

DEVAR Inc.

706 Bostwick Avenue, Bridgeport, CT 06605

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<http://www.devarinc.com>

Model 18-LPI-4 LOOP POWERED INDICATOR



PRODUCT DESCRIPTION
18-LPI-4
4-1/2 DIGIT LOOP POWERED INDICATOR

GENERAL DESCRIPTION

The 18-LPI-4 is a two-wire, digital indicator, that provides local indication of the measured variable on a 4½ digit liquid crystal display. This indicator can be inserted at any point in a 4-20 mA loop. It is powered directly from the loop and drops less than 3.3 volts across its input terminals.

The 18-LPI-4 provides a digital readout, which is proportional to the input. It is calibrated at the factory to display 00.00 to 100.00% for a 4-20 mA input, however, it can be easily recalibrated in the field, to read directly in engineering units, such as temperature or flow. Each indicator comes with a selection of stick-on-labels of commonly used engineering units. These labels can be attached to the display so that an operator can immediately determine what the indicator is reading.

Recalibration of the 18-LPI-4 is easily accomplished through the use of switches and trimpots. The display span can be adjusted from 0 to 39998 counts in 16 switch selectable ranges and the zero offset can be adjusted from -19999 to +19999 counts also in 16 switch selectable ranges. Fine adjustment of span and zero is made on two 15-turn trimpots. The span and zero pots are non-interactive and provide resolutions of better than one count. Some sample display calibrations are as follows:

0000	to	19999	(direct acting)
19999	to	0000	(reverse acting)
-19999	to	19999	(zero center)
2300	to	17350	(positive offset)
-7200	to	8500	(negative offset)

Display action, direct or reverse, is selected by means of movable jumpers. One of four decimal point positions, or no decimal point is also jumper selectable.

C	3384	REDRAWN IN ELECTRONIC FORMAT		
B	3067	ADD GROUND LUG, SET SCREW AND DIMENSION CHANGES	AG	03-14-94
A	3002A	INITIAL RELEASE	AG	10-11-90
REV.	ECN	DESCRIPTION	APPR.	DATE

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The 18-LPI-4 is housed in a rugged, indoor/outdoor, NEMA-4X polycarbonate housing. This housing is corrosion resistant and dust-tight, and will withstand direct water spray under hose pressure. Access into the housing can be made by means of M20 and M32 knockouts on the bottom of the housing.

Options available include a 3-inch Snaptrack mounting bracket (-M31S), a DIN rail, mounting bracket (M31D), a 2-inch pipe mounting bracket (-M36) and a ½ inch NPT watertight conduit hub (-M42). There is also an explosive proof version, (Model 18-LPIX-4) suitable for use in Division I, Class I, Groups B, C & D and Class II, Groups E, F, and G hazardous locations.

SPECIFICATIONS

1. Input
 - a. Signal: 4 to 20mA
 - b. Input Voltage Drop: 3.3V @ 20mA
 - c. Maximum Input Current: 60mA forward or reverse
2. Display
 - a. Type: 4½ Digit LCD, 7 segment
 - b. Character Height: 0.4 inches
 - c. Characters: -1.8.8.8.8
 - d. Decimal Point: 4 Positions or absent, jumper selectable
 - e. Polarity Indication: negative sign
 - f. Over-Range: blanks 4 least significant digits
3. Operation
 - a. Span Range: 0 to 39998 counts, 16 ranges, switch selectable
 - b. Zero Range: -19999 to +19999 counts, 16 ranges, switch selectable,
 - c. Action: direct (count increases as input increases), reverse (count decreases as input increases), jumper selectable
 - d. Sample Rate: 2.4 per second
4. Performance
 - a. Resolution, max: 0.4 µA
 - b. Resolution: (16000 µA)/(span counts)
 - c. Accuracy (25°C): reading ± 3 counts
 - d. Zero tempco: ±(0.0003% of span +0.4 counts) per °C typical.
±(0.0016% span +0.8 counts) per °C maximum
 - e. Span tempco: ±0.001% of span per °C typical
±0.009% of span per °C maximum

