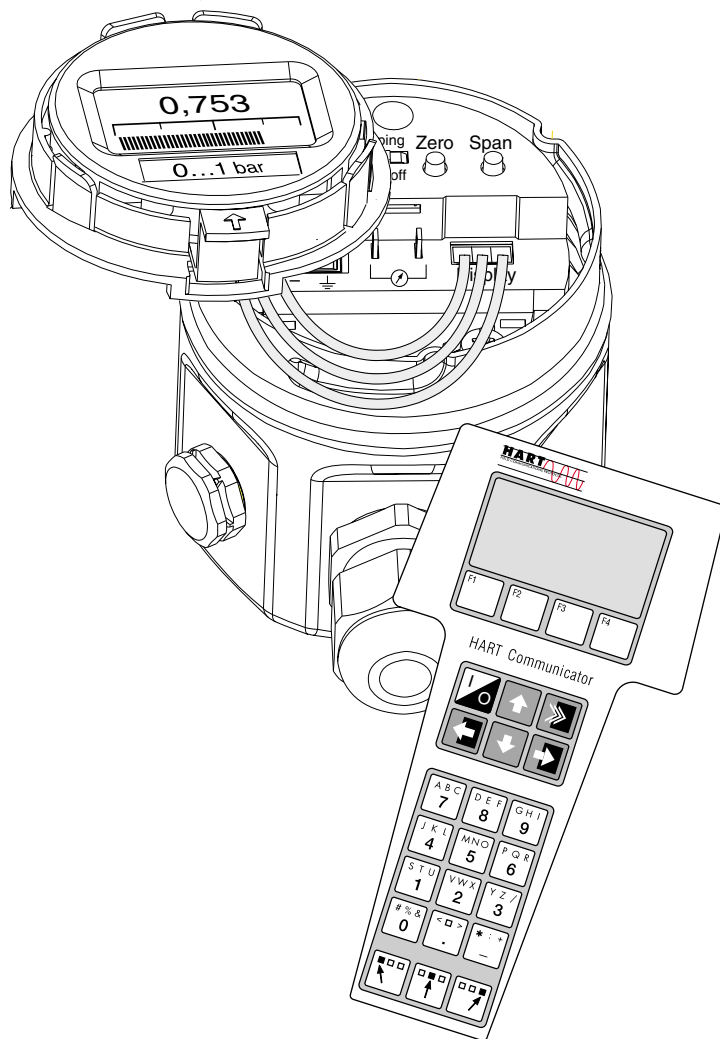


Barcon Pressure Transmitter

Barcon PPC (HART)

Barcon LHC (HART)

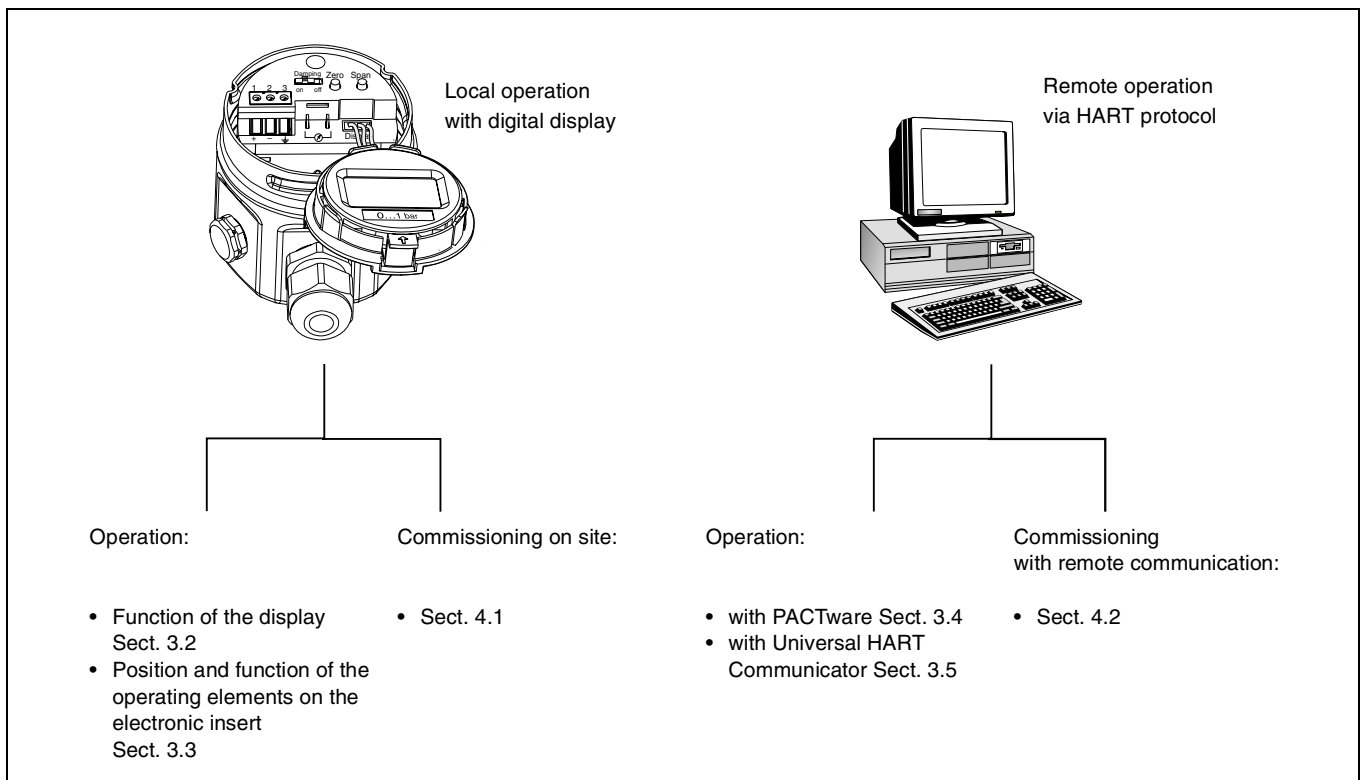
Operating instructions



With regard to the supply of products, the current issue of the following document is applicable:
The General Terms of Delivery for Products and Services of the Electrical Industry, as published by
the Central Association of the "Elektrotechnik und Elektroindustrie (ZVEI) e.V.",
including the supplementary clause "Extended reservation of title".

We at Pepperl+Fuchs recognise a duty to make a contribution to the future.
For this reason, this printed matter is produced on paper bleached without the use of chlorine.

Short operating instructions



Software history

Software version	Valid operating instructions (BA)	Device and Software No.	Software revision	Changes in operating instructions
1.0	07.01	8010	—	—

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Notes on safety

Approved usage

The Barcon is a pressure transmitter for measuring gauge or absolute pressure depending on the version.

Mounting, commissioning, operation

The Barcon has been designed to operate safely in accordance with current technical, safety and EU standards. If installed incorrectly or used for applications for which it is not intended, however, it is possible that application-related dangers may arise, e. g. product overspill by incorrect installation or adjustment. For this reason, the instrument must be installed, connected, operated and maintained by personnel that are authorised by the user of the facility and who are suitably qualified. The manual is to be read and understood, and the instructions followed. Modifications and repairs to the device are permissible only when they are expressly approved in the manual.

Explosion-hazardous area

The measuring system used in the explosion-hazardous area must comply with all existing national standards. The instrument can be supplied with the following certificates as listed in the table. The certificates are designated by the last letters of the order code on the nameplate (see table below).

Ensure that technical personnel are sufficiently trained.

All measurement and safety regulations which apply to the measuring points are to be observed.






Typecode Barcon: □□□-□□□-□□□□-□□□□-□□□□□-□□

Code	Certificate	Protection
NA	Standard	None
EX	ATEX	ATEX II 1/2 G EEX ia IIC T6
E1	ATEX	ATEX II 2 G EEX ia IIC T6
SX	ATEX	ATEX II 1/2 D EEX ia IIC T6
S2	ATEX	ATEX II 1/3 D (non- Ex power supply)
E2	ATEX	ATEX II 3 G EEx nV IIC T5 (Zone 2)
CG	CSA	General Purpose
C1	CSA	CSA IS (suitable for Div. 2) Cl. I, II, III, Div. 1, Groups A ... G
CD	CSA	CSA Cl. I, Div. 2, Groups A ... D, Cl. II, III, Div. 1, Groups E ... G
FM	FM	FM IS (non incensive) Cl. I, II, III, Div. 1, Groups A...G
FD	FM	FM DIP, Cl. II, III, Div. 1, Groups A ... G
TI	TIIS	TIIS Ex ia IIC T6




Table S.1 Certificates for applications in explosion hazardous areas

Safety conventions

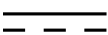

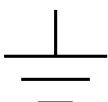


In order to highlight safety-relevant or alternative operating procedures in the manual, the following conventions have been used, each indicated by a corresponding icon in the margin.

Symbol	Meaning
 Note!	Note! A note highlights actions or procedures which, if not performed correctly, may indirectly affect operation or may lead to an instrument response which is not planned
 Caution!	Caution! Caution highlights actions or procedures which, if not performed correctly, may lead to personal injury or incorrect functioning of the instrument
 Warning!	Warning! A warning highlights actions or procedures which, if not performed correctly, will lead to personal injury, a safety hazard or destruction of the instrument

Safety conventions

	Device certified for use in explosion hazardous area If the device has this symbol embossed on its name plate it can be installed in an explosion hazardous area
	Explosion hazardous area Symbol used in drawings to indicate explosion hazardous areas. <ul style="list-style-type: none"> Devices located in and wiring entering areas with the designation "explosion hazardous areas" must conform with the stated type of protection
	Safe area (non-explosion hazardous area) Symbol used in drawings to indicate, if necessary, non-explosion hazardous areas. <ul style="list-style-type: none"> Devices located in safe areas still require a certificate if their outputs run into explosion hazardous areas.

Explosion protection

	Direct voltage A terminal to which or from which a direct current or voltage may be applied or supplied
	Alternating voltage A terminal to which or from which an alternating (sine-wave) current or voltage may be applied or supplied
	Grounded terminal A grounded terminal, which as far as the operator is concerned, is already grounded by means of an earth grounding system
	Protective grounding (earth) terminal A terminal which must be connected to earth ground prior to making any other connection to the equipment
	Equipotential connection (earth bonding) A connection made to the plant grounding system which may be of type e.g. neutral star or equipotential line according to national or company practice

Electrical symbols

1 Introduction

Application

The Barcon PPC and the Barcon LHC pressure transmitter measures the pressure of gases, vapours and liquids and is used in all areas of chemical and process engineering.

Operating principle

Ceramic sensor

The system pressure acts directly on the rugged ceramic diaphragm of the pressure sensor deflecting it by a maximum of 0.025 mm (0.0098 in). A pressure-proportional change in the capacitance is measured by the electrodes on the ceramic substrate and diaphragm. The measuring range is determined by the thickness of the ceramic diaphragm.

Metal sensor

The process pressure deflects the separating diaphragm with a filling liquid transmitting the pressure to a resistance bridge. The bridge output voltage, which is proportional to pressure, is then measured and processed.

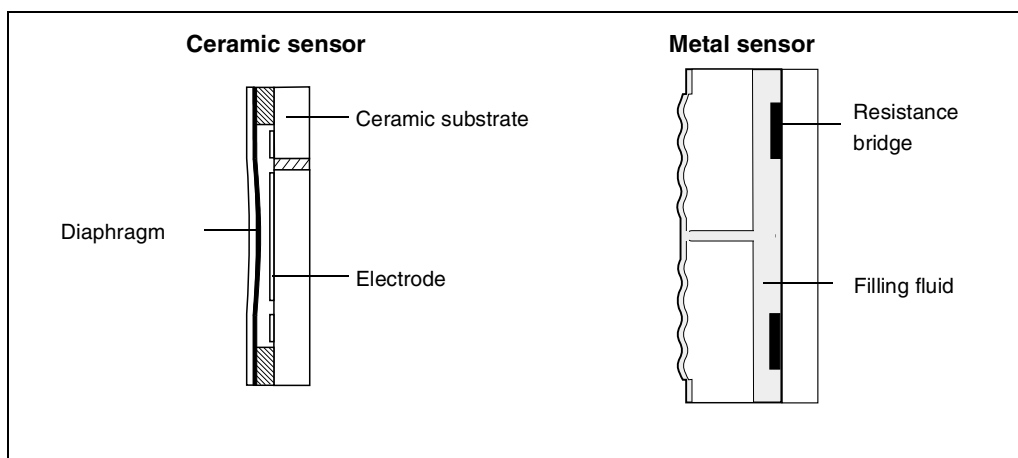


Fig. 1.1: Sensor construction

Measuring system

The complete measuring system consists of

- Barcon pressure transmitter with 4 mA ... 20 mA signal output with superposed digital signal (HART communication) and
- power supply 11.5 V ... 45 V DC, in Ex area 11.5 V ... 30 V DC.

Operation can be carried out via:

- a digital display for operating and calling up measured values locally,
- the universal handheld HART Communicator,
- the Pepperl+Fuchs PACTware operating program.

