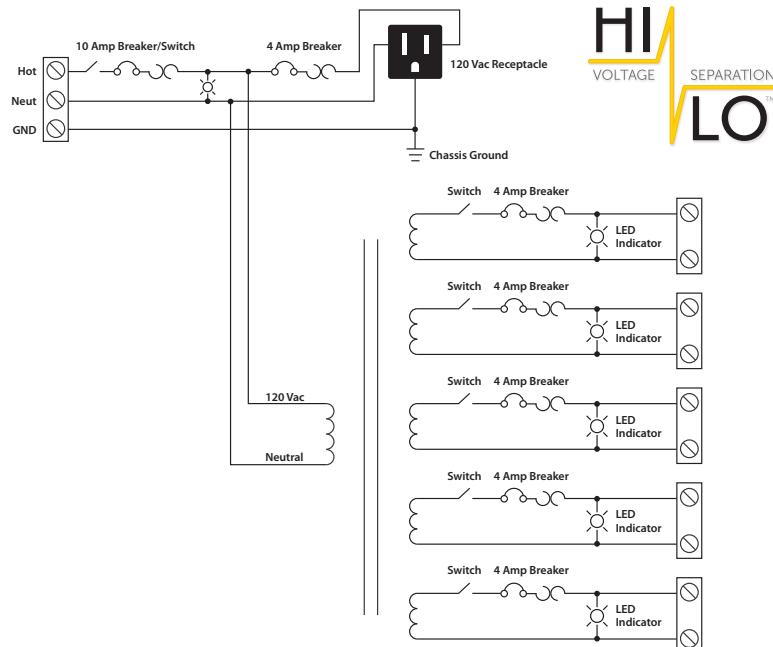
## NOTES



## AC POWER SUPPLY

### → PSH500AB10-LVC

Enclosed 500VA Power Supply, **High/Low Voltage Separation** with Five 100VA Class 2 Outputs, 120 Vac to 24 Vac with 120 Vac Receptacle



**UL LISTED**  
Class 2

**Made in USA**  
Meets  
"Buy American"  
of ARRA 2009

**POWER SUPPLIES**



PSH500AB10-LVC  
Shown With High Voltage  
Cover & Low Voltage  
Access Plate

## SPECIFICATIONS

**Transformer:** One (1) 500 VA  
**Over Current Protection:** Circuit Breaker  
**Primary:** 120 Vac  
**Frequency:** 50/60 Hz  
**Main Breaker ON/OFF:** Switch / Breaker (10 Amp)  
(Kills power to entire unit:  
1 Outlet & Transformer)  
**Approvals:** Class 2 (UL Approved UL5085-3),  
UL916, C-UL  
**Dimensions:** 12.125" x 12.125" x 6.000"  
**Housing:** NEMA1 Metal Enclosure with  
high/low separation  
**Weight:** 32.30 lbs.

**5 Secondaries:**  
24 Vac, with LED Indicators  
4 Amp breaker for each output

**24 Vac ON/OFF:**  
On / Off Switch & Breaker

**Input:**  
120 Vac **Finger-Safe Terminals**, 8-18 AWG

**Output:**  
5 Ungrounded, Isolated, 100 VA Class 2,  
24 Vac Outputs. Removable Terminals  
accept 16-22 AWG wire.

**Ambient Temperature Derating:**  
4A up to 40° C; 3A up to 50° C; 2A up to 55° C  
(When All 5 Outputs Operated Simultaneously)

**Standby Wattage:**  
48.515 W @ 120 Vac

**Full Load Primary Current:**  
4.66 A @ 120 Vac

**Secondary Output Voltage vs. Load:**  
24.0 V @ 1 Amp  
23.0 V @ 2 Amp  
21.8 V @ 3 Amp  
21.1 V @ 4 Amp

- When all 5 outputs operated simultaneously, at room temperature

**Notes:**  
• 4A (Breaker protected) Convenience  
Receptacle Provided

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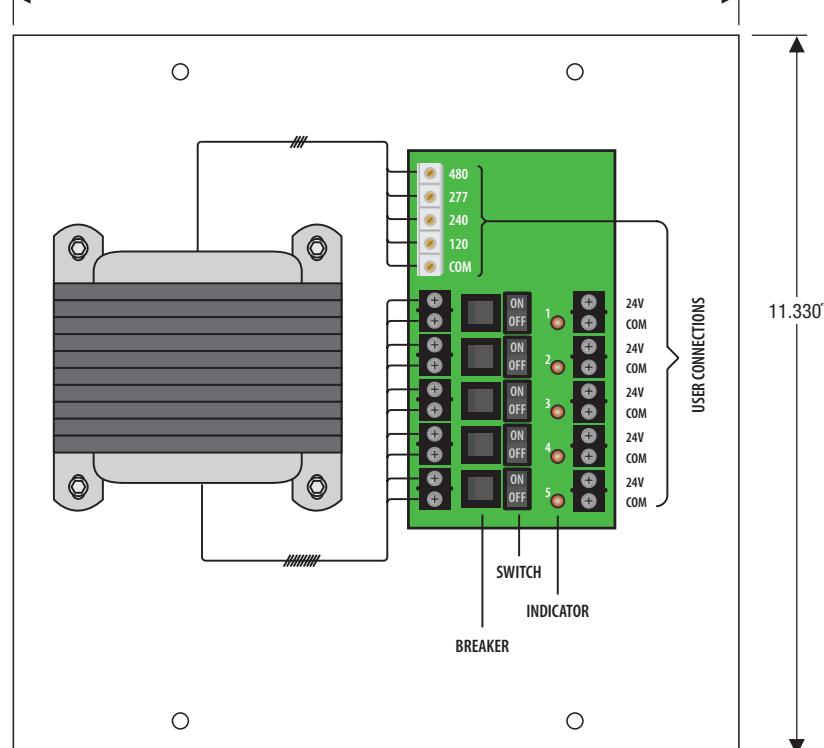


### AC Power Supply

#### PSH500A

Enclosed 500VA Power Supply with Five 100VA Class 2 Outputs, 480/277/240/120 Vac to 24 Vac

11.400"



### SPECIFICATIONS

Transformer: One (1) 500 VA  
Over Current Protection: Circuit Breaker  
Primary: 480/277/240/120 Vac  
Frequency: 50/60 Hz  
Dimensions: 12.125" x 12.125" x 6.000" (PSH500A)  
11.330" x 11.400" x 5.000" (PSMN500A)  
Approvals: Class 2 UL Listed, UL916, UL508, C-UL, CE, RoHS  
Sub-Panel: Plenum Rated Polymetal Sub-Panel  
Housing: NEMA1 Metal Enclosure  
Weight: 30.16 lbs. (PSH500A)  
20.60 lbs. (PSMN500A)

5 Secondaries:  
24 Vac, with LED Indicators

24 Vac ON/OFF:  
On / Off Switch & Breaker

Input:  
480/277/240/120 Vac Finger-Safe Terminals, 10-26 AWG

Output:  
5 Isolated 100 VA Class 2 24 Vac Terminals, 12-26 AWG

Notes:  
» To order UL508, add "-IC" to end of model number.

Standby Wattage:

48.515 W @ 120 Vac

48.699 W @ 240 Vac

49.564 W @ 277 Vac

48.255 W @ 480 Vac

Full Load Primary Current:

4.66 A @ 120 Vac

2.41 A @ 240 Vac

2.06 A @ 277 Vac

1.17 A @ 480 Vac

Ambient Temperature Derating:

4A up to 40° C ; 3A up to 50° C ; 2A up to 55° C  
(When All 5 Outputs Operated Simultaneously)

**Great for VAV Applications**



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## PSM24A24DAS | 4.00" & 2.75" Track Mount Isolated Linear DC Power Supply, 24 Vac to 1.5-28 Vdc, 300 mA Adjustable Output



### ■ SPECIFICATIONS

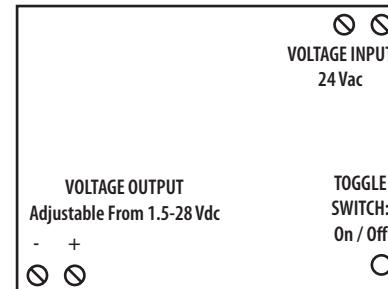
**Voltage Input:** 24 Vac  
**Voltage Output:** 1.5 - 28 Vdc Isolated  
**Frequency:** 50/60 Hz  
**Overload Protection:** Electrical and Thermal, Auto-Reset  
**Operating Temperature:** -30 to 140° F  
**Status:** LED On = Activated  
**Dimensions:** 1.625" x 2.750" x 4.000"  
**Track Mount:** 4.000" and 2.750"  
 MT212-4 Mounting Track Supplied  
**Weight:** 1.10 lbs.  
**ON/OFF Switch:** 2 Position Toggle  
**Approvals:** Class II UL Listed, UL916, C-UL, CE

**Output Current Ratings:**  
116 mA @ 10 Vdc  
125 mA @ 12 Vdc  
300 mA @ 24 Vdc

**Input Current Rating:**  
950 mA Maximum

**Percent Ripple:**  
0.0016%, 24 Vdc @ 300 mA

**Regulation:**  
Load: 0.04% No Load to Full Load  
Line: 0.0080 mV/V



## NOTES

**Small Enclosure, Hinge, No Backplate**

ATS BOM Tag	MAN PART #
EN-03A	A-HE 8X6X4
EN-06	A-HE10X10X4
EN-08	A-HE12X12X4
EN-09	A-HE16X12X4

## Hinged Cover Cutout Boxes



### Application

Designed for use as a surface-mounted junction box, service box, switch box, and cutout box.

### Features

- Various sizes of easily-removable concentric knockouts on all four sides

### Construction

- 16 gauge or 14 gauge steel
- Butt hinges
- Mounting holes on back of box
- Provision for grounding

### Finish

ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces.

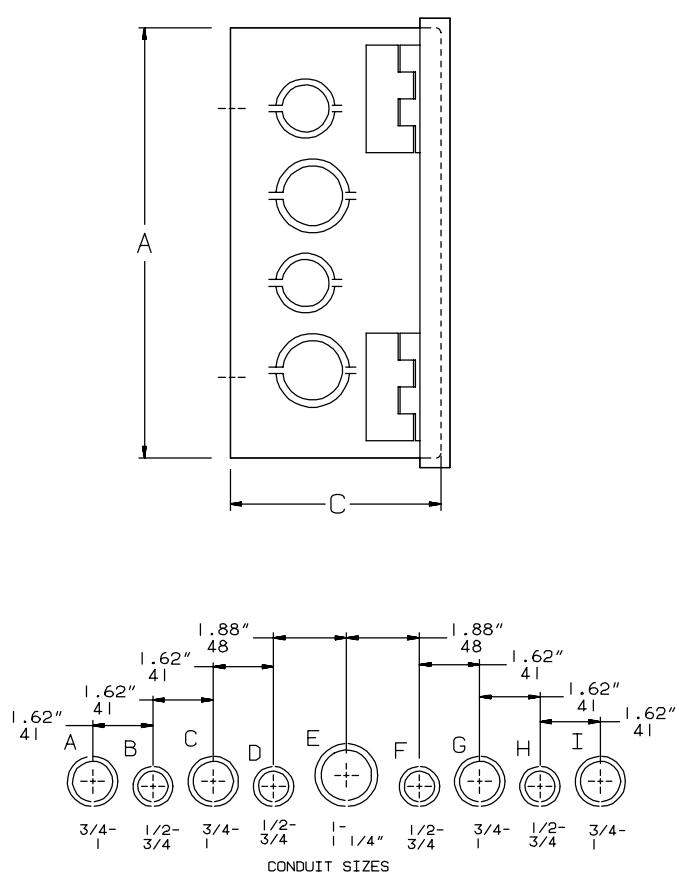
Unless otherwise specified, all custom cutout boxes are finished with ANSI 61 gray polyester paint.

### Industry Standards

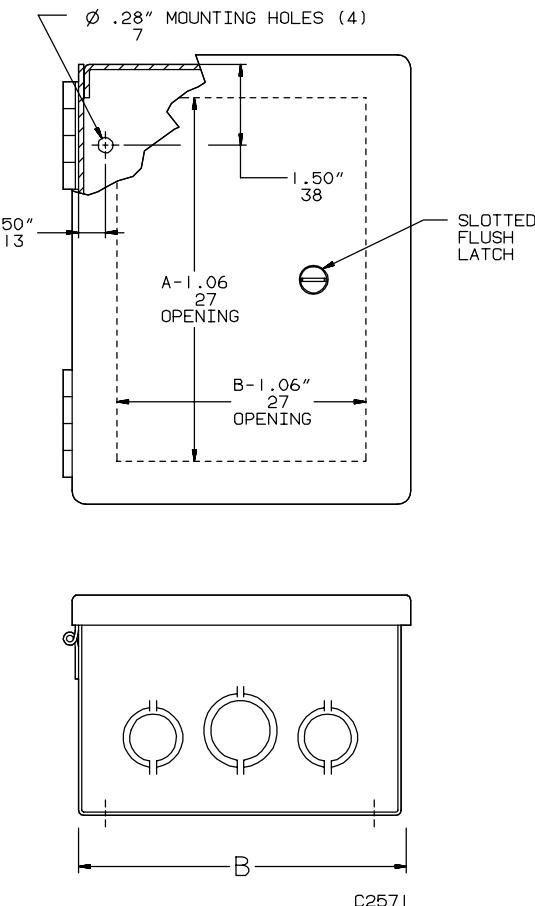
- UL 50, File No. E27567: Type I  
 NEMA/EEMAC Type I  
 CSA, File No. LL42184: Type I  
 IEC 60529, IP30

### Accessories

- Cylinder Lock Kit  
 Grounding Device  
 Padlock Kit  
 "T" Handle Latch Kit  
 Touch-Up Paint (ATPPY61)



**Knockout Pattern**  
 (from outside of box)



NOTE: Refer to Table for applicable knockout pattern.

**Hinged Cover Cutout Boxes****Standard Sizes Hinged Cover Cutout Boxes**

Catalog Number	Box Size A x B x C inch	Box Size A x B x C mm	Knockout Pattern along "A" Sides      "B" Sides	
AHE6X6X4	6.00 x 6.00 x 4.00	152 x 152 x 102	BCD	BCD
AHE6X4X4	6.00 x 4.00 x 4.00	152 x 102 x 102	BCD	BCD
AHE8X6X4	8.00 x 6.00 x 4.00	203 x 152 x 102	FGHI	BCD
AHE8X8X4	8.00 x 8.00 x 4.00	203 x 203 x 102	FGHI	FGHI
AHE10X8X4	10.00 x 8.00 x 4.00	254 x 203 x 102	FGHI	FGHI
AHE10X10X4	10.00 x 10.00 x 4.00	254 x 254 x 102	FGHI	CDEFG
AHE12X8X4	12.00 x 8.00 x 4.00	305 x 203 x 102	CDEFG	FGHI
AHE12X10X4	12.00 x 10.00 x 4.00	305 x 254 x 102	CDEFG	CDEFG
AHE12X12X4	12.00 x 12.00 x 4.00	305 x 305 x 102	CDEFG	CDEFG
AHE16X12X4	16.00 x 12.00 x 4.00	406 x 305 x 102	BCDEFGH	CDEFG
AHE18X12X4	18.00 x 12.00 x 4.00	457 x 305 x 102	ABCDEFHGI	CDEFG
AHE6X6X6	6.00 x 6.00 x 6.00	152 x 152 x 152	BCD	BCD
AHE8X8X6	8.00 x 8.00 x 6.00	203 x 203 x 152	FGHI	FGHI
AHE10X8X6	10.00 x 8.00 x 6.00	254 x 203 x 152	FGHI	FGHI
AHE10X10X6	10.00 x 10.00 x 6.00	254 x 254 x 152	FGHI	CDEFG
AHE12X10X6	12.00 x 10.00 x 6.00	305 x 254 x 152	CDEFG	CDEFG
AHE12X12X6	12.00 x 12.00 x 6.00	305 x 305 x 152	CDEFG	CDEFG
AHE16X12X6	16.00 x 12.00 x 6.00	406 x 305 x 152	BCDEFGH	CDEFG
AHE16X16X6	16.00 x 16.00 x 6.00	406 x 406 x 152	BCDEFGH	BCDEFGH
AHE18X12X6	18.00 x 12.00 x 6.00	457 x 305 x 152	ABCDEFHGI	CDEFG
AHE18X18X6	18.00 x 18.00 x 6.00	457 x 457 x 152	ABCDEFHGI	ABCDEFHGI
AHE24X18X6	24.00 x 18.00 x 6.00	610 x 457 x 152	ABCDEFHGI	ABCDEFHGI
AHE24X24X6	24.00 x 24.00 x 6.00	610 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE30X24X6	30.00 x 24.00 x 6.00	762 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE36X24X6	36.00 x 24.00 x 6.00	914 x 610 x 152	ABCDEFHGI	ABCDEFHGI
AHE36X24X8	36.00 x 24.00 x 8.00	914 x 610 x 203	ABCDEFHGI	ABCDEFHGI

**Small Enclosure, Hinge, No Backplate**

ATS BOM Tag	MAN PART #
EN-03A	A-HE 8X6X4
EN-06	A-HE10X10X4
EN-08	A-HE12X12X4
EN-09	A-HE16X12X4

## Hinged Cover Cutout Boxes



### Application

Designed for use as a surface-mounted junction box, service box, switch box, and cutout box.

### Features

- Various sizes of easily-removable concentric knockouts on all four sides

### Construction

- 16 gauge or 14 gauge steel
- Butt hinges
- Mounting holes on back of box
- Provision for grounding

### Finish

ANSI 61 gray polyester powder paint finish inside and out over phosphatized surfaces.

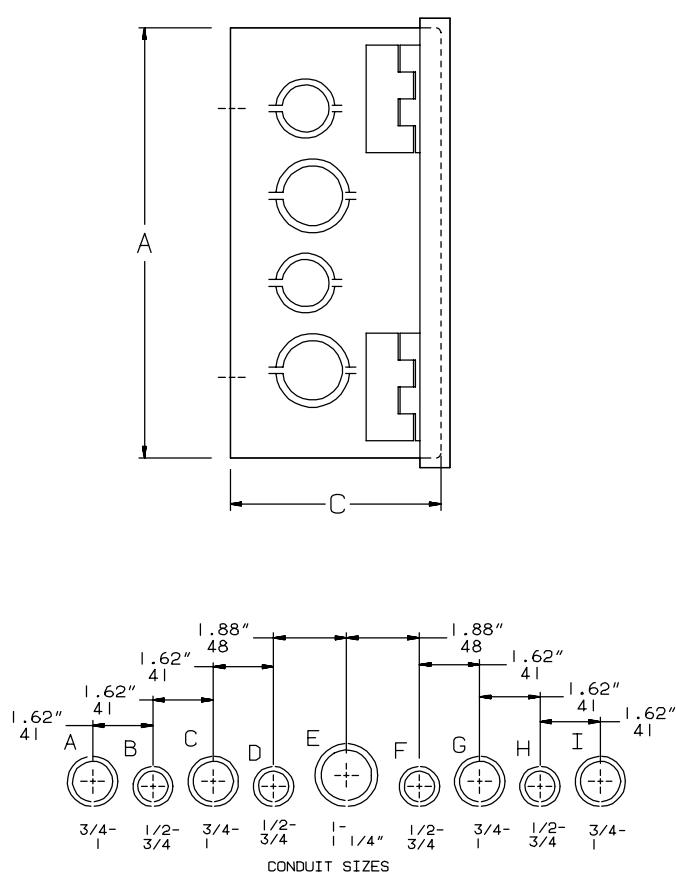
Unless otherwise specified, all custom cutout boxes are finished with ANSI 61 gray polyester paint.

