

# SATRON VG Flush Mount Pressure Transmitter

**BPLV700**  
March 1, 2008

**SATRON VG pressure transmitter** belongs to the series V transmitters which will have both analog and smart properties. SATRON VG is used for 0-1.4 kPa...0-25 MPa ranges. The transmitter communicates in a 2-wire system. In pressure measuring applications SATRON VG-transmitters are used for measuring the pressure of clean, sedimenting, crystallizing and sticking materials. The transmitter's sensor is piezoresistive. The rangeability is 25:1. 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 depending from the desired option. This can be made by using external control shafts (analog option), keyboard (display option) or HART®275/375 communicator.

### Damping

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

### Temperature limits

Ambient: -30 to +80 °C  
Process: -30 to +125/+200 °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: 12 - 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; O-ring seals, 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:

$\pm[0.01+0.012 \times (\frac{\text{max. span}}{\text{calibrated span}})]\%$  of calibrated span

(incl. nonlinearity, hysteresis and repeatability)

### Long-term stability

±0.1 % / max. span / year

<sup>1)</sup> Parts in contact with process medium

### Temperature effect

- on -20 to +80 °C range  
(process temperature code **N**)  
Zero and span error:  
±0.15 % of max. span.  
- on 0 to +200 °C range  
(process temperature code **H**)  
Zero and span error:  
±1 % of max. span, VG6 - VG8  
±2 % of max. span, VG4 - VG5

### Mounting position effect

Zero error < 0.32 kPa, which can be calibrated out.

### 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

### EMC-test standards

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

### Insulation test voltage

500 V rms 50 Hz

### CONSTRUCTION AND CALIBRATION

#### Materials

Diaphragm <sup>1)</sup>: AISI316L, Duplex (Wnr 1.4462), Hast. C22/276, Titanium or Tantalum.

Coupling <sup>1)</sup>: AISI316L, Duplex (Wnr. 1.4462), Hast.C276 or Titanium.

Other sensing element materials: AISI316, SIS 2343.

**Filling fluid:** Silicone oil, food industry oil or inert oil

### Enclosure class IP66

### Housing with PLUG connector, housing type codes H and T

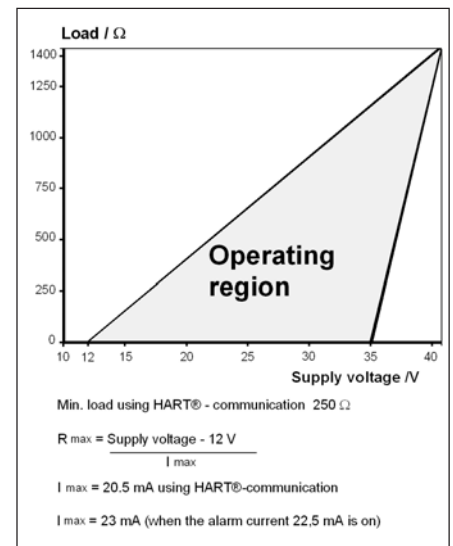
Housing: AISI316  
Seals: Viton® and NBR  
TEST jacks: MS358Sn/PVDF, protected with silicone rubber shield.  
PLUG connector: PA6-GF30 jacket, Silicone rubber seal, AISI316 retaining screw.

### Housing with junction box/terminal strip, housing type codes M and N

Housing: AISI303/316; Seals: Nitrile and Viton®; Nameplates: Polyester

### Connection hose between sensing element and housing

Codes L and K:  
PTFE hose with AISI316 braiding.



### Pressure limits

Maximum process pressure, MPa

Transmitter type	Max. overload pressure	Pressure class
VG3	0.2	PN40
VG4	0.3	PN40
VG5	1.5	PN40
VG6	7.5	PN100
VG7	40.0	PN250
VG8	100.0	PN250

Minimum process pressure

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

# SATRON VG Flush Mount Pressure Transmitter

## Calibration

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

## Process connections

G1 connecting thread  
 Process couplings: See Selection Chart and installation instructions or technical specification: Couplings for Transmitters **G150**.

