# Installation and Setting-Up Instructions
# Spare Parts List

*Contents:*



*DOCUMENTS*
Technical Specifications: BPDUV760
Installation and Setting-Up Instructions:BPDUV760AV



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# 1 INSTALLATION

## 1.1 Mechanical installation

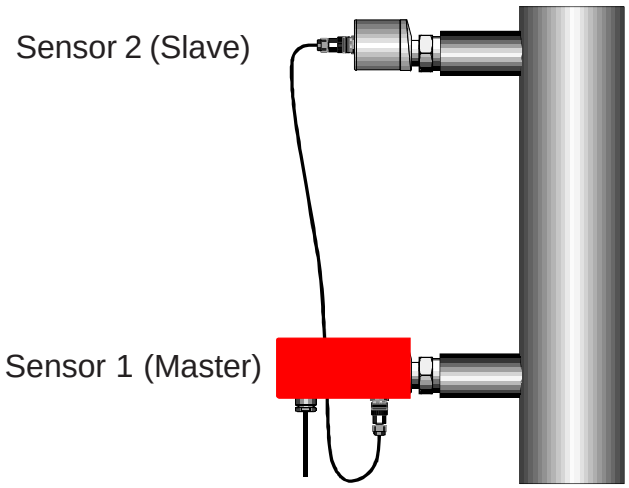


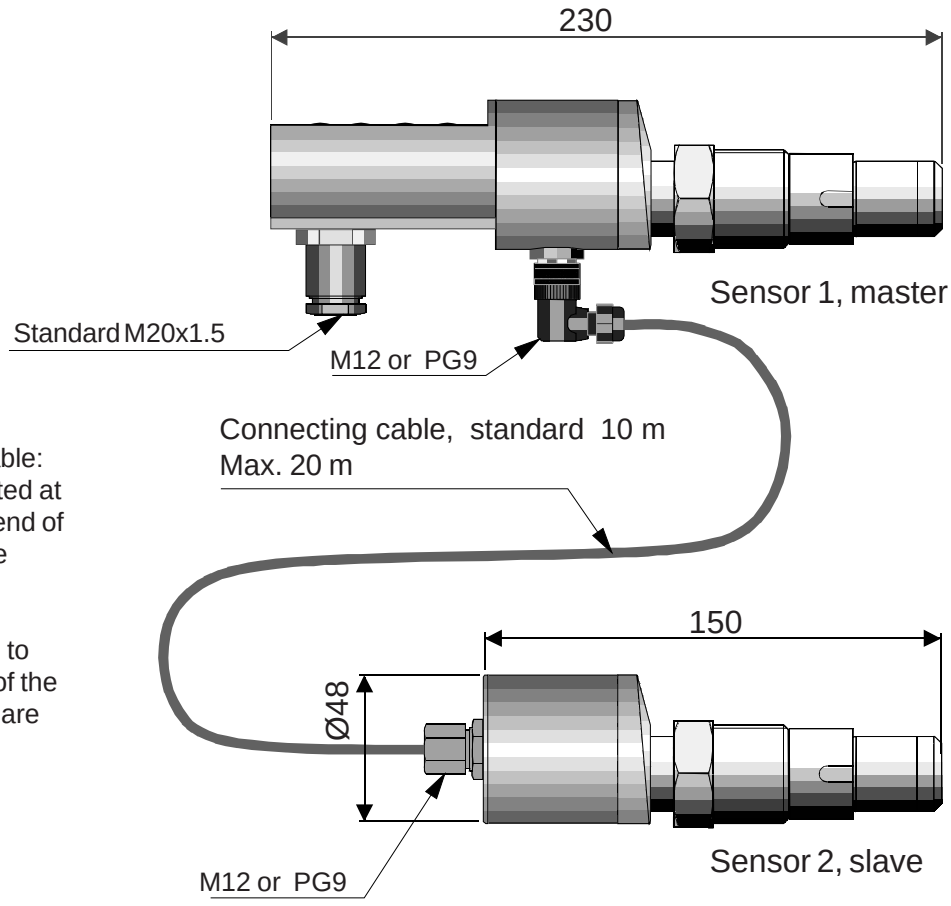

**Figure 1-1**
Recommended mounting position

### General

Flange-mounted transmitter is installed directly on the side of a tank. As a result the measurement conditions may be quite demanding. As far as possible, however, the location of the transmitter should be such that the effects of temperature variations will be as small as possible. Mechanical stresses, such as vibration, should also be avoided as far as possible.

**The installation should be such that the operating temperature of the transmitter's electronics will not exceed +80°C.** For example, the tank must be insulated if necessary (see Fig. 1-1). Sufficient space should be provided around the transmitter to ensure free circulation of air.

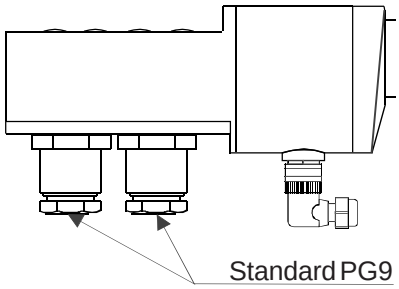
Dimensional drawings
(dimension in mm)



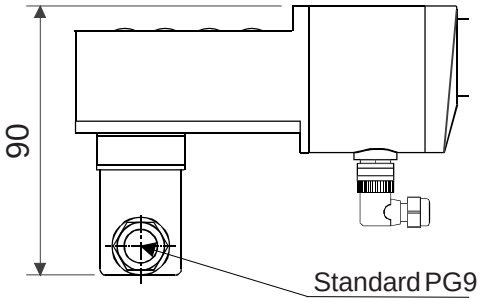

Options of the connecting cable:
a) M12 connector are situated at the end of sensor 1 and the end of sensor 2. The material of the cable is PUR.

b) Cable is firmly connected to both sensors. The material of the cable is PVC. Cable glands are AISI316.

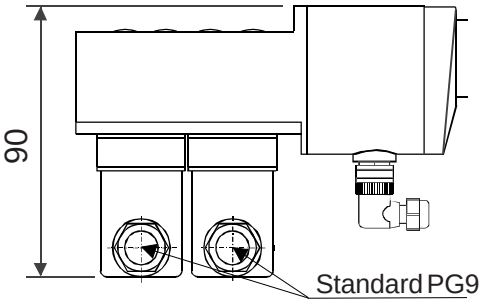
Dimensional drawings
(dimension in mm)



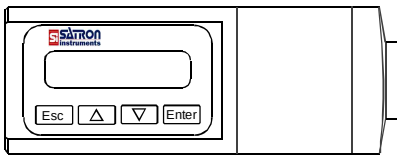

Double current output

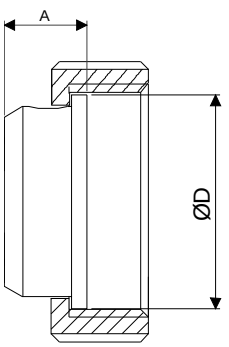



Plug DIN 43650 electrical inlets



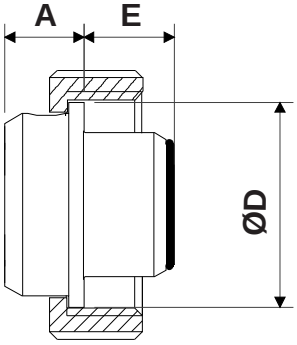

Double current output with
plug DIN43650 connector



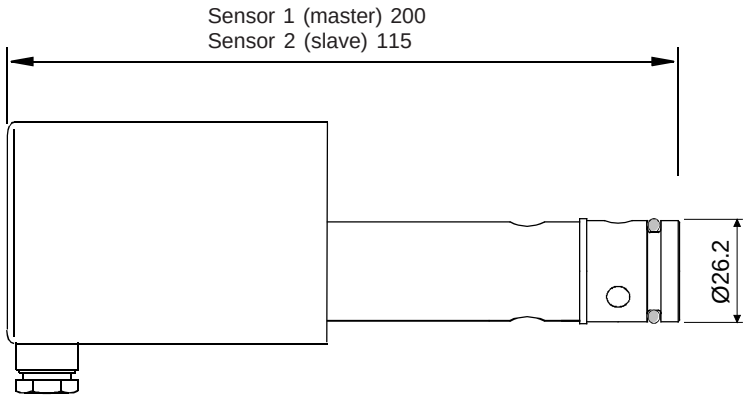

| Size | Dimensions | | Thread |
|---|---|---|---|
| | ØD | A | |
| 38 | 54 | 21 | Rd 60 x 1/6 |
| 51 | 64 | 23 | Rd 70 x 1/6 |

**Figure 1-2** Mounting dimensions type **SMS**

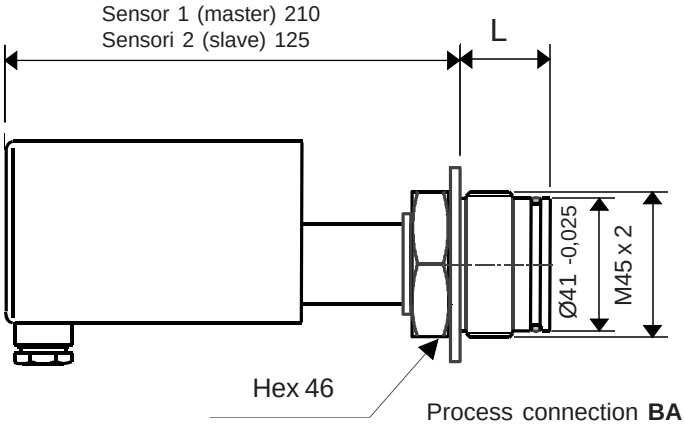



| KOKO | MITAT | | | KIERRE |
|---|---|---|---|---|
| | ØD | A | E | |
| SI38 | 54 | 21 | 24 | Rd 60 x 1/6 |
| SI51 | 64 | 23 | 27 | Rd 70 x 1/6 |

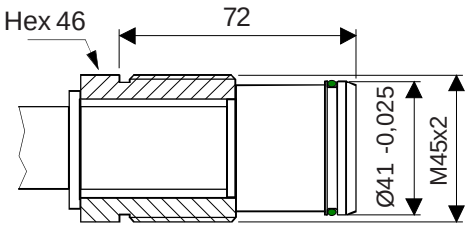
**Figure 1-3** Mounting dimensions type **SMS-SI**




Process connection **PA**
- PMC 1"

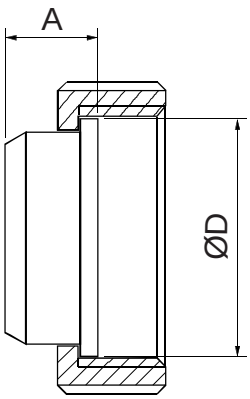



Process connection **BA**
- M45x2

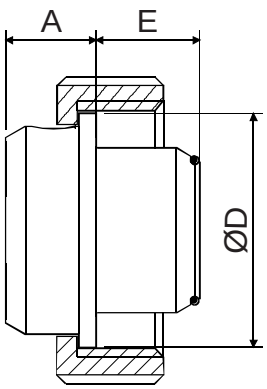



Process connection **BB**
- M45x2, with metal/metal taper

| BA-extension code | L |
|---|---|
| **0** | 28,5 |
| **2** | 51 |
| **3** | 72 |
| **4** | 102 |



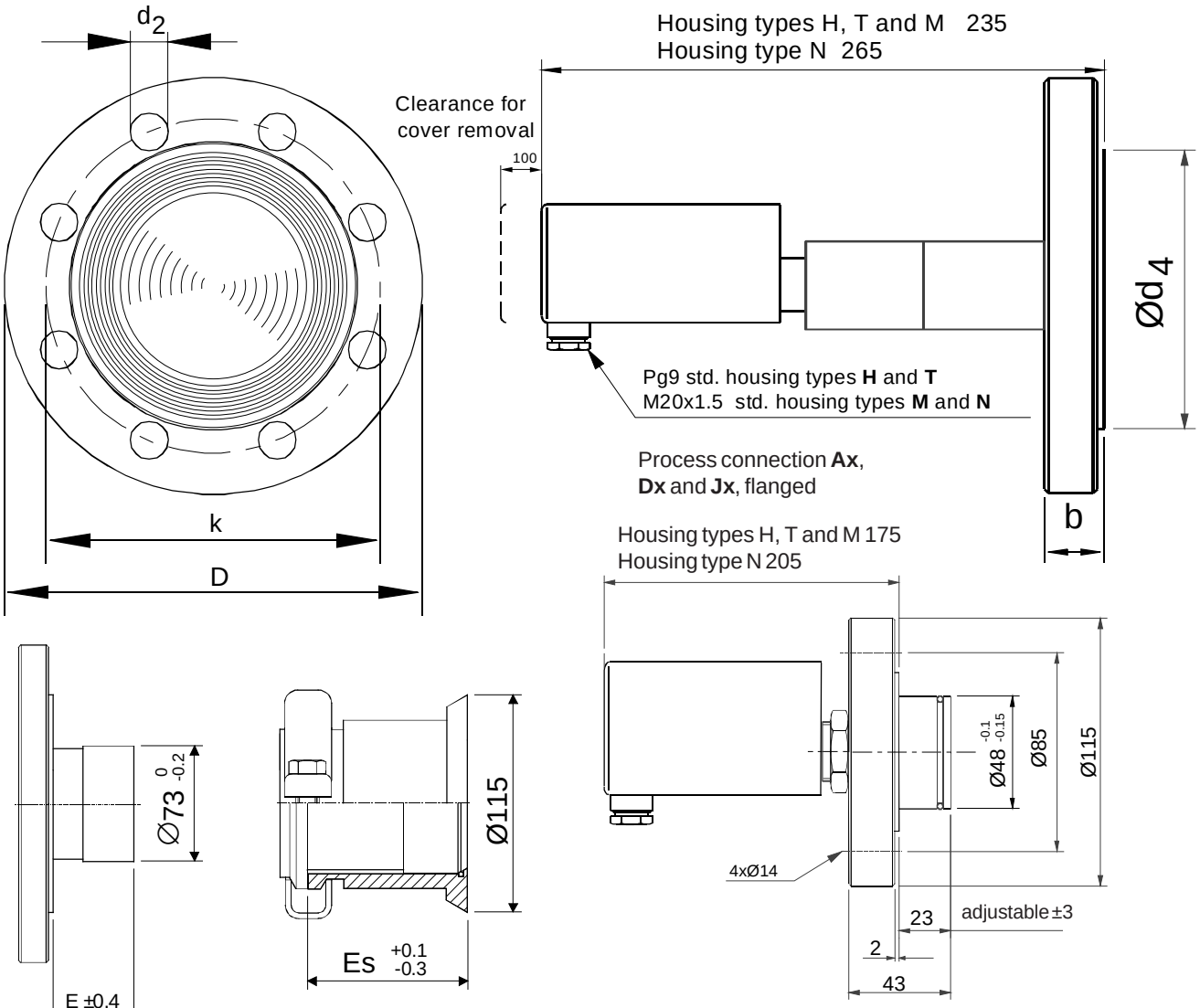

Process connection **VA** and **VB**
- SMS38 and SMS51




Process connection **WA** and **WB**
- SMS-SI38 and SMS-SI51

| Size | Dimension | | Thread |
|---|---|---|---|
| | ØD | A | |
| 38 | 54 | 21 | Rd 60 x 1/6 |
| 51 | 64 | 23 | Rd 70 x 1/6 |

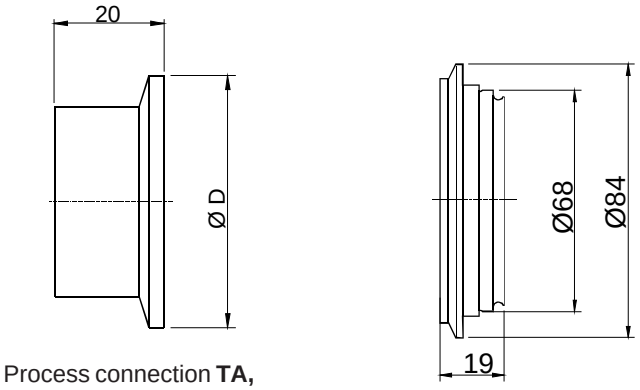
| Size | Dimension | | | Thread |
|---|---|---|---|---|
| | ØD | A | E | |
| SI38 | 54 | 21 | 24 | Rd 60 x 1/6 |
| SI51 | 64 | 23 | 27 | Rd 70 x 1/6 |




