ADJUSTABLE TRANSMITTER

FEATURES

- Single Turn Potentiometer with 4-20 mA Scale
- Transient Voltage Protection
- Internal Fuse
- Internal Series Diode
- Zero and Span Calibration

TYPICAL APPLICATIONS

Used to simulate a 4-20 mA signal from field devices while testing control equipment.

Used to calibrate equipment having a 4-20 mA analog input.

Use as part of a product demo unit that requires control of a 4-20 mA analog input for demonstration purposes.

OPERATION

The Adjustable Transmitter is a device that is placed in an analog current loop in order to test, calibrate or demo equipment. It may be used to simulate analog field devices such as Pressure Transducers or Temperature Transmitters.

When placed in a analog current loop, the Adjustable Transmitter regulates the current in the loop to the setting on the knob, between 4 and 20 mA.

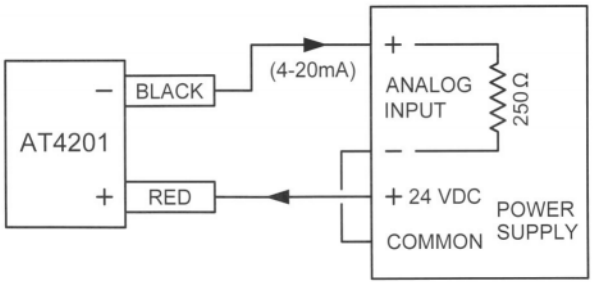
Where a precise current setting is required, an Ammeter may be place in the current loop, and used to display the loop current.

CALIBRATION

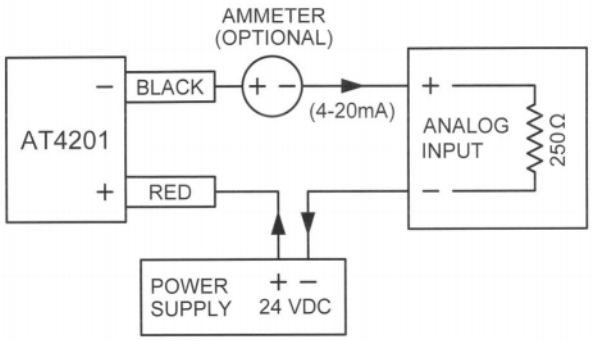
To calibrate the Zero setting, place an Ammeter in the loop, turn the knob all the way to the left and turn the Zero adjustment screw until the Ammeter reads 4.00 mA.

To calibrate the Span setting, turn the knob all the way to the right and turn the Span adjustment screw until the Ammeter reads 20.0 mA.

Connection with Internal Power Supply



Connection with External Power Supply



SPECIFICATIONS

Operating Voltage Range:	10.0 – 35.0 VDC
Internal Fuse:	1/8 Amp, 125 Volt
Dimensions:	4.2” x 2.5” x 2.20”
Operating Temperature:	-18 °C to +77 °C
Maximum Loop Resistance:	600 Ohms

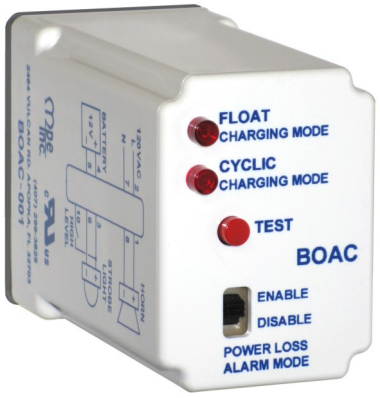
ORDERING INFORMATION

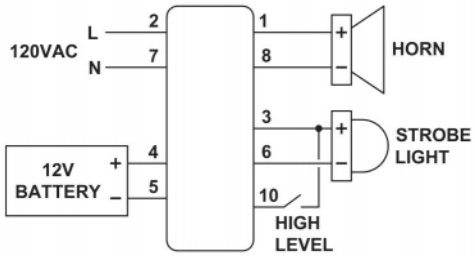
Model Number: AT4201

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

BOAC

Battery Operated Alarm with Charger



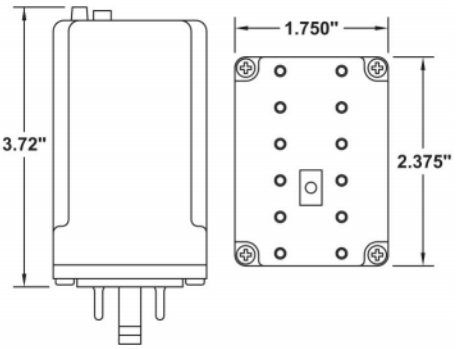


FEATURES:

12V Battery Charger
Power Loss Alarm with Enable/Disable Mode Switch
Push-To-Test Switch
Repeat Cycle Timer for Horn

c UL us

UL FILE # E101681



OPERATION

The BOAC is a device that performs the various tasks required to manage a 12VDC alarm system that has an alarm strobe light and horn powered by a 12V backup battery. The BOAC charges the backup battery, provides a Power Loss Alarm (when required), has a repeat cycle timer for the horn, a system push-to-test button and indication of the battery charging mode.

