

Installation and Setting-Up Instructions Spare Parts List



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4 PARTS LIST

DOCUMENTS

Technical Specifications: BPV711
Installation and Setting-Up Instructions: BPV711AV

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Hastelloy® is the registered trademark of Haynes International.
Viton® is the registered trademark of DuPont Down Elastomers.



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SATRON VT_e pressure transmitter

1. INSTALLATION AND PUTTING INTO OPERATION

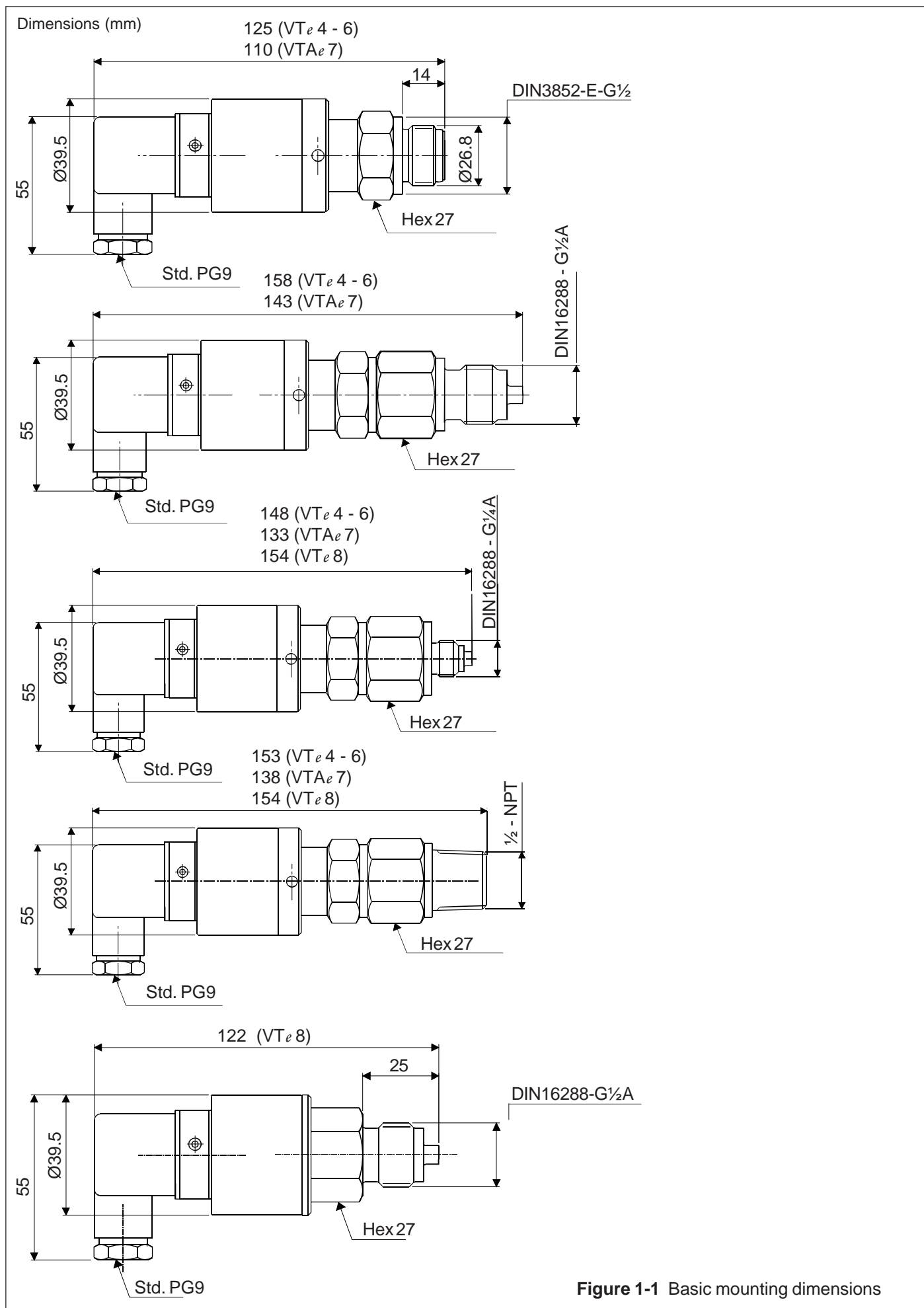
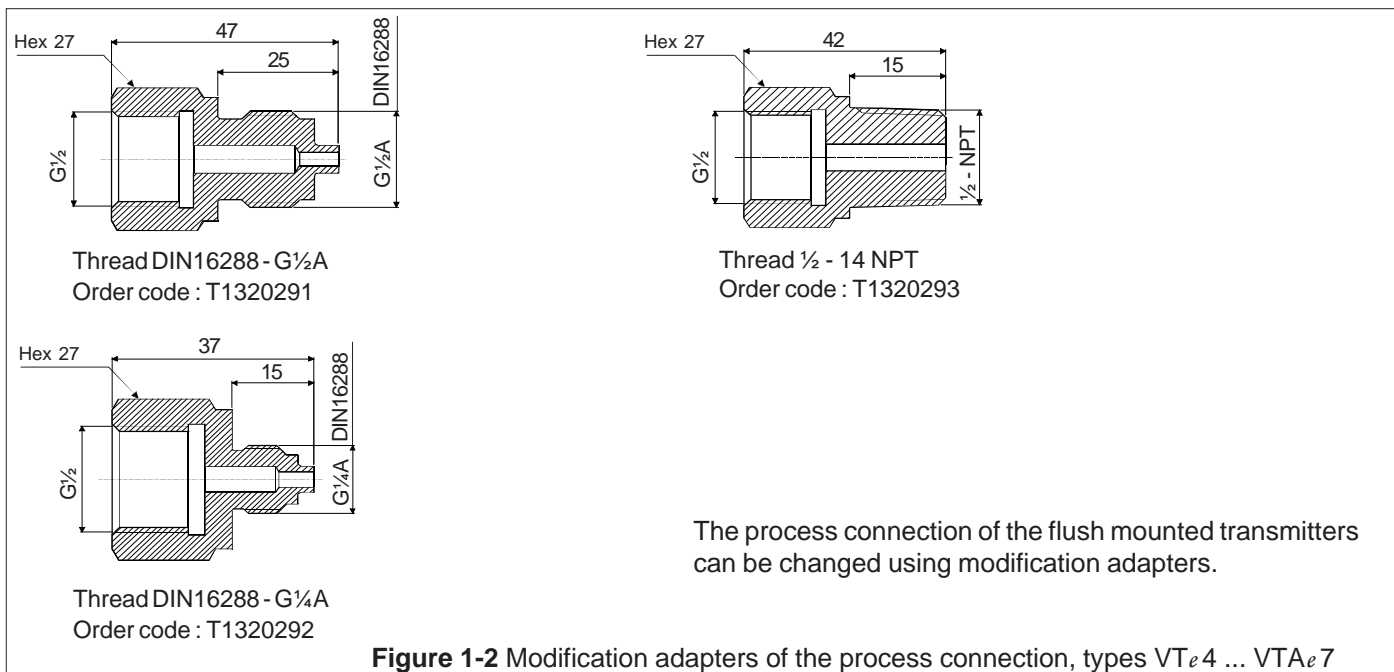
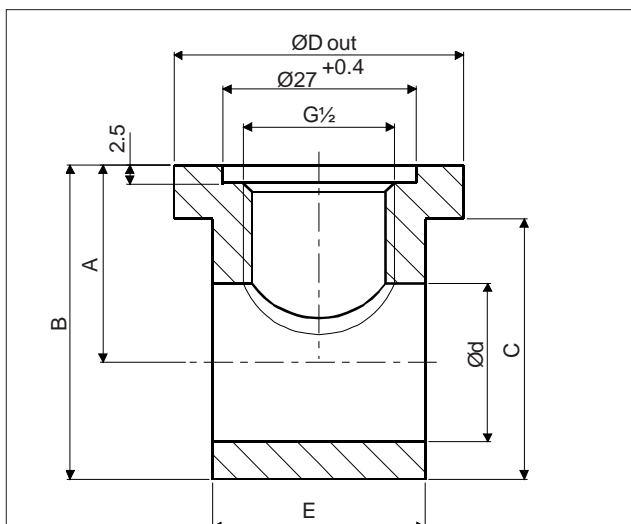


