

PENNINGVAC-Transmitter PTR 90 N



PENNINGVAC Transmitter PTR 90 N analog (left); digital (middle), with Display (right)

The PENNINGVAC transmitter combines the cold cathode ionization principle with the MEMS-Pirani sensor. This allows the complete coverage of the measurement range from 1×10^{-8} mbar to atmosphere by a single transmitter. The compact design, broad measurement range and cost efficiency make this transmitter the perfect gauge for several applications.

Advantages to the User

- Enhanced reliability through automatically turning on the cold cathode by the MEMS-Pirani
- Significantly higher accuracy in the upper range by using the MEMS Pirani
- Longer lifetime due to low cold cathode turn on pressure
- High reproducibility
- Available with display for pressure units, set point parameters and operation status
- Wide measurement range combining two sensor technologies into a single output
- Ease of serviceability by modular design of the cold cathode
- Automatic zeroing during pump down cycle for improved accuracy
- LED ring to indicate status of the sensor
- Measurement signal insensitive to mounting position

Typical Applications

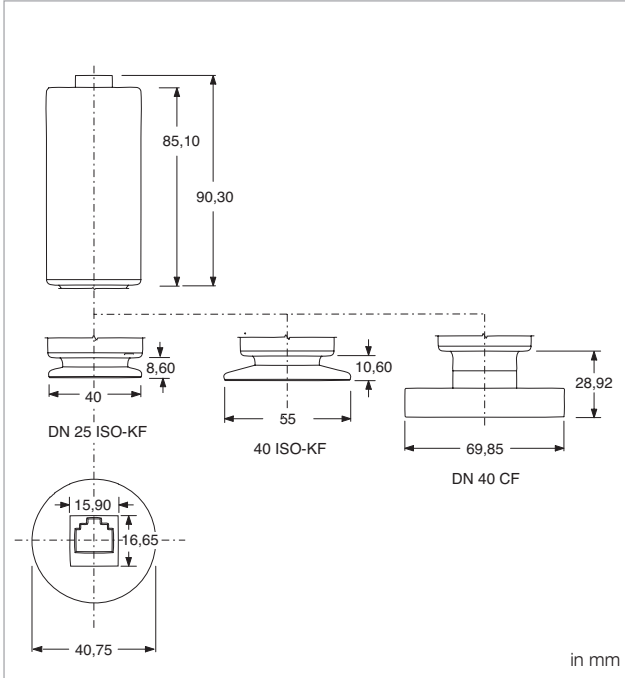
Typical Applications within the measurement range from 1×10^{-8} mbar to atmosphere are:

- General vacuum base pressure measurement
- Sputtering and coating technology
- Analytical technology (e. g. mass spectrometer control)
- Vacuum Furnaces
- Multipurpose pressure measurement and control up to the high vacuum range
- Metallurgy
- Scanning electron microscopes
- Process industry

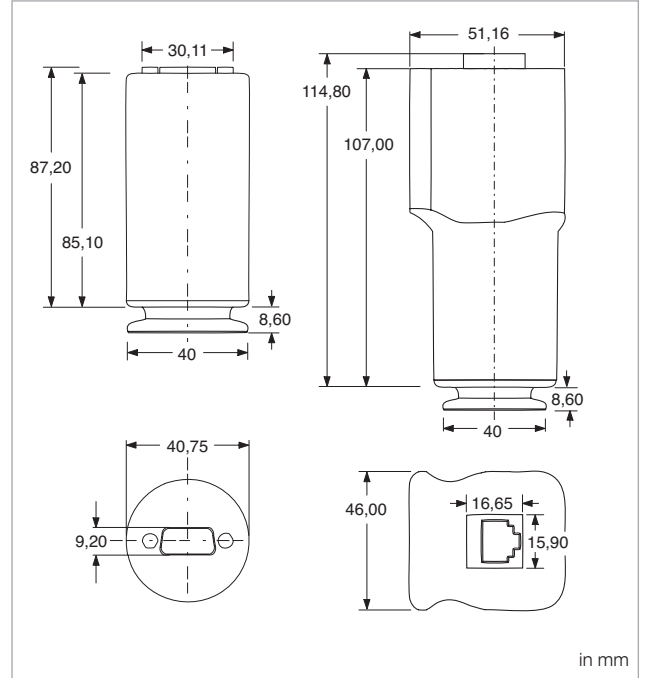
Option

For protection of the sensor PTR 90 N against contamination, radiation and other disturbing factors the installation of a baffle is recommended.

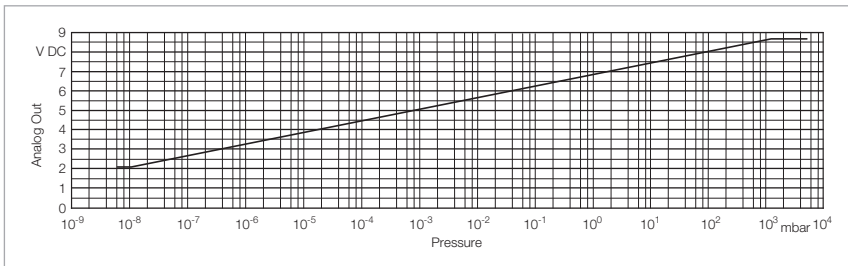
Two types of baffles are available: A build-in version for CF connections is mounted in the sensor; the baffle for ISO-KF connections is integrated in a centering ring.



