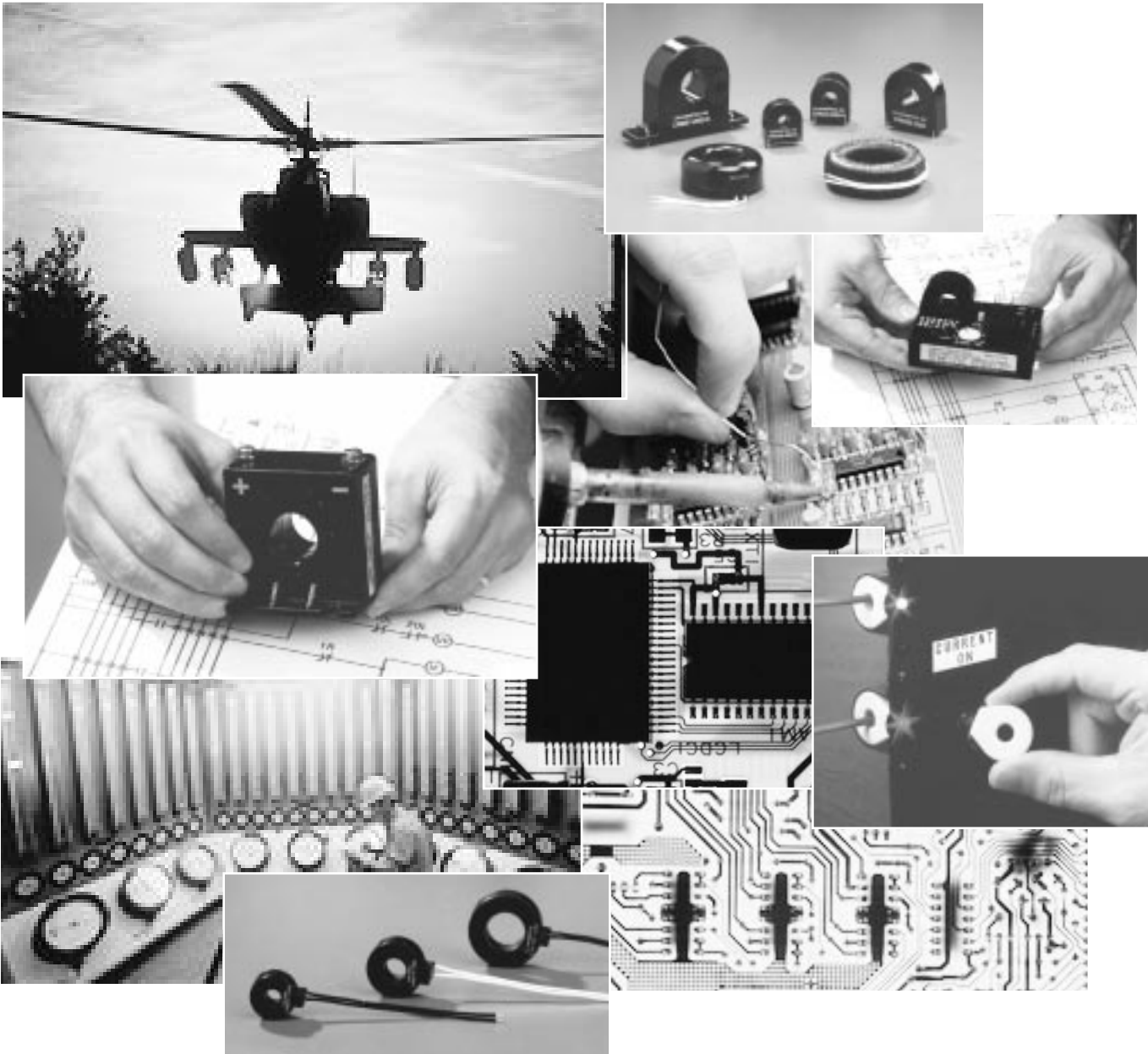
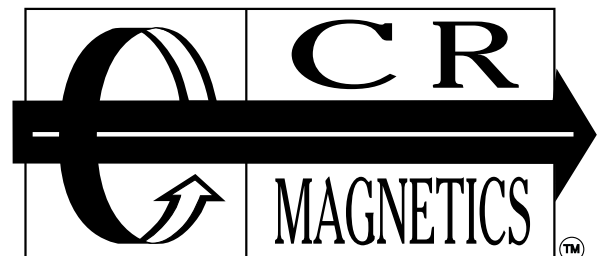


CURRENT MONITORING HANDBOOK

Performance Applications For All Industries



Transducers • Relays • Transformers • Indicators





Specialist in Electrical Current Monitoring

Selection Guide

Transducers and Relays	2
Current Transformers	3
Current Indicators and Voltage Transformers	4
Current Transformer Ratios	5
Transducers	
AC Current to 0-5 / 10 Vdc	6
AC Current to 4-20 mA, 2-wire	8
AC Current to 4-20 mA, 4-wire	10
AC Voltage to 4-20 mA, 3-phase	12
Relays	
AC Current Sensing Relay	14
Current Switch	16
Typical Relay Applications	17
Transformers	
Wire Lead Current Transformers	18
Vertical Mounting, PCB Current Transformers	20
Wire Lead Current Transformers, Series 8400	22
Horizontal Mounting, PCB Current Transformers	25
Commercial and ANSI Metering Class Current Transformers	26
3-Phase Balanced Networks	31
Indicators	
Wire-Mounted Current Indicator	32
Remote Current Indicators	34
Low Cost Remote Current Indicators	36
AC Motor Loads & U.S. Standard Voltages	37

Custom Toroid and Bobbin Wound Transformers	-Contact Factory
Excitation Curves	-Contact Factory
Other CR Magnetics Catalogs	
3-Phase Current Transformers	-Section 3
Rectangular Current Transformers	-Section 4
Split-Core Current Transformers	-Section 5
Breaker Type Current Transformer	-Section 6
Wound Primary Current Transformers	-Section 7
Bushing Type Current Transformers	-Section 8
Ground Fault Sensors	-Section 9
Current & Voltage Transformers, IEC Rated, 50 Hz	-Section 10
Low Voltage, Voltage Transformers	-Section 11
Low Voltage, Control Power Transformers	-Section 12
Medium Voltage, Current Transformers	-Section 13
Medium Voltage, Current Transformers, IEC Rated, 50 Hz	-Section 14
Medium Voltage, Voltage Transformers	-Section 15
Medium Voltage, Voltage Transformers, IEC Rated, 50 Hz	-Section 16
Medium Voltage, Control Power Transformers	-Section 17
Ground Fault Systems	-Section 18
Instrumentation Switches	-Section 19


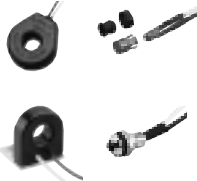



TRANSDUCERS and RELAYS

	Transducers				Relays	
						
Part Number	CR431	CR4320	CR4340	CR473	CR4395	CR9321
Description	AC Current to Voltage	2-Wire AC Current to 4-20	4-Wire AC Current to 4-20	Voltage to 4-20 mA	Current Relay	Current Switch
Frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	60/400 Hz	50/400Hz
Input Range	5 thru 200 Aac	5 thru 400 Aac	5 thru 600 Aac	90-150 Vac 360-600 Vac	.01-to 100 Aac	0.350 Aac
Output	5/10 Volts DC	4-20 mA	4-20 mA	4-20 mA	Dry Contacts Transistor Triac	Solid State
Accuracy	0.5 thru 1.0% F.S.	0.5% F.S.	0.5% F.S.	0.5% F.S.	—	—
Dimensions (H)x(W)x(D)	2.75x2.69x2.36 (69.9x68.3x59.9)	2.75x2.69x2.36 (69.9x68.3x60)	4.50x2.68x2.37 (114.3x68x60.1)	3.63x4.19x4.38 (92.2x106.4x111.3)	2.13 x 3.50 x 2.5 (54.1x88.9x63.5)	1.50x1.0x.75 (38.1x25.4x19.1)
Power Source	Self-Powered	Loop-Powered	120 Vac	Loop-Powered	120 Vac 240 Vac 24 Vdc	Self Powered
Agency Approval	UL	UL	UL	UL	—	—
Page Number	6	8	10	12	14	16