Process connection **Ax**, **Dx** and **Jx**
- with extension

Process connection **SA**
- Sandvik-clamp

Process connections **DA**, DN25 PN40 flange with extension, process temperature max. +125°C




Process connection **TA, TB** and **TC**
- Tri-clamp DN38 ... 63,5

| DN | ØD |
|---|---|
| 38 | 50,5 |
| 51 | 64 |
| 63,5 | 77,5 |

Process connection **UA**
- Tuchenhagen DN50/40 (Varivent)

| Extension code | E ±0.4 | Es +0.1 -0.3 |
|---|---|---|
| **0** | 0 | - |
| **2** | 51 | 54.5 |
| **4** | 102 | 105 |
| **6** | 152 | 156 |

**Figure 1-4 Dimensional drawings** (dimensions in mm)

**Dimensional drawings** (dimensions in mm)

| Flange size/ code | Flange dimensions | | | Holes | | | Extens. |
|---|---|---|---|---|---|---|---|
| | b | D | Ød4 | Kpl | d2 | k | Ød |
| ISO DN25PN40 / DA | 18 | 115 | 68 | 4 | 14 | 85 | 48 |
| ISO DN50PN40 / DB | 20 | 165 | 102 | 4 | 18 | 125 | 51 |
| ISO DN80PN40 / DC | 24 | 200 | 138 | 8 | 18 | 160 | 73 |
| ISO DN100PN40 / DD) | 24 | 235 | 162 | 8 | 22 | 190 | 73 |
| ANSI 1" 150 lbs / (AA) | 15 | 108 | 51 | 4 | 16 | 79.4 | - |
| ANSI 1" 300 lbs (AB) | 18 | 124 | 51 | 4 | 20 | 88.9 | |
| ANSI 2" 150 lbs / (AC) | 23 | 152 | 92 | 4 | 20 | 120.6 | 51 |
| ANSI 2" 300 lbs / (AD) | 25 | 165 | 92 | 8 | 20 | 127 | 51 |
| ANSI 3" 150 lbs / (AE) | 26 | 191 | 127 | 4 | 20 | 152.4 | 73 |
| ANSI 3" 300 lbs / (AF) | 31 | 210 | 127 | 8 | 23 | 168.3 | 73 |
| ANSI 4" 150 lbs / (AG) | 26 | 229 | 157 | 8 | 20 | 190.5 | 73 |
| ANSI 4" 300 lbs / (AH) | 34 | 254 | 157 | 8 | 23 | 200 | 73 |
| JIS 10K-50 / (JA) | 16 | 155 | 96 | 4 | 19 | 120 | 51 |
| JIS 40K-50 / (JB) | 26 | 165 | 105 | 8 | 19 | 130 | 51 |
| JIS 10K-80 / (JC) | 18 | 185 | 126 | 8 | 19 | 150 | 73 |
| JIS 40K-80 / (JD) | 32 | 210 | 140 | 8 | 23 | 170 | 73 |
| JIS 10K-100 / (JE) | 18 | 210 | 151 | 8 | 19 | 175 | 73 |
| JIS 40K-100 / (JF) | 36 | 250 | 165 | 8 | 25 | 205 | 73 |

### 1.1.1 Installing welded process couplings

***Mounting hole for coupling***

• Make a Ø 45.5 mm (+0.5/-0.2 mm) hole in the tank wall or pipe, as shown in Figure 1-5.

***Welding the coupling***

These instructions apply to all welded couplings; welding the G1 standard coupling is described here as an example.

• Place the coupling in the mounting hole as shown in Fig. 1-6. Then weld with several runs so as to prevent the coupling's oval distortion and tightness problems.

• The transmitter must be out of the coupling while the coupling is welded.You can use the shut-off plug shown in Fig. 1-7 to shut the coupling. The plug protects the coupling's sealing face and permits the starting of the process without the transmitter.

• It is always recommendable to use the welding assistant (M1050450) while welding the coupling to prevent any distortions due to heat (Fig 1-7).

• Do not make weld grounding via any transmitter's body!

### 1.1.2 Mounting the transmitter on the coupling

***Procedure***

• Make sure that the coupling's sealing face is clean.

• Remove the orange protective plug from the transmitter's diaphragm.

***Do not touch the diaphragm! Figure 1-8.***

• Insert the transmitter **in a straight line** into the coupling (Fig. 1-7), so that the guide groove on the transmitter aligns with the stop pin on the coupling. The transmitter settles into position when the groove and pin are aligned, and will be prevented from rotating in the coupling.

***When inserting the transmitter, be careful not to damage the edge of the sensor diaphragm on the edges of the coupling or on the end of the stop pin!***

• Lock the transmitter in position by screwing the hex nut fully home. Finger tightness is sufficient to tighten the sealing faces. However, we recommend final tightening with a tool to eliminate the effect of vibration and other such factors. Apply 60±20 Nm torque.

**Do not use sealing tape etc. on threaded connection!**

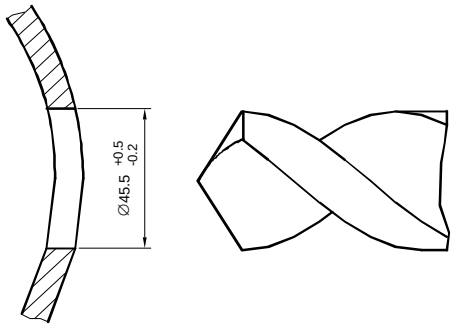



**Figure 1-5** Coupling mounting hole 10044110

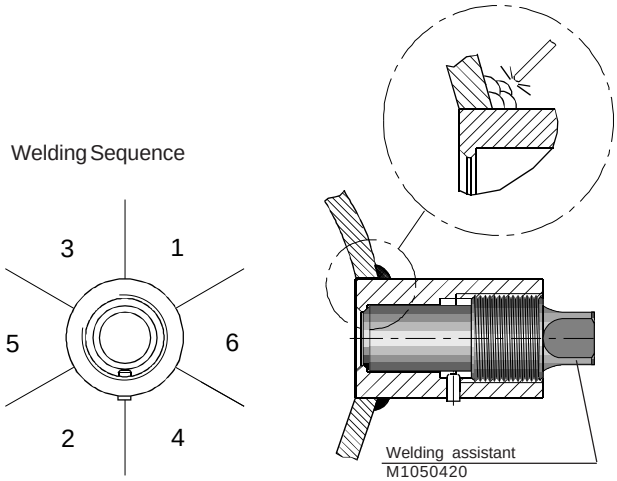
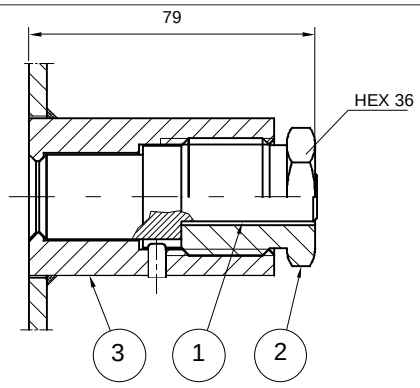



**Figure 1-6** Welding the coupling 1050354043




1 Shut-off plug, AISI316 (Order No. M550405)
2 Shut-off screw G1
3 G1 welded process coupling

**Figure 1-7** Coupling shut-off plug 10044108

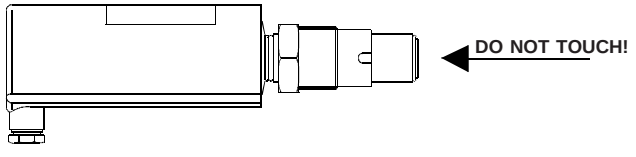



**Figure 1-8** 10044004

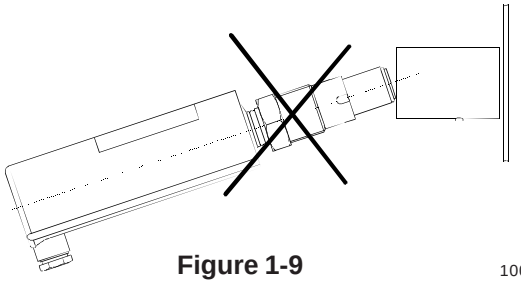


**Figure 1-9** 10044006

### 1.1.3 Couplings

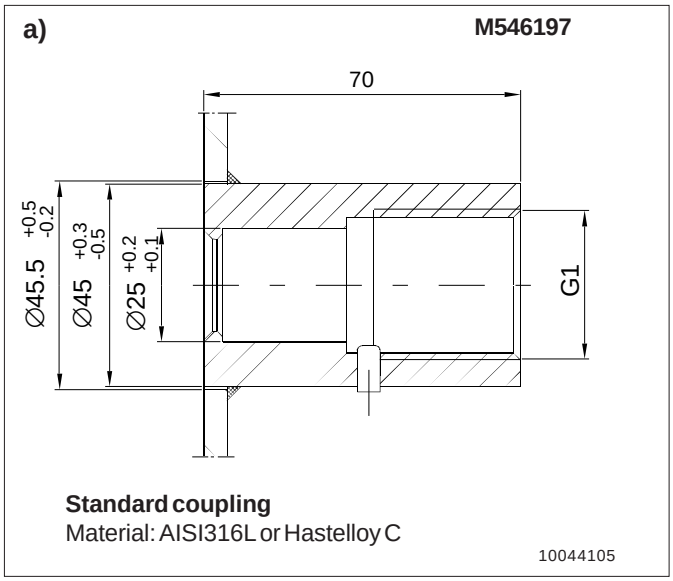



**Figure 1-10 Welded couplings**

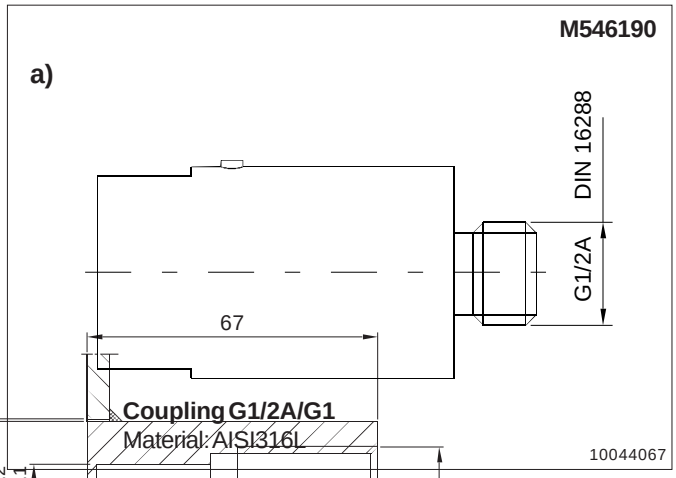



**Figure 1-11 Special couplings**

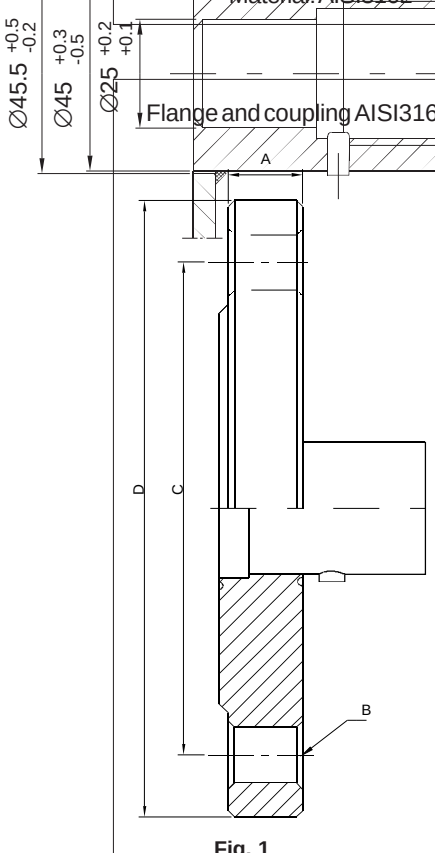



**Fig. 1 dimensions**

| Dim. | DN25 | DN50 | DN80 |
|---|---|---|---|
| A | 18 | 20 | 24 |
| B | 4x90°Ø14 | 4x90°Ø18 | 8x45°Ø18 |
| C | 85 | 125 | 160 |
| D | 115 | 165 | 200 |

| Dim. | ANSI 1" | ANSI 2" | ANSI 3" |
|---|---|---|---|
| A | 17.5 | 22.5 | 29 |
| B | 4x90°Ø20 | 8x45°Ø20 | 8x45°Ø23 |
| C | 88.9 | 127 | 168.3 |
| D | 124 | 165 | 210 |

**G1 Flanged couplings**

(DIN Std.)

| Nominal size | Type | Fig. 1 DIN2527B SFS2166 |
|---|---|---|
| DN25/G1 PN40 | std. | 548832 |
| | hygienic | 548833 |
| | EExia | 548834 |
| DN50/G1 PN40 | std. | 860282 |
| | hygienic | 548830 |
| | EExia | 548831 |
| DN80/G1 PN40 | std. | 860281 |
| | hygienic | 548828 |
| | EExia | 548829 |

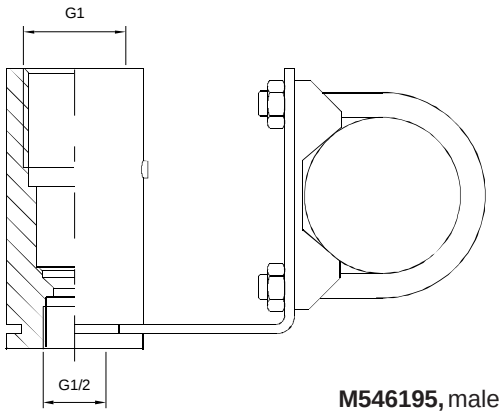
(ANSI Std.)

| Nominal size | Type | Fig. 1 ANSIB16.5 |
|---|---|---|
| ANSI1"/ G1 300 lbs | std. | 548861 |
| | hygienic | 548862 |
| | EExia | 548863 |
| ANSI2"/ G1 300 lbs | std. | 548864 |
| | hygienic | 548865 |
| | EExia | 548866 |
| ANSI3"/ G1 300 lbs | std. | 548867 |
| | hygienic | 548868 |
| | EExia | 548869 |

Other flange sizes available to order.

**Figure 1-12 Flanged couplings**

10044069

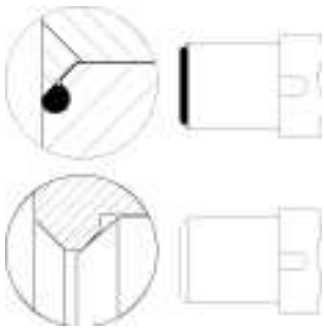



**M546195,** male G1/2A
**M550393**, female G1/2

**Figure 1-13 G1/2 / G1 couplings**

10044070

1050354040

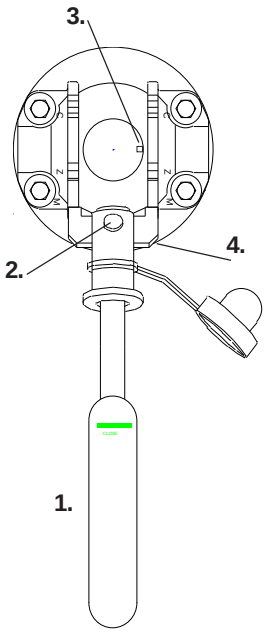


AISI316L, AISI317L or Duplex diaphragm, o-ring **FPM** (Viton) (code **G5**)
EHEDG - certified

AISI316L, AISI317L or Duplex diaphragm, o-ring **EPDM** (code **G6**)
EHEDG - certified

AISI316L, CoNi-, Duplex, Hastelloy C276 or Tantalum diaphragm, metal/metal taper sealing
(diaphragm on sealing face)
(code **G4**)

**Figure 1-14** Process sealing (process connections G4, G5 and G6)




***Operation:***
1. Lock (rotate) and select operating position (turn).
2. Release safety catch.
3. Transmitter dowel pin.
4. Reference and calibration pressure connection (M6).

