

SATRON VDt differential pressure transmitter belongs to V-transmitter family. The series V transmitters have both analog and smart properties. SATRON VDt is used for 0-0,1kPa...0-15 MPa ranges. The transmitter communicates in a 2-wire system. In pressure measuring applications SATRON VDt transmitters are used for measuring differential pressure and vacuum pressure. SATRON VDt transmitter is equipped with an SOS (Silicon On Sapphire) or piezoresistive sensing element. 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), HART®275/375 communicator.

### Damping

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

### Temperature limits

Sensing element operating:

- 30 to +125 °C

Electronics operating: -30 to +80 °C

Shipping and storage: -50 to +80 °C.

Operating temperature of display: 0 to +50°C (does not affect operation of the transmitter)

### Pressure limits

Min. and max. process pressure:

Type	Max. overload pressure, MPa	Pressure class
VDt2	4	PN40
VDt3	10	PN100
VDt4,5	10	PN100
VDt6	10	PN100
VDt3...7	40	PN400

Transmitter operates within specifications for pressures above 10 mbar abs.

### Process chamber volume (cm³)

Type	Volume (cm³)	
	Standard transmitter	with hydraulic seal
VDt2...7	2.0	1.0

**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

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

### PERFORMANCE SPECIFICATIONS

Tested in accordance with IEC 60770:

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 7.5:1-60:1:

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

(incl. nonlinearity, hysteresis and repeatability)

#### Long-term stability

±0.1 %/max. span for 12 months

#### Temperature effect on compensated temperature ranges -20 to 80 °C

Zero and span shift: ±0,15 % of max. span

#### Static pressure effect on Zero of max. span

VDt2: ±0.2 % per 4 MPa

VDt3...7, PN100: ±0.3 % per 10 MPa; ;

PN400: ±0.6 % per 40 MPa.

#### Overpressure effect on Zero of max. span

VDt2: ±0,5 % per 4 MPa;

VDt3...7: PN100: ±0.3 % per 10 MPa;

PN400: ±1 % per 40 MPa.

#### Mounting position effect

Zero error ±0.3 kPa, which can be calibrated out.

#### Power supply effect

< ±0.01 % of calibrated span per volt.

#### Insulation test voltage

500 V rms 50 Hz

### CONSTRUCTION AND CALIBRATION

#### Materials

Diaphragms <sup>1)</sup>: AISI316L, AISI317L,

Duplex (EN 1.4462) or Hast. C276.

Flanges <sup>1)</sup> and vent valves <sup>1)</sup>: AISI316 or Hast. C276.

O-ring on sensing element: PTFE.

Other sensing element materials:

AISI316, SIS 2343, SIS 2324.

Mounting bolts and nuts for sensor flanges: AISI316 (PN400: m.8.8.Zne)

#### Fill fluid

Silicone oil (DC200, 10 cSt) or inert oil.



### Housing with PLUG connector, H, P 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, M and N

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

### Connection cable between sensing element and housing

Codes L and K :

PTFE hose with AISI316 braiding.

**Enclosure class:** IP66.

### Process connections

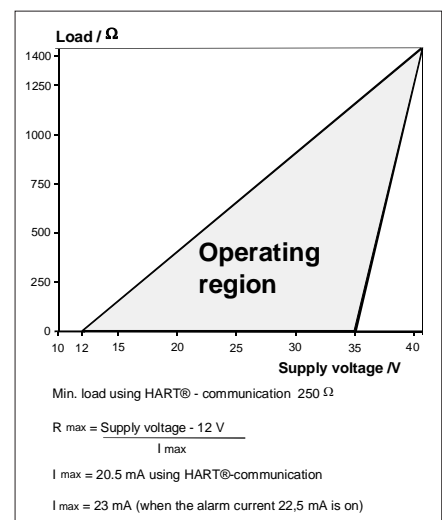
See Selection Table.

