

GREYSTONE

ACCURACY BY DESIGN

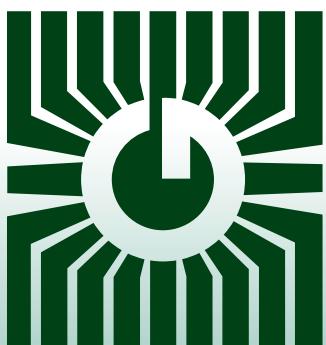
Greystone Accuracy by Design Products for the HVAC Professional



Greystone Energy Systems Inc., is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

- Temperature Sensors
- Temperature Transmitters
- Humidity Transmitters
- Gauge Pressure Transducers
- Differential Pressure Transducers
- Static Pressure Transducers
- Air Flow Transducers
- Current Switches & Sensors
- Analog to Pneumatic (I/P) Transducers
- Signal Conditioning Transmitters
- Proportional Resistive Output Boards
- Pulse Width Modulated Boards
- Power Supplies
- Air Quality Monitor
- Carbon Dioxide Detectors
- Carbon Monoxide Detectors



*Peace of mind
through reliable sensors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

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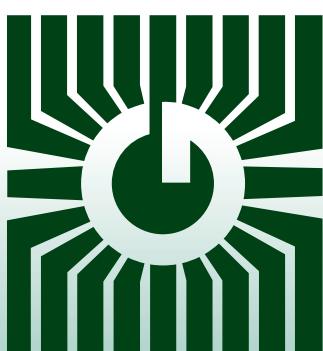


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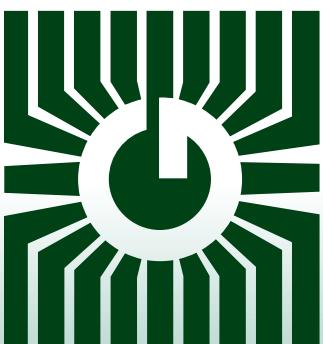
TEMPERATURE SENSORS TE200 Series



Precision temperature
control/sensing

FEATURES:

- Thermistor, Precision RTD or I.C. sensing element
- Various configurations available, i.e.: duct averaging, immersion, etc.
- Room Sensor options – Setpoint Adjustment, Override, etc.
- Custom logos available



*Peace of mind
through reliable
temperature monitoring*

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TE200 - TEMPERATURE SENSOR CONFIGURATIONS

FEATURES AND SPECIFICATIONS:

The TE200 temperature sensors offer a choice of precision platinum RTD's, I.C., or NTC Thermistors which can be interfaced with a computerized monitoring or control system. A wide variety of configurations are available such as:



AE) Executive – Features include a universal back plate to mount to any wall box or may be flush mounted. Available with various options, including setpoint adjustments, push button overrides, LCD's, etc. (see product ordering information)



AS) Surface - A stainless steel plate which can be mounted to a wall box used where tamper-proof or protection is required. Available with various options, including push button overrides and or LED's.



AD) Designer – Features include a two-piece enclosure that mounts directly to a wall box or on any wall. Available with various options, including setpoint adjustments, & push button overrides. (see product ordering information)



A) Micro – Includes a compact snap-mounted cover for ease of installation, available with various temperature sensors.



B) Duct Sensor – For single point monitoring. It is available with various probe lengths and enclosures to fit any application.



C) Immersion Sensor – Comes in two configurations. It has either spring loaded or non-spring loaded probes and has a 1/2" NPT fitting to be mounted into a thermowell. It is available in various lengths and enclosures styles. Above shown with LCD option (left) and round ABS enclosure (right)



E) & ES) Strap-on Sensor – Comes in a stainless steel probe option or with a 10" clamp assembly and is used in remote applications where surface temperature is measured.



FD) Flex-Duct Sensor – Is made of flexible plenum rated cable which incorporates numerous sensors along the assembly. It acts as a single sensor averaging any temperature change across the sensors.

F, FE, & FX) OSA Sensor – Comes in an aluminum LB (F) or ABS (FE/FX) enclosure. The LB is c/w 1/2" NPT fitting for connection to conduit. Both incorporate a sun/wind shield to protect the sensor.



NOTE: TEMPERATURE RATINGS - Space Assemblies (A, AD and AE) are rated at 0C - 70C (32F - 158F). Stainless plate (AS) rated at -20C - 93C (-4F - 200F). Probe assemblies (AP, B, C, E, ES, G and HC) are rated -20C - 105C (-4F - 221F). Assemblies (BB, D, FD and FL) are rated at -20C - 60C (-4F - 140F). Assembly (DC) is rated -40C - 100C (-40F - 221F). Assemblies (F and FX) are rated at -50C - 100C (-58F - 212F). **For higher or lower temperature applications, please contact Greystone.**



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TE200 - ROOM TEMPERATURE SENSOR:

PRODUCT ORDERING INFORMATION:

MODEL	Product Description	
TE200	Sensor assembly	
CODE	Enclosure	
A	Micro	
AD	Designer	
AE	Executive	
AS	S/S plate	
CODE	Sensor	
2	PT100-100 Ω Platinum, IEC 751, 385 Alpha, thin film	
5	1801 Ω, NTC Thermistor, ±0.2 C	
6	3000 Ω, NTC Thermistor, ±0.2 C	
7	10,000 Ω, type 3, NTC Thermistor, ±0.2 C	
8	2.252K Ω, NTC Thermistor, ±0.2 C	
9	100,000 Ω, NTC Thermistor, ±0.2 C	
11	LM334 IC, 1.0uA/ C (Not available in Micro)	
12	PT1000-1000 Ω Platinum, IEC 751, 385 Alpha, thin film	
13	1000 Ω Nickel	
14	10,000 Ω, type 3, NTC Thermistor, ±0.2 C c/w 11K shunt resistor	
15	PT3000 PTC Platinum, ±0.2 C	
20	20,000 Ω, NTC Thermistor, ±0.2 C	
21	LM335 IC, 10mv/ C (Not available in Micro)	
24	10,000 Ω, type 2, NTC Thermistor, ±0.2 C	
CODE	TE200 AD/AE Options (Multiple selections can be made)	
AP	20-30K linear slide pot for set point control (call for other values)	
AS	Concealed push button momentary switch (N.O.) (TE200AD only)	
BS	Exposed push button momentary switch (NO)	
GB	Grayhill exposed pushbutton, (N.O.), SPST, 3A (TE200AS only)	
AM	Alcohol thermometer °C/F (TE200AE only)	
BC	Bimetal thermometer °C (TE200AE only)	
BF	Bimetal thermometer °F (TE200AE only)	
AC	3-digit LCD temperature indicator °C (TE200AE only)	
AF	3-digit LCD temperature indicator °F (TE200AE only)	
LY	Yellow LED	
LR	Red LED	
LG	Green LED	
CJ	3.5mm Phono jack for remote system access	
AE	External jack for remote system access (4-pin header)	
AI	Internal jack (RJ-45)	
TP	Tamper proof security screws (TE200AS only)	

TE200 AE 7 AP BS

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

Executive space sensor, c/w 10K Thermistor,
20-30K slidepot and exposed pushbutton.

NOTE:

Due to the many possible configurations,
special part numbers may be required, please
contact Greystone for more information.



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TE200 - PROBE TEMPERATURE SENSOR:

PRODUCT ORDERING INFORMATION:

MODEL	Product Description						
TE200	Sensor assembly						
CODE	Style						
AP	All purpose						
B	Duct mount						
BB	Duct probe w/ mounting bracket only						
C	Immersion						
D	Duct average (copper)						
DC	Duct average continuous (copper) Available with Type 12, 1000 ohm RTD only						
E	Strap-on - 50 mm (2") probe assembly						
ES	Strap-on - Assembly clamps around pipe with copper plate c/w 254 mm (10") stainless clamp						
F	O.S.A.						
FE	O.S.A. (Round ABS, w/ gasketed cover)						
FD	Duct average (flexible plenum rated cable)						
FL	Flying lead						
FX	O.S.A. (ABS enclosure)						
G	Glass						
H	Stack						
HC	Sensor with mounting clip						
CODE	Enclosure (N/A for AP, BB, F, FE, FL, FX, H & HC)	CODE	Flex Duct Only (FD)				
-	ABS enclosure, standard (no code required, leave blank)	A	Lead only, no box				
M	Metal utility box	B	ABS enclosure				
E	Round ABS, w/gasketed cover	C	Aluminum weatherproof				
W	Aluminum weatherproof box	D	Metal utility box				
		E	Round ABS w/ Gasketed cover				
CODE	Sensor	CODE	Probe Length	CODE	Copper Avg. (D & DC)	CODE	Flex Duct Only (FD)
2	PT100-100 Ω Platinum, IEC 751, 385 Alpha, thin film	A	50 mm (2")	G	1800 mm (6'')**	A	1800 mm (6')
4	PT100-100 Ω Platinum, IEC 751, 385 Alpha, wire wound-ceramic* (see below)	B	100 mm (4")	H	3600 mm (12')	B	3600 mm (12')
5	1801 Ω, NTC Thermistor, ±0.2 C	C	150 mm (6")	I	6100 mm (20'')**	C	6100 mm (20')
6	3000 Ω, NTC Thermistor, ±0.2 C	D	200 mm (8")	J	7300 mm (24')	D	7300 mm (24')
7	10,000 Ω, type 3, NTC Thermistor, ±0.2 C	E	300 mm (12")		**-not available in DC		
8	2.252K Ω, NTC Thermistor, ±0.2 C	F	450 mm (18")				
9	100,000 Ω, NTC Thermistor, ±0.2 C						
11	LM334 IC, 1.0uA/ C (N/A in AP, BB, D, DC, F, FD, H or HC configurations)						
12	PT1000-1000 Ω Platinum, IEC 751, 385 Alpha, thin film						
13	1000 Ω Nickel						
14	10,000 Ω, type 3, NTC Thermistor, ±0.2 C c/w 11K shunt resistor						
15	PT3000 PTC Platinum, ±0.2 C						
20	20,000 Ω, NTC Thermistor, ±0.2 C						
21	LM335 IC, 10mv/ C (N/A in AP, BB, D, DC, F, FD, H or HC configurations)						
24	10,000 Ω, type 2, NTC Thermistor, ±0.2 C						
CODE	Probe Material (not required for ES, F, FD, G, HC)	CODE	Probe Length	CODE	Copper Avg. (D & DC)	CODE	Flex Duct Only (FD)
2	Stainless steel	A	50 mm (2")	G	1800 mm (6'')**	A	1800 mm (6')
3	Copper (rigid duct average only)	B	100 mm (4")	H	3600 mm (12')	B	3600 mm (12')
		C	150 mm (6")	I	6100 mm (20'')**	C	6100 mm (20')
		D	200 mm (8")	J	7300 mm (24')	D	7300 mm (24')
		E	300 mm (12")		**-not available in DC		
		F	450 mm (18")				
CODE	Fitting (only required for immersion "C")	CODE	Probe Length	CODE	Copper Avg. (D & DC)	CODE	Flex Duct Only (FD)
A	Spring loaded 1/2" NPT	A	50 mm (2")	G	1800 mm (6'')**	A	1800 mm (6')
E	Non-spring loaded 1/2" NPT	B	100 mm (4")	H	3600 mm (12')	B	3600 mm (12')
		C	150 mm (6")	I	6100 mm (20'')**	C	6100 mm (20')
		D	200 mm (8")	J	7300 mm (24')	D	7300 mm (24')
		E	300 mm (12")		**-not available in DC		
		F	450 mm (18")				

Custom ranges available upon request

TE200 D - 7 I 3 -

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EXAMPLE:
Duct Average, 10 K Thermistor, 20' Copper

* must use for high temperature applications
over 400 C (752 F)



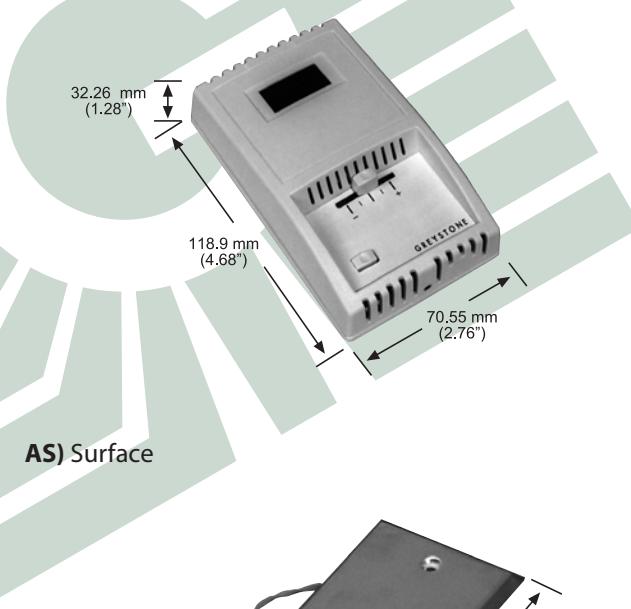
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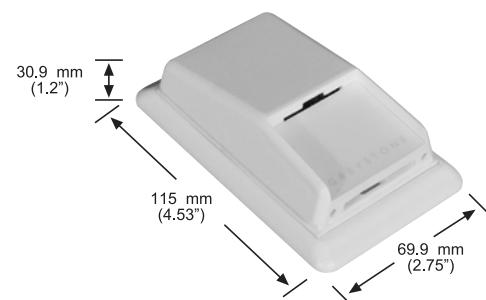


ENCLOSURE DIMENSIONS:

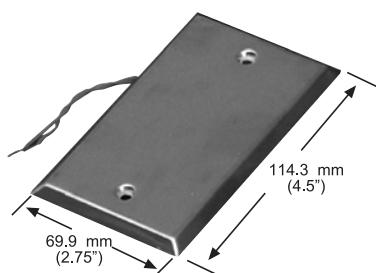
AE) Executive



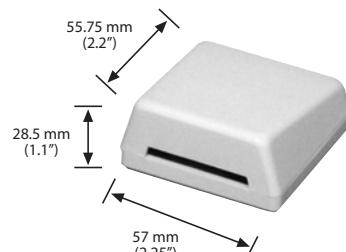
AD) Designer



AS) Surface



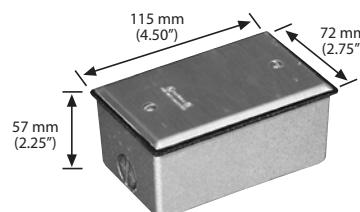
A) Micro



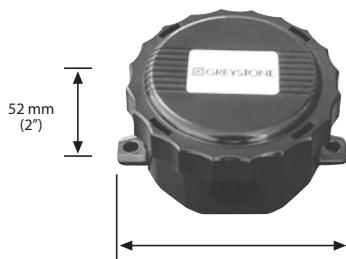
Standard ABS Enclosure



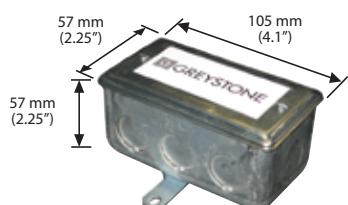
W) Aluminum Weatherproof Box



E) Round ABS Enclosure



M) Metal Utility Box



ABS Weatherproof Box (TE200FX)



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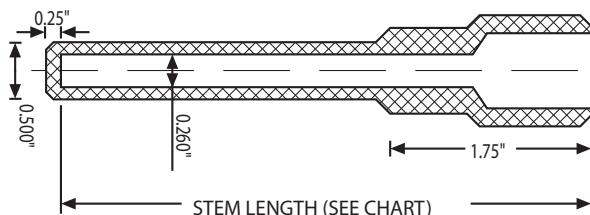
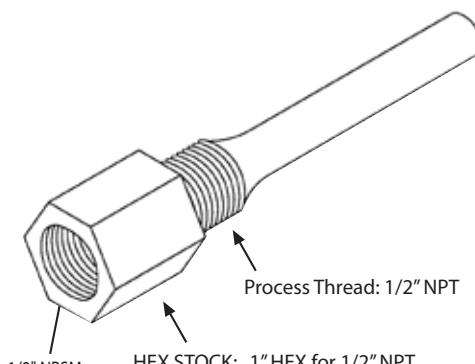
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LCD SPECIFICATIONS: (AC and AF options)

Power Supply.....	12 to 30 Vac/dc at 2mA max
Display Units	C or F (Factory set)
Display Range	0 - 35 C (AC option)
Display Resolution	32 - 95 F (AF option)
Display Accuracy	0.1 C or 0.1 F for display of
Display Update Rate	0.00 to 99.9
Display Size	± 0.2 C or ± 0.2 F over full range
PCB Operating Temperature	3 times per second
PCB Operating Humidity	24 mm W x 11 mm H
Wiring Connections	(0.95" x 0.45") three digit
Manufacturing Process	0 to 70 C (32 to 158 F)
Internal Adjustments	0 to 95% RH (non-condensing)
	Two wires, screw terminal block, (14 to 22 AWG)
	ISO 9001 Certified
	Clearly marked ZERO and SPAN pots

THERMOWELLS:



OTHER CONFIGURATIONS:

BB) Duct probe c/w mounting bracket



H) Stack



FL) Flying Lead



AP) All Purpose

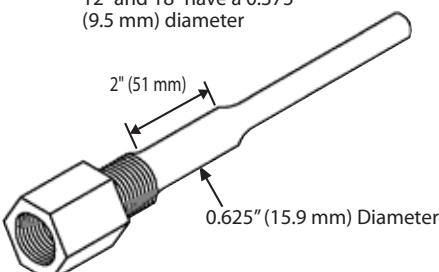


G) Glass



NOTE:

6" and 8" thermowells have a two step stem as shown
12" and 18" have a 0.375" (9.5 mm) diameter



THERMOWELL PART NUMBERING SYSTEM

SERIES NUMBER	NPT THREAD SIZE	MATERIAL	STEM LENGTH
T-1	1/2"	P - 304 SS R - 316 SS BR - BRASS	2" 4" 6" 8" 12" 18"

EXAMPLE: T-1 1/2 P 4
4" 304 STAINLESS THERMOWELL
WITH 1/2" NPT PROCESS THREAD



GREYSTONE

ACCURACY BY DESIGN

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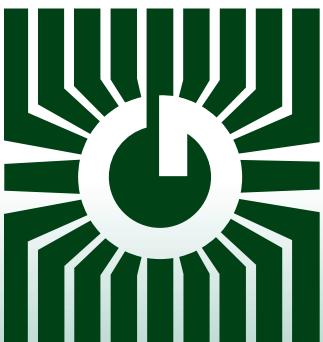
TEMPERATURE TRANSDUCERS TE500/TE511/TE512 Series



Precision temperature
control/sensing

FEATURES:

- Precision RTD
- High accuracy transmitter for any application
- Several mounting configurations, i.e.: room, duct, duct averaging, immersion, etc.
- Room Sensor options – Setpoint Adjustment, Override, etc.
- Custom logos available



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TE500/511/512 - TEMPERATURE TRANSDUCER CONFIGURATIONS

FEATURES AND SPECIFICATIONS:

The TE500/511/512 is a precision current loop temperature transmitter. It utilizes the platinum RTD and is available in various configurations. The transmitter provides a high accuracy signal with excellent long term stability, low hysteresis and fast response while being virtually immune to power supply noise and input voltage fluctuations. All models operate on a wide range of AC or DC power supplies. The TE511/512 incorporates a LCD which is factory configured to display readings in either °C or °F.

4-20mA Loop Power Supply.....	15-35 Vdc or 22 to 32 Vac (No LCD)
	22 to 35 Vdc or 22 to 32 Vac (with 250 ohm load) with LCD
Minimum Loop Current	2 mA nominal, (occurs with shorted sensor)
Maximum Loop Current	22.5 mA nominal, (occurs with open sensor)
Maximum Loop Load	> 600 ohms no LCD or > 325 ohms with LCD
0-5 Vdc Power Supply	10 to 35 Vdc or 10 to 32 Vac
0-10 Vdc Power Supply	15 to 35 Vdc or 15 to 32 Vac
Voltage Mode Maximum Current ..	5 mA nominal
Voltage Mode Maximum Output ..	Limited to < 5.5 Vdc for 0-5 model and < 10.5 Vdc for 0-10 model
Input Voltage Effect	Negligible over specified operating range
RFI Rejection	Good RFI rejection of normal frequencies with standard installation
Protection Circuitry	Reverse voltage protected and output limited

Output Signal	4-20mA current loop, 0-5 Vdc or 0-10 Vdc (factory configured)
Transmitter Accuracy	±0.1% of span, including linearity
Temperature Calibration	Three point with precision calibration standards
Display Units	C or F (Factory set)
Display Range	0 – 100°C typical range for transmitter (other ranges available)
Display Resolution	0.1°C or 0.1°F for display of 00.0 to 99.9
Display Accuracy	±0.2°C or ±0.2°F over full range with respect to the output signal
Display Update Rate	3 times per second
Display Size	24 mm W x 11 mm H (0.95" x 0.45") three digit
PCB Operating Temperature	0 to 70°C (32 to 158°F)
O.S.A. Operating Temperature.....	-40 to 85°C (-40 to 185°F)
PCB Operating Humidity	0 to 95% RH (non-condensing)
Wiring Connections	Two or three wires,screw terminal block,(14 to 22 AWG)
Manufacturing Process	ISO 9001 Certified
Internal Adjustments	Clearly marked ZERO and SPAN pots



AE) Executive – Features include a universal back plate to mount to any wall box or may be flush mounted. Available with various options, including setpoint adjustments, push button overrides, LCD's, etc.



AD) Designer – Features include a two-piece enclosure that mounts directly to a wall box or on any wall.



AS) Surface - A stainless steel plate which can be mounted to a wall box used where tamper-proof or protection is required. Available with various options, including push button overrides.



B) Duct Sensor – For single point monitoring. It is available with various probe lengths and enclosures to fit any application.



C) Immersion Sensor – Comes in two configurations. It has either spring loaded or non-spring loaded probes and has a 1/2" NPT fitting to be mounted into a thermowell. It is available in various lengths and enclosures styles.



E) & ES) Strap-on Sensor – Comes in a stainless steel probe option or with a 10" clamp assembly and is used in remote applications where an immersion sensor can not be installed.



D) Duct Average Sensor – Incorporates numerous sensors inside a copper tube. It acts as a single sensor, averaging any temperature change across the sensors



FD) Flex-Duct Sensor – Is made of flexible plenum rated cable which incorporates numerous sensors along the assembly. It acts as a single sensor averaging any temperature change across the sensors.



F) OSA Sensor – Comes in an ABS enclosure. It incorporates a 1/2" NPT knockout for connection to conduit. It incorporates a sun/wind shield to protect the sensor.

NOTE: TEMPERATURE RATINGS - Space Assemblies (A, AD and AE) are rated at 0°C - 70°C (32°F - 158°F). Stainless plate (AS) rated at -20°C - 105°C (-4°F - 221°F). Probe assemblies (B, C, E, ES, G and HC) are rated -20°C - 105°C (-4°F - 221°F). Assemblies (D, FD and FL) are rated at -20°C - 60°C (-4°F - 140°F). Assembly (DC) is rated -40°C - 100°C (-40°F - 212°F). Assemblies (F and FX) are rated at -50°C - 100°C (-58°F - 212°F). **For higher or lower temperature applications, please contact Greystone.**



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TE500 - SPACE TEMPERATURE TRANSDUCERS:

PRODUCT ORDERING INFORMATION:

MODEL	Product Description																			
TE500	Sensor assembly c/w transmitter																			
	<table border="1"> <thead> <tr> <th>CODE</th> <th>Enclosure</th> </tr> </thead> <tbody> <tr> <td>AD</td> <td>Designer</td> </tr> <tr> <td>AE</td> <td>Executive</td> </tr> <tr> <td>AS</td> <td>S/S plate</td> </tr> </tbody> </table>		CODE	Enclosure	AD	Designer	AE	Executive	AS	S/S plate										
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AM	Alcohol thermometer °C/F (TE500AE only)																			
BC	Bimetal thermometer °C (TE500AE only)																			
BF	Bimetal thermometer °F (TE500AE only)																			
AC	3-digit LCD temperature indicator °C (TE500AE only)																			
AF	3-digit LCD temperature indicator °F (TE500AE only)																			
TP	Tamper proof Security screws (TE500AS only)																			
	<table border="1"> <thead> <tr> <th>CODE</th> <th>TE500 Transmitter Output Option</th> </tr> </thead> <tbody> <tr> <td>1A</td> <td>Current 4-20mA</td> </tr> <tr> <td>1D</td> <td>Voltage 0-5 VDC</td> </tr> <tr> <td>1E</td> <td>Voltage 0-10 VDC</td> </tr> </tbody> </table>		CODE	TE500 Transmitter Output Option	1A	Current 4-20mA	1D	Voltage 0-5 VDC	1E	Voltage 0-10 VDC										
CODE	TE500 Transmitter Output Option																			
1A	Current 4-20mA																			
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	<table border="1"> <thead> <tr> <th>CODE</th> <th>TE500 Transmitter Range Option</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0°C - 35°C (32°F - 95°F)</td> </tr> <tr> <td>2</td> <td>0°C - 50°C (32°F - 122°F)</td> </tr> </tbody> </table>		CODE	TE500 Transmitter Range Option	1	0°C - 35°C (32°F - 95°F)	2	0°C - 50°C (32°F - 122°F)												
CODE	TE500 Transmitter Range Option																			
1	0°C - 35°C (32°F - 95°F)																			
2	0°C - 50°C (32°F - 122°F)																			
TE500	AE	12	AC	1A	2															

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

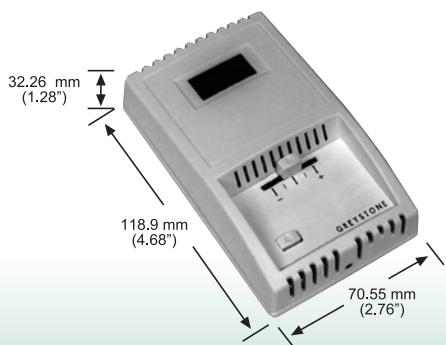
Executive space temperature transmitter, c/w PT1000 ohm RTD, 4-20mA output with a 0°C - 50°C (32°F - 122°F) range and LCD display in °C.

NOTE:

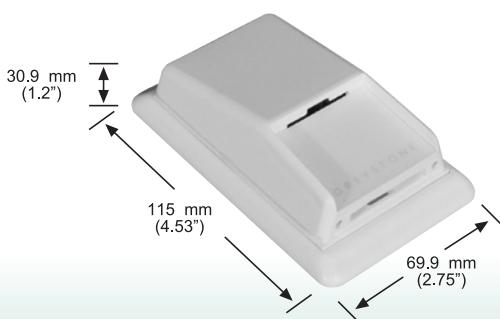
Due to the many possible configurations, special part numbers may be required, please contact Greystone for more information.

ENCLOSURE DIMENSIONS:

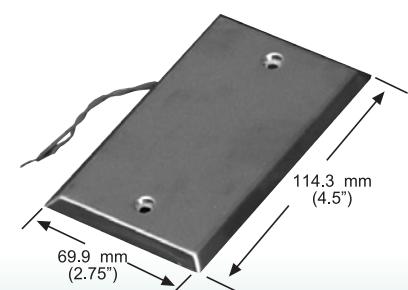
AE) Executive



AD) Designer



AS) Surface



GREYSTONE ENERGY SYSTEMS, INC.

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TE500 - PROBE TEMPERATURE TRANSDUCERS:

PRODUCT ORDERING INFORMATION:

MODEL	Product Description				
TE500	Sensor assembly c/w transmitter				
CODE	Style				
B	Duct mount				
C	Immersion				
D	Duct average (copper)				
DC	Duct average continuous (copper) Available with Type 12, 1000 ohm RTD only				
E	Strap-on - 50 mm (2") probe assembly				
ES	Strap-on - Assembly clamps around pipe with copper plate c/w 254 mm (10") stainless clamp				
F	O.S.A. (ABS enclosure)				
FD	Duct average (flexible plenum rated cable)				
FL	Flying lead				
G	Glass				
H	Stack				
CODE	Enclosure				
-	ABS enclosure, standard (no code required, leave blank)				
M	Metal utility box				
W	Aluminum weatherproof box				
E	Round ABS, w/ gasketed cover				
CODE	Sensor (Type 12 is Standard)				
2	PT100-100 Ω Platinum, IEC 751, 385 Alpha, thin film				
4	PT100-100 Ω Platinum, IEC 751, 385 Alpha, wire wound-ceramic* (see below)				
12	PT1000-1000 Ω Platinum, IEC 751, 385 Alpha, thin film				
CODE	Probe Length	CODE	Copper Avg. (D & DC)	CODE	Flex Duct Only (FD)
A	50 mm (2")	G	1800 mm (6')*	A	1800 mm (6')
B	100 mm (4")	H	3600 mm (12')	B	3600 mm (12')
C	150 mm (6")	I	6100 mm (20')*	C	6100 mm (20')
D	200 mm (8")	J	7300 mm (24')	D	7300 mm (24')
E	300 mm (12")		*-not available in DC		
F	450 mm (18")				
CODE	Probe Material (not required for ES, F, FD, G, HC)				
2	Stainless steel				
3	Copper (rigid duct average only)				
CODE	Fitting (only required for immersion "C")				
A	Spring loaded 1/2" NPT				
E	Non-spring loaded 1/2" NPT				
CODE	Input/Output Options				
1A	24 VAC/VDC, 4-20mA 2 or 3 wire				
1D	24 VAC/VDC, 0-5 VDC 3 wire				
1E	24 VAC/VDC, 0-10 VDC 3 wire				
CODE	TE500 Transmitter Range Option				
1	0°C - 35°C (32°F - 95°F)				
2	0°C - 50°C (32°F - 122°F)				
3	0°C - 100°C (32°F - 212°F)				
4	50°C - 150°C (122°F - 302°F)				
5	50°C - 250°C (122°F - 482°F)				
6	-50°C - 50°C (-58°F - 122°F)				

Custom ranges available upon request

TE500 B - 12 E 2 - 1A 2

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE: Duct temperature transmitter, c/w 1000Ω RTD, 12" S/S Probe, ABS enclosure, 4-20mA output with a 0°C-50°C (32°F-122°F) range.

* must use for high temperature applications over 400°C (752°F)



GREYSTONE ENERGY SYSTEMS, INC.

RoHS
COMPLIANT



TE511/512 - PROBE TEMPERATURE TRANSDUCERS:

PRODUCT ORDERING INFORMATION:

MODEL	Product Description							
TE511	Sensor assembly c/w transmitter and LCD display °C							
TE512	Sensor assembly c/w transmitter and LCD display °F							
CODE	Style							
B	Duct mount							
C	Immersion							
D	Duct average (copper)							
DC	Duct average continuous (copper)							
E	Strap-on - 50 mm (2") probe assembly							
ES	Strap-on - Assembly clamps around pipe with copper plate c/w 254 mm (10") stainless clamp							
F	Heavy-duty wall mount (PVC enclosure)							
FD	Duct average (flexible plenum rated cable)							
FL	Flying lead							
G	Glass							
CODE	Enclosure (ABS enclosure is standard)	CODE	Flex Duct Only (FD)					
-	ABS enclosure, standard (no code required, leave blank)	B	ABS enclosure					
W	PVC weatherproof enclosure	C	PVC weatherproof enclosure					
CODE	Secondary Sensor (Not available on D, DC, FD configurations) (Leave blank if not required)							
2	PT100-100 Ω Platinum, IEC 751, 385 Alpha, thin film							
5	1801 Ω, NTC Thermistor, ±0.2°C							
6	3000 Ω, NTC Thermistor, ±0.2°C							
7	10,000 Ω, type 3, NTC Thermistor, ±0.2°C							
8	2.252K Ω, NTC Thermistor, ±0.2°C							
9	100,000 Ω, NTC Thermistor, ±0.2°C							
12	PT1000-1000 Ω Platinum, IEC 751, 385 Alpha, thin film							
13	1000 Ω Nickel							
14	10,000 Ω, type 3, NTC Thermistor, ±0.2°C c/w 11K shunt resistor							
15	PT3000 PTC Platinum, ±0.2°C							
20	20,000 Ω, NTC Thermistor, ±0.2°C							
24	10,000 Ω, type 2, NTC Thermistor, ±0.2°C							
CODE	Probe Length (B, C, & E)	CODE	Copper Avg. (D & DC)	CODE	Flex Duct Only (FD)			
A	50 mm (2")	G	1800 mm (6')*	A	1800 mm (6')			
B	100 mm (4")	H	3600 mm (12')	B	3600 mm (12')			
C	150 mm (6")	I	6100 mm (20')*	C	6100 mm (20')			
D	200 mm (8")	J	7300 mm (24') *-not available in DC	D	7300 mm (24')			
E	300 mm (12")							
F	450 mm (18")							
CODE	Probe Material (not required for ES, F, FD, G)							
2	Stainless steel							
3	Copper (rigid duct average only)							
CODE	Input/Output Options							
A	24 VAC/VDC, 4-20mA 2 or 3 wire							
D	24 VAC/VDC, 0-5 VDC 3 wire							
E	24 VAC/VDC, 0-10 VDC 3 wire							
CODE	TE511/512 Transmitter Range Option							
1	0°C - 35°C (32°F - 95°F)							
2	0°C - 50°C (32°F - 122°F)							
3	0°C - 100°C (32°F - 212°F)							
*	Custom range, please contact Greystone							
TE511	B	-	20	E	2	1A	2	Custom ranges available upon request

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE: Duct temperature transmitter, 12" S/S Probe, ABS enclosure, 20K Thermistor - Secondary Sensor, 4-20mA output with a 0°C - 50°C (32°F-122°F) range, and LCD in °C



GREYSTONE ENERGY SYSTEMS, INC.

