

SATRON VT_e Pressure Transmitter

BPV711
M2, Revision 3
15.02.2013

SATRON VT_e pressure transmitter belongs to the series V-transmitters. SATRON VT_e 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_e-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_e6 - VT_e7.



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 mm³/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_e5 - VTA_e7:
±0.15 % of max. span

Zero and span shift, type VT_e4:

±0,25 % of max. span

Mounting position effect

(VT_e4 ... VTA_e7)

Zero error < 0.15 kPa, which can be calibrated out.

VT_e8: 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**

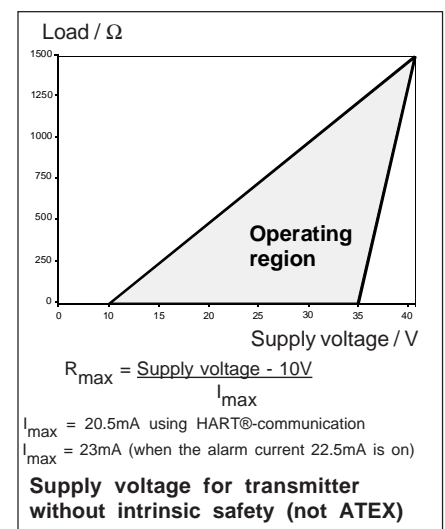
Housing: AISI303/316, Seals: Viton® and NBR
TEST jacks: MS358Sn/PVDF, protected with silicone rubber shield.
PLUG connector: PA6-GF30 jacket, Silicone rubber seal, AISI316 retaining screw.

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_e4 ... VTA_e7)

Enclosure class IP66



Pressure limits

Maximum process pressure, MPa

Transmitter type	Max. overload. pressure, MPa	Pressure class
VT _e 4	0.3	PN40
VT _e 5	1.5	PN40
VT _e 6	7.5	PN100
VTA _e 7	40.0	PN400

Minimum process pressure

T _{proc.} °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

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 mm².

Housing with junction box/terminal strip, **M** and **N** :
M20x1.5, 1/2-NPT inlet; screw terminals for 0.5 to 2.5 mm² 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

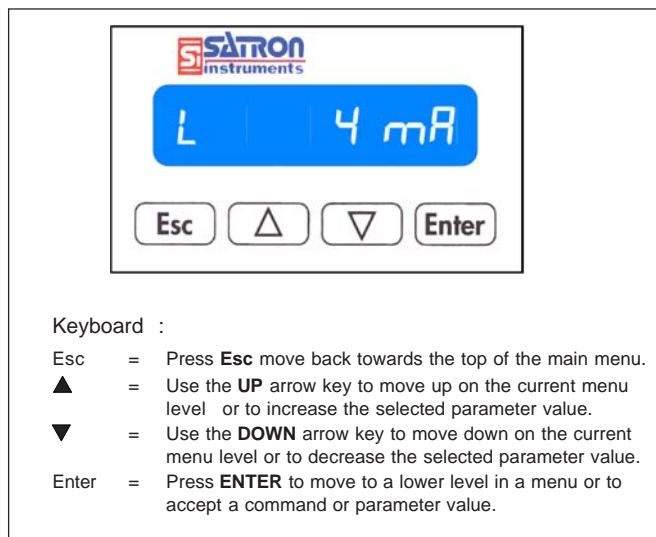
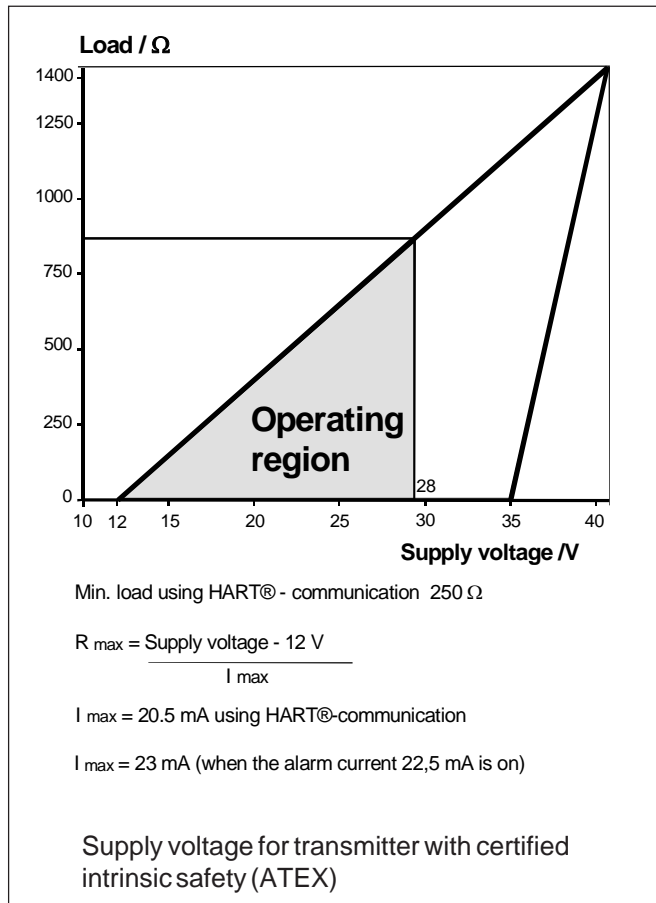
Input Parameters :