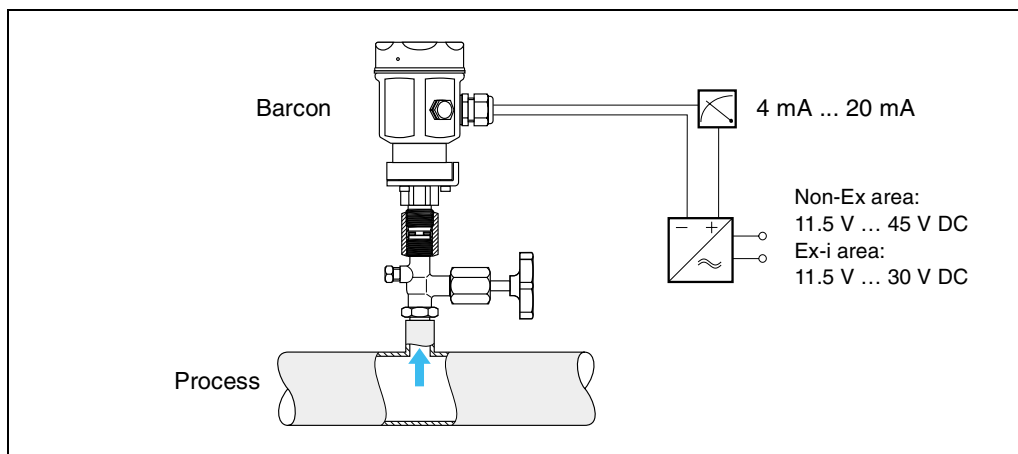


Fig. 1.2: The measurement system

2 Installation

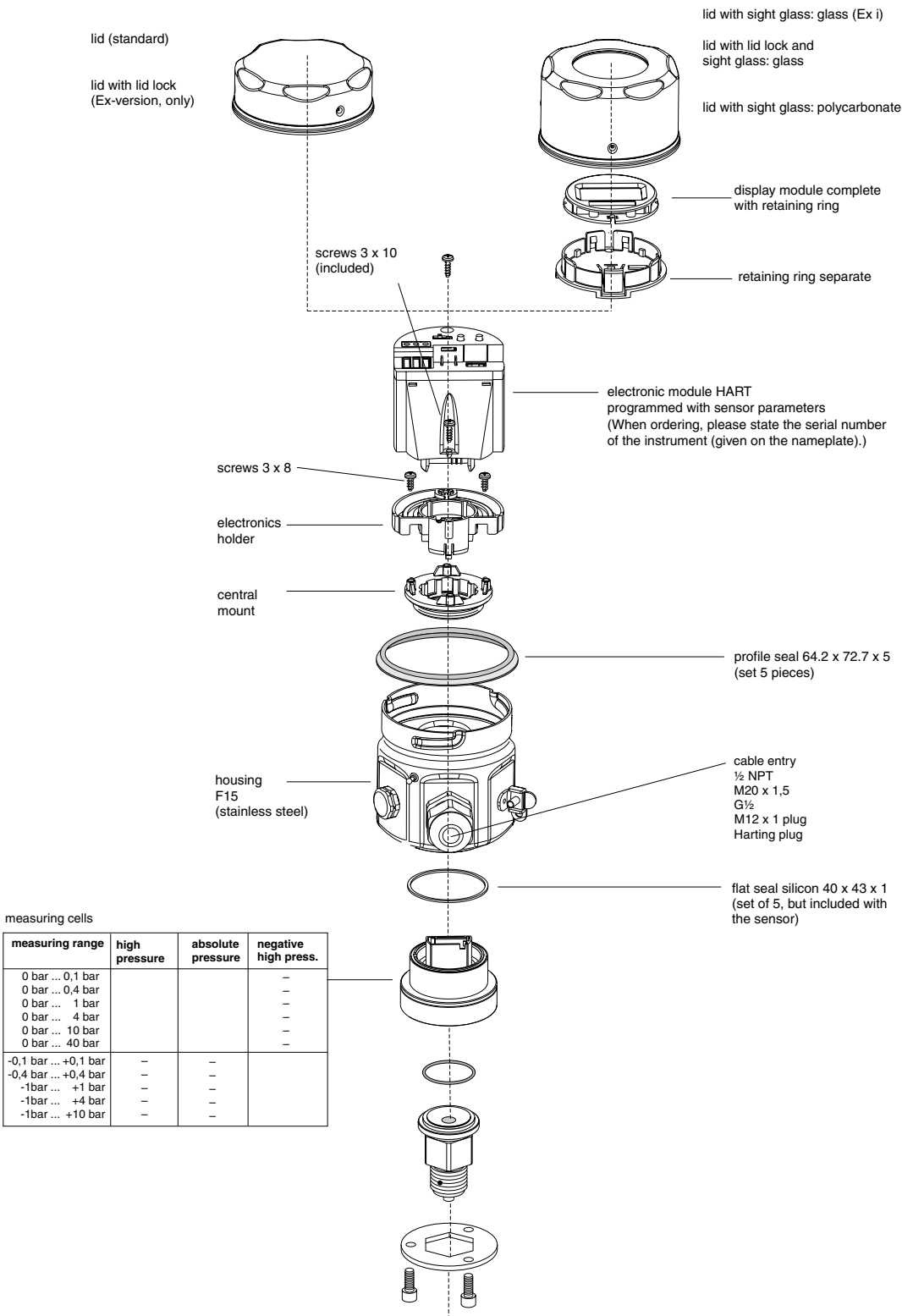
This section describes:

Contents

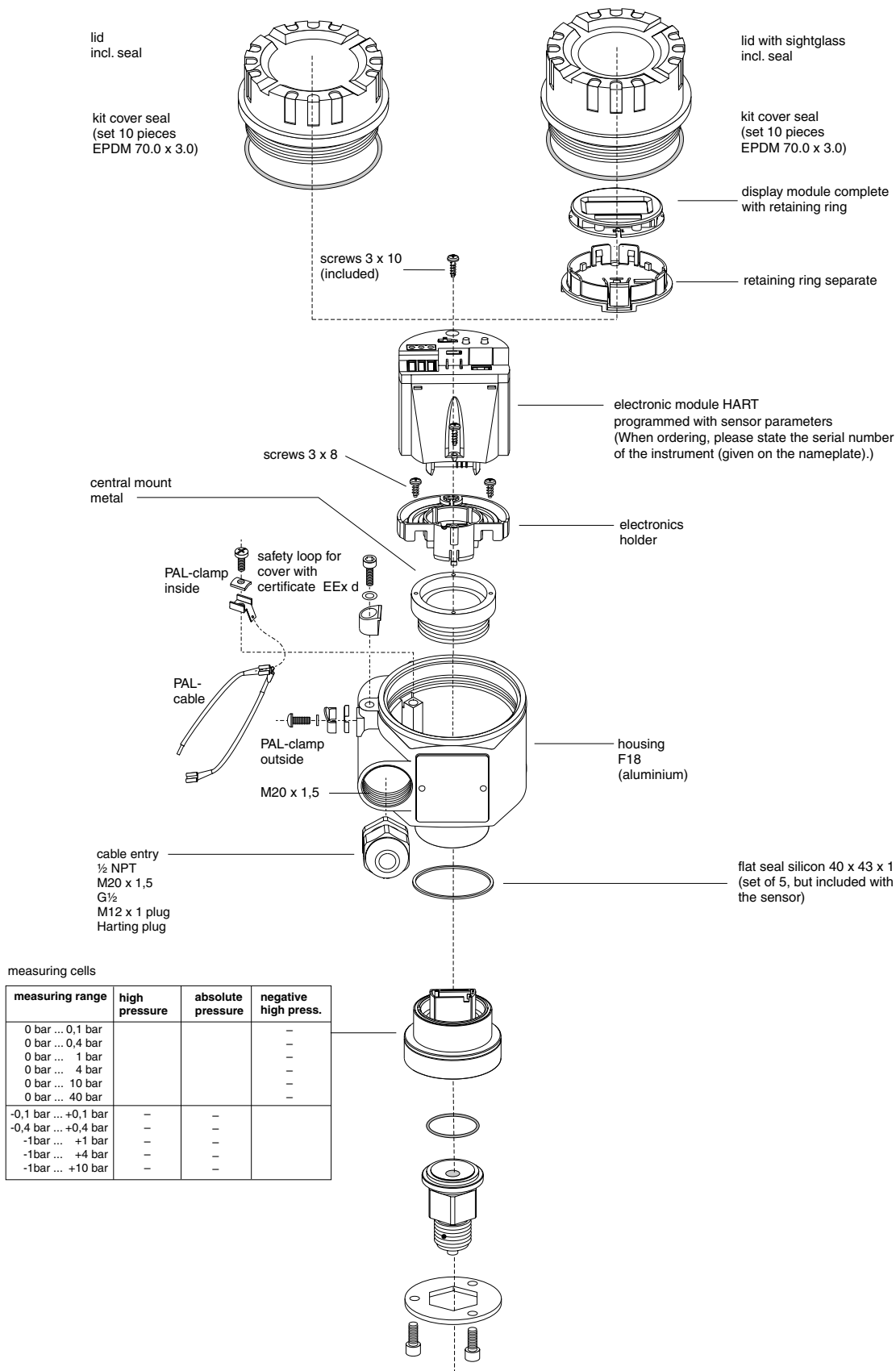
- the mechanical design of Barcon,
- the mechanical installation of Barcon with and without diaphragm seal,
- the electrical connection.

2.1 Mechanical design of devices

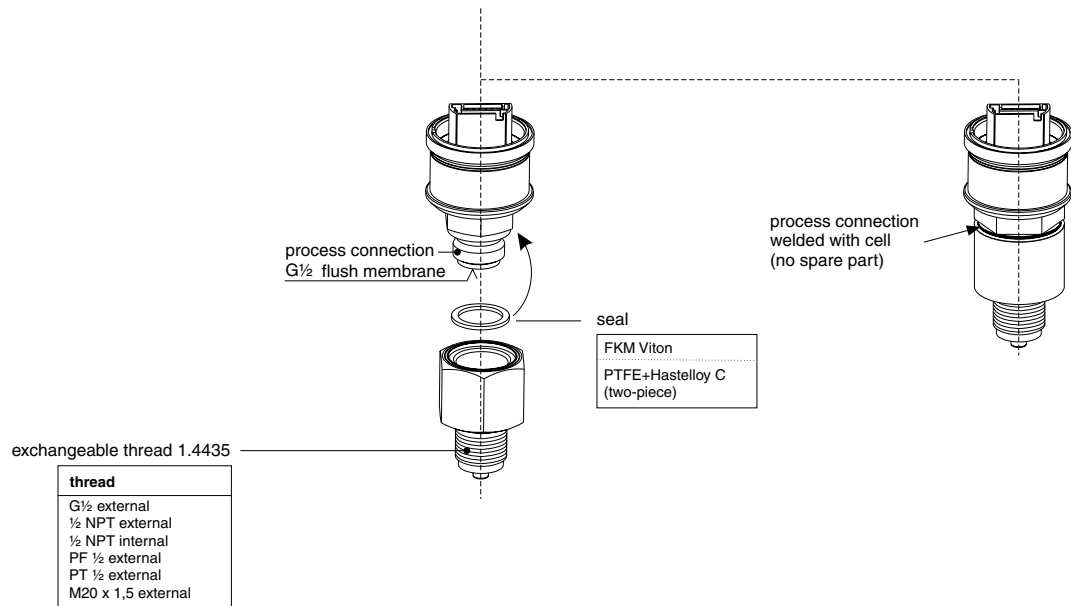
Mechanical design of Barcon with stainless steel housing



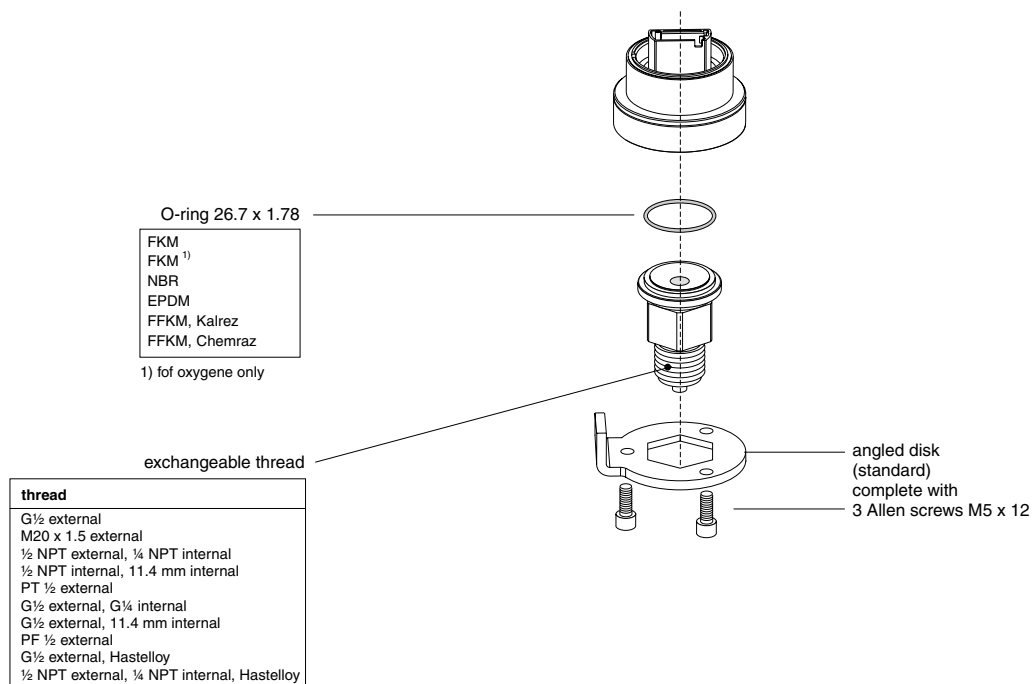
Mechanical design of Barcon with aluminium housing



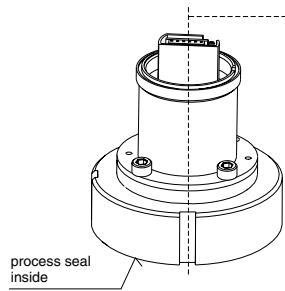
Process connection PPC-M10



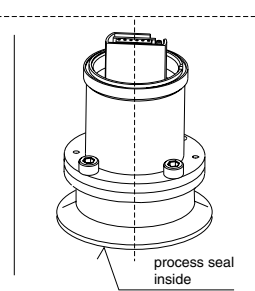
Process connection PPC-M20



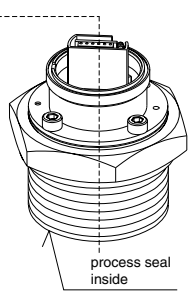
Process connection LHC-M20



process seal inside



process seal inside



process seal inside

measuring cell with sanitary couplings 1.4435

DIN 11851, DN 50
DIN 11851, DN 40
DIN 11864-1-A DN 40
DIN 11864-1-A DN 50
SMS 1½"
SMS 2"

Clamp 2"
Varivent 68 mm
DRD D = 65 mm
APV Inline PN 40

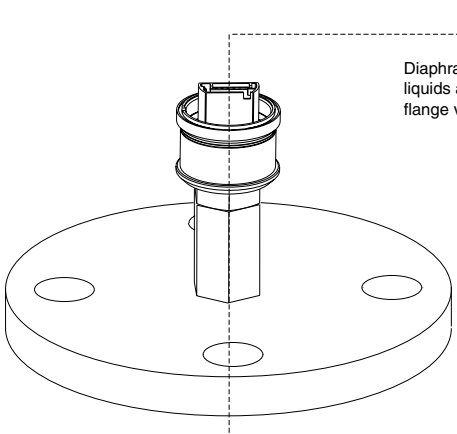
threaded boss 1.4435

G2
2 NPT

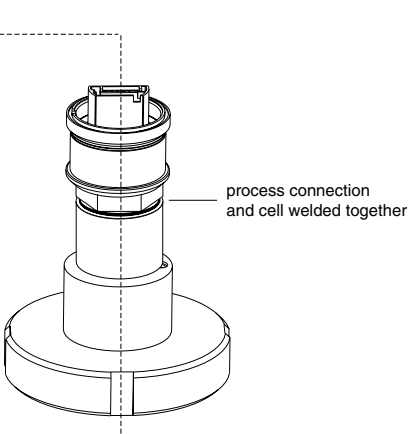
process seals of the membrane O-rings 26.7 x 1.78	FKM FFKM Kalrez FKM ¹⁾	
	FDA listed EPM NBR	

1) for oxygene only

Process connection LHC-M40



Diaphragm seals can be filled with different liquids and can feature a multitude of flange versions and sanitary couplings.



process connection and cell welded together

2.2 Mounting instructions without diaphragm seal

The Barcon without diaphragm seal is mounted in the same way as a manometer. The use of shut-off valves and pigtails is recommended. The position depends upon the application.

**Barcon
without diaphragm seal**
– PPC-M10, PPC-M20
– LHC-M20

- **Measurement in gases:**
Mount the shut-off valve above the tapping point so that condensate can run back into the process.

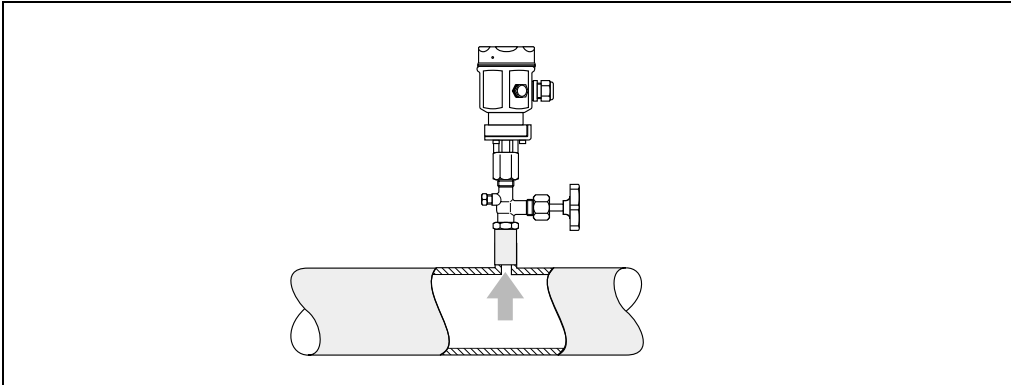


Fig.2.1: Mounting on a shut-off valve for measuring gases

- **Measurement in steam:**
Mount with a pigtail above the tapping point.
The pigtail reduces the temperature in front of the diaphragm to almost ambient temperature. Before start-up, the pigtail must be filled with water.

