

Operating Instructions  
Betriebsanleitung  
Instructions d'utilisation

**Compact Differential Pressure Gauge PN 40 with Combined Working Pressure Gauge and Integrated Pressure Equalising Valve  
Model 732.51.2170**

GB

**Differenzdruck-Kompaktgerät PN 40 mit kombinierter Betriebsdruck-anzeige und integriertem Druckausgleichsventil  
Typ 732.51.2170**

D

**Manomètre Compact pour Pression Différentielle PN 40 avec affichage de la pression de service et soupape d'équilibrage de pression intégrée  
Type 732.51.2170**

F



CE

Model 732.51.2170 with option transmitter for differential pressure and transmitter for working pressure

**WIKAI**  
Part of your business



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## 1. General information / 2. Installation

### 1. General information

These operating instructions are based upon the following information:

- EN 837-2: Selection and installation recommendations for pressure gauges
- Data sheet SP 03.01: Compact differential pressure gauge model 732.51.2170
- Data sheet PM 07.05: Differential pressure gauge model 732.51
- Data sheet PM 02.XX: Bourdon tube pressure gauges

### 2. Installation

The installation of the differential pressure gauge is made following the installation recommendations for pressure gauges according to EN 837-2 /7.

- Prior to the installation of the pressure gauge, the pipes should be thoroughly cleaned.
- The pressure gauge should be installed and operated such as to avoid exposure to vibration.
  - Requires mounting by means of rigid tailpipe or
    - Body incorporates threaded mounting holes or
    - Additional pipe or surface mounting bracket
- The pressure gauges should be protected against contamination and high temperature fluctuations.
- The permissible maximum media/ambient temperature must not be exceeded.

Mounting of pressure connection: pressure entries identified ⊕ and ⊖

⊕ high pressure ⇒ bottom pressure ( $p_B$ ),

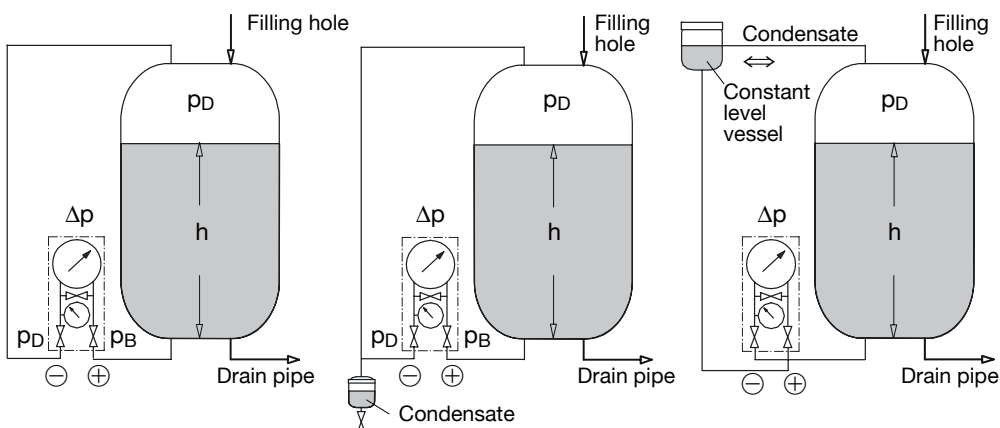
⊖ low pressure ⇒ working pressure/overriding pressure ( $p_D$ )

$$p_B = p_{FL} + p_D \quad (\text{with } p_{FL} = \text{hydrostatic pressure of liquid} = \rho \cdot g \cdot h)$$

**Types of installation for level measurement** (see illustrations of principle)

Standard in cryogenic equipment  
(liquid gases)