### Industry Standards

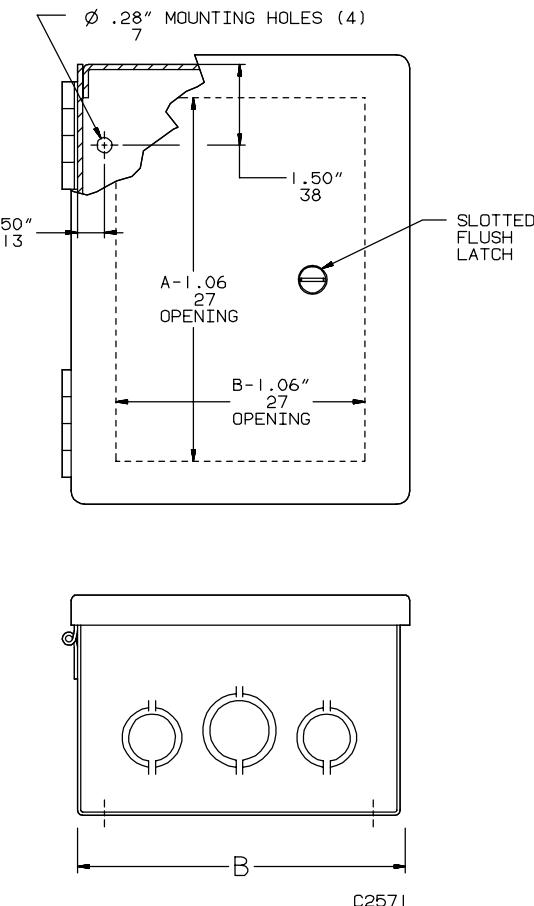
- UL 50, File No. E27567: Type I  
 NEMA/EEMAC Type I  
 CSA, File No. LL42184: Type I  
 IEC 60529, IP30

### Accessories

- Cylinder Lock Kit  
 Grounding Device  
 Padlock Kit  
 "T" Handle Latch Kit  
 Touch-Up Paint (ATPPY61)



**Knockout Pattern**  
 (from outside of box)



NOTE: Refer to Table for applicable knockout pattern.

**Hinged Cover Cutout Boxes****Standard Sizes Hinged Cover Cutout Boxes**

Catalog Number	Box Size A x B x C inch	Box Size A x B x C mm	Knockout Pattern along "A" Sides      "B" Sides	
AHE6X6X4	6.00 x 6.00 x 4.00	152 x 152 x 102	BCD	BCD
AHE6X4X4	6.00 x 4.00 x 4.00	152 x 102 x 102	BCD	BCD
AHE8X6X4	8.00 x 6.00 x 4.00	203 x 152 x 102	FGHI	BCD
AHE8X8X4	8.00 x 8.00 x 4.00	203 x 203 x 102	FGHI	FGHI
AHE10X8X4	10.00 x 8.00 x 4.00	254 x 203 x 102	FGHI	FGHI
AHE10X10X4	10.00 x 10.00 x 4.00	254 x 254 x 102	FGHI	CDEFG
AHE12X8X4	12.00 x 8.00 x 4.00	305 x 203 x 102	CDEFG	FGHI
AHE12X10X4	12.00 x 10.00 x 4.00	305 x 254 x 102	CDEFG	CDEFG
AHE12X12X4	12.00 x 12.00 x 4.00	305 x 305 x 102	CDEFG	CDEFG
AHE16X12X4	16.00 x 12.00 x 4.00	406 x 305 x 102	BCDEFGH	CDEFG
AHE18X12X4	18.00 x 12.00 x 4.00	457 x 305 x 102	ABCDEFGHI	CDEFG
AHE6X6X6	6.00 x 6.00 x 6.00	152 x 152 x 152	BCD	BCD
AHE8X8X6	8.00 x 8.00 x 6.00	203 x 203 x 152	FGHI	FGHI
AHE10X8X6	10.00 x 8.00 x 6.00	254 x 203 x 152	FGHI	FGHI
AHE10X10X6	10.00 x 10.00 x 6.00	254 x 254 x 152	FGHI	CDEFG
AHE12X10X6	12.00 x 10.00 x 6.00	305 x 254 x 152	CDEFG	CDEFG
AHE12X12X6	12.00 x 12.00 x 6.00	305 x 305 x 152	CDEFG	CDEFG
AHE16X12X6	16.00 x 12.00 x 6.00	406 x 305 x 152	BCDEFGH	CDEFG
AHE16X16X6	16.00 x 16.00 x 6.00	406 x 406 x 152	BCDEFGH	BCDEFGH
AHE18X12X6	18.00 x 12.00 x 6.00	457 x 305 x 152	ABCDEFGHI	CDEFG
AHE18X18X6	18.00 x 18.00 x 6.00	457 x 457 x 152	ABCDEFGHI	ABCDEFGHI
AHE24X18X6	24.00 x 18.00 x 6.00	610 x 457 x 152	ABCDEFGHI	ABCDEFGHI
AHE24X24X6	24.00 x 24.00 x 6.00	610 x 610 x 152	ABCDEFGHI	ABCDEFGHI
AHE30X24X6	30.00 x 24.00 x 6.00	762 x 610 x 152	ABCDEFGHI	ABCDEFGHI
AHE36X24X6	36.00 x 24.00 x 6.00	914 x 610 x 152	ABCDEFGHI	ABCDEFGHI
AHE36X24X8	36.00 x 24.00 x 8.00	914 x 610 x 203	ABCDEFGHI	ABCDEFGHI

## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

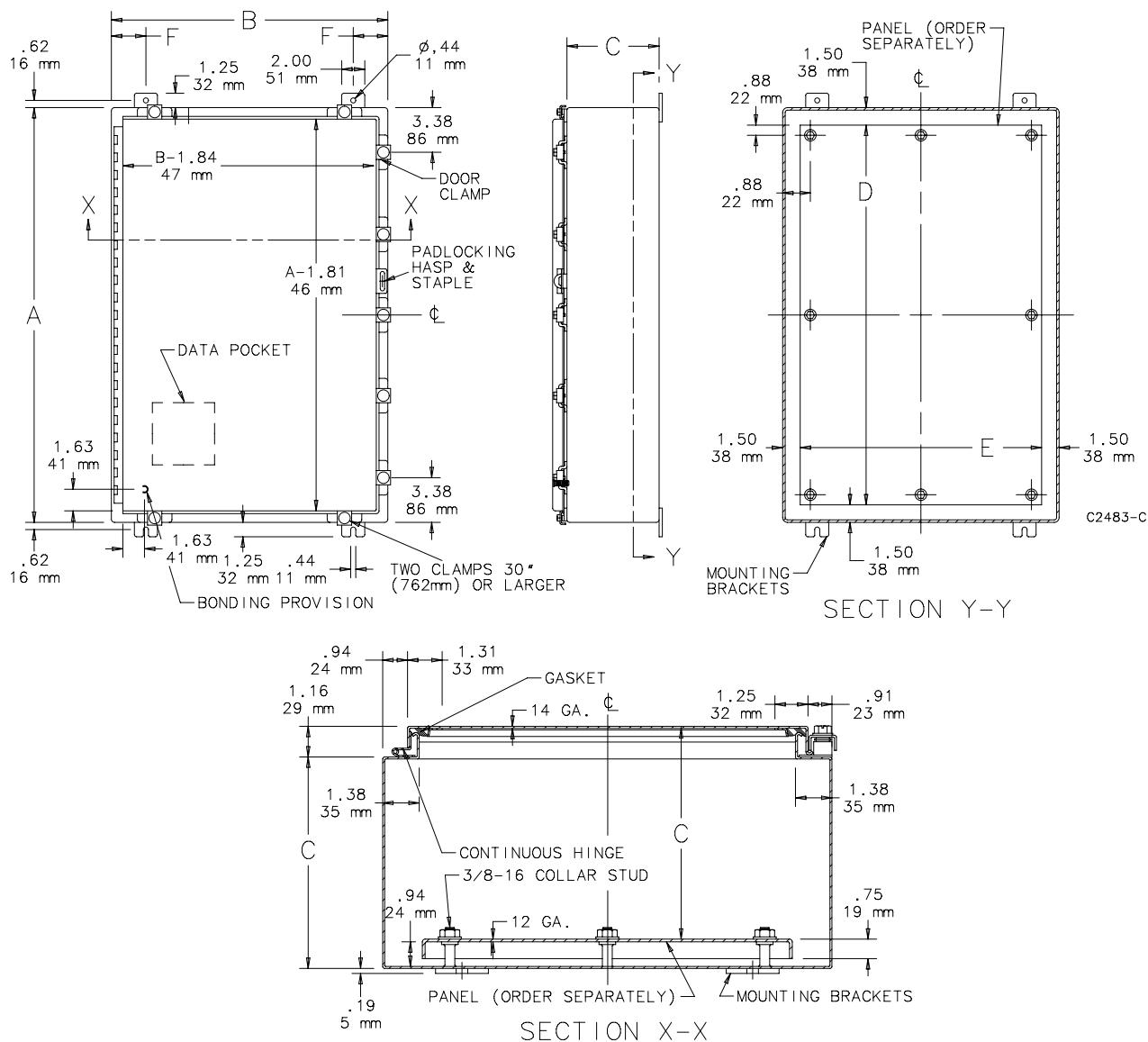
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#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

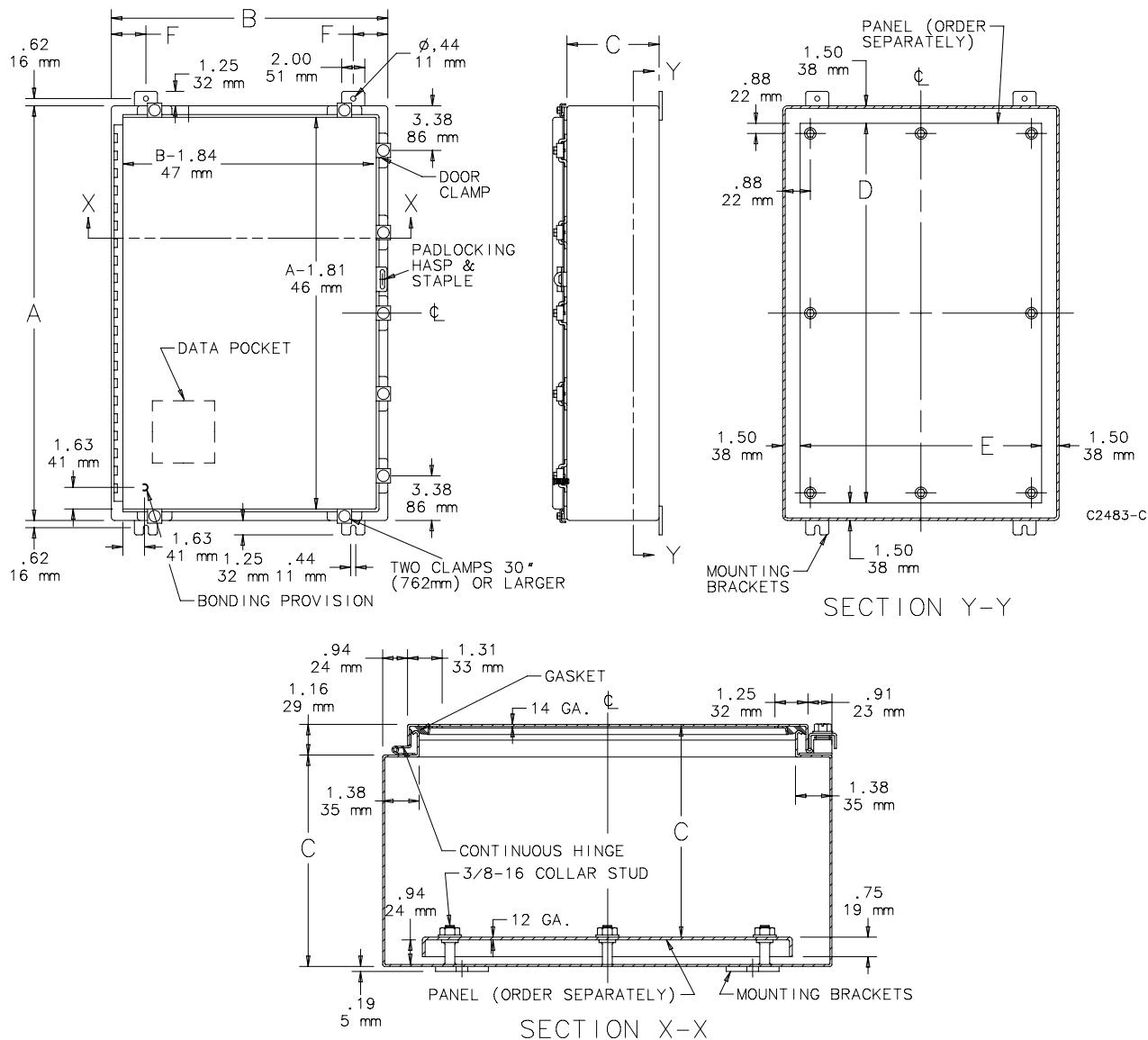
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

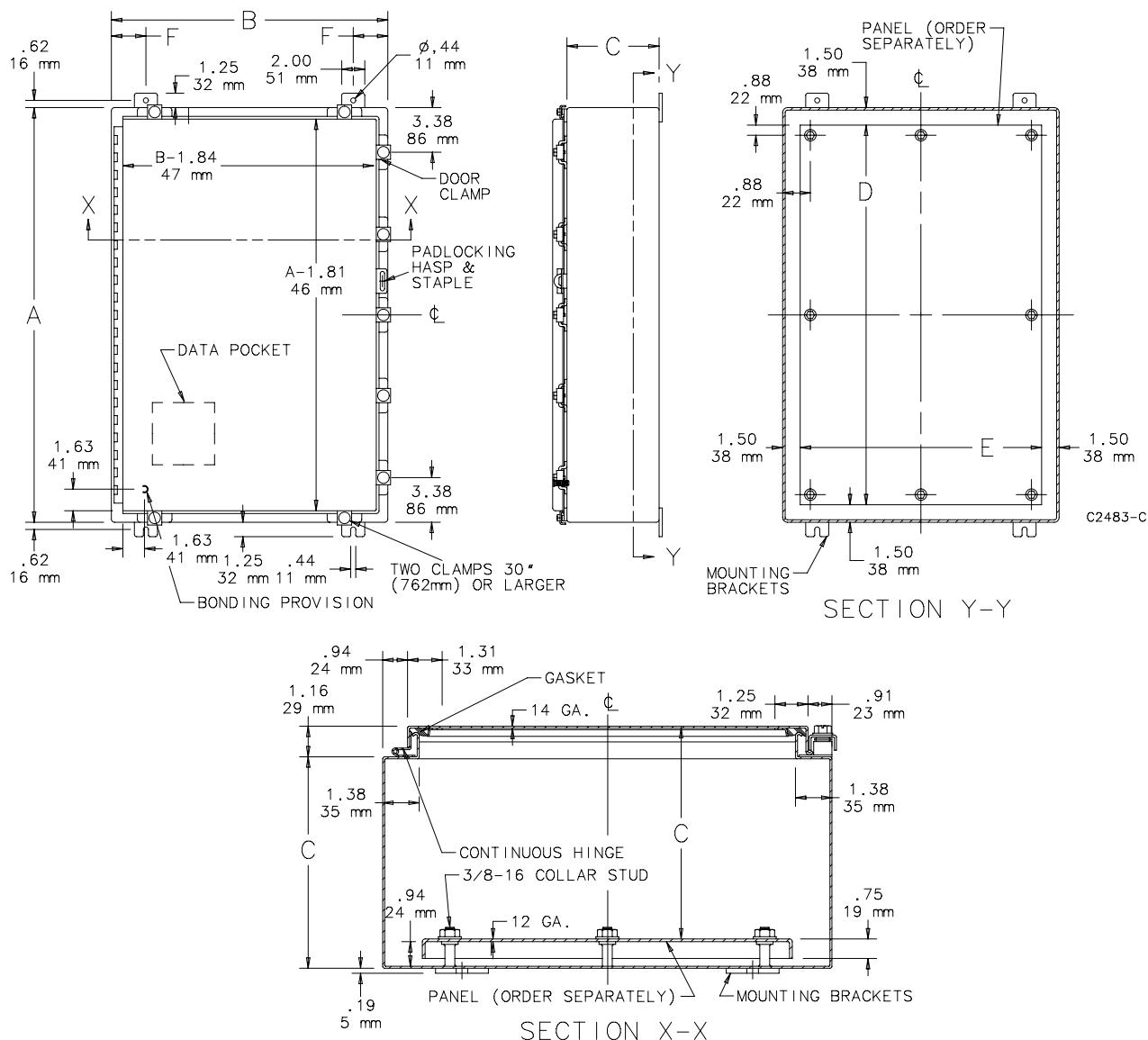
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

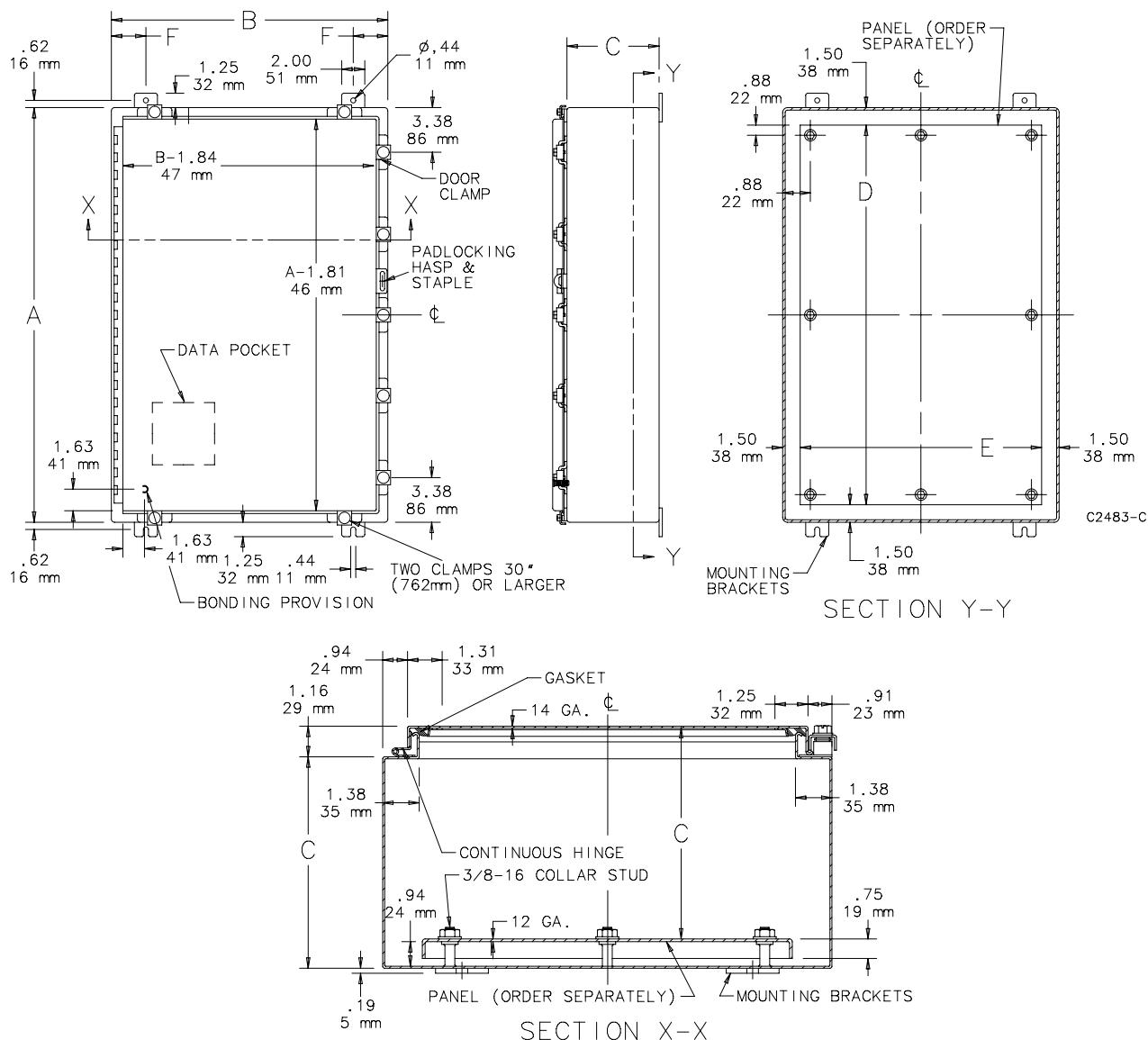
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	→ A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
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- 16 or 14 gauge steel (see table)
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- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

Hoffman excels at modifying and customizing products to your specifications. Contact your local Hoffman sales office or distributor for complete information.