Figure 1-1 Basic mounting dimensions

SATRON VT_e pressure transmitter



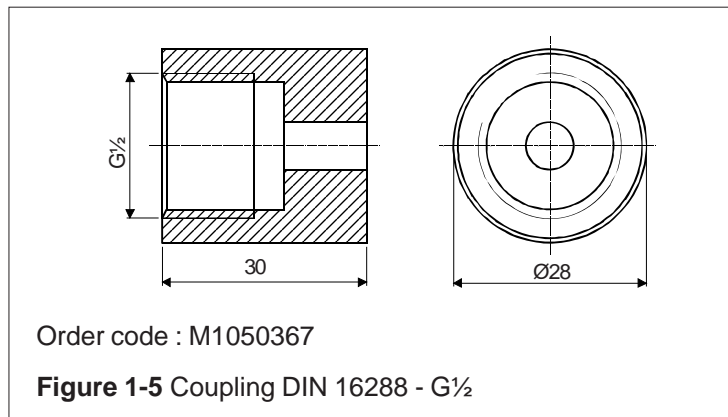
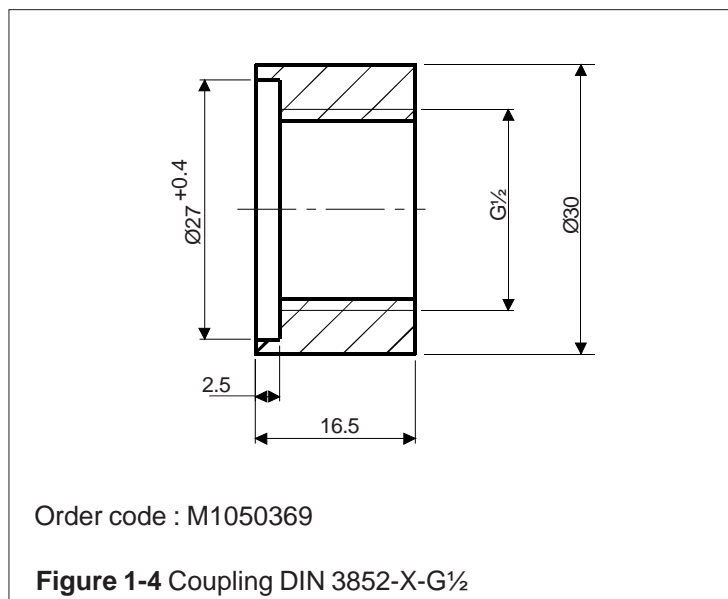
Process couplings

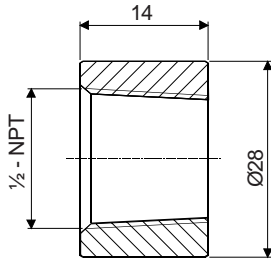


Pipe size	Dim. øD out	Dim. A	Dim. B	Dim. C	Dim. Ø d	Dim. E	Order code
DN15	40	27.5	43.5	36	22	29.5	M1050395
DN20	40	30.5	49	42	27.5	26	M1050396
DN25	50	33.5	55.5	48	34	29.5	M1050397

Other sizes, please contact Satron Instruments Inc.

Figure 1-3
T-coupling DIN 3852-X-G $\frac{1}{2}$, sizes DN15 - 25





Order code: M1050368

Figure 1-6 Process coupling 1/2 - NPT

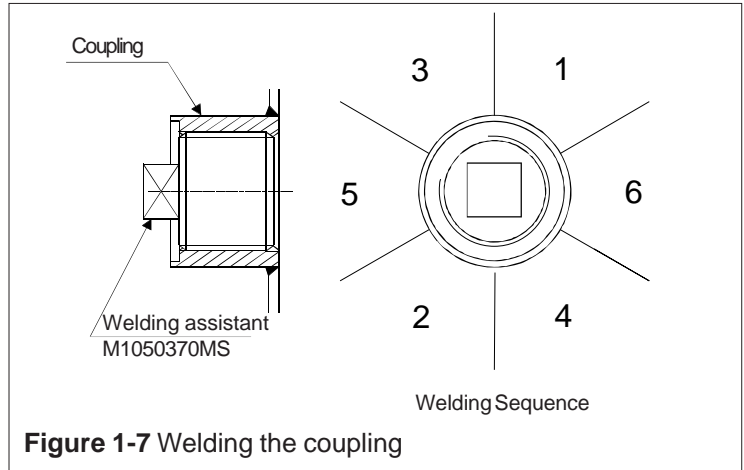


Figure 1-7 Welding the coupling

1.1 Mechanical installation

1.1.1 Recommended mounting positions

- Process connection direction: horizontal
- Cable entry direction: from below
- Connector direction, calibration direction: horizontal

Other considerations:

- In outdoor installations you should make sure that water condensed from e.g. a steam line will not freeze and, by expanding, damage the transmitter's sensor diaphragm. For instance, this can be avoided by installing heat insulation up to the sensor diaphragm.

1.1.2 Impulse piping

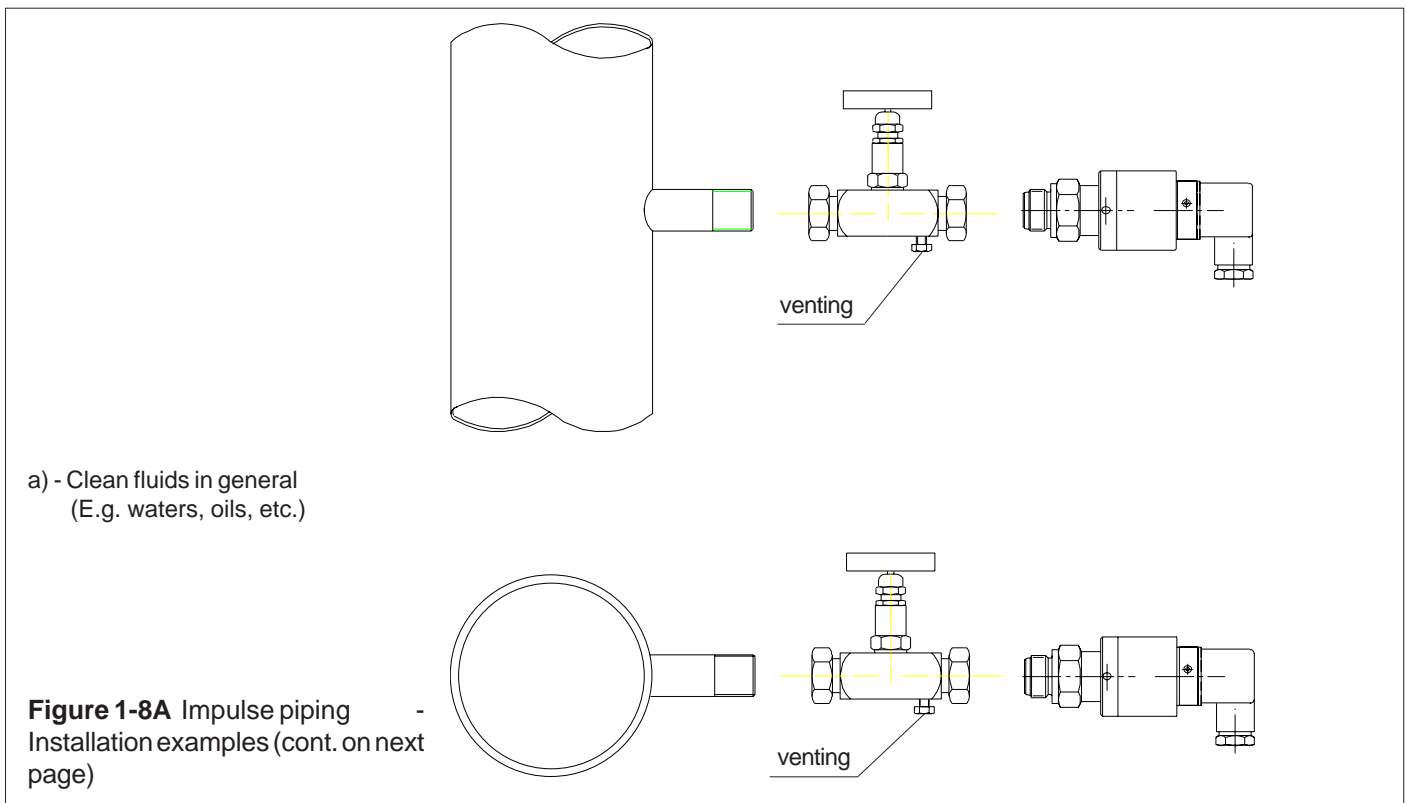
The process medium and the transmitter's position in relation to the process pipe determine the impulse piping line.

