

# INSTALLATION INSTRUCTIONS

## Model 370 DGC, DIAPHRAGM INSTRUMENTS

### DIFFERENTIAL PRESSURE INSTRUMENT / SWITCH



For efficient working of your instrument, please read all instructions carefully before attempting to install. Ensure that this manual is close to the instrument.

#### WARNING!

**Hazard Warning:** Please ensure that the electrical connections are handled by trained personnel. Please ensure that local safety laws for prevention of accidents are followed during handling of electrical connections. Failure to connect Earth port may result in serious injury.

**Caution:** Do not exceed maximum operating pressure given on the instrument label.

**Compatibility:** Check fluid compatibility with wetted parts before use. For highly corrosive media, hazardous location or area please contact manufacturer.

**Liability:** In case of damage caused by incorrect use, failure to comply with manufacturer's instruction, failure to comply with local accident prevention safety laws and last but not the least handling by untrained personnel, the liability of Manufacturer is null and void.

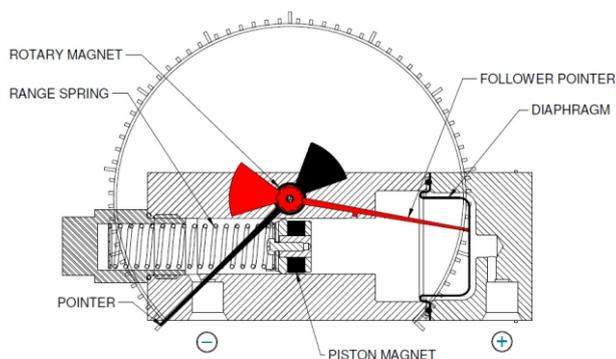
#### OPERATING PRINCIPLE

High (Liquid side) and Low (Gas side) pressures are separated by a sensor assembly consisting of a magnet, diaphragm and a range spring. The difference in pressure causes the sensor assembly to move in proportion to the change against a range spring.

A rotary magnet, located in a separate body compartment and isolated from the acting pressures, is rotated by magnetic coupling as per the linear movement of the sensor assembly. A pointer attached to the rotary magnet indicates differential pressure on the dial.

**SWITCH :** Reed switches are located adjacent to the pressure chamber and are activated by the magnetic field of the sensor assembly.

**Note :** The instruments are calibrated to give  $\pm 2\%$  full scale accuracy on ascending readings.



#### MOUNTING OF INSTRUMENT

##### Hex bolt:

Please ensure that suitable hex bolt (wherever applicable) are used for mounting the instrument using bracket. Please ensure that the minimum thread engagement of the bolt is observed so that the mounted instrument is stable. Bolt size is marked on gauge.

##### Other types of mounting:

The instrument can also be mounted on 2 inch horizontal or vertical pipe using U-hook. Accessories including bolts will be provided when such type of mounting is ordered.

##### Responsibility of end user:

It is the final responsibility of the end user to ensure that the mounted instrument is stable. Incorrectly mounted instrument can cause injury.

**DISPOSAL:** Please ensure that local environment safety laws are observed during the safe disposal of this instrument.

#### INSTALLATION

For better performance the instrument should be mounted horizontally by keeping the dial vertical. Two mounting holes should be used for mounting (wherever applicable). Select instrument location where it is not subjected to heavy vibrations or shocks.

Depressurize the system and connect the high and low pressure lines of your system to the " High "(+)(Liquid side) & " Low "(-)(Gas side) ports of the instrument, respectively.

It is recommended to use "O" rings with male connectors to avoid excessive tightening and to prevent leakage (For parallel threads),

For taper thread, use Teflon<sup>®</sup> tape or thread sealant. The instrument is now ready for operation.

Apply "High"(Liquid side) and "Low"(Gas side) pressures simultaneously, to avoid damage to the internal parts.

Instrument consists of a rolling diaphragm to sense the pressure difference. It can withstand maximum operating pressure from high side & temperature as mentioned on the label for all DP ranges.

If pressure exceeds the rated maximum pressure, "O" rings used on male connectors, diaphragm and the seal inside the pressure chamber, will be damaged. If maximum operating pressure is within the allowable limit, but the differential pressure exceeds instrument range, there will be no damage to the instrument. Pointer will only go to the extreme right end of the scale. Pointer will reset when surge reduces.

#### PRECAUTIONS

Do not connect "High"(Liquid side) and "Low"(Gas side) ports to wrong pipe ends. Do not subject the instrument to excessive vibration.

The instrument is never to be used in an area where a magnetic field is present. It may show wrong readings.

