

## Area Protection Panel (APP)



## Installation / Operation / Maintenance Manual 12 Point or 24 Point Monitoring Systems

## WARNING!

WHEN WORKING ON EQUIPMENT OF THIS TYPE, EXTREME DANGER OF ELECTROCUTION EXISTS THAT MAY RESULT IN INJURY OR DEATH. DO NOT ATTEMPT ANY REPAIRS OR ADJUSTMENTS TO THIS EQUIPMENT WITHOUT FIRST TAKING THE APPROPRIATE PRECAUTIONS TO PREVENT PERSONAL INJURY AND EQUIPMENT DAMAGE.

DURING INSTALLATION AND USE OF THIS PRODUCT, COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), FEDERAL, STATE AND LOCAL CODES, AND ALL OTHER APPLICABLE SAFETY CODES.

MAIN UTILITY POWER MUST BE OFF DURING INSTALLATION, WHEN PERFORMING EQUIPMENT MAINTENANCE OUTSIDE THE EQUIPMENTS NORMAL MAINTENANCE SCOPE AND WHEN PERFORMING REQUIRED MAINTENANCE ON ANY POWER CABLE(S) CONNECTED TO THE EQUIPMENT.

## WARRANTY

Lake Shore Electric Area Protection Panels are guaranteed against defective materials and workmanship for a period of one year from date of shipment. If, within one year after shipment, it is proved to Lake Shore's satisfaction that the equipment requires valid warranty and Lake Shore is promptly notified of same, Lake Shore will make necessary corrections, free of charge. F.O.B. works where manufactured.

Such necessary corrections constitute the full extent of Lake Shore's warranty. There are no warranties, which extend beyond those described herein. This warranty is exclusive and is in lieu of all other warranties, whether written, oral, implied or statutory. No warranty of merchantability or of fitness for purpose shall apply.

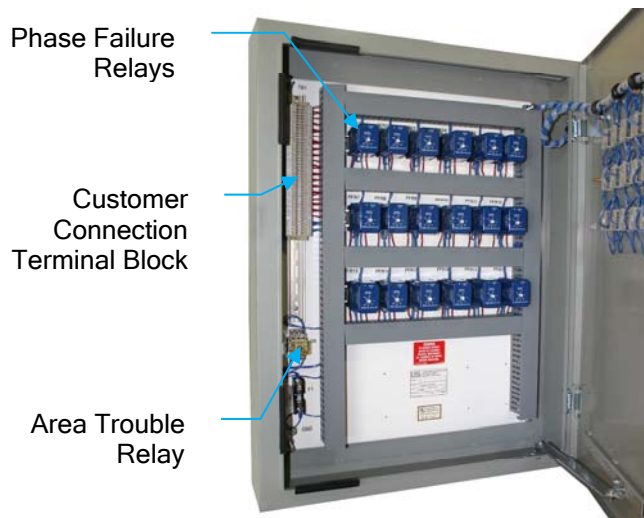
Lake Shore is not responsible for damage to its equipment through improper installation or use, unauthorized repair or modifications, or attempts to operate it above its rated capacities or in abnormal environments. In no event, whether as a failure to meet conditions of the warranty or otherwise, shall Lake Shore be liable for any special, incidental, or consequential damages, including, but not limited to, loss of profit or revenues, loss of good will, damages to associated equipment, cost of capital, cost of substitute products, facilities, service or replacement power, costs of downtime or claims of third parties for such damages.

**Notice:** The owner of this area protection panel must perform periodic maintenance as described in this manual in order to maintain Lake Shore Electric Corporation's one year exclusive warranty. Failure to perform this maintenance shall void this warranty.

### NOTE

Engineering changes may have been made after publication date. Any departure from this manual should be checked with Lake Shore Electric Corporation.

Lake Shore Electric Corporation reserves the right to change specifications without prior notice.



### APP OVERVIEW / OPERATION

Area Protection Panels (APP) are designed to monitor multiple points in an electrical system for normal source voltages.

Every APP comes with an output contact which changes state in the event of one, or more, areas being out of their correct voltage ranges. Each area is monitored with its' own Phase Failure Relay (PFR) to ensure it is within the proper voltage operating range.

When a failure of any single area occurs, the APP's output contact will change state to give the appropriate equipment a signal to activate, (i.e.: audible alarm or a remote visual indicator for trouble in an area, or areas).

As normal power returns, the APP's output contact changes back to its normal state to signal the appropriate equipment to deactivate.

Additionally, this equipment comes with local trouble indication.

- The first type is a "Common Failure Light", which lights when any area is in a trouble state.
- The second type is "Area Failure Lights", which will only turn on when their specific area is in a trouble state.

If additional assistance is required, please call Lake Shore Electric at 1.800.225.0141 or locally at 440.232.0200.

### APP INSTALLATION & MAINTENANCE

**IMPORTANT!** When the APP system is first installed, please insure that all power is OFF!

#### Enclosure Installation Instructions

The cabinet must be mounted level to allow for proper drainage through the integral weep holes located in the bottom of the unit.

The conduit entries must be sealed to prevent moisture from building up inside the enclosure.

#### Wiring Instructions

The wiring schematic and general layout provide the specific installation instructions needed to install the unit purchased, see pages 4 & 5 for typical, 3 $\phi$ , wiring examples. [Please note that if this is a 1 $\phi$  unit,  $\phi$ B is not wired; see pages 6 & 7.]

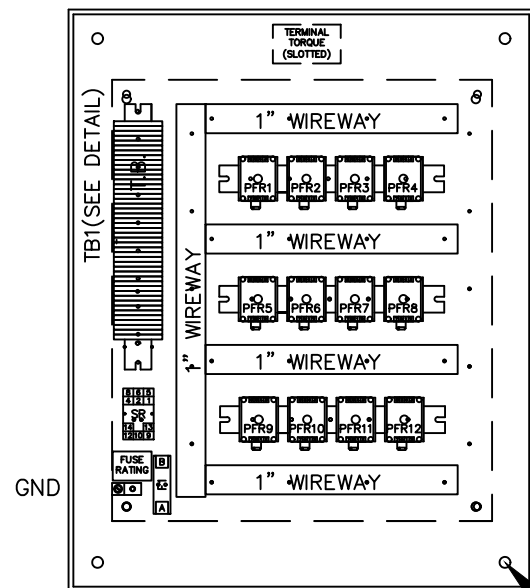
On the Customer Terminal Block Strip:

1. Connect the 12Vdc or 24Vdc battery input to terminals B+ and B-.
2. Connect  $\phi$ A,  $\phi$ B, &  $\phi$ C for each monitoring point requested. [NOTE!: Please pay particular attention to the Phase Failure Relays Control Voltage inputs labeled on the schematic drawing; these are phase sequence sensitive.]
3. Connect the Trouble Relay Contact to the required equipment. (i.e: Generator, Remote Annunciator or Controls, etc.)