## Electrical connections

Housing with PLUG connector, **H** and **T**:  
 PLUG connector, 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, **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** and **T** : 0.7 kg  
 - with housing type **M** : 1.2 kg  
 - with housing type **N** : 1.3 kg

## Product Certifications

### European Directive Information

#### 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 :

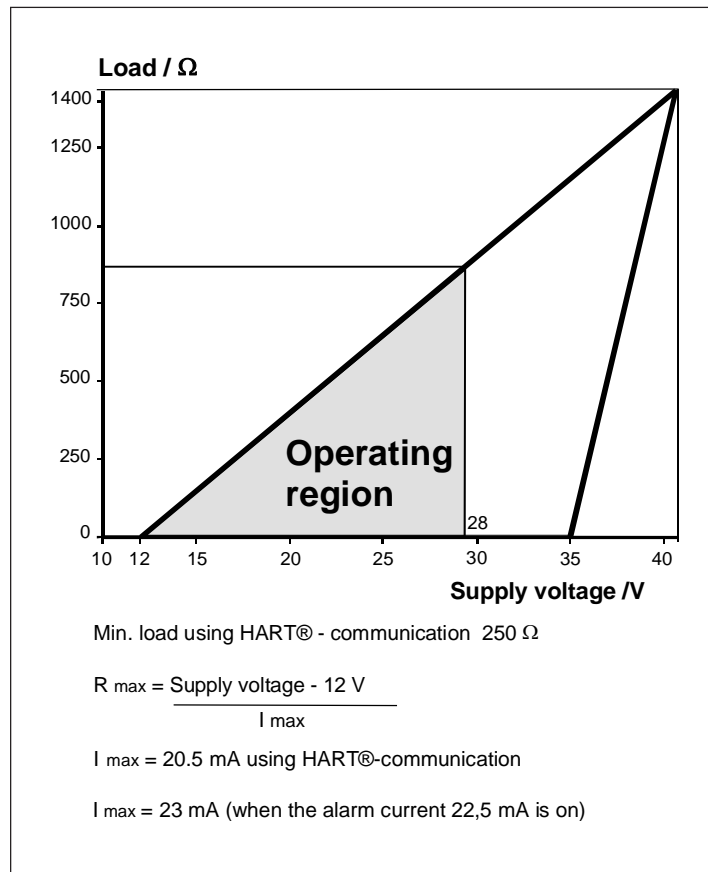
U<sub>i</sub> = 28 V  
 I<sub>i</sub> = 93 mA  
 P<sub>i</sub> = 0.651 W  
 C<sub>i</sub> = 5 nF  
 L<sub>i</sub> = 0.2 mH