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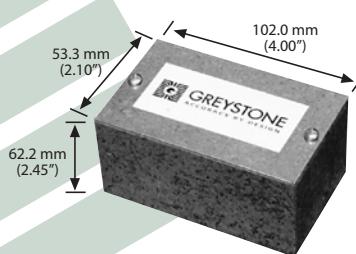


ENCLOSURE DIMENSIONS:

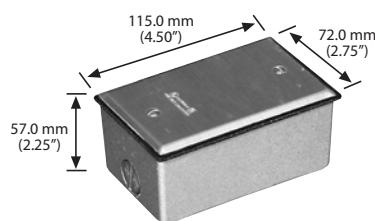
Standard ABS Enclosure



M) Stamped Metal Utility Box



W) Aluminum Weatherproof (TE500)



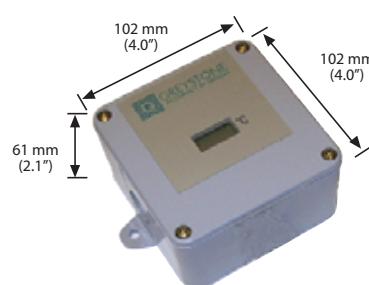
ABS Weatherproof Box (TE500F only)



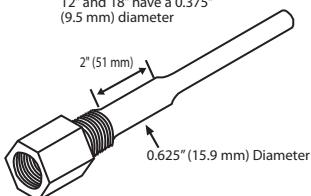
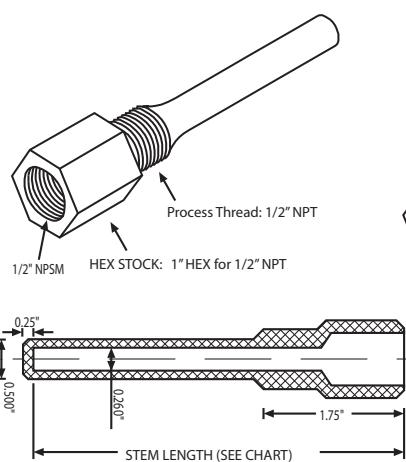
E) Round ABS Enclosure



W) PVC Weatherproof Box (TE511/512)



ACCESSORIES:



NOTE:
6" and 8" thermowells have a
two step stem as shown
12" and 18" have a 0.375"
(9.5 mm) diameter

THERMOWELL PART NUMBERING SYSTEM

SERIES NUMBER	NPT THREAD SIZE	MATERIAL	STEM LENGTH
T-1	1/2"	P - 304 SS R - 316 SS BR - BRASS	2" 4" 6" 8" 12" 18"

EXAMPLE: T-1 1/2 P 4
4" 304 STAINLESS THERMOWELL
WITH 1/2" NPT PROCESS THREAD



GREYSTONE
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North America: 1-800-561-5611
e-mail: mail@greystoneenergy.com
www.greystoneenergy.com

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

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Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

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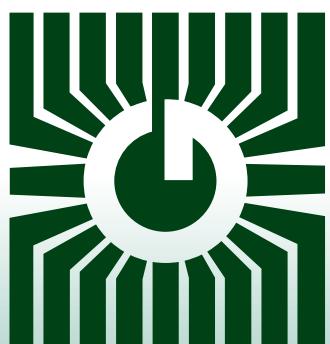
MICROPROCESSOR BASED
TEMPERATURE SENSORS



Precision temperature
control / sensing

FEATURES:

- Thermistor or RTD sensing element
- LCD indication of temperature and setpoint
- Celsius or Fahrenheit display
- Optional override switch
- Optional LED indication
- 24 Vac/dc or 5 Vdc power supplies
- NEW functional and attractive enclosure
- Installer-friendly wiring access
- Custom logo application
- Highest quality double-sided FR4 PCB's



*Peace of mind
through reliable
temperature monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

MICROPROCESSOR BASED TEMPERATURE SENSORS

DESCRIPTION:

The TE-200-AEM is a space temperature sensor that is microprocessor based and terminates to the analog inputs of virtually all makes of Building Control Systems.

The LCD displays can be configured to display readings in either °C or °F. The setpoint value will be displayed for two seconds after the momentary push button is released. This setpoint is factory configured from two to five degrees on either side of a fixed preprogrammed space temperature.

An optional override button and LED are available for local indication of override status.

SPECIFICATIONS:

Enclosure	Executive (AE) 71mm W x 119mm H x 32mm D (2.8" x 4.7" x 1.25")
Power Supply	5 Vdc ± 5% (must be regulated) or 10-35 Vdc / 24 Vac ±20% (Vac is half wave rectified)
Sensors	Thermistors or RTD's (see ordering information)
Display	Displays room temperature with 0.1 resolution for 0-35°C or 32-95°F Celsius or Fahrenheit (specified at time of ordering) Setpoint displays for two seconds when button is pressed Accuracy ±0.2 plus sensor accuracy
Setpoint (Resistive Output)	Dual (2) momentary push button controlled Output is always with respect to power supply common Range values are specific to application (see ordering information) Setpoint can be programmed to have a reset time value (1, 2, or 3 hours)
Override	Optional feature, one momentary push button Switch activation results in a closed contact output Optional wiring as separate two wire output, in parallel with sensor, in parallel with setpoint or with respect to power supply common
LED	Optional LED (red, yellow or green) Specify as a two wire output or as a one wire output with cathode connected to common or an anode connected to +5 Vdc

MICROPROCESSOR BASED TEMPERATURE SENSORS

PRODUCT ORDERING INFORMATION

Please circle and fax to Greystone for part number and product requirements

Circle the suitable options in *italics* below

Power Supply	24 Vac/dc	5 Vdc
Temperature Display	Degrees C only <i>Degrees F only</i>	
LCD Adjustment	<input type="checkbox"/> Yes	<input type="checkbox"/> No
$\pm 2^\circ\text{C}$ (3.6°F)		
Sensor Type and Wiring	PT 100 - 100 ohm, Platinum, IEC 751, 385 Alpha, thin film (2) 1801 ohm, NTC Thermistor, $\pm 0.2^\circ\text{C}$ (5) 3,000 ohm, NTC Thermistor, $\pm 0.2^\circ\text{C}$ (6) 10,000 ohm, type 3, NTC Thermistor, $\pm 0.2^\circ\text{C}$ (7) 100,000 ohm, NTC Thermistor, $\pm 0.2^\circ\text{C}$ (9) PT 1000 - 1000 ohm, Platinum, IEC 751, 385 Alpha, thin film (12) 1000 ohm, nickel (13) 20,000 ohm, NTC Thermistor, $\pm 0.2^\circ\text{C}$ (20) 10,000 ohm, type 2, NTC Thermistor, $\pm 0.2^\circ\text{C}$ (24)	

Setpoint Resistance	Setpoint Display Value
(Fill in appropriate ohm and Deg. value)	
_____ ohms _____ °C _____ °F	Example → ← Midpoint Note: We offer 0.5 degree increments in °C
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	
_____ ohms _____ °C _____ °F	

Circle the suitable options in *italics* below

Setpoint Reset	does not reset	60 min.	120 min.	180 min.
Override Switch	none	two wire output	reference to common	
	parallel with sensor	parallel with setpoint		
LED	none	red	yellow	green
Current limiting resistor 499 ohm standard for 5V				
Two wire output		cathode to common (active high output)		
		anode to +5V (active low input)		
Communication Jack (4 Pin)		<input type="checkbox"/> yes	<input type="checkbox"/> No	

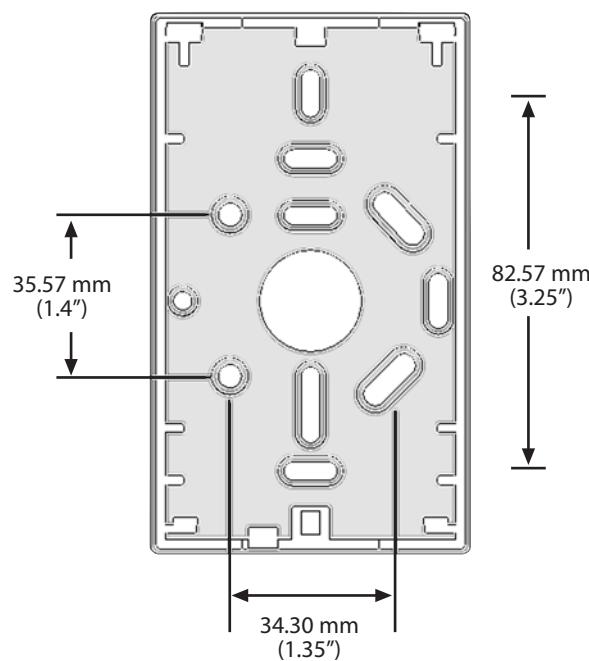
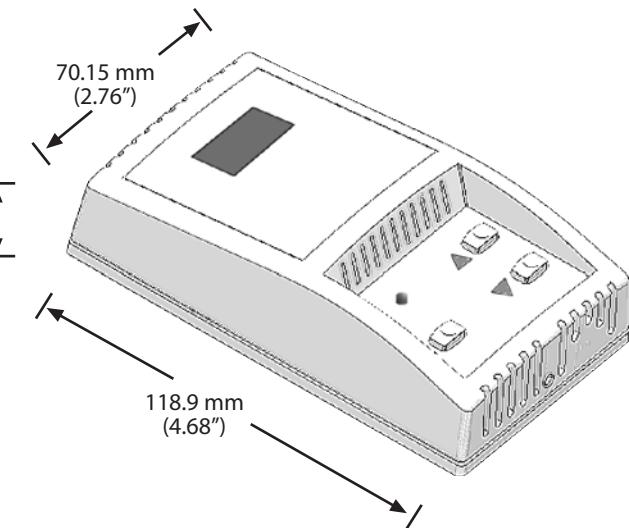
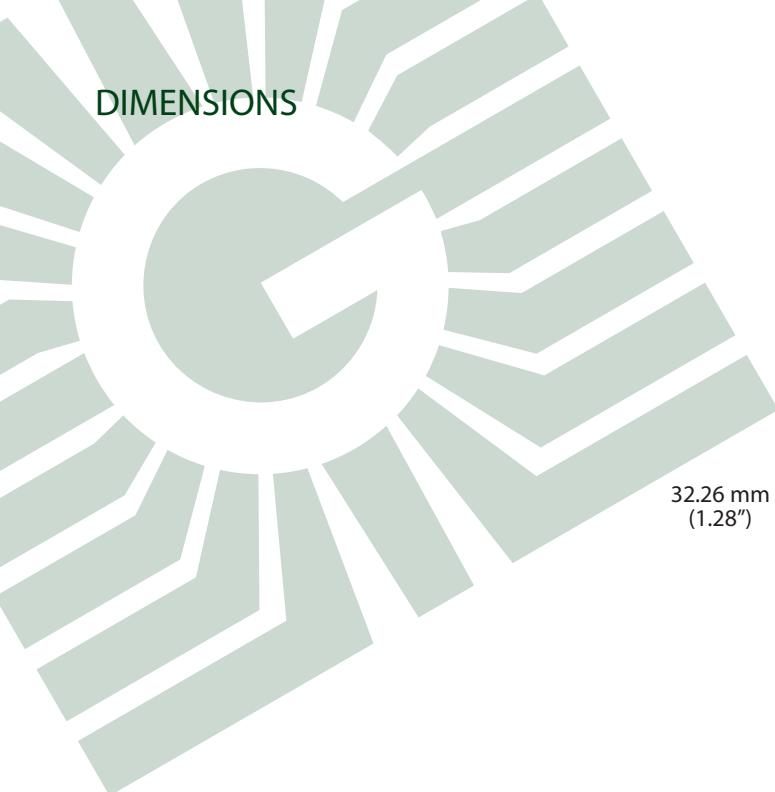


GREYSTONE ENERGY SYSTEMS INC

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DIMENSIONS



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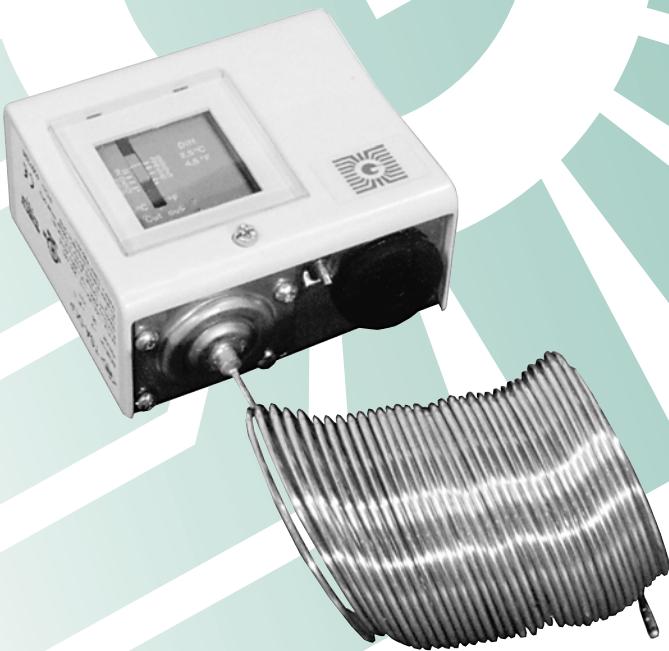
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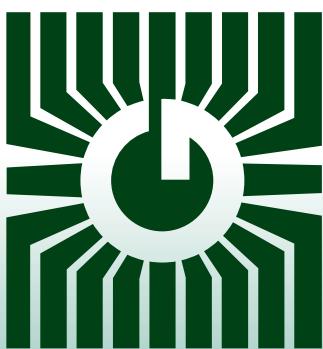
FROST PROTECTION
THERMOSTAT
LLC Series



LLC-307 model
shown above

FEATURES:

- SPDT or DPDT
- Auto or manual reset version
- 6 meter (20') capillary
- Optional capillary mounting clip



*Peace of mind
through reliable
temperature switches*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

DESCRIPTION:

The LLC series frost protection thermostats provide a switched output based on the average temperature detected along a six meter (20 foot) capillary sensor.

The unit is fixed across a duct using capillary mounting clips, downstream of the frost coil and is used to prevent the icing up of filters, fans and coils.

SPECIFICATIONS:

Control Range	SPDT DPDT	+1.7 to +20°C (35 to 68°F) +1.1 to + 21°C (34 to 70°F)
Differential	SPDT DPDT	2.5°C (4.5°F) 2.5°C (4.5°F)
Electrical Ratings	SPDT	24 F.L.A. inductive @ 120 VAC 24 F.L.A. inductive @ 240 VAC 720 VA max pilot duty @ 120-600 VAC 144 VA max pilot duty @ 24 VAC
	DPDT	14 F.L.A. inductive @ 120 VAC 12 F.L.A. inductive @ 240 VAC 720 VA max pilot duty @ 120-600 VAC 144 VA max pilot duty @ 24 VAC
Capillary	SPDT DPDT	6m x 2mm dia copper (20' x 0.1") 6m x 2mm dia copper (20' x 0.1")
Ambient Range	SPDT DPDT	Operating: -51 to 71°C (-60 to 160°F) Operating: -51 to 71°C (-60 to 160°F)
Protection	SPDT DPDT	IP 23, NEMA1 IP 23, NEMA1
Housing Dimensions	SPDT DPDT	75 x 40 x 85mm (2.938 x 1.963 x 3.344") 92 x 67 x 140mm (3.625 x 2.625 x 5.5")

ORDER INFORMATION:

LLC-306 - SPDT Auto reset frost protection thermostat

LLC-307 - SPDT Manual reset frost protection thermostat

LLC-316 - DPDT Auto reset frost protection thermostat c/w 5 mounting clips

LLC-317 - DPDT Manual reset frost protection thermostat c/w 5 mounting clips

LLC-CLIPS - Capillary mounting clips

* Greystone reserves the right to make design changes at any time.



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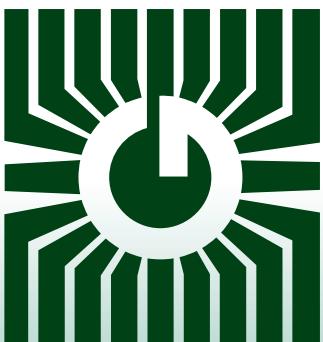
HUMIDITY/TEMPERATURE
TRANSDUCER c/w SETPOINT
ADJUSTMENTS
SP Series



Precision humidity/temperature
control/sensing

FEATURES:

- Dual humidity and temperature outputs
- Optional dual setpoint adjustment outputs
- Current and voltage models
- LCD indication
- Highly stable RH sensor element
- Functional and attractive enclosure
- Installer friendly wiring access



*Peace of mind
through reliable
humidity/temperature
monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

DESCRIPTION:

The SP series RH/T transmitter incorporates two sensors in one attractive wall mount enclosure for the most efficient environmental monitoring and control system. It uses a field-proven RH sensor to monitor relative humidity over 0-100% RH and a curve-matched thermistor to measure temperature over common field-selectable ranges.

Two setpoint controls are also available for temperature and RH adjustment. The device may also include an occupancy override button and an external communication jack. Both measurements and setpoint signals are continuously available on separate outputs as linear 4-20 mA, 0-5 or 0-10 Vdc signals.

Several configurations of the device are available with one to four outputs as required. An LCD is included for configuration and local indication of all parameters. Several operating parameters can be programmed using a keypad for specific applications including four temperature ranges and °C/°F display.

SPECIFICATIONS:

GENERAL

Power Supply.....	24Vac/dc ±10% (non-isolated half-wave rectified)
Consumption.....	20 mA + (20ma x number of outputs) max @ 24 Vdc
Input Voltage Effect	Negligible over specified operating range
RFI Rejection	Good RFI rejection of normal frequencies with standard Installation
Protection Circuitry	Reverse voltage protected and output limited
Output Signals	4-20 mA active (sourcing) or 0-5 Vdc or 0-10 Vdc (specify when ordering)
Output Resolution.....	10 bit for all signals
Output Drive Capability	550 ohm max for current 10Kohm min for voltage
Programing and Selection	Via internal push buttons and on-screen menu
LCD Display.....	3.5 digit for 0-100%, 0°-35°C (32°-95°F) or 0°-50°C (32°-122°F). 33 mm W x 14 mm H (1.3"W x 0.55"H) Can be programmed for RH, T or RH & T
Wiring Connections	Screw terminal block (14 to 22 AWG)
Operating Conditions.....	0°-50°C (32°-122°F) 0-95%RH non-condensing
Enclosure Size	71mmW x 119mmH x 32mmD (2.8"x 4.7" x 1.25")
Manufacturing Process.....	ISO9001

TEMPERATURE

Accuracy.....	± 0.2°C (±0.4°F)
Range	0°-35°C (32-95°F) or 0°-50°C (32°-122°F) programmable
Offset.....	± 5° programmable
Display Units	°C or °F programmable

RH

Sensor.....	Thermoset polymer based capacitive
Accuracy.....	±2% RH
Range.....	0-100% RH
Temperature Compensation.	0°-50°C (32°-122°F)
Hysteresis...	± 2% RH
Response Time.....	15 seconds typical
Stability.....	±1% RH typical @ 50% RH in 5 years
Offset.....	±9% RH programmable

TEMPERATURE SETPOINT

Midpoint.....	17°-27°C or 63°-81°F programmable
Range.....	±5° or ±10° of the midpoint, programmable

RH SETPOINT

Midpoint.....	20-70% RH programmable
Range.....	±5 or ±10% RH of the midpoint, programmable

OVERRIDE

Switch Contact.....	Referenced to common
---------------------	----------------------

COMMUNICATION

3.5mm phone jack.....	Connects to 3-pin terminal block
-----------------------	----------------------------------



GREYSTONE ENERGY SYSTEMS, INC.

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RH/TEMPERATURE TRANSMITTER WITH DUAL SETPOINT CONTROL: PRODUCT ORDERING INFORMATION:

MODEL	Product Description
SP	Model Series Designation
CODE	Product Description
01	RH transmitter c/w with setpoint control
02	Temperature transmitter c/w setpoint control
03	RH and temperature transmitter only
04	RH and temperature transmitter c/w setpoint control for temperature only
05	RH and temperature transmitter c/w setpoint control for RH only
06	RH and temperature transmitter c/w setpoint control for both RH and temperature
CODE	Outputs
I20	4-20mA outputs
V05	0-5Vdc outputs
V10	0-10Vdc outputs
CODE	Options
OR	Override switch
CJ	Communication jack (3.5 mm phone)
BL	Blank cover to conceal LCD

↓ ↓ ↓ ↓

SP	06	I20	OR
----	----	-----	----

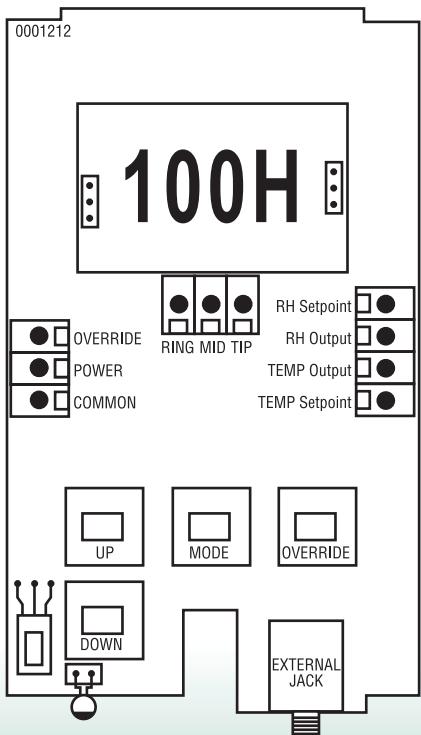
Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

RH and temperature transmitter c/w setpoint for both, with 4-20mA outputs and override switch.

SP06I20OR

PCB/WIRING INFORMATION



Terminal	Function
POWER	From +24 Vac/dc of controller or power supply
COMMON	To GND or COMMON of controller
OVERRIDE	To digital input of controller
RH Setpoint	To analog input of controller 4-20 mA or 0-5 Vdc or 0-10 Vdc
RH Output	To analog input of controller 4-20 mA or 0-5 Vdc or 0-10 Vdc
TEMP Output	To analog input of controller 4-20 mA or 0-5 Vdc or 0-10 Vdc
TEMP Setpoint	To analog input of controller 4-20 mA or 0-5 Vdc or 0-10 Vdc
TIP	External Jack TIP (tip of plug) connection
MID	External Jack MID (middle of plug) connection
RING	External Jack RING (base of plug) connection

* Some models do not have all these features

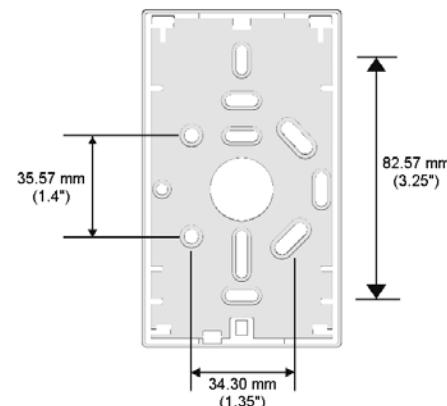
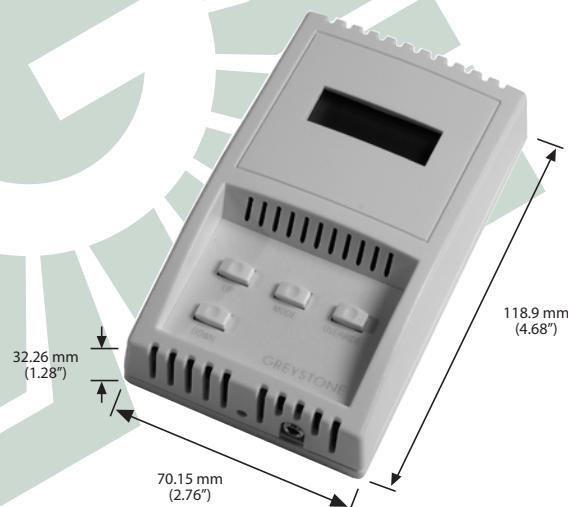


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DIMENSIONS



Other GREYSTONE *Accuracy by Design* Products for the HVAC Professional

- Temperature Sensors and Transducers
- Humidity Transducers
- Pressure Transducers
- Current Switches and Sensors
- Electronic to Pneumatic (IP)
- Transducers
- Power Supplies



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Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

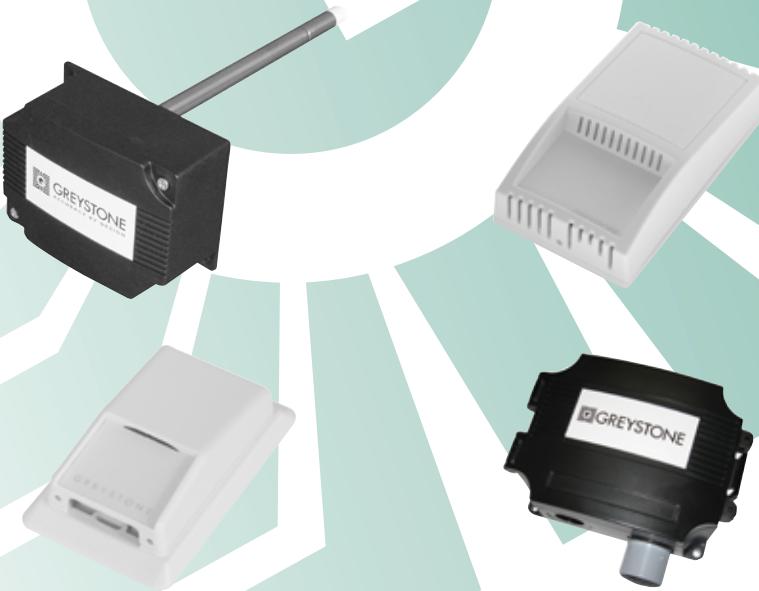
We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

GREYSTONE

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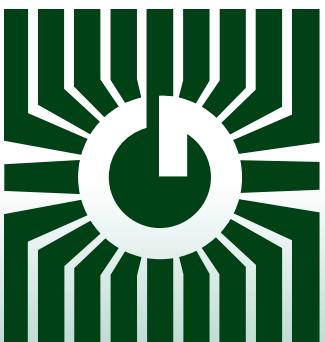
RELATIVE HUMIDITY TRANSDUCER RH Series



Precision humidity
control/sensing

FEATURES:

- Highly stable RH sensor element
- Humidity range: 0-100%
- Accuracy available 2%, 3%, & 5%
- Choice of precision temperature sensors
- LCD display available
- Field selectable outputs
- AC/DC operation
- Custom logo available



*Peace of mind
through reliable
humidity monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

SPECIFICATION:

Sensor Type:.....	Thermoset Polymer based capacitive
Accuracy at 25°C:.....	±2, 3, or 5% RH, (5% to 95% RH)
Measurement Range:.....	0 to 100% RH
Temperature Dependence:.....	±0.05% RH/ °C
Hysteresis:.....	±1.5% RH maximum
Repeatability:.....	±0.5% RH typical
Linearity:.....	±0.5% RH typical
Sensor Response Time:.....	15 seconds typical
Stability:.....	±1% RH typical at 50% RH in 5 yrs.
Operating Temperature:.....	0° to 50°C (32° to 122°F) for RH100 -40° to 70°C (-40° to 158°F) for RH200/RH300
Operating Humidity:.....	0 to 95% RH non-condensing
Power Supply:.....	18 to 35 Vdc, 15 to 26 Vac (RH110B is Vdc only)
Consumption:.....	22 mA maximum
Input Voltage Effect:.....	Negligible over specified operating range
Protection Circuitry:.....	Reverse voltage protected and out limited
Output Signal:.....	4-20 mA current loop, 0-1, 0-5 or 0-10 Vdc (jumper-selectable) jumper selectable outputs not available on RH110, 210 or 310 RH110B is only available with 4-20 mA, 2-wire output
Output Drive at 24 Vdc:.....	550 ohms max for current output 10K ohms min for voltage output
Internal Adjustments:.....	Clearly marked ZERO and SPAN pots
Wiring Connections:.....	Screw terminal block (14 to 22 AWG)
Optional LCD Display:.....	RH100A and RH200A 3 digit for 0.0 to 99.9% RH, 24 x 11mm (0.95"w x 0.45"h)
	RH110A 2 Line x 8 character alphanumeric LCD for 0 to 100% RH and 0° to 35 °C or 32° to 95 °F (other ranges available) Display resolution is 1% RH or 0.5°C or 0.5°F Display size is 29 x 14mm (1.15"w x 0.55"h)
Optional Override Switch:.....	Normally open push-button, 0.4 VA at 24 Vac/dc two-wire output
Optional Temperature Sensor:....	Various RTDs and thermistors available as two-wire resistance output
Enclosures:.....	RH100A (Executive), 71x119x32mm (2.8"w x 4.7" h x 1.25"d) RH100B (Designer), 70x114x30mm, (2.75"w x 4.5" h x 1.2" d) RH200A (ABS), 114x84x53mm (4.5"w x 3.3" h x 2.1" d) RH200E (Round), 91mm (3.6") diameter x 53mm (2.1") deep RH200M (Metal), 102x63x58mm (4" w x 3.3" h x 2.1" d) RH200W (Metal WP) 115x72x56mm (4.5" w x 2.8" h x 2.5" d) RH300A (ABS WP) 122x112x63mm (4.8" w x 4.8" h x 2.5" d) RH300E (Round), 91mm (3.6") diameter x 53mm (2.1") deep
RH200 Probe:.....	230 mm (9") probe length x 12.7 mm (1/2") diameter stainless steel with porous filter



GREYSTONE ENERGY SYSTEMS, INC.

RoHS
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RELATIVE HUMIDITY: PRODUCT ORDERING INFORMATION

MODEL	Product Description																									
RH100	Space																									
RH200	Duct																									
RH300	Outside Air																									
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RH200	A	03																								
		C																								
		-																								

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EXAMPLE:

Duct humidity c/w ABS enclosure,
3% accuracy and 1000 Ω temperature
sensor.

RH200A03C



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ENCLOSURE STYLES



RH100B



RH100A



RH200B



RH200E



RH200M



RH200W



RH300A



RH300E



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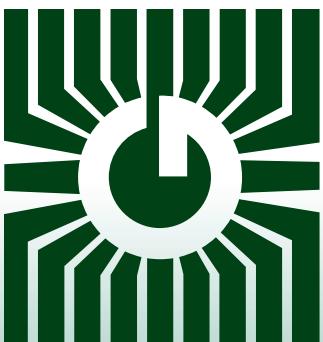
RELATIVE HUMIDITY/ TEMPERATURE TRANSDUCER RH Series



Precision humidity
control/sensing

FEATURES:

- Highly stable RH sensor element
- Humidity range: 0-100%
- Accuracy available 2%, 3%, & 5%
- Platinum RTD for Temperature
- LCD display available
- Field selectable outputs
- AC/DC operation
- Custom logo available



*Peace of mind
through reliable
humidity monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

DESCRIPTION:

The RH series of humidity/temperature transducers are designed for use in environmental monitoring and control systems where high performance and stability are demanded. It's state-of-the-art design combines digital linearization and temperature compensation with a world class capacitive humidity sensor and platinum RTD for reliability and accuracy in even the most critical applications. Various models cover many aspects of RH and temperature measurement and several optional features are available to meet virtually all HVAC applications.

SPECIFICATION:

Humidity Sensor Type:.....	Thermoset Polymer based capacitive
Accuracy at 25°C:.....	±2, 3, or 5% RH, (5% to 95% RH)
Measurement Range:.....	0 to 100% RH
Temperature Dependence:.....	±0.05% RH / °C
Hysteresis:.....	±1.5% RH maximum
Repeatability:.....	±0.5% RH typical
Linearity:.....	±0.5% RH typical
Sensor Response Time:.....	15 seconds typical
Stability:.....	±1% RH typical at 50% RH in 5 yrs.
Operating Temperature:.....	0° to 50°C (32° to 122°F) for RH110 -40° to 70°C (-40° to 158°F) for RH210/RH310
Operating Humidity:.....	0 to 95% RH non-condensing
Power Supply:.....	18 to 35 Vdc, 15 to 26 Vac (RH110B is Vdc only)
Consumption:.....	22 mA maximum
Input Voltage Effect:.....	Negligible over specified operating range
Protection Circuitry:.....	Reverse voltage protected and out limited
Output Signal:.....	4-20 mA current loop, 0-1, 0-5 or 0-10 Vdc (jumper-selectable) jumper selectable outputs not available on RH110, 210 or 310 RH110B is only available with 4-20 mA, 2-wire output
Output Drive at 24 Vdc:.....	550 ohms max for current output 10K ohms min for voltage output
Internal Adjustments:.....	Clearly marked ZERO and SPAN pots
Wiring Connections:.....	Screw terminal block (14 to 22 AWG)
Optional LCD Display:.....	RH100A and RH200A 3 digit for 00.0 to 99.9% RH, 24 x 11mm (0.95" w x 0.45" h)
Optional Override Switch:.....	Normally open push-button, 0.4 VA at 24 Vac/dc two-wire output
Optional Temperature Sensor:...	Various RTDs and thermistors available as two-wire resistance output
Enclosures:.....	RH110A (Executive), 71x119x32mm (2.8" w x 4.7" h x 1.25" d) RH110B (Designer), 70x114x30mm, (2.75" w x 4.5" h x 1.2" d) RH210A (ABS), 114x84x53mm (4.5" w x 3.3" h x 2.1" d) RH310A (ABS WP) 122x112x63mm (4.8" w x 4.8" h x 2.5" d) 230 mm (9") probe length x 12.7 mm (1/2") diameter stainless steel with porous filter
RH200 Probe:.....	



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RELATIVE HUMIDITY: PRODUCT ORDERING INFORMATION

MODEL	Product Description (Dual transmitter - Humidity and Temperature)						
RH110	Space						
RH210	Duct						
RH310	Outside Air						
CODE	Style						
A	Executive (RH110), ABS enclosure (RH210) and ABS enclosure weatherproof (RH310)						
B	Designer space (RH110)						
CODE	RH Accuracy						
02	2%						
03	3%						
05	5%						
CODE	Temperature Sensor						
C	PT1000-1000Ω Platinum, IEC 751, 385 Alpha, thin film						
L	PT100-100Ω Platinum, IEC 751, 385 Alpha, thin film (N/A on RH110)						
CODE	Power Supply						
1	24 Vdc (RH110B)						
2	24 Vac/dc (RH110A, RH210 and RH310)						
CODE	Output Signal (RH and Temperature)						
A	4 - 20mA (RH110A, RH110B, RH210, and RH310)						
D	0 - 5 Vdc (RH110A, RH210 and RH310)						
E	0 - 10 Vdc (RH110A, RH210 and RH 310)						
CODE	Temperature Transmitter Range						
1	0°C - 35°C (32°F - 95°F)						
2	0°C - 50°C (32°F - 122°F)						
3	0°C - 100°C (32°F - 212°F)						
6	-50°C - 50°C (-58°F - 122°F)						
CODE	Options						
AC	Dual LCD display (Celcius for RH110A)						
AF	Dual LCD display (Fahrenheit for RH110A)						
RH110	A	03	C	2	A	1	AC

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

3% Space executive humidity c/w temperature transmitter with 1000Ω RTD, 24 Vac/dc power supply, 4 - 20mA output over 0°C - 35°C (32°F - 95°F)and dual LCD displaying both humidity and temperature (°C).

RH110A03C2A1AC

Note: Remote display option available, see
Miscellaneous Control Devices data sheet.