#### Maintenance

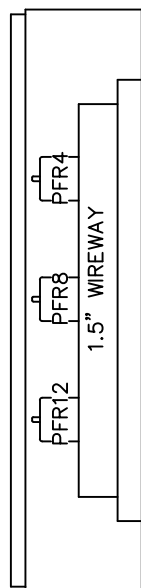
Periodic maintenance is required to insure proper operation; recommended once a year. Inspect the interior of the enclosure to ensure there is no corrosion or mineral buildup on any of the controls. Visually inspect the wires going to all components to ensure none of them have come loose or disconnected from their terminals. If the equipment is installed in an area with vibration, re-tighten all terminal connections with the appropriate tools. If any parts are malfunctioning, please see the component information attached to this document.



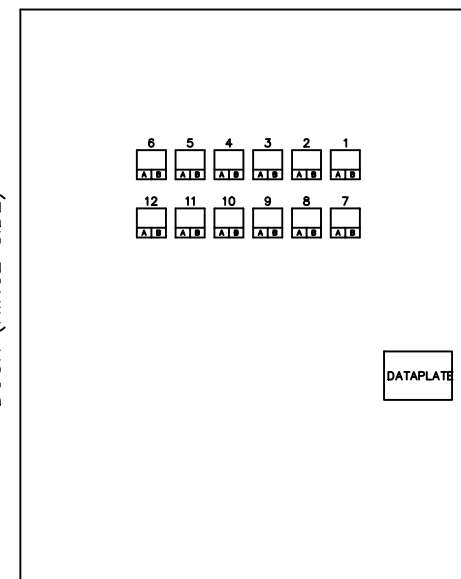


FRONT VIEW

.5625" DIA. MTG. HOLES 4-REQ.



SIDE VIEW



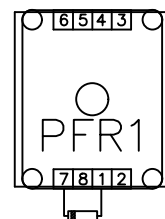
DOOR (REAR VIEW)

TB1 DETAIL

øA1
øB1
øC1
øA2
øB2
øC2
øA3
øB3
øC3
øA4
øB4
øC4
øA5
øB5
øC5
øA6
øB6
øC6
øA7
øB7
øC7
øA8
øB8
øC8
øA9
øB9
øC9
øA10
øB10
øC10

