

# MAXI-AMP™ CI3RC

## Current Trip Point Module



- Self-contained current sensing amplifier
- Works with intrinsically safe barrier to provide power to a Banner SMI912 intrinsically safe DC sensor; converts the signal coming from the sensor to a contact closure
- Powered by 105-130 or 210-250V ac (50/60Hz)
- INHIBIT input allows use of "gating" sensor
- Two output devices: SPDT 5 amp electromechanical relay and opto-isolated transistor for logic level dc switching

The Banner MAXI-AMP model CI3RC is a self-contained module which converts the current output signal of an SMI912 series VALU-BEAM to a trip point switch.

VALU-BEAM SMI912 series sensors (see Banner catalog or data sheet P/N 03396) carry Factory Mutual Research's rating for use in hazardous areas. Sensors are wired to model CI3RC using the two-wire hookup, which requires the use of one intrinsic-safety barrier (see next page). In this mode, the SMI912 sensor sinks  $\leq 10$  milliamps in the "OFF" state and  $\geq 20$  milliamps in the "ON" state. Model CI3RC senses this current change and switches internal relays that may be easily wired to most loads and/or additional control circuitry.

Model CI3RC is powered by either 105-130 or 210-250V ac. The module supplies the power to operate the SMI912 sensor. There are two inputs. A sensor may be connected to the second

CI3RC module (left) shown with RS-11 socket and DIN rail; also VALU-BEAM SMI912 Series sensor and intrinsic safety barrier.



input to "inhibit" the module output (this use requires an additional barrier). This is useful for "gating" schemes used in inspection or flow control applications. Both inputs are protected against short circuits. Built-in circuit diagnostics indicate an overload of either input by flashing an LED status light.

The MAXI-AMP CI3RC module has two isolated output switches. There is a 5-amp rated SPDT electromechanical relay, and a solid-state transistor switch which may be used for logic-level interfaces.

Banner also offers the CI3RC in kit form for connection to either one or two sensors. See the next page for more information.

### SPECIFICATIONS

**SUPPLY VOLTAGE:** 105 to 130 or 210 to 250V ac, 50/60 Hz (8VA)

#### OUTPUT CONFIGURATION:

##### SPDT electromechanical relay:

Contact rating: 250V ac max., 24V dc max., 5 amps max. (resistive load), 1/10 HP at 240V ac. Install transient suppressor (MOV) across contacts which switch inductive loads.

Closure time: 10 milliseconds max.

Release time: 10 milliseconds max.

Maximum switching speed: 20 operations/second.

Mechanical life: 20,000,000 operations

**Solid-state dc relay:** SPST optically-coupled transistor;

30V dc max., 20mA max.

#### INPUTS:

Trip point for output "OFF":  $\leq 10$  milliamps

Trip point for output "ON":  $\geq 20$  milliamps

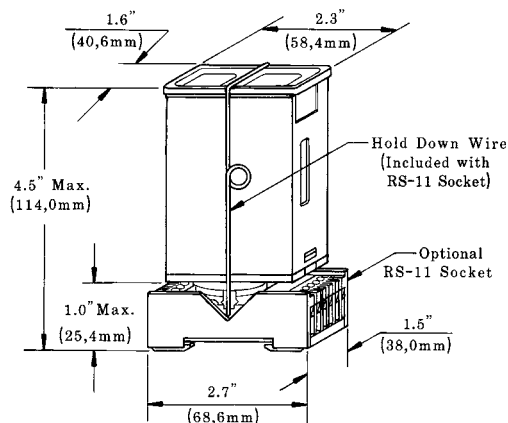
Trip point range for input overload indication:  
30mA  $\leq I \leq 80$ mA.

**INDICATOR LEDs:** Status indicators for INHIBIT input, OUTPUT "ON", and INPUT (or INHIBIT input) overload/short.

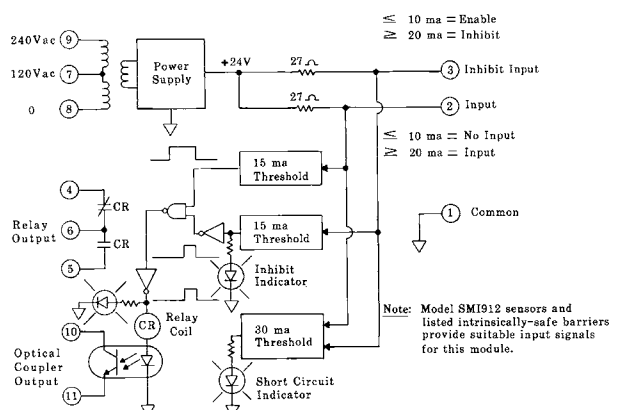
**OPERATING TEMPERATURE:** 0 to 50°C (32 to 122°F).

**CONSTRUCTION:** rugged NORYL® polyphenylene oxide (PPO®) housing, 1.6" x 2.3" x 4". Standard round-pin 11-pole base. Use RS-11 socket or equivalent.

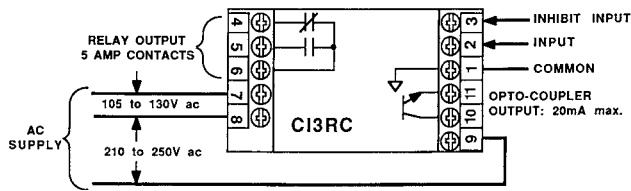
### DIMENSION DRAWING



### FUNCTIONAL SCHEMATIC



## GENERALIZED HOOKUP



SMI912 Series sensors are certified intrinsically safe ONLY when used with certified energy-limiting intrinsically-safe barriers. Banner does not itself manufacture intrinsically-safe barriers. Barriers may, however, be purchased from Banner as part of a kit which includes one CI3RC current trip point module, one module socket, one 70mm length of DIN rail (for mounting of socket), one DIN rail barrier mount, and one (in kit model CIBK-1) or two (in kit model CIBK-2) certified barriers.

