

# SATRON VT<sub>e</sub> Pressure Transmitter

BPV711  
M2, Revision 3  
15.02.2013

**SATRON VT<sub>e</sub> pressure transmitter** belongs to the series V-transmitters. SATRON VT<sub>e</sub> is used for 0-4 kPa ...0-400 MPa ranges. It is a 2-wire transmitter with HART® standard communication. In pressure measuring applications SATRON VT<sub>e</sub>-transmitters are used for measuring the pressure of clean gases, steam, sedimenting, crystallizing and sticking liquids. The transmitter's sensor is piezoresistive. The rangeability is 100:1 for types VT<sub>e</sub>6 - VT<sub>e</sub>7.



## TECHNICAL SPECIFICATIONS

**Measuring range and span**  
See Selection Chart.

**Zero and Span adjustment**  
Zero elevation: Calibrated span is freely selectable on the specified range made by using HART®275/375 communicator.

**Damping**  
Time constant is continuously adjustable 0,01 to 60 s.

**Response time**  
max. 100 ms

**Temperature limits**  
Ambient: -30 to +80 °C  
Process: -30 to +125 °C  
Shipping and storage: -40 to +80 °C.

**Pressure limits**  
Min. and max. process pressure: See the appended tables.

**Volumetric displacement**  
< 0.5 mm<sup>3</sup>/max. span

**Output**  
2-wire (2W), 4-20 mA, user selectable for linear, square root, inverted signal or the transfer function (16 points) specified by the user

**Supply voltage and permissible load**  
See the load capacity diagram;  
4-20 mA output: 10-35 VDC.

**Humidity limits**  
0-100 % RH; freezing of condensed water not allowed in reference pressure channels.

**PERFORMANCE SPECIFICATIONS**  
Tested in accordance with IEC770:  
Reference conditions, specified span, no range elevation, horizontal mounting;  
AISI316L diaphragm, silicone oil fill.

**Accuracy**  
±0.1 % of calibrated span  
(span 1:1- 7.5:1 /max.range).  
On the measuring ranges 7.5: 1 - 100:1:

$$\pm [0.025 + 0.010 \times \left( \frac{\text{max. span}}{\text{calibrated span}} \right)] \% \text{ of calibrated span}$$

(incl. nonlinearity, hysteresis and repeatability)

**Long-term stability**  
±0.1 %/max. span/12 months

**Temperature effect on compensated temperature ranges -20...+80 °C**  
**Zero and span shift, types VT<sub>e</sub>5 - VTA<sub>e</sub>7:**  
±0.15 % of max. span

Zero and span shift, type VT<sub>e</sub>4:  
±0,25 % of max. span

**Mounting position effect (VT<sub>e</sub>4 ... VTA<sub>e</sub>7)**  
Zero error < 0.15 kPa, which can be calibrated out.  
**VT<sub>e</sub>8:** mounting position has no effect

**Vibration effect (IEC 68-2-6: FC):**  
±0.1 % of measuring range/  
2g/10 to 2000 Hz  
4g/10 to 100 Hz

**Power supply effect**  
< ±0.01 of calibrated span per volt

**European Directive Information**  
European Pressure Equipment Directive (PED) (97/23/EY)  
- Sound Engineering Practice  
Electro Magnetic Compatibility (EMC directive 2004/108/EC)  
-All pressure transmitters

**Insulation test voltage**  
500 V rms 50 Hz

**CONSTRUCTION**  
**Wetted materials:**  
EN 1.4435 (AISI316L)

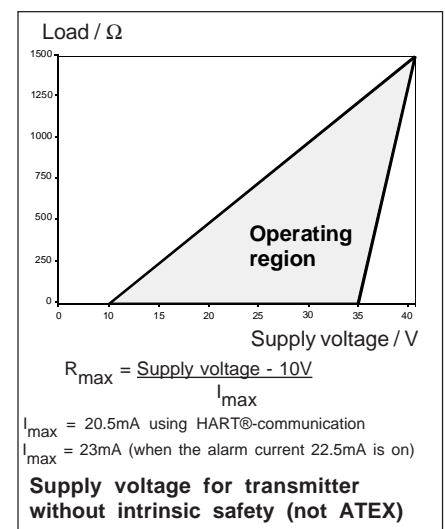
**Other materials:**  
EN 1.4404 (AISI316), EN 1.4305 (AISI303)

**Housing with PLUG connector, housing type code H**  
Housing: AISI303/316, Seals: Viton® and NBR  
TEST jacks: MS358Sn/PVDF, protected with silicone rubber shield.  
PLUG connector: PA6-GF30 jacket, Silicone rubber seal, AISI316 retaining screw.

