

PENNINGVAC Transmitters

PTR 225 / PTR 225 S / PTR 237



The PENNINGVAC transmitters have been developed especially for integration in programmable control systems. As active sensors (pressure to voltage converters) - equipped with a rugged cold cathode sensing cell and with matched operating and processing electronics - these transmitters offer a wide measurement range of 1×10^{-9} to 1×10^{-2} mbar (0.75×10^{-9} to 0.75×10^{-2} Torr). The measurement signal may be transmitted over long distances without problems.

Advantages to the User

- All-metal cold cathode sensors (inverted Penning)
- High reproducibility
- Good ignition characteristics through the optimized design for the electrodes
- Low tendency for contamination (also during argon operation) due to high voltage reduction after ignition of the plasma and due to the titanium cathodes
- Switching threshold adjustable over a wide range (1×10^{-9} to 1×10^{-2} mbar (0.75×10^{-9} to 0.75×10^{-2} Torr)) and with a load-bearing relay contact (PTR 225 S)
- Low stray magnetic field
- High EMI compatibility through screened housing, FCC-68 connector and cables
- LED indicator for operation
- Logarithmic signal output (algorithm supplied)
- Intelligent interface
- CE mark
- High resistance against sputtering due to titanium cathode plates

Typical Applications

- Evaporation and sputtering systems
- Analytical engineering
- Vacuum furnaces
- High vacuum systems
- General pressure measurement and control on systems in the fine and rough vacuum range which have the following requirements:
 - Immediate data transfer to a programmable control/computer via analog interface
 - Coverage of greater distances between the point of the measurement and processing location
 - Several locations which are to be monitored continuously
 - Low voltage supply
 - Simple, cost and space saving installation
 - Increased reliability, also in argon processes (sputtering)
 - Simple operation
 - Increased requirements concerning electromagnetic compatibility (EMI)

Option

For protection of the sensors PTR 225 against contamination, radiation and other disturbing factors the installation of a baffle is recommended.



Baffle DN 25 KF, Part No. 230 078

Sensor

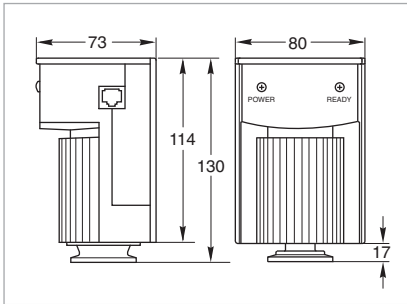
Cold cathode sensors - based on the well-proven principle of the inverted Penning - are built into the PENNINGVAC transmitters PTR 225/225 S/237 which have a DN 25 KF or DN 40 CF flange. The housing of the transmitter, including its electronics, as well as the magnet can easily be removed for degassing of the all-metal sensor with Al_2O_3 current feed-through. The design of the Penning

sensors with its closed magnetic field causes a negligible stray field. Thus the PTR 225/225 S/237 may also be installed close to sensitive parts within a system.

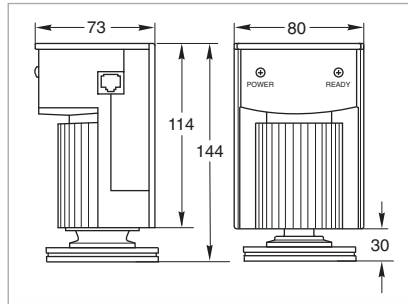
The anode ring and the titanium cathode plates can be exchanged easily for quick maintenance of the sensors in case of contamination. The shape of the cathode plates is such that they also act as a baffle for the sensors.

Integration of the transmitter in programmable control systems is facilitated by the linear characteristic which can be defined by entering a simple equation into the computer.

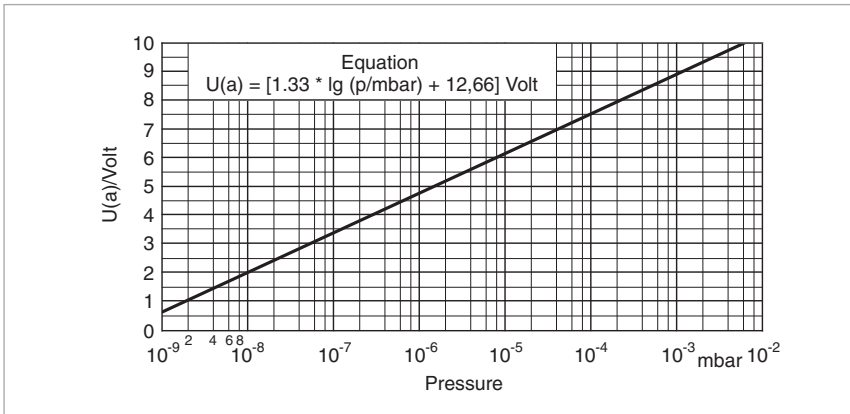
Built-in relays (PTR 225 S) allow switching functions to be performed directly by the transmitter, without the need of a programmable control.



