

## Installation and Setting-Up Instructions Spare Parts List



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### DOCUMENTS

Technical Specifications: BPLV770

Installation and Setting-Up Instructions: BLV770AV

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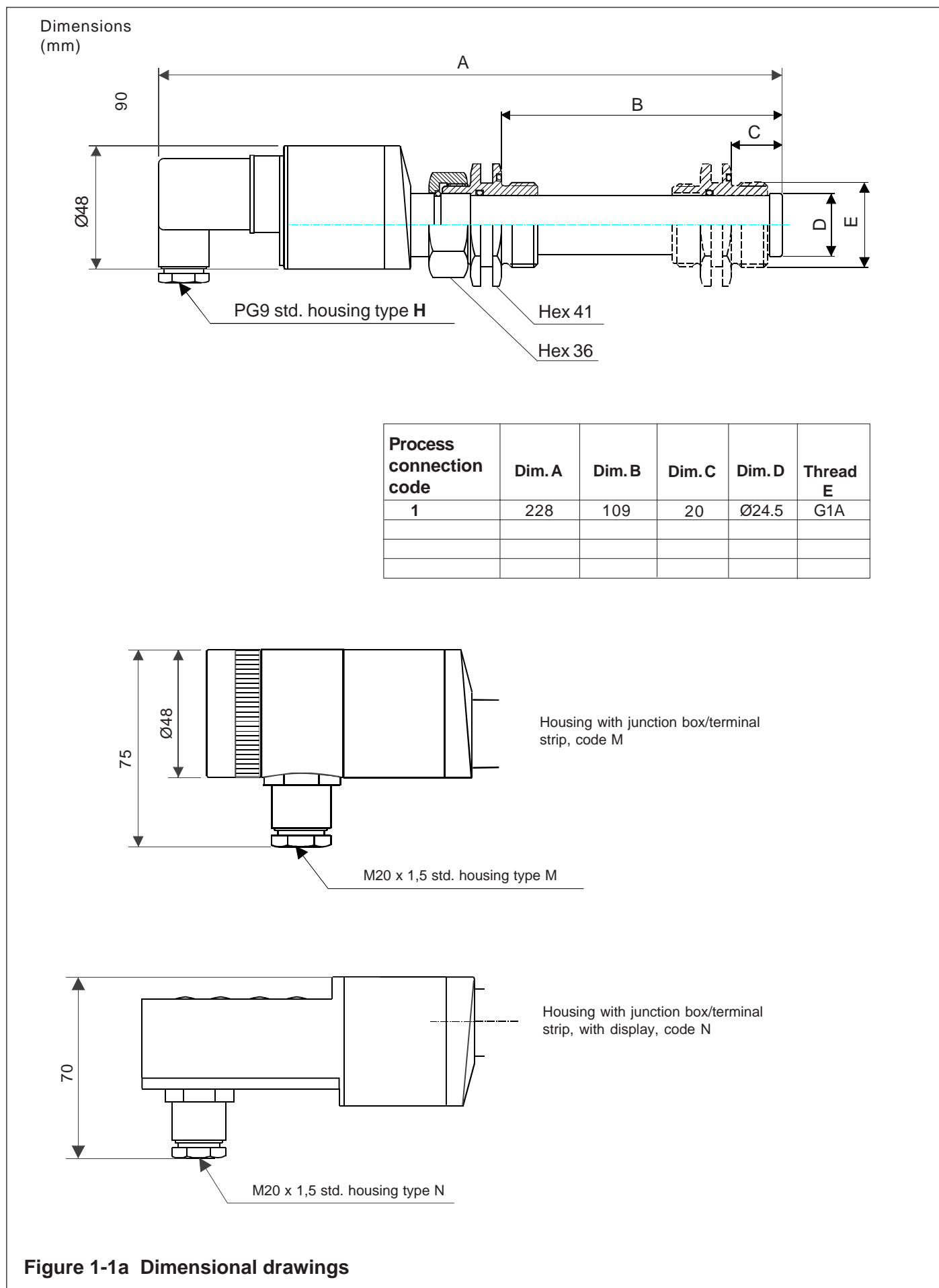
**Satron Instruments Inc.**

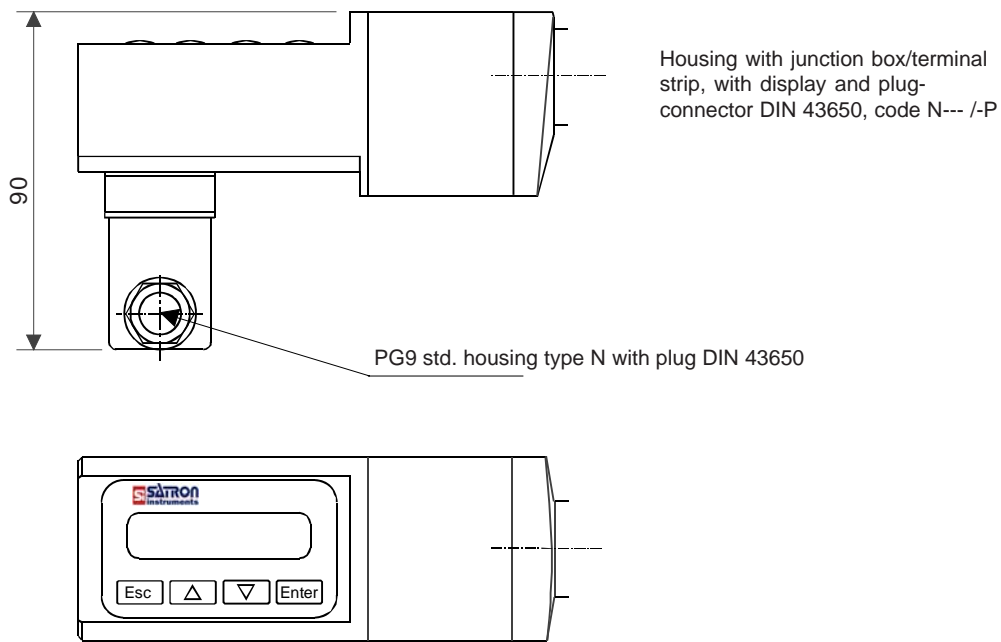
P.O.Box 22, FIN-33901 Tampere, Finland  
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www.satron.com, info@satron.com