### 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.

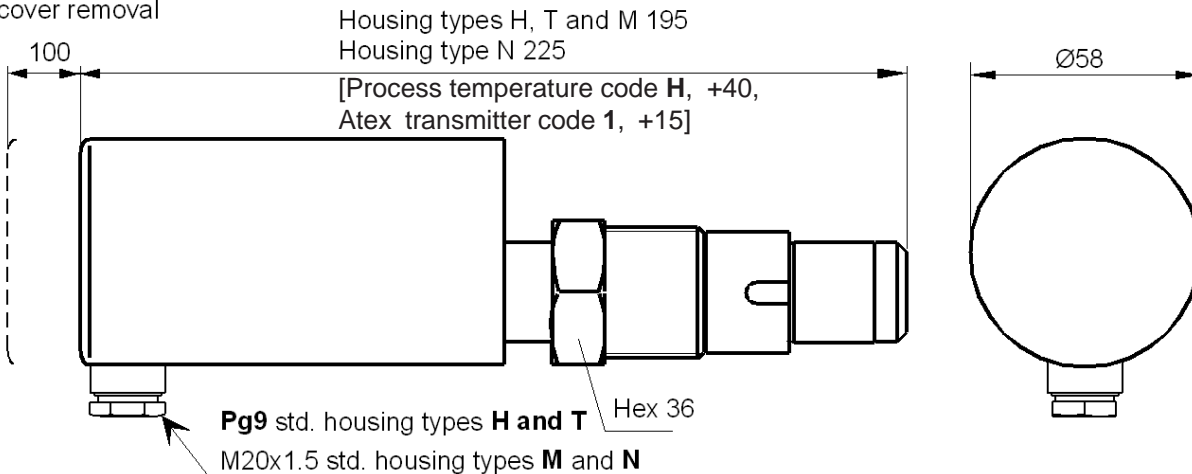


# SATRON VG Flush Mount Pressure Transmitter

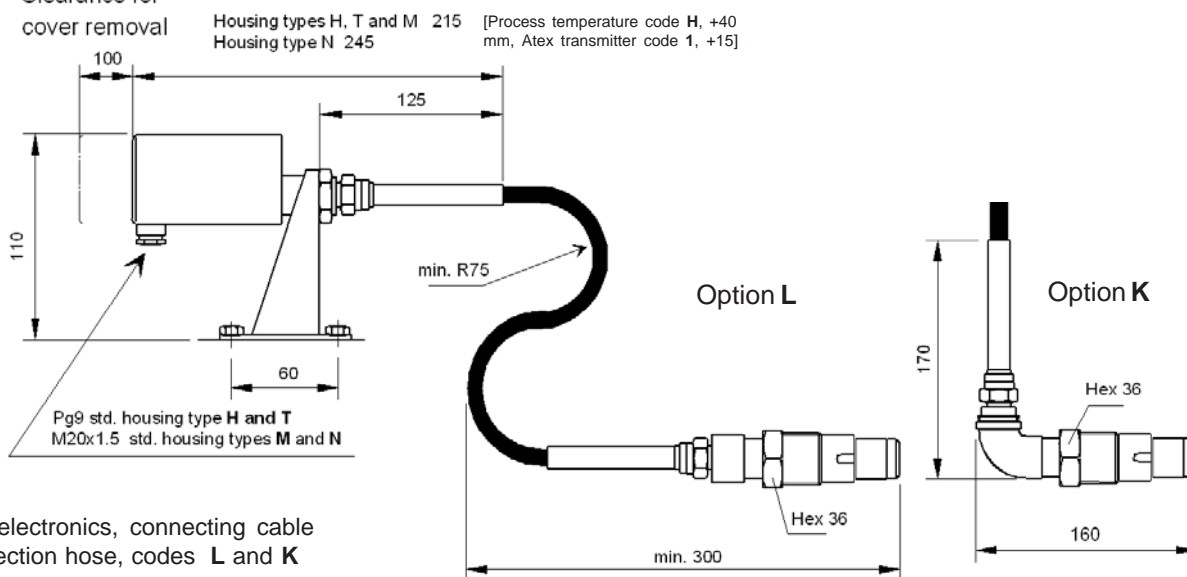
Dimensions (in mm)

1300354152

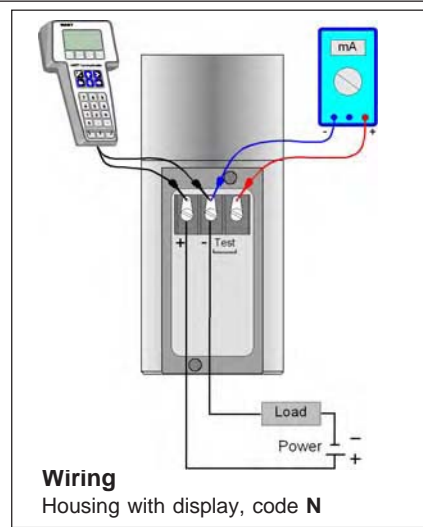
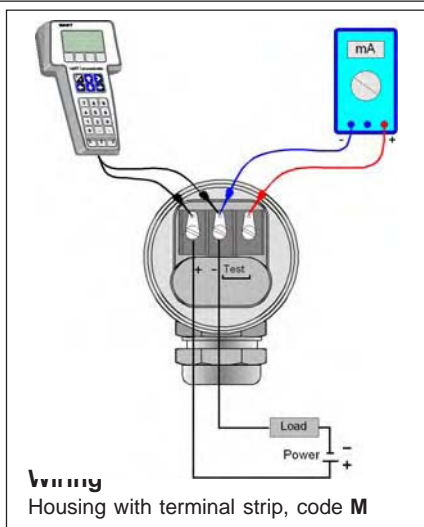
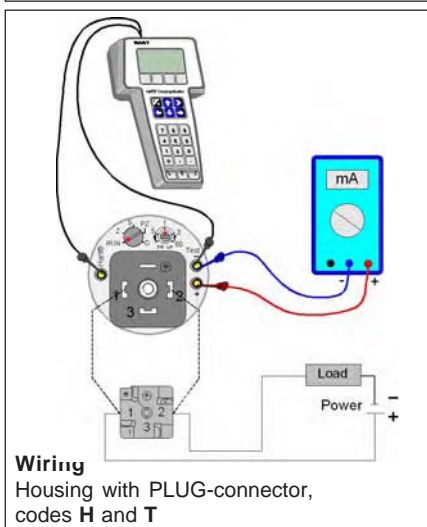
Clearance for cover removal