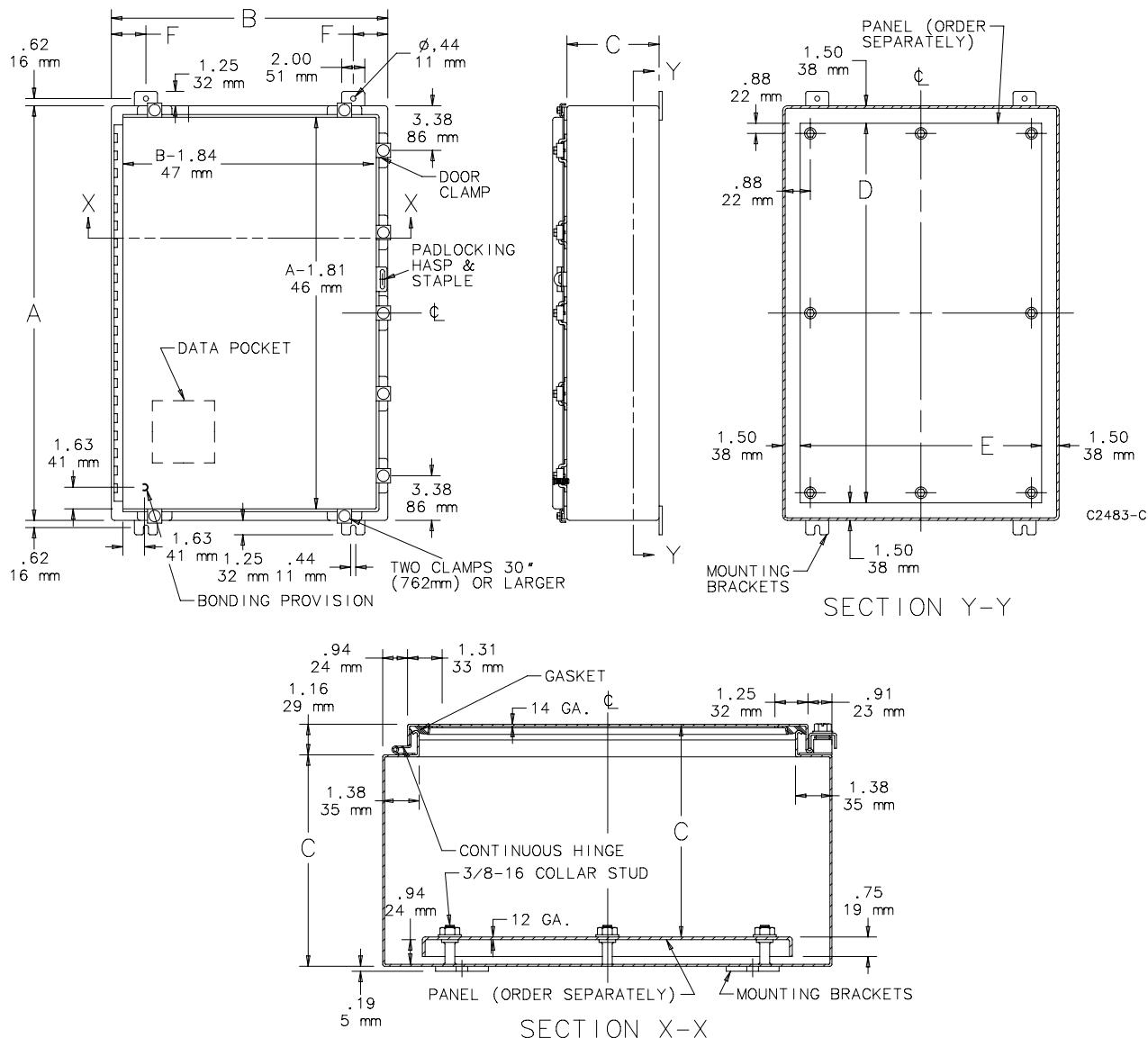
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## Type 4 Wall-Mount Enclosures

### Continuous Hinge with Clamps, Type 4



#### Industry Standards

UL 508A Listed; Type 4, 12, 13; File No. E61997  
cUL Listed per CSA C22.2 No. 94; Type 4, 12, 13; File No. E61997

NEMA/EEMAC Type 3, 4, 12, and 13  
CSA, File No. 42186: Type 4 and 12  
IEC 60529, IP66

#### Application

These single-door enclosures feature a hinged door with clamps on three sides to create a secure seal in indoor or outdoor environments. The gray polyester powder finish inside and out provides enhanced corrosion protection in outdoor applications.

#### Specifications

- 16 or 14 gauge steel (see table)
- Seams continuously welded and ground smooth
- External wall-mounting brackets
- Formed external flanges around all sides of enclosure opening
- Stainless steel door clamps on three sides of door
- Removable heavy gauge stainless steel continuous hinge pin
- Hasp and staple provided for padlocking
- Data pocket is high-impact thermoplastic
- Collar studs provided for mounting optional panels
- Bonding provision on door

#### Finish

ANSI 61 gray polyester powder paint inside and out

#### Accessories

See also *Accessories*.  
Industrial Corrosion Inhibitors  
Fast-Operating Clamp-Cover Junction Box Clamp  
Incandescent Light Package  
Compact Cooling Fans  
Steel and Stainless Steel Window Kits

#### Modification and Customization

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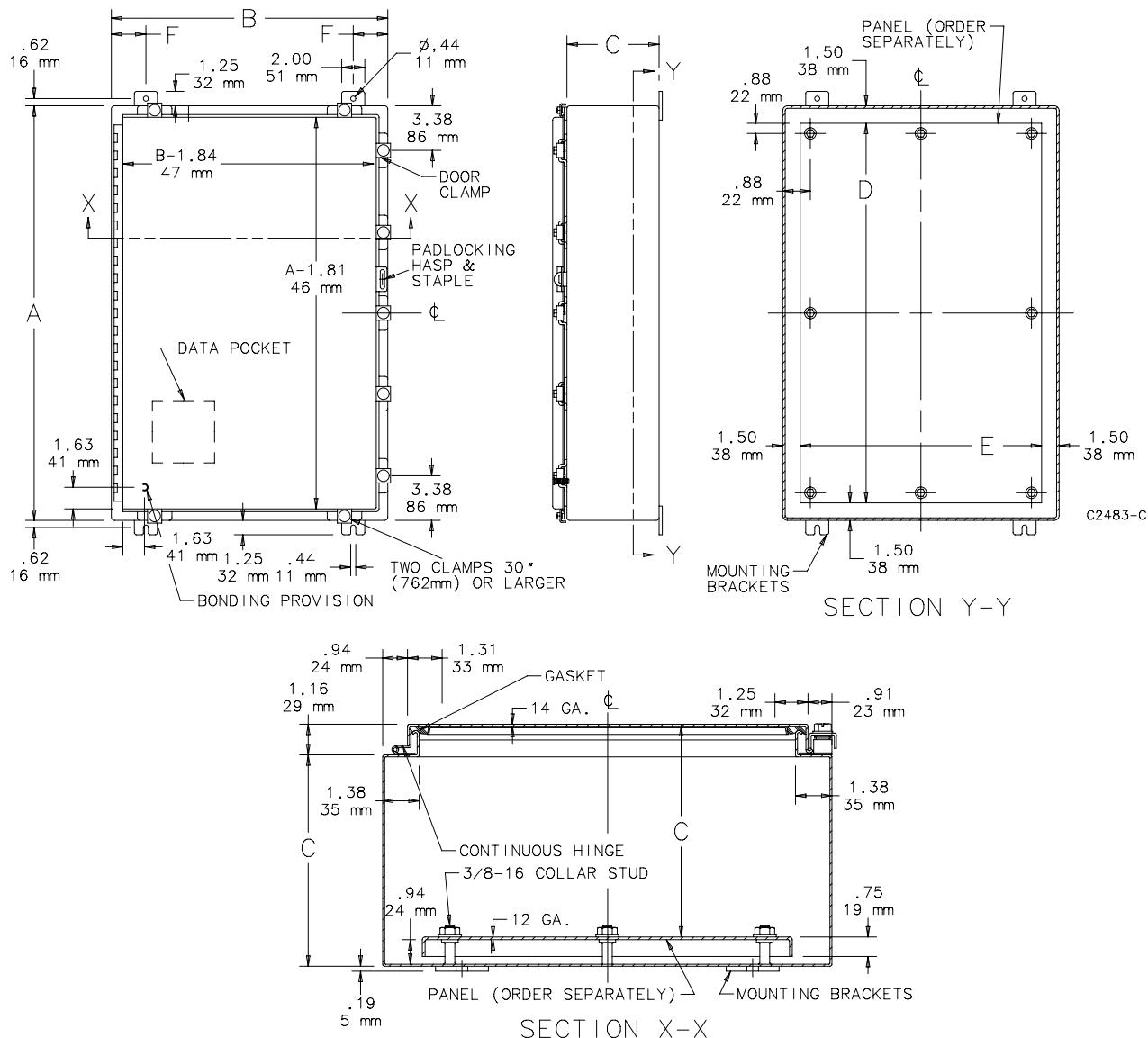
Bulletin: A4

#### Standard Product

Catalog Number	AxBxCin.	AxBxCmm	Body Gauge	Panel	Conductive Panel	Panel Size D x E (in.)	Panel Size D x E (mm)	F (in.)	F (mm)	Number of Clamps	Data Pocket
A16H12ALP	16.00 x 12.00 x 6.00	406 x 305 x 152	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A16H16ALP	16.00 x 16.00 x 6.00	406 x 406 x 152	16	A16P16	A16P16G	13.00 x 13.00	330 x 330	3.00	76	4	Small
A16H20ALP	16.00 x 20.00 x 6.00	406 x 508 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H16ALP	20.00 x 16.00 x 6.00	508 x 406 x 152	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20ALP	20.00 x 20.00 x 6.00	508 x 508 x 152	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A24H12ALP	24.00 x 12.00 x 6.00	610 x 305 x 152	16	A12P24	A12P24G	9.00 x 21.00	229 x 533	1.25	32	5	Small
A24H16ALP	24.00 x 16.00 x 6.00	610 x 406 x 152	16	A24P16	A24P16G	21.00 x 13.00	533 x 330	3.00	76	5	Small
A24H20ALP	24.00 x 20.00 x 6.00	610 x 508 x 152	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24ALP	24.00 x 24.00 x 6.00	305 x 305 x 152	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A30H20ALP	30.00 x 20.00 x 6.00	762 x 508 x 152	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24ALP	30.00 x 24.00 x 6.00	762 x 610 x 152	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H24ALP	36.00 x 24.00 x 6.00	914 x 610 x 152	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A16H12BLP	16.00 x 12.00 x 8.00	406 x 305 x 203	16	A16P12	A16P12G	13.00 x 9.00	330 x 229	1.25	32	4	Small
A20H16BLP	20.00 x 16.00 x 8.00	508 x 406 x 203	16	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A20H20BLP	20.00 x 20.00 x 8.00	508 x 508 x 203	16	A20P20	A20P20G	17.00 x 17.00	432 x 432	3.00	76	4	Small
A20H24BLP	20.00 x 24.00 x 8.00	508 x 610 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	4	Small
A24H20BLP	24.00 x 20.00 x 8.00	610 x 508 x 203	16	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A24H24BLP	24.00 x 24.00 x 8.00	610 x 610 x 203	16	A24P24	A24P24G	21.00 x 21.00	533 x 533	3.00	76	5	Small
A24H30BLP	24.00 x 30.00 x 8.00	610 x 762 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	7	Small
A30H20BLP	30.00 x 20.00 x 8.00	762 x 508 x 203	14	A30P20	A30P20G	27.00 x 17.00	686 x 432	3.00	76	5	Small
A30H24BLP	30.00 x 24.00 x 8.00	762 x 610 x 203	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A30H30BLP	30.00 x 30.00 x 8.00	762 x 762 x 203	14	A30P30	A30P30G	27.00 x 27.00	686 x 686	3.00	76	7	Large
A36H24BLP	36.00 x 24.00 x 8.00	914 x 610 x 203	14	A36P24	A36P24G	33.00 x 21.00	838 x 533	3.00	76	5	Large
A36H30BLP	36.00 x 30.00 x 8.00	914 x 762 x 203	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A42H30BLP	42.00 x 30.00 x 8.00	1067 x 762 x 203	14	A42P30	A42P30G	39.00 x 27.00	991 x 686	3.00	76	8	Small
A42H36BLP	42.00 x 36.00 x 8.00	1067 x 914 x 203	14	A42P36	A42P36G	39.00 x 33.00	991 x 838	3.00	76	8	Large
A48H36BLP	48.00 x 36.00 x 8.00	1219 x 914 x 203	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36BLP	60.00 x 36.00 x 8.00	1524 x 914 x 203	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A20H16CLP	20.00 x 16.00 x 10.00	508 x 406 x 254	14	A20P16	A20P16G	17.00 x 13.00	432 x 330	3.00	76	4	Small
A24H20CLP	24.00 x 20.00 x 10.00	610 x 508 x 254	14	A24P20	A24P20G	21.00 x 17.00	533 x 432	3.00	76	5	Small
A30H24CLP	30.00 x 24.00 x 10.00	762 x 610 x 254	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30CLP	36.00 x 30.00 x 10.00	914 x 762 x 254	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H30CLP	48.00 x 30.00 x 10.00	1219 x 762 x 254	14	A48P30	A48P30G	45.00 x 27.00	1143 x 686	3.00	76	8	Small
A48H36CLP	48.00 x 36.00 x 10.00	1219 x 914 x 254	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36CLP	60.00 x 36.00 x 10.00	1524 x 914 x 254	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large
A30H24DLP	30.00 x 24.00 x 12.00	762 x 610 x 305	14	A30P24	A30P24G	27.00 x 21.00	686 x 533	3.00	76	5	Large
A36H30DLP	36.00 x 30.00 x 12.00	914 x 762 x 305	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36DLP	48.00 x 36.00 x 12.00	1219 x 914 x 305	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A36H30FLP	36.00 x 30.00 x 16.00	914 x 762 x 406	14	A36P30	A36P30G	33.00 x 27.00	838 x 686	3.00	76	7	Large
A48H36FLP	48.00 x 36.00 x 16.00	1219 x 914 x 406	14	A48P36	A48P36G	45.00 x 33.00	1143 x 838	3.00	76	8	Large
A60H36FLP	60.00 x 36.00 x 16.00	1524 x 914 x 406	14	A60P36	A60P36G	57.00 x 33.00	1448 x 838	3.00	76	9	Large

Purchase panels separately. Optional stainless steel, conductive, composite and aluminum panels are available for most sizes.

**Type 4 Wall-Mount Enclosures**



## WING KNOB LATCH



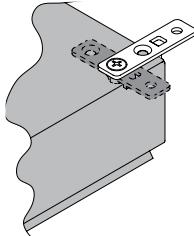
Wing Knob Latch can replace the standard slotted, quarter-turn latch on all hinged-cover and window-cover enclosures. Latch is black die-cast zinc. Includes two keys and installation instructions.

BULLETIN: A54Y

Catalog Number	Product Weight
LLKWK	0.2 lb.

Reduces UL Type rating from 4 or 4X to 12.

## MOUNTING BRACKET KIT, PLATED AND 316



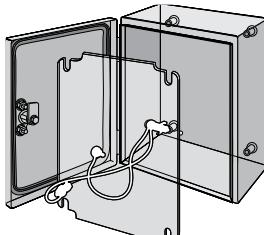
Kit is field-installable on all solid-back-body enclosures. Hardware included. Four brackets per kit.

BULLETIN: A54SY, A54Y

Catalog Number	Description
LMFK	Plated steel mounting-bracket kit
LMFKSS	Type 316L stainless steel mounting-bracket kit

Use of LMFKSS recommended to maintain Type 4X rating.

## GROUNDING KIT



Grounding Kit provides means to attach a grounding conductor to the enclosure. Kit includes two insulated copper wires with a ring terminal at each end, all installation hardware and instructions.