CURRENT TRANSFORMERS

Current Transformers						
						
17,18, 19	CR8300	CR8400	CR8750			
Wire Lead	Vertical Mount	Wire Lead	Horizontal Mount	Commercial & ANSI Class	Split Core	Medium Voltage
50-400 Hz	50-400 Hz	—	50-400 Hz	50-400 Hz	50-400 Hz	50-400 Hz
Up to 60 Aac	Up to 100 Aac	—	Up to 60 Aac	Up to 4,000 Aac	Up to 10,000 Aac	Up to 3,000 Aac
—	—	—	—	5.0, 1.0 0.2, 0.1 AAC	5.0 Aac & High Ratios	5.0 Aac
—	—	—	—	Up to 0.3%	Up to 0.3%	Up to 0.3%
.29 & .55 (7.4 & 14.0)	.272 to .772 (6.9 to 19.6)	.232 to .610 (5.8 & 15.5)	.250 (6.4)	See Catalog	See Catalog	See Catalog
—	—	—	—	—	—	—
—	—	—	—	UL/CSA	UL/CSA	UL
18	20	22	25	26	Request Catalog Sec 5	Request Catalog Sec 13

CURRENT INDICATORS AND VOLTAGE TRANSFORMERS

	Indicators			Voltage Transformers	
					
Part Number	CR45	Model 18 & 19	CR2550		
Description	Wire Mounted Current Indicator	Remote Current Indicator	Remote Current Indicator	Low Voltage V/T	Medium Voltage V/T
Frequency	50/60 Hz	50/60 Hz	50/400 Hz	60 Hz	60 Hz
Input Range	2 thru 100 Aac	2 thru 100 Aac	2 thru 100 Aac	Up to 600 Vac	Up to 34.5 kV
Output	Visual	Visual	Visual	120 Vac	120 Vac
Accuracy	—	—	—	Up to 0.3%	Up to 0.3%
Dimensions (H)x(W)x(D)	1.04x.95x.46 (26.4x24.1x11.7)	See Page 32	See Page 34	See Catalog	See Catalog
Power Source	Self-Powered	Self-Powered	Self-Powered	—	---
Agency Approval	—	—	—	UL/CSA	UL/CSA
Page Number	32	34	36	Request Catalog Sec 11	Request Catalog Sec 15

Current Transformer Ratios

Changing Current Transformer Ratios

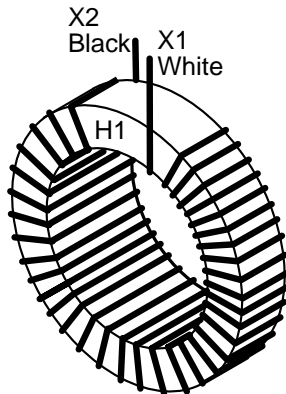
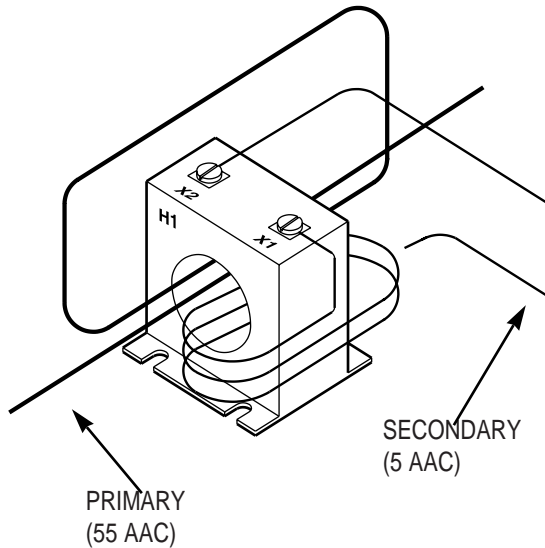
The actual current ratio may be changed from the nameplate ratio by wrapping the primary and/or secondary leads through the window opening.

$$\text{ACTUAL TURNS RATIO} = \frac{\text{NAMEPLATE RATIO} \pm \text{NUMBER OF SECONDARY TURNS THROUGH WINDOW OPENING}}{\text{NUMBER OF PRIMARY TURNS THROUGH WINDOW OPENING}}$$

- Wire from X1 terminal is routed through the H1 side
- + Wire from X1 terminal is routed through the side opposite the H1 side (H2 side)

Examples

This illustration shows how a current transformer with a nameplate turns ratio of 125:5 can be rescaled to operate as a non-standard 55:5 ratio transformer.



WHERE:

Nameplate ratio = 125 (125/5)

Number of secondary turns through window = - 3

Use -3 because the secondary wire is routed from the X1 terminal first through the H1 side.

Use + if the wire was routed first through the side opposite the H1 side.

Number of primary turns through window = 2

$$\frac{\frac{125}{5} - 3}{2} = 11$$

TURNS RATIO = 11:1

CURRENT RATIO = 55:5

This illustration shows the internal construction of a current transformer. The outside face of the transformer is identified as H1. The opposite face is identified as H2. The secondary leads are identified as X1 and X2.

Current flowing out of terminal X1 will have the same polarity as current flowing into terminal H1.

Internet Resources <http://www.crmagnetics.com/>

- Transducer Selection Guide: [transducer.html](#)
- Application Sheet: [pdf/ancrct-1.pdf](#)
[error.html](#)
[appguide.html](#)



Precision, AC Current to Voltage Transducer

The **CR431** series, Current-to-Voltage Transducer produces a 0-5 Vdc or 0-10 Vdc output signal that is directly proportional to the input AC current. The output signal is average-sensing, calibrated for RMS.

This transducer is used with process control and industrial instrumentation equipment. The DC output signal can be connected directly to a high impedance analog input of a computer or PLC without additional signal conditioning.

The series will measure up to 200% of full scale on a short time basis (1 minute or less) and 150% on a continuous basis at its rated accuracy.

To protect external circuits from damage caused by short circuits or motor inrush currents.



Features

- Permanently calibrated
- Output overload protected
- Fully isolated
- 10 different ranges
- Self-powered, requires no external power source



Specifications

Accuracy:

Depends on the range and load resistance, see Part Numbers table

Ripple:

1% Max. peak ripple on output

Calibrated Signal Out:

0-5 Vdc for CR4310

0-10 Vdc for CR4311

Response Time:

250 ms max., 10-90% FS

Max. Signal Out:

16 Vdc for CR4310

33 Vdc for CR4311

Frequency:

50/60 Hz

Continuous Thermal Current Rating Factor:

2.50 @ 30°C

Short Time Thermal Current Rating Factor:

60 x Full Scale (For 1 Second)

Insulation Class:

600 V, BIL 10 kV Full Wave

Operating Temperature Range:

-30°C to +60°C

Storage Temperature Range:

-55°C to +85 °C

Shipping Weight:

1.5 pounds (.68 kg.)