During an alarm condition the alarm strobe light and horn are powered by the battery. After an alarm condition and with 120VAC applied/restored, the BOAC will recharge the 12V backup battery. During an alarm condition battery power is conserved by operating the horn intermittently, on for 2 seconds, and then off for 2 seconds.

Upon closure of an alarm contact across pins 3 and 10, the strobe light and horn will be activated. Also, upon the loss of 120VAC power, the Power Loss Alarm (if enabled) will activate the strobe light and horn. The Power Loss Alarm may be enabled/disabled by setting the Power Loss Alarm Mode switch to the desired setting.

The push-to-test button is provided to verify system operation. When pushed, the battery charger is turned off so that the strobe light and horn may be powered solely by the battery during the test.

The BOAC utilizes a Battery Charge Controller IC chip that was specifically designed to manage the charging of sealed lead-acid batteries. This chip carefully controls the charging current and voltage during the charging process to maximize battery capacity and life. The Charge Controller has two charging modes, "Cyclic Charging" and "Float Charging". During an alarm event, the strobe light and horn will slowly run down the battery. As long as the battery voltage stays above 12.1V (50% charged), the Charge Controller will stay in the Float Charging Mode. In the Float Charging Mode, the battery will be recharged to 13.6V ±1% @ 25°C, when the alarm clears. If the alarm where to be turned on often enough (or stay on long enough) to run the battery down below 12.1V (50% charged), the Charge Controller will toggle into the Cyclic Charging Mode and recharge the battery to 14.6V ±1% @ 25°C. After a period of time in the Cyclic Charging Mode with no alarm events, the charging current will drop below 25mA, and the Charge Controller toggles back to the Float Charging Mode. Battery manufacturers typically recommend this dual voltage charging regiment to ensure the optimum capacity and life of their batteries. To accommodate lead-acid battery chemistry, the Charge Controller also adjusts the charging voltage to account for changes in the ambient temperature (-20.7mV/C° or -11.5mV/F°).

SPECIFICATIONS

Input Power:	120VAC ±10% 8.9VA max
Charging Voltage:	Cyclic Charging Mode - 14.6V ±1% @ 25°C Float Charging Mode - 13.6V ±1% @ 25°C
Charging Current Limit:	103mA
Strobe Light Output:	12VDC @ 500mA or Less
Horn Output:	12VDC @ 500mA or Less (See Note on Horn Selection)
Operating Temp:	-20°C to +60°C
Storage Temp:	-45°C to +85°C
Enclosure:	Lexan
Plug In Base:	Phenolic

ORDERING INFORMATION

Part Number:
BOAC-001

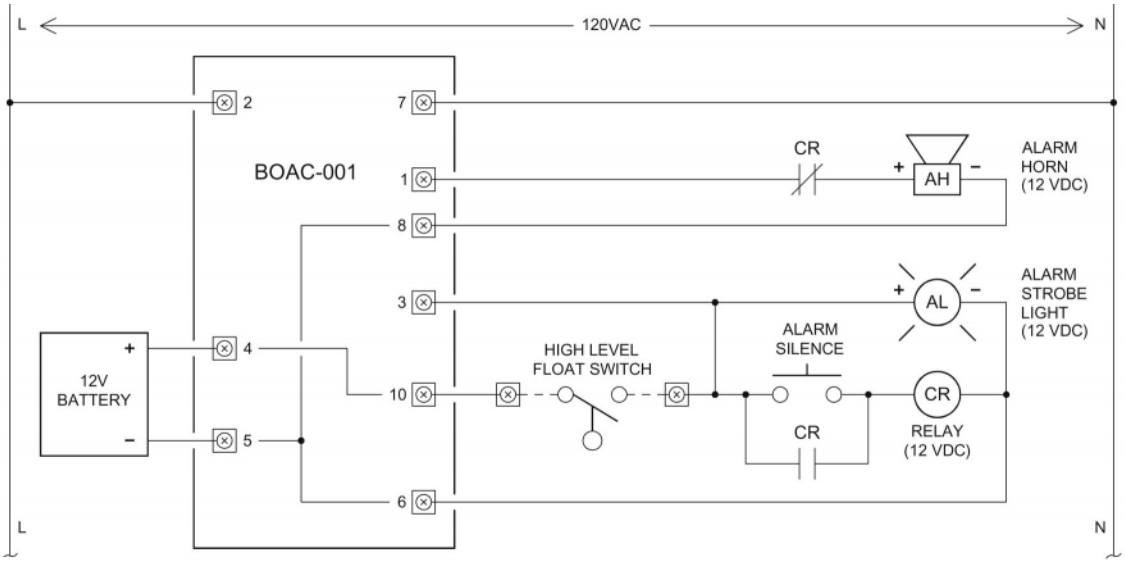
Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