**Housing with junction box/terminal strip, housing type codes M and N**  
Housing: AISI303/316, Seals: Silicone and Viton® rubber; Nameplates: Polyester

**Filling fluid:** Silicone oil or inert oil (VT<sub>e</sub>4 ... VTA<sub>e</sub>7)

**Enclosure class** IP66



**Pressure limits**  
Maximum process pressure, MPa

Transmitter type	Max. overload. pressure, MPa	Pressure class
VT <sub>e</sub> 4	0.3	PN40
VT <sub>e</sub> 5	1.5	PN40
VT <sub>e</sub> 6	7.5	PN100
VTA <sub>e</sub> 7	40.0	PN400

Minimum process pressure

T <sub>proc.</sub> °C	Minimum pressure for different fill fluid (kPa, abs.)	
	DC200 100 cSt	Inert oil
20	5	8
40	8	10
80	16	28
120	21	53

120

## Calibration

For customer-specified range with 1 s. damping. (If range is not specified, transmitter is calibrated for maximum range.)

## Electrical connections

Housing with PLUG connector, **H**:  
PLUG connector, connector type DIN 43650 model AF; Pg9 gland for cable; wire cross-section 0.5 to 1.5 mm<sup>2</sup>.

Housing with junction box/terminal strip, **M** and **N** :  
M20x1.5, 1/2-NPT inlet; screw terminals for 0.5 to 2.5 mm<sup>2</sup> wires

## Weight

Transmitter  
- with housing type **H**: 0.5 kg  
- with housing type **M**: 1 kg  
- with housing type **N**: 1.1 kg

## Product Certifications

### European Directive Information

**Electro Magnetic Compatibility**  
(EMC directive 2004/108/EC)  
All pressure transmitters

### Atex Directive (94/9/EC)

Satron Instruments Inc. complies with the ATEX Directive.


### European Pressure Equipment Directive (PED) (97/23/EC)


All Pressure Transmitters :  
- Sound Engineering Practice

### Hazardous Locations Certifications

**European Certifications**  
ATEX Intrinsic Safety

Certification No. : DNV-2007-OSL-ATEX- 1346X

 II 1 GD T135°C EEx ia II C T4 -20°C ≤ Tamb ≤ 50°C

 II 2 GD T135°C EEx ia II C T4 -20°C ≤ Tamb ≤ 50°C

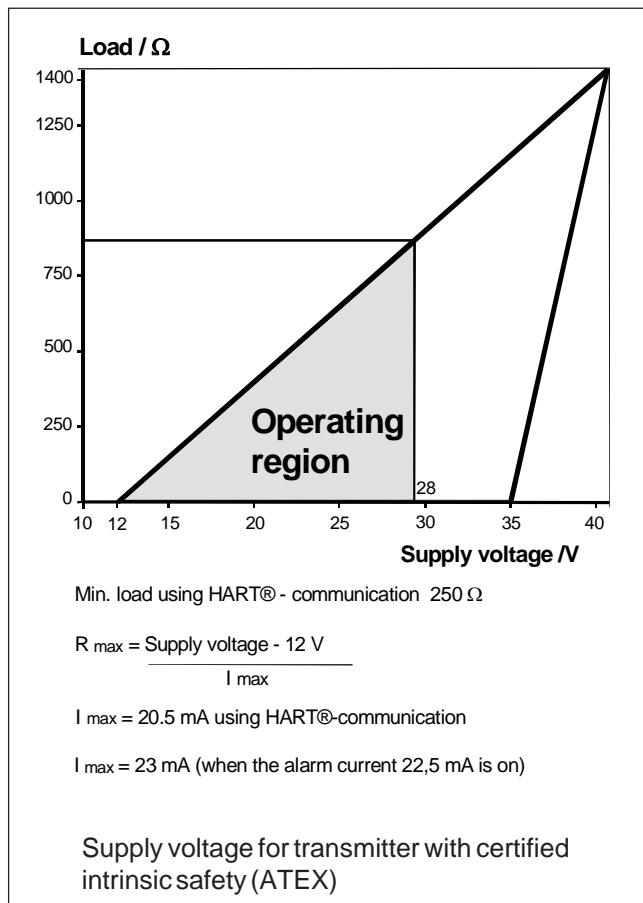

### Input Parameters :

$U_i = 28 \text{ V}$   
 $I_i = 93 \text{ mA}$   
 $P_i = 0.651 \text{ W}$   
 $C_i = 5 \text{ nF}$   
 $L_i = 0.2 \text{ mH}$

