

# Supplemental Motor Protection Devices Specifications

Bulletin Numbers 809S, 813S, 814S, 817S, 1409, 1410

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## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.





Resource	Description
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

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## Product Line Overview

	Bulletin 809S Current Monitoring Relay	Bulletin 813S Voltage Relay		Bulletin 814S Power Factor Relay	Bulletin 814S Power (kW) Relay	Bulletin 817S Thermistor Relay
						
Type	Single-Phase	Single-Phase	Three-Phase	Three-Phase	Three-Phase	—
Operating range	1...10 A AC/DC	2...500V AC/DC	110...115V AC 208...240V AC	1...10 A AC	1...10 A AC	24/48V AC/DC
	24/48V AC/DC	24/48V AC/DC	380...415V AC 440...480V AC	380...480V AC	380...480V AC	115V AC
	115/230V AC	115/230V AC	600...690V AC	600...690V AC	600...690V AC	230V AC
Under- and overcurrent protection	√	—	—	—	—	—
Under- and overvoltage protection	—	√	√	—	—	—
Phase loss protection	—	—	√	—	—	—
Phase imbalance	—	—	√	—	—	—
Phase reversal	—	—	√	—	—	—
Minimum and maximum cos (φ) protection	—	—	—	√	—	—
Under- and over active power (kW) protection	—	—	—	—	√	—
Overtemperature protection	—	—	—	—	—	√
Adjustable time delay settings	√	√	√	√	√	—
Programmable latching or inhibit at set level	√	√	—	√	√	—
Changeover Contacts (SPDT)	1	1	2	1	1	1
Automatic Reset	√	√	√	√	√	—
LED status indicator	√	√	√	√	√	√
Dimensions (W x H x D)	22.5 x 80 x 99.5 mm	22.5 x 80 x 99.5 mm	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm	22.5 x 80 x 99.5 mm

# Cat. No. Explanation

Examples given in this section are for reference purposes. This basic explanation should not be used for product selection; not all combinations will produce a valid catalog number.

**809S – C1 – 10A – 48**  
*a                      b                      c                      d*

*a*

Bulletin Number	
Code	Description
809S	Current Monitoring Relay
813S	Voltage Monitoring Relay
814S	Power Monitoring Relay
817S	Thermistor Monitoring Relay

*d*

External Power Code	
Code	Description
<b>Bulletin 809S</b>	
48	24/48V AC/DC
230	115/230V AC
<b>Bulletin 813S</b>	
48	24/48V AC/DC (Type V1 only)
230	115/230V AC (Type V1 only)
<b>Bulletin 814S</b>	
—	—
<b>Bulletin 817S</b>	
48	24/48V AC/DC
115	115V AC
230	230V AC

*b*

Type	
Code	Description
<b>Bulletin 809S</b>	
C1	Single-Phase Current Monitoring Relay
<b>Bulletin 813S</b>	
V1	Single-Phase Voltage Monitoring Relay
V3	Three-Phase Voltage Monitoring Relay
<b>Bulletin 814S</b>	
W3	Three-Phase Power (kW) Monitoring Relay
PF3	Three-Phase Power Factor Monitoring Relay
<b>Bulletin 817S</b>	
PTC	Thermistor Monitoring Relay

*c*

Measurement Rating	
Code	Description
<b>Bulletin 809S</b>	
10A	1...10 A AC/DC
<b>Bulletin 813S</b>	
500V	2...500V AC/DC (Type V1)
110V	110...115V AC (Type V3)
230V	208...240V AC (Type V3)
400V	380...415V AC (Type V3)
480V	440...480V AC (Type V3)
690V	600...690V AC (Type V3)
<b>Bulletin 814S</b>	
480V-10A	380...480V AC & 1...10 A AC
690V-10A	600...690V AC & 1...10 A AC
<b>Bulletin 817S</b>	
—	—

# Specifications

## Bulletin 809S Current Monitoring Relay, Single-Phase

Cat. No.	809S-C1-10A-48	809S-C1-10A-230
<b>Input Specifications</b>		
Measuring Range	1...10 A AC/DC	1...10 A AC/DC
Internal Resistance	3 mΩ	3 mΩ
Maximum for 1 Second	50 A	50 A
Contact Input	Terminals Z1, Y1	Terminals Z1, Y1
Disabled	>10 kΩ	>10 kΩ
Enabled	<500 Ω	<500 Ω
Latch Disable	>500 ms	>500 ms
<b>Output Specifications</b>		
Type of Contact	(1) Form C	(1) Form C
Rated Insulation Voltage	250V AC	250V AC
<b>Supply Specifications</b>		
	Terminals A1, A2 or A3, A2	Terminals A1, A2 or A3, A2
Rated Operational Voltage	24...48V AC/DC +/- 15%	115/230V AC +/- 15%
	45 to 65 Hz, Insulated	45 to 65 Hz, Insulated
Rated Operational Power	4 VA, 3 W	4 VA, 3 W
<b>General Specifications</b>		
Power ON Delay	1 s +/- 0.5 s or 6 s +/- 0.5 s	1 s +/- 0.5 s or 6 s +/- 0.5 s
<b>Environment</b>		
Degree of Protection	IP 20	IP 20
Pollution Degree	3	3
Dimensions (W x H x D)	22.5 x 80 x 99.5 mm	22.5 x 80 x 99.5 mm
Screw Terminals	Max. 0.5 N•m	Max. 0.5 N•m

## Bulletin 813S Voltage Relay, Single-Phase

Cat. No.	813S-V1-500V-48	813S-V1-500V-230
<b>Input Specifications</b>		
Measuring Range	2...500 V AC/DC	2...500 V AC/DC
Internal Resistance	500 kΩ	500 kΩ
Maximum for 1 Second	1000 V	1000 V
Contact Input	Terminals Z1, Y1	Terminals Z1, Y1
Disabled	>10 kΩ	>10 kΩ
Enabled	<500 Ω	<500 Ω
Latch Disable	>500 ms	>500 ms
<b>Output Specifications</b>		
Type of Contact	(1) Form C	(1) Form C
Rated Insulation Voltage	250V AC	250V AC
<b>Supply Specifications</b>		
	Terminals A1, A2 or A3, A2	Terminals A1, A2 or A3, A2
Rated Operational Voltage	24...48V AC/DC +/- 15%	115/230V AC +/- 15%
	45 to 65 Hz, Insulated	45 to 65 Hz, Insulated
Rated Operational Power	4 VA, 3 W	4 VA, 3 W
<b>General Specifications</b>		
Power ON Delay	1 s +/- 0.5 s or 6 s +/- 0.5 s	1 s +/- 0.5 s or 6 s +/- 0.5 s
<b>Environment</b>		
Degree of Protection	IP 20	IP 20
Pollution Degree	3	3
Dimensions (W x H x D)	22.5 x 80 x 99.5 mm	22.5 x 80 x 99.5 mm
Screw Terminals	Max. 0.5 N•m	Max. 0.5 N•m