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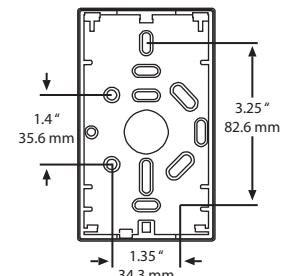
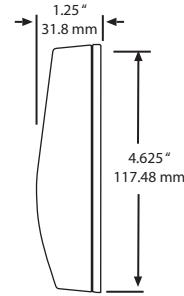
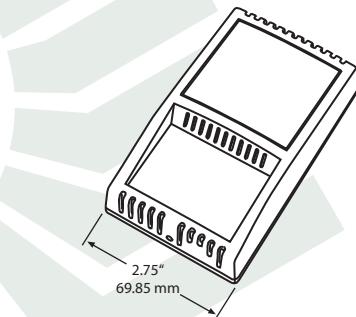


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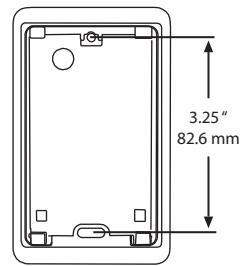
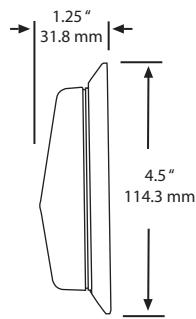
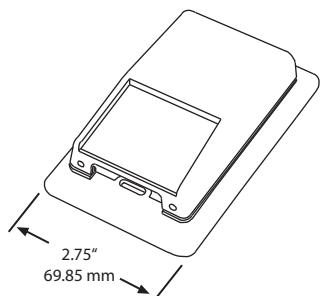


ENCLOSURE STYLES

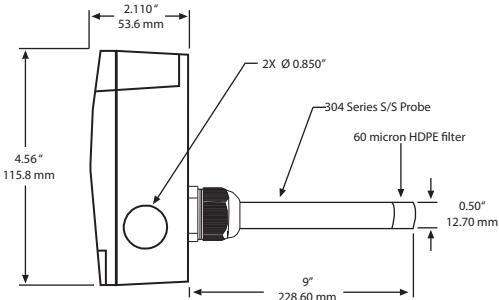
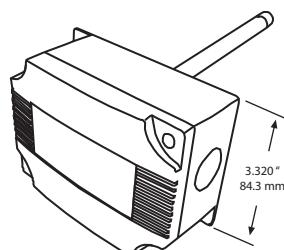
RH110A



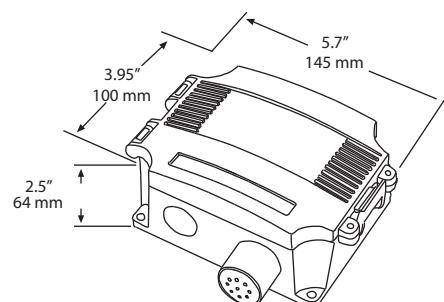
RH110B



RH210A



RH310A



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Made
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CE

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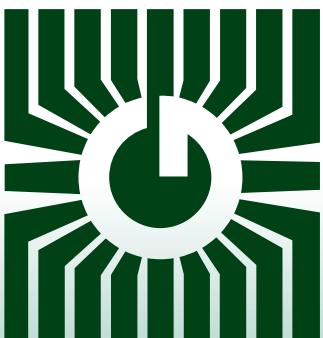
**ROOM PRESSURE
MONITOR**
RP Series



**Precision room pressure
control/sensing**

FEATURES:

- LCD indication
- Jumper selectable outputs
- Precision silicon sensor
- Functional and attractive enclosure
- Installer friendly wiring access
- Several ranges available



***Peace of mind
through reliable
pressure monitoring***

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

DESCRIPTION:

The RP series Room Pressure Monitor is used to measure differential pressure in the range of 0.125 to 1" wc or 30 to 250 Pa.

It combines precision high sensitivity silicon sensing capabilities and the latest ASIC technology to substantially reduce offset errors due to changes in temperature, stability to warm up, long term instability and position sensitivity.

It features an LCD to display the pressure value, several bi-directional pressure ranges and field-selectable output signal types for the most flexible application. The device has an on-board auto-zero function as well as a connection for remote zeroing. It also features an optional alarm output with a variable trip point, a remote buzzer output with silence switch and a flashing alarm LED.

SPECIFICATIONS:

Pressure Ranges	± 1" wc, ± 0.5" wc, ± 0.25" wc, ± 0.125" wc ± 250 Pa, ± 125 Pa, ± 60 Pa, ± 30 Pa
Accuracy	± 1% F.S.O. (±2% F.S.O. for 0.125"wc and 30 Pa ranges)
Measurement Type	Differential (two port)
Response Time	0.5 Sec
Thermal Effects	< ± 3.5% over compensated range
Compensated Range	0 - 70°C (32 - 158°F)
Over Pressure	100" wc (24.9 kPa)
Operating Conditions	0 - 70 C (32 - 158 F), 10 - 90% RH non-condensing
Power Supply (at transmitter)	15 - 27 Vac, 20 – 35 Vdc (non-isolated half-wave rectified)
Supply Current	< 30mA (base model), 50mA (with alarm options), 70mA (with buzzer connected)
Input Voltage Effect	Negligible over specified operating range
Protection Circuitry	Reverse voltage protected and output limited
Output Signal	4-20 mA (3-wire), 0-5 Vdc or 0-10 Vdc (3-wire), Pin jumper selectable
Current Output Drive Capability..	550 ohms maximum
Voltage Output Drive Capability..	2 Kohms minimum
Zero Adjustment	Pushbutton auto-zero (on device or remote)
Wiring Connections	Screw terminal block (14 to 22 AWG)
Pressure Connections	1/8" ID Flexible tubing
Display	3 1/2 digit LCD, 0.4" digit height
Relay Output	N.O. contact, 2.5 Amps @ 120 Vac, 2.5 Amps @ 30 Vdc
Relay Trip Point	Adjustable from ZERO to SPAN via trimpot
Relay Delay	5 seconds on / 5 seconds off
Enclosure	Executive Space, 71 W x 119 H x 32mm D (2.8" x 4.7" x 1.25")
Weight	110 grams (3.9 oz)



GREYSTONE ENERGY SYSTEMS, INC.

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ROOM PRESSURE MONITOR PRODUCT ORDERING INFORMATION:

MODEL	Product Description
RP	Room pressure monitor/transmitter with remote zero
CODE	Range
01	± 1" WC
02	± 0.5" WC
03	± 0.25" WC
04	± 0.125" WC
05	± 0.250 Pa
06	± 0.125 Pa
07	± 0.60 Pa
08	± 0.30 Pa
CODE	Options
LC	LCD display-Displays the differential pressure value and the alarm setpoint value on demand
A	Alarm functions-LED, Silence switch, Buzzer out, Relay out and Setpoint control
SP	Stainless plate pick-up port
AE	Executive (AE) pick-up port

RP 04 LCASP

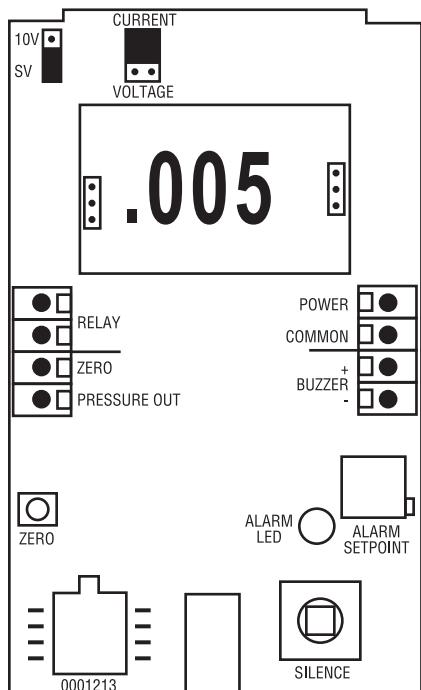
Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

Room pressure sensor, ±0.125" range, c/w LCD, alarm functions and stainless plate pick-up port.

RP04LCASP

PCB/WIRING INFORMATION



Terminal	Function
POWER	From +24 Vac/dc of controller or power supply
COMMON	To GND or COMMON of controller
PRESSURE OUT	To analog input of controller 4-20 mA or 0-5 Vdc or 0-10 Vdc
ZERO	To digital output of controller for remote zeroing
RELAY (2)	To digital input of controller or external annunciator
BUZZER +	To plus of remote buzzer
BUZZER -	To minus of remote buzzer

* Some models do not have all these features



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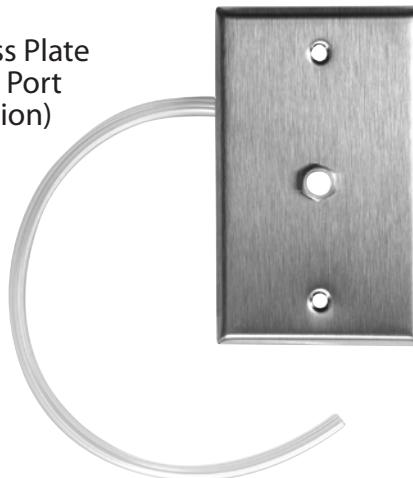


OPTIONS

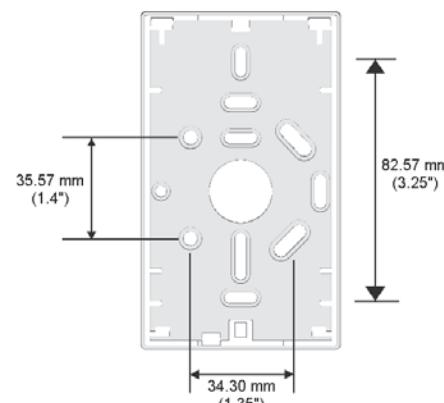
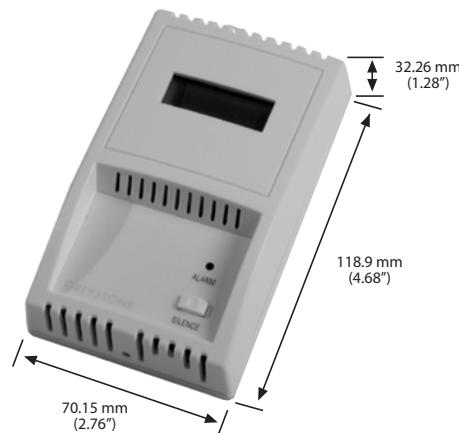
Audible Alarm
Part # AA-1
(to be ordered
separately)



Stainless Plate
Pick-up Port
(SP Option)



DIMENSIONS nts



Other GREYSTONE *Accuracy by Design* Products for the HVAC Professional

- Temperature Sensors and Transducers
- Humidity Transducers
- Pressure Transducers
- Current Switches and Sensors
- Electronic to Pneumatic (IP)
- Transducers
- Power Supplies



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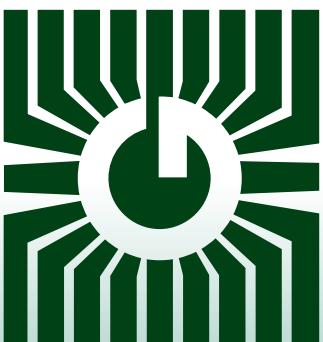
ULTRA LOW PRESSURE
TRANSDUCERS
ULP Series



Precision low pressure
control/sensing

FEATURES:

- 3 jumper selectable current or voltage outputs
- 24 Vac/dc power supply standard
- 2 jumper selectable pressure ranges per model
- Functional weather resistant ABS Enclosure
- Optional LCD display available
- Optional relay output



*Peace of mind
through reliable
pressure transducers*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

APPLICATIONS:

- HVAC/VAV
- Process Control
- Air Flow Monitoring
- Drop Across Air Filters
- Static Building Pressure
- Room Pressure Monitoring

SPECIFICATIONS: ULP Series

Pressure Ranges	See ordering information
Calibration Accuracy	± 1% F.S.O.
Measurement Types	Differential (two ports)
Response Time	0.5 ms
Thermal Effects	<±3% over compensated range
Compensated Range	10 - 50°C (32 - 122°F)
Over Pressure	100" W.C. (24.9 kPa)
Operating Conditions	0 - 70°C (32 - 158°F), 10 - 90% RH non-condensing
Media Compatibility	Low Port: dry gasses only, media must be compatible with epoxy adhesive High Port: wetted materials compatible with nylon housing, epoxy adhesive and silicon
Power Supply (at transducer)	13 - 28 Vac, 18 - 35 Vdc (non-isolated half-wave rectified)
Supply Current	<30 mA (without delay), or 50 mA (with relay option)
Input Voltage Effect	Negligible over specified operating range
Protection Circuitry	Reverse voltage protected and output limited
Output Signal	4 - 20 mA (3-wire), 0 - 5 Vdc or 0 - 10 Vdc (3-wire), jumper selectable
Current Output	550 ohms
Drive Capability	
Voltage Output	2 Kohms minimum for 0-5 Vdc signal
Drive Capability	10 Kohms minimum for 0-10 Vdc signal
Zero Adjustment	Pushbutton auto-zero (On device or remote)
Optional Relay Output	N.O. contact, 5 Amps @ 250 Vac, 5 Amps @ 30 Vdc
Relay Trip Point	Adjustable from ZERO to SPAN via trimpot
Relay Delay	5 seconds on / 5 seconds off
Wiring Connections	Screw terminal block (14 to 22 AWG)
Pressure Connections	Barbed ports for 4.3 mm (0.170") ID flexible tubing
Conduit Connections	Access hole for 1/2" NPT conduit or cable gland
Optional LCD	31/2 digit, 10 mm (0.4") digit height
Enclosure	High Impact Black ABS, plenum rated with optional gasket 116mm W X 84 mm H X 53 mm D (4.55" X 3.3" X 2.1")



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RoHS
COMPLIANT



DESCRIPTION:

The ULP Ultra Low Pressure Transducer is used to measure differential pressure in the ranges of 0.125" W.C. to 1" W.C. (30 to 250Pa). It combines precision high sensitivity silicon sensing capabilities and the latest ASIC technology with Dynamic Self Compensation to substantially reduce offset errors due to changes in temperature, stability to warmup, long term instability and position sensitivity. It is ideal for monitoring pressure for air and other clean inert gas and is limited only to those media which will not attack silicon, nylon and epoxy adhesive.

The ULP features a field selectable uni- or bi-directional pressure ranges and output signal types for the most flexible applications. An optional on-board relay output, which is field adjustable, allows for an alarm function. Available options include an LCD and static pressure probes.

Please read the installation instructions carefully before installing and commissioning the pressure transducer. Failure to follow the instructions may result in product damage. A qualified technician must install this device.

The ULP Pressure Transducer mounts on any surface using the two holes provided on the base of the unit. Make sure there is enough space around the unit to connect the pressure tubing without kinking and avoid locations where severe vibrations or excessive moisture are present. Mount the enclosure with two user-supplied screws but do not over-tighten.

The unit may be mounted in any position but typically is installed on a vertical surface with the pressure ports on the right and the cable entrance on the left. The enclosure has a standard opening for a 1/2" conduit and may be installed with either conduit and a conduit coupler or a cable gland type fitting.

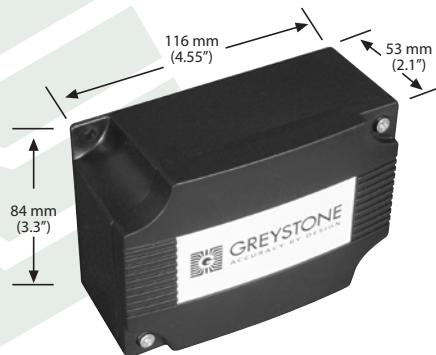
Do not use in an explosive or hazardous environment, with combustible or flammable gasses, as a safety or emergency stop device or in any other application where failure of the product could result in personal injury. Take electrostatic discharge precautions during installation and do not exceed the device ratings.

PRODUCT ORDERING INFORMATION:

MODEL	Product Description																			
ULP	Jumper Selectable Ultra Low Pressure Transducer																			
	<table border="1"><thead><tr><th>CODE</th><th>Options</th></tr></thead><tbody><tr><td>A</td><td>Standard</td></tr><tr><td>B</td><td>LCD Display</td></tr></tbody></table>		CODE	Options	A	Standard	B	LCD Display												
CODE	Options																			
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B	LCD Display																			
	<table border="1"><thead><tr><th>CODE</th><th>Pressure Ranges</th></tr></thead><tbody><tr><td>01</td><td>0-1" W.C., ± 1" W.C.</td></tr><tr><td>02</td><td>0-0.5" W.C., ± 0.5" W.C.</td></tr><tr><td>03</td><td>0-0.25" W.C., ± 0.25" W.C.</td></tr><tr><td>04</td><td>0-0.125" W.C., ± 0.125" W.C.</td></tr><tr><td>05</td><td>0-250 Pa, ± 250 Pa</td></tr><tr><td>06</td><td>0-125 Pa, ± 125 Pa</td></tr><tr><td>07</td><td>0-60 Pa, ± 60 Pa</td></tr><tr><td>08</td><td>0-30 Pa, ± 30 Pa</td></tr></tbody></table>		CODE	Pressure Ranges	01	0-1" W.C., ± 1" W.C.	02	0-0.5" W.C., ± 0.5" W.C.	03	0-0.25" W.C., ± 0.25" W.C.	04	0-0.125" W.C., ± 0.125" W.C.	05	0-250 Pa, ± 250 Pa	06	0-125 Pa, ± 125 Pa	07	0-60 Pa, ± 60 Pa	08	0-30 Pa, ± 30 Pa
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CODE	Alarm Output																			
A	Alarm relay, N.O. 5 Amp																			
ULP	B	01																		
		A	←	Typical Model Number																
Example: LCD, 0-1" or ±1" W.C., Alarm Relay																				

Greystone Energy Systems Inc. reserves the right to make design modifications without prior notice.

DIMENSIONS:



ABS enclosure dimensions

ACCESSORIES:



RPV
Stainless Steel Pick-up Port

The RPV is a stainless steel wall plate that incorporates a filtered port with a 1/4" barb connection for pneumatic tubing. It can be mounted on a standard junction box and used in conjunction with a low pressure transducer to monitor room pressure.

OPV
Outside Pick-up Port

The OPV is a weatherproof ABS enclosure with wind shield that incorporates a filtered port with a 1/4" barb fitting for connection of pneumatic tubing. It can be mounted on the side of a building and used in conjunction with a low pressure transducer to monitor building pressure.



EPV
Executive ABS Pick-up Port

The EPV is a low profile, decorative ABS enclosure that incorporates a port with a 1/4" barb connection for pneumatic tubing. It can be mounted on a standard junction box and used in conjunction with a low pressure transducer to monitor room pressure.



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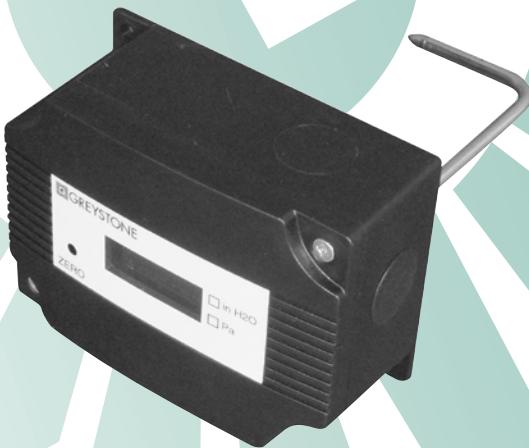
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GREYSTONE ACCURACY BY DESIGN

LOW PRESSURE
TRANSDUCERS
LP2 Series

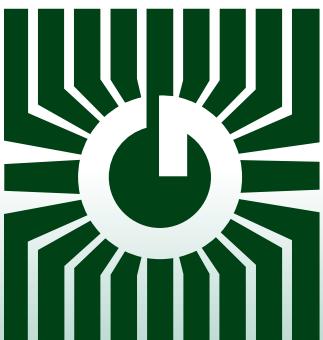


Shown above c/w LCD and integrated static probe options.

Precision low pressure
control/sensing

FEATURES:

- Jumper selectable 2 wire current and 3 wire voltage outputs standard
- 24 Vac/dc power supply standard
- Four variable jumper selectable pressure ranges, W.C. & Pa.
- Functional weather resistant ABS Enclosure
- Available options include LCD display and integrated static probe



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APPLICATIONS:

- HVAC/VAV
- Process Control
- Air Flow Monitoring
- Drop Across Air Filters
- Hydraulic Pressures
- Pneumatic Pressures

SPECIFICATIONS: LP2 Series

Pressure Ranges	See ordering information
Calibration Accuracy	$\pm 1\%$ F.S.O.
Measurement Types	Differential (two ports), Static, Velocity and Total Pressure
Response Time	1 ms maximum
Stability	< $\pm 1\%$ F.S.O. per year
Thermal Effects	< $\pm 3\%$ over compensated range
Compensated Range	10 - 50°C (50 - 122°F)
Over Pressure	20 psi or 2 x range (whichever is greater)
Operating Conditions	0 - 60°C (32 - 140°F), 10 - 90% RH non-condensing
Media Compatibility	Limited only to those that will not attack polyetherimide, silicon, fluorosilicone, silicone, EPDM, and neoprene seals. Typically dry air or inert gas but liquid is allowed.
Power Supply (at transducer)	12 - 28 Vac, 15 - 35 Vdc (non-isolated half-wave rectified)
Supply Current	<4 mA
Input Voltage Effect	Negligible over specified operating range
Protection Circuitry	Reverse voltage protected and output limited
Output Signal	4 - 20 mA (2-wire), 0 - 5 Vdc or 0 - 10 Vdc (3-wire)
Current Output	400 ohms maximum @ 24 Vdc
Drive Capability	
Voltage Output	2 Kohms minimum for 0-5 Vdc signal
Drive Capability	10 Kohms minimum for 0-10 Vdc signal
Zero Adjustment	Pushbutton auto-zero
Wiring Connections	Screw terminal block (14 to 22 AWG)
Pressure Connections	Barbed ports for 4.3 mm (0.170") ID flexible tubing
Conduit Connections	Access hole for 1/2" NPT conduit or cable gland
Optional LCD	31/2 digit, 10 mm (0.4") digit height
Enclosure	High Impact Black ABS, plenum rated with optional gasket 116 mm W x 84 mm H x 53 mm D (4.55" x 3.3" x 2.1")



LP2 c/w LCD



LP2 c/w LCD
& integrated static probe



GREYSTONE ENERGY SYSTEMS, INC.

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COMPLIANT



DESCRIPTION:

The LP2 Low Pressure Transducer can be used to measure positive, negative or differential pressure in the ranges of 1" W.C. to 12" W.C. (200 TO 2000Pa). The piezoresistive sensor is ideal for monitoring the pressure for air or other clean inert gas and is limited only to those media which will not attack polyetherimide, silicon, fluorosilicone, silicone, EPDM and neoprene seals.

The LP2 features field selectable pressure ranges and output signal types for the most flexible applications. Typical HVAC applications include monitoring of filter differential pressure or VAV applications. The output signal is factory calibrated and temperature compensated for highest startup accuracy and trouble-free operation. Available options include LCDs and integrated static pressure probe.

Please read the installation instructions carefully before installing and commissioning the pressure transducer. Failure to follow the instructions may result in product damage. A qualified technician must install this device.

The LP2 Pressure Transducer mounts on any surface using the two holes provided on the base of the unit. Make sure there is enough space around the unit to connect the pressure tubing without kinking and avoid locations where severe vibrations or excessive moisture are present. Mount the enclosure with two user-supplied screws but do not over-tighten.

The unit may be mounted in any position but typically is installed on a vertical surface with the pressure ports on the right and the cable entrance on the left. The enclosure has a standard opening for a 1/2" conduit and may be installed with either conduit and a conduit coupler or a cable gland type fitting. Do not use in an explosive or hazardous environment, with combustible or flammable gasses, as safety or emergency stop devices or in any other application where failure of the product could result in personal injury. Take electrostatic discharge precautions during installation and do not exceed the device ratings.

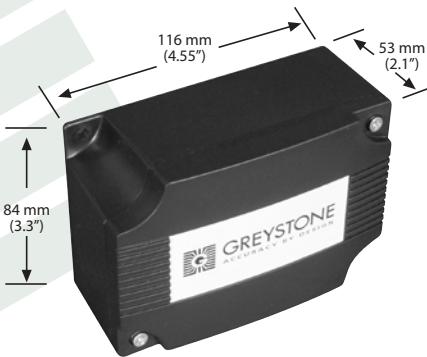
PRODUCT ORDERING INFORMATION

MODEL	Description	
LP2	Jumper Selectable Low Pressure Transducer	
	CODE	Options
	A	Standard
	B	LCD Display
	CODE	Pressure Ranges
	00	±0.5", ±1", 0-1", 0-2" W.C.
	01	±1.5", ±3", 0-3", 0-6" W.C.
	02	±2", ±4", 0-4", 0-8" W.C.
	03	±2.5", ±5", 0-5", 0-10" W.C.
	04	±3", ±6", 0-6", 0-12" W.C.
	05	±100, ±200, 200, 400 Pa
	06	±250, ±500, 500, 1000 Pa
	07	±400, ±800, 800, 1600 Pa
	08	±500, ±1000, 1000, 2000 Pa
	CODE	Options
	S	Integrated Static Pressure Probe
LP2	B	00
		S
← Typical Model Number		
Example: LCD, ±0.5" to 0-2" W.C., Static Pressure Probe		

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Note: 1" W.C. = 249.0Pa @ 40 F
1 bar = 10⁵ Pa

DIMENSIONS:



ABS enclosure dimensions

OPTIONS:



Pitot Tube
HFO & HSO Series

The HFO and HSO series are used to sense velocity pressure or static pressure respectively. Available in 152 mm (6") length. Kits are available for differential and static that are complete with pneumatic tubing.



Differential Pressure Probe
SSS Series

The SSS series DP probe is used for sensing velocity pressure in the duct. Available in 102 mm, 152 mm, 203 mm & 254 mm (4', 6', 8' & 10") lengths. Kits are available that come complete with pneumatic tubing.



Static Probe Option

The S option is a high accuracy static tube. It is available as an option on the LP2 Series low pressure transducer.



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ACCURACY BY DESIGN

GAUGE PRESSURE TRANSDUCERS

PGS Series

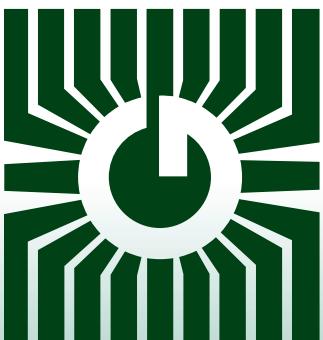


PGS100A

Precision pressure
control/sensing

FEATURES:

- 1/4" NPT
- NIST traceable calibration
- Weather resistant for harsh environments
- Fast response time
- Capacitance sensing element
- Ranges -14.7 through 10,000 PSIG (-101.4 through 68947.6 kPa)
- Accuracy to $\pm 0.25\%$ FSO
- DC inputs, current output
- Compensated temperature range: -20°C to 80°C (-4°F to 176°F)
- Operating temperature range: -40°C to 85°C (-40°F to 185°F)
- 17-4PH Stainless Steel has excellent corrosion resistance (comparable to grade 304 stainless)



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APPLICATIONS:

- HVAC Systems
- Energy Management Systems
- Steam Pressures
- Refrigerants and Ammonia
- Gas Chromatography
- Paint Spraying Systems

- Electronic Pressure Switch
- Heat Pumps
- Hydraulic Systems
- Irrigation Systems
- Compressor Control
- Propane

SPECIFICATIONS:

PGS100 Series	
Accuracy at Constant Temp.	.25% F.S.O
Supply Voltage	Minimum supply voltage (VDC) = $9 + 0.02 \times (\text{Resistance of receiver plus line})$. Maximum supply voltage (VDC) = $30 + 0.004 \times (\text{Resistance of receiver plus line})$.
Output	4 to 20 mA
External Load	0 to 800 ohms
Media Compatibility	17 - 4PH stainless steel
Pressure Port	1/4" - 18 NPT External
Operating Temp. Range (sensor)	-40°C - 85°C (-40°F - 185°F)
Compensated Temp. Range	-20°C - 80°C (-4°F - 176°F)
Zero Thermal Shift	<±2% of F.S.
Span Thermal Shift	<±1.5% of F.S.
Pressure Overload	See pressure scale chart

PRODUCT DESCRIPTION:

PGS100A is a compact gauge pressure transducer complete with a 2 wire 4-20mA output, various pressure ranges, 1/4" NPT connection and 2 foot cable for electrical termination.

MEDIA COMPATIBILITY:

The PGS100 Series transducers are designed to be used with any gases or liquids compatible with 17-4PH stainless steel. The 17-4PH stainless has excellent corrosion resistance. Corrosion tests and service experience have shown that in all aged conditions it is superior to standard hardenable stainless grades such as 420, 431 and 410 stainless. This corrosion resistance is comparable to 304 stainless. Note it is not recommended for hydrogen applications.

PRESSURE RANGES:

Code	Full Scale Pressure Range PSI	Proof Pressure PSI	Burst Pressure PSI
4A1A	-14.7-15 PSIG (-101.4-103.4 kPa)	20	500
5A1A	-14.7-30 PSIG (-101.4-206.8 kPa)	50	500
6A1A	-14.7-60 PSIG (-101.4-413.7 kPa)	100	750
7A1A	-14.7-100 PSIG (-101.4-689.5 kPa)	200	1000
8A1A	-14.7-150 PSIG (-101.4-1034.2 kPa)	400	2000
9A1A	0-10 PSIG (0-68.95 kPa)	20	500
10A1A	0-25 PSIG (0-172.4 kPa)	50	500
11A1A	0-50 PSIG (0-344.7 kPa)	100	750
12A1A	0-100 PSIG (0-689.5 kPa)	200	1000
13A1A	0-150 PSIG (0-1034.2 kPa)	400	2000
14A1A	0-200 PSIG (0-1379 kPa)	400	2000
15A1A	0-250 PSIG (0-1723.2 kPa)	500	2000
16A1A	0-300 PSIG (0-2068.4 kPa)	500	2000
17A1A	0-500 PSIG (0-3447.4 kPa)	1000	3000
18A1A	0-1000 PSIG (0-6894.8 kPa)	2000	5000
19A1A	0-5000 PSIG (0-34473.8 kPa)	7500	10,000
20A1A	0-10,000 PSIG (0-68947.6 kPa)	12,500	20,000

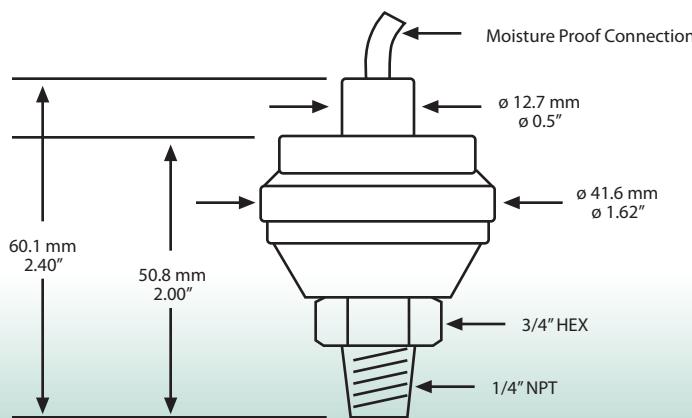
ORDER EXAMPLE:

To order a **PGS-100A, 0-200 PSIG Range, supply voltage of 24 VDC, output of 4-20mA**, the following order number would apply:

PGS100A14A1A



OUTLINE DRAWING:



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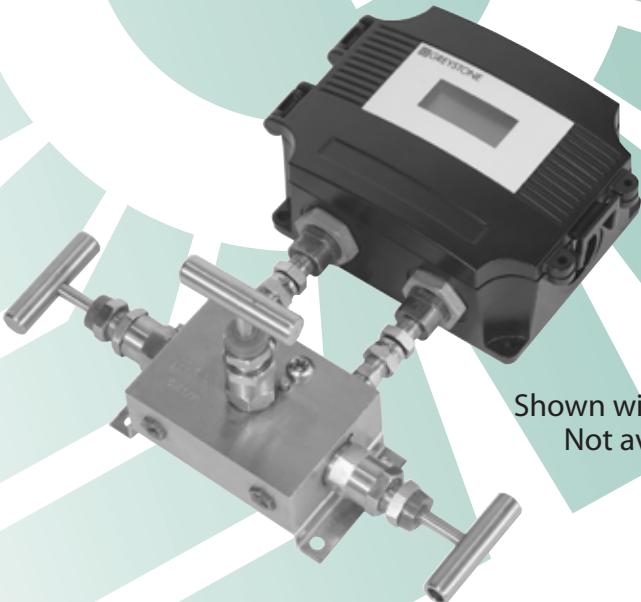
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LIQUID PRESSURE TRANSDUCERS

WP Series

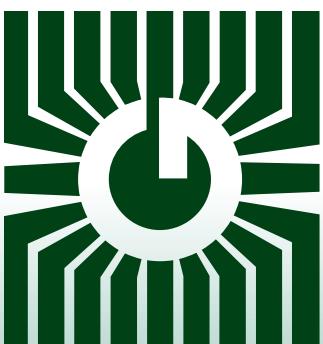


Shown with 3 Way Valve Option
Not available in the USA

Precision pressure
control/sensing

FEATURES:

- Differential and gauge pressure models
- Four , switch selectable, ranges per model
- Jumper selectable outputs: 4-20mA, 0-5 Vdc or 0-10 Vdc
- Optional backlit (jumper-selectable) LCD
- All stainless steel sensor construction
- Port swap switch to correct incorrect plumbing
- Switch selectable uni or bi-directional
- Nema 4 (IP54) hinged enclosure



*Peace of mind
through reliable
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APPLICATIONS:

- Pump Monitoring
- Filter Monitoring
- Chiller Monitoring
- HVAC Systems

SPECIFICATIONS:

Media compatibility	17-4 PH stainless steel		
Input power	18 to 28 Vac/Vdc (non-isolated half-wave rectified)		
Supply Current @ 24 Vdc	100 mA max @ 24 Vdc with LCD backlight, 35 mA with backlight disabled		
Output	3-wire transmitter; user selectable 4-20mA active(sourcing), 0-5V and 0-10V		
Pressure Ranges:	0-5/10/25/50 psig/d	0-5/1/2.5/5 Bar	0-50/100/250/500 kPa
	0-10/20/50/100 psig/d	0-75/1.5/3.75/7.5 Bar	0-75/150/375/750 kPa
	0-20/40/100/200 psig/d	0-1/2/5/10 Bar	0-100/200/500/1000 kPa
	0-50/100/250/500 psig/d	0-3/6/15/30 Bar	0-300/600/1500/3000 kPa
Line Pressure	Max. Line Pressure is the highest of the selectable ranges on each models. i.e.: WP-D-101 has a maximum line pressure of 50 psi		
Proof Pressure	Max. 2X highest range per model		
Burst Pressure	Max. 5X highest range per model		
Accuracy	$\pm 1\%$ F.S. of range selected with combined linearity, hysteresis, and repeatability. Lowest range on each model has accuracy of $\pm 2\%$ F.S.		
Pressure cycles	> 100 million		
Surge Damping	Normal 4-second averaging Slow 8-second averaging, switch selectable		
Temperature compensated range	0° to 55°C (32 to 130°F)		
Sensor operating range	-40° to 85°C (-40 to 185°F)		
Long term stability	$\pm 0.25\%$ typical (1 year)		
Zero adjust	Push-button auto-zero and digital input		
Operating environment	0° to 50°C 10-90% RH condensing		
Fittings	1/8" NPT female		
Enclosure	ABS with hinged lid and gasket, 145 x 100 x 64mm (5.7" w x 3.95" h x 2.5" d)		
Shock	100G, 11 mSec, 1/2 sine		
Vibration	10G peak 20 to 2000 Hz		
Rating	IP54 (NEMA 4)		



GREYSTONE ENERGY SYSTEMS, INC.