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

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.

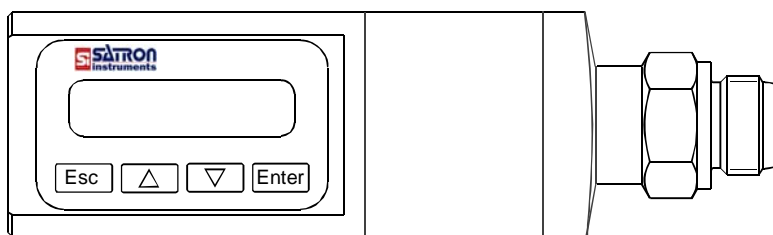
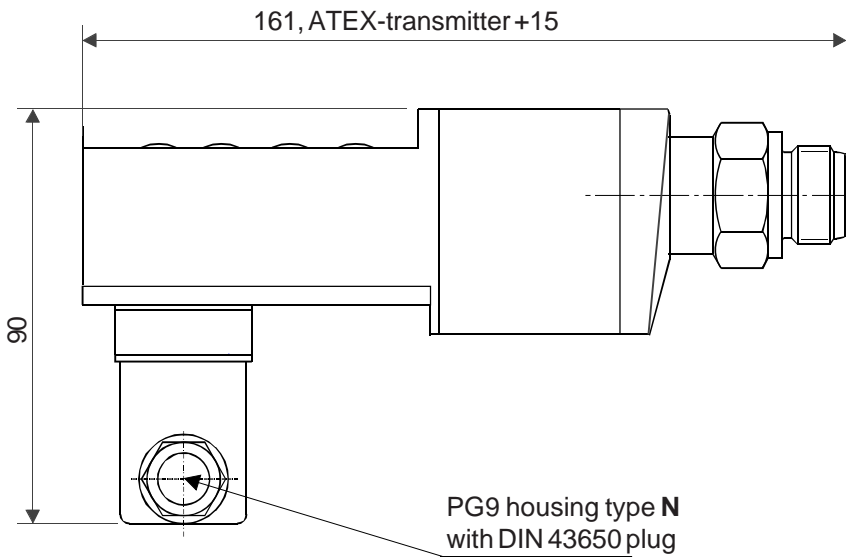
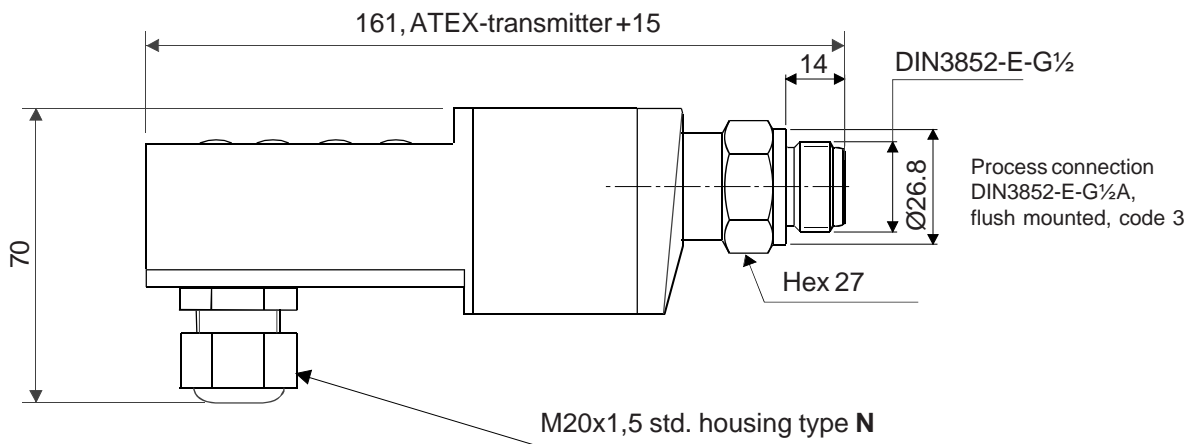
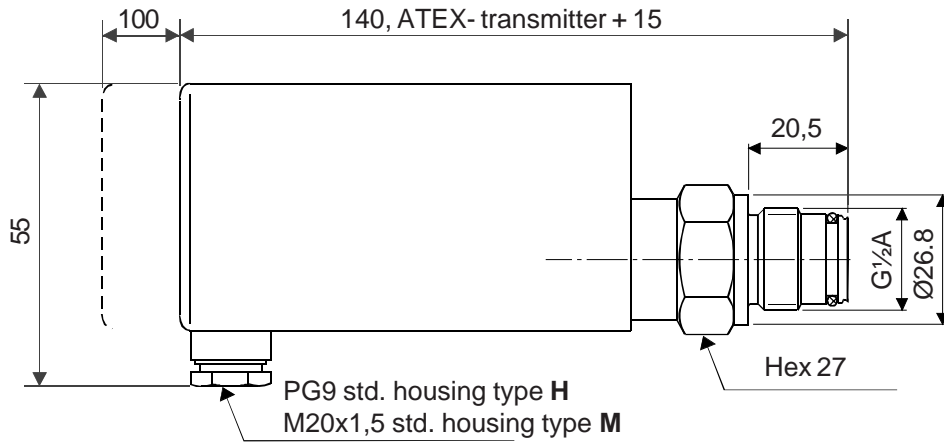
The equipment shall be installed and connected according to the manufacturers instructions.

