

**SATRON VT<sub>e</sub> pressure transmitter** belongs to the series V-transmitters which will have both analog and smart properties. SATRON VT<sub>e</sub> is used for 0-4 kPa ...0-100 MPa ranges. The transmitter communicates in a 2-wire system. 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>8. The transmitter communicates digitally using the HART® protocol.



## 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 - VT<sub>e</sub> 8:**  
±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)

Model VT<sub>e</sub> 8 :

- Module A Conformity Assessment

All other models :

- Sound Engineering Practice

Electro Magnetic Compatibility (EMC) (89/336/ETY)

### Insulation test voltage

500 V rms 50 Hz

## CONSTRUCTION

### Wetted materials:

AISI316L, Titanium (VT<sub>e</sub> 8).

### Other materials:

AISI316, AISI303

### Housing with PLUG connector,

housing type codes H and P

Housing: AISI303/316, Seals: Viton® and NBR

TEST jacks: MS358Sn/PVDF, protected with TPE rubber shield.

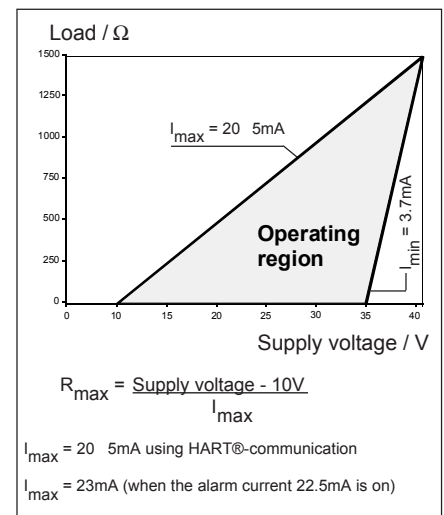
PLUG connector: PA6-GF30 jacket, Silicone rubber seal, AISI316 retaining screw.

### Housing with junction box/terminal strip, housing type code M

Housing: AISI303/316, Seals: Nitrile and Viton®; 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	PN250
VT <sub>e</sub> 8	100.0	PN1000

## Minimum process pressure

(VT<sub>e</sub> 8 : no min. pressure limitations)

