

Control Systems, Inc.

P.O. Box 4852
Jackson, MS 39296

Phone: 601-355-8594
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INVOICE

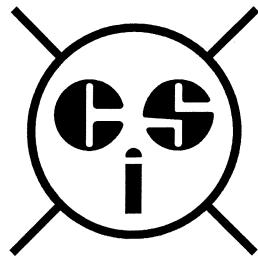
Invoice Number: 39401
Invoice Date: Nov 20, 2008
Page: 1

| Bill To: |
|--|
| TOWN OF MIZE P.O. BOX 68 MIZE , MS 39116 |

| Ship to: |
|------------------|
| CUSTOMER PICK UP |

| Customer ID | | Customer PO | Payment Terms | | |
|---------------------|-------------|---|----------------------|-----------------|---------------|
| MIZE | | 929600 | Net 30 Days | | |
| Sales Rep ID | | Shipping Method | Ship Date | Due Date | |
| RS | | CUSTOMER | 11/20/08 | 12/20/08 | |
| Quantity | Item | Description | Unit Price | Amount | Job ID |
| 1.00 | AS-BUILTS | ELEVATED TANK TRANSMITTER PANEL OIL POT | 2,062.00 | 2,062.00 | 36727 |
| 1.00 | | ELEVATED TANK LEVEL CONTROL PANEL | 1,464.00 | 1,464.00 | 36727 |
| 1.00 | | ALARM LIGHT INSIDE ENCLOSURE TO BE FIELD MOUNTED BY OTHERS | | | 36727 |
| 4.00 | | "AS-BUILTS" MAILED SEPARATE FROM INVOICE | | | 36727 |

| | |
|------------------------|-----------------|
| Subtotal | 3,526.00 |
| Sales Tax | |
| Freight | |
| Total Invoice Amount | 3,526.00 |
| Payment/Credit Applied | |
| TOTAL | 3,526.00 |



CONTROL SYSTEMS, INC.

P.O. Box 4852, Jackson, Mississippi 39296-4852
PHONE (601) 355-8594 FAX (601) 355-8774

ELEVATED TANK LEVEL TRANSMITTER & LEVEL CONTROL PANEL(S)

MIZE, MS

2008

**CUSTOMER: TOWN OF MIZE
P.O.# 929600**

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JOB NO.: 36727

DATE: November 14, 2008

VISIT OUR WEBSITE AT [HTTP://WWW.CONTROLSYSINC.COM](http://WWW.CONTROLSYSINC.COM)

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General

WARRANTY STATEMENT

Warranties to distributors and other commercial customers. Control Systems, Inc. warrants equipment manufactured by it to be free from defects in materials and workmanship for a period of one (1) year from date of shipment by Control Systems, Inc. If within such period any such equipment shall be proved to Control Systems, Inc. satisfaction to be defective, such equipment shall be repaired or replaced at the option of Control Systems, Inc. Repair parts may be new parts, used parts, rebuilt parts, or exchange parts, at the option of Control Systems, Inc. This warranty shall not apply (a) to equipment not manufactured by Control Systems, Inc., (b) to equipment which shall have been repaired or altered by others than Control Systems, Inc. so as, in its judgement, to affect the equipment adversely, or (c) to equipment which shall have been subjected to negligence, accident or damage by circumstances beyond the control of Control Systems, Inc. or to improper operation, maintenance or storage, or to other than normal use or service. With respect to equipment not manufactured by Control Systems, Inc., the warranty obligations of Control Systems, Inc. shall in all respects conform to and be limited to the warranty actually extended to Control Systems, Inc. by its supplier. The foregoing warranties do no cover reimbursement for transportation, removal, installation, or other expenses which may be incurred in connection with repair or replacement.

This warranty is expressly in lieu of any other warranties, expressed or implied, including, but not limited to, any warranty of merchantability or fitness for a particular purpose. Remedies under this or any warranty are expressly limited to repair or replacement as specified above, and such repair or replacement constitutes the sole and exclusive remedy. Under no circumstances shall Control Systems, Inc. be liable for any claims for loss or damage of any kind, for injuries to any person or property caused either directly or indirectly by the equipment. Any and all claims for direct special, indirect or consequential damage for any person or property or for any other economic loss are expressly excluded, whether arising out of failure of the equipment to operate for any period of time or out of any defects of the equipment or for any other reason. Except as may be expressly provided in an authorized writing by Control Systems, Inc., Control Systems, Inc. shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured by Control Systems, Inc. or services rendered by Control Systems, Inc.

ALL PANELS
ELECTRICAL SYMBOLS

PAGE G2

| <u>SYMBOL</u> | <u>DESCRIPTION</u> |
|--|---------------------------------------|
| — | FACTORY WIRING |
| - - - - - | FIELD WIRING |
| Ø | TERMINAL |
| CR1 (RELAY DESIGNATION) 22 (LINE NO. LOCATION OF COIL) | NORMALLY OPEN INSTANTANEOUS CONTACT |
| X | NORMALLY CLOSED INSTANTANEOUS CONTACT |
| TR1 (TIMER DESIGNATION) 10S. (TIME SETTING) | NORMALLY OPEN TIMED CLOSED CONTACT |
| O O | NORMALLY CLOSED TIMED OPEN CONTACT |
| O O | NORMALLY OPEN TIMED OPEN CONTACT |
| O O | NORMALLY CLOSED TIMED CLOSED CONTACT |
| (DEVICE DESIGNATION) CR1 22, 23 (LINE NO. LOCATION OF N.O. CONTACT) (LINE NO. LOCATION OF N.C. CONTACT) | DEVICE COIL |
| O O | NORMALLY OPEN FLOAT SWITCH |
| O O | NORMALLY CLOSED FLOAT SWITCH |
| O O | NORMALLY OPEN PRESSURE SWITCH |
| O O | NORMALLY CLOSED PRESSURE SWITCH |
| R PL (COLOR INSERT) | PILOT LIGHT |
| R PL | PUSH-TO-TEST PILOT LIGHT |
| OFF (NAMEPLATE) ON OFF ON (X-DENOTES SWITCH CLOSED) | TWO POSITION SELECTOR SWITCH |
| MAN OFF AUTO MAN OFF AUTO (X-DENOTES SWITCH CLOSED) | THREE POSITION SELECTOR SWITCH |
| 20/1 (AMPERE AND NO. OF POLES) | CIRCUIT BREAKER |
| FH37 (HEATER SIZE) | OVERLOAD RELAY |

NITW January 14, 1983
Industrial Control Panels

CONTROL SYSTEMS INC. JACKSON MS 39216 E84896 (N)

Industrial control panels for general use.

P O BOX 4852

LOOK FOR LISTING MARK ON PRODUCT

Replaces E84696 dated Dec. 2, 1982.
457833001 **Underwriters Laboratories Inc.***

F1V0092917

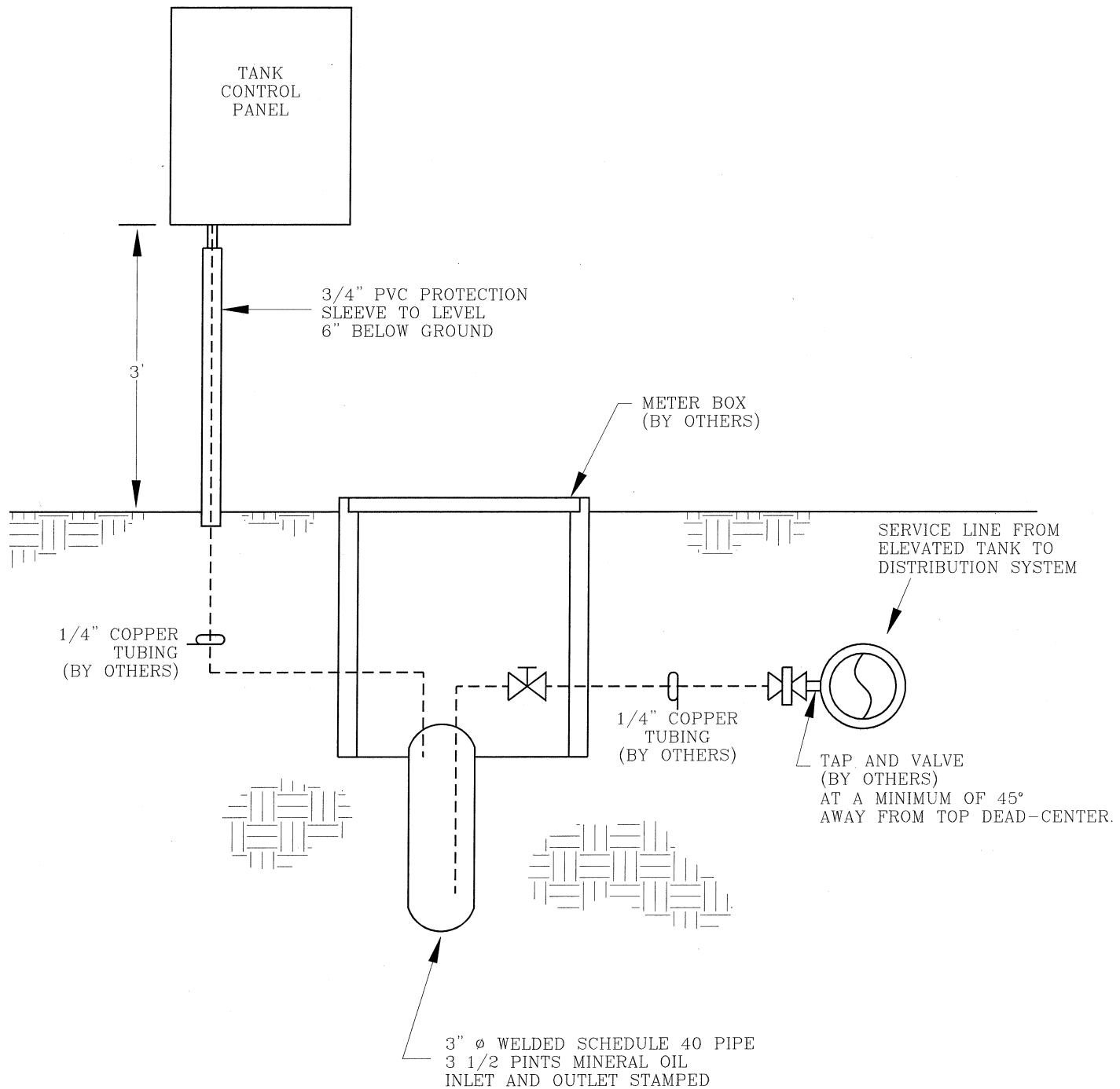
START-UP / FIELD TERMINATION CHECK LIST

1. Has control panel ground lug been properly attached to earth ground rod? Problems caused by ungrounded control panel are not covered under warranty.
2. Have conduits been properly sealed? Problems due to corrosion caused by unsealed conduits are not covered under warranty.
3. Have overloads been checked and set for actual full load amps of motor?
4. Motor Monitors MUST BE FIELD SET based on actual motor full load amps. Please refer to catalog cutsheet page C231B for instructions on setting the running amps setpoint and the high amps setpoint. Set the running amps setpoint to 20% below the actual full load amps. Set the high amps setpoint to 10% above the actual full load amps. (*Do NOT set the motor monitor using the motor nameplate full load amps.*) **IF APPLICABLE**
5. Check and tighten all power connections, i.e. main lugs, all circuit breakers, line and load side of starters and overload relays.
6. Wiring Note:
 - A. D Prefix = DC Low Voltage = Blue Wire
 - B. All Others = 120Vac Minimum
 - C. DC Low Voltage conductors shall be installed in separate conduit from AC conductors per national electrical code.

ELEVATED TANK LEVEL TRANSMITTER PANEL

ELEVATED TANK LEVEL TRANSMITTER PANEL
INSTALLATION INSTRUCTIONS

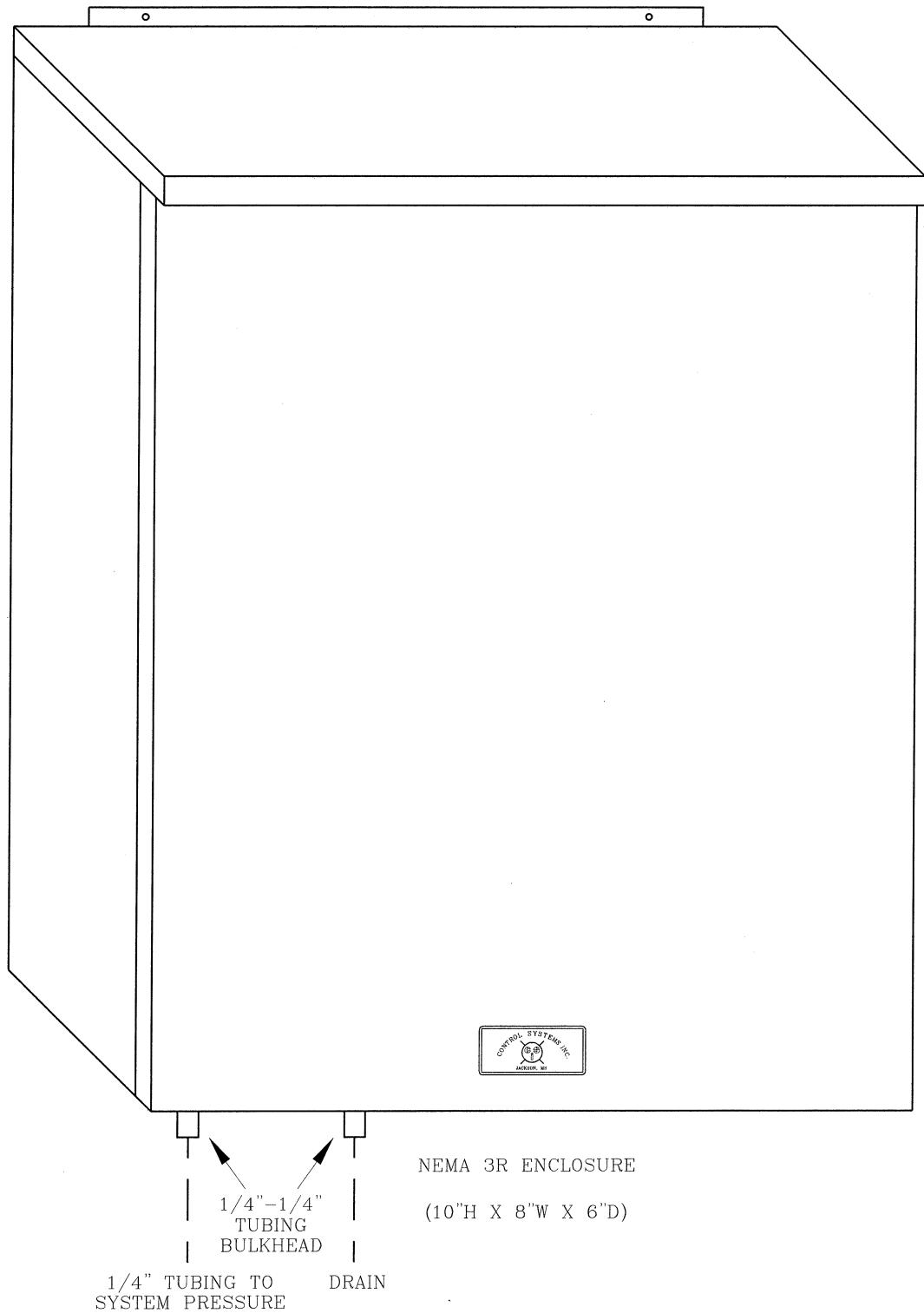
PAGE 1P1



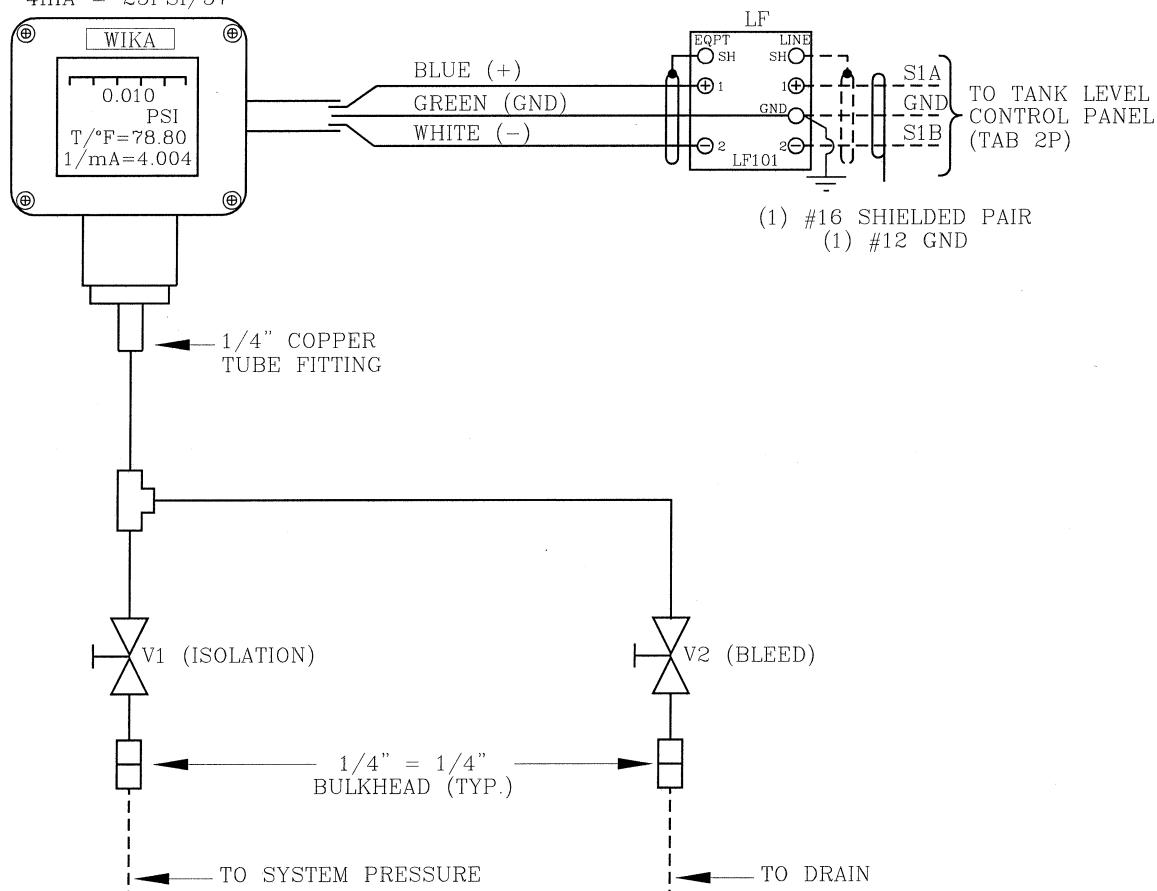
NOTE: OIL POT HAS 1/4" NPT MALE FITTINGS.