## Special Conditions for Safe Use (X) :

The enclosure with plastic window and the plastic DIN43650 connector must not be installed in potentially explosive atmosphere requiring category 1 apparatus. The non-conducting surface of the sensor element may be charged by the flow of non-conducting media, so there may be electrostatic hazard with IIC-gases. These units should be marked 2 GD.

The equipment shall be installed and connected according to the manufacturers instructions.

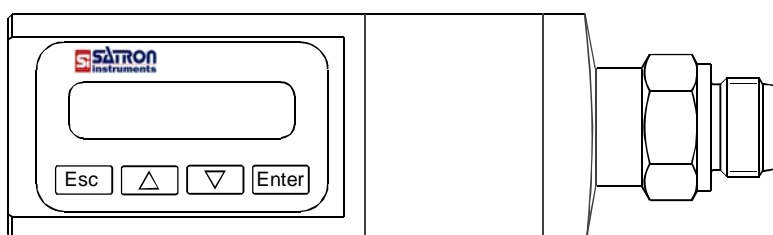
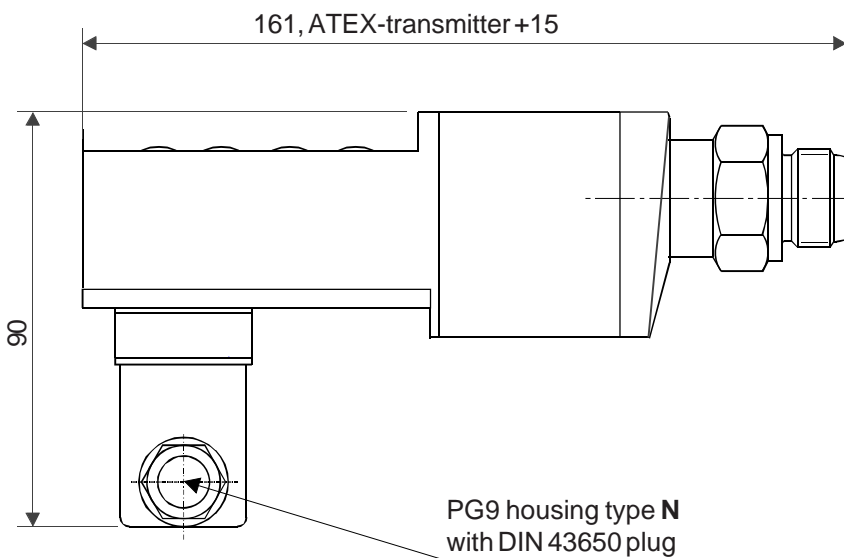
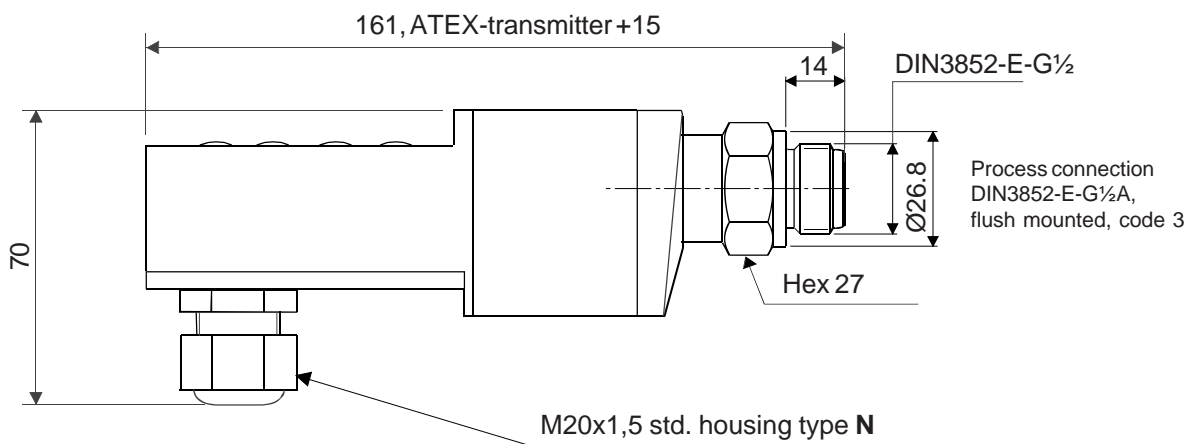
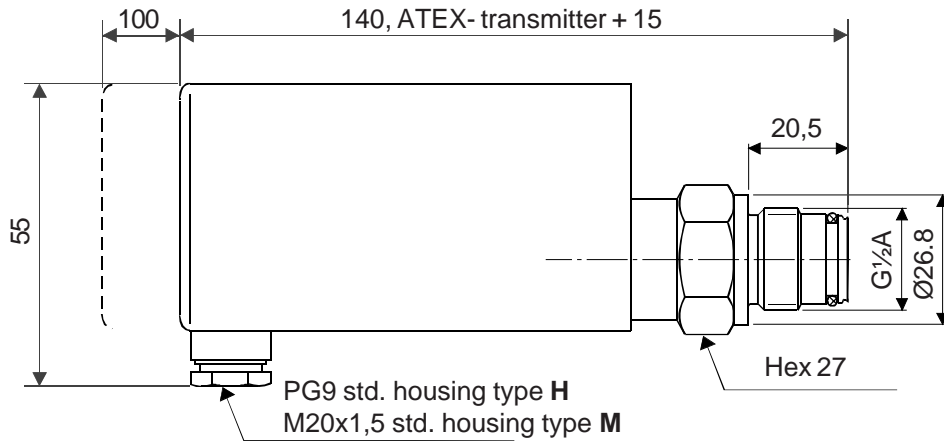
Keyboard :