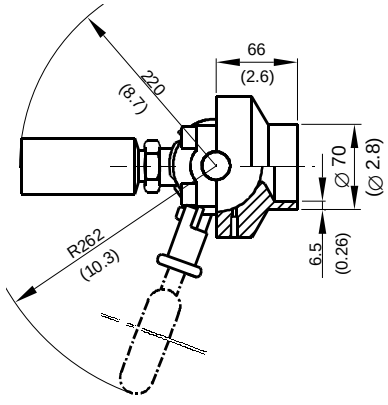
**Figure 1-15 Using PASVE®**

### 1.1.4 Installing the transmitter with PASVE® mounting/service valve

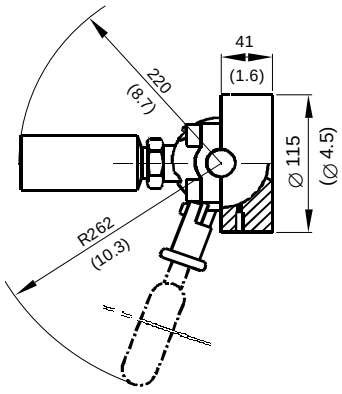
The three-position PASVE® mounting/service valve makes the installation of the transmitter easy. All necessary cleaning, zero adjustment and replacement operations will be easy and fast to perform with PASVE® without stopping the process.

All PASVE® types are also available with pneumatic actuator, flushing and limit switches.

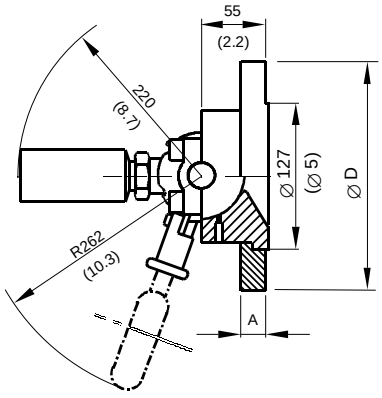
| Flange | Dimension D |
|---|---|
| ANSI 3" 150 lb | 191 |
| ANSI 3" 300 lb | 210 |
| DN80 PN40 | 200 |




**PASVE GP**
(Welded on pipe)




**PASVE GC**
(Welded on container)

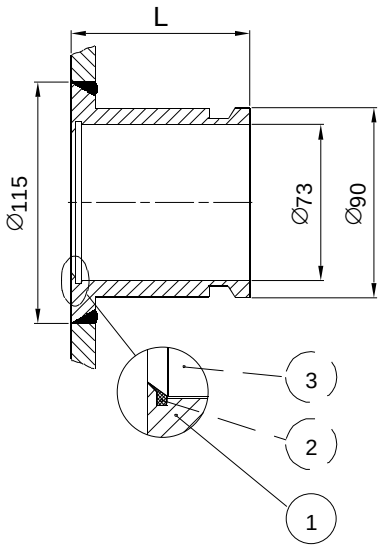



**PASVE GF**
(Flange type)

**Figure 1-16 Mounting dimensions for different PASVE® types**

10044132

## SATRON VDU differential pressure transmitter with Sandvik-Clamp:




Coupling length **L** :
Code 2 = 53 mm
Code 4 = 104 mm
Code 6 = 155 mm

When welding the coupling, avoid ovalling or straining the bevelled sealing joint (e.g. several rounds with small run; blanking plug can be used during welding to prevent ovalling of the coupling).

**Figure 1-17** Welded Sandvik coupling

1. Welded Sandvik coupling DN70 PN40
2. Seal EPDM (Order no. T1051205)
   Options: FPM (Order no. T1051204)
   PTFE (Order no. T1051203)
3. SATRON VDU transmitter with Sandvik process connection

10034030

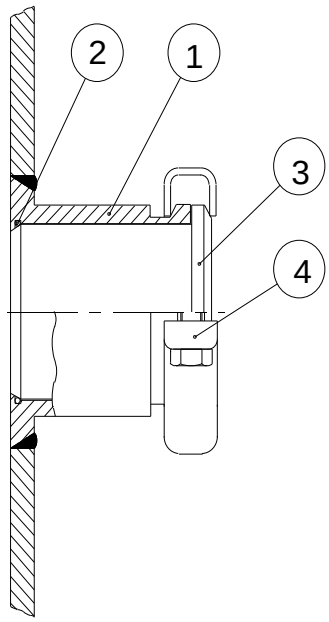



**Figure 1-18** Sandvik blanking plug

1. Welded Sandvik coupling DN70 PN40
2. Seal EPDM (Order no. T1051205)
3. Blanking plug (T549804)
4. Sandvik clamp DN70 PN40 (V82220000)

10034029

## SATRON VDU differential pressure transmitter with flange:

The transmitter is mounted on DN80 PN40 flange coupling (counterflange) (Fig. 1-19). The connection dimensions are specified in ISO2082 and ISO2123 Standards. Transmitters with ANSI 3" 150 lbs or 300 lbs process

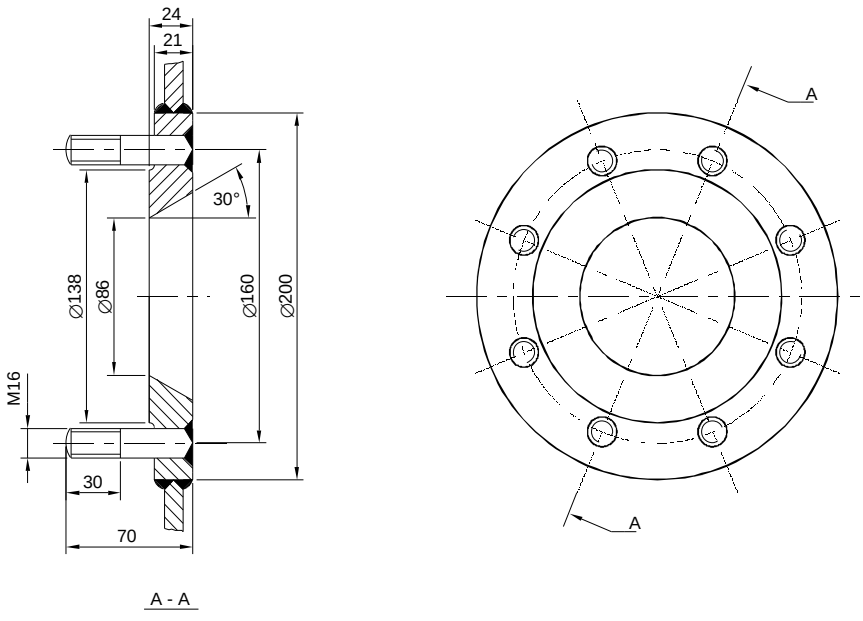



**Figure 1-19** Flange coupling (counterflange)

Order no. M546606,
incl. Hex nuts M16 and seal

1004354094

**SATRON VDU differential pressure transmitter with Tri-Clamp :**

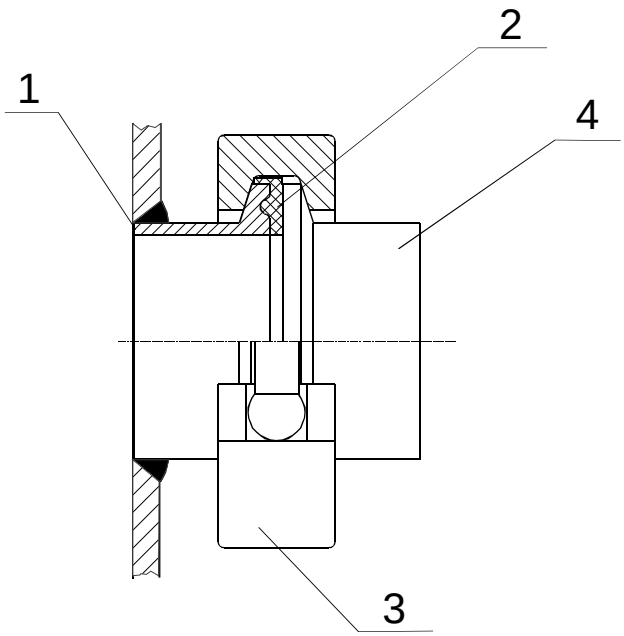



**Figure 1-20** Welded Tri-Clamp coupling

1. Welded Tri-Clamp coupling
2. Seal EPDM
3. Tri-Clamp
3. SATRON VDU transmitter with Tri-Clamp

When welding the coupling, avoid ovalling or straining the sealing joint (e.g. several rounds with small run).

1300354152

**SATRON VDU differential pressure transmitter with M45x2 connection:**

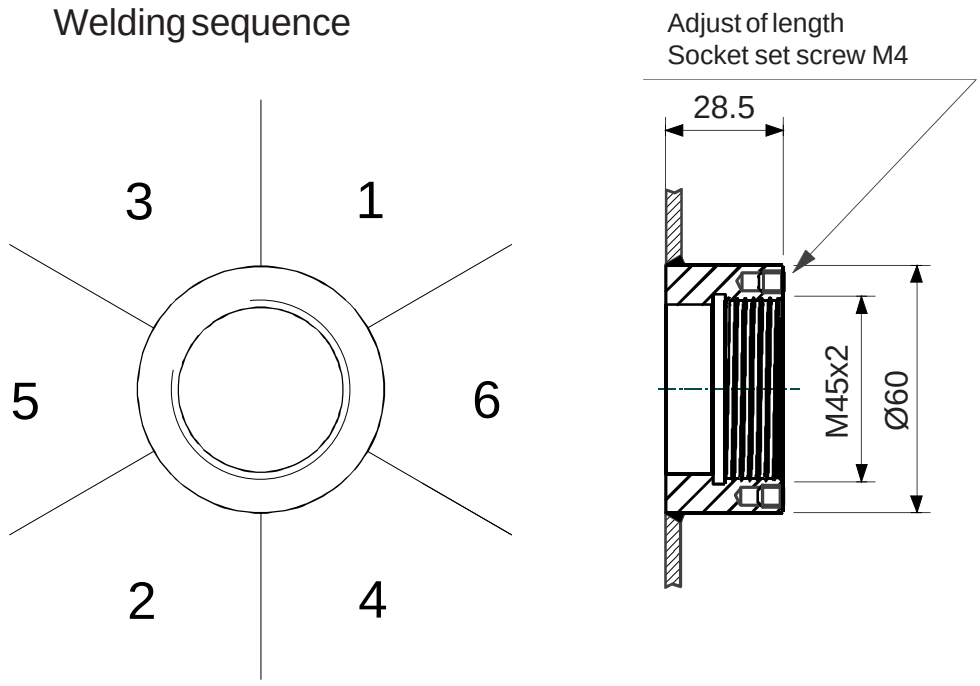



**Figure 1-21** Welding the coupling M45x2

1300354152

## SATRON VDU differential pressure transmitter with SMS connection :

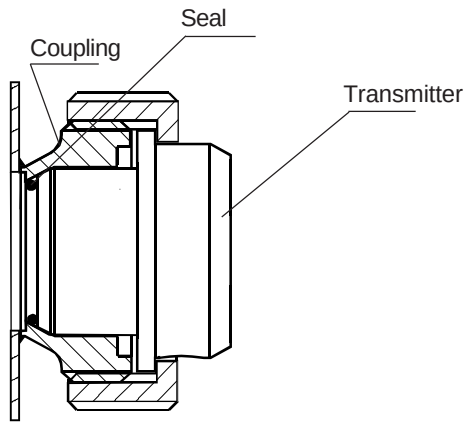



**Figure 1-22** Mountig type **SMS-SI**

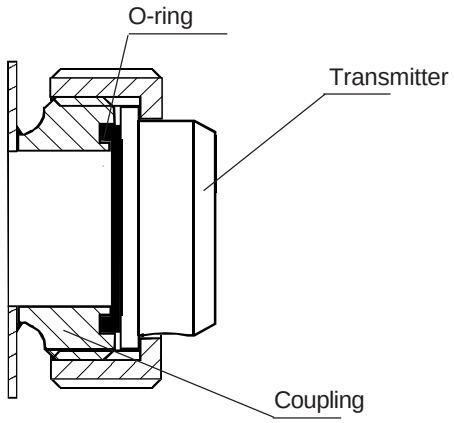
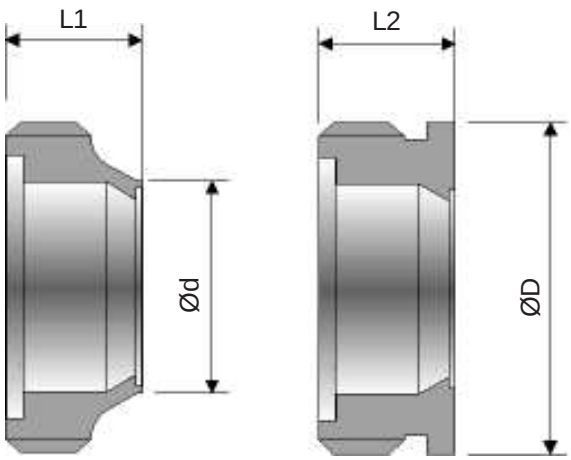



**Figure 1-23** Mounting type **SMS**

**SMS-SI** couplings :



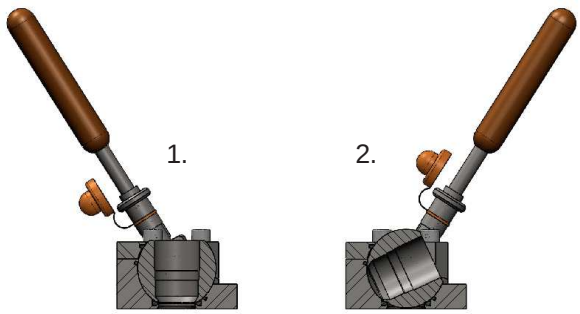

for pipe for vessel

| Size | Dimensions | | | | Thread |
|---|---|---|---|---|---|
| | L1 | Ød | L2 | ØD | |
| 38 | 27 | 38,5 | 24 | 60 | Rd 60 x 1/6 |
| 51 | 30 | 51 | 25 | 70 | Rd 70 x 1/6 |

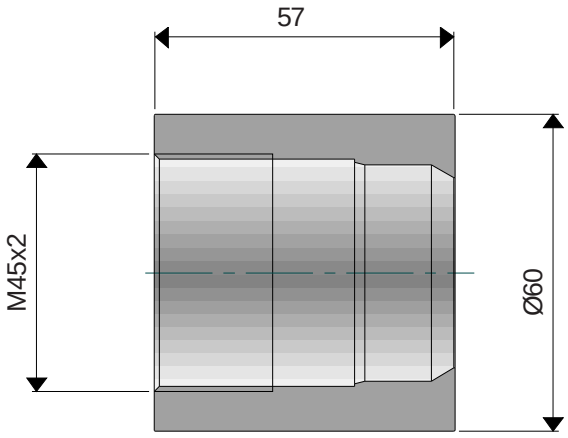
**Figure 1-24** Mounting dimension type **SMS-SI**

**Pasve BA working position:**

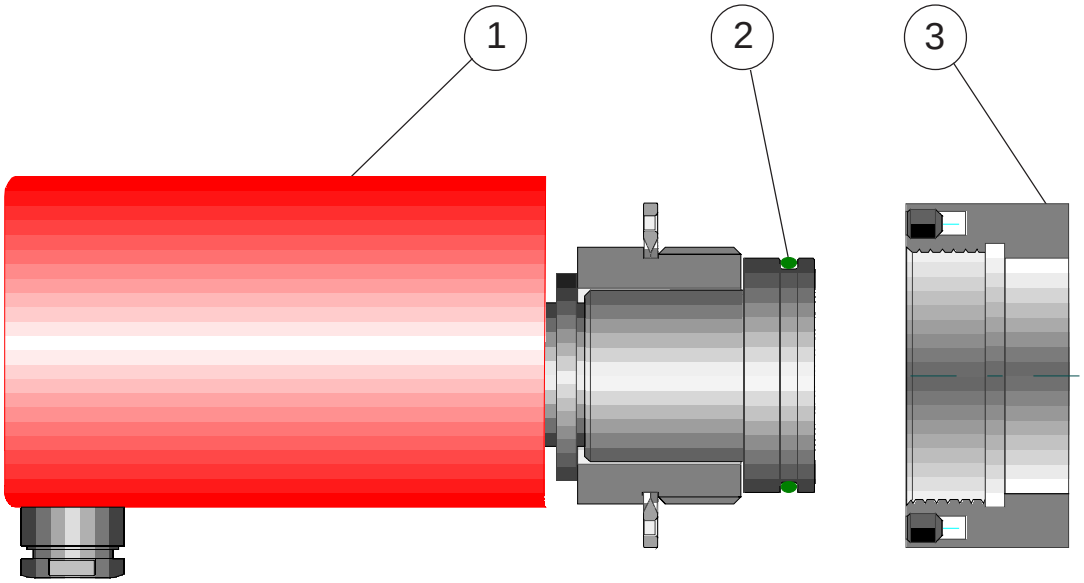
For process connections **BA3** and **BB**
1. Transmitter in measuring
2. Transmitter can be checked, changed, calibrated or the transmitter diaphragm can be flushed