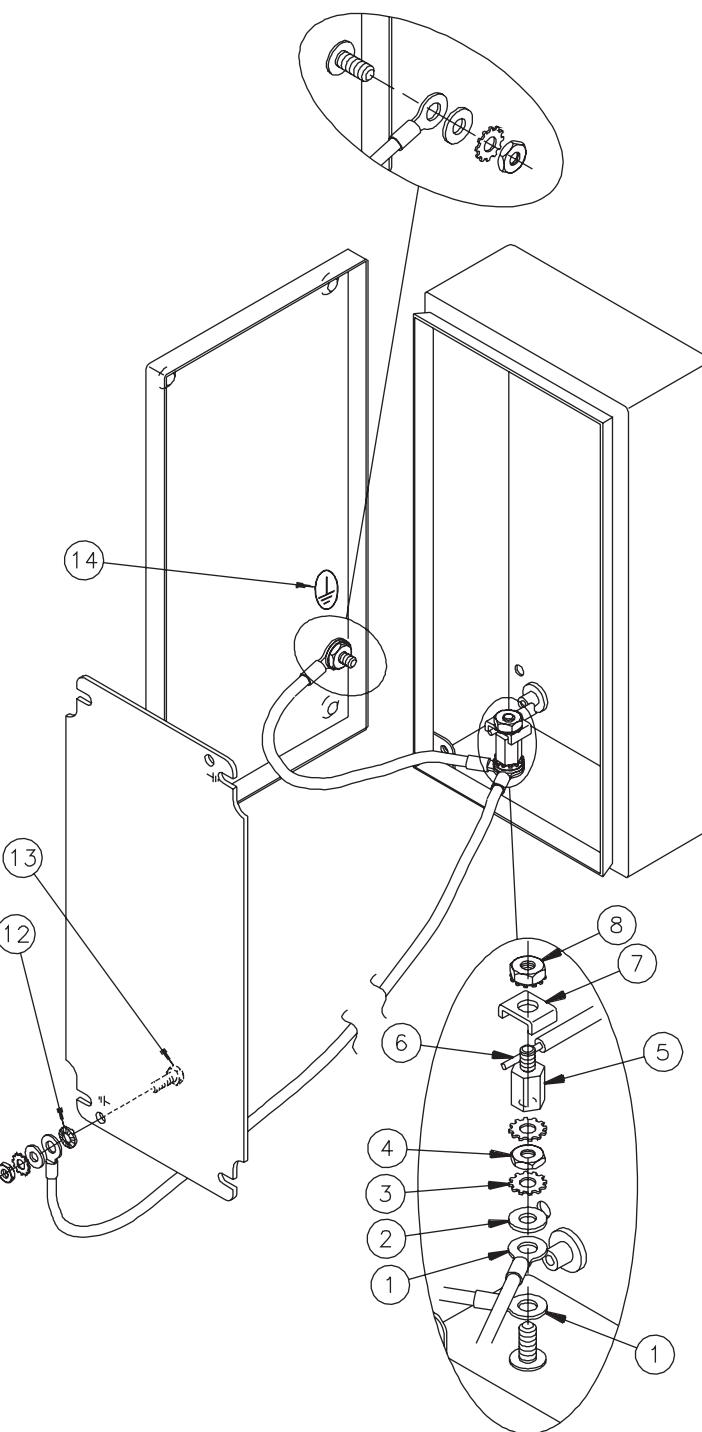
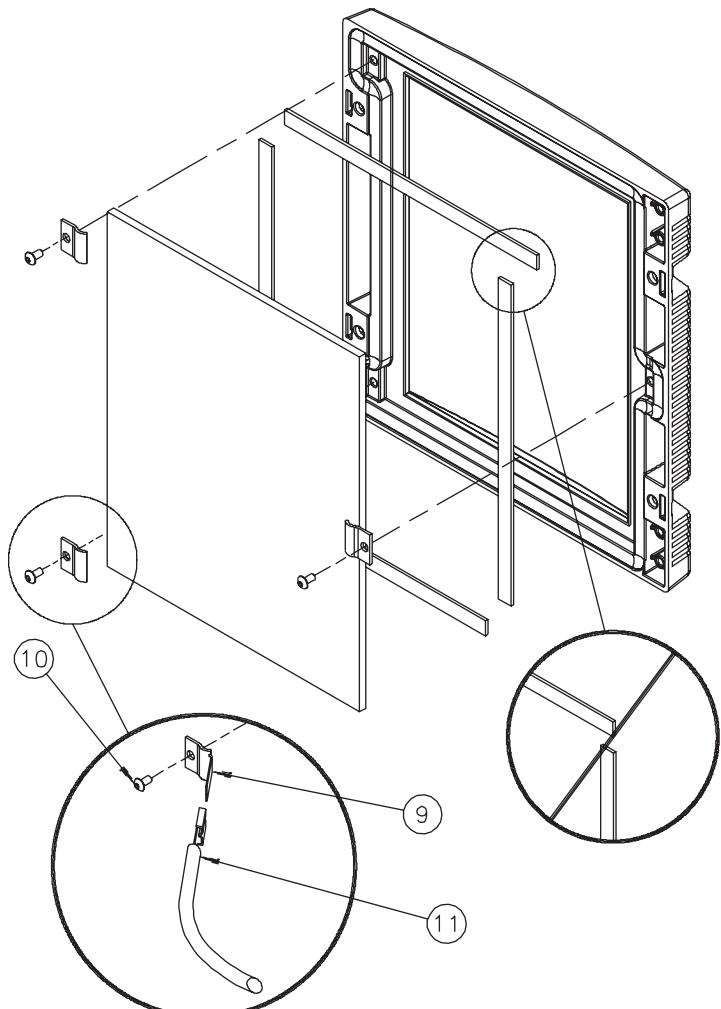
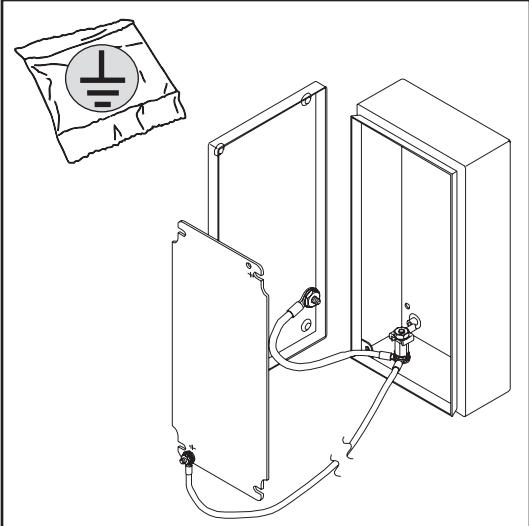
BULLETIN: A54Y

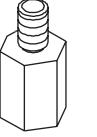
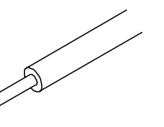
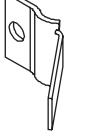
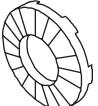
Catalog Number	Product Weight
LLGK	0.2 lb.

INLINE®

INLINE®

INLINE® OI



1	2	3
		
(2x)	(3x)	(4x)
4 M6-1	5 M6-1	6
		
(3x)	(1x)	(0x)
7	8	9
		
(1x)	(1x)	(1x)
10 M4x8	11	12
		
(1x)	(1x)	(1x)
13 M6-1	14	
		
(1x)	(2x)	



# PANEL & INSTALLATION MATERIALS

## DIN RAIL TERMINAL BLOCKS MODELS M4/6, M6/8

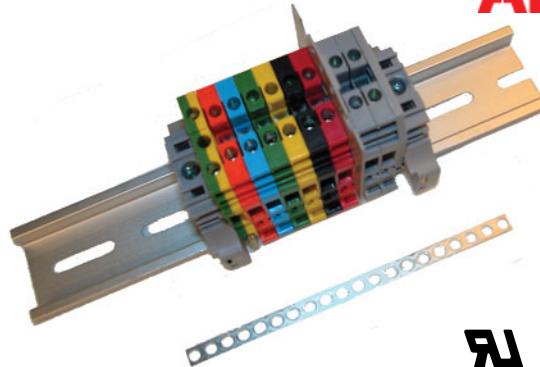
ABB

### DESCRIPTION

Models **M4/6** and **M6/8** DIN Rail Terminal Blocks offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top- or side-mount marking capability. The **Model M4/6** offers maximum circuit density while the **Model M6/8** offers the convenience of larger screws for conventional screwdriver installation.

### FEATURES

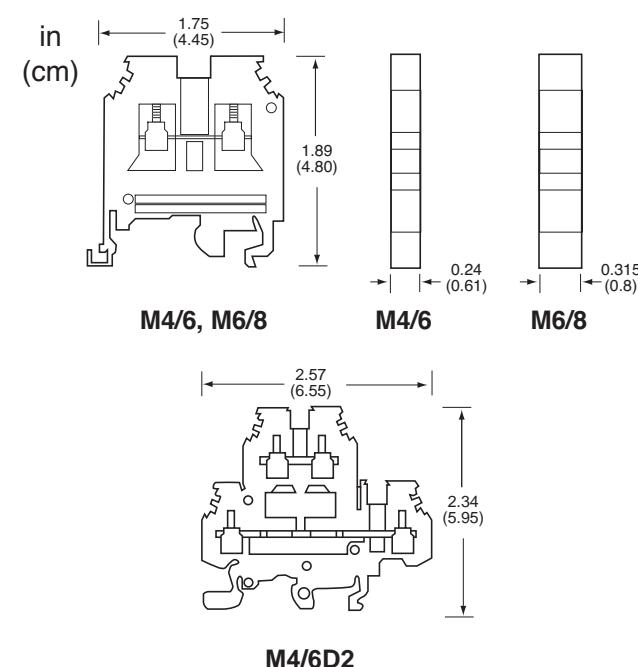
- *Wire secured by ribbed compression clamp*
- *Universal DIN rail mounting*
- *Reduced installation time*
- *Block removable without displacing adjacent blocks*
- *Various marking options*



### SPECIFICATIONS

<b>Rated voltage</b>	600 VAC/VDC
<b>Rated current</b>	30A UL, 25A CSA
<b>Rated wire size</b>	22-10 AWG
<b>Agency approvals</b>	UL-recognized component, File #E60645, E72667; CSA certified

### DIMENSIONS



ORDERING INFORMATION	
<b>MODEL</b>	<b>DESCRIPTION</b>
<b>SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6	DIN rail terminal block, gray
M4/6-BK	DIN rail terminal block, black
M4/6-BL	DIN rail terminal block, blue
M4/6-GR	DIN rail terminal block, green
M4/6-RD	DIN rail terminal block, red
M4/6-OR	DIN rail terminal block, orange
M4/6-YW	DIN rail terminal block, yellow
M4/6P	Grounding block, green and yellow
<b>SINGLE 8 mm TERMINAL BLOCKS (use M4/6 accessories)</b>	
M6/8	8 mm DIN rail terminal block, gray
M6/8P	8 mm grounding block, green and yellow
<b>ACCESSORIES</b>	
DIN-3F	35 mm steel DIN mounting rail, 39.4" L(1m)
BAM-1000	35 mm aluminum DIN mounting rail, 39.4" L(1m)
BAM2	End stop (two required), gray
FEM6	End section (one required), gray
SCF6	Circuit separator, gray
BJS6	Jumper bar for M4/6, 20 poles per bar
BJS6-2	Jumper bar for M4/6, two poles per bar
BJS6-3	Jumper bar for M4/6, three poles per bar
BJS6-4	Jumper bar for M4/6, four poles per bar
BJS6-5	Jumper bar for M4/6, five poles per bar
BJS6-10	Jumper bar for M4/6, 10 poles per bar
BJS8	Jumper bar for M6/8, 20 poles per bar
EV6	Jumper bar hardware (screw and post, package 20)
<b>DOUBLE STACK 6 mm TERMINAL BLOCKS</b>	
M4/6D2	Double stack terminal block, gray
FEM6D	Double stack end section, gray
BAMH	Double stack end stop, gray
SCF6D	Double stack circuit separator, gray
<b>BEIGE SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6-BG	DIN rail terminal block, beige
FEM6-BG	End section, beige
BAM2-BG	End stop, beige
SCF6-BG	Circuit separator, beige
<b>MARKERS</b>	
RC610B	Blank strips
RC610/1-10	10 strips of 1-10
RC610/1-50	Two strips of 1-50
RC610/1-100	One strip of 1-100
RC610/X01-X00	One strip of 100 numbers (fill in range, i.e., 201-300)
RC610-G	Ground marker strip
RC610-L	Line marker strip
RC610-N	Neutral marker strip
RC610-CUSTOM	Custom markers printed at Kele
RTM7	Top mount, blank, 19.7" (50 cm)

# INSTALLATION MATERIALS

ATS BOM Tag:Panel-5, Manufacture's P/N:FEM6

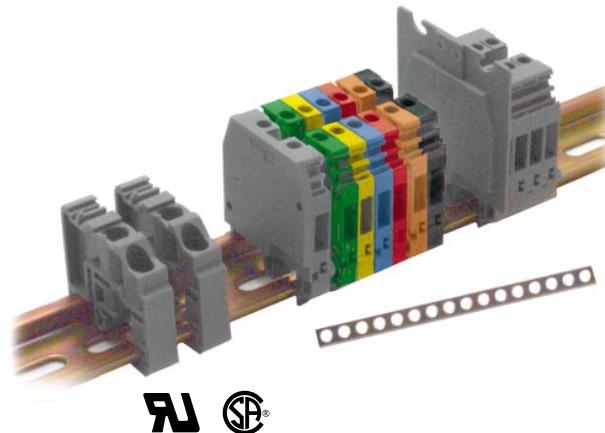
## DIN RAIL TERMINAL BLOCKS MODEL M4/6

### DESCRIPTION

The **M4/6 DIN Rail Terminal Blocks** offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top or side mount marking capability. These blocks can be used with the **M10/16SFL** fuse holder.

### FEATURES

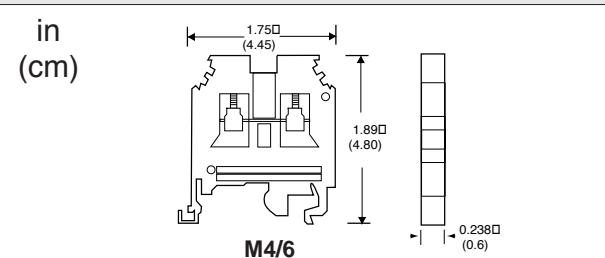
- *Wire secured by ribbed compression clamp*
- *Universal DIN rail mounting*
- *Reduced installation time*
- *Block can be removed without displacing adjacent blocks*
- *Various marking options*



### SPECIFICATIONS

Rated voltage	600 VAC/DC
Rated current	30 amps UL, 25 amps CSA
Rated wire size	22-10 AWG
Spacing	0.238" (0.60cm)
Circuits per ft	50
Approvals	UL recognized file #E60645, E72667 CSA Certified

### DIMENSIONS



### ORDERING INFORMATION

ACCESSORIES	MODEL	DESCRIPTION
① DIN-3F	M4/6	DIN Rail Terminal Block - Gray
② BAM	M4/6-BK	DIN Rail Terminal Block - Black
③ FEM6	M4/6-BL	DIN Rail Terminal Block - Blue
④ SCF6	M4/6-GR	DIN Rail Terminal Block - Green
⑤ BJS6	M4/6-RD	DIN Rail Terminal Block - Red
⑥ EV6	M4/6-OR	DIN Rail Terminal Block - Orange
	M4/6-YW	DIN Rail Terminal Block - Yellow
	M4/6.P	DIN Rail Grounding Block - Green & Yellow
	① DIN-3F	35 mm steel DIN Mounting Rail length: 39.4 in (1 meter)
	② BAM	End Stop (2 required)
	③ FEM6	End Section (1 required)
	④ SCF6	Circuit Separator
	⑤ BJS6	Jumper Bar - 20 poles/bar
	⑥ EV6	Jumper Bar Hardware (screw & post, pkg. 20)
	⑥ MARKERS (Side mount, individually scored)	
	RC610B	Blank Strips
	RC610/1-10	10 strips of 1-10
	RC610/1-50	2 strips of 1-50
	RC610/1-100	1 strip of 1-100
	RC610/101-200	1 strip of 101-200
	RC610/201-300	1 strip of 201-300
	RC610/301-400	1 strip of 301-400
	RC610/401-500	1 strip of 401-500
	RTM7	Top Mount - Blank length: 19.7 in (50 cm)

# INSTALLATION MATERIALS

ATS BOM Tag:Panel-9, Manufacturer's P/N:RTM7

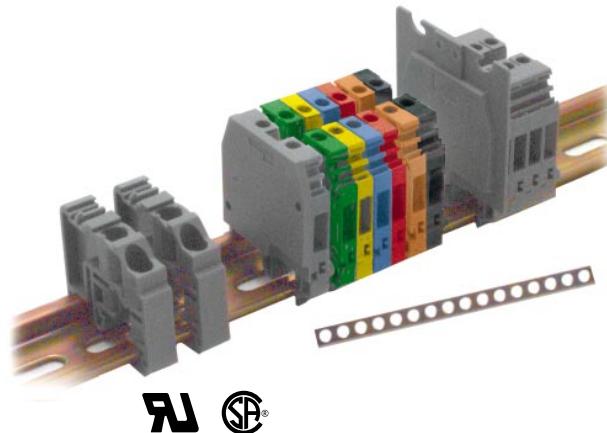
## DIN RAIL TERMINAL BLOCKS MODEL M4/6

### DESCRIPTION

The **M4/6 DIN Rail Terminal Blocks** offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top or side mount marking capability. These blocks can be used with the **M10/16SFL** fuse holder.

### FEATURES

- *Wire secured by ribbed compression clamp*
- *Universal DIN rail mounting*
- *Reduced installation time*
- *Block can be removed without displacing adjacent blocks*
- *Various marking options*

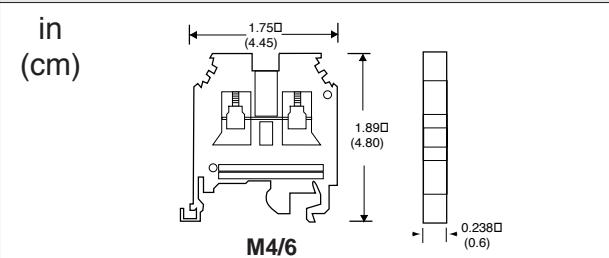


UL CSA

### SPECIFICATIONS

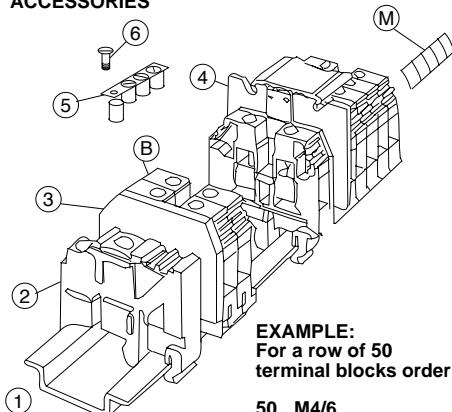
Rated voltage	600 VAC/DC
Rated current	30 amps UL, 25 amps CSA
Rated wire size	22-10 AWG
Spacing	0.238" (0.60cm)
Circuits per ft	50
Approvals	UL recognized file #E60645, E72667 CSA Certified

### DIMENSIONS



### ORDERING INFORMATION

#### ACCESSORIES



EXAMPLE:  
For a row of 50  
terminal blocks order:  
50 M4/6  
1 FEM6  
2 BAM  
1 DIN-3F

MODEL	DESCRIPTION
M4/6	DIN Rail Terminal Block - Gray
M4/6-BK	DIN Rail Terminal Block - Black
M4/6-BL	DIN Rail Terminal Block - Blue
M4/6-GR	DIN Rail Terminal Block - Green
M4/6-RD	DIN Rail Terminal Block - Red
M4/6-OR	DIN Rail Terminal Block - Orange
M4/6-YW	DIN Rail Terminal Block - Yellow
M4/6.P	DIN Rail Grounding Block - Green & Yellow
① DIN-3F	35 mm steel DIN Mounting Rail length: 39.4 in (1 meter)
② BAM	End Stop (2 required)
③ FEM6	End Section (1 required)
④ SCF6	Circuit Separator
⑤ BJS6	Jumper Bar - 20 poles/bar
⑥ EV6	Jumper Bar Hardware (screw & post, pkg. 20)
⑦ MARKERS (Side mount, individually scored)	
RC610B	Blank Strips
RC610/1-10	10 strips of 1-10
RC610/1-50	2 strips of 1-50
RC610/1-100	1 strip of 1-100
RC610/101-200	1 strip of 101-200
RC610/201-300	1 strip of 201-300
RC610/301-400	1 strip of 301-400
RC610/401-500	1 strip of 401-500
RTM7	Top Mount - Blank length: 19.7 in (50 cm)

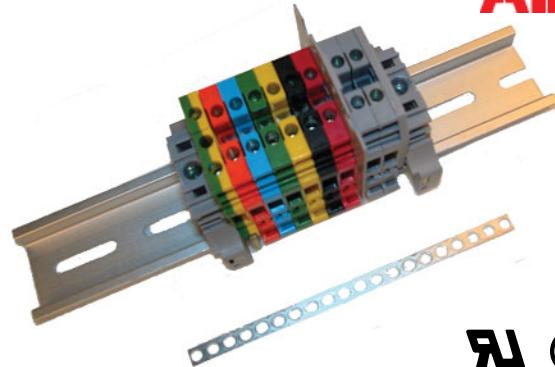


# PANEL & INSTALLATION MATERIALS

## DIN RAIL TERMINAL BLOCKS MODELS M4/6, M6/8

### DESCRIPTION

Models M4/6 and M6/8 DIN Rail Terminal Blocks offer a modular design for flexibility in layout and reduced installation time. Unique marker holders provide optional top- or side-mount marking capability. The **Model M4/6** offers maximum circuit density while the **Model M6/8** offers the convenience of larger screws for conventional screwdriver installation.



