Differential pressure gauge
Model 712.15 6", copper alloy
Model 732.15 6", Stainless steel version

for further approvals see page 4

Cryo Gauge

Applications

- Level measurements in closed tanks, particulary in cryotechnology
- Filter monitoring
- Pump monitoring and control
- For gaseous and liquid media that are not highly viscous or crystallizing and have no suspended particles

Special features

- Differential pressure measuring ranges from 0…16 in.WC to 0…1600 in.WC (0…40 mbar to 0…4000 mbar)
- High working pressure (static pressure) of 725 psi (50 bar)
- Scalable measuring ranges (turndown ratio to max. 1 : 3.5)
- Option: Remote data transfer module intelliMETRY®
  Option: With compact valve manifold with working pressure Indicator

Cryo Gauge model 712.15 6” with integrated 1-way valve manifold & working pressure gauge model 212.53 4”.

Description

These high-quality and highly innovative gauges are distinguished by their compact and robust design. They are primarily used for liquid level measurement on liquid gas tanks.

With only 6 different measuring cells all common tank sizes in the cryogenic industry are covered. As a result of the wide overlap of the measuring range of each respective cell the installed gauge can be adjusted to all gas types (i.e. Ar, CO2, N2 or O2) over the full 270° span. The span adjustment is accessible from the outside and does not affect the zero point. The mechanical display and the optional output signal can be easily and simultaneously adjusted.

An optional field installable valve manifold with working pressure gauge makes it possible to view all critical measurements in one compact unit.

The level indicator can be supplied with an optional integrated 4…20 mA, 2-wire transmitter. Switch contacts for level and working pressure, as well as a transmitter for the working pressure are available.

The standard center to center port distance of the two process connections is 37 mm (1.45”) and can be retrofitted by means of adaptors to a center to center distance of 52 mm (2”) and 31 mm (1.22”).

Data sheets showing similar products:
Differential pressure gauge, Cryo Gauge, NS 160; model 7x2.15.100; see data sheet PM 07.29

Specifications

Models 712.15 6" and 732.15 6"	
Nominal size	Nominal Size 6” (160 mm) for level indicator
Accuracy class	± 2.5 % of full span Option: ■ 1.6 ■ 1.0
DP ranges	Measuring cell 56 inWC (140 mbar): Adj. span 0…16 inWC to 0…56 inWC Measuring cell 112 inWC (280 mbar): Adj. span 0…32 inWC to 0…112 inWC Measuring cell 224 inWC (560 mbar): Adj. span 0…64 inWC to 0…224 inWC Measuring cell 453 inWC (1130 mbar): Adj. span 0…128 inWC to 0…453 inWC Measuring cell 923 inWC (2300 mbar): Adj. span 0…260 inWC to 0…923 inWC Measuring cell 1605 inWC (4000 mbar): Adj. span 0…461 inWC to 0…1605 inWC
Max. working pressure	725 psi (50 bar)
Overpressure safety	725 psi (50 bar) either side
Max. ambient temp. range	-40…+176 °F (-40…+80 °C), -40…+140 °F (-40…+60 °C) for oxygen service
Max. media temp. range	-40…+176 °F (-40…+80 °C), -40…+140 °F (-40…+60 °C) for oxygen service
Ingress protection	IP65 per EN/IEC 60529
Measuring cell flanges (wetted)	Model 712.15: Copper alloy CW614N (CuZn39Pb3) Model 732.15: 316L Stainless steel
Pressure elements (wetted)	Compression spring, stainless steel 1.4310 Transmission parts, stainless steel 1.4301 and 1.4305 Separating diaphragm, NBR
Movement	Wear parts stainless steel
Dial	White aluminum
Pointer	Adjustable pointer, black aluminum
Case and bezel	304 stainless steel, slip-on, secured with clips
Window	Polycarbonate

Design and operating principle

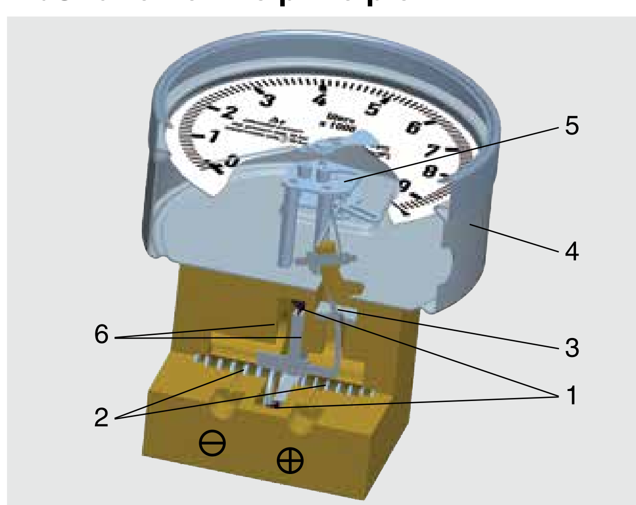
Pressures p_1 and p_2 act on the media chambers ⊕ and ⊖, which are separated by an elastic diaphragm (1).

The differential pressure ($\Delta p = p_1 - p_2$) leads to an axial deflection of the diaphragm against the measuring range spring (2).

The deflection, which is proportional to the differential pressure, is transmitted to the movement (5) in the indicating case (4) via a pressure-tight and low-friction lever mechanism (3).

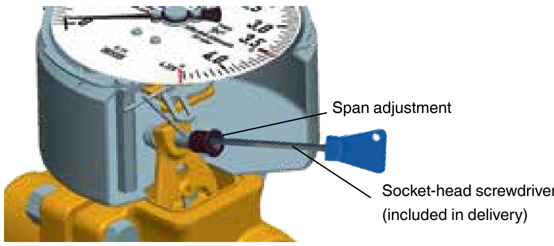
Overload safety is provided by metal bolsters (6) resting against the elastic diaphragm.

Illustration of the principle



Span adjustment

The measuring span of the differential pressure gauge can be adjusted within the measuring range limits as indicated in the specification table (see page 2). Even though the adjustment can be done in the field using a portable hand test pump, we recommend these adjustments are performed on a test bench. The access port to the span adjustment feature is located on the right hand side of the case, covered by a black rubber plug. Once the Level Gauge is pressurized to its desired pressure (the pointer is positioned below or above the full scale value) remove the rubber plug and insert the Allen wrench (3 mm) into the funnel guide. Adjust the span by moving the pointer to the full scale value. To decrease the measuring span turn the key clockwise and to increase the measuring span turn counter clockwise. If the gauge is equipped with a transmitter 89X.44 this process will adjust the output signal simultaneously. After completing the adjustment process close and seal the access hole with the rubber plug.