## Bulletin 813S Voltage Relay, Three-Phase

Cat. No.	813S-V3-110V	813S-V3-230V	813S-V3-400V	813S-V3-480V	813S-V3-690V
<b>Input Specifications</b>					
Input	Terminals L1, L2, L3, N	Terminals L1, L2, L3, N	Terminals L1, L2, L3, N	Terminals L1, L2, L3, N	Terminals L1, L2, L3, N
Supply	110...115V AC	208...240V AC	380...415V AC	440...480V AC	600...690V AC
	Self-powered	Self-powered	Self-powered	Self-powered	Self-powered
Frequency	50...400 Hz	50...400 Hz	50...400 Hz	50...400 Hz	50...400 Hz
<b>Ranges</b>					
Upper Level	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage
Lower Level	-22...-2 % of the nominal voltage	-22...-2 % of the nominal voltage	-22...-2 % of the nominal voltage	-22...-2 % of the nominal voltage	-22...-2 % of the nominal voltage
Asymmetry	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage
Tolerance	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage	2...22 % of the nominal voltage
<b>Hysteresis</b>					
Set Points from 2...5 %	1 %	1 %	1 %	1 %	1 %
Set Points from 5...22 %	2 %	2 %	2 %	2 %	2 %
<b>Output Specifications</b>					
Type of Contact	(2) Form C, Normally Energized	(2) Form C, Normally Energized	(2) Form C, Normally Energized	(2) Form C, Normally Energized	(2) Form C, Normally Energized
Rated Insulation Voltage	250V AC	250V AC	250V AC	250V AC	250V AC
<b>Supply Specifications</b>					
Rated Operational Power	13 VA @ $\Delta$ 400V AC, 50 Hz	13 VA @ $\Delta$ 400V AC, 50 Hz	13 VA @ $\Delta$ 400V AC, 50 Hz	13 VA @ $\Delta$ 400V AC, 50 Hz	21 VA @ $\Delta$ 600V AC, 50 Hz
<b>General Specifications</b>					
Power ON Delay	1 s +/- 0.5 s or 6 s +/- 0.5 s	1 s +/- 0.5 s or 6 s +/- 0.5 s	1 s +/- 0.5 s or 6 s +/- 0.5 s	1 s +/- 0.5 s or 6 s +/- 0.5 s	1 s +/- 0.5 s or 6 s +/- 0.5 s
<b>Environment</b>					
Degree of Protection	IP 20	IP 20	IP 20	IP 20	IP 20
Pollution Degree	3	3	3	3	3
Dimensions (W x H x D)	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm
Screw Terminals	Max. 0.5 N•m	Max. 0.5 N•m	Max. 0.5 N•m	Max. 0.5 N•m	Max. 0.5 N•m

## Bulletin 814S Power Factor Relay, Three-Phase

Cat. No.	814S-PF3-480V-10A	814S-PF3-690V-10A
<b>Input Specifications</b>		
Input	Terminals L1, L2, L3	Terminals L1, L2, L3
Voltage	380...480V AC, Self-powered	600...690V AC, Self-powered
Current	1...10 A	1...10 A
<b>Measuring Ranges</b>		
Power Factor (cos $\phi$ )		
Upper Level	0.1...0.99	0.1...0.99
Lower Level	0.1...0.99	0.1...0.99
Direct Input		
Upper Level	1...10 A	1...10 A
Lower Level	50 A	50 A
<b>Contact Input</b>		
Enabled / Disabled	<500 $\Omega$ / >10 k $\Omega$	<500 $\Omega$ / >10 k $\Omega$
Pulse Width	>500 ms	>500 ms
Hysteresis	PF Approx. 0.1	PF Approx. 0.1
<b>Output Specifications</b>		
Type of Contact	(1) Form C	(1) Form C
Rated Insulation Voltage	250V AC	250V AC
<b>Supply Specifications</b>		
Rated Operational Power	13 VA @ $\Delta$ 400V AC, 50 Hz	21 VA @ $\Delta$ 600V AC, 50 Hz
<b>General Specifications</b>		
Power ON Delay	1 to 30 s +/- 0.5 s	1 to 30 s +/- 0.5 s
<b>Environment</b>		
Degree of Protection	IP 20	IP 20
Pollution Degree	3	3
Dimensions (W x H x D)	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm
Screw Terminals	Max. 0.5 N•m	Max. 0.5 N•m

## Bulletin 814S Power (kW) Relay, Three-Phase

Cat. No.	814S-W3-480V-10A	814S-W3-690V-10A
<b>Input Specifications</b>		
Input	Terminals L1, L2, L3	Terminals L1, L2, L3
Voltage	380...480V AC, Self-powered	600...690V AC, Self-powered
Current	1...10 A	1...10 A
<b>Measuring Ranges</b>		
Active Power		
Upper Level	-100...+100 %	-100...+100 %
Lower Level	-100...+100 %	-100...+100 %
Direct Input		
Upper Level	1...10 A	1...10 A
Lower Level	50 A	50 A
<b>Contact Input</b>		
Enabled / Disabled	<500 $\Omega$ / >10 k $\Omega$	<500 $\Omega$ / >10 k $\Omega$
Pulse Width	>500 ms	>500 ms
Hysteresis	~2 % of Set Value - Fixed	~2 % of Set Value - Fixed
<b>Output Specifications</b>		
Type of Contact	(1) Form C	(1) Form C
Rated Insulation Voltage	250V AC	250V AC
<b>Supply Specifications</b>		
Rated Operational Power	13 VA @ $\Delta$ 400V AC, 50 Hz	21 VA @ $\Delta$ 600V AC, 50 Hz
<b>General Specifications</b>		
Power ON Delay	1 to 30 s +/- 0.5 s	1 to 30 s +/- 0.5 s
<b>Environment</b>		
Degree of Protection	IP 20	IP 20
Pollution Degree	3	3
Dimensions (W x H x D)	45 x 80 x 99.5 mm	45 x 80 x 99.5 mm
Screw Terminals	Max. 0.5 N•m	Max. 0.5 N•m

