

The TCSA Series is a loop-powered, linear output current transducer that provides an output that is directly proportional to the RMS AC current passing through the onboard toroid. The TCSA provides a 4 - 20mA output over a power supply range of 10 - 30VDC. Each unit is factory calibrated for monitoring in one of four ranges; 0-5, 0-10, 0-20, or 0-50A. The 0 - 5A range allows the use of external current transformers so loads up to 1200AC amps can be monitored.

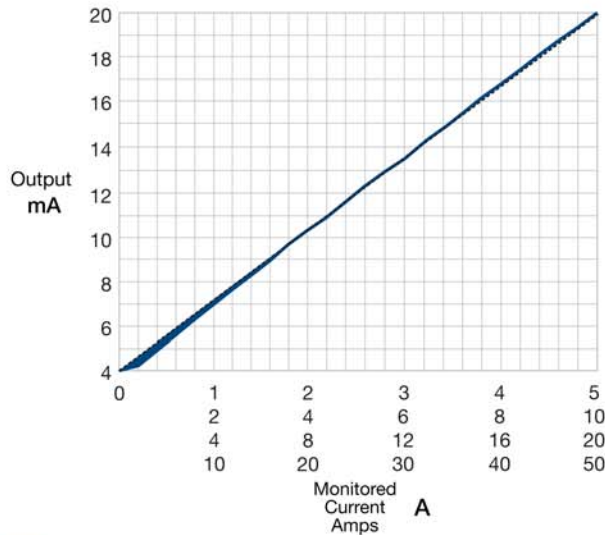
For more information see:
Appendix B, page 166, Figure 21 for dimensional drawing.
Appendix C, page 169, Figure 20 for connection diagram.

Operation

The TCSA varies the effective resistance of its output in direct proportion to the current flowing in the monitored conductor. The unit is factory calibrated so that 0 amps provides a 4mA output and full span provides a 20mA output. Zero and span adjustments are provided for minor calibration adjustments in the field (if required).

Using an External Current Transformer (CT)

Select a 2VA, 0 to 5A output CT, rated for the current to be monitored. Select TCSA5. Pass one of the CT's secondary wire leads through the TCSA's toroid. Connect the CT's secondary leads together.



Order Table:

Current Range	Part Number
0-5A	TCSA5
0-10A	TCSA10
0-20A	TCSA20
0-50A	TCSA50

Specifications

Sensor Type	Toroid, through hole wiring, alternating current, monitored conductor must be properly insulated
Monitored AC Current Ranges	0 - 5A, 0 - 10A, 0 - 20A, or 0 - 50A
4 factory calibrated ranges	0 - 5A, 0 - 10A, 0 - 20A, or 0 - 50A
Factory calibration	±2% of full scale
Maximum Allowable Current	Steady - 50A turns; Inrush - 300A turns for 10s
Repeat Accuracy	±0.25% of full scale under fixed conditions
Response Time	≅ 300ms
Burden	≤ 0.5VA
AC Line Frequency	0 - 20A / 21 - 50A ... 20 - 100Hz / 30 - 100Hz
Temperature Coefficient	±0.05%/°C
Output Type: Series Connection	Current directly proportional to monitored current
Range	4 - 20mA
Sensor Supply Voltage*	10 to 30VDC
Momentary Voltage	40VDC for 1m
Zero Adjust.	≅ 3.75 - 4.25mA

Span Adjust	18mA - 22mA
Adjustment	Mini-screw, 25-turn potentiometer
Protection	
Dielectric Breakdown	≥ 2000V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	Units are reverse polarity protected
Mechanical	
Mounting	Surface mount with one #10 (M5 x 0.8) screw
Dimensions	2 x 2 x 1.75 in. (50.8 x 50.8 x 44.5 mm)
Termination	0.25 in. (6.35 mm) male quick connect terminals
Sensor Hole	0.36 in. (9.14 mm) for up to #4 AWG (21.1 mm ²) THHN wire
Environmental	
Operating / Storage Temperature	-30° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 2.4 oz (68 g)

*Minimum loop-power supply voltage equals the minimum sensor voltage 10VDC plus the voltage drop developed across all the other loop devices at 20mA.

