

# Loadlock Transmitter

## THERMOVAC TTR 200 N PENNINGVAC PTR 200 N



THERMOVAC Transmitter TTR 200 N (left) and PENNINGVAC Transmitter PTR 200 N (right)

The TTR 200 N and PTR 200 N combine different measurement technologies in one housing making them the perfect gauges for load lock applications. The transmitters offer a wide absolute measurement range and a differential range of  $-10^{13}$  to  $10^{13}$  mbar (relative to ambient pressure). The highly accurate differential sensor is ideal for loadlock control since it is insensitive to changes in ambient pressure conditions. Efficient loadlock control will improve throughput due to reduced cycle time.

### Advantages to the User

- Fast, accurate and repeatable pressure measurements reduce process cycle time
- Gas type independent pressure measurements from 50 mbar to 1500 mbar
- Combination of absolute and differential measurements offer unprecedented loadlock control
- Three integrated setpoints
- Up to three sensors in one housing for a wide measurement range
- Measurement signal insensitive to mounting position
- Ease of operation via analog output and digital communication
- LED ring to indicate status of the sensor

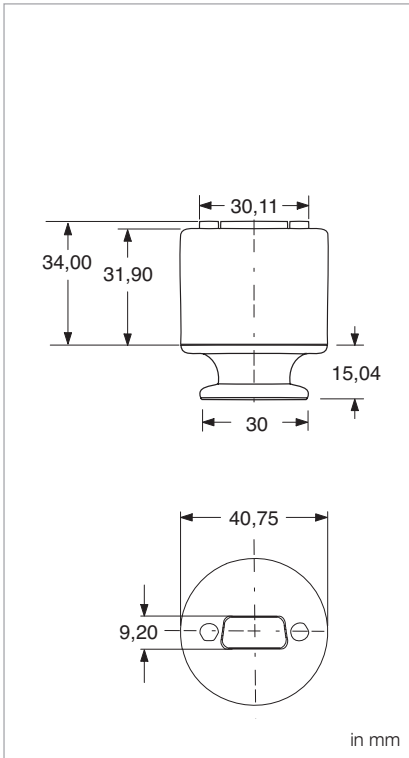
### Typical Applications

- Load lock applications
- Chamber over and under pressure control relative to ambient
- Coating Systems (e. g. UNIVEX)
- Vacuum chamber production
- Processes requiring both absolute pressure measurement and atmospheric switching capabilities
- Analytical equipment (e. g. mass spectrometer control)
- Scanning electron microscopes

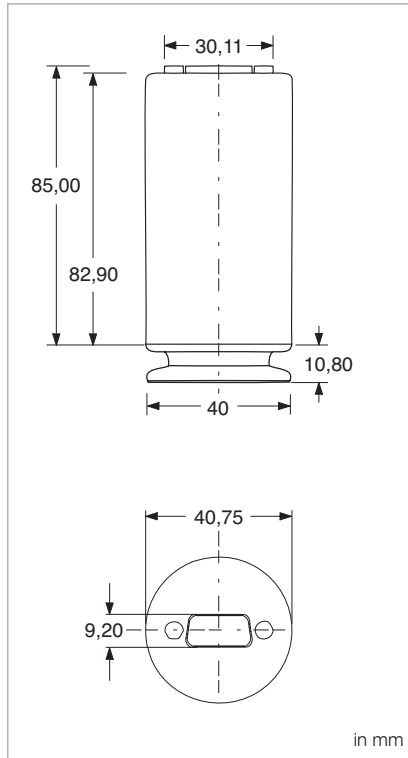
### Option

For protection of the sensor TTR 200 N and PTR 200 N against contamination, radiation and other disturbing factors the installation of a baffle is recommended.