An SMI912 Series sensor is wired through a barrier using the 2-wire hookup. In the 2-wire hookup configuration, the sensor acts as a current sink, drawing less than 10mA in the OFF state and more than 20mA in the ON state. Model CI3RC senses this current change and switches internal relays. The SPDT electromechanical relay in the CI3RC can switch a load which draws up to 5 amps (see specifications). The SPST solid-state relay can switch a dc load of up to 30V dc, max.; 20mA, max.



**WARNING** This photoelectric sensing product does NOT include the self-checking redundant circuitry necessary to allow its use in personnel safety applications. A failure or malfunction can result in either an energized or a de-energized output condition.

Never use this product as a sensing device for personnel protection. Its use as a safety device may create an unsafe condition which could lead to serious injury or death.

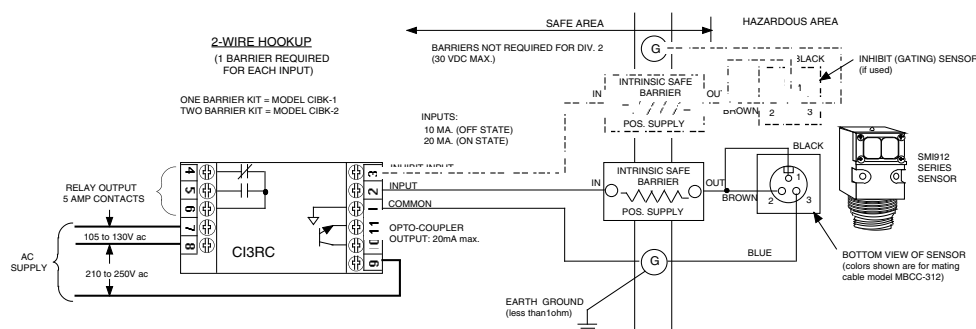
Only MACHINE-GUARD and PERIMETER-GUARD Systems, and other systems so designated, are designed to meet OSHA and ANSI machine safety standards for point-of-operation guarding devices. No other Banner sensors or controls are designed to meet these standards, and they must NOT be used as sensing devices for personnel protection.

Terminal #3 of the CI3RC serves as an "INHIBIT" input. This input is used with a second sensor and barrier, shown by the dashed outline in hookup diagram "A". The INHIBIT input is useful for "gating" schemes used in inspection or flow control applications.

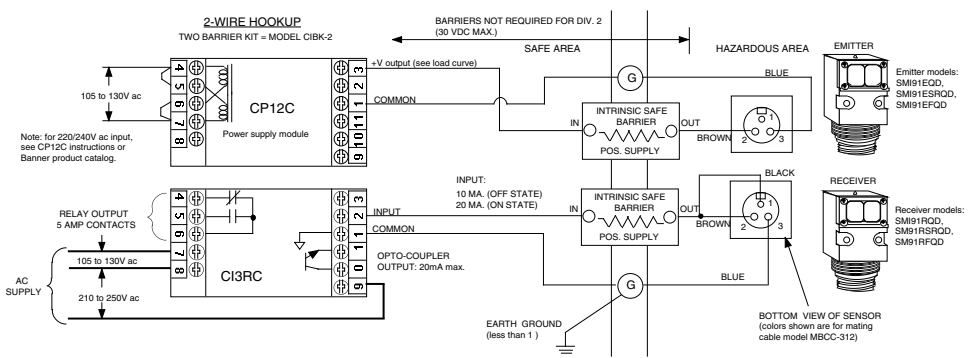
Emitter-only units (SMI91EQD, ESRQD, EFQD) use the 2-wire hookup through a barrier (hookup diagram "B"). The power requirement for each emitter is 10 to 30V dc at 25mA max. Banner power supply model CP12C is recommended for powering up to 10 emitters.

The user of this equipment is responsible for the proper installation and maintenance of the equipment, and must conform with certification requirements relating to barriers and to maximum allowable capacitance and inductance of field wiring. If you have questions about these requirements, Banner applications engineers can refer you to the proper authority.

## HOOKUP DIAGRAM A: SMI912 Series SENSOR HOOKUP to CI3RC



## HOOKUP DIAGRAM B: SMI91 Series EMITTER/RECEIVER HOOKUP



## CIBK-1 & CIBK-2 Kits for Intrinsically Safe Sensors

Model CIBK-1 intrinsic safety kit includes one model CI3RC current amplifier, one intrinsic safety barrier, one socket, and DIN rail mounts. Kit CIBK-1 includes all of the items shown in the photograph (page 1), with the exception of the VALU-BEAM sensor.

For information on VALU-BEAM® SMI912 Series intrinsic safe sensors, see product data sheet P/N 03396 or the Banner product catalog.

Kit CIBK-2 is similar to kit CIBK-1, but contains two intrinsic safety barriers.

**WARRANTY:** Banner Engineering Corporation warrants its products to be free from defects for a period of one year. Banner Engineering Corporation will repair or replace, free of charge, any product of its manufacture found to be defective at the time it is returned to the factory during the warranty period. This warranty does not cover damage or liability for the improper application of Banner products. This warranty is in lieu of any other warranty either expressed or implied.