RoHS
COMPLIANT



DESCRIPTION:

The Wet-Wet pressure transmitter is designed with dual sensors that enable it to accept high differential pressure ranges. The gauge pressure transmitter is designed with a single sensor that enables it to accept high pressures ranges.

Both transmitters can accept ranges from 5 PSI to 500 PSI. All models can handle overload pressure 2X the maximum full scale range and burst pressure is 5X the maximum full scale range. Features include field selectable pressure ranges and output signal types for the most flexible applications. Typical HVAC applications include monitoring of liquid differential and gauge pressure. The output signal is factory calibrated and temperature compensated for the highest start-up accuracy.

NOTE: When choosing pressure range ensure that the maximum individual port pressure does not exceed the maximum pressure range of the unit. For example, the maximum individual port pressure of the WP-D-102 is 100 PSI. Exceeding this may cause damage to the sensors and will give erroneous readings.

PRODUCT ORDERING INFORMATION:

MODEL	Description	
WP-D	Wet/Wet differential pressure transmitter, jumper selectable outputs	
WP-G	Gauge pressure transmitter, jumper selectable outputs	
	CODE	Pressure ranges
	101	5, 10, 25 and 50 PSI ranges
	102	10, 20, 50 and 100 PSI ranges
	103	20, 40, 100 and 200 PSI ranges
	104	50, 100, 250 and 500 PSI ranges
	105	0.5, 1.0, 2.5 and 5.0 Bar
	106	0.75, 1.50, 3.75 and 7.50 Bar
	107	1, 2, 5 and 10 Bar
	108	3, 6, 15 and 30 Bar
	109	50, 100, 250 and 500 kPa
	110	75, 150, 375 and 750 kPa
	111	100, 200, 500 and 1000 kPa
	112	300, 600, 1500 and 3000 kPa
	CODE	Option
	LCD	Backlit LCD option
	VB	Valve and bracket Assembly (Not available in the USA)
WP-D	101	LCD
← Typical Model Number →		

Example: Wet to Wet differential, 5 thru 50 PSI ranges c/w LCD (WP-D-101-LCD)



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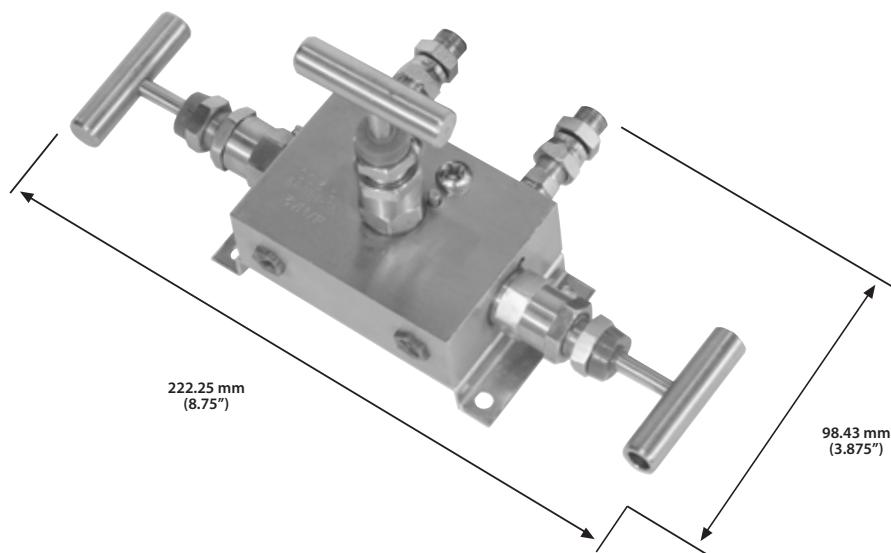
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ENCLOSURE DIMENSIONS:



-VB Option
3 Way Valve for WP-D
 Not Available in the USA



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RoHS
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ACCURACY BY DESIGN

LIQUID PRESSURE SWITCHES

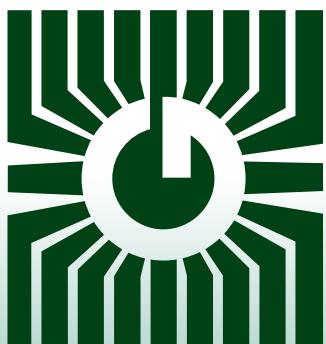
WPS Series



Precision pressure
control / sensing

FEATURES:

- High rated SPDT contacts
- Adjustable setpoint
- Adjustable differential
- Direct switching of 240 Vac loads
- Full mechanical switching



*Peace of mind
through reliable
pressure monitoring*

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WPS-G-PS3

Liquid Static Pressure Switch

DESCRIPTION:

The WPS-G-PS3 pressure switch is a cost effective pressure monitoring solutions for liquids and non aggressive gases.

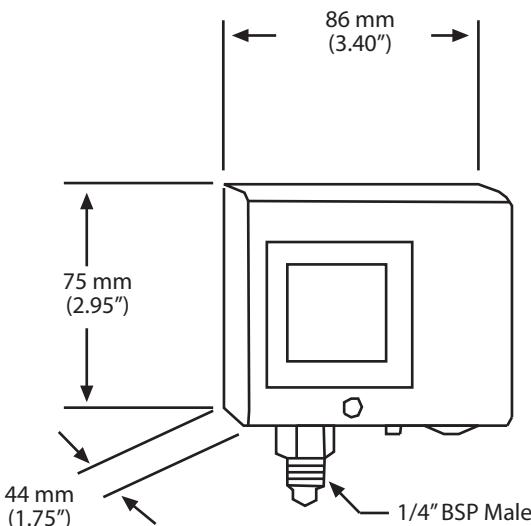
The compact design and rugged construction makes the WPS-G suitable for monitoring pumps, chillers, valves, etc. The unit has an adjustable setpoint with adjustable differential and comes complete with a dial to show the liquid pressure.



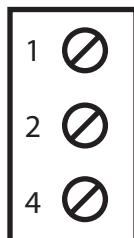
SPECIFICATIONS:

GENERAL

Range.....	-0.5 to 7 Bar -7.25 to 101.5 Psi
Pressure Connection.....	1/4" BSP Male
Electrical Connection.....	Screw terminals suitable for 1.5 mm conductors max.
Contact Rating.....	24 Amp@ 230 Vac resistive 10 Amp Inductive
Protection	IP44 (NEMA 2)
Ambient Temperature	-50° to 70°C (-58° to 158°F)
Fluid Temperature	-50° to 170°C (-58° to 338°F)
Dimensions	42 x 85 x 75 mm
Weight	346 gms (12.2 oz)
Approvals.....	ULC #E85974



WIRING:



- | | |
|---|------------------|
| 1 | Common |
| 2 | Rising pressure |
| 4 | Falling pressure |



GREYSTONE ENERGY SYSTEMS, INC.



WPS-D-FD113

Liquid Differential Pressure Switch

DESCRIPTION:

The WPS-D-FD113 differential pressure switch is a low cost effective pressure monitoring solutions for liquids and non aggressive gases.

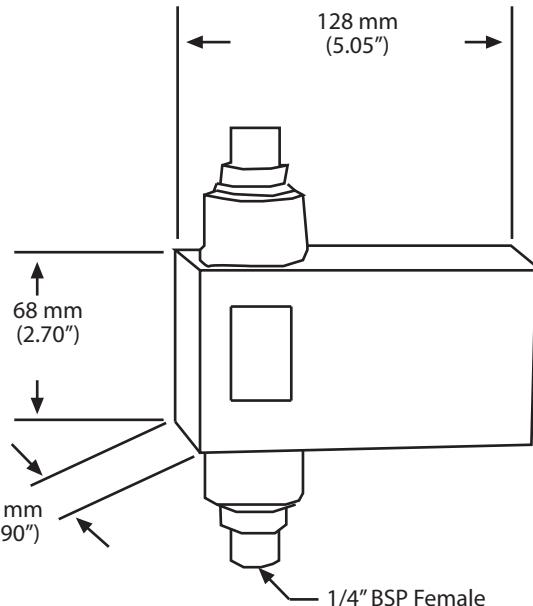
The unit is designed for both flow proving and flow failure detection to cover the range of 0.3 to 4.5 Bar (4.35 to 65.25 PSI). Approximate setpoint can be viewed on the dial at the front of the unit.



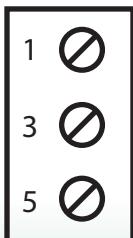
SPECIFICATIONS:

GENERAL

Range.....	0.2 to 4.5 Bar 2.9 to 65.25 PSI
Differential	0.2 Bar (2.9 PSI)
Factory Setting	0.7 Bar (10.15 PSI)
Max. Operating Pressure.....	12 Bar (174 PSI)
Max. Test Pressure	23 Bar (334 PSI)
Pressure Connection.....	1/4" BSP Female
Electrical Connection.....	Screw terminals suitable for 1.5 mm conductors max.
Contact Rating.....	3 Amp @ 230 Vac Inductive 0.1 Amp @ 230 Vdc
Ambient Temperature	-20° to 70°C (-4° to 158°F)
Fluid Temperature	Max. 70°C (158°F)
Materials	Fittings - Brass Wetted Parts - Phosphor bronze Switch Back plate - Zinc plated mild steel Housing cover - Flame resistant polycarbonate
Protection	IP30 (NEMA 2)
Dimensions	48 x 128 x 175 mm
Weight	790 gms (1.75 lbs)
Approvals.....	ULC #E85974



WIRING:



- | | |
|---|-----------------|
| 1 | Normally Open |
| 3 | Common |
| 5 | Normally Closed |



Other GREYSTONE *Accuracy by Design* Products for the HVAC Professional

- Temperature Sensors and Transducers
- Humidity Transducers
- Pressure Transducers
- Current Switches and Sensors
- Electronic to Pneumatic (IP)
- Transducers
- Power Supplies



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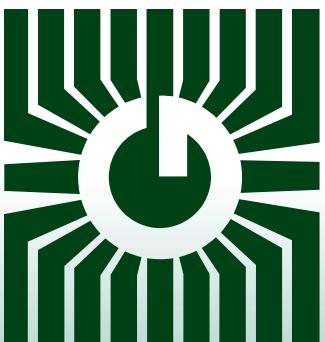
DIFFERENTIAL PRESSURE SWITCH GFS Series



Precision pressure
control/sensing

FEATURES:

- The housing contains a diaphragm, a snap-acting SPDT switch, range adjustment knob with increments
- The sample connections located on the side accept 6.35mm (0.25") OD tubing
- An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting knob with indication.
- Optional pressure ranges available.
- Includes 2 pick up tubes and 2 M (6.56') of PVC tubing



*Peace of mind
through reliable
pressure switches*

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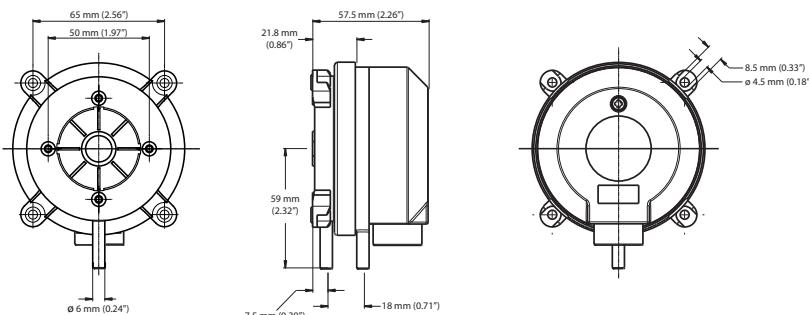
SPECIFICATIONS:

Adjustment Range.....	See Product Ordering Information
Adjustment Knob Markings.....	Scaled in Pascal and "WC
Switch Tolerance.....	±15%
Maximum Operating Pressure.....	1.45 PSI (10 kPa) for all pressure ranges
Medium.....	Air, non-combustible and non-aggressive gases
Temperature Range.....	Medium and ambient temperature -20°C to 60°C (-4°F to 140°F) Storage temperature -40°C to 85°C (-40°F to 185°F)
Diaphragm Material.....	Silicone, tempered at 200°C, free of gas emissions
Pressure Connections.....	2 plastic pipe connections pieces (P1 and P2), external diameter 6.0 mm P1 for connection to higher pressure P2 for connection to lower pressure
Electrical Rating.....	Max. 1.0A (0.4A) / 250 VAC, 50/60 Hz Max. 0.1 A / 24 VDC
Electrical Connections.....	AMP flat plug 6.3 mm x 0.8 mm Push-on screw terminals Cable conduit with cable relief
Mechanical Working Life.....	Over 10 million switching operations
Housing Materials.....	Switch body made of PA 6.6 Cover made of PC
Protection Category.....	IP54 with cover (NEMA 13)
Weight.....	With cover 160 g
Included Accessories.....	2 meters of PVC hose and 2 plastic tubes Set of 3 push-on screw terminals
Approvals.....	UL508 & CSA 22.2

PRODUCT ORDERING INFORMATION

MODEL	Description	
GFS	Adjustable Airflow Switch with Setpoint Indication	
CODE Range		
80	0.08" to 1.20" w.c. (20 to 300 Pa), Switch differential 0.04" w.c. (10 Pa)	
83	0.2" to 2.00" w.c. (50 to 500 Pa), Switch differential 0.08" w.c. (20 Pa)	
86	2.00" to 10.00" w.c. (500 to 2500 Pa), Switch differential 0.60" w.c. (150 Pa)	
CODE Electrical Connection		
N-IK	1/2" NPT Connection	
M-IK	M20 Connection	
Greystone Energy Systems Inc. reserves the right to make design modifications without prior notice.		
GFS	80	N-IK
←		Typical Model Number
Example: 0.08" to 1.2" w.c., 1/2" NPT Connection		

Dimensions in millimeters and (inches)



Alarm or Control

To prove excessive airflow or pressure



To prove insufficient airflow or pressure



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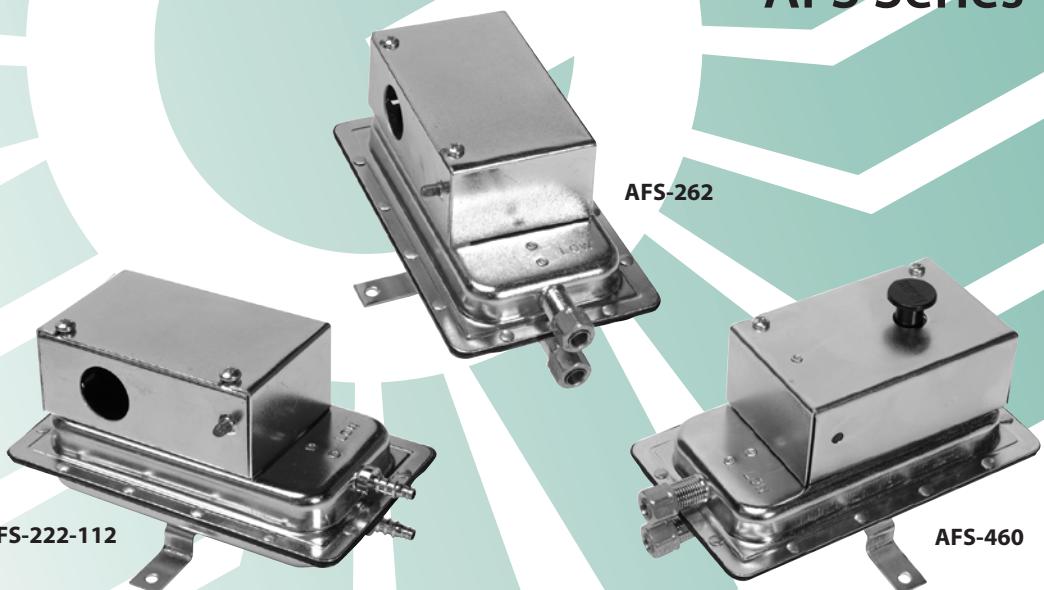
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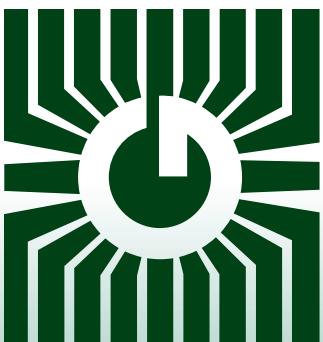
PRESSURE SWITCH AFS Series



Precision pressure
control/sensing

FEATURES:

- The plated housing contains a diaphragm, a calibration spring and a snap-acting SPDT switch.
- The sample connections located on each side of the diaphragm accept 6.35mm (0.25") OD tubing via the integral compression ferrule and nut or barbed fitting.
- An enclosure cover guards against accidental contact with the live switch terminal screws and the set point adjusting screw. The enclosure cover will accept a 12.7mm (0.5") conduit connection.
- Optional pressure ranges and manual resets available.

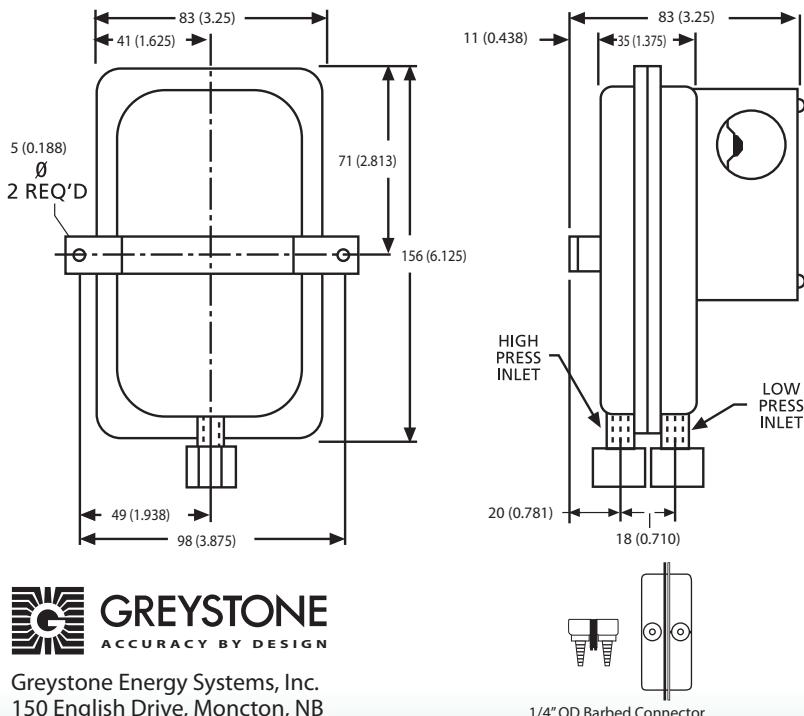


*Peace of mind
through reliable
pressure switches*

SPECIFICATIONS:

MODEL	AFS-222/AFS-222-112	AFS-262/AFS-262-112	AFS-460
Sample Media	Air	Air	Air
Mounting Position	Diaphragm in any vertical plane	Diaphragm in any vertical plane	Diaphragm in any vertical plane
Field Adjustable Range	0.05±, 0.02" w.c. to 12" w.c.	0.05±, 0.02" w.c. to 2" w.c.	0.40±, 0.06" w.c. to 12" w.c.
Switch Differential	Progressive, increasing from approx. 0.02± 0.01" w.c. at min. set point, to approx. 0.8" w.c. at max. set point	Progressive, increasing from 0.02± 0.01" w.c. at min. set point to approx. 0.1" w.c. at max. set point	Progressive, increasing from approx. 0.06± 0.01" w.c. at min. set point, to approx. 0.8" w.c. at max. set point
Maximum Pressure	0.5psi (0.03 bar)	0.5psi (0.03 bar)	0.5psi (0.03 bar)
Operating Temperature Range	-40°C - 82°C (-40°F - 180°F)	-40°C - 82°C (-40°F - 180°F)	-40°C - 82°C (-40°F - 180°F)
Life	100,000 cycles at 0.5psi max pressure each cycle and at max electrical load	100,000 cycles at 0.5psi max pressure each cycle and at max electrical load	6000 cycles at 0.5psi max pressure each cycle and at max. electrical load
Electrical Rating	300 va pilot duty at 115 - 277 VAC, 10 amp, non-inductive, 277 VAC, 60Hz	300 va pilot duty at 115 - 277 VAC, 10 amp, non-inductive, 277 VAC, 60Hz	300 va pilot duty at 115 - 277 VAC, 10 amp, non-inductive, 277 VAC, 60Hz
Contact Arrangement	SPDT	SPDT	SPST-NC
Electrical Connections	Screw top terminals with cup washers	Screw top terminals with cup washers	Screw top terminals with cup washers
Sample Line Connections	Ferrule and nut compression type connectors that accept 6.35mm (0.25") OD rigid tubing or 1/4" OD barbed connections (-112) that accept flexible tubing.	Ferrule and nut compression type connectors that accept 6.35mm (0.25") OD rigid tubing or 1/4" OD barbed connections (-112) that accept flexible tubing.	Ferrule and nut compression type connectors that accept 6.35mm (0.25") OD rigid tubing
Automatic/Manual Reset	Automatic	Automatic	Manual
Approvals	UL and CSA	UL and CSA	UL and CSA

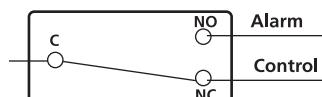
Dimensions in millimeters and (inches)



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Alarm or Control

To prove excessive airflow or pressure



To prove insufficient airflow or pressure



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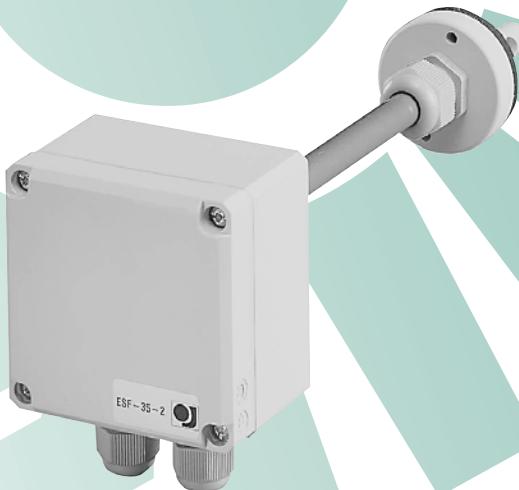
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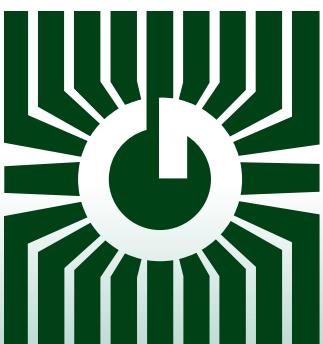
AIR FLOW
TRANSDUCER
ESF-35-2



Precision airflow
control/sensing

FEATURES:

- Converts airspeed into a 4 - 20mA or a 0 - 10 VDC signal
- Linear output signal
- Made with corrosion resistant material
- Fully electronic registration of airflow speed
- AC or DC voltage supply
- Compensates for changes of air temperature
- Telescopic sensor facilitates installation
- Temperature output signal 0 - 10 VDC
- Fuse protected



*Peace of mind
through reliable
air velocity monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

APPLICATION:

The ESF-35-2 airflow transducer can be used in a wide range of applications such as:

- Measurements of airflow speed via PLC/outstation/EMS
- Regulation of airflow speed
- Monitoring of airflow speed

FUNCTION:

The ESF-35-2 transducer registers the airflow speed according to a thermal principle based on the fact that the cooling action of air increases with airspeed. The action is measured and converted to a 4 - 20 mA or a 0 - 10 V signal corresponding to airflow speeds from 0 - 8 m/s (0 - 1575 ft/min) or 0 - 16 m/s (0 - 3150 ft/min).

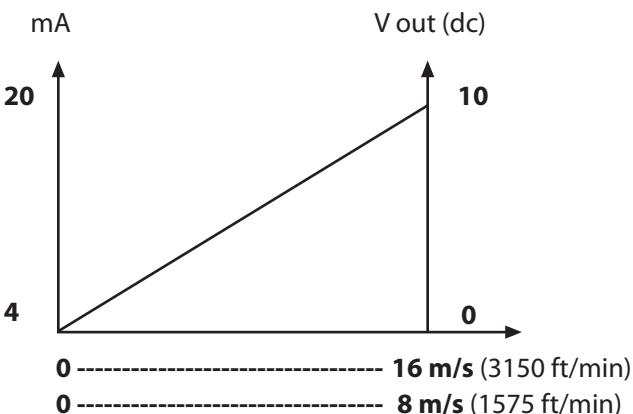
TECHNICAL DATA:

Airflow speed	0 - 16 m/s (3150 ft/min), (jumper selectable)
	0 - 8 m/s (1575 ft/min)
Output signal (flow)	4 - 20mA, 0 - 10 VDC
Output signal (temperature)	0 - 10 VDC
Temperature range	0 - 50°C (32°F - 122°F)
Air temperature	-10°C - 60°C (14°F - 140°F)
Ambient temperature	-20°C - 50°C (-4°F - 122°F)
AC voltage supply	24 VAC (120mA)
DC voltage supply	16 - 30 VDC (80mA)
Absolute accuracy	±5 %
Rise time	20 sec
Time constant	5 sec
Depth of insertion in channel	50 - 200 mm (2 - 8 in.)
Dimensions (H x W x D)	80 x 80 x 55 mm (3.15 x 3.15 x 2.17 in.)

INSTALLATION:

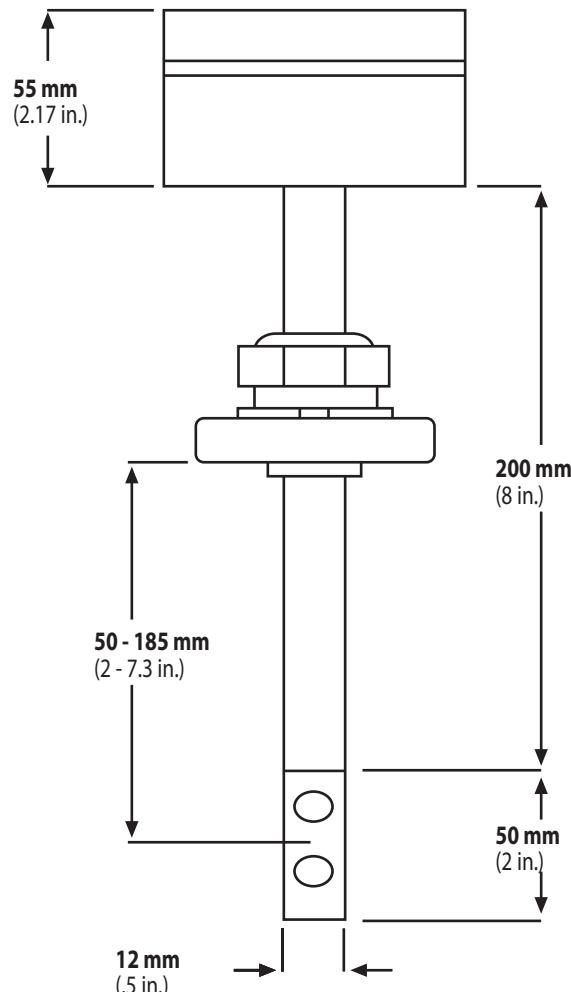
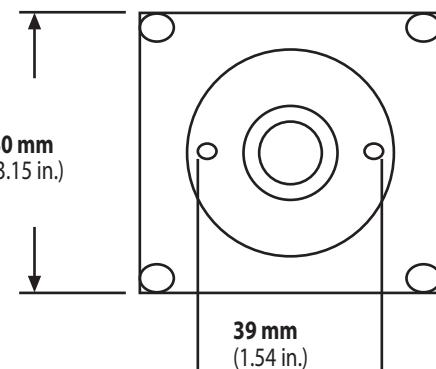
The airflow transducer ESF-35-2 is installed in such a way that the current of air passes through the gap of the sensor head.

Conductors to and from the transducer should be kept isolated from high-power conductors where powerful transient voltage spikes may appear.



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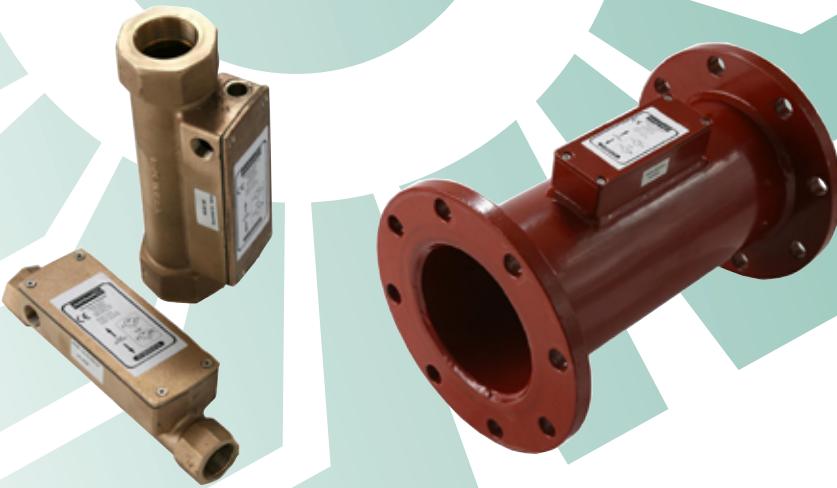


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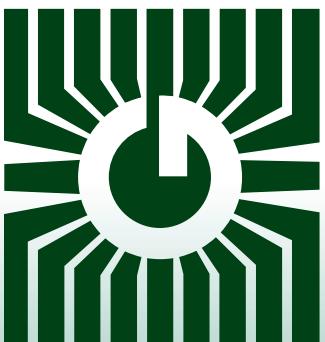
ULTRASONIC LIQUID FLOW TRANSDUCER Models CSLF



Precision flow
control/sensing

FEATURES:

- Dual Sensor, Bi-directional
- 2 Selectable ranges per model
- Loop-powered 4-20mA output
- Zero pressure drop
- Several pipe sizes available
- Choice of connection type
- No moving parts
- Plug 'n Play



*Peace of mind
through reliable
flow monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

DESCRIPTION:

The CSLF series of ultrasonic liquid flow transducers are designed for use with building automation, energy management, and process control systems. Models include various sizes and connection types for liquid flow measurement.

The CSLF series ultrasonic liquid flow transducers are ideal for the measurement of flow rates of acoustically conductive liquids including most clean liquids and many liquids with entrained solids.

Main advantages include excellent long term stability, no pressure drop, broad fluid compatibility, high accuracy and low cost. Also, there are no moving parts.

At the heart of the transmitter is a proprietary mixed signal ASIC which allows sophisticated timing, control and transducer drive circuitry to be combined on a single integrated circuit. The ASIC uses a special algorithm that is an improvement upon the standard single-path measurement technique. Using the "sing around" method, the ultrasonic transducer alternates between transmitting and receiving to measure differences in flight time between upstream and downstream transmissions. A sound pulse is transmitted from an upstream transducer towards a downstream transducer like a traditional time-of-flight measurement. However, the received sound pulse then triggers a second downstream transmission that then triggers a third and so on for a specific number of cycles. This process is repeated in the upstream direction.

Because it takes an average flight time over multiple cycles to compute the difference in flight times, the approach yields a significant improvement in timing accuracy when compared with the time-of-flight difference of a single pulse in each direction. This algorithm, combined with the pico-second timing resolution of the ASIC, provides the precise time measurement capability necessary for compact, small diameter ultrasonic meters.

The output of the transmitter is unaffected by changes in fluid temperature, density and viscosity as the flow calculation is independent of the speed of sound.

Wetted materials include ULTEM® encapsulated ultrasonic transducers with a choice of elastomer seals and epoxy coated carbon steel or brass body material.

CSLFB

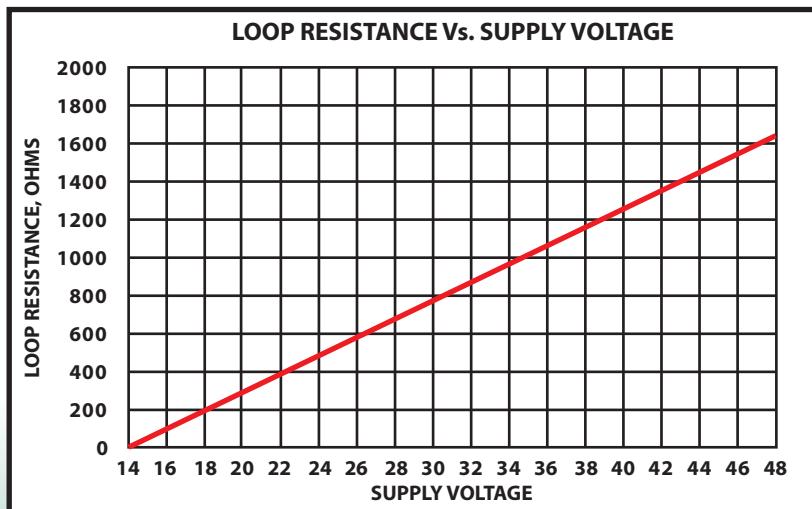


CSLFC



DESCRIPTION:

Flow Range.....	Bi-directional, field selectable per table (Standard Models)
Accuracy.....	±0.75% of full scale
Operating Temperature.....	CSLFB -40° to 82° C (-40° to 180°F) CSLFC -40° to 87° C (-40° to 190°F)
Response Time.....	User selectable, 2 to 10 seconds
Viscosity Range.....	0.2 to 150 sCt (0.2 to 150 mPas)
Liquid Density.....	30.6 to 74.9 lb/cu.ft. (490 20 1200 kg/m ³)
Ma. Working Pressure.....	200 PSI
Pipe Sizes.....	3/4", 1", 1.5", 2", 3", 4", 6", 8", 10"
Pipe Connections.....	3/4" to 2" - Female NPT or BSP 3" - ASME 150 or DIN 16 Flange 4" to 10: - ASME Class 150 Flange
Electrical Enclosure.....	Integral to body casting with gasketed cover; One 1/2" NPT conduit connection (plugged when model ordered with metric threads) and one M16 x 1.5 connection (plugged when model ordered with NPT threads)
Electrical Connections.....	Screw Terminal connections on PC board
Enclosure Rating.....	NEMA 4 (IP65)
Power Supply.....	18 to 36 Vdc
Ultrasonic Transducers.....	ULTEM® Encapsulated
Seals.....	EPDM, Buna-N, Neoprene™, FKM or other
Body Material.....	CSLFB - Brass (UNS C83600) CSLFC - Schedule 40, epoxy coated, carbon steel
Output Signal.....	Analog, 2 wire, 4-20 mA; Output is 4 mA from zero to min. flow (see Standard Model table)
Error Detection.....	An optically isolated sink output is activated under certain detectable fault conditions, such as transducer failure or overly noisy output due to flow stream anomalies, as might be seen due to excessive bubble entrainment. The optional Fault output is an optically isolated NPN transistor capable of sinking up to 10 mA from a voltage source of no more than 48 Vdc.
Direction of Flow.....	Optional output to indicate direction of flow is available. Activation or deactivation of an optically isolated 10 mA sink output indicates flow direction. Error detection is not available when this option is ordered.