## Bulletin 817S Thermistor Relay

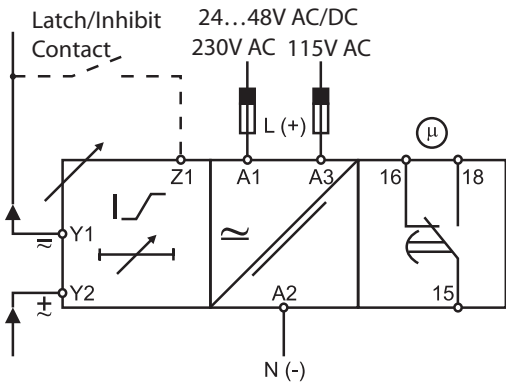
Cat. No.	817S-PTC-48	817S-PTC-115	817S-PTC-230
<b>Input Specifications</b>			
Input	Terminals T1, T2	Terminals T1, T2	Terminals T1, T2
Supply	24...48V AC/DC	115V AC	230V AC
<b>Measuring Ranges</b>			
Max Cold PTC Resistance	1500 $\Omega$	1500 $\Omega$	1500 $\Omega$
Alarm Setpoint	3100 $\Omega$ +/- 10 %	3100 $\Omega$ +/- 10 %	3100 $\Omega$ +/- 10 %
Return Setpoint	1650 $\Omega$ +/- 10 %	1650 $\Omega$ +/- 10 %	1650 $\Omega$ +/- 10 %
Short-circuit Detection	0...10 $\Omega$	0...10 $\Omega$	0...10 $\Omega$
Measurement Voltage	<2.5 V	<2.5 V	<2.5 V
<b>Contact Input</b>			
Disabled	>10 k $\Omega$	>10 k $\Omega$	>10 k $\Omega$
Enabled	<500 $\Omega$	<500 $\Omega$	<500 $\Omega$
Alarm Reset	>500 ms	>500 ms	>500 ms
<b>Output Specifications</b>			
Type of Contact	(1) Form C	(1) Form C	(1) Form C
Rated Insulation Voltage	250V AC	250V AC	250V AC
<b>Supply Specifications</b>			
Rated Operational Power			
AC	2.5VA	2.5VA	2.5VA
DC	1.5 W	1.5 W	1.5 W
<b>General Specifications</b>			
Alarm ON Delay	<150 ms	<150 ms	<150 ms
Reset Delay	<500 ms	<500 ms	<500 ms
<b>Environment</b>			
Degree of Protection	IP 20	IP 20	IP 20
Pollution Degree	3	3	3
Dimensions (W x H x D)	22.5 x 80 x 99.5 mm	22.5 x 80 x 99.5 mm	22.5 x 80 x 99.5 mm
Screw Terminals	Max. 0.5 N•m	Max. 0.5 N•m	Max. 0.5 N•m

## Standards Compliance and Certifications

Standards Compliance	Certifications
EN 60664, EN 60038	cULus Listed (File E14840, Guide NKCR, NKCR7)
UL 508	

# Function and Wiring Diagrams

## Bulletin 809S Wiring Diagram



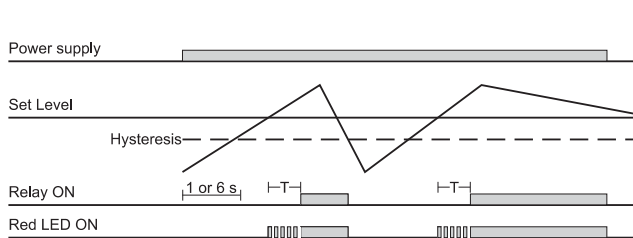
Terminals	Power Supply
A1, A2	24/48V AC/DC
	230V AC
A3, A2	115V AC

## Single-Phase Current Monitoring Relays

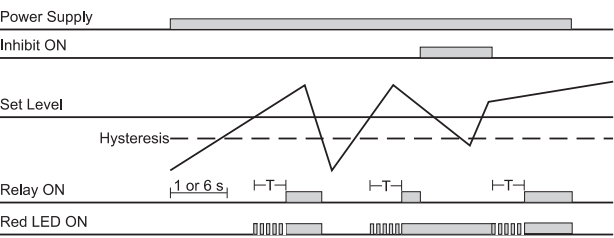
These devices are TRMS AC/DC over- or undercurrent monitoring relays. Through the built-in shunt, it is possible to monitor loads up to 10 A AC/DC by direct measuring or through a current transformer. When monitoring current through a current transformer and the latch function is disabled, the relay operates when the measured value exceeds (or drops below) the set level for more than the set delay time. It releases when the current drops below (or exceeds) the set level or when the power supply is interrupted. With the built-in latch function, the ON position of the relay output can be maintained. The inhibit function can be used to avoid relay operation when not desired. The LEDs indicate the state of the alarm and the output relay.

## Bulletin 809S Function Diagrams

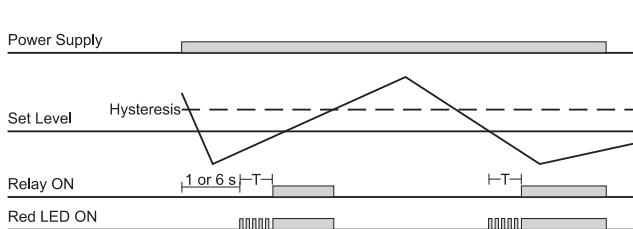
### Overcurrent - Normally De-energized relay



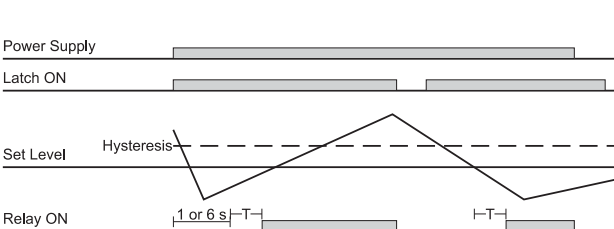
### Overcurrent - Inhibit function - Normally De-energized relay



### Undercurrent - Normally De-energized relay



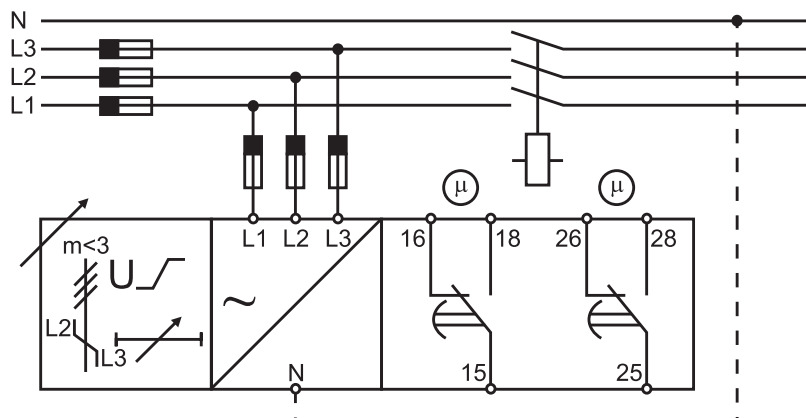
### Undercurrent - Latch function - Normally De-energized relay