BOAC

Battery Operated Alarm with Charger

APPLICATION EXAMPLE

The following is an example of how a pushbutton and relay may be connected to the BOAC to provide an alarm horn silence feature:



Notes:

Alarm Silence - In the above example, when there is an alarm condition, pressing the "ALARM SILENCE" pushbutton will energize the control relay (CR) and remove power from the alarm horn. The above circuit has a latch feature formed by having a contact from the control relay wired across the pushbutton. Since the latch is broken when the alarm condition clears, the horn will sound again if the alarm condition returns.

Alarm Light Output Pins 3 & 6 - With the Power Loss Alarm Enabled and upon a loss of 120 VAC, the BOAC will provide +12 V battery power to Pin 3 to turn on the strobe light. Also, upon a high level alarm, the +12 V battery power from Pin 10 will be connected to the strobe light. Pin 6 is connected internally to the battery negative from Pin 5.

Alarm Horn Output Pins 1 & 8 - With the Power Loss Alarm Enabled and upon a loss of 120 VAC, the BOAC will provide +12 V battery power to Pin 1 to turn on the alarm horn. Also, upon a high level alarm, the +12 V battery power from Pin 10 will be connected through the high level float switch to Pin 3. With power connected to Pin 3, the BOAC will turn on the alarm horn output. The output to the horn is always operated intermittently, on for 2 seconds, and then off for 2 seconds. Pin 8 is connected internally to the battery negative from Pin 5.

Alarm Horn Selection - An Electronic or Piezoelectric type horn (such as the Wheelock MT-12/24-R) is required for use with the BOAC. Vibrating electro-mechanical type alarm horns create damaging high voltage transients which cannot be mitigated without affecting the operation of the horn, and therefore must not be used with the BOAC.

Parts Typically used with BOAC-001

Description	Manufacturer	Part Number
Battery, Sealed Lead Acid, 12 V, 7 Ah	EnerSys	NP7-12
Alarm Horn, Multitone Electronic, 12-24 VDC, Red	Wheelock	MT-12/24-R
Alarm Horn Back Box, Red	Wheelock	IOB-R
Alarm Strobe Light, 12-48 VDC, Red	Federal Signal	LP3M-012-048R
Socket (for BOAC-001), 12 Pin, Surface Mount, 10 A, 600 V	Custom Connector	SD12-PC

Pump Monitor Relay PMR1

MOTOR PROTECTION ELECTRONICS LLC

MADE IN THE U.S.A.

UL FILE #E101681

OPERATION

The Pump Monitor Relay provides Motor Over Temperature and Seal Leakage alarms for Submersible Pumps.

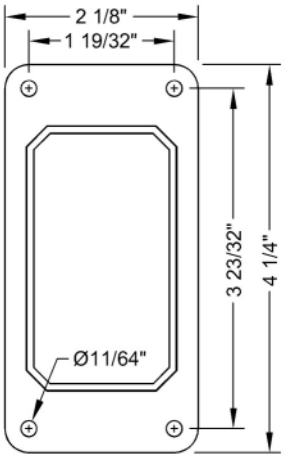
Motor Over Temperature Alarm - The unit applies a low voltage DC signal to the Motor Thermal Sensor to check its status. If the unit detects that the Motor Thermal Sensor contacts are closed (normal condition), the Overtemp indication remains off, and the Overtemp Relay is energized closing the contacts between terminals 2 and 11.

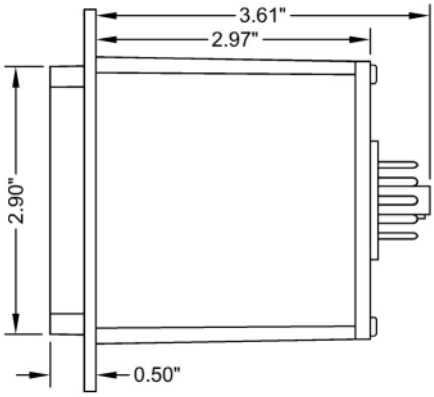
If the Motor Thermal Sensor contacts open (Over Temperature condition), the Overtemp Indication is turned on and the Overtemp Alarm Relay is de-energized opening the contacts between terminals 2 and 11 and closing the contacts between terminals 2 and 1.