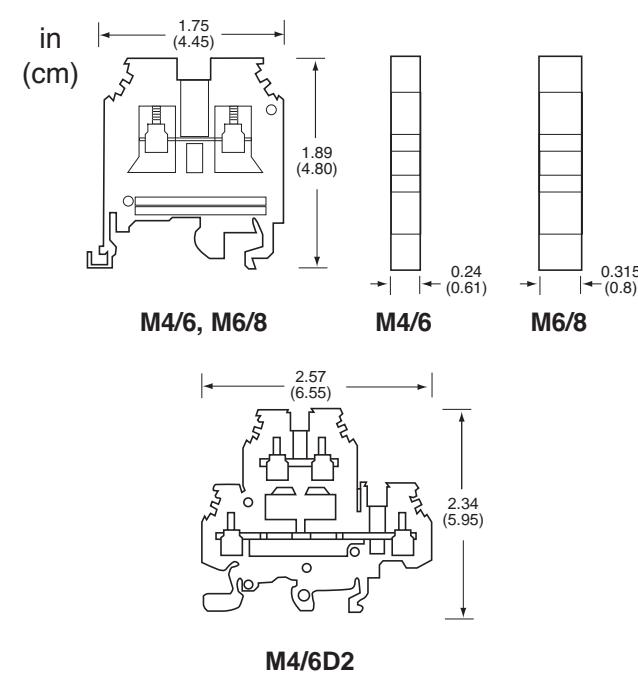
### FEATURES

- Wire secured by ribbed compression clamp
- Universal DIN rail mounting
- Reduced installation time
- Block removable without displacing adjacent blocks
- Various marking options

### SPECIFICATIONS

<b>Rated voltage</b>	600 VAC/VDC
<b>Rated current</b>	30A UL, 25A CSA
<b>Rated wire size</b>	22-10 AWG
<b>Agency approvals</b>	UL-recognized component, File #E60645, E72667; CSA certified

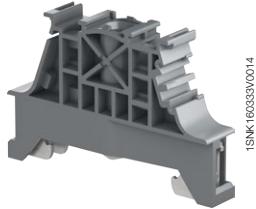
### DIMENSIONS



ORDERING INFORMATION	
<b>MODEL</b>	<b>DESCRIPTION</b>
<b>SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6	DIN rail terminal block, gray
M4/6-BK	DIN rail terminal block, black
M4/6-BL	DIN rail terminal block, blue
M4/6-GR	DIN rail terminal block, green
M4/6-RD	DIN rail terminal block, red
M4/6-OR	DIN rail terminal block, orange
M4/6-YW	DIN rail terminal block, yellow
M4/6P	Grounding block, green and yellow
<b>SINGLE 8 mm TERMINAL BLOCKS (use M4/6 accessories)</b>	
M6/8	8 mm DIN rail terminal block, gray
M6/8P	8 mm grounding block, green and yellow
<b>ACCESSORIES</b>	
DIN-3F	35 mm steel DIN mounting rail, 39.4" L(1m)
BAM-1000	35 mm aluminum DIN mounting rail, 39.4" L(1m)
BAM2	End stop (two required), gray
FEM6	End section (one required), gray
SCF6	Circuit separator, gray
BJS6	Jumper bar for M4/6, 20 poles per bar
BJS6-2	Jumper bar for M4/6, two poles per bar
BJS6-3	Jumper bar for M4/6, three poles per bar
BJS6-4	Jumper bar for M4/6, four poles per bar
BJS6-5	Jumper bar for M4/6, five poles per bar
BJS6-10	Jumper bar for M4/6, 10 poles per bar
BJS8	Jumper bar for M6/8, 20 poles per bar
EV6	Jumper bar hardware (screw and post, package 20)
<b>DOUBLE STACK 6 mm TERMINAL BLOCKS</b>	
M4/6D2	Double stack terminal block, gray
FEM6D	Double stack end section, gray
BAMH	Double stack end stop, gray
SCF6D	Double stack circuit separator, gray
<b>BEIGE SINGLE 6 mm TERMINAL BLOCKS</b>	
M4/6-BG	DIN rail terminal block, beige
FEM6-BG	End section, beige
BAM2-BG	End stop, beige
SCF6-BG	Circuit separator, beige
<b>MARKERS</b>	
RC610B	Blank strips
RC610/1-10	10 strips of 1-10
RC610/1-50	Two strips of 1-50
RC610/1-100	One strip of 1-100
RC610/X01-X00	One strip of 100 numbers (fill in range, i.e., 201-300)
RC610-G	Ground marker strip
RC610-L	Line marker strip
RC610-N	Neutral marker strip
RC610-CUSTOM	Custom markers printed at Kele
RTM7	Top mount, blank, 19.7" (50 cm)

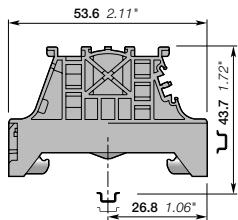
# BAM4 screw end stops

## Common terminal block accessories



1SNK160333V0214

BAM4



10 mm 0.394 in spacing

### Description

- Give efficient support to the SNK terminal blocks assemblies thanks to the BAM4 double gripping rail contact,
- Ease the assemblies identification with the BAM4 marking location compatible with all SNK markers and labels.

### Ordering details

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) <b>g</b>
10 mm 0.394 in spacing	Dark grey <input checked="" type="checkbox"/>	BAM4	1SNK900001R0000	50	14.00

### Main technical data

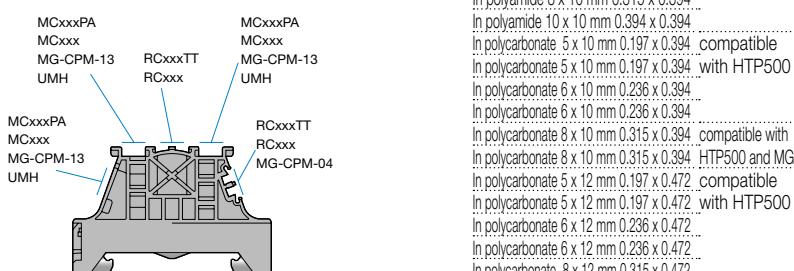
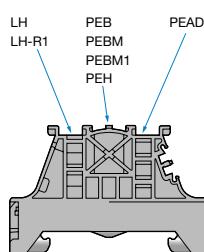
Material specifications	Insulating material	Polyamide	Rail		TH 35-7.5, TH 35-15
Flammability	VO		Tool		Flat screwdriver
NF F 16 101	I2F2				Ø 5.5 mm
Ambient temperature min/max	Service IEC 60068-2-1	-55 ... +110 °C	-67 ... +230 °C		Ø 0.217 in
	Storage	-55 ... +110 °C	-67 ... +230 °C		
	Installing	-5 ... +40 °C	+23 ... +104 °C	Torque	1.3 N.m ± 0.1 11.4 lb.in ± 0.88

All the main technical data provided are "manufacturer" values

### Mounting instructions

	RoHS
	<input checked="" type="checkbox"/> RoHS

### Mounting instructions



### Accessories

Description	Color	Type	Order code	Pkg qty	Weight (1 pce) <b>g</b>
Mounting rail		Symmetrical complying with IEC60715, TH35-7.5	PR3.Z2	1SNA174300R1700	2
		Prepunched symmetrical	PR30	1SNA173220R0500	2
		Symmetrical complying with IEC60715, TH35-15	PR4	1SNA168500R1200	2
		Prepunched symmetrical	PR50	1SNA178529R0400	2
		Symmetrical	PR3.G2	1SNA164800R0300	2
		Symmetrical	PR5	1SNA168700R2200	2
		TH35-7.5			718.00
		TH35-15			328.00
Label holder		for end stop 33 x 10 mm 1.30 x 0.394 in	LH	1SNK900605R0000	50
		for end stop 35 x 17 mm 1.378 x .669 in	PEB	1SNA113077R1100	50
		for end stop 37 x 19.5 mm 1.456 x 0.768 in	LH-R1	1SNK900607R0000	50
		for end stop 35 x 17 mm 1.378 x .669 in	PEB	1SNA195077R1400	50
		for end stop 29 x 9 mm 1.142 x 0.354 in	PEAD	1SNA399719R1000	20
		for end stop 40 x 5 mm 1.575 x 0.197 in	PEH	1SNA163211R2600	10
		PEB with black marker and protection included	PEBM1	1SNA113079R2300	50
		PEB with white marker and protection included	PEBM	1SNA113084R0100	50
Blank marker		In polyamide 5 x 12 mm 0.197 x 0.472, Compatible	MC512PA	1SNK149999R0000	20
		In polyamide 6 x 12 mm 0.236 x 0.472, with AMS	MC612PA	1SNK159999R0000	20
		In polycarbonate 8 x 12 mm 0.315 x 0.472	MC812PA	1SNK169999R0000	20
		In polycarbonate 5 x 10 mm 0.197 x 0.394	RC510-YL	1SNA103890R2100	50
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610	1SNA206230R1100	45
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610	1SNA206223R0600	45
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610	1SNA206232R0700	45
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610	1SNA206223R0000	45
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610	1SNA206235R0200	45
		In polycarbonate 6 x 10 mm 0.157 x 0.394	RC410	1SNA229000R1500	50
		In polycarbonate 5 x 10 mm 0.197 x 0.394	RC510	1SNA231000R0700	50
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610	1SNA233000R100	45
		In polycarbonate 8 x 10 mm 0.315 x 0.394	RC810	1SNA234000R0200	35
		In polycarbonate 10 x 10 mm 0.394 x 0.394	RC1010	1SNA238000R1600	35
		In polycarbonate 5 x 10 mm 0.197 x 0.394 compatible	RC510TT	1SNA231600R1500	22
		In polycarbonate 5 x 10 mm 0.197 x 0.394 with HTP500	RC510TT-YL	1SNA231700R1100	22
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610TT	1SNA233600R1700	22
		In polycarbonate 6 x 10 mm 0.236 x 0.394	RC610TT-YL	1SNA233700R1300	22
		In polycarbonate 8 x 10 mm 0.315 x 0.394, compatible with HTP500 and MG3	RC810TT	1SNA234600R1000	22
		In polycarbonate 8 x 10 mm 0.315 x 0.394 with HTP500	RC810TT-YL	1SNA234700R1400	22
		In polycarbonate 5 x 12 mm 0.197 x 0.472, compatible	MC512	1SNK140000R0000	22
		In polycarbonate 5 x 12 mm 0.197 x 0.472 with HTP500	MC512-YL	1SNK140004R0000	22
		In polycarbonate 6 x 12 mm 0.236 x 0.472	MC612	1SNK150000R0000	22
		In polycarbonate 6 x 12 mm 0.236 x 0.472	MC612-YL	1SNK150004R0000	22
		In polycarbonate 8 x 12 mm 0.315 x 0.472	MC812	1SNK160000R0000	22
		In polycarbonate 8 x 12 mm 0.315 x 0.472	MC812-YL	1SNK160004R0000	22
		In polycarbonate 5 x 12 mm 0.197 x 0.472, Compatible	MG-CPM 13.41790	1SNB041790R0512	1960
		In polycarbonate 6 x 12 mm 0.236 x 0.472 with MG3	MG-CPM 13.41791	1SNB041791R0612	1680
		In polycarbonate 5 x 12 mm 0.197 x 0.472	MG-CPM 13.41740	1SNB041740R0512	1960
		In polycarbonate 6 x 12 mm 0.236 x 0.472	MG-CPM 13.41741	1SNB041741R0612	1680
		In polycarbonate 5 x 10 mm 0.197 x 0.394	MG-CPM-04 41390	1SNB041390R0510	1120
		In polycarbonate 6 x 10 mm 0.236 x 0.394	MG-CPM-04 41391	1SNB041391R0610	1344
		In polycarbonate 5 x 10 mm 0.197 x 0.394	MG-CPM-04 41396	1SNB041396R0810	1120
		In polycarbonate 5 x 10 mm 0.197 x 0.394	MG-CPM-04 41340	1SNB041340R0510	1120
		Universal wire makers holder 5.2 mm 0.205 in spacing	UMH	1SNK900611R0000	10

All the technical data for UL/CSA standard and dimensions in inches are in italic.

Technical data valid for copper conductors only.

## Double-deck terminal blocks

### Screw clamp

 DIN 1 - 3



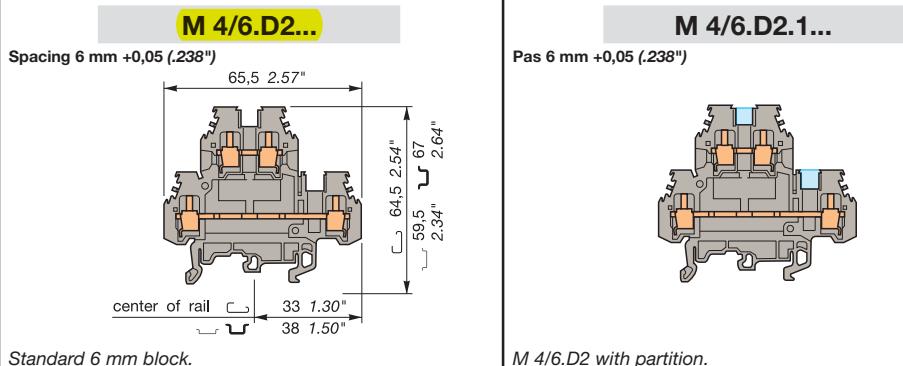
 refer to the section "Special Applications" for part numbers and characteristics.

End stop		th. 12 mm	BADH	1SNA 116 900 R2700
End stop		th. 9,1 mm	BAMH	1SNA 114 836 R0000
End stop		th. 9,1 mm	BAMH	1SNA 194 836 R0100
Rail		35 x 7,5 x 1	PR3.Z2	1SNA 174 300 R1700
Rail		35 x 15 x 2,3	PR4	1SNA 168 500 R1200
Rail		35 x 15 x 1,5	PR5	1SNA 168 700 R2200
Rail		32 x 15 x 1,5	PR1.Z2	1SNA 163 050 R0400

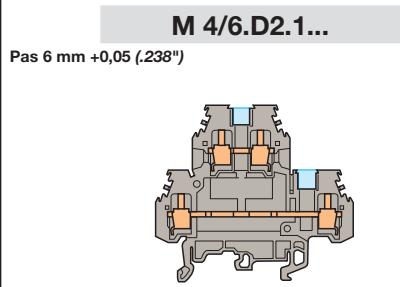
Other end stops, rails and accessories : see section on accessories.

### Notes

The use of some accessories may decrease the block's voltage rating. For more information, consult us.



Standard 6 mm block.



M 4/6.D2 with partition.

UL			CE			UL			CE		
Colour	Type	Part numbers	Colour	Type	Part numbers	Colour	Type	Part numbers	Colour	Type	Part numbers
Grey	 M 4/6.D2	1SNA 115 271 R2200	Grey	 M 4/6.D2.1	1SNA 115 126 R0100						
Green	 M 4/6.D2	1SNA 105 044 R2100	Blue	 M 4/6.D2.1.N	1SNA 125 126 R0300						
Yellow	 M 4/6.D2	1SNA 105 045 R2200	Beige	 M 4/6.D2.1	1SNA 195 126 R0200						
White	 M 4/6.D2	1SNA 105 046 R2300									
Black	 M 4/6.D2	1SNA 105 047 R2400									
Red	 M 4/6.D2	1SNA 105 048 R0500									
Orange	 M 4/6.D2	1SNA 105 049 R0600									
Blue	 M 4/6.D2.N	1SNA 125 271 R2400									
Beige	 M 4/6.D2	1SNA 195 271 R2300									

### Characteristics

### Characteristics

Wire size			Wire size		
	IEC NFC DIN	UL		IEC NFC DIN	UL
Screw	Rigid 0,2-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG	Rigid 0,2-4 mm <sup>2</sup>	22-12 AWG
clamp	Flexible 0,22-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG	Flexible 0,22-4 mm <sup>2</sup>	22-12 AWG

### Voltage

### Voltage

Rated	800 V	300 V(5)	600 V	Rated	800 V	300 V(5)	600 V
Impulse withstand	8 kV			Impulse withstand	8 kV		
Pollution degree	3			Pollution degree	3		
<b>Current</b>				<b>Current</b>			
Rated	32 A	20 A	25 A	Rated	32 A	20 A	25 A
<b>Wire size</b>				<b>Wire size</b>			
Rated / Gauge	4 mm <sup>2</sup> / A4	12 AWG	12 AWG	Rated / Gauge	4 mm <sup>2</sup> / A4	12 AWG	12 AWG
Wire strip. length	Recomm. Screwdriver	Recomm. torque	Protection	Wire strip. length	Recomm. Screwdriver	Recomm. torque	Protection
8,5 mm	4 mm	0,5-0,8 Nm	IP20	8,5 mm	4 mm	0,5-0,8 Nm	IP20
.33"	.157"	4.4-7.1 lb.in	NEMA 1	.33"	.157"	4.4-7.1 lb.in	NEMA 1

### Accessories

Type	Part numbers	Type	Part numbers
1 End section	grey blue beige	FEM6D	th. 1,0 mm 1SNA 118 499 R2300
2 Circuit separator	grey beige	FEM6D	th. 1,0 mm 1SNA 128 499 R2500
3 Separator end section	grey beige	FEM6D	th. 1,0 mm 1SNA 198 499 R2400
4 Test socket	grey beige	SCM6D	1SNA 113 482 R0500
5 Test device		SCM6D	1SNA 193 482 R0600
6 Test plug		SCF6D	th. 1,0 mm 1SNA 118 495 R1700
		SCF6D	th. 1,0 mm 1SNA 198 495 R1000
7 Assembled jumper bar (with IP 20 protection)	32 A	AL2	(1) DIA. 2,0 mm 1SNA 163 070 R0000
	32 A	AL3	(1) DIA. 3,0 mm 1SNA 163 261 R0000
	32 A	DCG	grey 1SNA 163 218 R0500
	32 A	FC2	(3) DIA. 2,0 mm 1SNA 007 865 R2600
		BJMI6D	(2) poles 1SNA 179 668 R2000
		BJMI6D	(2) poles 1SNA 179 669 R2100
		BJMI6D	(2) poles 1SNA 179 670 R2600
		BJMI6D	(2) poles 1SNA 179 671 R1300
		BJMI6D	(2) poles 1SNA 179 672 R1400
		EL6	1SNA 173 627 R2100
		BJS61	(1)(4) 10 poles 1SNA 168 485 R2700
		EV6D	1SNA 168 400 R1600
		BJP61	1SNA 167 225 R2000
		PC61	10 poles 1SNA 163 311 R2200
		AD2,5	1SNA 114 205 R2000
		ITV6	1SNA 168 962 R0400
		CBM5D	th. 0,5 mm 1SNA 173 530 R2400
<b>R</b> See section on markers marking method		RC65 - RC610 Sides of block	RCT610 - RTM7 Top of block
		RC65 - RC610 Sides of block	RCT610 - RTM7 Top of block

Note : (1) A circuit separator SC may be required with the use of these accessories. (2) Use of these accessories requires the user to cut out the partition. (3) For block equipped with test socket AL2. (4) See section accessories for other configuration of poles. (5) 600 V with end section.

