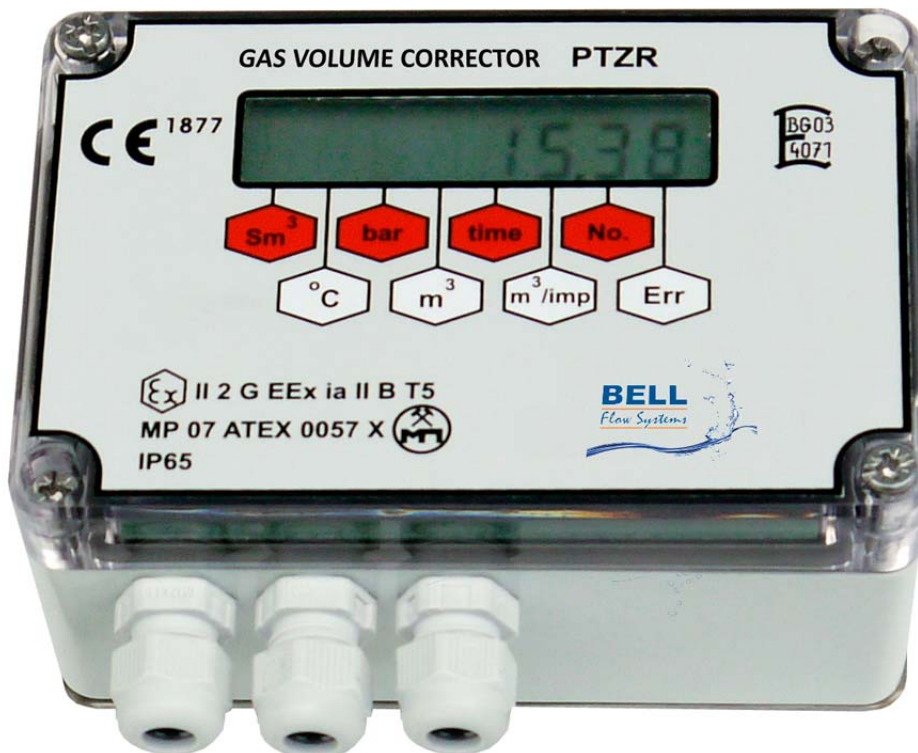


Electronic Gas Volume corrector model PTZR



1. Introduction

The following user manual gives information about the installation, configuration, usage and storage of the electronic gas volume corrector model PTZR

2. Function

The electronic gas volume corrector PTZR is designed for the measurement of natural gas volume flow. The device measures the pulses sent from a natural gas volume flowmeter. The PTZR corrects the flow in accordance to the base temperature and pressure of the territory where the device is used.

3. Kit Contents

The electronic corrector PTZR is an automatic device for natural gas flow volume correction . The kit supplied includes a transmitter for absolute pressure and RTD sensor & pocket for gas temperature measurement. The device enclosure is suitable for wall mounting or as a stand-alone unit mounted on a metal plate.

4. Technical specifications

PTZR has the following specifications:

1. Dimensions: 120 x 80 x 55 mm
2. Mounting: wall or panel mount, protection IP 65
3. Power supply: 3.6 V:: Li battery
4. Ambient temperature: - 25 to + 40 °C
5. Ambient barometric pressure: from 86 kPa to 106 kPa

Input channels

1. Pressure range: up to 16 bar
2. Temperature range: from – 20 °C to + 50 °C
3. Pressure measurement accuracy: 0.25 % F.S.
4. Temperature measurement accuracy: 0.5 % F.S.
5. Maximum impulse frequency: 10 Hz

NOTE: The pressure transmitter is ONLY suitable for gas pressure measurement.

The multifunction LCD screen of the PTZR displays the following information:

1. Total corrected flow (m³) – shown with eight digits
2. Temperature value (°C): X X . X
3. Absolute pressure value (bar): X X . X X X
4. Non corrected flow (m³) – 8 decimal digits format X X X X X X X X X
5. Flow meter constant (m³ for 1 impulse):
X X . X X X
6. Real time clock. Displayed in two parts:
Y Y Y Y . M M . D D and h h . m m
7. Error codes:
LoBat – low battery

Message **Err** is shown on the screen while displaying the temperature or the pressure in case of a break or short circuit in the corresponding circuit.

In error message display mode: the prompt (-----) is shown if the voltage of the battery is within tolerable limits; the prompt (**LoBat**) is shown if the battery voltage falls below the minimum limit.