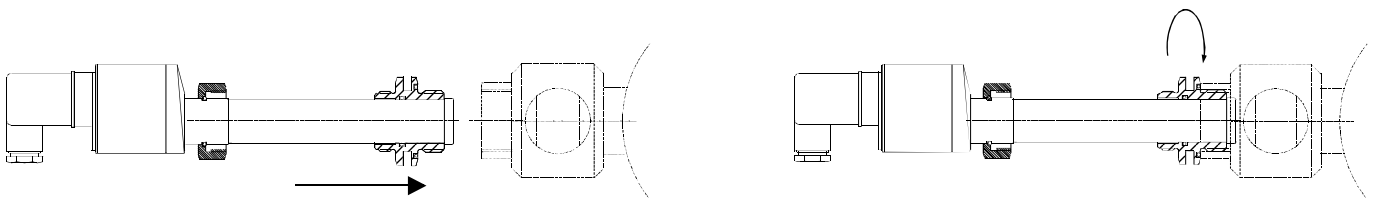
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Atlanta, GA 770-300-0224  
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## 1 MOUNTING AND INSTALLATION

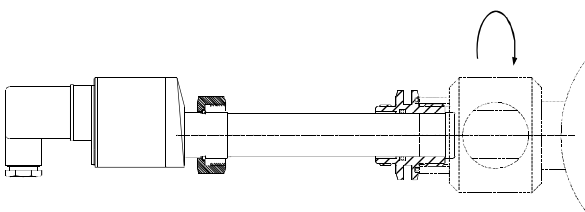




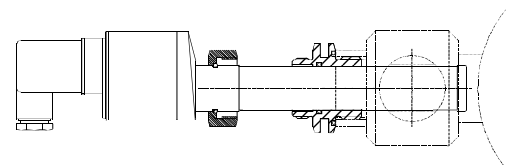
**Figure 1-1b Dimensional drawings**



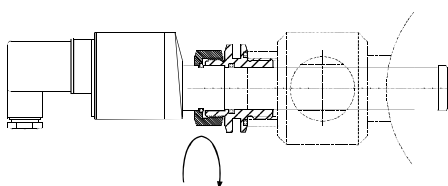
1. Make sure that inside the valve is not anything that could damage the diaphragm of the transmitter.