ELEVATED TANK LEVEL TRANSMITTER PANEL
PHYSICAL LAYOUT

PAGE 1P2



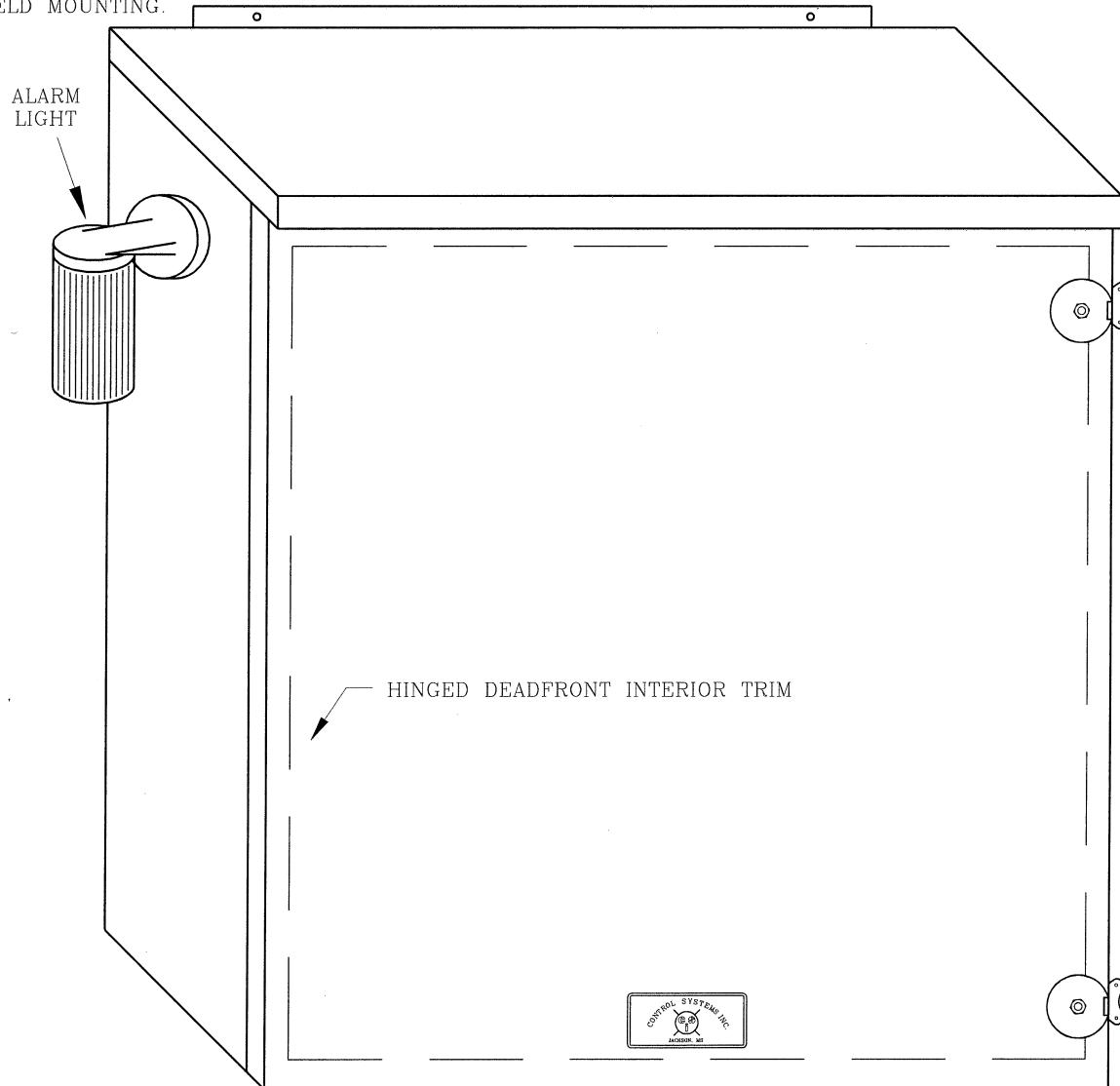
LEVEL TRANSMITTER
0-100 PSI (RATED RANGE)
4-20mA = 0-35' (SPAN)
35' = OVERFLOW LEVEL
20mA = 40PSI/92'
4mA = 25PSI/57'



| QTY | SYM | MFR | CAT # | DESC | PAGE # |
|-----|-------|----------|---------------------------|--|--------------|
| 1 | ETPLT | CSI | ETPLT-100 | Pressure/level Transducer (0-100 PSI) UT-10 | C222-C222A |
| 1 | | CSI | Oilpot "SHIP SEPARATE" | Oilpot 1/4" Npt Male Fittings | N/A |
| 1 | LF | CSI | LF101-B | Small Signal Line Filter,30V | C243-C243A |
| 2 | V1/V2 | Grainger | 6GD11 | 1/4" Ball Valve | C455 |
| 1 | | Hoffman | A-10R86HCR | NEMA 3R Enclosure 10X8X6 | C481 - C481A |

ELEVATED TANK LEVEL CONTROL PANEL

* ALARM LIGHT
SHIPPED INSIDE
CABINET FOR
FIELD MOUNTING.

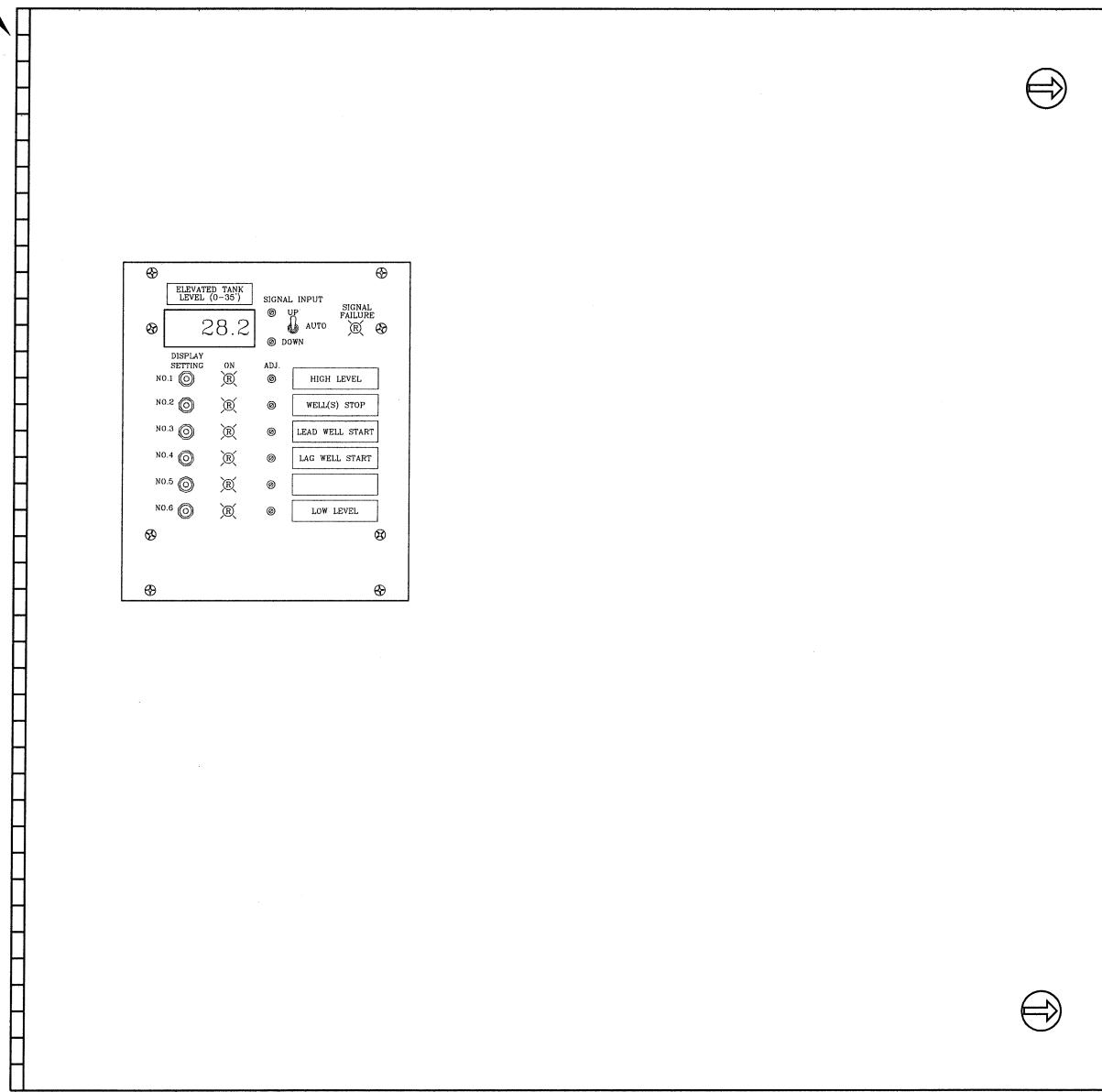


NEMA 3R ENCLOSURE
(20"H X 20"W X 8"D)

ELEVATED TANK LEVEL CONTROL PANEL
DEADFRONT DETAIL

PAGE 2P2

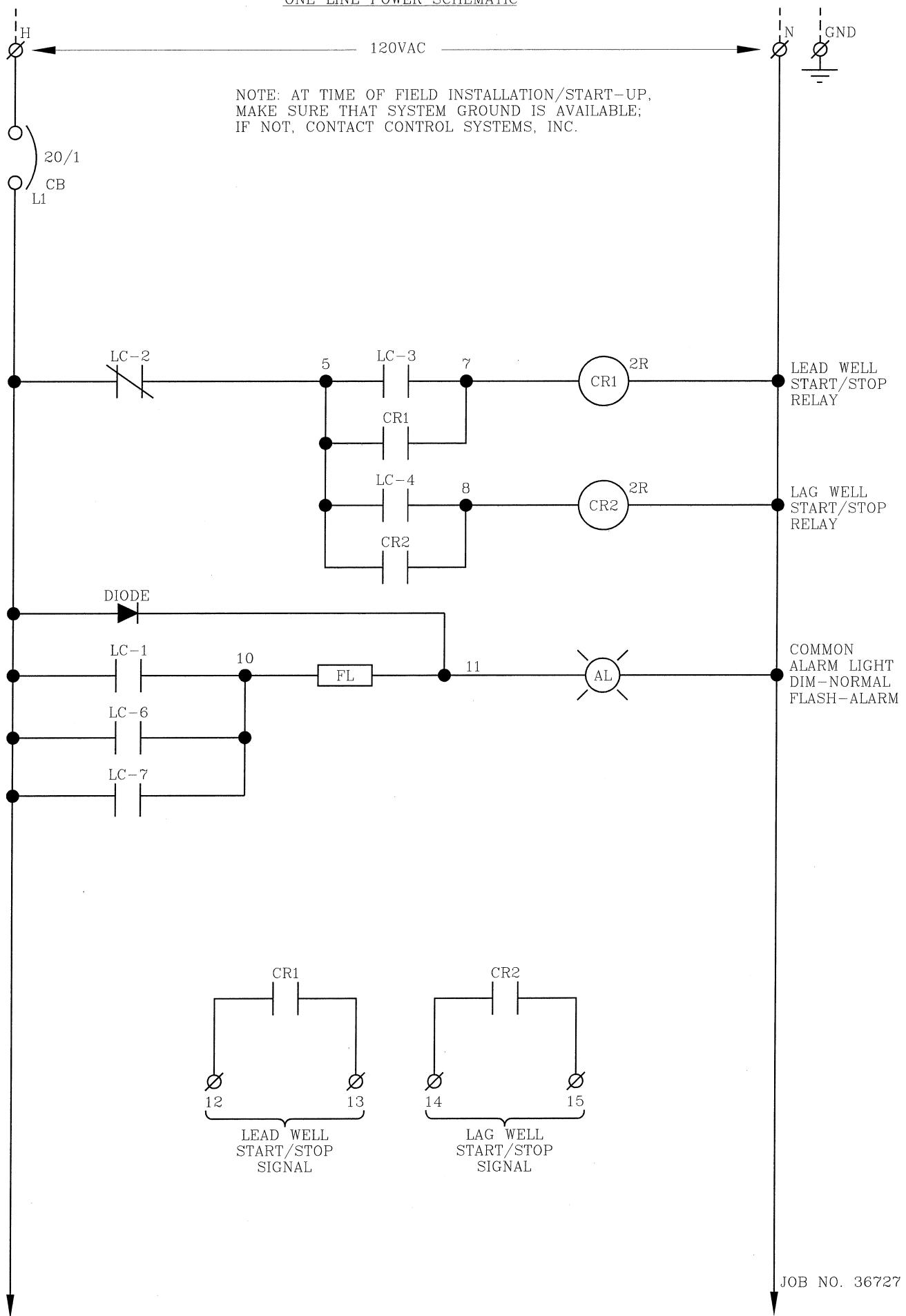
CONTINUOUS HINGE



ANODIZED ALUMINUM DEADFRONT

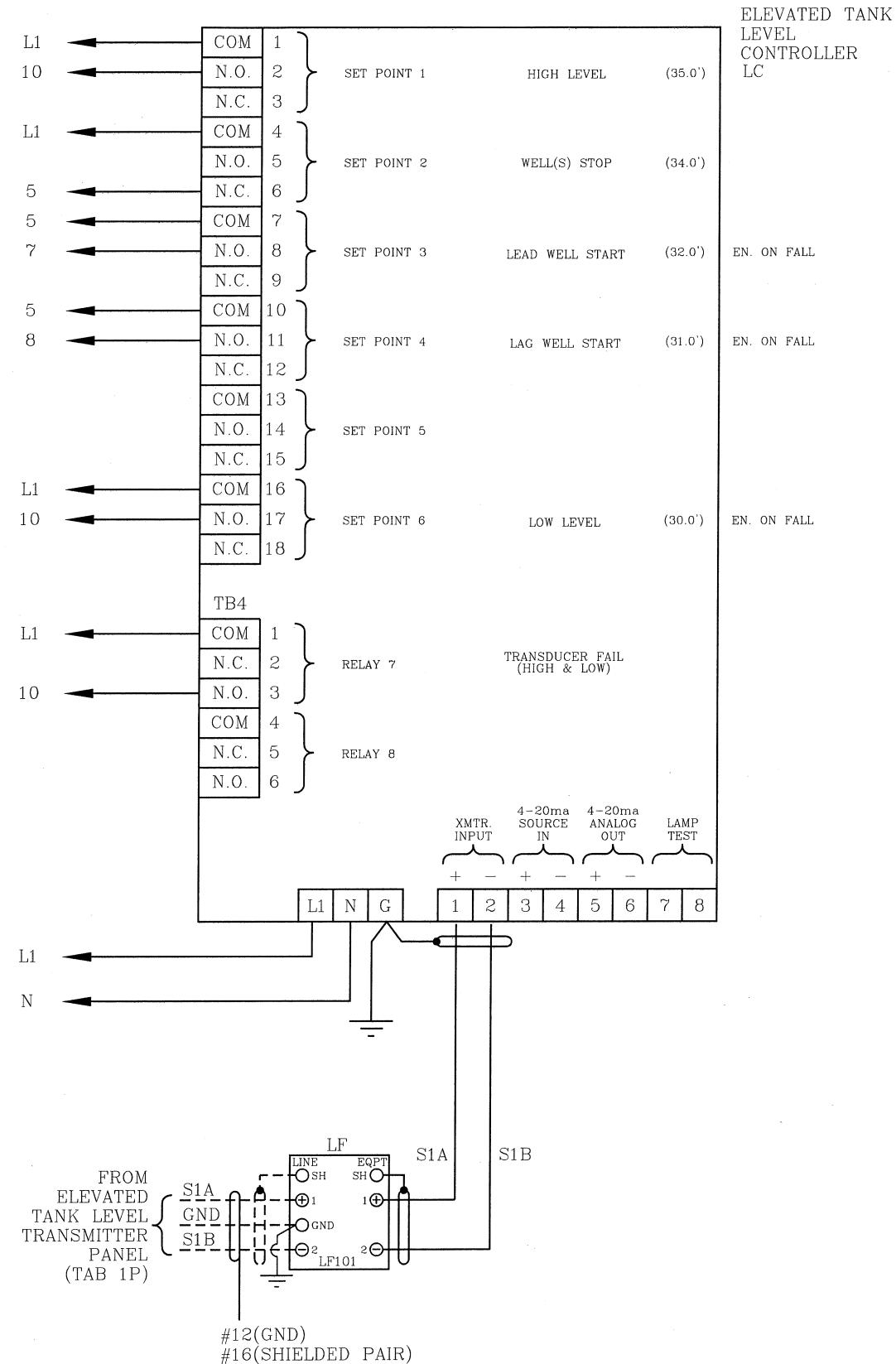
ELEVATED TANK LEVEL CONTROL PANEL
ONE LINE POWER SCHEMATIC