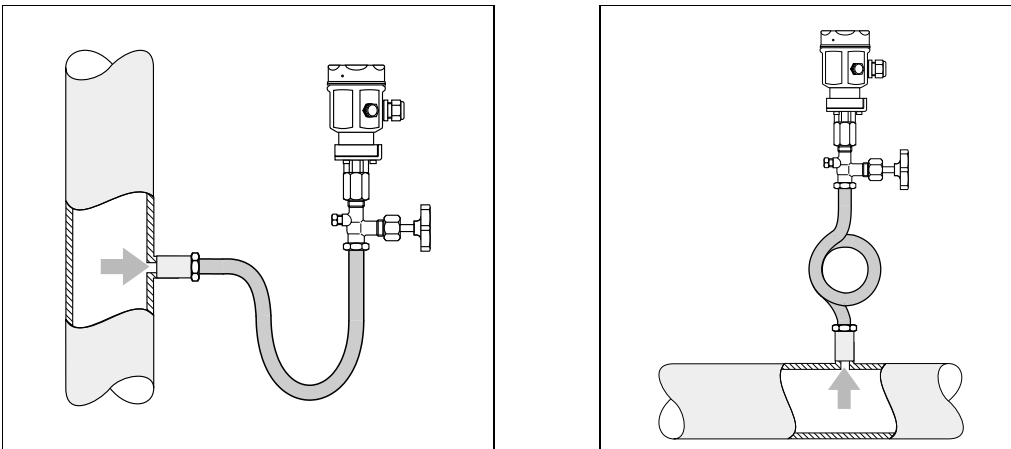


Fig. 2.2: left: Mounting with U-shaped pigtail for measuring steam
right: Mounting with circular pigtail for measuring steam

Barcon LHC/PPC (HART)

Installation

- Measurement in liquids:
Mount on the shut-off valve below the tapping point or at the same height

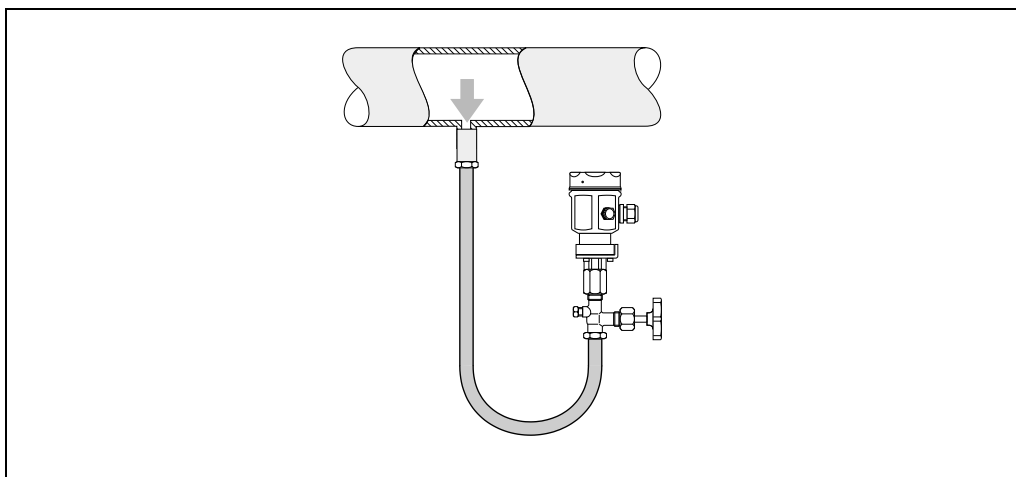


Fig.2.3: Mounting on a shut-off valve for measuring liquids

Mounting the PPC-M10

The PPC-M10 with metal sensor is available in the following versions:

- with flush-mounted diaphragm or
 - with adapter and internal diaphragm.
- The adapter can be screwed on or welded in.

A gasket is enclosed according to the material used and version.

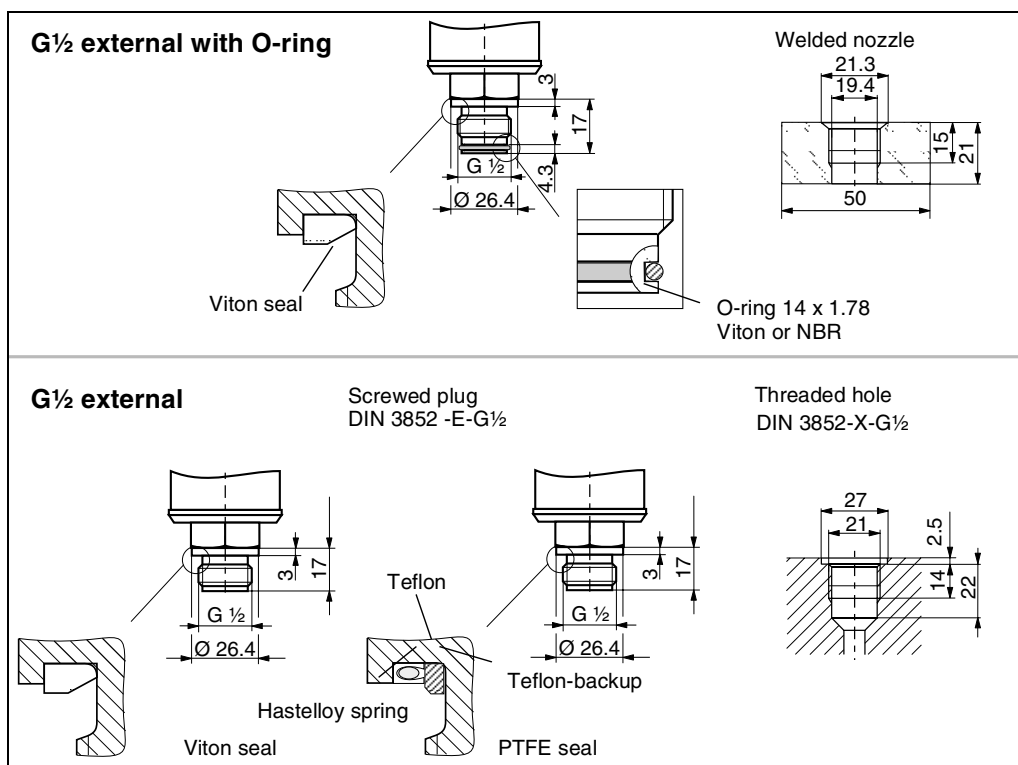


Fig.2.4: PPC-M10 with flush-mounted diaphragm

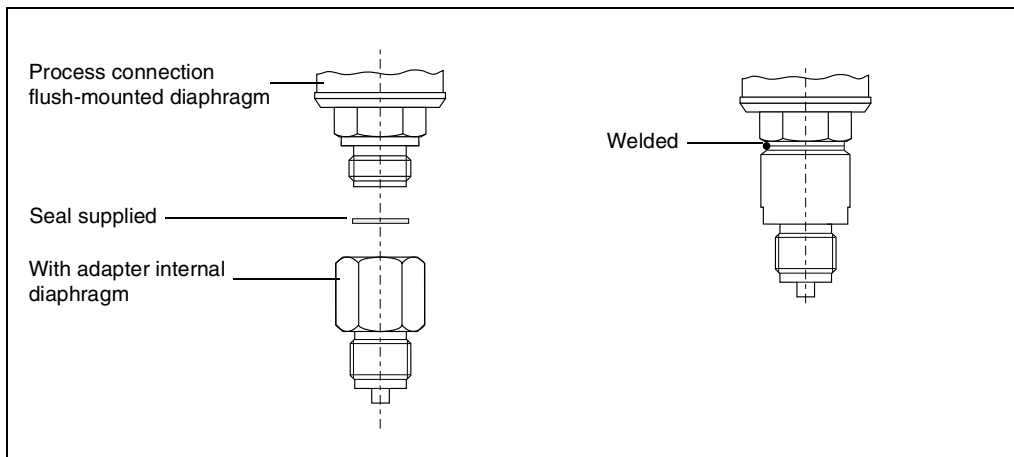


Fig.2.5: Barcon PPC-M10 with screwed or welded adapter. With screw adapter max. torque 80 Nm

2.3 Mounting instructions with diaphragm seal

The Barcon with diaphragm seal is screwed in, flanged or clamped, depending on the type of diaphragm seal.

**Barcon
with diaphragm seal
– LHC-M40**

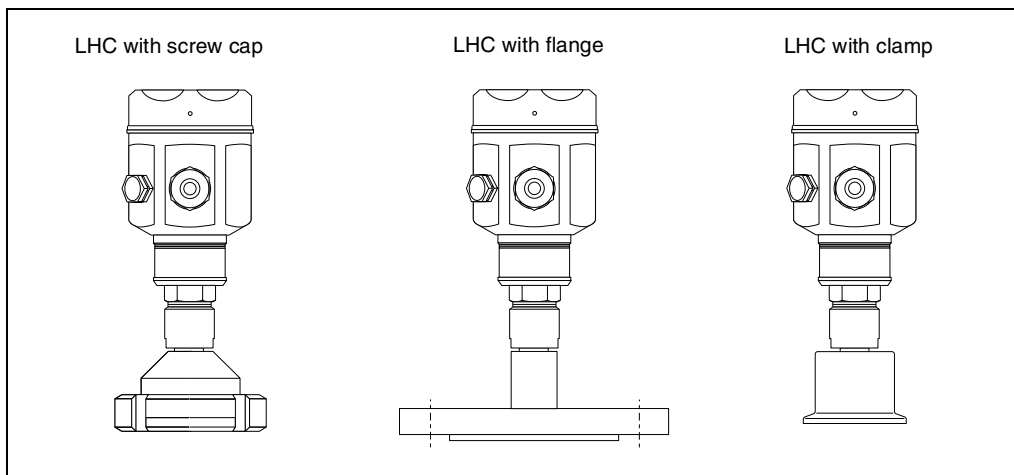


Fig.2.6: Diaphragm seal versions

- The protective cap of the diaphragm seal should only be removed just before mounting in order to protect the diaphragm.
- The diaphragm of the diaphragm seal of the Barcon must not be dented or cleaned with pointed or hard objects.
- The diaphragm seal and the pressure sensor together form a closed and calibrated system which is filled with filling fluid through a hole in the upper part of the sensor. The following rules should be observed:
 - This hole is sealed and is not to be opened.
 - The instrument should only be turned by the diaphragm seal at the point provided and not by the housing.

Barcon LHC/PPC (HART) Installation

Mounting with temperature spacers

The use of temperature spacers is recommended for constant extreme product temperatures that can cause the maximum permissible ambient temperature of +85 °C (+185 °F) to be exceeded.

- Note when mounting that the temperature spacer increases the maximum height by 100 mm (3.94 in).
- Due to the water column in the temperature spacer, the increased height also causes a zero point shift of approx. 10 mbar (0.15 psi).

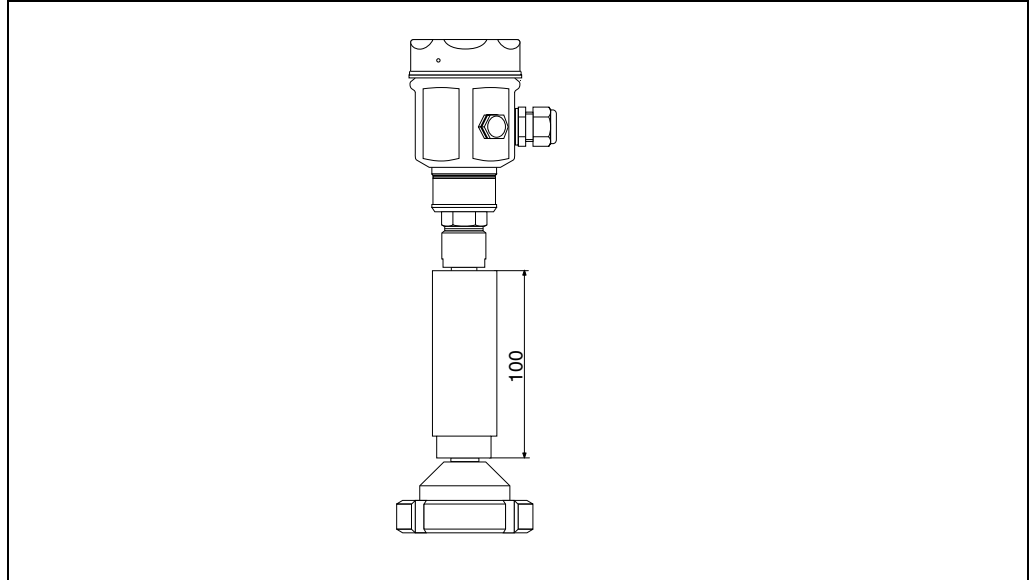


Fig.2.7: Mounting with temperature spacers

Mounting with capillary tubing

To protect from high temperature, moisture or vibration, or where the mounting point is not easily accessible, the housing of the Barcon can be mounted with a capillary tube to one side of the measuring point.

A bracket for mounting on a wall or pipe is available for this.

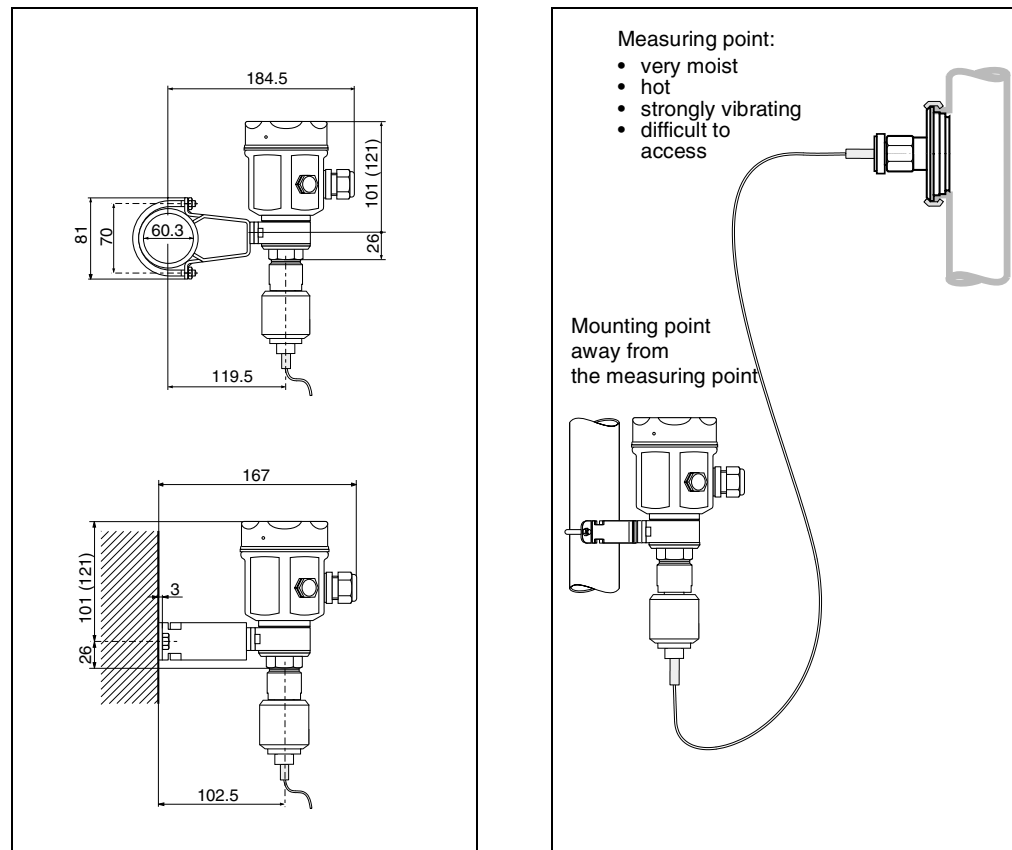
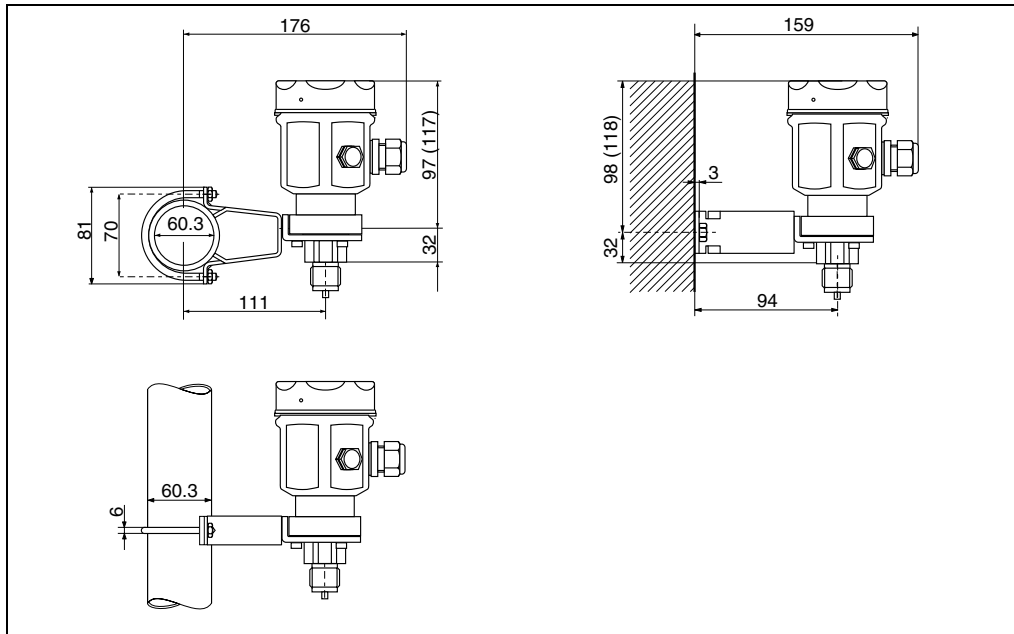