3. Open the ball valve.



4. Insert the transmitter to the process.



5. Fasten the transmitter to the ball valve

**Figure 1-2 Transmitter installation process**

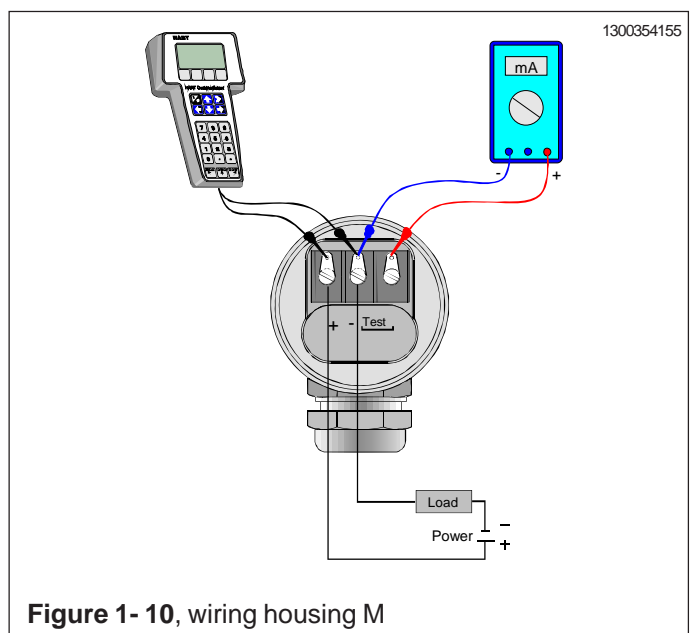
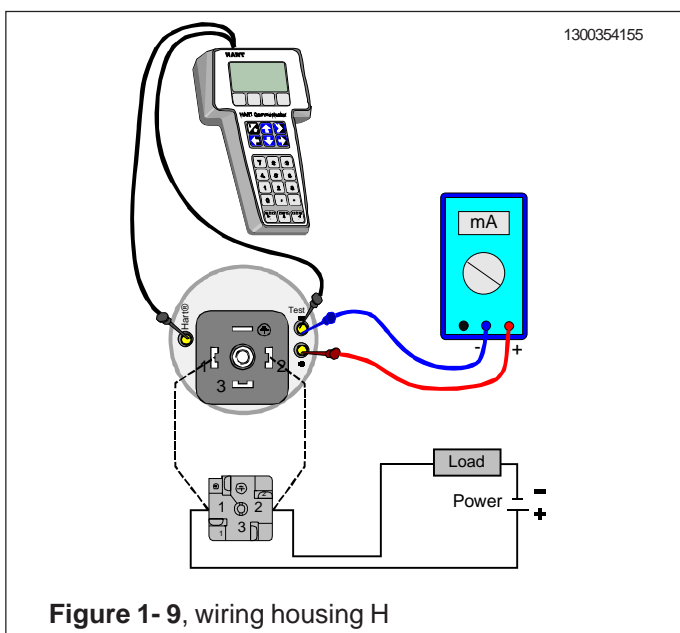
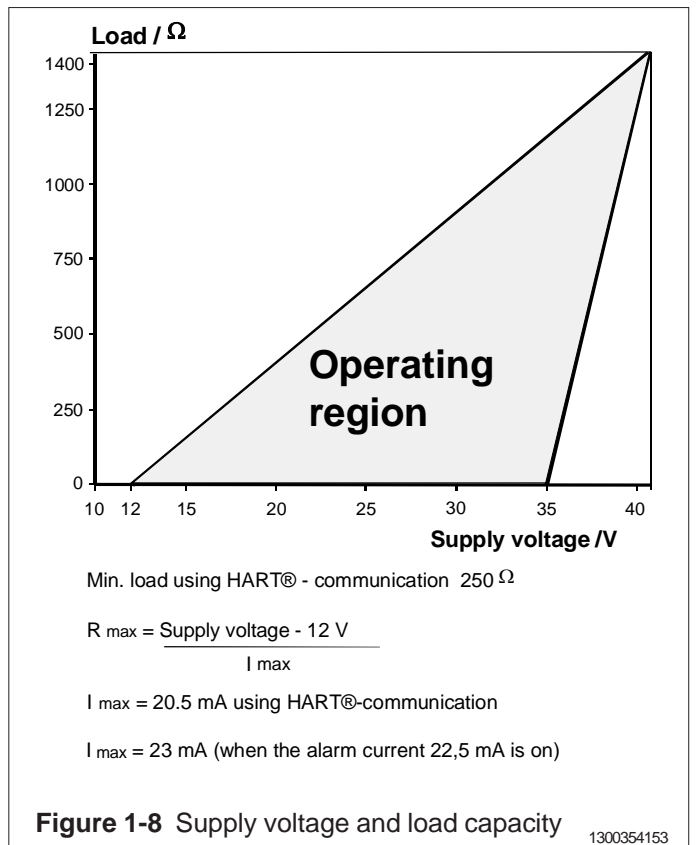
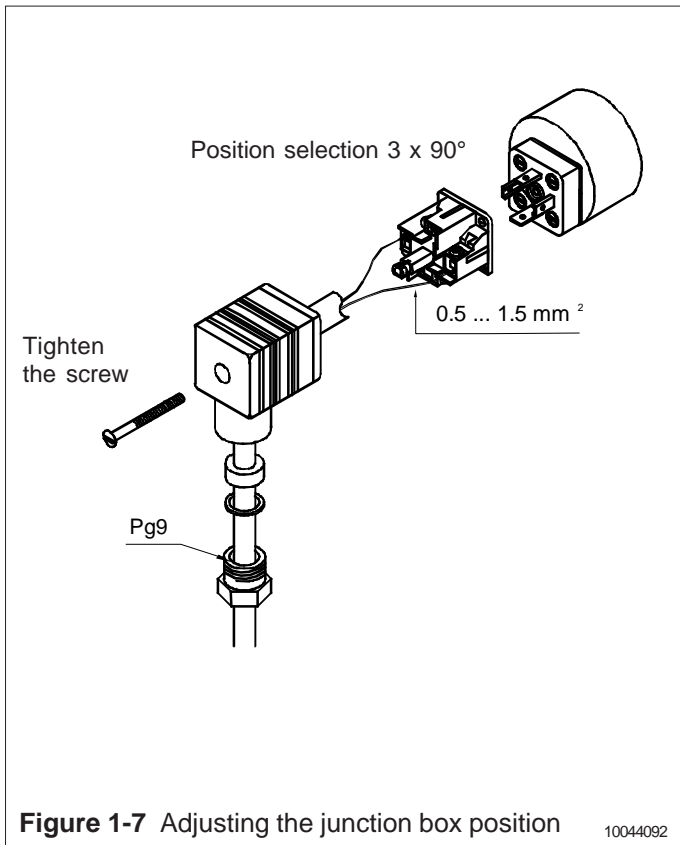
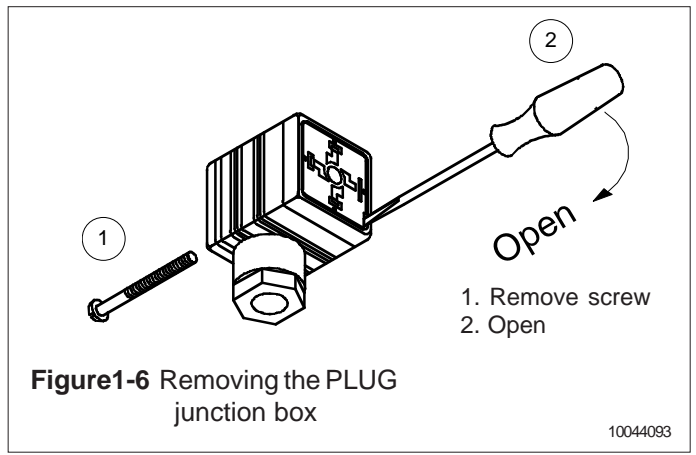
## 1.2 Electrical connections