- For liquid and steam pressure measurements it is preferable to install the transmitter below orifice plate to prevent the formation of disturbing gas bubbles in the impulse piping.

If the transmitter has to be installed above the process pipe for reasons of accessibility or for some other compelling reasons, it is recommendable to provide the piping with a gas seal to avoid disturbance.

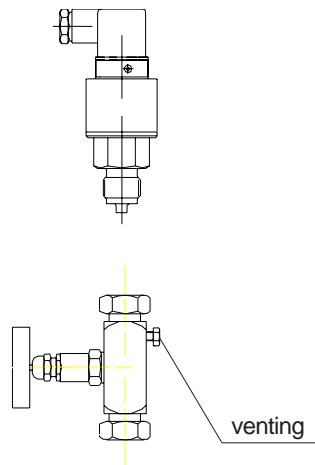
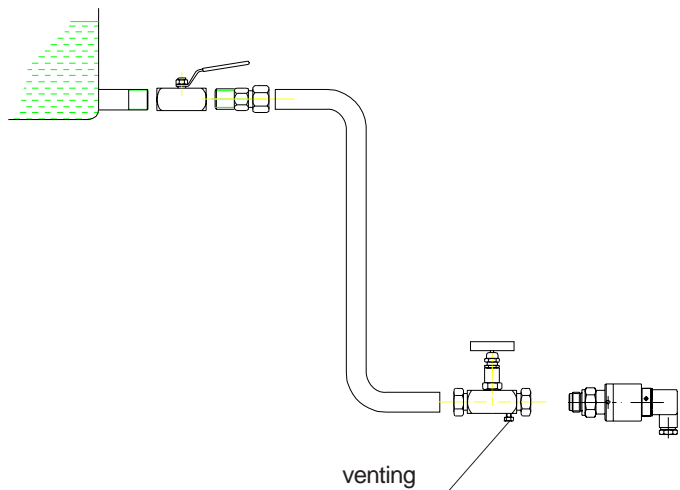
- Mounting the transmitter above the process pipe in gas pressure measurement will eliminate disturbances caused by condensing liquid.

- Steam should not be admitted to the transmitter's sensing element. See installation examples 1-8 c and d.

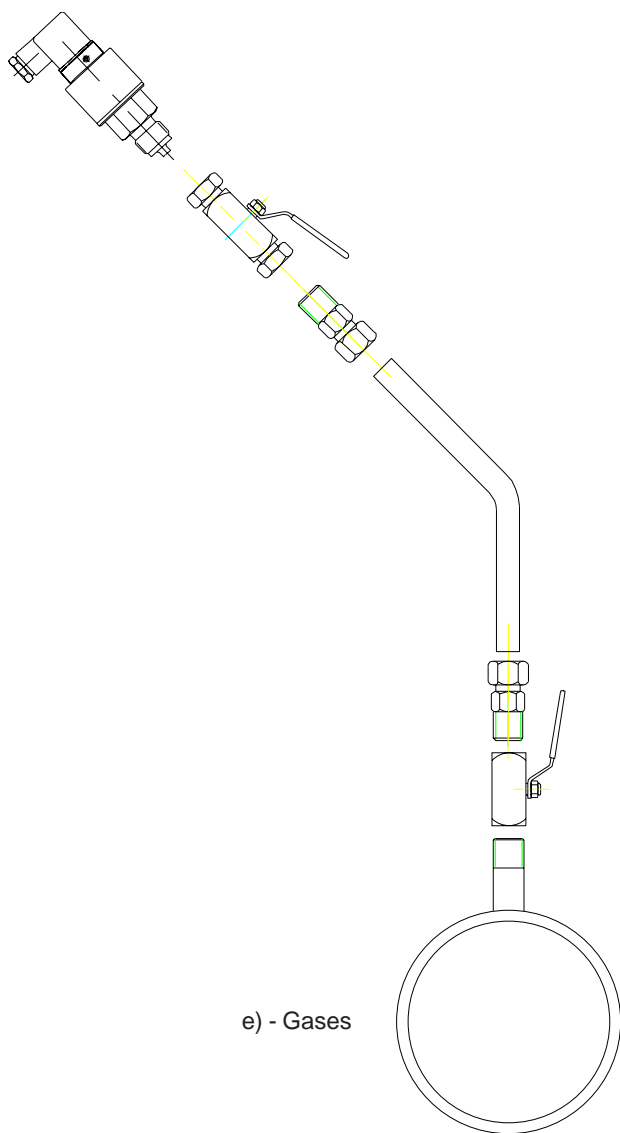


a) - Clean fluids in general
(E.g. waters, oils, etc.)

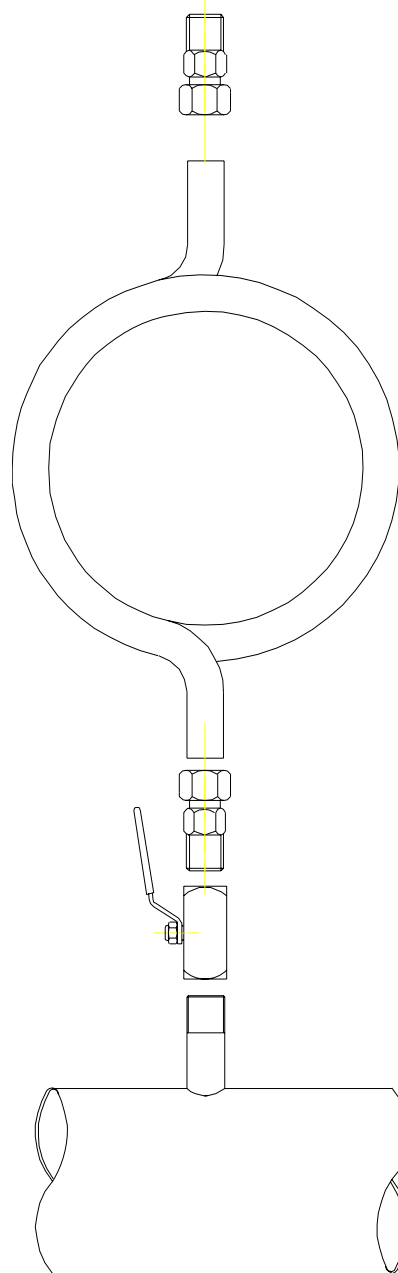
Figure 1-8A Impulse piping -
Installation examples (cont. on next page)



b) - Liquid level in open vessel



e) - Gases



c) - Steams

Figure 1-8B Impulse piping
- Installation examples (cont. on next page)

