MODEL K-703

TWO WIRE PRESSURE TRANSMITTER

OPERATION

AND

INSTRUCTION MANUAL

Switzer Instrument Limited
Regd. Off: 29 (Old# 14), Thanikachalam Road, P.B.No.1423, Chennai 600 017

Internet web-site
www.switzerinstrument.com

Sales – Head Office
17 (Old# 9), South Boag Road, Chennai 600 017
Ph : 044-24340999 / 24343956 / 24344321
Fax : 044-24347887 **e-mail :** sales@switzerinstrument.com

Works
127 Sidco Estates, Chennai 600 098
Ph : 044-26242244 / 26242255 / 26243355
Fax : 044-26248849 **e-mail :** works@switzerinstrument.com

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INTRODUCTION

SWITZER Series K-703 Pressure Transmitters offer economical alternative to conventional transmitters without compromising either accuracy or performance to measure gauge pressure of liquids, gases and vapours. The process pressure is converted into standard analog dc signal of 4-20mA current proportional to the input pressure.

The transmitter utilize latest thin film technology and high stability electronics resulting in exceptional performance and endurance.

These transmitters are housed in fully stainless steel enclosure which are weatherproof to IP:66 and flameproof to Gr.IIA, IIB & IIC of IS:2148 for use in hazardous industrial environment.

PRINCIPLE OF OPERATION

The primary pressure sensing element for the detection is a silicon wafer on which ion implanted piezo-resistive elements are configured in a bridge form. The bridge elements are laser trimmed to unity ratio of corresponding arms.

The sensing wafer is suitably protected by 316 SS diaphragm. When the diaphragm is subjected to a pressure, the stress on silicon wafer produces a strain on the deposited bridge to give an electrical output when excited by constant DC current. The sensor is temperature compensated to ensure minimal drift with ambient and process temperature changes.

The mV output signal of the sensor is suitably conditioned to generate the 4-20mA output current proportional to pressure. The minimum voltage compliance is 9VDC.

INSTALLATION INSTRUCTIONS

K-703 Pressure Transmitter can be installed directly on to the pressure line. 2" pipe mounting option is also possible for which necessary mounting brackets with clamps are to be used. The process pressure connection can either be 1/2"NPTM or 1/4"NPTF. Both these threads are provided on the instrument for user convenience.

Use a 32mm A/F wrench at the hexagonal portion of the process connection to fix the transmitter on the pressure line.

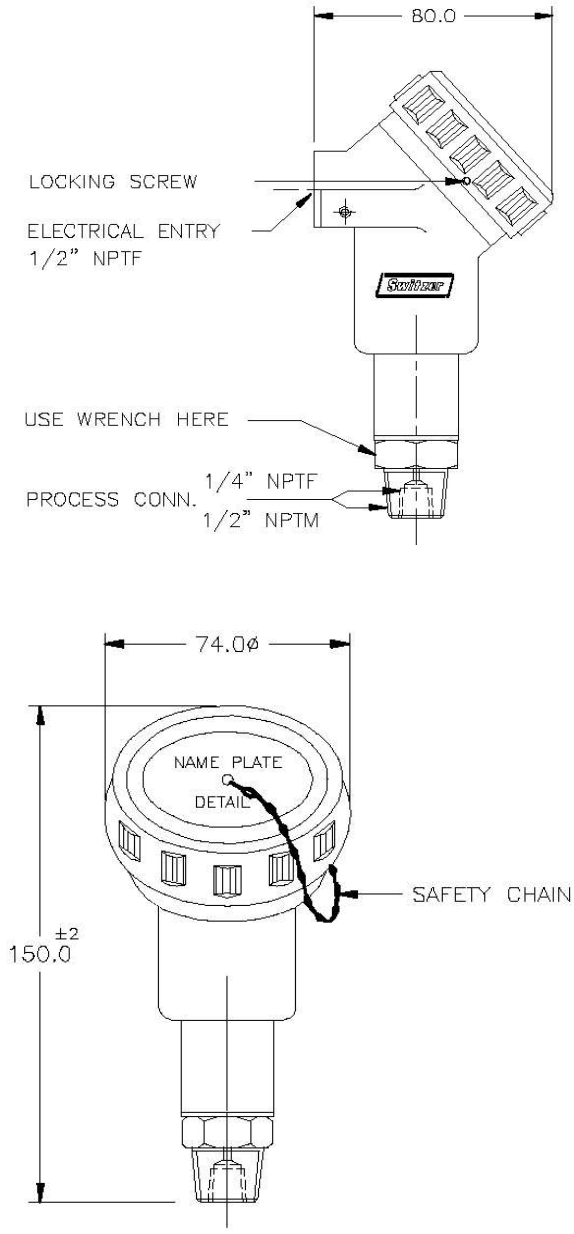
**** CAUTION***

Do not rotate the unit by holding the casting which may cause irreparable damage to the mechanical mounting of the pressure sensor and also to the internal wiring from the sensor to electronics. Warranty service shall not be applicable in cases of violation.

