



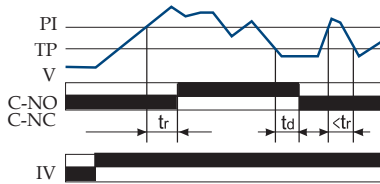
The HLV Series is a single-phase undervoltage monitor designed to protect sensitive equipment from brownout or undervoltage conditions. Time delays are included to prevent nuisance tripping and short cycling. The 30A, 1hp rated, SPDT relay contacts allow direct control of motors, solenoids and valves. The output relay can be ordered with isolated SPDT contact to allow monitoring of one voltage and switching a separate voltage. Two undervoltage trip point ranges allow monitoring of 110 to 120VAC or 208 to 240VAC systems.

For more information see:
Appendix B, page 165, Figure 2 for dimensional drawing.
Appendix C, page 169, Figure 15 for connection diagram.

Operation

Upon application of input voltage the output relay remains de-energized. When the input voltage value is above the pull-in voltage, the restart delay begins. At the end of the restart delay, the output relay energizes. When the input voltage falls below the trip point, the trip delay begins. If the input voltage remains below the pull-in voltage for the entire trip delay the relay de-energizes. If the input voltage returns to a value above the pull-in voltage, during the trip delay, the trip delay is reset and the relay remains energized. If the input voltage falls below the trip point voltage during the restart delay, the delay is reset and the relay remains de-energized. Reset is automatic upon correction of an undervoltage fault.

Reset: Removing input voltage resets the output relay and the time delays.



tr = Restart Delay
td = Trip Delay
PI = Pull-in 105% or trip point
TP = Trip Point
V = Monitored Voltage
IV = Input voltage
C-NO = Normally Open Contacts
C-NC = Normally Closed Contacts

Features:

- Protects against undervoltage in single-phase systems
- 30A, SPDT, NO output contacts
- 100 to 240VAC input voltage
- 70 to 220VAC adjustable undervoltage trip point in 2 ranges
- Restart delays from 3 - 300s
- Trip delay 1 - 20s fixed
- Isolated or non-isolated relay contacts

Approvals:   

Auxiliary Products:

- **Quick connect to screw adaptor:**
P/N: P1015-18
- **Female quick connect:**
P/N: P1015-13 (AWG 10/12)
P/N: P1015-64 (AWG 14/16)
- **Mounting bracket:** P/N: P1023-6
- **DIN rail:** P/N: C103PM (Al)
- **DIN rail adaptor:** P/N: P1023-20

Available Models:

HLVA6123

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

Order Table:

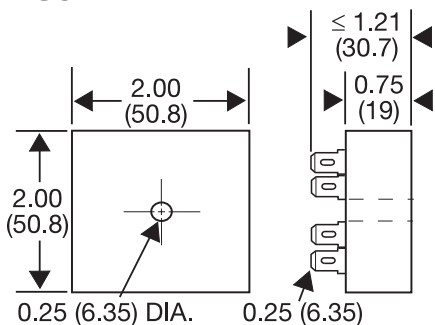
HLVA	X	X	X
	Undervoltage Range	Output Connection	Restart Delay
	4 - 70 to 120VAC	I - Isolated SPDT	2 - Onboard adjustment
	6 - 170 to 220VAC	N - Non-Isolated SPDT	3-300s
			X
			Trip Delay
			Fixed - Specify from 1-20s
			in 1s increments

Specifications

Input	Ratings	SPDT-N.O	SPDT-NC
Min & Max RMS Voltage	General Purpose	125/240VAC	30A
AC Line Frequency	Resistive	125/240VAC	30A
Power Consumption		28VDC	20A
Undervoltage Sensing	Motor Load	125VAC	1 hp*
Type		240VAC	2 hp**
Peak voltage sensing	Life		Mechanical - 1 x 10 ⁶
Ranges			Electrical - 1 x 10 ⁵ , *3 x 10 ⁴ , **6,000
(4)			
(6)			
Pull-In Voltage	Protection		
105% or trip point voltage	Surge	IEEE C62.41-1991 Level A	
Trip Point Accuracy	Circuitry	Encapsulated	
± 3% of trip point	Isolation Voltage	≥ 1500V RMS input to output; isolated units	
Time Delay	Insulation Resistance	≥ 100 MΩ	
Restart Delays	Mechanical		
3 - 300s adjustable	Mounting	Surface mount with one #10 (M5 x 0.8) screw	
Trip Delay	Dimensions	.3 x 2 x 1.5 in. (76.7 x 51.3 x 38.1 mm)	
1 - 20s fixed in 1s increments	Termination	.025 in. (6.35 mm) male quick connects	
Repeat Accuracy	Environmental		
±0.5% or 20ms, whichever is greater	Operating / Storage Temperature	-40° to 60°C / -40° to 85°C	
Tolerance (Factory Calibration)	Humidity	95% relative, non-condensing	
±5%	Weight	≈ 3.9 oz (111 g)	
Reset Time			
≤ 150ms			
Time Delay vs. Temp. & Voltage			
≤ ±10%			
Output			
Type			
Electromechanical relay			
Form			
SPDT			

