



ATEX INSTRUCTION MANUAL

PRESSURE GAUGES TYPE 30

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| Audit | | |
|--------|------------|---|
| Number | Data | Description |
| 0 | 26/06/2014 | Prima emissione - First issue |
| 1 | 17/01/2017 | From ATEX 94/9/CE to new release ATEX 2014/34/EU - No technique changes |
| 2 | 19/06/2023 | Marking strings updated according to EN80079-36 and new definition of temperature classes |



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You must read carefully all the instructions of this manual. You must not start the installation before taking these instructions into account.

This equipment might receive some hazardous voltages. If you do not consider these instructions, you risk facing serious corporal and/or material injuries.

Before setting up your installation, check the model suit your application. The wiring of this equipment must be executed with the in force rules by a qualified staff.

1. GENERAL WARNINGS

1.1. Premise

Before installation of the instruments follow the recommendations listed in European normative EN 837-2.

In particular is necessary to check if:

- Required security level is compatible with the safety markings indicated on instrument dial.
- Process fluid is compatible with wetted parts indicated on instrument dial.

Warning

When instrument is installed on dangerous fluids like oxygen, acetylene, or fluids that are inflammables or toxics or dangerous for the environment, please check carefully that instrument is suitable for these applications.

Especially for use with oxygen the instrument dial must show the word "OXYGEN" and the international symbol of "Oil-free". Pressure gauges must not come in contact with oils or greases not compatibles with oxygen.

In the event of installation in potentially explosives atmospheres, the instrument dial must show the markings foreseen from ATEX 2014/34/EU directive. Installation is possible only following the rules foreseen.

1.2. Notes on applicability of pressure devices directive (PED 2014/68/EU)

BART pressure gauges 30 are considered "pressure accessories", according art. 1 clause 1.2.4.

Instruments with static pressure higher than 200 bar are manufactured according A module of the directive and must have CE logo on dial.

Instruments with static pressure lower than 200 bar must not be marked with CE logo but are manufactured according to art. 3 clause 3 "sound engineering practice" (SEP).

1.3. Materials

Wetted parts: Stainless steel 1.4571 / 1.4404

Movement: Stainless steel

Dial and pointer: Aluminium

Case, bezel ring : Stainless steel

Seal and Gasket: FKM

Window: Laminated safety glass

1.4. Instrument measuring range

Verify that measuring range of instrument is suitable with working conditions of the pressure circuit/plant. Normal operating pressure must be:

- Within 75 % of dial range for steady pressures
- Within 60 % of dial range for pulsating pressures

The choice of non-suitable range, or not suitable model, or non-suitable installation, causes not proper functioning and shorter working life of instrument.

1.5. Admitted over pressures

Accidental over pressures are admitted for short periods, provided that they remain within the values indicated in the catalogue.

1.6. Ambient temperature

Instruments are designed to work with an ambient temperature between -30°C/+65°C (-22°F/+149°F). It is recommended to verify that the pressure gauge installation position is not subject to direct heat sources, both for convection or radiation: if this is not possible, please foresee a protective screen. Temperature variations of sensing element, compared with reference temperature, cause indications drift (accuracy errors) lower than ± 0.4 % of read value, every 10 °C of ambient temperature variation.



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1.7. Process fluid temperature

Instruments are designed to work with a process fluid temperature within $-40^{\circ}\text{C}/+200^{\circ}\text{C}$ ($-40^{\circ}\text{F}/+392^{\circ}\text{F}$).
If instrument is filled with dampening fluid, maximum temperatures admitted of process fluid, are indicated in table 1.
In event of installations on steam, we recommend to follow installation sketches of Figure 1 and suggestions indicated in paragraph 2.3.

1.8. Mechanical vibrations

Verify that chosen position for the installation is not subjected to continuous mechanical vibrations, because this will cause accuracy errors and shorter working life of instrument.
Where required, a decoupling from the mounting location can be achieved e.g. by a flexible connecting line from the measuring point to the pressure gauge and mounting via a measuring instrument bracket.
If this is not possible, it is recommended to use instruments filled with dampening liquid and the following limits must not be exceeded:

| | |
|----------------------|--|
| Dry gauges | Frequency range < 150 Hz Acceleration < 0.7 g (7 m/s ²) |
| Liquid-filled gauges | Frequency range < 150 Hz Acceleration < 4 g (40 m/s ²) |

The liquid filling has to be checked on a regular basis.
The liquid level must not drop below 75% of the gauge diameter

1.9. Pulsating pressures

In the event that instrument is subjected to pulsating pressures, please foresee a dampening protection, like mechanical dampeners (screw type or porous disc type) or restriction screw inserted into the socket. These accessories are available upon request.