## Double-deck terminal blocks

### Screw clamp

 DIN 1 - 3



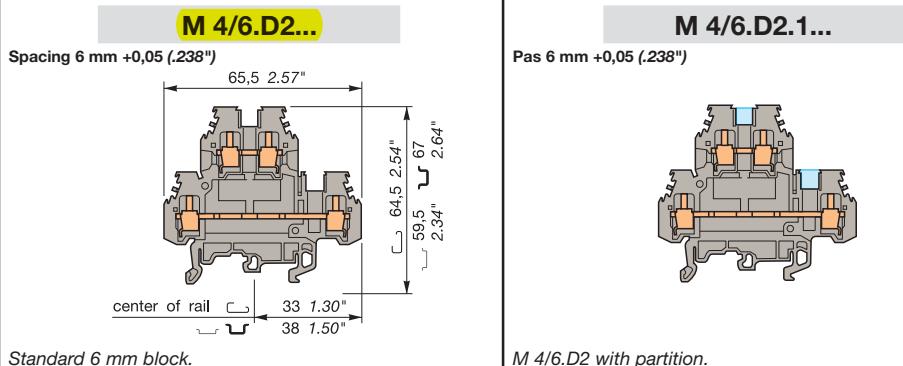
 refer to the section "Special Applications" for part numbers and characteristics.

End stop		th. 12 mm	BADH	1SNA 116 900 R2700
End stop		th. 9,1 mm	BAMH	1SNA 114 836 R0000
End stop		th. 9,1 mm	BAMH	1SNA 194 836 R0100
Rail		35 x 7,5 x 1	PR3.Z2	1SNA 174 300 R1700
Rail		35 x 15 x 2,3	PR4	1SNA 168 500 R1200
Rail		35 x 15 x 1,5	PR5	1SNA 168 700 R2200
Rail		32 x 15 x 1,5	PR1.Z2	1SNA 163 050 R0400

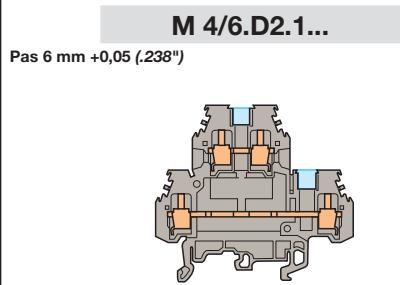
Other end stops, rails and accessories : see section on accessories.

### Notes

The use of some accessories may decrease the block's voltage rating. For more information, consult us.



Standard 6 mm block.



M 4/6.D2 with partition.

UL			CE			UL			CE		
Colour	Type	Part numbers	Colour	Type	Part numbers	Colour	Type	Part numbers	Colour	Type	Part numbers
Grey	 M 4/6.D2	1SNA 115 271 R2200	Grey	 M 4/6.D2.1	1SNA 115 126 R0100						
Green	 M 4/6.D2	1SNA 105 044 R2100	Blue	 M 4/6.D2.1.N	1SNA 125 126 R0300						
Yellow	 M 4/6.D2	1SNA 105 045 R2200	Beige	 M 4/6.D2.1	1SNA 195 126 R0200						
White	 M 4/6.D2	1SNA 105 046 R2300									
Black	 M 4/6.D2	1SNA 105 047 R2400									
Red	 M 4/6.D2	1SNA 105 048 R0500									
Orange	 M 4/6.D2	1SNA 105 049 R0600									
Blue	 M 4/6.D2.N	1SNA 125 271 R2400									
Beige	 M 4/6.D2	1SNA 195 271 R2300									

### Characteristics

### Characteristics

Wire size				Wire size			
	IEC NFC DIN	UL	CSA		IEC NFC DIN	UL	CSA
Screw	Rigid 0,2-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG	Screw	Rigid 0,2-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG
clamp	Flexible 0,22-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG	clamp	Flexible 0,22-4 mm <sup>2</sup>	22-12 AWG	24-12 AWG

Voltage				Voltage			
Rated	800 V	300 V(5)	600 V	Rated	800 V	300 V(5)	600 V
Impulse withstand	8 kV			Impulse withstand	8 kV		
Pollution degree	3			Pollution degree	3		

Current				Current			
Rated	32 A	20 A	25 A	Rated	32 A	20 A	25 A

Wire size				Wire size			
Rated / Gauge	4 mm <sup>2</sup> / A4	12 AWG	12 AWG	Rated / Gauge	4 mm <sup>2</sup> / A4	12 AWG	12 AWG
Wire strip. length	Recomm. Screwdriver	Recomm. torque	Protection	Wire strip. length	Recomm. Screwdriver	Recomm. torque	Protection
8,5 mm	4 mm	0,5-0,8 Nm	IP20	8,5 mm	4 mm	0,5-0,8 Nm	IP20
.33"	.157"	4.4-7.1 lb.in	NEMA 1	.33"	.157"	4.4-7.1 lb.in	NEMA 1

Type				Part numbers				Type				Part numbers			
1	End section	grey blue beige	FEM6D	th. 1,0 mm	1SNA 118 499 R2300			FEM6D	th. 1,0 mm	1SNA 118 499 R2300					
2	Circuit separator	grey beige	FEM6D	th. 1,0 mm	1SNA 128 499 R2500			FEM6D	th. 1,0 mm	1SNA 128 499 R2500					
3	Separator end section	grey beige	SCM6D	th. 1,0 mm	1SNA 198 499 R2400			SCM6D	th. 1,0 mm	1SNA 198 499 R2400					
4	Test socket	grey beige	SCM6D	th. 1,0 mm	1SNA 113 482 R0500			SCM6D	th. 1,0 mm	1SNA 113 482 R0500					
5	Test device		SCF6D	th. 1,0 mm	1SNA 118 495 R1700			SCF6D	th. 1,0 mm	1SNA 118 495 R1700					
6	Test plug		SCF6D	th. 1,0 mm	1SNA 198 495 R1000			SCF6D	th. 1,0 mm	1SNA 198 495 R1000					
7	Assembled jumper bar (with IP 20 protection)	32 A	AL2	(1)	DIA. 2,0 mm	1SNA 163 070 R0000		AL2	(1)	DIA. 2,0 mm	1SNA 163 070 R0000				
8	Connector plate	35 A	AL3	(1)	DIA. 3,0 mm	1SNA 163 261 R0000		AL3	(1)	DIA. 3,0 mm	1SNA 163 261 R0000				
9	Jumper bar not assembled Screw + washer + post	32 A	DCG	grey	1SNA 163 218 R0500			DCG	grey	1SNA 163 218 R0500					
10	Pivoting jumper bar	35 A	EL6	1SNA 173 627 R2100				EL6	1SNA 173 627 R2100						
11	Comb type jumper bar	35 A	BJS61	(1)(4)	10 poles	1SNA 168 485 R2700		BJS61	(2)(4)	10 poles	1SNA 168 485 R2700				
12	IDC jumper	24 A	BJP61			1SNA 168 400 R1600		BJP61			1SNA 168 400 R1600				
13	Vertical interconnection		PC61		10 poles	1SNA 163 311 R2200		PC61		10 poles	1SNA 163 311 R2200				
14	Shield connector		AD2,5			1SNA 114 205 R2000		AD2,5			1SNA 114 205 R2000				
R	See section on markers marking method		ITV6			1SNA 168 962 R0400		ITV6			1SNA 168 962 R0400				
			CBM5D	th. 0,5 mm	1SNA 173 530 R2400			CBM5D	th. 0,5 mm	1SNA 173 530 R2400					

RC65 - RC610 Sides of block RCT610 - RTM7 Top of block

RC65 - RC610 Sides of block RCT610 - RTM7 Top of block

Note : (1) A circuit separator SC may be required with the use of these accessories. (2) Use of these accessories requires the user to cut out the partition. (3) For block equipped with test socket AL2. (4) See section accessories for other configuration of poles. (5) 600 V with end section.

# Static Pressure Probe

## Model A-520



- Unique dual orifice design to eliminate air flow error
- Gasketed flange for ease of installation
- 1/4" brass hose barb connection for transducer/switch
- Available in 4" and 8" probe lengths
- 6061T-6 aluminum alloy
- Gasketed mounting flange, brass connector and mounting holes guarantee quick and easy installation

The A-520 Static Pressure Probe is designed to pick up static pressure in a duct, plenum, air handler or other HVAC equipment. The Probe has two orifices vertically opposite each other to cancel out any air flow induced errors. If a bent tube with a single orifice at the end is used to pick up static pressure in a duct, the air flowing across the probe may cause a small low pressure within the probe. This low pressure acts against the duct static pressure and hence induces an error which is exponentially proportional to the air flow. As the air flow increases, this error will increase also and as the flow decreases, the error decreases in an exponential relationship.

The engineers at MAMAC Systems resolved this problem with a unique design which incorporates two orifices diametrically opposing each other in a vertical plane. When the air flows across an orifice, it creates a suction towards that orifice. Similarly, when the same air flows across the other orifice, it creates an opposing suction which cancels out the first pressure drop. Regardless of the velocity, the flow error is constantly cancelled out and the A-520 provides an accurate,

The A-520 Static Pressure Probe is available in 6061T-6 aluminum alloy or 304 stainless steel material. In this way, for standard HVAC applications, the aluminum probe can be used. However, in exhaust applications where corrosive gases are present, the 304 stainless steel is recommended. The A-520 is available in two probe length options: 1) 4" aluminum/stainless steel; 2) 8" aluminum/ stainless steel. The Probe is attached to a 2" O.D. flange with two conveniently located mounting holes for ease of attachment to the sheet metal. The flange also has a neoprene gasket to seal off the mounting holes. An industry standard 1/4" hose barb or 1/8" NPT female swivel brass fitting is provided for PVC/copper tubing connection. The A-520 is designed to substantially reduce the installation time required and to provide a convenient method to pick up static pressure in HVAC equipment.

Installation is completed by drilling a 1/4" hole in the sheet metal, inserting the Probe and securing the assembly by using the mounting flange as a template to mark and drill two holes for the self tapping sheet metal screws. A label is provided to correctly position the mounting holes during installation to insure that the two orifices are perpendicular to the air flow.



**MAMAC SYSTEMS®**  
MONITOR • DECISION • CONTROL  
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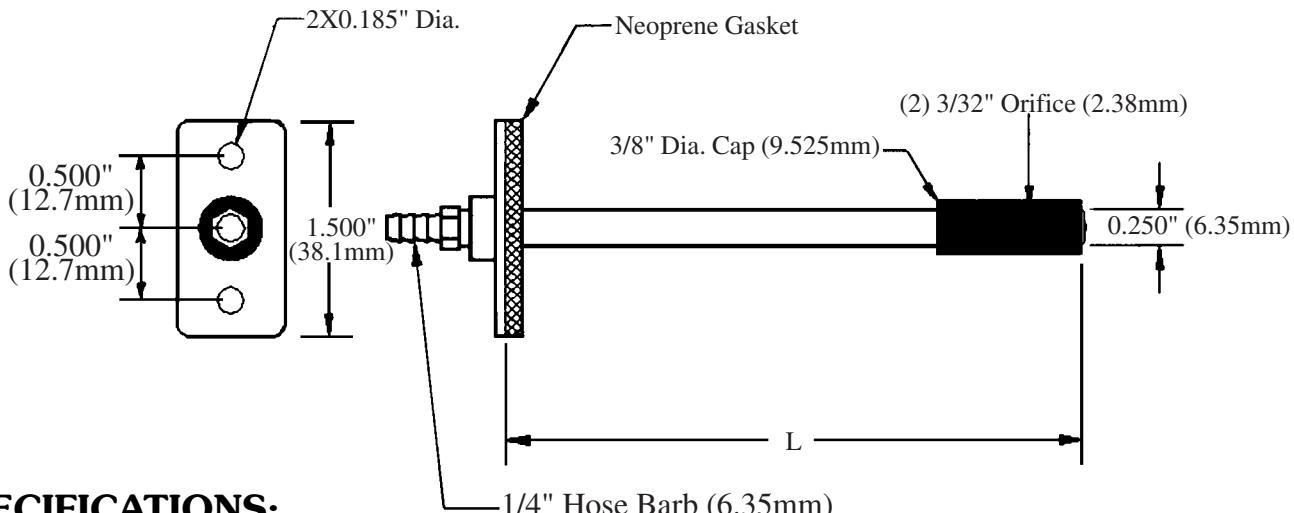
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# A-520

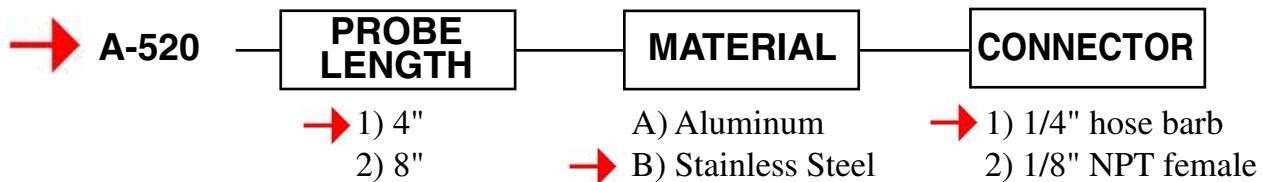


## SPECIFICATIONS:

**Material:** 6061T-6 Aluminum Alloy or 304 Stainless Steel  
**Port Connections:** 1/4" brass hose barb or 1/8" NPT female  
**Gasket Material:** Neoprene  
**Maximum Pressure:** 10 psig

**Maximum Temperature:** 250° C  
**Maximum Air Flow:** Unlimited  
**Weight:** 1.5 oz.

## ORDERING INFORMATION:



The MAMAC Systems warranty covers parts and labor for 2 years from date of shipment. MAMAC Systems reserves the right to change any specifications without notice to improve performance, reliability, or function of our products.

## A Complete Line of Control Peripherals From a Single Source

**MAMAC Systems** is the only manufacturer offering more than fifty products to satisfy all temp, humidity, pressure, flow, light, speed or any other DDC controls application. MAMAC's complete line of control peripherals is available in over two thousand different configurations of supply voltage, output, range and enclosure type to make our products guaranteed compatible to all HVAC controls, industrial automation and COGEN systems worldwide.

Single source accountability, liberal 2 year warranty, worldwide service and technical support, competitive pricing, accumulated experience of more than 10,000 installations are some of the benefits offered by MAMAC Systems which are second to none in the HVAC DDC controls industry.



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# ULTIMA® X5000 Gas Monitor

The future looks bright.

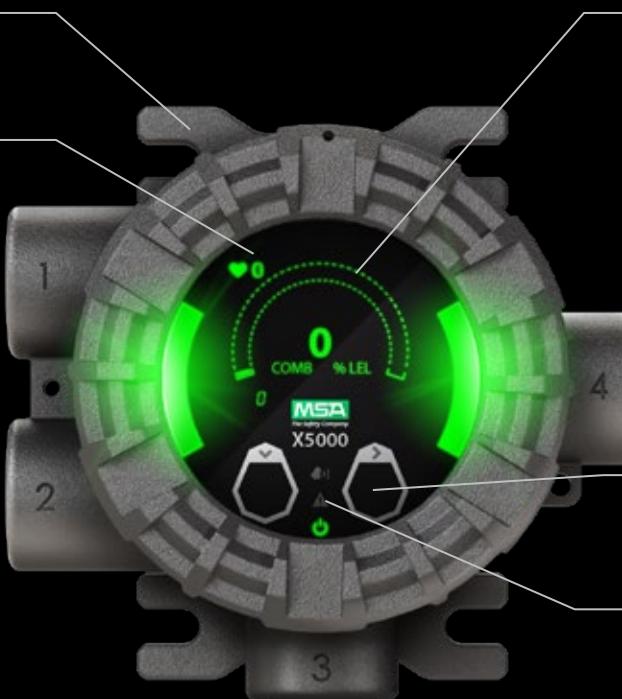


Simple retrofits have identical footprint and wiring to ULTIMA X Gas Monitor series.

Bluetooth® wireless technology allows mobile device to act as HMI screen and controller.



Reduce setup time by at least 50% with the X/S Connect App.



Intuitive display features new design equipped with organic LED (OLED) display, with full word text in 9 languages. Bright green, yellow, and red status LEDs for extreme visibility.

Industry-first, touch-button interface provides intuitive, tool-free user experience.

Instrument status indicators illuminate power, fault, and alarm conditions.

## Advanced Sensor Technology

POWERED BY



WITH



- Patented XCell Sensors with TruCal technology\* extend calibration cycles for as long as 18 months, actively monitor sensor integrity and compensate for environmental factors and electrochemical sensor drift.
- Diffusion Supervision** sends acoustic signal every 6 hours to check that sensor inlet isn't obstructed so gas can reach the sensor.
- Worry-free operation; automatically self-checks four times per day.
- Three-year warranty and five-year expected life for XCell Sensors.
- Dual sensor capability** doubles sensing power with half the footprint of a single gas sensor transmitter.
- SafeSwap** enables safe and quick XCell Sensor replacement without powering off gas detector.



## Applications

- |               |                 |                    |
|---------------|-----------------|--------------------|
| • Chemical    | • Petrochemical | • Wastewater       |
| • Oil and gas | • Utilities     | • General industry |

\* Only CO & H<sub>2</sub>S XCell Sensors

WE KNOW WHAT'S AT STAKE.