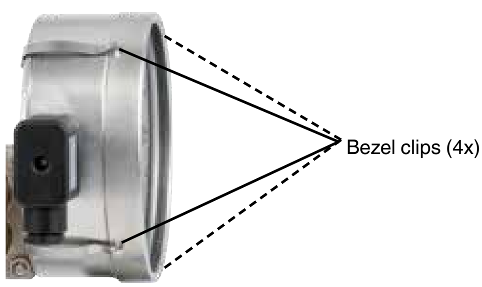


Turn clockwise: Smaller measuring range
Turn anticlockwise: Larger measuring range

Zero point adjustment

Prior to making the zero adjustment via the micro adjustable pointer you must gain access to the pointer by remoming the bezel and the window:

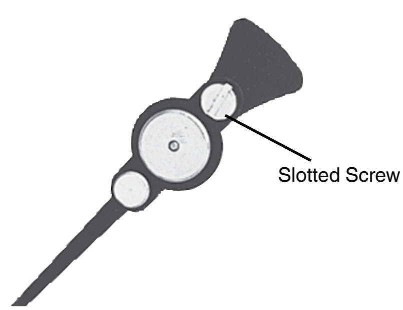
1. **Bezel removal for gauges without switches:**
   Remove the four clips that hold the bezel in place.
   Remove the bezel. You can use one of the clips as leverage to pull the bezel.
   Remove the fully gasketed window. Most of the times the window is stuck to the bezel and comes out with the bezel.



2. **Bezel removal for gauges with Reed Switch:**
   Gauges with Reed switches come with a bayonet bezel. Support the back of the gauge. Turn the bezel counter clockwise for approx. 1/4 of an inch. The bayonet bezel comes out together with the window, distance ring and form gasket. Make sure you keep the form gasket and distance ring in place inside the bezel.

Zero point adjustment via micro adjustable pointer

1. Close both shut-off valves.
2. Open the pressure equalizing valve. While the media is now moving from the high pressure to the low pressure side, equalizing both chambers, the indicating pointer should drop to zero within the allowed tolerance of the gauge. If the pointer does notreturn to zero a zero ajdust-ment should be performed.
3. Remove the bezel and window per the above instruc-tions to gain access to the adjustable pointer.
4. Adjust zero point via the micro adjustable pointer:
   Hold the pointer in place by grabbing the pointer tip close to the pointer axis for best support. Turn the slotted screw on the right side of the pointer axis using a flat head screw driver.
   Turning the screw counter-clockwise the pointer will move In a counter-clockwise direction.
   Turning the screw clockwise the pointer will move in a clockwise direction.
5. Put the window and bezel back in place.
6. Close the equalizing valve and open both shut-off valves.



Approvals

Logo	Description	Country
	EU declaration of conformity ■ EMC directive ■ Pressure equipment directive ■ ATEX directive (option) [1)] Hazardous areas - Ex ia Gas [II 2G Ex ia IIC T6/T5/T4 Gb]	European Union
	IECEx (option) [1)] Hazardous areas - Ex ia Gas [Ex ia IIC T6/T5/T4 Gb]	International
	EAC (option) ■ EMC directive ■ Pressure equipment directive ■ Low voltage directive ■ Hazardous areas [1)]	Eurasian Economic Community
	GOST (option) Metrology, measurement technology	Russia
	KazInMetr (option) Metrology, measurement technology	Kazakhstan
-	**MTSCHS (option)** Permission for commissioning	Kazakhstan
	BelGIM (option) Metrology, measurement technology	Belarus
	Uzstandard (option) Metrology, measurement technology	Uzbekistan
-	**CPA** Metrology, measurement technology	China
-	**CRN** Safety (e.g. electr. safety, overpressure, ...)	Canada
	BAM Oxygen application	Germany

1) Only for instruments with integrated transmitter model 892.44

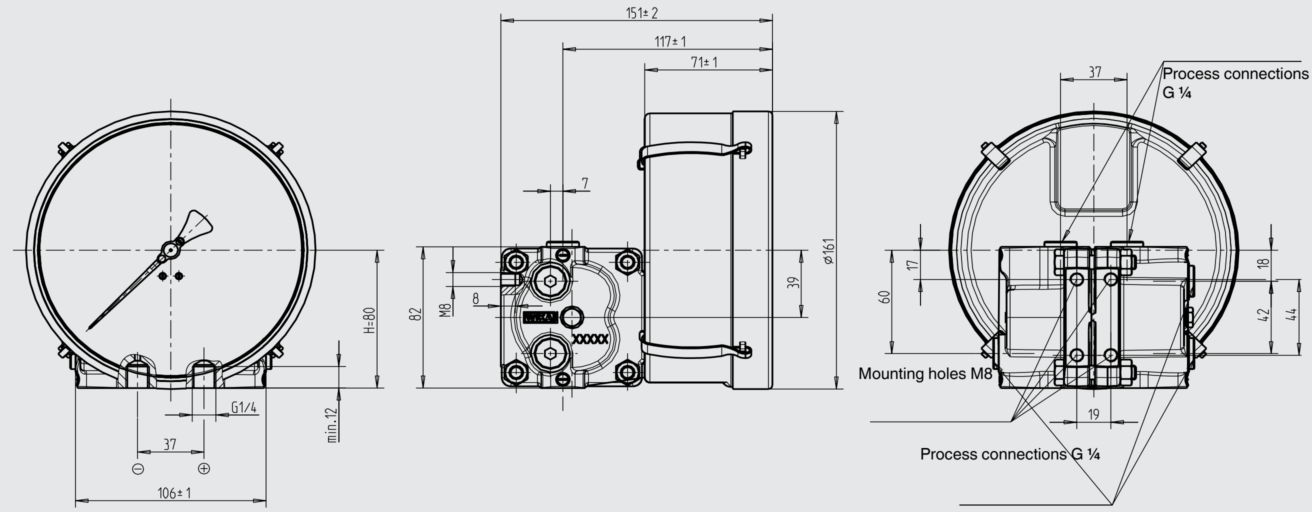
Certificates (option)

- 2.2 test report per EN 10204 (e.g. state-of-the-art manufacturing, indication accuracy)
- 3.1 inspection certificate per EN 10204 (e.g. indication accuracy)

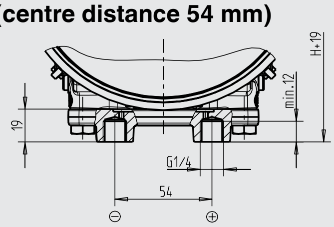
Approvals and certificates, see website

Dimensions in mm

Models 712.15.160 and 732.15.160



Drawing with optional mounted adapter (centre distance 54 mm)



