

# DEVAR Inc.

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## Model 18-232A LOOP POWERED ALARM



REV C

MANUAL NO. 990029



# MODEL 18-232A

## LOOP POWERED ALARM

### GENERAL DESCRIPTION

The DEVAR Type 18-232A LOOP POWERED ALARM is used to monitor a single 4 to 20 mA loop and provide a relay contact output when the input variable becomes too high or too low. The 18-232A requires no external power, as it is powered directly from the 4 to 20 mA input signal, requiring only 4 Volts from the loop for operation.

The 18-232A provides, as an output, a set of 3 Amp, single pole double throw relay contacts. The relay is operated in the failsafe mode, with the relay coil energized during normal operation and de-energized during alarm. In an addition to the relay output, a red LED, located on the face of the 18-232A, lights up indicating an alarm condition.

Alarm action, "HI" or "LO", is selected by means of an internal DIP switch. This DIP switch is also used to select a hysteresis of 1,2,4,6,8 or 16 percent. The alarm trip point is set by means of a multiturn pot, accessible from the face of the 18-232A. As a special feature, the 18-232A provides a 0 to 1 Volt, trip point voltage between the "+CAL" and "-CAL" output terminals. By reading the voltage at this point, the trip point setting is precisely determined, 0 to 1 Volt representing 0 to 100% of input.

An optional latching feature can be provided upon request. When the latching feature is provided, a momentary push button switch is added at the top of the 18-232A housing. Once the 18-232A goes into the alarm condition it will remain in the alarm condition until the push button switch is depressed.

### CONFIGURATION

The first step in configuring the 18-232A is the setting of the internal DIP switches. To do this, remove the base plate, which is fastened to the 18-232A housing with two screws. Once the DIP switch is exposed, set the alarm action to "HI" or "LO" by using switch positions 1,2,3 and 4 on the DIP switch. See the DIP switch selection table for proper setting of the DIP switches.

The amount of hysteresis (or dead band) selected, determines the point at which the 18-232A will come out of the alarm condition. For example, a high alarm set to trip at 12 milliamps with 2% hysteresis will go into the alarm condition at 12 milliamps and come out of the alarm condition at 11.68 milliamps (2% of a 16 mA span equals 0.32 mA). Hysteresis can be set to 1,2,4,6,8 or 16 percent using DIP switch positions 5,6,7 and 8. See the DIP switch selection table for proper setting of the DIP switches.

The trip points set by means of a multiturn potentiometer at the face of the 18-232A. Turning the pot from fully counterclockwise to fully clockwise moves the trip point from 4 to 20 mA. The trip point can be set by one of two methods. The first method is to set the input current to the trip level, then adjust the trip point pot until the 18-232A goes into alarm. The second method is quick and easy, and only requires the use of the 0 to 1 Volt output voltage, measured between the "+cal" and the "-cal" terminals. When using this method, the 18-232A is connected in a current loop; the output voltage is then adjusted using the trip point pot until the desired trip point is reached. The 0 to 1 volt output voltage corresponds to a trip point of 0 to 100% of the input span. For example, setting the voltage to 0.5 volts sets the trip point to 12 mA. This output voltage can also be used to check the trip point settings of 18-232A alarms after they have been installed in working loops.

## FACTORY CALIBRATION

- Set Input Resistance:**  
Connect an Ohm meter between the input terminals "+INPUT" and test point "TP 1". Adjust internal pot "P1" for a resistance of 1057 Ohms.
- Zero Adjustment:**  
Input 12 mA at terminals "+INPUT" and "-INPUT". Using the external trip point pot, set the voltage between terminals "+CAL" and "-CAL" to 0.5 volts. Adjust internal pot "P3" until the alarm trips.
- Test Span:**  
Input 20 mA, turn external trip point pot until alarm trips. Voltage between "+CAL" and "-CAL" terminals should be 1 volt.

## SPECIFICATIONS:

### GENERAL:

- |    |                                |                                     |
|----|--------------------------------|-------------------------------------|
| 1. | Input:                         | 4 to 20 mA                          |
| 2. | Input Voltage drop:            | 4 Volts @ 20 mA                     |
| 3. | Alarm Action:                  | High or Low (DIP Switch Selectable) |
| 4. | Resolution of trip adjustment: | 0.1% of span                        |
| 5. | Repeatability:                 | 0.1% of span                        |
| 6. | Minimum Trip Point:            | 2% of Span                          |
| 7. | Hysteresis:                    | 1,2,4,6,8, or 16%                   |
| 8. | Temperature Effect:            | 0.01% of Span per °F                |
| 9. | Temperature Range:             | 32 to 140 °F                        |

### RELAY:

- |    |                       |   |
|----|-----------------------|---|
| 1. | Contact Arrangement:  | Single Pole Double Throw  |
| 2. | Contact Rating:       | 0.1A Min., 3A Max., 2A Typ. @ 28 VDC or 115 VAC, Resistive Load |
| 3. | Contact Material:     | Fine Silver   |
| 4. | Breakdown Voltage:    | 500V RMS across contact gap                                     |
| 5. | Minimum Contact Life: | 1 Million operations, at 1 Amp, 28 VDC                          |
| 6. | Relay Operation:      | Coil normally energized, de-energizes on Alarm                  |

### TRIP SET CALIBRATION VOLTAGE:

- |    |                            |  |
|----|----------------------------|--|
| 1. | Output Voltage Range:      | 0 to 1 Volt, Representing a trip point of 0 to 100% of Span  |
| 2. | Output Voltage Accuracy:   | ± 0.075% of Span Typ., ±0.75% of Span Max.   |
| 3. | Trip Point Voltage Change: | 0.01% Typ. @ 1% Hysteresis<br>0.04% Max. @ 1% Hysteresis<br>0.12% Typ. @ 16% Hysteresis<br>0.60% Max. @ 16% Hysteresis |

NOTE: Trip Set Voltage is calibrated in the HI alarm mode. For best LO alarm accuracy calibrate in the LO alarm mode.

### OPTIONS:

- |    |                                    |                             |
|----|------------------------------------|-----------------------------|
| 1. | Latching Alarm:(option -L)         | Momentary push button reset |
| 2. | Low Temperature Option:(option -T) | -40 to 140 °F               |

### REFERENCE DRAWINGS:

- |    |                             |         |
|----|-----------------------------|---------|
| 1. | Product Description:        | A515154 |
| 2. | Dimensions and Field Wiring | B515194 |
| 3. | Schematic                   | C515145 |
| 4. | Circuit Board Assembly      | B515146 |

SWITCH	1	2	3	4	5	6	7	8
ALARM	HI	O	I	3	O			
	LO	I	O	O	I			
% DEAD BAND	1					I	I	I
	2					O	O	O
	4					O	O	I
	6					O	I	O
ON/OFF	8					I	O	O
	16					O	O	O

DIP SWITCH SELECTION TABLE

