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.

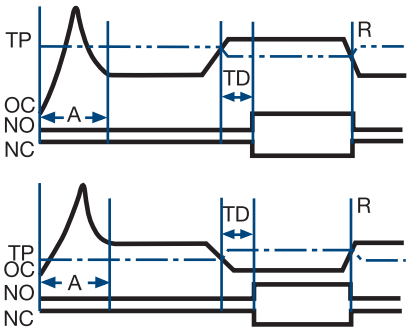
For more information see:
Appendix B, page 166, Figure 20 for dimensional drawing.
Appendix C, page 169, Figure 17 for connection diagram.

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
NC = Normally Closed Contact
A = Sensing Delay On Start Up
TD = Trip Delay
TP = Trip Point
R = Reset
OC = Monitored Current

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 **2-50**A 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

Specifications

Sensor
Type . . . . . Toroidal through hole wiring
Mode . . . . . Over or undercurrent, switch selectable on the unit or factory fixed
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%
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

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%
Sensing Delay on Startup . . . . . Factory fixed 0 - 6s: +40%, -0%

Input
Voltage . . . . . 24 , 120, or 230VAC; 12 or 24VDC
Tolerance
12VDC & 24VDC/AC . . . . . -15 - 20%
120 & 230VAC . . . . . -20 - 10%
AC Line Frequency . . . . . 50/60 Hz

Output
Type . . . . . Electromechanical relay
Form . . . . . Isolated, SPDT
Rating . . . . . 10A resistive @ 240VAC; 1/4 hp @ 125VAC; 1/2 hp @ 250VAC
Life . . . . . Mechanical – 1 x 10^6; Electrical – 1 x 10^5

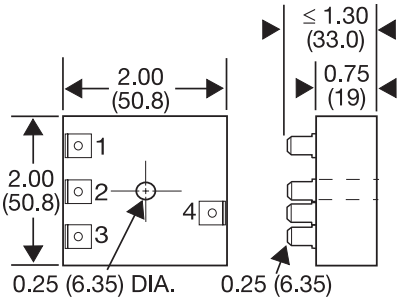
Protection
Circuitry . . . . . Encapsulated
Isolation Voltage . . . . . ≥ 2500V RMS input to output
Insulation Resistance . . . . . ≥ 100 MΩ

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)

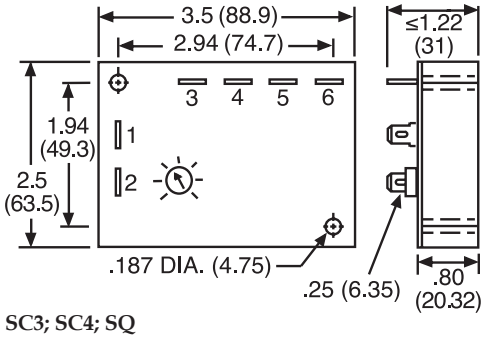
Appendix B - Dimensional Drawings

FIGURE 13



AF

FIGURE 14



SC3; SC4; SQ

FIGURE 15

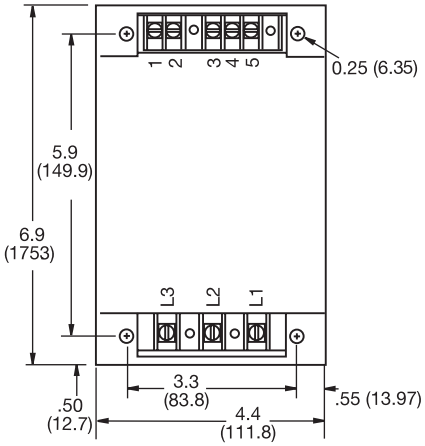
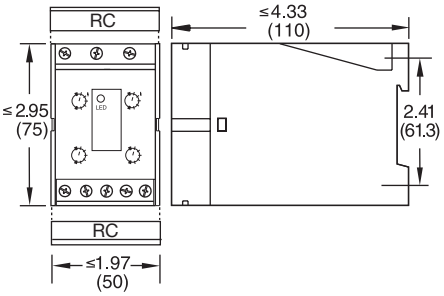
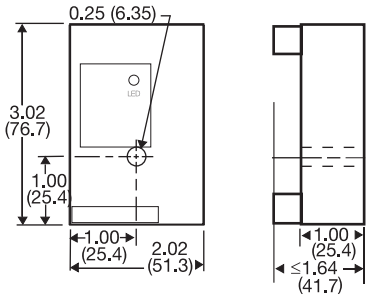