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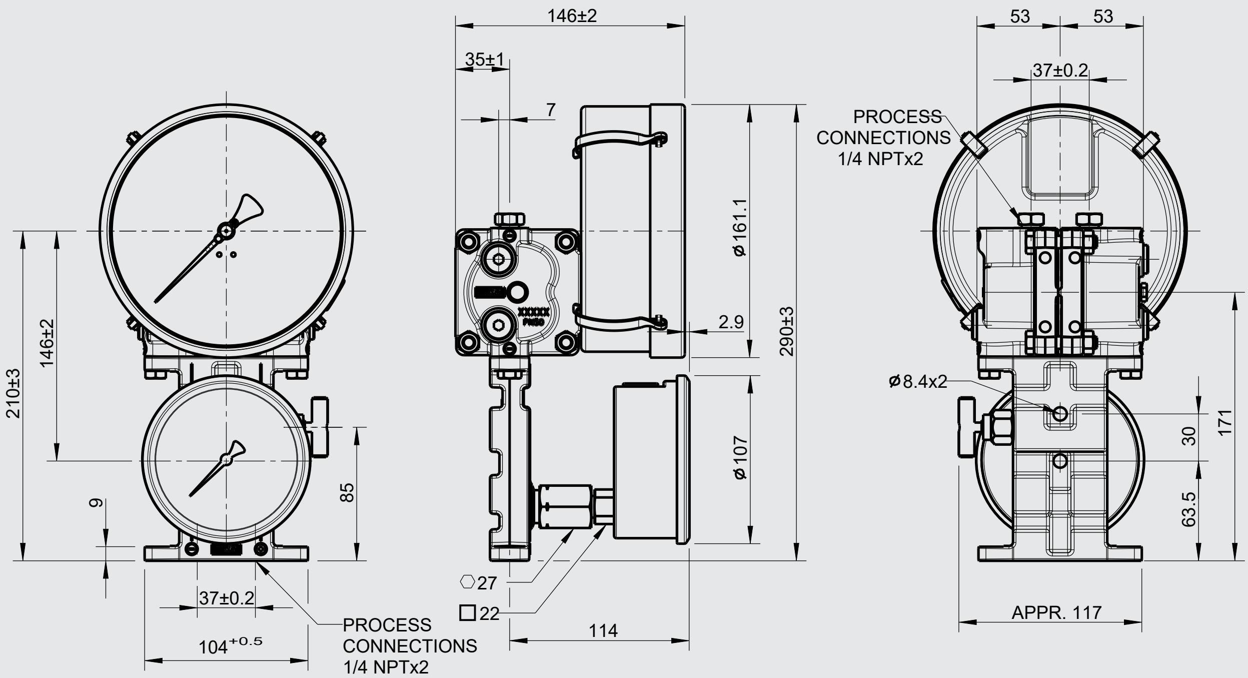
Option

One-way manifold (wetted)
Complete with working pressure gauge 212.53 4”

Specifications	
Valves	1-Way Manifold (1 x pressure equalizing valve) 3-Way Manifold (2 x shut-off-valves, 1 x pressure equalizing valve)
Process connection	2 x 1/4"NPT female (37 mm port distance)
Test connection	M20 x 1.5 with sealing cap (DIN 16287-A) 25 psi (50 bar)
Valve body	■ Model 712.15: Copper alloy CW61N (CuZn39Pb3) ■ Model 732.15: 316L stainless steel
Spindle with conical nipple	■ Model 712.15: Copper alloy ■ Model 732.15: 316L stainless steel
Packing/sealing	NBR/PTFE With the valve fully-opened, the spindle area is isolated from the process by a metallic seal. The packing is not loaded and the spindle thread is not in contact with the measured media.
Working pressure indication	
Standard	Model 212.53 4”, wetted parts copper alloy, cleaned for O2 service with “USE NO OIL” in red on dial. Standard ranges 0/300 psi, 0/400 psi & 0/600 psi.
Optional	Model 232.50 4”, wetted parts 316L stainless steel, cleaned for O2 service with “USE NO OIL” in red on dial. Standard ranges 0/300 psi, 0/400 psi & 0/600 psi.

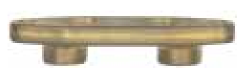
Dimensions in mm

Model 712.15 6” attached to a standard 1-way manifold with working pressure gauge model 212.53 4” (option)



Option

Adapter for process connection



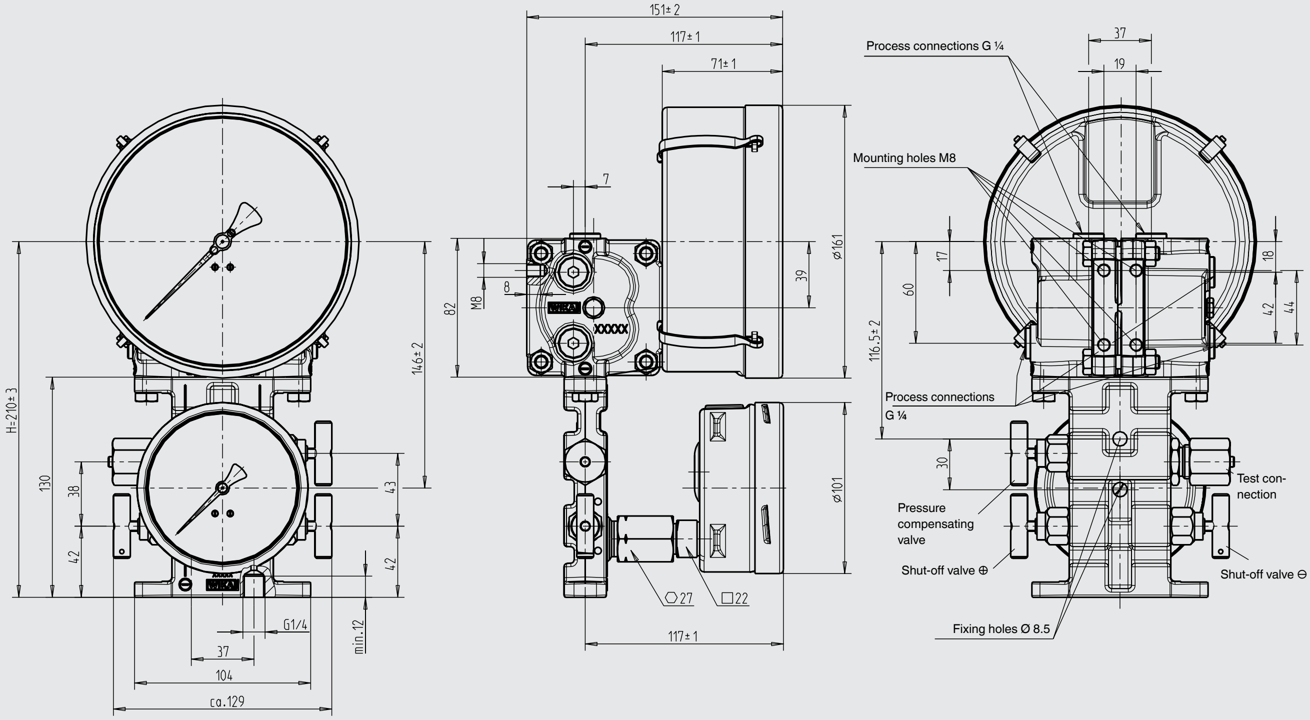
The adapters can be flange-mounted either directly to the differential pressure gauge or to the valve manifold.