FLOW TRANSDUCER: PRODUCT ORDERING INFORMATION

MODEL	Product Description																
CSLFB	Flow Transducer, 2 selectable ranges																
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ED	Error Detection (Digital)																
CSLFB	34	NPT	G	B	-												

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

3/4" c/w NPT connection.
Range GPM, & Buna-N seal

CSLFB34NPYGB

*For non-listed ranges, specify model followed by full span value:

Example CSLFB15 = 50 GPM, at 20mA or CSLF-20L
200LPM @ 20mA

Model	Pipe Size/Thread Size	*Field Selectable Full Scale Ranges (GPM)		*Field Selectable Full Scale Ranges (LPM)		
		Min.	Max.	Min.	Max.	
CSLFB34	3/4" NPT or BSP	L	0.18	15	0.72	60
		H	0.31	25	1.20	100
CSLFB10	1" NPT or BSP	L	0.38	30	1.38	115
		H	0.63	50	2.40	200
CSLFB15	1.50" NPT or BSP	L	0.50	40	1.80	150
		H	1.00	80	3.60	300
CSLFB20	2.0" NPT or BSP	L	0.75	60	2.70	225
		H	1.88	150	6.90	575
CSLFB30	3" ASME Class 150 Flange 80 mm DIN Class 150 Flange	L	2.48	200	9.00	750
		H	4.96	400	18.00	1500

* Other F.S. ranges can be specified



GREYSTONE ENERGY SYSTEMS, INC.



FLOW TRANSDUCER: PRODUCT ORDERING INFORMATION

MODEL	Product Description	
CSLFC	Flow Transducer, 2 selectable ranges	
CODE	Pipe Size	
4	4"	
6	6"	
8	8"	
10	10"	
CODE	Units of measure	
G	Gallons per Minute (U.S.)	
L	Liters per Minute	
CODE	Transducer Seal	
E	EPDM (Ethylene propylene diene M-class rubber)	
B	Buna-N	
N	Neoprene	
V	FKM (Fluorinated elastomers)	
CODE	Options	
DF	Direction of flow output (Digital)	
ED	Error Detection (Digital)	

CSLFC 8 G B -

Greystone Energy Systems, Inc. reserves the right to make design modifications without prior notice.

EXAMPLE:

8" pipe, GPM, c/w Buna-N seal
CSLFC8G

*For non-listed ranges, specify model followed by full span value:

Example CSLFC300G = 300 GPM, at 20mA or CSLFC4-750L = 750LPM @ 20mA

Model	Pipe Size	*Field Selectable Full Scale Ranges (GPM)				*Field Selectable Full Scale Ranges (LPM)	
		Min.		Max.	Min.	Max.	
CSLFC4	4"	L	6.25	500	25	2000	
		H	12.5	1000	50	4000	
CSLFC6	6"	L	12.5	1000	50	4000	
		H	25	2000	94	7500	
CSLFC8	8"	L	25	2000	94	7500	
		H	50	4000	188	15000	
CSLFC10	10"		37.5	3000	138	11500	

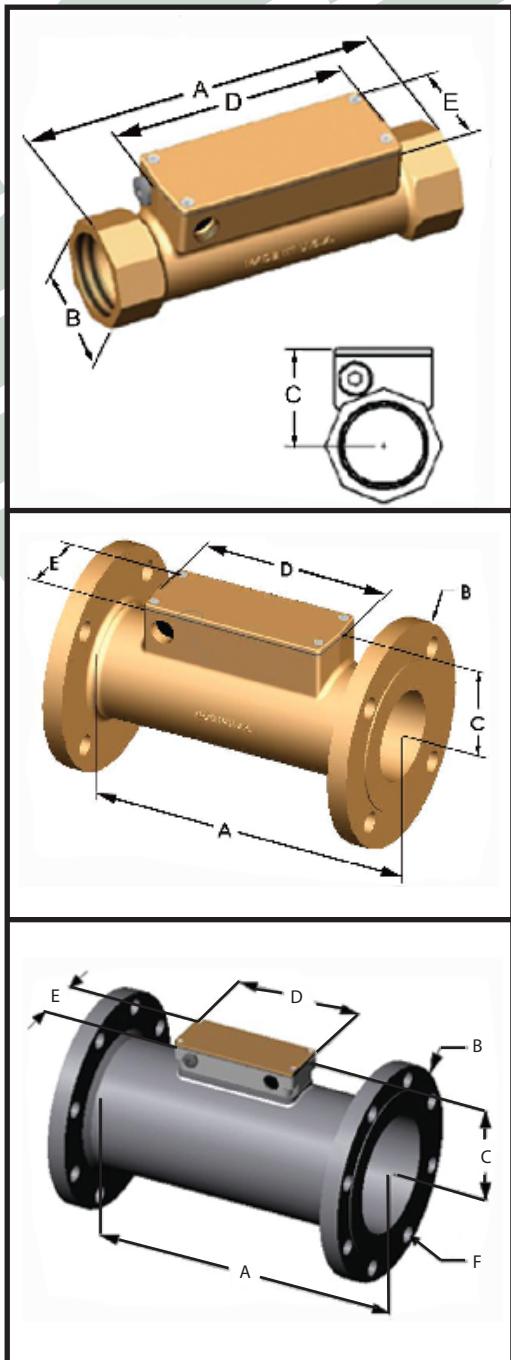
* Other F.S. ranges can be specified



GREYSTONE ENERGY SYSTEMS, INC.



ENCLOSURE DIMENSIONS:



CSLFB Dimensions (3/4" - 2")

Size/Connection	A		B		C		D		E	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
3/4" & 1"	9.20	234	1.62	41.10	2.06	52.30	6.40	163	2.40	61.00
1-1/2" & 2"	9.88	251	2.75	69.90	2.51	63.80	6.40	163	2.40	61.00

CSLFB Dimensions (3" Only)

Size/Connection	A		B		C		D		E	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
3/4" & 1"	9.20	234	1.62	41.10	2.06	52.30	6.40	163	2.40	61.00
1-1/2" & 2"	9.88	251	2.75	69.90	2.51	63.80	6.40	163	2.40	61.00

CSLFC Dimensions (3" - 10")

Pipe Size	Dimensions (Inches)							
	A	B	C	D	E	F	Bolt Circle Diameter	No. of Holes
4"	13.00	9.00	4.00	6.54	2.62	0.75	7.50	8
6"	16.00	11.00	5.09	6.54	2.62	0.88	9.5	8
8"	18.00	13.50	6.11	6.54	2.62	0.88	11.75	8
10"	22.00	16.00	7.18	6.54	2.62	1.00	14.25	12



GREYSTONE
ACCURACY BY DESIGN

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150 English Drive, Moncton, NB
Canada E1E 4G7

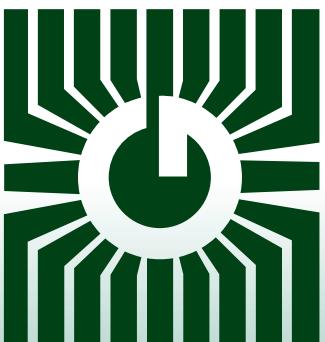
(506) 853-3057 Fax: (506) 853-6014
North America: 1-800-561-5611
e-mail: mail@greystoneenergy.com
www.greystoneenergy.com

Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

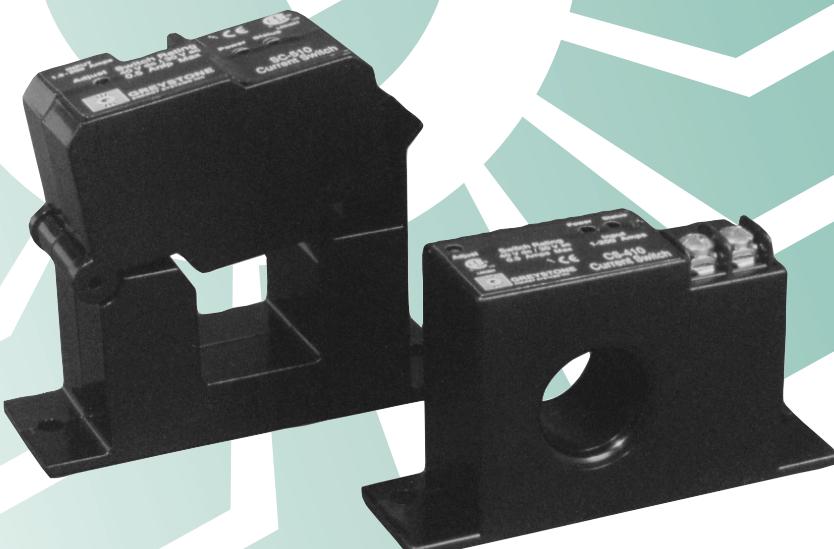
We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.



GREYSTONE ACCURACY BY DESIGN



CURRENT SWITCHES



Precision power control/sensing

FEATURES:

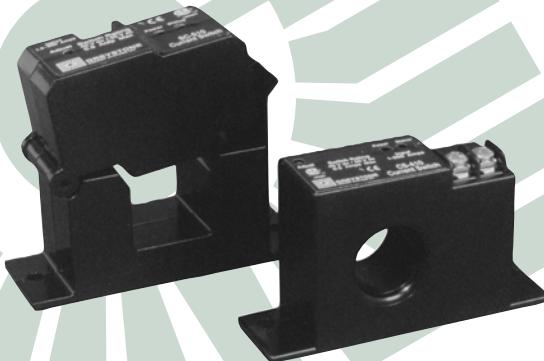
- Solid or Split Core models
- Adjustable trip levels
- Up to 200 amps input current
- High current output models

*Peace of mind
through reliable
current switches*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

AC CURRENT SWITCHES

CS-400 / SC-500



ADJUSTABLE CURRENT-OPERATED SOLID-STATE RELAYS FOR SWITCHING AC OR DC CIRCUITS

FEATURES:

- Auto-ranging eliminates lost jumpers
- Self-powered and no insertion loss
- True digital switching and no leakage
- Small compact size
- Easy field adjustment with status LED's
- Input / Output isolation via current transformer
- Solid-state reliability
- Solid, reliable mounting method

DESCRIPTION:

The CS-400 / SC-500 series of AC current switches are solid-state switches that activate a contact closure whenever the monitored primary circuit current exceeds a pre-set level. Several models are available to switch various load types as indicated in the Product Ordering Chart. Several models feature integral LEDs to indicate device power and also the switch status. Most switch

models include a multi-turn adjustment to set the trip threshold to the desired value and the GNG model operates as a go/no-go status indicator with a factory set minimum threshold value. The switches can monitor up to 200 Amps continuous and feature an auto-range circuit to eliminate manual jumpers. All models are CSA certified or UL approved and CE compliant.

SPECIFICATIONS:

Setpoint Range	1-200 Amps for CS models, 1.5-200 for SC models, GNG model fixed at 1A, GNG-L model fixed at 0.5 A <u>Jumper</u> <u>Apm-Turns</u> Low (none) 1-6 Medium 6-40 High 40-200 40-150 {SC-525-S (-NS)}	Enclosure Size (H x W x D)	Solid Core - 49 x 87 x 25 mm (1.95 x 3.45 x 1.0") Split Core - 70 x 87 x 30 mm (2.75 x 3.45 x 1.2")
Wiring Connections	Solid Core - Barrier strip Split Core - Screw terminals (14 to 22 AWG)	Enclosure Material	UL 94V-0 flammability rated ABS Insulation Class 600V
Hysteresis	< 2% FS max.	Certification	CSA or UL (see below table), CE
Operating Temperature	0 to 40°C (32 to 104°F)	Power Supply	None - Self-powered
Response Time	< 200 mS	AC Conductors Hole	Solid Core - 20mm (0.8") diameter Split Core - 24 x 19mm (0.95 x 0.75")

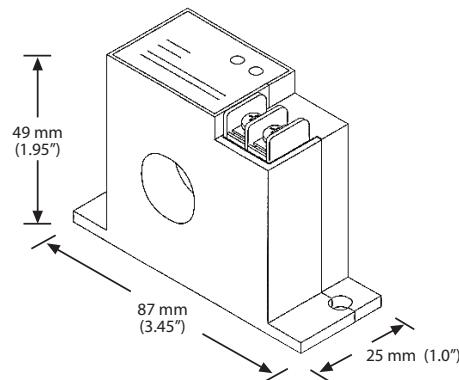
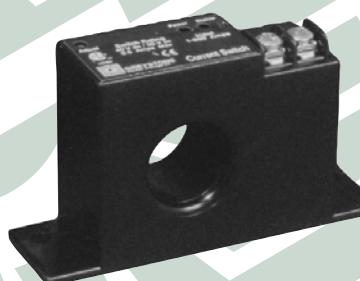
CURRENT SWITCH: PRODUCT ORDERING INFORMATION

Model	Output Type	Switch V Max	I Max	Von@24Vdc @ 150 mA	Leakage Current	Power LED	Status LED	Auto Range	Input I Min	Input I Max	Approval
CS-GNG	Mosfet	30Vac/40Vdc	500 mA	<0.1 V	<25 µA	No	No	Yes	1.0A	200A	cULus
CS-GNG-L	Mosfet	30Vac/40Vdc	500 mA	<0.1 V	<25 µA	No	No	Yes	0.5A	200A	cULus
CS-410	Mosfet	30Vac/40Vdc	500 mA	<0.1 V	<25 µA	Yes	Yes	Yes	1.0A	200A	cULus
CS-325*	Triac	250Vac	1 Amp	n/a	<5 mA	No	No	No	1.25A	200A	cCSAus
CS-325-NS*	Triac	250Vac	1 Amp	n/a	<1 mA	No	No	No	1.25A	200A	cCSAus
SC-GNG	Mosfet	30Vac/40Vdc	500 mA	<0.1 V	<25 µA	No	No	Yes	1.5A	200A	cCSAus, cULus
SC-510	Mosfet	30Vac/40Vdc	500 mA	<0.1 V	<25 µA	Yes	Yes	Yes	1.5A	200A	cCSAus, cULus
SC-525-S*	Triac	120 Vac	500 mA	n/a	<5 mA	No	No	No	1.5A	150A	cULus
SC-525-NS*	Triac	120 Vac	500 mA	n/a	<1 mA	No	No	No	1.5A	150A	cULus

*The CS-325/SC-525-S with the snubber circuit is best used to switch high-current inductive loads such as small fan motors. The CS-325/SC-525-NS is best used to switch resistive or low-current inductive loads such as relays or lights.

AC CURRENT SWITCH

CS-425-HC Series



APPLICATIONS:

- Direct control of AC loads, such as dryer booster fans, in response to the current of a monitored AC circuit
- Replaces Differential Pressure Switches

DESCRIPTION:

The CS-425-HC products are solid-state current switches with N.O. triac outputs to control high-current line-voltage AC loads. All models have a factory set trip level of approximately 1 Amp and require no field adjustment for easy installation. Internal circuits are powered by induction from the line being monitored and all models are cULu certified.

SPECIFICATIONS:

Maximum Core Current	50 Amps	Turn on time Turn off time	<200 mS 0, 5, 10 or 15 minutes (factory set)
Operating Temperature	0 to 40°C (32 to 104°F)	Operating Humidity	0 - 95% RH non-condensing
Trip Set-Point	Approximately 1 Amps	Material	UL 94V-0 flammability rated ABS Insulation Class 600V
Enclosure Size (H x W x D)	49 x 87 x 25 mm (1.95" x 3.45" x 1")	Mounting Holes	2 x 5 mm holes spaced 76 mm on base (2 x 0.19" holes spaced 3" on base)
AC Conductor Hole	20 mm (0.8") Diameter	Switch Type	Solid-state triac
Switch Rating	120 Vac @ 2.5 Amps Max.	Off-state Leakage	<1 mA

DRYER BOOSTER FAN OPERATION:

The CS-425-HC series can operate a dryer booster fan directly. These devices sense when a clothes dryer is drawing 1 Amp of current and then closes the output switch to activate the dryer vent booster fan. When the dryer cycle is complete and the current drops below the threshold, the output switch will remain closed for a pre-set delay time to allow heat to be removed from the vent before the switch is opened again. The device output can switch 120 Vac loads up to 2.5 Amps.

CURRENT SWITCH: PRODUCT ORDERING INFORMATION

Model	Output Type	Switch V Max.	Switch I Max.	Leakage Current	Input I Min.	Input I+ Max.	Time Delay (off)	Approval
CS-425-HC-0	Triac	120 VAC	2.5 Amp	<1 mA	~1 Amp	50 Amps	none	cULus
CS-425-HC-5	Triac	120 VAC	2.5 Amp	<1 mA	~1 Amp	50 Amps	5 minutes	cULus
CS-425-HC-10	Triac	120 VAC	2.5 Amp	<1 mA	~1 Amp	50 Amps	10 minutes	cULus
CS-425-HC-15	Triac	120 VAC	2.5 Amp	<1 mA	~1 Amp	50 Amps	15 minutes	cULus



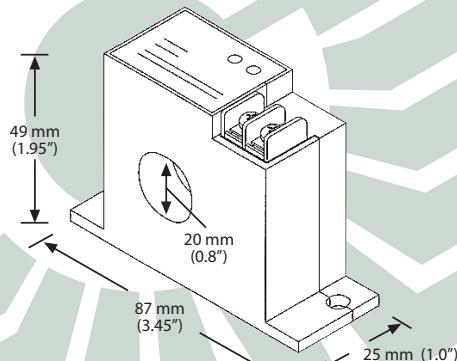
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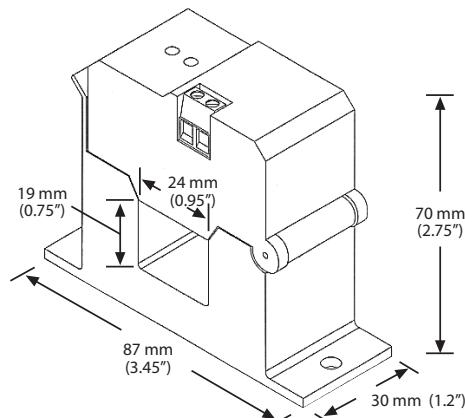
RoHS
COMPLIANT



Solid Core CS-400 Series Current Switch



Split Core SC-500 Series Current Switch



OPTIONS:

Relay Mounting Base CR-112 / CR-124



FEATURES:

- Can be easily mounted to any CS or SC product for easier installation
- Can be used as a stand-alone relay
- Convenient Relay Status LED
- Can be factory assembled with any CS or SC product
- Push-rivets supplied for fast and reliable field assembly
- SPDT Form C relay contacts
- Environmentally-friendly cadmium-free contacts
- Ideal for switching contactors, solenoids and motors
- Small compact size

DESCRIPTION:

The **CR-112** and **CR-124** Command Relays are line voltage relays for use with the CS and SC current sensors and switches or as stand-alone devices. All models are CSA certified to Canadian and US standards and CE compliant

SPECIFICATIONS:

Relay Coil	CR-112 12 Vac/dc ± 20% @ 18 mA CR-124 24 Vac/dc ± 20% @ 10 mA	Enclosure Size (L x W x D)	102 x 44 x 25 mm (4 x 1.75 x 1") 125 mm (4.9") length with mounting tabs
Relay Contacts	SPDT Form C (normally open, common, normally closed) 10 Amp resistive @ 250 Vac (UL508) 8 Amp inductive @ 250 Vac 5 Amp @ 30 Vdc	Mounting Holes Dimensions	114 mm (4.5") spacing 4.8 mm (0.19") diameter
Contact Resistance	100 mΩ maximum	Enclosure Material	UL 94V-0 flammability rated ABS
Oper. Temperature	-40 to 85°C (-40 to 185°F)	Operating Humidity	20 to 85% RH, non-condensing
Wiring Connections	Screw terminal block (12 to 28 AWG)	Approval	cCSAus



GREYSTONE

ACCURACY BY DESIGN

Greystone Energy Systems Inc.
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RoHS



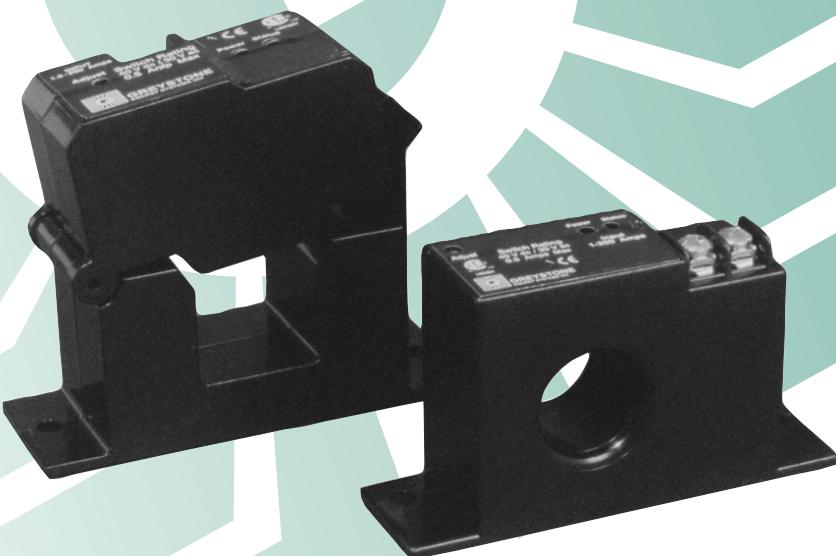
Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

GREYSTONE

ACCURACY BY DESIGN

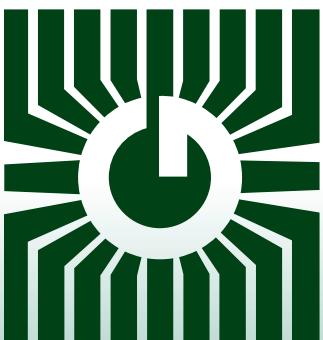
CURRENT SENSORS



Precision current
control/sensing

FEATURES:

- Solid and split core models
- 4-20 mA, 0-5 Vdc, or 0-10 Vdc output models
- Monitor up to 200 amps

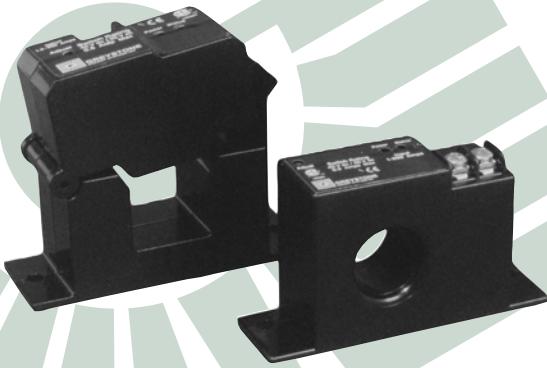


*Peace of mind
through reliable
current sensors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

AC CURRENT SENSORS

CS-450 / 475 and SC-550 / 575



SOLID-STATE SENSORS FOR MONITORING AC CIRCUITS

FEATURES:

- No field adjustment necessary, factory calibrated
- Average measurement is equivalent to True RMS for pure sine waves for the CS-450 / SC-550 series
- True RMS measurement for sine waves or variable frequency drives for the CS-475 / SC-575 series
- Input / Output isolation via current transformer
- Solid-state reliability
- Small compact size
- Solid, reliable mounting method

DESCRIPTION:

The CS-450/475 and SC-550/575 series of AC current sensors are solid-state transducers that convert a primary circuit current to a proportional output signal. The sensors can monitor up to 200 Amps continuous and feature three jumper selectable current ranges for the highest accuracy. All sensors are factory calibrated to

ensure better than 1% accuracy. The CS-450 and the SC-550 are available with 0-5, 0-10 Vdc or 4-20 mA output signal types. The CS-475 and the SC-575 feature a true RMS 4-20 mA loop-powered output signal. All models are CSA certified or UL approved and CE compliant.

SPECIFICATIONS:

	CS-45X / SC-55X	CS-475 / SC-575
Power Supply	0-5/0-10 Vdc models are self-powered, 4-20 mA model requires 15-42 Vdc loop supply	15-42 Vdc (loop powered)
Input Current Ranges	Three field selectable ranges (see below)	Three field selectable ranges (see below)
Maximum Input Current	10/20/50 Amp ranges - 80/120/180 Amps inrush 50/100/200 Amp ranges - 120/200/325 Amps inrush (see page 3 for SC-551 series)	2/5/10 Amp ranges - 35/60/90 Amps inrush 10/20/50 Amp ranges - 80/120/200 Amps inrush 50/100/200 Amp ranges - 175/300/400 Amps inrush
Response Time	100 mS (0-90%)	250 mS (0-90%)
AC Conductor Hole	Solid Core - 20 mm (0.8") diameter Split Core - 24 x 19 mm (0.95 x 0.75")	Solid Core - 20 mm (0.8") diameter Split Core - 24 x 19 mm (0.95 x 0.75")
Output Loading Error (0-5 / 0-10)	Calibrated with 1 M ohm load, add 1.2% error with 100k ohm	N/A
Enclosure Size (H x W x D)	Solid Core - 49 x 87 x 25 mm (1.95 x 3.45 x 1.0") Split Core - 70 x 87 x 30 mm (2.75 x 3.45 x 1.2")	Solid Core - 49 x 87 x 25 mm (1.95 x 3.45 x 1.0") Split Core - 70 x 87 x 30 mm (2.75 x 3.45 x 1.2")
Operating Temp.	0 to 40°C (32 to 104°F)	0 to 40°C (32 to 104°F)
Operating Humidity	0 to 95% RH, non-condensing	0 to 95% RH, non-condensing
Protection Circuitry	Reverse voltage protected and output limited	Reverse voltage protected and output limited
Wiring Connections	Solid Core - Barrier strip Split Core - Screw terminals (14 to 22 AWG)	Solid Core - Barrier strip Split Core - Screw terminals (14 to 22 AWG)
Enclosure Material	UL 94 V-0 flammability rated ABS, Insulation class 600V	UL 94 V-0 flammability rated ABS, Insulation class 600V
Manufacturing	ISO 9001 Certified	ISO 9001 Certified
Output Signal and Accuracy	0-5 Vdc, 0-10 Vdc or 4-20 mA Better than ±1% FS on all three ranges	4 to 20 mA represents 0 to 100% of current span Better than ±1% FS on all three ranges

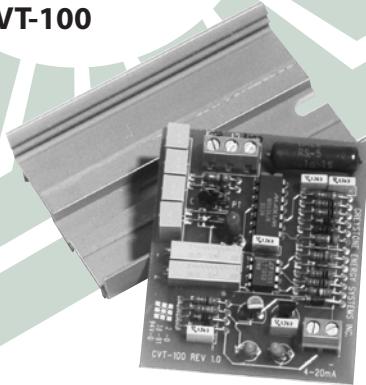
CURRENT SENSOR: PRODUCT ORDERING INFORMATION

Solid Core (CS)					Split Core (SC)					
Model	Output	Approval	Frequency	Amp Ranges	Model	Output	Approval	Frequency	Amp Ranges	
CS-450-1	0-5 Vdc	cULus	40-100 Hz	0-10/0-20/0-50	SC-550-1	0-5 Vdc	cCSAus, cULus	40-100 Hz	0-10/0-20/0-50	
CS-450-2	0-5 Vdc	cULus	40-100 Hz	0-50/0-100/0-200	SC-550-2	0-5 Vdc	cCSAus, cULus	40-100 Hz	0-50/0-100/0-200	
CS-451-1	0-10 Vdc	cULus	40-100 Hz	0-10/0-20/0-50	SC-551-1	See page 3 for new part numbers and ordering details				
CS-451-2	0-10 Vdc	cULus	40-100 Hz	0-50/0-100/0-200	SC-551-2	See page 3 for new part numbers and ordering details				
CS-452-1	4-20 mA	cULus	40-100 Hz	0-10/0-20/0-50	SC-552-1	4-20 mA	cCSAus, cULus	40-100 Hz	0-10/0-20/0-50	
CS-452-2	4-20 mA	cULus	40-100 Hz	0-50/0-100/0-200	SC-552-2	4-20 mA	cCSAus, cULus	40-100 Hz	0-50/0-100/0-200	
CS-475-0	4-20 mA	cULus	10-400 Hz	0-2/0-5/0-10	SC-575-1	4-20 mA	cCSAus, cULus	10-400 Hz	0-10/0-20/0-50	
CS-475-1	4-20 mA	cULus	10-400 Hz	0-10/0-20/0-50	SC-575-2	4-20 mA	cCSAus, cULus	10-400 Hz	0-50/0-100/0-200	
CS-475-2	4-20 mA	cULus	10-400 Hz	0-50/0-100/0-200						

CURRENT SENSOR (SC-551 SERIES): PRODUCT ORDERING INFORMATION

Model	Output	Approval	Frequency	Amp Range	Amperage Max.
SC-551-10	0-10 Vdc	cULus	40-100Hz	0-10 Amps	140 Amp
SC-551-25	0-10 Vdc	cULus	40-100Hz	0-25 Amps	160 Amp
SC-551-50	0-10 Vdc	cULus	40-100Hz	0-50 Amps	190 Amp
SC-551-100	0-10 Vdc	cULus	40-100Hz	0-100 Amps	250 Amp
SC-551-200	0-10 Vdc	cULus	40-100Hz	0-200 Amps	350 Amp

CT/PT INPUT TRANSDUCER CVT-100



FEATURES:

- True RMS-DC conversion
- CT or PT input (pin selectable)
- Loop Powered
- Reverse voltage protection
- CSA NRTL/C approval (Canada / USA)

APPLICATIONS:

- Power consumption monitoring
- Overload detection

The CVT-100 accepts a 0 to 5 Amp RMS current from a CT, or a 0 to 20 Volt RMS voltage from a PT, and converts it to a proportional DC current loop. The CVT-100 incorporates a true RMS conversion which is corrected to all types of waveforms, and therefore can be used with a wide variety of load types: SCR, TRIAC, Inductive motors, etc.

NOTE: PT option includes 115/20 Vac transformer. For other potential transformers, contact Greystone

SPECIFICATIONS:

Power Supply: 10 - 32 Vdc

Current Consumption: 26 mA (max.)

Input Signal: 0 - 5 Amp RMS (CT)
0 - 20 Volt RMS (PT)

Input Impedance 0.1 ohm(CT) 15k ohm(PT)

Accuracy: ±1% Full Scale Output

Operating Temperature: 0 to 70°C (32 to 158°F)

Operating Humidity: 0 - 95% RH non-condensing

H x W x D: 19 x 57 x 70 mm (0.75 x 2.25 x 2.75")

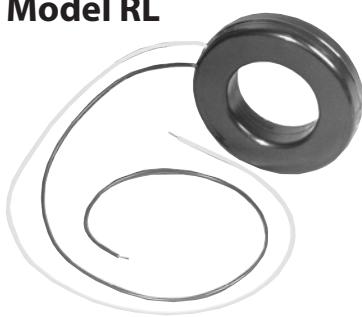
Mounting: Snap Track (factory supplied)

CVT-100: PRODUCT ORDERING INFORMATION

CODE	Enclosure Options	CODE	Input Options
A	Snap Track	1	CT (0-5) AMP
		4	PT

CURRENT TRANSFORMER

Model RL



SPECIFICATIONS:

Insulation Class:

0.6 Kv 10Kv Bil

Frequency:

50-400 Hz

Approximate weight:

Model 5RL: 0.45 kg (1.0 lb)

Model 7RL: 0.68 kg (1.5 lb)

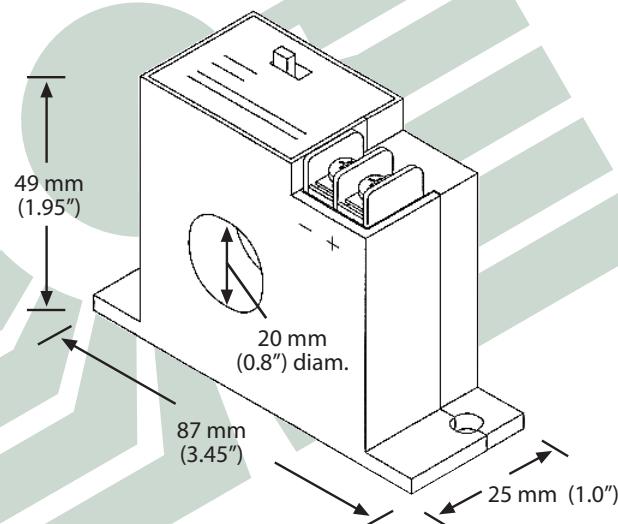
SOLID CORE CURRENT TRANSFORMER: PRODUCT ORDERING INFORMATION

Model	Order Code	Current Ratio	Model #5RL I.D. 39.6 mm (1.56")		Model #7RL I.D. 63.5 mm (2.50")	
			Precision	VA	Accuracy	VA
5RL	500	50:5	±2%	1.0	-	-
5RL	750	75:5	±2%	1.5	-	-
5RL or 7RL	101	100:5	±2%	2.0	±2%	2.5
5RL or 7RL	151	150:5	±1%	5.0	±1%	5.0
5RL or 7RL	201	200:5	±1%	5.0	±1%	5.0
5RL or 7RL	251	250:5	±1%	10.0	±1%	5.0
5RL or 7RL	301	300:5	±1%	12.5	±1%	12.5
5RL or 7RL	401	400:5	±1%	12.5	±1%	15.0
5RL or 7RL	501	500:5	±1%	20.0	±1%	25.0
5RL or 7RL	601	600:5	±1%	25.0	±1%	30.0
5RL or 7RL	751	750:5	±1%	25.0	±1%	30.0
5RL or 7RL	801	800:5	±1%	25.0	±1%	35.0
5RL or 7RL	102	1000:5	±1%	25.5	±1%	30.0
5RL or 7RL	122	1200:5	±1%	30.0	±1%	35.0
7RL	152	1500:5	-	-	±1%	40.0
7RL	162	1600:5	-	-	±1%	45.0

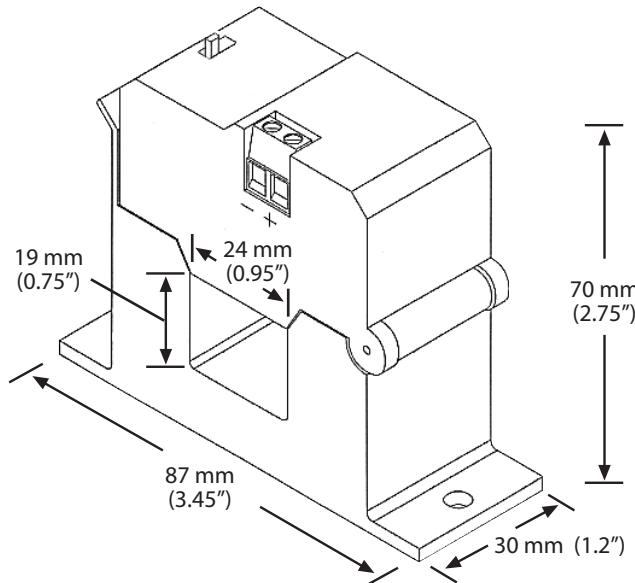
APPLICATIONS:

Current Transformers provide a low amperage current output proportional to line current, for use in building automation, relaying, or metering. The core and windings of each unit are completely encased in UL approved plastic that is rated 94V1, and there are no exposed metal parts other than the terminals. All models are CSA certified and UL approved.