Part Numbers

CR431 - CURRENT TO VOLTAGE TRANSDUCER

	Range in AC Amps	Accuracy % FS *
5	0-5	1.0
10	0-10	0.75
15	0-15	0.75
20	0-20	0.5
30	0-30	0.5
50	0-50	0.5
75	0-75	0.5
100	0-100	0.5
150	0-150	0.5
200	0-200	0.5

0	0-5 Vdc Out
1	0-10 Vdc Out

* For total load resistance of:
1.0 megohm or higher for CR4310
150 K ohm or higher for CR4311

Internet Resources <http://www.crmagnetics.com/>

- Transducer Selection Guide: [transducer.html](#)
- Application Sheet: [pdf/ancr4310.pdf](#), [pdf/ancr4310-2](#)
- Pricing: [pricing/4310.html](#)
- External Current Transformers: [cts.html](#)



2-Wire Current Transmitter, 4-20 mA Output

The **CR4320** series, loop-powered, 2-Wire Current Transmitter produces a calibrated 4-20 mA. DC output current directly proportional to the average RMS value of the input alternating current. The controlled current output is unaffected by variations in supply voltage, interconnect and load impedance (within specification limits) to provide a highly accurate means for monitoring alternating current over long distances.

Features

- Permanently calibrated
- Loop-powered
- Fully isolated
- 12 different ranges
- 2 case styles, .93" (23.6 mm) and 1.25" (31.8 mm) window opening
- Output overload protected



Case Style 1

Case Style 2

Specifications

Accuracy:

±0.5% Full-Scale (FS)

Repeatability:

Less than 0.1%

Ripple & Noise:

1% Max., peak to peak

Calibrated Signal Out:

4-20 mA DC

Response Time:

200 ms max., 10-90% FS

Max. Signal Out:

30 mA DC

Temperature Coefficient:

± 0.04%/°C

Supply Voltage:

24 Vdc ±10%

Frequency:

50/60 Hz

Continuous Thermal Current Rating Factor:

1.33 @ 30°C

Short Time Thermal Current

Rating Factor (For 30 Seconds):

6.0 x Full Scale for AC ranges up to 200 Amp.

4.0 x Full Scale for ranges 300 and 400 Amp.

Output Load:

0 to 600 ohms

Insulation Class:

600 V, BIL 10 kV Full Wave

Reverse Polarity Protection:

Yes

Operating Temperature Range:

-30°C to +60°C

Storage Temperature Range:

-55°C to +85°C

Approximate Weight:

1.5 pounds (.68 kg)

Part Numbers

CR4320 - 4-20 MA CURRENT TRANSMITTER

	Full-Scale (FS) Range in AC Amps	Case Style
5	0-5	1
10	0-10	1
15	0-15	1
20	0-20	1
30	0-30	1
50	0-50	1
75	0-75	1
100	0-100	1
150	0-150	1
200	0-200	1
300	0-300	2
400	0-400	2

Internet Resources <http://www.crmagnetics.com/>

- Transducer Selection Guide: [transducer.html](#)
- Application Sheet: [pdf/ancr4320-1.pdf](#)
- Pricing: [pricing/4320.html](#)
- Motor Loads: [mot_ld_a.pdf](#)



4-Wire Current Transmitter 4-20 mA Output

The **CR4340** series, 4-Wire Current Transmitter produces a calibrated 4-20 mA DC signal proportional to the average RMS value of the input alternating current. The output signal is produced by an internal current generator powered from an external 120 Vac supply. The output signal is unaffected by variations in interconnect and load impedance (within specification limits) thus providing a highly accurate means for monitoring alternating current over long distances.

The 4-wire transmitter allows for direct attachment to instrumentation. There is no need for external DC power as required with 2-wire transmitters.

Features

- Permanently calibrated
- Fully isolated
- Output overload protected
- 13 different ranges - 6 field selectable
- Internal current generator
- 2 case styles, .94" (23.9) and 2.13" (54.1) window opening
- Monitors over long distances

Specifications

Accuracy:

±0.5% Full-Scale (FS)

Ripple & Noise:

1% Max., peak to peak

Calibrated Signal Out:

4-20 mA DC

Response Time:

150 ms max., 10-90% FS

Max. Signal Out:

30 mA DC

Temperature Coefficient:

± 0.02%/°C

Supply Voltage:

120 ±10% Vac

Frequency:

50/60 Hz

Continuous Thermal Current Rating Factor:

1.50 @ 30°C for ranges-All Ranges up to 75 Amp.

1.33 @ 30°C for ranges 100 Amp. and over

Short Time Thermal Current

Rating Factor (For 30 Seconds):

15.0 x Full Scale for AC ranges up to 75 Amp.

4.0 x Full Scale for ranges 400 Amp. and over

Output Load:

0-1000 ohms

Insulation Class:

600 V, BIL 10 kV Full Wave

Operating Temperature Range:

-30°C to +60°C

Storage Temperature Range:

-55°C to +85°C



Case Style 2

Case Style 1

Part Numbers

CR4340 - 4-WIRE CURRENT TRANSMITTER

	Full-Scale (FS) Range in AC Amps	Case Style
5	0-5	1
	0-10*	1
	0-15*	
	0-20*	
20	0-25*	1
	0-50*	
	0-75*	
75		
100	0-100	2
150	0-150	2
200	0-200	2
300	0-300	2
400	0-400	2
600	0-600	2

* RANGE SET WITH FIELD SELECTABLE SWITCH

Internet Resources <http://www.crmagnetics.com/>

- Transducer Selection Guide: [transducer.html](#)
- Application Sheet: [pdf/ancr4340-1.pdf](#)
- Pricing: [pricing/4340.html](#)



3-Phase Voltage Transmitter 4-20 mA Output

The **CR473** series, Voltage Transmitters are expanded scale instruments designed to accurately measure three-phase voltages. Each model produces three discrete 4-20 mA signals which are proportional (across the selected input voltage range) to the three-phase input voltage. The output is a true constant current driver which is unaffected by resistance variations in the output loop of 0-600 ohms. The CR4730 is designed to measure line-to-line voltages and the CR4731 to measure line-to-neutral. Both are average-reading, calibrated to read RMS.

Features

- Permanently calibrated
- Fully isolated
- ANSI/ISO 50.1 Class L3

Internet Resources <http://www.crmagnetics.com/>

- Transducer Selection Guide: [transducer.html](#)
- Application Sheet: [pdf/ancr4730-1.pdf](#)
- Pricing: [pricing/4730.html](#)



E154235

Specifications

Nominal Input Voltages:

120, 240, 277 & 480 Vac

Accuracy:

±0.5% Full-Scale (FS)

Ripple On Output:

Less than 1%

Calibrated Signal Out:

4-20 mA DC

Response Time:

1.50 sec. max., 10-90% FS

Temperature Coefficient:

± 0.03%/°C

Supply Voltage:

24 Vdc ± 10%

Load Resistance:

0-600 ohms

Frequency:

50/60 Hz

Max. Continuous Input Voltage:

600 V

Operating Temperature Range:

-30°C to +60°C

Storage Temperature Range:

-50°C to +85°C

Shipping Weight:

Approx. 1.3 Pounds (.59 kg)

Reverse Polarity Protection:

Yes

PART NUMBERS	APPLICATION	NOMINAL VOLTAGE RANGE	INPUT VOLTAGE RANGE	INPUT BURDEN (MAX)	TRANSFER FUNCTION I _{LOOP} MA DC
CR4730-120	Line-to-line	120 V	90 V to 150 V	0.1 VA @ 240 V	$\frac{E_{IN} - 75}{3.75}$
CR4730-480 (Dual Range)	Line-to-line	240 V	180 V to 300 V	0.1 VA @ 265 V	$\frac{E_{IN} - 150}{7.5}$
		480 V	360 V to 600 V	0.1 VA @ 530 V	$\frac{E_{IN} - 300}{15}$
CR4731-120	Phase-to-neutral	120 V	90 V to 150 V	0.1 VA @ 150 V	$\frac{E_{IN} - 75}{3.75}$
CR4731-277	Phase-to-neutral	277 V	180 V to 300 V	0.1 VA @ 300 V	$\frac{E_{IN} - 150}{7.5}$

E_{in}=Volts RMS



Current Sensing Relay

The **CR4395** series, Current Sensing Relay provides an effective and highly stable method for monitoring electrical current. The current-carrying wire is routed through the opening extending from the top of the case. When current reaches the level set by the trip point adjustment, the relay trips and starts the adjustable timer. After the timer cycles the electro-mechanical relay is energized. A precision voltage reference circuit ensures a highly repeatable trip point.