When the High Motor Temperature condition has cleared, the unit will reset based on the position of Alarm Reset Mode Select Switch (Auto or Manual). When in the Auto position, the Overtemp Alarm resets automatically. If the switch is in the Manual position, the Overtemp Reset Push-button must be pushed for approximately 1.5 seconds to clear the alarm.

Seal Leakage Alarm - The unit detects moisture inside a pump motor by using a low voltage AC signal to measure the resistance between a single (or dual) Leakage Probe(s) and the grounded motor housing, or across two Leakage Probes. A Seal Leakage condition is considered present when the amount of moisture in the motor causes the resistance between terminal 6 and 5 to drop below the setting on the potentiometer. When this occurs the unit turns on the Leakage Indication and energizes the Leakage Alarm Relay closing the contacts between terminals 9 and 10.

The alarm trip point may be set by the following procedure: Isolate the Leakage Probe(s) from terminals 5 and 6. Connect a resistor, with the desired trip value, across terminals 5 and 6. Slowly adjust the potentiometer to the point where the alarm turns on. Remove the resistor and reconnect to the Leakage Probe(s).





SPECIFICATIONS

Input Power:	120 VAC ±10%, 7.0 VA max
Output Rating:	8A Resistive @ 120VAC
Operating Temp:	-20°C to +65 °C
Storage Temp:	-45°C to +85 °C
Temp Sensor Voltage:	6.6 VDC ±10%
Leak Sensor Voltage:	4.7 VAC ±10%
Enclosure:	White Lexan
Base:	Phenolic

ORDERING INFORMATION

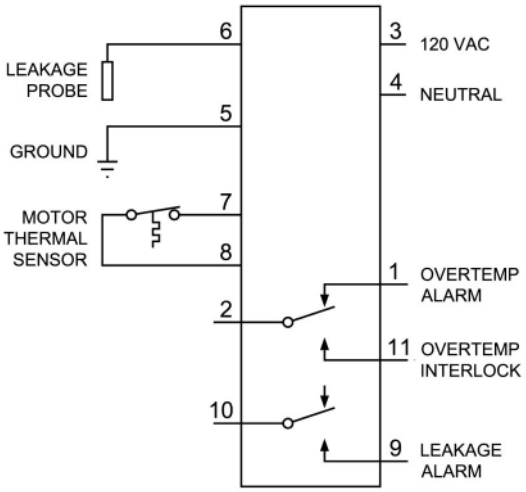
Part Number: PMR1

Order from: **C A Briggs Company**; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

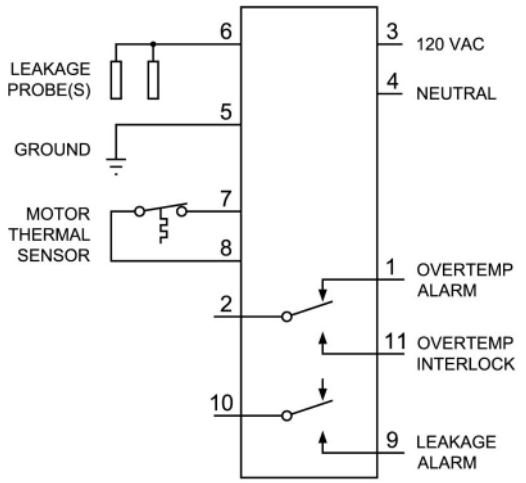
Pump Monitor Relay

CONNECTION DIAGRAMS

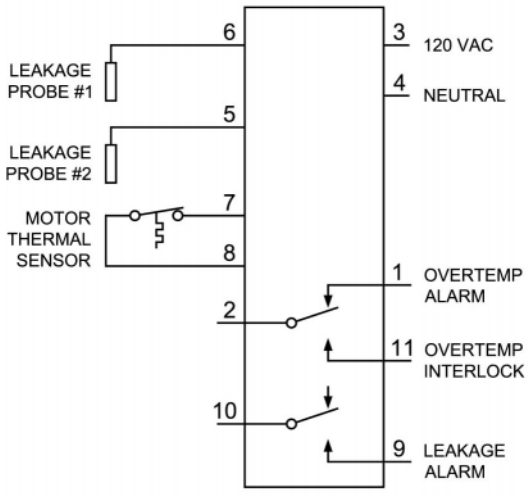
CHECKS RESISTANCE BETWEEN ONE PROBE AND MOTOR HOUSING



CHECKS RESISTANCE BETWEEN TWO PROBES AND MOTOR HOUSING



CHECKS RESISTANCE BETWEEN TWO PROBES



Pump Monitor Relay PMR2

MADE IN THE U.S.A.