Clearance for cover removal

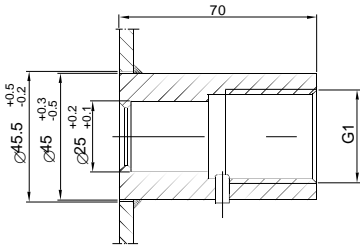


Remote electronics, connecting cable with protection hose, codes L and K



# SATRON VG Flush Mount Pressure Transmitter

## Couplings

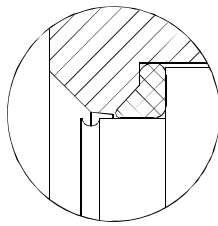


**Standard coupling**  
Material: AISI316 L or Hastelloy C

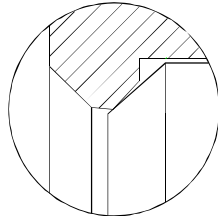
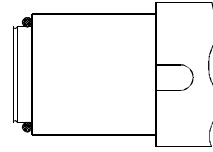
**Special couplings:**  
G1 hygienic coupling, M548101  
G1/2A/G1 coupling, M546190  
G1/2A/G1 coupling with venting, M860280  
G1/2A/G1 couplings with bracket:  
• G1/2A male, M546195  
• G1/2 female, M550393

## Transmitter's process sealing

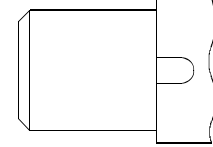
Three different options are available for the transmitter's process sealing:



AISI316L diaphragm,  
Viton O-ring  
(code 1)



AISI316L diaphragm,  
PTFE O-ring  
(code 2)



AISI316L, CoNi-, Duplex,  
Hastelloy C276 or Tantalum  
diaphragm, metal/metal taper  
sealing  
(diaphragm on sealing face)  
(code 4)

### Flanges:

Dimensions of flanged couplings, see the installation and setting-up instructions

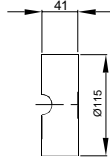
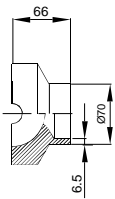
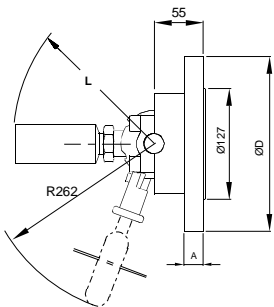
## PASVE® mounting & service valve

All PASVE® types are also available with pneumatic actuator, flushing and limit switches.

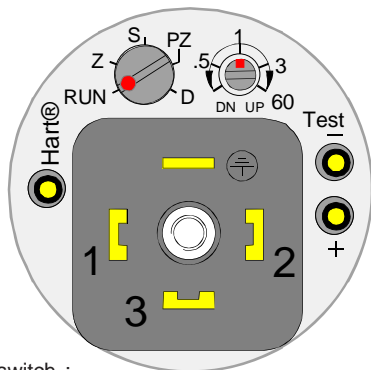
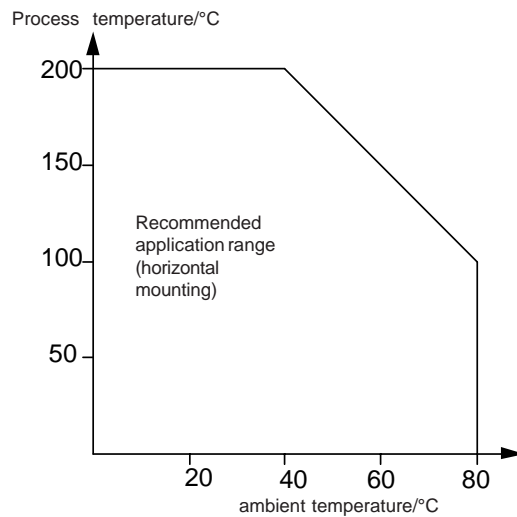
**PASVE GF (NF)**  
(Flange type)