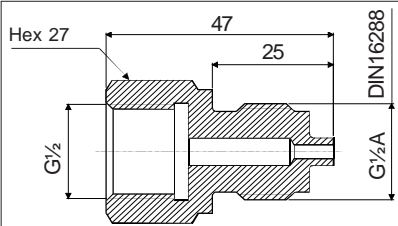
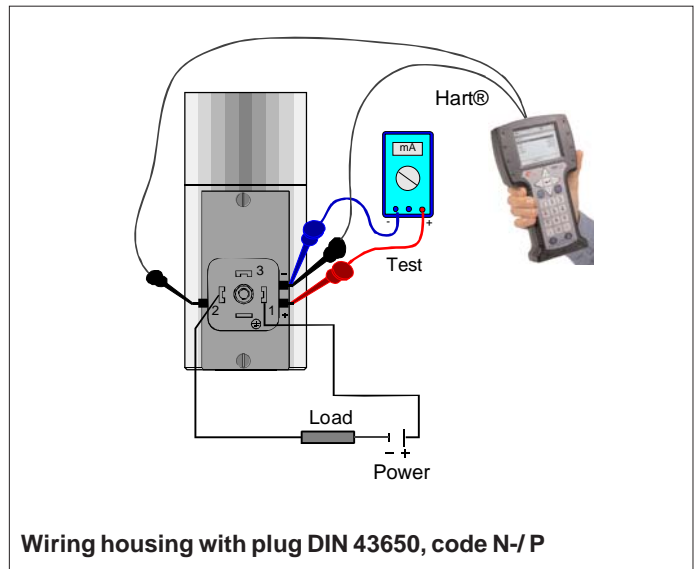
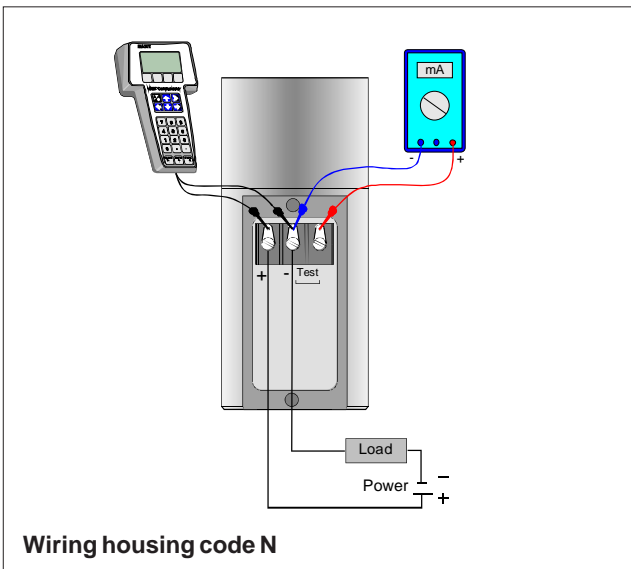
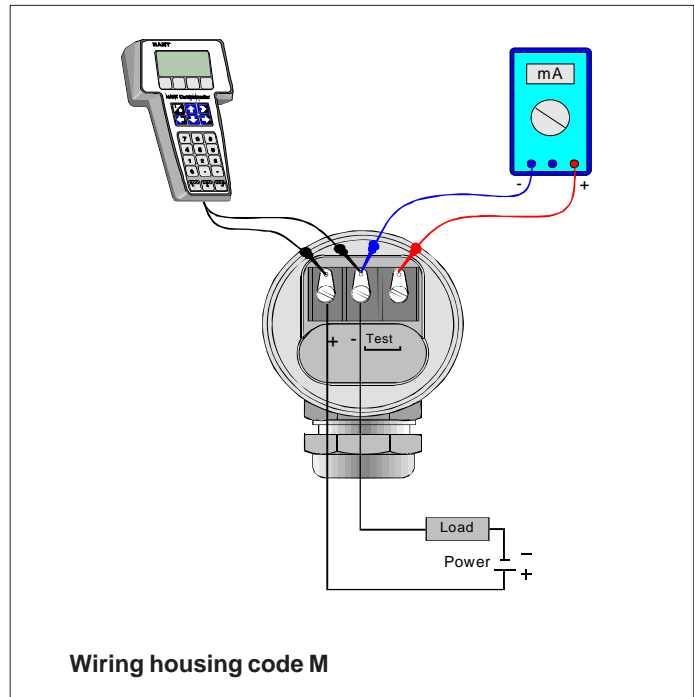
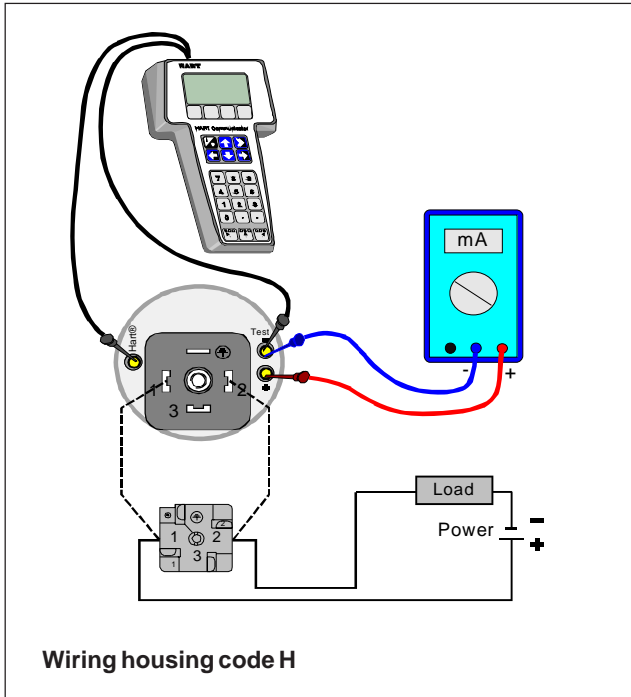