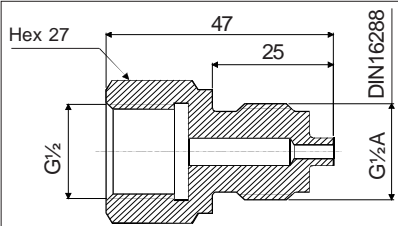
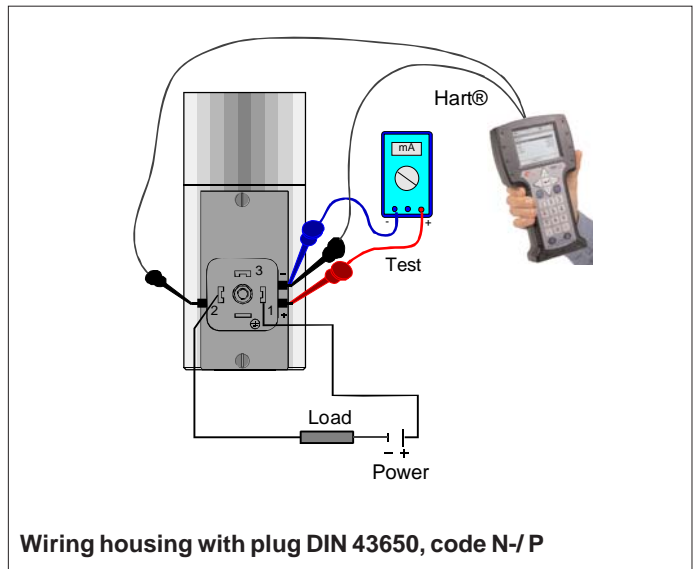
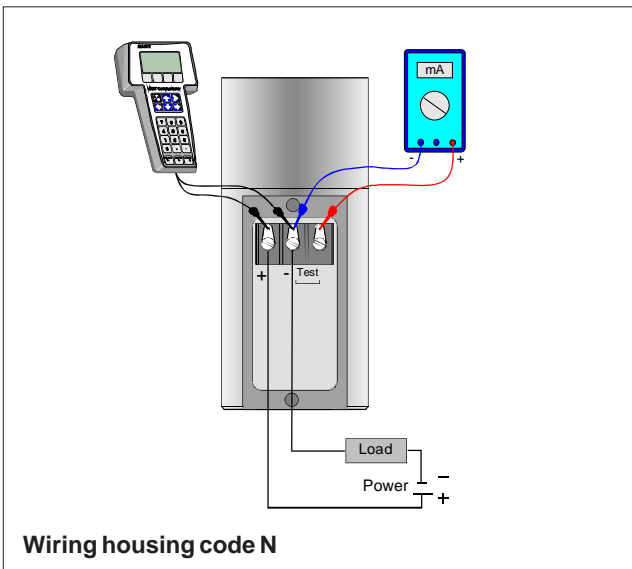
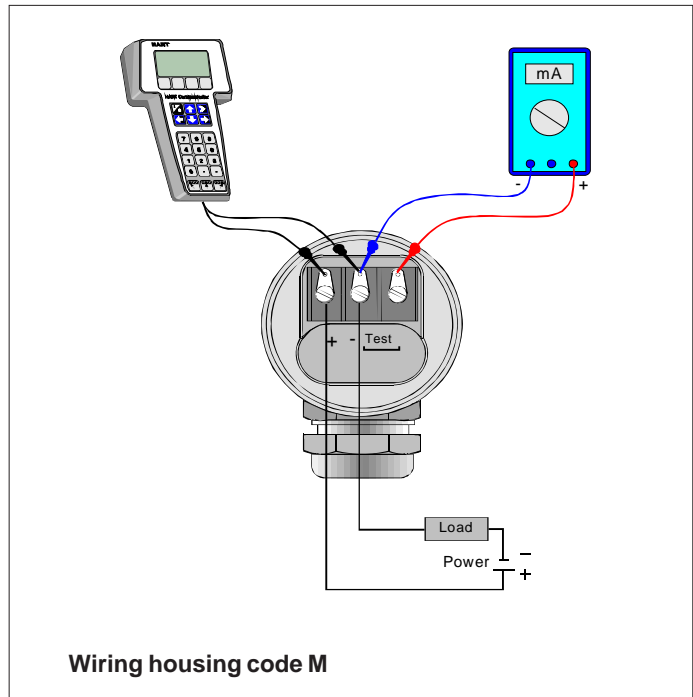
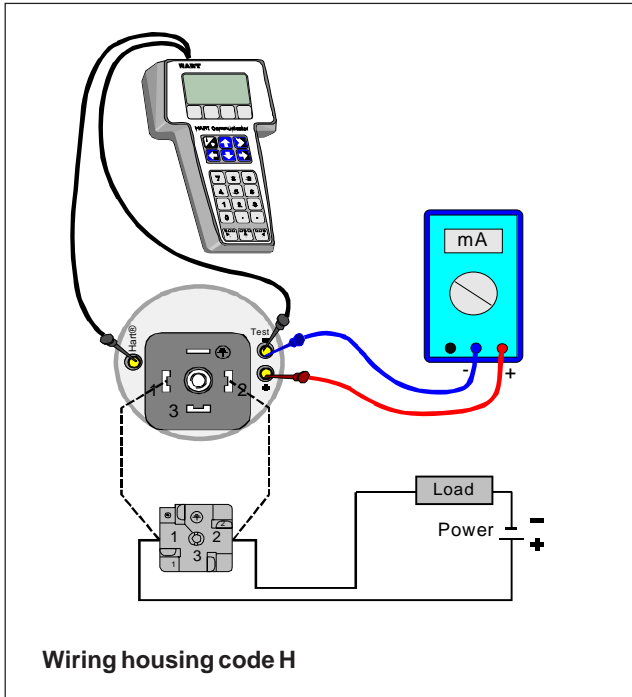
- Esc = Press **Esc** move back towards the top of the main menu.
- ▲ = Use the **UP** arrow key to move up on the current menu level or to increase the selected parameter value.
- ▼ = Use the **DOWN** arrow key to move down on the current menu level or to decrease the selected parameter value.
- Enter = Press **ENTER** to move to a lower level in a menu or to accept a command or parameter value.