## Bulletin 813S Wiring Diagram — Three-Phase

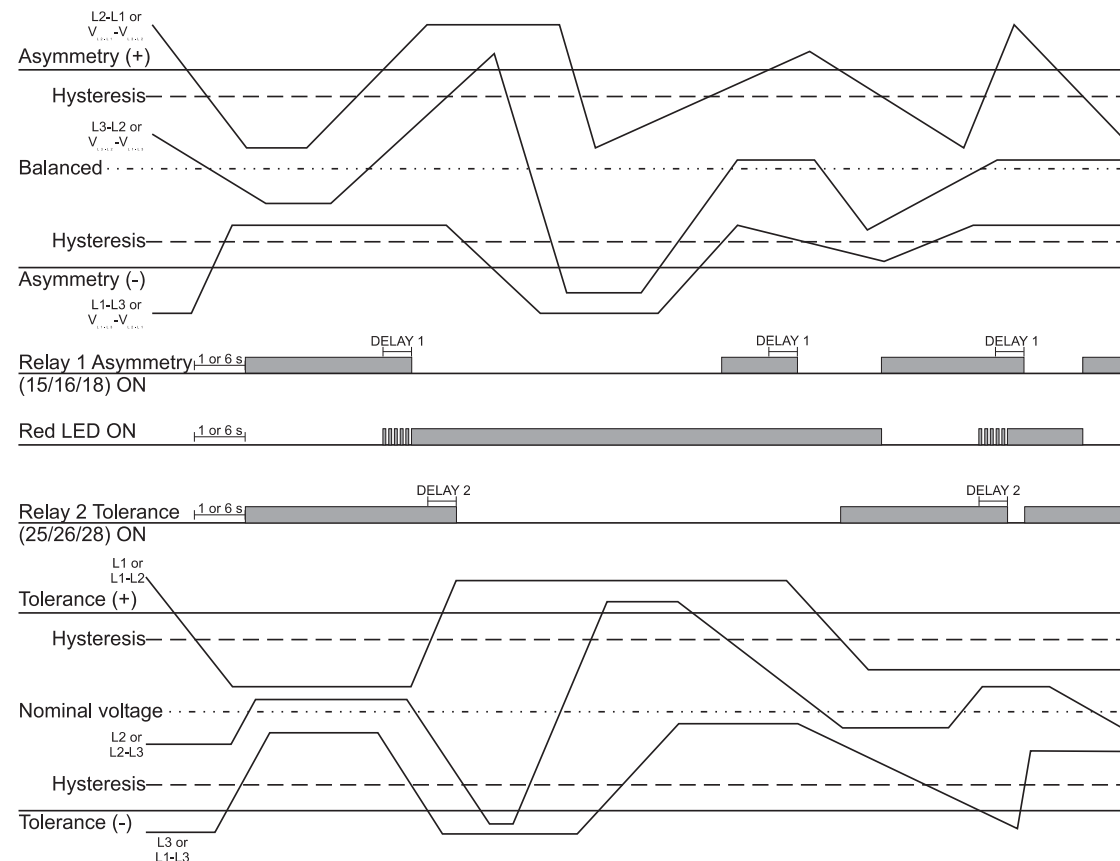


### Three-Phase Voltage Monitoring Relays

These self-powered devices are TRMS three-phase over- and undervoltage, phase sequence, phase loss, and asymmetry and tolerance monitoring relays. For voltage level monitoring, if one or more phase-phase or phase-neutral voltage exceeds the upper set level or drops below the lower set level, the red LED starts flashing and the respective output relay releases after the set time period. For asymmetry and tolerance monitoring, if one or more phase-phase or phase-neutral voltage exceeds the set levels, the red LED starts flashing and the respective output relay releases after the set time period. For both functions, if the phase sequence is wrong or one phase is lost, both output relays release immediately.

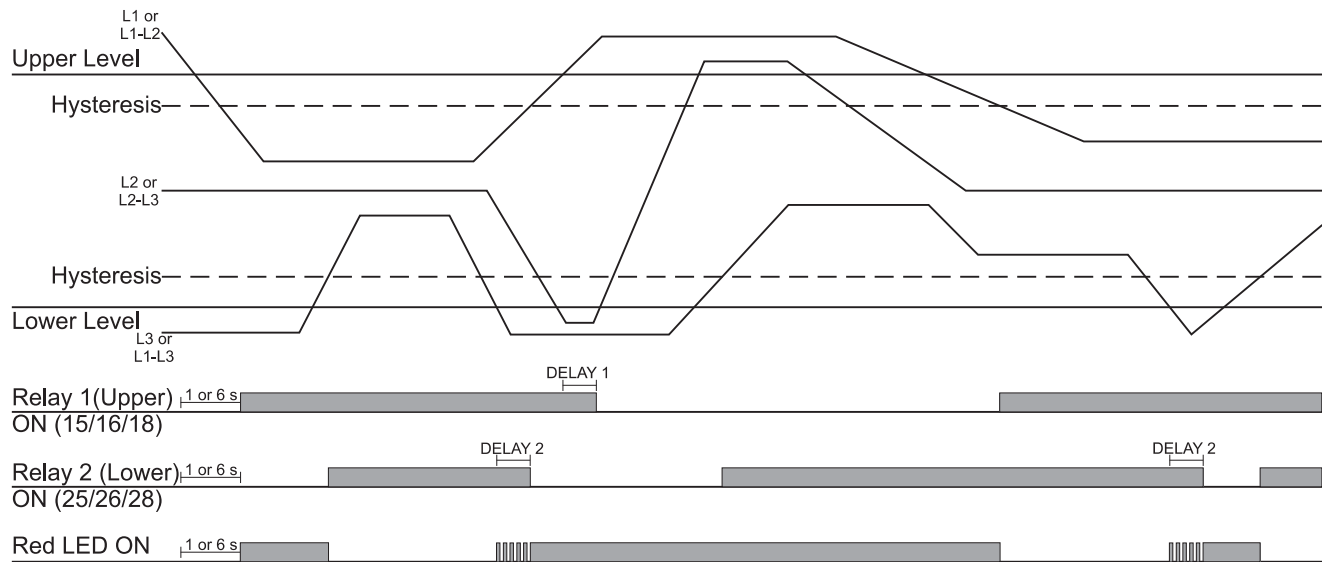
## Bulletin 813S Function Diagrams — Three-Phase