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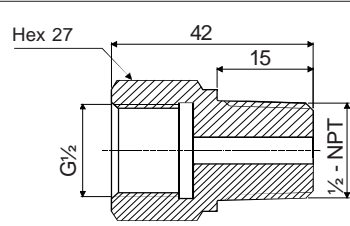
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Dimensions (mm)

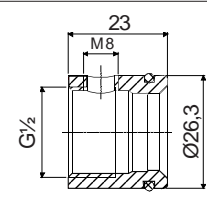




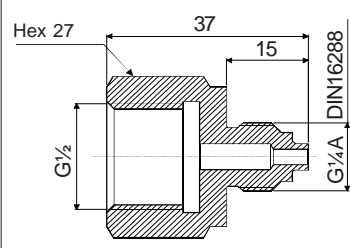
Thread DIN16288 - G $\frac{1}{2}$ A
Order code : T1320291



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



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

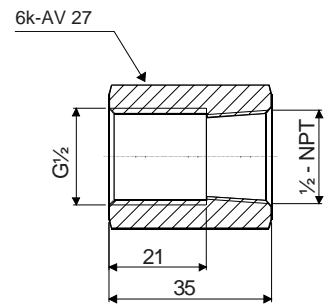


Thread DIN16288 - G $\frac{1}{4}$ A
Order code : T1320292

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_e...VTA_e7



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

Selection Chart

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


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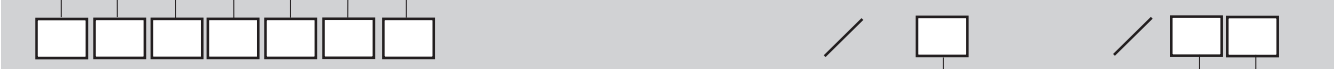
Process connection	
3	DIN 3852-E-G½A (male), (flush mounted)
5	G½A (male), (flush mounted), with o-ring