# SATRON VT<sub>e</sub> Pressure Transmitter

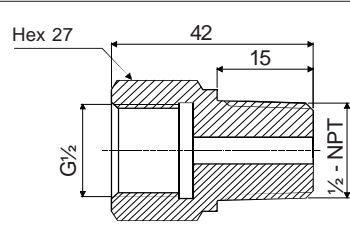
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Dimensions (mm)

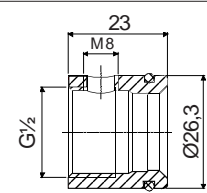




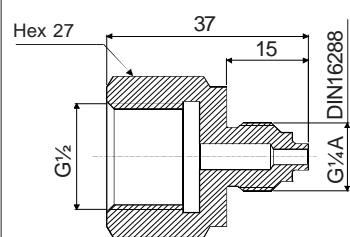
Thread DIN16288 - G $\frac{1}{2}$ A  
Order code : T1320291



Thread  $\frac{1}{2}$  - 14 NPT, male  
Order code : T1320293



PMC 1" (Ø26.3), for process connection code 5  
Order code : T1320310

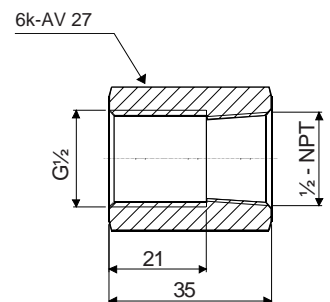


Thread DIN16288 - G $\frac{1}{4}$ A  
Order code : T1320292

The process connection of the flush mounted transmitters (DIN3852-E-G $\frac{1}{2}$ ) can be changed using modification adapters.

*Other adapter sizes, please contact to Satron Instruments Inc.*

**Modification adapters of the process connection, for types VT<sub>e</sub>4...VTA<sub>e</sub>7**



Thread  $\frac{1}{2}$  - 14 NPT, female  
Order code : M1050471

## Selection Chart

Adjustability	Span, min	Span, max	Measuring range
VT <sub>e</sub> 4	4 kPa (40 mbar)	100 kPa (1000 mbar)	-100...+100 kPa (-1000...1000 mbar)
VT <sub>e</sub> 5	10 kPa (100 mbar)	500 kPa (5000 mbar)	-100...+500 kPa (-1000...5000 mbar)
VTA <sub>e</sub> 5	10 kPa (100 mbar)	500 kPa (5000 mbar)	-100...+500 kPa (-1000...5000 mbar), abs.
VT <sub>e</sub> 6	0.03 MPa (0.3 bar)	3 MPa (30 bar)	-0,1...+3 MPa (-1...+30 bar)
VTA <sub>e</sub> 6	0.03 MPa (0.3 bar)	3 MPa (30 bar)	0...+3 MPa (0...+30 bar), abs.
VTA <sub>e</sub> 7	0.4 MPa (4 bar)	40 MPa (400 bar)	0...+40 MPa (0...+400 bar), abs.

<b>Output</b>	<b>S</b> 4-20mA DC/HART®
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<b>Process connection</b>	
<b>3</b>	DIN 3852-E-G½A (male), (flush mounted)
<b>5</b>	G½A (male), (flush mounted), with o-ring

Wetted materials	Body	Diaphragm
	Code    Material	Code    Material
	<b>2</b> EN 1.4404 (AISI316L)	<b>2</b> EN 1.4435 (AISI316L)


  


<b>Fill fluid</b> (specify for types VT <sub>e</sub> 4 ... VTA <sub>e</sub> 7)	<b>S</b> Silicone oil	<b>G</b> Inert oil (*)
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<b>Housing type</b>	
<b>H</b>	Housing with PLUG-connector, DIN43650, no display, inlet PG9
<b>M</b>	Housing with junction box/terminal strip, no display, inlet M20x1,5
<b>N</b>	Housing with junction box/terminal strip, with display, inlet M20x1,5

<b>Explosion proof</b>	<b>0</b> No explosion proof classification
	<b>1</b> Atex Intrinsic Safety, 

<b>Special size of electrical inlet</b>		
<b>N</b> 1/2 NPT	<b>G</b> Pg13.5	<b>P</b> PLUG-connector, DIN43650


  

<b>Documentation</b>	
<b>Installation and operating instructions</b>	<b>IE</b> English <b>IF</b> Finnish