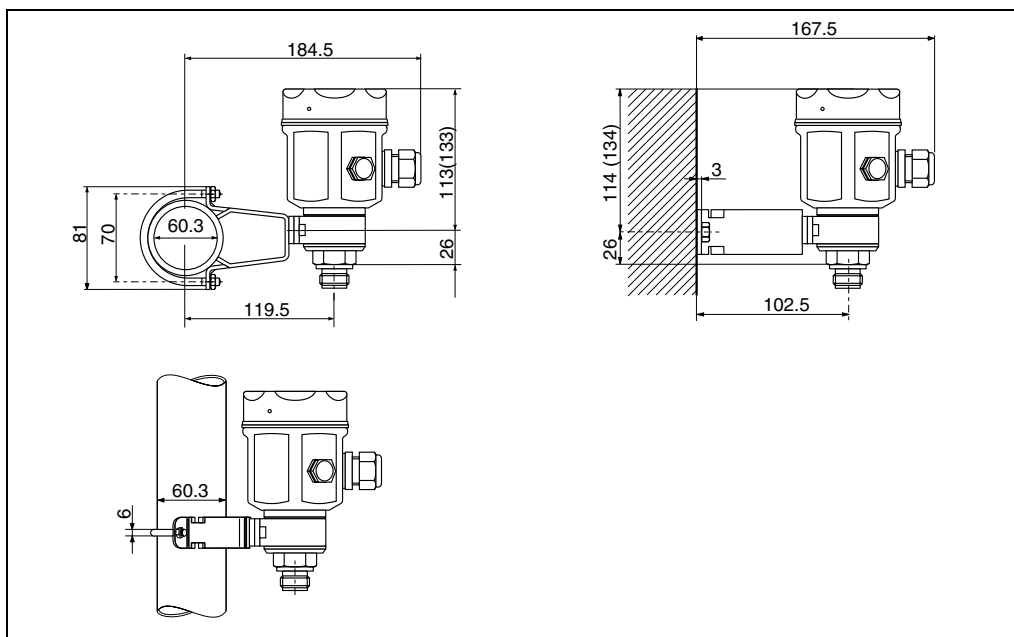
Fig.2.8: Mounting with capillary tubing and bracket away from the measuring point. Values in brackets apply to instruments with a raised cover.

2.4 Mounting accessories



PPC-M20:
wall and pipe mounting
with bracket

Fig. 2.9: left: Mounting with bracket on a vertical pipe
right: Mounting with bracket on a wall
Values in brackets apply to instruments with a raised cover.



PPC-M10:
wall and pipe mounting
with bracket

Fig. 2.10: left: Mounting with bracket on a vertical pipe
right: Mounting with bracket on a wall
Values in brackets apply to instruments with a raised cover.

2.5 Electrical connection

Transposed, screened two-wire cabling is recommended for the connecting cable.
 Max. wire diameter: 2.5 mm² permanently attached cable

The power supply voltage is:

- Non-Ex: 11.5 V... 45 V DC
- Ex i area: 11.5 V ... 30 V DC

Internal protection circuits against reverse polarity, HF interference and overvoltage peaks.

A test signal can be measured using the terminal plugs for this purpose without interrupting measurement.

Cable connection

- Unscrew the cover
- If present, remove the retainer ring with digital display. In addition:
 - Push up the latch with the arrow until the grip of the retaining ring is audibly released.
 - Loosen the retainer ring carefully to prevent the display cable from breaking. The plug of the display can remain plugged in.
- Insert the cable through the cable entry
- Connect the cable wires as shown in the connection diagram.
- Where appropriate, replace the retainer ring with digital display. The grip of the retainer ring clips in with an audible click.
- Screw down the cover

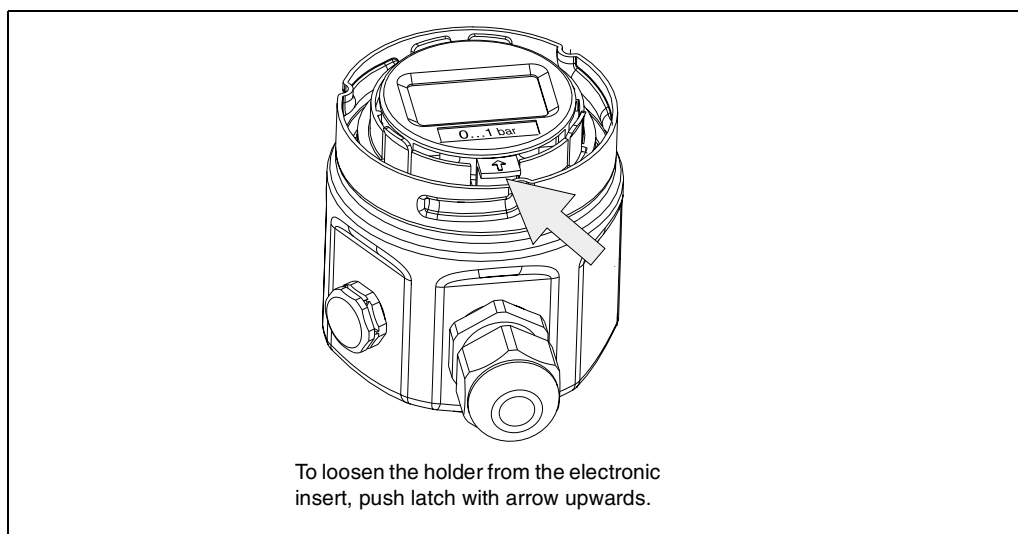


Fig.2.11: Lifting off the display and removing the retaining ring

Observe all local regulations for applications in the EEx i area!

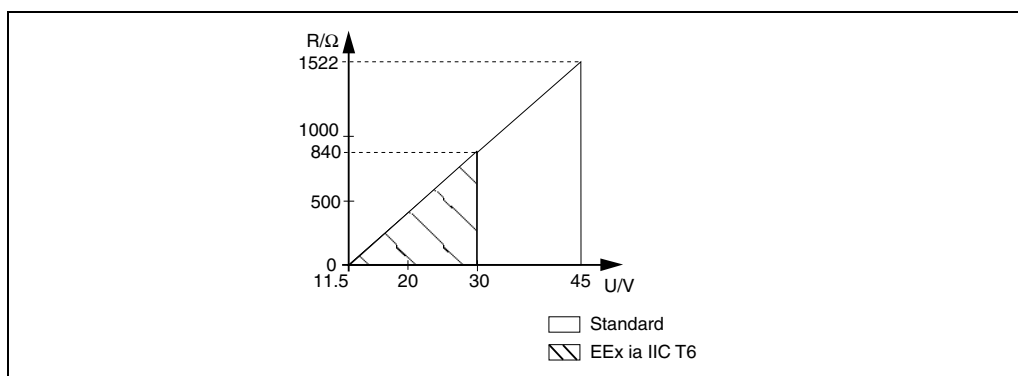


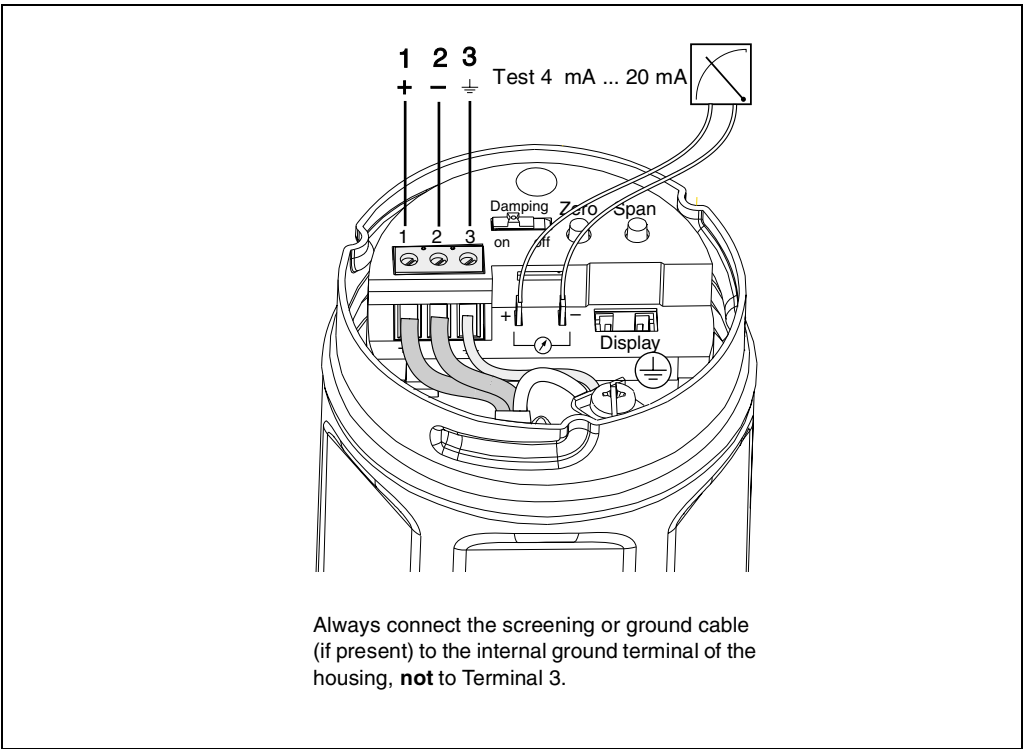
Fig.2.12: Graph showing load

Note!

Terminal 3 on the electronic insert is for grounding and is already wired internally. If the connection cable has a screening or ground cable within it, then this may only be connected to the grounding terminal of the housing and not to Terminal 3 (see connecting diagrams).



Note!



Always connect the screening or ground cable
(if present) to the internal ground terminal of the
housing, **not** to Terminal 3.

Fig.2.13: Connection

Plug	Plug assignment			
	Terminal	Function	Wire colour code	
Harting plug	1	+	Blue (BL)	
	2	-	Brown (BN)	
	8	PE	Green-Yellow (GNYE)	
Plug M12 x 1		+	Red (RD)	
		-	Black (BK)	
		PE	Green (GN)	

Barcon LHC/PPC (HART)

Installation

Connecting the handheld terminal

- Do not replace the battery of the handheld terminal in the explosion hazardous area.
- For a BARCON with FM or CSA certificate: Electrical connection according to "Installation drawing" (enclosed in the packing of the Barcon).
- For correct transmission of the communication signal, a minimum resistance of $250\ \Omega$ must be present between the connection points and the power supply.

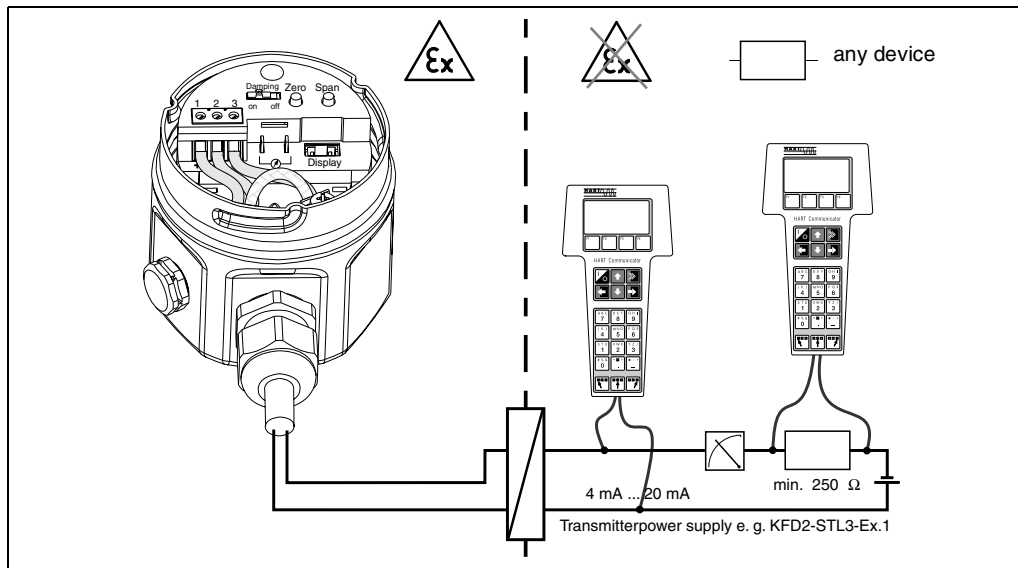


Fig.2.14: The handheld terminal can be connected anywhere along the 4 mA ... 20 mA line.

Connecting the HART- Modem for operating with PACTware

The HART modem connects the Barcon with a HART protocol to the RS 232 C serial interface of a personal computer. This enables the Barcon to be remotely operated with operating program PACTware.