### Asymmetry and tolerance monitoring (2 x SPDT relays)

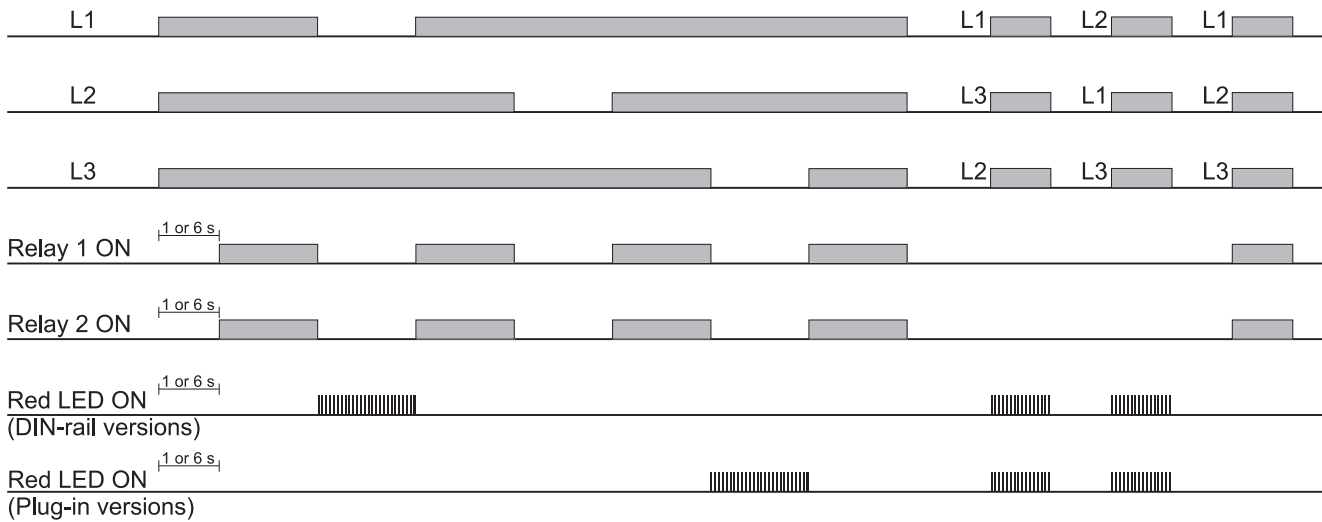


# Bulletin 813S Function Diagrams — Three-Phase, Continued

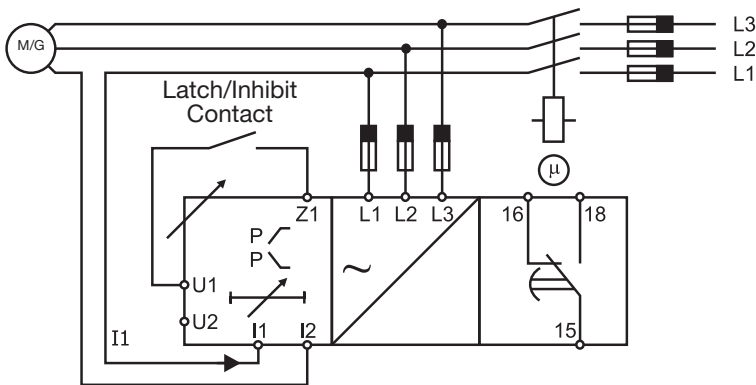
## Over and undervoltage monitoring (2 x SPDT relays)



## Phase sequence, total phase loss



## Bulletin 814S Wiring Diagram — Power (kW) Type

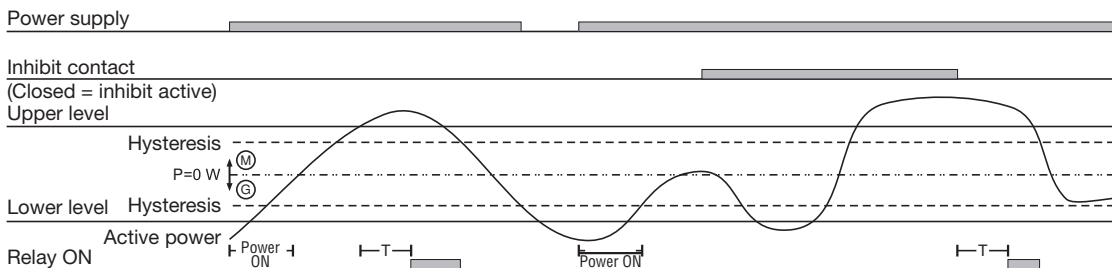


### Three-Phase Active Power (kW) Monitoring Relays

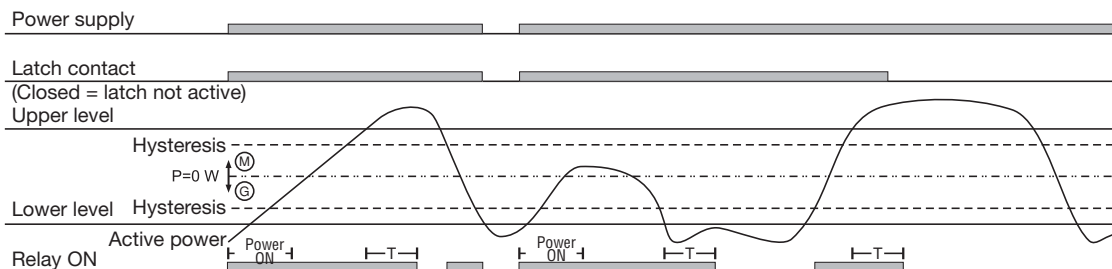
These self-powered devices are TRMS active power monitoring relays for three-phase balanced systems. They can be used for monitoring the actual load of asynchronous motors and other symmetrical loads, as well as to see if the power flows in the correct direction. The monitoring relay measures the active power of a three-phase balanced system. The relay has an adjustable power ON delay in order to avoid undesired overload detection during motor start. With the built-in latch function, the ON-position of the relay output can be maintained. The inhibit function can be used to avoid relay operation when not desired. The LEDs indicate the state of the alarm and the output relay.

## Bulletin 814S Function Diagrams — Power (kW) Type

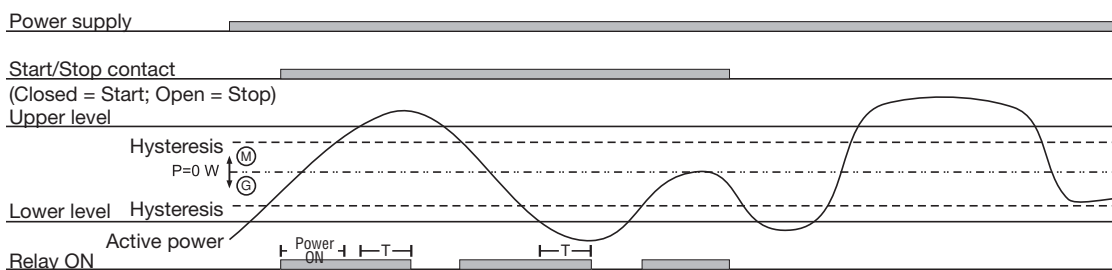
### Inhibit function - Normally De-energized relay



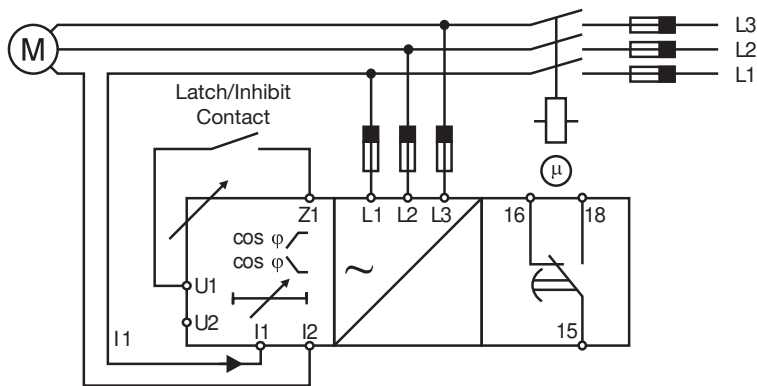
### Latch function - Normally Energized relay



