

# Series Included

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# Current Sensors & Monitors



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.

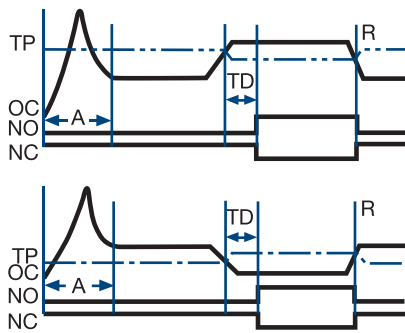
### Operation

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:

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

### Specifications

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



The ECSW Series of single-phase, AC window, current sensors includes adjustable overcurrent and undercurrent trip points. Detects locked rotor, jam, loss of load, an open heater or lamp load, a broken belt, or loss of suction. LED's aid in trip point adjustment and provide fault indication. The built-in toroidal sensor eliminates the need for an external current transformer. The output can be electrically latched after a fault, or automatically reset. Remote resetting of a latched output by removing input voltage. The unit includes switch selectable zero current detection and normally de-energized or energized output operation. Time delays are included to improve operation and eliminate nuisance tripping.

For more information see:  
Appendix B, page 166, Figure 20 for dimensional drawing.  
Appendix C, page 169, Figure 18 for connection diagram.

### Operation

When the input voltage is applied, sensing delay on startup begins and the output transfers (if normally energized is selected). Upon completion of the startup delay, sensing of the monitored current begins. As long as current is above undercurrent trip point and below the overcurrent trip point (inside the window), the output relay remains in its normal operating condition and both red LED's are OFF. The green LED glows when the output is energized. If current varies outside the window, the associated red LED glows, and the trip delay begins. If the current remains outside the window for the full trip delay, the relay transfers to fault condition state. If the current returns to normal levels (inside the window) during the trip delay, the red LED goes OFF, the trip delay is reset, and the output remains in the normal condition.

Reset: Remove input voltage or open latch switch. If zero current detection is selected, the unit will reset as soon as zero current is detected.

Operation With Zero Current Detection Enabled: If the current decreases to zero within the trip delay period, then zero current is viewed as an acceptable current level. The unit's output remains in its normal operating state. This allows the monitored load to cycle ON and OFF without nuisance tripping the ECSW. Zero current is defined as current flow of less than 250 milliamp-turns. Note: When zero current detect is selected, the latching operation of switch SW2 is canceled; the output will not latch after a fault trip.

### Notes on Operation:

- 1) There is no hysteresis on the trip points. The overcurrent and undercurrent trip points should be adjusted to provide adequate protection against short cycling.
- 2) If the upper setpoint is set below the lower setpoint, both red LED's will glow indicating a setting error.
- 3) If zero current detection is selected (SW2 ON), and the system is wired to disconnect the monitored load, the system may short cycle. After the unit trips, the load de-energizes, and zero current is detected. The ECSW resets, and the load energizes again immediately and may be short cycled.
- 4) The sensing delay on start up only occurs when input voltage is applied. When zero current detection is selected, the trip delay must be longer than the duration of the inrush current or the unit will trip on the inrush current.

### Typical Pump or Fan Protection Circuit Operation

Window Current Sensing: With the ECSW connected as shown in the diagram, a load may be monitored and controlled for over and undercurrent. The ECSW Series' on board CT (CS) may be placed on the line or load side of the contactor. The ECSW selection switches are set for zero current sensing (see Selector Switch SW2) and the output selection is normally de-energized (see Selector Switch SW3). The input voltage (V) is applied to the ECSW continually. As the control switch (FSW) is closed, the input voltage (V) is applied to the motor contactor coil (MCC), and the motor (M) energizes. As long as the current remains below the overcurrent and above the undercurrent trip points, the ECSW's output contacts remain de-energized. If the load current should rise above or fall below a trip point, for the full trip delay, the normally open (NO) contact will close, energizing the control relay (CR) coil. The CR normally closed contact (CR1) opens and the MCC de-energizes and CR latches on through its normally open contacts (CR2). Reset is accomplished by momentarily opening the normally closed reset switch (RSW). Note: If the current falls to zero within the trip delay, the ECSW remains de-energized. The sensing delay on startup occurs when input voltage is applied therefore trip delay must be longer than the duration of the motor's inrush current. The external latching relay CR2 is required in this system to prevent rapid cycling. A timer can be added to provide an automatic reset.