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

# SATRON VT<sub>e</sub> pressure transmitter

BPV711

February 15, 2008

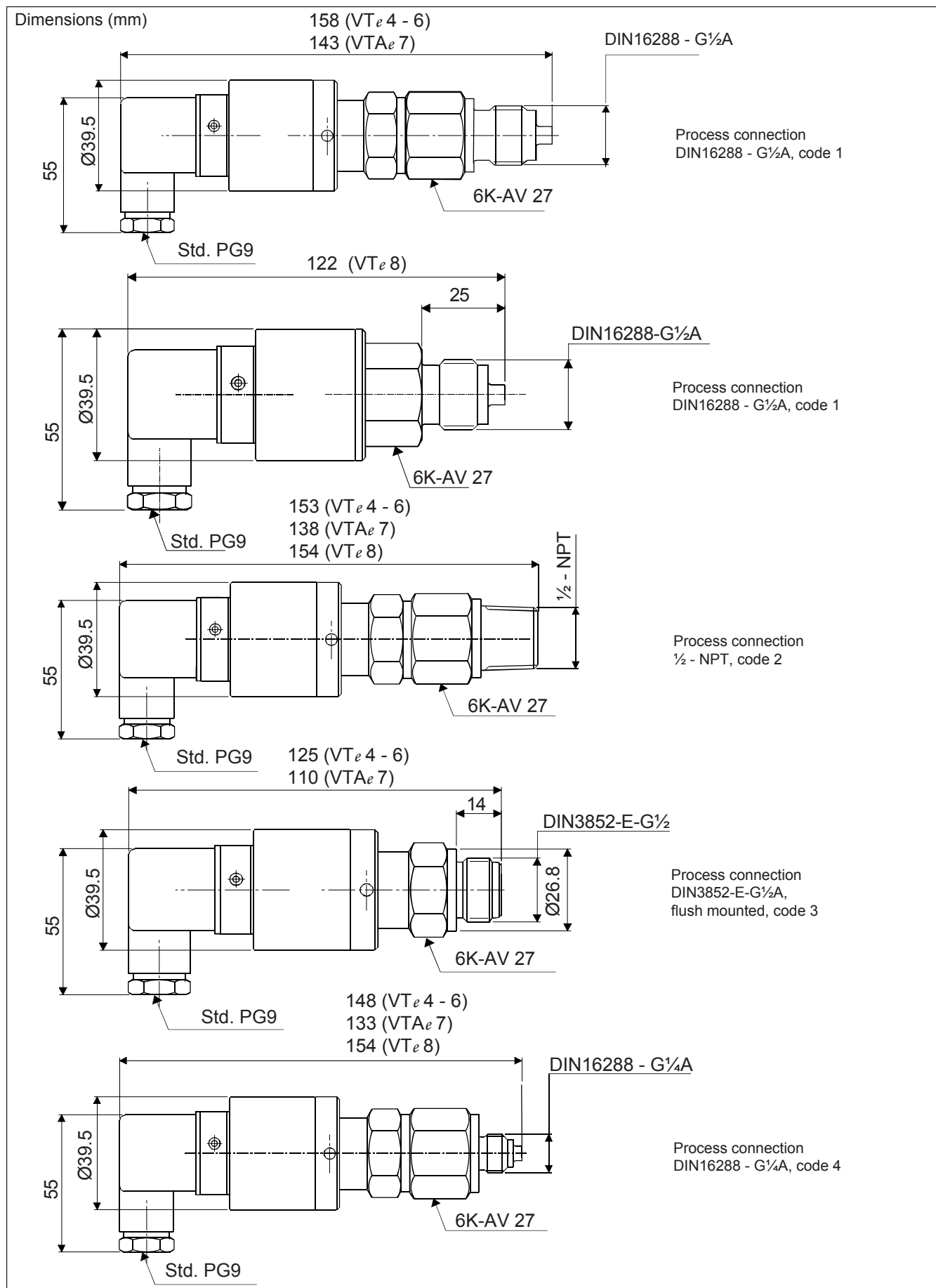
## Electrical connections

Housing with PLUG-connector, codes **H** and **P**, connector type DIN 43650 model AF; Pg9 gland for cable; wire gross-section 0,5 to 1,5 mm<sup>2</sup>.

Housing with junction box/terminal strip, code **M**: M16x1.5 inlet; screw terminals for 0.5 to 2.5 mm<sup>2</sup> wires

## Weight

Transmitter  
 - with housing type **H** : 0,3 kg  
 - with housing type **P** : 0,35 kg  
 - with housing type **M** : 0,5 kg