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- f. Operating Temperature: -20 to +70°C
- g. Storage Temperature: -40 to +85°C
- h. Ripple Rejection: reading change of less than 0.01% of span for 1 mA, 60 Hz, ripple applied to the input

5. Options

- M31S 3 inch SnapTrack mounting bracket
- M31D DIN rail mounting bracket
- M36 2 inch pipe mounting bracket
- M42 ½ inch NPT watertight conduit hub
- BL Backlight

Note: The backlight derives its power from the 4 to 20 mA signal and adds an additional 2V burden to the loop

6. Enclosure

- a. Material: Polycarbonate
- b. Access: M20 and M32 conduit knockouts
- c. Classification: NEMA-4X
- d. Weight: 10 oz.

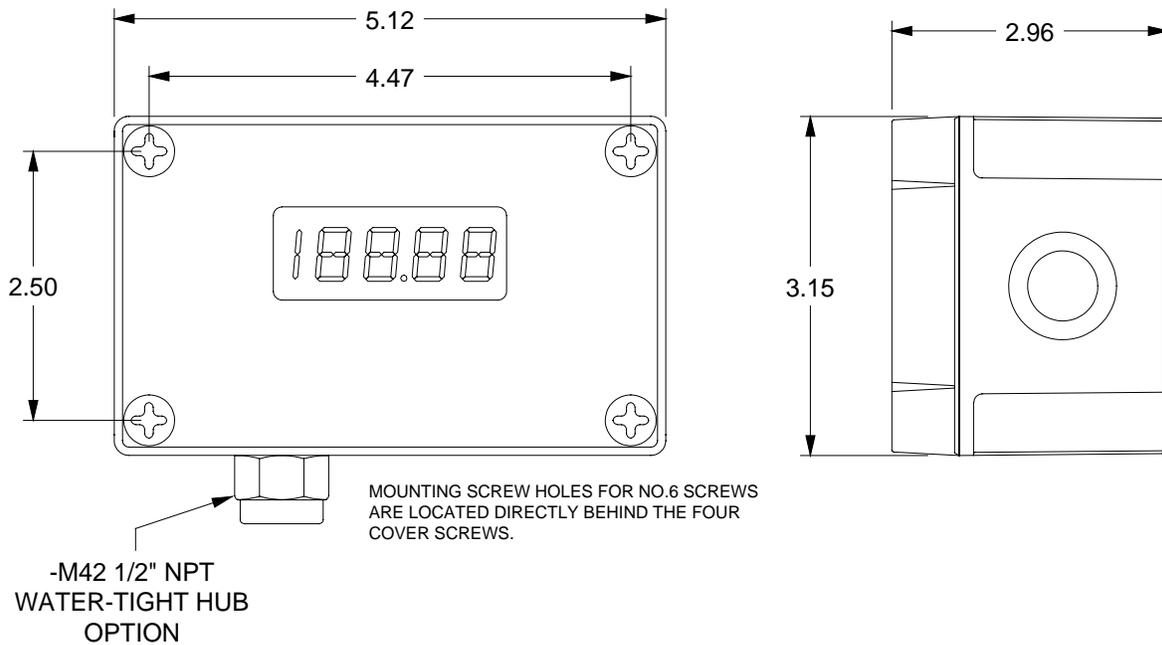


FIG. 1 GENERAL DIMENSIONS

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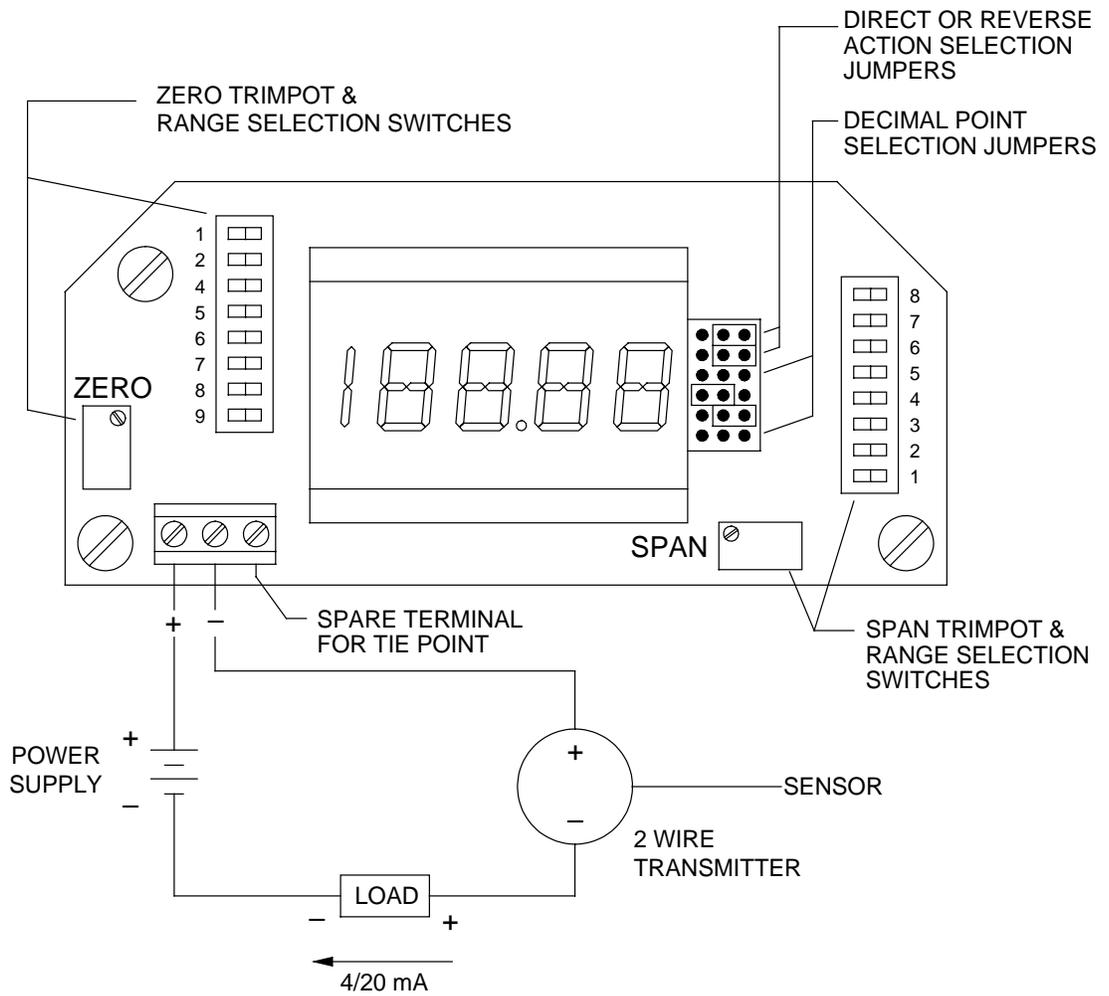


FIG. 2 TYPICAL FIELD WIRING CONNECTIONS AND LOCATION OF CALIBRATION SWITCHES AND POTS

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CALIBRATION PROCEDURE

1. Zero Adjustment (Factory calibration):

To prevent the interaction of the span and zero trim pots, the 4 mA offset is compensated for at the output of amplifier "U3". This done by applying a 4 mA input to the indicator and adjusting pot "P1", located on the lower PC board, for 0.0000 volts at the output of "U3". This voltage is measured between common (the black wire) and pin 1 of U3 (the blue wire).

2. Calibrate Display:

To calibrate the 18-LPI-4, remove the front cover and label to expose the calibrating switches and the span and zero pots. Connect a current source to the input terminals (fig. 2) and proceed to calibrate the indicator as follows.