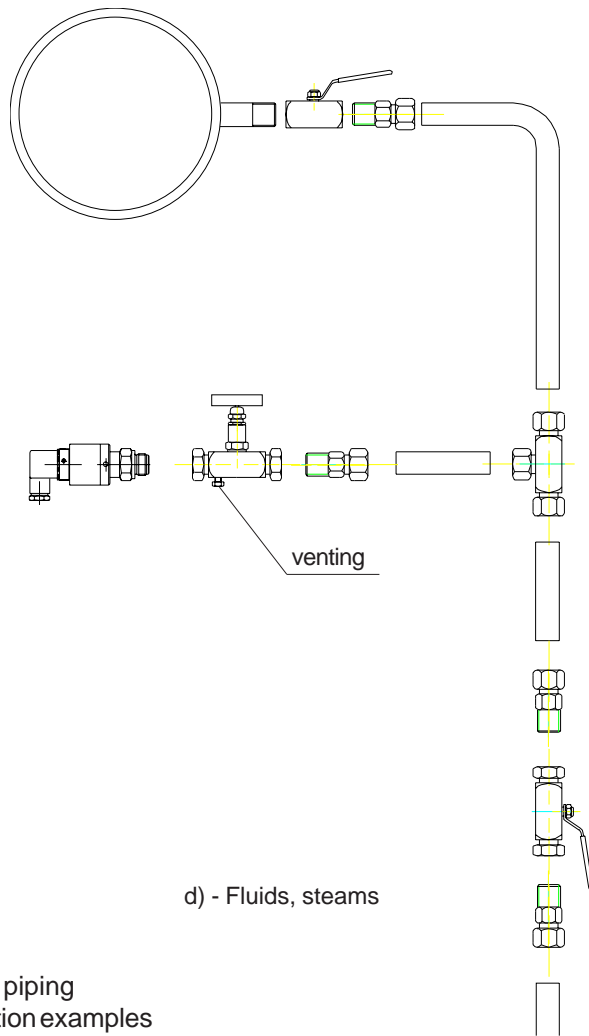


Figure 1-8C Impulse piping
- Installation examples

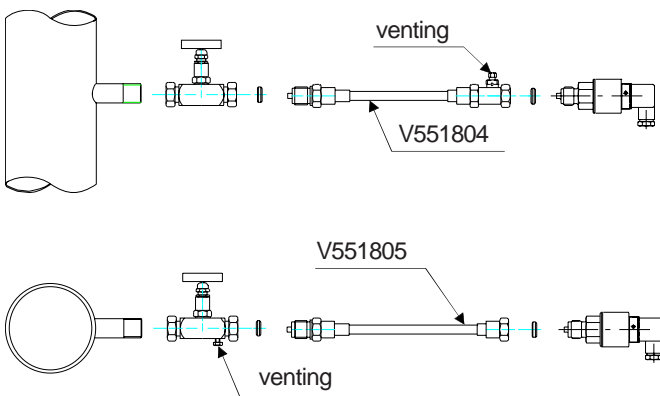


Figure 1-9 Damping hose for protecting the sensor
- Order number T551804, with venting
- Order number T551805, without venting

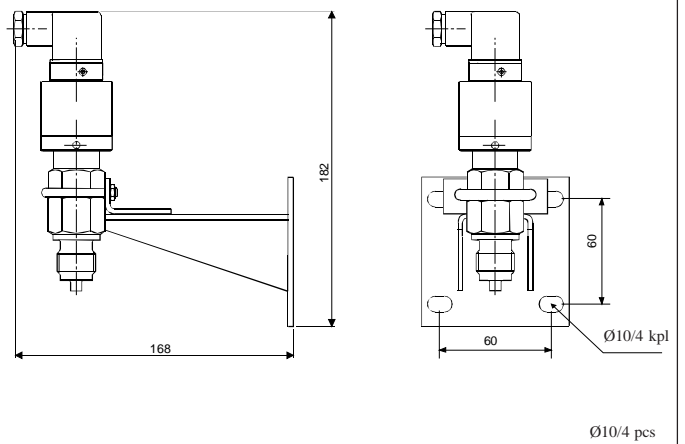


Figure 1-10 Mounting bracket for VT_e transmitter
- Order number M820289

SATRON VT_e pressure transmitter

1.2 Electrical connections

Supply voltage and load of the transmitter according to the figure 1-13.

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.

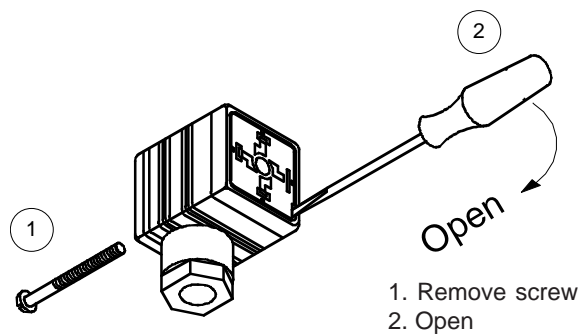


Figure 1-11 Removing the PLUG junction box

10044093

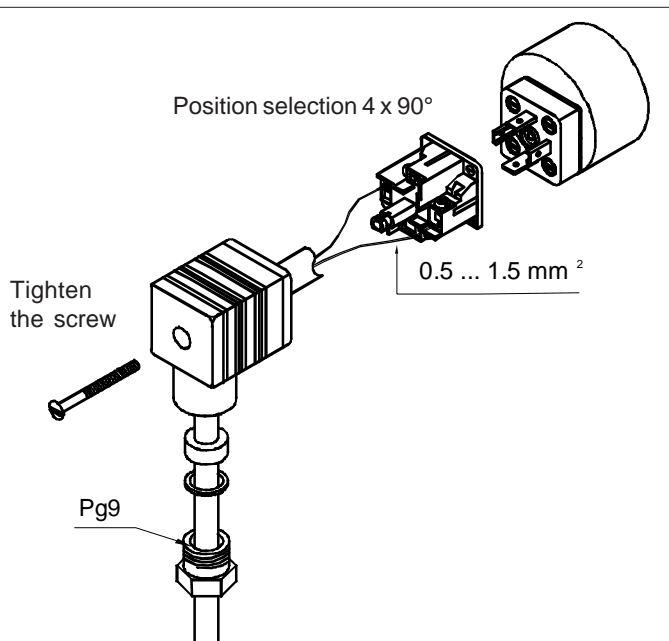
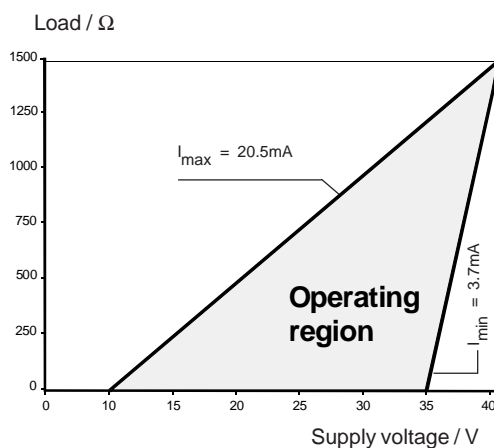