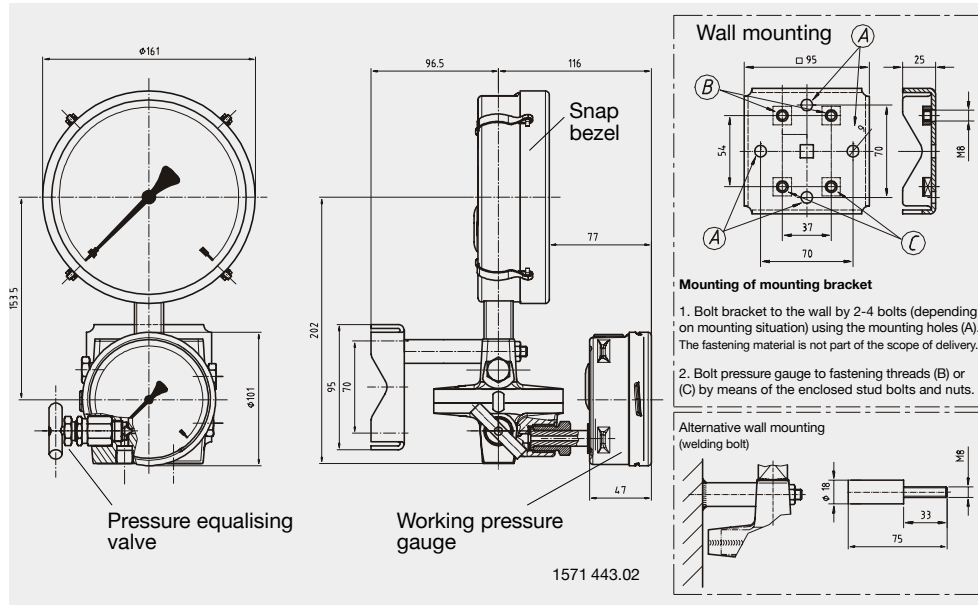
2 examples with condensate formation



## 2. Installation ... 4. Pressure equalising valve

### Wall mounting (see drawing)

Installation/Fastening by means of mounting brackets



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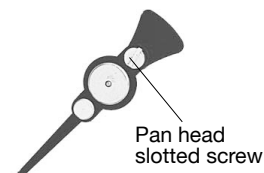
### 3. Combined working pressure gauge (see drawing)

Built-in working pressure gauge to monitor and control the static working pressure (overriding pressure  $p_D$ ), mounted with male nut G  $\frac{1}{2}$  B to the minus pressure chamber.

### 4. Pressure equalising valve (see drawing)

Allows **zero control** during the working process (with open valve)

- While the media are flowing from the side subject to higher pressure to the opposite side, the differential pressure at the pressure gauge drops to zero (the differential pressure readout must be at zero, i.e. fall into the area of the zero tolerance range which shows that the gauge is working correctly).
- A zero adjustment can be made using standard integrated adjustable pointer (previously remove snap fit bezel incl. window and sealing ring). Twisting the pan head slotted screw at the adjustable pointer you can adjust the zero point. After completion of zero adjustment, the snap fit bezel incl. window and sealing ring must be correctly re-mounted and the pressure equalising valve must be closed again.



## 5. Additional pressure connections / 6. Adjustable measuring span

### 5. Additional pressure connections (see drawing page 10)

- G ¼ female ① on minus media chamber e.g. to connect a pressure switch or safety valve
- G ¼ female ② on minus media chamber e.g. to connect a pressure transmitter Model ECO-1, C-10 resp. IS 10
- G ¼ female ③ on plus media chamber for recalibration

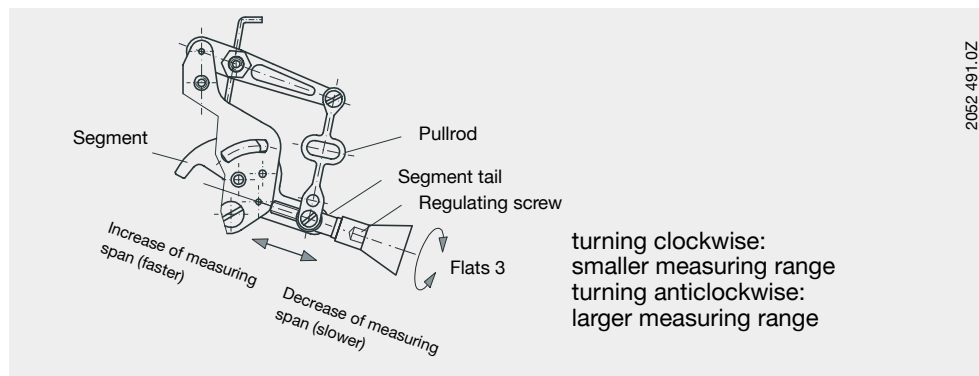
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### 6. Adjustable measuring span from outside (optional)

Depending on the measuring system of the differential pressure gauge, the measuring span may be adjusted to the stated measuring range limits. Ideally, the adjustment should be made on the test bench.