FIGURE 16

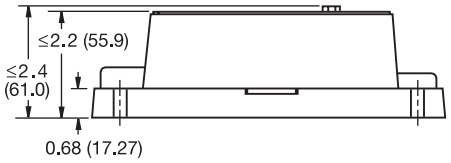


DLMU

FIGURE 17

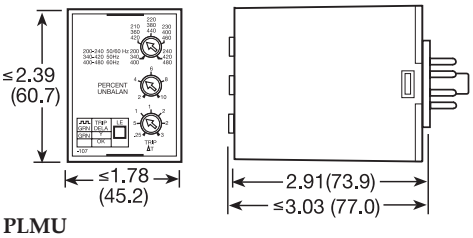


FB9L; HLMU; SCR9L



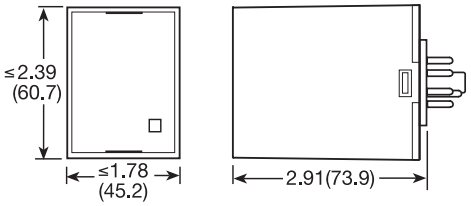
WVM

FIGURE 18



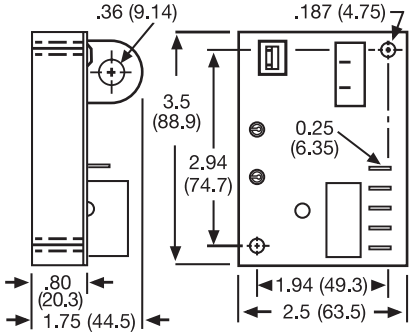
PLMU

FIGURE 19



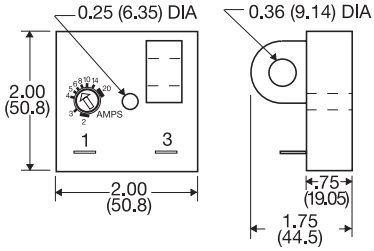
LLC4; LLC6; PLS

FIGURE 20



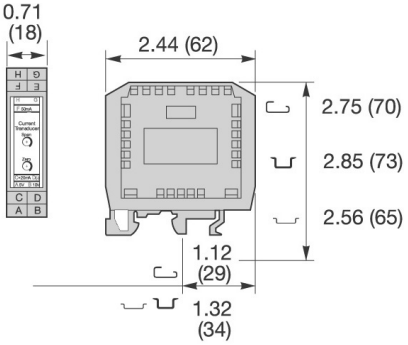
ECS; ECSW (ECS has spade connectors and ECSW has terminal board)

FIGURE 21



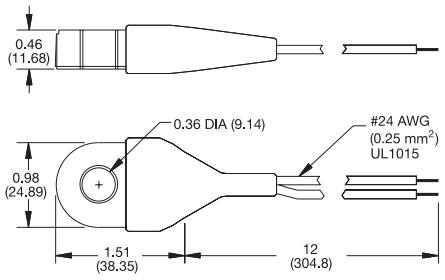
TCS; TCSA

FIGURE 22



DCSA

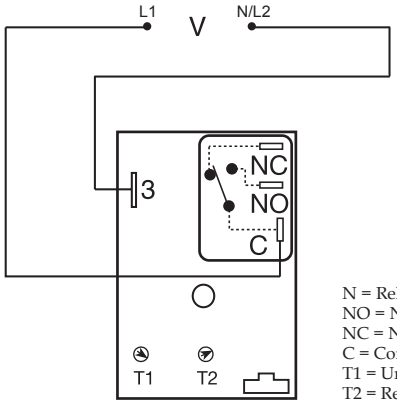
FIGURE 23

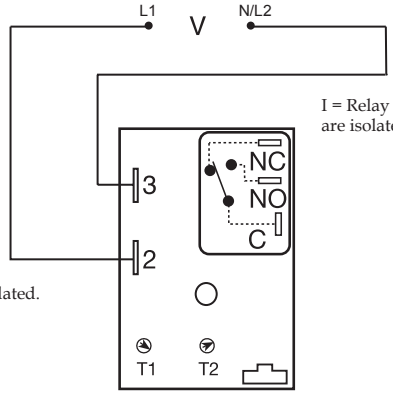


LCS

inches (millimeters)

FIGURE 15 - HLV Series

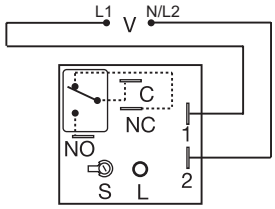




I = Relay contacts are isolated.