### Start and stop function - Normally Energized relay



## Bulletin 814S Wiring Diagram — Power Factor Type

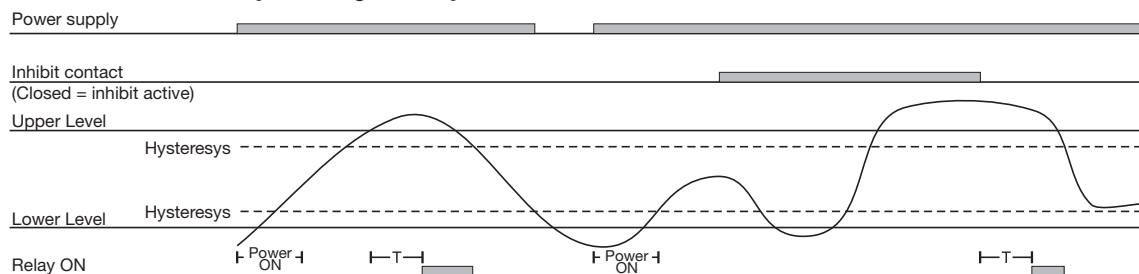


### Three-Phase Power Factor Monitoring Relays

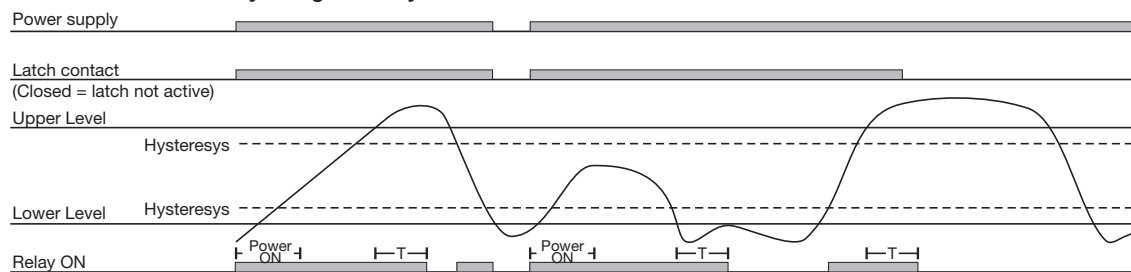
These self-powered devices are TRMS power factor monitoring relays for three-phase balanced systems. They can be used for monitoring the actual load of asynchronous motors and other symmetrical loads, where the power factor is almost proportional to the load. The relay measures the absolute value for the power factor of the system  $PF = \text{Active Power} / \text{Apparent Power}$  that is for balanced system with sinus waveforms the cosine of the angle between motor current and motor voltage ( $\cos \phi$ ). As  $\cos \phi$  varies with the load of the motor, underload and overload can be indirectly detected by the monitoring relay. With the built-in latch function, the ON-position of the relay output can be maintained. The inhibit function can be used to avoid relay operation when not desired. The LEDs indicate the state of the alarm and the output relay.

## Bulletin 814S Function Diagrams — Power Factor Type

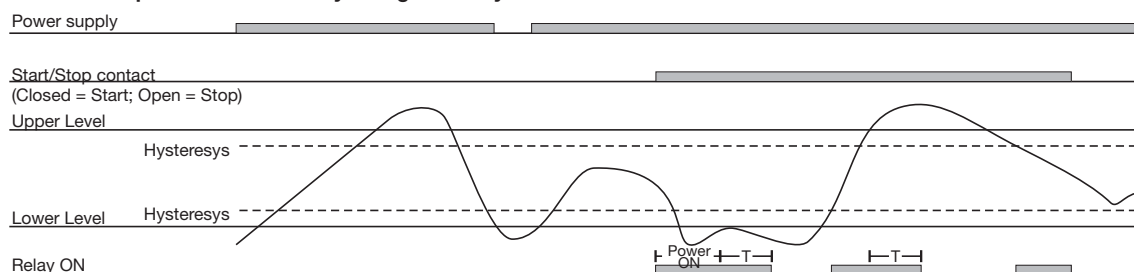
### Inhibit function - Normally De-energized relay



### Latch function - Normally Energized relay



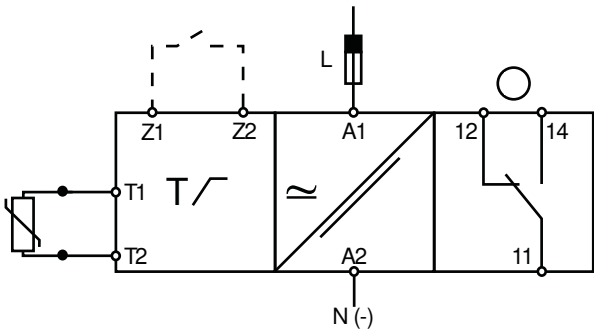
### Start and stop function - Normally Energized relay



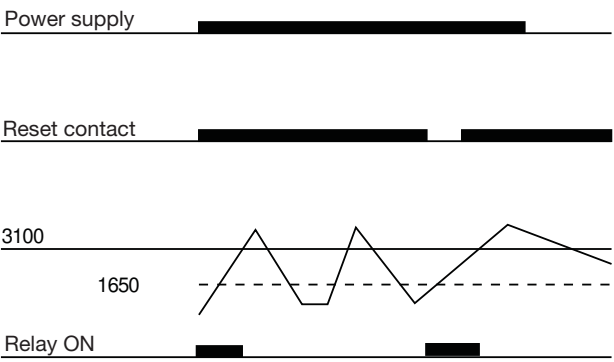
## Thermistor Monitoring Relays

These devices are motor temperature monitoring relays, used to monitor the temperature of the coils of a motor with built-in PTC's. The alarm status of the relay can be reset by either an external contact or an internal button. The test button allows the simulation of the fault condition. The LED's indicate the alarm status.

### Bulletin 817S Wiring Diagram



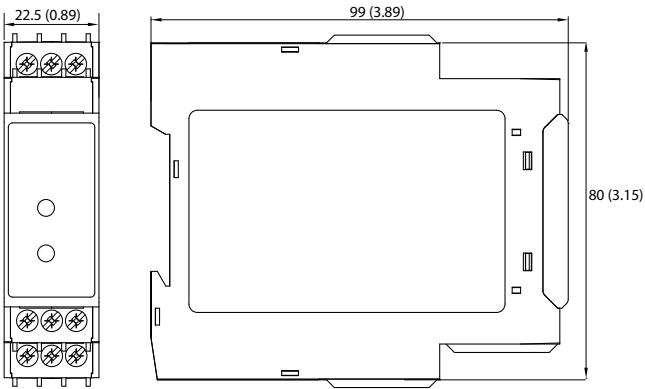
### Bulletin 817S Function Diagram



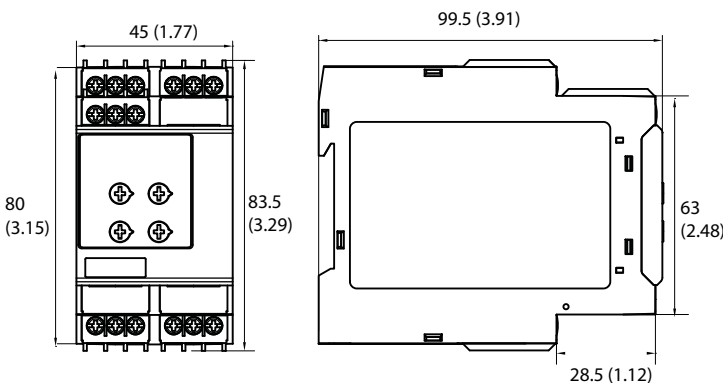
## Approximate Dimensions

Dimensions shown are in millimeters (inches) Dimensions are not intended for manufacturing purposes.