1.10. Installation in potentially explosive atmospheres (gas and dust)

The instrument can be installed in potentially explosives atmospheres only if on dial are indicated the markings showed on figure 1. The temperature classification of the instrument depends only from the working conditions (maximum ambient and process fluid temperature). The differential pressure gauges series 30 35 3W does not contain any potential ignition source
Dial marking




II 2G Ex h IIC T6..T2 Gb X
II 2D Ex h IIIC T85°C..T215°C Db X
T. Amb -30+65°C

Explanation

| | |
|-------------------------------|--|
| II | equipment intended for use on the surface - <i>apparecchiature destinate all'uso in atmosfera esplosiva in superficie</i> |
| 2G - 2D | suitable for installation in zone 1 and 2 for gases, zone 21 and 22 for dust - <i>idoneo all'installazione in zona 1 e 2 per I gas, zona 21 e 22 per le polveri</i> |
| Ex h | Protection mode in accordance with EN80079-36/37 norms - <i>Modo di protezione in accordo alle norme EN80079-36/37</i> |
| IIC - IIIC | Product suitable for installation in the presence of fluids/gases of Group IIC (no limitation) and dusts of Group IIC (both conductive and non-conductive) - <i>Prodotto idoneo ad essere installato in presenza di fluidi/gas del Gruppo IIC (nessuna limitazione) e polveri del Gruppo IIC (sia conduttive che non conduttive)</i> |
| T6..T2 - T85°C..T215°C | Temperature classes and maximum possible surface temperatures - <i>Classi di temperature e massime temperature superficiali possibili</i> |
| X | For class definition see table 1 - <i>Per la definizione della calvedere tabella 1</i> |



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Table 1 –

| Ambient Temperature | Max process temperature | | | Temperature class | |
|---------------------|-------------------------|---------------|-------------|-------------------|--------|
| | Dry | Liquid filled | | Gas | Dust |
| | | Glycerine | Silicon Oil | | |
| -30+65°C | 75°C | 60°C | 75°C | T6 | T85°C |
| | 90°C | 80°C | 90°C | T5 | T100°C |
| | 125°C | 100°C | 125°C | T4 | T135°C |
| | 185°C | 100°C | 185°C | T3 | T200°C |
| | 200°C | 100°C | 200°C | T2 | T215°C |

2. INSTALLATION

Nominal position per EN 837-1 / 9.6.7 Figure 7: 90° ()

Pressure connections: lower mount parallel in-line (with special versions back mount)

In order to ensure that pressure can be safely and reliably vented through the case back, a distance of at least 25 mm as to remain free behind the case!

In order to avoid any additional heating, the instruments must not be exposed to direct solar irradiation while in operation!

With filled versions the ventilating valve at the top of the case must be opened or cut prior to commissioning!

2.1. Process connections

For the process installation of the instrument, we recommend to use the key flat foreseen on the instrument socket.

WARNING Do not use the case for to screw or lock the instrument to the process connection.

In the event that instrument will be surface or panel mounted, it is necessary to foresee a flexible piping to connect it to the process.

The sealing of process connection is normally guaranteed by using:

- A flat gasket, if using cylindrical connections
- A sealing material, such as PTFE tape, if using tapered connections (NPT or BSPT).

The serration torque depends only from gasket type.

WARNING: When pressure is applied for the first time to the mounted instrument, please check the sealing of the connection, especially when instrument is mounted with dangerous and/or toxic and/or aggressive fluids. Please be very careful with this check, if process fluid is dangerous

2.2. Panel (flush) or surface (wall) mounting

For panel or surface mounting consider that a space of about 25mm. must be leaved free between the back side of instrument and the wall. This permits the exit of the safety blow out disc.

2.3. Mounting on steam applications (FIGURE 1)

When instrument is used on steam applications is necessary to foresee a coil siphon, mounted between process and instrument connection. The coil siphon must be filled with water, for to avoid that steam enter into the instrument.

In the event that instrument is occasionally subjected to vacuum, is necessary to shape the process piping in a way that the coil siphon remain always water filled. The possible accuracy error, given from weight of water column, could be compensated by using the micrometric adjustment on the pointer (see paragraph 4.1).