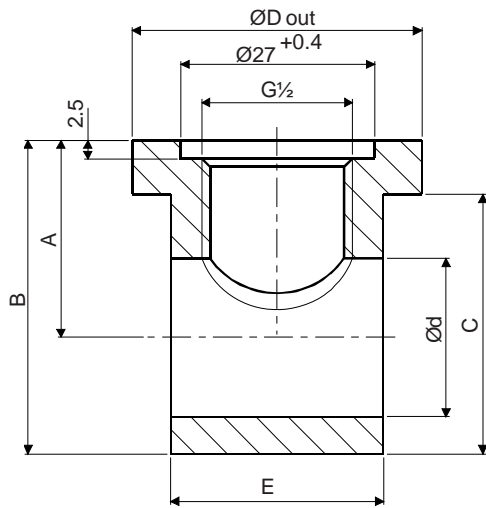
  

<b>Material certificates</b>	
<b>O</b>	No material certificate
<b>MC1</b>	Raw material certificate without appendices, in accordance with SFS-EN 10204-2.1 (DIN 50049-2.1) standard
<b>MC2</b>	Raw material certificate for wetted parts, with appendices in accordance with SFS-EN 10204-2.2 (DIN 50049-2.2) standard
<b>MC3</b>	Raw material certificate for wetted parts, with appendices in accordance with SFS-EN 10204-3.1 B (DIN 50049-3.1 B) standard

(\*) = Oxygen cleaning must be ordered separately!

(\*\*) = Housing H and N : 

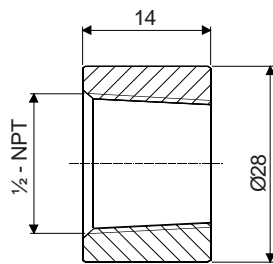
## Process couplings



Pipe size	Dim. ØD out	Dim. A	Dim. B	Dim. C	Dim. Ød	Dim. E	Order code
DN15	40	27.5	43.5	36	22 <sup>+0.2</sup> <sub>0</sub>	29.5	M1050395
DN20	40	30.5	49	42	27.5 <sup>+0.3</sup> <sub>0</sub>	26	M1050396
DN25	50	33.5	55.5	48	34 <sup>+0.5</sup> <sub>+0.2</sub>	29.5	M1050397

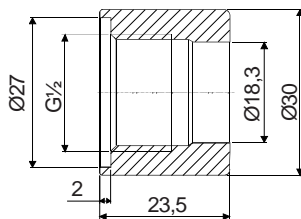
Other sizes, please contact Satron Instruments Inc.

### T-coupling DIN 3852-X-G<sup>1</sup>/<sub>2</sub>, sizes DN15 - 25



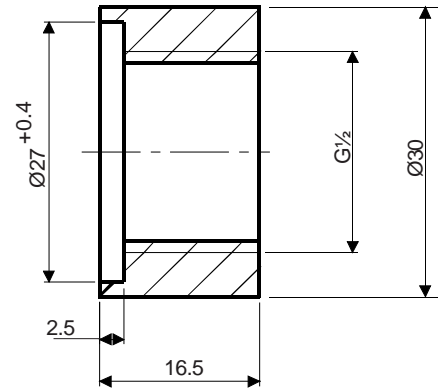
Order code: M1050368

### Process coupling 1/2 - NPT



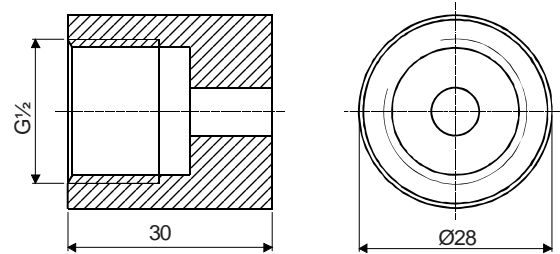
Order code: M1050515

### Coupling G<sup>1</sup>/<sub>2</sub> (for process connection code 5)



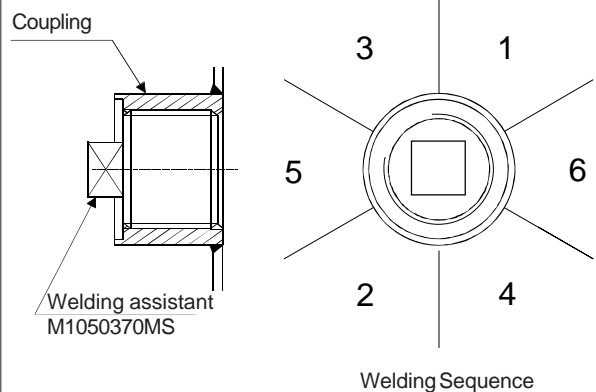
Order code: M1050369

### Process coupling DIN 3852-X-G<sup>1</sup>/<sub>2</sub>



Order code: M1050367

### Process coupling DIN 16288 - G<sup>1</sup>/<sub>2</sub>



### Welding the coupling M1050369

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