**Coupling BB M45x2**, for process connection **BB**, order code **M1050474** (Welding assistant, code M1050473)



**SATRON VDU differential pressure transmitter with process connection M45x2 :**




1. Satron VDU-transmitter
2. O-ring Ø42,2x3 FPM (Viton®), order number 80014223
3. Process coupling M45x2 with adjust, order number M1050459

**Figure 1-22** Satron VDU with process connection M45x2

1300354154

**SATRON VDU differential pressure transmitter with process connection DN25 PN40 with Ø48 extension:**

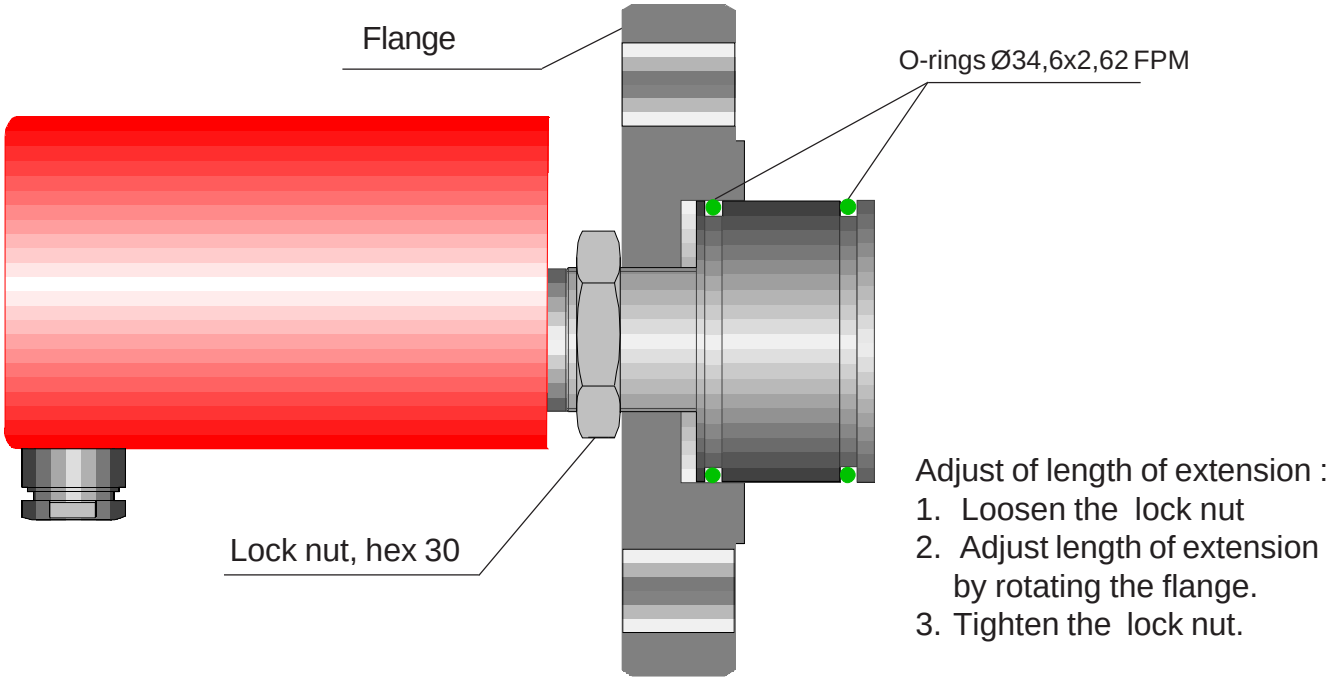



**Figure 1-23 Satron VDU with process connection DN25 PN40 with Ø48 extension (adjustable)**

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## 1.2 Electrical connections

Supply voltage and load of the transmitter according to the figure 1-24.

We recommend shielded twisted-pair cable as signal cable.

The signal cable should not be installed near high-voltage cables, large motors or frequency converters.

The shield of the cable is grounded at the power supply end or according to the recommendations of the manufacturer of the used control system.

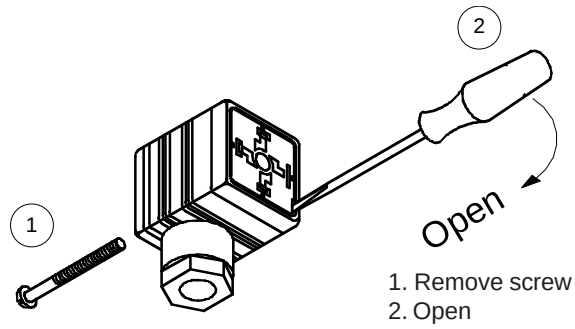


**Figure1-24** Removing the PLUG junction box

10044093

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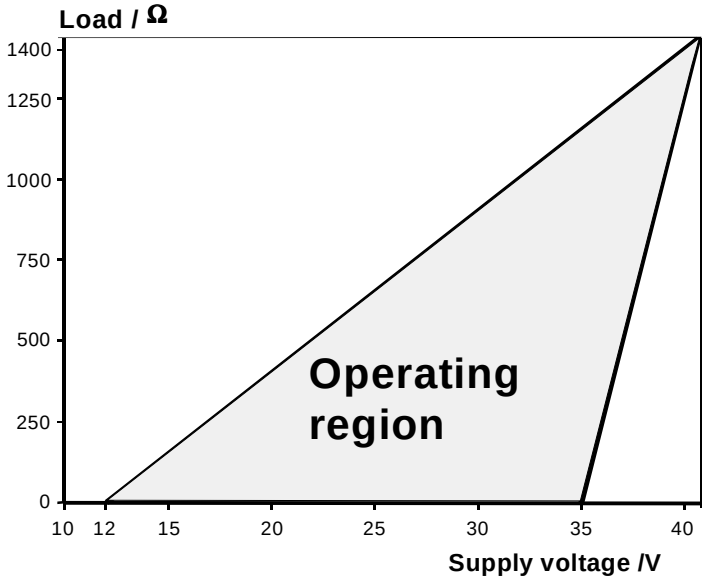



Min. load using HART® - communication 250 Ω

$R_{max} = \frac{\text{Supply voltage - 12 V}}{I_{max}}$

$I_{max}$ = 20.5 mA using HART®-communication

$I_{max}$ = 23 mA (when the alarm current 22,5 mA is on)

**Figure 1-24** Supply voltage and load capacity

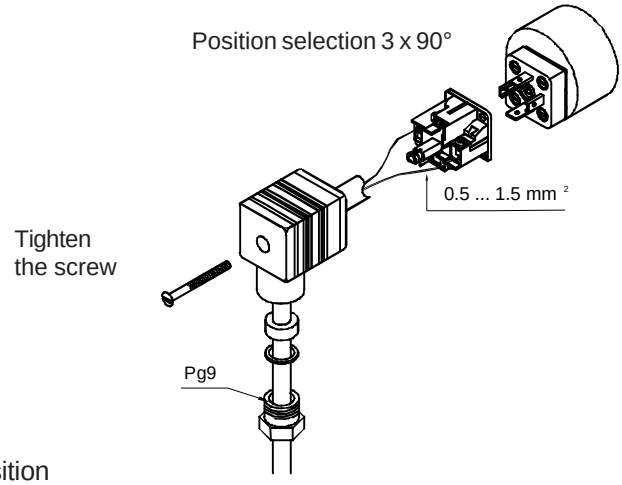
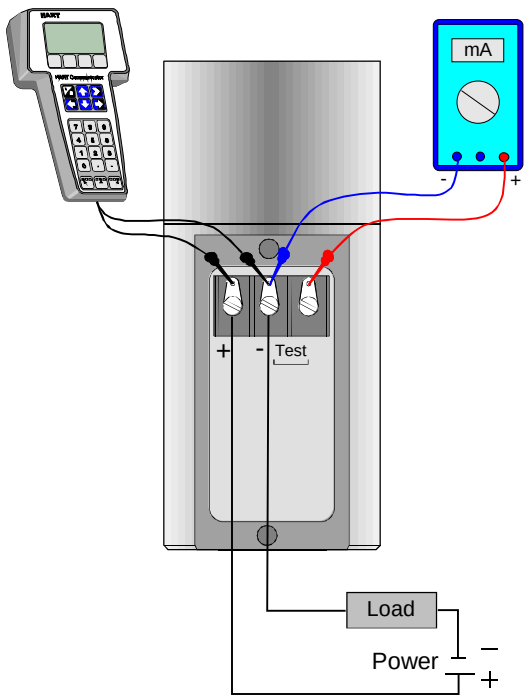
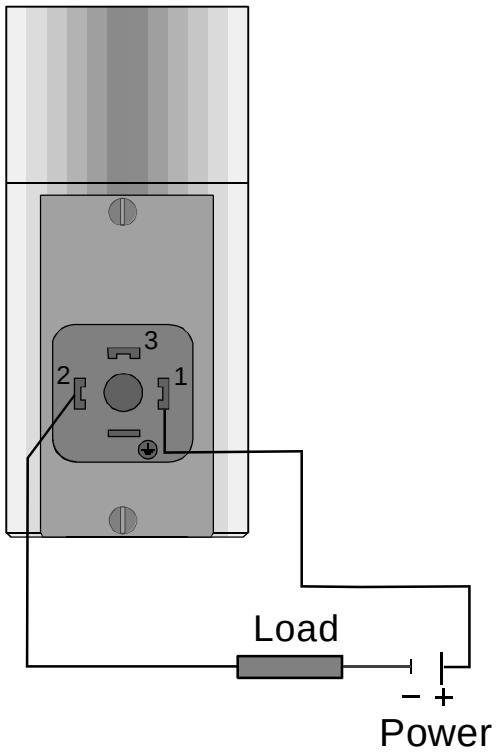



**Figure 1-25** Adjusting the junction box position

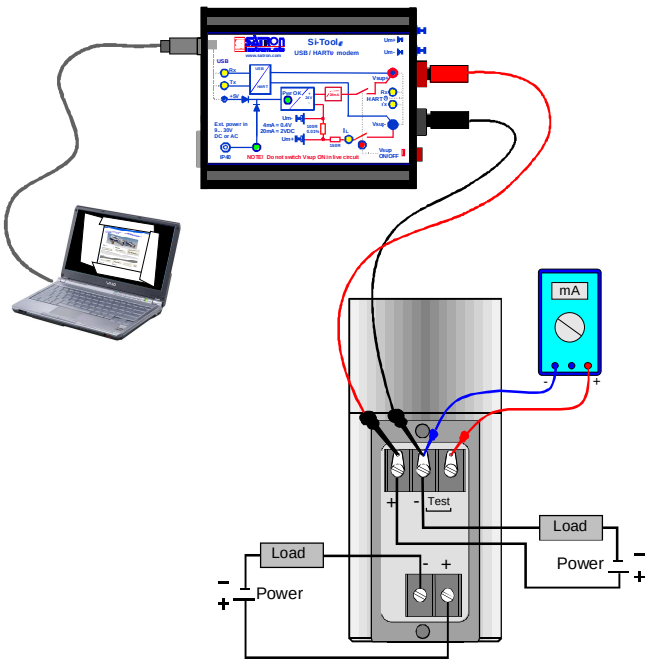
10044092



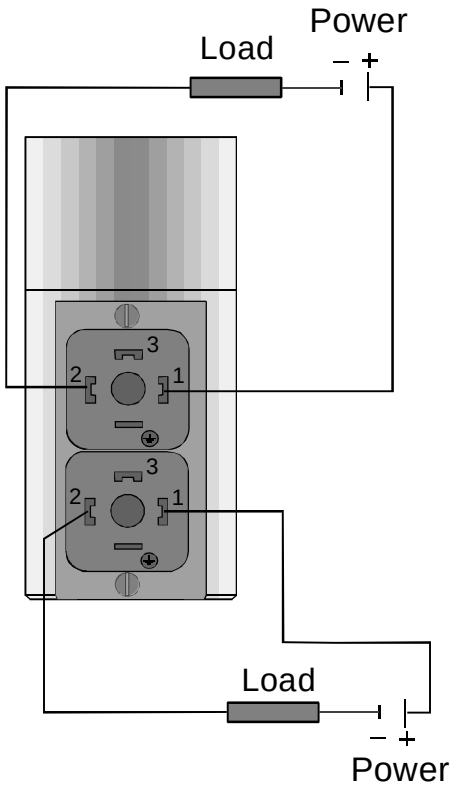

Wiring one current output




Wiring one current output, plug DIN43650 connector




Wiring double current output




Wiring double current output, plug DIN 43650 connector

# 2 SETTING UP

## 2.1 Using the 275 user interface

***Operation keys***
The six operation keys are located above the alphanumeric keyboard:

The ON/OFF key (**I/O**) switches the user interface on and off. When you switch the user interface on, it starts looking for a HART® transmitter connected to it. If the transmitter is not found, the message **"No Device Found. Press OK"** will be displayed.
The **ONLINE** menu is displayed when the user interface finds the transmitter.

**(^)** This key allows you to move upwards in menus and scroll lists forwards.

**(v)** This key allows you to move downwards in menus and scroll lists backwards.

**(<)** This two-function key allows you to move the cursor to the left and to go back to a previous menu.

**(>)** This two-function key allows you to move the cursor to the right and to select a menu option.

**(>>>)** The quick-selection key will start the user interface and display the quick-selection menu. You can define the desired menu as quick-selection menu.

***Function keys***
With function keys F1, F2, F3 and F4 you can perform the program functions displayed above each function key. When you move in the software menus, the functions of these keys will change in accordance with the currently selected menu.

**Figure 2-1**
275 user interface

## 2.2 Setting up through HART® 275 user interface

After installing and connecting the transmitter, connect the user interface to the transmitter. The following menu is displayed:

**1 Measurement**
**2 Configuration**
**3 Information**
**4 Diagnostics**

To change the measuring range, unit damping time constant to output mode (linear/square-root), select **Configuration**.

The following menu is then displayed:

**1 Range values**
**2 Detailed config**

To change the measuring range, select **Range values**.

The selection displays the following menu:

**1 LRV** (lower range value)
**2 URV** (upper range value)
**3 LSL** (lower sensor limit)
**4 USL** (upper sensor limit)
**5 Min span** (minimum span)
**6 Apply values**

To change the measurement unit, damping time constant or output mode, select **Detailed config** from the **Configuration** menu.

The selection displays the following menu:

**1 Damping**
**2 Pres. unit**
**3 Tempr. unit**
**4 Alarm current**
**5 Write protect**
**6 Lin. func**
**7 Diff El status**
**8 Burst mode**
**9 Burst option**
**Poll addr**
**Tag**
**User function**
**User funct. setup**

After these activities or if the transmitter is supplied with the ready configuration you must correct a zero error of the transmitter in a final installation position.

Press **Diagnostics** and **PV Zero calibr.**

The selection displays the following menu: **Give correct value for Zero pressure in ...**

The current zero point will be shown in display and the final zero error correction can be done.

Depending on the function mode the influence of zeroing is:

1. Function mode is choosen to be P1 or P2
   - command resets PV values to Zero from the selected sensor
2. Function mode is choosen to be P1-P2 or P2-P1
   - command resets both sensors (differential pressure)

## 2.3 Using the 375 user interface


**Figure 2-2**
375 user interface

## 2.4 Setting up through HART® 375 user interface

After installing and connecting the transmitter, connect the user interface to the transmitter. The following menu is displayed: **Main menu**. To select the **HART Application.**

The following menu is then displayed:

**1 Measurement**
**2 Configuration**
**3 Information**
**4 Diagnostics**
**5 Review**

To change the measurement unit, damping time constant or output mod, select **Configuration**.