Solid Core CS-450 & CS-475 Series Current Sensor



Split Core SC-550 & SC-575 Series Current Sensor



OPTIONS:

Relay Mounting Base CR-112 / CR-124



FEATURES:

- Can be easily mounted to any CS or SC product for easier installation
- Can be used as a stand-alone relay
- Convenient Relay Status LED
- Can be factory assembled with any CS or SC product
- Push-rivets supplied for fast and reliable field assembly
- SPDT Form C relay contacts
- Environmentally-friendly cadmium-free contacts
- Ideal for switching contactors, solenoids and motors
- Small compact size

DESCRIPTION:

The **CR-112** and **CR-124** Command Relays are line voltage relays for use with the CS and SC current sensors and switches or as stand-alone devices. All models are CSA certified, UL approved and CE compliant.

SPECIFICATIONS: (NOTE: COMMAND RELAY DOES NOT ACCEPT A VARIABLE ANALOG SIGNAL)

Relay Coil	CR-112 12 Vac/dc ± 20% @ 18 mA CR-124 24 Vac/dc ± 20% @ 10 mA	Enclosure Size (L x W x D)	102 x 44 x 25 mm (4 x 1.75 x 1") 125 mm (4.9") length with mounting tabs
Relay Contacts	SPDT Form C (normally open, common, normally closed) 10 Amp resistive @ 250 Vac (UL508) 8 Amp inductive @ 250 Vac 5 Amp @ 30 Vdc	Mounting Holes Dimensions	114 mm (4.5") spacing 4.8 mm (0.19") diameter
Contact Resistance	100 mΩ maximum	Enclosure Material	UL 94V-0 flammability rated ABS
Oper. Temperature	-40 to 85°C (-40 to 185°F)	Operating Humidity	20 to 85% RH, non-condensing
Wiring Connections	Screw terminal block (12 to 28 AWG)	Manufacturing Process	ISO 9001 Certified



GREYSTONE

ACCURACY BY DESIGN

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North America: 1-800-561-5611
e-mail: mail@greystoneenergy.com
www.greystoneenergy.com



Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

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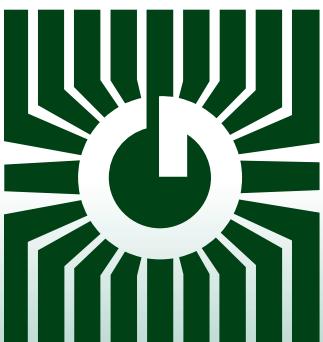
ELECTRONIC TO PNEUMATIC TRANSDUCER ETP Series



Precision pneumatic control

FEATURES:

- Direct connection to PCs for pneumatic control
- Two-wire loop powered or three-wire voltage models
- Easily accessible wiring terminal blocks
- Quick panel mounting with supplied snap-track
- High accuracy with low hysteresis
- Driftless operation with high repeatability
- AC/DC operation



*Peace of mind
through reliable
pneumatic transducers*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

APPLICATIONS:

The ETP-9500 Series transducers convert an electrical input signal to a pneumatic output signal to position pneumatic damper and valve actuators in HVAC systems. The ETP-9520 accepts an industry standard 4 - 20mA current input signal and produces a proportional 21 - 103 kPa (3 - 15 psig) pneumatic output. The ETP-9500 offers more flexibility as it is field selectable to accept either a 4 - 20mA or a 0 - 10 VDC input signal to control the 21 - 103 kPa (3 - 15 psig) pneumatic output.

The ETP-9520-PW accepts a field selectable pulse width signal to control the pneumatic output.

The ETP-9520 is powered by the process loop signal and requires no power supply. The ETP-9500 is also loop powered in the 4 - 20mA configuration and will accept a wide range of AC or DC power supply voltages in the 0 - 10 VDC mode. The ETP-9520-PW requires a 24 VDC or 22 to 28 VAC power supply.

SPECIFICATIONS: ETP-9500 / 9510 / 9520

Input Signal	ETP-9500 , 4-20 mA or 0-10 Vdc, jumper selectable ETP-9510 , 2-10 Vdc, 2 wire ETP-9520 , 4-20mA, 2 wire ETP-9500-PW , Dry contact to common, 5 to 24 Vdc, or 24 Vac ± 10%	Air Connections	Male barbed fittings for flexible 1/4" OD pneumatic tubing
Input Impedance	4-20 mA input, 400 Ω minimum, 550 Ω maximum 0-10 Vdc input, >100 KΩ	Wiring Connections	Screw terminals for 14-22 AWG wire
PWM Input Signal	Time between pulses: 1 millisecond min, Pulse Duration: .02 to 5 Sec.; 0.59 to 2.93 sec.; 0.1 to 10 sec.; 0.1 to 25.5 sec. Accuracy: ±3% of span for all ranges	Output Signal	21 - 103 kPa (3 - 15 psig) nominal, direct acting
Power Supply	4-20 mA input, Loop powered 0-10 Vdc input, 24-30 Vac/Vdc, 1.0 watt max. ETP-9500-PW - Regulated 24 Vdc min, 35 Vdc max, Regulated 22-28 Vac	Linearity	±1% of span
Air Supply	138 kPa (20 psig) nominal, 207 kPa (30 psig) maximum. Clean, dry, oil-free air required	Hysteresis	±1% of span
Air Consumption	5.66 ml/s (0.012 scfm) @ 138 kPa (20 psig) supply, maximum	Adjustments	Zero and span potentiometers
Output Air Capacity	141 ml/s (515 scfm) maximum @ 138 kPa (20 psig) supply	Operating Temperature	0°C - 60°C (32°F - 140°F)
Maximum Span/ Minimum Span	97 kPa (14 psig) / 55kPa (8 psig)	Operating Humidity	5 - 95% RH, non-condensing
Lowest Offset/Highest Offset	7 kPa (1 psig) / 41 kPa (6 psig)	Dimensions H x W x D	83 x 70 x 50 mm (3.25 x 2.75 x 2") PW Option: 83x165x50 mm (3.25x7x2")

PRODUCT ORDERING INFORMATION:

MODEL	Product Description	
ETP	Pneumatic transducer	
	CODE	Input Signal
	9500	Field selectable 0 - 10 Vdc or 4 - 20 mA
	9510	0 - 10 Vdc, loop-powered
	9520	4 - 20 mA, loop-powered
	CODE	Options
	E	Enclosure (Not available with PW option)
	EG	Enclosure c/w 0 to 30 psi Gage (Not available with PW option)
	PW	PWM input (9500 series only)
ETP	9510	EG

Greystone Energy Systems Inc. reserves the right to make design modifications without prior notice.

OPTIONS:

- Pressure gauge (not mounted) **PG-100-30**, 0-30 psig
- Pneumatic air filter (not mounted) **K-335**, 0.5 micron



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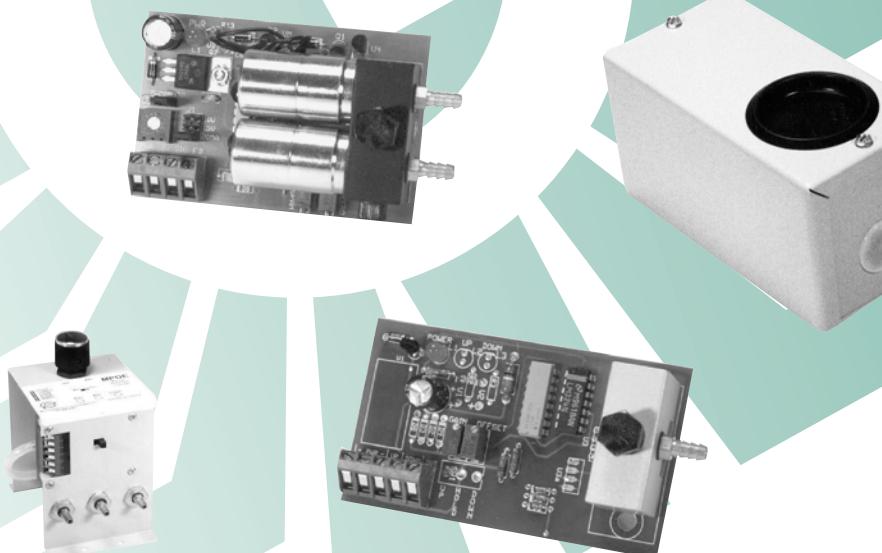
150 English Drive, Moncton, NB (506) 853-3057 Fax: (506) 853-6014
Canada E1E 4G7 North America: 1-800-561-5611
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RoHS
COMPLIANT



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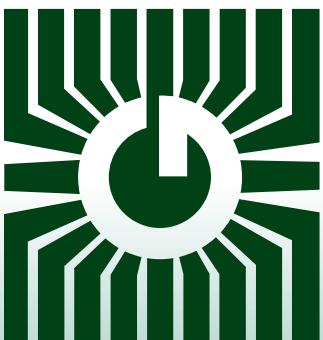
PNEUMATIC TRANSDUCERS



Precision pneumatic control

FEATURES:

- Pulse Width, floating or input models
- Fixed and adjustable output models
- Maintain or failsafe models
- Feedback signals
- Manual override option
- Quick panel mounting with supplied snap-track



*Peace of mind
through reliable
pneumatic transducers*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

ENC1

Enclosure. Protects transducers or any automation or HVAC component. Twenty gauge metal, 2" diameter opening in cover for gauge, two 7/8" diameter openings in the base ends for 1/2" EMT fitting for wiring connection, plastic snap-in covers for all openings. Size 3.05"W x 3.3"H x 6'L

EFP

Floating Point to Pneumatic Output. Input: Two Digital (relay, triac, or transistor) 9-24 VAC/VDC. Output: Jumper selectable 0-10, 0-15, or 0-20 psig air pressure. Rate of Change: 30, 45, 60, 90 sec., 2, 3, 6, & 8 min. Manual Override. Power: 24 VDC or 24 VAC@4VA. Size 4.0"L x 3.45"W x 1.875"H Anodized aluminum manifold **OUTPUT: PNEUMATIC**- Jumper Select 0-10, 0-15, 0-20 psig

EPC*

Analog to Pneumatic Output. Input: 0-5 VDC, 0-10 VDC, and 0-15 VDC@infinite Ω or 4-20 mA@250W. Output: 0-20 psig. Feedback: 0-5 VDC = selected output. Power: 24 VAC or 24 VDC (50/60 Hz)@160 mA. Valved exhaust (EPC2), bleed-type in 41 scfm (EPC), & dual valve **Fail-Safe** model (EPC2FS). Aluminum manifold **OUTPUT: PNEUMATIC**- Jumper Select 0-10, 0-15, 0-20 psig

EPCB

Analog to Pneumatic Output. Input: 0-5 VDC, 0-10 VDC, and 0-15 VDC@infinite Ω or 0-20 mA@250W. Output: 0-10, 0-15 and 0-20 psig. Feedback: 0-5 VDC = selected output. Power: 24 VAC or 24 VDC (50/60 Hz)@180 mA. Controlled exhaust dual valve. **Fail-Safe** model EPC2GFSB. Aluminum manifold. Rugged painted metal housing. **OUTPUT: PNEUMATIC**- Jumper Select 0-10, 0-15, 0-20 psig

EPW

PWM* to pneumatic Output. Input: 0.1-10, 0.02-5, 0.023-6, or 0-10 sec. duty cycle, 0.59-2.93, 0.1-25.5 sec. or 0-20V phase cut. Trigger: 9-24 VAC/VDC. Output: 0-10, 0-15, 0-20 psig. Manual override. Feedback: 0-5 VDC = range. Power: 24 VDC or 24 VAC@160 mA. Valved exhaust or bleed type at 14, 41 & 73 scfm, & **Fail-Safe** model **OUTPUT: PNEUMATIC**- Jumper Select 0-10, 0-15, 0-20 psig

MPO/E

Manual Pneumatic Override/Electric. Installs between controller and actuator. Provides control in case of controller malfunction or for system checkout. 20 gauge metal bracket. Power: 24 VDC or VAC \pm 10% @ 800mA maximum. Alarm feedback: N.O. or N.C. contact. Alarm Current 1.2 A maximum. Size 4.0"W x 3.0"W x 5.0"H. **OUTPUT: PNEUMATIC OVERRIDE-Powered**

PTS4.1

Floating Point to Pneumatic Output. Input: Two Digital (relay, triac, or transistor). Output: Jumper selectable 0-10, 5-15, or 0-15 psig air pressure. Rate of Change: 90 seconds. 1% Accuracy at room temperature. Power: 24 VDC or 24 VAC@4 VA. Size: 3.25)L x 2.25"W x 1.5"H. Anodized aluminum manifold. Gauge optional. **OUTPUT: PNEUMATIC** - 0-10, 5-15, or 0-15 psig

PTP100

100 psig Pressure to Analog Voltage or Current Output. Input: 20-100 psig air pressure. Jumper Selectable Output: 1-5 VDC@250W, 2-10 VDC@500W, 3-15 VDC, or 4-20mA@750W load impedance. Power: 24 VAC or 24 VDC@50mA max. Size: 3.75)L x 2.25"W x 1.5"H. Aluminum manifold with guage port. **OUTPUT: ANALOG** - Voltage or Current

PTP

Pressure to Analog Voltage or Current Output. Input: 3-15 or 3-30 or 0-minus 7.5 psig air pressure. Jumper Selectable Output: 1-5 VDC@250Ω, 2-10 VDC@500Ω, 3-15 VDC, or 4-20mA@750Ω load impedance. Power: 24 VAC or 24 VDC@50mA max. Size: 3.25)L x 2.25"W x 1.5"H. Aluminum manifold. 1% accuracy. Gauge optional. **OUTPUT: ANALOG** - Voltage or Current

PWP100

PWM①to 100 psig Output. Input Pulse: 0-10 sec. duty cycle, 0.1-10, 0.02-5, .023-6, 0.59-2.93, and 0.1-25.5 sec., or 0-20V Staefa™ phase cut. Trigger: 9-24 VAC or VDC. Output: 0-100 psig. Feedback: 0-5 VDC = 0-100 psig. Power: 24 VDC or 24 VAC@150mA. Manual override. Field adj. min/max psi. Aluminum manifold with guage port. **OUTPUT: PNEUMATIC** - 100 psig

PWP*.3

PWM①to Pneumatic Output. Input: 10 sec. duty cycle, 0.1-10, 0.02-5, 0.023-6, 0.59-2.93, 0.1-25.5 sec., or 0-20V phase cut. Trigger: 9-24 VAC or VDC. Output: 0-15 psig. Manual override. 1% accuracy. Feedback: 0-5 VDC = 0-15 psig. Power: 24 VDC or VAC@160mA. Valved exhaust or bleed type at 14, 41 & 73 scfm, **Fail-Safe** model. **OUTPUT: PNEUMATIC** - 0-15 psig

PXP100

Analog to 100 psig Output. Input ranges/impedance: 0-5 VDC@10KW, 0-10 VDC@10KΩ, 0-15 VDC@10KΩ, or 0-20mA@250Ω. Output: 0-100 psig. Feedback: 0-5 VDC = 0-100 psig. Power: 24 VAC or VDC@150mA. Size: 3.25)L x 2.25"W x 1.5"H. Valved exhaust, anodized aluminum manifold with guage port. **OUTPUT: PNEUMATIC** - 100 psig

PXP*.3

Analog to Pneumatic Output. Input: 0-5 VDC@10KΩ, 0-10 VDC@10KΩ, 0-15 VDC@10KΩ, or 0-20mA@250Ω. Output: 0-15 psig. 1% accuracy@room temp. Feedback: 0-5 VDC = 0-15 psig. Power: 24 VAC or VDC@160mA. Valved exhaust or bleed type in 14, 41 & 73 scfm, & dual valve **Fail-safe** model. Aluminum manifold. Gauge optional. **OUTPUT: PNEUMATIC** - 0-15 psig

Notes: ① PWM - Pulse Width Modulated

* Different models available

Please contact Greystone or visit our website for detailed specifications.



GREYSTONE

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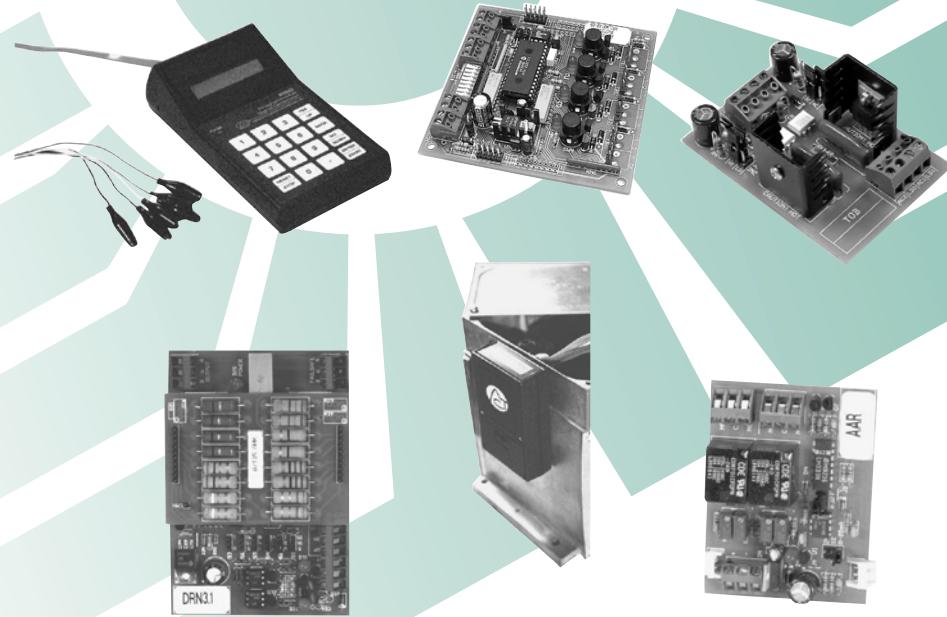
Greystone Energy Systems Inc. is one of North America's largest ISO registered manufacturers of HVAC sensors and transducers for Building Automation Management Systems.

We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

GREYSTONE

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CONTROL INTERFACE TRANSDUCERS

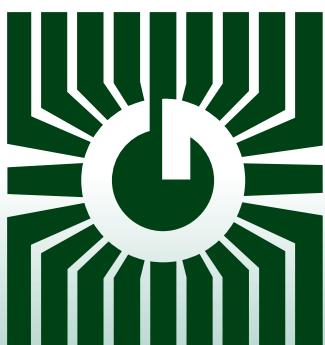


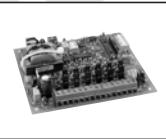
Models for converting typical control signals to various outputs to control or monitor HVAC system components.

FEATURES:

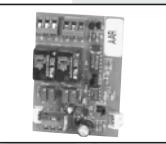
- Direct connection to PCs
- Easily accessible wiring terminal blocks
- Quick panel mounting with supplied snap-track
- Floating point and pulse width modulation options
- High accuracy
- Input signal and power supply protection
- AC/DC operation
- Feedback signals available
- Signal generators
- Lighting controls

*Peace of mind
through reliable
control interfaces*



**6N1**

Six Analog Inputs to One Output. The 6N1-ISO is a microprocessor controlled interface designed to provide maximum flexibility with a minimum of cost. With a variety of standard inputs the 6N1-ISO provides the user with the ability to interface several devices to the analog output. The 6N1-ISO can average two to six inputs, output the highest of two to six inputs, output the lowest of two to six inputs or output the difference of two inputs. Input ranges are jumper selectable and all modes and analog output are DIP switch selectable. Output signal is optically isolated from input signals. Also accepts up to 6 digital inputs (binary sequence) and outputs a proportional analog signal.

**AAR**

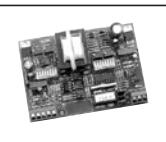
Analog to Two High and Low Trip Level Relay Outputs. The AAR is controlled by a single analog input signal with two potentiometers controlling each output relay. The two 10 amp output relays can be independently set to fixed or adjustable deadband. An onboard deadband selector can be set to Fixed or Adjustable. "Fixed", the relay will turn "ON" at the level set by the Low pot and will turn "OFF" at a fixed 3% of the input signal below the turn-on level.

**AFP**

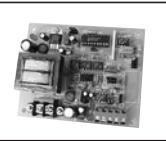
Analog to Floating Point Output. The AFP allows an analog signal to control a floating point actuator. AFP converts an analog signal into two relay contact outputs (one increase/one decrease). The AFP's isolated floating point output can be controlled by any one of eight analog input signal ranges (using offset jumper). On a loss of power, the AFP's output relays will be open, and no signal will be generated. The actuator will remain at the last commanded position unless it is "spring return". An LED indicates power to the AFP. The output rate of change (nine ranges, in three versions) is DIP switch selectable. Custom rates of change are available upon request.

**AIM1**

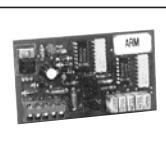
Analog Input with Optical Isolation to Analog Output (1:1 Ratio). The AIM1 optically isolates an analog voltage or current input signal from its corresponding output signal. It is factory calibrated and the output is linear and proportional (1:1 ratio) to the input signal. Will accept a 0 to 5 volt, 0 to 10 volt or 0 to 20 mA span input, and output any one of those same ranges. Can be wired for a voltage or current input signal. The output can be wired for a voltage or current (sink or source) signal.

**AIM2**

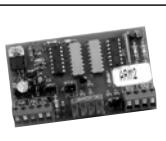
Analog Input with Optical Isolation to Analog Output (Re-scales & Limits Output). The AIM2 optically isolates the analog (voltage or current) signal to the device being controlled. Will accept any input signals between 0 and 20 volts, or 0 and 20 mA, and output any signal within those ranges. The AIM2 has preset or adjustable inputs, and preset or adjustable outputs, that can be either voltage or current. The current signals on the input or output, can be either sink or source.

**AIM3**

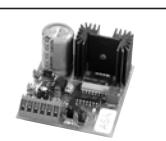
Analog Input with Optical Isolation to Analog Output. The AIM3 will accept a current or voltage input, and deliver a single voltage or sourcing current output. Developed to accept a feedback signal from a variable speed drive and direct it back to the controller (BAS) for monitoring motor speed, it can be modified for signal isolation between the output of the BAS system and the VFD drive controller also. Isolation is provided between the power supply, the signal input, and signal output circuits. The AIM3 is 120 VAC powered.

**ARM**

Analog Current or Voltage Re-scaling Module. The ARM is an analog re-scaling module, which accepts an analog voltage or current signal and re-scales it to another voltage or current range. Several preset ranges are jumper selectable. The top-adjust trimmer potentiometers can be used to make fine adjustments to output ranges for maximum flexibility. The ARM can attenuate an input signal to 100%. The ARM also has an adjustable gain and offset. The output gain can be adjusted from 1 to 25 times the input (gain will vary depending on input) to the ARM. The offset of the output can be adjusted anywhere from +/- .25 to +/- 20 VDC for the ARM. Has the ability to reverse a signal. The ARM also has a regulated 20 VDC power output to power sensors.

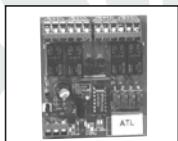
**ARM2**

Analog Current or Voltage Rescaling Signal Splitter. The ARM2 will accept a single analog voltage or current signal and split that signal into two DC non-isolated current sourcing outputs that can be re-scaled. Its primary application is as a signal splitter. The outputs are always scaled identically and will always track each other.

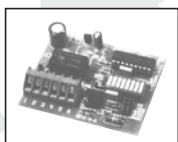
**ASA**

Analog Signal Amplifier. The ASA is an analog signal amplifier which accepts an analog voltage or current signal and outputs a voltage signal. Several preset input ranges are jumper selectable. ASA is designed to give a B.A.S. signal output the power (wattage) to control Maxitrol™ gas valves normally installed in rooftop units. The top-adjust trimmer potentiometers can be used to make fine adjustments of gain and offset. The output gain can be adjusted anywhere from 1 to 20 times the input on the ASA (gain will vary depending on type of input). The offset of the output can be +/- 0 to 20 VDC.

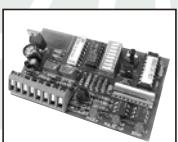
Notes: ① PWM - Pulse Width Modulated

**ATL**

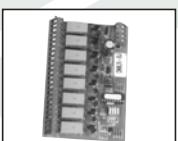
Analog Current or Voltage to Four Adjustable Trip Level Relay Output. The ATL accepts an analog voltage or current input signal and controls four relays. Each relay has an adjustable trip point which is set by a multi-turn trimmer potentiometer. Each relay is activated when the input signal is equal to or greater than the trip point setting. The relays deactivate when the input signal is less than the trip point. Common (C), Normally Open (NO) and Normally Closed (NC) terminals are available at each relay.

**ATP**

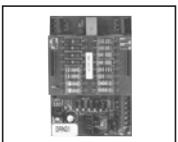
Analog Current or Voltage to PWM^① Output. The ATP converts an analog signal into a digital pulse output signal. The user can select eight standard analog input ranges to the ATP by changing jumper shunt positions. To select the output pulse range, the ATP has an eight position DIP switch. The output pulse is continuous with a one second off between pulses.

**AUD**

Floating Point to Analog Output. The AUD converts a floating point signal into a linear analog output. There are two inputs, one to increase the analog output and one to decrease the analog output. The output is stable when the inputs are both off. A contact closure or voltage signal to either input will cause the output to begin to ramp either up or down depending on which input was activated. The output stops ramping once the up or down input is deactivated, and will remain at that value until another up or down signal is received. If both inputs are "ON" the output will reset to the lowest value of the selected range. The output of the AUD is in the form of an analog, steady state voltage or current.

**DMUX**

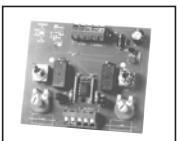
PWM^① Input to 4 or 8 Addressable Relays. The DMUX is a selectable output controller designed to expand the output capacity of an energy management or process controller. The DMUX has either 4 or 8 output relays which can be individually addressed by a single pulse width modulated input signal. Three position On/Off/Auto jumpers are standard and allow manual override at the DMUX. The DMUX converts a relay, transistor or Triac input signal to operate an appropriate relay output based on the duration of the signal.

**DRN3.1**

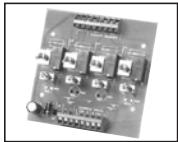
PWM^①, Analog, Floating Point (FP) to Resistance Output. The DRN3.1 is an interface that allows microprocessor control of a variable resistance. The isolated resistor network can be controlled by several different DDC signal types. It directly replaces a variable resistance controller and simulates the action of a slide wire or rotary potentiometer. All connections of the simulated potentiometer, the wiper and both ends of the resistance range, are available on the terminal strip. The DRN3.1 has on-board fallback relays that lock out the original resistive controller during operation. Several resistive ranges are available.

**DRN4**

Analog, Floating Point, & PWM^① to Proportional Resistance Output. The DRN4 is a resistive output motor actuator interface that accepts several types of DDC system signals. The output is 0 to 135 ohms. The input signal types are field selectable by an 8-position DIP switch. Signal input selections include voltage, current, pulse and floating point. The enclosure can be directly mounted to a 1/2 inch knockout on the motor actuator. Color coded wire leads with spade connectors are provided for electrical connections.

**MAO**

Dual Analog Voltage/Current Adjustable Manual Override. The MAO installs between a controller and an actuator to provide an adjustable analog manual override when needed. In normal operation two (2) analog signals can be routed from the controller through the MAO to each actuator. Flip the override switch from automatic to MANUAL on either MAO output and vary the analog signal independently. Either output can be analog current or voltage and have a different span. In MANUAL position, an alarm contact output is made to indicate override is in effect.

**MDO2FS**

Two Channel Digital Manual Override (Maintained). The MDO2FS is designed to be installed between a controller and an actuator to provide manual override when needed. In AUTO operation up two (2) digital signals can be routed through the MDO2FS from the controller(s) to each actuator. Slide the override switch on either output from AUTO to HAND, and you override the actuator with a maintained digital signal from the MDO2FS. With the override switch in HAND or OFF position, an alarm feedback contact closure will indicate those modes are in use. An option of alarm contacts open in HAND or OFF position is available. If power is lost to the MDO2FS, the signal from the controller is restored to the controlled device.

Notes: ① PWM - Pulse Width Modulated

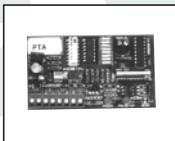


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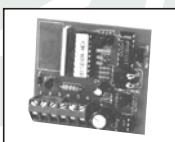


**PSG**

Programmable Signal Generator. The PSG is a hand held programmable signal generator designed to simulate analog or pulse signals from controllers, sensors, and other building automation system components. It is designed as an aid to speed up the process of system setup and calibration. PSG is equipped with a removable cable with alligator clips for power and signal attachment. User friendly prompts on the LCD screen and a membrane switch keypad allow the user to set the output values. A ballistic nylon carrying pouch is included.

**PTA**

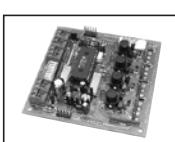
PWM ① to Analog Current or Voltage Output. The PTA converts a single pulse-width modulated input to an analog current or voltage output. A timed contact or solid state closure from the controlling microprocessor controller is converted to a linear analog output signal with 256 steps of resolution. The last output signal is held until the PTA receives the end of the next pulsed input signal. The PTA's output will not wrap around if an excessively long input pulse is received. Ten preset analog output signal spans are DIP switch selectable. The input signal is optically isolated and can accept either positive or negative polarity.

**PTA2**

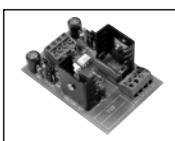
PWM ① to Analog Current or Voltage Output. The PTA2 accepts a timed contact or solid state closure from the controlling microprocessor controller is converted to a linear analog output with 255 steps of resolution. The last output signal is held until the PTA2 receives the end of the next pulsed input signal. The PTA2 will not wrap around if an excessively long pulse is received. Four input pulse rates are jumper selectable. The input signal is optically isolated and can accept either positive or negative polarity. The PTA2 includes triac adapter circuitry (jumper selectable) for a triac input. The PTA2 has a jumper selectable manual override which will allow modulation of the output between 0-10 VDC to verify proper operation of the controlled device.

**RTI**

Resistance to Analog Output. The RTI converts a 3-wire resistance signal to an analog output, using current loop power (two wire). The RTI is reverse polarity protected and offers linear tracking of a 3-wire resistance input against the standard output signal of a 4 to 20 milliamp (current source). Its small size and selfpowered feature lends its use to remote mounting for feedback signals from a valve or damper motor indicating its position.

**PHOTON-4.1**

Lighting Control Interface via RS485 bus or digital input. The PHOTON4.1 interface has 4 outputs capable of controlling G.E. ® RR7 or RR9 relay types (up to 10 per output) or Schlage Electronics ® or TOUCH-PLATE ® 3000-PL relay type lighting contactors. It provides the necessary latch and unlatch pulses required by these contactors. Up to 255* PHOTON4.1s can be controlled and monitored over a single twisted pair of wires from a desktop PC or a building automation system computer. Each PHOTON4.1 has an 8-position DIP switch to set its individual address. The PHOTON4.1 has momentary local override push buttons for each of the 4 outputs. Each PHOTON4.1 has 4 digital inputs for remote override. These require a momentary or maintained contact (specify when ordering).

**TOB**

Pulse to Pulse Output (Triac amplifier). The TOB will accept up to two separate signals from up to two AC TRIAC outputs, or DC sources, and provide up to two TRIAC outputs each capable of driving a 2.5A load. Each output TRIAC is activated for the time that the signal is applied to the input. The TOB provides isolation between the input and output circuits as well as the two identical circuits.

Notes: ① PWM - Pulse Width Modulated *Different models available

Please contact Greystone or visit our website for detailed specifications.



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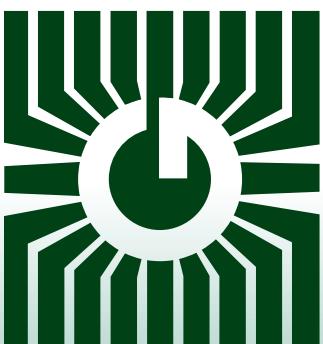
CARBON MONOXIDE (CO)
DETECTORS
CMD Series



Precision gas
control/sensing

FEATURES:

- Surface or Duct mount models
- Long-life, replaceable electrochemical sensor
- Optional LCD display
- Optional relay outputs & audible alarm



*Peace of mind
through reliable
gas monitoring*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

CO DETECTOR

Environmental, industrial and commercial indoor Carbon Monoxide (CO) gas detector. Available in both a space and duct mount version.



ABS Duct Enclosure for CO

APPLICATION:

To sense and transmit carbon monoxide levels to any compatible electronic analog control, DDC/PLC controller or automation system for the control of ventilation equipment.

FEATURES:

- Superior Electrochemical sensing elements
- Set up/calibration fully menu driven (requires LCD option)
- 0-300 PPM standard (5%), other ranges available (contact Greystone)
- 0-500 PPM for (3%)
- Optional on board relays with field adjustable trip point.
- Optional LCD for displaying PPM level and menu options.
- Powered by either AC or DC source with no change to circuit required.
- Choice of three field adjustable analog output signals, linearized over full range.
- Modbus communications option.
- Field replaceable calibrated sensor module.