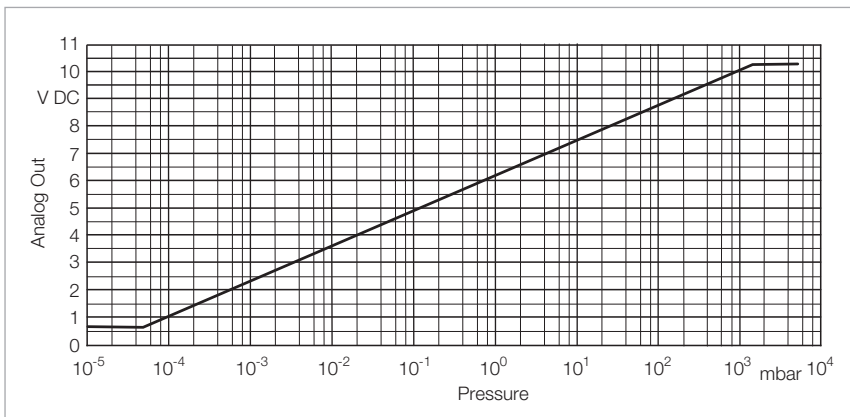
Two types of baffles are available: A build-in version for CF connections is mounted in the sensor; the baffle for ISO-KF connections is integrated in a centering ring.



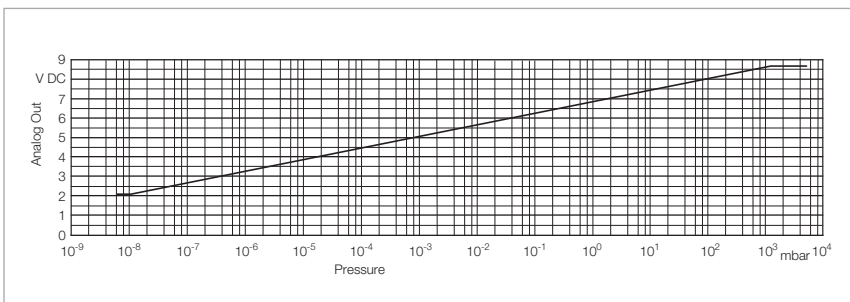
Dimensional drawing for the THERMOVAC transmitter TTR 200 N