**Measuring range limits**  
(are also stamp-marked on the circumference of the measuring system)

Measuring system	Adjustable measuring ranges	
	from	to
150 mbar	120 mbar	200 mbar
300 mbar	200 mbar	400 mbar
400 mbar	300 mbar	600 mbar
600 mbar	500 mbar	1000 mbar
1000 mbar	780 mbar	1250 mbar
1600 mbar	1250 mbar	2000 mbar
2500 mbar	1950 mbar	2850 mbar



#### Handling information:

1. Remove plastic cover (on the side of the case at 5 o'clock)
2. Insert a hexagon socket screw driver with spherical head (flats 3 mm) into the funnel-shaped guide and decrease / increase the measuring range (span) as desired by means of right / left turns.
3. If required, the zero point can be corrected via the adjustment pointer, then the instrument is to be pressurised until the instrument's pointer is at the upper limit of the measuring range. The upper limit of the measuring range is to be checked with a pressure standard. This process is to be repeated until the upper limit of the measuring range corresponds to the desired nominal pressure.

## 7. Wiring details ... 10. Optional extras / Accessories

### 7. Wiring details (for pressure gauges with electrical accessories)

- Standard alarm contact = data sheet AC 08.01
  - using the terminal box at the circumference of the case (on the right side of the case).  
The terminal connection is made in accordance with the wiring scheme on the circumference of the case.
- Alarm contacts, modular design (for retrospective fitting on site)
  - using the plug with 2m flying lead (tapered). The connection of the plug is integrated into a transparent hood (polycarbonate) on the front. The terminal connection is made in accordance with the wiring diagram on the circumference of the case (see item 10.2)
- Capacitive transmitter with magnetic-field dependent sensor and amplifier
  - using the terminal box on the circumference of the case (on the right side of the case).  
The terminal connection is made in accordance with the wiring diagram on the circumference of the case.

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### 8. Application note

Apart from the general directives, with regard to the application in sewage works, pressure vessels, etc. and as far as dangerous media like, for example, oxygen, acetylene, combustible or acidic media are concerned, the prevailing directives/guidelines also have to be met.



Caution

### 9. Maintenance

WIKA differential pressure gauges require no maintenance or servicing and will give very long service when handled and operated properly.

### 10. Optional extras / Accessories (see drawing on page 8 and 9)

#### 10.1 Built-on pressure isolating valve block

- To isolate pipe pressures without interruption of process for gauge disassembly/examination or to protect the gauge against unacceptable pressure loads at n-th multiple test pressure loads of plants
- To protect the gauge against pressure surges/pressure spikes, which correspond to undefined operation conditions
- For gauge shut-downs, if no measurements are required for long operating periods, i.e. if only sporadic measurements are necessary (to increase service life of differential and working pressure gauges with a high frequency of pressure alternations).
- Recalibration of differential pressure gauges (tank volume readout)
  - a) Open pressure equalising valve integrated in the measuring system
  - b) Close plus and minus shut-off cock, and afterwards close pressure equalising valve again
  - c) Connect pressure standard and testing pump by means of additional G ¼ female in the plus chamber of measuring system (right bottom ☉, see drawing on page 10)
  - d) Take out **air bleed screw** integrated in the valve block of the minus side
  - e) Now the plus side can be pressurised
  - f) After adjustment:
    - Close air bleed screw
    - Disconnect pressure standard and testing pump and close the connection
    - Open integrated pressure equalising valve
    - Open slowly at first plus and then minus shut-off cock
    - Close pressure equalising valve
- Test connection M20 x 1.5

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## 10. Optional extras / Accessories

### 10.2 Alarm contacts, modular design -oilproof

These alarm contacts are fitted into the case of a pressure gauge and intended to make or break an electric control circuit relative to the position of the instrument's pointer. Please refer to data sheet AC 08.01 for technical data.

