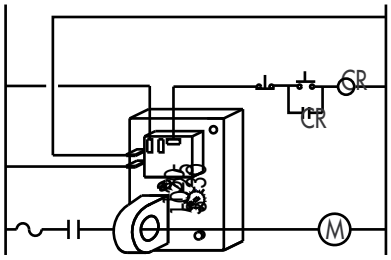
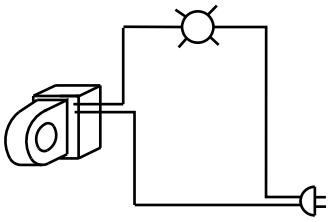


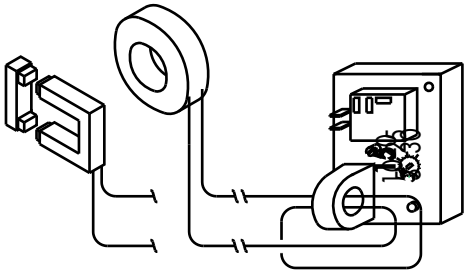

## MOTOR OVER / UNDER MOTOR

The relay may be used to monitor the operational load of a motor. One leg of the motor wiring is routed through the window opening. With the "EH" (Energized on High) trip status, when the motor current draw exceeds the trip point, the relay will energize and open the starter motor. The time delay would be set long enough to inhibit tripping during high inrush starting current. Note that an electrical fuse and other overload devices will be required for complete motor protection.



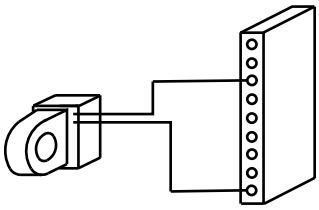
## CONNECTION TO INDICATOR LAMP

The current switch may be used to directly an indicating lamp. When using the AC output version, either of the two black leads may be attached to the power source. A snubber network is required when connecting to a indictive device such as a eletromechanical relay.



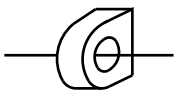
## EXTERNAL CURRENT TRANSFORMERS

The relay may be used with an external split or solid-core current transformer. The external transformer can be used to access remote loads or where the current-carrying wire is too large to fit through the window opening in the relay. A standard, 5 amp secondary, commercial grade current transformer (Section F, Pages 94-107) would be attached with the secondary leads threaded twice through the window opening, as illustrated. The trip range option -110 (1.0 to 10 ACA) would then provide full-scale adjustment for the transformer.

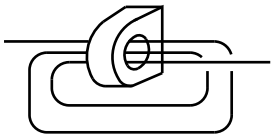


## CONNECTION TO PLC

The current switch may be connected directly to a PLC. Supply power may be provided from the PLC, as shown, or from an external power source. When using a transistor output, the negative or black lead from the switch is attached to the negative side of the supply.

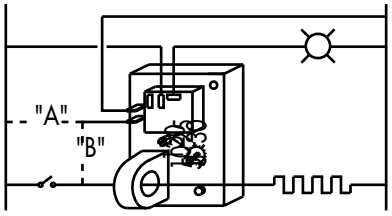


## ONE WIRE PASS



## THREE WIRE PASS

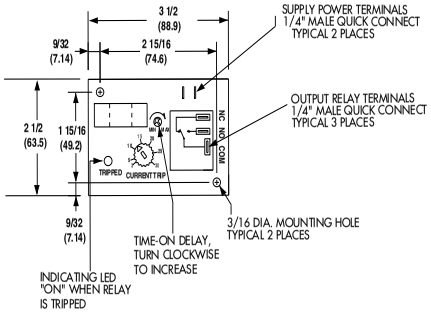
The trip ranges shown on Page 63 represent on wire pass through the window opening. The trip range may be changed by threading the current-carrying wire through the window opening several times, as shown above. The "actual" trip range would be the relay name plate range divided by the number of wire passes through the opening. I.E. a name plate range of -660 (6.0 to 60 ACA) with three wire passes would provide an actual range of 2.0 to 20 ACA (6/3=2.0 & 60/3=20).




## OPEN HEATER / LAMP DETECTOR

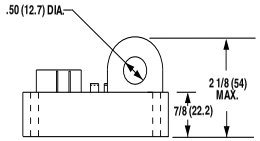
The relay may be used to provide an alarm signal to indicate an open heater element. The current-carrying wire is routed through the window opening. With the "EL" (Energized on Low) current status option, when the heater element draws current above the trip point, the relay remains de-energized. If the element becomes open, the current level will be reduced causing the relay to become energized. Supply power is constantly supplied to the relay with the "A" connection and the relay will cycle every time the temperature controller cycles. Using the alternate connection with line "B", power is provided to the relay only when the temperature controller is cycled on. With this connection, the relay will energize only when the element is open.

## OUTLINE DRAWING




Top view of Current Sensing Relay

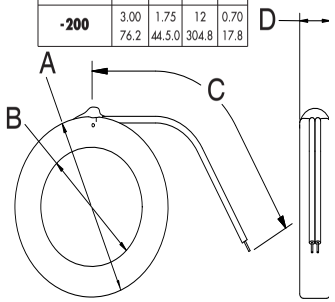

Shown with Remote Current Transformer Option (-R)




Shown with Internal Transformer Option (-I)

### CR4395 Series

| CRGFS | A | B | C | D |
|---|---|---|---|---|
| -100 | 2.70<br>68.6 | 1.65<br>42.0 | 12<br>304.8 | 0.70<br>17.8 |
| -200 | 3.00<br>76.2 | 1.75<br>44.5.0 | 12<br>304.8 | 0.70<br>17.8 |




Remote Current Transformers CRGFS - Series

## PART NUMBER

**CR4395 - ❑❑ - ❑❑❑ - ❑❑❑ - ❑ - ❑❑ - ❑❑❑ - ❑**

**TRIP STATUS**
**EH** - Energized on High, trips when sense current is above trip point and returns to non-trip status when sense current is below the trip point.
**EL** - Energized on Low, trips when sense current is below trip point and returns to non-trip status when sense current is above the trip point.
**LH** - Latch on High, trips when sense current is above trip point and remains tripped until supply power is removed.
**LL** - Latch on Low, trips when sense current is below trip point and remains tripped until supply power is removed.