Specifications	
Material	Model 712.15: Copper alloy, Model 732.15: 316L stainless steel
Process connections (wetted)	2 x 1/4"NPT female (54 mm port distance)

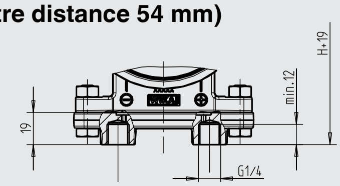
All parts necessary for installation are included in the scope of delivery:
- 2 x hexagon screws M8 x 16
- 2 x hexagon screws M8 x 28
- 2 x nut M8
- 2 x O-ring sealing

Dimensions in mm

Model 712.15 6” or 732.15 6” mounted to a 3-way manifold with working pressure gauge model 212.20 4” (brass wetted parts) or model 232.50 (stainless steel wetted parts), (option)



Drawing with optional mounted adapter (centre distance 54 mm)



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Option

Level Switches

Single Reed Switch model 851.3 (1 x SPDT)
Dual Reed Switch model 851.3.3 (2 x SPDT)

Description

The built-in electrical reed switches are auxiliary current switches which open or close (single pole double throw) electrical circuits at set limits via a magnet that is permanently attached to the instrument pointer. The reed contacts are bi-stable switches that keep their condition after a signal change until the next actuation.

Application

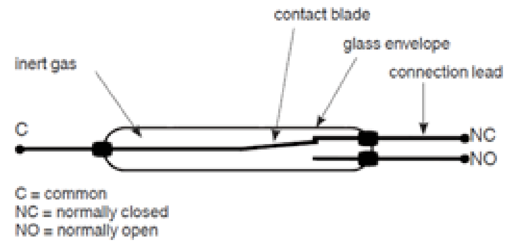
Reed switches are typically used for switching small voltages and currents. Due to the hermetically sealed construction and the switches insulated by inert gas the contact surfaces cannot corrode. Reed switches are highly resistant to shocks and vibrations. High reliability and low contact resistance make them suitable for many applications e.g. PLC applications, signal switching in measuring instruments, indicator lights, audible alarms etc. Due to the hermetically sealed enclosure reed switches are most suited at high altitude. The thinner the atmosphere, the greater the contact clearance needs to be to prevent arcing. Reed switches need no electrical power supply and due to their low mass they are not susceptible to vibration. With two Reed switches (851.3.3) the individual switches are galvanically isolated from each other.

Operating principle

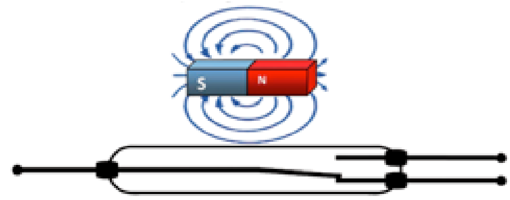
One reed switch consists of three contact blades (SPDT single pole double throw) from ferromagnetic material, fused into an inert gas atmosphere inside a glass chamber. In order to reduce abrasive wear and to ensure a low contact resistance the blades are metal coated in the area of the contact surface. The reed switch is operated through an external magnetic field (such as a permanent magnet) with sufficient field strength. The switching state will remain until the magnetic field strength has fallen below a certain value. WIKA in general is using bi-stable and magnetically biased reed switches. Due to the bias the signal state remains until a magnetic field with an opposite magnetic polarity to the contact will reset the signal.

Functional diagram

Reed contact SPDT (changeover) not actuated:



Reed contact SPDT (changeover) actuated:



With its hard coating on the contact surface with ferromagnetic rhodium, the reed switch achieves a very long life. The number of possible switch cycles depends largely on the magnitude of the electrical load and typically ranges between 10 Mio and 100 Mio cycles. If only signal loads or no loads are connected a maximum switch cycle past 1,000 Mio cycles is possible. With switching voltages below 5 V (arcing limit) the reed switch can reach more than 10,000 Mio cycles. However, with capacitive or inductive loads the use of a protective circuit/device is necessary since current or voltage spikes can destroy the reed switch or at a minimum reduce its life span significantly. Please see data sheet AE 08.01 for protective devices.

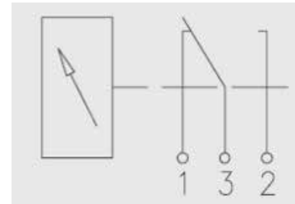
If a magnetic field approaches the reed switch both contact blades are pulled together and the contact closes. Electrical current can flow. If the magnetic field is moved further away, the field strength decreases with increasing distance. The contact though remains closed due to its bi-stability. Only the additional passing of the reed switch by a magnetic field in the opposite direction will open both contact blades again and interrupt the electrical current. Like other mechanical switches the reed switch is not bounce-free. The bounce time of reed switches, however, is shorter than in most other mechanical contacts. Nevertheless, this physical property mainly found in PLC applications should not be neglected (key word: software contact bounce suppression / push button contact bounce suppression.

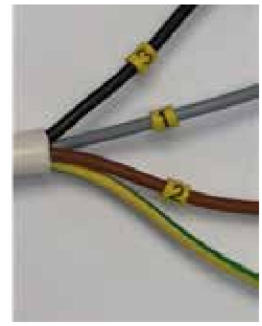
Specifications		
Contact design		SPDT (single pole double throw)
Contact type		Bistable
Max switching voltage	AC/DC V	250
Min. switching voltage	V	N/A
Switching current	AC/DC A	1
Min. switching current	mA	N/A
Carry current	AC/DC A	2
cos		1
Switching capacity	W/VA	60
Contact resistance (static)	mΩ	100
Insulation resistance	Ω	10^9
Breakdown voltage	DC V	1000
Operating time incl. bounce	ms	4.5
Contact material		Rhodium
Switching hysteresis	%	3...5

- The limit values listed shall not be exceeded, independently of each other.
- If two contacts are used, they cannot be set to the same value. A minimum distance of approx. 30° is required.
- The switch adjustment range is from 10…90% of the scale.
- The switching hysteresis can be factory set at falling or rising pressure to actuate the switch at the desired switch set point. Customer must provide the switching direction (falling or rising) at the time of the order.

Switching Instructions

Wiring diagram
Wire designation:
3 (black) = Common
1 (grey) = Normally closed (opens at increasing pressure)
2 (brown) = Normally open (closes at increasing pressure)
(yellow/green) = Ground





Notes / Trouble Shooting
In rare cases an actuation of the reed switch can occur during due to high shock or vibration during transportation. In these cases the reed switches have to be reset after installation of the instrument at the final destination by moving the instrument pointer (needle) once over the switch set point of the reed switch. You can also move the red set pointer all the way to zero and back up to the required set point as long as the pointer gets passed along the way.