### Calibration

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

### Weight (kg)

Type	Housing type		
	H	M	N
VDt2 ... 7	4,0	4,6	4,7



# SATRON VDt differential pressure transmitter

BPdT750  
August 15, 2009

## Electrical connections

Housing with PLUG connector, **H**, **P** and **T** :  
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** :  
Pg13.5, 1/2-NPT inlet; screw terminals for 0.5 to 2.5 mm<sup>2</sup> wires

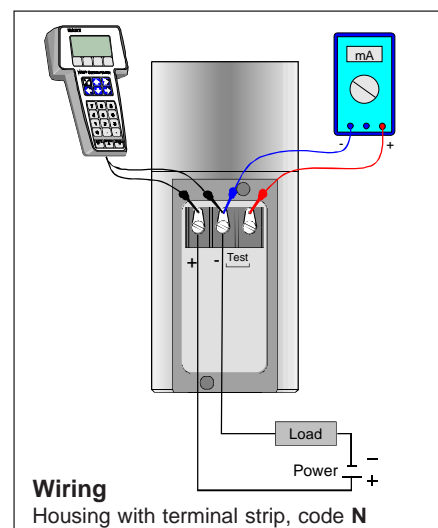
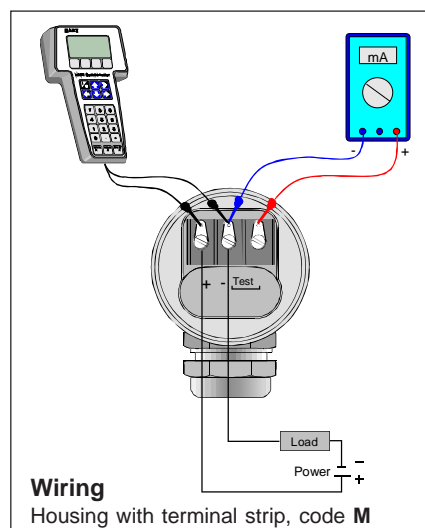
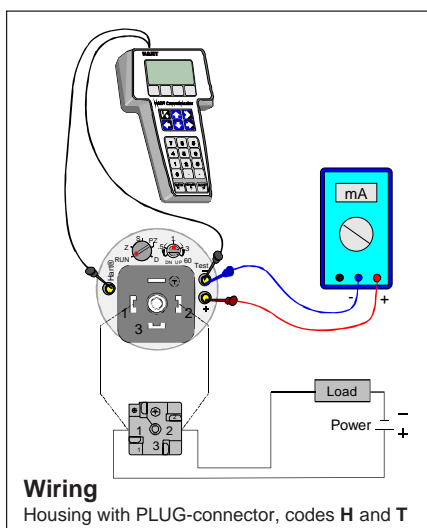
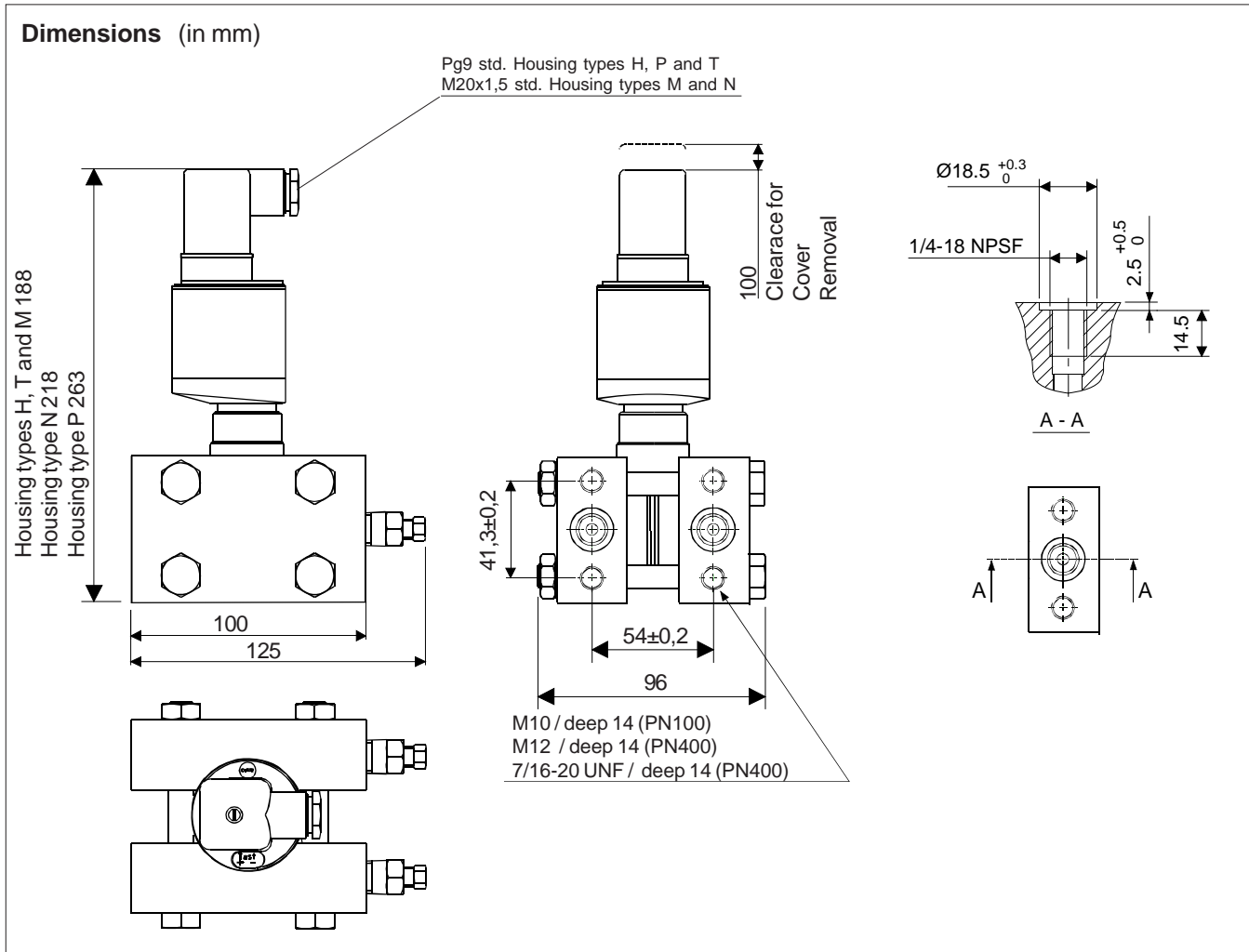
## Product Certifications