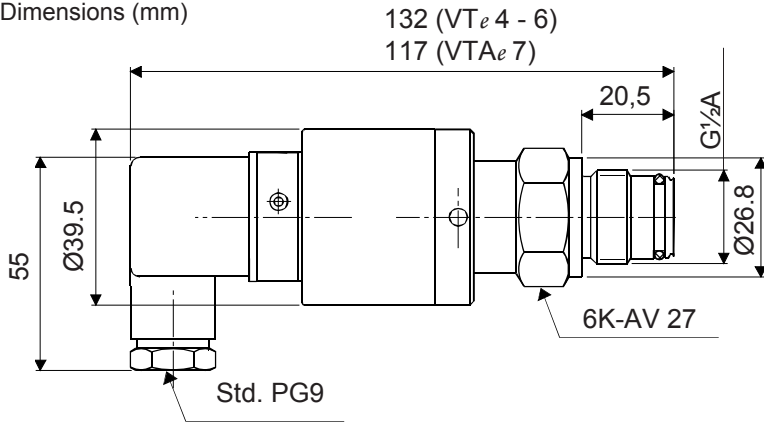


# SATRON VT<sub>e</sub> pressure transmitter

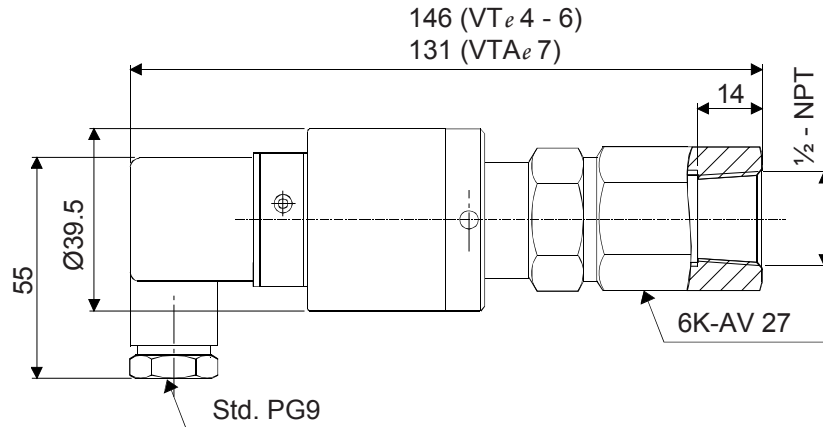
BPV711

February 15, 2008

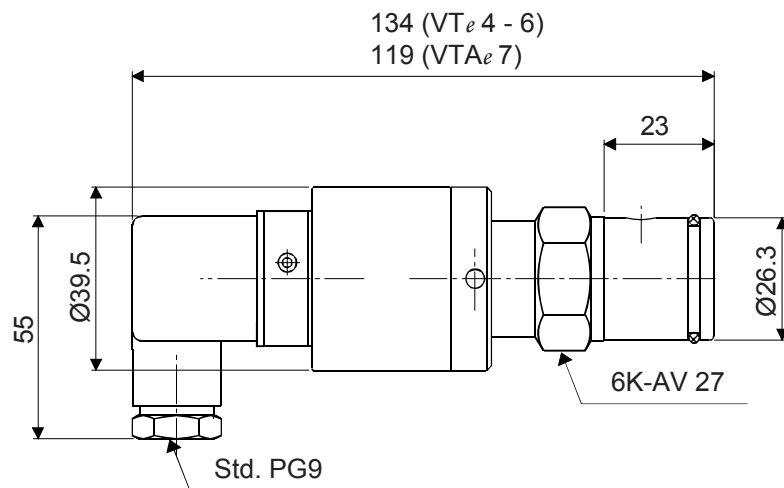
Dimensions (mm)



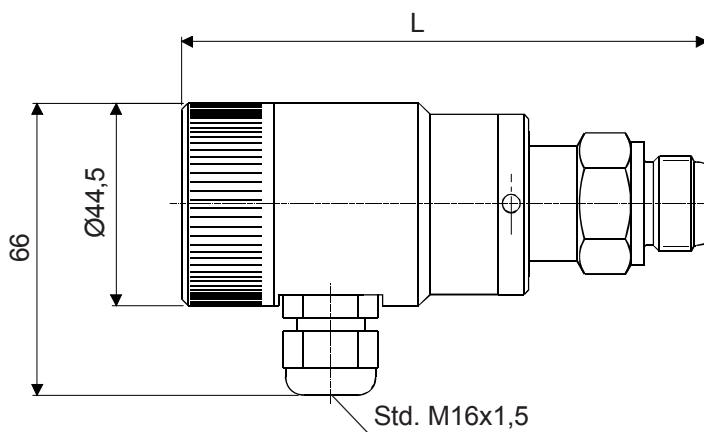
Process connection  
G1/2A, flush mounted,  
with o-ring, code 5



Process connection  
1/2 - NPT (female), code 6



Process connection  
PMC 1" (Ø26,3), code 7



## Housing with junction box, code M

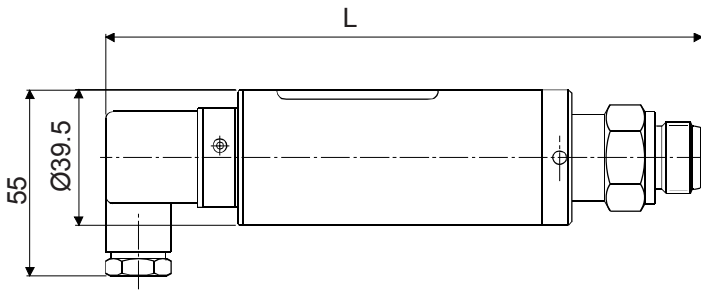
- Process connection 1, VT<sub>e</sub> 4 - 6, dimension L = 150
- Process connection 1, VTA<sub>e</sub> 7, dimension L = 135
- Process connection 1, VT<sub>e</sub> 8, dimension L = 110
- Process connection 2, VT<sub>e</sub> 4 - 6, dimension L = 145
- Process connection 2, VTA<sub>e</sub> 7, dimension L = 130
- Process connection 2, VT<sub>e</sub> 8, dimension L = 145
- Process connection 3, VT<sub>e</sub> 4 - 6, dimension L = 115
- Process connection 3, VTA<sub>e</sub> 7, dimension L = 100
- Process connection 4, VT<sub>e</sub> 4 - 6, dimension L = 140
- Process connection 4, VTA<sub>e</sub> 7, dimension L = 125
- Process connection 4, VT<sub>e</sub> 8, dimension L = 145
- Process connection 5, VT<sub>e</sub> 4 - 6, dimension L = 120
- Process connection 5, VTA<sub>e</sub> 7, dimension L = 110
- Process connection 6, VT<sub>e</sub> 4 - 6, dimension L = 135
- Process connection 6, VTA<sub>e</sub> 7, dimension L = 120
- Process connection 7, VT<sub>e</sub> 4 - 6, dimension L = 125
- Process connection 7, VTA<sub>e</sub> 7, dimension L = 110