## Order Table:

### ECSW

Input	Trip Point	Trip Delay	Sensing Delay on Start up	Connection
1 - 12VDC	L - 0.5-5A adjustable	F - Specify: 0.1-50s	B - 0.1s	T - Terminal Blocks
2 - 24VAC	M - 2-20A adjustable	A - 0.150-7s adjustable	C - 1s	
3 - 24VDC	H - 5-50A adjustable	B - 0.5-50s adjustable	D - 2s	
4 - 120VAC			E - 3s	
6 - 230VAC			F - 4s	
			G - 5s	
			H - 6s	

\*If fixed delay is selected, insert delay (0.1-50) in seconds. 0.1-1.9s in 0.1s increments; 2-50s in 1s increments.

### Selector Switch

ON ↔ OFF

SW1	Not Used
SW2	Latched
SW2	Zero I
SW3	Output - Normally Energized

### Mode Selection Switches

- SW1 = Latched or Auto reset selector  
 OFF - Automatic reset after a fault  
 ON - Output relay latches after a fault trips the unit  
 SW2 = Zero current detection (below 250 mA)  
 OFF- Zero current detection disabled  
 ON- Zero current detection enabled  
 SW3 = Output during normal operation  
 OFF- Output relay de-energized  
 ON - Output relay energized

## Specifications

Sensor	
Type	Toroid, through hole wiring for up to #4 AWG (21.1 mm <sup>2</sup> ) THHN wire
Mode	Over & undercurrent trip points (window current sensing)
Trip Point Range	0.5 - 50A in 3 adjustable ranges
Tolerance	Guaranteed range
Maximum Allowable Current	Steady - 50A turns; Inrush - 300A turns for 10s
Time Point vs Temp. & Voltage	±5%
Response Time	≤ 75ms
Frequency	45/500 Hz
Type of Detection	Peak detection
Zero Current Detection	< 250mA turns typical
Time Delay	
Range	0.15 - 50s in 2 adjustable ranges or 0.1 - 50s fixed
Tolerance	Adjustable: guaranteed range; Fixed: ±10%
Sensing Delay On Start Up	Fixed □ 0.1 - 6s in 1s increments
Tolerance	+40% -0%
Delay vs. Temperature & Voltage	±15%
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

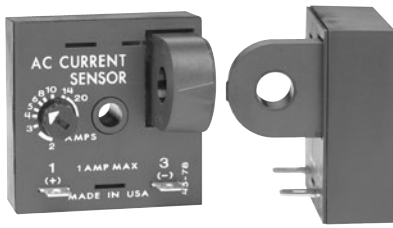
Mode: Switch selectable	ON	Energized during normal operation, de-energized after a fault
	OFF	De-energized during normal operation, energizes during a fault
Form		Isolated, SPDT
Rating		10A resistive @ 240VAC; 1/4 hp @ 125VAC; 1/2 hp @ 250VAC
Life		Mechanical - 1 x 10 <sup>6</sup> ; Electrical - 1 x 10 <sup>5</sup>
Latch	Type	Electrical
	Reset	Remove input voltage
	Function	Switch selectable latching function

### Protection

Surge	IEEE C62.41-1991 Level A
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	0.197 in. (5 mm) terminal blocks for up to #12 (3.2 mm <sup>2</sup> ) AWG wire

### Environmental

Operating / Storage Temperature	-40° to 60° C / -40° to 85° C
Humidity	95% relative, non-condensing
Weight	≈ 6.4 oz (181 g)

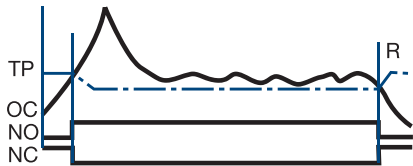


The TCS Series is a low cost method of go/no go current detection. It includes a solid-state output to sink or source current when connected directly to a standard PLC digital input module. Its normally open or normally closed output can also be used to control relays, lamps, valves, and small heaters rated up to 1A steady, 10A inrush. The TCS is self-powered (no external power required to operate the unit) and available with an adjustable actuation range of 2 - 20A or factory fixed actuation points from 2 - 45A.

For more information see:  
Appendix B, page 166, Figure 21 for dimensional drawing.  
Appendix C, page 169, Figure 19 for connection diagram.

### Operation

**Normally Open:** When a current equal to or greater than the actuate current is passed through the toroidal sensor, the output closes. When the current is reduced to 95% of the actuate current or less, the output opens.  
**Normally Closed:** When the current through the toroid is equal to or greater than the actuate current, the output opens. When the current is reduced below 95% of the actuate current, the output closes. To increase sensitivity, multiple turns may be made through the TCS'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, 0-20A output CT rated for the current to be monitored. Select TCS adjustment range 0. Pass one secondary wire lead through the TCS' toroid and connect the secondary leads together.