The following menu is then displayed:

**1 Range values**
**2 Output**
**3 Tranfer function**
**4 General setup**

To change the measurement unit, select **Range values**.

The following menu is then displayed:

**1 LRV**
**2 URV**
**3 LSL**
**4 USL**
**5 Min span**
**6 Apply values**

To change the damping time constant, select **Output** from the **Configuration** menu.

The following menu is then displayed:

**1 Damping**
**2 Alarm current**

To change the output mode, select **Transfer function** from the **Configuration** menu.

The following menu is then displayed:

**1 Lin. func**
**2 User function data**

After these activities or if the transmitter is supplied with the ready configuration you must correct a zero error of the transmitter in a final installation position.

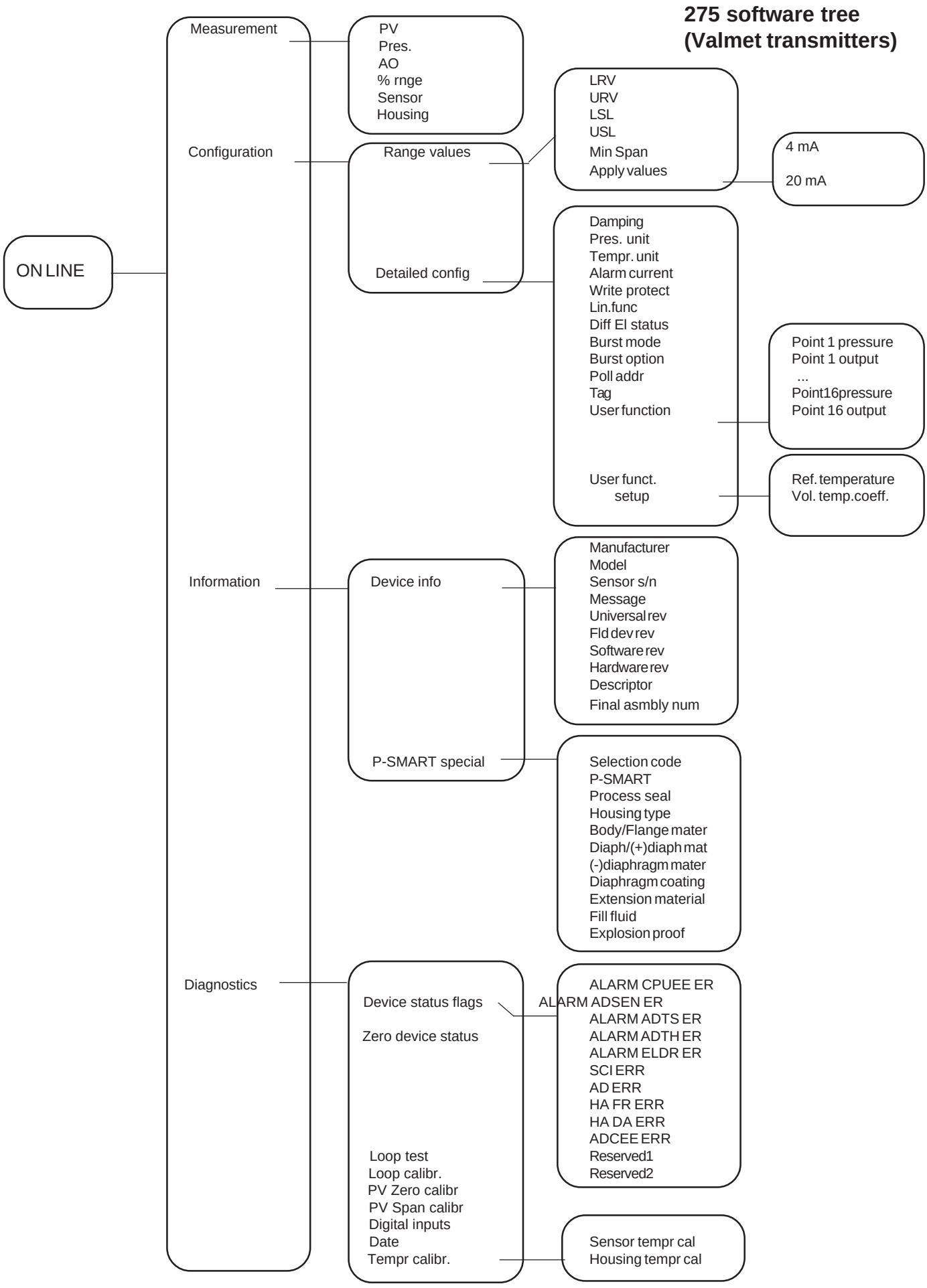
The First press **Diagnostics** and then **Sensor trim** and then **Zero trim**

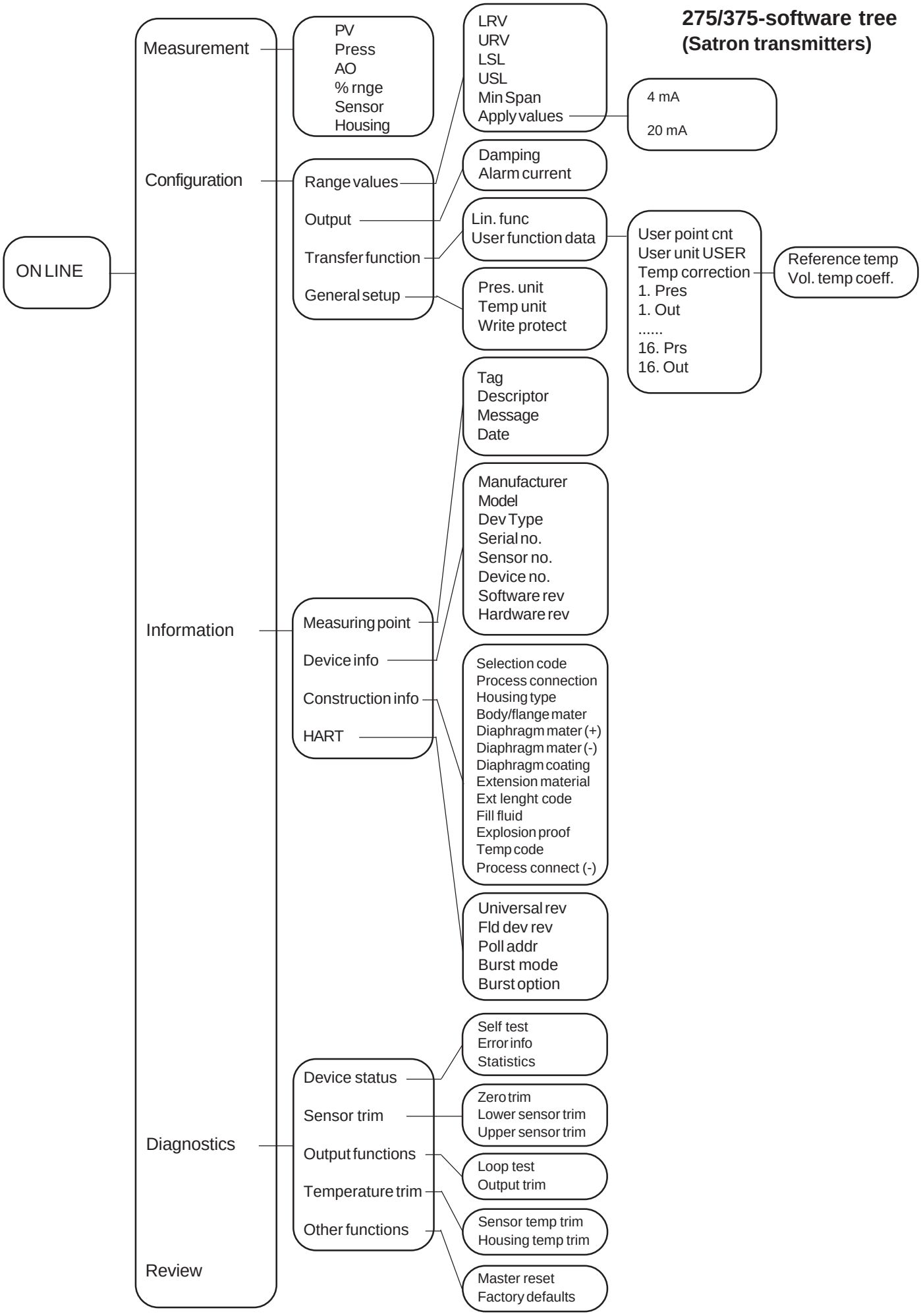
The following text is then displayed : *WARN-Loop be removed from automatic control*

The final zero error correction can be done to select **ABORT** or **OK** on the display .

Depending on the function mode the influence of zeroing is:

1. Function mode is choosen to be P1 or P2
   - command resets PV values to Zero from the selected sensor
2. Function mode is choosen to be P1-P2 or P2-P1
   - command resets both sensors (differential pressure)


275 software tree
(Valmet transmitters)
ON LINE
Measurement
PV
Pres.
AO
% rnge
Sensor
Housing
Configuration
Range values
LRV
URV
LSL
USL
Min Span
Apply values
4 mA
20 mA
Detailed config
Damping
Pres. unit
Tempr. unit
Alarm current
Write protect
Lin.func
Diff El status
Burst mode
Burst option
Poll addr
Tag
User function
Point 1 pressure
Point 1 output
...
Point16pressure
Point 16 output
User funct.
setup
Ref. temperature
Vol. temp.coeff.
Information
Device info
Manufacturer
Model
Sensor s/n
Message
Universal rev
Fld dev rev
Software rev
Hardware rev
Descriptor
Final asmbly num
P-SMART special
Selection code
P-SMART
Process seal
Housing type
Body/Flange mater
Diaph/(+)diaph mat
(-)diaphragm mater
Diaphragm coating
Extension material
Fill fluid
Explosion proof
Diagnostics
Device status flags
ALARM CPUEE ER
ALARM ADSEN ER
ALARM ADTS ER
ALARM ADTH ER
ALARM ELDR ER
SCI ERR
AD ERR
HA FR ERR
HA DA ERR
ADCEE ERR
Reserved1
Reserved2
Zero device status
Loop test
Loop calibr.
PV Zero calibr
PV Span calibr
Digital inputs
Date
Tempr calibr.
Sensor tempr cal
Housing tempr cal


275/375-software tree
(Satron transmitters)
ON LINE
Measurement
Configuration
Information
Diagnostics
Review
PV
Press
AO
% rnge
Sensor
Housing
Range values
Output
Transfer function
General setup
LRV
URV
LSL
USL
Min Span
Apply values
4 mA
20 mA
Damping
Alarm current
Lin. func
User function data
User point cnt
User unit USER
Temp correction
1. Pres
1. Out
.....
16. Prs
16. Out
Reference temp
Vol. temp coeff.
Pres. unit
Temp unit
Write protect
Measuring point
Device info
Construction info
HART
Tag
Descriptor
Message
Date
Manufacturer
Model
Dev Type
Serial no.
Sensor no.
Device no.
Software rev
Hardware rev
Selection code
Process connection
Housing type
Body/flange mater
Diaphragm mater (+)
Diaphragm mater (-)
Diaphragm coating
Extension material
Ext lenght code
Fill fluid
Explosion proof
Temp code
Process connect (-)
Universal rev
Fld dev rev
Poll addr
Burst mode
Burst option
Device status
Sensor trim
Output functions
Temperature trim
Other functions
Self test
Error info
Statistics
Zero trim
Lower sensor trim
Upper sensor trim
Loop test
Output trim
Sensor temp trim
Housing temp trim
Master reset
Factory defaults

## 2.5 Setting-up with Satron-pAdvisor Service Software

When you will have available all the operations of the Smart transmitter, we recommend to use Satron-pAdvisor Service Software and Satron SI-Tool$_e$ USB-HART-modem in setting-up.

**Test connections for configuration and pressure/output current values checking and calibration and for SENSOR TRIM function**

**Recommended equipment for calibration**

Satron-pAdvisor service software for SATRON Smart transmitter (can be loaded free of charge from www.satron.com)

PC: operating system Win-98, Windows 2000 or Windows XP)

DMM: Digital multimeter, basic DCV accuracy better than 0,01 % of reading (for example Fluke 8840A, Keithley 2000)

Cal. pressure generation and measurement device (accuracy better than 0,03 % of reading)

USB-HART-modem, Satron SI-Tool$_e$, order code: M1330001

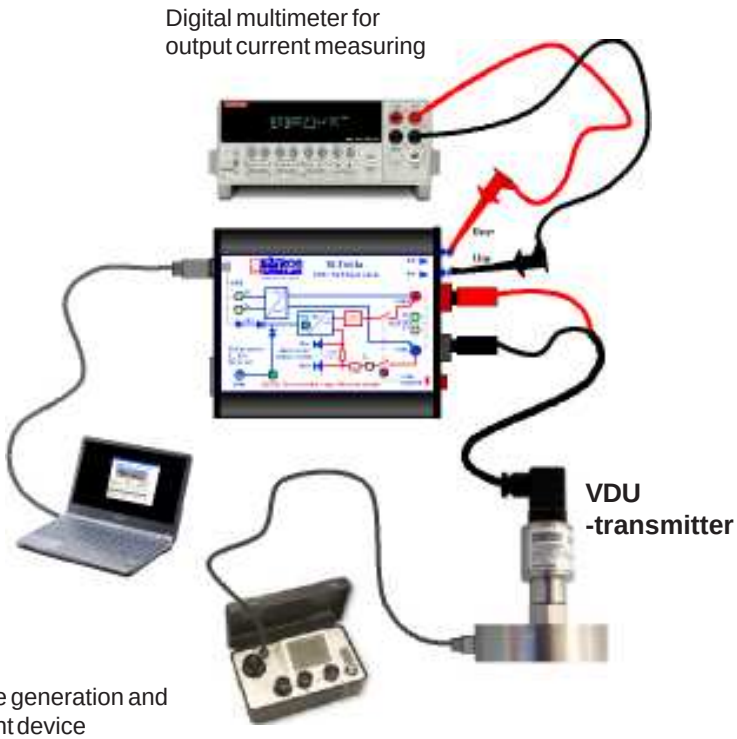



**Figure 2-3 Calibration connections window**

## 2.6 Setting-up with local switches

The additional instruction of display menus is enclosed to this manual, see chapter 5.


Keyboard :

Esc = Press **Esc** move back towards the top of the main menu.

▲ = Use the **UP** arrow key to move up on the current menu level or to increase the selected parameter value.

▼ = Use the **DOWN** arrow key to move down on the current menu level or to decrease the selected parameter value.

Enter = Press **ENTER** to move to a lower level in a menu or to accept a command or parameter value.