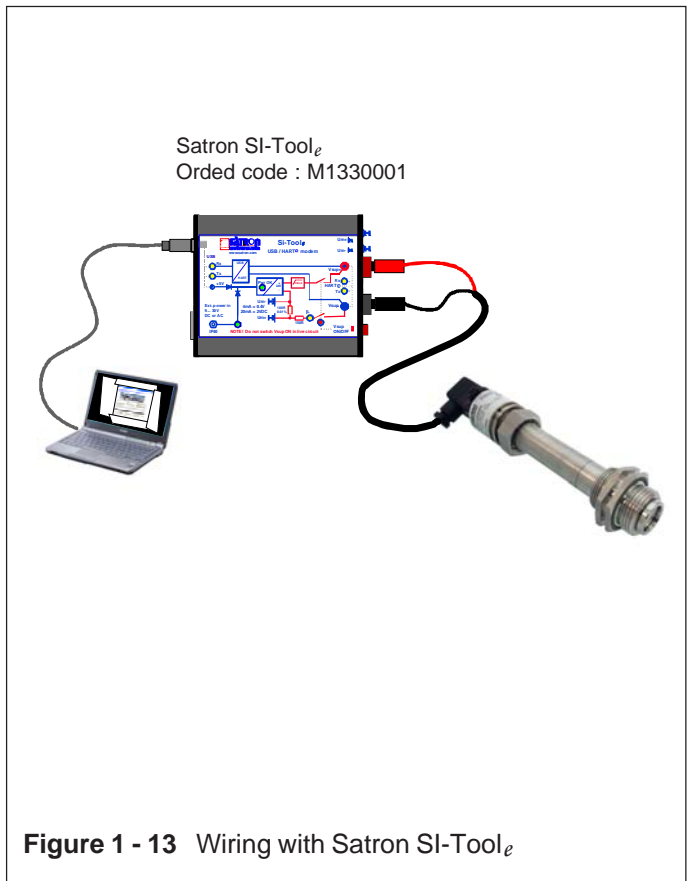
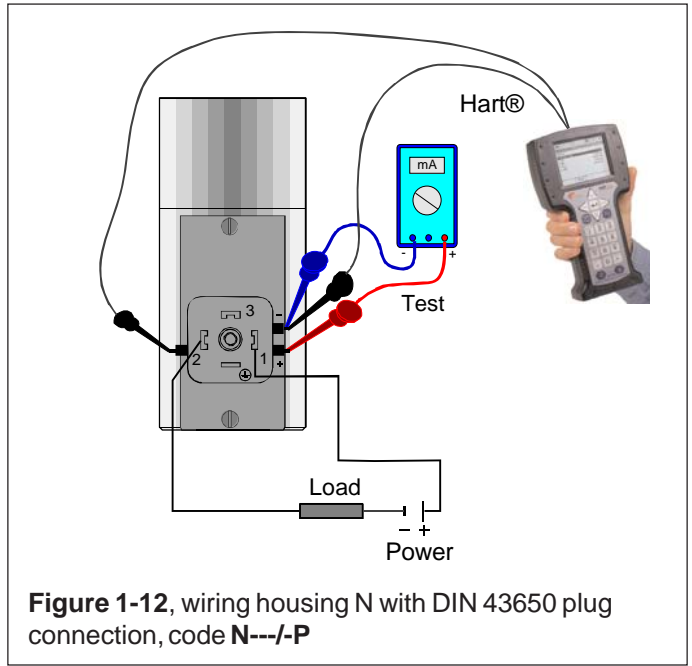
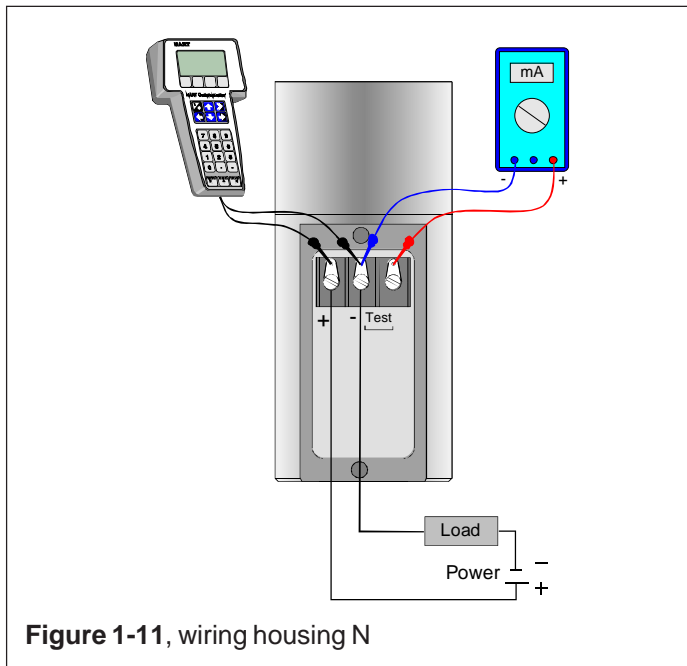
Supply voltage and load of the transmitter according to the figure 1-8.

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 - 14 Transmitter with display, code N**

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.

## 2 SETTING UP

Setting up is dependent on type of user interface and 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.