**GP (NP)**  
(Welded  
on pipe)

**GC (NC)**  
(Welded  
on container)

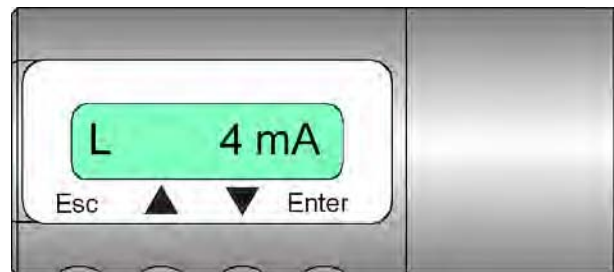


## Process temperature limits, code H



- Use of selector switch :
- RUN = working position
  - PZ = Process value zero
  - D = damping adjustment
  - S = Span adjustment
  - Z = Zero adjustment
  - DN = Down
  - UP = Up

Housing with PLUG-connector, housing code T



### 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.

Housing with display, housing code N

## Selection Chart

Adjustability	Span, min	Span, max	Measuring range
VG3	1.4 kPa (14 mbar)	35 kPa (350 mbar)	- 35...+35 kPa (-350...350 mbar)
VG4	4 kPa (40 mbar)	100 kPa (1000 mbar)	-100...+100 kPa (-1000...1000 mbar)
VG5	26.5 kPa (265 mbar)	500 kPa (5000 mbar)	-100...+500 kPa (-1000...5000 mbar)
VG6	0.03 MPa (0.3 bar)	3 MPa (30 bar)	-0.1...+3 MPa (-1...30 bar)
VGA6	0.03 MPa (0.3 bar)	3 MPa (30 bar)	0...+3 MPa (0...30 bar), abs.
VG7	0.15 MPa (1.5 bar)	15 MPa (150 bar)	0...+15 MPa (0...150 bar), abs.
VG8	1 MPa (10 bar)	25 MPa (250 bar)	-0,1...+25 MPa (-1...250 bar)

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

**Process seal** 1 O-ring (Viton®)(\*\*) 2 O-ring (PTFE)(\*\*) 4 metal/metal taper

### Wetted materials

Code	Material	Code	Material
2	AISI316L	6	Titanium (*) (**)
3	Hast. C 276 (*) (**)	7	CoNi-alloy (*) (not ranges 3-4)
5	Tantalum (*) (**)	8	Duplex (Wnr 1.4462) (*) (**)

### Diaphragm coating

Code	Material
9	gold/rhodium
Y	diamond

**Fill fluid** S Silicon oil G Inert oil A Food and beverage special oil (Neobee M20)

### Housing type

H	Housing with PLUG-connector, DIN43650, no display, inlet PG9
T	Housing with PLUG-connector and with manual adjust, DIN43650, no display, inlet PG9, (No ATEX)
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,  II 1 GD T135°C (\*\*\*)

**Process temperature limits** N -30 ... +125 °C H 0 ... +200 °C (\*) (\*\*)



### Process coupling

0 No coupling E Hygienic coupling  
G Standard coupling

### Material

2 AISI316L  
3 Hast.C276  
6 Titanium  
8 Duplex

PASVE® mounting valve, specify separately in the order  
Specify special couplings separately in the order

### Special size of electrical inlet

N 1/2 NPT G Pg13.5 P PLUG-connector DIN43650

## Special features

**Remote electronics** (specify only if housing connected with cable to sensing element)

### - connecting cable with protection hose

L Hose protected with PTFE/AISI316 braiding, straight  
K Hose protected with PTFE/AISI316 braiding, angle of 90°

### Length of connection cable between sensing element and housing

2 2 m cable  
3 3 m cable etc. (max. 10 m)

### Mounting parts for remote electronics for Ø 51 mm tube

0 No mounting parts 1 Mounting parts

### Documentation

**Calibration certificate** AE English

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


### Material certificates

0 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, in accordance with SFS-EN 10204-2.2 (DIN 50049-2.2) standard  
MC3 Raw material certificate for wetted parts, in accordance with SFS-EN 10204-3.1 B (DIN 50049-3.1 B) standard

We reserve the right for technical modifications without prior notice.

(\*) = only process seal code 4

(\*\*) = not for range 3

(\*\*\*) = Housing H and N :  II 2 GD T135°C

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