# SATRON VT<sub>e</sub> pressure transmitter

BPV711

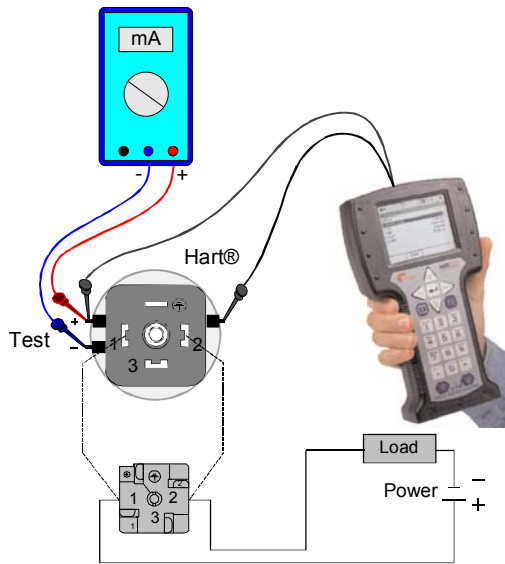
February 15, 2008

Mitat (mm)

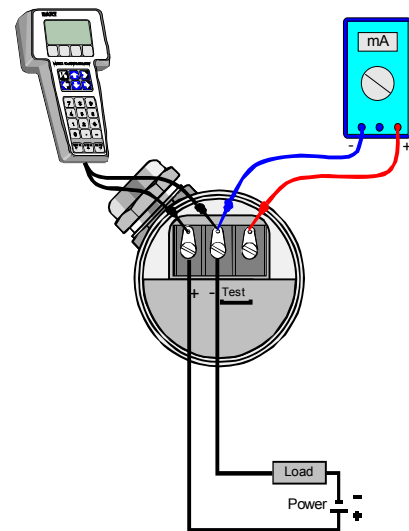


Housing with plug connection and display, code **P**

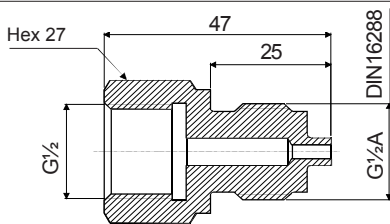
- Process connection 1, VT<sub>e</sub> 4 - 6, dimension L = 215
- Process connection 1, VTA<sub>e</sub> 7, dimension L = 200
- Process connection 1, VT<sub>e</sub> 8, dimension L = 180
- Process connection 2, VT<sub>e</sub> 4 - 6, dimension L = 210
- Process connection 2, VTA<sub>e</sub> 7, dimension L = 195
- Process connection 2, VT<sub>e</sub> 8, dimension L = 210
- Process connection 3, VT<sub>e</sub> 4 - 6, dimension L = 180
- Process connection 3, VTA<sub>e</sub> 7, dimension L = 165
- Process connection 4, VT<sub>e</sub> 4 - 6, dimension L = 205
- Process connection 4, VTA<sub>e</sub> 7, dimension L = 190
- Process connection 4, VT<sub>e</sub> 8, dimension L = 210
- Process connection 5, VT<sub>e</sub> 4 - 6, dimension L = 190
- Process connection 5, VTA<sub>e</sub> 7, dimension L = 175
- Process connection 6, VT<sub>e</sub> 4 - 6, dimension L = 200
- Process connection 6, VTA<sub>e</sub> 7, dimension L = 185
- Process connection 7, VT<sub>e</sub> 4 - 6, dimension L = 190
- Process connection 7, VTA<sub>e</sub> 7, dimension L = 175