UL FILE #E101681

OPERATION

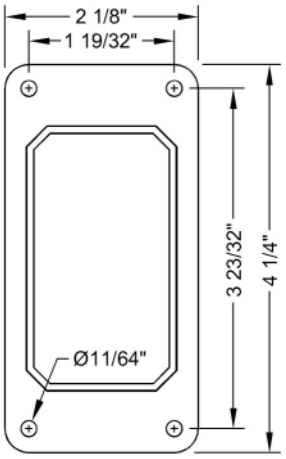
The PMR2 Pump Monitor Relay provides Motor Over Temperature and Seal Leakage alarms for submersible pumps equipped with FLS or CLS sensors.

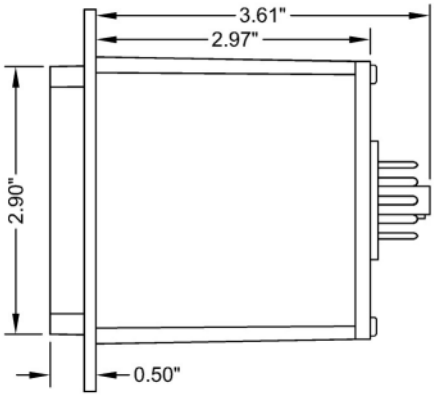
The PMR2 applies 12 VDC to the sensor and measures the current flow through the sensor. The sensor controls the current in the circuit. If the sensor current is in the normal range the Temperature Alarm Relay is energized to allow normal pump operation. If the sensor circuit becomes shorted, the 12 VDC is turned off and all LEDs flash.

Upon a High Motor Temperature condition, the sensor opens so that the sensor circuit current drops to zero. With the sensor current below the Trip Point (≤3.0 mA ±5%), the Overtemp Indication is turned on and the Temperature Alarm Relay is de-energized, preventing pump operation.

When the High Motor Temperature condition has cleared, the unit will reset based on the position of Alarm Reset Mode Select Switch (Auto or Manual). When in the Auto position, the Overtemp Alarm resets automatically. If the switch is in the Manual position, the Overtemp Reset Push-button must be pushed to clear the alarm.

Upon a Seal Leakage condition, the sensor increases the sensor circuit current above the Trip Point (≥22 mA ±5%), the Leakage Indication is turned on and the Leakage Alarm Relay is energized.





SPECIFICATIONS

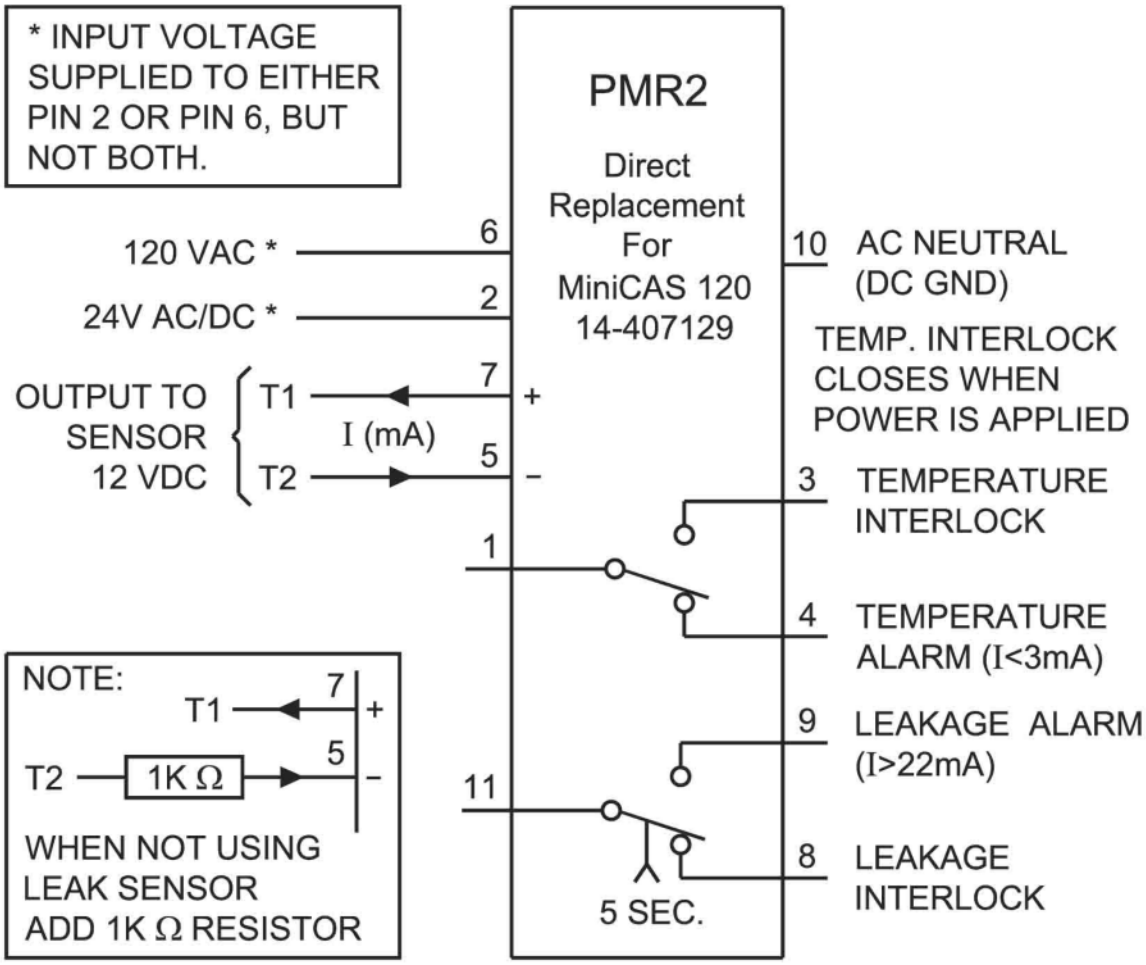
Input Power:	120 VAC ±10%, 7.0 VA max 24 VAC ±10%, 3.5 VA max 24 VDC ±10%, 125 mA max
Output Rating:	8A Resistive @ 120VAC
Operating Temp:	-20 °C to +65 °C
Storage Temp:	-45 °C to +85 °C
Sensor Circuit Voltage:	12 VDC ±10%
Temp Alarm Trip Point:	≤3.0 mA ±5%
Leak Alarm Trip Point:	≥22 mA ±5%
Enclosure:	Blue Lexan
Base:	Phenolic

