



# MODEL K-5106

## 4½ DIGIT LOOP POWERED INDICATOR

OPERATION

&

INSTRUCTION MANUAL



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**INTRODUCTION**

Model K-5106 is a two wire indicator for 4–20mA process signals. Process variables such as Temperature, Flow, Pressure, Level, etc., are digitally displayed in Engineering units or in percentage.

Additional power source is not required as the operational power for the unit is derived directly from the current loop.

A 4½ digit 10.2 mm (0.4") LCD display provides the readout to ±19999 counts with jumper selectable decimal points. The instrument is also programmable for zero ranges within the entire calibration range of the instrument which is jumper selectable to achieve zero suppression or elevation. Multi turn potentiometers are provided for adjusting Zero and Span for any calibration range required for the application.

The indicator is available in panel mounted 1/8<sup>th</sup> DIN case and also in field mounted weatherproof/flameproof enclosure suitable to Gr.IIA, IIB & IIC of IS:2148

**INSTALLATION INSTRUCTIONS**

**Panel mount:**

- Unscrew the two clamp nuts on the rear and pull out the clamp.
- Insert the instrument through the cutout from the panel front.
- Fit the clamp by inserting from the rear, over the 2 screws.
- Tighten the clamp nut.

**Field mount:**

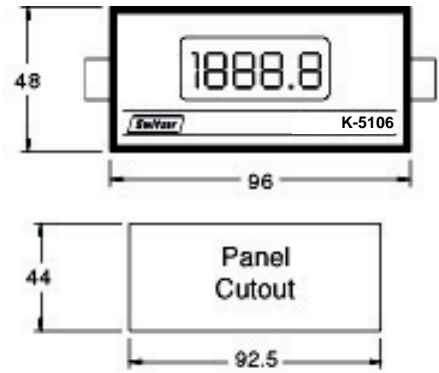
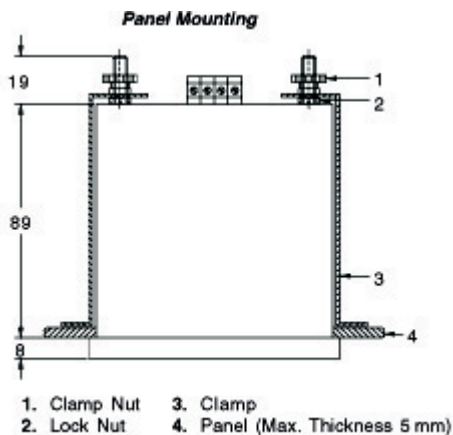
The cast aluminium weatherproof or flameproof housing is wall mounting type for which 2 nos. of 7mm diameter holes are provided on the base of the casting.

Optional 2" pipe mounting is also possible to mount the weatherproof / flameproof enclosure. Relevant mounting plate, u-bolt and nuts are required to be used with instrument for pipe mounting.

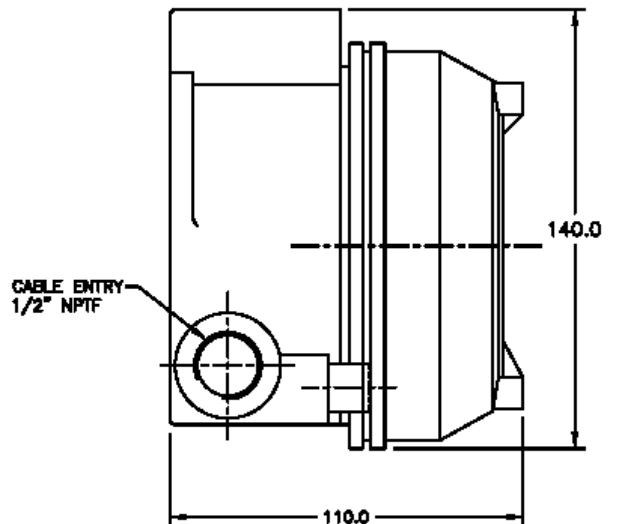
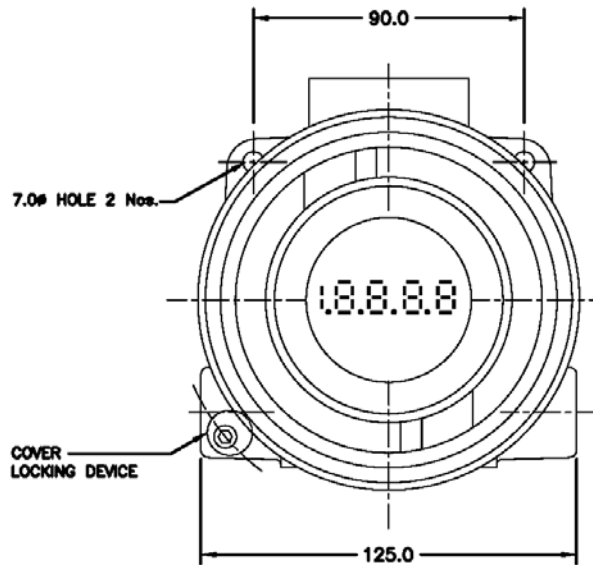
**Important installation notes:**