- L = Load
- V = Voltage
- PS = Power Supply
- PLC = PLC Digital Input Module
- R = Reset
- TP = Trip Point
- OC = Monitored Current
- NO = Normally Open Output
- NC = Normally Closed Output

### Features:

- Direct connection to a PLC digital input module
- 3 to 50VDC, 24 to 240VAC
- 1A steady - 10A inrush
- Actuation Points -
  - 2 - 45A (fixed units)
  - 2 - 20A (adjustable units)
- NO or NC solid-state output
- 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 (Al)
- **DIN rail adaptor:** P/N: P1023-20

### Available Models:

TCSG2A	TCSH3A
TCSGAA	TCSH4A
TCSGAB	TCSHAA
TCSH2A	TCSHAB
TCSH2B	

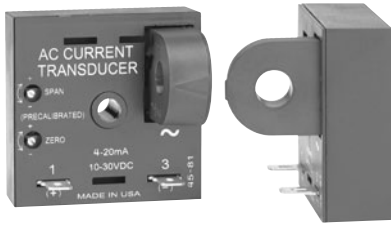
If desired part number is not listed, please call us to see if it is technically possible to build.

### Order Table:

<u>TCS</u>	<u>X</u>	<u>X</u>	<u>X</u>
	<b>Output Voltage</b>	<b>Actuate Current</b>	<b>Output Form</b>
	-G - 3-50VDC	-A - 2-20A adjustable	-A - Normally Open
	-H - 24-240VAC	<b>Fixed</b> - Specify from 2-45A in 1A increments	-B - Normally Closed

### Specifications

<b>Sensor</b>	Type..... Toroid, through hole wiring, alternating current, monitored wire must be properly insulated	<b>Protection</b>	Circuitry..... Encapsulated
<b>Current to Actuate.</b>	Adjustable: - 2 - 20A, guaranteed range Fixed: - 2 - 45A, +0/-20%	<b>Dielectric Breakdown</b>	..... ≥ 2000V RMS terminals to mounting surface
<b>Reset Current</b>	..... ≅ 95% of the actuate current	<b>Insulation Resistance</b>	..... ≥ 100 MΩ
<b>Maximum Allowable Current</b>	Steady - 50A turns Inrush - 300A turns for 10s	<b>Mechanical</b>	<b>Mounting</b> ..... Surface mount with one #10 (M5 x 0.8) screw
<b>Actuate Current vs. Temp. &amp; Voltage</b>	..... ≤ ±5%	<b>Dimensions</b>	..... 2 x 2 x 1.75 in. (50.8 x 50.8 x 44.5 mm)
<b>Response Times</b>	Overcurrent - ≤ 200ms Undercurrent - ≤ 1s	<b>Termination</b>	..... 0.25 in. (6.35 mm) male quick connect terminals (2)
<b>Burden</b>	..... < 0.5VA	<b>Sensor Hole</b>	..... 0.36 in. (9.14 mm) for up to #4 AWG (21.1 mm <sup>2</sup> ) THHN wire
<b>Output</b>	Type..... Solid state	<b>Environmental</b>	<b>Operating / Storage Temperature</b> ..... -20° to 60°C / -40° to 85°C
<b>Form</b>	..... NO or NC	<b>Humidity</b>	..... 95% relative, non-condensing
<b>Rating</b>	..... 1A steady, 10A inrush	<b>Weight</b>	..... ≅ 2.6 oz (74 g)
<b>Voltage</b>	..... AC - 24 to 240VAC +10/-20%		
	..... DC - 3 to 50VDC		
<b>Voltage Drop</b>	..... AC NO & NC - ≅ 2.5V		
	..... DC NO & NC - ≅ 1.2V		



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.

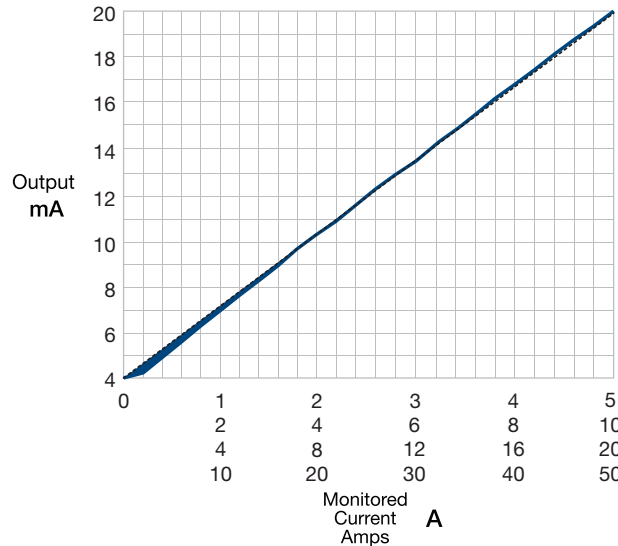
For more information see:  
 Appendix B, page 166, Figure 21 for dimensional drawing.  
 Appendix C, page 169, Figure 20 for connection diagram.