### Bulletin 809S, 813S Single-Phase Relays/Bulletin 817S Thermistor Relays



### Bulletin 813S, 814S Three-Phase Relays



# Bulletin 1409 Arcing Ground Fault Detection System

## Supplemental Motor Protection Devices Specifications



Arcing Ground Fault Relay  
Cat. No. 1409-DOB



Arcing Ground Fault Sensor  
Cat. No. 1409-N2

The Bulletin 1409 Arcing Ground Fault Detection Systems are intended for equipment protection only. **These systems are not Ground-Fault Circuit-Interrupters for personnel protection as defined in Article 100 of the U.S. National Electric Code.**

Bulletin 1409 is available in two designs, Class I and Class II. The Class I systems are intended for use with shunt-trip circuit breakers or medium voltage controllers. These Class I systems **do not** contain a high-current inhibit circuit.

The Class II Systems are designed for use with motor starters or contactors to interrupt low-level ground faults. They incorporate a high-current inhibit circuit that guards against the controller opening when the fault current exceeds the controller interrupting capacity. Ground fault currents exceeding the interrupting rating of the controllers are designed to be cleared by the short circuit protection device (fuse or circuit breaker).

Both Class I and Class II Systems consist of two parts — a relay and a sensor. The relay contains all the detection, adjustment and output circuitry. The sensor is a special two-winding current transformer. Operation of the ground fault detection system is indicated by the relay toggle.

## Specifications

<b>Response Time</b>	50 ms nominal plus the controller drop-out time
<b>Supply Voltage</b>	120V AC, 60 Hz
<b>Power Input</b>	3 VA
<b>Temperature Range</b>	The operating ambient temperature range for the sensor is $-40 \dots +85^{\circ}\text{C}$ ( $-40 \dots +184^{\circ}\text{F}$ ) and for the relay is $0 \dots +65^{\circ}\text{C}$ ( $32 \dots 149^{\circ}\text{F}$ )
<b>Output Contact Rating</b>	Make 30 A; Break 3 A; Continuous carrying current 5 A at 120V

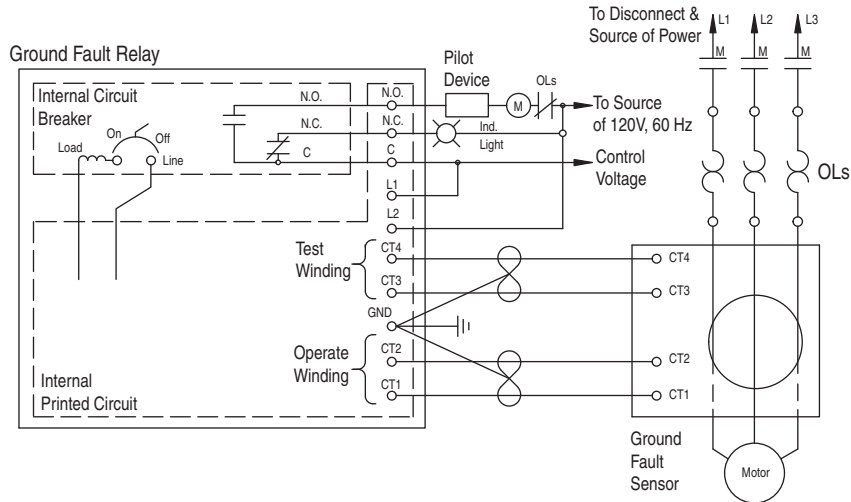
## Standards Compliance and Certifications

Standards Compliance	Certifications
CSA C22.2, No. 144	CSA Certified (LR49901)
UL 1053	UL Listed (File E53935, Guide KDAX)

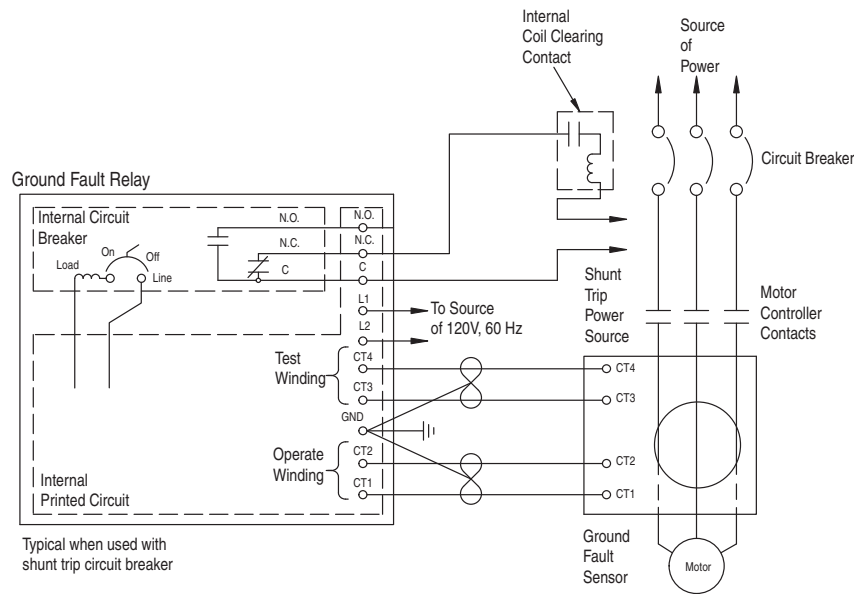
## Typical Wiring Diagrams

See Applicable Codes and Laws.

**Figure 1 - Class II with High Current Inhibit Circuit <sup>(1)</sup>**



**Figure 2 - Class II with High Current Inhibit Circuit <sup>(1)</sup>**



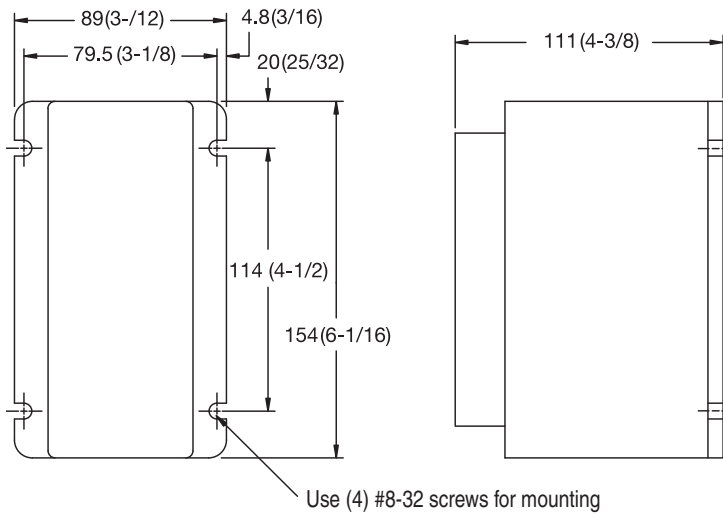
<sup>(1)</sup> Wiring diagrams are shown in the tripped condition.