Dimensional drawing for the PTR 225



Dimensional drawing for the PTR 237



Characteristic of the PTR 225/225 S/237

Technical Data

PENNINGVAC Transmitter

PTR 225 / PTR 225 S / PTR 237

Display range	mbar (Torr)	1×10^{-9} to 1×10^{-2} (0.75×10^{-9} to 0.75×10^{-2})
Measurement uncertainty		30% in the range 1×10^{-8} to 1×10^{-4} mbar (0.75×10^{-8} to 0.75×10^{-4} Torr)
Principle of measurement		Cold cathode ionization according to Penning
Supply voltage		14.5 to 36 V DC typ. 24 V DC hum voltage < 2 Vpp
Power consumption	VA	< 2
Storage temperature range	°C	-20 to +70
Nominal temperature range	°C	+10 to +50
Max. rel. humidity (climatic class F)	% n.c.	95
Protection class	IP	40
Dimensions (H x W x D)	mm	125 x 80 x 73
Weight, approx.	kg (lbs)	0.5 (1.1)
Inflammability		UL 94 - V 2
Sensor		Detachable for cleaning
Vacuum connection	DN	25 KF or 40 CF
Degassing temperature, max.	°C	250 with electronics detached
Dead volume, max.	cm ³	21
Materials in contact with the medium		Stainless steel, CrNi, Al ₂ O ₃ ceramics, NiFe, Mo, Cu, Ni, titanium
Over-pressure rating (abs.)	bar	10
Signal output (R _a ≥ 10 kΩ) Measurement signal		0 to 10.6 V 0.66 to 10 V, corresponds to 1×10^{-9} to 1×10^{-2} mbar logarithm. divisions 1.333 V/decade
Trigger (PTR 225 S) Adjustment range Hysteresis Rating Error status	mbar (Torr)	Changeover relay contact 1×10^{-9} to 1×10^{-3} (0.75×10^{-9} to 0.75×10^{-3}) About 30% of the adjusted pressure 60 V, 0.5 A DC Contact in its rest position when "no ignition" / "HT off"
High voltage control input		ON: At U < 2.9 V, or U > 12 V OFF: At U > 3 V, or U < 7 V
Status output Ready to measure Error (no ignition)		Voltage level HIGH (typ. 24 V DC) LOW (0 V)
Status indicators		Operation: Orange LED Ready to measure (ignited): Green LED Trigger (active): Green LED
Monitor output (R _a ≥ 100 kΩ)		Jack socket (3.5 mm) at which the trigger setting is available
Electrical connection		FCC-68 socket, 8 way with shield
Cable length, max.	m	100
Interface PTR 225 PB PTR 237 D		Profibus DP DeviceNet

Ordering Information

PENNINGVAC Transmitter PTR 225 / PTR 225 S / PTR 237

PTR 225, DN 25 KF	Part No. 157 34
PTR 225 S, DN 25 KF	Part No. 164 34
PTR 225 PB, DN 25 KF Profibus interface	Part No. 896 41
PTR 237, DN 40 CF	Part No. 157 36
PTR 237 D, DN 40 CF DeviceNet interface	Part No. 896 42
Baffle, DN 25 KF, with centering ring	Part No. 230 078
Replacement cathode plates, titanium (set of 5 pieces) Replacement anode ring	Part No. EK 162 91 Part No. 200 28 711
Calibration	see section "Miscellaneous", para. "Oerlikon Leybold Vacuum Calibration Service"
Connection cable, FCC 68 on both ends, 8 way, shielded 5 m 10 m 15 m 20 m 30 m 40 m 50 m 75 m 100 m	Type A Part No. 124 26 Part No. 230 012 Part No. 124 27 Part No. 124 28 Part No. 124 29 Part No. 124 30 Part No. 124 31 Part No. 124 32 Part No. 124 33