



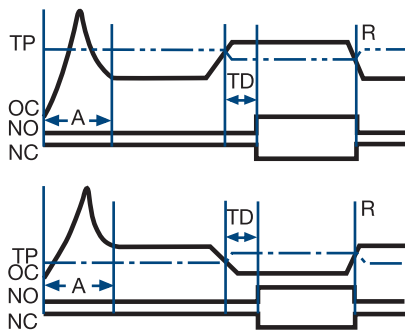
The ECS Series of single-phase AC current sensors is a universal, overcurrent or undercurrent sensing control. Its built-in toroidal sensor eliminates the inconvenience of installing a stand-alone current transformer. Includes onboard adjustments for current sensing mode, trip point, and trip delay. Detects over or undercurrent events like; locked rotor, loss of load, an open heater or lamp load, or proves an operation is taking place or has ended.

For more information see:
Appendix B, page 166, Figure 20 for dimensional drawing.
Appendix C, page 169, Figure 17 for connection diagram.

Operation
Input voltage must be supplied at all times for proper operation. When a fault is sensed throughout the trip delay, the output relay is energized. When the current

returns to the normal run condition or zero, the output and the delay are reset. If a fault is sensed and then corrected before the trip delay is completed, the relay will not energize and the trip delay is reset to zero.

Adjustment
Select the desired function, over or under current sensing. Set the trip point and trip delay to approximate settings. Apply power to the ECS and the monitored load. Turn adjustment and watch the LED. LED will light; turn slightly in opposite direction until LED is off. Adjustment can be done while connected to the control circuitry if the trip delay is set at maximum. To increase sensitivity, multiple turns may be made through the ECS's toroidal sensor. The trip point range is divided by the number of turns through the toroidal sensor to create a new range. When using an external CT, select a 2VA, 0-5A output CT rated for the current to be monitored. Select ECS adjustment range 0. Pass one secondary wire lead through the ECS toroid and connect the secondary leads together.



NO = Normally Open Contact TP = Trip Point
NC = Normally Closed Contact R = Reset
A = Sensing Delay On Start Up OC = Monitored Current
TD = Trip Delay

Features:

- Toroidal through hole wiring
- 0.5 - 50A trip points
- Adjustable or factory fixed trip delays
- Isolated, 10A, SPDT output contacts
- 5% trip point hysteresis (dead band)

Approvals:

Auxiliary Products:

- **Female quick connect:**
P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
P/N: P1015-14 (AWG 18/22)

Available Models:

ECS20BC	ECSH21F.08C
ECS21BC	ECSH30AC
ECS21BH	ECSH3HF0.08D
ECS2HBC	ECSH40AC
ECS30AC	ECSH40AD
ECS40A	ECSH41AD
ECS40AC	ECSH41BC
ECS40BC	ECSH41F.08D
ECS40BD	ECSH4HF.08D
ECS41A	ECSH61AD
ECS41AC	ECSL31A
ECS41BC	ECSL40AC
ECS41BD	ECSL40B
ECS41BH	ECSL40BH
ECS41F.08	ECSL41A
ECS4HBC	ECSL41AD
ECS4HBH	ECSL45F7
ECS60AH	ECSL4HBH
ECS60BC	ECSL61AH
ECS61BC	ECSL6HAC
ECS6HAH	

If desired part number is not listed, please call us to see if it is technically possible to build.

Order Table:

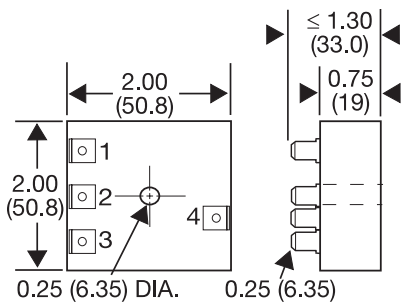
X Series -ECS - Selectable over or undercurrent sensing -ECSH - Overcurrent sensing -ECSL - Undercurrent sensing	X Input -1 - 12VDC -2 - 24VAC -3 - 24VDC -4 - 120VAC -6 - 230VAC	X Trip Point -Fixed - Specify 2-50A in 1A increments -0 - 0.5-5A adjustable -1 - 2-20A adjustable -H - 5-50A adjustable	X Trip Delay -F - Specify: 0.08-50s factory fixed -A - 0.150-7s adjustable -B - 0.5-50s adjustable	X Sensing Delay on Start Up -Blank - 0s -C - 1s -D - 2s -E - 3s -F - 4s -G - 5s -H - 6s
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Specifications