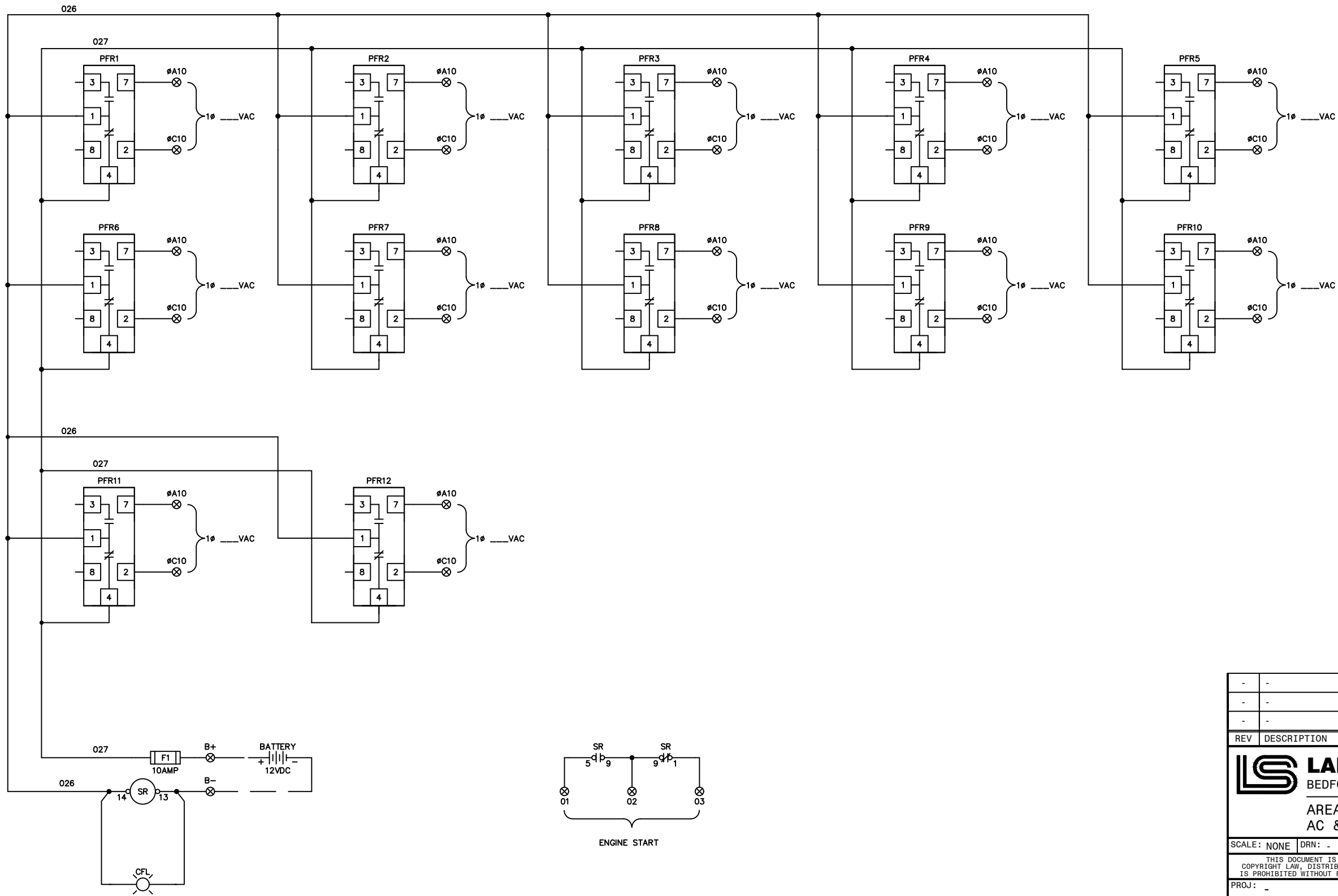
  

øA11
øB11
øC11
øA12
øB12
øC12
B+
B-
01
02
03




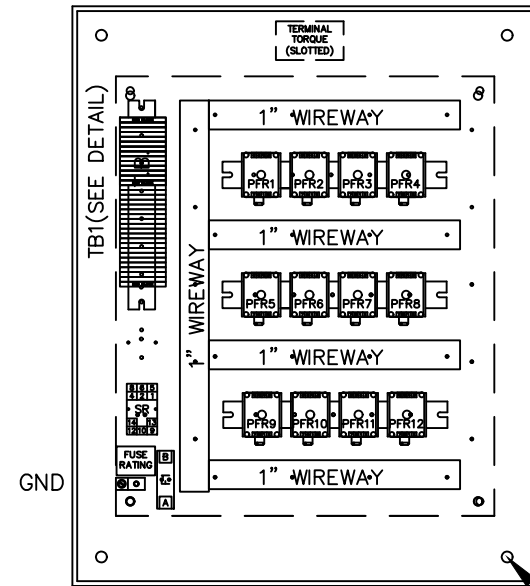
DETAIL OF VOLTAGE SENSING RELAY WITH DIODE MOUNTED ON SOCKET

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
REV	DESCRIPTION	BY	APV	DATE
<b>LAKE SHORE ELECTRIC Corp</b> BEDFORD, OHIO U.S.A. AREA PROTECTION PANEL AP12_3 PART LAYOUT				
SCALE: NONE	DRN: - -	CHK: - -	APV: - -	
THIS DOCUMENT IS THE PROPERTY OF Lake Shore Electric Corporation. UNDER COPYRIGHT LAW, DISTRIBUTION AND REPRODUCTION OF THIS DOCUMENT, IN WHOLE OR IN PART, IS PROHIBITED WITHOUT PRIOR WRITTEN PERMISSION FROM Lake Shore Electric Corporation.				
PROJ: -				
CUSTOMER: -		DWG NUMBER		-
-		XX2-XXXX-04		-
-		QUOTE/JOB#:	PG	OF
		-	1	1

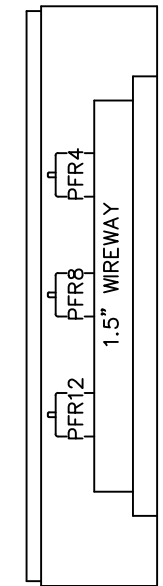


NOTE: DC CIRCUITS: USE BLUE WIRE  
AC CIRCUITS: USE RED WIRE

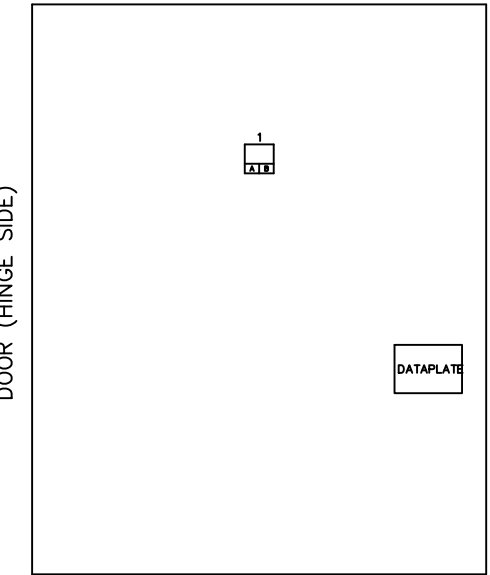
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
REV	DESCRIPTION	BY	APV	DATE
 <b>LAKE SHORE ELECTRIC Corp</b> BEDFORD, OHIO U.S.A.				
<b>AREA PROTECTION PANEL - AP12_1</b> <b>AC &amp; DC SCHEMATIC</b>				
SCALE: NONE	DRN: - -	CHK: - -	APV: - -	
<small>THIS DOCUMENT IS THE PROPERTY OF Lake Shore Electric Corporation. UNDER COPYRIGHT LAW, DISTRIBUTION AND REPRODUCTION OF THIS DOCUMENT, IN WHOLE OR IN PART, IS PROHIBITED WITHOUT PRIOR WRITTEN PERMISSION FROM Lake Shore Electric Corporation.</small>				
PROJ: -				
CUSTOMER: -		DWG NUMBER		-
-		<b>XX2-XXXX-03</b>		-
-		QUOTE/JOB#: -	PG 1	OF 1



FRONT VIEW



SIDE VIEW



DOOR (REAR VIEW)

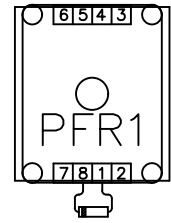
OUTLINE NOTES

- 1) GENERAL ENCLOSURE CONSTRUCTION:
  - A) WALL-MOUNTED
  - B) 14 GA. SHEET METAL
  - C) 1 HINGED FRONT DOOR
  - D) MOUNTING DIMENSIONS ARE ± .0625", ALL OTHER DIMENSIONS ARE APPROXIMATE
  - E) LOUVERS (OPTIONAL-NEMA 1 ONLY)
- 2) NEMA 1 ENCLOSURE:
  - A) KEYLOCKABLE HANDLE (PADLOCKABLE HANDLE OPTIONAL)
- 3) ENCLOSURE FINISH:
  - A) PRIMED & PAINTED ANSI-61 LIGHT GRAY (OTHER COLORS OPTIONAL)

.5625"DIA. MTG. HOLES 4-REQ.