Calibrated Dial
Option Shown

Applications

- Monitor electrical heater elements
- Sense motor over/under loads
- Detect lamp burn-out
- Indicate phase loss

Features

- Variable trip point and time delay
- Monitors currents from 10 mA to 100 AC Amps
- Electrical isolation between circuits
- Output relay rated up to 20 Amps
- LED trip status indicator
- Dead band prevents relay chatter
- Calibrated dial option available
- External current transformers available

Specifications *

Mounting:

3/16" dia. clearance holes on 1 15/16" by 2 15/16" centers

Environmental:

Operating Temperature: -30°C to +60°C
Storage Temperature: -55°C to +85°C

Power-On Delay: 100 ms max

Hysteresis: 5% Max.

Input Supply Power:

Terminals: 2 - 1/4" Male Q C

Sensed Current:

Max. Continuous: 200% Full Scale
Frequency: 60-400 Hz

Internet Resources <http://www.crmagnetics.com/>

- Relay Selection Guide: relays.html
- Application Sheets : pdf/ancr4395-1.pdf, pdf/ancr4395-2.pdf, pdf/ancr4395-3
- Pricing: pricing/4395.html
- External Current Transformers: cts.html

Output Options

The Relay is available with three different output configurations, electromechanical relay, optoisolated NPN transistor or optoisolated triac. Specify desired selection in part number.

Relay

Arrangement: 1 Form C (SPDT)

Contact Material: Silver-cadmium oxide

Terminals: 3 - 1/4" Male Q C

Mechanical Life: 10 million operations, typ. @ rated load

Electrical Life: 100,000 operations, typ. @ rated load

Initial Contact resistance:

50 milliohms max. @ 500 mA, 12 Vdc

Contact Rating: UL508/873 & CSA

VOLTAGE	LOAD TYPE	N.O. CONTACT	N.C. CONTACT
240 Vac	Resistive	20A	10A
240 Vac	Motor	2HP	1/2HP
125 Vac	Motor	1HP	1/4HP
28 Vdc	Resistive	20A	10A

DC Switching (-NPN)

Vce (full off): 30 Vdc max.

Isink (full on): 120 mAdc max. @ rated full-on

Vce (full on): 1.5 Vdc @ 120 mAdc Isink

Off state leakage current: 5ua @ 30 Vdc (typical)

AC Switching (-AAC)

Off state voltage: 240 Vac RMS max.

Minimum switch voltage: 24 Vac RMS

On state current: 0.5 Aac RMS max. continuous

Switching mode: Zero crossing

Off state leakage: 60 ua @ 240 Vac max.

*All specifications for operation at 60 Hz only



Low Cost Current Switch

The **CR9321-LC** series is a low cost, self powered, fixed set-point Current Switch designed for applications that require an on-off indication of current flow.

Current levels above the guaranteed full-on level will turn the output to full on. The Current Switch is recommended only for applications where the continuous operating current is above the rated full on level of 350 mA. Operation below this point will not drive the output device full-on and derate the output ratings.

The unit is available with a NPN or PNP output transistor for switching DC and a SCR output for switching AC. Connections can be made directly to items such as a PLC or electromechanical relay. Note that connections made directly to an inductive device such as an electromechanical relay will require a customer supplied clamping diode for DC operation or a snubber network for AC operation.



Specifications *

Rated full-on: 0.350 Aac RMS

Turn-on time:
100 ms max. @ rated full-on

Turn-off time:
250 ms. max. to 80% of Vce

Maximum sense current:
Continuous: 100 Aac
1 Second: 500 Aac

Frequency: *
50 to 400 Hz

Operating Temperature:
-30 °C to +60 °C

Storage Temperature:
-55 °C to +85 °C

DC Switching (-NPN or -PNP)

Vce (full off): 30 Vdc max.

Isink (full on): 120 mAac max. @ rated full-on

Vce (reverse polarity voltage): 1.2 Vdc @ 100 mA dc

Vce (full on): 1.5 Vdc @ 120 mAac Isink

Off state leakage current: 5ua @ 30 Vdc (typical)

AC Switching (-ACA)

Off state voltage: 240 Vac RMS max.

Minimum switch voltage: 24 Vac RMS

On state current: 1.0 Aac RMS max. continuous

Off state leakage: 50 ua @ 240 Vac max.

Peak Non-Repetitive Surge Current:
8 Aac RMS (1 cycle, 60 Hz.)

*All specifications for operation at 60 Hz only

Part Number

CR9321-LC - [] [] CURRENT SWITCH

NPN - Transistor output

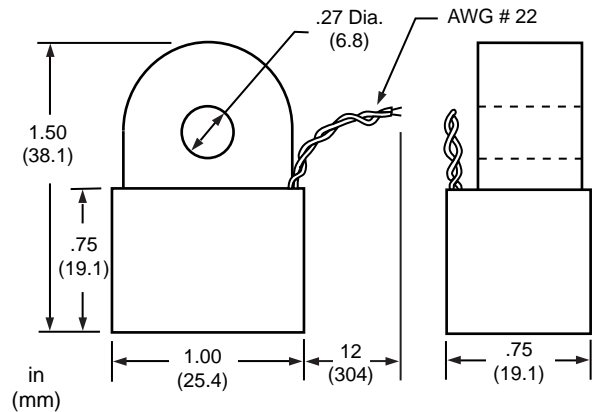
PNP - Transistor output

ACA - AC Output

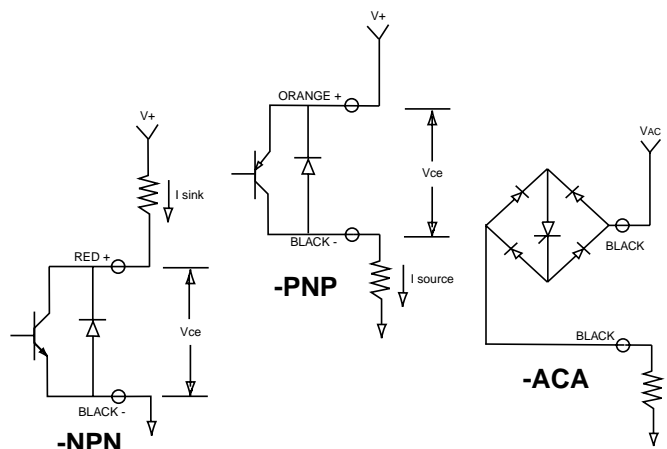
Features

- Low cost
- Low fixed trip point
- Fully isolated
- Reverse output polarity protected
- Self-powered

Outline Drawing



Electrical Connections





Wire Lead Current Transformers

CR Magnetics offers a versatile line of rugged wire lead current transformers. Installed around a current-carrying wire, the sensor provides a current output relative to the AC input current (within specification limits). With the output connected across a resistive load (burden), the voltage developed is proportional to the input current.