### 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: 0 - 50A  
 Ranges: 4 factory calibrated ranges . . . . . 0 - 5A, 0 - 10A, 0 - 20A, or 0 - 50A  
 Factory calibration: . . . . .  $\pm 2\%$  of full scale  
 Maximum Allowable Current: . . . . . Steady - 50A turns; Inrush - 300A turns for 10s  
 Repeat Accuracy: . . . . .  $\pm 0.25\%$  of full scale under fixed conditions  
 Response Time: . . . . .  $\approx 300\text{ms}$   
 Burden: . . . . .  $\leq 0.5\text{VA}$   
 AC Line Frequency: 0 - 20A / 21 - 50A . . . . . 20 - 100Hz / 30 - 100Hz  
 Temperature Coefficient: . . . . .  $\pm 0.05\%/^{\circ}\text{C}$

**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: . . . . .  $\approx 3.75 - 4.25\text{mA}$

Span Adjust: . . . . . 18mA - 22mA  
 Adjustment: . . . . . Mini-screw, 25-turn potentiometer

**Protection**  
 Dielectric Breakdown: . . . . .  $\geq 2000\text{V}$  RMS terminals to mounting surface  
 Insulation Resistance: . . . . .  $\geq 100\text{M}\Omega$   
 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<sup>2</sup>) THHN wire

**Environmental**  
 Operating / Storage Temperature: . . . . . -30° to 60°C / -40° to 85°C  
 Humidity: . . . . . 95% relative, non-condensing  
 Weight: . . . . .  $\approx 2.4\text{ oz}$  (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



The DCSA 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 LCSC10T12 sensor. The DCSA provides either an analog current or voltage: 4 - 20 mA, 1 to 5VDC, or 2 to 10VDC. Each unit is factory calibrated for monitoring (with the LCSC10T12 connected) in one of four ranges; 0 - 5, 0 - 10, 0 - 20, or 0 - 50A. Zero and span adjustments allow field calibration if needed. The DCSA mounts on both DIN 1 and DIN 3 rails.

For more information see:  
Appendix B, page 166, Figure 22 for dimensional drawing.  
Appendix C, page 169, Figure 21 for connection diagram.

## Features:

- Mounts on DIN 1 or DIN 3 rail
  - 0 - 50A in 4 ranges using LCSC10T12 sensor
  - Loop powered from 10 to 30VDC
  - Linear output from 4 - 20mA, 1 - 10VDC
  - Zero & span adjustments
  - Separate sensor & control unit
- Approvals:

## Auxiliary Products:

- **Current sensor:**  
P/N: LCSC10T12

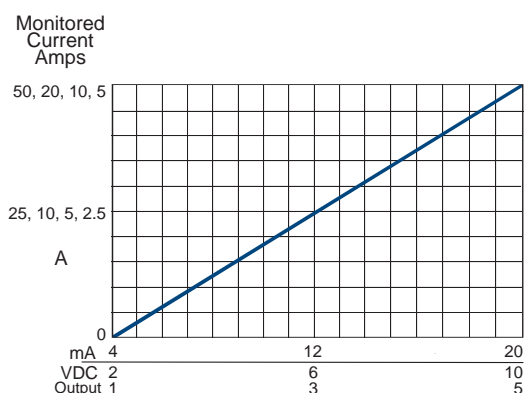
## Available Models:

DCSA50  
LCSC10T12

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

## Operation

The DCSA varies the effective resistance of its output in direct proportion to the current flowing in the conductor monitored by the LCSC10T12. Connecting the power supply to terminals C & D provides a 4 to 20mA DC current. Connect the power supply to terminals C & A to get 1 to 5VDC at terminal D. Connect the power supply to terminals C & B to get 2 to 10VDC at terminal D.