8. Device Features

The electronic gas volume corrector model PTZR has the following features:

- ~~RS~~RS232 Interface for connection to a PC
- Archive for corrected and non corrected flow – values saved every hour for a week
- Indication of unauthorized front lid/facia removal.
- Ex-proof - (EX) ia IIc T5
- Battery power supply (up to 10 years)
- Programmable parameters accessible by authorized personnel:
 - Flow meter constant
 - Nominal temperature
 - Nominal pressure
 - Nominal super-compression coefficient
 - Temperature input type (Pt 100, Pt 1000, Pt 500, Cu)
 - Serial number
 - Gas properties

5. Operating principle

PTZR is a microprocessor driven device for gas volume measurement. This quantity may be corrected using different parameters. The measured values are saved and are accessible through the digital display or the serial interface. The gas correction is carried out in accordance with the formula:

$$V_c = V \frac{P \cdot T_b \cdot Z_b}{P_b \cdot T \cdot Z}$$

where:

V_c(m³) – corrected flow

V(m³) - non corrected flow

T_b(k) – basic temperature (15°C)

P_b(bar) – basic gas absolute pressure (1.01325bar)

Z_b(-) – compression factor while in basic conditions

P(bar) – gas absolute pressure

T(K) – gas absolute temperature

Z(-) – gas compression factor at current pressure and temperature

The analogue signals: temperature and pressure – are transmitted to the device from the sensors included. The PTZR converts these signals to a digital format and all the units calculations , data storage etc are then performed digitally.

The PTZR counts the pulse signal for the non corrected gas volume from the gas flow meter (usually a reed switch contact).

6. Technical maintenance and setting-up

PTZR is a programmable device delivered ready for use. The built-in interface allows the construction of a network of data collecting devices. It also provides easy configuration and setup of the device. The corrector consists of a battery powered unit mounted in a special box, complete with pressure sensor and temperature sensor. The display of the values on the LCD screen is toggled automatically. The device does not have control buttons so the parameter shown on the display is changed every 5 seconds. There is additional indication of measuring units and the meaning of the value that is shown on the LCD display at that time.

The maintenance of the PTZR consists of data retrieval (visually or through the interface) and scanning / storage of the input values and the calculated values. The setting-up of PTZR is performed via the serial channel. The settings and parameters, as well as the system error messages, can be accessed only by authorized personnel.

7. Instructions for initial setting-up

PTZR is mounted in a plastic case with IP65 protection. The connection terminals are located in the lower part of the box. The box is mounted on a metal plate using 4 screws, then plate can be mounted on a wall or panel using 2 screws. Mounting the device this way excludes the unauthorized opening of the case. The cables from the pressure transmitter, temperature sensor and flow meter reed contact are connected to PTZR through the cable glands fitted to the enclosure.

The cables should be connected to the device only by authorized personnel in accordance with a previously approved connection diagram. The connection diagram is shown at fig.1.

The correct use of the device is determined by its configuration, which is why the configuration should only be performed by previously trained personnel.

The configuration mode can be entered by:

- Password
- Editing

8. Safety instructions

PTZR is mounted in a special 'electronically sealed' case. The seal prevents any unauthorized access. A message appears on the display if the enclosure has been opened.

Enclosure lid removal is prohibited! Changes to the schematics and the software of the device are forbidden!

The battery should be changed by authorized and trained personnel only, and never within a hazardous zoned area. The device must be promptly sealed again after this.

The battery has to be changed periodically (every 10 years) or when the prompt “LoBat” appears on the display.

PTZR does not have control buttons and has an ingress protection rating to IP65. The device should be cleaned with soapy water only. Do not clean the box with solvents or similar because they could damage the important information on the front facia and labels located elsewhere

CAUTION! Do not rub the enclosure. Any dust has to be removed from the device using a damp cloth. This limits the potential of generating hazardous static / electrical charges.

9. Storage and transportation

The device can be transported by car, train or airplane subject to governing rules and laws surrounding the transportation of electrical equipment and also the internal Lithium battery. The PTZR corrector should be shipped and/or stored in sturdy box in a dry location.

10. General instructions

The electronic gas volume corrector model PTZR is packed and programmed by the Manufacturer. The wiring and the initial set-up should be performed only by authorized personnel (with a certificate from the manufacturer).

The wiring of the temperature sensor, absolute pressure sensor and the inputs from the flowmeter reed switch contact is shown in **fig.1**.