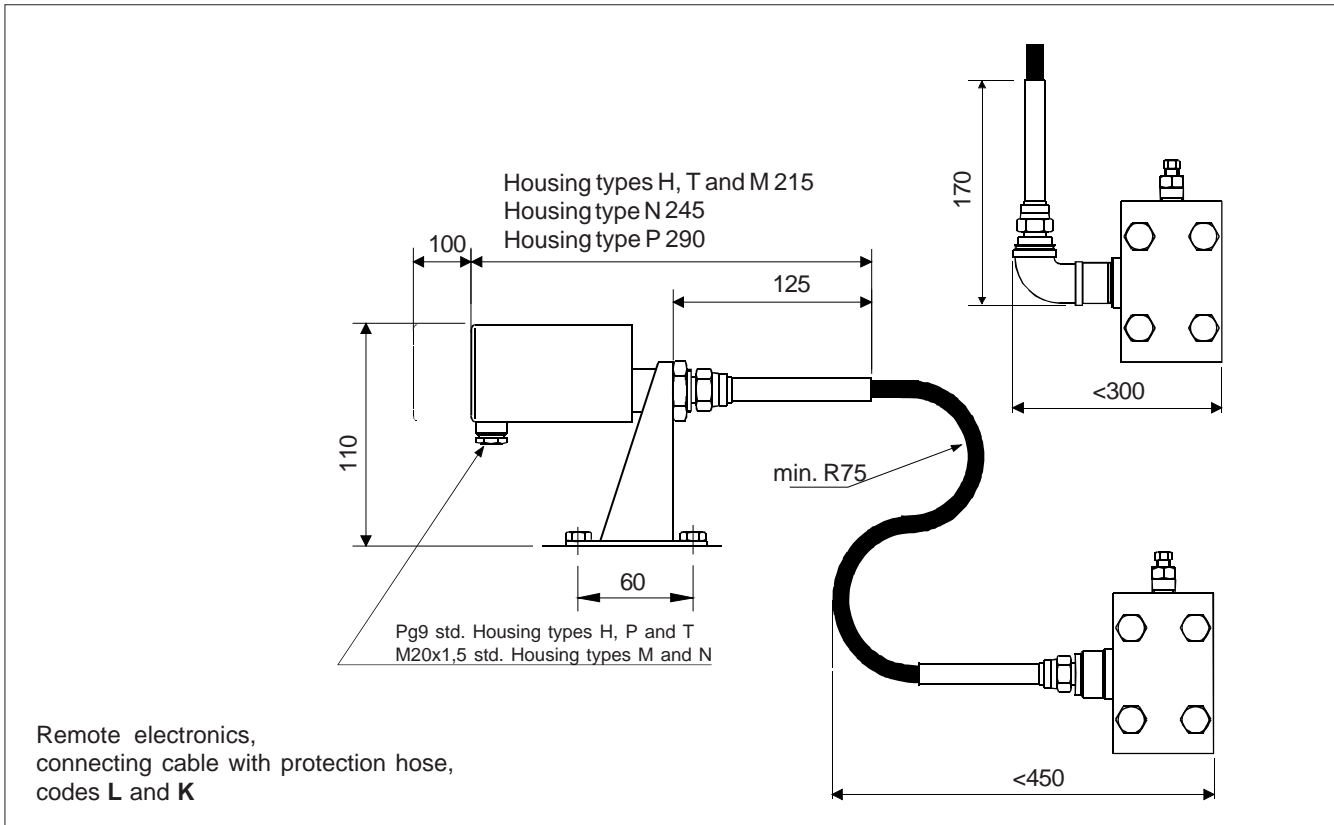
### European Directive Information

**Electro Magnetic Compatibility**  
(EMC directive 2004/108/EC)  
All Differential Pressure Transmitters

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

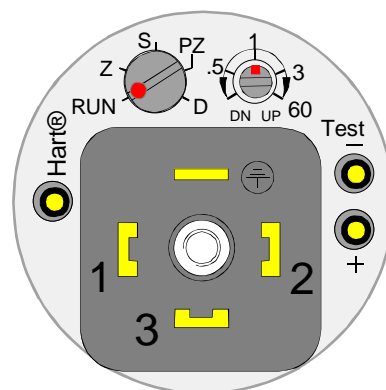
All Differential Pressure Transmitters :



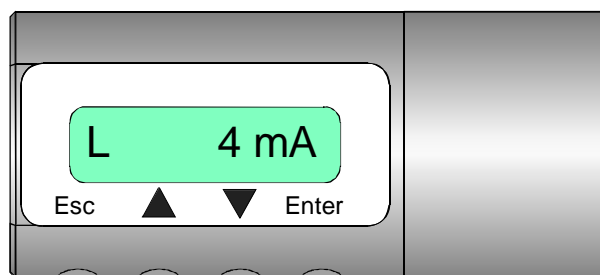
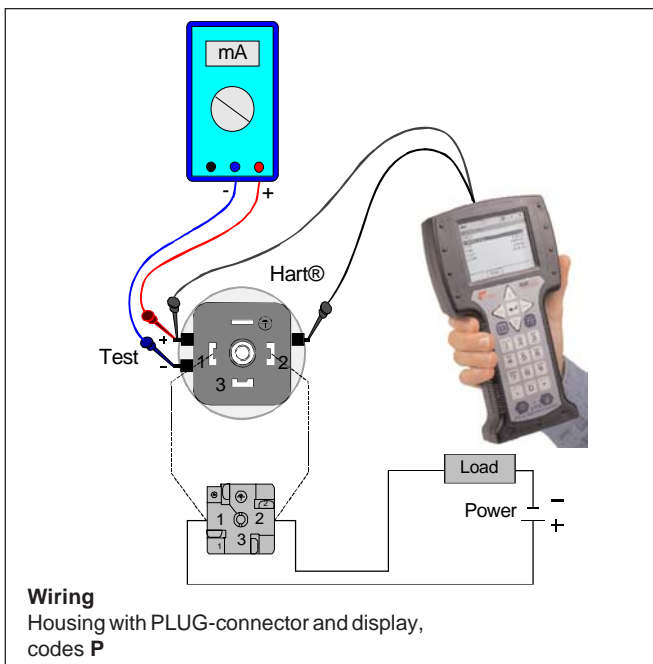