Figure 1-12 Adjusting the junction box position

10044092



$$R_{\max} = \frac{\text{Supply voltage} - 10V}{I_{\max}}$$

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

$I_{\max} = 23\text{mA}$ (when the alarm current 22.5mA is on)

Figure 1-13 Supply voltage and load capacity

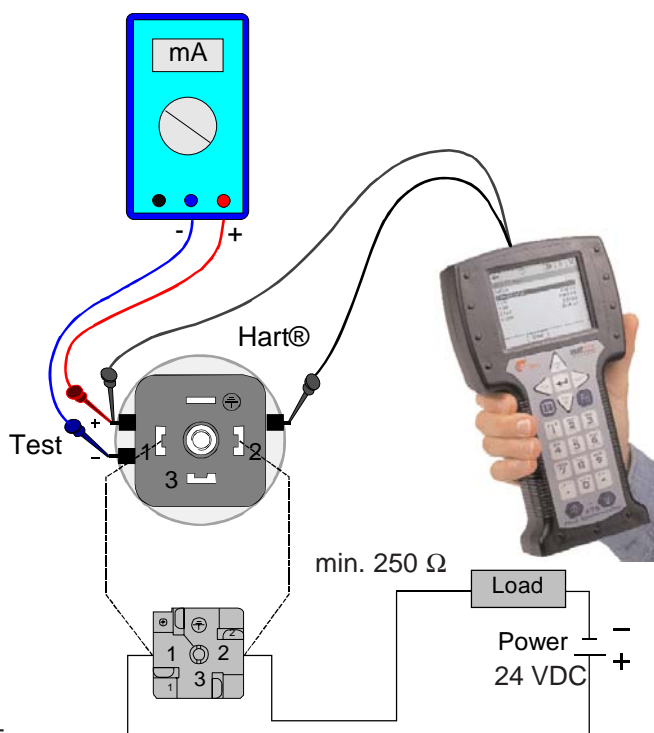
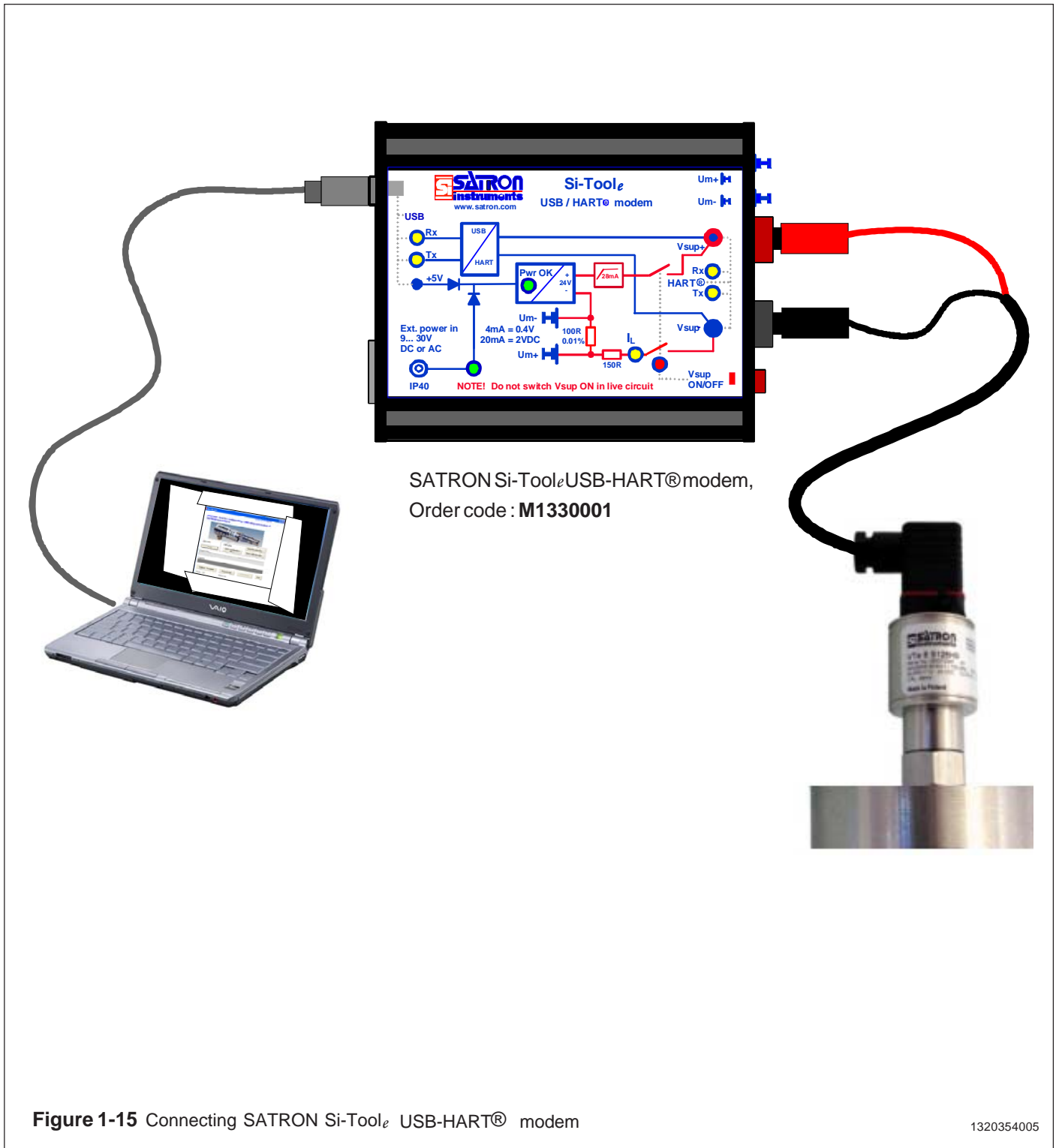


Figure 1-14 Connection with 275/375-communicator

1320354005



2 SETTING UP

Setting up is dependent on the type of user interface and the loaded description **VALMET** or **SATRON**. Also must be noted that when the older **VALMET** description is in use then the transmitter must be configured so that it can operate with the old **VALMET** description.

The change from description to another is made by writing to **MESSAGE**-field either **.VALMET** or **.SATRON** (Note, capital letters and dot in front).

After writing the message the new description will be activated by switching transmitter's power OFF and ON again.

SATRON VT_e pressure transmitter

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.

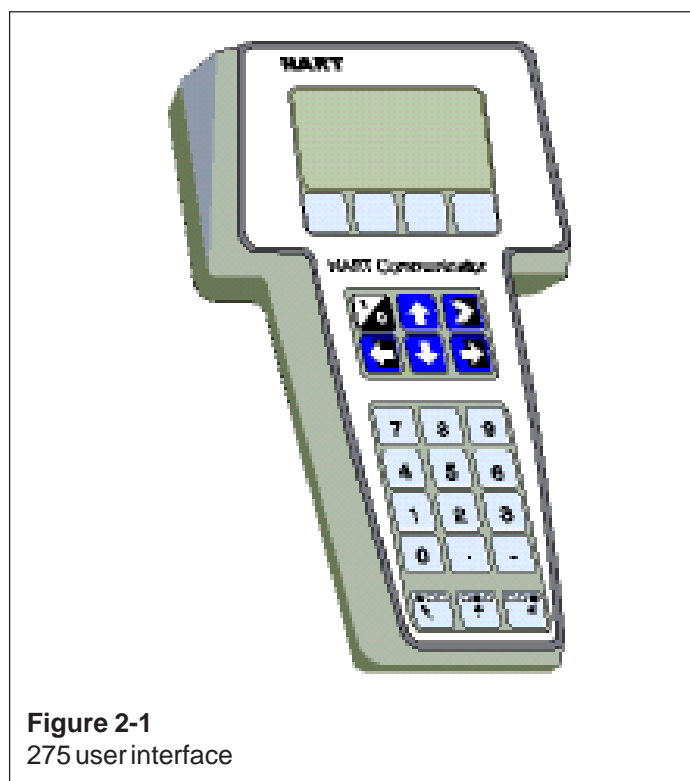


Figure 2-1
275 user interface

2.2 Setting up through HART® 275 user interface and VALMET description

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, factory setting)
- 4 **USL** (upper sensor limit, factory setting)
- 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 EI 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.