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: Dimensions



COVER LOCK

The 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 lock is provided by a grub screw fixed on the side of the cover. See above Figure for location. Clockwise rotation of the grub screw will lock the cover in place with the bottom housing. Anticlockwise rotation will loosen the grubscrew and cover can be freely unscrewed for removal.

The cover is NOT locked in position when the instrument is shipped after manufacturing.

**** CAUTION***

Do not rotate the cover with the grub screw tightened in position. This will cause irreparable damage to the enclosure threading and the cover may be jammed without further removal.

WIRING INSTRUCTION

The 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 ² wires.

The terminal is of 2-part type. The top plug can be pulled out for ease of wiring and inserted back with the bottom base which is soldered on to the PCB. The terminal is polarised and can be inserted only in one direction. *Do not force the top plug into the base in the wrong direction which may damage the connector polarisation.*

Below Wiring Connection Drawing is a typical arrangement for electrical connection to the transmitter. *There is no specific polarity to be considered for connecting to the transmitter* ***Terminals 1 & 2.*** Necessary protection are provided in the instrument to function normally, even when the connection to transmitter terminals are reversed from what has been shown below.

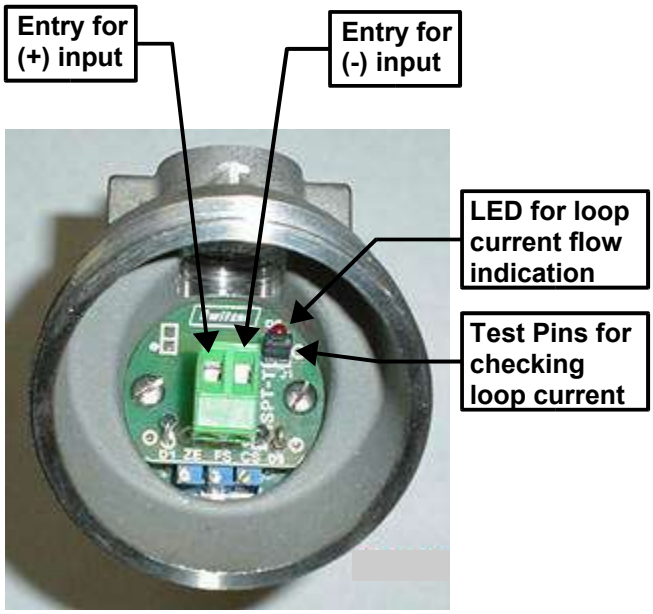
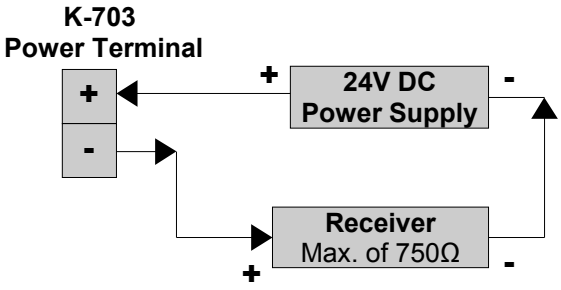