Features:

- Monitors 0 - 50A in 4 ranges
- Loop powered from 10 to 30VDC
- Linear output from 4 - 20mA
- Zero & span adjustments
- Complete isolation between sensed current & control circuit

Approvals:   

Auxiliary Products:

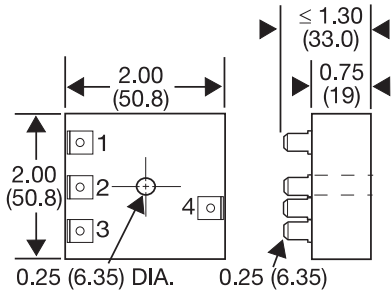
- **Female quick connect:**
P/N: P1015-64 (AWG 14/16)
- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Mounting bracket:** P/N: P1023-6
- **DIN rail:** P/N: C103PM
- **DIN rail adaptor:** P/N: P1023-20

Available Models:

- TCSA5
- TCSA10
- TCSA20
- TCSA50

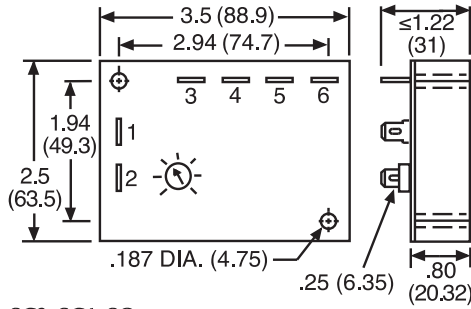
Appendix B - Dimensional Drawings

FIGURE 13



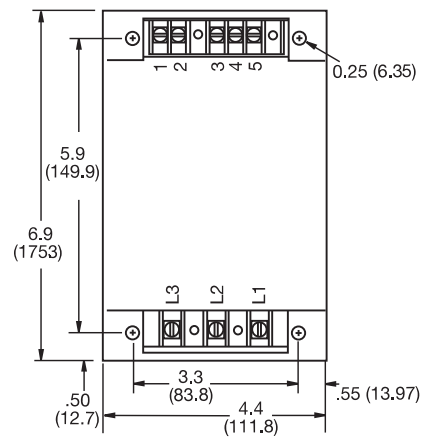
AF

FIGURE 14



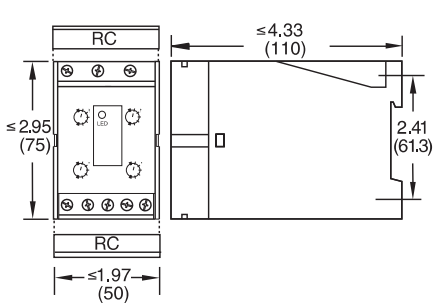
SC3; SC4; SQ

FIGURE 15



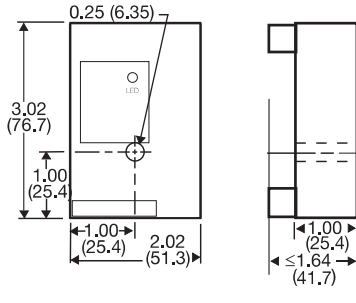
WVM

FIGURE 16



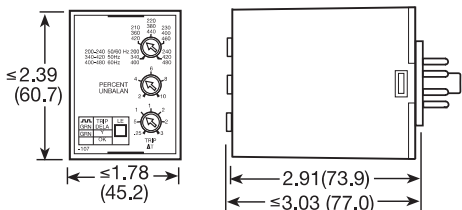
DLMU

FIGURE 17



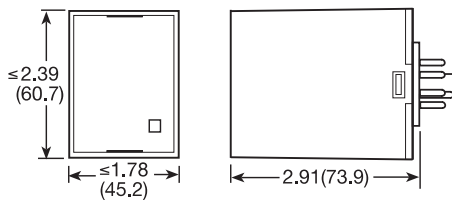
FB9L; HLMU; SCR9L

FIGURE 18



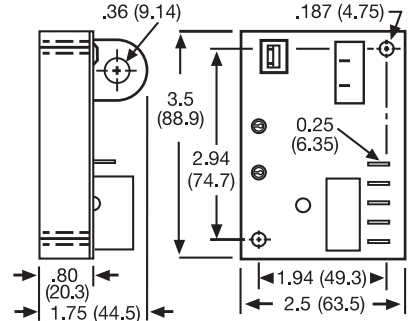
PLMU

FIGURE 19