ORDERING INFORMATION

Part Number: PMR2

Pump Monitor Relay PMR2

CONNECTION DIAGRAM



Pump Monitor Relay PMR3

MOTOR PROTECTION ELECTRONICS LLC

MADE IN THE U.S.A.

c UL us

UL FILE #E101681

OPERATION

The Pump Monitor Relay provides Motor Over Temperature and Seal Leakage alarms for Submersible Pumps.

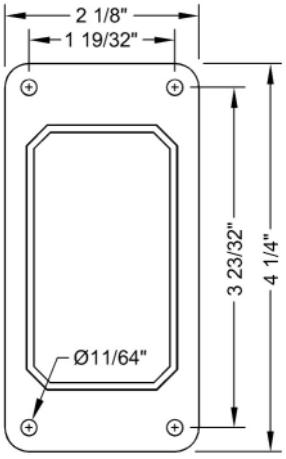
Motor Over Temperature Alarm - The unit applies a low voltage DC signal to the Motor Thermal Sensor to check its status. If the unit detects that the Motor Thermal Sensor contacts are closed (normal condition), the Overtemp indication remains off, and the Overtemp Relay is energized closing the contacts between terminals 1 and 3.

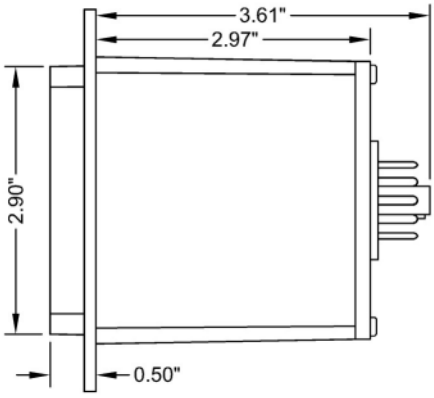
If the Motor Thermal Sensor contacts open (Over Temperature condition), the Overtemp Indication is turned on and the Overtemp Alarm Relay is de-energized opening the contacts between terminals 1 and 3 and closing the contacts between terminals 1 and 4.

When the High Motor Temperature condition has cleared, the unit will reset based on the position of Alarm Reset Mode Select Switch (Auto or Manual). When in the Auto position, the Overtemp Alarm resets automatically. If the switch is in the Manual position, the Overtemp Reset Push-button must be pushed for approximately 1.5 seconds to clear the alarm.

Seal Leakage Alarm - The unit detects moisture inside a pump motor by using a low voltage AC signal to measure the resistance between a single (or dual) Leakage Probe(s) and the grounded motor housing, or across two Leakage Probes. A Seal Leakage condition is considered present when the amount of moisture in the motor causes the resistance between terminal 2 and 5 to drop below the setting on the potentiometer. When this occurs the unit turns on the Leakage Indication and the Leakage Alarm Relay is energized opening the contacts between terminals 11 and 8 and closing the contacts between terminals 11 and 9.