PAGE 2P3



ELEVATED TANK LEVEL CONTROL PANEL
CONTROL SCHEMATIC

PAGE 2P4



| QTY | SYM | MFR | CAT # | DESC | PAGE # |
|-----|-----|----------|--------------------------------------|--|-------------|
| 1 | LC | CSI | MPCT6B with Alarm Board | 6 Point Meter/controller | C218-C218C |
| 1 | LF | CSI | LF101-B | Small Signal Line Filter,30V | C243-C243A |
| 2 | 2R | CSI | 2RB-120VAC | DPDT Relay, 120VAC With Indicating Light | C292-C292A |
| 1 | | Hoffman | A-20R208HCR | NEMA 3R Enclosure 20X20X8 | C483 - C484 |
| 1 | DI | Motorola | N-4007 | Diode | C607 |
| 1 | AL | RAB | VBR100 / GL100PGR "SHIP SEPARATE" | Wall Mounted Alarm Light With Red Lexan Globe | C718, C718A |
| 1 | CB | Square D | QOU120 | Circuit Breaker 20 Amp, 1 Pole, 120V | C791-C791A |
| 1 | GND | Square D | PK9GTA | Equipment Ground Bar | C823 |
| 1 | FL | SSAC | FS126 | Flasher, 120V, Fullwave | C836 |

CATALOG DATA



Control Systems, Inc.

PRODUCT DATA BULLETIN

BULLETIN
MPCT6B
MULTIPOINT
CURRENT TRIP



STANDARD FEATURES

- 3½ DIGIT LED OR LCD READOUT
- DISPLAY RANGE ADJUSTABLE FROM THE FRONT OF THE UNIT.
- OFFSET ZERO FEATURE
- DIFFERENTIAL INPUT CIRCUITRY
- 250 OHM INPUT IMPEDANCE
- TRANSDUCER OR 4-20maDC INPUTS
- SIX INDIVIDUAL CONTROL POINTS
- SETPOINTS ARE VISIBLE ON DISPLAY
- SIGNAL FAILURE RELAY OUTPUT OPTION WITH FRONT PANEL LED.
- 4-20 ma OR 1-5 vdc OUTPUT
- SIX SPDT DRY CONTACT OUTPUTS
- LAMP TEST
- PANEL MOUNTED
- 120 VAC @ 60 HZ. POWER

DESCRIPTION

The MPCT6B Multipoint Current Trip board is a 115/120 VAC powered, solid-state, proportional level meter/controller. Input level and setpoints are displayed on a 3 ½ digit LED or LCD display. The display can be field adjusted without an external simulator, up to the maximum display of 1999. The input can be a 2-wire transmitter, in which case the MPCT6B supplies the power for the current loop, or an instrument with its own 4-20maDC output. The input is a true differential type to prevent ground loop problems. All settings can be individually displayed on the display for simple adjusting at any time. The display range can be calibrated from the front of the unit and can be zero offset which makes it possible to read elevated levels directly, such as 50ft to 75ft. The display can be offset anywhere within the range of the meter, with a minimum range of 60 counts. Six LED indicators show the condition of each setpoint at all times. Six independent dry contact relay outputs are provided along with a 4-20ma (or 1-5vdc) output. In addition to these six outputs there is a signal failure relay output option that will energize when the input level signal drops below 4ma or goes above 20ma. This option adds two additional relays and a front panel blinking failure LED. For customization, the nameplate has spaces for labeling each setpoint for easy identification.

SUGGESTED SPECIFICATIONS

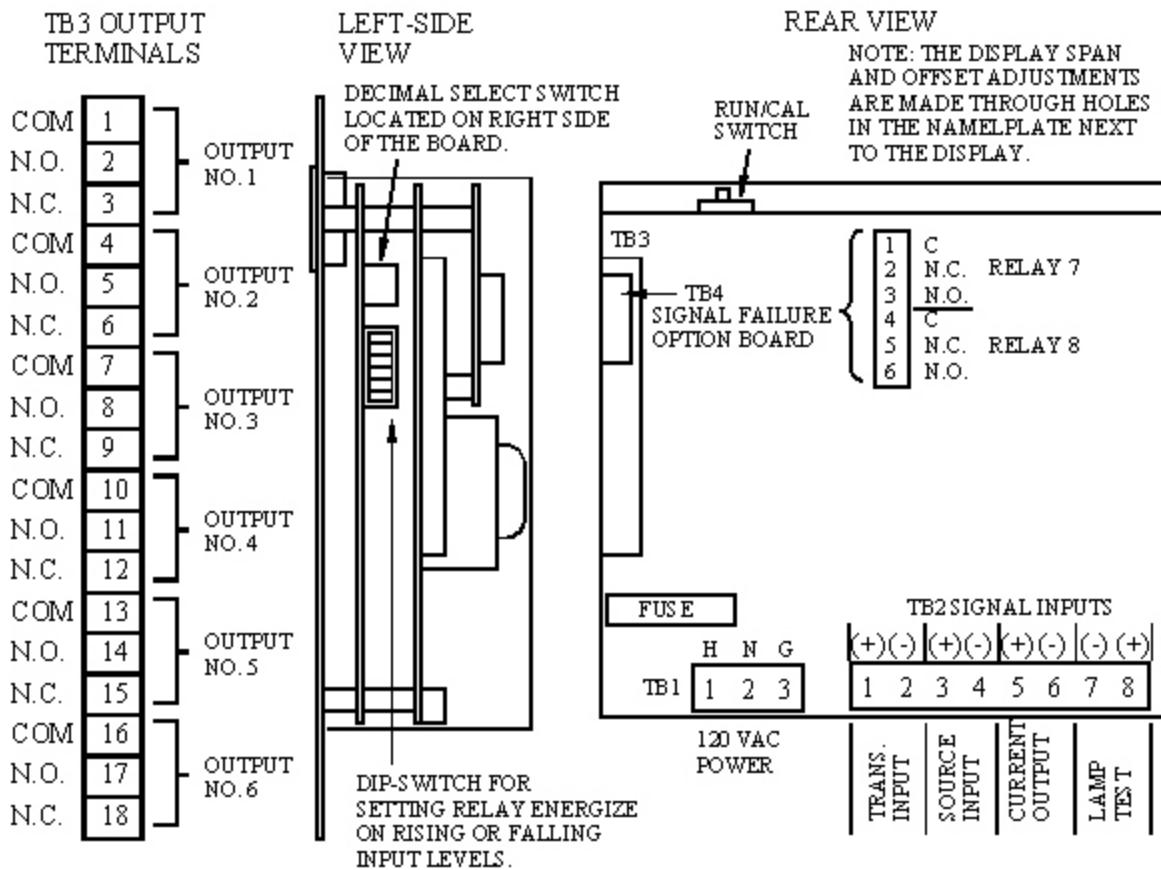
Provide an electronic, solid-state, proportional level meter/controller that will accept a four (4) to twenty (20) milliamp or a one (1) to five (5) volt DC signal, condition the signal to provide a valid basis for control and then perform On/Off or Open/Close discrete dry type set point contact conditions based on the input value of the analog input signal. The level meter/controller shall have the following features: (1) Provided with a 3 ½ digit LED or LCD readout meter. (2) The display shall be capable of being calibrated from the front of the unit (3) The display zero shall be capable of being offset anywhere within the range of the meter, with a minimum range of 60 counts. (4) Provide 6 separate setpoints each with discrete, isolated SPDT relay output contacts. (5) Provide excitation voltage to drive a transducer/transmitter and condition its output signal to provide a continuous display of level. (6) The setpoints shall be field adjustable to operate on rising above or falling below the setpoint. (7) An LED indicator shall be provided for each setpoint to indicate when it is activated. (8) The actual setting of each setpoint shall be able to be displayed on the digital readout at any time. (9) Each setpoint shall be adjustable throughout the complete signal range from the front of the meter/controller. (10) Provide a means of manually ramping the meter/controller up and down, throughout its complete signal range, to test the operation of the setpoints. (11) Provide a signal failure relay option with two relays, to energize when the input signal goes above 20ma or below 4ma. The relays can energize on both high/low conditions or one can energize on high failure and the other on low failure. This failure alarm shall also energize a front panel flashing LED alarm indicator. (12) Provide a 4-20ma or 1-5vdc output signal for additional monitoring and control devices. (13) Input impedance shall be 250 ohms and the output shall be capable of driving at least 500 ohms (14) Provide a lamp test feature to test all front panel LED indicators and digital display.

SPECIFICATIONS

- SUPPLY VOLTAGE: 115/120 VAC, 50/60 Hz.
- SUPPLY CURRENT: 95 ma
- POWER CONSUMPTION: 12 Watts
- INPUT IMPEDANCE: 250 Ohms
- OUTPUT CONTACT RATING: 5 Amps @ 120 VAC, Resistive
- DUTY CYCLE: Continuous
- NAMEPLATE DIMENSIONS: 6 3/4" Wide X 8" High

BULLETIN
MPCT6B
MULTIPOINT
CURRENT TRIP

MPCT6B FIELD CONNECTIONS



ORDERING INFORMATION

Multipoint Current Trip Board (6-point) : MPCT6B
Signal Failure Relay Output Option board : MPCT-ALARM

WARRANTY: Control Systems, Inc. (CSI) warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will replace any component found to be defective on its return to CSI, transportation charges prepaid, within one year of its original purchase. CSI will extend the same warranty protection on accessories which is extended to CSI by the original manufacturer. CSI also assumes no liability, express or implied, beyond its obligation to replace any component involved. Such warranty is in lieu of all other warranties express or implied.



CONTROL SYSTEMS, INC.
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Document Revision: D

MULTIPOINT CURRENT TRIP BOARD (MPCT6B) OPERATIONAL FEATURES

GENERAL DESCRIPTION:

The MPCT6B Multipoint Current Trip board is a 120 VAC powered, solid-state, proportional level meter/controller. Input level and setpoints are displayed on a 3 ½ digit LED or LCD display. The display can be field adjusted without an external simulator, up to the maximum display of 1999. The input can be a 2-wire transmitter, in which case the MPCT6B supplies the power for the current loop, or an instrument with its own power. The input is a true differential type to prevent ground loop problems. All settings can be individually displayed on the display for simple adjusting at any time. The display range can be calibrated from the front of the unit and can be zero offset which makes it possible to read elevated levels directly. The display can be offset anywhere within the range of the meter, with a minimum range of 60 counts. Six LED indicators show the condition of each setpoint at all times. Six independent dry contact relay outputs are provided along with a 4-20ma (or 1-5vdc) output. The optional signal failure relay output will energize when the input level signal drops below 4ma or goes above 20ma. This option adds two additional relays and a front panel blinking failure LED. For customization, the nameplate has spaces for labeling each setpoint for easy identification.

DIGITAL DISPLAY:

The digital display is a 3½ digit (1999 count), .56" high, 7 segment L.E.D. indicator with polarity indication. Adjustments to the display can be made in the field if necessary by means of Zero and Span potentiometers located on the nameplate between the display and the signal ramp test switch. There are two holes through the nameplate that are not labeled, which are the adjustment potentiometers. The Span is on the top and the Zero is underneath it.

Calibration of the display should always be made before attempting to adjust any of the setpoints for the first time. If the display range is changed, all setpoints will have to be readjusted since the settings are relative to the display calibration. Calibration of the display can be made with or without the use of a current simulator. Looking at the rear of the MPCT6B, there is a slide switch that is used to switch between the calibrate and normal (run) modes. Please see the diagram located at the end of this document for visual aid.

The decimal point is switch selectable. The right-angle DIP switch is located on the display circuit board of the MPCT6B next to the digital display. Each decimal point on the display has its own enable/disable switch. Simply select the correct one for the application.

Calibration using a current simulator:

Switch the Run/Cal switch, located at the top of the display board, to the Run position (this is the normal setting). Set the simulator to 4 mAdc output and adjust the Zero pot until the display indicates zero or the desired offset if the input sensor is not mounted at the bottom of the device or an elevated range is desired. The circuit is capable of offsetting the zero setting anywhere within the range of the display (1999 counts), with a minimum range of 60 counts. For example, the display can be calibrated to read from 0 - 60, 0 - 35.0, 100.0 - 125.0 or 1939 - 1999.

Set the simulator to 20 mAdc (full scale) output and adjust the Span pot to indicate the desired full scale reading. NOTE: the decimal place is independently selected.

Repeat the above two steps until no further adjustments are necessary. The Zero and Span adjustments do affect each other, so the adjustments will have to be repeated a several times, depending on the range desired.

Calibration without a simulator:

Switch the Run/Cal switch, located at the top of the display board, to the Cal position. The test toggle switch, located next to the display on the nameplate is used to switch the display between Zero and Full Scale. Hold the switch in the Down position and adjust the Zero pot until the display indicates zero or the desired offset if the input sensor is not mounted at the bottom of the device or an elevated range is desired.

Next, hold the switch in the Up position and adjust the Span pot until the display indicates the desired full scale reading. NOTE: the decimal place is independently selected.

Repeat the above two steps until no further adjustments are necessary. The Zero and Span adjustments do affect each other.

IMPORTANT: When no further adjustments are needed, switch the Run/Cal switch back to the Run position for normal operation.

NOTE: While in the CAL position, the display reading will be meaningless unless the toggle switch is held in either the Up or Down position. When it is in its normal middle position, the display reading will read essentially what will be displayed if the input signal is lost (0 ma).

SIGNAL INPUT SWITCH:

The signal input switch, located to the right of the digital display, is used to manually test the setpoints. This switch will automatically return to the Auto position when released. When held in the Up position, the input signal will ramp up. When the switch is held in the Down position, the signal will ramp down.

NOTE: This switch is used to test the MPCT6B board for proper operation. The output relays are activated according to each setpoint. When using this switch, it is advisable to turn off any motors being controlled by this device and only activate their starters. For a more controlled test of the system, it is recommended to use a transmitter simulator in order to simulate the input.

DISPLAY SETTING SWITCHES:

These switches are used in order to view or set the individually adjusted setpoints. In order to view a setpoint, simply press and hold the desired setpoint switch and the setting will be displayed on the digital indicator. Only press one switch at a time. It does not hurt to press more, but the readings will be meaningless. Please refer to the section on Setpoint Adjustments for more information.

MULTIPOINT CURRENT TRIP BOARD (MPCT6B) OPERATIONAL FEATURES

SIGNAL INPUTS/OUTPUTS:

The MPCT6B controller operates with transmitters that output 4-20 mA or 1-5 Vdc. The board also has separate output terminals that provide 4-20 mA or 1-5 Vdc outputs for additional monitoring and control devices. Please refer to the diagram at the end of this document for the Input Terminal (TB2) connections.

SETPOINT ADJUSTMENTS:

Six individually adjustable settings for completely automatic process control are provided. Each setpoint operates a SPDT relay and has an L.E.D. indicator to show when that setpoint is active. Each setpoint can be adjusted throughout the complete input signal range from the front of the controller. The actual setting of each setpoint can be displayed on the digital readout at any time by pressing the corresponding display setting switch as described on page 1. Each setpoint can be selected to energize its relay either on rising or falling input levels.

Adjusting each setpoint is a simple process with the use of a small adjusting tool or small screwdriver. Before any setpoints are adjusted for the first time, the digital display must be calibrated to the desired range. Please refer to the digital display section for complete adjustment instructions. After the display has been adjusted, determine for each desired setpoint whether the output relay should energize on rising or falling levels. On the rear of the display circuit board (closest to the nameplate) there is a six position DIP switch that controls the relay action for each setpoint on the board. For the relay to energize on rising signal levels, set the corresponding switch to the OFF position. For the relay to energize on falling levels, set the corresponding switch to the ON position.