**GB** The oilproof alarm contact, modular design, is a self contained unit, which can be built onto the pressure gauge within a few minutes.

The alarm contacts provide IP65 ingress protection even for even for oil-filled gauges. The connection to the instrument pointer is made by means of a special fork so that a carrying pin at the pointer itself is not necessary. By means of this simple mounting, the instrument can be converted into a contact measuring instrument quickly and inexpensively.

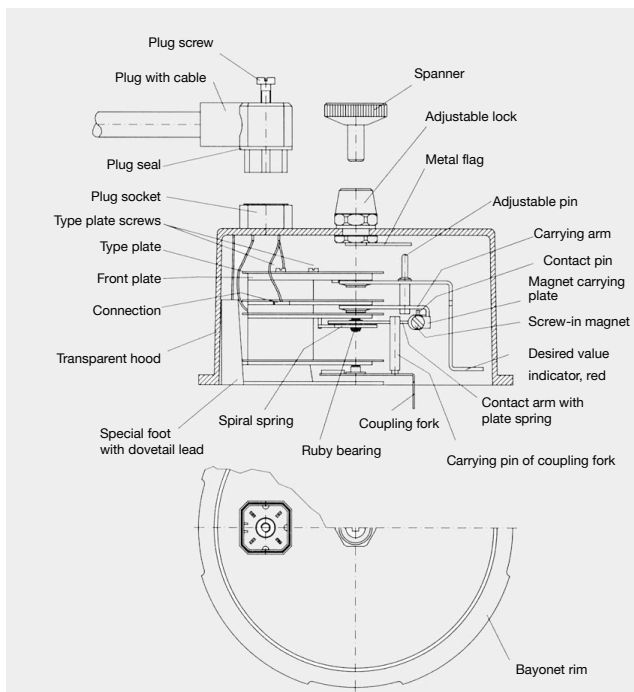
The alarm contacts mainly comprise:

- the pre-wired alarm contact, which is provided with a special foot and a fork coupling
- a transparent hood (polycarbonate) with dovetail lead into which the alarm contact is pushed and which is fastened by means of a recessed head screw
- a 4-pin plug socket, which is injection-moulded or welded to the transparent hood and cast to be oilproof
- an oilproof, adjustable lock, which is mounted in the middle of the transparent hood.
- pre-assembled sealing ring

The desired value indicators of the built-in alarm contact are adjusted to the value at which the contact is supposed to switch from the outside via the adjustable lock using a separate or a rigidly mounted spanner.

The alarm contacts are designed to allow the instrument pointer to move beyond the adjusted desired value indicator after contact actuation takes place, although the contact actuation will be maintained.

The design therefore guarantees a stable switching condition, which corresponds to the position of the instrument pointer, even if the power fails.



## 10. Optional extras / Accessories

### Mounting of alarm contacts

First the snap fit style bezel with sealing ring and the window of the measuring instrument have to be removed. Prior to attaching the transparent hood to the measuring instrument, the contacts must be adjusted in accordance with their operating range.

Using the magnetic snap-action contact, the magnetic retention force must be adapted to the conditions relating to the specific instrument by adjusting (twisting) the screw-in magnet. The magnet must then be protected against unintentional adjustment by using an appropriate protection lacquer.

The small plate spring at the flexible contact arm must be angled accordingly.

The fully adjusted unit must now be attached to the measuring instrument together with the snap fit bezel and aligned to the extent that the fork coupling guiding the flexible contact arms grips over the instrument pointer of the measuring instrument without touching the dial. Should this occur, the carrying fork must be shortened by means of an appropriate cutting tool.

The contacts are best adjusted if they are supplied together with the pressure gauge.

By snapping the bezel onto the case the whole contact unit will be mounted within the pressure gauge.