As the instrument works on magnetic coupling -

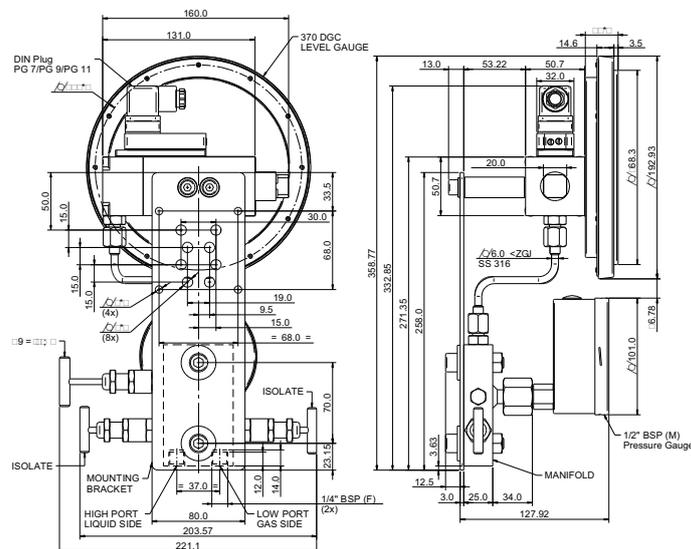
-Make sure instrument is atleast 50mm away from ferrous materials (from all sides).

-For panel mounting cutout for all sizes please contact factory.

Do not try to open any part of the instrument for any reason, because if not reassembled properly calibration will be affected.

Remnants of the media in the instrument can cause injury to people and damage to environment. Follow local accident prevention laws. Please ensure that the instrument is dismantled once the system is depressurized.

Ensure that media and ambient temperature remain within 0-80 degree Celcius unless differently specified on gauge label.

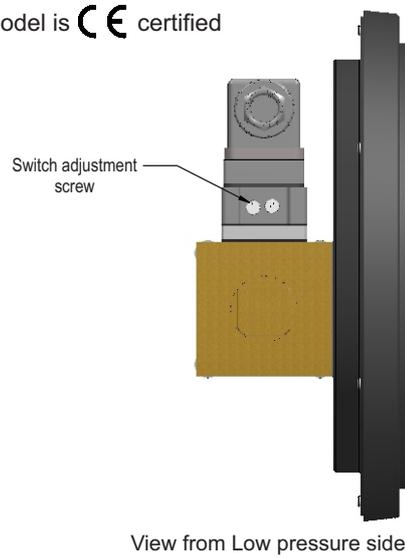


**SWITCH SETTING :**

Please follow these instructions when your differential pressure instruments are supplied with switch.

*Caution:* Supply should not exceed switch rating. For higher supply, use of relay circuit is recommended. The switches are normally factory set to save time at customer's end. However they are field adjustable.

This model is  certified



**REED SWITCH SPECIFICATIONS :**

Reed switch type	Max. VA	Max. voltage V AC/DC	Max. Current Amps.
SPST	10	100	0.5
	40	230	1
	100	300	1
	60	240	3
SPDT	3	30	0.3
	5	125	0.25
	5	175	0.25

**SWITCH ADJUSTMENT**

Switch adjustment screw is located on plastic cover.

Rotate the screw anti-clockwise to increase the set point and clockwise to decrease the set point.

One or two trials may be necessary to attain the exact set point.

Above procedure to be followed by putting the instrument on test bed or while in actual service.

**Note:** Instrument and switch has IP65 protection.

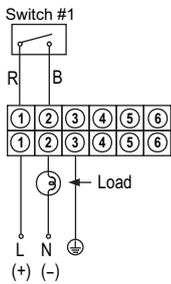
PG7 or PG 9 glands provided for cables. Use cable sizes dia 3 to 6.5 mm and dia 4 to 8 mm respectively.

**SPST SWITCH**

Switches are provided as per customer requirement. Please refer gauge label for switch specification.

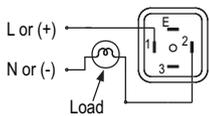
**One SPST switch**

Reed switches & terminal strip connection

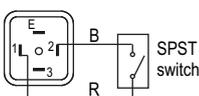


Reed switches & Din plug connection

View of socket for supply connections

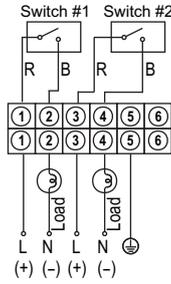


View of plug after removing the socket



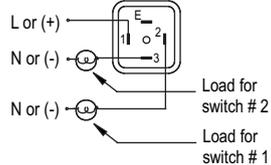
**Two SPST switches**

Reed switches & terminal strip connection

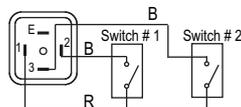


Reed switches & Din plug connection

View of socket for supply connections



View of plug after removing the socket

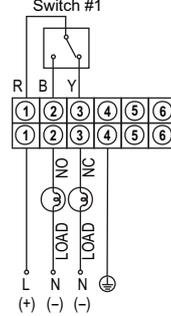


**SPDT SWITCH**

Switches are provided as per customer requirement. Please refer gauge label for switch specification.