Appendix B - Dimensional Drawings

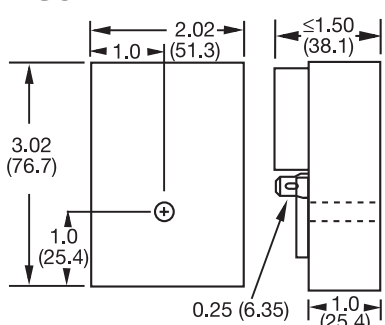
FIGURE 1



0.25 (6.35) DIA. 0.25 (6.35)

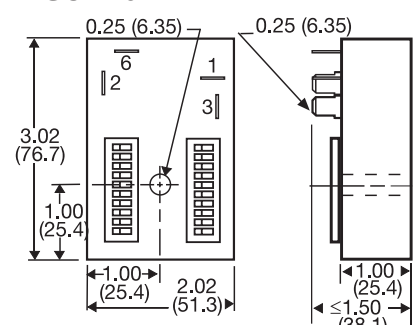
CT; ESD5; ESDR; FS100; FS200; FS300; KR3; KR9; KRDB; KRDI; KRDM; KRDR; KRDS; KRPD; KRPS; KSD1; KSD2; KSD3; KSD4; KSDB; KSDR; KSDS; KSDU; KSPD; KSPS; KSPU; KVM; T2D; TA; TAC1; TAC4; TDU; TDUB; TDUI; TDUS; TL; TMV8000; TS1; TS2; TS4; TS6; TSB; TSD1; TSD2; TSD3; TSD4; TSD6; TSD7; TSDB; TSDR; TSDS; TSS; TSU2000

FIGURE 2



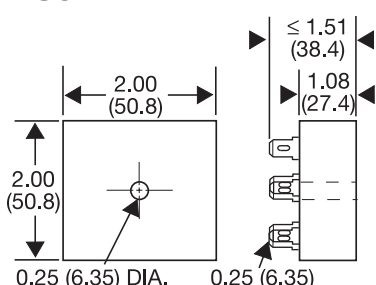
HLV; HRD3; HRD9; HRDB; HRDI; HRDM; HRDR; HRDS; HRID; HRIS; HRIU; HRPD; HRPS; HRPV; HRV; RS

FIGURE 3



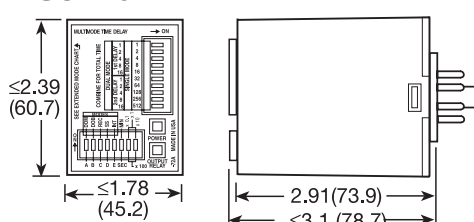
HSPZ

FIGURE 4



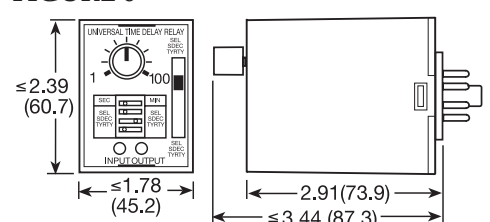
FA; FS; FSU1000*; NHPD; NHPS; NHPV; NLF1*; NLF2*; PHS*; PTHF*; SIR1; SIR2; SLR1*; SLR2*; TH1; TH2; THC; THD1; THD2; THD3; THD4; THD7; THDB; THDM; THDS; THS