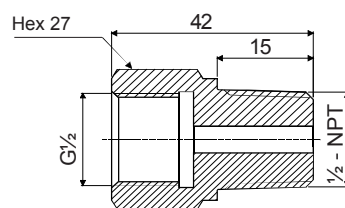
Wiring housing codes H and P



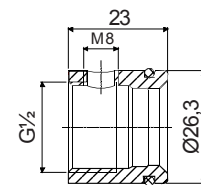
Wiring housing code M



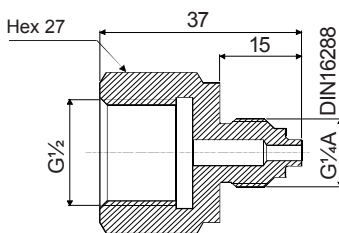
Thread DIN16288 - G $\frac{1}{2}$ A  
Order code : T1320291



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

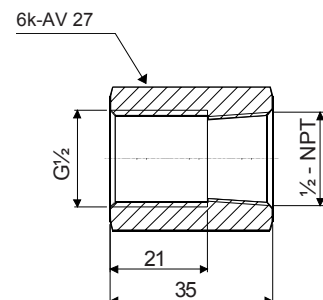


PMC 1" (Ø26.3), for process connection code 5  
Order code : T1320310



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.



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

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

## 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)
VT <sub>e</sub> 6	0.03 MPa (0.3 bar)	3 MPa (30bar)	-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	0.15 MPa (1.5 bar)	15 MPa (150 bar)	0...+15 MPa (0...+150 bar), abs.
VT <sub>e</sub> 8	1 MPa (10 bar)	100 MPa (1000 bar)	-0.1...+100 MPa (-1...+1000 bar)

**Output**      **S**    4-20mA DC/HART®

### Process connection

<b>1</b>	DIN16288-G½A (male)	<b>5</b>	G½A (male),(flush mounted), with o-ring, not VT <sub>e</sub> 8
<b>2</b>	½ - NPT (male)	<b>6</b>	½ - NPT (female)
<b>3</b>	DIN 3852-E-G½A (male),(flush mounted), not VT <sub>e</sub> 8	<b>7</b>	PMC 1" (outside diameter 26.3 mm), not VT <sub>e</sub> 8
<b>4</b>	DIN16288 - G½A (male)		

### Wetted materials

#### Body

Code	Material
<b>2</b>	AISI316L

#### Diaphragm

Code	Material
<b>2</b>	AISI316 (no VT <sub>e</sub> 8)
<b>6</b>	Titanium ( only VT <sub>e</sub> 8)

**Fill fluid** (specify for types VT<sub>e</sub> 4 ... VTA<sub>e</sub>7)    **S** Silicone oil      **G** Inert oil (\*)

### Housing type

<b>H</b>	Housing with plug connector, DIN43650, no display, inlet PG9
<b>M</b>	Housing with junction box / terminal strip, no display, inlet M16x1,5
<b>P</b>	Housing with plug connector, DIN43650, display, inlet PG9

**Explosion proof**    **0**    No explosion proof classification

### Special size of electrical inlet

**N** 1/2 NPT      **G** Pg13.5

### Documentation

**Installation and operating insructions**      **IE** English      **IF** Finnish

### Material certificates

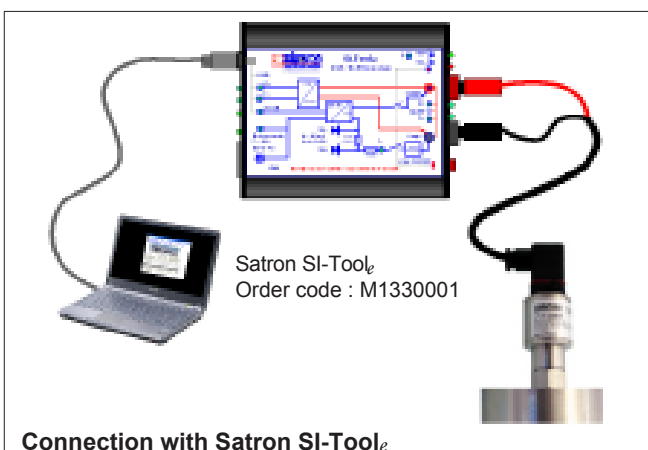
<b>O</b>	No material certificate
<b>MC1</b>	Raw material certificate without appendices, in accordance with SFS-EN 10204-2.1 (DIN 50049-2.1) standard
<b>MC2</b>	Raw material certificate for wetted parts,with appendices in accordance with SFS-EN 10204-2.2 (DIN 50049-2.2) standard
<b>MC3</b>	Raw material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