TB1 DETAIL

øA1	øC1	øA2	øC2	øA3	øC3	øA4	øC4	øA5	øC5	øA6	øC6	øA7	øC7	øA8	øC8	øA9	øC9	øA10	øC10	øA11	øC11	øA12	øC12	B+	B-	01	02	03
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	------	----	----	----	----	----



DETAIL OF VOLTAGE SENSING RELAY WITH DIODE MOUNTED ON SOCKET

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
REV	DESCRIPTION	BY	APV	DATE
<b>LAKE SHORE ELECTRIC Corp</b> BEDFORD, OHIO U.S.A. AREA PROTECTION PANEL AP12__1__ PART LAYOUT				
SCALE: NONE	DRN: - -	CHK: - -	APV: - -	
<small>THIS DOCUMENT IS THE PROPERTY OF Lake Shore Electric Corporation. UNDER COPYRIGHT LAW, DISTRIBUTION AND REPRODUCTION OF THIS DOCUMENT, IN WHOLE OR IN PART, IS PROHIBITED WITHOUT PRIOR WRITTEN PERMISSION FROM Lake Shore Electric Corporation.</small>				
PROJ:	-			
CUSTOMER:	-	DWG NUMBER	XX2-XXXX-04	-
	-	QUOTE/JOB#:	PG 1 OF 1	



# Three Phase Voltage Relay

# TVM

## Specifications

### Electrical

**Line Voltage:** 100VAC to 600VAC, 3Ø

**Frequency:** 50/60Hz

### Line Voltage Ranges:

100 Series - 100 to 130VAC, 3Ø

200 Series - 200 to 250VAC, 3Ø

300 Series - 350 to 420VAC, 3Ø

400 Series - 410 to 490VAC, 3Ø

600 Series - 520 to 600VAC, 3Ø

### Over/Under Voltage:

±10, 13, or 16% of Nominal Voltage

**Phase Rotation:** A - B - C

**Pick-up & Drop-out Delays:**

0.5 sec. fixed

**Power Consumption:** 1.5VA

### Output Rating @ 25°C:

10 Amps @ 250VAC

1/2 HP @ 250VAC

1/3 HP @ 125VAC

10 Amps @ 30VDC

### Physical

**Mounting:** Plug-In

**Termination:** 8 Pin (Octal)

(For 300, 400 and 600 series use OT-08)

**Packaging:** Dust Cover

**Weight:** 4.5 Oz. Approx.

### Ambient Temperatures

**Operating:** 0°C to 40°C

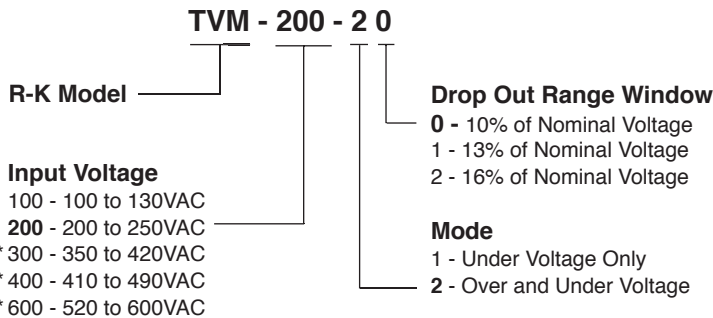
**Storage:** -40°C to 85°C



- Plug-In Package
- Over & Under Voltage
- Phase Loss
- Phase Rotation
- Pick-Up & Drop-Out Delays
- 10Amp Contacts
- Status LED



## Ordering Information

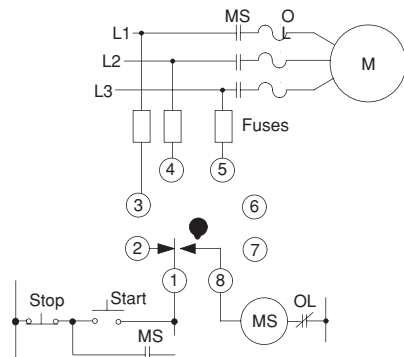


\* For 300, 400 and 600 series use 600V OT-08 socket.

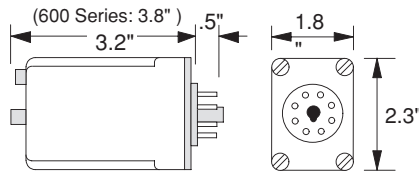
## Connections

The TVM should be connected to the line voltage on the load side of the last line fuse before the motor and on the line side of the starter (MS).

- M = Motor
- MS = Motor Starter
- OL = Overloads
- Fuses = ≤1 amp (optional)



## Dimensions

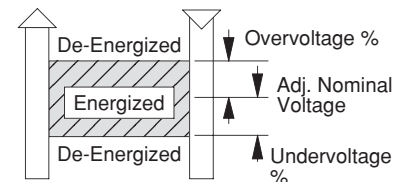


## Operation

The TVM's output contacts energize when:

1. All phases are present;
2. The voltages are within the adjustable range;
3. The phases are in proper rotation.

If any of these conditions are not satisfied, or if the voltage shifts beyond the over/undervoltage percentage around the nominal, the output relay will drop out after the drop out time delay. The LED lights when conditions are normal and the output relay is energized.





**RH Series — General Purpose Midget Relays**

Key features of the RH series include:

- Compact midget size saves space
- High switching capacity (10A)
- Choice of blade or PCB style terminals
- Relay options include indicator light, check button, and top mounting bracket
- DIN rail, surface, panel, and PCB type sockets available for a wide range of mounting applications



<b>Specifications</b>	<b>Contact Material</b>	Silver cadmium oxide
	<b>Contact Resistance</b>	50mΩ maximum (initial value)
	<b>Minimum Applicable Load</b>	24V DC/30mA, 5V DC/100mA (reference value)
	<b>Operating Time</b>	SPDT (RH1), DPDT (RH2): 20ms maximum 3PDT (RH3), 4PDT (RH4): 25ms maximum
	<b>Release Time</b>	SPDT (RH1), DPDT (RH2): 20ms maximum 3PDT (RH3), 4PDT (RH4): 25ms maximum
	<b>Maximum Continuous Applied Voltage (AC/DC) at 20°C</b>	110% of the rated voltage
	<b>Minimum Operating Voltage (AC/DC) at 20°C</b>	80% of the rated voltage
	<b>Drop-Out Voltage (AC)</b>	30% or more of the rated voltage
	<b>Drop-Out Voltage (DC)</b>	10% or more of the rated voltage
	<b>Power Consumption</b>	<b>SPDT (RH1):</b> DC: 0.8W AC: 1.1VA (50Hz), 1VA (60Hz) <b>DPDT (RH2):</b> DC: 0.9W AC: 1.4VA (50Hz), 1.2VA (60Hz) <b>3PDT (RH3):</b> DC: 1.5W AC: 2VA (50Hz), 1.7VA (60Hz) <b>4PDT (RH4):</b> DC: 1.5W AC: 2.5VA (50Hz), 2VA (60Hz)
	<b>Insulation Resistance</b>	100MΩ min (measured with a 500V DC megger)
	<b>Dielectric Strength</b>	<b>SPDT (RH1)</b> Between live and dead parts: 2,000V AC, 1 minute; Between contact circuit and operating coil: 2,000V AC, 1 minute; Between contacts of the same pole: 1,000V AC, 1 minute <b>DPDT (RH2), 3PDT (RH3), 4PDT (RH4)</b> Between live and dead parts: 2,000V AC, 1 minute; Between contact circuit and operating coil: 2,000V AC, 1 minute; Between contact circuits: 2,000V AC, 1 minute; Between contacts of the same pole: 1,000V AC, 1 minute
	<b>Frequency Response</b>	1,800 operations/hour
	<b>Temperature Rise</b>	Coil: 85°C maximum Contact: 65°C maximum
	<b>Vibration Resistance</b>	0 to 6G (55Hz maximum)
	<b>Shock Resistance</b>	SPDT/DPDT: 200N (approximately 20G) 3PDT/4PDT: 100N (approximately 10G)
<b>Life Expectancy</b>	Electrical: over 500,000 operations at 120V AC, 10A; (over 200,000 operations at 120V AC, 10A for SPDT [RH1], 3PDT [RH3], 4PDT [RH4]) Mechanical: 50,000,000 operations	
<b>Operating Temperature</b>	-30 to +70°C	
<b>Weight</b>	SPDT: 24g, DPDT: 37g (approximately) 3PDT: 50g, 4PDT: 74g (approximately)	