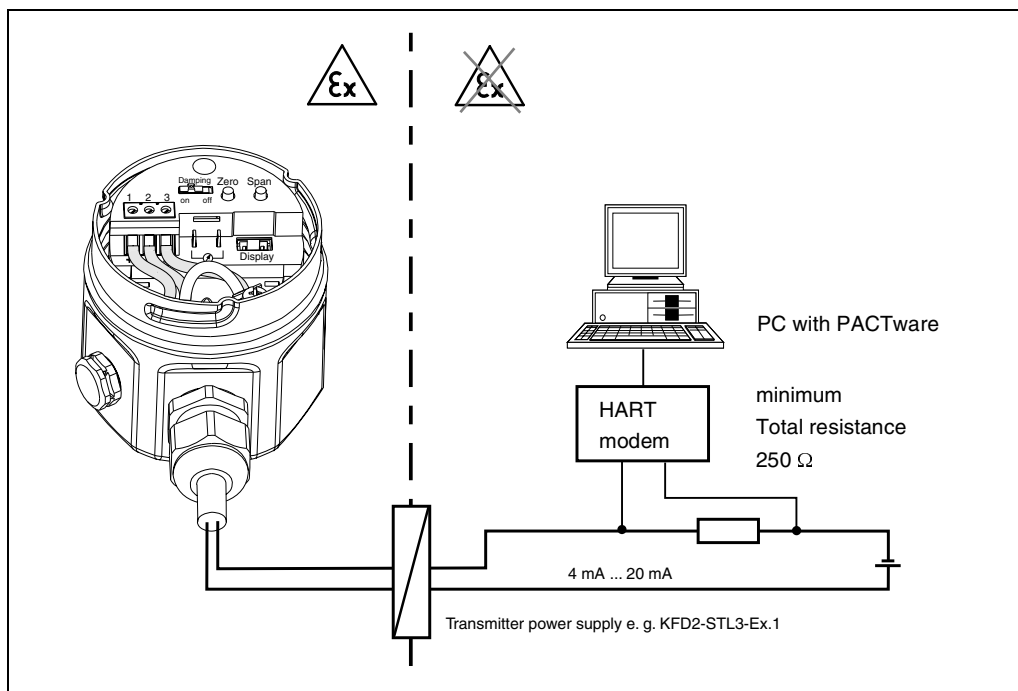


Fig.2.15: The HART modem can be connected anywhere along the 4 mA ... 20 mA line.

3 Operation

This section describes:

Contents

- Mounting the digital display
- Function of the digital display
- Position and function of the operating elements on the electronic insert
- Operating via PACTware
- Operating via the universal HART Communicator

3.1 Access to the operating elements

The digital display is delivered already mounted when it is ordered with the instrument. In this case the digital display with the retaining ring must be removed before operating. If you want to order an digital display at a later date, then please observe the instructions in chapter 6.3 "Mounting the digital display".

Lift display for operating

Removing the display:

- Push up the latch with the arrow until the grip of the retaining ring on the electronic insert is heard to click.
- Loosen the retainer ring and lift off carefully to prevent the display cable from breaking.
- For reading the display during operation, plug the display onto the edge of the housing or let it hang down loosely by its cable next to the housing.

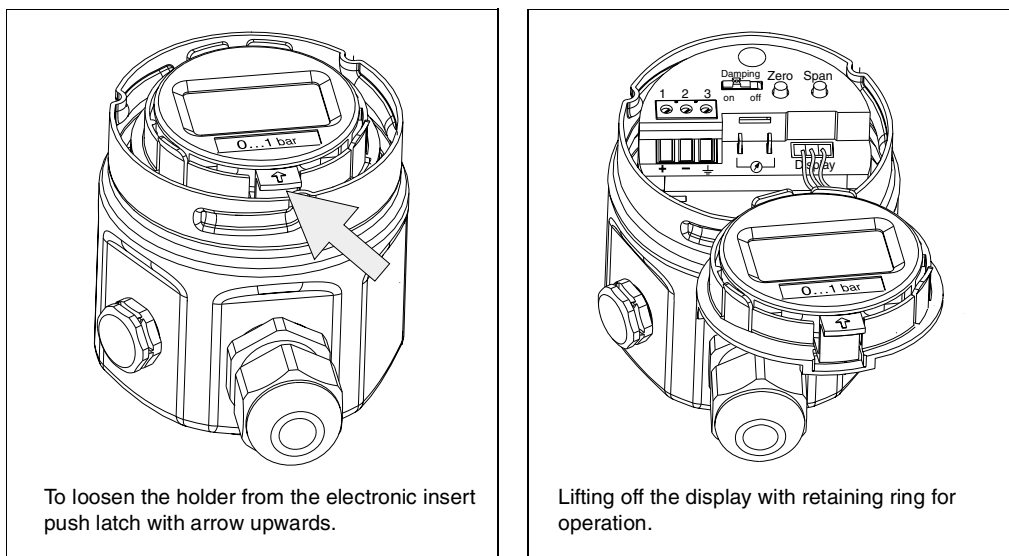


Fig. 3.1: left: Loosening the retaining ring
right: Display with retaining ring for operation

3.2 Function of the display

The digital display has two types of display:

- Display in measurement mode: This is shown as standard
- Display in calibration mode: This is shown after pressing the Zero or Span key once. It returns automatically to measurement mode after 2 seconds

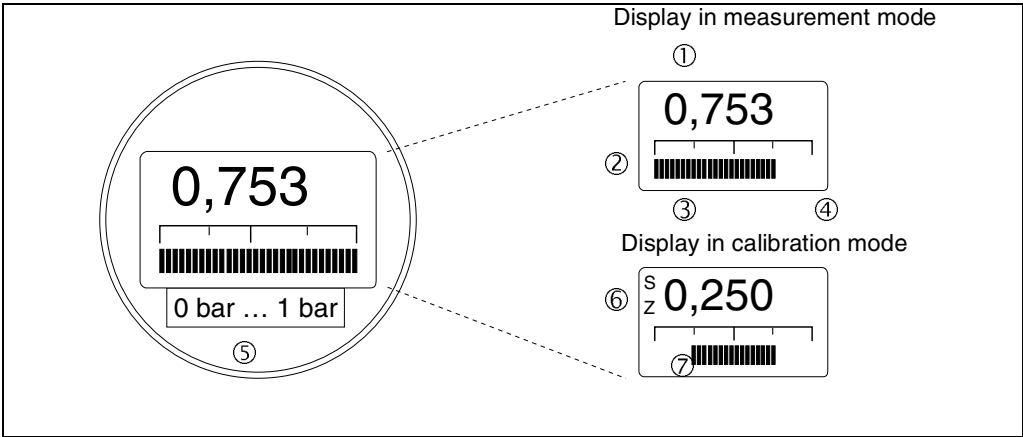


Fig. 3.2: Function of the display

Display in measurement mode

- ① 4-character display of measured values and input parameters
- ② bargraph of measured value
- ③ lower range value
- ④ upper range value
- ⑤ nominal measuring range

Additional displays in calibration mode

- ⑥ Display of the calibration point (Z=Zero or S=Span)
- ⑦ sets measuring range within the limits of the measuring cell

3.3 Position and function of the operating elements on the electronic insert

Position of the operating elements

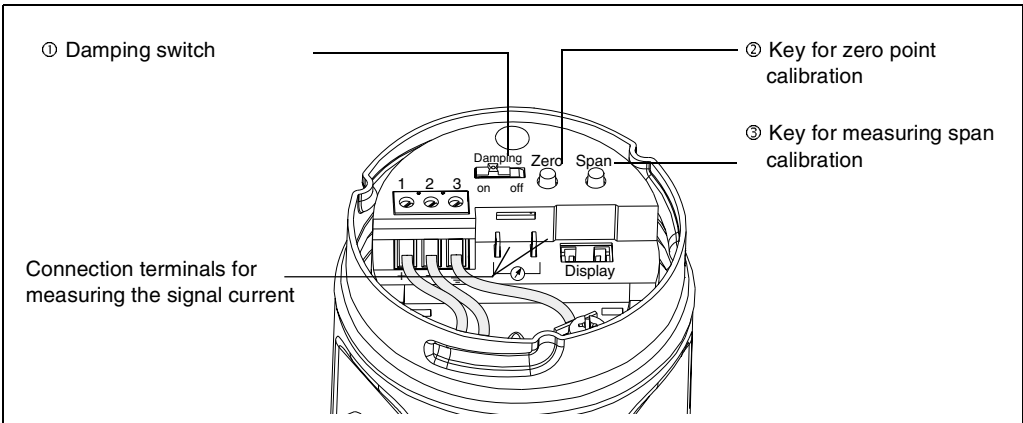


Fig. 3.3: Position of the operating elements

Function of the Operating Elements

No.	Operating element	Function
①	Damping switch	Switch position "off": Damping 0 s Switch position "on": Damping 2 s. This switch position also enables any damping to be entered between 0 s ... 40 s by remote communication e.g. with the handheld terminal.
②	Key for calibrating the zero point	press once: The acting pressure for the zero point is shown press twice: The acting pressure for the zero point is adopted
③	Key for calibrating the measuring span	press once: The acting pressure for the measuring span is shown press twice: The acting pressure for the measuring span is adopted
	Key for calibrating the zero point and key for calibrating the measuring point	press once simultaneously: The acting pressure is shown as the bias pressure press twice simultaneously: The acting pressure is adopted as the bias pressure

Date of Issue 25.10.2001

3.4 Operation using PACTware®

When operating using the PACTware display and operating program the Barcon is calibrated and operated. The appropriate server (e. g. HART) must be activated. A description of the PACTware operating program is found in the operating manual.

The advanced functions of the Barcon can be accessed in this operating mode in the menu.

Display and operating program

The calibrating parameters are entered in the appropriate fields

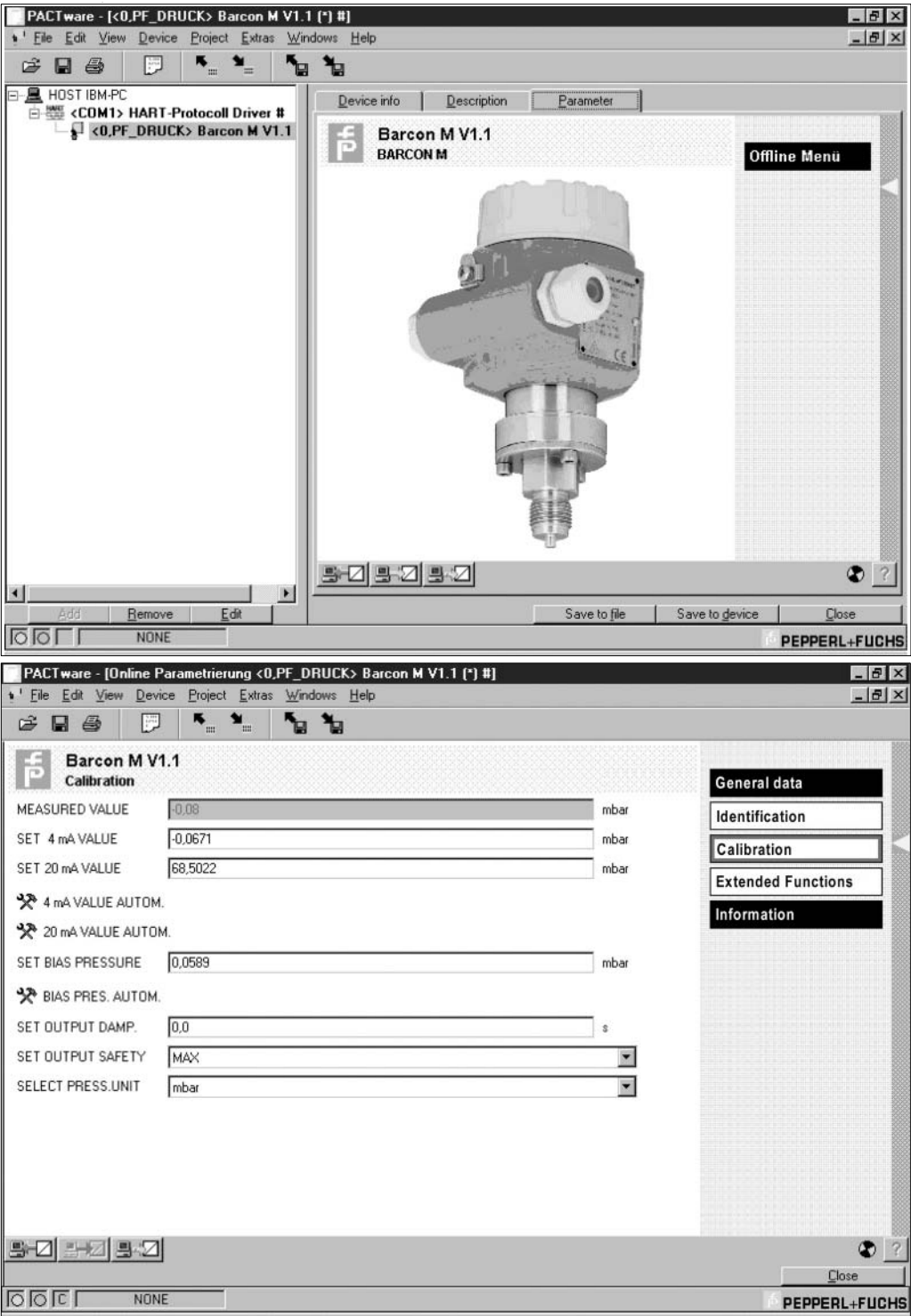


Fig. 3.4: Menu of instrument data in PACTware

3.5 Operating with the HART protocol via universal HART communicator

When operating with the HART protocol an interactive menu operation derived from the matrix is used (see also the appropriate operating manual for the handheld terminal).

- The menu "Group Select" calls up the matrix.
- The bar lines display the menu headings.
- Parameters are set using submenus.

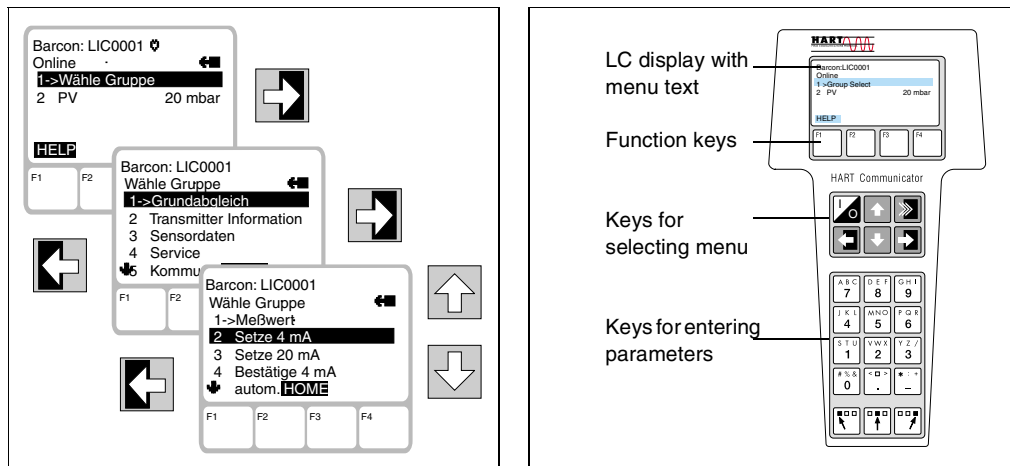


Fig. 3.5: left: Menu operation
right: Universal HART Communicator handheld terminal

Connecting the handheld terminal is described in chapter 2.

The procedure for commissioning the measuring point with the Universal HART Communicator handheld terminal is described in chapter 4.

4 Commissioning

This section contains the following information:

Contents

- On-site commissioning using keys on the electronic insert
- Commissioning and operation using remote communication (Universal HART Communicator handheld terminal or PACTware)
- Locking and unlocking the measuring point
- Information on the measuring point

4.1 On-site commissioning

- Wire up the Barcon (see chapter 2.5 "Electrical connection")
- Connect a multimeter (4 mA ... 20 mA) to the connection terminals provided.
- Ensure that a pressure can be generated within the required measuring range.

Preparatory work

The damping τ affects the speed with which the output signal and the digital display react to changes in pressure.