SPECIFICATIONS	CO DETECTOR - Product #CMD
Gas Detected	Carbon Monoxide (CO)
Range	0-300 PPM (5%), 0-500 PPM (3%)
Standard Accuracy at 0-50°C (32-122°F), 15-90%RH	±5 PPM or 5% of reading for 0-300 PPM (whichever is greater) ±5 PPM or 3% of reading for 0-500 PPM (whichever is greater)
Sensing Element Life Expectancy	Electrochemical 5-7 years in air
Operation Conditions	-20-50°C (-4-122°F) for 5%, 0-50°C (32-122°F) for 3%, 15-95% RH non-condensing
Sample Method	Diffusion or flow through, sample tube for duct mounted units
Stability	< 5% signal loss/year
Manufacturing Process	ISO 9001 certified
Output Signal	4-20 mA active (sourcing), 0-5 Vdc or 0-10 Vdc jumper selectable
Output Drive Capability	Current output - 500 ohms max 10 Kohm min for voltage output
Output Resolution	10 bit PWM (± 0.4 ppm)
LCD Display (optional)	LCD for displaying PPM and menu parameters 1 PPM resolution, 28mm W X 13mm H (1.1" X 0.5") alpha-numeric 2 line X 8 characters
Field Calibration	By applying calibration gas standards (Contact Greystone for calibration kit)
External Dimensions	ABS Space - 124.5mm W X 183.5mm H X 43mm D (7.2" X 4.9" X 1.7") Duct ABS - 124.5mm X 183.5mm X 250.5mm (7.2" X 4.9" X 9.9") includes duct insertion tube



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CO DETECTOR

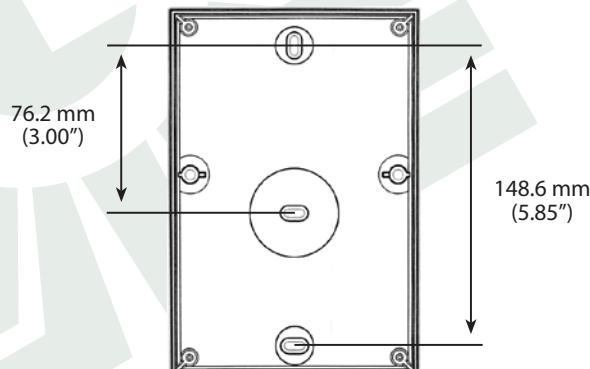
SPECIFICATIONS cont'd		CO DETECTOR - Product #CMD
Agency Approvals		Sensor is UL Recognized Component for ANSI/UL-2034 and UL-2075, E240671
Typical Coverage Area		700 m ² (7500 ft ²) or 15m (50ft) radius
Response Time		< 35 seconds for 90% step change
Warm-up Time		200 seconds
Power Supply		15-30 Vac/dc (non-isolated half-wave rectified)
Consumption		80 mA max @ 24 Vdc with all options on 150 mA max @ 24 Vac with all options on
Input Voltage Effect		Negligible over specified operating range
Protection Circuitry		Reverse voltage protected and output limited Transient protection
Optional Relay Output		One or two Form C contact (N.O. and N.C.) 5 amps @ 250 Vac, 5 amps @ 30 Vdc, p.f. = 1 Relay 1 Trip Point - Programmable 25, 40-350 PPM in 10 PPM increments Relay 2 Trip Point - Programmable 100-400 PPM in 10 PPM increments Relay Hysteresis - Programmable 10, 15, 25, 50 or 75 PPM Relay Delay - Programmable 0, 1, 2, 3, 4, or 5 minutes
Programming and Selection		Via internal push-buttons and jumpers or optional Modbus communication (LCD required)
Wiring Connections		Screw terminal block (14 to 22 AWG)

CARBON MONOXIDE (CO): PRODUCT ORDERING INFORMATION

MODEL	Description	
CMD	Carbon Monoxide Detector (CO)	
	CODE	Sensing Element and Accuracy
	3	Electrochemical
	5	Electrochemical
	CODE	Gas Type
	B	CO - Carbon Monoxide Detector (CMD)
	CODE	Enclosure
	2	Space ABS
	6	Duct ABS
	9	Space ABS, weather proof
	CODE	Circuit Board Relay (s)
	00	No Relay
	10	One Relay, Form C contact (N.O. and N.C.), 5 amps @ 250 Vac, 5 amps @ 30 Vdc, p.f. = 1
	11	Two Relays, Form C contact (N.O. and N.C.), 5 amps @ 250 Vac, 5 amps @ 30 Vdc, p.f. = 1
	CODE	Options
	0	No Options
	1	LCD (Not to be used in temperatures below 5°C / 32°F)
	2	Audible Alarm
	MOD	Modbus Communications
	TS	Test Switch (if pressed, puts output to 100% and activates relays for 5 minutes) CMD5 only
CMD	5	B
		2
		00
		0
← Typical Model Number		
Example: Electro chemical CO Space ABS No Relay No Options		

Greystone Energy Systems Inc. reserves the right to make design modifications without prior notice.

DIMENSIONS



Other GREYSTONE *Accuracy by Design* Products for the HVAC Professional

- Temperature Sensors and Transducers
- Humidity Transducers
- Pressure Transducers
- Current Switches and Sensors
- KW and KWH Transducers
- Electronic to Pneumatic (IP)
- Transducers
- Power Supplies



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GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

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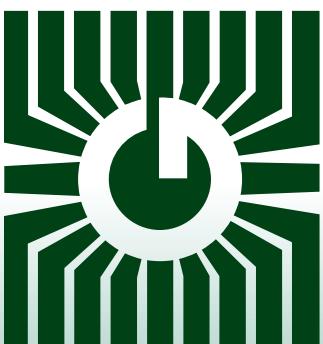
CARBON DIOXIDE (CO₂)
DETECTORS
CDD Series



Precision carbon dioxide
control/sensing

FEATURES:

- Space and duct models
- Adjustable range models
- Optional on-board relay
- Optional LCD display
- Custom logos available



*Peace of mind
through reliable
gas sensors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

CO₂ DETECTOR

FEATURES:

- Menu driven set-up
- 0-2000 PPM default CO₂ range
- Field programmable ranges
- Patented self-calibration algorithm
- Guaranteed 5 year calibration interval
- Easily field calibrated
- Accepts AC/DC power
- Duct or wall mount models
- Voltage and current output signals

OPTIONS:

- LCD
- RS-485 network communication
- Field calibration kits
- Control relay

PRODUCT ORDERING INFORMATION:

MODEL	Description					
CDD1A	Carbon Dioxide Detector (CO ₂), Non-Dispersive Infrared (NDIR) sensor					
	CODE Enclosure and Outputs					
	1 Corporate Space c/w 4-20 mA and 0-5 Vdc outputs 2 Corporate Space c/w 4-20 mA and 0-10 Vdc outputs 3 Space ABS c/w 4-20 mA, 0-5 Vdc and 0-10 Vdc outputs 6 Duct ABS c/w Sampling Tube, 4-20 mA, 0-5 Vdc and 0-10 Vdc outputs					
	CODE Circuit Board Relay					
	00 No Relay 10 One Relay (DPDT, N.O. or N.C., 5A @ 24 VDC)					
	CODE LCD					
	0 No LCD 1 LCD					
	CODE Options					
	-MOD Modbus Communication					
CDD1A	6	00	1	-MOD	←	Typical Model Number
Example: Duct No Relay LCD and Modbus communication						

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SPECIFICATIONS:

Range.....	0 - 2000 ppm standard, programmable from 1500 up to 10,000 ppm
Standard Accuracy.....	±50 PPM or +3% of reading @22°C (72°F) when compared to certified calibration gas
Sensing Element.....	Non-Dispersive Infrared (NDIR)
Operation Conditions.....	0°-50°C (32°-122°F), 0-95% RH non-condensing.
Temperature Dependence.....	0.2% FS per °C
Stability.....	< 2 % FS over life of sensor (15 years typical)
Output Signal.....	4-20 mA active (sourcing) or 0-5Vdc and 0-10Vdc
Output Drive Capability.....	.550 ohm max for current output 10 Kohm max for voltage output
Pressure Dependence.....	0.13% of reading per mm Hg
Altitude Correction.....	Programmable from 0-5000 ft in 500 ft increments
Response Time.....	2 minutes for 90% step change
Warm-up Time.....	2 minutes
Power Supply.....	20-30 Vac/dc (non-isolated half-wave rectified)
Consumption.....	140 mA @ 24V maximum (40 mA typical)
Input Voltage Effect.....	Negligible over specified operating range
Protection Circuitry.....	Reverse voltage protected and output limited
LCD Display (optional).....	LCD for displaying PPM level (required for field programming), 1 ppm resolution, 28mm W x 13mm H (1.1" x 0.5") alpha-numeric 2 line x 8 character
Relay Output (optional).....	One form C contact (N.O. and N.C.), status LED, 5 amp @ 250 Vac, 5 amp @ 30 Vdc, p.f.= 1
Programming and Selection.....	Via internal push-buttons and jumper
Wiring Connections.....	Screw terminal block (14 to 22 AWG)
External Dimensions.....	Corporate - 91mm W x 127mm H x 43mm D (3.6" x 5" x 1.7") Space/Duct ABS - 124mm W x 183mm H x 43mm D (4.9" x 7.22" x 1.7")

ACLP SOFTWARE AND 5-YEAR CALIBRATION GUARANTEE

ACLP SOFTWARE

ACLP (Automatic Calibration Logic Program) software utilizes the computing power in the sensor's on-board microprocessor to remember the lowest CO₂ concentration that takes place every 24 hours. The sensor assumes this low point is at outside levels. The sensor is also smart enough to discount periodic elevated readings that might occur if for example a space was used 24 hours per day over a few days. Once the sensor has collected 14 days worth of low concentration points, it performs a statistical analysis to see if there has been any small changes in the sensor reading over background levels that could be attributable to sensor drift. If the analysis concludes there is drift, a small correction factor is made to the sensor calibration to adjust for this change.

5-YEAR CALIBRATION GUARANTEE

Based on the results of years of testing of ACLP software, Greystone now offers a 5-year calibration guarantee on all its CDD series wall and duct mount sensors used for CO₂ based ventilation control when operated in an environment that can utilize ACLP software. If the sensor is found to be out of calibration more than 150 PPM as compared to a calibration gas or recently calibrated reference, Greystone will provide a free factory calibration of the sensor if returned to Greystone. This guarantee only applies if the sensor is operated in an environment where inside levels periodically drop to outside concentrations (i.e. during evenings or weekends when there is no occupancy) as is required by ACLP software. If a space does not experience a periodic drop to outside levels (i.e. where occupancy is 24 hours, 7 days/week), ACLP software should be deactivated. With ACLP deactivated (via menu buttons), calibration may be required every 2 to 3 years.

OPTIONAL MODBUS COMMUNICATION

Modbus communication is optional and the correct device must be ordered to have this capability. Modbus is a network protocol for industrial manufacturing environments. The detector communicates on a standard Modbus network using either of two transmission modes: RTU (Remote Terminal Unit) or ASCII (American Standard Code for Information Interchange). The hardware interface is RS-485. Select the desired mode along with the other parameters using the Configuration Menu. For complete protocol details, see the document titled CO₂/RH/T Detector - Modbus Implementation Specification.

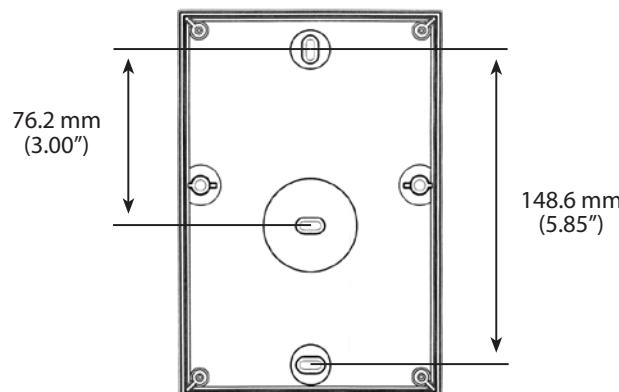
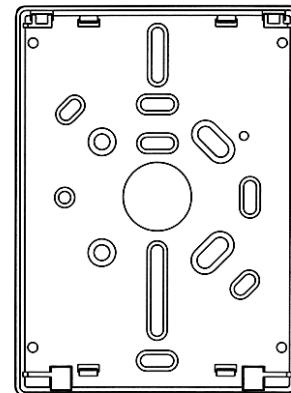
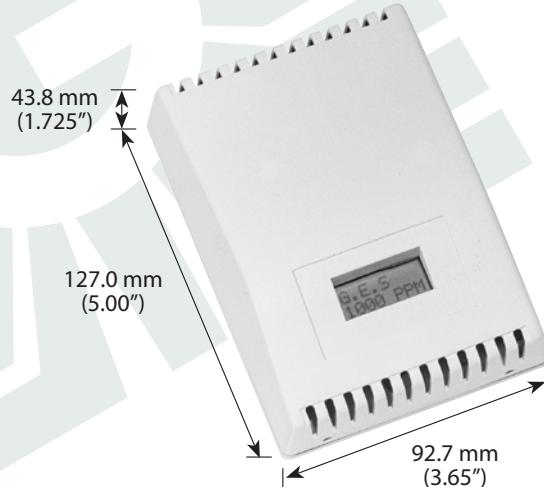


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DIMENSIONS nts



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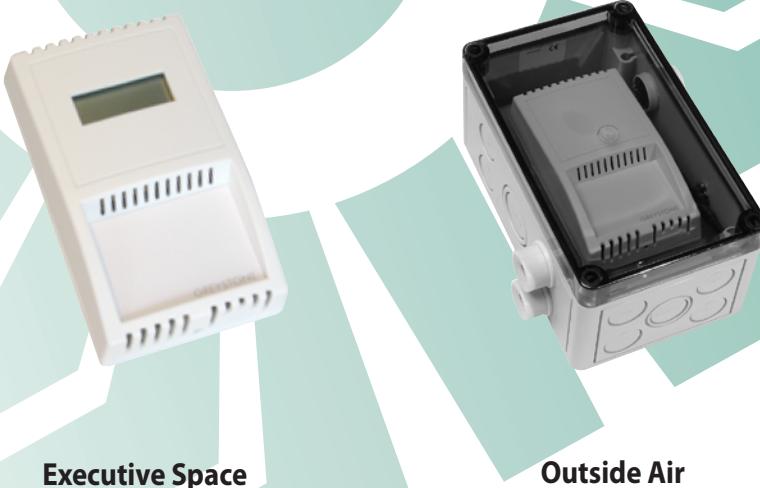
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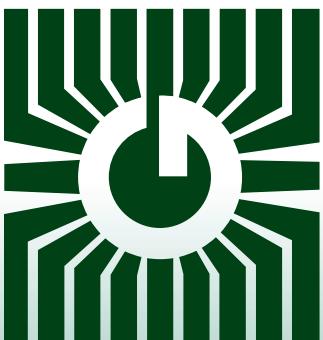
CARBON DIOXIDE
& TEMPERATURE DETECTORS
CDD Series



Precision carbon dioxide &
temperature control/sensing

FEATURES:

- Carbon Dioxide & Temperature
- Adjustable ranges
- Analog voltage or current output for CO₂
- Compact, decorative enclosure
- Optional OSA Enclosure
- Custom logos available



*Peace of mind
through reliable
gas sensors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

CO₂ DETECTOR

FEATURES:

- Menu driven set-up
- 0-2000 PPM default CO₂ range
- Patented self-calibration algorithm
- Guaranteed 5 year calibration interval
- Easily field calibrated
- Accepts AC/DC power
- Decorative wall enclosure
- Voltage and current output signals



OPTIONS:

- LCD
- Temperature Sensor

SPECIFICATIONS:

Range.....	0 - 2000 ppm
Standard Accuracy.....	±50 PPM or +3% of reading @22°C (72°F) when compared to certified calibration gas
Sensing Element.....	Non-Dispersive Infrared (NDIR)
Operation Conditions.....	0°-50°C (32°-122°F), 0-95% RH non-condensing. -40° - 70°C (-40° - 158°F) in OSA Enclosure
Temperature Dependence.....	0.2% FS per °C
Stability.....	< 2 % FS over life of sensor (15 years typical)
Output Signal.....	4-20 mA active (sourcing) or 0-5Vdc and 0-10Vdc
Output Drive Capability.....	550 ohm max for current output 2 Kohm max for voltage output
Pressure Dependence.....	0.13% of reading per mm Hg
Response Time.....	2 minutes for 90% step change
Warm-up Time.....	2 minutes
Power Supply.....	20-30 Vac/dc (non-isolated half-wave rectified)
Consumption.....	65 mA @ 24V maximum (25 mA typical)
Input Voltage Effect.....	Negligible over specified operating range
Protection Circuitry.....	Reverse voltage protected and output limited
LCD Display (optional).....	LCD for displaying PPM level 0-2000, 1 ppm resolution, 33mm W x 14mm H (1.3" x 0.55")
Programming and Selection.....	Via internal push-buttons and jumper
Temperature Sensor.....	Optional Thermistor or RTD
Wiring Connections.....	Screw terminal block (14 to 22 AWG)
External Dimensions.....	Executive Space - 71mm W x 119mm H x 32mm D (2.8" x 4.7" x 1.25")



GREYSTONE ENERGY SYSTEMS, INC.

RoHS
COMPLIANT



PRODUCT ORDERING INFORMATION:

MODEL	Description																											
CDD1A	Carbon Dioxide (CO ₂) Detector c/w optional Temperature Sensor																											
	<table border="1"> <thead> <tr> <th>CODE</th> <th>Enclosure and Outputs</th> </tr> </thead> <tbody> <tr> <td>400</td> <td>Executive Space c/w 4-20 mA or 0-10 Vdc output for CO₂, and optional Temperature Sensor</td> </tr> <tr> <td>500</td> <td>Executive Space c/w 4-20 mA or 0-5 Vdc output for CO₂, and optional Temperature Sensor</td> </tr> </tbody> </table>		CODE	Enclosure and Outputs	400	Executive Space c/w 4-20 mA or 0-10 Vdc output for CO ₂ , and optional Temperature Sensor	500	Executive Space c/w 4-20 mA or 0-5 Vdc output for CO ₂ , and optional Temperature Sensor																				
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CDD1A	500	1																										
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Example: CO₂, 4-20 mA / 0 - 10 Vdc, LCD and 10,000 ohm, type 3, NTC Thermistor																												

Greystone Energy Systems Inc. reserves the right to make design modifications without prior notice.

ACLP SOFTWARE AND 5-YEAR CALIBRATION GUARANTEE

ACLP SOFTWARE

ACLP (Automatic Calibration Logic Program) software utilizes the computing power in the sensor's on-board microprocessor to remember the lowest CO₂ concentration that takes place every 24 hours. The sensor assumes this low point is at outside levels. The sensor is also smart enough to discount periodic elevated readings that might occur if for example a space was used 24 hours per day over a few days. Once the sensor has collected 14 days worth of low concentration points, it performs a statistical analysis to see if there has been any small changes in the sensor reading over background levels that could be attributable to sensor drift. If the analysis concludes there is drift, a small correction factor is made to the sensor calibration to adjust for this change.

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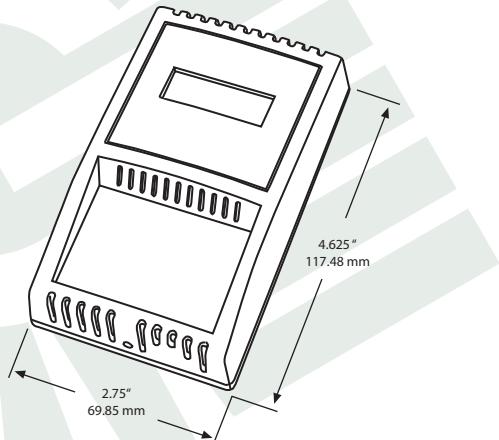


GREYSTONE ENERGY SYSTEMS, INC.

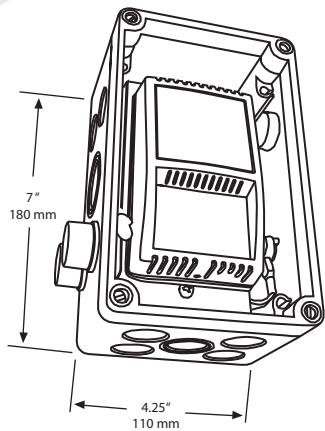
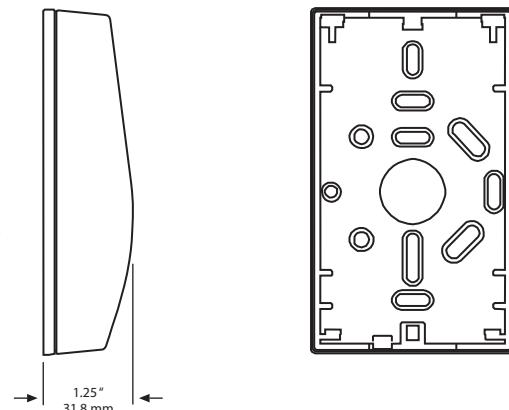
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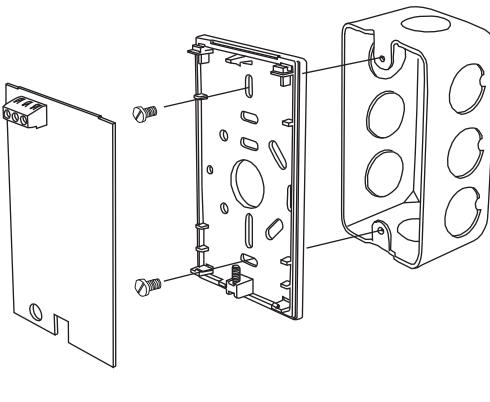
DIMENSIONS



Executive Enclosure (AE)



Outside Air Enclosure



GREYSTONE
ACCURACY BY DESIGN

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CARBON DIOXIDE, TEMPERATURE & HUMIDITY DETECTORS CDD Series

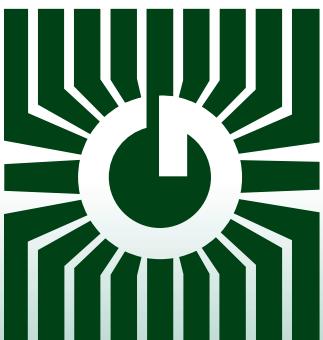


Executive Space

Precision carbon dioxide
temperature & humidity
control/sensing

FEATURES:

- Carbon Dioxide, Temperature & Humidity
- Adjustable ranges
- 3 Analog voltage or current outputs
- Compact, decorative enclosure
- Optional MODBUS communication
- Custom logos available



*Peace of mind
through reliable
gas sensors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

CO₂ DETECTOR

FEATURES:

- Menu driven set-up
- 0-2000 PPM default CO₂ range
- Field programmable ranges
- Patented self-calibration algorithm
- Guaranteed 5 year calibration interval
- Easily field calibrated
- Accepts AC/DC power
- Decorative wall enclosure
- Voltage and current output signals



OPTIONS:

- LCD
- MODBUS network communication

SPECIFICATIONS:

Range.....	0 - 2000 ppm standard, programmable from 1500 up to 10,000 ppm
Standard Accuracy.....	±50 PPM or +3% of reading @22°C (72°F) when compared to certified calibration gas
Sensing Element.....	Non-Dispersive Infrared (NDIR)
Operation Conditions.....	0-50°C (32-122°F), 0-95% RH non-condensing
Temperature Dependence.....	0.2% FS per °C
Stability.....	< 2 % FS over life of sensor (15 years typical)
Output Signal.....	4-20 mA active (sourcing) or 0-5Vdc and 0-10Vdc
Output Drive Capability.....	550 ohm max for current output 2 Kohm max for voltage output
Pressure Dependence.....	0.13% of reading per mm Hg
Altitude Correction.....	Programmable from 0-5000 ft in 500 ft increments
Response Time.....	2 minutes for 90% step change
Warm-up Time.....	2 minutes
Power Supply.....	20-30 Vac/dc (non-isolated half-wave rectified)
Consumption.....	125mA @ 24V maximum (70mA typical)
Input Voltage Effect.....	Negligible over specified operating range
Protection Circuitry.....	Reverse voltage protected and output limited
LCD Display (optional).....	LCD for displaying PPM level 0-2000, 0-100% RH and 0-35°C (32-95°F) temperature 33mm W x 14mm H (1.3" x 0.55")
Programming and Selection.....	Via internal push-buttons and jumper
Temperature Sensor.....	10K ohm curve matched Thermistor
Temperature Output Range.....	0-35°C (32-95°F) or 0-50°C (32-122°F) Programmable
Temperature Output Accuracy.....	±0.2°C (±0.4°F)
Humidity Sensor.....	Thermoset Polymer Based Capacitive
Humidity Output Range.....	0-100% RH
Humidity Output Accuracy.....	±2% RH
Humidity Response Time.....	15 Seconds Typical
Humidity Output Hysteresis.....	±2% RH
Humidity Stability.....	±1% RH typical @ 50% RH in 5 years
Wiring Connections.....	Screw terminal block (14 to 22 AWG)
External Dimensions.....	Executive Space - 71mm W x 119mm H x 32mm D (2.8" x 4.7" x 1.25")



GREYSTONE ENERGY SYSTEMS, INC.

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PRODUCT ORDERING INFORMATION:

MODEL	Description	
CDD1A	Carbon Dioxide Detector (CO ₂), Relative Humidity and Temperature	
	CODE Enclosure and Outputs 700 Executive Space c/w 4-20 mA output for CO ₂ , Relative Humidity and Temperature 800 Executive Space c/w 0-5 Vdc and 0-10 Vdc output for CO ₂ , Relative Humidity and Temperature	
	CODE LCD 0 No LCD 1 LCD	
	CODE Options -MOD Modbus Communication	
CDD1A	700	1
	-MOD	← Typical Model Number
Example:	CO ₂ /Temp/Humidity	Executive Current Output LCD and Modbus communication

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ACLP SOFTWARE AND 5-YEAR CALIBRATION GUARANTEE

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OPTIONAL MODBUS COMMUNICATION

Modbus communication is optional and the correct device must be ordered to have this capability. Modbus is a network protocol for industrial manufacturing environments. The detector communicates on a standard Modbus network using either of two transmission modes: RTU (Remote Terminal Unit) or ASCII (American Standard Code for Information Interchange). The hardware interface is RS-485. Select the desired mode along with the other parameters using the Configuration Menu. For complete protocol details, see the document titled CO₂/RH/T Detector - Modbus Implementation Specification.

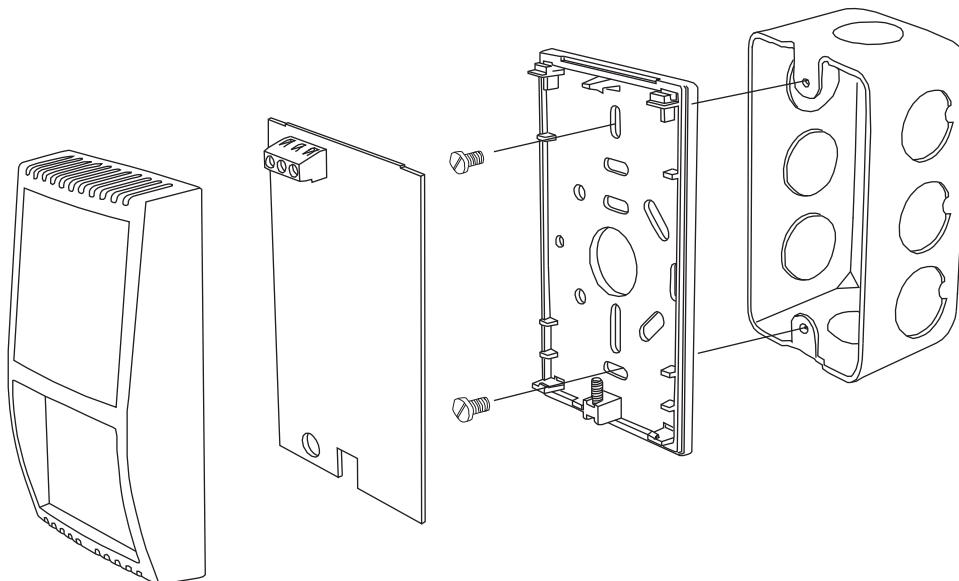
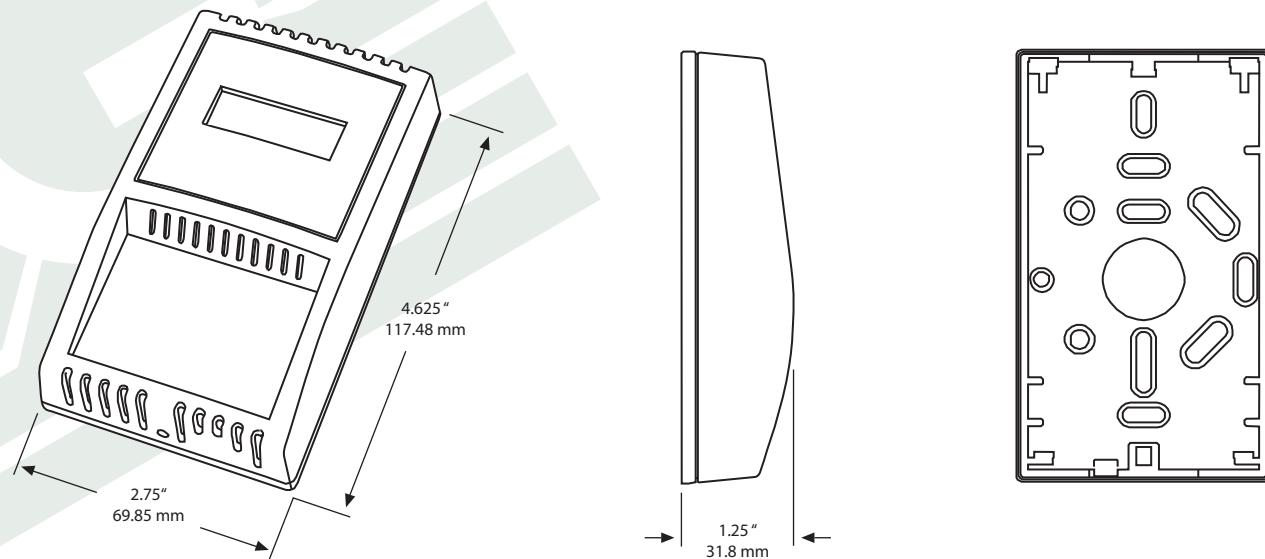


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DIMENSIONS nts



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ACCURACY BY DESIGN

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GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

GREYSTONE
ACCURACY BY DESIGN

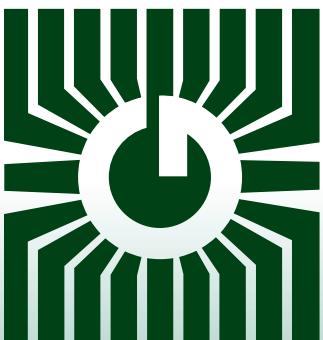
AIR QUALITY MONITOR-CONTROLLER AIR300 Series



Precision air quality
control / sensing

FEATURES:

- True Air Quality Monitor
- Microprocessor based controller
- Analog, stepped & relay output options
- Able to detect one cigarette in 15 m³
(540 cu. ft.) room
- Wall or duct mount versions
- Visual indication of air quality (Internal)



*Peace of mind
through reliable
gas sensors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

AIR QUALITY MONITOR / CONTROLLER

Environmental, industrial and commercial indoor Air Quality detector. Available in both space and duct mount versions.



Executive Enclosure for AIR 300 (AE)

APPLICATION:

- Schoolrooms
- Office buildings
- Parking garages
- Washroom ventilation fans
- Cigarette smoke detectors

FEATURES:

- True Air Quality Monitor
- Microprocessor based controller
- Analog, Stepped & Relay Output options
- 10 bit resolution
- Able to detect one cigarette in 15 m³ (530 cu. ft.) room
- Integral sensitivity adjustment
- Ability to directly control air handling unit
- Visual indication of air quality (internal)
- No calibration required

SPECIFICATIONS	Air Quality Monitor / Controller - Product # AIR300
Measurement	Solid State TGS-800 VOC sensor
Sample Method	Diffusion or flow through, sample tube for duct
Power Supply	20 - 30 Vac/dc
Consumption	100 mA @ 24 Vdc, 220 mA @ 24 Vac, 6 VA max.
Input Voltage Effect	Negligible over specified operating range
Protection Circuitry	Reverse voltage protected and output limited
Operating Conditions	0-40°C (32-104°F), 0-95% RH non-condensing
Standard Output Signal	Analog Stepped Output (ASO) in four steps representing OK, Low, Medium and High pollution levels (each step is independently adjustable from 0-10 Vdc)
Optional Output Signal	Linear output representing 0-100% pollution level, jumper selectable for either 0-5 or 0-10 Vdc or 4-20 mA, the current signal is generated by the sensor (active)
Output Drive Capability	550 ohm max for current output, 10k ohm min for voltage output
Optional Relay Output	One Form C contact (N.O. and N.C.), status LED, 5 amps @ 250 Vac, 5 amps @ 30 Vdc, p.f. = 1
Display	5 LED's indicating pollution level, operational mode and programming values
Programming and Selection	Via internal push buttons and jumpers
Wiring Connections	Screw terminal block (14 - 22 AWG)
Enclosures	Executive Space - 70mm W X 118mm H X 32mm D (2.75" X 4.65" X 1.25") Duct ABS c/w sampling tube - 163mm X 108mm X 64mm (6.4" X 4.25" X 2.5")



GREYSTONE ENERGY SYSTEMS, INC.

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OPERATION

The AIR-300 Air Quality Monitor uses a tin dioxide semiconductor sensor to detect oxidizable gases and is specifically designed to have high sensitivity to gaseous organic materials which are components of indoor air pollutants. These air contaminants include cigarette smoke, smoke from cooking, exhaust gases from automobiles, solvents and many others.

Air quality is a term covering a very broad spectrum of definitions and factors. Temperature, humidity, air flow, occupancy and where the air is used all come into play when determining air quality. The air that is considered to be acceptable in a mechanical workshop may be quite unacceptable in an office environment.

A reliable method of measurement for air quality is found in a gas sensor based on the Taguchi Gas principle. This gas sensor is essentially a heated element inside a porous semiconductive tube. The tube has a large surface area and is able to freely absorb gas molecules on the semiconductor surface. Electron transfer occurs between the gas molecules and the already absorbed oxygen molecules. This causes a relatively large increase in conductivity for a small change in gas concentration. This change occurs quite quickly (within a few seconds) and is completely reversible. Since the element is a semiconductor Taguchi Gas Sensor and has no moving parts, it will operate reliably for many years. The sensor responds with varying degrees of sensitivity to a wide variety of gasses which include hydrogen, hydrocarbons, alcohols, carbon monoxide, benzene, etc.

It is readily apparent that this sensor works well in the detection of contaminants such as solvents, but what about carbon dioxide? Although the sensor does not detect carbon dioxide, it is still quite useful in human environments. As well as carbon dioxide, hydrocarbons, body odours and water vapors are emitted by breathing and perspiration. The levels of these other contaminants change at roughly the same rate as the carbon dioxide and the sensor will track these other contaminants at approximately the same rate as the carbon dioxide in occupied spaces.

The AIR-300 may be used as either a stand-alone controller to detect levels of pollution and operate a clean-air damper directly, or it may be used as a monitor where the analog output signal is transmitted to the Building Automation System for further processing.

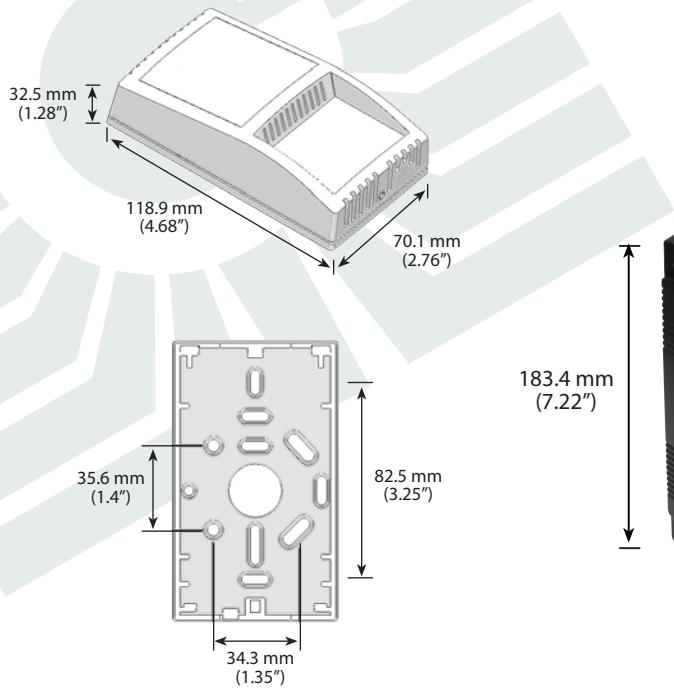
Many different environments can be controlled with careful adjustment of the device parameters. This allows the AIR-300 to function equally well in a school room where the air is to be kept very clean, or a utility room where the fresh air requirements are not as stringent. The Air Quality Monitor can be used to control intake dampers at an airport where jet fumes are periodic contaminants, automatically control exhaust air on an assembly line where epoxies are used, or a multitude of other applicants.