UL Recognized  
Files No. RH1 = E66043  
RH2 = E66043  
RH3 = E66043  
RH4 = E55996



CSA Certified  
File No. LR35144



File No. B020813332452



**Ordering Information**

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

**Basic Part No.**

RH2B-U

**Coil Voltage:**

AC110-120V

**E**  
Relays

Part Numbers

Part Numbers: RH Series with Options

Termination	Contact Configuration	Basic Part No.	Indicator Light	Check Button	Indicator Light and Check Button	Top Bracket
B (blade)	SPDT	RH1B-U	RH1B-UL	RH1B-UC	RH1B-ULC	RH1B-UT
	DPDT	RH2B-U	RH2B-UL	RH2B-UC	RH2B-ULC	RH2B-UT
	3PDT	RH3B-U	RH3B-UL	RH3B-UC	RH3B-ULC	RH3B-UT
	4PDT	RH4B-U	RH4B-UL	RH4B-UC	RH4B-ULC	RH4B-UT
V2 (PCB 0.078" [2mm] wide)	SPDT	RH1V2-U	RH1V2-UL	RH1V2-UC	RH1V2-ULC	—
	DPDT	RH2V2-U	RH2V2-UL	RH2V2-UC	RH2V2-ULC	—
	3PDT	RH3V2-U	RH3V2-UL	RH3V2-UC	RH3V2-ULC	—
	4PDT	RH4V2-U	RH4V2-UL	RH4V2-UC	RH4V2-ULC	—

Ratings

Coil Ratings

Rated Voltage	Rated Current ±15% at 20°C								Coil Resistance ±15% at 20°C				
	60Hz				50Hz				SPDT	DPDT	3PDT	4PDT	
	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT					
AC	6V	150mA	200mA	280mA	330mA	170mA	238mA	330mA	387mA	18.8Ω	9.4Ω	6.0Ω	5.4Ω
	12V	75mA	100mA	140mA	165mA	86mA	118mA	165mA	196mA	76.8Ω	39.3Ω	25.3Ω	21.2Ω
	24V	37mA	50mA	70mA	83mA	42mA	59.7mA	81mA	98mA	300Ω	153Ω	103Ω	84.5Ω
	120V*	7.5mA	11mA	14.2mA	16.5mA	8.6mA	12.9mA	16.4mA	19.5mA	7,680Ω	4,170Ω	2,770Ω	2,220Ω
	240V†	3.2mA	5.5mA	7.1mA	8.3mA	3.7mA	6.5mA	8.2mA	9.8mA	3,1200Ω	15,210Ω	12,100Ω	9,120Ω
		SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT
DC	6V		128mA		150mA		240mA		250mA	47Ω	40Ω	25Ω	24Ω
	12V		64mA		75mA		120mA		125mA	188Ω	160Ω	100Ω	96Ω
	24V		32mA		36.9mA		60mA		62mA	750Ω	650Ω	400Ω	388Ω
	48V		18mA		18.5mA		30mA		31mA	2,660Ω	2,600Ω	1,600Ω	1,550Ω
	110V‡		8mA		9.1mA		12.8mA		15mA	13,800Ω	12,100Ω	8,600Ω	7,340Ω

\* For RH2 relays = 110/120V AC.

† For RH2 relays = 220/240V AC.

‡ For RH2 relays = 100/110V DC.

Rated Voltage	Coil Inrush				Coil Inductance								
	SPDT	DPDT	3PDT	4PDT	Energizing				De-Energizing				
					SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	
AC	6V	250mA	340mA	520mA	620mA	0.09H	0.08H	0.05H	0.05H	0.06H	0.04H	0.03H	0.02H
	12V	120mA	170mA	260mA	310mA	0.037H	0.30H	0.22H	0.18H	0.22H	0.16H	0.12H	0.10H
	24V	56mA	85mA	130mA	165mA	1.5H	1.2H	0.9H	0.73H	0.9H	0.63H	0.5H	0.36H
	120V*	12mA	16mA	26mA	33mA	37H	33H	21H	18H	22H	15H	12H	9H
	240V†	7mA	8mA	12mA	16mA	130H	130H	84H	73H	77H	62H	47H	36H
		SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT	SPDT	DPDT	3PDT	4PDT
DC	6V												
	12V												
	24V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	48V												
	110V												

\* For RH2 relays = 110/120V AC.

† For RH2 relays = 220/240V AC.