- Enclosure is W/P only when all entries and joints are suitably sealed.
- Use certified cable gland when not supplied by SWITZER.
- Mounting plate and clamps not supplied for Direct Mounting option.

**Fig-1: Overall Dimensions – Panel mount**



**Fig-2: Overall Dimensions – Field mount**



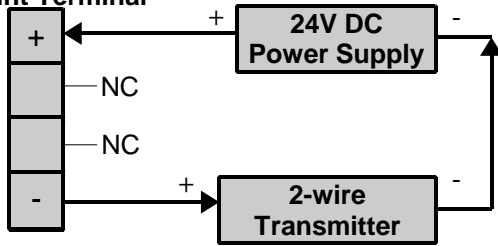
**WIRING INSTRUCTION**

**Panel mount:**

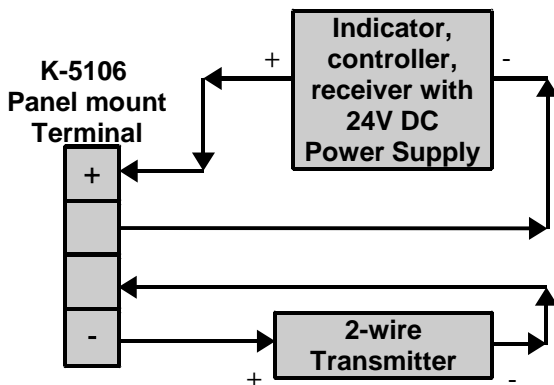
Four terminals for electrical connection are located on the rear of the instrument. The 2 centre terminals are provided for convenient field wiring interconnection between transmitter, receiver instrument and K-5106 Loop Powered Indicator. Some typical connection methods are shown in the next page.

Connection Type-1: Panel Mount

**K-5106 Panel mount Terminal**

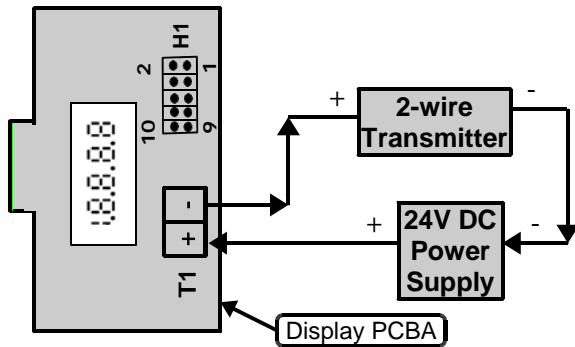


Connection Type-2: Panel Mount



**Field mount:**

Two terminals for electrical connection are located on the PCB inside the enclosure. Terminals can be accessed upon removal of the cover. The terminals used are screw clamp type and can accommodate a maximum of 2.5mm<sup>2</sup> wires.



**Cover Lock:** (Applicable for Field mounted model only)

The field mounted model instrument is provided with cover lock facility to enable it to be used for weatherproof or flameproof applications. The cover is fully threaded onto the body and locked in position for proper sealing with o-ring to ensure compliance to weatherproof and flameproof requirements.