Next, set each setpoint by depressing and holding the desired display setting switch and turning the corresponding adjustment potentiometer so that the desired setpoint is shown on the display. Repeat this procedure for every desired setpoint. In order to check the settings, press each setpoint's switch one at a time and view the settings on the display.

NOTE: There is a small deadband (approx. 2 percent) associated with each setpoint in order to prevent relay bounce with unstable inputs. Also, be careful when adjusting the setpoints, due to the fact that the input signal is continually being monitored. When a setpoint is adjusted, the output can be activated or deactivated depending on the input signal level.

LAMP TEST OPTION:

The MPCT6B board has a lamp test feature that will turn on all of the front panel LED indicators, including the digital display, for testing. An externally mounted, normally-open, momentary action, push-button switch is needed to add this feature. The switch should be connected to the board's TB2 pins 7 and 8. In order to prevent damage to the digital display, do not activate the lamp test for more than ten (10) seconds.

SIGNAL FAILURE RELAY OPTION:

The optional signal failure relay board provides two additional relays which energize when the input signal goes below 4mA or above 20mA and blink a front panel mounted LED. The relays can be selected to energize on both high and low alarms or one can be set to energize on high alarm and the other on low alarm. Either relay can also be selected to continually switch on and off during failure.

OUTPUT RELAY CONTACT SPECIFICATIONS:

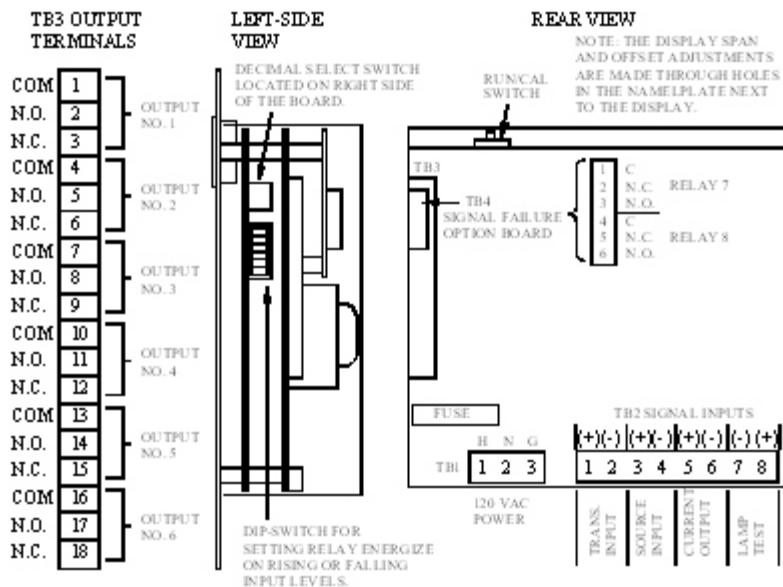
The setpoint relay contacts are rated for 5 amps @ 120 VAC, Resistive. Both normally open and closed contacts are accessible on the 18-pin output connector (TB3) on the rear of the board. Please refer to the diagram below for the TB3 connections.

DIMENSIONS:

The MPCT6B's nameplate dimensions are 6 3/4" Wide X 8" High. The rear case size is 5 15/16" Wide X 6 3/16" high. The depth of the unit from the back of the nameplate to the top of the case is 2 15/16".

INPUT POWER REQUIREMENTS:

The board operates on 115 VAC @ 50/60 Hz. Power consumption is 12 Watts. The circuit is protected by an AGC 1/2 amp fuse and three 120 Volt MOVs for surge protection. The power input terminal block is labeled TB1.





Control Systems, Inc.

PRODUCT DATA BULLETIN

BULLETIN
ETPLT
GAUGE PRESSURE /
LEVEL
TRANSMITTER



STANDARD FEATURES

- Large easy to read, multiline Display with bargraph
- Rotatable display
- Pressure display user set to PSI, feet, inches, % of span
- Temperature display
- 4-20ma 2-wire output signal with display
- 0-40 sec. dampening
- Calibration with or without pressure input.
- keypad setup
- Accuracy of 0.15% of span
- Response Time < 11 ms
- All Stainless wetted parts
- Fiberglass reinforced PBT plastic case (NEMA 4)
- Silicone oil fill fluid
- Span turn down of 20: 1
- Zero point adjustable from 0 to 99%
- Digital signal processing
- ½ " NPT male press connector
- 12-36vdc supply voltage
- Weight: 1.5 pounds

TYPICAL APPLICATIONS

- Elevated Tanks Standpipes Pipe lines

DESCRIPTION

The ETPLT is a gauge pressure transmitter, manufactured by WIKA, which is ideal for measurements of level or pressure in a variety of applications, including level in elevated tanks and stand-pipes and pressure in pipes or tanks. The simple design and rugged construction of this solid state instrument provides long lasting service with virtually no maintenance. Data is transmitted by a two-wire 4-20 mA output signal which is protected against reverse polarity, short circuit and overvoltage. This unit includes a built-in, high-contrast LCD display which displays the level/pressure, temperature and output current. Engineering units, display settings, zero and span, dampening and other settings are entered via a 4-key keypad located inside the unit.

Pressure connection is via a ½" NPT male 316 stainless steel connector. The ETPLT is available in a wide selection of pressure ranges, from 5 to 15000 PSI.

SUGGESTED SPECIFICATIONS

Provide a solid state universal gauge pressure transmitter with multiline LCD display, using 316 stainless steel wetted parts and housed in a fiberglass reinforced PBT plastic (polybutene terephthalate) case rated for IP65 (NEMA 4). The range of the transmitter shall be as required for the desired application, with excitation voltage of 12-36 VDC. The LCD display shall be capable of indicating the level or pressure along with ambient temperature and current output simultaneously. In addition, the display shall be rotatable in 90 degree increments or read from above to meet specific installation requirements. User selectable parameters including engineering units, dampening and zero/span adjustments shall be entered by a 4-key keypad. The unit shall be able to be calibrated with or without a pressure input. The electronics shall provide a 4-20ma analog output to drive a level meter or pressure controller. Provide a 20:1 span turndown capability and a zero adjustment from 0 to 99% of span. Hysteresis and repeatability shall be less than .05% of span. The ambient operating temperature shall be -4 degrees to +158 degrees Fahrenheit with a media temperature of -22 degrees to +221 degrees Fahrenheit. The accuracy shall be <= 015% of span (on pressure ranges less than 600 PSI). The unit shall be a WIKA model UT-10.

Specifications:

Input

Pressure Range: 5 to 15,000 PSI (9 ranges)

Performance

Long Term Drift: 0.1 % FS/year
Accuracy: 0.15 % FS typical
Thermal Error: 0.1 % Typical
Operating Temp: -4 to +158 degrees F.
Response Time: 10ms or less

Mechanical

Wetted Parts: 316 and PH 17-4 Stainless Steel
Case: Fiberglass reinforced PBT plastic (polybutene terephthalate)
Dimensions: 3.35" wide x 5.83" high x 4.33" deep (including wire entry connector)
Weight: 1½ pounds

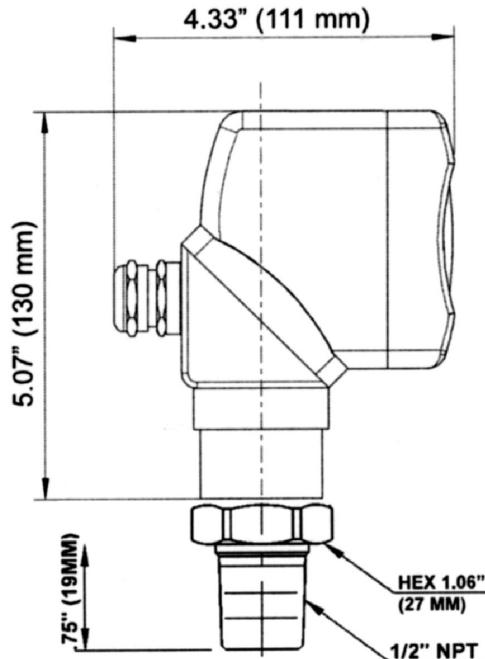
Current Output

Output: 4-20ma (2-wire)
Supply Voltage (Vs): nominal 24vdc (12-36vdc)

4-20ma Electrical Wiring: Supply + = L+ terminal
Signal - = L- terminal
Ground = ground terminal

WIKA model UT10 part numbers and range information:

| Pressure Range | Minimum Range | CSI Part Number | UT-10 Part Number | Maximum Pressure | Burst Pressure |
|----------------|---------------|-----------------|-------------------|------------------|----------------|
| 5 PSI | 0.25 PSI | ETPLT-5 | 4292333 | 30 PSI | 30 PSI |
| 25 PSI | 1.25 PSI | ETPLT-25 | 4292341 | 150 PSI | 150 PSI |
| 100 PSI | 5 PSI | ETPLT-100 | 4292350 | 500 PSI | 500 PSI |
| 250 PSI | 12.5 PSI | ETPLT-250 | 4292368 | 1100 PSI | 1100 PSI |
| 500 PSI | 25 PSI | ETPLT-500 | 4292376 | 1100 PSI | 5800 PSI |



Ordering Information

CSI Order Number: ETPLT-x, where x= PSI rating (see chart above)

Note: Standard in-stock units are 100 PSI

WARRANTY: Control Systems, Inc. (CSI) warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will replace any component found to be defective on its return to CSI, transportation charges prepaid, within one year of its original purchase. CSI will extend the same warranty protection on accessories which is extended to CSI by the original manufacturer. CSI also assumes no liability, express or implied, beyond its obligation to replace any component involved. Such warranty is in lieu of all other warranties express or implied.



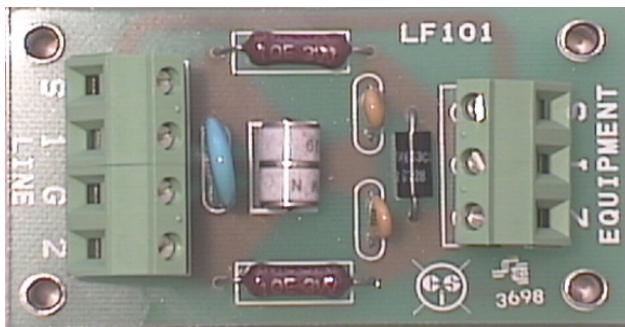
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Document Revision: B



PRODUCT DATA BULLETIN

BULLETIN
LF101
SMALL SIGNAL
LINE FILTER



STANDARD FEATURES

- INPUT SIGNALS OF UP TO 30VDC
- IDEAL FOR INSTRUMENTATION SIGNAL LOOPS
- STAND-OFF MOUNT OR TRACK MOUNT
- LOW IMPEDANCE DESIGN
- NO ADJUSTMENTS REQUIRED
- NO EXTERNAL POWER REQUIRED
- INTEGRAL WIRING TERMINAL BLOCKS
- SMALL SIZE: 1.8" X 3.25"

DESCRIPTION

The LF101 is an instrumentation signal filter which is ideal for 4-20ma signal loops or telemetry signals which are limited to 30vdc or less. The small size is easily placed and the unit can be either mounted with stand-off's or 3 1/4" plastic track mounting hardware. The low impedance design assures that no signal loss will occur within the filter. Two models are available: the LF101-A is limited to 8 Vdc signals and the LF101-B is limited to 30 Vdc signals. The lower voltage "A" model is perfect for protecting smaller signal sources such as telemetry signals, while the 30 volt rating of the "B" model should be used in current loops where the power source is typically 24vdc.

SUGGESTED SPECIFICATIONS

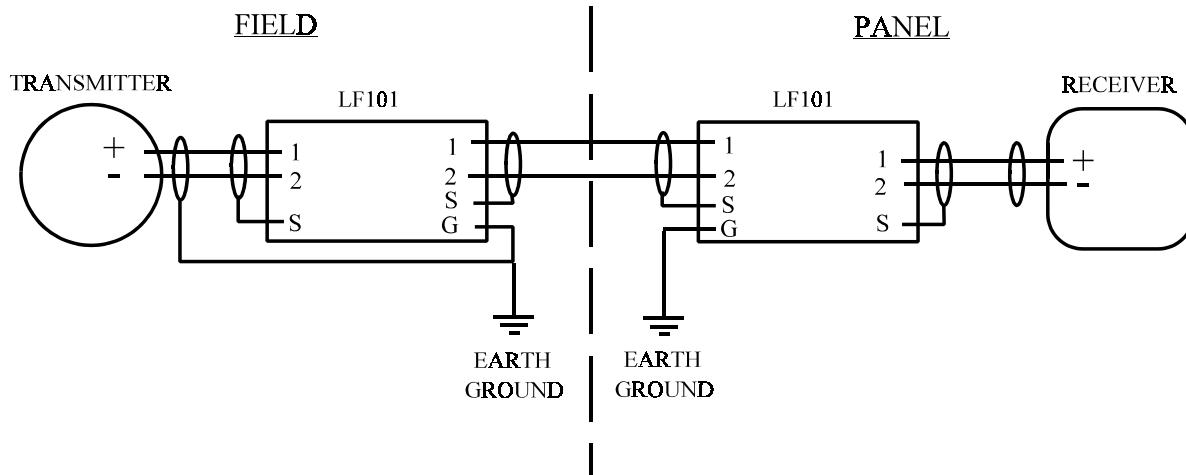
Provide a small signal line filter for instrumentation use with a fast-acting design to protect data and communications equipment from transient voltage surges and induced voltages. The filter shall be a low-impedance, two-stage hybrid design with a first stage consisting of a heavy-duty energy handling gas discharge tube having a breakdown voltage rating between 200 and 350 volts. Impulse breakdown at 100 volts per microsecond shall equal 600 volts. A filter capacitor shall be connected across the lines, rated at 1kv. The second stage shall consist of two current limiting resistors, a fast-acting, solid-state transient voltage surge absorber from each line to ground to protect each line up to a maximum continuous voltage of 30 Vac or 38 Vdc with a 50 nanosecond response time, and a separate bi-directional transient voltage surge absorber rated at 1500W @ 33 Vdc which is connected across the two lines, for maximum protection. Integral wiring terminal blocks shall be included for both line and equipment sides of the filter. The filter shall be mountable directly on the panel backplate or use optional 3 1/4" track mounting.

SPECIFICATIONS

- NO EXTERNAL POWER SOURCE REQUIRED
- DUTY CYCLE: Continuous
- Low Impedance, Two-Stage Hybrid Design
- MOUNTING: Stand-Off mount or 3 1/4" Track Mount
- SIZE: 1.8" X 3.25"

BULLETIN
LF101
SMALL SIGNAL
LINE FILTER

TYPICAL WIRING DIAGRAM



NOTES:

1. The Earth Ground (G) terminal MUST be properly terminated in order to provide the rated protection.
2. For maximum protection, use two LF101's: one at each end of the transmission line.
3. Use two wire shielded cable and ground the shield at one end of the line only. Usually, the grounded end is the end where the signal power source is located.
4. All instrumentation signal wiring should be run in separate metal conduit from power wiring to minimize induced voltages.

ORDERING INFORMATION

08 vdc cut-off limit: LF101-A
30 vdc cut-off limit: LF101-B

NOTE: Track mounting configuration is optional and should be specified if it is desired when ordering.

WARRANTY: Control Systems, Inc. (CSI) warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will replace any component found to be defective on its return to CSI, transportation charges prepaid, within one year of its original purchase. CSI will extend the same warranty protection on accessories which is extended to CSI by the original manufacturer. CSI also assumes no liability, express or implied, beyond its obligation to replace any component involved. Such warranty is in lieu of all other warranties express or implied.



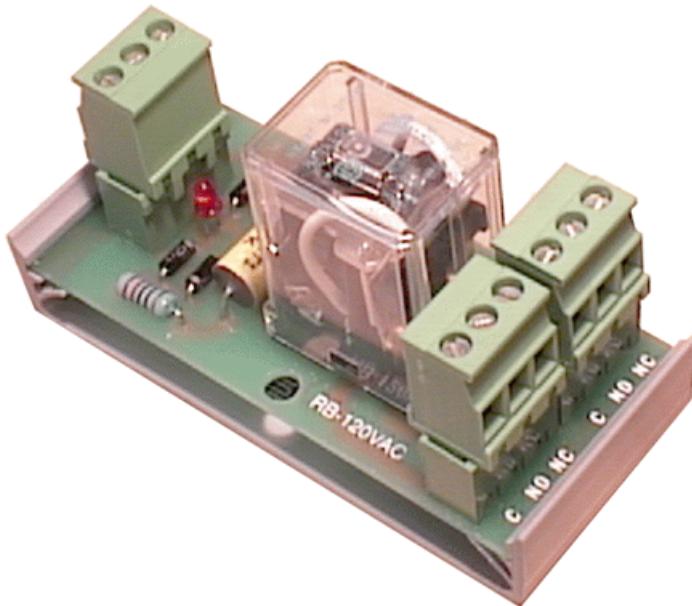
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PRODUCT DATA BULLETIN

2RB
DPDT Relay
Board



STANDARD FEATURES

- 3.25" SNAPTRACK CHANNEL MOUNTING
- 120VAC, 24VAC, 24VDC AND 12VDC MODELS
- INPUT TRANSIENT SURGE PROTECTION
- FORM C, DPDT CONTACTS
- QUICK-RELEASE SCREW TERMINALS
- LED STATUS INDICATOR
- SIZE: 3.25" x 1.50"

DESCRIPTION

The CSI model 2RB relay is a 3.25" SnapTrack channel mounted relay board with input surge protection. Quick-connect terminals are used for the power input as well as individual contact outputs, making it very convenient to use. An LED indicator is included on the board to indicate when the relay has been energized. The unit is available in 120VAC, 24VAC 24VDC and 12VDC models..