## 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.

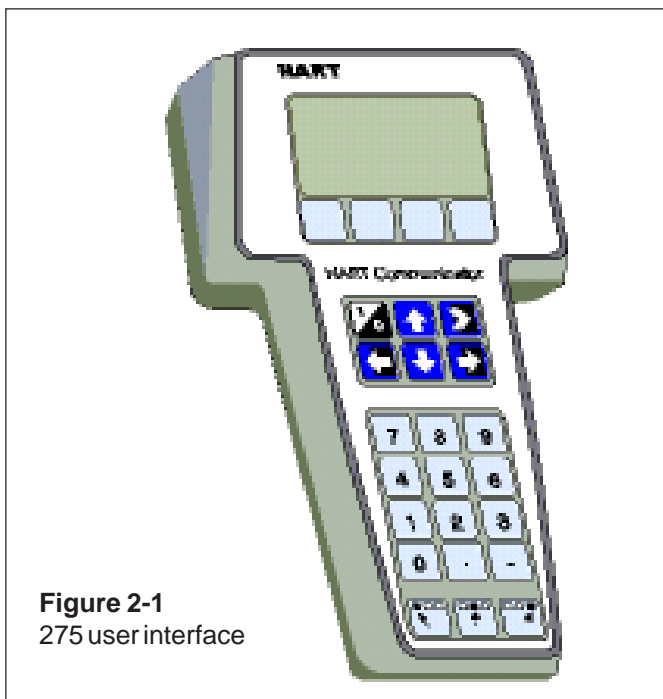


Figure 2-1  
275 user interface

## 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 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

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 Service Software

When you will have available all the operations of the Smart transmitter, we recommend the use of Satron-pAdvisor Service Software and Satron SI-Tool<sub>z</sub> 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](http://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 modeemi, Satron SI Tool<sub>z</sub>, tilauskoodi: **M1330001**

