THERMOVAC-Transmitter TTR 101 N (S)

THERMOVAC Transmitter TTR 101 N, analog (left), EtherCAT (middle), Display (right)

The THERMOVAC TTR 101 N models utilize a thermal conductivity MEMS-Pirani combined with a silicon membrane Piezo. They offer superior accuracy and gas type independent readings between 10 mbar and 1500 mbar.

Advantages to the User

- Wide measurement range combining two sensor technologies into a single output
- Extended measuring range up to 5 x 10^{-5} mbar and significantly higher accuracy compared to conventional sensors
- Robust MEMS-Pirani and Piezo solid state sensors resilient to vibration and shock venting
- Rapid cycling by fast and repeatable pressure measurements
- High reproducibility and high accuracy
- Gas type independent from 10 to 1500 mbar
- Autozero of Piezo
- Individually temperature compensated to ensure stable measurements
- Measurement signal insensitive to mounting position
- Available with display for pressure units, set point parameters and operation status
- Available with up to three set point relays for improved process control
- LED ring to indicate status of the sensor

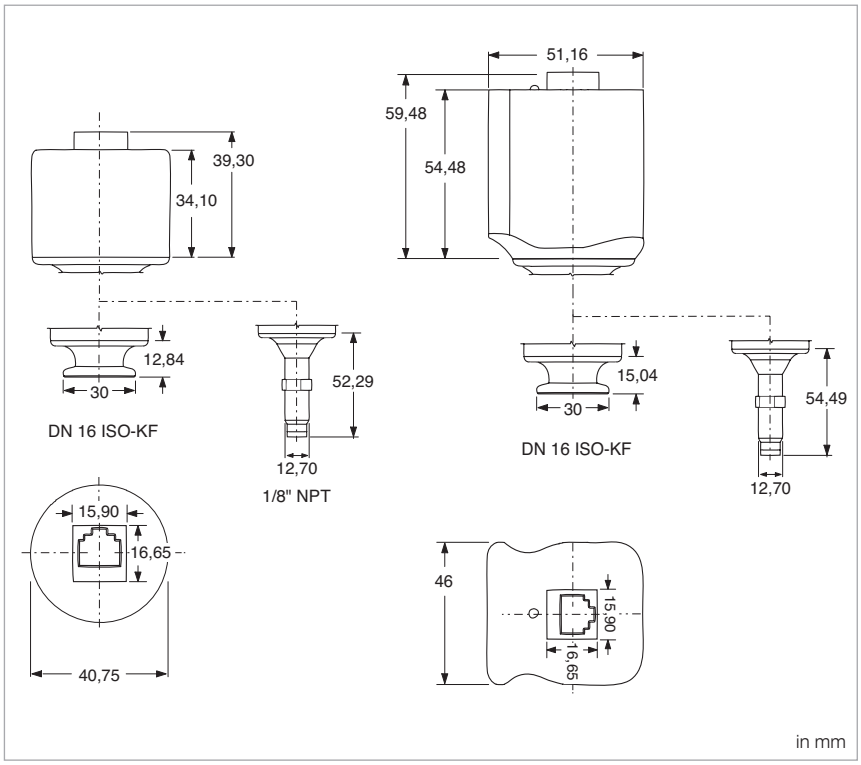
Typical Applications

The THERMOVAC TTR 101 N transmitters can be used in any application that requires absolute pressure measurement and switching capabilities.

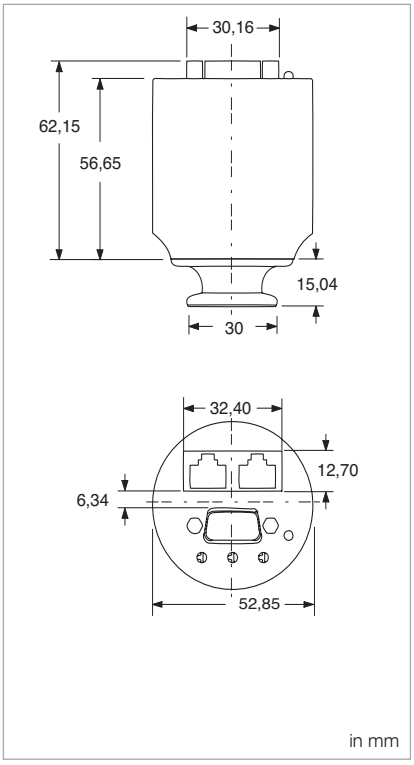
- General vacuum measurement and control from low to medium vacuum pressure
- Safety circuits in vacuum systems
- Control of high vacuum ionization gauges
- Analytical Instrumentation
- Research and development
- Vacuum Drying
- System process control
- Vacuum furnaces and sintering
- Coating
- Process industry

Sensor

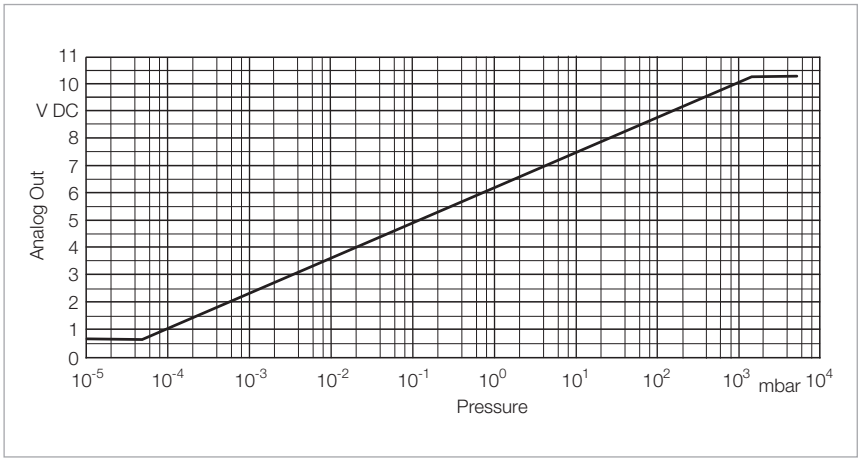
Dust and other particles may cause measurement errors and reduced lifetime. Therefore we recommend the installation of a fine filter in critical applications.
Fine filters are listed in chapter “General”, para. “Connection Accessories for Small Flanges”.