**Ratings con't**

**Contact Ratings**

# of Poles	Max Contact Power		General Ratings		
	Resistive	Inductive	Voltage	Resistive	Inductive*
RH1	AC1540VA DC300W	AC990VA DC210W	AC110	10A	7A
			AC220	7A	4.5A
			DC30	10A	7A
RH2 RH3 RH4	AC1650VA DC300W	AC1100VA DC225W	AC110	10A	7.5A
			AC220	7.5A	5A
			DC30	10A	7.5A



\* $\cos\phi = 0.3$   
L/R - 7ms

**UL Ratings**

Voltage	Resistive			General Use			Horse Power Rating	
	RH1, RH2	RH3	RH4	RH1, RH2	RH3	RH4	RH1, RH2 RH3	
AC240V	10A	7.5A	7.5A	7A	6.5A	5A	1/3HP	
AC120V	10A	10A	10A	7A	7.5A	7.5A	1/6HP	
DC30V	10A	10A	—	7A	—	—	—	—
DC28V	10A	10A	10A	7A	—	—	—	—

**TÜV Ratings**

Voltage	RH1	RH2	RH3	RH4
AC240V	10A	10A	7.5A	7.5A
DC30V	10A	10A	10A	10A

**CSA Ratings**

Voltage	Resistive				General Use				HP Rating
	RH1	RH2	RH3	RH4	RH1	RH2	RH3	RH4	RH1, 2, 3
AC240V	10A	10A	—	7.5A	7A	7A	7A	5A	1/3HP
AC120V	10A	10A	10A	10A	7.5A	7.5A	—	7.5A	1/6HP
DC30V	10A	10A	10A	10A	7A	7.5A	—	—	—

**Applicable Sockets**

**Part Numbers: Sockets**

Relay	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Surface Mount	Panel Mount	PCB Mount
<b>RH1B</b>	SH1B-05	SH1B-05C	—	SH1B-51	SH1B-62
<b>RH2B</b>	SH2B-05	SH2B-05C	SH2B-02	SH2B-51	SH2B-62
<b>RH3B</b>	SH3B-05	SH3B-05C	—	SH3B-51	SH3B-62
<b>RH4B</b>	SH4B-05	SH4B-05C	—	SH4B-51	SH4B-62

Spring & Clips (optional)	
Part Number	Use With
SY2S-02F1 <sup>③</sup> SFA-101 <sup>①</sup> SFA-202 <sup>②</sup>	SH1B-05, 05C
SY4S-51F1 <sup>③</sup> SFA-301 <sup>①</sup> SFA-302 <sup>②</sup>	SH1B-51, 62
SY4S-02F1 <sup>③</sup> SFA-101 <sup>①</sup> SFA-202 <sup>②</sup>	SH2B-05, 05C
SY4S-51F1 <sup>③</sup> SFA-301 <sup>①</sup> SFA-302 <sup>②</sup>	SH2B-51, 62
SH3B-05F1 <sup>③</sup> SFA-101 <sup>①</sup> , -202 <sup>②</sup>	SH3B-05, 05C
SY4S-51F1 <sup>③</sup> SFA-301 <sup>①</sup> SFA-302 <sup>②</sup>	SH3B-51, 62
SH4B-02F1 <sup>③</sup> SFA-101 <sup>①</sup> , -202 <sup>②</sup>	SH4B-05, 05C
SY4S-51F1 <sup>③</sup> SFA-301 <sup>①</sup> SFA-302 <sup>②</sup>	SH4B-51, 62



See Section F for details on sockets. All DIN rail mount sockets shown above can be mounted using DIN rail BNDN1000.



- ① Top latch
- ② Side latch
- ③ Pullover spring

Internal Circuits

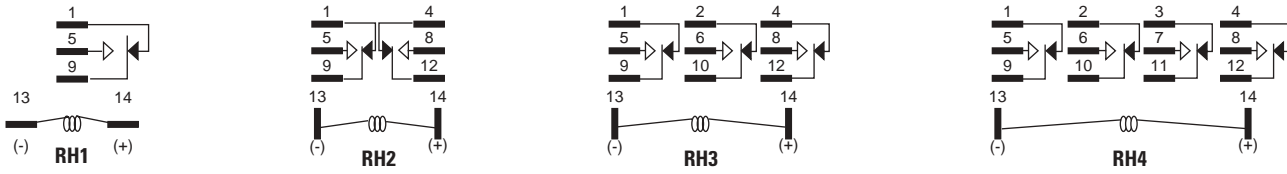
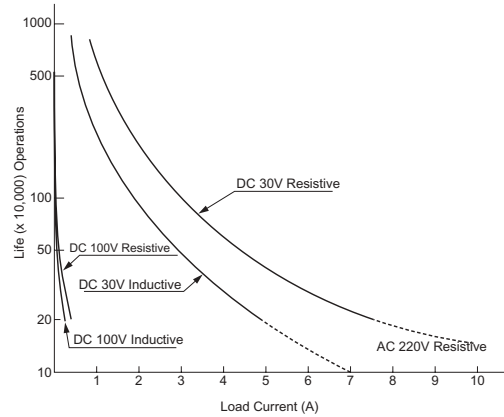
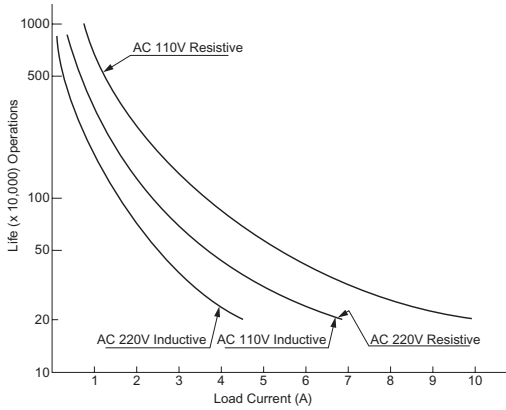


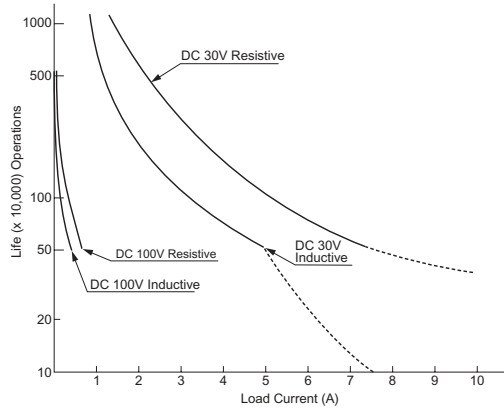
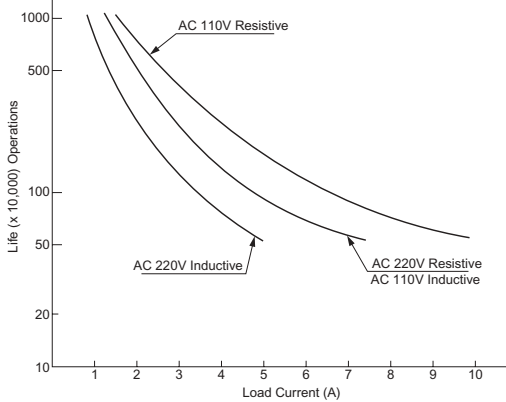
Image as viewed from bottom of relay. Refer to socket for exact wiring layout (Section F).