Wetted materials	Body	Diaphragm
	Code Material	Code Material
	2 EN 1.4404 (AISI316L)	2 EN 1.4435 (AISI316L)

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

Explosion proof	0 No explosion proof classification
	1 Atex Intrinsic Safety, 




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

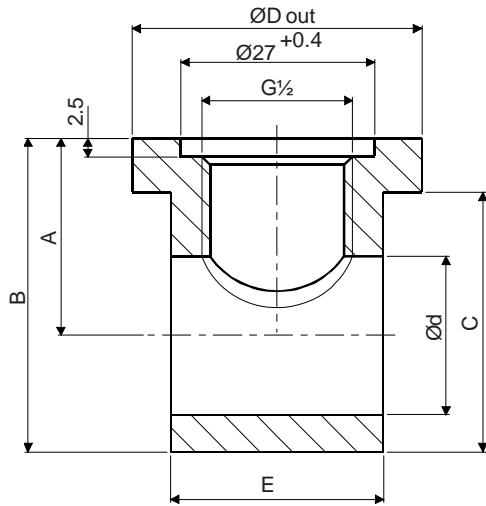
Documentation	
Installation and operating instructions	IE English IF Finnish

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

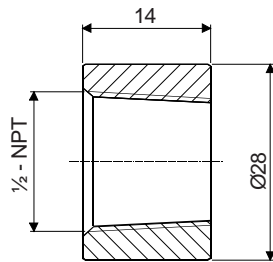
Process couplings



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 $\begin{smallmatrix} +0.2 \\ 0 \end{smallmatrix}$	29.5	M1050395
DN20	40	30.5	49	42	27.5 $\begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$	26	M1050396
DN25	50	33.5	55.5	48	34 $\begin{smallmatrix} +0.5 \\ +0.2 \end{smallmatrix}$	29.5	M1050397

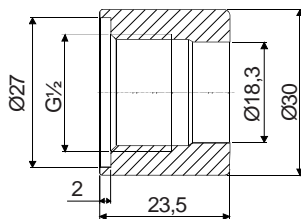
Other sizes, please contact Satron Instruments Inc.

T-coupling DIN 3852-X-G½, sizes DN15 - 25



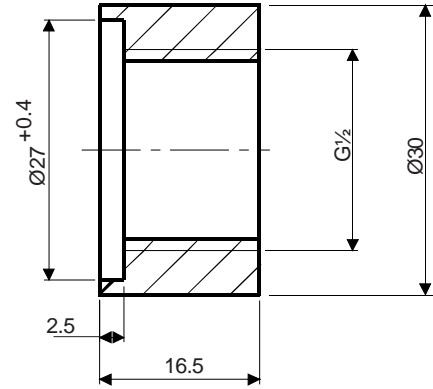
Order code: M1050368

Process coupling ½ - NPT



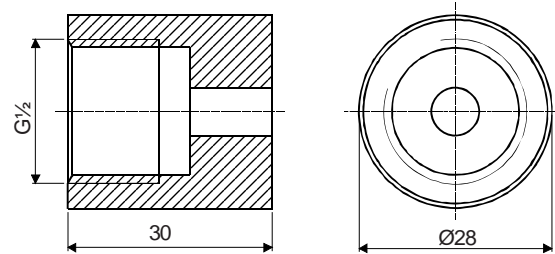
Order code: M1050515

Coupling G½ (for process connection code 5)



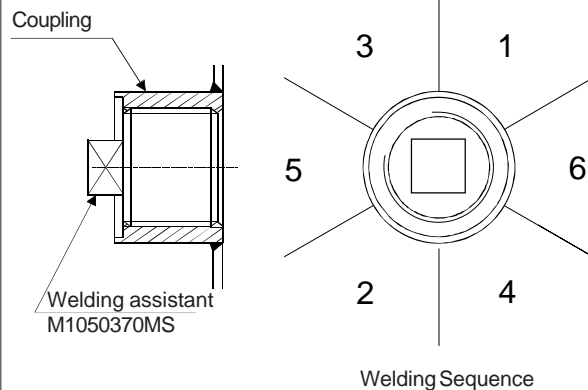
Order code: M1050369

Process coupling DIN 3852-X-G½



Order code: M1050367

Process coupling DIN 16288 - G½



Welding the coupling M1050369

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