## Order Table:

<u>Current Range with LCSC10T12</u>	<u>DCSA Input Range (F to E)</u>	<u>Part Number</u>
0-5A	0-5mA AC	DCSA5
0-10A	0-10mA AC	DCSA10
0-20A	0-20mA AC	DCSA20
0-50A	0-50mA AC	DCSA50

Toroidal Current Sensor LCSC10T12

## Specifications

<b>Input</b>	
Ranges (without LCSC10T12 connected)	
4 factory calibrated ranges in mA AC	0 - 5mA, 0 - 10mA, 0 - 20mA, or 0 - 50mA AC
Factory calibration	±0.5% of full scale
Repeat Accuracy	±0.25% of full scale under fixed conditions
Response Time	≅ 300ms
Temperature Coefficient	±0.05%/°C
Input To Output	Not isolated
<b>Output</b>	
Type	Analog
Range	Current directly proportional to input current
Supply Voltage*	4 - 20mA, or 1 to 5VDC or 2 to 10VDC
Momentary Voltage	10 to 30VDC
Zero Adjust	40VDC for 1m
Span Adjust	≅ 3.75 - 4.25mA
Adjustment	18mA - 22mA
Protection	Mini-screw, multi-turn potentiometer
Dielectric Breakdown	≥ 2500V RMS terminals to mounting surface
Insulation Resistance	≥ 100 MΩ
Polarity	Units are reverse polarity protected

<b>Mechanical</b>	
Mounting	DIN 1 & DIN 3 rail mounting
Termination	Wire clamp
	For 22 - 14AWG (.336 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> )
<b>Environmental</b>	
Operating / Storage Temperature	-30° to 60°C / -40° to 85°C
Humidity	95% relative, non-condensing
Weight	≅ 1.6 oz (45.4 g)

<b>Accessory - LCSC10T12 Toroidal Sensor</b>	
Number of Turns	1000
Nominal Output Current Full Range	0 - 50 mA
Maximum Allowable Current	Steady 50A turns
	Inrush 300A turns for 10s
Burden	≤ 0.5 VA
Frequency	0 - 20A / 21 - 50A
	20/100 Hz / 30/100 Hz
Sensor Hole	0.36 in. (9.14 mm) for up to #4 AWG
	(21.1 mm <sup>2</sup> ) THHN wire
Weight	≅ 1 oz (28.3 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.



The LCS10T12 connected to the LPM12 or LPMG12 indicator is a low cost, easy to use, go/no-go indication system for the remote monitoring of current flow. The LCS10T12 is installed on an adequately insulated wire of the monitored load. Its 12in. (30.4cm) leads are connected to the LPM12 or LPMG12 panel mount indicator directly or via customer supplied wires up to 500 feet (152.4m) long.

For more information see:  
 Appendix B, pages 166 & 167, Figures 23 & 24 for dimensional drawings.  
 Appendix C, page 170, Figure 22 for connection diagram.

## Features:

- Low cost go/no go indication
- May be connected to wires up to 500 feet (152.4 m) long
- Remote monitoring of currents up to 50A
- Green or red LED indicator available

Approvals:   

## Available Models:

LCS10T12  
 LPM12  
 LPMG12

## Operation

When the monitored current is 5A turns, the panel mount LPM indicator will glow. The LCS10T12 is designed to maximize the light output of the panel mount indicator. It can be used to monitor current flow of less than 5A by passing the monitored conductor 2 or more times through the sensor.

CAUTION: The LCS10T12 must be connected to the LPM12 or LPMG12 before current flows to prevent damage or a shock hazard. Monitored wires must be properly insulated.

Panel mount indicator designed to match the output of the LCS10T12. The LPM12 and LPMG12 come with 12 in. (30.4 cm) wires and a one piece mounting clip. Both devices install quickly in a 0.25 in. (6.35 mm) hole in panels from 0.031 - 0.062 in. (0.79 - 1.6 mm) thick.

## Order Table:

Description	Part Number
AC Current Sensor	LCS10T12
Red LED Indicator	LPM12
Green LED Indicator	LPMG12

## Specifications

Monitored Current					
Current Range	2 - 50A AC				
Wire Passes	Min. Current	Max Current	Max. Inrush	Max. Wire Dia.	
1	5A	50A	120A	0.355 in. (9.0 mm)	
2	2.5A	25A	60A	0.187 in. (4.7 mm)	
3	1.7A	16.6A	40A	0.15 in. (3.8 mm)	
4	1.3A	12.5A	30A	0.125 in. (3.2 mm)	
5	5/X	50/X	120/X		
Maximum Current	50A turns continuous				
AC Line Frequency	50/60Hz				
DC Resistance of Current Limiter	65 Ω				
<b>Mechanical</b>					
Sensor Hole	0.36 in. (9.14 mm) for up to #4 AWG (21.1 mm <sup>2</sup> ) THHN wire				
Termination	12 in. (30.4 cm) wire leads				
<b>Environmental</b>					
Operating / Storage Temperature	-40° to 60°C / -40° to 85°C				
Weight	LCS: ≅ 0.8 oz (23 g) LPM: ≅ 0.2 oz (6 g)				