Damping

A switch on the electronic insert is used for calibrating the damping:

- Switch position **off**: Damping 0 s
- Switch position **on**: Damping 2 s

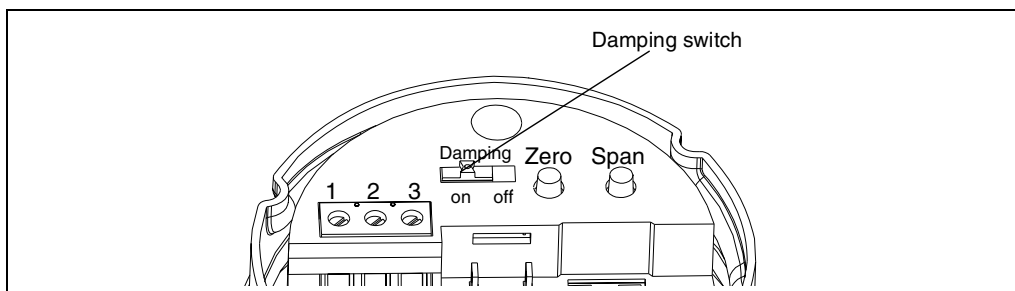


Fig. 4.1: Position of the damping switch

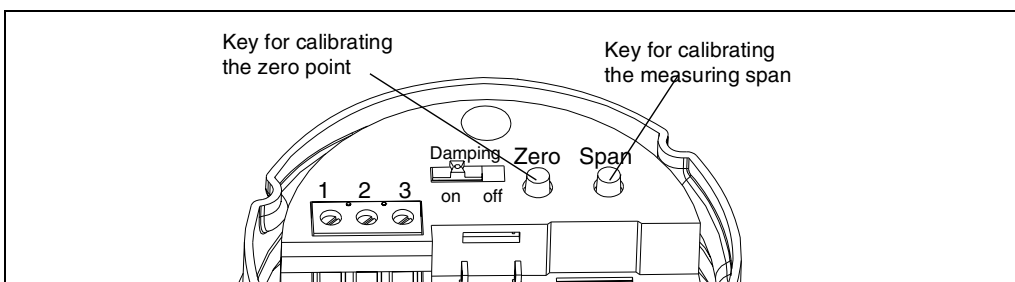


Fig. 4.2: Position of keys for calibrating zero point and measuring span

Zero point calibration is carried out using the key for zero point adjustment (Zero).

Zero point adjustment

Carry out the measuring span adjustment as follows:

- Enter exactly the pressure for the lower range value.
- Press the Zero key twice.
The acting pressure is adopted as the zero point.
By pressing the Zero key once the value can be called up if a digital display is connected.

The measuring span is adjusted using the key for calibrating the measuring span (Span). Carry out the measuring span adjustment as follows:

Adjusting the measuring span

- Enter exactly the pressure for the upper range value.
- Press the Span key twice.
The acting pressure for the measuring span is adopted.
By pressing the Span key once the value can be called up if a digital display is connected.

4.2 Commissioning and operation using communication

Preparatory work

- Wire up the Barcon (see chapter 2.5 "Electrical connection").
- Decide which tool is to operate the Barcon and wire it up accordingly. (see chapter 3.4 "Operation using PACTware®" and see chapter 3.5 "Operating with the HART protocol via universal HART communicator")
- All used parameters are listed in the matrix of parameters (see chapter 8 "Matrix of parameters").

Resetting to factory settings (Reset)

By entering a code, the entries in the Parameter are reset partially or completely to factory settings. Further information on the various types of reset and their effects are given in chapter 5.3 "Reset".

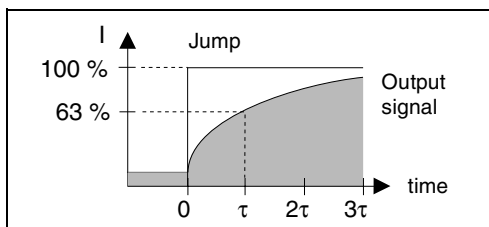
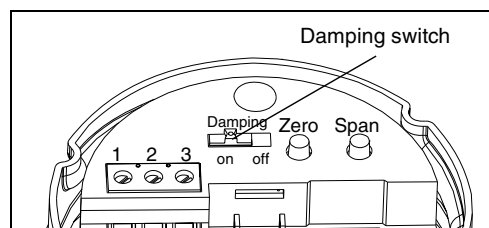
#	Para.	Moving through the menus	Entry
Main group: Transmitter information			
1	Resetting to factory settings (Reset)		
	V2H9	➤ Default Values	e. g. 2380 Enter

Damping

The damping τ affects the speed with which the output signal and the digital display react to changes in pressure.

For setting the damping using the handheld terminal, the damping switch must be set to "on". Values for damping between 0 s and 40 s can be selected using the handheld terminal.

#	Para.	Moving through the menus	Entry
1	Set the damping switch to "on"		
Main group: Basic setting			
2	Suppressing variations in the measured value		
	V0H7	➤ Damping output $\tau = 0 \text{ s} \dots 40 \text{ s}$	e. g. 20 s Enter



Selecting the pressure units

Selecting the pressure units determines in which units the pressure-specific parameters are to be shown. The pressure units available are given in the table below.

After selecting new pressure units all information on the pressure are converted into the new units, e. g. 0 bar ... 1 bar = 0 psi ... 14.5 psi.

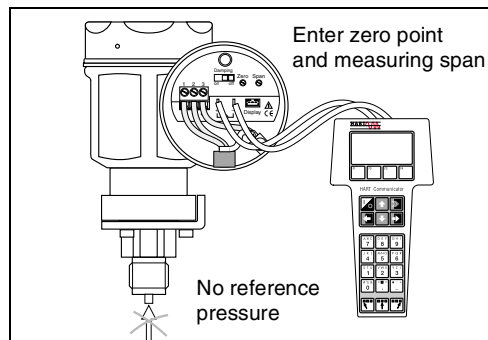
#	Para.	Moving through the menus	Entry
Main group: Basic setting			
1	Selecting pressure units		
	V0H9	➤ Selecting pressure units	e. g. psi Enter

Units	Units	Units	Units	Units
mbar	kPa	in H ₂ O	kg / cm ²	Torr
bar	MPa	ft H ₂ O	kgf / cm ²	mm Hg
Pa	mm H ₂ O	psi	atm	in Hg
hPa	m H ₂ O	g / cm ²	lb / ft ²	

The pressure required for zero point and span is calibrated using the handheld terminal without entering a reference pressure.

Lower and upper range value: calibration without reference pressure

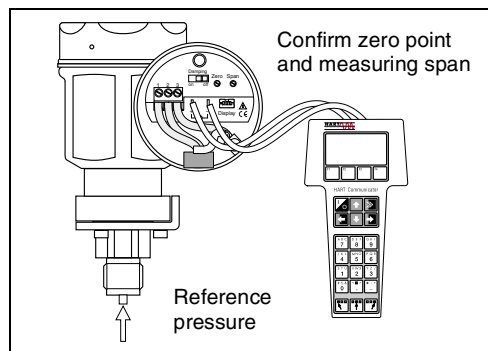
#	Para.	Moving through the menus	Entry
Main group: Basic setting			
1	Entering known pressure for zero point		
	V0H1	➤ Setting 4 mA	e. g. 0 psi Enter
2	Entering known pressure for span		
	V0H2	➤ Setting 20 mA	e. g. 14.5 psi Enter



A reference pressure is available that corresponds exactly to the zero point and span required.

Lower and upper range value: calibration with reference pressure

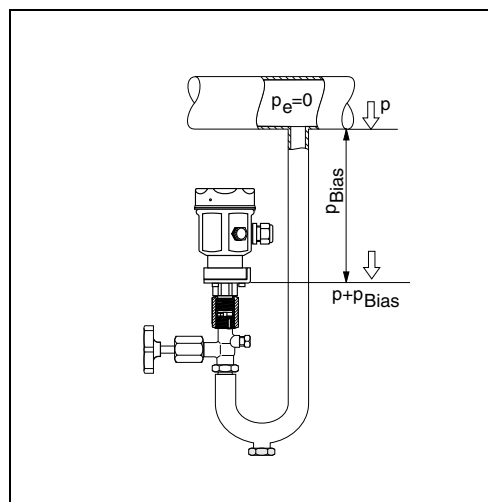
#	Para.	Moving through the menus	Entry
Main group: Basic settings			
1	Adopting the acting pressure for the zero point		
	V0H3	➤ Confirming 4 mA automatically	e. g. 0 psi Enter
2	Adopting the acting pressure for the span		
	V0H4	➤ Confirming 20 mA automatically	e. g. 14.5 psi Enter



If the display does not show zero after zero point adjustment (due to position), then this can be corrected to zero by entering a bias pressure or by adopting the bias pressure acting (depending on position).

Bias adjustment

#	Para.	Moving through the menus	Entry
Main group: Basic setting			
1	Setting the display to zero by entering a known bias pressure (pressure dependent on position).		
	V0H5	➤ Setting bias pressure	e. g. 5 psi Enter
alternatively			
2	Setting the display to zero A bias pressure acting (pressure dependent on position) is adopted as zero pressure.		
	V0H6	➤ Confirming bias pressure automatically	Enter



The current signal is set to 3.8 mA ... 20.5 mA as standard when operating correctly. Selecting the 4 mA level, ensures that a minimum current signal does not fall below 4 mA.

4 mA level (current output min. 4 mA)

#	Para.	Moving through the menus	Entry
Main group: Sensor data			
1	V7H3	➤ Off Current output min. 4 mA	e. g. On Enter

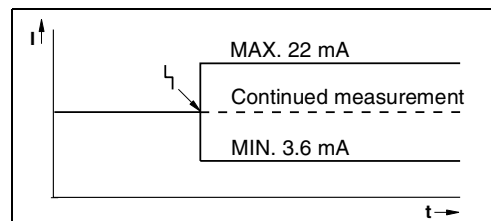
Output on error

To indicate an error, an error code is transmitted with the measured value.

At the same time the bargraph in the digital display assumes the value selected by the operator. The following values can be selected:

- MIN: 3.6 mA
- MAX: 22 mA
- CONTINUE: measurement continued

#	Para.	Moving through the menus	Entry
Main group: Basic settings			
1	Selecting output on error		
	V0H8	➤ Selecting fail-safe	e. g. MAX. Enter



4.3 Locking/unlocking operation

After calibrating or entering all parameters, the operation can be locked by entering a three-figure code other than 130. This blocks all fields and functions except V9H9 "Locking". Locking is released by entering 130.

#	para.	Moving through the menus	Entry
Main group: Service			
1	Locking operation		
	V9H9	➤ Locking	e. g. 131 Enter

2	Releasing locking		
	V9H9	➤ Locking	130 Enter

4.4 Information on the measuring point

The following information on the measuring point can be called up with the handheld terminal:

Parameter field	Display or entry
Measured values	
V0H0	Main measured value for pressure
V7H0	Current display: Actual current in mA
V7H8	Sensor pressure (units in V0H9) selectable
V9H7	Actual dampened pressure without bias correction
Sensor data	
V7H4	Lower calibration pressure
V7H5	Upper calibration pressure
V7H6	Lower measurement limit of sensor (units in V0H9 selectable)
V7H7	Upper measurement limit of sensor (units in V0H9 selectable)
Information on transmitter	
V2H2	8010 = Software number
V2H7	Sensor data No.: Number of entry in the sensor table (1...10). Please remove from sensor pass
V2H8	Sensor data value: Entry in sensor table, contains all sensor-specific data. Please remove from sensor pass
Error response	
V2H0	Actual diagnostic code
V2H1	Last diagnostic code

Communication level

Parameter field	Display or entry
VAH0	Measuring point tag. The measuring point can be identified here with a max. of 8 characters.
VAH1	Descriptor. A max. of 16 characters can be entered here for the Descriptor.
VAH2	User text. A max. of 8 characters can be entered here.
VAH3	Serial number of the transmitter
VAH4	Serial number of the sensor

5 Diagnosis and troubleshooting

5.1 Diagnosis of errors and warnings

Error

If the Barcon identifies an error (E):

- an error code is given and flashes on the digital display,
- when a digital display is plugged in, the bargraph assumes the value selected for an error message (MIN, MAX, CONTINUE),
- if the value displayed and the bargraph are flashing,
- transmitter information can be read off in the main group or error codes read off in the parameterfields V2H0 and V2H1.

Warning

If the Barcon identifies a warning (W):

- an error code is given: the Barcon continues to measure,
- if the digital display is plugged in and the scale is flashing,
- transmitter information can be read off in the main group or error codes read off in the parameterfields V2H0 and V2H1.

Error codes in V2H0 and V2H1

If several codes occur simultaneously, the sequence in which they are displayed corresponds to their order of priority.

Code	Type	Ursache und Beseitigung
E 101	Error	Sensor Table check sum error <ul style="list-style-type: none"> • is shown e. g. when sensor parameters are being entered. The error message disappears when the sensor parameters are entered correctly and in full.
E 103	Error	Initialisation is being carried out <ul style="list-style-type: none"> • Wait until the procedure has been completed
W 104	Warning	Sensor calibration error (calibration points lie too near each other) <ul style="list-style-type: none"> • Recalibrate sensor
E 106	Error	Up/download active <ul style="list-style-type: none"> • Wait until the procedure has been completed
E 115	Error	Sensor overpressure <ul style="list-style-type: none"> • Remains until the overpressure disappears
E 116	Error	Download error <ul style="list-style-type: none"> • Restart download
E 120	Error	Sensor underpressure <ul style="list-style-type: none"> • Remains until the underpressure disappears
W 613	Warning	Current simulation active <ul style="list-style-type: none"> • Remains until the simulation is completed, see also page 26
E 620	Error	Measured value outside initial value/final value

5.2 Current simulation

Sollen die Funktion oder bestimmte Reaktionen von eingeschleiften Auswertegeräten überprüft werden, kann ein Signalstrom unabhängig vom anliegenden Systemdruck simuliert werden.

#	Para.	Moving through the menus	Entry
Main group: Additional functions			
1	V7H1	➤ Simulation	ON
2	V7H2	➤ Simulates current	e. g. 22 mA

5.3 Reset

By entering a specific code, entries to the parameter can be reset either partially or fully.

#	Para.	Moving through the menus	Entry
Main group: Transmitter Info			
1	V2H9	➤ Factory values	e. g. 2380

The Barcon differentiates between four types of reset with various responses. Which parameter is affected by which reset is given in the table below. **Matrix of parameters**

	H0	H1	H2	H3	H4	H5	H6	H7	H8	H9
V0 5140 2380 731 2509		Sets 4 mA 0.0 0.0 0.0	Sets 20 mA V7H7 V7H7 V7H7	4 mA automat. deleted deleted deleted	20 mA automat. deleted	Sets bias pressure 0.0 0.0 0.0	Bias pressure autom. deleted	Dampens output 0.0 0.0 0.0	Selects fail-safe max. max. max.	Pressure unit bar
V2 5140 2380 2509 731		Diagnos- tic code 0 0 0								
V3 ... V6										
V7 5140 2380 2509 731		Simulatio n off	Simulates current deleted	Current min. 4 mA off off off	Low and high sensor calibration The pressure delivered by the equation system is not corrected					
V8										
V9 5140 2380 2509 731										Locking 130
VA 5140 2380 2509 731	Measure- ment point deleted deleted	Descripto r deleted deleted	User text deleted	Serial number deleted						

6 Maintenance and repair

6.1 Repair

If the Barcon must be sent to Pepperl+Fuchs for repair, then a note should be enclosed containing the following information:

- An exact description of the application
- The chemical and physical characteristics of the product.
- A brief description of the error.

Before sending in the Barcon to Pepperl+Fuchs for repair, please take the following protective measures:

- Remove all traces of the product. This is particularly important if the product is dangerous to health, e. g. corrosive, poisonous, carcinogenic, radioactive, etc.
- We do request that no instrument should be returned to us without all dangerous material being completely removed as it can, e. g. penetrate into fissures or diffuse through plastic.



Caution!

Caution!

Instruments with certificates of conformity or design approval must be sent in for repair as complete units only.

6.2 Replacement parts

In the chapter 2.1 shows all replacement parts which can be ordered from Pepperl+Fuchs.