Transportation Security Lock
In order to avoid a reed switch actuation during transportation the reed switch set point is positioned at zero pressure to “lock” the reed switch in place. The red set pointer should not be moved until the gauge is being installed at its final destination.

External alarm set point adjustment
The alarm set point can be externally adjusted. Using the black or blue adjustment key the set point can be adjusted by inserting the key into the adjustment lock by following these steps:

1. Remove black key which is stored outside of the black L-Plug or the short blue key that is loosely attached to the gauge.
2. Insert the key into the adjustment lock located at the center of the instrument window.
3. Without applying any pressure move the adjustment arm just below or above the set pointer.
4. Push the adjustment arm further in and against the red set pointer by applying pressure onto the spring-loaded adjustment lock.
5. Move the set pointer in clockwise or counter clockwise position to the desired position.
6. Remove the adjustment key and store it.

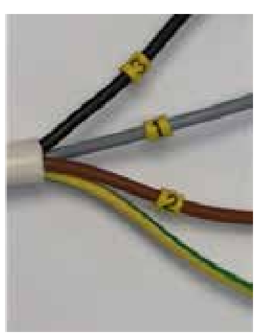
Instructions to access wiring terminal block inside the L-Plug (angular connector)

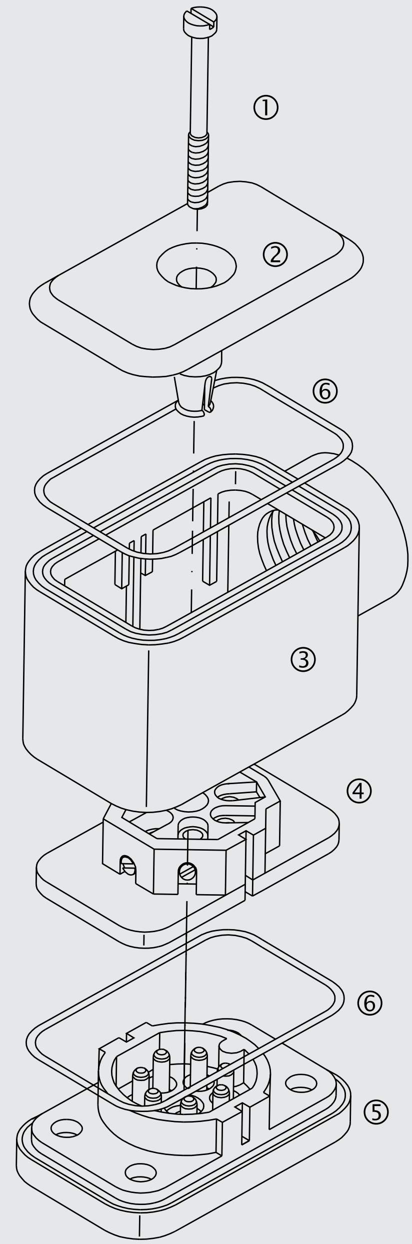
Every gauge with Reed switch comes standard with a 15 foot cable lead.

In order to connect/disconnect wires you need to access the wiring terminal block inside the L-Plug.

Instructions to assemble / disassemble the L-Plug:

1. Loosen the entire L-Plug assembly on the left hand side by completely unscrewing the screw (1) on top of the cable housing cover (2) using a small flat head screw driver.
2. Pull the L-Plug assembly entirely from cable socket base (5) and thus separate the pressure gauge from the power supply.
3. Extract the screw (1) from the assembly. It might require pushing the screw out from behind with the screw driver tip.
4. Remove the cable housing cover (2) from the cable housing and push out the socket insert (4) downwards through the entire cable housing.
5. Now the cable terminals and screws are exposed and accessible for installing or removing the cables. to the socket base (5) at the gauge and re-tighten the screw (1).
6. Ensure that the sealing rings (6) are properly and securely Reinstalled to maintain the wether protection rating.





Parts Legend:
① Screw
② Cable housing cover
③ Cable housing
④ Socket insert (with terminals)
⑤ Socket base (fixed to case)
⑥ Sealing rings

Reasons for Reed switch overload

General

Each mechanical switch as four physical limitations:

- Maximum electrical switching voltage
- Maximum electrical switching current
- Maximum electrical power to be switched
- Maximum mechanical switching rate

The switches must not be operated outside of these physical limitations. The operating life of the switch will be affected even if only one of these limits will be exceeded during operation. The more these limits are exceeded the greater is the possibility of reducing operating life up to the point of permanent failure.

Causes of electrical overload

Maximum electrical switching voltage:

When switching an electrical load a more or less visible electrical arc may occur. This process creates a significant and locally confined heat that during each switching operation causes contact material to evaporate (material erosion, burn-off). The higher the voltage that is being switched a greater electrical arc is created, which in turn will accelerate the evaporation process. Over time permanent damage to the switch will be unavoidable.

Maximum electrical switching current:

When an electrical current is switched, the contact surfaces are heated by the flow of electrons (contact resistance). If the maximum permissible switching current is exceeded the N/O and N/C contacts will start sticking to each other. This could also occur if the contact remains in a closed position over a longer period of time for example if the contact is used in a fail-safe operation. This can lead to contact fusion when the magnetic force can no longer overcome the adhesive bonding of the contacts.

To protect reed switches from contact fusion WIKA supplies each reed switch with so-called varistors (voltage dependent resistors) to protect from constant current or current spikes.

Maximum electrical power:

The maximum electrical power that a contact can switch is the combination of the switching voltage and switching current.
The electrical power heats the contacts and the limit must not be exceeded to avoid contact sticking and fusion.
Over time permanent damage to the switch will be unavoidable.

Maximum mechanical switching rate:

The maximum mechanical switching frequency possible depends upon both the wear of the bearings and material fatigue.

Minimum electrical values:

Each mechanical contact also possesses a threshold resistance resulting from surface contamination (surface contamination resistance RF). This surface contamination resistance results from oxidation or corrosion of the contact surfaces and increases the electrical resistance of the switch. When switching at low power this layer cannot be penetrated. Only by switching with higher currents and voltages this layer can be broken. This effect is known as fritting and the minimum voltage required is the “fritting voltage”. If this voltage cannot be achieved with switching, the contamination layer will continue to grow and the switch will cease to work. This effect is reversible.