Applications

- Remote monitoring of electrical loads
- Input to electrical control system
- Detect open heater elements
- Indicate phase loss
- Monitor motor operation

Features

- Low cost
- Non-contact, isolated current measurement
- Surface mounting bracket available for Model 17 and Model 18
- 2 case sizes, 3 different standard ratios

Specifications

Frequency: 50-60 Hz

Working Class: 600 Vac

Case Material: Black thermoplastic

Part Numbers

Model 17-2000	Current Transformer with wire leads, .55 dia. opening, 2000 turns
Model 17-1000	Current Transformer with wire leads, .55 dia. opening, 1000 turns
Model 18-600	Current Transformer with wire leads, .55 dia. opening, 600 turns
MB-18	Surface Mounting Bracket for Model 17 or Model 18
Model 19	Current Transformer with .29 dia. opening, 230 turns



Model 19



Model 17 & 18

Shown with optional mounting bracket **MB-18**

Internet Resources <http://www.crmagnetics.com/>

- Transformer Selection Guide: pcb.html



Vertical Mounting, PCB Current Transformers - Series 8300

Features

- Low cost
- 4 standard sizes
- Non-symmetrical mounting pattern
- Silicon Steel & Nickel Alloy cores available

Applications

- **Silicon Steel** cores provide moderate accuracy and lower cost for applications such as current measurement and current relaying.
- **Nickel Alloy** cores are for applications that require highest accuracy with minimal phase angle error and are higher in cost. Applications would include power and energy monitoring devices.

Specifications

Case Material: Polypropylene Resin

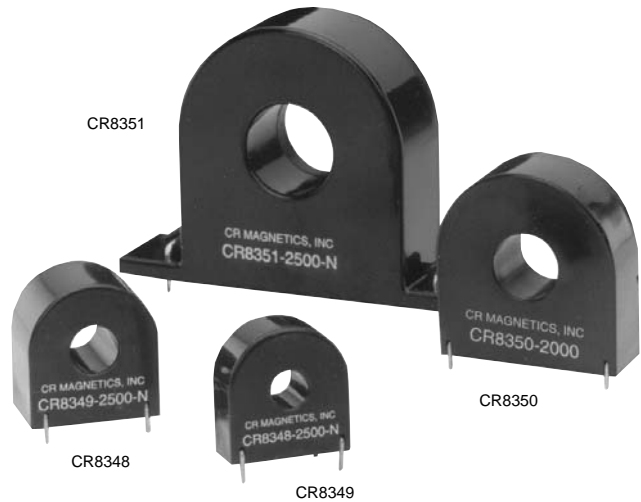
Construction: Epoxy Encapsulated

Operating Temperature: -25°C to +66°C

Insulation Resistance: 100 M ohm @ 500 Vdc

High Potential: 1500 volts x 1 minute

Frequency: 50 to 400 Hz



Outline Dimensions

PART NUMBERS	A	B	C	D	E	F	G	H	I	J	K	L	M	Fig.
	min.	max.	max.	± .04 (±1.0)	max.									
CR8348-xxxx	.265 (6.7)	.925 (23.5)	.433 (11)	.118 (3)	.984 (25)	.040 (1.0)	.075 (1.905)	.60 (15.24)	.75 (19.05)	.374 (9.5)				1
CR8349-xxxx	.354 (9)	1.024 (26)	.669 (17)	.118 (3)	1.102 (28)	.040 (1.0)	.075 (1.905)	.60 (15.24)	.75 (19.05)	.60 (15.24)				1
CR8350-xxxx	.504 (12.8)	1.476 (37.5)	.551 (14)	.118 (3)	1.535 (39)	.040 (1.0)	.15 (3.81)	1.00 (25.4)	1.30 (33.02)	.50 (12.7)				1
CR8351-xxxx	.772 (19.6)	1.969 (50)	.748 (19)	.137 (3.5)	2.204 (56)	.059 (1.5)	.591 (15)	1.181 (30)	2.362 (60)	.394 (10)	.059 (1.5)	3.15 (80)	.040 (1.0)	2

Part Numbers

CR □ □ □ □ - □ □ □ □ - □ □ □ □

Number of Secondary Turns

- 8348** - .272 Window Opening
- 8349** - .354 Window Opening
- 8350** - .504 Window Opening
- 8351** - .772 Window Opening

Leave blank for Silicon Steel Core
N 0.2 - Nickel Alloy Core, 0.2 Accuracy Class
N 0.1 - Nickel Alloy Core, 0.1 Accuracy Class

Internet Resources <http://www.crmagnetics.com/>

- Transformer Selection Guide: [pcb.html](#)
- Pricing: [pricing/8300.html](#)

Standard Configurations

The following are standard configurations that are stocked.

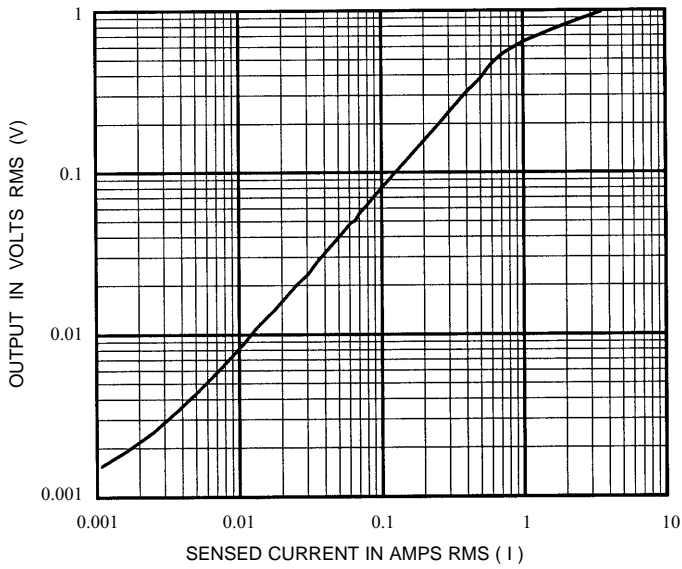
- CR8348-2000
- CR8348-2500-N-0.2
- CR8349-1500
- CR8349-2500-N-0.2
- CR8350-2000
- CR8350-2500-N-0.2
- CR8351-2000-N-0.2

CONTACT FACTORY FOR ADDITIONAL ELECTRICAL SPECIFICATIONS

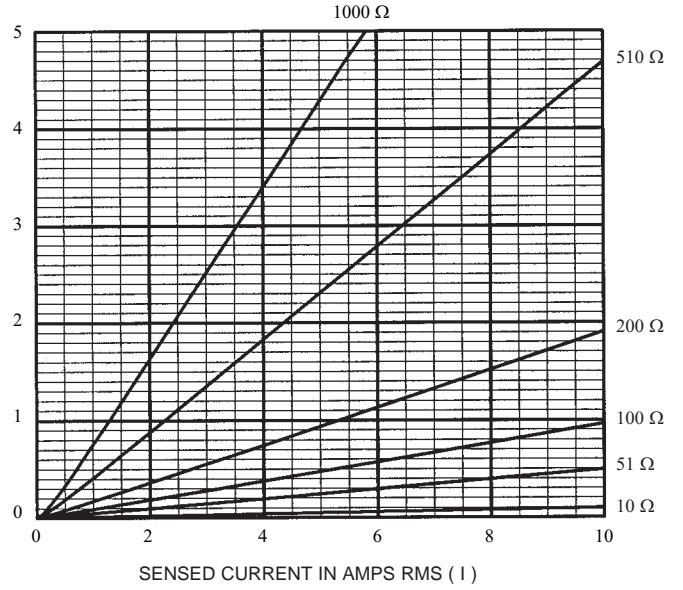
Wire Lead Current Transformers Series 8400

Output Voltage vs Sensed Current for Different Values Of Burden Resistance (R)