**SUPPLY VOLTAGE**
**AC**
**120** - 120 VAC
**240** - 240 VAC
**DC**
**24D** - 24 VDC
All supply voltage tolerances are ± 10 %

**TRIP RANGE**
**110** - 1.0 to 10 AAC
**330** - 3.0 to 30 AAC
**660** - 6.0 to 60 AAC
**101** - 10 to 100 AAC
The trip ranges shown are for one wire pass through the window opening. The trip range may be proportionally lowered with additional wire passes through the window.

**TRIP POINT DIAL**
**CD** - Calibrated Dial
**FP** - Fixed Trip Point
(Specify value of fixed trippoint with order)
No adjustment dial provided with the fixed set point option
- CD - FP
3.30 trip range shown

**I** - INTERNAL TRANSFORMER
**R** - REMOTE TRANSFORMER

**TRIP ON DELAY**
**A** - .5 to 6 Sec.
**B** - 2 to 25 Sec.
**C** - .1 to 1 Sec.
**X** - None
Time-on delay is the time from when the relay trips to when the output energizes. The ranges are guaranteed minimum, actual range may be slightly greater.

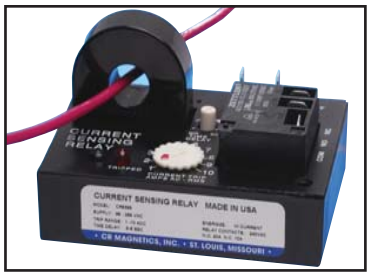
**OUTPUT OPTIONS**
NC NO COM
**ELR** Electromechanical Relay
**NPN** Optoisolated NPN Transistor
**TRC** Optoisolated Triac, Zero Crossing

**CRGFS - ❑❑❑ EXTERNAL CURRENT SENSING TRANSFORMER**
**100** - 1.65 dia. Window
**200** - 1.75 dia. Window

The Professional Energy Monitoring Company
CR MAGNETICS
ISO 9001:2008 Quality Management System
CR Magnetics, Inc. 3500 Scarlet Oak Blvd. St. Louis MO USA 63122 V: 636-343-8518 F: 636-343-5119
Web: http://www.crmagnetics.com E-mail: sales@crmagnetics.com

Current Sensing Relay

### CR4395 Series




## OUTPUT OPTIONS

The Relay is available with three different output configurations, electromechanical relay, optoisolated NPN transistor or optoisolated triac. Specify desired selection in part number.

## RELAY (-ELR)

Arrangement: 1 Form C (SPDT)
Contact Material: Silver-cadmium oxide
Terminals: 3 1/4" Male QC
Mechanical Life: 10 million operations, typ.@ rated load
Electrical Life: 100,000 operations, typ. @ rated load
Initial Contact Resistance: 50 milliohms max. @ 500 mA, 12 VDC
Contact Rating: UL508/873 & CSA

## DC SWITCHING (-NPN)

Vce (full off): 30 VDC max.
Isink (full on): 120 mADC max.@ rated full-on
Vce (full on): 1.5 VDC @ 120 mADC Isink
Off state leakage current: 5ua @ 30 VDC (typical)

## AC SWITCHING (-TRC)

Off state voltage: 240 VAC RMS max.
Minimum switch voltage: 24 VAC RMS
On state current: 0.5 AAC RMS max. continuous
Switching mode: Zero crossing
Off state leakage: 60 ua @ 240 VAC max.

The **CR4395** Series, Current Sensing Relay provides an effective and highly stable method for monitoring electrical current. The current-carrying wire is routed through the opening extending from the top of the case. When current reaches the level set by the trip point adjustment, the relay trips and starts the adjustable timer. After the timer cycles the electromechanical relay is energized. A precision voltage reference circuit ensures a highly repeatable trip point.

### Applications

Monitor Electrical Heater Elements
Sense Motor Over/Under Loads
Detect Lamp burn-out
Indicate Phase Loss

### Features

Variable Trip Point and Time Delay
Monitors Currents from 1 AC to 100 AC Amps
Electrical Isolation Between Circuits
Output Relay Rated up to 20 Amps
LED Trip Status Indicator
Dead Band Prevents Relay Chatter
Calibrated Dial Option Available
External Current Transformers Available

### Specifications

Mounting:
3/16" dia. clearance holes on 1 15/16" by 2 15/16" centers
Environmental:
Operating Temperature: -30° C to +60° C
Storage Temperature: -55° C to +85° C
Power-On Delay: 100 MS MAX
Hysteresis: 5% Max.
Input Supply Power:
Terminals: 2 1/4" Male QC
Typical 80mA Max. 100mA
Sensed Current:
Max. Continuous: 200% Full Scale
Frequency: 60-400 Hz *
*All specifications for operation at 60 Hz only
Weight 0.5 LBS.

### Regulatory Agencies

c UL us

RoHS COMPLIANT

| VOLTAGE | LOAD TYPE | N.O. CONTACT | N.C. CONTACT |
|---|---|---|---|
| 240 VAC | Resistive | 20A | 10A |
| 240 VAC | Motor | 2HP | 1/2 HP |
| 125 VAC | Motor | 1HP | 1/4 HP |
| 28 VDC | Resistive | 20A | 10A |

The Professional Energy Monitoring Company
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