Further information:

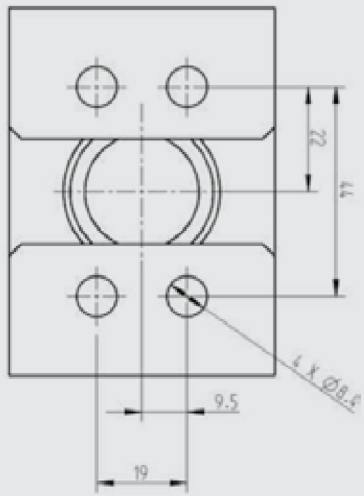
Electric overloads can be caused based on the following examples:

Light bulbs draw 15 times more current at the moment of switching than they do during normal operation (nominal value).

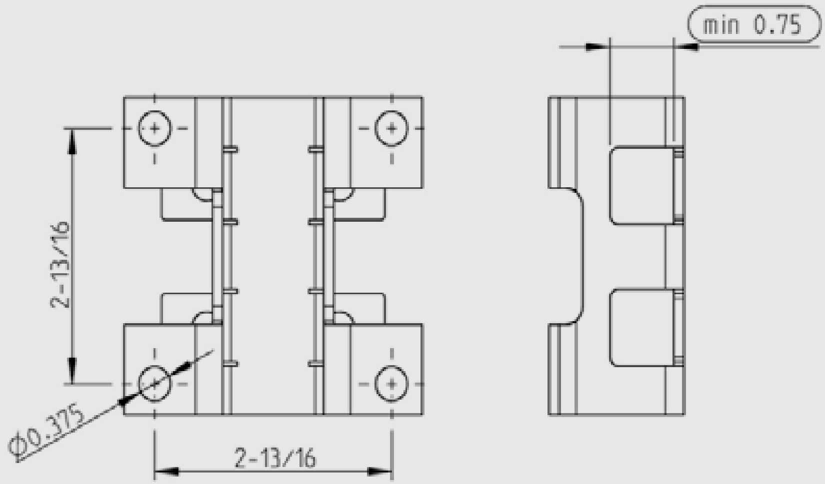
Capacitive loads form a short-circuit at the moment of switching (long control cables, cables running in parallel).
Inductive components (relays, contactors, solenoid valves, wound cable drums, electric motors etc.) create very high voltages when switching (up to 10 times the nominal voltage).

Option

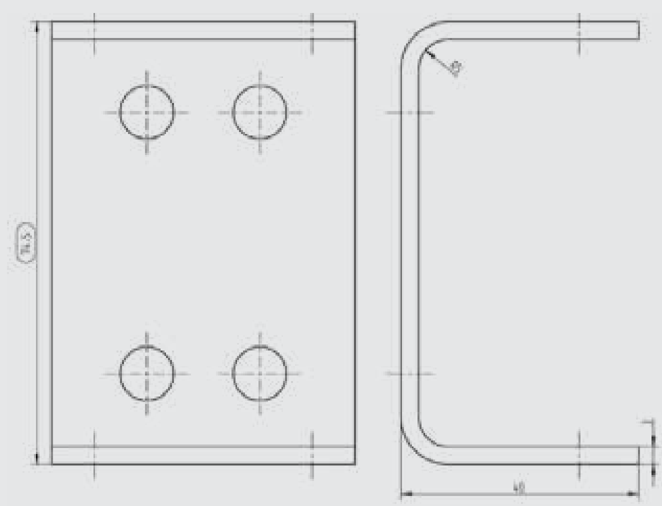
Mounting options / brackets
Dimensions in mm



C-Bracket



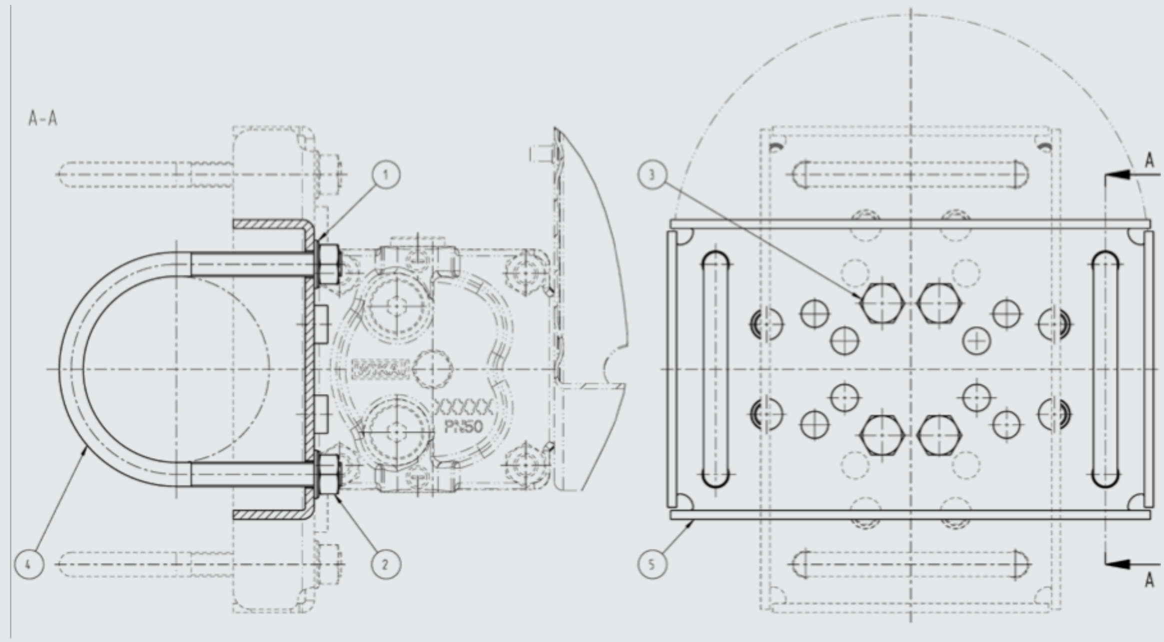
H-Bracket



Barton adapter bracket

Option

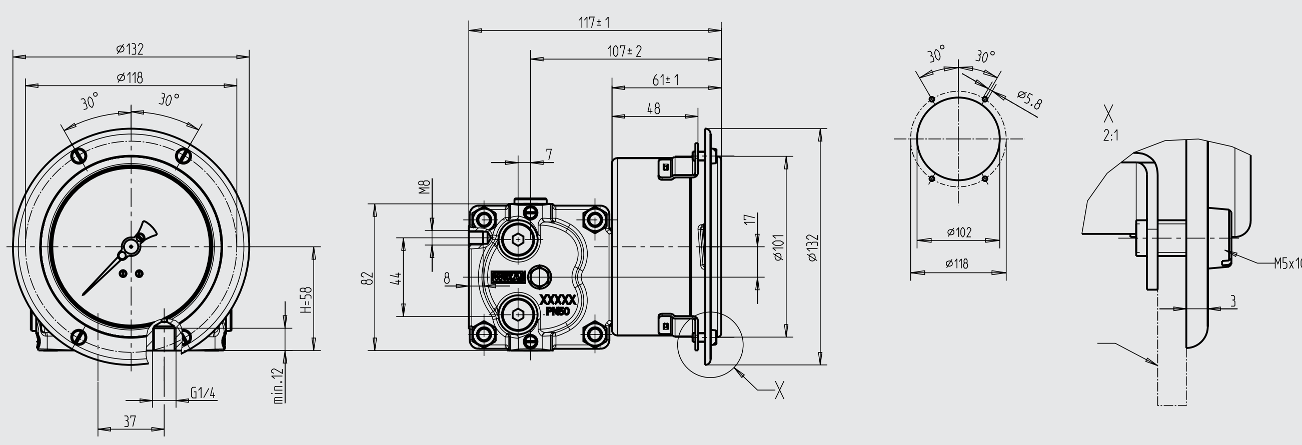
Mounting options / brackets
Dimensions in mm