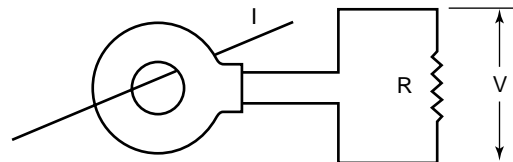
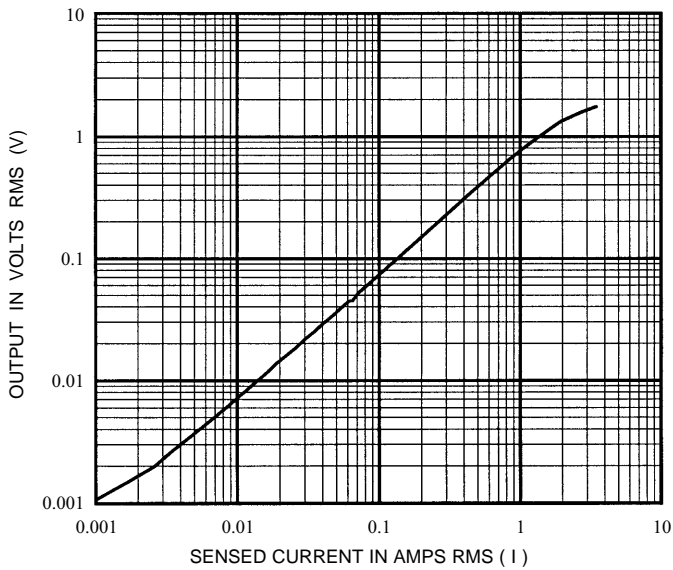
CR8401-1000 (.232 WINDOW)
R=1,000 ohms



CR8410-1000 (.350 WINDOW)



CR8420-1000 (.610 WINDOW)
R=1,000 ohms



Series 8300 and 8400 Current Transformers

Outline Drawings

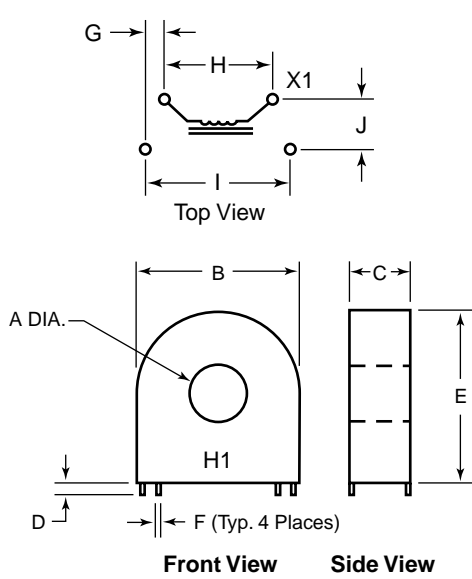


Figure 1

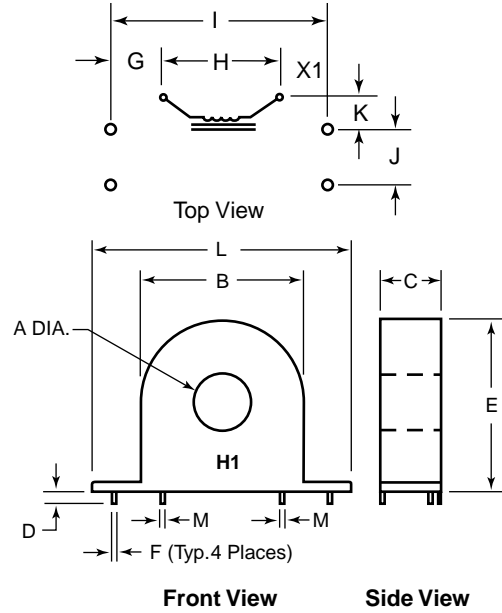


Figure 2

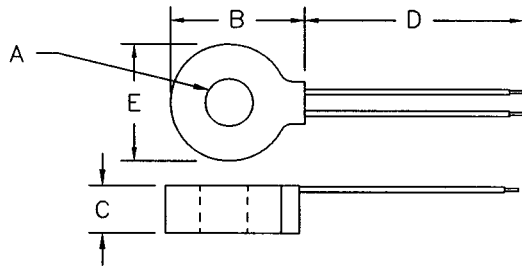


Figure 3

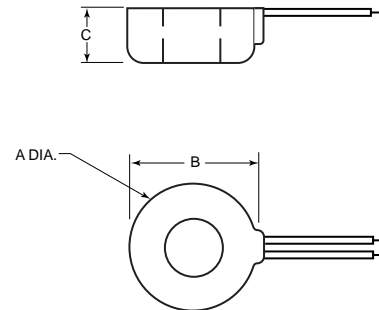


Figure 4

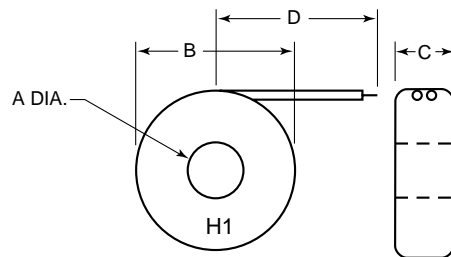
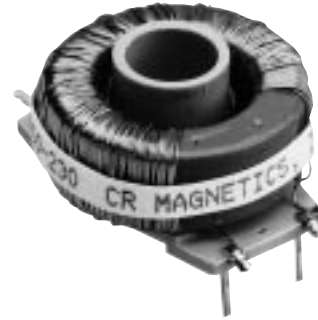


Figure 5



Horizontal Mounting, PCB Current Transformer

The **CR8750** series, PCB Current Transformer provides a low cost method for monitoring electrical current. The transformer is intended to be mounted on a Printed Circuit Board with the current-carrying wire routed through the center window opening. A five-pin, non-symmetrical mounting pattern ensures correct orientation on the PCB. Two different winding ratios are available to accommodate various applications. The graph below illustrates how different values of burden resistors attached to the output terminal will provide a number of different output voltage ranges.



Specifications

Frequency: 60-400 Hz
Insulation Level: 600 V

Internet Resources <http://www.crmagnetics.com/>

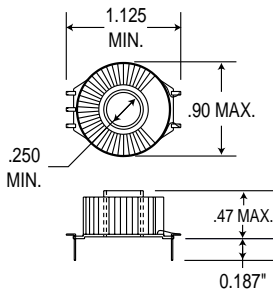
- Transformer Selection Guide: pcb.html
- Pricing: pricing/8750.html

Part Numbers

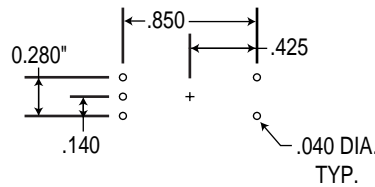
CR8750-□□□□ PCB CURRENT TRANSFORMER

0230 TURNS
1000 TURNS

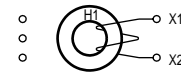
Application Notes



Outline Drawing

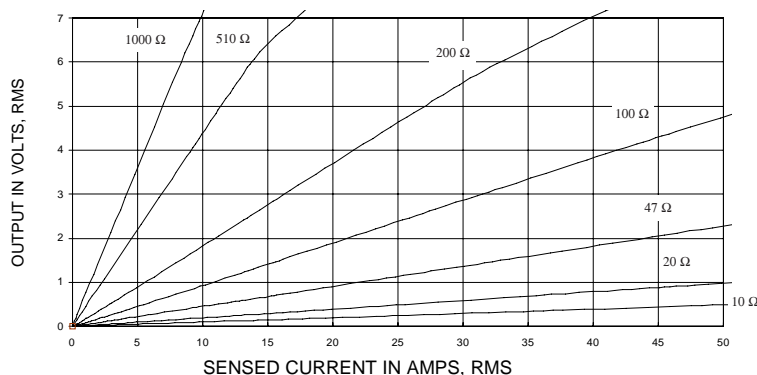


Recommended Mounting Hole Pattern (Top View)



Window Polarity (Top View)