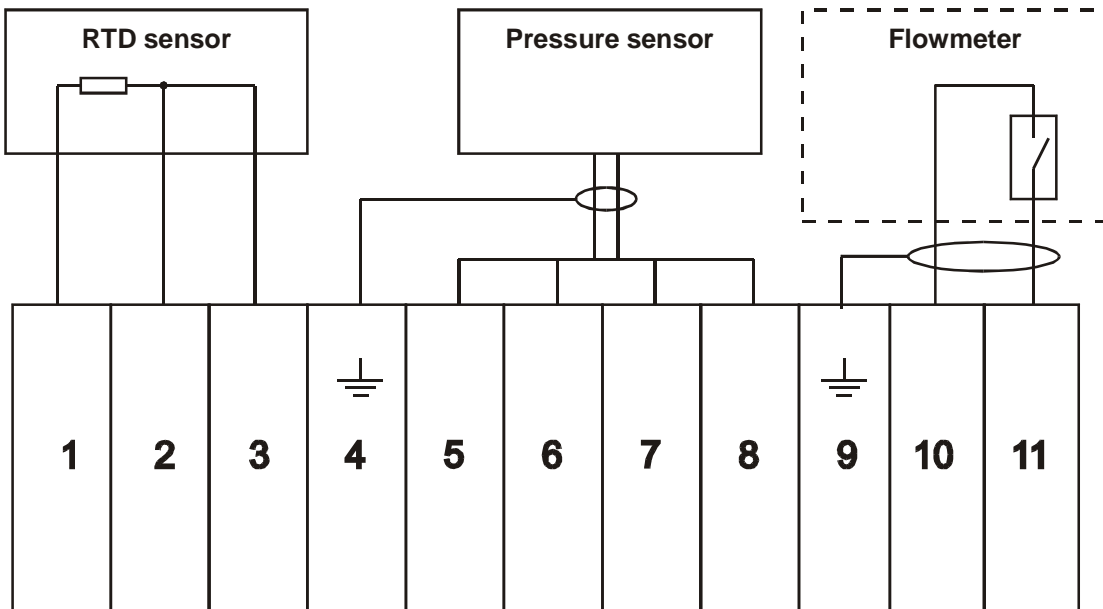


Fig.1

The meaning of the terminals is specified in **table 1**.

| Temperature sensor 3-wire connection | |
|---|--|
| 1 | Terminal 1 – separate end of the temperature sensor Terminal 2 and 3 – common end |
| 2 | |
| 3 | |
| Pressure sensor | |
| 4 | - GND – cable shield |
| 5 (blue) | - sensor power supply |
| 6 (white) | - sensor output |
| 7 (green) | - sensor output |
| 8 (red) | - sensor power supply |
| Flowmeter impulse input | |
| 9 | - GND – cable shield |
| 10 | - input dry contact |
| 11 | - input dry contact |

Table 1

NOTE: The serial number of the connected to DGVC-04 pressure sensor model SPG01-Ex must be **identical** with the serial number of the corrector.

11. Mounting

PTZR is suitable for wall or panel mounting (see **fig.2** below).