Electrical Life Curves

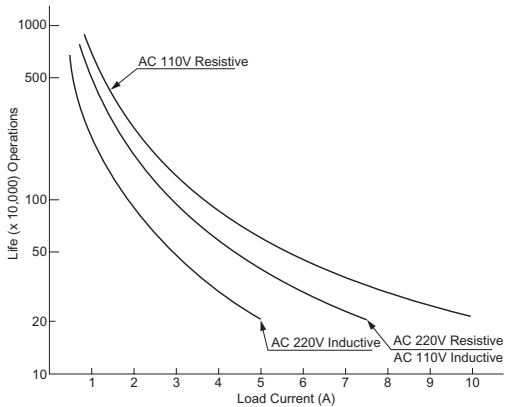
RH1



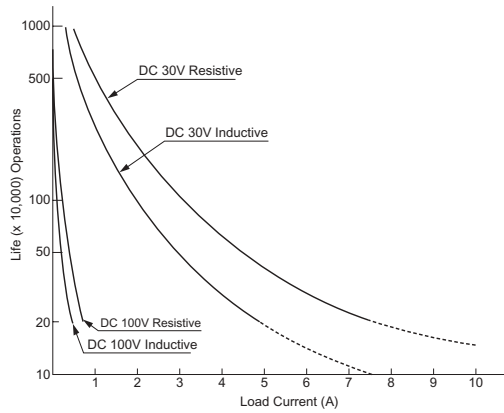
RH2



RH3



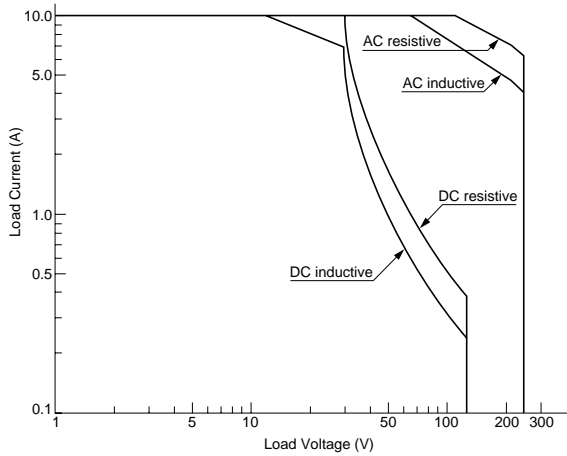
RH4



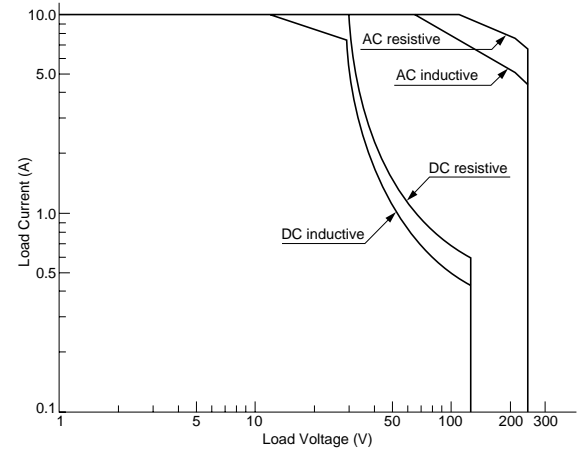
Relays

**Maximum Switching Capacity**

**RH1**

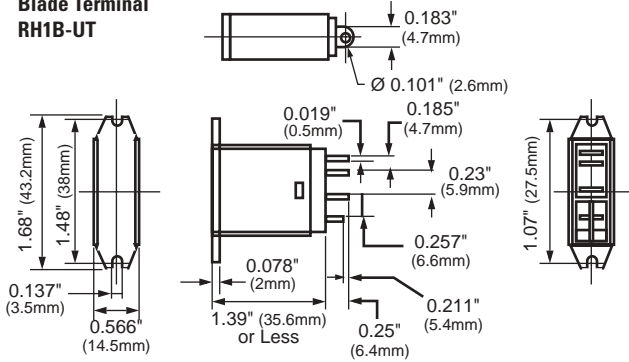


**RH2/RH3/RH4**

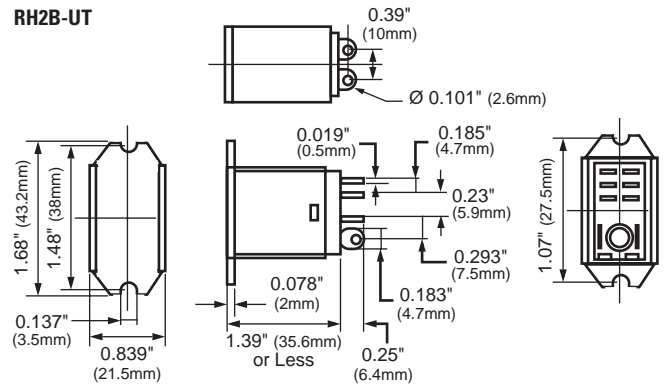


**Dimensions**

**Top Bracket Mounting  
Blade Terminal  
RH1B-UT**

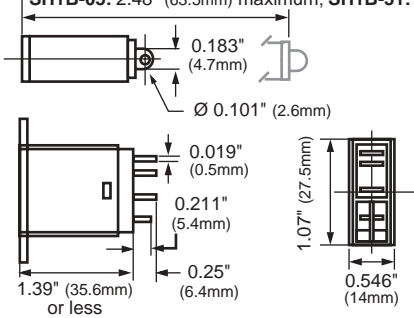


**RH2B-UT**



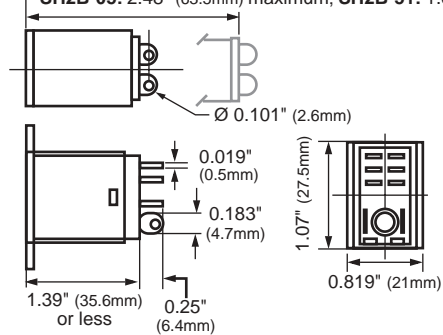
**Plug-in Blade Terminal  
RH1B**

Total length from panel surface including socket:  
**SH1B-05:** 2.40" (61.5mm) maximum; **SH1B-51:** 1.54" (39mm) maximum  
 Total length from panel surface including hold-down spring:  
**SH1B-05:** 2.48" (63.5mm) maximum; **SH1B-51:** 1.62" (41.6mm) maximum