Sensor Type..... Toroidal through hole wiring Mode..... Over or undercurrent, switch selectable on the unit or factory fixed	Tolerance 12VDC & 24VDC/AC..... -15 - 20% 120 & 230VAC..... -20 - 10%
Trip Point Range 0.5 - 50A in 3 adjustable ranges or fixed Tolerance Adjustable..... Guaranteed range Fixed..... 0.5 - 25A: 0.5A or ±5% whichever is less; 26 - 50A: ±2.5%	AC Line Frequency 50/60 Hz
Maximum Allowable Current Steady - 50A turns; Inrush - 300A turns for 10s Trip Point Hysteresis ±5% Trip Point vs. Temperature ±5% Response Time ≤ 75ms Frequency 45/500 Hz Type of Detection Peak detection	Output Type..... Electromechanical relay Form..... Isolated, SPDT Rating..... 10A resistive @ 240VAC; 1/4 hp @ 125VAC; 1/2 hp @ 250VAC
Trip Delay Type..... Analog Range..... Adjustable 0.150 - 7s; 0.5 - 50s (guaranteed ranges) Factory Fixed..... 0.08 - 50s (±20ms, whichever is greater) Delay vs. Temperature..... ±15%	Life Mechanical - 1 x 10 ⁶ ; Electrical - 1 x 10 ⁵
Sensing Delay on Startup Factory fixed 0 - 6s: +40%, -0%	Protection Circuitry..... Encapsulated Isolation Voltage..... ≥ 2500V RMS input to output Insulation Resistance..... ≥ 100 MΩ
Input Voltage..... 24, 120, or 230VAC; 12 or 24VDC	Mechanical Mounting..... Surface mount with two #6 (M3.5 x 0.6) screws Dimensions..... 3.5 x 2.5 x 1.75 in. (88.9 x 63.5 x 44.5 mm) Termination..... 0.25 in. (6.35 mm) male quick connect terminals (5)
	Environmental Operating / Storage Temperature..... -40° to 60°C / -40° to 85°C Humidity..... 95% relative, non-condensing Weight..... ± 6.4 oz (181 g)

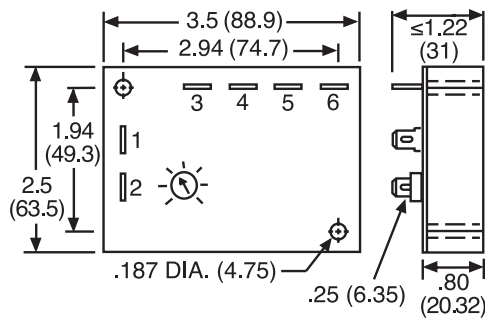
Appendix B - Dimensional Drawings

FIGURE 13



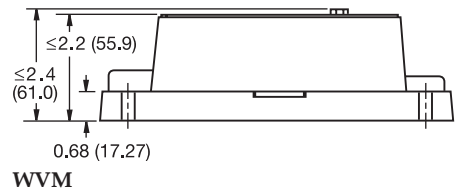
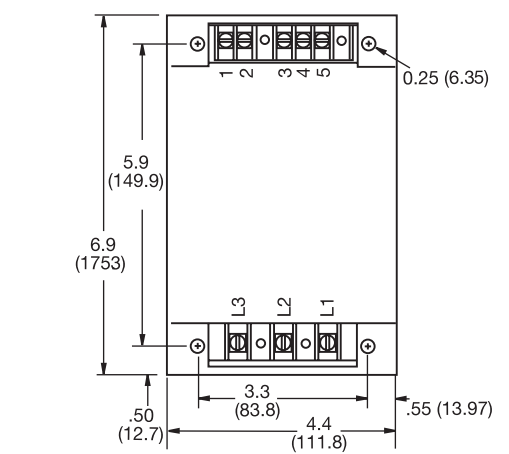
AF