Typical Response



CR8750-1000

Commercial Class Current Transformers

WINDOW OPENING DIMENSION A	SERIES	MOUNTING STYLE	DIMENSIONS						CURRENT RATIO	ACCURACY AT 60 Hz	BURDEN VA AT 60 Hz		
			B	C	D	E	F	G					
1.13 (28.7)	CR2	RL	2.46 (62.5)	1.05 (26.7)					50:5	±3%	2.0		
		SFT							60:5	±2%	2.0		
		SFL							75:5	±2%	2.0		
		SHT							80:5	±2%	2.0		
		SHL							100:5	±1%	2.0		
									120:5	±1%	2.5		
									125:5	±1%	2.5		
									150:5	±1%	4.0		
									200:5	±1%	4.0		
									250:5	±1%	6.0		
	300:5	±1%	8.0										
1.56 (39.6)	CR5	RL	3.56 (90.4)	1.10 (27.9)					50:5	±2%	1.0		
		SFT	3.78 (96.0)	2.15 (54.6)	2.75 (69.9)	1.77 (45.0)	.21 (5.3)	.31 (7.9)	75:5	±2%	1.5		
		SFL	3.78 (96.0)	2.15 (54.6)	2.75 (69.9)	1.77 (45.0)	.21 (5.3)	.31 (7.9)	100:5	±2%	2.0		
		SHT	3.83 (97.3)	1.09 (27.7)					150:5	±1%	5.0		
		SHL	3.83 (97.3)	1.09 (27.7)					200:5	±1%	5.0		
		RT	3.62 (91.9)	1.13 (28.7)					250:5	±1%	10.0		
		RBT *	3.90 (99.1)	1.25 (31.8)	3.88 (98.6)		.44 (11.2)	.27 (6.9)	300:5	±1%	12.5		
		RBL *	3.70 (94.0)	1.25 (31.8)	3.88 (98.6)		.44 (11.2)	.27 (6.9)	400:5	±1%	12.5		
									500:5	±1%	20.0		
									600:5	±1%	25.0		
									750:5	±1%	25.0		
									800:5	±1%	25.0		
									1000:5	±1%	25.0		
									1200:5	±1%	30.0		
		2.50 (63.5)	CR7	RL	4.70 (919.4)	1.10 (27.4)					100:5	±2%	2.5
SFT	4.85 (123.2)			2.13 (54.1)	3.78 (96.0)	1.75 (44.5)	.25 (6.4)	.31 (7.9)	150:5	±1%	5.0		
SFL	4.85 (123.2)			2.13 (54.1)	3.78 (96.0)	1.75 (44.5)	.25 (6.4)	.31 (7.9)	200:5	±1%	5.0		
SHT	4.70 (119.4)			1.10 (27.9)					250:5	±1%	5.0		
SHL	4.70 (119.4)			1.10 (27.9)					300:5	±1%	12.0		
RT	4.61 (117.1)			1.10 (27.9)					400:5	±1%	15.0		
RBT	4.94 (125.5)			1.25 (31.8)	5.75 (146.1)	6.5 (7.1)	.28 (7.1)	.28 (7.1)	500:5	±1%	25.0		
RBL	4.70 (125.5)			1.25 (31.8)	5.75 (146.1)	6.5 (16.5)	.28 (7.1)	.28 (7.1)	600:5	±1%	30.0		
									750:5	±1%	30.0		
									800:5	±1%	35.0		
									1000:5	±1%	30.0		
									1200:5	±1%	35.0		
									1500:5	±1%	40.0		
									1600:5	±1%	45.0		
2.06 (52.3)	CR56			RL	3.50 (88.9)	1.09 (27.7)					50:5	±3%	0.5
		SFT	3.63 (92.2)	2.15 (54.6)	2.70 (68.6)	1.70 (43.2)	.21 (5.3)	.31 (7.9)	75:5	±1%	0.5		
		SFL	3.63 (92.2)	2.15 (54.6)	2.70 (68.6)	1.70 (43.2)	.21 (5.3)	.31 (7.9)	100:5	±1%	1.0		
		RT	3.62 (91.9)	1.10 (27.9)					150:5	±1%	2.5		
		RBT	3.90 (99.1)	1.25 (31.8)	3.88 (98.6)	4.50 (114.3)	.27 (6.9)	.44 (11.2)	200:5	±1%	4.0		
		RBL	3.70 (94.0)	1.25 (31.8)	3.88 (98.6)	4.50 (114.3)	.27 (6.9)	.44 (11.2)	250:5	±1%	6.0		
									300:5	±1%	7.5		
									400:5	±1%	10.0		
									500:5	±1%	12.5		
									600:5	±1%	15.0		
									750:5	±1%	7.0		
									800:5	±1%	8.0		
									1000:5	±1%	10.0		
									1200:5	±1%	12.5		
		3.00 (76.2)	CR76	RL	4.50 (114.3)	1.09 (27.7)					200:5	±1%	5.0
SFT	4.68 (128.9)			2.08 (52.8)	3.70 (44.0)	1.75 (44.5)	.25 (6.4)	.31 (7.9)	250:5	±1%	5.0		
SFL	4.68 (118.9)			2.08 (52.8)	3.70 (44.0)	1.75 (44.5)	.25 (6.4)	.31 (7.9)	300:5	±1%	6.0		
RT	4.62 (117.3)			1.10 (27.9)					400:5	±1%	10.0		
RBT	4.94 (125.5)			1.25 (31.8)	5.75 (146.1)	6.50 (165.1)	.28 (7.1)	.28 (7.1)	500:5	±1%	10.0		
RBL	4.70 (119.4)			1.25 (31.8)	5.75 (146.1)	6.50 (165.1)	.28 (7.1)	.28 (7.1)	600:5	±1%	10.0		
									750:5	±1%	10.0		
									800:5	±1%	12.5		
									1000:5	±1%	10.0		
									1200:5	±1%	10.0		
									1500:5	±1%	12.5		
									1600:5	±1%	12.5		
									2000:5	±1%	15.0		
.64 (16.3)	CR1A			RL	1.99 (50.5)	1.25 (31.8)					50:5	±2%	1.0
										60:5	±1%	2.0	
								75:5	±1%	2.0			
								80:5	±1%	2.0			
								100:5	±1%	2.5			
								120:5	±1%	3.0			
								125:5	±1%	3.0			
								150:5	±1%	4.0			
								200:5	±1%	5.0			
								250:5	±1%	7.5			

* RBT and RBL mounting styles in the CR5 series are not available in current ratios of 750:5 thru 1200:5

ANSI Metering Class Current Transformers

WINDOW OPENING DIMENSION A	SERIES	MOUNTING STYLE	DIMENSIONS						CURRENT RATIO	ANSI METERING CLASS @ 60 Hz				
			B	C	D	E	F	G		B0.1	B0.2	B0.5	B0.9	B1.8
3.25 (82.6)	CR8	RL SHT SHL	5.73 (145.5)	1.15 (29.2)					200:5	1.2	1.2	-	-	-
									250:5	0.6	1.2	2.4	-	-
									300:5	0.6	0.6	1.2	2.4	-
									400:5	0.3	0.6	1.2	1.2	-
									500:5	0.3	0.3	0.6	1.2	2.4
									600:5	0.3	0.3	0.6	1.2	1.2
									750:5	0.3	0.3	0.3	0.6	1.2
									800:5	0.3	0.3	0.3	0.6	1.2
									1000:5	0.3	0.3	0.3	0.6	0.6
									1200:5	0.3	0.3	0.3	0.6	0.6
									1500:5	0.3	0.3	0.3	0.6	0.6
									1600:5	0.3	0.3	0.3	0.6	0.6
									2000:5	0.3	0.3	0.3	0.3	0.3
									2500:5	0.3	0.3	0.3	0.3	-
									3000:5	0.3	0.3	0.3	0.3	-
3200:5	0.3	0.3	0.3	0.3	-									
4000:5	0.3	0.3	0.3	0.3	-									
4.25 (108)	CR170	RL SHT SHL	6.73 (170.9)	1.25 (31.8)					200:5	1.2	1.2	-	-	-
									250:5	1.2	1.2	-	-	-
									300:5	0.6	0.6	1.2	2.4	-
									400:5	0.6	0.6	1.2	1.2	2.4
									500:5	0.3	0.3	0.6	1.2	2.4
									600:5	0.3	0.3	0.6	0.6	1.2
									750:5	0.3	0.3	0.3	0.3	0.6
									800:5	0.3	0.3	0.3	0.3	0.6
									1000:5	0.3	0.3	0.3	0.3	0.6
									1200:5	0.3	0.3	0.3	0.3	0.6
									1500:5	0.3	0.3	0.3	0.6	0.6
									1600:5	0.3	0.3	0.3	0.6	0.6
									2000:5	0.3	0.3	0.3	0.3	0.3
									2500:5	0.3	0.3	0.3	0.3	0.3
									3000:5	0.3	0.3	0.3	0.3	0.3
3500:5	0.3	0.3	0.3	0.3	0.3									
4000:5	0.3	0.3	0.3	0.3	0.3									