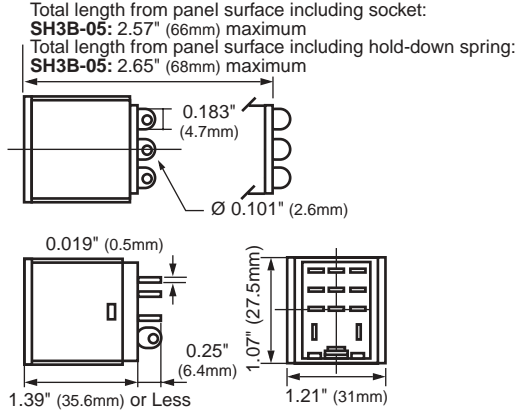
**RH2B**

Total length from panel surface including socket:  
**SH2B-05:** 2.40" (61.5mm) maximum; **SH2B-51:** 1.54" (39.6mm) maximum  
 Total length from panel surface including hold-down spring:  
**SH2B-05:** 2.48" (63.5mm) maximum; **SH2B-51:** 1.62" (41.6mm) maximum

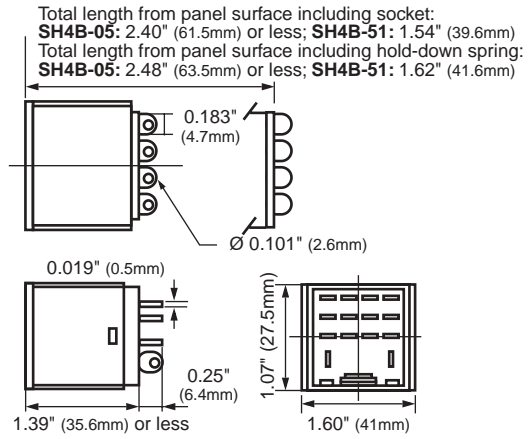


Dimensions con't

**Plug-in Blade Terminal**  
**RH3B**

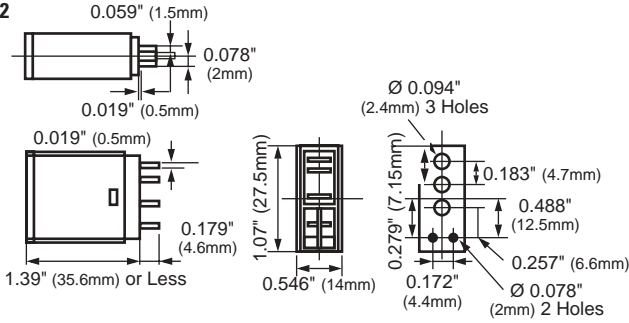


**RH4B**

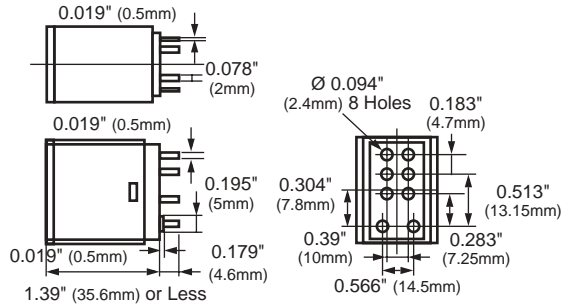


Relays

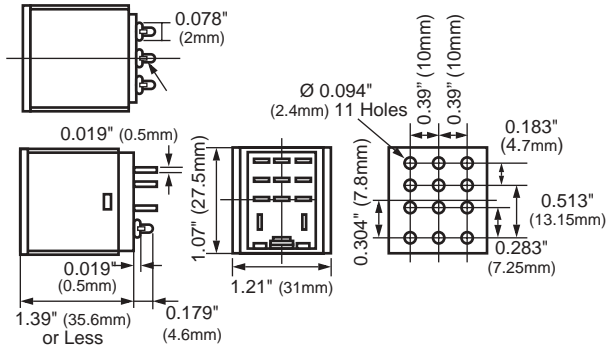
**PCB Terminal**  
**RH1V2**



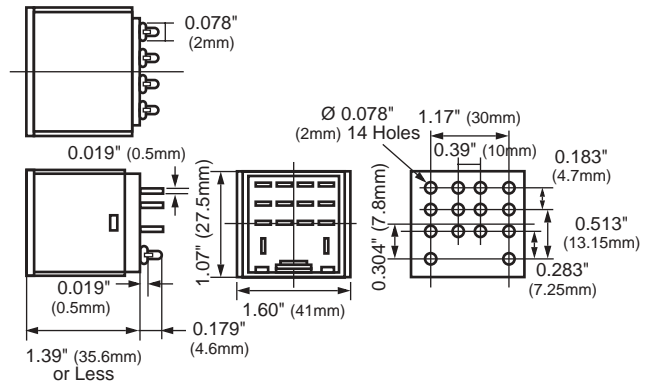
**RH2V2**



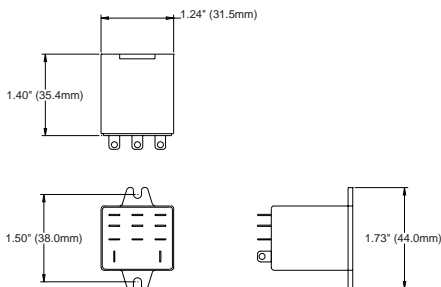
**RH3V2**



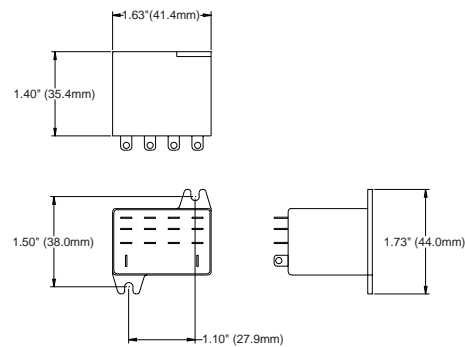
**RH4V2**



**RH3B-UT**



**RH4B-UT**



THIS PAGE INTENTIONALLY LEFT BLANK



**Contact Information**  
p:800.225.0141  
f:440.232.5644  
[sales@lake-shore-electric.com](mailto:sales@lake-shore-electric.com)  
[www.lake-shore-electric.com](http://www.lake-shore-electric.com)

**Location of Factory**  
Lake Shore Electric  
205 Willis Street  
Bedford, OH 44146