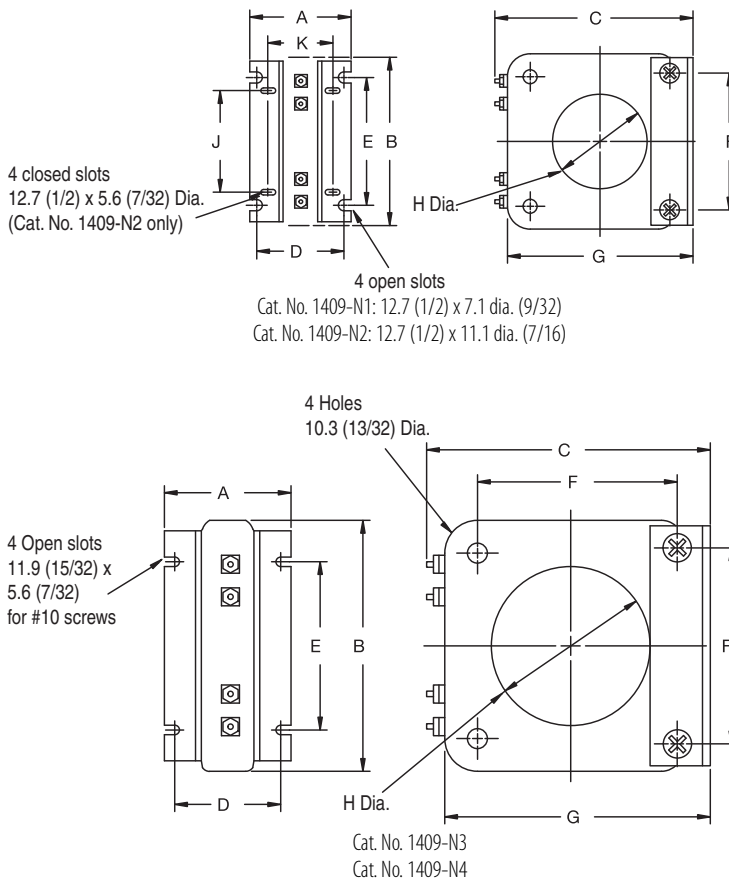
## Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

**Figure 3 - Arcing Ground Fault Relay**



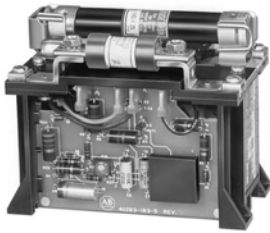
**Figure 4 - Arcing Ground Fault Sensors**



Cat. No.	A	B	C	D	E	F	G	H	J	K
1409-N1	92.6 (3-21/32)	88.9 (3-1/2)	104 (4-3/32)	74 (2-15/16)	67.3 (2-21/32)	56.4 (2-7/32)	92.9 (3-21/32)	39.6 (1-9/16)	—	—
1409-N2	91.4 (3-19/32)	115.8 (4-9/16)	131.8 (5-3/16)	77 (3-1/32)	88.9 (3-1/2)	88.9 (3-1/2)	120.6 (4-3/4)	63.5 (2-1/2)	69.8 (2-3/4)	54.9 (2-5/32)
1409-N3	73.2 (2-7/8)	144 (5-11/16)	157.2 (6-3/16)	54.9 (2-5/32)	96.8 (3-13/16)	119.4 (4-23/32)	146.1 (5-3/4)	82.6 (3-1/4)	—	—
1409-N4	77.2 (3-1/32)	169.9 (6-11/16)	182.6 (7-3/16)	59.5 (2-11/32)	123.7 (4-7/8)	138.2 (5-7/16)	171.5 (6-3/4)	108 (4-1/4)	—	—

# Bulletin 1410 Motor Winding Heater

## Supplemental Motor Protection Devices Specifications



Motor Winding Heater

Bulletin 1410 Motor Winding Heater is intended for use with 3-phase AC motors to guard against damage caused by condensation build-up on motor windings, which can occur in high-humidity environments during motor off times. **This device is not intended to be used to dry out damp motors.**

Bulletin 1410 Motor Winding Heater is designed for used with 3-phase AC squirrel-cage motors controlled by automatic full-voltage starters. For applications involving reduced-voltage starters, multi-speed starters, synchronous motors, or the used of power factor correction capacitors, consult your local Rockwell Automation sales office or Allen-Bradley distributor.

## Specifications

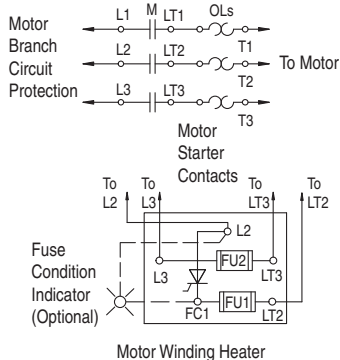
<b>Output Voltage Regulation</b>	Voltage applied to motor winding will vary $\pm 5\%$ maximum for line voltage variations of $+10\%$ , $-15\%$ .
<b>Ambient Temperature Range</b>	Operating, $0 \dots 50^\circ\text{C}$ ( $32 \dots 122^\circ\text{F}$ ) Storage, $-25 \dots +85^\circ\text{C}$ ( $-13 \dots +184^\circ\text{F}$ )
<b>Additional SCR Protection</b>	Metal oxide varistor protects against voltage surges. RC snubber circuit limits rate of change of circuit voltage.
<b>True RMS Output Current</b>	Approximately 15% of full load current.
<b>Power Delivered to the Motor</b>	Approximately 1...3 W/Hp.

## Standards Compliance and Certifications

Standards Compliance	Certifications
CSA C22.2, No. 144	CSA Certified (LR1234)
UL 508	UL Listed (File E56639, Guide NMTR)

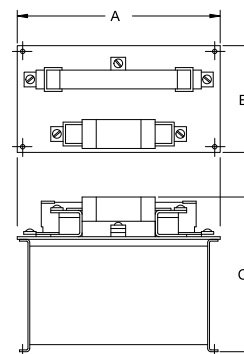
## Connection Diagram

See Applicable Codes and Laws.



## Approximate Dimensions

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



Cat. No.	A	B	C
1410-E0A47 1410-E0B50 1410-E0C50	146.1 (5-3/4)	88.9 (3-1/2)	114.3 (4-1/2)
1410-F0A50 1410-F0B54 1410-F0C54	204.8 (8-1/16)	108 (4-1/4)	177.8 (7)
1410-G0A54 1410-G0B59 1410-G0C59	238.1 (9-3/8)	146.1 (5-3/4)	206.4 (8-1/8)
1410-H0A57 1410-H0B62 1410-H0C62	279.4 (11)	244.5 (9-5/8)	207.2 (8-5/32)



# Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

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