FIGURE 5



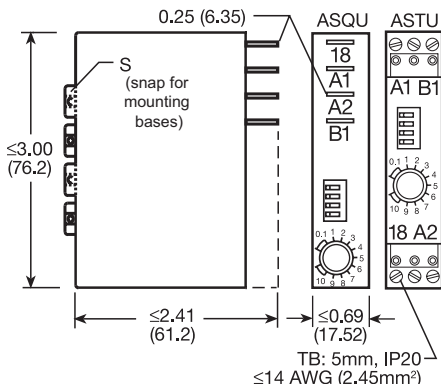
TRDU

FIGURE 6



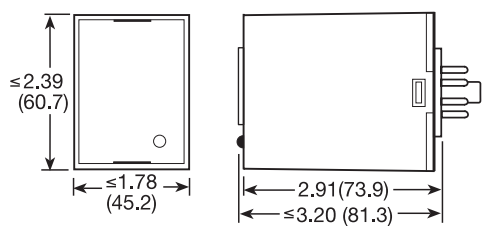
TRU

FIGURE 7



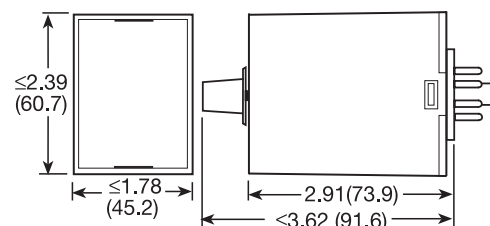
ASQU; ASTU; DSQU; DSTU

FIGURE 8



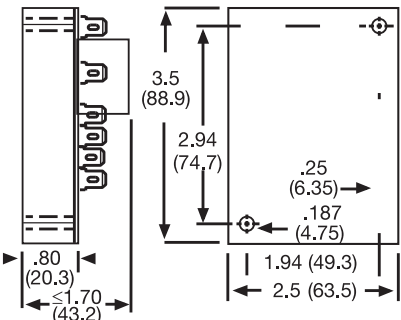
PLM; PLR; TDB; TDBH; TDBL; TDI; TDIH; TDIL; TDM; TDMB; TDMH; TDML; TDR; TDS; TDSH; TDSL

FIGURE 9



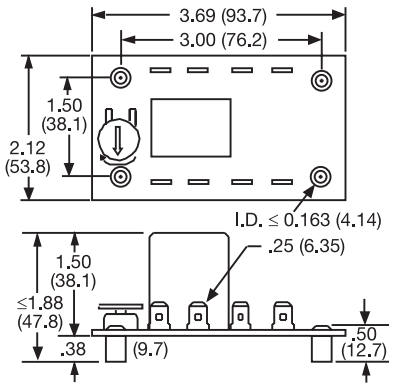
FS500; PRLB; PRM; PRLS; TRB; TRM; TRS

FIGURE 10



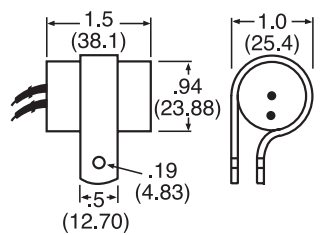
ERD3; ERDI; ERDM

FIGURE 11



ORB; ORM; ORS

FIGURE 12

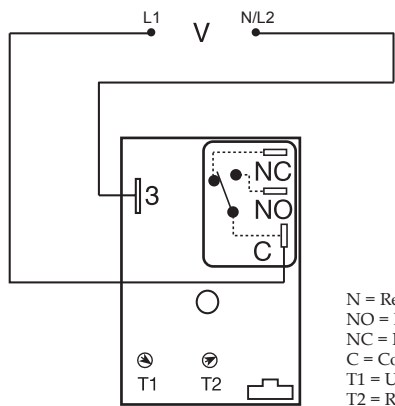


FS100; FS400

inches (millimeters)

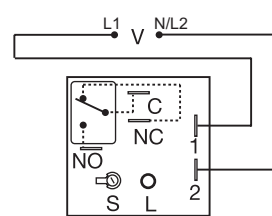
Appendix C - Connection Diagrams

FIGURE 15 - HLV Series



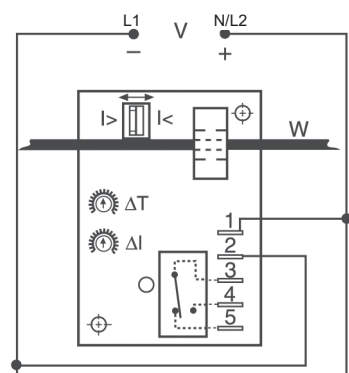
N = Relay contacts are non-isolated.
 NO = Normally Open
 NC = Normally Closed
 C = Common
 T1 = Undervoltage Trip Point
 T2 = Restart Delay

FIGURE 16 - KVM Series



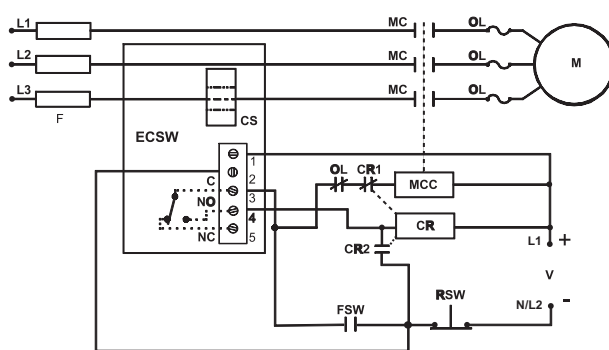
I = Relay contacts are isolated.
 V = Voltage
 L = LED
 S = Undervoltage Setpoint
 NO = Normally Open
 NC = Normally Closed
 C = Common, Transfer Contact

FIGURE 17 - ECS Series

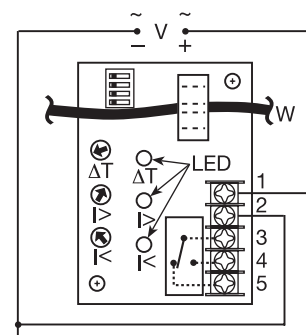


V = Voltage
 W = Insulated Wire Carrying Monitored Current
 I> = Overcurrent
 I< = Undercurrent
 Relay contacts are isolated.