3. CALIBRATION AND CHECK

As good practice, is better to make a complete check of the instruments once or twice per year.

The calibration check is normally made by comparing the instrument with a suitable test instrument. Check is carried out on the main divisions of the dial, following the prescription of European normative EN 837.

It is possible to make a fast check of functioning and accuracy of the instrument, verifying the pointer indication at beginning of scale (zero indication).

If zero pointer indication, at atmospheric pressure, is within the 2% of range, it will be highly probable that instrument is in good efficiency. A zero drift of more than 2% could mean a stress fatigue of the instrument.

Every pressure gauge that has been subjected to abnormal working conditions must be substituted.



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4. MAINTENANCE

The instrument doesn't need any particular maintenance.

In case of damage please repair or replace immediately the pressure gauge.

The indicator should be checked once or twice every 12 months, disconnecting from the process to check with a pressure testing device.

Do not lubricate the moving parts because this could attract dust and to form particles and impurities that could produce malfunctions or accuracy errors.

4.1. ZERO ADJUSTMENT OF INSTRUMENT

If the instrument needs zero adjustment, after removing bayonet ring and transparent, is necessary to act on the micrometric screw, situated on the pointer. We suggest to use proper tools for to open the bayonet ring, if this results strongly closed. (eg. opening belt).

4.2. INSTRUMENT WITH LIQUID FILLING

The level of dampening fluid must be periodically controlled. If a further filling is necessary, we recommend however to don't fill over 75 % of case diameter.

4.3. CLEANING

The instruments external should be cleaned with a damp cloth moistened with soap solution to remove dust.

Internal cleaning, necessary in case you need to verify calibration with an hydraulic press, could be made by using compressed air inside the socket hole. Please be careful to the process fluid traces that could remain inside the sensing element, especially if fluid is toxic or dangerous.

5. PUT OUT OF SERVICE

Before to dismount the instrument from the working circuit is necessary to control that:

- Instrument is isolated from process fluid
- No pressure is present inside the instrument
- Temperature of the case is not excessive

Please be careful to the process fluid traces that could remain inside the sensing element, especially if fluid is toxic or dangerous.

6. DEMOLITION

The instrument is essentially made in stainless steel. Therefore, after removing transparent, gasket, plugs and after removing all the process fluid traces from the wetted parts (especially if fluid is dangerous for peoples or ambient) the instrument could be recycled or scraped

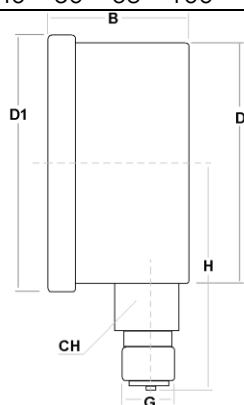


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Bottom Connection

Dial 40 – 50 – 63 – 100 – 150



| Nominal Dial | Dimension mm. | | | | | | connections G | Weight (Kg) Empty/Filled |
|-----------------|---------------|--------|--------|--------|----|-----------|------------------|-----------------------------|
| | B | D1 | D | H | CH | | | |
| 40 | 12,00 | 45,00 | 41,00 | 41,50 | 11 | 1/8" BSPT | 0,062/0,135 | |
| 50 | 30,00 | 59,00 | 51,50 | 55,00 | 14 | 1/4" BSPP | 0,100/0,175 | |
| 63 | 29,80 | 66,60 | 62,50 | 57,40 | 14 | 1/4" BSPP | 0,135/0,200 | |
| 100 | 46,60 | 110,90 | 98,70 | 93,60 | 22 | 1/2" BSPP | 0,490/0,680 | |
| 150 | 50,00 | 159,00 | 148,80 | 126,60 | 22 | 1/2" BSPP | 0,960/0,000 | |

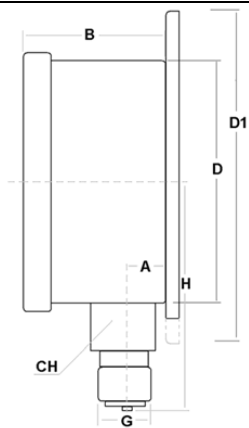


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Bottom Connection with wall flange