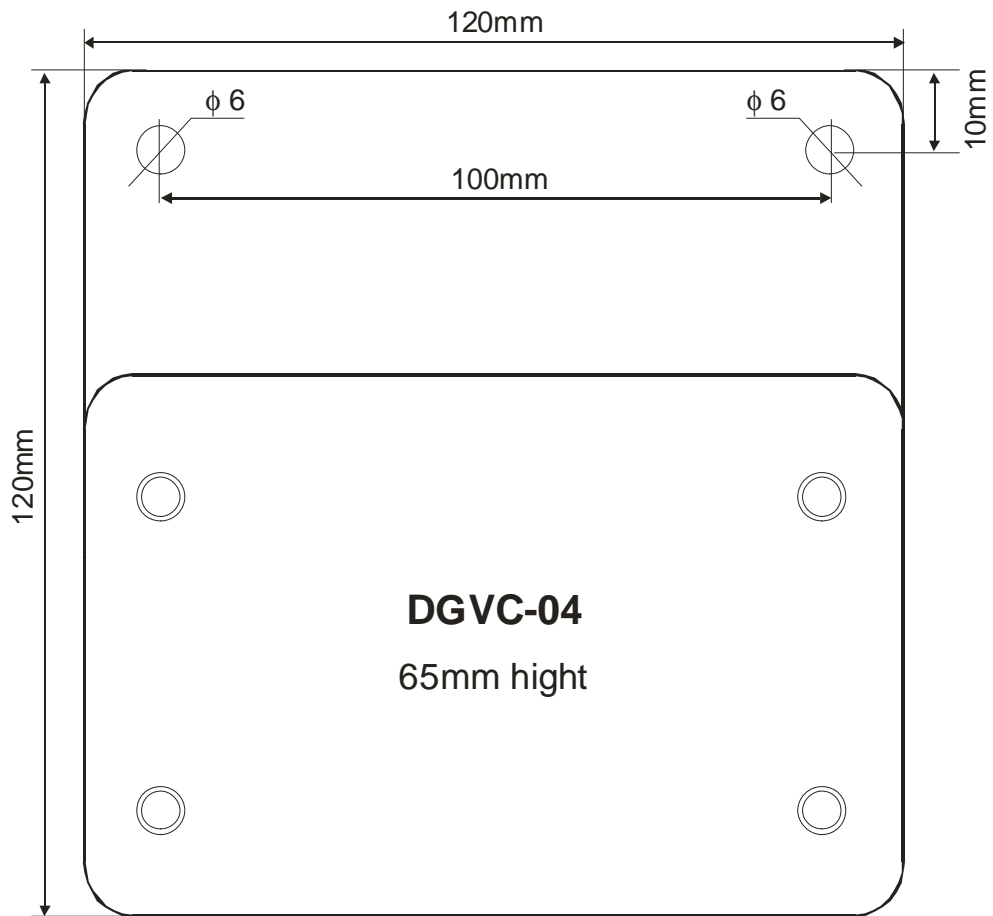


Fig. 2



PRESSURE SENSOR model SPG01 - Ex

- *Stainless steel case*
- *For use only with 1/8" gas volume corrector model RV\ T*
- *Electrical connection G 1/4"*
- *Ex CVGZ rated - (Ex) ia IIC T5*



TECHNICAL SPECIFICATION AND USER MANUAL

DESCRIPTION

The pressure sensor SPG01-Ex transmits the pressure applied to it into an electrical output signal. It should **ONLY** be used with the Electrical gas volume corrector model PTZR and **ONLY** for gas pressure measurement.

The construction of the sensor permits easy mounting and connection through a standard thread G 1/4". The electrical connection is via PG7 cable gland using 4-wire shielded cable with $\phi 5\div 7$ mm.

OPERATING PRINCIPLE

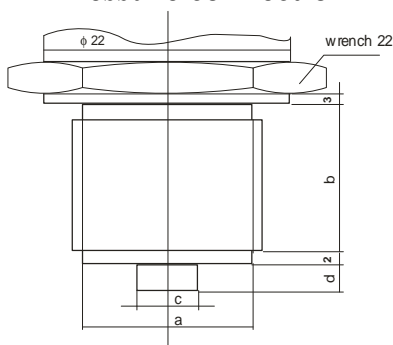
The SPG01-Ex sensor uses a piezo-element for pressure measurement. A special micro-power electrical amplifier is built-into the Electrical gas volume corrector model PTZR. Precise temperature compensation of the zero and span is provided by the RTD.

TECHNICAL SPECIFICATIONS

| | |
|---|---|
| Working media | gas |
| Ranges | on request – from 0÷1bar to 0÷16bar absolute pressure |
| Accuracy | 0.25% F.S. |
| Non-linearity error | < 0.15% F.S. |
| Additional temperature error | < 0.05 % °C |
| Ambient temperature | 0 ... 23°C ... 55°C |
| Overload | up to 150% F.S. |
| Protection | IP65 |
| Electrical connection | 4-wire shielded cable 1.5m length |
| Electrical isolation between the body and the terminals | > 20MΩ - voltage up to 50V DC |
| Mounting | G 1/4" x 18 thread |
| Working position | Any |
| Dimensions | φ 27, maximum length 70mm (without the fitted cable glands) |
| Max weight | < 0.2 kg |

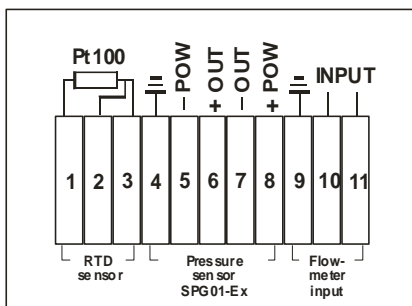
CONNECTION DIAGRAM

Pressure connection



| a | b | c | d |
|------|----|-----|---|
| 1/4" | 12 | φ 5 | 3 |

Electrical connections



PTZR

Terminal No.: 4 – shield
 5 – blue
 6 – white
 7 – green
 8 – red

NOTE: The serial number of PTZR connected pressure sensor model SPG01-Ex must be **identical** with the serial number of the corrector.