**Figure 2-4 VDU differential pressure transmitter with display**

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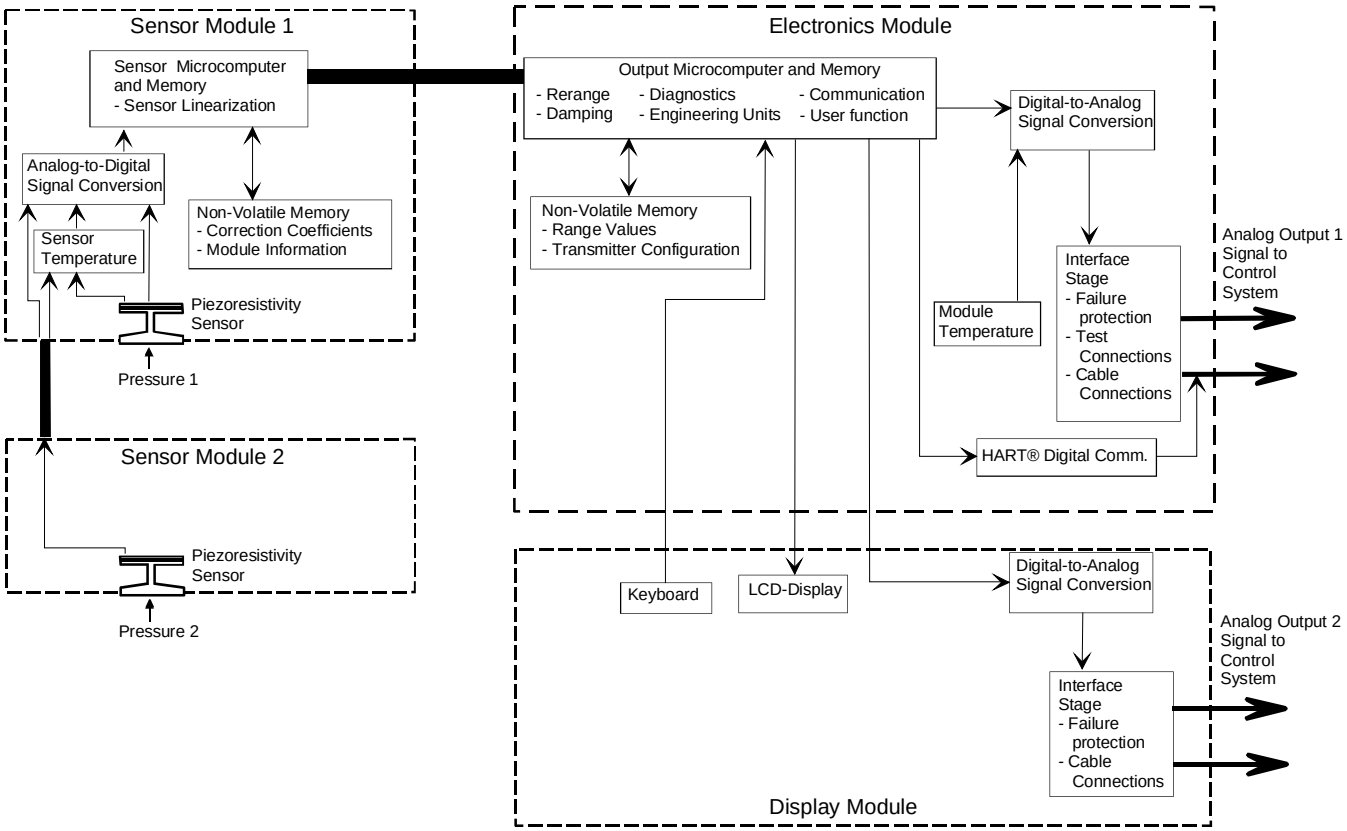


**Figure 4-1 Functional construction of the SATRON VDU differential pressure transmitter**

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# 4. CONSTRUCTION AND OPERATION

**Sensor Module**

The piezoresistive sensor, which has a silicone oil fill, is isolated from the process with a diaphragm. Sensor pressure and temperature are measured with a 24-bit AD converter. Linearity and temperature effects are digitally corrected with an internal microprocessor connected to the sensor module.

The **sensor** converts pressure to electrical signal. The conversion is carried out through a Wheatstone bridge supplied with direct current. The elastic displacement produced in the bridge by the pressure causes bridge unbalance which is measured as a DC voltage signal.

**Electronics Module**

The electronics module converts the process pressure signal from the sensor module to 4-20 mA output signal.

The conversion can be made in linear, square root or inverted mode, or it can be done through user-selectable pressure/output point pairs (2-16 points).
For output current control can be choosen:
- Pressure P1 of sensor 1
- Pressure P2 of sensor 2
- Pressure difference P1-P2 of sensors 1 and 2

**Display Module**

Transmitter's own display is equipped with operating keys that allow you to define the transmitter's all functions.

The transmitter can be have also two current outputs. The other current output control can be choosen:
- Pressure P1 of sensor 1
- Temperature T1 of sensor 1
- Pressure P2 of sensor 2
- Temperature T2 of sensor 2
- Pressure difference P1-P2 of sensors 1 and 2
- Pressure difference P2-P1 of sensors 2 and 1

# 5. PARTS LIST

When ordering spares, please quote this document's number BPDUV760AV and date 15.3.2014, the name and order number of the required part, and the transmitter's serial number. Parts indicated with asterisk (*) as well as screws, nuts and seals (packings) are spare parts.

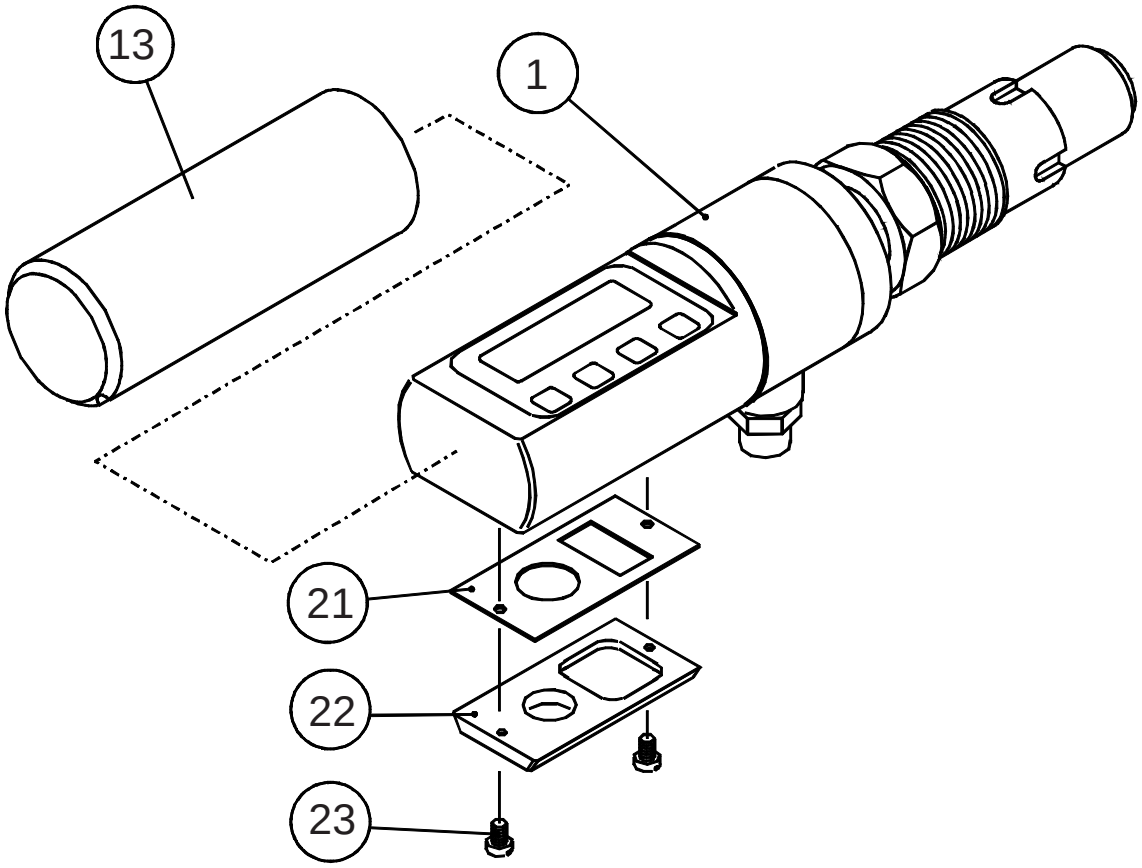


**Figure 5-1** Parts list: VDU with G1 thread with metal/metal taper procss connection , sensor 1 (master)

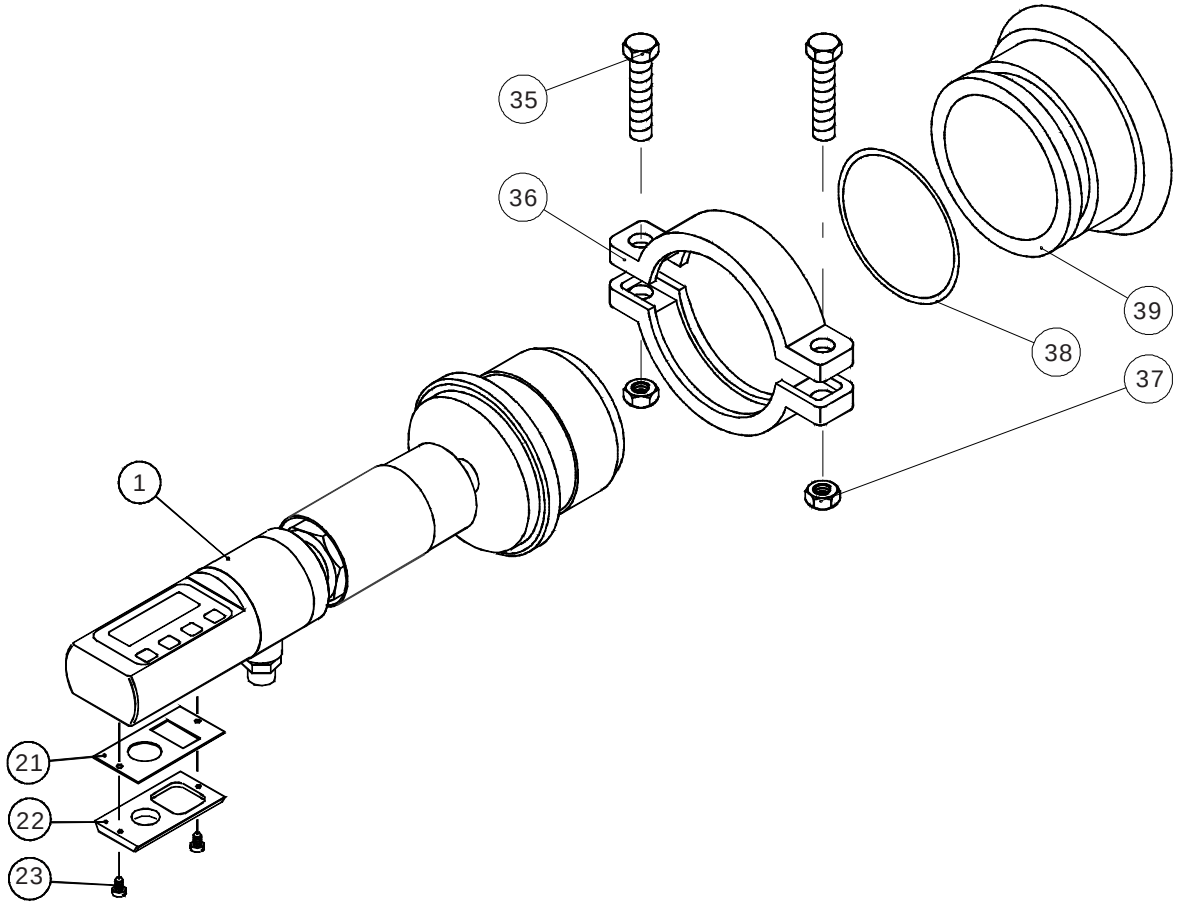


**Figure 5-2** Parts list: VDU with Sandvik-clamp process connection , sensor 1 (master)

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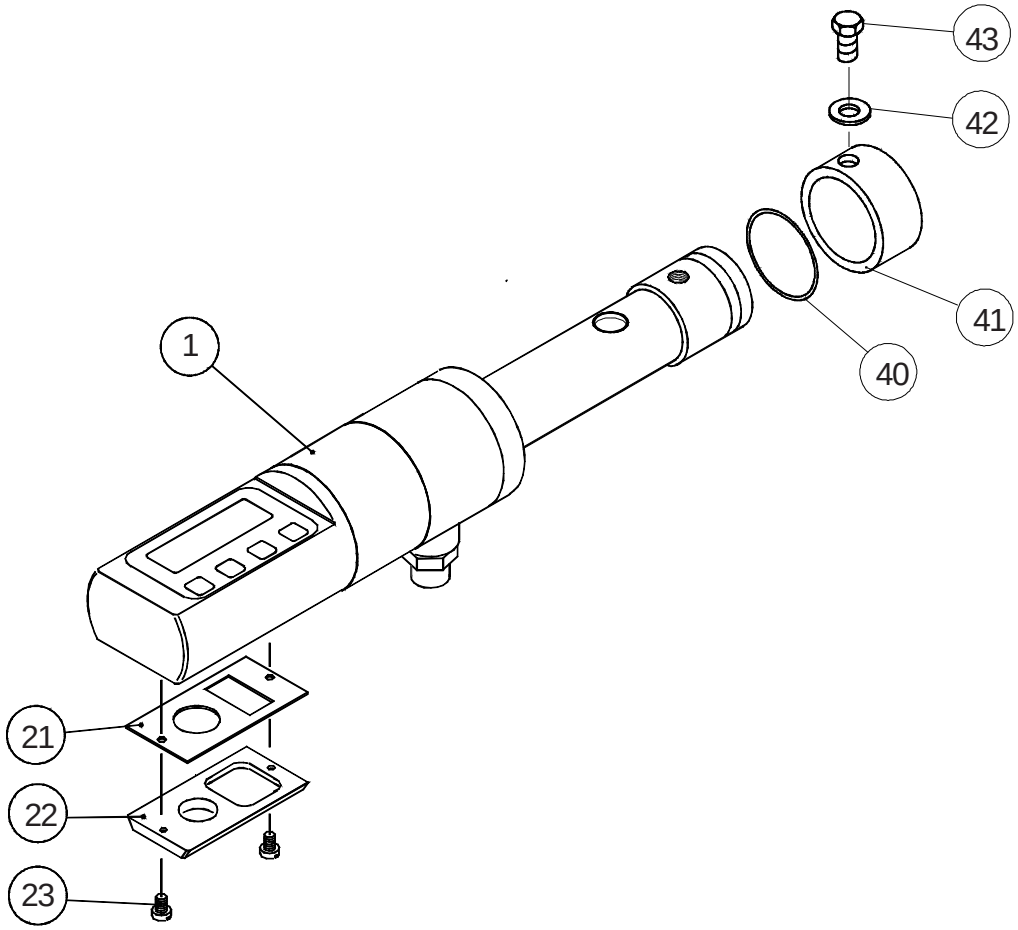