The cover is locked in position when the instrument is shipped after manufacturing.

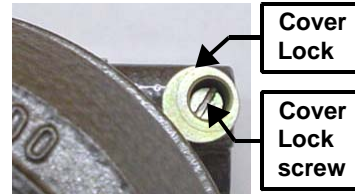
Unlock method:

- Loosen the lock screw.
- Rotate the lock by 180° and ensure that tongue of lock is out of the cover groove.
- Unscrew cover in anticlockwise direction to access internals of the instrument.

Lock method:

- Fix the cover and rotate clockwise to fully seat on body and seal the o-ring.
- Rotate lock and ensure that the tongue of lock enters the groove on cover.
- Tighten the cover lock screw.

**Fig-3: Cover Locked**



**Fig-4: Cover Unlocked**



**CALIBRATION INSTRUCTION**

The instrument is factory calibrated in accordance with the Specified Scaling. UNSPECIFIED UNITS WILL BE CALIBRATED FOR 0 TO 100% FOR 4-20MA INPUT. Field Calibration can be carried out by the following procedure.

Accessories required for field scaling changes are:

1. 4-20mA Current Source.
2. 4½ Digit Current Indicator of ±0.05% accuracy.

**Procedure**

**1. Determine Scale Values**

$$4\text{mA} = Y \text{ counts}$$

$$20\text{mA} = X \text{ counts}$$

$$\text{Scale Span} = X - Y$$

For examples refer table below:

Type	Range	4mA (Y)	20mA (X)	Span (X - Y)
Basic	0 to 19999	0000	19999	19999
Zero Elevation	-1000 to 10000	-1000	10000	11000
Zero Suppression	2000 to 7000	2000	7000	5000

**2. Selection of Span jumper**

Refer Table below for span jumper selection:

Jumper position J3	Limits of reading (X & Y counts)
1	2000 to 6000
2	6000 to 12000
3	12000 to 19999

**3. Selection of Zero jumper 'J1' & 'J2'**

Select suitable limits for zero suppression or elevation using Jumper J1 & J2. The values provided are for guidance and are approximate values and there will be minor variations due to the tolerances of the components used.

- For ranges starting from 0000 corresponding to 4mA, select J1-1 and J2-2.
- For Zero elevation, select J1-1 & J2-2. If the required Zero value is not achieved, shift J2-2 to J2-3.
- For Zero suppression select J2-1 & J1-2. If the required Zero value is not achieved, shift J1-2 to J1-3.

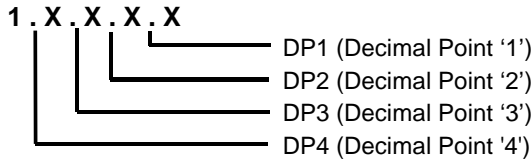
**4. Calibration method**

- Set all decimal points to be OFF. Place jumper to link H1-2 & 4. Refer to next section-5 for selecting appropriate decimal point after calibration.
- Apply 4mA and adjust ZERO pot for a reading of '0' counts on the display. Since decimal points are OFF, all leading zeroes are suppressed.
- Apply 20mA and adjust SPAN pot for 'X-Y' counts on display, as calculated in Step-1.

- For ranges starting from 0 at 4mA, this step is not required to be followed. For Zero Suppression and Elevation ranges, apply 4mA again and readjust ZERO pot for the required elevated or suppressed zero reading corresponding to 4mA.
- Apply 20mA, the instrument will correctly read the relevant value for this current input.
- Check for intermediate values.

**5. Decimal Point selection**

Select Decimal Point using header H1. Refer Table below:



**Decimal point jumper selection (Header H1)**

H1 – 2 & 4: All Decimal points are OFF.