2.3 Using the 375 user interface



Figure 2-2
375 user interface

2.4 Setting up through HART® 375 user interface and SATRON description

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 **Transfer 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 .

2.5 Setting up with SATRON pAdvisor -Software

If you want to use all the features of the VT_e Smart transmitter, we recommend the use of SATRON pAdvisor - Software and SATRON SI-Tool_eUSB-HART®modem.

Test connections for checking and changing the configuration values and calibrating pressure and current signals including *SENSOR TRIM* operation

Recommended equipment for calibration:

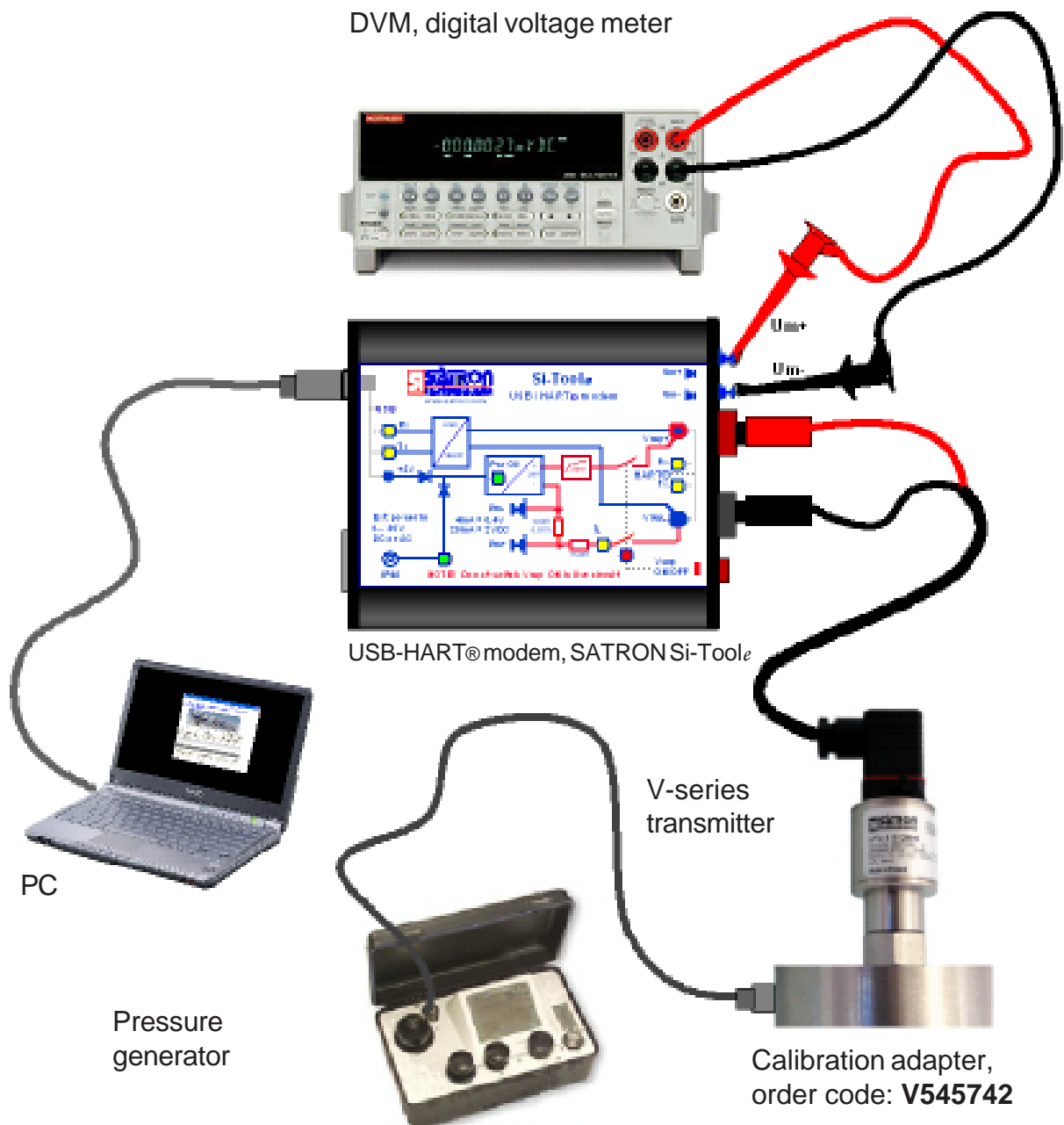
SATRON-pAdvisor software for SATRON Smart transmitter downloadable free of charge at www.satron.com

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

DVM: Digital voltage meter, accuracy better than 0,01 % of reading (for example Fluke 8840A or Keithley 2000)

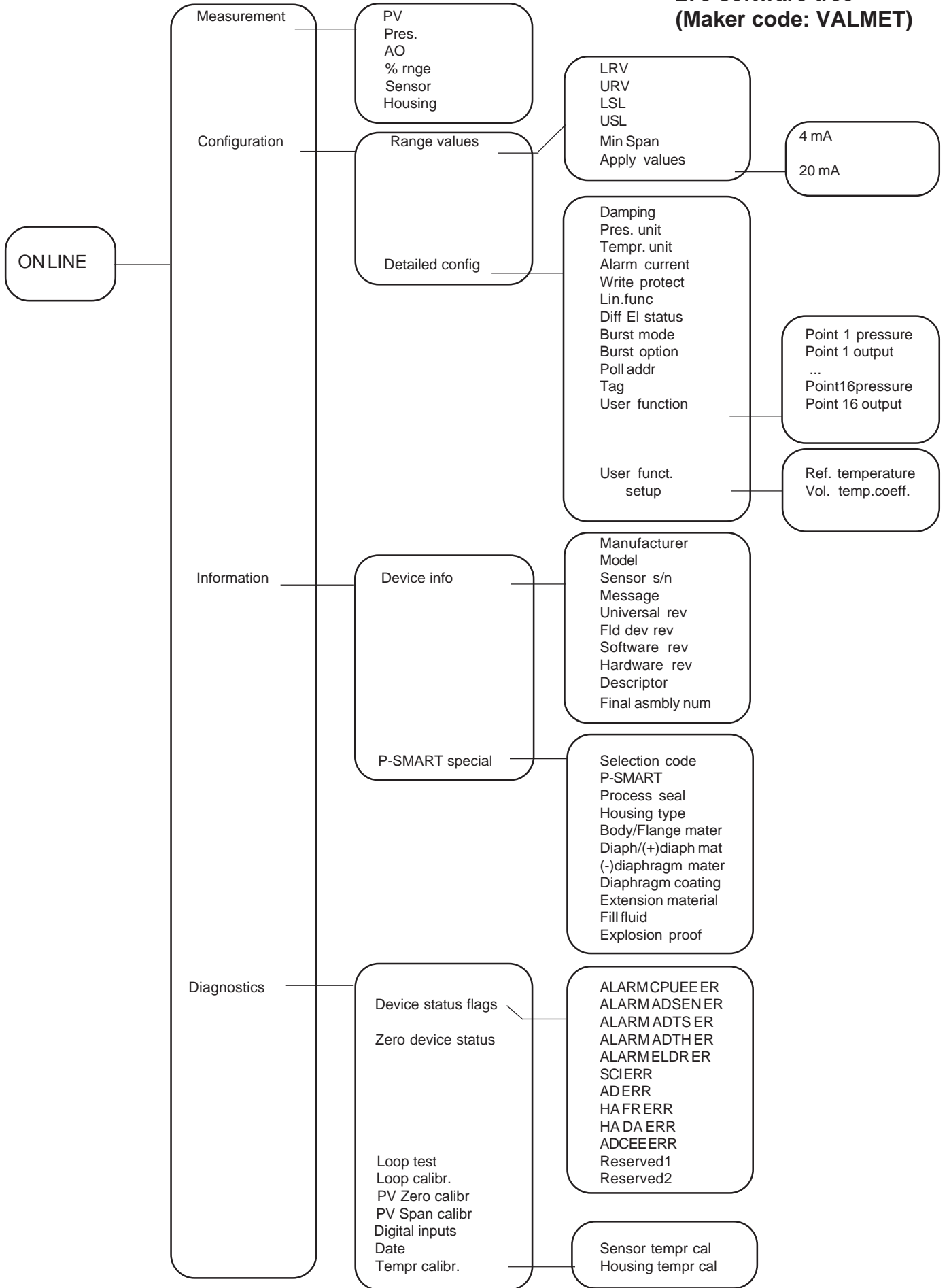
Pressure generator (accuracy better than 0.03 % of reading)