When ordering replacement parts, please note the following:

- If parts given in the order code are to be replaced, then ensure that the order code (instrument designation) on the nameplate is still applicable.
- If the instrument designation on the nameplate has changed then a modified nameplate must also be ordered. The information about the new instrument must then be entered on the modified nameplate. This must then be attached to the housing of the Barcon.
- If a new sensor is ordered as a spare part, it is usually supplied as the complete mounted device with housing and process connection, but without the electronic insert.
- Only the process connection on the PPC-M20 can be exchanged by the customer. For all other versions, the process connection ordered is supplied with the complete housing, but without the electronic insert.
- It is not possible to convert a standard instrument into an Ex instrument by replacing its parts. The appropriate regulations are to be observed when certified instruments are to be repaired.

6.3 Mounting the digital display

The digital display is delivered already mounted when it is ordered with the instrument. In cases of damage, accessories can be ordered.

- Push up the latch with the arrow until the grip of the retaining ring on the electronic insert is heard to click.
- Loosen the retainer ring and lift off carefully to prevent the display cable from breaking.
- Remove the plug of the display from the electronic insert.

Removing the display

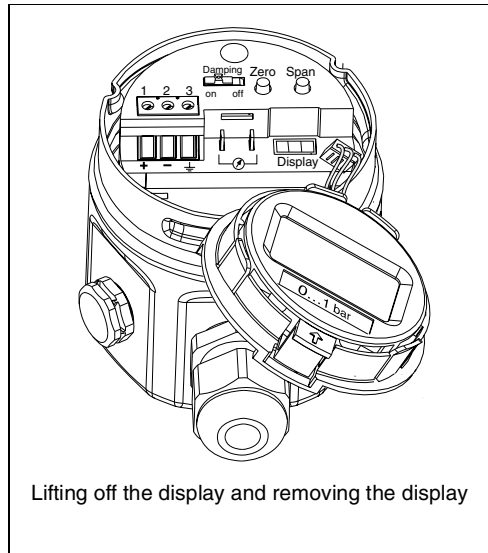
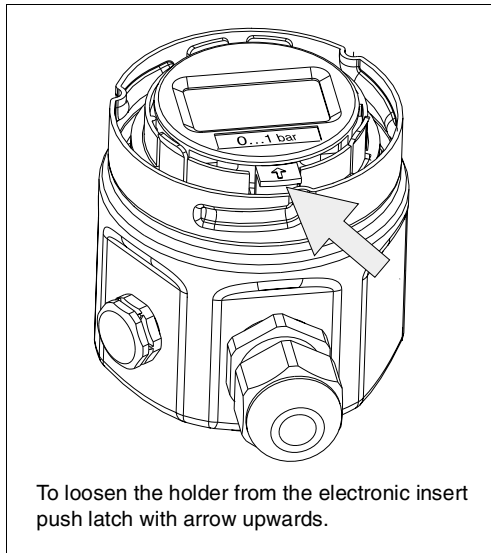


Fig. 6.1: left: Loosening the retaining ring
right: Removing the display

- Insert the plug of the display in the jack in the electronic insert provided for this purpose and clip in ①.
- Insert the pin on the retaining ring into the hole in the electronic insert provided for this purpose ②.
- Firmly press down the retaining ring with the display onto the electronic insert. The stop makes an audible click.

Mounting the display

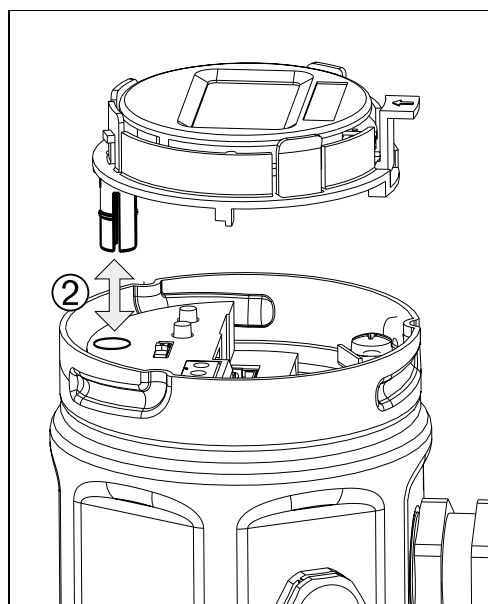
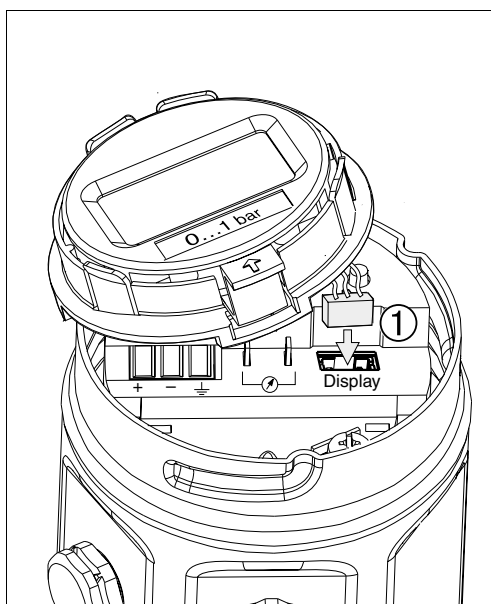


Fig. 6.2: Mounting the display

6.4 Changing the electronic insert

If the existing Smart electronic insert is to be replaced with another Smart electronic insert, then it can be ordered under the following order No.:

- LHC-Z102: Electronics for Barcon, 4 mA ... 20 mA, HART protocol,
with sensor parameters
 When ordering with this order No., please state the sensor number of the instrument (given on the nameplate). Your electronic insert is then reset in the factory to your sensor parameters
- LHC-Z101: Electronics for Barcon, 4 mA ... 20 mA, HART protocol,
without sensor parameters
 When ordering with this order No. the electronic insert is programmed with a default set of data, i.e. the instrument will function, but with less accuracy. In order to restore the defined accuracy, the new sensor parameters should be re-entered after exchanging the electronic insert. All information on this is given in subsection "Entering sensor parameters" in this section.
- After replacing the electronic insert the instrument must be recalibrated.
 Information on adjustment is given in chapter 4 "Commissioning".

If the existing Smart electronic insert is to be replaced with an analogue electronic insert, then the information contained in BA 200O, supplied with the analogue electronic insert, applies.

Removing the electronic insert

- Where appropriate, loosen the retaining ring and lift off and remove the plug of the display from the electronic insert.
- Remove the cable from the electronic insert.
- Loosen screws ① and ② on the electronic insert.
- Lift out the electronic insert.

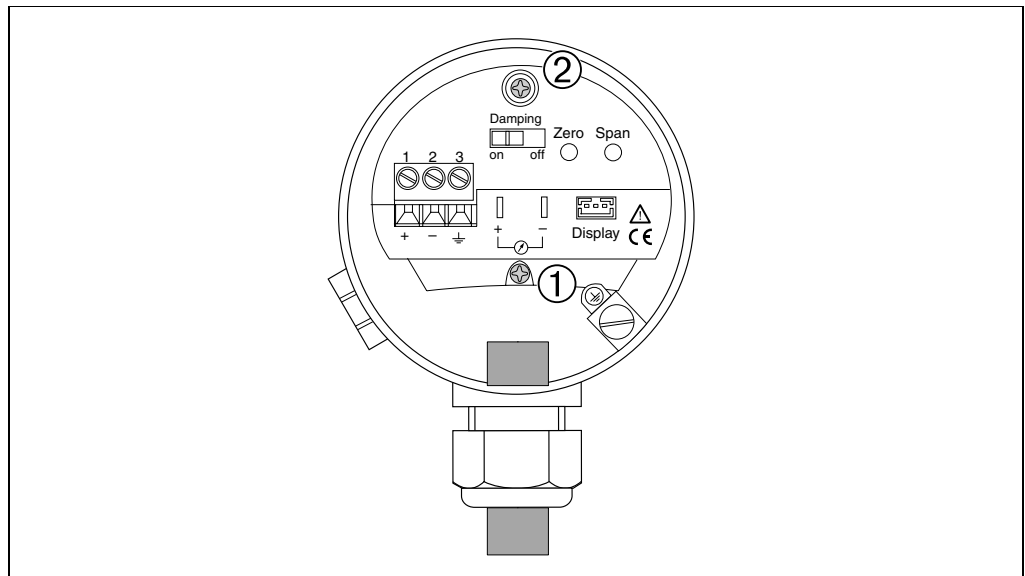


Fig. 6.3: Position of screws ① and ② for removing the electronic insert

Mounting the electronic insert

- Plug in the new electronic insert and tighten screws ① and ②.
- Connect the connecting cable as shown in connection diagram in chapter 2.5 "Electrical connection".
- Carry out a calibration as shown in chapter 4 "Commissioning".
- Where appropriate, mount the display.

A sensor pass showing the sensor parameters is included with every instrument. These must be changed if the electronic insert is replaced.

Entering sensor parameters

The following eleven pairs of values must be entered in matrix fields V2H7 and V2H8.

V2H7 sensor data No.	V2H8 sensor data value
01	Word 16 sensor check sum
02	HI Word 16 sensor serial number
03	LO Word 16 sensor serial number
04	HI Word 16 lower measurement limit
05	LO Word 16 lower measurement limit
06	HI Word 16 upper measurement limit
07	LO Word 16 upper measurement limit
08	HI Word 16 sensor coefficient A0
09	LO Word 16 sensor coefficient A0
10	HI Word 16 sensor coefficient A1
11	LO Word 16 sensor coefficient A1

After entering the sensor parameters, the matrix fields V2H7 and V2H8 are released by the code 333. All other matrix fields are then blocked against unauthorised operation.

Carry out the entry procedure as follows:

#	Para.	Moving through the menus	Entry
Main group: Service			
1	Locking operation		
	V9H9	➤ Locking	333
Main group: Transmitter information			
2	Enter sensor parameters		
	V2H7	➤ Enter sensor data No.	01
	V2H8	➤ Enter sensor check sum	e. g. 47769
	V2H7	➤ Enter sensor data No.	02
	Enter all other pairs of values		
	V2H7	➤ Enter sensor data No.	11
	V2H8	➤ Enter sensor coefficient A1	e. g. 48112
Main group: Service			
3	Unlocking operation		
	V9H9	➤ Unlocking	e. g. 130

Note!

When entering the sensor parameters, the error code E101 "Sensor table check sum error" is shown. The error message disappears when all sensor parameters are entered correctly.



Note!

6.5 Changing the measuring cell

If the measuring cell is to be changed then Pepperl+Fuchs offers a complete housing with the new measuring cell and process connection required but without an electronic insert. Therefore, when changing the measuring cell, simply remove the electronic insert from the old housing and install it in the new one. After changing the measuring cell, the sensor parameters of the new measuring cell and the Barcon must be recalibrated.

- Ordering a housing with measuring cell and process connection:
 PPC-M□□-□□□□-□□□□-□□NA□-□□
 LHC-M20-□□□□-□□□□-□□NA□-□□
 LHC-M40-□□□□-□□□□□□-□□NA□-□□
- For instructions on mounting the electronic insert and for entering sensor parameters see chapter 6.4 "Changing the electronic insert"
- For instructions on calibration see chapter 4 "Commissioning".

6.6 Changing the gasket

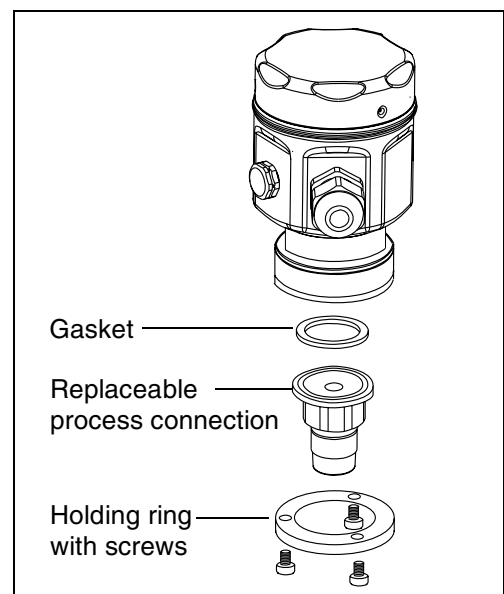
The gasket in contact with the medium and inside the process connection of the Barcon PPC-M20 can be replaced. Except for the PTFE gasket, all gaskets can thus be interchanged as required. The different temperature limits should therefore be observed for individual materials.

Dichtung		Temperaturgrenzen
1	FPM, Viton	-20 °C (-4 °F)*
6	FPM, Viton grease-free	-10 °C (+14 °F)*
A	FPM, Viton oil and grease-free for oxygen	-10 °C ... +60 °C (+14 °F ... +140 °F)
2	NBR	-20 °C (-4 °F)*
7	FFKM, Kalrez Compound 4079	+5 °C (+41 °F)*
4	EPDM	-40 °C (-40 °F)*

* Upper temperature limit according to specifications of standard instrument

Changing the gasket

- Loosen the screws on the retaining ring of the process connection.
- Remove the retaining ring and process connection.
- Replace gasket. The surfaces each side of the gasket and the gasket itself must be free from fibres and dirt.
- Secure the process connection with the retaining ring and screws



7 Technical data

General information

Manufacturer	Pepperl+Fuchs
Instrument	Pressure transmitter
Designation	PPC-M10, PPC-M20, LHC-M20, LHC-M40

Application

Measurement of absolute and gauge pressure in gases, vapours, liquids

Operation and system design Measuring principle

Barcon PPC-M20, LHC-M20 with ceramic sensor	The pressure causes a slight deflection of the ceramic diaphragm of the sensor. The change in the capacitance is proportional to the pressure and is measured by the electrodes of the ceramic sensor. Volume of chamber: approx. 2 mm ³ (0.078 in ³)
Barcon PPC-M10, LHC-M40 with metal sensor	The process pressure acting on the metallic separating diaphragm of the sensor is transmitted via a filling fluid to a resistance bridge. The change in the output voltage of the bridge is proportional to the pressure and is then measured. Volume of chamber: smaller than 1 mm ³ (0.039 in ³)
Measuring system	Barcon and power supply e. g. via transmitter power pack and operation via <ul style="list-style-type: none"> • two keys on the instrument and a plug-in display module • handheld terminal • PC with the PACTware operating program via HART modem
Construction	Standard SS housing, for process connections see Seite 9
Signal transmission	4 mA ... 20 mA signal with superposed HART communications signal, 2-wire

Input

Measured variables	Absolute or gauge pressure
--------------------	----------------------------

Measuring ranges

PPC-M20, LHC-M20				PPC-M10, LHC-M40			
Type of pressure	Measurement limits	Min. span (TD 10:1)	Overload	Type of pressure	Measurement limits	Min. span (TD 10:1)	Overload
	bar	bar			bar	bar	bar
gauge	0 ... 0.1	0.01	4	gauge	0 ... 1	0.1	4
gauge	0 ... 0.4	0.04	7	gauge	0 ... 4	0.4	16
gauge	0 ... 1	0.1	10	gauge	0 ... 10	1	40
gauge	0 ... 4	0.4	25	gauge	0 ... 40	4	160
gauge	0 ... 10	1	40	gauge	0 ... 100	10	400
gauge	0 ... 40	4	60	gauge	0 ... 400	40	600
gauge	-0.1 ... 0.1	0.02	4	gauge	-1 ... +1	0.2	4
gauge	-0.4 ... 0.4	0.08	7	gauge	-1 ... +4	0.5	16
gauge	-1 ... +1	0.2	10	gauge	-1 ... +10	1.0	40
gauge	-1 ... +10	0.5	40				
absolute	0 ... 0.4	0.04	7	absolute	0 ... 1	0.1	4
absolute	0 ... 1	0.1	10	absolute	0 ... 4	0.4	16
absolute	0 ... 4	0.4	25	absolute	0 ... 10	1	40
absolute	0 ... 10	1	40	absolute	0 ... 40	4	160
absolute	0 ... 40	4	60	absolute	0 ... 100	10	400
				absolute	0 ... 400	40	600