Universal pipe/surface mounting bracket

Option

Panel mounting



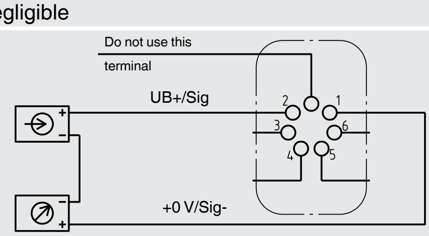
Front flange for panel mounting
Complete with 4 mounting M5x10 packed inside a clear zip lock back

Option

Transmitter for level

Standard version model 891.44
Intrinsically safe version model 892.44

WIKA differential pressure gauges with integrated transmitter Model 89X.44 combines all the advantages of a local display with the demands of modern industries for electrical signal transmission and the acquisition of measured values. The transmitter is integrated into the case of the level indicator. The measuring span (electrical output signal) is set automatically to match the local display. The scale over 270° of angle corresponds to 4…20 mA. With multiple scales or interchangeable attachable scales (optional), the output signal of 4…20 mA corresponding to each of the scales can be stored in a microprocessor. The output signal can be changed over to the desired gas type by rotating the optional BCD switch using a flat head screw driver. Access to the BCD switch is located on the left hand side of the case, covered by a rubber plug.

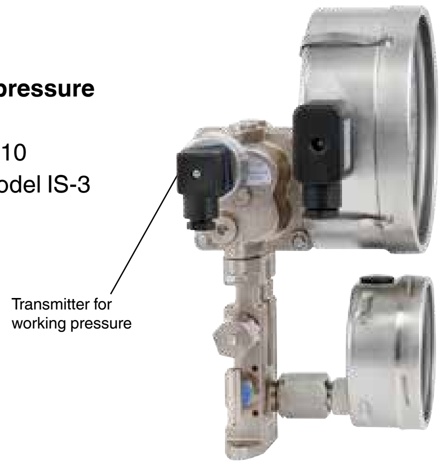
Specifications	Models 891.44 and 892.44 (Intrinsically safe version)
Output signal	4 … 20 mA, 2-wire
Supply voltage U_B	DC 12 < UB ≤ 30 V (≥ 14 V with intrisically Ex version)
Influence of supply voltage	≤ 0.1 % of full scale/10 V
Permissible residual ripple	≤ 10 % ss
Permissible max. load R_A	for non intrinsically safe version model 891.44: RA ≤ (UB-12V) / 0.02 A with RA in Ohm and UB in Volt for intrinsically safe version model 892.44: RA ≤ (UB-14V) / 0.02 A with RA in Ohm and UB in Volt
Effect of load	≤ 0.1 % of full scale
Adjustability	
Zero point, electrical	Zero point adjustment through momentary bridging of terminals 5 and 6, or Using the "scale selection switch" option, selectable via buton 1)
Linear error	≤ 1.0 % of span (terminal method)
Permissible ambient temperature range	-40…+180 °F (-40…+80 °C), -40…+140 °F (-40…+60 °C) for oxygen service
Compensated temperature range	-40…+180 °F (-40…+80 °C)
Temperature coefficients in the compensated temperature range	
Mean TC zero point	≤ 0.3 % of span/10 K
Mean TC span	≤ 0.3 % of span/10 K
Electrical connection	L-Plug (angular connector), 180 degrees rotatable, wire protection, cable gland M20 x 1.5, incl. strain relief, connection cable OD 7…13 mm, conductor cross-section 0.14…1.5 mm2, temperature resistance up to 140°F (60°C)
Media temperature	-40…+180 °F (-40…+80 °C), -40…+140 °F (-40…+60 °C) for oxygen service
Ambient temperature	-40…+140 °F (-40…+60 °C)
Ingress protection	IP65 per EN/IEC 60529
Safety-related maximum values for Ex version, model 892.44	
Supply voltage U_i	DC 14 ... 30 V
Short-circuit current I_i	≤ 100 mA
Power P_i	≤ 720 mW
Internal capacitance C_i	≤ 17.5 nF
Internal inductance L_i	negligible
Designation of connection terminals, 2-wire	 Terminals 3, 4, 5 and 6: For internal use only Connection ① must not be used for equipotential bonding. The instrument must be incorporated in the equipotential bonding via the process connection.

1) Only possible within 30 seconds of connecting the supply voltage

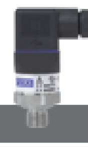
Option

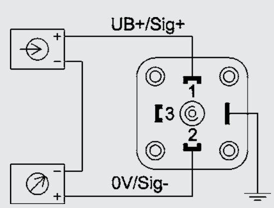
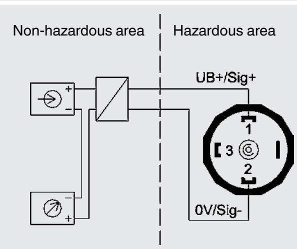
Transmitter for working pressure

Standard version model A-10
Intrinsically safe version model IS-3

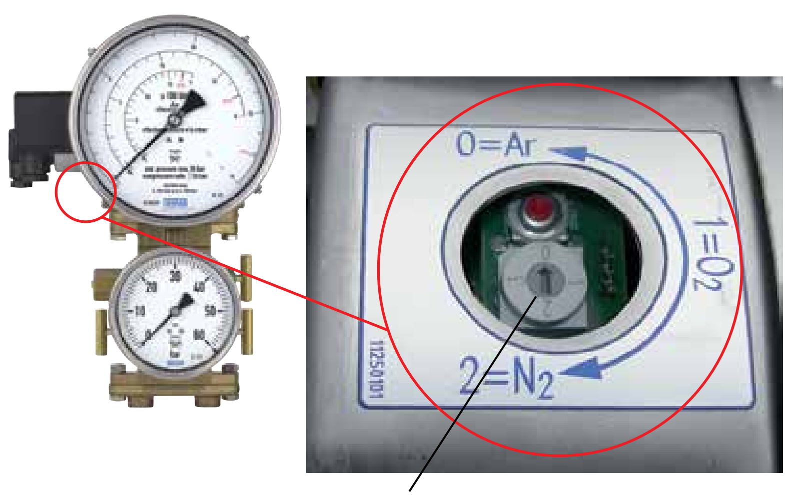


The transmitter for the working pressure is mounted to the minus side of the DP cell and can be installed on site.
Pressure connection of the transmitter:
G1/4B male