USB-HART®modem, SATRON Si-Tool_e, order code: **M1330001**

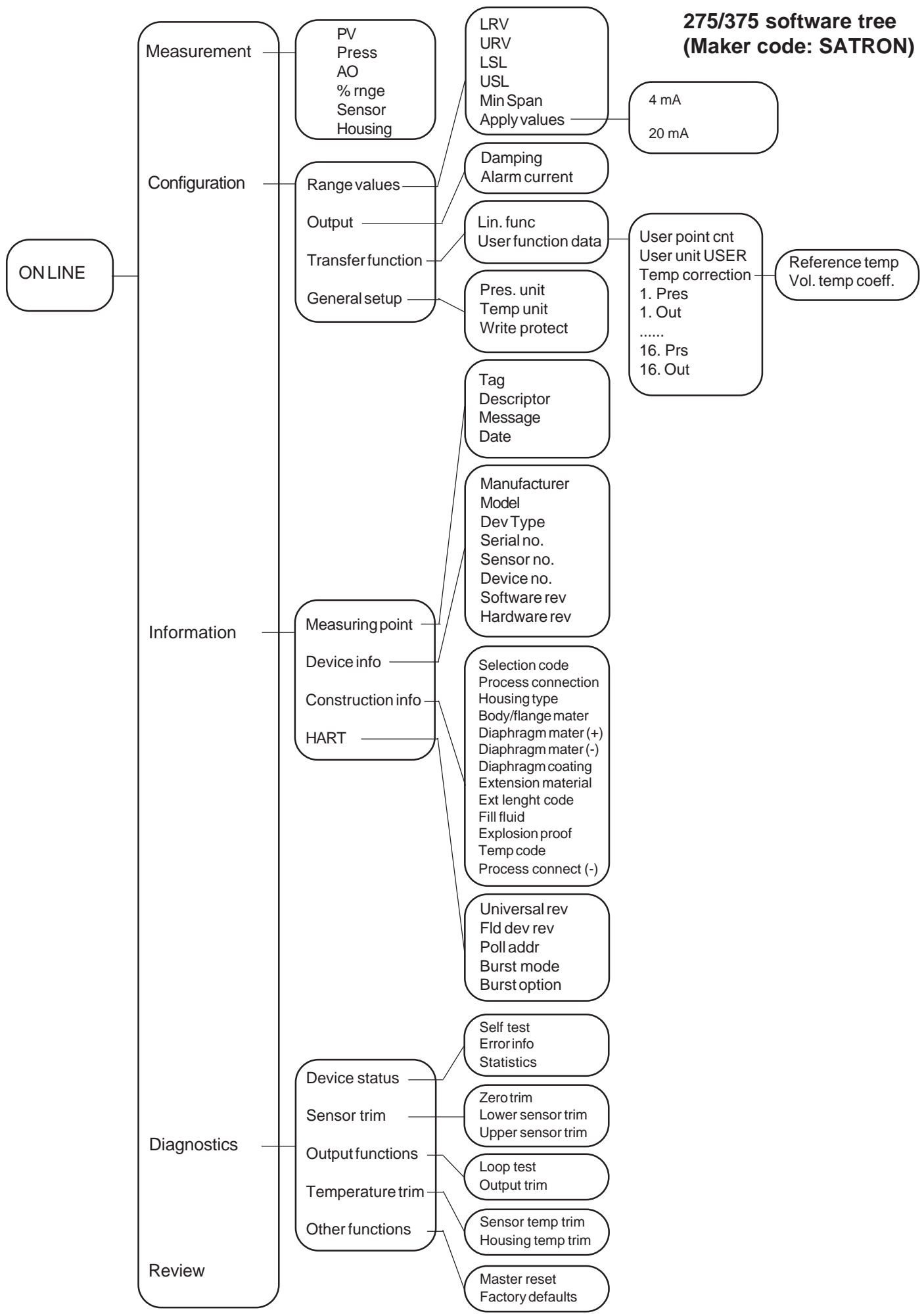


Kuva 2-3 Calibration connections

275 software tree
(Maker code: VALMET)



275/375 software tree
(Maker code: SATRON)



3. CONSTRUCTION AND OPERATION

Sensor Interface

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.

Output Stage

The output stage 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).