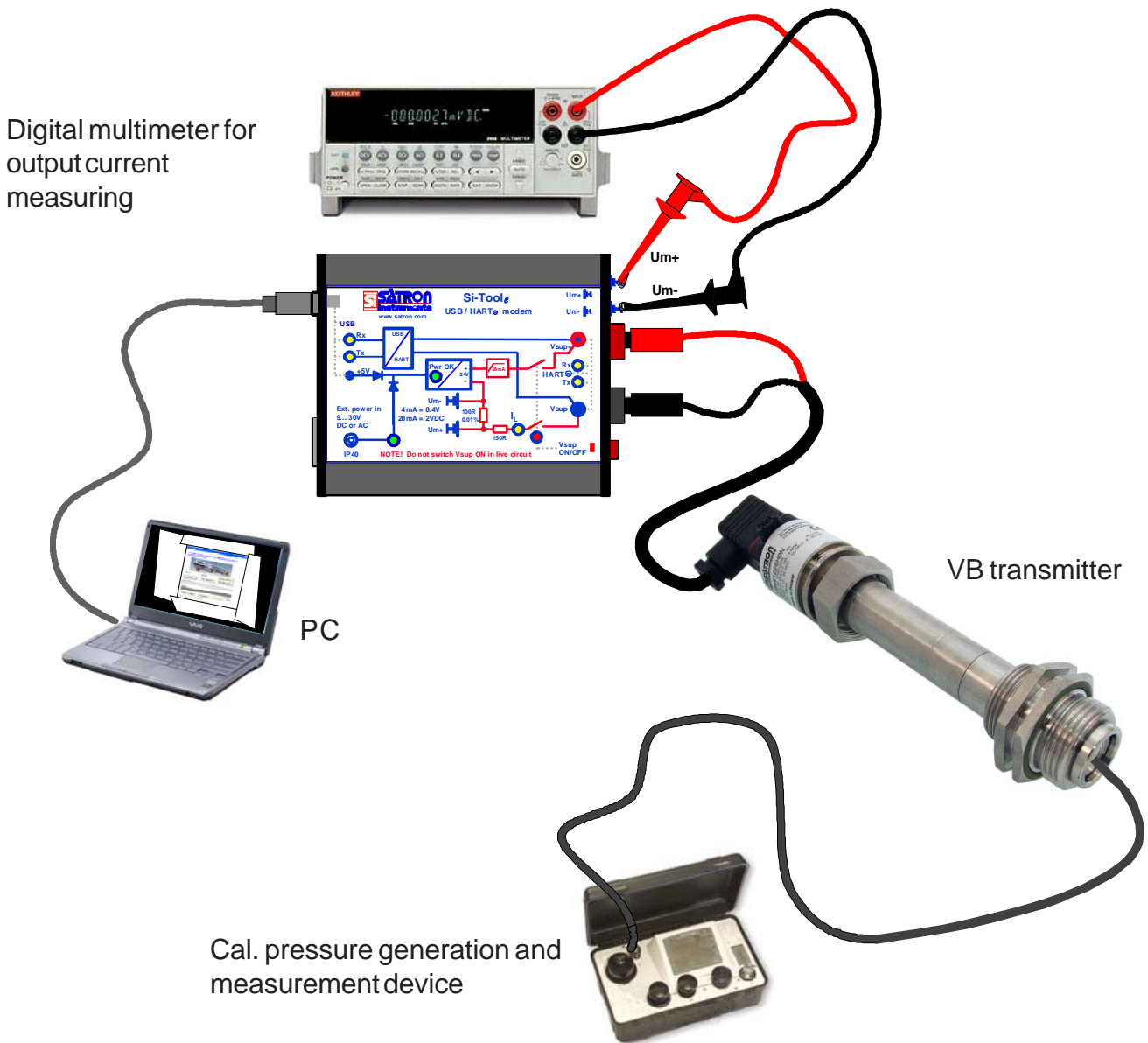
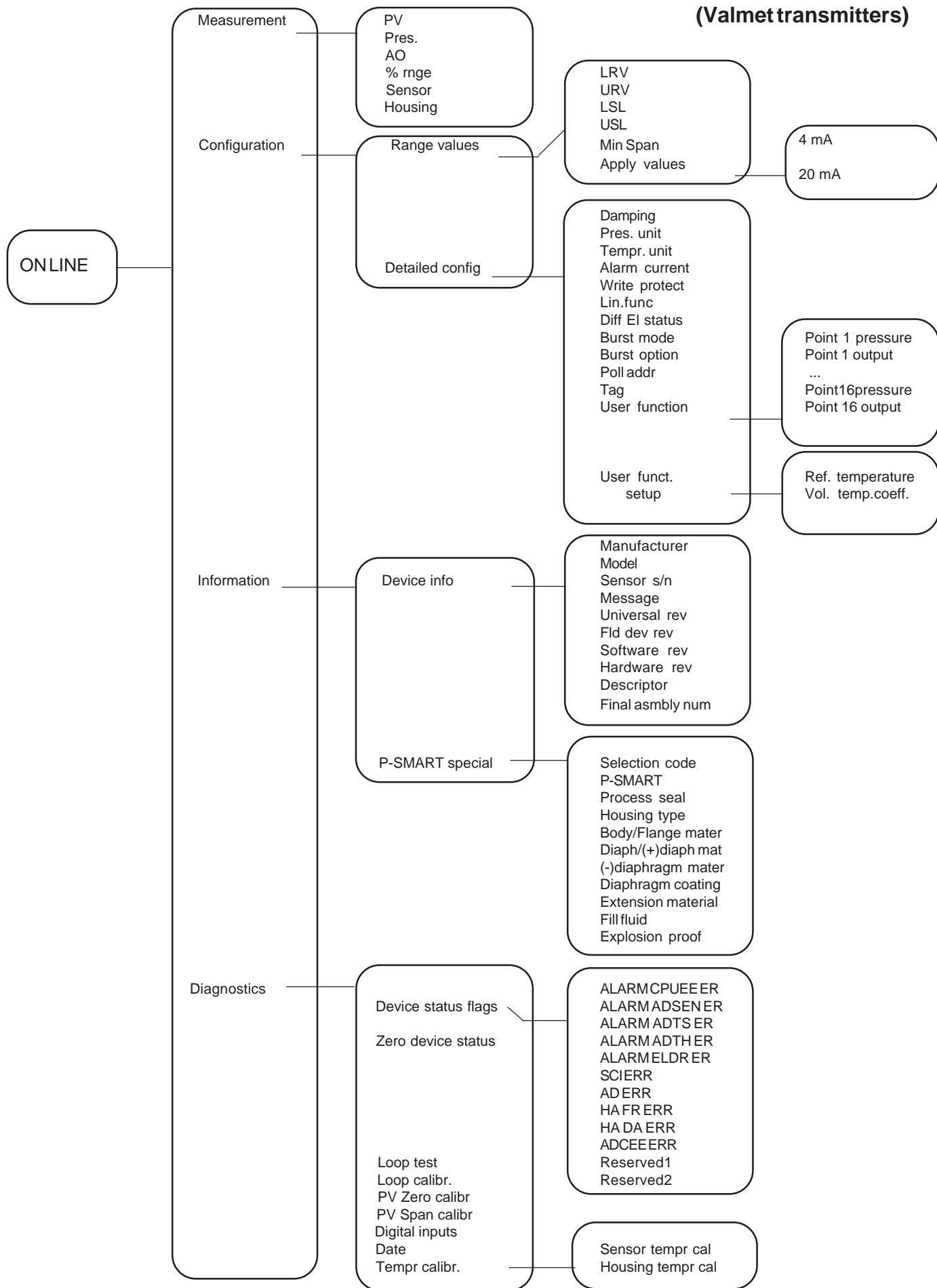