FIGURE 14



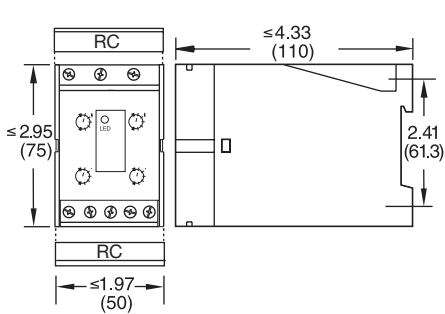
SC3; SC4; SQ

FIGURE 15



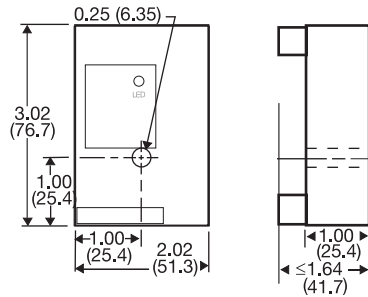
WVM

FIGURE 16



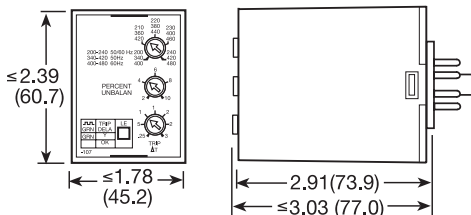
DLMU

FIGURE 17



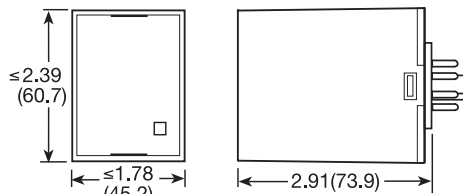
FB9L; HLMU; SCR9L

FIGURE 18



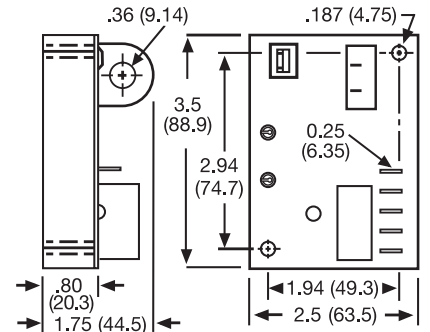
PLMU

FIGURE 19



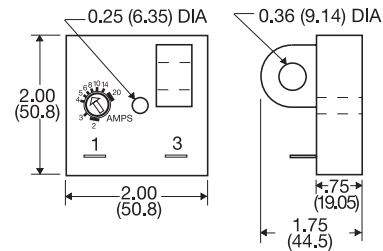
LLC4; LLC6; PLS

FIGURE 20



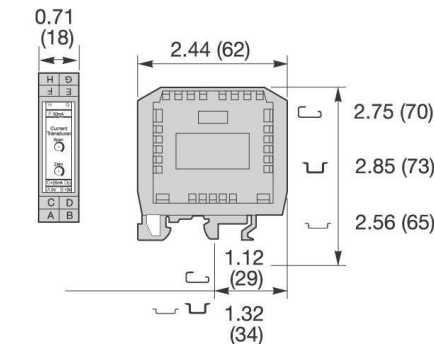
ECS; ECSW (ECS has spade connectors and ECSW has terminal board)

FIGURE 21



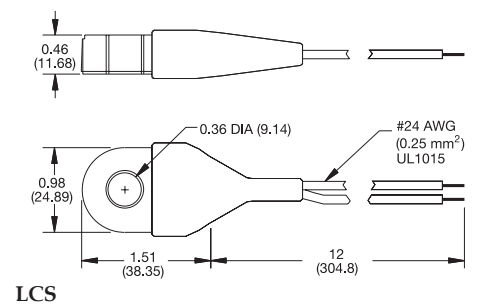
TCS; TCSA

FIGURE 22



DCSA

FIGURE 23

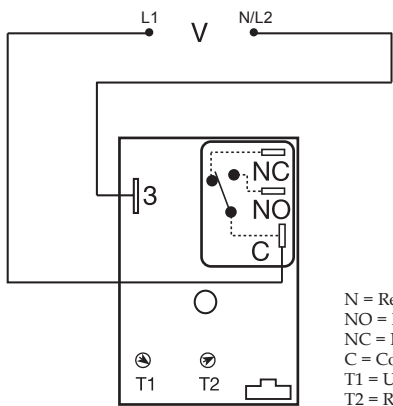


LCS

inches (millimeters)

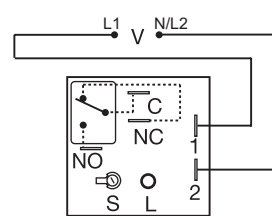
Appendix C - Connection Diagrams

FIGURE 15 - HLV Series



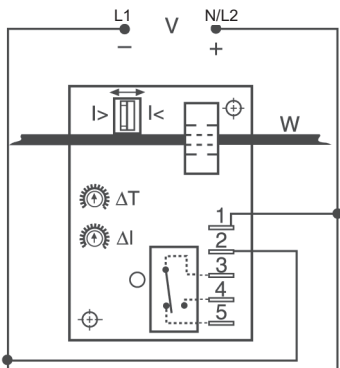
N = Relay contacts are non-isolated.
 NO = Normally Open
 NC = Normally Closed
 C = Common
 T1 = Undervoltage Trip Point
 T2 = Restart Delay