### Wiring details

Magnetic snap-action contacts:

As counterpart to the plug socket welded onto the transparent hood

- Plug with PG 7 cable gland, 3-pin + ⊕
- 3-pin plug + ⊕ , with 2 m cable 4 x 0.75 mm<sup>2</sup>

Inductive contacts:

- 4-pin low voltage plug with 2 m cable 4 x 0.75 mm<sup>2</sup> (without grounded conductor)

All plugs (in plugged-in and protected condition) correspond to ingress protection IP 65.

### Versions

Single and double magnetic snap-action contacts or  
single and double inductive contacts

### 10.3 Capacitive transmitters with magnetic-field dependent sensor and amplifier

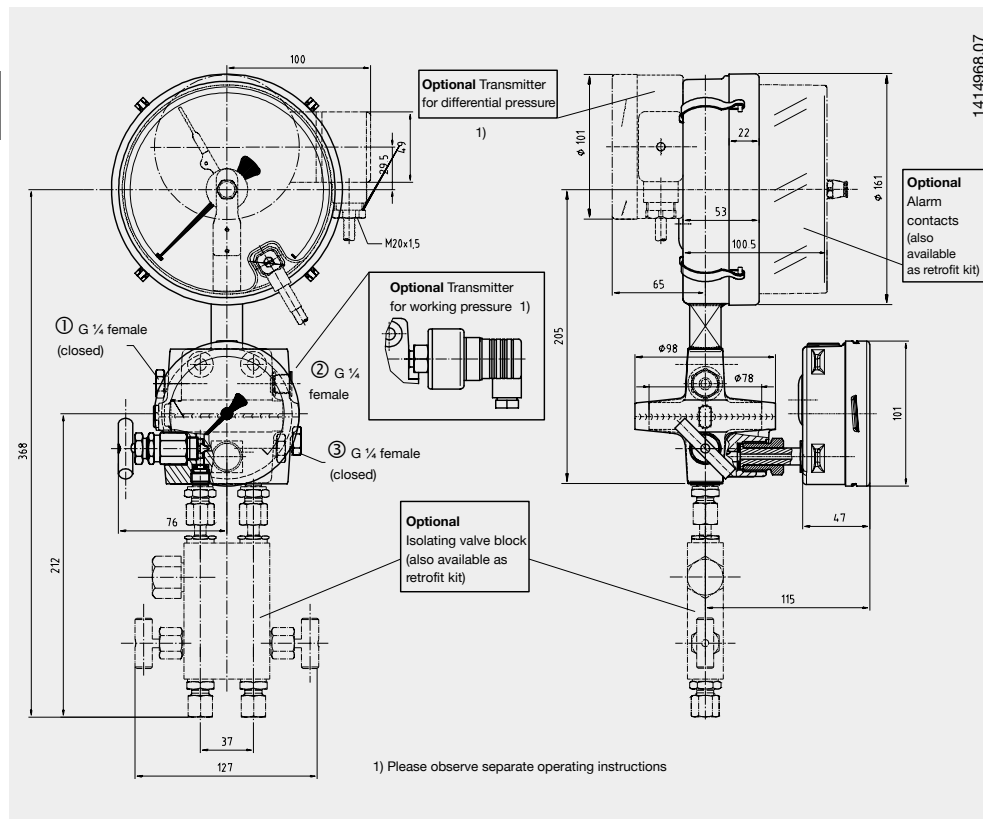
Remote transmission of pressure values in the form of an electric signal. The output signals can either be carried out by means of

- 2-wire system 4 ... 20 mA (also ⊕-intrinsically safe) or
- 3-wire system 0 ... 20 mA

Please refer to data sheet AE 08.02 as well as to the operating instructions for pressure transmitters with local readout model 891.34. or ⊕-class model 892.34 for technical data and construction details.

## 10. Optional extras / Accessories / 11. Disposal

### Illustration with optional extras / accessories



### 11. Disposal

Dispose of instrument components and packaging materials in accordance with the respective waste treatment and disposal regulations of the region or country to which the instrument is supplied.