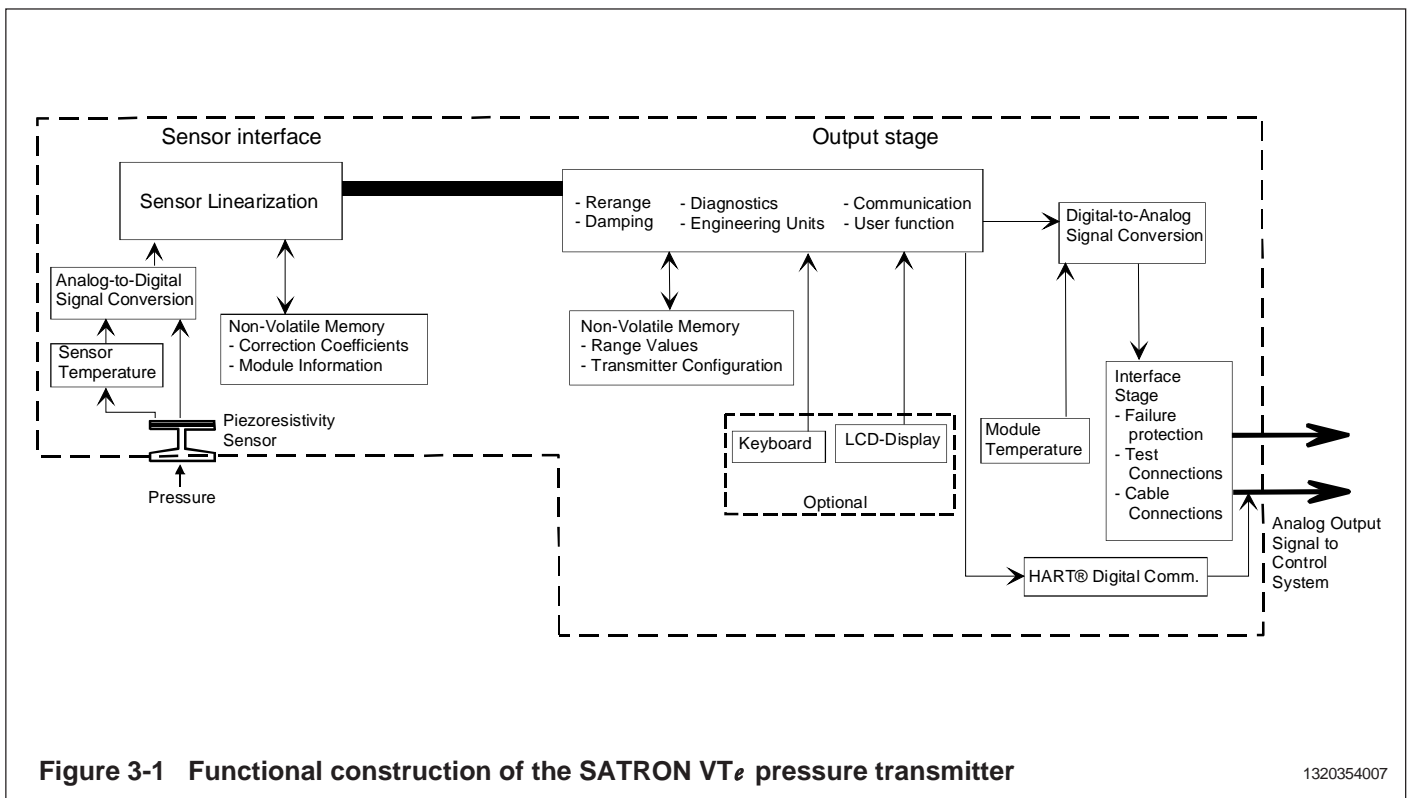


Figure 3-1 Functional construction of the SATRON VT_e pressure transmitter

1320354007

4. PARTS LIST

When ordering spares, please quote this document's number BPH711AV and date 2007-03-30, 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.

Number	Name	Order code
1	Sensing element	
2	Seal GDM3-17, silicone	72900116
* 3	Device plug DIN43650	72900114
4	Cylinder-head screw S M3 x 35 SFS2179 A4	51723053

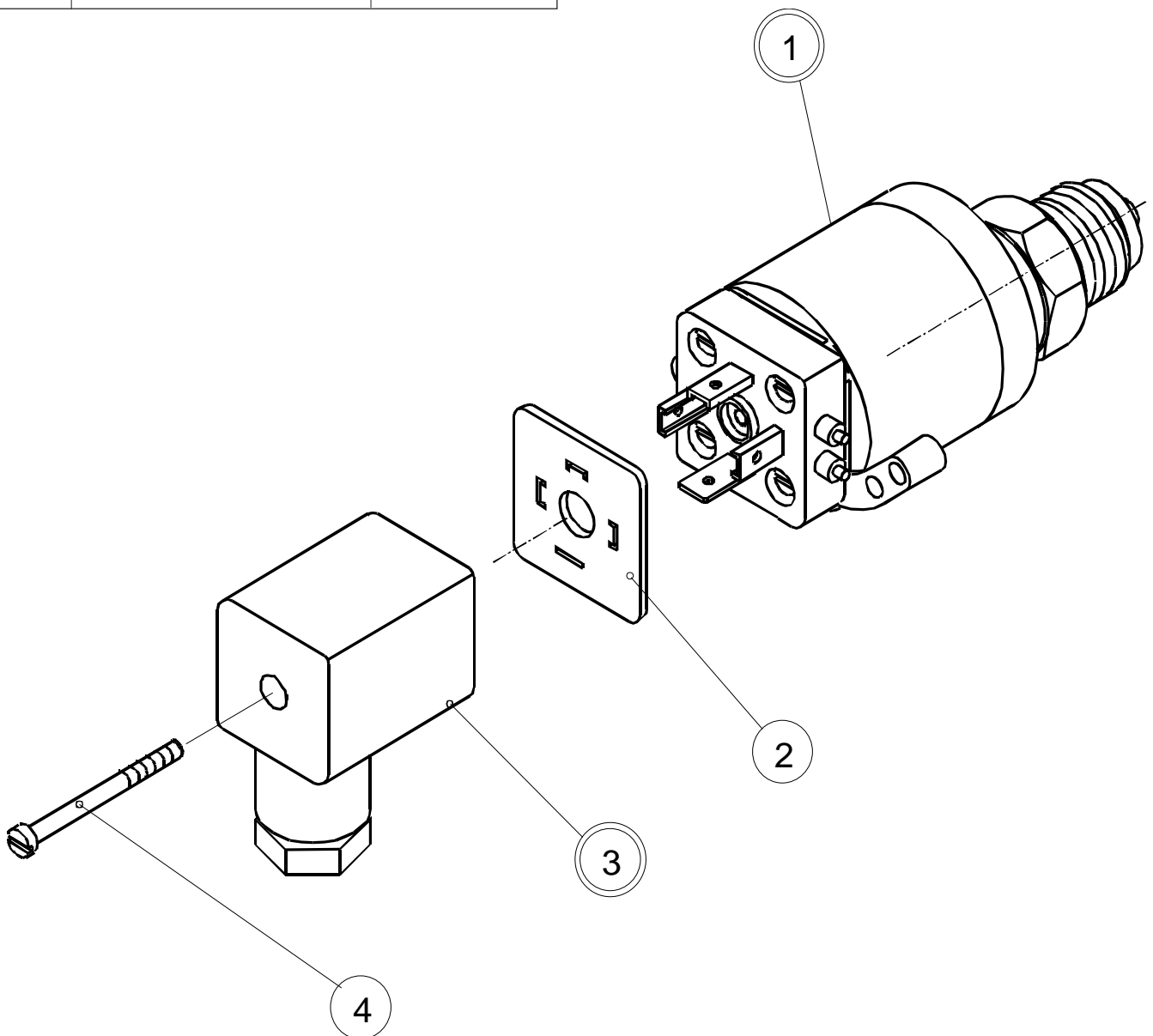


Figure 5 -1 Parts list: housing with PLUG connector



EC DECLARATION OF CONFORMITY

Type of Equipment
Pressure or Differential Pressure Transmitter

Brand Name
V-Series

Type Designation
Ref. back side of this declaration page

Manufacturer
**Satron Instruments Inc., Patamäenkatu 5, 33900 Tampere, Finland
Tel. +358 207 464 800, Fax. +358 207 464 801**

We hereby declare that the equipment specified above is in conformity with the provisions of:

EMC directive (89/336/EEC) incl. latest amendments with the application of the harmonized standards:

EN 55022:1998 class B
FCC CFR 47 Part 15:2003 subpart B class B
EN 61000-6-2:2001
EN 61000-6-3:2001
EN 61000-4-2:1995+ Am1(1998)+Am2(2001)
EN 61000-4-3:1996+ Am1(1998)+Am2(2000)
EN 61000-4-4:1995+ Am1(2001)+Am2(2001)
EN 61000-4-5:1995+ Am1(2001)
EN 61000-4-8:1994+ Am1(2001)

Declaration is based at report from SGS Fimko No 233443-1,2

Low Voltage Directive (73/23/EEC) incl. latest amendments with the application of the harmonized standards:

EN 61010-1:2001
Conformity is maintained by the use of good engineering praxis. Production control follows the ISO9000:2000 regulations and includes required electrical safety routine tests.

Pressure Equipment Directive (97/23/EC)

Transmitters fulfill the requirements of the Conformity Assessment procedure Module A of the directive.

Tampere 2007-1-15

Hannu Hurme, Technical Director