The alarm trip point may be set by the following procedure: Isolate the Leakage Probe(s) from terminal 2. Connect a resistor, with the desired trip value, across terminals 2 and 5. Slowly adjust the potentiometer to the point where the alarm turns on. Remove the resistor and reconnect to the Leakage Probe(s).





SPECIFICATIONS

Input Power:	230 VAC ±10 %, 50 Hz / 60 Hz 7.0 VA max
Output Rating:	8 A Resistive @ 230 VAC
Operating Temp:	-20 °C to +65 °C
Storage Temp:	-45 °C to +85 °C
Temp Sensor Voltage:	6.6 VDC ±10 %
Leak Sensor Voltage:	4.7 VAC ±10 %
Enclosure:	White Lexan
Base:	Phenolic

ORDERING INFORMATION

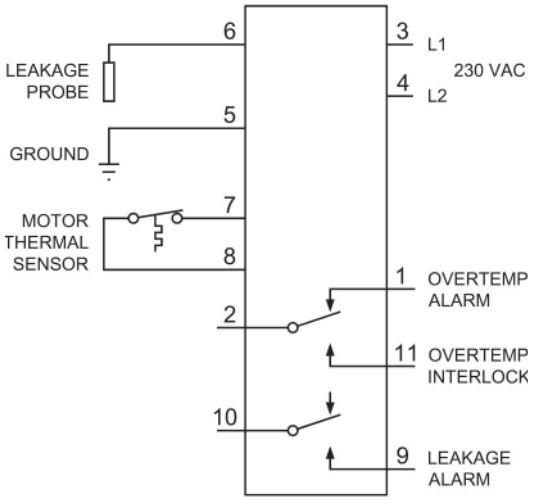
Part Number: PMR3

Pump Monitor Relay PMR3

CONNECTION DIAGRAMS

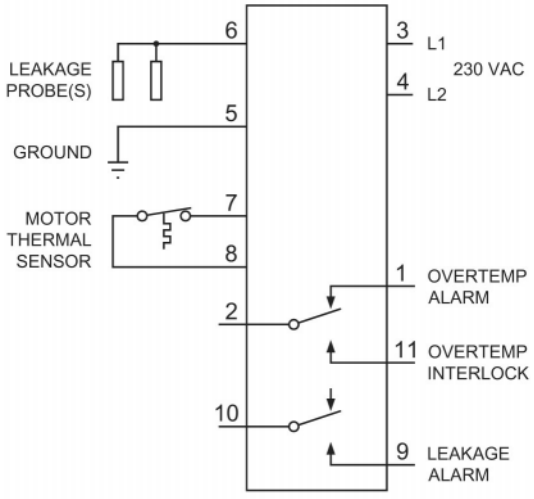
CHECKS RESISTANCE BETWEEN

ONE PROBE AND MOTOR HOUSING



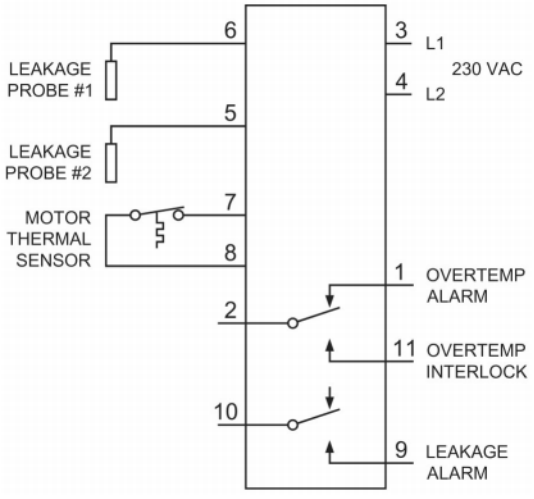
CHECKS RESISTANCE BETWEEN

TWO PROBES AND MOTOR HOUSING



CHECKS RESISTANCE BETWEEN

TWO PROBES



Pump Monitor Relay PMR5

MADE IN THE U.S.A.

UL FILE #E101681

OPERATION

The Pump Monitor Relay provides Motor Over Temperature and Seal Leakage alarms for Submersible Pumps.

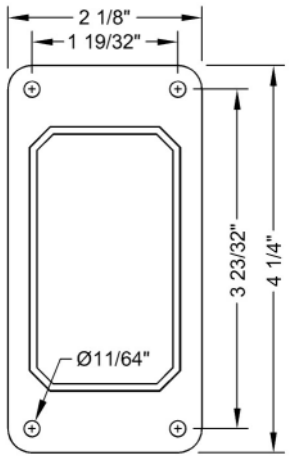
Motor Over Temperature Alarm - The unit applies a low voltage DC signal to the Motor Thermal Sensor to check its status. If the unit detects that the Motor Thermal Sensor contacts are closed (normal condition), the Overtemp indication remains off, and the Overtemp Relay is energized closing the contacts between terminals 1 and 3.