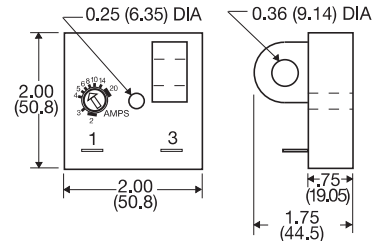
LLC4; LLC6; PLS

FIGURE 20



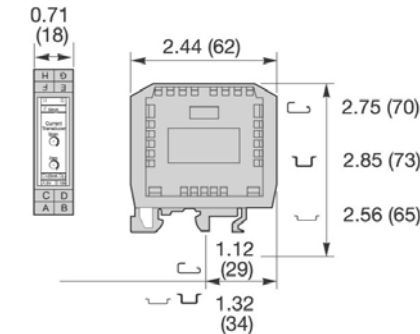
ECS; ECSW (ECS has spade connectors and ECSW has terminal board)

FIGURE 21



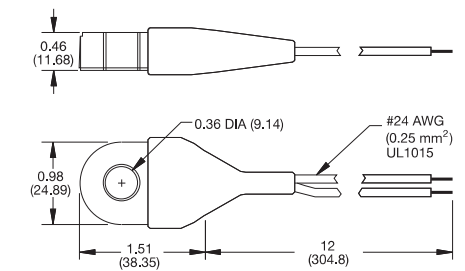
TCS; TCSA

FIGURE 22



DCSA

FIGURE 23

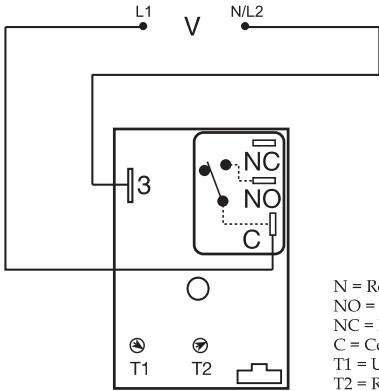


LCS

inches (millimeters)

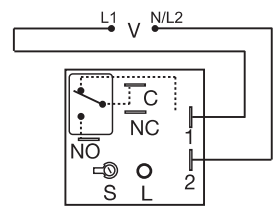
Appendix C - Connection Diagrams

FIGURE 15 - HLV Series



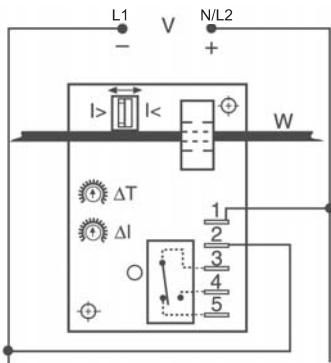
N = Relay contacts are non-isolated.
 NO = Normally Open
 NC = Normally Closed
 C = Common
 T1 = Undervoltage Trip Point
 T2 = Restart Delay

FIGURE 16 - KVM Series



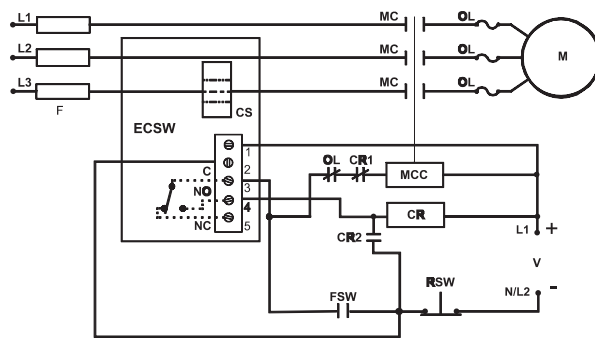
V = Voltage
 L = LED
 S = Undervoltage Setpoint
 NO = Normally Open
 NC = Normally Closed
 C = Common, Transfer Contact

FIGURE 17 - ECS Series

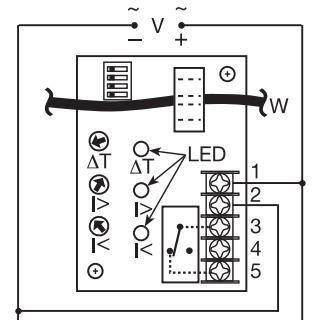


V = Voltage
 W = Insulated Wire Carrying Monitored Current
 I> = Overcurrent
 I< = Undercurrent
 Relay contacts are isolated.