Dial 40 – 50 – 63 – 100 – 150



| Nominal Dial | Dimension mm. | | | | | | Connections G | Weight (Kg) Empty/Filled |
|--------------|---------------|-------|--------|--------|--------|----|------------------|-----------------------------|
| | | B | D1 | D | H | CH | | |
| 40 | | 12,00 | 62,30 | 41,00 | 41,50 | 11 | 1/8" BSPT | 0,062/0,135 |
| 50 | | 30,00 | 72,00 | 51,50 | 55,00 | 14 | 1/4" BSPP | 0,100/0,175 |
| 63 | | 29,80 | 84,50 | 62,50 | 57,40 | 14 | 1/4" BSPP | 0,135/0,200 |
| 100 | | 46,60 | 129,80 | 98,70 | 93,60 | 22 | 1/2" BSPP | 0,490/0,680 |
| 150 | | 50,00 | 195,00 | 148,80 | 126,60 | 22 | 1/2" BSPP | 0,960/1,7600 |



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| Back Connection | | | | | | | |
|-----------------|---------------|--------|--------|--------------|----|--------------|-----------------------------|
| dn 40 – 50 - 63 | | | | Dn 100 - 150 | | | |
| | | | | | | | |
| Nominal Dial | Dimension mm. | | | | | Connection G | Weight (Kg) Empty/Filled |
| | B | H | D1 | D | CH | | |
| 40 | 25,40 | 44,00 | 45,20 | 41,10 | 11 | 1/8" BSPT | 0,060/0,115 |
| 50 | 28,00 | 51,70 | 56,20 | 51,40 | 14 | 1/4" BSPP | 0,095/0,155 |
| 63 | 28,70 | 52,00 | 66,60 | 62,70 | 14 | 1/4" BSPP | 0,125/0,190 |
| 100 | 35,80 | 110,00 | 98,50 | 71,20 | 22 | 1/2" BSPP | 0,380/0,650 |
| 150 | 54,00 | 89,00 | 162,00 | 149,00 | 22 | 1/2" BSPP | 1,200/1,800 |

| U-Clamp for panel clamping Aisi 304 | | | | | |
|-------------------------------------|-----------|-------|-------|---|-------------|
| dn 40 – 50 - 63 | | | | | |
| | | | | | |
| Nominal Dial | Dimension | | | | Weight (Kg) |
| | A | B | C | D | |
| 40 | 26,10 | 60,10 | 11,20 | | 0,019 |
| 50 | 32,00 | 82,90 | 14,20 | | 0,028 |
| 63 | 32,00 | 82,90 | 14,20 | | 0,028 |



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| Back Connection | | | | | | | |
|-----------------|---------------|--------------|--------|--------|----|--------------|-----------------------------|
| dn 40 – 50 - 63 | | Dn 100 - 150 | | | | | |
| | | | | | | | |
| Nominal Dial | Dimension mm. | | | | | Connection G | Weight (Kg) Empty/Filled |
| | B | H | D1 | D | CH | | |
| 40 | 25,40 | 44,00 | 45,20 | 62,30 | 11 | 1/8" BSPT | 0,060/0,115 |
| 50 | 28,00 | 51,70 | 56,20 | 72,00 | 14 | 1/4" BSPP | 0,095/0,155 |
| 63 | 28,70 | 52,00 | 66,60 | 84,50 | 14 | 1/4" BSPP | 0,125/0,190 |
| 100 | 35,80 | 110,00 | 98,50 | 129,80 | 22 | 1/2" BSPP | 0,380/0,650 |
| 150 | 54,00 | 89,00 | 195,00 | 149,00 | 22 | 1/2" BSPP | 1,200/1,800 |

Special size can be made according client needs. This customized will not change the basic and mainly features to respect the directive 2014/34/EU (ATEX).

Figure 1 – Typical installation on steam application

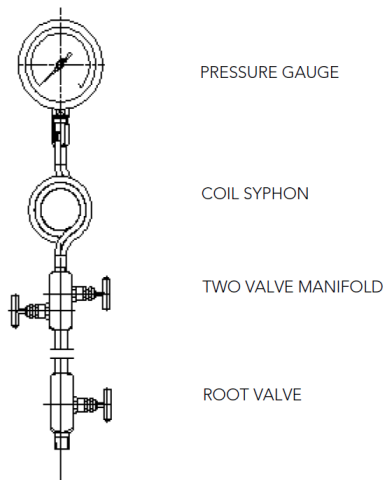


Figure 2 - Typical installation with manifold