FIGURE 16 - KVM Series



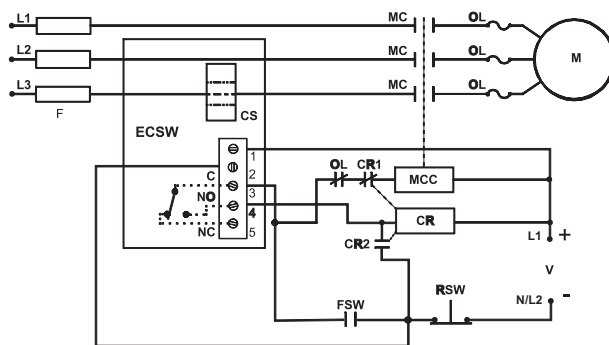
V = Voltage
 L = LED
 S = Undervoltage Setpoint
 NO = Normally Open
 NC = Normally Closed
 C = Common, Transfer Contact

FIGURE 17 - ECS Series

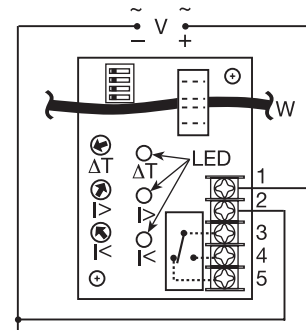


V = Voltage
 W = Insulated Wire Carrying Monitored Current
 I> = Overcurrent
 I< = Undercurrent
 Relay contacts are isolated.

FIGURE 18 - ECSW Series

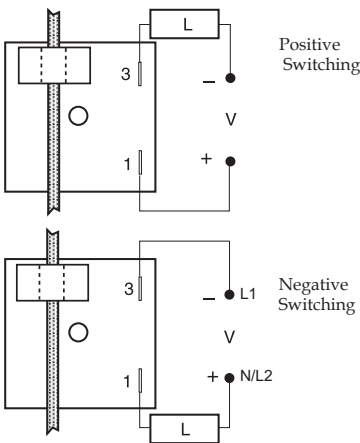


MC = Motor Contactor
 M = Motor
 F = Fuses
 OL = Overload
 RSW = Reset Switch
 CS = Current Sensor
 MCC = Motor Contactor Coil
 CR = Control Relay
 CR2 = Control Relay
 FSW = Fan or Float Contacts
 RSW = Reset Switch



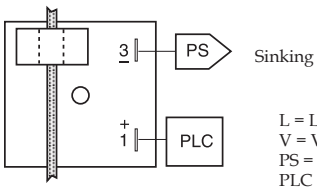
V = Voltage
 I> = Adjustable Overcurrent
 I< = Adjustable Undercurrent
 W = Monitored Wire
 ΔT = Adjustable Trip Delay

FIGURE 19 - TCS Series



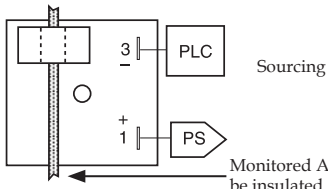
Positive Switching

Negative Switching



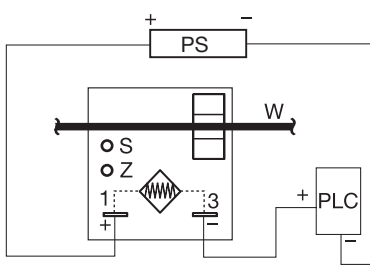
Sinking

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



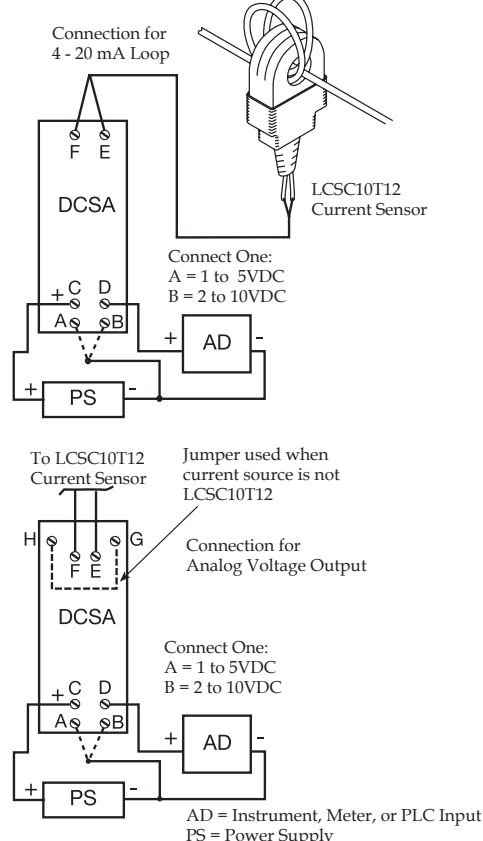
Monitored AC conductor must be insulated.

FIGURE 20 - TCSA Series



4... 20 mA
 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

To LCSC10T12 Current Sensor
 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