FIGURE 18 - ECSW Series

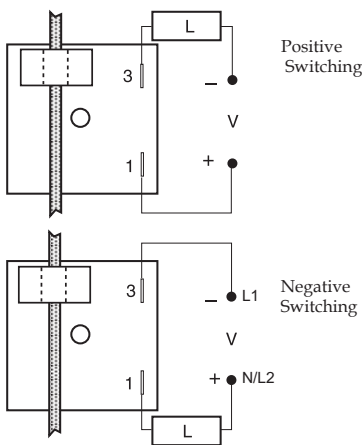


MC = Motor Contactor
 M = Motor
 F = Fuses
 OL = Overload
 RSW = Reset Switch
 FSW = Fan or Float Contacts
 CR = Control Relay
 CS = Current Sensor
 MCC = Motor Contactor Coil



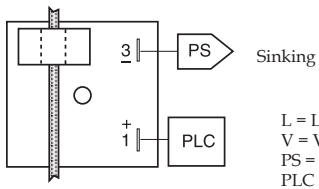
V = Voltage
 I> = Adjustable Overcurrent
 I< = Adjustable Undercurrent
 W = Monitored Wire
 ΔT = Adjustable Trip Delay

FIGURE 19 - TCS Series



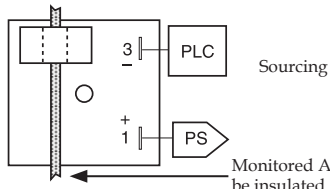
Positive Switching

Negative Switching



Sinking

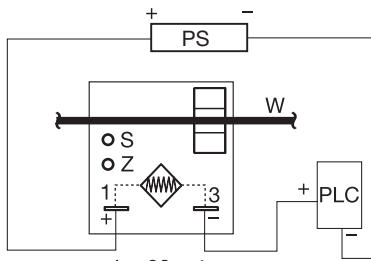
L = Load
 V = Voltage
 PS = Power Supply
 PLC = PLC Digital Input Module



Sourcing

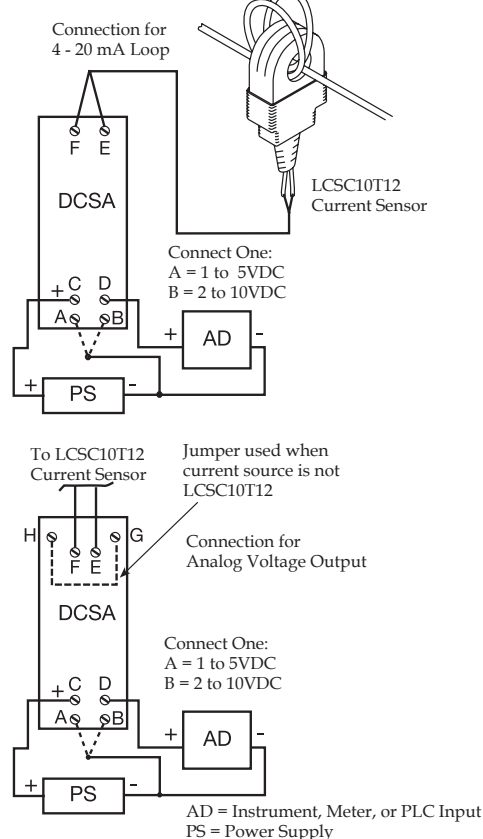
Monitored AC conductor must be insulated.

FIGURE 20 - TCSA Series



4... 20 mA
 PS = Power Supply
 Z = Zero Adjust
 S = Span Adjust
 W = Insulated Wire Carrying Monitored Current
 PLC = PLC Analog Input or Meter Input

FIGURE 21 - DCSA Series



Connection for 4 - 20 mA Loop

LCSC10T12 Current Sensor

Connect One:
 A = 1 to 5VDC
 B = 2 to 10VDC

To LCSC10T12 Current Sensor
 Jumper used when current source is not LCSC10T12
 Connection for Analog Voltage Output

Connect One:
 A = 1 to 5VDC
 B = 2 to 10VDC

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