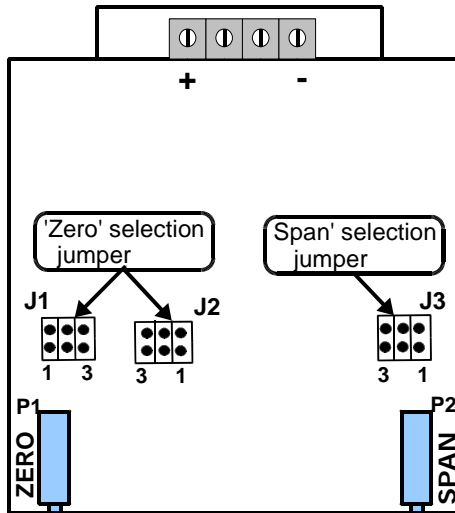
H1 – 1 & 2: Decimal Point selection is enabled based on jumper selection. Refer to below table.

H1	Display reading
4-6; 8-10	1 X X X . X
4-6; 9-10	1 X X . X X
5-6; 8-10	1 X . X X X
5-6; 9-10	1 . X X X X

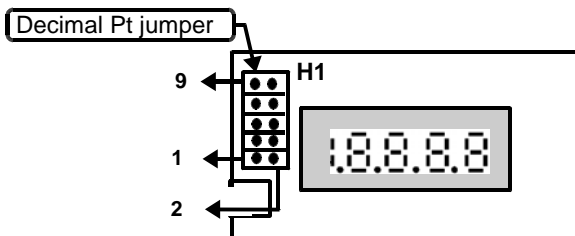
6. This completes calibration.

**JUMPER SELECTION DETAILS**

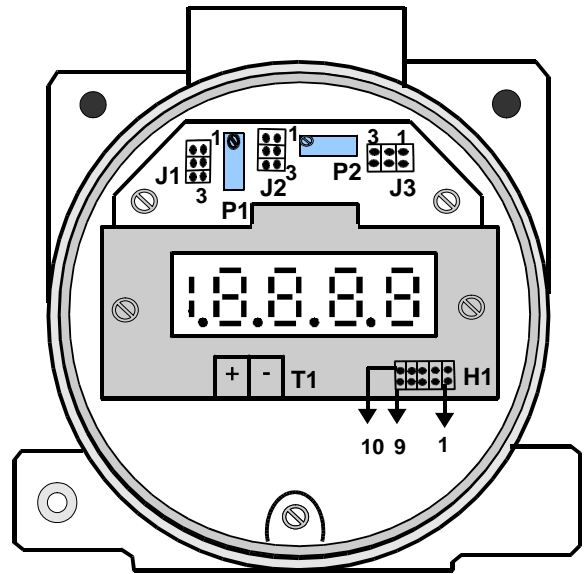
(a) Main board of panel mount model



(b) Display board of panel mount model



(c) Field mount model (front view without cover)



Components on bottom board

- J1 & J2 – Zero selection jumper
- J3 – Span selection jumper
- P1 – Zero adjustment potentiometer
- P2 – Span adjustment potentiometer

Components on top board

- T1 – Terminal
- H1 – Decimal point jumper

**TECHNICAL SPECIFICATIONS**

Characteristics	Specifications
<b>Electrical</b>	
<b>Input</b>	4-20mA or 10-50mA
<b>Protection</b>	200mA max. forward; 1000mA max. reverse
<b>Voltage drop</b>	4.5V max. forward 1.2V max. reverse
<b>Span range</b>	From 0-2000 to 0-20000 counts continuous adjustment
<b>Zero range</b>	-4000 to +4000 counts Zero Suppression: 45% of Span Zero Elevation: 15% of Span
<b>Span slope</b>	Positive
<b>Accuracy</b>	± 0.1% of reading ±1 count
<b>Display</b>	4½ digit LCD, 7 segment, with Character size of 10.2 mm
<b>Decimal point</b>	4 position jumper selectable
<b>Electrical connection</b>	Panel mount: Rear terminals Field mount: 1/2" NPT(F)
<b>Mechanical</b>	
<b>Enclosure</b>	Panel mount: ABS plastic Field mount: Style GR die cast aluminium weatherproof to IP:66 of IS:2147; Flameproof to Gr.IIA, IIB & IIC of IS:2148.
<b>Overall dimensions</b>	Panel mount: 96 x 48 x 116 mm Field mount: 140 x 110 x 125 mm
<b>Temperature</b>	Ambient: 0°C to 50°C