SUGGESTED SPECIFICATIONS

Provide a SnapTrack channel mounted relay board with LED status indicator and individual quick-connect terminals. The SnapTrack can be optionally snapped to a DIN rail. The indicator LED shall turn on when the relay is energized. The terminals shall be of the fixed screw cage clamp type, rated for at least 10 amps at 250 volts. Tubular screw clamp types will not be accepted. The relay shall be rated for 10 amps. Surge suppression shall be provided on the coil side of the relay. The board shall include built-in transient protection across the coil. DC powered versions shall include a built-in diode across the coil to protect external devices from coil surges. The relay and connectors shall be UL approved.

OPERATING SPECIFICATIONS

- SUPPLY VOLTAGE: 120VAC, 24VAC, 24VDC OR 12VDC (Model Dependent)
- SUPPLY CURRENT: 13ma @ 120vac; 46ma @ 24vac; 37ma @ 24vdc; 75ma @ 12vdc
- BOARD OUTPUT CONTACT RATING: 8 amps @ 110vac / 24vdc
- CONNECTORS: FIXED SCREW CLAMP TYPE RATED AT 10 AMPS 250V
- DIMENSIONS: 3.25" x 1.50"
- HUMIDITY: 5-95% NON-CONDENSING

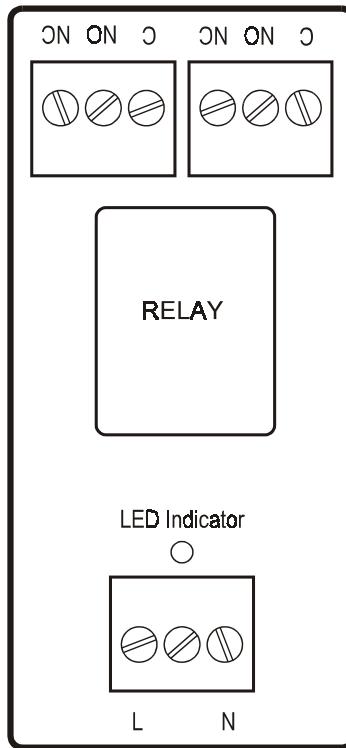
CONTACT OUTPUTS

**All connectors are separate,
unpluggable units for ease of
maintenance and troubleshooting.**

**Different model units will differ
slightly in labeling according to
the voltage input of the relay.**

**The LED status indicator will light
when the input is energized.**

**The middle pin of the input
connector is not used at this time.**



POWER INPUT

ORDERING INFORMATION:

120V MODELS: 2RB-120VAC
24V MODELS: 2RB-24VAC or 2RB-24VDC
12V MODELS: 2RB-12VDC

WARRANTY: Control Systems, Inc. (CSI) warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will replace any component found to be defective on its return to CSI, transportation charges prepaid, within one year of its original purchase. CSI will extend the same warranty protection on accessories which is extended to CSI by the original manufacturer. CSI also assumes no liability, express or implied, beyond its obligation to replace any component involved. Such warranty is in lieu of all other warranties express or implied.



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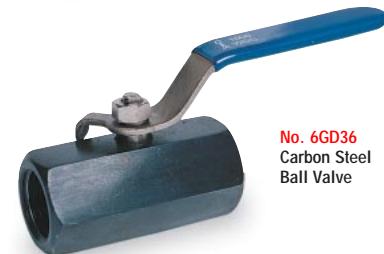
No. 6GD06
Brass Safety
Exhaust Ball Valve



No. 6GD11
Forged Brass
Ball Valve



No. 6GD44
Brass Mini
Ball Valve



No. 6GD36
Carbon Steel
Ball Valve



No. 6GD29
Stainless Steel
Ball Valve

Ball Valves

BRASS SAFETY EXHAUST VALVES
Exhaust port bleeds down compressed air between valve and machine. Valves have lockout handle and 10-32 threaded exhaust port.

Lockable handle accommodates 9/32" lock shackles, when valve is in closed position only. Two piece body with blow-out proof stem. Teflon ball seats and teflon stem seals. Complies with OSHA requirement 1910.147. Rated for 200 psi.

FORGED BRASS BALL VALVES

Industrial valves are precision machined. Blow out proof stem. Chrome plated brass ball. Teflon ball seats and stem seal. Vacuum rated to

25" HG. Full port. 600 psi (CWP), 150 psi (steam). 2½ and 3" valves are for 400 psi.

BRASS MINI BALL VALVES

Provide space savings for installation in tight areas. Ideal for use on small air and liquid control systems. Rated 450 psi (CWP) with Teflon ball seats and Teflon sealed stem. Full ports on 1/8 and 1/4"; standard ports on 3/8 and 1/2".

CARBON STEEL BALL VALVES

For use in abrasive air or liquid applications. 316 stainless steel ball and corrosion-resistant 304 stainless steel handle. Teflon seats and blow-out proof Teflon stems. 150 psi working steam pressure.

Uses: F or hydraulic use up to 2000 psi for sizes 1-1/4" and 1500 psi for sizes 1-1/4"-2".

STAINLESS STEEL BALL VALVES

Industrial two-piece valves are suitable for use in most corrosive environments compatible with 316 stainless steel. Bottom loaded stem resists blow-out. Full port design with Teflon stems and seat seals. 304 stainless steel handle and handle nut. Rated at 2,000 psi for sizes 1-1/4"-1" and 1500 psi for sizes 1-1/4"-2". 150 psi working steam pressure.

Uses: For air, gas, water, oil, and other liquids.

| Inlet/Outlet NPT Size (In.) | Thread Style | Temperature Rating (°F) | Stock No. | Each | Shpg. Wt. |
|---|-----------------|-------------------------|-----------|--------|-----------|
| BRASS SAFETY EXHAUST BALL VALVES | | | | | |
| 1/4 | Female x Female | -40 to 250 | 6GD06 | \$6.66 | 0.3 |
| 3/8 | Female x Female | -40 to 250 | 6GD07 | 6.66 | 0.2 |
| 1/2 | Female x Female | -40 to 250 | 6GD08 | 6.66 | 0.5 |
| 3/4 | Female x Female | -40 to 250 | 6GD09 | 9.59 | 0.8 |
| 1 | Female x Female | -40 to 250 | 6GD10 | 12.20 | 1.2 |
| FORGED BRASS BALL VALVES | | | | | |
| 1/4 | Female x Female | -40 to 350 | 6GD11 | 4.36 | 0.3 |
| 3/8 | Female x Female | -40 to 350 | 6GD13 | 4.36 | 0.2 |
| 1/2 | Female x Female | -40 to 350 | 6GD14 | 4.36 | 0.5 |
| 3/4 | Female x Female | -40 to 350 | 6GD15 | 5.90 | 0.7 |
| 1 | Female x Female | -40 to 350 | 6GD16 | 8.56 | 1.0 |
| 1 1/4 | Female x Female | -40 to 350 | 6GD17 | 14.76 | 1.7 |
| 1 1/2 | Female x Female | -40 to 350 | 6GD18 | 18.65 | 2.3 |
| 2 | Female x Female | -40 to 350 | 6GD19 | 25.15 | 3.5 |
| 2 1/2 | Female x Female | -40 to 350 | 6GD20 | 91.25 | 3.8 |
| 3 | Female x Female | -40 to 350 | 6GD12 | 133.25 | 5.4 |
| 1/4 | Male x Female | -40 to 350 | 6GD21 | 6.03 | 0.3 |
| 3/8 | Male x Female | -40 to 350 | 6GD22 | 6.03 | 0.3 |
| 1/2 | Male x Female | -40 to 350 | 6GD23 | 6.00 | 0.5 |
| 3/4 | Male x Female | -40 to 350 | 6GD24 | 7.02 | 0.8 |
| 1 | Male x Female | -40 to 350 | 6GD25 | 11.48 | 1.1 |
| BRASS MINI BALL VALVES | | | | | |
| 1/8 | Female x Female | -10 to 250 | 6GD44 | 3.39 | 0.2 |
| 1/4 | Female x Female | -10 to 250 | 6GD45 | 3.39 | 0.2 |
| 1/4 | Male x Female | -10 to 250 | 6GD48 | 3.39 | 0.2 |
| 3/8 | Female x Female | -10 to 250 | 6GD46 | 3.39 | 0.2 |
| 3/8 | Male x Female | -10 to 250 | 6GD49 | 3.39 | 0.2 |
| 1/2 | Female x Female | -10 to 250 | 6GD47 | 3.79 | 0.4 |
| 1/2 | Male x Female | -10 to 250 | 6GD50 | 3.79 | 0.3 |
| CARBON STEEL BALL VALVES | | | | | |
| 1/4 | Female x Female | -60 to 450 | 6GD36 | 10.20 | 0.3 |
| 3/8 | Female x Female | -60 to 450 | 6GD37 | 10.00 | 0.4 |
| 1/2 | Female x Female | -60 to 450 | 6GD38 | 10.71 | 0.6 |
| 3/4 | Female x Female | -60 to 450 | 6GD39 | 12.35 | 1.0 |
| 1 | Female x Female | -60 to 450 | 6GD40 | 16.55 | 1.3 |
| 1 1/4 | Female x Female | -60 to 450 | 6GD41 | 25.25 | 2.1 |
| 1 1/2 | Female x Female | -60 to 450 | 6GD42 | 34.85 | 3.4 |
| 2 | Female x Female | -60 to 450 | 6GD43 | 45.30 | 5.0 |
| STAINLESS STEEL BALL VALVES | | | | | |
| 1/4 | Female x Female | -60 to 450 | 6GD29 | 23.24 | 0.6 |
| 1/2 | Female x Female | -60 to 450 | 6GD30 | 23.24 | 0.8 |
| 3/4 | Female x Female | -60 to 450 | 6GD31 | 38.55 | 1.2 |
| 1 | Female x Female | -60 to 450 | 6GD32 | 47.00 | 2.0 |
| 1 1/4 | Female x Female | -60 to 450 | 6GD33 | 89.45 | 2.8 |
| 1 1/2 | Female x Female | -60 to 450 | 6GD34 | 93.45 | 4.3 |
| 2 | Female x Female | -60 to 450 | 6GD35 | 120.30 | 3.3 |

Hinged Cover Type 3R Small Enclosures



Application

Designed for use as a wiring and junction box. Enclosure provides protection in outdoor installations against rain, sleet, and snow or indoors against dripping water.

Features

- Drip-shield top and seam-free sides, front, and back
- Galvanized steel hinge has stainless steel pin
- Weldnuts provided for mounting optional panels

Construction

- 16 gauge galvanized steel
- Provisions for padlocking on zinc-plated draw pull catch
- Knockouts on bottom of enclosure
- No gasketing

Finish

ANSI 61 gray polyester powder paint finish inside and out over galvanized steel. Unless otherwise specified, all custom hinged cover Type 3R small enclosures are finished with ANSI 61 gray polyester powder paint. Optional solid panels are white and optional perforated panels are gray.

Industry Standards

UL 50, File No. E27567: Type 3R
 NEMA/EEMAC Type 3R
 cUL CSA C22.2 No. 94, File No. E27525: Type 3R
 IEC 60529, IP32

Accessories

Corrosion Inhibitors
 Grounding Device
 Panels (see Table)
 Touch-Up Paint (ATPPY61)

Standard Sizes Hinged Cover Type 3R Small Enclosures

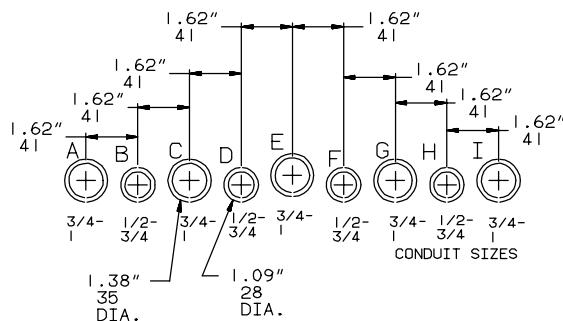
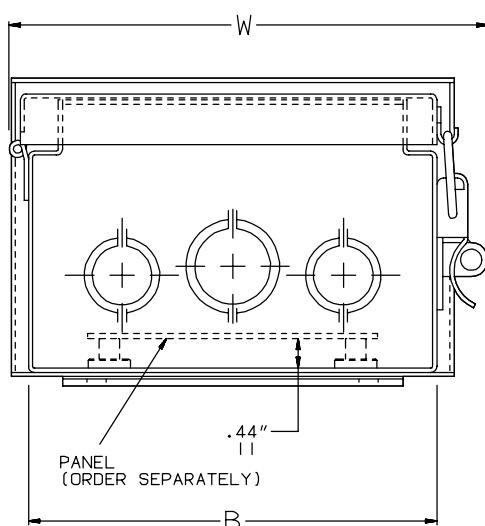
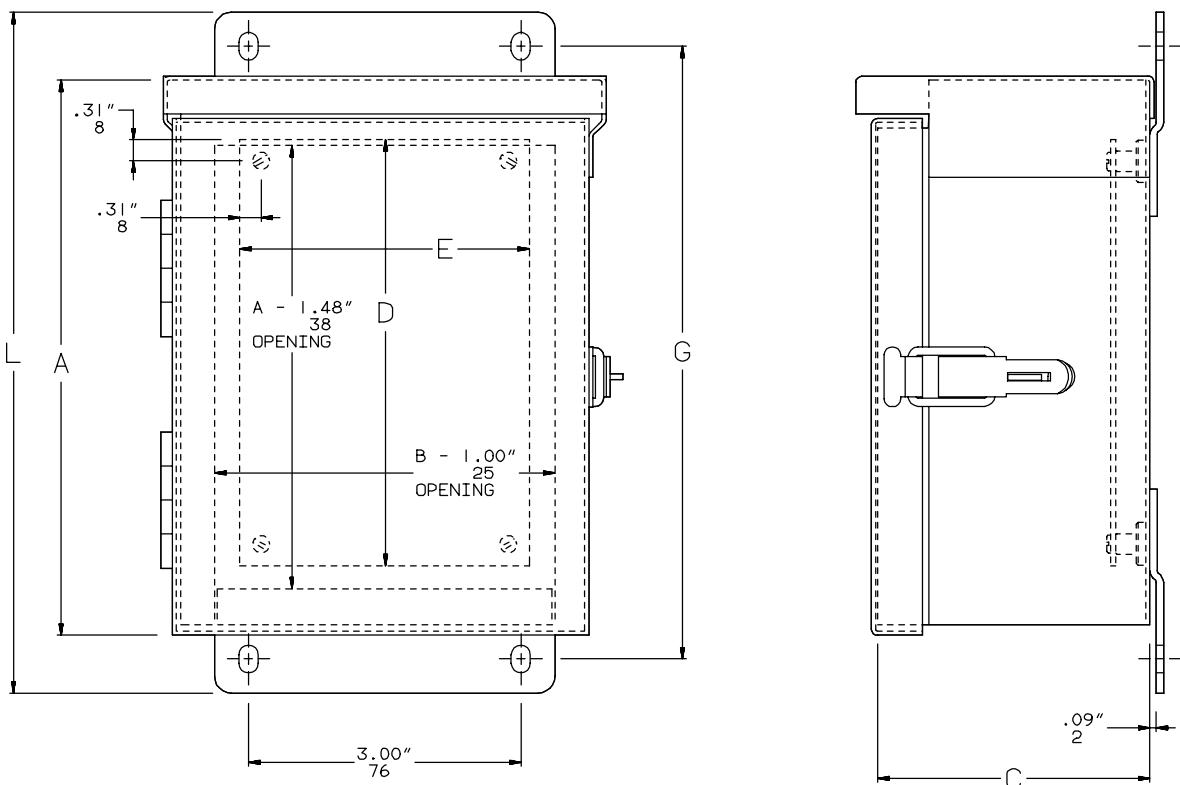
| Catalog Number | Enclosure Size A x B x C inch mm | | Panel Catalog Number ^a | Perforated Panel Catalog No. ^b | Panel Size D x E inch mm | | Mounting G inch mm | | Overall L x W inch mm | | Knockout Pattern |
|--------------------|--|---|-----------------------------------|---|--------------------------------|-----|-----------------------|-----|--------------------------|-----|--------------------------------|
| | A | B | C | | D | E | inch | mm | inch | mm | |
| A6R44HCR | 6.00 | x | 4.00 | x | 4.00 | 152 | x | 102 | x | 102 | A6N4P A6N4PP |
| A6R64HCR | 6.00 | x | 6.00 | x | 4.00 | 152 | x | 152 | x | 102 | A6N6P A6N6PP |
| A8R64HCR | 8.00 | x | 6.00 | x | 4.00 | 203 | x | 152 | x | 102 | A8N6P A8N6PP |
| A8R86HCR | 8.00 | x | 8.00 | x | 6.00 | 203 | x | 203 | x | 152 | A8N8P A8N8PP |
| A10R86HCR | 10.00 | x | 8.00 | x | 6.00 | 254 | x | 203 | x | 152 | A10N8P A10N8PP |
| A12R106HCR | 12.00 | x | 10.00 | x | 6.00 | 305 | x | 254 | x | 152 | A12N10P A12N10PP |
| A12R126HCR | 12.00 | x | 12.00 | x | 6.00 | 305 | x | 305 | x | 152 | A12N12P A12N12PP |
| A12R1210HCR | 12.00 | x | 12.00 | x | 10.00 | 305 | x | 305 | x | 254 | A12N12P A12N12PP |

^a Purchase panels separately.