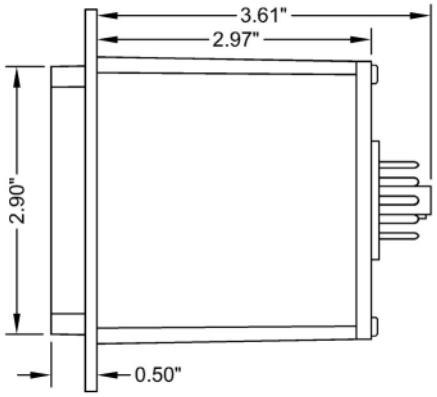
If the Motor Thermal Sensor contacts open (Over Temperature condition), the Overtemp Indication is turned on and the Overtemp Alarm Relay is de-energized opening the contacts between terminals 1 and 3 and closing the contacts between terminals 1 and 4.

When the High Motor Temperature condition has cleared, the unit will reset based on the position of Alarm Reset Mode Select Switch (Auto or Manual). When in the Auto position, the Overtemp Alarm resets automatically. If the switch is in the Manual position, the Overtemp Reset Push-button must be pushed for approximately 1.5 seconds to clear the alarm.

Seal Leakage Alarm - The unit detects moisture inside a pump motor by using a low voltage AC signal to measure the resistance between a single (or dual) Leakage Probe(s) and the grounded motor housing, or across two Leakage Probes. A Seal Leakage condition is considered present when the amount of moisture in the motor causes the resistance between terminal 2 and 5 to drop below the setting on the potentiometer. When this occurs the unit turns on the Leakage Indication and the Leakage Alarm Relay is energized opening the contacts between terminals 11 and 8 and closing the contacts between terminals 11 and 9.

The alarm trip point may be set by the following procedure: Isolate the Leakage Probe(s) from terminal 2. Connect a resistor, with the desired trip value, across terminals 2 and 5. Slowly adjust the potentiometer to the point where the alarm turns on. Remove the resistor and reconnect to the Leakage Probe(s).





SPECIFICATIONS

Input Power:	120 VAC ±10%, 7.0 VA max
Output Rating:	8A Resistive @ 120VAC
Operating Temp:	-20°C to +65 °C
Storage Temp:	-45°C to +85 °C
Temp Sensor Voltage:	6.6 VDC ±10%
Leak Sensor Voltage:	4.7 VAC ±10%
Enclosure:	White Lexan
Base:	Phenolic

ORDERING INFORMATION

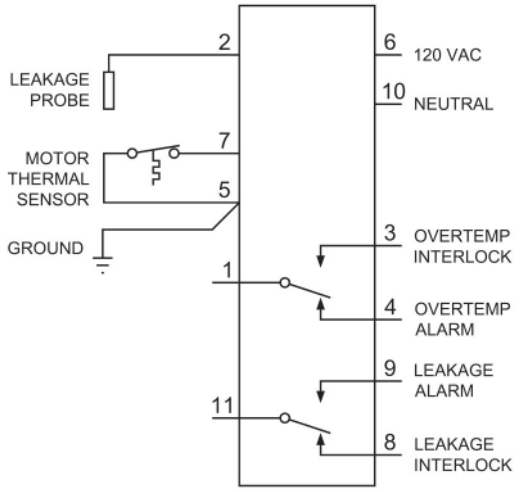
Part Number: PMR5

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

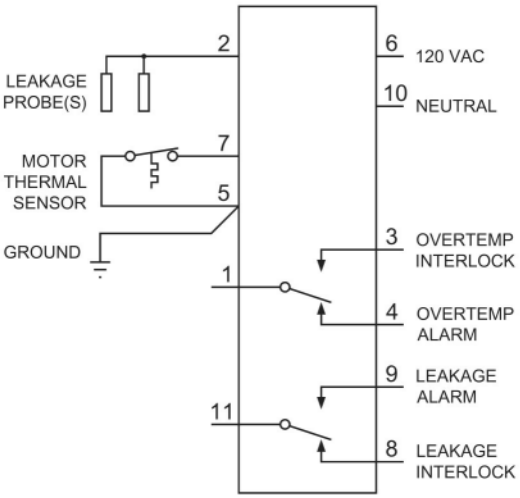
Pump Monitor Relay PMR5

CONNECTION DIAGRAMS

CHECKS RESISTANCE BETWEEN ONE PROBE AND MOTOR HOUSING



CHECKS RESISTANCE BETWEEN TWO PROBES AND MOTOR HOUSING



CHECKS RESISTANCE BETWEEN TWO PROBES