Below is a list of common pollutants in decreasing order of sensitivity, detectable by the AIR-300. Most of these chemicals are easily detectable in quantities of 20 PPM or less.

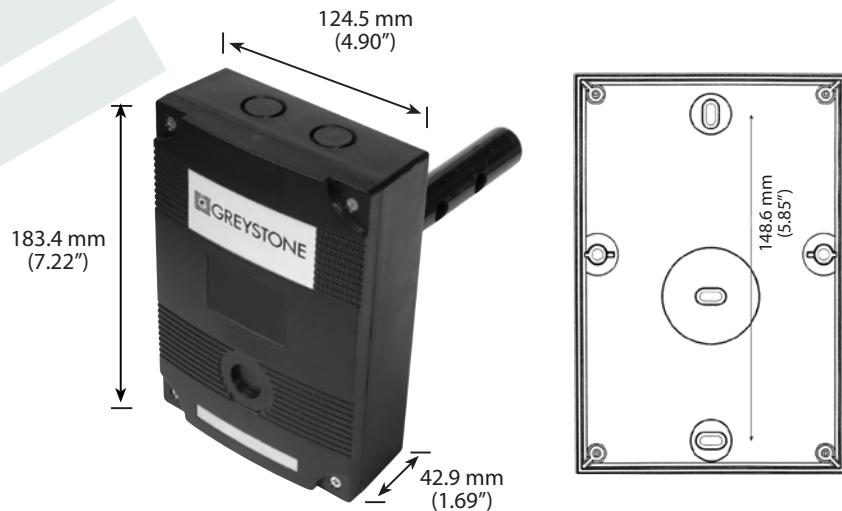
CHEMICAL	SYMBOL	COMMON SOURCE
Methyl Ethyl Ketone	C ₄ H ₈ O	Solvents and cleaning products
Acetone	C ₃ H ₆ O	Solvents and organic synthesis
Ethyl Alcohol	C ₂ H ₆ O	Solvents and liquor fermentation
Formaldehyde	CH ₂ O	Disinfectants and preservatives
Hydrogen	H ₂	Used in synthetics
Methyl Alcohol	CH ₄ O	Solvents, antifreeze and synthetics
Vinyl Chloride	C ₂ HCl	Textiles and polymers
Hydrogen Sulfide	H ₂ S	Water and putrefying matter
Methyl Chloride	CH ₃ Cl	Solvents, paints and refrigerant
Benzene, Toluene, Xylene	C ₆ H ₆ , C ₇ H ₈ , C ₈ H ₁₀	Solvents and motor fuels
Trichloroethylene	C ₂ HCl ₃	Solvents and cleaning agents
Propane	C ₃ H ₈	Fuels and chemical synthesis
Carbon Monoxide	CO	Combustion of carbon
Freon-22	CHClF ₂	Refrigerants and aerosols
Ammonia	NH ₃	Solvents and refrigerants
Methane	CH ₄	Decomposition and synthesis



ENCLOSURE DIMENSIONS:



AE Enclosure Dimensions



Duct Enclosure Dimensions

PRODUCT ORDERING INFORMATION

MODEL	Description	
AIR300	Air Quality Monitor / Controller	
CODE	Enclosure	
AE D	Executive Space Duct	
CODE	Output Option	
- R A AR	Analog Stepped Output Only (no designation) ASO and Relay Outputs ASO and Analog Outputs ASO, Analog and Relay Outputs	
AIR300 D AR		Typical Model Number

Example: Air Quality Duct c/w ASO, analog and relay outputs

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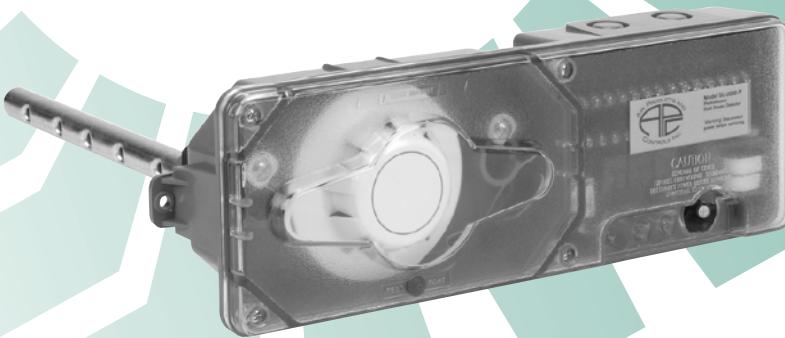


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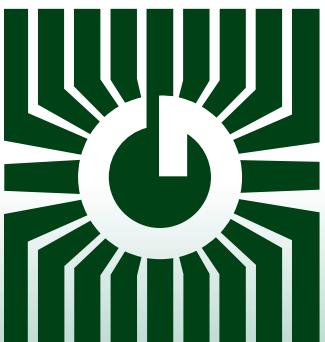
DUCT SMOKE
DETECTOR
Model SL2000



Precision duct smoke
detection

FEATURES:

- 24 VAC/DC or 120/240 VAC operation
- Simple change-out of photo or ion detector heads
- Low flow air velocity rating from 100 to 4000 FPM
- UL, CSFM and MEA Listed
- Two (2) sets of 10A form "C" alarm contacts
- One (1) set of 10A form "C" trouble contacts
- Easy and quick mounting to round or rectangular ducts from 1' - 12' wide
- Clear cover for convenient visual inspection
- Built-in reset switch that is also an alarm test switch



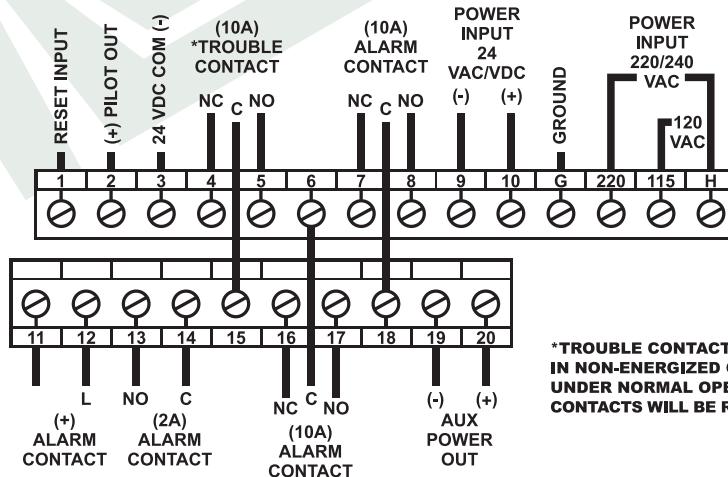
*Peace of mind
through reliable
smoke detectors*

GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

PRODUCT APPLICATION / DESCRIPTION:

The SL-2000 Series Smoke Detector is the latest innovation for early detection of smoke and products of combustion present in air moving through HVAC ducts in Commercial, Industrial and Residential application. The SL-2000 Series, 4-wire duct housing will accommodate either the ionization sensor or the photoelectronic sensor. The interchangeable detector heads allow easy removal for quick cleaning and maintenance, or a change in application without removing the duct housing. The SL-2000 samples air currents passing through a duct and gives dependable performance for management of fans, blowers, and air conditioning systems.

WIRING:



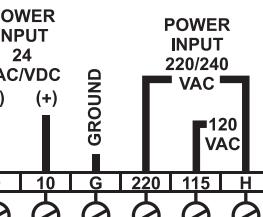
PRODUCT SPECIFICATIONS:

Models SL-2000-N and SL-2000-P	
Power Requirements	Stand By: 230 VAC-7.9 mA 115 VAC-13.8 mA 24 VAC-39.4 mA 24 VDC-13.5 mA Alarm Current: 230 VAC-16.0 mA 115 VAC-27.0 mA 24 VAC-59.3 mA 24 VDC-128.7 mA
Relay Contact Rating	Alarm Contacts: 2 sets form "C" rated at 10 amps @115 VAC resistive 1 set form "A" rated at 2 amps Trouble Contacts: 1 set form "C" rated at 10 amps @ 115 VAC resistive
Air Velocity	.50 to 20 M/S (100 to 4000 FPM)
Ambient Temperature	SL-2000-N SL-2000-P 0-68°C (32 to 155°F) 0-60°C (32-140°F)
Humidity	10% to 85% R.H. No Condensation
Wiring	#14 to #22 AWG
Approvals	Underwriters Laboratories Listed: (UL268A;UROX.S2829) CSFM Listed: (3240-1004:105) MEA Listed: (73-92E;VOL.27)
Material	Grey plastic backbox, clear plastic cover
Dimensions	343 mm L x 115 mm H x 58 mm D (13.5" x 4.5" x 2.25")
Max. Net Wt.	1.14 KG (2.5 lbs.)
Manufacturer	Built for Greystone by Air Products and Controls, Inc.

Output terminals are provided for remote accessories such as horns, strobes, remote status indicators and test/reset key switches or push buttons.

The SL-2000 includes many features that represent true innovations from current generation duct smoke detectors. It is designed and built to meet all local requirements, as well as the NFPA regarding duct smoke detectors.

All detectors must be used with a metal sampling tube, model STN series.



***TROUBLE CONTACTS ARE SHOWN
IN NON-ENERGIZED CONDITION.
UNDER NORMAL OPERATION
CONTACTS WILL BE REVERSED.**

ORDERING INFORMATION:

Part No.	Description
SL-2000-N	4-wire ionization duct detector, high temperature applications
SL-2000-P	4-wire photoelectric duct detector

ACCESSORIES

Part No.	Description
STN-1.0	Metal sampling tube duct widths 1' - 2'
STN-2.5	Metal sampling tube duct widths 2' - 4'
STN-5.0	Metal sampling tube duct widths 4' - 8'
STN-10.0	Metal sampling tube duct widths 8' - 12'
MS-RA/R	Remote Alarm LED (Red) and Push-Button Test/Reset Switch
MS-KA/R	Remote Alarm LED (Red) and Key-Operated Test/Reset Switch
MS-RH/KA/P/R	Remote Alarm Horn, Alarm LED (Red), Pilot LED (Green) and Key-Operated Test/Reset Switch



CSFM LISTED

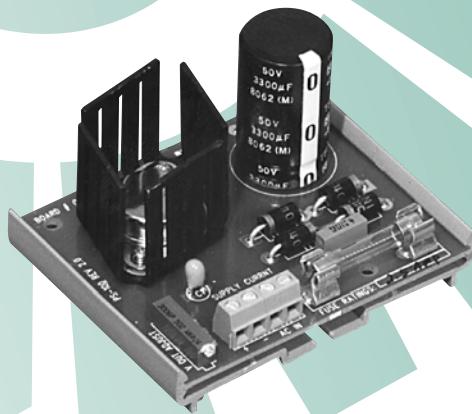


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We have conscientiously established a worldwide reputation as an industry leader by maintaining leading-edge design technology, prompt technical support, and a commitment to on-time deliveries. We take pride in our Quality Management System which is ISO 9001 certified, assuring our customers of consistent product reliability.

GREYSTONE ACCURACY BY DESIGN

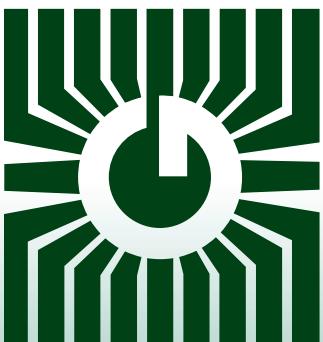
REGULATED DC POWER SUPPLIES PS Series



Precision power
supplies

FEATURES:

- 24 VAC input/DC output
- Factory set @ 24 VDC out
- Adjustable voltage output
- Full or half wave rectified
- Snap track mounted
- Fuse protected

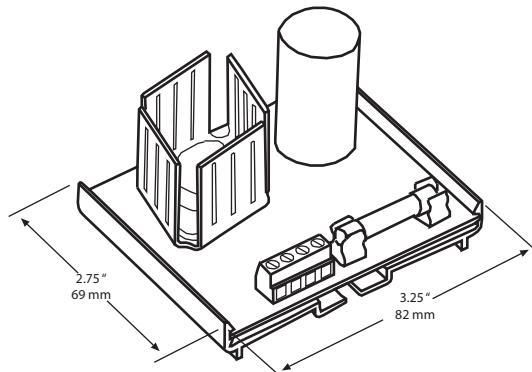


*Peace of mind
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power supplies*

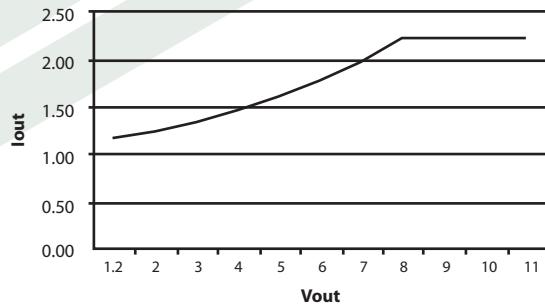
GREYSTONE HAS AN ISO 9001 REGISTERED QUALITY SYSTEM

SPECIFICATIONS:

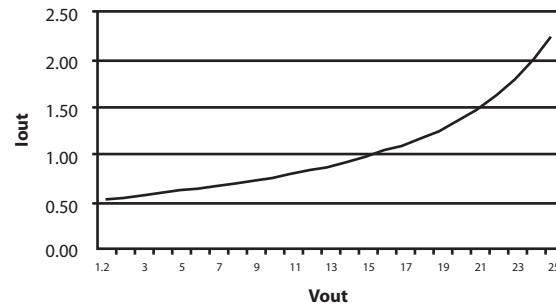
MODEL	PS1X0
Input Voltage	5 - 30 VAC
Output Voltage	Factory set to 24 VDC, Field Adjustable 2 - 27 VDC
Output AC Ripple	<200 mV RMS
Output Current: (max)	1.5A (PS100-1) and (PS110-1) 3.0A (PS100-3) and (PS110-3)
Supply Regulation	2%
Overcurrent Protection	2.5A Fuse (PS100-1) and (PS110-1) 5.0A Fuse (PS100-3) and (PS110-3)
Operating Temperature	0° - 70°C (32° - 158°F)
Dimensions: L x W x H	82 mm x 69 mm x 48 mm (3.25" x 2.75" x 1.90")



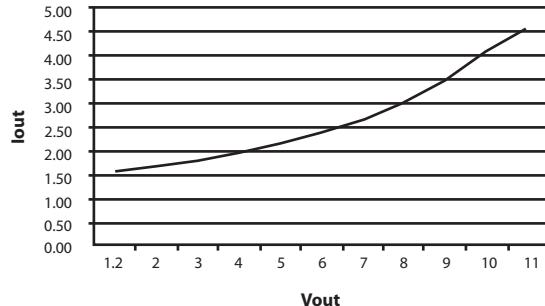
PS1X0-1 Safe Operating Range - 12 VAC Input



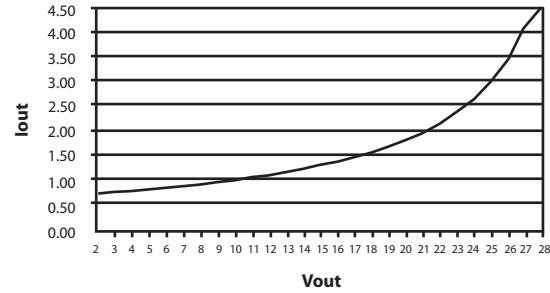
PS1X0-1 Safe Operating Range - 24 VAC Input



PS1X0-3 Safe Operating Range - 12 VAC Input



PS1X0-3 Safe Operating Range - 24 VAC Input



PRODUCT ORDERING INFORMATION

- PS-100-1 24 VAC/24 VDC @ 1.5 Amps, Adjustable full wave rectified
- PS-110-1 24 VAC/24 VDC @ 1.5 Amps, Adjustable half wave rectified
- PS-100-3 24 VAC/24 VDC @ 3.0 Amps, Adjustable full wave rectified
- PS-110-3 24 VAC/24 VDC @ 3.0 Amps, Adjustable half wave rectified



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ACCURACY BY DESIGN

WATER DETECTOR WD-100 Series



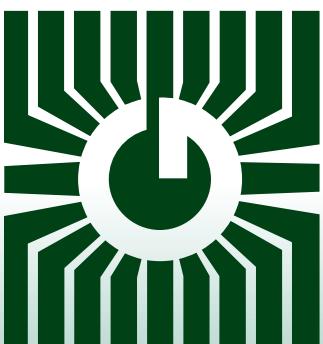
WD-100-XX - Water Detector c/w Conductivity Cable



WD-100 - Water Detector Standalone



WD-102 - Water Detector c/w Remote Sensor



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WATER DETECTOR - WD100 SERIES

DESCRIPTION:

The WD100 is a microchip-based device that uses gold-plated sensing probes to detect the presence of water or other conductive liquid. The WD100 is powered by an AC or DC source, 14 - 30 volts. It features normally open and normally closed (form C) relay contacts rated at 5A @ 120 VAC/30 VDC for connection to a monitoring system, or direct control of another device. The mounting legs will allow a sensing height adjustment from 0" to 1/2". The WD100 is designed to signal an alarm if one or more of three conditions are met: water is detected, power is lost to the unit, or if there is an internal failure. The WD100 provides the highest level of water detection confidence.

The WD-102 operates on the same principle as the WD-100 but comes with a 5 ft. remote probe. For custom lead lengths please contact Greystone.

The WD-100-xx Series c/w the specified length of conductivity cable. See ordering information for available lengths.

SPECIFICATIONS:

Power supply:	14 - 30 VAC/DC
Supply current	60mA max @ 24 VDC, (no water)
Operating temperature:	-40°C - 85°C (-40°F - 185°F)
Enclosure dimension (LxWxH):	127 x 127 x 102 mm 5-3/8" x 5-3/8" x 4" (max)
(mounting legs@ max/min height):	127 x 127 x 89 mm 5-3/8" x 5-3/8" x 3-1/2" (min)
Alarm output:	Form C relay, rated @ 5 amps @ 120 VAC / 30 VDC (resistive load)

APPLICATIONS:

The following chart gives examples of what types of fluids the WD100 can and can not be used to detect.

Fluids that can be detected	Fluids that can't be detected
City water	Pure water
Sea water	Gasoline
Copper sulfate solution	Oil
Weak acid	Brake fluid
Weak base	Alcohol
Household ammonia	Ethylene glycol
Water & glycol mixture	Paraffin
Wet soil	Dry soil
Coffee	Whiskey

OTHER FEATURES:

Fail-safe circuitry
Reverse acting contacts
Reverse voltage protection
RFI/EMI noise immunity

ORDERING INFORMATION:

WD-100 - Stand Alone
WD-102 - Remote Probe (5')
WD-100-5 - c/w 5' conductivity cable
WD-100-10 - c/w 10' conductivity cable
WD-100-25 - c/w 25' conductivity cable
WD-100-50 - c/w 50' conductivity cable
WD-100-100 - c/w 100' conductivity cable

Custom lengths available upon request



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GENERAL PURPOSE RELAYS

LY2N Series



FEATURES:

- High switching power
- Compact size
- 10A switching capacity
- 2 pole configuration
- DC or AC coils
- High sensitivity

DESCRIPTION:

The LY2N series industrial relays in conjunction with the PTF08A0E base can be used for a wide range of commercial or industrial applications.

The LY2N has a 2 pole change-over configuration. Its wide terminals allow reliability at large currents.

GENERAL SPECIFICATIONS:

Contact Configuration	2 change over (DPDT) -2 form C 10A	Ambient Humidity	35% to 85%
Nominal Coil Power	0.9 W DC - 1.2VA AC	Vibration resistance	10 to 55Hz, 1mm (0.04") double amplitude
Operating Time (at nominal voltage)	≤25ms	Shock resistance (Functional)	200m/s ² (200G)
Release Time (at nominal voltage)	≤25ms	Termination (Relay)	Flanges (blades) 5 mm (0.20")
Ambient Temperature	-25°C to 55°C (-13°F to 131°F)	Construction	Duct Cover
		Weight	40g (1.41oz)

Coil Characteristics, DC @ +23°C (+73°F), coil power 900mW

Coil Code	Nominal Voltage Vdc	Pick-up Voltage Vdc	Drop-out Voltage Vdc	Max. Allowed Voltage Vdc	Coil Current mA	Coil Resistance Ω
12	12	9.6	1.2	13.2	75	160
24	24	19.2	2.4	26.4	36.9	650

Coil Characteristics, AC @ +23°C (+73°F), coil power 1.2VA

Coil Code	Nominal Voltage Vac	Pick-up Voltage Vac	Drop-out Voltage Vac	Max. Allowed Voltage VAC	Coil Current mA		Coil Resistance Ω
					50Hz	60Hz	
A24	24	22.4	7.2	26.4	53.8	46	180
A120	120	96	36.0	132	10.8	9.2	4430



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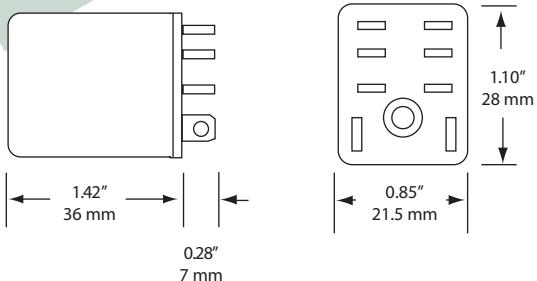
PRODUCT ORDERING INFORMATION:

SERIES	DESCRIPTION
LY2N	10 amp contacts, DPDT w/ Neon Light
CODE	COIL VOLTAGE
12VDC	Low voltage DC, 12 VDC
24VDC	Low voltage DC, 24 VDC
24VAC	Low Voltage AC, 24 VAC
120VAC	High voltage AC, 120 VAC

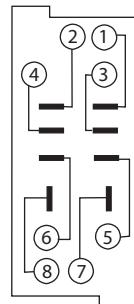
LY2N	24VDC
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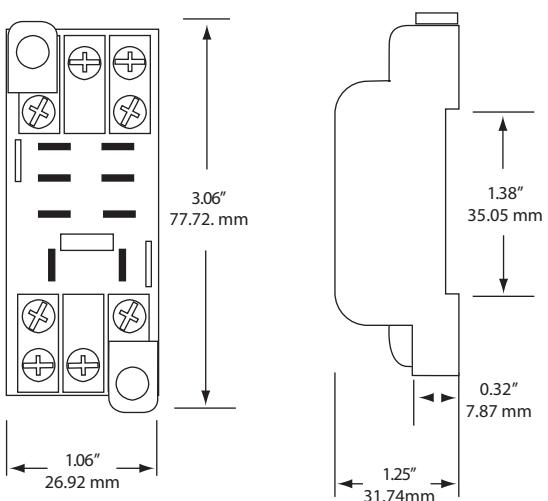
DIMENSIONS: LY2 Relay - Omron



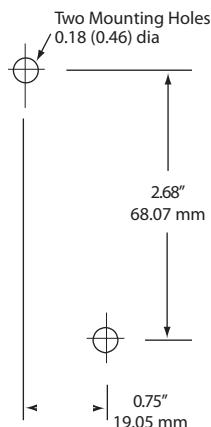
WIRING DIAGRAM:



PTF08A-E Base



DRILLING PATTERN:



V.02/10

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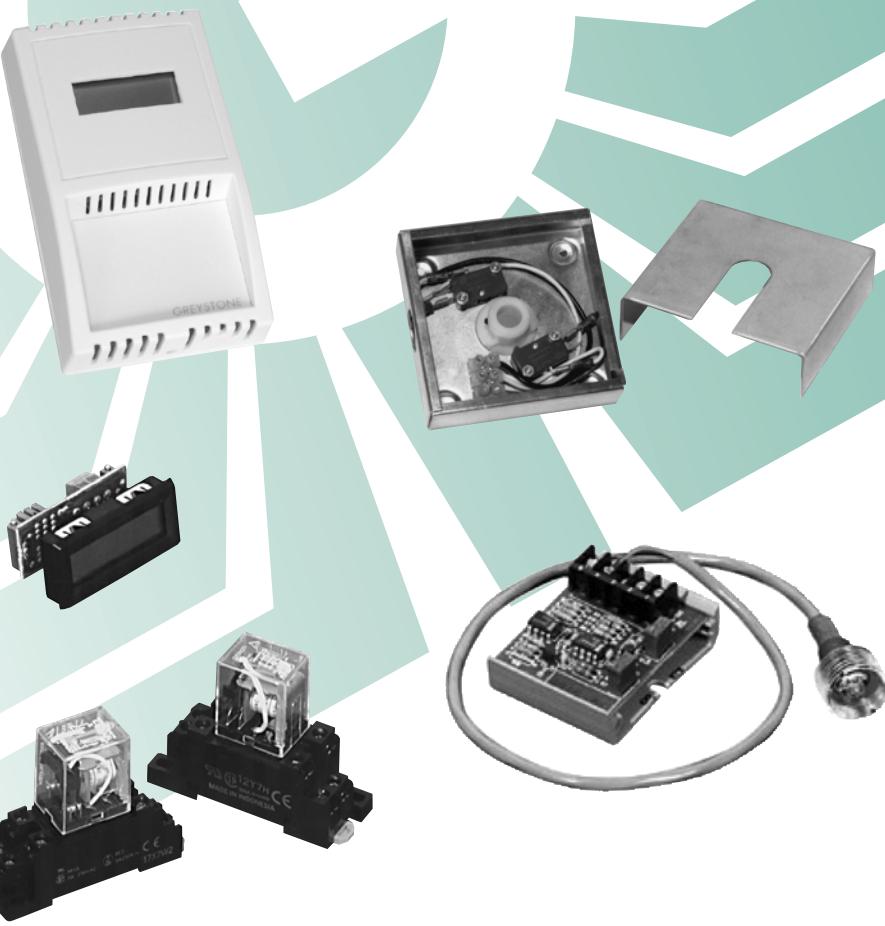
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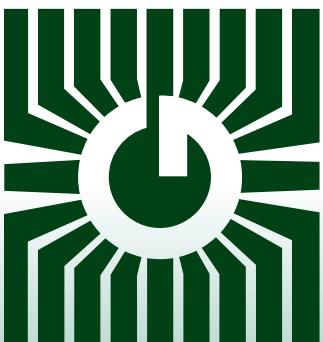
ACCURACY BY DESIGN

MISCELLANEOUS CONTROL DEVICES



PRODUCTS:

- Light sensor/transducer - PSR series
- Loop powered indicator - Executive Enclosure
- Loop powered indicator - LPI series
- Damper end switch - DES-100 series
- General purpose relays - LY & MY & MK series



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LIGHT SENSOR - PSR SERIES

DESCRIPTION:

The PSR-1 is a Light Sensitive Resistor that may be used as an input to indicate the presence of light at the sensor location. The PSR-1-T is a PSR-1 coupled with a B420-P transmitter. The PSR-1-T produces a 4 - 20mA output signal. The sensor is designed to be mounted in the end of a weatherproof conduit box.

SPECIFICATIONS:

PSR-1 Output (non-linear)

>1 MΩ in dark
<1.5 kΩ in bright light

Temperature

-25°C to 75°C
(-13°F to 167°F)

PSR-1-T Power Max current draw Output (linear)

12 - 35 VDC
22mA
4 - 20mA (current limited to 22mA)
-25°C to 75°C
(-13°F to 167°F)

Temperature

APPLICATION:

The PSR-1 has a resistance in darkness in excess of 1 MΩ and resistance in bright light of less than 1.5 kΩ.

The PSR-1 and PSR-1-T indicate the presence or absence of light. They should not be used for foot-candle control of occupied spaces. The PSR-1-T is calibrated for 4mA in bright light > 100 foot-candles and 20mA in darkness < 0.1 foot-candles.

PSR: PRODUCT ORDERING INFORMATION

MODEL	PRODUCT DESCRIPTION	
PSR	RESISTIVE LIGHT SENSOR	
CODE	OPTIONS	
1	Sensor only	
T	4 - 20mA Transmitter	
E	Weatherproof Enclosure	

EXAMPLE:

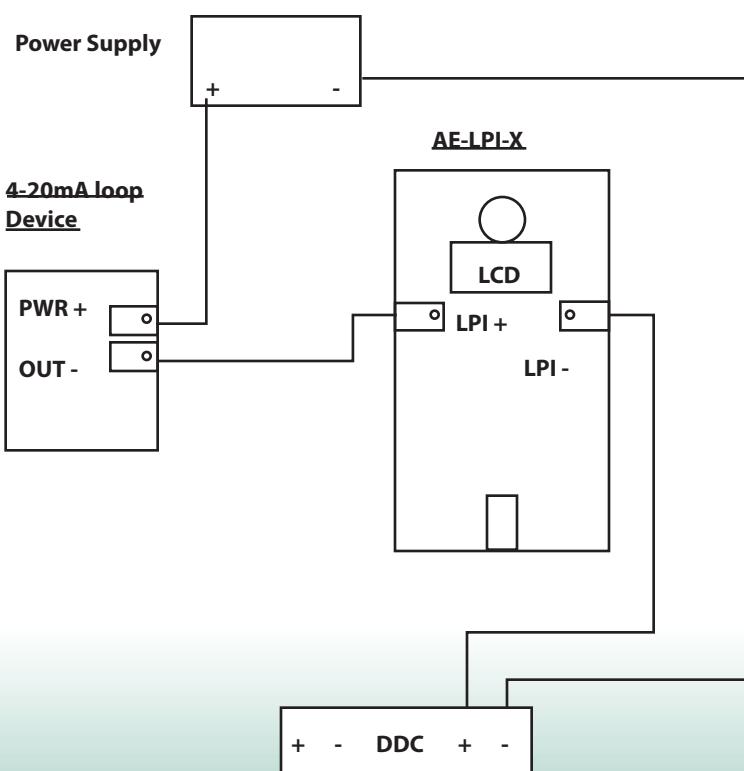
Light sensor c/w 4 - 20mA output in weatherproof enclosure

PSR-1-T-E

LOOP POWERED INDICATOR-EXECUTIVE ENCLOSURE SERIES

DESCRIPTION:

The AE-LPI-X is a loop powered indicator in an executive space enclosure. The indicator is factory calibrated for a specific temperature range or 0-100% RH.



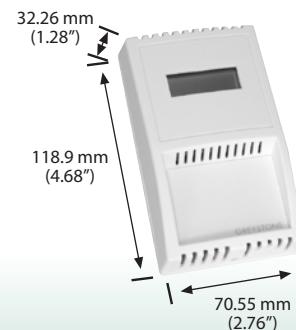
SPECIFICATIONS:

Power Supply.....	12 to 30 Vdc loop powered
Display Units	C or F (Factory set)
Display Range	As per order
Display Resolution	0.1 C or 0.1 F for display of 00.0 to 99.9
Display Size	24 mm W x 11 mm H (0.95" x 0.45") three digit
PCB Operating Temperature ...	0 to 70 C (32 to 158 F)
PCB Operating Humidity	0 to 95% RH (non-condensing)
Wiring Connections	Two wires, screw terminal block, (14 to 22 AWG)
Manufacturing Process	ISO 9001 Certified
Internal Adjustments	Clearly marked ZERO and SPAN pots

ORDERING:

AE-LPI-X
X- Suffix Equals

- 1- 0-35 C
- 2- 0-50 C
- 3- 0-100 C
- 7F- 0-50 F
- 7K- 0-100 F
- RH- 0 to 100% RH



GREYSTONE ENERGY SYSTEMS, INC.



DAMPER END SWITCH - DES-100 SERIES

DESCRIPTION:

The damper position switch is a mechanically activated electrical switch which provides accurate and reliable indication of damper blade position. Unlike standard limit switches which only indicate damper drive linkage position, the position switch is mounted directly on the main damper drive axle or on an auxiliary axle off of an indirectly driven blade. This assures true damper blade position indication.

ORDERING:

DES-100 - Provides two output signals to indicate a fully open and fully closed position.

DES-101 - Provides two output signals that act as a double pole switch.

DESIGN FEATURES:

- Adjustable axle mounted collar provides for easy set-up and adjustment minimizing labour costs.
- Electrical enclosure has a 1/2" knockout which allows for quick and easy installation.
- Dual, opposed switches in the same enclosure provide for indication of fully open or closed.
- Switches can be set by user as NC or NO (form A or B)
- Fits 1/2" shaft only

SWITCH RATINGS:

- 4A at 125 VAC

LOOP POWERED INDICATOR LPI-1 - 4-20mA

DESCRIPTION:

LPI-1 loop powered indicators with large 3-1/2 digit LCD are designed to display any 4 to 20mA signal directly in the engineering units of the measured media. The display is powered directly by the measured 4 to 20mA signal so there is no need for a power supply.

SPECIFICATIONS:

Supply voltage	• Powered by milliamp control loop
Input	• 4 - 20mA dc
Impedance	• 300 ohms nominal
Accuracy	• $\pm 0.1\%$ of scale
Adjustments	• SPAN (GAIN) and ZERO (OFFSET)
Decimal point	• 3 positions or none (user selectable)
Range	• -1999 to +1999
Operating temp.	• 0°C to 50°C (32°F to 122°F)
Humidity	• 95% Non-condensing
Connection	• 2 pin screw terminal
Cutout required	• 25.1 mm (0.988") x 55.5 mm (2.19")
Panel clearance	• 40 mm (1.6")
Display	• 3-1/2 digit
Digits size	• 11.43 mm (0.45") LCD
Dimensions	• 35.5 mm (1.4") H x 58.67 mm (2.31") W

APPLICATIONS:

- Temperature indication
- Pressure indication
- Kilowatt demand
- Voltage indication
- Humidity indication
- Differential or static pressure
- Gallons per minute flow
- Current indication
- Other 4 - 20mA indications

FEATURES:

- Snap in panel mounting
- Large easy to read LCD display
- Optional NEMA 4X enclosure
- Pre-calibrated for desired range (optional)
- Optional selector switch for multiple indicators on one display unit

NOTE:

Impedance is rated at 24 VDC and 20mA. Exercise caution to avoid too much impedance in the current loop. Most transmitters are rated 500 to 750 ohms.





Greystone's head office and factory is located on the east coast of Canada, in Moncton NB. Over the past 10 years, we have strategically opened offices throughout the world to better serve our customers. Additionally, we have created partnerships in specific areas for distribution of Greystone products. For more information on our products or to check for a distributor in your area, please contact the closest office from the list below. If you are interested in becoming a distributor in an open territory, please contact the Area Manager as listed on our website.



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