# ULTIMA X5000 Gas Monitor

## Specifications



Product Specifications		
<b>COMBUSTIBLE GAS SENSOR TYPE</b>	Catalytic Bead (XCell combustible) Infrared (XIR Plus)	
<b>TOXIC GAS &amp; OXYGEN SENSOR TYPE</b>	<b>XIR PLUS</b>	Carbon Dioxide (CO <sub>2</sub> )
	<b>XCell Toxic</b>	Carbon Monoxide (CO) Carbon Monoxide (CO) H <sub>2</sub> -resistant Hydrogen Sulfide (H <sub>2</sub> S) Chlorine (Cl <sub>2</sub> )
	<b>XCell O<sub>2</sub></b>	Oxygen (O <sub>2</sub> )
	<b>XCell SO<sub>2</sub></b>	Sulfur Dioxide (SO <sub>2</sub> )
	<b>Electrochem.</b>	Hydrogen (H <sub>2</sub> ) Nitrogen Dioxide (NO <sub>2</sub> )
<b>SENSOR MEASURING RANGES</b>	<b>Combustible</b>	0-100% LEL
	<b>CO<sub>2</sub></b>	0-2%, 0-5% Vol
	<b>CO</b>	0-100, 0-500, 0-1000 ppm
	<b>CO, H<sub>2</sub>-resistant</b>	0-100 ppm
	<b>Cl<sub>2</sub></b>	0-5, 0-10, 0-20 ppm
	<b>H<sub>2</sub></b>	0-1000 ppm
	<b>H<sub>2</sub>S</b>	0-10, 0-50, 0-100, 0-500 ppm
	<b>NO<sub>2</sub></b>	0-10 ppm
	<b>O<sub>2</sub></b>	0-25%
	<b>SO<sub>2</sub></b>	0-25 ppm
<b>TYPICAL SENSOR LIFE</b>	<b>XCell Sensors</b>	5 years
	<b>Infrared</b>	10 years
<b>SENSOR PERFORMANCE*</b>	<b>T90 (typical)</b>	<b>Repeatability</b>
XIR PLUS COMB.	< 2 sec.	< ± 1% LEL
XIR PLUS CO <sub>2</sub>	< 6 sec.	< ± 1% Vol
XCELL COMB.	< 22 sec.	< ± 3% LEL
XCELL CO	< 9 sec.	< ± 1%
XCELL Cl <sub>2</sub>	< 12 sec.	± 1%
H <sub>2</sub>	< 185 sec.	< ± 10%
XCELL H <sub>2</sub> S	< 23 sec.	< ± 1%
NO <sub>2</sub>	< 60 sec.	< ± 10%
<b>XCELL O<sub>2</sub></b>	< 11 sec.	< ± 1% Vol
XCELL SO <sub>2</sub>	< 6 sec.	± 1%
<b>APPROVALS CLASSIFICATION</b>	Markings vary by component. See manual for specific component markings.	
DIVISIONS (US/CAN)	Class I, II, III; Div 1 & 2, T4/T5/T6	
ZONES (GLOBAL)	Ex db nA IIC T5 Gb (Class I, Zone 1/Zone2) Ex tb IIIC T85°C Db (Class II, Zone 21)	
ENCLOSURE RATING	Type 4X, IP66	
<b>WARRANTY</b>	<b>X5000 transmitter</b>	2 years
	<b>XIR PLUS</b>	10 years source, 5 years electronics
	<b>XCell Sensors</b>	3 years
	<b>Electrochemical Sensors</b>	Varies by gas
<b>APPROVALS</b>	CSA, ATEX, IECEx, INMETRO, DNV-GL Marine, CE Marking. Complies with C22.2 No. 152, FM 6320 RED, FCC, Suitable for SIL 2	

\*Typical response at standard temperature and pressure test conditions

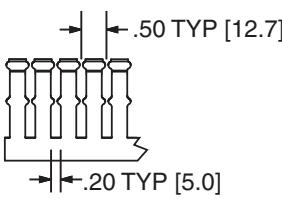
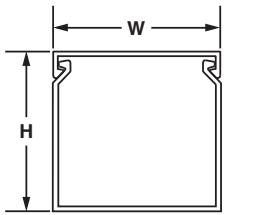
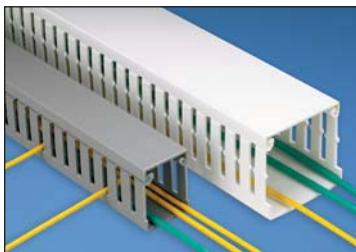
Note: This Bulletin contains only a general description of the products shown. While product uses and performance capabilities are generally described, the products shall not, under any circumstances, be used by untrained or unqualified individuals. The products shall not be used until the product instructions/user manual, which contains detailed information concerning the proper use and care of the products, including any warnings or cautions, have been thoroughly read and understood. Specifications are subject to change without prior notice.

Environmental Specifications**		
<b>OPERATING TEMPERATURE RANGE</b>	** May differ by gas type, see manual XCell -40°C to +60°C XIR PLUS -40°C to +60°C	
<b>STORAGE TEMPERATURE RANGE</b>	-40°C to +60°C	
<b>RELATIVE HUMIDITY (NON-CONDENSING)</b>	XCell toxic & O <sub>2</sub> XCell combustible XIR PLUS	10-95% 0-95% 15-95%
Mechanical Specifications		
<b>INPUT POWER</b>	11 to 30 VDC, 3 wire, <5 W nominal	
<b>SIGNAL OUTPUT</b>	Dual 4-20 mA current source, HART	
<b>BLUETOOTH (OPTIONAL)</b>	Bluetooth Low Energy (BLE) v4.3 or higher	
<b>RELAY RATINGS</b>	5 A @ 30 VDC; 5 A @ 220 VAC (3X) SPDT - fault, warn, alarm	
<b>RELAY MODES</b>	Common, discrete, horn	
<b>NORMAL MAX POWER RELAYS</b>	XIR PLUS XCell combustible XCell Toxic & O <sub>2</sub> XIR PLUS & XCell combustible XIR PLUS & XCell toxic or O <sub>2</sub> Dual XIR PLUS Dual XCell toxic & O <sub>2</sub> Dual XCell combustible Dual XCell comb. & XCell toxic or O <sub>2</sub>	6.7 W 4.9 W 2.8 W 10.9 W 7.0 W 11.6 W 3.6 W 10.6 W 5.3 W
<b>EMC DIRECTIVE</b>	Complies with EN 50270, EN 61000-6-4, EN 61000-6-3	
<b>DISPLAY</b>	Organic LED (multi-lingual) with contrast ratio of 2000:1 and view angel of 160°	
<b>HART</b>	HART 7, HART device description language available	
<b>FAULTS MONITORED</b>	Low supply voltage, RAM checksum error, flash checksum error, EEPROM error, internal circuit error, relay, invalid sensor configuration, sensor faults, general system	
<b>WIRING REQUIREMENTS</b>	3-wire (single sensor) or 4-wire (dual sensor) shielded cable. Refer to manual for mounting distances and wire gauge.	
Dimensions		
<b>HOUSING (W x H)</b>	5.88" x 5.71" (150 x 145 mm)	
W/XCELL SENSOR	5.88" x 10.15" (150 x 258 mm)	
W/XCELL & XIR SENSORS	13.42" x 10.15" (341 x 258 mm)	
<b>LID (DEPTH)</b>	4.86" (123 mm) W/O RELAY BOARD 3.86" (98 mm)	
<b>WEIGHT</b>	8.8 lb. (4 kg), 316 SS	

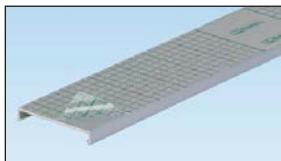
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	<b>2.25 x 3.12</b>	<b>57.2 x 79.2</b>	<b>0.20</b>	<b>5.0</b>	<b>C2LG6</b>	<b>6</b>	<b>60</b>	<b>120</b>
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48.

Base and cover sold separately.

\*"H" dimension includes duct and cover.

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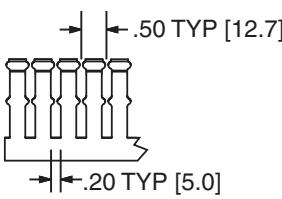
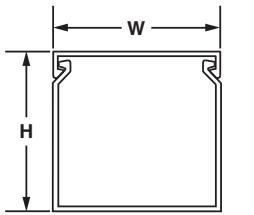
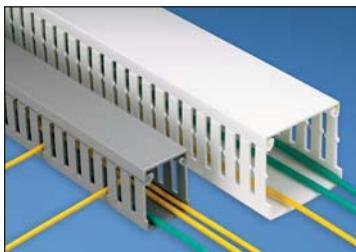
E4.  
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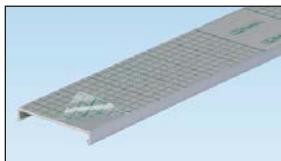
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	<b>2.25 x 4.10</b>	<b>57.2 x 104.1</b>	<b>0.20</b>	<b>5.0</b>	<b>C2LG6</b>	<b>6</b>	<b>60</b>	<b>120</b>
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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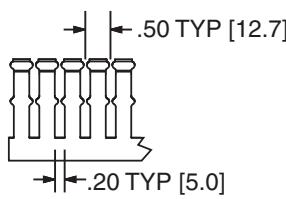
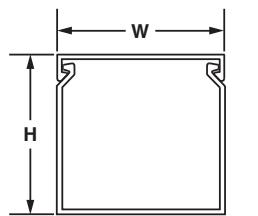
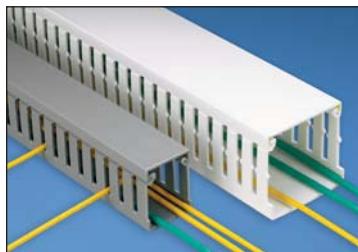
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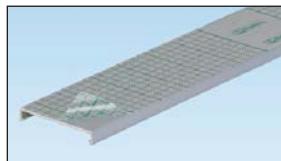
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**Panduit® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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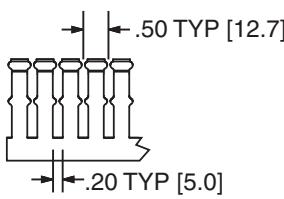
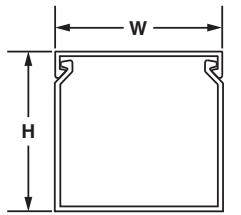
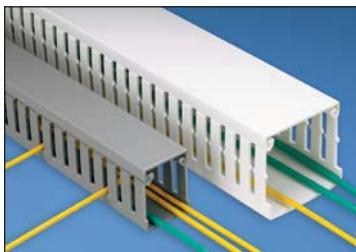
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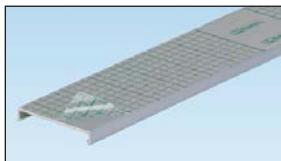
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**Panduit® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48.  
 Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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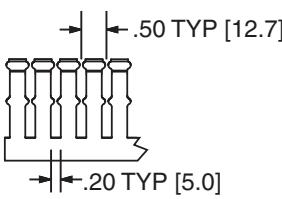
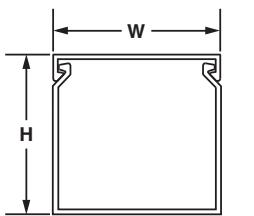
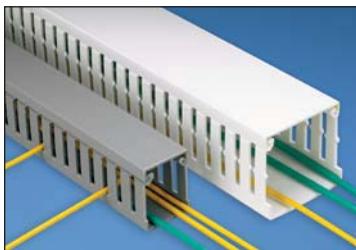
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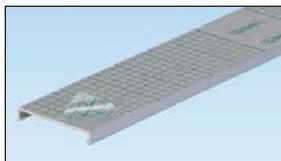
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**Panduit® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48. Base and cover sold separately.

\*"H" dimension includes duct and cover.

Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

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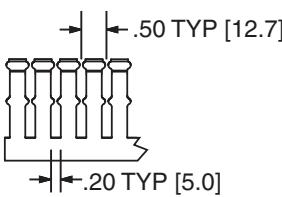
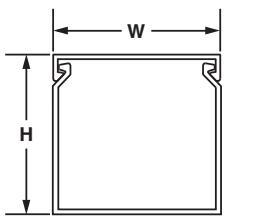
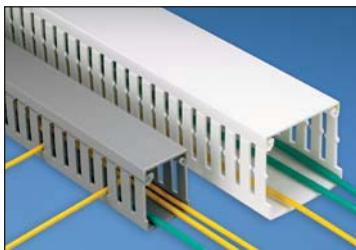
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**Panduct® Type F Narrow Slot Wiring Duct**

- Narrow slot/finger design provides more slots to fit the spacing of high-density terminal blocks and other hardware
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet



Multiple slot restrictors present with 2" and greater duct wall height.



To order cover with protective film add "F" to part number. 6" cover not available with film.



Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
<b>F.5X.5LG6</b>	0.69 x 0.60	17.5 x 15.2	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.5X1LG6</b>	0.69 x 1.06	17.5 x 26.9	0.20	5.0	<b>C.5LG6</b>	6	120	120
<b>F.75X.75LG6</b>	0.93 x 0.82	23.6 x 20.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F.75X1.5LG6</b>	0.93 x 1.57	23.6 x 39.9	0.20	5.0	<b>C.75LG6</b>	6	120	120
<b>F1X1LG6</b>	1.26 x 1.13	32.0 x 28.7	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X1.5LG6</b>	1.26 x 1.62	32.0 x 41.1	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X2LG6</b>	1.26 x 2.12	32.0 x 53.8	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X3LG6</b>	1.26 x 3.12	32.0 x 79.2	0.20	5.0	<b>C1LG6</b>	6	120	120
<b>F1X4LG6</b>	1.26 x 4.10	32.0 x 104.1	0.20	5.0	<b>C1LG6</b>	6	60	120
<b>F1.5X1LG6</b>	1.75 x 1.12	44.5 x 28.4	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X1.5LG6</b>	1.75 x 1.62	44.5 x 41.1	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X2LG6</b>	1.75 x 2.12	44.5 x 53.8	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X3LG6</b>	1.75 x 3.12	44.5 x 79.2	0.20	5.0	<b>C1.5LG6</b>	6	120	120
<b>F1.5X4LG6</b>	1.75 x 4.10	44.5 x 104.1	0.20	5.0	<b>C1.5LG6</b>	6	60	120
<b>F2X1LG6</b>	2.25 x 1.12	57.2 x 28.4	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X1.5LG6</b>	2.25 x 1.62	57.2 x 41.1	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X2LG6</b>	2.25 x 2.12	57.2 x 53.8	0.20	5.0	<b>C2LG6</b>	6	120	120
<b>F2X3LG6</b>	2.25 x 3.12	57.2 x 79.2	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X4LG6</b>	2.25 x 4.10	57.2 x 104.1	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2X5LG6</b>	2.25 x 5.10	57.2 x 129.5	0.20	5.0	<b>C2LG6</b>	6	60	120
<b>F2.5X3LG6</b>	2.75 x 3.12	69.9 x 79.2	0.20	5.0	<b>C2.5LG6</b>	6	120	120
<b>F3X1LG6</b>	3.25 x 1.12	82.6 x 28.4	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X2LG6</b>	3.25 x 2.12	82.6 x 53.8	0.20	5.0	<b>C3LG6</b>	6	120	120
<b>F3X3LG6</b>	3.25 x 3.12	82.6 x 79.2	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X4LG6</b>	3.25 x 4.10	82.6 x 104.1	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F3X5LG6</b>	3.25 x 5.10	82.6 x 129.5	0.20	5.0	<b>C3LG6</b>	6	60	120
<b>F4X2LG6</b>	4.25 x 2.12	108.0 x 53.8	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X3LG6</b>	4.25 x 3.12	108.0 x 79.2	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X4LG6</b>	4.25 x 4.10	108.0 x 104.1	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F4X5LG6</b>	4.25 x 5.10	108.0 x 129.5	0.20	5.0	<b>C4LG6</b>	6	60	120
<b>F6X4LG6</b>	6.25 x 4.15	158.8 x 105.4	0.20	5.0	<b>C6LG6</b>	6	60	120

Part number shown for LG (Light Gray). For other color availability see color selection guide, page C1.48.

Base and cover sold separately.

\*"H" dimension includes duct and cover.

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PCI8000

Phoenix Controls PCI8000 is a multi-purpose solution seamlessly integrating critical airflow control devices to building automation networks while providing a platform for custom control logic. It performs:

- Protocol translation and data integration between the company's environmental control systems to BACnet®-capable Building Automation Systems (BAS).
- Bidirectional translation between room-level devices using LonWorks® technology and the BAS utilizing either BACnet over IP or MS/TP to manage read requests and write commands.

The PCI8000 offers a graphical programming environment and configurable inputs and outputs to extend control functions provided by on-site valve controllers. Using optional remote I/O modules, it can also be used to provide local control for hard-wired third party devices - typically room-level lighting control, advanced temperature control sequences, or integrating air quality sensors to the building's front-end visualization system.

A web server is included with functions for troubleshooting and commissioning devices available through web pages. Diagnostic displays can be used to assess problems on the room devices, room network, or device itself. If remote access is provided, many troubleshooting tasks can be performed off-site, saving the time and expense of travel to fix a potentially minor issue.

The PCI8000 can be ordered with Wi-Fi radio enabled. Technicians can wirelessly connect their Workbench to analyze diagnostics or make changes to valves. Or they can stream to a PC web browser to view the health and diagnostics web pages. These wirelessly performed technician tasks reduce labor for difficult to access valves.

The Lab Verification feature is a set of web pages that field technicians use to perform field acceptance testing for one pressurization zone at a time. It temporarily overrides the airflow to min and max settings as well as occupied/unoccupied set points, then captures the readings for reporting and archiving.

The Test and Balance (TAB) feature is also a set of web pages that is used by third party verification experts to measure all airflows to ensure valves are flowing as intended. The TAB function can place several spaces in full heating or cooling so the balancer can check out the hot water and air handling systems. Balancers can enter the measured field data for adjustments and save the data in a .csv format for use in their own reporting tool.



PCI8000 with Communication Module

## FEATURES

- Support for Niagara 4 with Phoenix Controls Workbench 3.0 or later.
- Optional support for Niagara AX: Phoenix Controls Workbench 2.5 or later.
- Web User interface for device, network, and platform diagnostics.
- Supports up to 4 optional communications modules.
- Includes 2 on-board RS-485 BACnet® MS/TP ports.
- Up to 49\* LON devices with 20 fume hoods maximum per channel. 197 devices maximum per PCI8000.  
\*First LON module supports 50 devices.
- Data Recovery Services prevent data loss during power interruptions.
- Lab Verification function for field acceptance testing via password protected web pages.
- Test and Balance function for third party balancers to verify valves work as intended via password protected web pages.
- Support for remote I/O modules connected by BACnet MS/TP. Refer to *PCI I/O Module Product Data Sheet (MKT-0431)*.

## SPECIFICATIONS

### Platform

- ARM® Cortex™-A8 1Ghz processor
- 1GB DDR3 SDRAM
- 2Mb (megabit) Serial FRAM
- Up to 4GB microSD Flash memory
- Removable micro-SD card with 4GBflash total storage; 2GB user storage
- Real-time clock

### Operating System

Niagara 4.4 or later  
Niagara 3.8 (Optional)

### On-Board Communications

- Two 10/100Mbit Ethernet ports
- Two electrically isolated RS485 ports with selectable bias and termination
- USB Type A connector (backup and restore support)

### Integration Points

25 points per device (e.g; 20 devices = 500 points)

### Power

- 24 VAC, 50/60Hz @ 24 VA minimum
  - Dedicated UL listed Class 2 transformer
- 24 Vdc from Linear Power Supply (LPS) providing at least 1A (24W)
- Wall-mount, Class 2 universal AC power adapter; Input = 90-264 Vac, 47-63 Hz; Output = 24 Vdc, 1.25 A (30W) maximum
  - PCI option WPS
  - Supplies 24 Vdc via barrel-connector plugs, all ungrounded for US, UK, EU, and Australian outlets
  - Intended for office use only; excluded from agency testing
- Internal battery backup is neither required nor available.

### Optional Communication Modules

- LON Modules: One LON network port per module (ANSI 709.1 LonTalk Protocol)
  - Up to four LON modules per PCI
- BACnet MS/TP Module: Two RS485 ports, 3 Pin Connector (up to 115,200 baud)
  - Up to two BACnet modules per PCI
- Refer to *Communication Module Ordering Considerations* section

### Network Limitations

- First LON module supports up to 50 devices (LVC + LRC + PUL + PTC + LDU + FHD) with 20 fume hoods maximum. Subsequent modules limited to 49 LON devices with 20 hood maximum per channel. Up to 4 LON modules per PCI8xxx with up to 197 devices.
- BACnet MS/TP: Smaller of 32 Unit Loads or 50 Devices per network segment

### BACnet Unit Loads

These components each exert the following unit load on the MS/TP network.