^b Purchase perforated panels separately. See page 14.

Hinged Cover Type 3R Small Enclosures

2



Knockout Pattern
(from outside of box)

C2577

NOTE: Refer to Table for applicable knockout pattern.



Application

Designed for use as a wiring box and junction box. Enclosure provides protection in outdoor installations against rain, sleet and snow, or indoors against dripping water.

Construction

- 16 gauge or 14 gauge galvanized steel
- Drip shield top and seam-free sides, front, and back protect from rain, snow, or sleet
- 16 gauge galvanized steel continuous hinge has stainless steel pin
- Cover fastened securely with captive plated steel screws
- Hasp and staple provided for padlocking
- No gasketing or knockouts
- Collar studs provided for mounting optional panels

Finish

ANSI 61 gray polyester powder finish inside and out over galvanized steel. Optional panels are white.

Industry Standards

UL 50, File No. E27567, Type 3R
NEMA/EEMAC Type 3R
CSA, File No. LL42184, Type 3R (See table)
IEC 60529, IP32

Accessories

See General Accessories index.

Corrosion Inhibitors
Electric Heater
Grounding Device
Lock Kit (Keylock) for Type 12
Panel Support Kit
Panels (See table)
Rack Mounting Angle Kit
Terminal Kit Assembly
Touch-Up Paint (A-TPPY61)
Window Kit

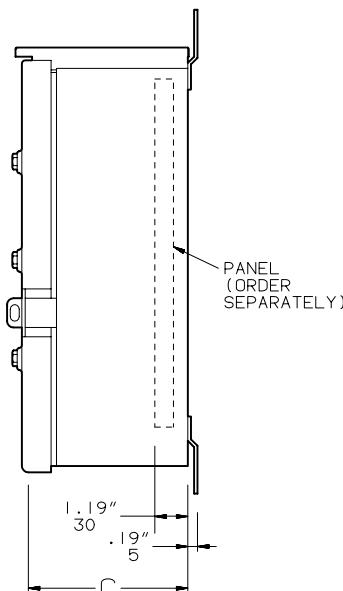
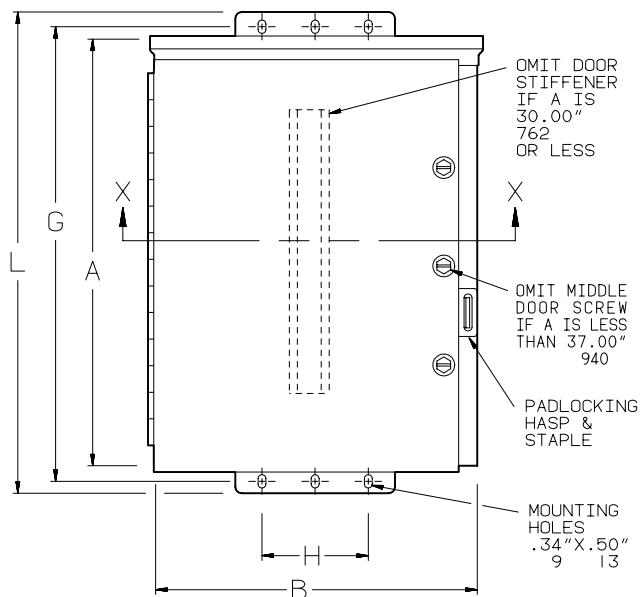
Standard Sizes Hinged Cover Type 3R Medium Enclosures

| Enclosure Catalog Number | Enclosure Size A x B x C | * Panel Catalog Number | Panel Size D x E | Mounting G x H | Overall L | Stiffener Door / Body |
|--------------------------|--|------------------------|----------------------------|----------------------------|--------------|-----------------------|
| † A-16R126HCR | 16.00 x 12.00 x 6.00 (406 x 305 x 152) | A-16P12 | 13.00 x 9.00 (330 x 229) | 17.00 x 5.00 (432 x 127) | 18.00 (457) | 0 0 |
| † A-16R166HCR | 16.00 x 16.00 x 6.00 (406 x 406 x 152) | A-16P16 | 13.00 x 13.00 (330 x 330) | 17.00 x 13.00 (432 x 330) | 18.00 (457) | 0 0 |
| † A-20R166HCR | 20.00 x 16.00 x 6.00 (508 x 406 x 152) | A-20P16 | 17.00 x 13.00 (432 x 330) | 21.00 x 13.00 (533 x 330) | 22.00 (559) | 0 0 |
| † A-20R208HCR | 20.00 x 20.00 x 8.00 (508 x 508 x 203) | A-20P20 | 17.00 x 17.00 (432 x 432) | 21.00 x 13.00 (533 x 330) | 22.00 (559) | 0 0 |
| † A-24R208HCR | 24.00 x 20.00 x 8.00 (610 x 508 x 203) | A-24P20 | 21.00 x 17.00 (533 x 432) | 25.00 x 13.00 (635 x 330) | 26.00 (660) | 0 0 |
| † A-24R248HCR | 24.00 x 24.00 x 8.00 (610 x 610 x 203) | A-24P24 | 21.00 x 21.00 (533 x 533) | 25.00 x 13.00 (635 x 330) | 26.00 (660) | 0 0 |
| A-30R248HCR | 30.00 x 24.00 x 8.00 (762 x 610 x 203) | A-30P24 | 27.00 x 21.00 (686 x 533) | 31.00 x 13.00 (787 x 330) | 32.00 (813) | 0 0 |
| A-24R2410HCR | 24.00 x 24.00 x 10.00 (610 x 610 x 254) | A-24P24 | 21.00 x 21.00 (533 x 533) | 25.00 x 13.00 (635 x 330) | 26.00 (660) | 0 0 |
| A-30R2410HCR | 30.00 x 24.00 x 10.00 (762 x 610 x 254) | A-30P24 | 27.00 x 21.00 (686 x 533) | 31.00 x 13.00 (787 x 330) | 32.00 (813) | 0 0 |
| A-30R3012HCR | 30.00 x 30.00 x 12.00 (762 x 762 x 305) | A-30P30 | 27.00 x 27.00 (686 x 686) | 31.00 x 27.00 (787 x 686) | 32.00 (813) | 0 1 |
| A-36R2412HCR | 36.00 x 24.00 x 12.00 (914 x 610 x 305) | A-36P24 | 33.00 x 21.00 (838 x 533) | 37.00 x 13.00 (940 x 330) | 38.00 (965) | 0 1 |
| A-36R3012HCR | 36.00 x 30.00 x 12.00 (914 x 914 x 305) | A-36P30 | 33.00 x 27.00 (838 x 686) | 37.00 x 27.00 (940 x 686) | 38.00 (965) | 0 1 |
| A-42R3012HCR | 42.00 x 30.00 x 12.00 (1067 x 914 x 305) | A-42P30 | 39.00 x 27.00 (991 x 686) | 43.00 x 27.00 (1092 x 686) | 44.00 (1118) | 1 1 |
| A-36R3612HCR | 36.00 x 36.00 x 12.00 (914 x 914 x 305) | A-36P36 | 33.00 x 33.00 (838 x 838) | 37.00 x 27.00 (940 x 686) | 38.00 (965) | 1 1 |
| A-42R3612HCR | 42.00 x 36.00 x 12.00 (1067 x 914 x 305) | A-42P36 | 39.00 x 33.00 (991 x 838) | 43.00 x 27.00 (1092 x 686) | 44.00 (1118) | 1 1 |
| A-48R3612HCR | 48.00 x 36.00 x 12.00 (1219 x 914 x 305) | A-48P36 | 45.00 x 33.00 (1143 x 838) | 49.00 x 27.00 (1245 x 686) | 50.00 (1270) | 1 1 |
| A-60R3612HCR | 60.00 x 36.00 x 12.00 (1524 x 914 x 305) | A-60P36 | 57.00 x 33.00 (1448 x 838) | 61.00 x 27.00 (1549 x 686) | 62.00 (1575) | 1 1 |
| A-30R3016HCR | 30.00 x 30.00 x 16.00 (762 x 762 x 406) | A-30P30 | 27.00 x 27.00 (686 x 686) | 31.00 x 27.00 (787 x 686) | 32.00 (813) | 0 1 |
| A-48R3616HCR | 48.00 X 36.00 X 16.00 (1219 X 914 X 406) | A-48P36 | 45.00 X 33.00 (1143 X 838) | 49.00 X 27.00 (1245 X 686) | 50.00 (1270) | 1 1 |

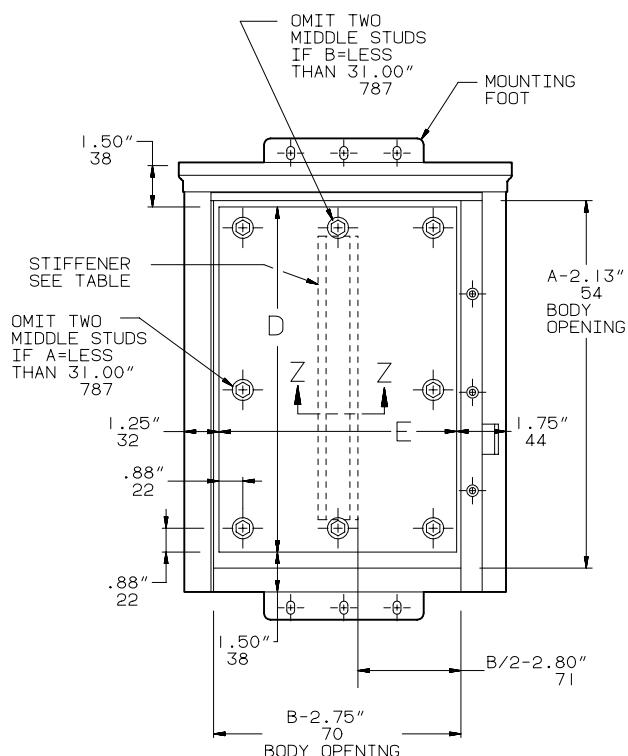
Millimeter dimensions () are for reference only; do not convert metric dimensions to inch.

* Panels must be ordered separately. Optional aluminum panels are available for most sizes. See General Accessories.

† Certified by Canadian Standards Association. Specify CSA label when ordering.

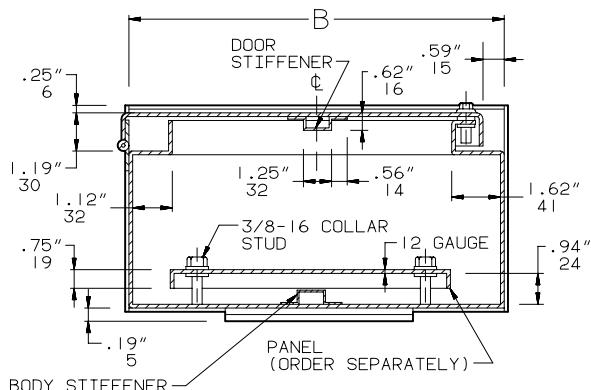


NOTE: Panels have flanges along sides which are more than 21.00 inches (533mm) long, except A-24P20 and A-24P24 which have flanges on two sides.

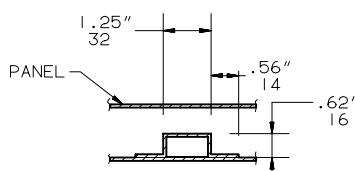


Inch
Millimeter

Door Removed



SECTION X-X



SECTION Z-Z

M·C·C

Micro Commercial Components
21201 Itasca Street Chatsworth
CA 91311
Phone: (818) 701-4933
Fax: (818) 701-4939

1N4001
THRU
1N4007

Features

- Low Current Leakage
- Metalurgically Bonded Construction
- Low Cost

Maximum Ratings

- Operating Temperature: -55°C to +150°C
- Storage Temperature: -55°C to +150°C
- Maximum Thermal Resistance; 20 °C/W Junction To Lead

| MCC Catalog Number | Device Marking | Maximum Recurrent Peak Reverse Voltage | Maximum RMS Voltage | Maximum DC Blocking Voltage |
|--------------------|----------------|--|---------------------|-----------------------------|
| 1N4001 | --- | 50V | 35V | 50V |
| 1N4002 | --- | 100V | 70V | 100V |
| 1N4003 | --- | 200V | 140V | 200V |
| 1N4004 | --- | 400V | 280V | 400V |
| 1N4005 | --- | 600V | 420V | 600V |
| 1N4006 | --- | 800V | 560V | 800V |
| 1N4007 | --- | 1000V | 700V | 1000V |

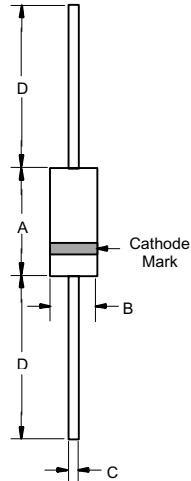
Electrical Characteristics @ 25°C Unless Otherwise Specified

| | | | |
|---|-------------|-------------------------|---|
| Average Forward Current | $I_{F(AV)}$ | 1.0A | $T_A = 75^\circ C$ |
| Peak Forward Surge Current | I_{FSM} | 30A | 8.3ms, half sine |
| Maximum Instantaneous Forward Voltage | V_F | 1.1V | $I_{FM} = 1.0A$; $T_J = 25^\circ C^*$ |
| Maximum DC Reverse Current At Rated DC Blocking Voltage | I_R | $5.0\mu A$ $50\mu A$ | $T_J = 25^\circ C$ $T_J = 125^\circ C$ |
| Typical Junction Capacitance | C_J | 15pF | Measured at 1.0MHz, $V_R=4.0V$ |

*Pulse test: Pulse width 300 μ sec, Duty cycle 2%

1 Amp Rectifier
50 - 1000 Volts

DO-41



| DIMENSIONS | | | | | |
|------------|--------|------|-------|------|------|
| DIM | INCHES | | MM | | NOTE |
| | MIN | MAX | MIN | MAX | |
| A | .166 | .205 | 4.10 | 5.20 | |
| B | .080 | .107 | 2.00 | 2.70 | |
| C | .028 | .034 | .70 | .90 | |
| D | 1.000 | -- | 25.40 | -- | |

VBR- Bracket

Die cast aluminum construction with sturdy wall mounting bracket. Medium base socket and a variety of globes to choose from. Available in incandescent up to 300 watts and 13 or 22 watt fluorescent. Fits 4" box. Lamp not included.

Finish: Natural
 Silver Gray
 White
 Black

New!
Colors!



VBR100DG
shown in silver gray

Product Information

Fixture with:

- clear glass & die cast guard
- clear glass & wire clamp guard
- clear glass globe
- clear Permaglobe
- white Permaglobe
- Fixture less globe
- 13 watt Fluorescent, 120 Volt
- 22 watt Fluorescent, 120 Volt

3/4" tapped hubs
 Finish: Silver Gray
 Add suffix White
 Black

Catalog Numbers

| 100 Series | 200 Series |
|--------------------|--------------------------------|
| 150w Glass | 300w Glass |
| 75w Permaglobe | 150w Permaglobe |
| VBR100DG | VBR200DG |
| VBR100G | VBR200G |
| VBR100 | VBR200 |
| VBR100P | VBR200P |
| VBR100PW | VBR200PW |
| VBR1 | VBR2 |
| add /F13 | |
| | add /F22 |
| add S | add S |
| add W | add W |
| add B | add B |
| Natural, no suffix | Natural & 1/2" hubs, no suffix |

VXBR- Bracket & Box

Die cast aluminum construction. Wall bracket plus junction box with sturdy mounting lugs. Medium base socket, 1/2" or 3/4" NPS hub size and a variety of globes to choose from. Available in incandescent up to 300 watts and 13 or 22 watt fluorescent. Lamp not included.

Finish: Natural
 Silver Gray
 White
 Black

New!
Colors!