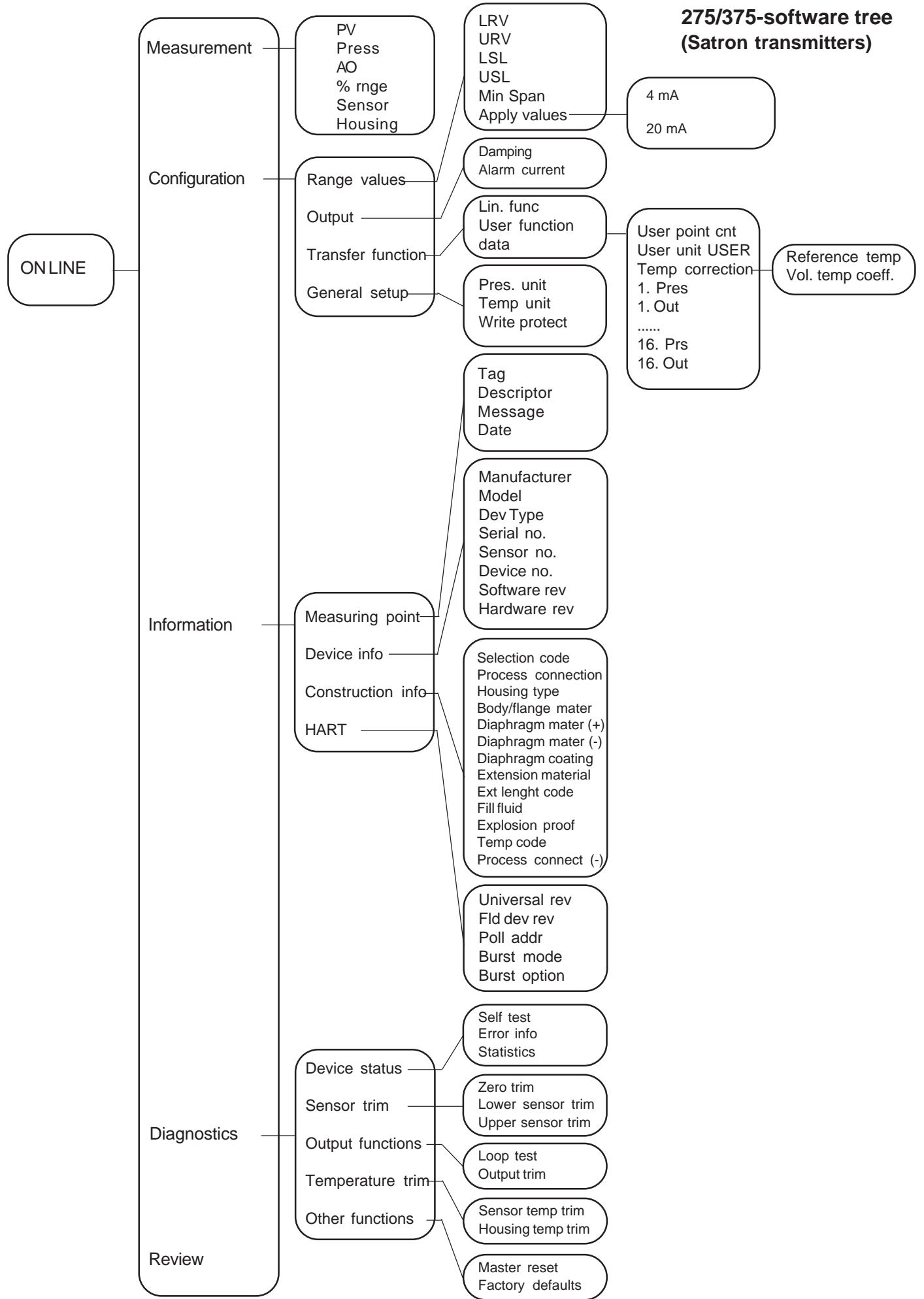