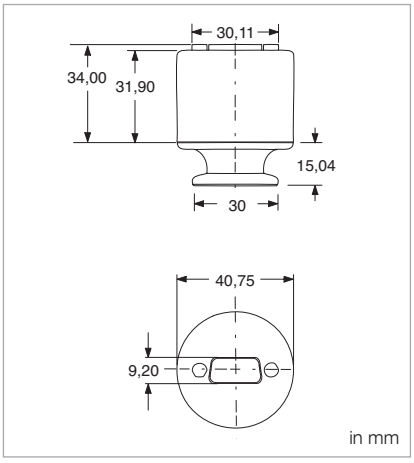
Dimensional drawing for the THERMOVAC Transmitters TTR 101 N (S) (left) and TTR 101 N Display (right)



Dimensional drawing for the TTR 101 N (EtherCAT)



Characteristic of the THERMOVAC Transmitters TTR 101 N (S)



Dimensional drawing for the TTR 101 N (RS 232)

Technical Data

		THERMOVAC Transmitter TTR 101 N (S)
Measurement range	mbar (Torr)	5 x 10^{-5} to 1500 (3.75 x 10^{-5} to 1125) 1 x 10^{-5} to 2000 (0.75 x 10^{-5} to 1500) [RS 232 / Display / EtherCAT]
Measurement uncertainty of reading [1]	mbar	5 x 10^{-4} to 1 x 10^{-3} ±10 % 1 x 10^{-3} to 10 ±5 % 11 to 1333 ±0.75 % 1333 to 2000 ±2 %
Repeatability of reading [1]	mbar	5 x 10^{-4} to 10 ±2 % 11 to 1067 ±0.2 %
Sensor Measurement principle		 MEMS-Pirani and Piezo
Supply voltage	V DC	9 – 30
Power consumption	W	< 1.2 [2 for EtherCAT]
Electrical connection		FCC 68, RJ 45 (analog) / Sub-D 15 PIN (digital)
Analog output Resolution Impedance Update rate	 V DC bit Ω Hz	V_{out} = log10 (P_{mbar}) x 1.286 + 6.143 0.61 to 10.23 16 100 16
Interfaces		FCC 68, RJ 45 (analog) / RS 232, EtherCAT, Profibus (digital)
Set point Range Relay Relay contact rating Relay contact resistance, max. Relay contact endurance, min. 1.0 A at 30 V DC load 0.2 A at 30 V DC load	 mbar (Torr) mΩ 	 2.7 x 10^{-4} to 1000 (2.7 x 10^{-4} to 750) / 1.0 x 10^{-4} to 1000 (0.75 x 10^{-4} to 750) 2 / 3 1 A at 30 V AC / DC, resistive load 100 100 000 2 000 000
Status indicators		LED-ring (360°)
Max. cable length	m	100
Overpressure limit (abs.)	bar	2
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	°C (°F)	85 (185), non-operating
Max. rel. humidity	% n.c.	0 – 95
Installation orientation		Any
Materials exposed to vacuum		304 stainless steel, Tin, Gold, Viton®
Dead volume (DN 16 ISO-KF), approx.	cm^3	2.8
Weight (DN 16 ISO-KF)	g	168
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

THERMOVAC Transmitter TTR 101 N (S)

	Part No.
TTR 101 N, DN 16 ISO-KF, FCC 68 / RJ 45	**230350V02**
TTR 101 N, 1/8" NPT, FCC 68 / RJ 45	**230351V02**
TTR 101 N, DN 16 ISO-KF, 2SP, FCC 68 / RJ 45	**230352V02**
TTR 101 N, 1/8" NPT, 2SP, FCC 68 / RJ 45	**230353V02**
TTR 101 N, DN 16 ISO-KF, Display, FCC 68 / RJ 45	**230354V02**
TTR 101 N, 1/8" NPT, Display	**230355V02**
TTR 101 N, DN 16 ISO-KF, Display, 2SP, FCC 68 / RJ 45	**230356V02**
TTR 101 N, DN 16 ISO-KF, 3SP, RS 232	**230366V02**
TTR 101 N, DN 16 ISO-KF, 2SP, EtherCAT	**230702V02**
Replacement sensor Flange DN 16 ISO-KF Flange 1/8" NPT	 **230361V02** **230362V02**
Centering ring with fine filter 16 ISO-KF	**883 96**
Calibration	See Section “Miscellaneous”, paragraph “Leybold calibration service”
Operating Units DISPLAY ONE DISPLAY TWO DISPLAY THREE GRAPHIX ONE GRAPHIX TWO GRAPHIX THREE	 **230 001** **230 024** **230 025** **230680V01** **230681V01** **230682V01**
Connection cable, FCC 68 on both ends [1)] 5 m 10 m 15 m 20 m 30 m 50 m 75 m 100 m	**Type A** **124 26** **230012** **12427** **12428** **12429** **12431** **12432** **12433**
Optional accessories Spiral tube DN 16 ISO-KF Connection cable, RS 232 [1)] 5 m 10 m 15 m 20 m RS232 / USB Converter for setpoint definition of RS232 gauges	 **230 082** **Type G** **230550V01** **230551V01** **230552V01** **230553V01** **230399V02**

[1)] See chapter “Connection cables for Active Sensors”