Dimensional drawing for the PENNINGVAC transmitter PTR 90 N



Dimensional drawing for the PENNINGVAC transmitters PTR 90 N, RS 232 (left) and PTR 90 N, EtherCAT (right)



Characteristics of the PENNINGVAC Transmitters PTR 90 N

Technical Data

PENNINGVAC Transmitter PTR 90 N

Measurement range	mbar (Torr)	1.0 x 10 ⁻⁸ to 1000 (0.75 x 10 ⁻⁸ to 750)
Measurement uncertainty of reading (typical) ¹⁾		
Cold cathode	mbar	1 x 10 ⁻⁸ to 5 x 10 ⁻⁴ ±30 %
MEMS Pirani	mbar	5 x 10 ⁻⁴ to 1 x 10 ⁻³ ±10 % 1 x 10 ⁻³ to 100 ±5 % 100 to 1000 ±25 %
Repeatability of reading (typical) ¹⁾	mbar	1 x 10 ⁻³ to 100 ±2 %
Sensor Measurement principle		Cold cathode and MEMS Pirani Cold cathode ionization and thermal conductivity
Supply voltage	V DC	9 – 30
Power consumption	W	< 2
Electrical connection		FCC 68, RJ 45 (analog) / Sub-D 15 PIN (digital)
Analog output	V DC	$V_{out} = \log 0.6 (P_{mbar}) + 6.8$ 2.0 to 8.668 / 2.0 to 8.667 [RS 232]
Resolution	bit	16
Impedance	Ω	100
Update rate	Hz	16
Interfaces		FCC 68, RJ 45 (analog) / RS232, EtherCAT (digital)
Set point		
Range	mbar (Torr)	1.0 x 10 ⁻⁸ to 1000 (0.75 x 10 ⁻⁸ to 750)
Relay		0 / 2 [RS 232]
Relay contact rating		1 A at 30 V AC / DC, resistive load
Relay contact resistance, max.	mΩ	100
Relay contact endurance, min.		
1.0 A at 30 V DC load		100 000
0.2 A at 30 V DC load		2 000 000
Status indicators		LED-ring (360°)
Max. cable length	m	100
Overpressure limit	bar	6
Operating temperature range ²⁾	°C (°F)	0 to 60 (32 to 140)
Storage temperature range	°C (°F)	-20 to +65 (-4 to 149)
Max. bakeout temperature (power off)	°C (°F)	85 (185)
Max. rel. humidity	% n.c.	0 – 95
Installation orientation		Any
Materials exposed to vacuum		304 stainless steel, 403 stainless steel, Ceramic (Al ₂ O ₃), Tin, Gold, Viton®, Titanium
Dead volume (DN 25 ISO-KF), approx.	cm ³	28.6
Weight (DN 25 ISO-KF)	g	321
Protection class	IP	40
CE certification		EMC Directive 2014/30/EEC
Controller type		DISPLAY ONE / TWO / THREE and GRAPHIX ONE / TWO / THREE

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

²⁾ There may be minimal deviation tolerances in the range of 40 - 60 °C

Ordering Information

PENNINGVAC Transmitter PTR 90 N

	Part No.
PTR 90 N	
DN 25 ISO-KF, FCC 68 / RJ 45	230070V02
DN 25 ISO-KF, Display, FCC 68 / RJ 45	230085V02
DN 25 ISO-KF, EtherCAT	230089V02
DN 25 ISO-KF, 2 SP, RS 232	230088V02
DN 40 ISO-KF, FCC 68 / RJ 45	230071V02
DN 40 CF, FCC 68 / RJ 45	230072V02
Replacement cathode plate for PTR 90 N / PTR 225 N (up to serial no. 17022777352)	EK16291V02
for PTR 90 N / PTR 225 N (from serial no. 17022777353)	EK16292V02
Replacement anode ring for PTR 90 N / PTR 225 N (up to serial no. 17022777352)	20028711V02
for PTR 90 N / PTR 225 N (from serial no. 17022777353)	E20028712V02
Baffle, with centering ring (FPM (FKM))	
DN 25 ISO-KF	230 078
DN 40 ISO-KF	230 079
Calibration	see chapter "Miscellaneous", para. "Leybold Calibration Service"
Operating Units	
DISPLAY ONE	230 001
DISPLAY TWO	230 024
DISPLAY THREE	230 025
GRAPHIX ONE	230680V01
GRAPHIX TWO	230681V01
GRAPHIX THREE	230682V01
Connection cable, FCC 68 on both ends ¹⁾	Type A
5 m	124 26
10 m	230 012
15 m	124 27
20 m	124 28
30 m	124 29
50 m	124 31
75 m	124 32
100 m	124 33
Connection cable, RS 232 ¹⁾	Type G
5 m	230550V01
10 m	230551V01
15 m	230552V01
20 m	230553V01
RS232 / USB Converter for setpoint definition of RS232 gauges	230399V02

¹⁾ See chapter "Connection cables for Active Sensors"