- 1) Determine desired display for 4 to 20mA input.
EXAMPLE: 150.0 to 1950.0 lbs
- 2) Set span switches for required span range (Figs. 2 & 4).
EXAMPLE: Span = 19500 – 1500 = 18000 counts; set span switch positions 1, 2, 3 & 8 ON and positions 4, 5, 6, & 7 OFF
- 3) Set zero switches for required zero offset. (Figs. 2 & 4)
EXAMPLE: Offset = +1500 counts. Set zero switch positions 4, 5, 6 & 7 ON and positions 1, 2, 3 & 8 OFF.
- 4) Select decimal point location.
EXAMPLE: Select DP 1 position by using decimal point selection jumpers. (Figs. 2 & 5)
- 5) Select display action, direct or reverse.
EXAMPLE: Select direct action by using action selection jumpers. (Figs. 2 & 5)
- 6) Input 4 mA and set zero pot to display bottom of range.
EXAMPLE: adjust zero pot to display 150.0
- 7) Input 20 mA and set span pot to display top of range.
EXAMPLE: adjust span pot to display 1950.0
- 8) The indicator is now calibrated.

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SWITCH POSITIONS		ZERO OFFSET COUNTS	SWITCH POSITIONS		ZERO OFFSET COUNTS
ON	OFF		ON	OFF	
1, 2, 3, 4	5, 6, 7, 8	18336 to 19999	1, 2, 3, 8	4, 5, 6, 7	-2638 to 0000
2, 3, 4, 5	1, 6, 7, 8	15723 to 18336	2, 3, 5, 8	1, 4, 6, 7	-5252 to -2638
1, 3, 4, 6	2, 5, 7, 8	13109 to 15723	1, 3, 6, 8	2, 4, 5, 7	-7865 to -5252
3, 4, 5, 6	1, 2, 7, 8	10487 to 13109	3, 5, 6, 8	1, 2, 4, 7	-10487 to -7865
1, 2, 4, 7	3, 5, 6, 8	7865 to 10487	1, 2, 7, 8	3, 4, 5, 6	-13109 to -10487
2, 4, 5, 7	1, 3, 6, 8	5252 to 7865	2, 5, 7, 8	1, 3, 4, 6	-15723 to -13109
1, 4, 6, 7	2, 3, 5, 8	2638 to 5252	1, 6, 7, 8	2, 3, 4, 5	-18336 to -15723
4, 5, 6, 7	1, 2, 3, 8	0000 to 2638	5, 6, 7, 8	1, 2, 3, 4	-19999 to -18336

FIG. 3 ZERO OFFSET, DIP SWITCH SETTINGS

SWITCH POSITIONS		SPAN RANGE COUNTS	SWITCH POSITIONS		SPAN RANGE COUNTS
ON	OFF		ON	OFF	
1, 2, 3, 4	5, 6, 7, 8	37233 to 39998	1, 2, 3, 8	4, 5, 6, 7	17521 to 20000
2, 3, 4, 5	1, 6, 7, 8	34777 to 37233	2, 3, 5, 8	1, 4, 6, 7	15065 to 17521
1, 3, 4, 6	2, 5, 7, 8	32320 to 34777	1, 3, 6, 8	2, 4, 5, 7	12608 to 15065
3, 4, 5, 6	1, 2, 7, 8	29856 to 32320	3, 5, 6, 8	1, 2, 4, 7	10144 to 12608
1, 2, 4, 7	3, 5, 6, 8	27392 to 29856	1, 2, 7, 8	3, 4, 5, 6	7680 to 10144
2, 4, 5, 7	1, 3, 6, 8	24936 to 27392	2, 5, 7, 8	1, 3, 4, 6	5224 to 7680
1, 4, 6, 7	2, 3, 5, 8	22479 to 24936	1, 6, 7, 8	2, 3, 4, 5	2767 to 5224
4, 5, 6, 7	1, 2, 3, 8	20000 to 22479	5, 6, 7, 8	1, 2, 3, 4	0000 to 2767