FIGURE 18 - ECSW Series

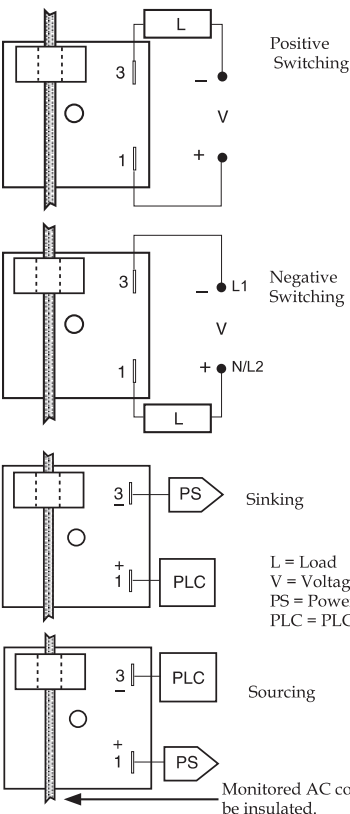


MC = Motor Contactor
 M = Motor
 F = Fuses
 OL = Overload
 RSW = Reset Switch
 FSW = Fan or Float Contacts
 CR = Control Relay
 MCC = Motor Contactor Coil



V = Voltage
 I> = Adjustable Overcurrent
 I< = Adjustable Undercurrent
 W = Monitored Wire
 ΔT = Adjustable Trip Delay

FIGURE 19 - TCS Series



Positive Switching

Negative Switching

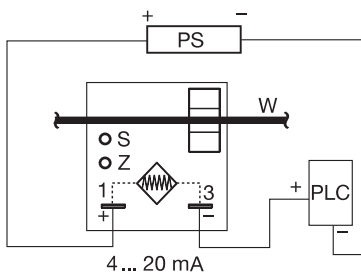
Sinking

Sourcing

L = Load
 V = Voltage
 PS = Power Supply
 PLC = PLC Digital Input Module

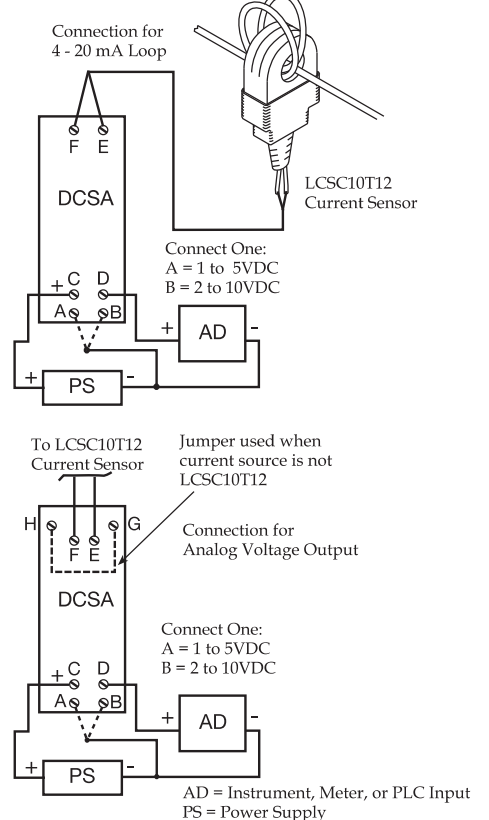
Monitored AC conductor must be insulated.

FIGURE 20 - TCSA Series



PS = Power Supply
 Z = Zero Adjust
 S = Span Adjust
 W = Insulated Wire Carrying Monitored Current
 PLC = PLC Analog Input or Meter Input

FIGURE 21 - DCSA Series



Connection for 4 - 20 mA Loop

LCSC10T12 Current Sensor

Connect One:
 A = 1 to 5VDC
 B = 2 to 10VDC

Jumper used when current source is not LCSC10T12

Connection for Analog Voltage Output

Connect One:
 A = 1 to 5VDC
 B = 2 to 10VDC

AD = Instrument, Meter, or PLC Input
 PS = Power Supply