Dimensional drawing for the PENNINGVAC transmitter PTR 200 N



Characteristic of the THERMOVAC Transmitter TTR 200 N



Characteristic of the PENNINGVAC transmitter PTR 200 N

## Technical Data

## Loadlock Transmitter

### TTR 200 N

### PTR 200 N

Measurement range (N <sub>2</sub> and air)	mbar (Torr)	5.0 x 10 <sup>-5</sup> to 1500 (3.75 x 10 <sup>-5</sup> to 1125) 5 x 10 <sup>-5</sup> to 1500 [RS 232] (3.75 x 10 <sup>-5</sup> to 1125) [RS 232]	1.0 x 10 <sup>-8</sup> to 1500 (0.75 x 10 <sup>-8</sup> to 1125) 1 x 10 <sup>-8</sup> to atm. [RS 232] (0.75 x 10 <sup>-8</sup> to atm.) [RS 232]
absolute		-1013 to 1013 [RS 232] (-760 to 760) [RS 232]	-1013 to 1013 [RS 232] (-760 to 760) [RS 232]
differential			
Measurement uncertainty of reading (typical) <sup>1)</sup>	mbar		
Cold Cathode		–	1 x 10 <sup>-8</sup> to 1 x 10 <sup>-3</sup> ±30 % 1 x 10 <sup>-4</sup> to 1 x 10 <sup>-3</sup> ±10 % 1 x 10 <sup>-3</sup> to 100 ±5 % 100 to atm. ±25 %
MEMS-Pirani		1 x 10 <sup>-4</sup> to 1 x 10 <sup>-3</sup> ±10 % 1 x 10 <sup>-3</sup> to 100 ±5 % 100 to atm. ±25 %	1 x 10 <sup>-4</sup> to 1 x 10 <sup>-3</sup> ±10 % 1 x 10 <sup>-3</sup> to 100 ±5 % 100 to atm. ±25 %
Diff. Piezo		-10 to 10 ±10 % ±0.67 mbar -100 to -10 ±8 % -1013 to -100 ±1 % 10 to 100 ±5 %	10 to 10 ±10 % ±0.67 mbar -100 to -10 ±8 % -1013 to -100 ±1 % 10 to 100 ±5 %
Repeatability of reading (typical) <sup>1)</sup>	mbar		
Penning		1 x 10 <sup>-3</sup> to 100 ±2 %	1 x 10 <sup>-8</sup> to 100 ±2 %
MEMS-Pirani		1 x 10 <sup>-3</sup> to 100 ±2 %	1 x 10 <sup>-3</sup> to 100 ±2 %
Diff. Piezo		-1013 to 10 ±1 %	-1013 to 10 ±1 %
Sensor Measurement principle		MEMS-Pirani and Diff. Piezo Thermal conductivity, combined with Piezo	Cold cathode, MEMS-Pirani and Diff. Piezo Thermal conductivity, combined with Piezo and cold cathode ionization
Supply voltage	V DC	9 to 30	
Power consumption	W	< 1.2	< 2
Electrical connection	V	D-Sub 15 pin	
Analog output	V DC	$V_{out} = \log_{10}(P_{mbar}) \times 1.286 + 6.143$ 0.61 to 10.23	$V_{out} = \log 0.6(P_{mbar}) + 6.8$ 2.0 to 8.667
Resolution	bit	16	16
Impedance	Ω	100	100
Update rate	Hz	16	16
Interfaces		RS 232	
Set point			
Range			
Absolute	mbar (Torr)	1 x 10 <sup>-4</sup> to 1333 (0.75 x 10 <sup>-4</sup> to 1000)	1 x 10 <sup>-8</sup> to 1333 (0.75 x 10 <sup>-8</sup> to 1000)
Differential	mbar (Torr)	-1013 to 133 (-775 to 100)	-1013 to 133 (-775 to 100)
Relay		3	3
Relay contact rating		1 A at 30 V AC / DC, resistive load	1 A at 30 V AC / DC, resistive load
Relay contact resistance, max.	mΩ	100	100
Relay contact endurance, min.			
1.0 A at 30 V DC load		100 000	100 000
0.2 A at 30 V DC load		2 000 000	2 000 000
Status indicators		LED-ring (360°)	
Max. cable length	m	20	
Overpressure limit (abs.)	bar	2	
Operating temperature range <sup>2)</sup>	°C (°F)	0 to 60 (32 to 140)	
Storage temperature range	°C (°F)	-20 to +65 (-4 to 149)	
Max. bakeout temperature	°C (°F)	85 (185)	
Max. rel. humidity	% n.c.	0 – 95	
Installation orientation		Any	
Materials exposed to vacuum		304 stainless steel, Tin, Gold, Viton®	304 stainless steel, Ceramic (Al <sub>2</sub> O <sub>3</sub> ), Tin, Gold, Viton®, Titaniu
Dead volume (DN 16ISO-KF), approx	cm <sup>3</sup>	2.8	28.6
Weight (DN 16 ISO-KF)	g	305	321
Protection class	IP	40	
CE certification		EMC Directive 2014/30/EEC	
Controller type		GRAPHIX ONE / TWO / THREE	

<sup>1)</sup> Accuracy and repeatability are typical values measured with Nitrogen gas at ambient temperature after zero adjustment

<sup>2)</sup> There may be minimal deviation tolerances in the range of 40 – 60 °C

## Ordering Information

## Loadlock Transmitter

### TTR 200 N

### PTR 200 N

	Part No.	Part No.
THERMOVAC TTR 200 N DN 16 ISO-KF, 3SP	<b>230365V02</b>	-
PENNINGVAC PTR 200 N DN 25 ISO-KF, RS 232, 3 SP	-	<b>230087V02</b>
Replacement cathode plate for PTR 90 N / PTR 225 N (up to serial no. 17022777352)	-	<b>EK16291V02</b>
for PTR 90 N / PTR 225 N (from serial no. 17022777353)	-	<b>EK16292V02</b>
Replacement anode ring for PTR 90 N / PTR 225 N (up to serial no. 17022777352)	-	<b>20028711V02</b>
for PTR 90 N / PTR 225 N (from serial no. 17022777353)	-	<b>E20028712V02</b>
Baffle, with centering ring (FPM (FKM)) DN 25 ISO-KF	-	<b>230 078</b>
Centering ring with fine filter DN 16 ISO-KF	<b>883 96</b>	-
Optional accessories		
Connection cable, RS 232 <sup>1)</sup>		<b>Type G</b>
5 m		<b>230550V01</b>
10 m		<b>230551V01</b>
15 m		<b>230552V01</b>
20 m		<b>230553V01</b>
RS232 / USB Converter for setpoint definition and parametrization of RS232 gauges		<b>230399V02</b>

<sup>1)</sup> See chapter "Connection cables for Active Sensors"