VXBR100DG
shown in silver gray

Adjustable Pendant

Universal swivel permits mounting at any angle and locks in place. Die cast aluminum construction. Medium base socket and a variety of globes to choose from. Available in incandescent up to 300 watts and 13 or 22 watt fluorescent. Lamp not included.

Finish: Natural

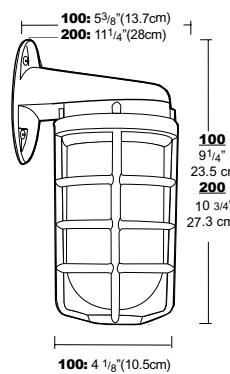


VA100DG
shown in Natural

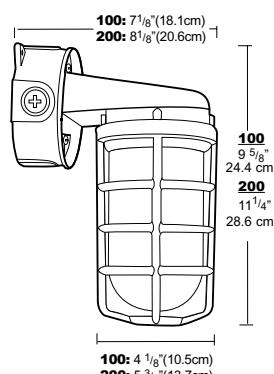
| 100 Series | 200 Series |
|--------------------------------|--------------------------------|
| 150w Glass | 300w Glass |
| 75w Permaglobe | 150w Permaglobe |
| VA100DG | VA200DG |
| VA100G | VA200G |
| VA100 | VA200 |
| VA100P | VA200P |
| VA100PW | VA200PW |
| VA1 | VA2 |
| add /F13 | |
| | add /F22 |
| add -3/4 | add -3/4 |
| add S | add S |
| add W | add W |
| add B | add B |
| Natural & 1/2" hubs, no suffix | Natural & 1/2" taps, no suffix |

Dimensions

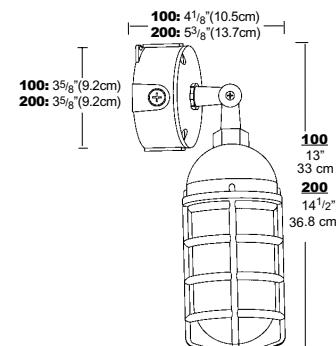
VBR100DG & VBR200DG



VXBR100DG & VXBR200DG



VA100DG & VA200DG



Permaglobes

Unbreakable Polycarbonate threaded globes to fit RAB and other standard Vaporproof fixtures. Lamp base up only. Observe wattage restrictions of 75 watts for 100 series and 150 watts for 200 series

**Prismatic Globes**

Prismatic glass globes hide the light source and allow maximum light output in RAB and other standard Vaporproof fixtures.

**Heat Resistant**

Highly tempered crystal lime glass to withstand high ambient temperatures in RAB and other standard Vaporproof fixtures. Standard threads.

**Ball**

Decorative Ball shaped threaded opal white globes in both glass and unbreakable polycarbonate to fit RAB 100 Series Vaporproof fixtures.

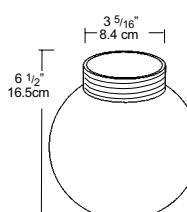
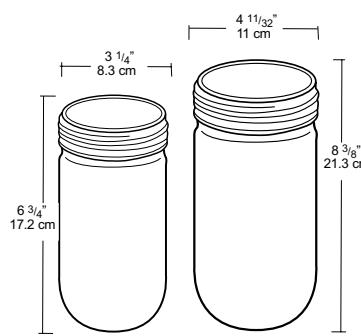
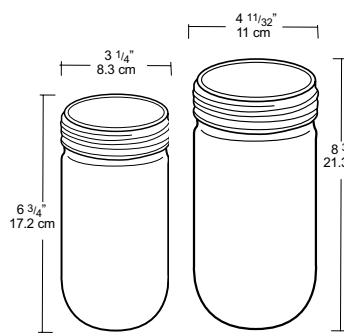
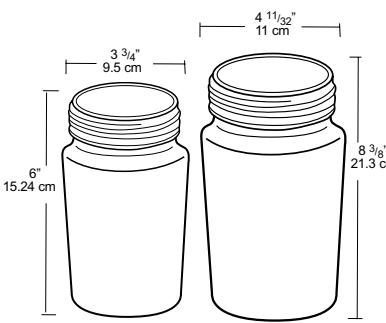


| Color | 75 watts | 150 watts |
|--------------|-----------------|------------------|
| Clear | GL100PG | GL200PGR |
| Opal | GL100PGW | GL200PGW |
| Ruby | GL100PGR | GL200PGR |
| Blue | GL100PGB | GL200PGB |
| Green | GL100PGG | GL200PGG |
| Amber | GL100PGA | GL200PGA |

| Color | 150 watts | 300 watts |
|--------------|------------------|------------------|
| Prismatic | GL100PRIS | GL200PRIS |

| Color | 150 watts | 300 watts |
|--------------|------------------|------------------|
| Clear | GL100HR | GL200HR |

| Shape | Watts | Catalog #: |
|--------------|--------------|-------------------|
| Ball Glass | 150 | GL100BO |
| Ball Poly | 75 | GL100BPGO |



QOU Unit Mount

Miniature Circuit Breakers

Class 720



Low Ampere QOU Miniature Circuit Breakers

General Specifications Common to All Low Ampere QOU Circuit Breakers

- Terminal lug wire size (1) #14–#2 AWG Cu or Al.
- Reversible line and load lugs for convenient flush or surface mount wiring.
- DIN mount (symmetrical rail 35 x 7.5 DIN/EN 50 022).
- UL Listed as HACR type—15–70 A.
- Field installable quick connectors.
- Single handle with internal common trip.
- UL Listed 48 Vdc (5,000 AIR).
- Bulk pack circuit breakers do not have mounting feet included.

Special Ordering Instructions:

For Bulk Packed QOU Circuit Breakers and Accessories

QOU circuit breakers and accessories must be ordered in multiples of the quantities listed. Units provided in standard quantity of one are individually packaged; standard quantities greater than one are bulk packed. Bulk packed circuit breakers do not include mounting brackets.

EXAMPLE:

Individual pack – small quantity orders: To receive five QOU220 circuit breakers, order five individual QOU220 circuit breakers at \$55.00 each. Product will be individually packaged, and will include necessary mounting feet.

Bulk pack – large quantity order. To order 440 QOU220 circuit breakers using bulk packaging, order 440 QOU220B at \$53.00 each. Product will be packaged in 22 packages of 20 pieces each. Product will not include mounting feet. To order mounting feet, order 880 pieces of QOUMFB2. Product will be packaged in eleven packages of 80 pieces each.

For QOUQ Low Amp Circuit Breakers with Four Point Quick Connect Terminals

QOUQ Low Amp circuit breakers with four point quick connect terminals are provided with permanent factory installed terminals which are affixed to the Load or "OFF" end of the circuit breaker. This special terminal will accommodate up to four 1/4 inch female quick connect wire terminations. Total ampacity of these connections must not exceed the rating of the circuit breaker. Price addition is \$5.60 for single-pole, \$11.20 for 2-pole and \$16.80 for 3-pole circuit breakers.

EXAMPLE:

To order QOUQ circuit breakers, change the Catalog Number prefix from "QOU" to "QOUQ". To order a QOU220 with factory installed four point quick connect terminals, order one QOUQ220 circuit breaker at \$55.00 each plus \$5.60 per pole (a total price of \$65.60).

Interrupting Ratings page 6-2

Accessories pages 6-37, 6-38, 6-43

Dimensions pages 6-45, 6-46

Square D

www.SquareD.com

FOR CURRENT INFORMATION

Low Ampere QOU Series 3 Circuit Breaker

| No. of Poles | Description | AIR Rating | Voltage Rating | Ampere Rating | Catalog Number | Unit Price | Order Qty. | |
|--------------|----------------------------------|-------------|----------------|---------------|--------------------|-------------------|------------|--|
| One | Thermal-Magnetic Circuit Breaker | 10,000 AIR | 120/240 Vac | 10 | QOU110/QOU110B | \$ 25.50 24.00 | 1 40 | |
| | | | | 10 | QYU110▲/QYU110B▲ | 77.00 76.00 | 1 40 | |
| | | 10,000 AIR | | 15 | QOU115/QOU115B | 25.50 24.00 | 1 40 | |
| | | | | 15 | QOU115HM/QOU115HMB | 25.50 24.00 | 1 40 | |
| | | | | 15 | QYU115▲/QYU115B▲ | 77.00 76.00 | 1 40 | |
| | | 10,000 AIR | | 20 | QOU120/QOU120B | 25.50 24.00 | 1 40 | |
| | | | | 20 | QOU120HM/QOU120HMB | 25.50 24.00 | 1 40 | |
| | | | | 20 | QYU120▲/QYU120B▲ | 77.00 76.00 | 1 40 | |
| | | 10,000 AIR | 120/240 Vac | 25 | QOU125/QOU125B | 25.50 24.00 | 1 40 | |
| | | | | 25 | QYU125▲/QYU125B▲ | 77.00 76.00 | 1 40 | |
| | | | | 30 | QOU130/QOU130B | 25.50 24.00 | 1 40 | |
| | | | | 30 | QYU130▲/QYU130B▲ | 77.00 76.00 | 1 40 | |
| | | | | 35 | QOU135/QOU135B | 25.50 24.00 | 1 40 | |
| | | | | 40 | QOU140/QOU140B | 25.50 24.00 | 1 40 | |
| | | | | 45 | QOU145/QOU145B | 25.50 24.00 | 1 40 | |
| | | | | 50 | QOU150/QOU150B | 25.50 24.00 | 1 40 | |
| | | | | 60 | QOU160/QOU160B | 25.50 24.00 | 1 40 | |
| | | | | 70 | QOU170/QOU170B | 49.40 44.90 | 1 40 | |
| Two | Thermal-Magnetic Circuit Breaker | 10,000 AIR | 120/240 Vac | 10 | QOU210/QOU210B | 55.00 53.00 | 1 20 | |
| | | | | 15 | QOU215/QOU215B | 55.00 53.00 | 1 20 | |
| | | | | 15 | QOU215H/QOU215HB | 107.00 102.00 | 1 20 | |
| | | | | 20 | QOU220/QOU220B | 55.00 53.00 | 1 20 | |
| | | | | 20 | QOU220H/QOU220HB | 107.00 102.00 | 1 20 | |
| | | | | 25 | QOU225/QOU225B | 55.00 53.00 | 1 20 | |
| | | | | 25 | QOU225H/QOU225HB | 107.00 102.00 | 1 20 | |
| | | | | 30 | QOU230/QOU230B | 55.00 53.00 | 1 20 | |
| | | | | 30 | QOU230H/QOU230HB | 107.00 102.00 | 1 20 | |
| | | | | 35 | QOU235/QOU235B | 55.00 53.00 | 1 20 | |
| | | 120/240 Vac | | 40 | QOU240/QOU240B | 55.00 53.00 | 1 20 | |
| | | | | 45 | QOU245/QOU245B | 55.00 53.00 | 1 20 | |
| | | | | 50 | QOU250/QOU250B | 55.00 53.00 | 1 20 | |
| | | | | N/A | Non-Auto Switch | 55.00 53.00 | 1 20 | |
| | | | | 60 | QOU260/QOU260B | 55.00 53.00 | 1 20 | |
| | | | | 60 | QOU270/QOU270B | 109.00 107.00 | 1 20 | |
| Three | Thermal-Magnetic Circuit Breaker | 10,000 AIR | 240 Vac | 10 | QOU310/QOU310B | 181.00 178.00 | 1 40 | |
| | | | | 15 | QOU315/QOU315B | 181.00 178.00 | 1 40 | |
| | | | | 20 | QOU320/QOU320B | 181.00 178.00 | 1 40 | |
| | | | | 25 | QOU325/QOU325B | 181.00 178.00 | 1 40 | |
| | | | | 30 | QOU330/QOU330B | 181.00 178.00 | 1 40 | |
| | | | | 35 | QOU335/QOU335B | 181.00 178.00 | 1 40 | |
| | | | | 40 | QOU340/QOU340B | 181.00 178.00 | 1 40 | |
| | | | | 45 | QOU345/QOU345B | 181.00 178.00 | 1 40 | |
| | | | | 50 | QOU350/QOU350B | 181.00 178.00 | 1 40 | |
| | | | | 60 | QOU360/QOU360B | 181.00 178.00 | 1 40 | |
| | | | | N/A | Non-Auto Switch | 181.00 178.00 | 1 40 | |

▲ UL Recognized Component, Supplementary Protector.

Note: See ordering instructions above left, all catalog numbers ending in B must be ordered in bulk package quantities.

DE2

Discount
Schedule





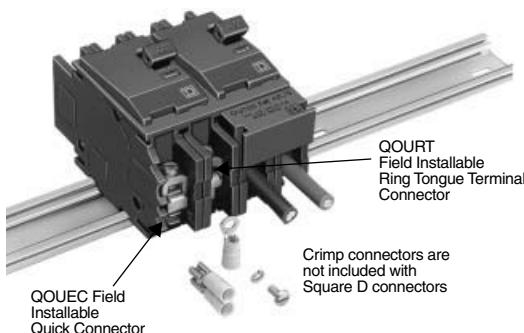
High Ampere QOU Circuit Breakers

General Specifications Common to All High Ampere QOU Circuit Breakers

- Flush and surface mount.
- Internal common trip.
- Lugs supplied in standard position only.
- DIN mount (Symmetrical rail 35 x 7.5 DIN/EN 50022).
- Bulk pack circuit breakers do not have mounting feet included.
- Terminal lug wire size (1) #4–#2/0 AWG Cu or Al.
- UL Listed 60 Vdc per pole (5000 AIR) – Note: except switches.
- UL Listed as HACR type—80–125 Amp.



QOU14100JBAF



2-Pole DIN Mounted QOU Circuit Breakers

| No. of Poles | Description | AIR Rating | Voltage Rating | Ampere Rating | Catalog Number | Unit Price | Order Qty. |
|--------------|----------------------------------|------------|----------------|---------------|-----------------------|--------------------|------------|
| One | Thermal-Magnetic Circuit Breaker | 10,000 AIR | 120/240 Vac | 80 | QOU180 QOU180B | \$111.00 110.00 | 1 40 |
| | | | | 90 | QOU190 QOU190B | 111.00 110.00 | 1 40 |
| | | | | 100 | QOU1100 QOU1100B | 111.00 110.00 | 1 40 |
| Two | Thermal-Magnetic Circuit Breaker | 10,000 AIR | 120/240 Vac | 80 | QOU280 QOU280B | 156.00 155.00 | 1 40 |
| | | | | 90 | QOU290 QOU290B | 156.00 155.00 | 1 40 |
| | Non-Automatic Molded Case Switch | N/A | 240 Vac | 100 | QOU2100 QOU2100B | 156.00 155.00 | 1 40 |
| | | | | | QOU2000 QOU2000B | 156.00 155.00 | 1 40 |
| | | | | 125 | QOU2125 QOU2125B | 287.00 284.00 | 1 40 |
| Three | Thermal-Magnetic Circuit Breaker | 10,000 AIR | 240 Vac | 70 | QOU370 QOU370B | 230.00 227.00 | 1 40 |
| | | | | | QOU380 QOU380B | 264.00 261.00 | 1 40 |
| | | | | 90 | QOU390 QOU390B | 264.00 261.00 | 1 40 |
| | Non-Automatic Molded Case Switch | N/A | 240 Vac | 100 | QOU3100 QOU3100B | 264.00 261.00 | 1 40 |
| | | | | | QOU3000 QOU3000B | 264.00 261.00 | 1 40 |
| | | | | 125 | QOU30001 QOU30001B | 454.00 451.00 | 1 40 |