Wire-Mounted Current Indicator

The **CR-45** series, Wire-Mounted Electrical Current Indicators provides an effective method of monitoring electrical current. The indicator is attached directly to a current-carrying wire. When the current exceeds the turn-on point, the LED will illuminate to indicate the presence of current.



CR-45 Current Indicators
(Shown Approx. Full Size)

Applications

- Monitor status of heater elements
- Observe remote loads
- Indicate phase loss
- Monitor motor operation

Features

- Self powered
- Red or green indicator
- Easy to install
- Supplied with plastic tie
- Bright yellow case for easy identification
- Panel mounting bracket available



MB-45 Panel Mounting Bracket
(Shown Approx. Full Size)

Specifications

Min. Turn-on Point

2 Amps for CR-45-R
2.5 Amps for CR-45-G

Indicating Range:

2 to 100 Amps (for CR-45-R)
2.5 to 100 Amps (for CR-45-G)

Max. Continuous Current:

100 Amps

LED Type:

T 1^{3/4} Diffused

LED Color:

Red or Green

Case Material:

Thermoplastic

Case Color:

Bright Safety Yellow

Weight:

.5 oz. (14.2 g)

Frequency:

50-60 Hz

Mounting Bracket Material:

Non-Magnetic Aluminum

WIRE PASSES	TURN-ON POINT		MAX. WIRE DIAMETER
	RED	GREEN	
1	2	2.5	.29
2	1	1.25	.14
3	.66	.83	.13
4	.5	.62	.12
N	2÷N	2.5÷N	

Internet Resources <http://www.crmagnetics.com/>

- Indicator Selection Guide: ind.html
- Application Sheet: pdf/ancr450-1.pdf
- Pricing: pricing/cr45.html

Part Numbers

- CR45** - Current Indicator with (Red or Green) LED
 R-Red Indicator
 G-Green Indicator
- MB-45** Panel Mounting Bracket for CR-45



Remote Current Indicators

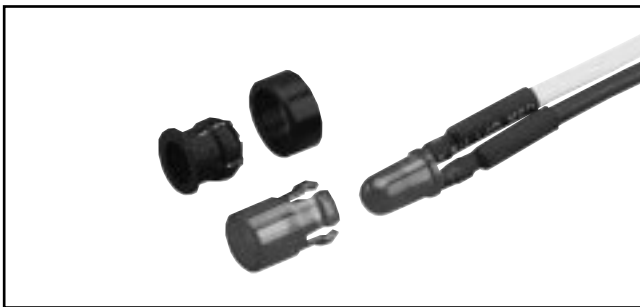
The CR Magnetics line of Remote Electrical Current Indicators provides an effective method for remote monitoring of electrical current. The remote current sensing transformer is installed around the current-carrying wire and is connected directly to the LED panel indicator. When the current exceeds the turn-on point of the sensing transformer, the LED illuminates to indicate the presence of current. Two sizes of remote current sensing transformers are available for use with either one of two types of LED indicators. The panel indicators are available with either red or green LED.



Model 19 Remote Current Transformer

(Connect directly to either PH-25 or PH-31 LED indicator)
 Indicating Range: 2 to 100 Amps (1-Wire Pass)
 Minimum turn-on point: 2 Amps
 Max. Cont. Current: 100 Amps
 Max. Transient Current: 150 Amps for 5 Sec.
 Working Class: 600 Volts, 50-60 Hz

WIRE PASSES	TURN-ON POINT	MAX. WIRE DIAMETER
1	2	.29 (7.4)
2	1	.14 (3.6)
3	.66	.13 (3.3)
N	$2 \div N$	



PH-25 Press-In LED Panel Indicator

(Supplied with two types of mounting hardware)
 LED type: T-1³/₄, Bi-Polar, Red or Green
 Mounting Hole: .250 (6.4) ± .002" Dia.
 Mounting Hardware: Use either one-piece press-in red lens or two-piece mounting clip

Applications

- Indicate open heater elements
- Observe remote loads
- Indicate phase loss
- Monitor motor operation



Model 18-600 Remote Current Transformer

(Connect directly to either PH-25 or PH-31 LED indicator)
SHOWN WITH MB-18, SURFACE MOUNTING BRACKET
 Indicating Range: 2.5 to 100 Amps (1-Wire Pass)
 Minimum turn-on point: 2.5 Amps
 Max. Cont. Current: 100 Amps
 Max. Transient Current: 150 Amps for 5 Sec.
 Working Class: 600 Volts, 50-60 Hz

WIRE PASSES	TURN-ON POINT	MAX. WIRE DIAMETER
1	2.5	.55 (14)
2	1.25	.27 (6.9)
3	.83	.25 (6.4)
N	$2.5 \div N$	



PH-31 Splash-Proof LED Panel Indicator

(Supplied with rubber sealing washer)
 LED type: T-1³/₄, Bi-Polar, Red or Green
 Housing Material: Chrome Plated Brass
 Mounting Hole: .312 ± .005" (7.9) Dia.



Low Cost Remote Current Indicator

The **CR2550** series Remote Current Indicators are designed as a low cost method for providing a visual indication of electrical current flow. The current-carrying wire is routed through the window opening in the current sensing transformer. Attached to the transformer is a high efficiency, bi-polar LED that illuminates when the current is above the turn-on point. The indicator is available as standard with an 11 inch long lead and a red or green LED indicator.

Features

- Low cost for high volume OEM installations
- Low fixed trip point
- Fully isolated
- Easy to install
- Self-powered

Specifications

Turn-on point: 0.75 Aac RMS for Red LED
1.5 Aac RMS for Green LED

Maximum Continuous Rating:
20 Aac RMS

Frequency:
50 to 400 HZ

Operating Temperature:
-30 °C to +60 °C

Storage Temperature:
-55 °C to +85 °C

LED Indicator type:
T-13/4, Bipolar, Red/Red or Green/Green Diffused, Indicator is supplied with LED attached to current sensing transformer

LED Mounting Hardware:
Supplied with both one-piece press-in lens and two-piece mounting clip



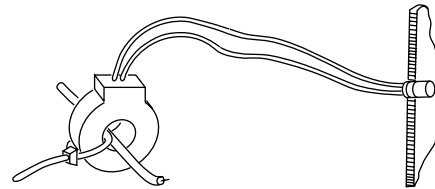
Applications

- Indicate open heater element
- Observe remote loads
- Indicate phase loss
- Monitor motor operation

Part Numbers

- CR2550-11-.75 R** CURRENT INDICATOR WITH RED LED
CR2550-11-1.5 G CURRENT INDICATOR WITH GREEN LED

Installation



Outline Drawing