- PCI8000 COM-1 = 1/8
- PCI8000 COM-2 = 1/8
- Each PCI8000 BACnet Communication Module = 1/4 (1/8 for each port)

### Optional Remote I/O Modules

- 16- and 34-point modules available
- Connect to PCI via RS485 and are ordered separately from PCI
- Refer to *PCI I/O Module Product Data Sheet*

### Dimensions

- PCI8000: 6.38" (162 mm) L x 4.33" (110 mm) W x 2.4" (61 mm) H
- Optional Communication Module (LON or BACnet): 2.07" (52.5 mm) L x 4.33" (110 mm) W x 2.4" (61 mm) H
- Optional Wall-mount Power Adapter (option -WPS): 3.56" (90.3 mm) L x 1.97" (50.0 mm) W x 1.50" (38.15 mm) H, excluding AC plug; add 0.25" (6.35 mm) to 1.00" (25.4 mm) to height, excluding prongs, based on which style plug is used

### Approximate Weight

- PCI8000: 13.2 oz (0.37kg)
- Optional Communication Module (LON, BACnet): 4.75 oz (0.13 kg)
- Optional Wall-mount Power Adapter (option -WPS): 8.00 oz (0.23 kg)

### Environmental Requirements

- Storage Temperature Range  
-40 - 185 °F (-40 - 85 °C)
- Operating Temperature Range  
-4 - 140 °F (-20 - 60 °C)
- Operating Humidity Range  
5 - 95% RH, non-condensing
- Product is for indoor use only, altitude to 6,562 ft (2,000 m).

### WiFi

For DIS region only:

- No Wi-Fi capability, not upgradable

For ROW and USA regions only:

- IEEE802.11a/b/g/n
- IEEE802.11n HT20 @ 2.4GHz
- IEEE802.11n HT20/HT40 @ 5GHz
- Configurable radio (Off, WAP, or Client)
- WPAPSK/WPA2PSK supported

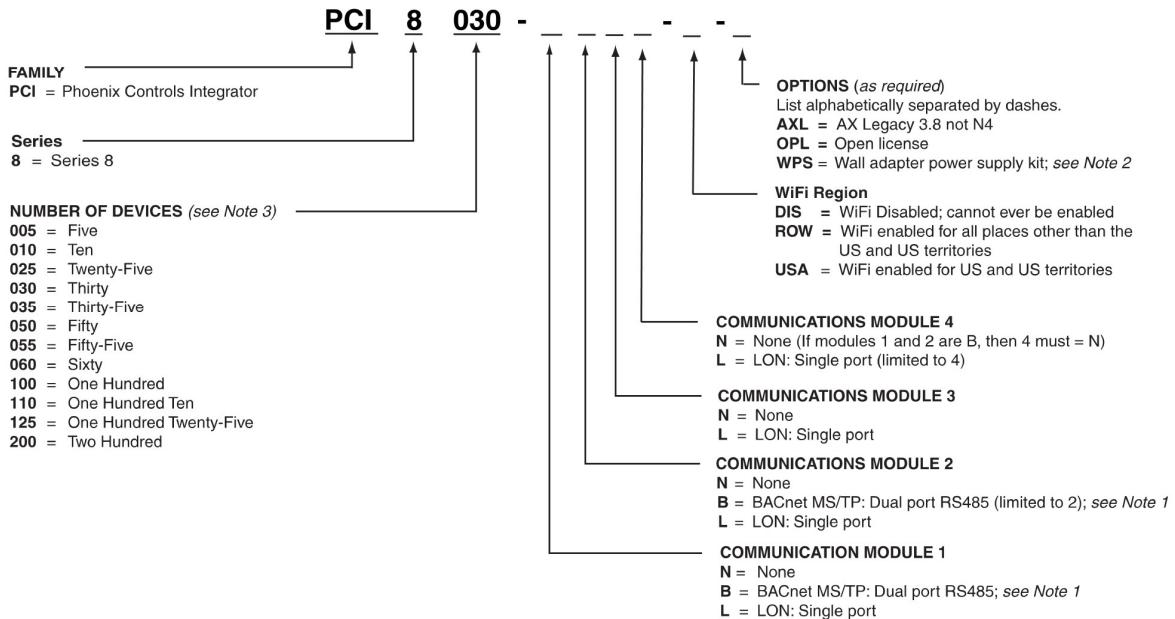
### Agency Listings\*



- UL 916
- CE EN 61326-1
- FCC Part 15 Subpart B, Class B
- FCC Part 15 Subpart C
- C-UL listed to Canadian Standards Association (CSA) C22.2 No. 205-M1983 Signal Equipment"
- 1999/5/EC R&TTE Directive
- CCC
- SRRC
- RSS
- ROHS
- ICES-003, Class B - Industry Canada Interference-Causing Equipment Standard
- CE Declaration of Conformity (Council Directive 004-108-EC)
- WEEE

\*Excludes Option WPS - Wall Adapter Power Supply kit.

## ORDERING GUIDE



### NOTES:

1. Communication Modules terminate BACnet MSTP room networks when more than the two on-board ports are needed.
2. 100-240 Vac, 50/60 Hz Wall Adapter – Connects to the 2.5 mm barrel plug 24 V input on the PCI8000 and includes US, EU, UK, and AU style plugs.
3. Maximum Device Count = Total LON Devices + Total BACnet Devices; refer to the *Maximum Number of Devices, Points, and Communications Modules* section.

### Communication Module Ordering Considerations

The PCI8000 controller supports a maximum of four communication modules in certain combinations. The following chart details the possible combinations. Note that if you use two RS485 option modules, you are limited to one additional LON module for a total of three.

Communication Module	Module Types								
1	BACnet	BACnet	BACnet	BACnet	LON	LON	LON	LON	LON
2	None	BACnet	BACnet	LON	LON	LON	LON	None	
3	None	None	LON	LON	LON	None	None	None	
4	None	None	None	LON	LON	None	None	None	

### Maximum Integration Channels

The maximum number of channels that can be integrated per PCI are shown in the following table, assuming they also meet the maximum allowable devices and points. Refer to the *Maximum Devices, Points, and LON Communications Modules* section.

Maximum On-Board Channels	Maximum Optional Communication Modules			Maximum Ports/Channels		Maximum Integration Channels
	BACnet	BACnet	LON	BACnet	LON	
2	2	2	1	4	1	7
2	1	1	3	2	3	7
2	0	0	4	0	4	6



## Overview

Lead time	Usually in Stock
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## General

Provided equipment	CD with software Documentation CD Installation guide Smart UPS signalling RS-232 cable
Number of tare power	15 W
Number of power module free slots	0
Number of power module filled slots	0
Redundant	No
UPS size	WS

## Physical

Depth	6.73 in (17.1 cm)
Height	5.83 in (14.8 cm)
Mounting preference	No preference
Net Weight	28.35 lb(US) (12.86 kg)
Mounting mode	Not rack-mountable
Two post mountable	0
USB compatible	No
Width	14.25 in (36.2 cm)

## Input

Input Frequency	50/60 Hz +/- 3 Hz auto-sensing
Number of input connectors	1 Hard Wire 3-wire (1PH+N+G)
Efficiency at full load	75...154 V adjustable

Nominal Input Voltage	120 V
-----------------------	-------

## Output

Rated power in W	325 W
Max Configurable Power (Watts)	325 W
Harmonic distortion	Less than 5%
Output Frequency (sync to mains)	47...53 Hz for 50 Hz nominal sync to mains 57...63 Hz for 60 Hz nominal sync to mains
Topology	Line Interactive
Waveform Type	Sine wave
Output connector type	Hard Wire 3-wire (H N + E) 1
Curve equation	Efficiency
Curve load maximum	100 %
Curve X-axis maximum	100 %
Curve X-axis minimum	0 %
Curve X-axis title	Load
Curve X-axis units	Percentage
Curve Y-axis maximum	100 %
Curve Y-axis minimum	50 %
Curve Y-axis title	Efficiency
Curve Y-axis units	Percentage
Efficiency at full load	94 % full load)
Graph display	1
Output voltage	120 V
Maximum configurable power in VA	500 VA
Rated power in VA	500 VA

## Conformance

Product certifications	UL Recognized
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## Environmental

Ambient air temperature for operation	32...104 °F (0...40 °C)
Relative humidity	0...95 %
Operating altitude	0...10000 ft
Ambient air temperature for storage	5...113 °F (-15...45 °C)
Storage Relative Humidity	0...95 %
Storage altitude	0...50000 ft (0.00...15240.00 m)
Acoustic level	55 dBA
Online Thermal Dissipation	90 Btu/h
Show note OP temperature	No
IP degree of protection	IP20

## Batteries & Runtime

Battery type	Lead-Acid battery
Included Battery Modules	1
Battery Slots Empty	1
Typical recharge time	2 h
RBC Quantity	1
Liquid Electrolyte Value	0
Battery curve	B
Battery Charge Power (Watts)	60 W rated

Battery power in VAH	120 VAh runtime
Battery life	3...5 year(s)
Extendable Run Time	0

### Communications & Management

Free slots	1
Control panel	LED status display with load and battery bar-graphs and On Line : On Battery : Replace Battery : and Overload Indicators
Audible Alarm	Alarm when on battery : distinctive low battery alarm : overload continuous tone alarm
Emergency Power Off (EPO)	Yes

### Surge Protection and Filtering

Surge energy rating	540 J
Filtering	Full time multi-pole noise filtering : 0.3% IEEE surge let-through : zero clamping response time : m

### Ordering and shipping details

Package weight(Lbs)	29.37 lb(US) (13.32 kg)
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### Packing Units

Package 1 Height	11.69 in (29.7 cm)
Package 1 width	11.69 in (29.7 cm)
Package 1 Length	18.94 in (48.1 cm)

### Offer Sustainability

Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>
REACH Regulation	<a href="#">REACH Declaration</a>
EU RoHS Directive	Compliant <a href="#">EU RoHS Declaration</a>
Mercury free	Yes
RoHS exemption information	<a href="#">Yes</a>
Environmental Disclosure	<a href="#">Product Environmental Profile</a>
Circularity Profile	<a href="#">End of Life Information</a>
Optimized Energy Efficiency	Energy efficient product

### Contractual warranty

Warranty	2 years repair or replace
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## Model 264

Low Differential Pressure Transducer

### Features

- Industry standard for very low differential pressure
- $\pm 0.25\%$ ,  $\pm 0.4\%$ ,  $\pm 1\%$  FS accuracy
- 3 year unconditional warranty
- Up to 10 PSI overpressure (range dependent)
- Installation time minimized w/ mounting options
- Reverse wiring protection
- Internal regulation permits use with unregulated DC power supplies
- Fire retardant case (UL 94 V-0 approved)
- CE & RoHS compliant

### Applications

- HVAC/R systems
- Room pressurization for critical environments
- Energy management systems
- Variable air volume and fan control (VAV)
- Environmental pollution control
- Lab & fume hood control

With millions of sensors installed world wide, Setra's 264 is the "standard" for low differential pressure measurement in HVAC building automation. The 264 very low differential pressure transducer uses a dead-ended stainless steel welded capacitive sensing element that requires minimal amplification and delivers excellent accuracy and longterm stability in critical installations. The 264 has a 3 year, unconditional warranty, giving the end-user peace of mind well beyond the initial commissioning phase and guarantees performance well after the BAS warranty. The 264 utilizes a robust design that offers brass barbed fittings, and an optional conduit cover for easy and consistent installation.

### The industry standard

The 264 has been a consistent and trusted HVAC sensor for over two decades. The reputation of reliability and quality with exceptional delivery time has helped the 264 remain the trusted choice for any low differential pressure applications.

### Convenient installation

The 264 is available in both a wall and conduit versions providing the installer with flexible mounting options. The base mount allows the sensor to be installed anywhere, allowing for a simple installation.

### The Setra sensor

The core technology of the 264 is the all stainless steel capacitive sensing element. Setra designs and manufactures all of their sensing elements resulting in full control over the process and quality of every single sensor. The welded dead-ended capacitive sensors requires minimal amplification and delivers excellent accuracy and longterm stability. Setra's technology has been used in over 8 million installations and has the highest field acceptance rate in the industry.



# Specifications

## Performance data

Accuracy RSS <sup>1</sup> (at constant temp)	±1.0% FS (standard); ±0.4% FS, ±0.25% FS (optional)
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Non-linearity, BFSL	±0.96% FS (standard); ±0.38% FS, ±0.22% FS (optional)
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Hysteresis	0.10% FS
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## Thermal effects<sup>2</sup>

Compensated range °F (°C)	0 to +150 (-18 to +65)
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Zero shift %FS/100°F(50°C)	±0.033 (±0.06)
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Span shift %FS/100°F(50°C)	±0.033 (±0.06)
----------------------------	----------------

Max. line pressure	10 PSI
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Overpressure	Up to 10 PSI (range dependent)
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Long term stability	0.5% FS/YR
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## Environmental data

Operating temperature °F (°C) <sup>3</sup>	0 to +175 (-18 to +79)
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Storage temperature °F (°C)	-65 to +250 (-54 to +121)
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## Position effect<sup>4</sup>

Range	Zero offset (%FS/G)
0.1" W.C.	2.3
0.25" W.C.	1
0.5" W.C.	0.5
1.0" W.C.	0.3
2.5" W.C.	0.2
10" W.C.	0.15

<sup>1</sup>RSS of Non-Linearity, Hysteresis, and Non-Repeatability.

<sup>2</sup>Units calibrated at nominal 70°F. Maximum thermal error computed from this datum.

<sup>3</sup>Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher.

<sup>4</sup>Unit is factory calibrated at 0g effect in the vertical position.

<sup>5</sup>Calibrated into a 50K ohm load, operable into a 5000 ohm load or greater.

<sup>6</sup>Zero output factory set to within ±50mV (±25 mV for optional accuracies).

## Physical description

Case	Fire-retardant glass filled polyester (UL 94 V-O Approved)
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Electrical Connection	Screw terminal strip
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Mounting	4 screw holes on removable zinc plated steel base (designed for 2.75" snap track)
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Pressure Fittings	3/16" O.D. barbed brass for 1/4" push on tubing
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Zero and Span Adjustments	Accessible on top of case
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Weight (approx.)	10 Ounces
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## Electrical data (voltage)

Circuit	3-Wire (Com, Out, Exc)
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Excitation/output <sup>5</sup>	9 to 30 VDC / 0 to 5 VDC <sup>6,7</sup>
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Output impedance	100 ohms
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Bidirectional output at zero pressure	2.5 VDC <sup>6,7</sup>
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## Electrical data (current)

Circuit	2-wire
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Output <sup>8</sup>	4 to 20 mA <sup>9,10</sup>
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External load	0 to 800 ohms
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Min. loop supply voltage (VDC)	9 + 0.02 x (resistance of receiver plus line)
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Max. loop supply voltage (VDC)	30 + 0.004 x (resistance of receiver plus line)
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Bidirectional output at zero pressure	12 mA <sup>9,10</sup>
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## Pressure media

Clean air or similar non-conducting gases.

<sup>7</sup> Span (Full Scale) output factory set to within ±50mV. (±25 mV for optional accuracies).

<sup>8</sup> Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.

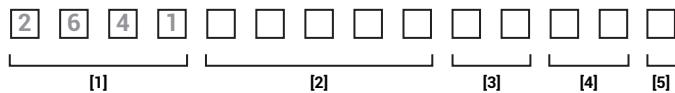
<sup>9</sup> Zero output factory set to within ±0.16mA (±0.08 mA for optional accuracies).

<sup>10</sup> Span (Full Scale) output factory set to within ±0.16mA (±0.08 mA for optional accuracies).

Specifications subject to change without notice.

## Ordering information

Example part number: 26412R5WD11T1C; Model 264, 0 to 2.5 in. W.C. Range, 4 to 20 mA Output, Terminal Strip Electrical Connection, and  $\pm 1\%$  Accuracy:



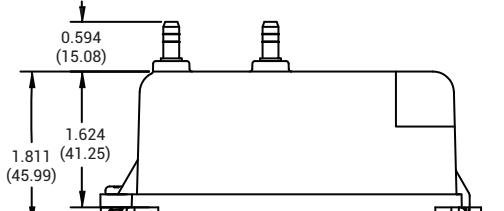
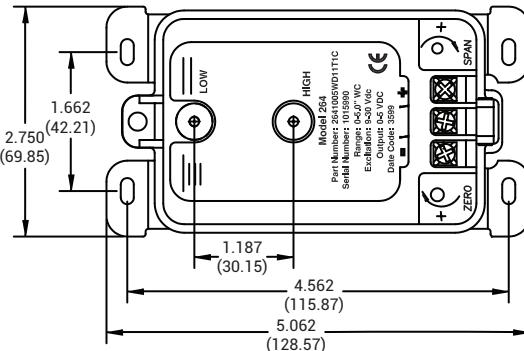
[1]	[2]	[2]	[3]	[4]	[5]
<b>Model</b>					
<b>2641</b> Model 264					
<b>Unidirectional ranges</b>		<b>Bidirectional ranges</b>		<b>Output</b>	
<b>0R1WD</b> 0 to 0.1" W.C.		<b>R05WB</b> $\pm 0.05$ W.C.		<b>11</b> 4 to 20 mA	
<b>R25WD</b> 0 to 0.25" W.C.		<b>0R1WB</b> $\pm 0.1$ W.C.		<b>2D</b> 0 to 5 VDC	
<b>0R5WD</b> 0 to 0.5" W.C.		<b>R25WB</b> $\pm 0.25$ W.C.			
<b>001WD</b> 0 to 1" W.C.		<b>0R5WB</b> $\pm 0.5$ W.C.			
<b>1R5WD</b> 0 to 1.5" W.C.		<b>001WB</b> $\pm 1$ W.C.			
<b>2R5WD</b> 0 to 2.5" W.C.		<b>1R5WB</b> $\pm 1.5$ W.C.			
<b>003WD</b> 0 to 3" W.C.		<b>2R5WB</b> $\pm 2.5$ W.C.			
<b>005WD</b> 0 to 5" W.C.		<b>005WB</b> $\pm 5$ W.C.			
<b>010WD</b> 0 to 10" W.C.		<b>7R5WB</b> $\pm 7.5$ W.C.			
<b>015WD</b> 0 to 15" W.C.		<b>010WB</b> $\pm 10$ W.C.			
<b>025WD</b> 0 to 25" W.C.		<b>025WB</b> $\pm 25$ W.C.			
<b>050WD</b> 0 to 50" W.C.		<b>050WB</b> $\pm 50$ W.C.			
<b>100WD</b> 0 to 100" W.C.		<b>025LB</b> $\pm 25$ Pa			
<b>025LD</b> 0 to 25 Pa		<b>050LB</b> $\pm 50$ Pa			
<b>050LD</b> 0 to 50 Pa		<b>100LB</b> $\pm 100$ Pa			
<b>100LD</b> 0 to 100 Pa		<b>250LB</b> $\pm 250$ Pa			
<b>250LD</b> 0 to 250 Pa		<b>500LB</b> $\pm 500$ Pa			
<b>500LD</b> 0 to 500 Pa		<b>10CLB</b> $\pm 1000$ Pa			
<b>10CLD</b> 0 to 1000 Pa					

<sup>1</sup> Optional accuracy codes E, F, G, include calibration certificate.

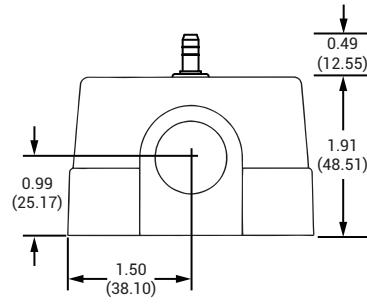
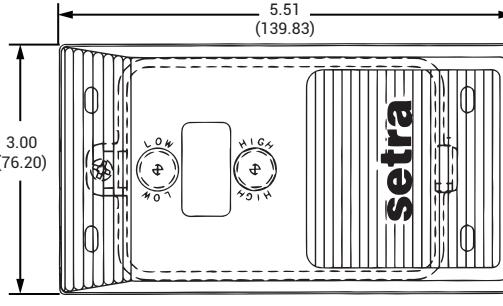
Contact Setra for versions not shown here.

## Dimensions

Electrical termination  
"T1"



Electrical termination  
"A1"



inches (mm)



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