Specifications	A-10	IS-3
Data sheet	PE 81.60	PE 81.58
Design	Standard	Intrinsically safe
Measuring ranges	0...36 psi (0…2.5 bar) to 0/870 psi (0…60 bar)	0...36 psi (0…2.5 bar) to 0/870 psi (0…60 bar)
Outputs	4 ... 20 mA	4 ... 20 mA (isolated barrier)
Medium temperature	-20…+212°F (-30…+100°C)	-4…+140°F (-20…+60°C)
Ambient temperature	-20…+180°F (-30…+80°C)	-4…+140°F (-20…+60°C)
Wetted parts	Stainless steel	Stainless steel
Supply voltage U_B	DC 10 V < U_B ≤ 30 V	DC 10 V < U_B ≤ 30 V
Permissible max. load R_A	R_A ≤ (U_B - 8 V) / 0.02 A	R_A ≤ (U_B - 10 V) / 0.02 A
Accuracy, best fit straight line, BFSL	≤ 0.5 % of span	≤ 0.2 % of span
Compensated temperature range	0…+176°F (0…+80°C)	0…+140°F (0…+60°C)
Designation of connection terminals, 2-wire		

For dimensions see page 10



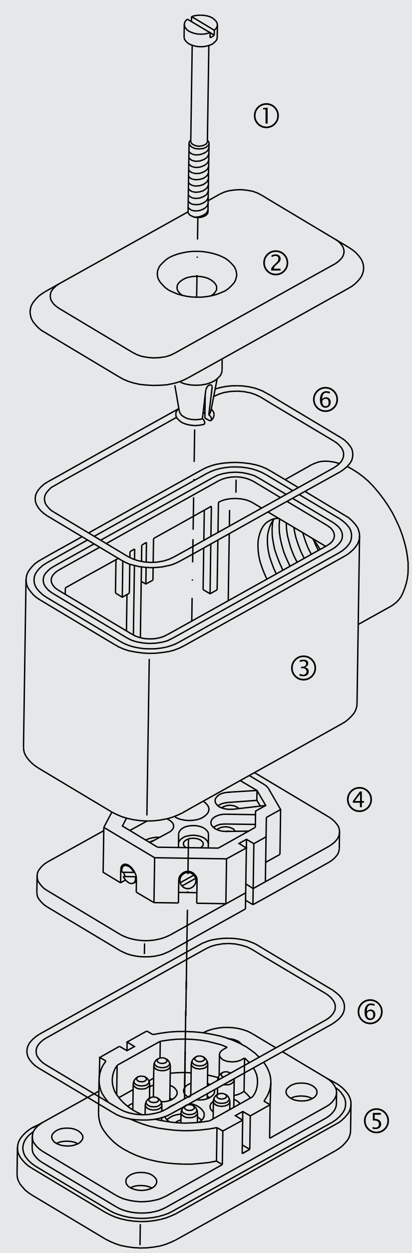
BCD switch (scale selection switch) and zero point key (sealing cap removed)

Electrical zero point adjustment (without BCD switch option)

If a mechnical zero adjustment is necessary the electrical zero point must be adjusted as well.

Steps to adjust the electrical zero point on a level transmitter:

1. After adjusting the mechanical zero point by means of the adjustable pointer (see instructions on page 3), the electricalzero point must be reset to match the mechanical zero point.
2. The gauge must remain in a depressurized condition.
3. Loosen the entire L-Plug assembly on the left hand side by completely unscrewing the screw (1) on top of the cable housing cover (2) using a small flat head screw driver.
4. Pull the L-Plug assembly entirely from cable socket base (5) and thus separate the pressure gauge from the power supply.
5. Extract the screw (1) from the assembly. It might require pushing the screw out from behind with the screw driver tip.
6. Remove the cable housing cover (2) from the cable housing and push out the socket insert (4) downwards through the entire cable housing.
7. Use a short stranded wire with bare points at both ends (max. permissible resistance 30 Ω) to bridge terminals #5 and #6 on the socket insert.
8. Reassemble the plug in reversed order. Push the L-Plug assembly with the piece of stranded wire inside back onto the socket base (5) and thus reastablish the power supply to the gauge.
9. Within a maximum of 30 seconds the new zero point will be restored within the electronics. During this period, the current in the loop will increase to 9.5 mA.
10. Loosen the plug again in the same order as previously Described and remove the piece of stranded wire. After reassembling the plug, the electrical output signal will once again correspond with the mechanical indication:
    Zero pressure = 4 mA
    Full pressure = 20 mA
11. Ensure that the sealing rings (6) are properly and securely reinstalled to maintain the wether protection rating.



Parts Legend:
① Screw
② Cable housing cover
③ Cable housing
④ Socket insert (with terminals)
⑤ Socket base (fixed to case)
⑥ Sealing rings

Level Transmitter – Trouble Shooting

Defect	Possible reason	Solution
No signal output	Failure of power supply	Check power supply and wiring
	Wiring disrupted/broken	Reconnect wires/replace defective components
	Transmitter incorrectly wired	Check wiring, compare with wiring diagram and rewire if needed
	No pressure	Check pressure-input/piping from the tank
	Open pressure equalizing value	Close pressure equalizing valve
	Defective electronics due to incorrect supply voltage or voltage spikes	Return pressure gauge to manufacturer for repair/replacement
Steady signal despite changes in pressure	Pressure entry blocked	Check tailpipes and pressure entry bore. Carefully clean if necessary
	Open pressure equalizing valve	Close pressure equalizing valve
	Electronic defect e.g. through incorrect supply voltage or voltage spikes	Return pressure gauge to manufacturer for repair/replacement
	Transmitter defect after being over-pressurized	Return pressure gauge to manufacturer for repair/replacement
Signal too high & steady, won't change despite changes in pressure	Defective electronics due to incorrect supply voltage or voltage spikes	Return pressure gauge to manufacturer for repair/replacement
Signal span reading too low	Supply voltage too low	Adjust supply voltage
	Load resistance too high	Consider permissible max. load
	Incorrect scale selected (if supplied with BCD switch option)	Check position of scale selection switch
Zero point signal too low	Wrong zero compensation	Re-adjust zero point
Zero point signal too high	Wrong zero compensation	Re-adjust zero point
	Transmitter overpressurized	Return pressure gauge to manufacturer for repair/replacement

Modifications may take place and materials specified may be replaced by others without prior notice.
Specifications and dimensions given in this data sheet represent the state of engineering at the time of printing.

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