Barcon LHC/PPC (HART)

Technical data

Resistance to low pressures PPC-M20, LHC-M20	for sensors with nominal values 0.1 bar: to 0.7 bar _{absolute} for all other sensors: to 0 bar _{absolute} to 10 mbar _{absolute}
PPC-M10, LHC-M40	
Calibration range (turndown)	TD 10:1
Zero point increase and decrease	within measurement limits

Output

Output signal	digital 4 mA ... 20 mA signal with superposed communications signal with HART protocol
Signal on alarm	optional 3.6 mA, 22 mA or CONTINUE (instrument continues measuring)
Damping Local: Remote:	Depending on switch position: off: 0 s; on: 2 s in switch position "on" freely adjustable between 0 and 40 s

Accuracy

Reference conditions	DIN IEC 770 T _U = 25 °C (+77 °F)
Linearity including hysteresis and reproducibility (based on the limit point method to DIN IEC 770)	M20: ±0.2 % of set span M10, M40: ±0.3 % of set span
Linearity at low absolute pressure ranges (due to performance limits of currently available DKD calibration rigs)	Absolute: for ≥ 40 mbar to < 100 mbar: ±0.3 % of set span
Warm-up time	1 s
Rise time	220 ms
Response time	600 ms
Long-term drift	0.1 % (FS) per year
Thermal effects with reference to the set span TD = nominal value/set span	for -10 °C ... +60 °C (+14 °F ... +140 °F): ±(0.2 % x TD + 0.2 %) for -40 °C ... -10 °C (-40 °F ... +14 °F); +60 °C ... +85 °C (+140 °F ... +185 °F): ±(0.4 % x TD + 0.4 %)
Temperature coefficient (maximum TK) (But not exceeding the error due to thermal effects.)	for zero signal and span: for -10 °C ... +60 °C (+14 °F ... +140 °F): ±0.08 % of nominal value/10 K for -40 °C ... -10 °C (-40 °F ... +14 °F); +60 °C ... +85 °C (+140 °F ... +185 °F): ±0.1 % of nominal value/10 K
Vibration effects	None (4 mm in path peak-to-peak 5 Hz ... 15 Hz, 2 g: 15 Hz ... 150 Hz, 1g: 150 Hz ... 2000 Hz)

Process conditions

Mounting conditions	Any position
Ambient conditions	
Ambient temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)
Ambient temperature range (short-term)	-40 °C ... +100 °C (-40 °F ... +212 °F)
Storage temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)
Climatic class	4K4H to DIN EN 60721-3
Protection	IP66/Nema 4x with cable gland IP68 (1 m water over 24 h) or Nema 6P (1.8 m water over 30 min.) with assembled cable with reference air feed
Electromagnetic compatibility	Interference emission to EN 50081-1, Interference immunity to EN 50082-2 and NAMUR NE 21: influence < 0.5 % Use screened transposed two-wire cabling.
Process conditions	
Process temperature	PPC-M10, PPC-M20: -40 °C ... +85 °C (-40 °F ... +185 °F) LHC-M20: -40 °C ... +125 °C (-40 °F ... +257 °F) LHC-M40: -40 °C ... +85 °C (-40 °F ... +185 °F)
Process temperature range	Cleaning temperature for Barcon flush-mounted +150 °C (+302 °F) up to 60 minutes, diaphragm seal with temperature spacer and high-temperature oil max. 350 °C (+662 °F)
Process pressure	corresponds to permissible overload

Date of issue 25.10.2001

Mechanical construction**Design**

Housing	<ul style="list-style-type: none"> Type F15 (stainless steel) or type F16 (aluminium) optional electrical connection via cable gland M20 x 1.5 cable entry PG13.5, G½, ½ NPT Harting plug, M12 x 1 plug assembled cable with reference air feed
Process connections	All common thread versions, flush-mounted connections and diaphragm seals

Materials

Housing	Stainless steel 1.4404 (AISI 316L) or cast aluminium housing with protective polyester based powder
Nameplate Stainless steel housing Aluminium housing	Engraved on housing with laser 1.4301 (AISI 304)
Process connections PPC-M10 PPC-M20 LHC-M20, LHC-M40	<ul style="list-style-type: none"> 1.4435 (SS 316L), adapter 1.4435 (SS 316L) 1.4435 (SS 316L), Hastelloy 2.4819 (C 276) 1.4435 (SS 316L)
Process diaphragm PPC-M20, LHC-M20 PPC-M10 LHC-M40	<ul style="list-style-type: none"> Al₂O₃ aluminium oxide ceramic 1.4435 (SS 316L) Hastelloy 2.4819 (C 276), tantalum, PTFE film on 1.4435 (SS316L)
Seals (see Section 6.6)	FPM Viton, FPM Viton grease-free, FPM Viton oil and grease-free for oxygen, EPDM, Kalrez, NBR, DVGW version with NBR seal
Mounting accessories	Bracket for pipe and wall mounting 1.4301 (SS 304)
Filling fluid in diaphragm seals	Silicone oil, vegetable oil, glycerine, high-temperature oil, FLUOROLOBE grease-free for oxygen

Measuring cell

Filling fluid PPC-M20, LHC-M20 PPC-M10, LHC-M40	<ul style="list-style-type: none"> None, dry cell sensor optional silicone oil or inert oil (Volltaef) for oxygen Vegetable oil (FDA listed)
--	---

Display and operating interface

Display	Plug-in display module with four-character pressure display and bargraph of current with 28 segments
---------	--

Power supply

Power supply	Non-Ex area: 11.5 V ... 45 V DC Ex area: 11.5 V ... 30 V DC
Overvoltage category	II to DIN EN 61010-1
Ripple	HART max. ripple (measured on 500 Ω) 47 Hz ... 125 Hz: U _{PP} = 200 mV max. noise (measured on 500 Ω) 500 Hz ... 10 kHz: U _{eff} = 2.2 mV

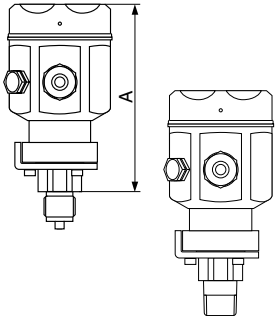
Certificates and approvals

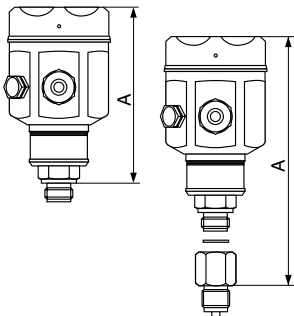
Ignition protection	see chapter "Notes on safety"
CE mark	By attaching the CE mark, Pepperl+Fuchs confirms that the instrument fulfils all the requirements of the relevant EC directives.

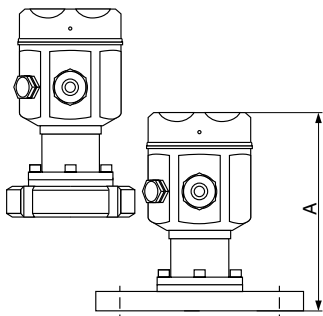
Barcon LHC/PPC (HART)

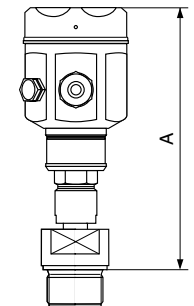
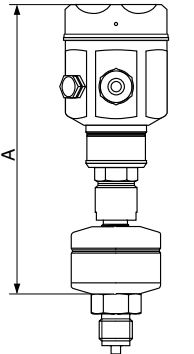
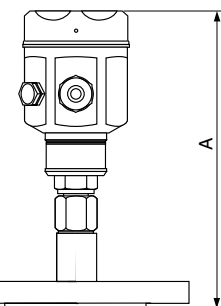
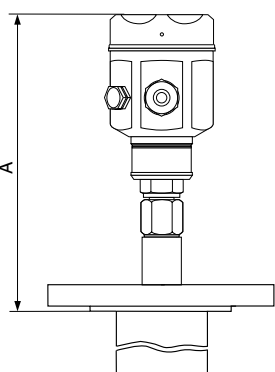
Technical data

Dimensions

PPC-M20	Thread	Max. height
	• G½ external	155.0 mm
	• G½ external, G¼ internal	155.0 mm
	• G½ external, Ø11.4 mm internal	155.0 mm
	• ½ NPT external, ¼ NPT internal	155.0 mm
	• ½ NPT external, Ø11.4 mm internal	155.0 mm
	• PF ½ external	155.0 mm
	• PT ½ external	155.0 mm
	• M20 x 1.5 external	155.0 mm
Dimensions 1 mm = 0.039 in 1 in = 25.4 mm		

PPC-M10	Thread flush-mounted or with internal adapter	Max. height
	Diaphragm flush-mounted:	
	• G½ external	162.0 mm
	• G½ external with O-ring for welded nozzle	162.0 mm
	Diaphragm flush-mounted:	
	• G½ external	197.5 mm
	• ½ NPT external	197.5 mm
	• ½ NPT internal	184.5 mm
	• PF ½ external	195.5 mm
	• PT ½ external	197.5 mm
	• M20 x 1.5 external	197.5 mm

LHC-M20	Dairy connections	Threaded bosses	Flanges
	• Triclamp 2" Max. height 172.5 mm • SMS 1½" 172.5 mm • SMS 2" 172.5 mm • DIN 11851 • DN 40, PN 40 172.5 mm • DIN 11851 • DN 50, PN 40 172.5 mm • Varivent, • D = 68 mm 172.5 mm • DRD flange • D = 65 mm 172.5 mm	• G1½ Max. height 172.5 mm • G2 173.5 mm • 1½ NPT 172.5 mm • 2 NPT 173.5 mm • M44 x 1.25 172.5 mm	DIN 2527 • DN 50, PN 40 172.5 mm • DN 80, PN 40 172.5 mm ANSI B16.5 with sealing strip • 1½" 172.5 mm • 2" 172.5 mm • 3" 172.5 mm • 4" 172.5 mm JIS B 2210 • JIS 10K 50A RF 172.5 mm

LHC-M40	Diaphragm seal, flange	
	Threaded bosses	Max. height
	• G1½, DIN ISO 228/1, from 0.4 bar span	232.5 mm
	• G2, DIN ISO 228/1 from 0.1 bar span	237.5 mm
	• 1½ NPT, ANSI B 1.201, from 0.4 bar span	233.5 mm
	• 2 NPT, ANSI B 1.201, from 0.1 bar span	233.5 mm
	• Spacer with G ½, EN 16288, Form 6kt	237.5 mm
	• Spacer with ½ NPT, ANSI B 1.201	237.5 mm
	Flanges, dimensions to DIN 2527	
	• DN 25, PN 64/160	255.0 mm
	• DN 25, PN 250	255.0 mm
	• DN 25, PN 400	255.0 mm
	• DN 50, PN 10/40	255.0 mm
	• DN 50, PN 64	261.0 mm
	• DN 50, PN 100/160	265.0 mm
	• DN 50, PN 250	273.0 mm
	• DN 50, PN 400	287.0 mm
	• DN 80, PN 10/40	259.0 mm
	Flanges with extension, dimensions to DIN 2527	
	• DN 50, PN 10/40, Extension 50 mm	255.0 mm
	• DN 80, PN 10/40, Extension 50 mm	259.0 mm
	• DN 50, PN 10/40, Extension 100 mm	255.0 mm
	• DN 80, PN 10/40, Extension 100 mm	259.0 mm
	• DN 50, PN 10/40, Extension 200 mm	255.0 mm
	• DN 80, PN 10/40, Extension 200 mm	259.0 mm
	Flanges, dimensions to ANSI B16.5 with sealing strip Form RF	
	• 1", 400/600 lbs	250.5 mm
	• 1", 900/1500 lbs	254.5 mm
	• 1", 2500 lbs	254.5 mm
	• 2", 150 lbs	254.5 mm
	• 2", 300 lbs	257.5 mm
	• 2", 400/600 lbs	267.0 mm
	• 2", 900/1500 lbs	280.0 mm
	• 2", 2500 lbs	295.0 mm
	• 3", 150 lbs	254.5 mm
	• 3", 300 lbs	259.0 mm
	• 4", 150 lbs	259.0 mm
	• 4", 300 lbs	262.5 mm
	Flanges with extension, dimensions to ANSI 16.5	
	• 2", 150 lbs, extension 2"	254.5 mm
	• 3", 150 lbs, extension 2"	254.5 mm
	• 4", 150 lbs, extension 2"	254.5 mm
	• 2", 150 lbs, extension 4"	254.5 mm
	• 3", 150 lbs, extension 4"	254.5 mm
	• 4", 150 lbs, extension 4"	254.5 mm
	• 2", 150 lbs, extension 6"	254.5 mm
	• 3", 150 lbs, extension 6"	254.5 mm
	• 4", 150 lbs, extension 6"	254.5 mm

Dimensions

1 mm = 0.039 in

1 in = 25.4 mm

8 Matrix of parameters

	H0	H1	H2	H3	H4	H5	H6	H7	H8	H9
V0 Basic calibration	Measured value	Sets 4 mA	Sets 20 mA	Confirms 4 mA autom.	Confirms 20 mA autom.	Sets bias pressure	Confirms bias pressure autom.	Dampens output 0 s ... 40 s	Selects fail-safe MIN. MAX. CONTINUE	Selects pressure units
V1										
V2 Transmitter information	Diagnostic code	Last diagnostic code	8010 Software No.					Sensor data No.	Sensor data value	Reset "731" "2380"
V3 ... V6										
V7 Sensor data	Current display	Off Simulation	Simulates current	Off Current output min. 4 mA	Low sensor calibration	High sensor calibration	Lower measurement limit	Upper measurement limit	Sensor pressure	
V8										
V9 Service								Pressure before bias-correction		Locking: ≠130 Unlocking: 130 Release V2H7, V2H8:333
VA Communication	Measurement point	Descriptor	User text	Serial number	Serial number of sensor					

 Display field

This matrix gives a summary of factory settings. Your own values can also be entered here.

	H0	H1	H2	H3	H4	H5	H6	H7	H8	H9
V0	–	0.0	V7H7	–	–	0.0	–	0.0	MAX.	bar
V1										
V2		0	xxxx							0
V3 ... V6										
V7	–	OFF	–	OFF			–	–	–	0
V8										
V9								–		130
VA	–	–								

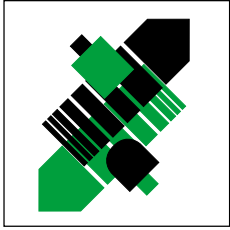
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With regards to the supply of products, the current issue of the following document is applicable:
The General Terms of Delivery for Products and Services of the Electrical Industry, as published by
the Central Association of the "Elektrotechnik und Elektroindustrie (ZVEI) e.V.",
including the supplementary clause "Extended reservation of title".

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Factory Automation Division

Product Range

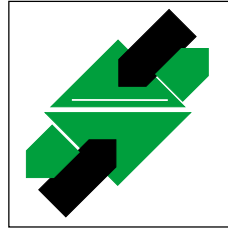
- Digital and analogue sensors
- in different technologies
 - Inductive and capacitive sensors
 - Magnetic sensors
 - Ultrasonic sensors
 - Photoelectric sensors
- Incremental and absolute rotary encoders
- Counters and control equipment
- Identification Systems
- AS-Interface

Areas of Application

- Machine engineering
- Conveyor or transport
- Packaging and bottling
- Automotive industry

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Process Automation Division

Product Range

- Signal conditioners
- Intrinsically safe interface modules
- Remote Process Interface (RPI)
- Intrinsically safe field bus solutions
- Level control sensors
- Process measuring and control systems engineering at the interface level
- Intrinsic safety training

Areas of Application

- Chemical industry
- Industrial and community sewage
- Oil, gas and petrochemical industry
- PLC and process control systems
- Engineering companies for process systems

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