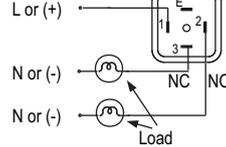
**One SPDT switch**

Reed switches & terminal strip connection



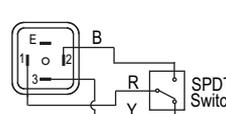
Reed switches & Din plug connection

View of socket for supply connections



Circuit diagram-1

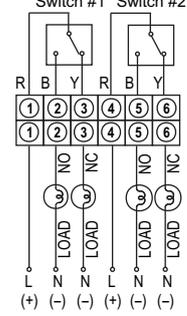
View of plug after removing the socket



Circuit diagram-2

**Two SPDT switches**

Reed switches & terminal strip connection (for earth, see note)



Reed switches & Din plug connection

Refer Circuit diagram 1 & 2 for connection.

**Note:** For terminal strip option

*Caution :* Chassis ground is provided on exterior of the gauge, not in the connector. It is the responsibility of the end customer to connect ground wire to chassis ground provided. 

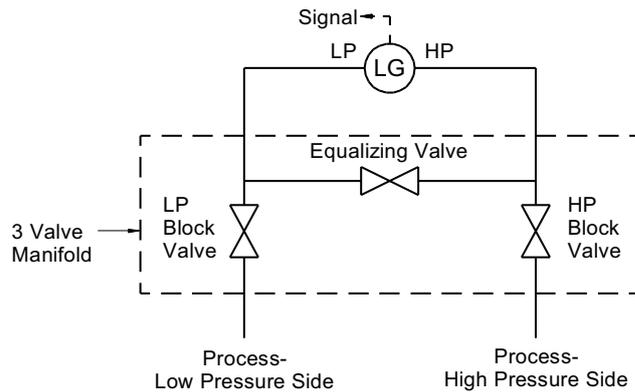
R=Red, B=Black, Y=Yellow, L=Live or +ve supply, N=Nutral or -ve supply, ⊕earth connection

\*Teflon TM of Chemours company

Form MKT:13/Ver 1

### 3 VALVE MANIFOLD OPERATING INSTRUCTIONS :

During normal operation, the equalizing valve is closed and the two block valves are open. When the Level Gauge is put into or removed from service, the valves must be operated in such a manner that very high pressure is never applied to only one side of the DP capsule.

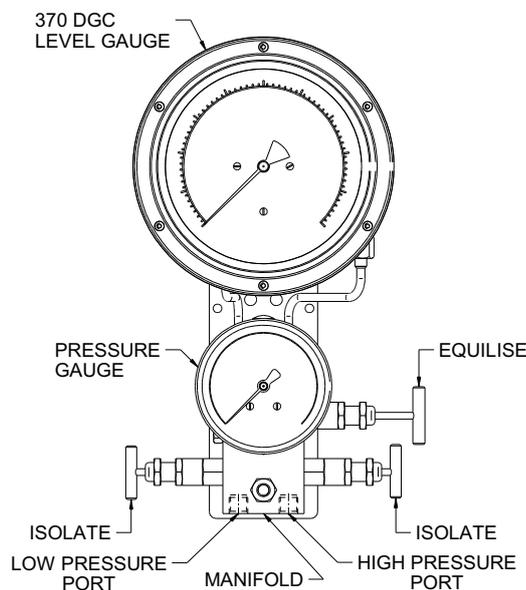


#### Operational Sequences of Three-Valve Manifold Valving Level Gauge into Service:

To valve a Level Gauge into service an operator would perform the following steps:

1. Check all valves are closed.
2. Open the equalizing valve – this ensures that the same pressure will be applied to both sides of the Level Gauge, i.e., zero differential pressure.
3. Open the High Pressure block valve slowly, check for leakage from both the high pressure and low-pressure side of the Level Gauge.
4. Close the equalizing valve – this locks the pressure on both sides of the Level Gauge.
5. Open the low-pressure block valve to apply process pressure to the low-pressure side of the Level Gauge and establish the working differential pressure.
6. The Level Gauge is now in service.

Note it may be necessary to bleed any trapped air from the capsule housing.



#### Removing Level Gauge from Service:

Reversal of the above steps allows the Level Gauge to be removed from service:

1. Close the low-pressure block valve.
2. Open the equalizing valve.
3. Close the high-pressure block valve.

The Level Gauge is now out of service.

Note the Level Gauge capsule housing still contains process pressure; this will require bleeding.