### Use of selector switch :

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



### Housing with PLUG-connector, 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, codes N and P

## Selection Chart

### VDt Differential Pressure Transmitter

#### Adjustability ( ± )

	Span, min.	Span, max.	Measurig range
<b>2</b>	0,1 kPa (1 mbar)	6 kPa (60 mbar)	-6...+6 kPa (-60...+60 mbar)
<b>3</b>	1,4 kPa (14 mbar)	35 kPa (350 mbar)	-35 kPa...+35 kPa (-350...+350 mbar)
<b>4</b>	4 kPa (40 mbar)	100 kPa (1000 mba)	-100...+100 kPa (-1000...+1000 mbar)
<b>5</b>	26,5 kPa (265 mbar)	500 kPa (5000 mbar)	-500...+500 kPa (-5000...+5000 mbar)
<b>6</b>	0,145 MPa (1,45 bar)	3 MPa (30 bar)	-3...+3 MPa (-30...+30 bar)
<b>7</b>	1 MPa (10 bar)	15 MPa (150 bar)	-15...+15 MPa (-150...+150 bar)

#### Output

**S** 4-20mA DC/HART® -protocol

#### Process connection

**D** M10,PN40 range 2/PN100 ranges 3 to 6,DIN19213 Teil 1. **H** M12,PN400 ranges 3, 4, 5 and 7,DIN 19213 Teil 2.  
**U** 7/16-20 UNF,(PN400 ranges 3, 4, 5 and 7 only). **F** Screwed flange adapters,PN40 range 2 and PN100 ranges 3 to 6,DIN19213 Teil 1; PN250 range 7,DIN19213 Teil 2.  
**Z** Welded flange adapters,PN400 ranges 3 to 5 and 7,DIN19213. **V** Connection through hydraulic seal.

#### Wetted material

#### Flanges

Code	Material
<b>2</b>	AISI316L
<b>3</b>	Hast.C 276

#### Diaphragm

Code	Material
<b>2</b>	AISI316L/AISI317L
<b>3</b>	Hast.C 276
<b>5</b>	Tantalum
<b>8</b>	Duplex (EN 1.4462)

#### Diaphragm coating

Code	Material
<b>9</b>	gold / rhodium (specify only when coated)

#### Fill fluid

**S** Silicone oil **G** Inert oil

#### Housing type

**H** Housing with PLUG-connector, DIN43650, no display, inlet PG9  
**P** Housing with PLUG-connector, DIN43650, with display, inlet PG9  
**T** Housing with PLUG-connector, DIN43650, no display, inlet PG9, with manual adjust  
**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



Process thread on flange adapter (only specify for type F)	Thread type		Thread size	
	Code	Type	Code	Size
	<b>R</b>	straight R thread	<b>2</b>	1/4
	<b>N</b>	NPS thread	<b>3</b>	3/8
	<b>P</b>	taper R thread	<b>4</b>	1/2
	<b>T</b>	NPT thread		

**Special size of electrical inlet**  
**N** 1/2 NPT **G** Pg13.5

#### Special features

**Special electronics** (specify only if housing connected with hose 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 cable between sensing element and housing

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

**2** 2 m cable **3** 3 m cable etc. (max. 20 m)

#### Mounting parts for remote electronics for Ø51 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 materials certificate without appendixes, in accordance with SFS-EN 10204-2.1 (DIN 50049-2.1) standard

**MC2** Raw materials certificate for wetted parts with appendixes, in accordance with SFS-EN 10204-2.2 (DIN 50049-2.2) standard

**MC3** Raw materials certificate for wetted parts with appendixes, in accordance with SFS-EN 10204-3.1B (DIN 50049-3.1B) standard

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