**Figure 5-3** Parts list: Vdu with PMC 1" process connection, sensor 1 (master)

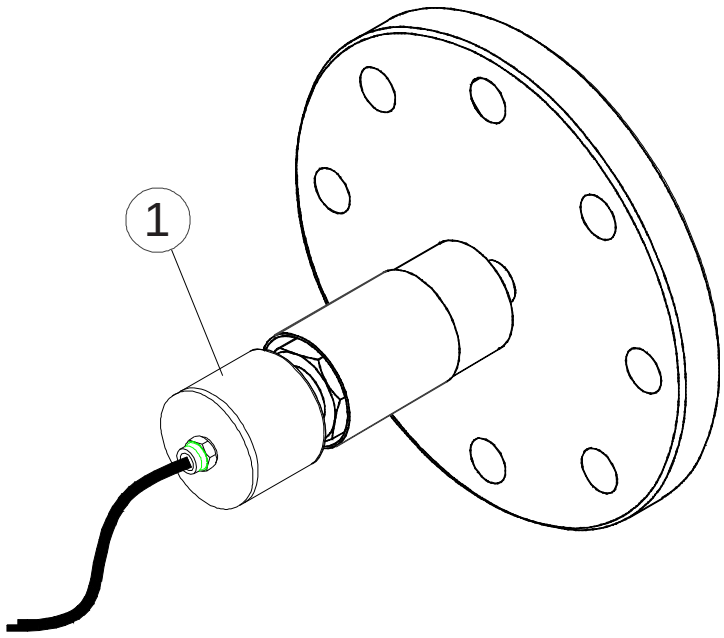



**Figure 5-4** Parts list: VDU with flange process connection , sensor 2 (slave)

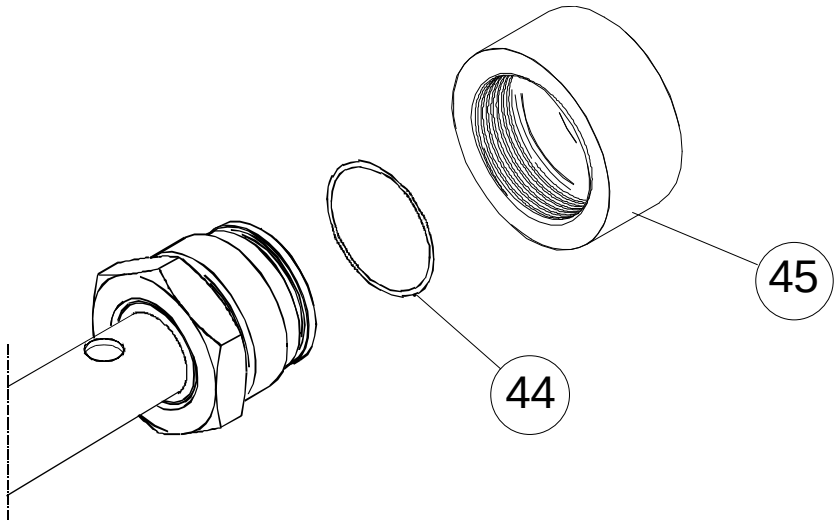


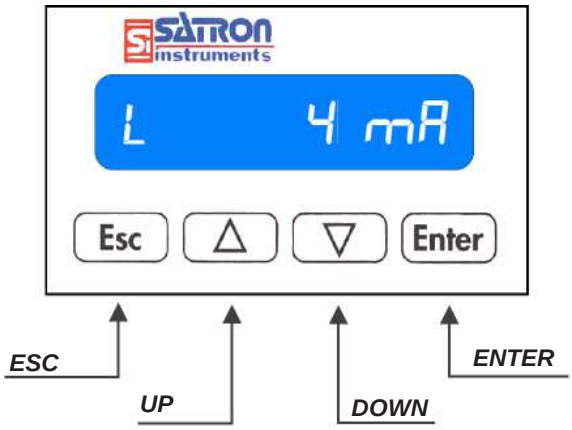

**Figure 5-5** Parts list: VDU with M45x2 process connection

| Number | Name | Order number |
|---|---|---|
| 1 | Sensing element | |
| * 13 | Protection cup, housing N | T1300296 |
| 21 | Seal N, Silicone rubber | T1300262 |
| * 22 | Cover N | T1300260 |
| 23 | Cylinder-head screw S M4x8 SFS2176 A4 | 51624012 |
| 35 | Hex bolt, M10 x 40 SFS2064 m A4 | 54228140 |
| * 36 | Mounting clamp NS70/76.1-SFS 2333 | 82220000 |
| 37 | Hex nut M10 SFS 2067 A4 | 56022810 |
| 38 | Seal EPDM | T1051205 |
| 38 | Seal FPM (Viton®) | T1051204 |
| 38 | Seal PTFE | T1051203 |

| Number | Name | Order number |
|---|---|---|
| * 39 | Coupling Sandvik 53 mm | T547290 |
| * 39 | Coupling Sandvik 104 mm | T547291 |
| * 39 | Coupling Sandvik 155 mm | T547292 |
| 40 | O-ring 18.64 x 3.53 FPM | 8001186353 |
| * 41 | Coupling PMC1" | M1050300 |
| * 42 | Washer 8.4 A4 DIN125 | 50002630 |
| 43 | Hex screw M8x12 A4 | 54228010 |
| 44 | O-ring 34.6x2.62 FPM | 80013460 |
| * 45 | Coupling M45x2, adjusting (BA...) | M1050459 |
| * 45 | Coupling BB M45x2 | M1050474 |
| | O-ring 41.2x3 FPM | 800141230 |

## 5. OPERATIONS TRANSMITTER'S KEYBOARD

The user interface for the VDU transmitters, consists of display and operating keys. Among other things, the user interface allows you to set process variables in the desired units on the display and to configure the transmitter e.g. by setting the lower and upper range-values (LRV, URV) and the process variable's unit and tag code. In addition, you can perform diagnostic routines and view device information through the user interface.




The 8-character liquid crystal display (LCD) allows you to display information with letters and numbers.

OPERATING KEYS:
With the UP/DOWN[↑↓] arrow keys and ENTER and ESC you can move in the menus. The functions of the keys:

ENTER:
Press ENTER to move to a lower level in a menu or to accept a command or parameter value.

UP [↑]:
Use the UP arrow key to move up on the current menu level or to increase the selected parameter value.

DOWN [↓]:
Use the DOWN arrow key to move down on the current menu level or to decrease the selected parameter value.

ESC:
Press ESC to move back towards the top of the main menu.

The main menu has 4 submenus: Measurement, Configuration, Info and Diagnostics menus. When the transmitter is powered up it will go to the Measurement menu's main display, i.e. Process Value.

## 1. MEASUREMENT MODE MENU: MEASURE

When the transmitter is powered up, it immediately shows the MEASURE menu's main display, PROCESS VALUE. Use the UP/DOWN[↑↓] keys to move in the menu. The menu does not have any variables adjustable by the user. Use the ESC key to exit the MEASURE menu to the main menu.

### 1.1 1. PROCESS VALUE :

L 12.34

This shows the PV (process value/primary variable) which may be pressure, volume, differential pressure, etc. The letter at the left of the display specifies the linearization function in use. The available options are as follows:

| | |
|---|---|
| L | Linear |
| Z | Zero-based linear |
| I | Inverted linear |
| S | Square root |
| U | User 16 points |

Define the linearization function by selecting LIN FUNC from the CONFIGUR menu. This process value (L) is the first control value of the first outputsignal.

### 1.2 1. UNITS

MBAR

With the [↓] key you can display the process value's unit. Define the unit by selecting UNITS from the CONFIGUR menu. If user-defined has been selected as linearization function, the text USER (default value ) is shown as unit .

### 1.3 1. PRESSURE VALUE

P 12.34

Depending on the function mode:
- the pressure measured by the choosen sensor
- the pressure difference of sensors 1 and 2

### 1.4 1. PRESSURE UNIT

MBAR

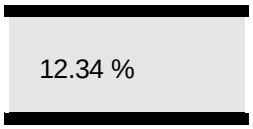
Depending on the function mode:
- the unit of pressure measured by the choosen sensor
- the unit of pressure difference of sensors 1 and 2.

### 1.5 MA, 1. CURRENT LOOP

12.34 MA

1. Current signal's value in milliamps.

*1*.6 %, PER CENT




1. Current signal's value in per cents of full-range value.

1.7 S F/C, SENSOR TEMP


1. Sensor temperature in °C or °F. Select the unit from the CONFIGUR submenu.

1.8 E F/C, ELECTRONICS TEMP

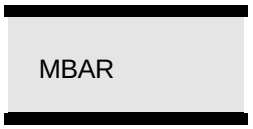

The temperature of the transmitter's electronics, either °C or °F. Select the unit from the CONFIGUR submenu.

1.9 2. PROCESS VALUE (PV2):


This shows the PV (process value/primary variable) which may be pressure, volume, differential pressure, etc.

This process value (L2) is control value for double current output.

1.10 2. UNITS

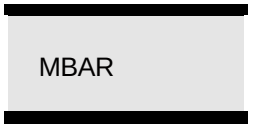



With the [↓] key you can display the unit of 2. process value. Define the unit by selecting UNITS from the CONFIGUR menu.

1.11 2. PRESSURE VALUE


The pressure detected by the sensor 2.

1.12 2. PRESSURE UNIT

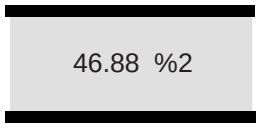



The unit of the pressure detected by the sensor 2

1.13 MA, 2. CURRENT LOOP


2. Current signal's value in milliamps.

1.14 %, PER CENT




2. Current signal's value in per cents of full-range value.

1.15 S F/C, SENSOR TEMP


2. Sensor temperature in °C or °F. Select the unit from the CONFIGUR submenu.

## 2. CONFIGURATION MENU: CONFIGUR

Select Configuration mode from the main menu level with the UP/DOWN[↑↓] keys. Then press ENTER[↵] to access the CONFIGUR menu. In this submenu you can define the upper and lower range-values (URV, LRV), device identification code, linearization function, etc.

2.1. MANUFCTR


Manufacturer's name. Cannot be changed.

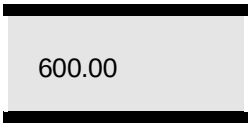
2.2. DEV TYPE


Product type code. Cannot be changed.

2.3. TAG


Tag code. You can enter free-format text one character at a time. When you select this option withENTER[↵] the cursor will be at the left. Select characters with ENTER[↵](to the right) and ESC[X] (to the left). You can view the selectable characters one character at a time with the UP/DOWN[↑↓] keys until the desired character is found. When the cursor is at the right edge you can go back to the CONFIGUR menu either by accepting the new tag code with ENTER[↵] or by exiting without changing the tag code by pressing ESC[X]. You can go back to edit mode by pressing the ESC[X] key when asked to accept your entry. Apostrophe indicates the cursor position; at point, however, the cursor will disappear. A great deal of special characters are available besides letters and numbers.

2.4 PV URV, UPPER RANGE-VALUE




This is the process variable's upper range-value corresponding to 20 mA. Set the value in the selected units, which are displayed first. The numerical value is shown in the next screen where you can also edit the value. The procedure is similar to TAG, except that you first set the position of the decimal point with the UP/DOWN[↑↓] keys. After accepting that with ENTER you can edit each digit in the value in the same way as the characters in TAG. If the defined upper range-value is invalid, the display will blink and you go back to re-edit the value.

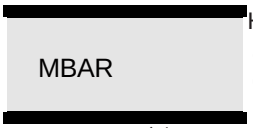
2.5 PV LRV, LOWER RANGE-VALUE


Here you set the process variable's lower range-value corresponding to 4 mA. The procedure is the same as for upper range-value.

2.6 PV DAMP, DAMPING


Time constant, in seconds, for output damping. The range is 0.025s to 60s. Set the value with the UP/DOWN[↑↓] keys and accept it with ENTER[↵] , or press ESC[X] if you do not want to change the value.

2.7 UNITS

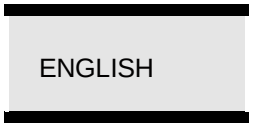



Here you can display or change the applied unit of measure. Press ESC[X] to exit without making a change. Press ENTER[↵] to accept new value. Use the UP/DOWN[↑↓] keys to view the units. The selectable units include KPA, TORR, ATM, MPa, INH2O, INHG, FTH2O, MMH2O, MMHG, PSI, BAR, MBAR, G SQCM, KG SQCM, PA.

2.8 T UNITS

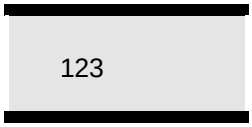

Select the temperature unit from this menu. The unit can be °C or °F. Proceed as described above to make the selection.

2.9 LANGUAGE




From this menu you can select the desired language (SUOMI, SVENSKA, ENGLISH, DEUTSCH or FRANCAIS). Use the UP/DOWN[↑↓]keys to select the language, press ENTER[↵] to save the selection, or press ESC[X] to exit without saving.

2.10 PASSWORD




From this menu you can set a password (0…999) for the transmitter. If a password has been specified, you cannot set any parameters or make any other settings on the transmitter unless you enter the correct ID number in this menu. Password is not in use when PASSWORD is 000 after reset. You enter the PASSWORD in the same way as TAG. PASSWORD will be on when you define a value between 1 and 999. If you forget password get on to Satron Instruments Inc.

2.11 LRV=PV


Here you set the current process pressure as lower range-value (LRV). Accept the setting with ENTER[↵] when asked to confirm the value (SAVE?). Press ESC[X] to exit if you do not want to change the value. Compare this function to LRV. Blinking value indicates an error, i.e., measured pressure is lower than the sensor's lower range-value or the difference between upper and lower range-values is not on the specified range.

2.12 URV=PV


Here you set the current process pressure as upper range-value (URV). Accept the setting with ENTER[↵] when asked to confirm the value. Press ESC[X] to exit if you do not want to change the value. Compare this function to URV. Blinking value indicates an error, i.e., measured pressure is higher than the sensor's upper range-value or the difference between upper and lower range-values is not on the specified range.

2.13 LIN FUNC


In this menu you select the output transfer function for current loop connection. The selection is done with the UP/DOWN[↑↓] keys, and the options are as follows:

| | |
|---|---|
| LIN: | Linear 4mA to 20mA [process value's zero point = current pressure value (value measured by sensor)]. |
| LIN ZERO: | Process value's zero point is the same as the lower range-value. |
| INV LIN: | Inversely linear 20mA to 4mA. |
| SQR: | Square root 4mA to 20mA. |
| USER LIN: | User-defined 16-point interpolated transfer function for output. Enter the points through the USER FUNCTION option or through HART user interface. |
| USER SPL: | The same as USER LIN, but this generates a smoother transfer function for the output. |

## 2.14 HART® COMMUNICATION LINK SETTINGS

HART

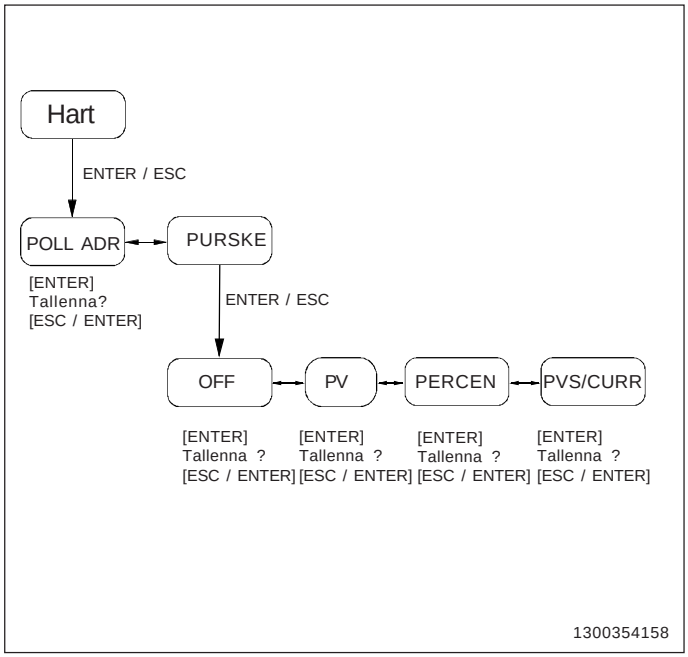
Select this function with the UP/DOWN[↑↓]keys. In menus 1-3 you select the content of the burst message. You can view the available selections with the UP/DOWN[↑↓] keys. Available options:

In menu 1 (PV): Transmitter sends process value PV to system.

In menu 2 (PERCEN%): Transmitter sends process variable's value in per cent of specified measuring range to master.

In menu 3 (PVS/CURR): Transmitter sends all process variables and current signal's value.

In menu 5 (POLL ADR): Select the transmitter's Hart® address. The address can be set between 0 and 15. Address 0 defines current loop, in which case the transmitter will operate in two-wire system. The procedure is the same as described above.




## 2.15 ALRM TYP

3.7 MA

Current signal will settle at either 3.7 mA or 22.5 mA to indicate transmitter fault to an external device. Use the UP/DOWN[↑↓]keys to select the current value from the menu. The default is 3.7 mA.

## 2.16 DATE

*15022004*

The date consists of a single field. For instance, 15022004 specifies 15 February 2004. You can edit the date in form ddmmyy. The calendar year can be selected from between 1900 and 2155. This date can be example date of calibration.

## 2.17 USER FUNC

USER

In this menu you define the points for a user-defined function. You enter the pressure and corresponding output point by point. The number of points is at least 2 and at most 16. In this connection you can also define the corresponding reference temperature T REF and volume's temperature coefficient V T COF. Select and accept the numerical values as described above. Set the pressure and the corresponding output. Make the settings one character at a time in the same way as when defining TAG. Press ESC to return to the CONFIGUR menu. Press ENTER to edit the selected variable. Use the arrow keys to select the desired variable. The selectable variables include the following:

| | |
|---|---|
| PRES 0 | 1st reference pressure |
| OUT 0 | Output corresponding to 1st reference pressure at reference temperature |
| PRES 1 | 2nd reference pressure |
| OUT 1 | Output corresponding to 2nd reference pressure at referencetemperature |
| . | |
| . | |
| . | |
| PRES 15 | 16th reference pressure |
| OUT 15 | Output corresponding to 16th reference pressure at reference temperature |
| T REF | Reference temperature |
| V T COF | Volume's temperature coefficient |

You can change the variables in the same way as TAG.