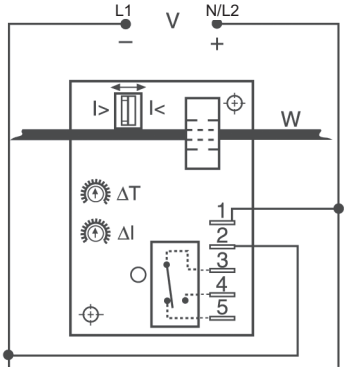
N = Relay contacts are non-isolated.
NO = Normally Open
NC = Normally Closed
C = Common
T1 = Undervoltage Trip Point
T2 = Restart Delay

FIGURE 16 - KVM Series



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

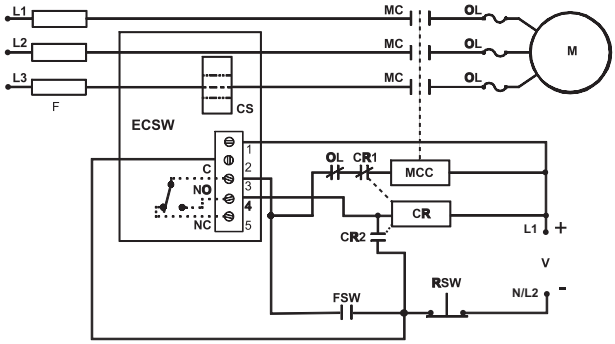
FIGURE 17 - ECS Series



V = Voltage
I> = Overcurrent
I< = Undercurrent

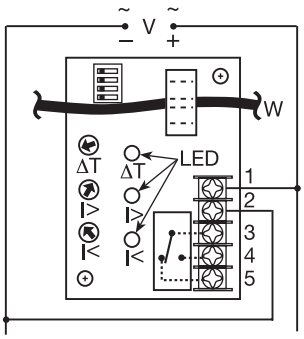
W = Insulated Wire
Carrying Monitored Current
Relay contacts are isolated.

FIGURE 18 - ECSW Series



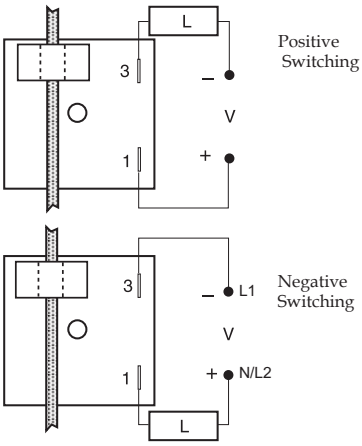
MC = Motor Contactor
M = Motor
F = Fuses
OL = Overload
RSW = Reset Switch

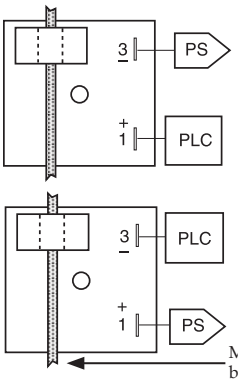
FSW = Fan or Float Contacts
CR = Control Relay
CS = Current Sensor
MCC = Motor Contactor Coil



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

FIGURE 19 - TCS Series

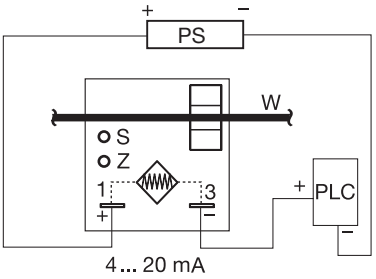




L = Load
V = Voltage
PS = Power Supply
PLC = PLC Digital Input Module

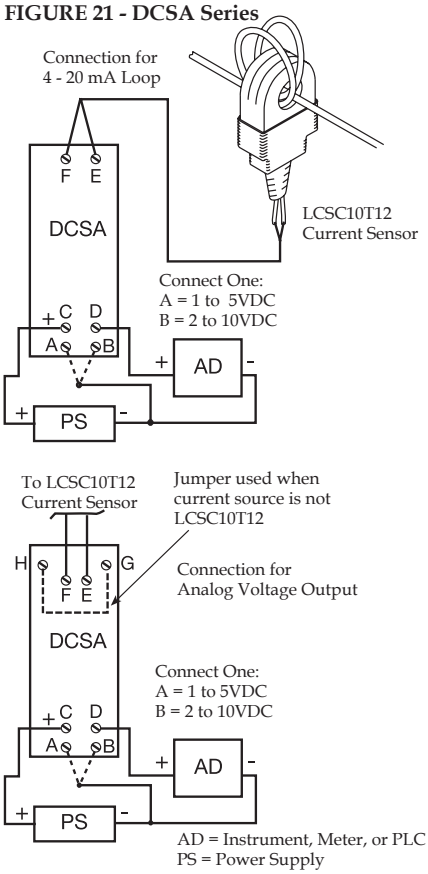
Monitored AC conductor must be insulated.

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



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