Accessories for QOU Low Ampere Circuit Breakers (Except as Noted)

| Description | Catalog Number | Unit Price | Order Qty. |
|--|-----------------------|-----------------------------|------------|
| 4-Pole Jumper Bar Assy. W/Front Wiring With Base, Cover and Screw | QOU14100JBAF | \$46.50 | 1 |
| 4-Pole Jumper bar assy. w/Right Side Wiring with Base, Cover and Screw. | QOU14100JBAR | 46.50 | 1 |
| 4-Pole Jumper Bar Assy. w/Left Side Wiring with Base, Cover and Screw | QOU14100JBAL | 46.50 | 1 |
| Single Phase, 4-Pole, 100 A Jumper Bar Base with Front Wiring | QOU14100BAFB | 33.50 | 40 |
| Single Phase, 4-Pole, 100 A Jumper Bar Base with Left Side Wiring | QOU14100BALB | 33.50 | 40 |
| Single Phase, 4-Pole, 100 A Jumper Bar Base with Right Side Wiring | QOU14100BARB | 33.50 | 40 |
| 4-Pole Jumper Bar Cover | QOU14100CAB | 8.40 | 40 |
| Mounting Screw for Jumper Bar Cover | QOU1CMBS | 0.22 | 40 |
| 6-Pole Jumper Bar Assy. W/Front Wiring With Base, Cover and Screw | QOU16150JBAF | 63.00 | 1 |
| Single Phase, 6-Pole, 150 A Jumper Bar Base with Front Wiring | QOU16150BAFB | 43.50 | 40 |
| Single Phase, 6-Pole, 150 A Jumper Bar Base with Left Side Wiring | QOU16150BALB | 43.50 | 40 |
| Single Phase, 6-Pole, 150 A Jumper Bar Base with Right Side Wiring | QOU16150BARB | 43.50 | 40 |
| 6-Pole Jumper Bar Cover | QOU16150CAB | 10.90 | 40 |
| Vertical Rainproof Cover 2- and 3-Pole QO, QOU, Q2, EH, FA and KA | BCV▲ BCVB▲ | 19.50 17.20 | 1 10 |
| Horizontal Rainproof Cover 2-Pole QO, QOU, Q2, EH and 3-Pole Q2, EH | BCH▲ BCHB▲ | 19.50 17.20 | 1 10 |
| 1-Pole Finger Safe Cover For High Ampere QOU | QOUHFSC1 QOUHFSC1B | 1.60 1.00 | 1 40 |
| 1-Pole Finger Safe Cover For Low Ampere QOU | QOULFSC1 QOULFSC1B | 1.60 1.00 | 1 40 |
| Cover Plate for One 2-Pole QOU Circuit Breaker | QOUCP2 QOUCP2B | 5.20 4.20 | 1 40 |
| Cover Plate for One 3-Pole QOU Circuit Breaker | QOUCP3 QOUCP3B | 10.00 8.10 | 1 40 |
| Cover Plate for Two 2-Pole QOU Circuit Breakers | QOUCP4 QOUCP4B | 6.30 5.00 | 1 40 |
| Cover Plate for Three 2-Pole QOU Circuit Breakers | QOUCP6 QOUCP6B | 9.90 7.70 | 1 40 |
| Ring Tongue Terminal Adaptor | QOURT QOURTB | 3.60 2.75 | 1 80 |
| Quick Connector End Connection Wiring | QOUEC QOUECB | 3.60 2.80 | 1 40 |
| Quick Connector Forward or Reverse Wiring | QOUFR QOUFRB | 3.60 2.80 | 1 40 |
| 1-Pole QOU Mounting Foot | QOUMF1▲ QOUMF1B▲ | 0.45 0.34 | 1 40 |
| 2-Pole QOU Mounting Foot | QOUMF2▲ QOUMF2B▲ | 0.89 0.67 | 1 40 |
| 3-Pole QOU Mounting Foot | QOUMF3▲ QOUMF3B▲ | 1.40 1.00 | 1 40 |
| Mechanical Interlock Attachment: Used to interlock two circuit breakers mounted side-by-side so that only one circuit breaker can be ON at a time. A 1-Pole or 2-Pole circuit breaker can be mounted on the left and interlocked with a 2-Pole or 3-Pole circuit breaker on the right. | QOU2DTILA ■ | 15.80 | 1 |

▲ For use on low and high ampere QOU.
■ 10 A–70 A 1-Pole and 2-Pole, 10 A–60 A 3-Pole.
◆ DE2E Discount Schedule.

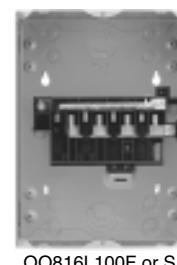
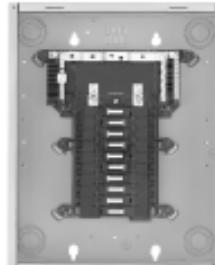


103W Load Centers, 120/240 Vac, UL Listed
Table 1.16: Main Lugs (Order QO, QOT, QO-EPD, QO-GFI, QO-AFI, and QO-PL branch circuit breakers from pages 1-2 and 1-3)

| Mains Rating | Spaces | Max. 1P Circuits▲ | Max. Tandem Circuit Breakers | \$ Price (Interior, Box & Cover) | Load Center Box and Interior | | Indoor Cover with Door (Order Separately) | | | Main Wire Size AWG/kcmil | Equipment Ground Bar Kit (Order Separately) | Box No. See Page 1-16 | | | |
|---|--------|-------------------|------------------------------|----------------------------------|------------------------------|-------------------|---|------------------|----------|--------------------------|---|-----------------------|----------------------|-------|--|
| | | | | | Cat. No. | \$ Price | Flush Cat. No. | Surface Cat. No. | \$ Price | AI | Cu | | | | |
| Fixed Mains—Factory-installed Main Lugs—10 kA Short Circuit Current Rating ■ | | | | | | | | | | | | | | | |
| 30 A | 2 | 2 | 0 | 27.80 | QO2L30S♦★ | 27.80 | | | | 12-10 | 14-10 | PK3GTA1 | 7.60 | 1 | |
| 70 A | 2 | 4 | 2 | 45.70 | QO24L70F/S▼△ | 45.70 | | | | 12-3 | 14-4 | PK4GTA | 7.20 | 2 | |
| | | | | 58.00 | QO612L100F/S▼□ | 58.00 | | | | 8-1 | | PK7GTA | 7.80 | 4 | |
| | | | | 60.00 | QO612L100DF/S▼□♦ | 60.00 | | | | 8-1 | | PK7GTA | 7.80 | 4 | |
| 100 A | | 6 | 12 | 6 | | | | | | | | | | | |
| | | | | 87.00 | QO816L100F/S▼□ | 87.00 | | | | 8-1 | | PK7GTA | 7.80 | 4 | |
| | | | | 95.00 | QO816L100DF/S▼□♦ | 95.00 | | | | 8-1 | | PK7GTA | 7.80 | 4 | |
| 100 A | 6 | 12 | 6 | 74.00 | QO612L100DFCU/SCU▼□♦★ | 74.00 | | | | 8-1 | | PK7GTA | 7.80 | 4 | |
| 125 A | 8 | 16 | 8 | 116.00 | QO816L100DFCU/SCU▼□♦★ | 116.00 | | | | 8-1 | | PK7GTA | 7.80 | 4 | |
| | | | | 62.00 | QO148L125GF/S▼▼ | 62.00 | | | | 12-2/0 | 14-2/0 | PK7GTA♦ | 21 | | |
| Convertible Mains—Factory-installed Main Lugs—65 kA Short Circuit Current Rating QOM1 Main Frame Size—Convertible to Main Circuit Breaker—Cu Bus ■ □ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| INDOOR | 12 | 12 | 0 | 131.10 | QO112L125G | 106.00 | QOC16UF | QOC16US | 25.10 | | | PK9GTA♦ | 6 | | |
| | 12 | 24 | 12 | 157.10 | QO1124L125G | 132.00 | QOC16UF | QOC16US | 25.10 | | | PK15GTA♦ | 6 | | |
| | 16 | 16 | 0 | 170.10 | QO116L125G | 145.00 | QOC24UF | QOC24US | 25.10 | | | PK12GTA♦ | 7 | | |
| | 16 | 24 | 8 | 200.10 | QO1162L125G | 175.00 | QOC24UF | QOC24US | 25.10 | | | PK15GTA♦ | 7 | | |
| | 20 | 20 | 0 | 181.10 | QO120L125G | 156.00 | QOC24UF | QOC24US | 25.10 | | | PK15GTA♦ | 7 | | |
| | 20 | 24 | 4 | 247.10 | QO12024L125G | 222.00 | QOC24UF | QOC24US | 25.10 | | | PK15GTA♦ | 7 | | |
| | 24 | 24 | 0 | 254.10 | QO124L125G | 229.00 | QOC24UF | QOC24US | 25.10 | | | PK15GTA♦ | 7 | | |
| | 32 | 32 | 0 | 289.40 | QO132L125G | 263.00 | QOC32UF | Use Flush | 26.40 | | | PK23GTA & LK100AN♦ | 8 | | |
| Convertible Mains—Factory-installed Main Lugs—65 kA Short Circuit Current Rating , QOM2 Main Frame Size—Convertible To Main Circuit Breaker—Cu Bus ■ □ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | 20 | 30 | 10 | 279.00 | QO12030L150G | 221.00 | QOC30UF | QOC30US | 58.00 | | | PK23GTA & LK100AN♦ | 9 | | |
| | 24 | 24 | 0 | 287.00 | QO124L150G | 229.00 | QOC30UF | QOC30US | 58.00 | | | PK15GTA♦ | 9 | | |
| | 30 | 30 | 0 | 291.00 | QO130L150G | 233.00 | QOC30UF | QOC30US | 58.00 | | | PK23GTA & LK100AN♦ | 9 | | |
| | 12 | 12 | 0 | 235.00 | QO112L200G | 177.00 | QOC30UF | QOC30US | 58.00 | | | PK15GTA♦ | 9 | | |
| | 24 | 36 | 12 | 546.00 | QO12436L200TFT* | 488.00 | QOC40UF | QOC40US | 58.00 | | | PK23GTA & LK100AN♦ | 10 | | |
| | 30 | 30 | 0 | 316.00 | QO130L200G | 271.00 | QOC30UF | QOC30US | 58.00 | | | PK23GTA & LK100AN♦ | 9 | | |
| | 30 | 40 | 10 | 369.00 | QO13040L200G | 311.00 | QOC30UF | QOC30US | 58.00 | | | PK23GTA & LK100AN♦ | 9 | | |
| | 40 | 40 | 0 | 497.00 | QO140L200G | 439.00 | QOC40UF | QOC40US | 58.00 | | | PK23GTA & LK100AN♦ | 10 | | |
| | 225 A | 42 | 42 | 0 | 552.00 | QO142L225G | 478.00 | QOC42UF | QOC42US | 74.00 | | | PK23GTA & LK100AN♦ | 11 | |
| Fixed Mains—Factory-installed Main Lugs—65 kA Short Circuit Current Rating ■ □ | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | 400 A | 12 | 12 | 0 | 1468.00 | QON12LS400 (int)♦ | 971.00 | MHC50QVF | MHC50QVS | 422.00 | (1) 1/0-750 or (2) 1/0-300 | | | 15 | |
| | | | | | | MH50 (box)□ | 75.00 | | | | | | PK27GTA♦ or PK15GTA6 | 22.50 | |
| | 400 A | 30 | 30 | 0 | 1547.00 | QON30LS400 (int)♦ | 1050.00 | MHC50QVF | MHC50QVS | 422.00 | (1) 1/0-750 or (2) 1/0-300 | | | 15 | |
| | | | | | | MH50 (box)□ | 75.00 | | | | | | 35.50 | 17 | |
| | 400 A | 42 | 42 | 0 | 1641.00 | QON42LS400 (int)♦ | 1125.00 | MHC53QVF | MHC53QVS | 441.00 | (1) 1/0-750 or (2) 1/0-300 | | | | |
| | | | | | | MH53 (box)□ | 75.00 | | | | | | | | |

Above listings through 200 A mains rating meet Federal Specification W-P-115C as Type 1, Class 2.

- ▲ Maximum single pole branch circuits utilizing QO and/or QOT circuit breakers.
- UL short circuit current rating depends on lowest interrupting rating of circuit breaker installed.
- ♦ Will not accept QO-EPD or Qwik-Gard® QO-GFI or QO-AFI circuit breakers.
- ★ Mains rated 25 A when AI wire is used.
- ▼ Order F for flush device or S for surface device.
- △ Use 10 AWG maximum size wire for GFI and AFI circuit breakers.
- 70 A Max. branch circuit breaker and 70 A max. back fed main circuit breaker.
- ◊ No provisions for lock kits.
- ★ CU indicates copper bus.
- ▽ Copper bus.
- UL Listed 5000 A short circuit current rating for corner grounded Delta systems. Use QO-H circuit breakers only.
- * Supplied with feed-thru lugs.
- ♦ Factory-included.
- Interior only, order box separately.
- PK27GTA includes a 6-2/0 AWG AI/Cu lug.
- PE1A Discount Schedule.


QO120L125G
without cover

Main Circuit Breaker Kits

Table 1.17: Field-installable Main Circuit Breaker (Use With Convertible Load Centers Only)

| Main Circuit Breaker Rating ♦ | Convertible Load Center Mains Rating | QOM1 Frame Size | | Lug Wire Size † AWG/kcmil | QOM2 Frame Size ● | |
|-------------------------------|--------------------------------------|----------------------|----------|---------------------------|----------------------|----------|
| | | Main Circuit Breaker | \$ Price | | Main Circuit Breaker | \$ Price |
| 50 A | 100-125 | QOM50VH | 93.00 | | 100 A | 150-225 |
| 60 A | 100-125 | QOM60VH | 93.00 | | 125 A | 150-225 |
| 70 A | 100-125 | QOM70VH | 93.00 | | 150 A | 150-225 |
| 80 A | 100-125 | QOM80VH | 134.00 | | 175 A | 200-225 |
| 90 A | 100-125 | QOM90VH | 134.00 | | 200 A | 200-225 |
| 100 A | 100-125 | QOM100VH | 134.00 | | 225 A | 225 |
| 110 A | 125 | QOM110VH | 312.00 | | | |
| 125 A | 125 | QOM125VH | 312.00 | | | |

- ♦ Do not exceed the load center mains rating.
- † 22 kA main circuit breaker UL Listed for use ahead of QO, QOT and QO-PL 10 k AIR branch circuit breakers to permit their application on systems with up to 22 kA available fault current.
- ‡ Wire range listed for QOM circuit breaker kits is the wire range of that circuit breaker. To find out maximum wire size permitted in a particular load center per UL, see pages 1-5 through 1-10 under Main Wire Size.
- Add suffix 1021 for 120, 208 or 240 Vac shunt trip. Add \$126.00.


QOM1 Frame Size
50-125 Amperes

QOM2 Frame Size
100-225 Amperes

Flasher - Low Cost FS100 Series Solid State Flasher



TEN YEAR
WARRANTY
10

- Fixed Flash Rate at 75 Flashes Per Minute
- Custom Flash Rate 45 ... 150 F.P.M.
- 1 or 2 A Output
- 24 or 120 V AC Are Available
- Small Size: 1.5 x 0.94 in. (38 x 23.9 mm)

Description

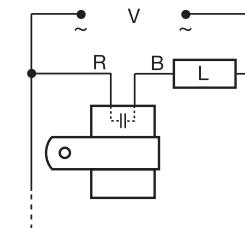
The FS100 Series may be used to control inductive, incandescent or resistive loads. This series offers a 1 A (fullwave) or a 2 A (halfwave) steady state, 10 A inrush solid state output; and may be ordered with an input voltage of 24 or 120 V AC. The FS100 Series offers a factory fixed flash rate of 75 flashes per minute or may be ordered with a fixed custom flash rate ranging from 45 to 150 flashes per minute. Ideal for OEM applications where cost is a factor.

Operation

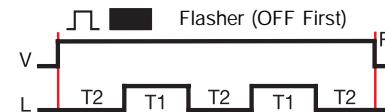
Upon application of input voltage, the T2 OFF time begins. At the end of the OFF time, the T1 ON time begins and the load energizes. At the end of T1, T2 begins and the load de-energizes. This cycle repeats until input voltage is removed.

Reset: Removing input voltage resets the output and the sequence to T2.

■ Approvals:



V = Voltage L = Load
R = Red Wire B = Black Wire



V = Voltage R = Reset L = Load
T1 = ON Time T2 = OFF Time

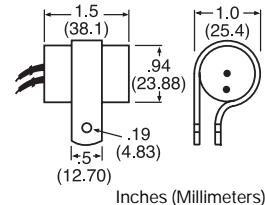
| Input | Output Rating | Output Type | Load Type * | Part Number |
|----------|---------------|--------------|-------------|-------------|
| 120 V AC | 1 A | AC, Fullwave | A | FS126 |
| 120 V AC | 1 A | AC, Fullwave | B | FS126RC |
| 120 V AC | 2 A | AC, Halfwave | A | FS127 |
| 24 V AC | 1 A | AC, Fullwave | A | FS146 |
| 24 V AC | 1 A | AC, Fullwave | B | FS146RC |
| 24 V AC | 2 A | AC, Halfwave | A | FS147 |

* Load Type: A - Incandescent & Resistive B - Incandescent, Resistive & Inductive

Technical Data

Specifications

| | |
|------------------------------|---|
| Mode of Operation | OFF/ON solid state flasher for continuous duty |
| Input Voltage | 24, 120 V AC, +/-15%, 50 ... 60 Hz |
| Flash Rate | Factory fixed at 75 flashes per minute +/-20% |
| ON/OFF Ratio | $\geq 50\%$ |
| Load Type | Incandescent, resistive, or inductive (Choose RC Suffix for inductive loads) |
| Output | Fullwave AC or Halfwave rectified AC |
| Maximum Load Rating | Fullwave: 1A steady state Halfwave: 2 A steady state |
| Inrush | 10 A |
| Custom Flash Rates Available | From 45 ... 150 FPM +/-20% |
| Mounting | Surface mount with one #8 (M4 x 0.7) screw |
| Package | 1.5 x 0.94 in. (38.1 x 23.9 mm) |
| Circuitry | Encapsulated |
| Operating Temperature | -20°C ... +60°C |
| Storage Temperature | -40°C ... +85°C |
| Humidity | 95% relative, non-condensing |
| Weight | ≤ 1.1 oz (31 g) |



Inches (Millimeters)

W = 18 AWG (0.82 mm²) wires
6 in. (15.2 cm)

Mounting bracket is removable