## 2.18 DISPLAY

DISPLAY

In this menu you can select the direction in which the display will

2.19 BACKLGHT

*BACKLGHT*

In this menu you select the backlight on / off. The selection is done with the UP/DOWN[↑↓] keys, and the options are as follows:

MODE:

| | |
|---|---|
| OFF | Backlight off |
| DELAYED | Backlight on 5 ... 75 s after the start, the default value is 60 s. Value is changed Satron pAdvisor program. |
| BUTTON | Backlight on 5 ... 75 s for the last button is pressed, the default value is 60 s. Value is changed Satron pAdvisor program. |

BLINK:

| | |
|---|---|
| OFF | Backlight blink off |
| ALARMS | Blacklight blinking (1/6 Hz) if the transmitter is in the alarm current. |
| WARNINGS | Blacklight blinking (1/6 Hz) if the text on the display is blinking. |

## 3. ADVANCED

Select ADVANCED menu on upper lever using UP/DOWN[↑↓] keys and after that you will go to ADVANCED-menu using ENTER key. In this sub-menu will be defined among others the function mode, upper range and lower range values and damping.

3.1 OP MODE

OP MODE

Function mode

With the function mode the transmitter can be set to operate as follows:

| | |
|---|---|
| P1 : | 1. pressure measured by sensor |
| P1 - P2 : | 1. difference of pressures of sensors 1. and 2. |
| P2 : | 2. pressure measured by sensor |
| P2 - P1 : | 2. the difference of pressures of sensors 2. and 1. |

3.2 OP MODE2 (only double current output)

OP MODE2

Function mode 2

With the function mode 2. the transmitter can be set to operate as follows

| | |
|---|---|
| P1 : | 1. pressure measured by sensor |
| T1 : | 1. temperature measured by sensor |
| P2 : | 2. pressure measured by sensor |
| T2 : | 2. temperature measured by sensor |
| P1 - P2 : | 1. difference of pressures of sensors 1 and 2 |
| P2 - P1 : | the difference of pressures of sensors 2. and 1. |
| NONE : | other current output is not in use |

3.3 URV2 (only double current output)

500.00

upper limit for double current output

This is the process variable's upper range-value corresponding to 20 mA. Set the value in the selected units, which are displayed first. The numerical value is shown in the next screen where you can also edit the value. The procedure is similar to TAG, except that you first set the position of the decimal point with the UP/DOWN[↑↓] keys. After accepting that with ENTER you can edit each digit in the value in the same way as the characters in TAG. If the defined upper range-value is invalid, the display will blink and you go back to re-edit the value.

3.4 LRV2 (only double current output)

0.0000

lower limit for double current output

Here you set the process variable's lower range-value corresponding to 4 mA. The procedure is the same as for upper range-value.

3.5 DAMP2 (only double current output)

1.0 S

Time constant, in seconds, for output damping. The range is 0.025s to 60s. Set the value with the UP/DOWN[↑↓] keys and accept it with ENTER[↵] , or press ESC[X] if you do not want to change the value.

## 4. DEVICE INFORMATION MENU: INFO

You can select the device information menu from the Main Menu level with the ENTER key. In this submenu you can view the upper and lower range-values (URV, LRV), device ID number, sensor's upper and lower scale-limits (USL, LSL), etc. Use the UP/DOWN[↑↓]keys to view these items. Press ESC to return to the Main Menu level. You cannot change the data displayed in this menu.

4.1 MANUFCTR:

SATRON

The manufacturer of the transmitter.

4.2 DEV TYPE

VDU4

Product type code.

4.3 TAG

PI-206

Tag code.

4.4 PV USL

300.0000

Sensor's upper scale-limit in the selected units. Press ENTER to select this item. The configured unit will be displayed when you press ENTER a second time.

4.5 PV LSL

0.000000

Sensor's lower scale-limit in the selected units. The procedure is the same as for USL.

4.6 MIN SPAN

600.00

Minimum span. Press ENTER to select this item. Press ENTER a second time to display the unit. Press ESC to exit

4.7 ASSM NUM

0614

The transmitter's assembly number. Press ENTER to select this item. Press ESC to exit. For instance, assembly number 0614 shows that the transmitter was made in week 14 of the year 2006.

4.8 PV SNSR

*1456*

The sensor's serial number. Press ENTER to select this item. Press ESC to exit.

4.9 VERSION

201

Version numbers of the transmitter's electronics and software. Press ENTER to select this item. Press ESC to exit. With the UP/DOWN[↑↓] keys you can select either CPU HW, CPU SW, ADC HW, ADC SW or MAN REV (manual revision) revision number or CPU ID-number from this submenu.

4.10 OP TIME

*11:36:52*

The value of the operation time save at 1 hour intervals. When the value of the counter is < 100 hours so value save 1-minute intervals.

The value of the operation time counter on the display :

| | |
|---|---|
| HH:MM:SS | when the value of counter is <100 hours |
| HHHH:MM | when the value of counter is <100000 hours |
| HHHHHHHH | when the value of counter is ≥100000 hours |

## 5. DIAGNOSTICS MENU: DIAGNOST

Select the DIAGNOST menu on the Main Menu level with the ENTER key. This submenu allows you to examine the transmitter's internal errors and faults, to set the transmitter to give out a fixed current, and to calibrate the transmitter.

5.1 STATUS

OK

Here you can display and reset accumulated errors one at a time. The text OK will be displayed if there are no errors. Possible error messages (alarm means a serious fault/error that also puts the current signal in fault status and makes the display blink):

5.2 LOOP TST

LOOP TEST

The transmitter can be set to give out a fixed current signal for testing the mA output. The first ENTER after that will changed as desired with the UP/DOWN[↑↓] keys, the next ENTER will switch the transmitter off from normal mode (AUTO OFF), the second ENTER will set it for 4 mA output, and the third ENTER for 20 mA output. The next ENTER after that will give default value 12 mA, which can be changed as desired with the UP/DOWN[↑↓] keys. The last ENTER will switch the transmitter back to normal mode (AUTO ON). The purpose of this test is to test the accuracy of the transmitter's current output with a reference meter. If any shortcomings are detected, refer to 5.3 LOOP CAL for calibrating the mA output.

5.3 LOOP CAL

LOOP CAL

Here you can calibrate the current signal given by the transmitter. The first ENTER will switch the transmitter off from normal mode (AUTO OFF). The next ENTER will make the transmitter give out a signal which it assumes to be 4 mA. Use the UP/DOWN[↑↓] keys to change this value in accordance with the reading on the reference meter. Then press ENTER for 20 mA output, which you must also set in accordance with the reference meter. Press ENTER to accept the new reading. Note: Use a sufficiently accurate reference meter.

5.4 SENS.TRIM

| | |
|---|---|
| SENS.TRIM | Calibration of pressure measuring |

Pressure values can be calibrated here.
After the first ENTER you can select the object of calibration using UP/DOWN[↑↓] keys and accept the sensor for calibration by pressing ENTER.

P1 : 1. pressure of the sensor
ST1 : 1. temperature of the sensor
P2 : 2. pressure of the sensor
ST2 : 2. temperature of the sensor

Calibration P1 or P2 :
The first ENTER shows the display LRW.TRIM, there will be given the lower measured value of sensor trimming pressure, in the following display UPRTRIM will be given the upper measured value of sensor trimming pressure.

***The procedure:***

- Apply a pressure corresponding to the desired LRV (lower range-value).
- Select DIAGNOST / SENS.TRIM. Pressing ENTER will now display LWR.TRIM, and the next ENTER will show the pressure reading.
- Use UP/DOWN[↑↓]keys to adjust the displayed pressure in accordance with the reference meter's pressure reading as described in 2.4 UPV.
- Press ENTER to accept the adjusted reading, or press ESC to exit without saving the value.

- Apply a pressure corresponding to the desired URV (upper range-value).
- Pressing ENTER will display UPR.TRIM. The nex
- Select DIAGNOST / SENS.TRIM. Pressing ENTER will now display LWR.TRIM, and the next ENTER will show the pressure reading.

- Pressing ENTER will display UPR.TRIM. The next ENTER will display the measured pressure.
- Use the UP/DOWN[↑↓] keys to adjust the displayed pressure in accordance with the reference meter's pressure reading.
- Press ENTER to accept the adjusted reading, or press ESC to exit without saving the value.

NOTE!
The difference between LWR.TRIM and UPR.TRIM must be at least the transmitter's minimum span.

Calibration ST1 or ST2 :
The first ENTER shows in the display the temperature reading.

- Adjust the displayed temperature to be in accordance with the reference temperature meter's reading
- Press ENTER for accepting the new calibrating reading or press ESC to exit without saving the value.

5.5 PV ZERO

| | |
|---|---|
| PV ZERO | Zeroing the transmitter |

The zeroing of transmitter will be set here.
After the first ENTER will be choosen the desired sensor using UP/DOWN[↑↓] keys and accepthing the zeroing sensor by pressing ENTER.

P : 1. sensor zeroing
P2 : 2. sensor zeroing

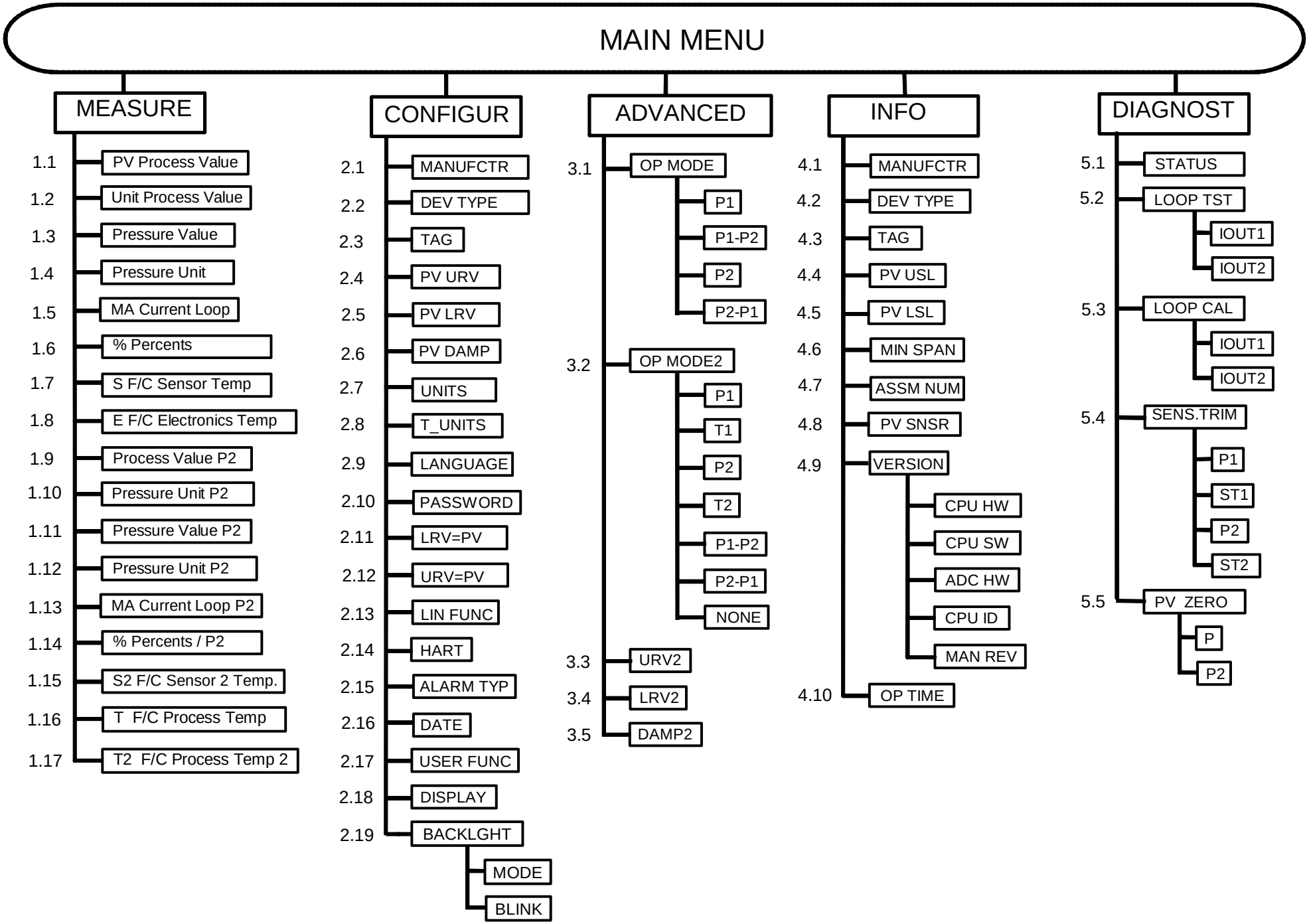
The following ENTER shows PV=ZERO?.
After that by pressing ENTER the display shows SAVE?. By pressing ENTER follows the zeroing.

*Table 1.*
*The content of error word 1*
***(EW1 = 0…15)***

| *Bit* | *Error message* | *Description* |
|---|---|---|
| *0* | *P ER* | *Pressure (P) error* |
| *1* | *ST ER* | *Sensor temperature (ST) error* |
| *2* | *ET ER* | *Electronics temperature (ET) error* |
| *3* | *RANGE ER* | *Percentage of output under -10% or over 110% error* |
| *4* | *OUTSA WA* | *Output current saturated* |
| *5* | *ADCR ER* | *ADC converter runtime error* |
| *6* | | |
| *7* | | |
| *8* | *ADCS ER* | *ADC converter startup error* |
| *9* | *EEPRR ER* | *EEPROM checksum error* |
| *10* | *EEPRW ER* | *EEPROM write error* |
| *11* | *EECAL ER* | *EEPROM calibration error* |
| *12* | *HART ER* | *HART communication error* |
| *13* | *INTRN ER* | *Internal system error* |
| *14* | | |
| *15* | | |

*Table 2.*
*The content of error word 2*
***(Error word 2 = 0…15)***

| *Bit* | *Error message* | *Description* |
|---|---|---|
| *0* | *P2 ER* | *Pressure 2 (P2) error* |
| *1* | *ST2 ER* | *Sensor 2 temperature (ST2) error* |
| *2* | | |
| *3* | | |
| *4* | | |
| *5* | | |
| *6* | | |
| *7* | | |
| *8* | | |
| *9* | | |
| *10* | | |
| *11* | | |
| *12* | | |
| *13* | | |
| *14* | | |
| *15* | | |


MAIN MENU
MEASURE
1.1 PV Process Value
1.2 Unit Process Value
1.3 Pressure Value
1.4 Pressure Unit
1.5 MA Current Loop
1.6 % Percents
1.7 S F/C Sensor Temp
1.8 E F/C Electronics Temp
1.9 Process Value P2
1.10 Pressure Unit P2
1.11 Pressure Value P2
1.12 Pressure Unit P2
1.13 MA Current Loop P2
1.14 % Percents / P2
1.15 S2 F/C Sensor 2 Temp.
1.16 T F/C Process Temp
1.17 T2 F/C Process Temp 2
CONFIGUR
2.1 MANUFCTR
2.2 DEV TYPE
2.3 TAG
2.4 PV URV
2.5 PV LRV
2.6 PV DAMP
2.7 UNITS
2.8 T_UNITS
2.9 LANGUAGE
2.10 PASSWORD
2.11 LRV=PV
2.12 URV=PV
2.13 LIN FUNC
2.14 HART
2.15 ALARM TYP
2.16 DATE
2.17 USER FUNC
2.18 DISPLAY
2.19 BACKLGHT
MODE
BLINK
ADVANCED
3.1 OP MODE
P1
P1-P2
P2
P2-P1
3.2 OP MODE2
P1
T1
P2
T2
P1-P2
P2-P1
NONE
3.3 URV2
3.4 LRV2
3.5 DAMP2
INFO
4.1 MANUFCTR
4.2 DEV TYPE
4.3 TAG
4.4 PV USL
4.5 PV LSL
4.6 MIN SPAN
4.7 ASSM NUM
4.8 PV SNSR
4.9 VERSION
CPU HW
CPU SW
ADC HW
CPU ID
MAN REV
4.10 OP TIME
DIAGNOST
5.1 STATUS
5.2 LOOP TST
IOUT1
IOUT2
5.3 LOOP CAL
IOUT1
IOUT2
5.4 SENS.TRIM
P1
ST1
P2
ST2
5.5 PV ZERO
P
P2