Figure 2-2 Calibration connections window



## 275 software tree (Valmet transmitters)





## 3. 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.

**Compensation** includes temperature compensation and linearization. Each sensor is calibrated individually through a resistance network connection. The temperature information required by compensation is derived from a temperature measuring element located by the Wheatstone bridge.

### 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).

Transmitters provided with own display (code **N**) is equipped with operating keys that allow you to define the transmitter's all functions.

The active functions required for **signal shaping** are in a customized IC which is divided into two sub-blocks: amplifier block and standard-signal shaping block. The standard-signal shaping block also includes zero, span and damping adjustments.

The **interface stage** includes failure protections to ensure the transmitter's operation and nonfailure in possible failure conditions. This stage also includes the TEST and cable connections

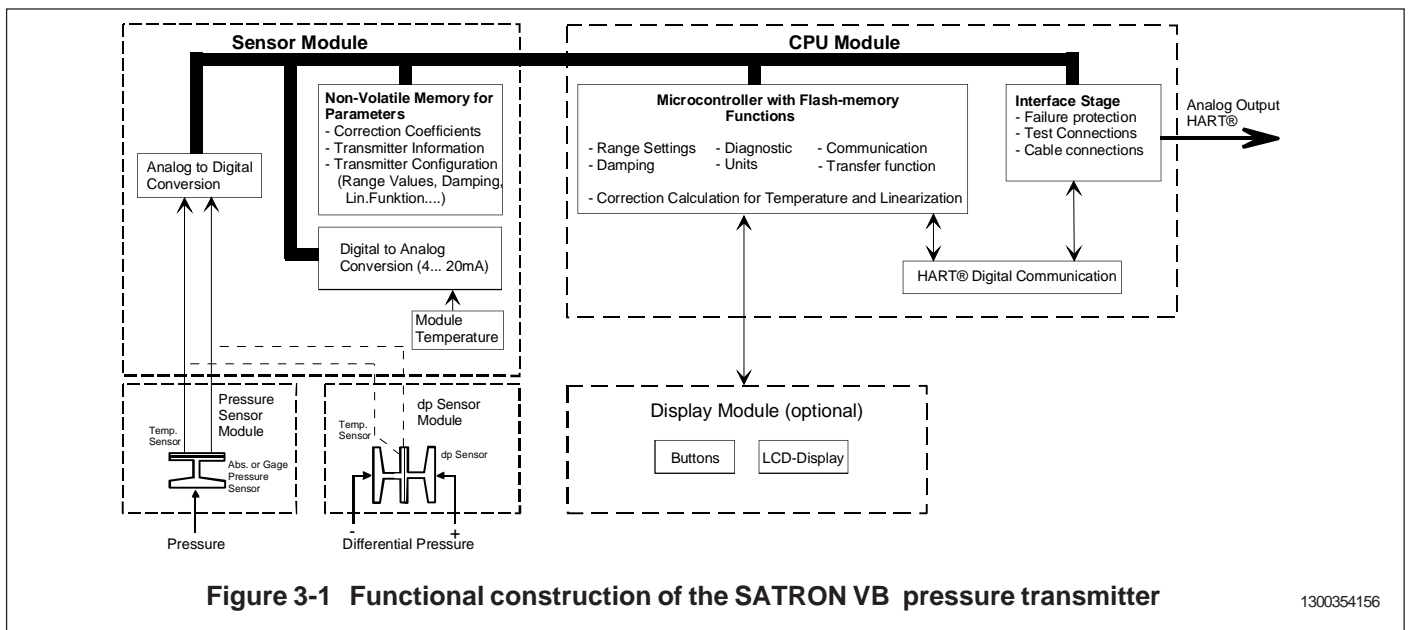


Figure 3-1 Functional construction of the SATRON VB pressure transmitter

1300354156

## 4. PARTS LIST

When ordering spares, please quote this document's number BPLV770AV and date 15.2.2013, 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.

1320354028

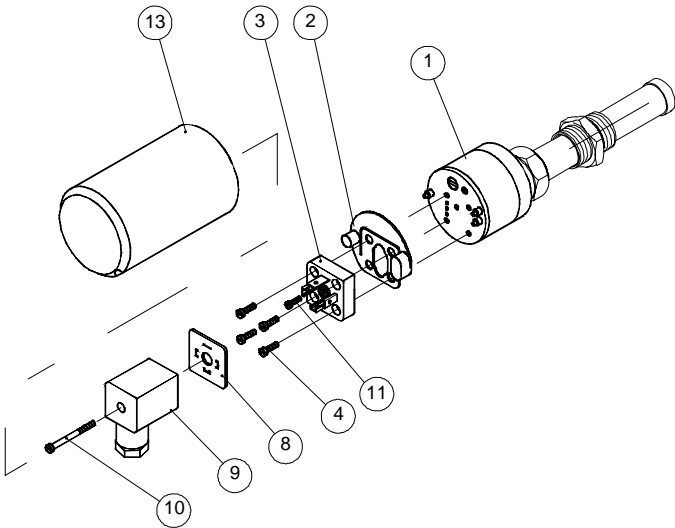


Figure 4-1 Parts list: Housing with PLUG connector, code H

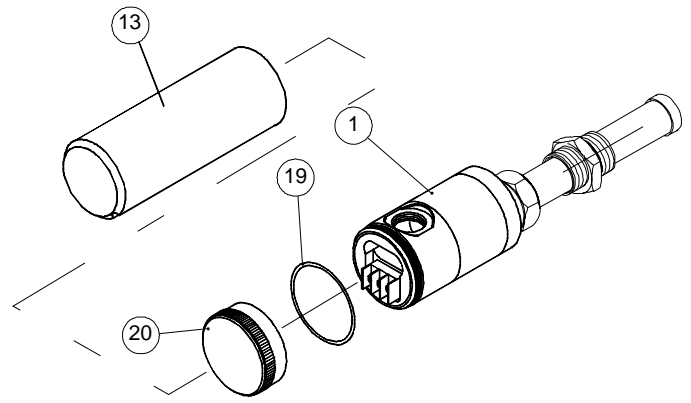


Figure 4-2 Parts list: Housing with junction box, code M

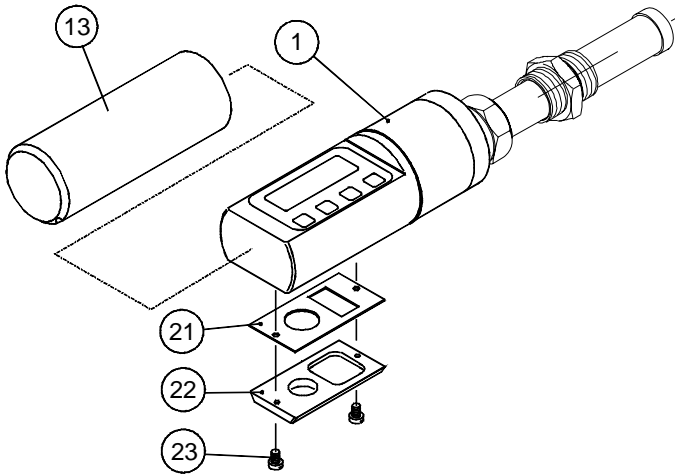


Figure 4-3 Parts list: Housing with junction box and display, code N

| Number | Name  | Order number | Number | Name  | Order number |
|--------|---|--------------|--------|---|--------------|
| 1      | Sensing element                             |              | 11     | Cylinder-head screw<br>S M3 x 4 VSM 13302 Zne | 51613009     |
| 2      | Seal  | T1300207     | * 13   | Protection cup, housing H<br>and M            | T1300295     |
| * 3    | Device plug DIN43650                        | 72900114     | * 13   | Protection cup, housing N                     | T1300400     |
| 4      | Cylinder-head screw<br>M3 x 10 SFS2179 Zne  | 51603021     | 19     | O-ring, 42x2 FPM (Viton®)                     | 80013800     |
| 8      | Seal GDM3-17,silicone                       | 72900116     | * 20   | Cover M                                       | T1300256     |
| * 9    | Wiring box GDM3009,<br>DIN43650             | 72900111     | 21     | Seal, Silicone rubber                         | T1300387     |
| 10     | Cylinder-head screw<br>S M3 x 35 SFS2179 A4 | 51723053     | * 22   | Back plate V                                  | T1300391     |
|        |   |              | 23     | Fastening screw M4                            | T1325347     |