### Calibration

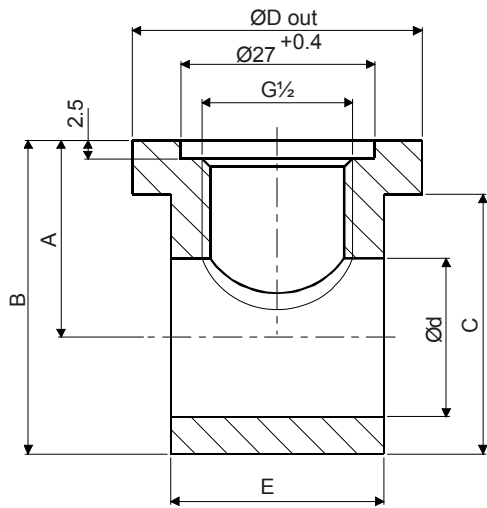
Transmitter is calibrated for maximum range with 0.5 sec. damping.

Calibration for customer-specified range and item positioning must be mentioned in the order.

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



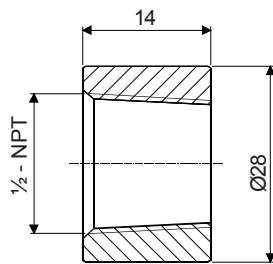
## Process couplings



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

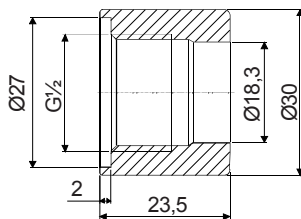
Other sizes, please contact Satron Instruments Inc.

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



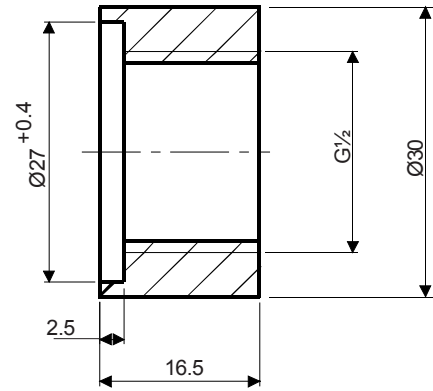
Order code: M1050368

### Process coupling $\frac{1}{2}$ - NPT



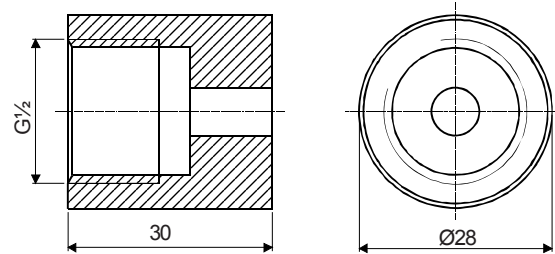
Order code: M1050515

### Coupling G $\frac{1}{2}$ (for process connection code 5)



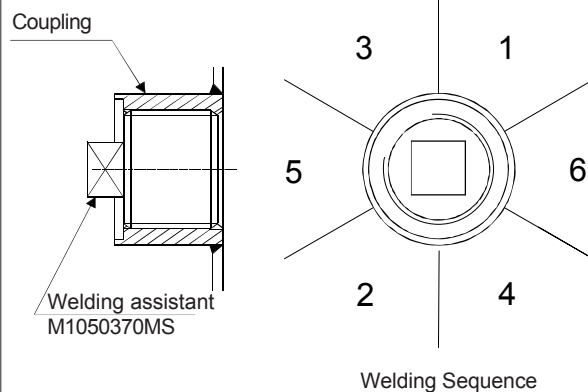
Order code: M1050369

### Process coupling DIN 3852-X-G $\frac{1}{2}$



Order code: M1050367

### Process coupling DIN 16288 - G $\frac{1}{2}$



### Welding the coupling M1050369

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