FIG. 4 SPAN RANGE, DIP SWITCH SETTINGS

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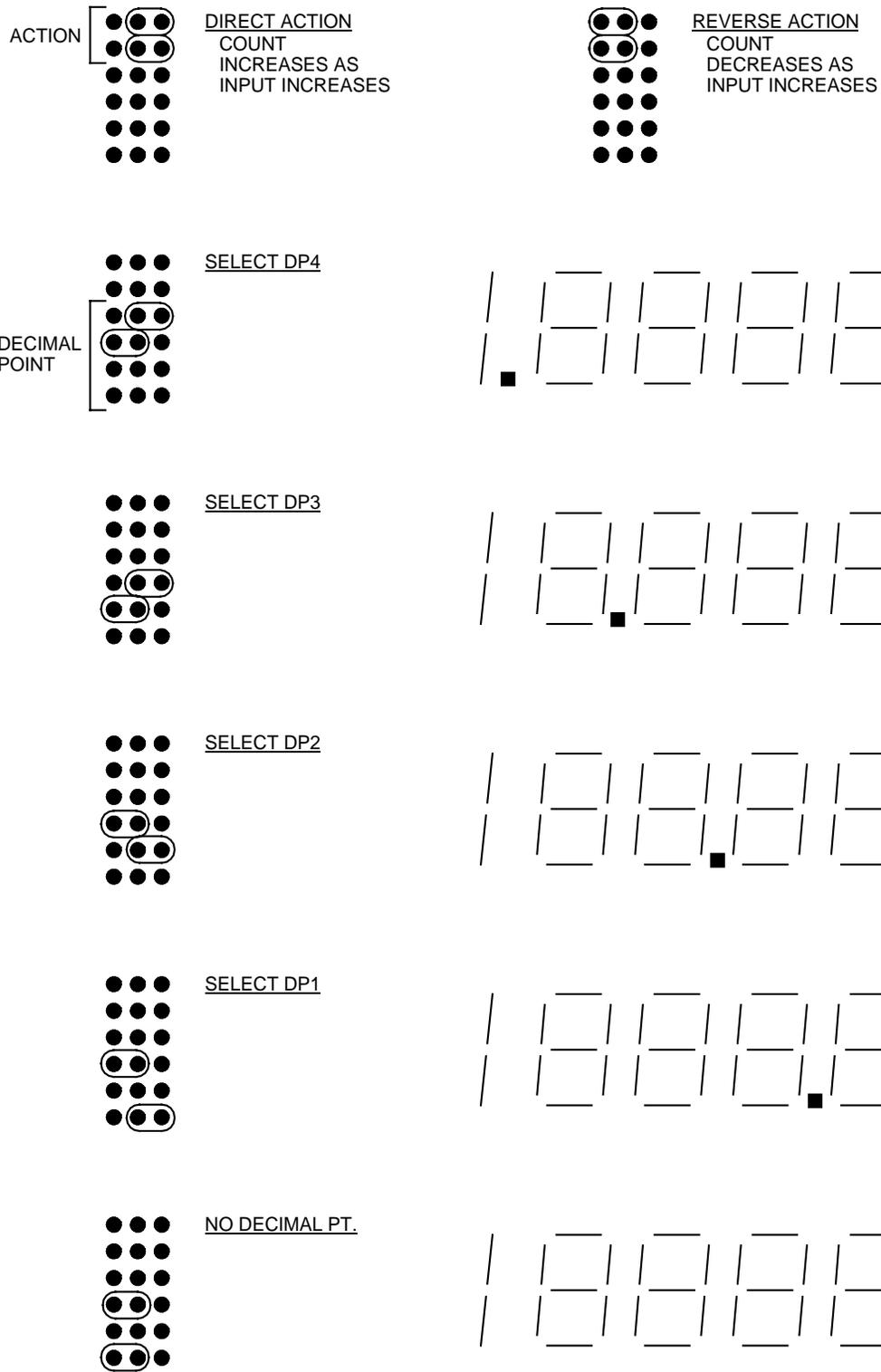


FIG. 5 JUMPER POSITIONS FOR DISPLAY ACTION AND DECIMAL POINT SELECTION

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