Fig-4: Wiring connection drawing



CALIBRATION INSTRUCTION

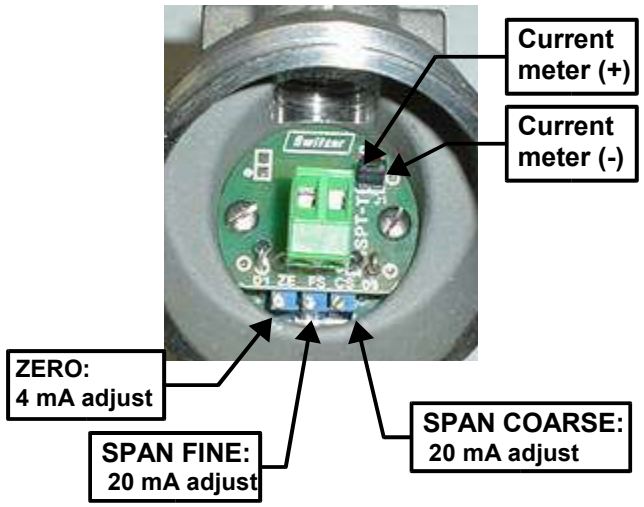
The pressure transmitters are factory calibrated to the required range and hence normally do not require any recalibration during installation. The following calibration procedure can be followed during any maintenance activity. Proper tools are to be used during calibration to ensure trouble free and precise performance of the transmitter.

Equipment required

1. A pressure source for the required range of the transmitter with an accuracy of 0.1% or better.
2. A 24VDC supply.
3. A 3-1/2 digit multimeter with 20.00 mA current range.

Calibration adjustment locations
See below picture for the potentiometer locations for calibration adjustments. 3 pots are provided for calibration.

1. ZERO for adjustment of 4 mA output
2. SPAN COARSE for coarse adjustment of 20 mA output
3. SPAN FINE for fine adjustment of 20 mA output



Procedure

1. Unscrew the cover of the transmitter housing.
2. Make the necessary pressure connection to the transmitter in the external 1/2" NPTM or internal 1/4" NPTF appropriately.
3. Initially vent the pressure to atmosphere.
4. Connect the supply wires to the terminals marked (+) and (-) appropriately as per the wiring diagram. This will also carry the 4-20 mA current output. The output current can be measured in 2 ways.

   (a) By Current meter in Series with Transmitter
   In this method the wiring need to be disconnected from the terminal to connect the current meter in series.

   (b) By connecting Current meter to the Test Pins
   This method enables to measure the current output without disturbing or disconnecting the supply wire by using the Test Pins provided. Remove the shorting link to access the Test Pins below the LED. Connect the current meter in the 2 Test Pins. Reverse connection of current meter will cause the meter reading to be negative.

5. Without applying any pressure, adjust the ZERO pot, for multimeter to read 4.00 mA.
6. Apply a pressure of 99% of the full range pressure, marked on the name plate of the transmitter.

7. Adjust the COARSE SPAN pot for the meter to read between 19.79 mA and 19.89 mA.

8. Trim the FINE SPAN pot for the precise output current of 19.84 mA.

9. Vent the pressure to atmosphere and check for 4.00 mA. Trim if necessary.

10. Check at various intermediate values for linearity.

11. This ends calibration.

TECHNICAL SPECIFICATIONS

ELECTRICAL

Output	4-20 mA
Range (in bar)	0 to 1, 2, 3.5, 7, 20, 35, 70, 200, 350
Power Supply	9 to 32 VDC, 24VDC nominal
Accuracy	± 0.2% calibrated span
Repeatability & Hysteresis	± 0.05% calibrated span
Output current limit	27mA (max.); 2.5mA (min.)
Load capability	750 ohms @ 24VDC
Zero temp co-eff.	± 0.03%/ºC of full scale wrt 25 ºC
Span temp co-eff.	± 0.03%/ºC of full scale wrt 25 ºC
Turn down ratio	4:1
Maximum pressure	2 times the rated pressure
Response time	< 100 m secs
Electrical connection	1/2” NPT(F)

MECHANICAL

Process connection	1/2” NPT(M)-External and 1/4” NPT(F)-Internal
Sensor diaphragm	316 SS
Enclosure	GD die cast stainless steel Weatherproof to IP:66 of IS:2147 Flameproof to Gr.II-A, II-B & II-C of IS:2148.
Mounting	Direct on line; 2” pipe optional
Overall dimensions	150 x 80 x 74 mm
Weight	960 gms

TEMPERATURE LIMITS

Process	0ºC to 100ºC
Ambient	0ºC to 70ºC

MAINTENANCE INSTRUCTIONS:

There are no user serviceable parts in this transmitter. The transmitter may need only a recalibration occasionally. Recalibration can be done at site by following the procedure as described earlier.

Keep the sensor port clean to enable accurate measurement. If there is any clogging of the port with any debris, remove it gently with a tweezer. Do not use any sharp tool that can damage the diaphragm. Non-corrosive solvents can be used for cleaning the pressure port such as iso-propyl alcohol.

Return instrument to factory if there is any malfunction.