

Pressure transmitter for refrigeration and air-conditioning applications

Model R-1, with hermetically welded thin film measuring cell

WIKA data sheet PE 81.45



Applications

- Compressors
- Condensers

Special features

- Wetted parts from stainless steel
- Resistant to all common refrigerants
- Special case design for the best possible condensation tightness
- Private labelling possible



Pressure transmitter model R-1
Fig. left: with M12 x 1 circular connector
Fig. centre: with Metri-Pack series 150
Fig. right: with cable outlet

Description

Application area in refrigeration and air-conditioning technology

The model R-1 pressure transmitter has been optimally designed for the specific requirements of refrigeration and air-conditioning technology. Its monolithic construction dispenses with the need to use seals on the process side. This enables the model R-1 to be used with all typical refrigerants (e.g. Freon and Ammonia).

Excellent reliability

The hermetically-welded, dry, thin-film cell ensures long-term leak tightness. Moreover, these efficient cells, made with a sputtering technique, feature high long-term stability and a very high burst pressure.

Attractive price/performance ratio

The production on highly-flexible production lines, also offers a very attractive price-performance ratio with higher quantities.

Measuring ranges

Relative pressure								
bar	Measuring range	0 ... 6	0 ... 10	0 ... 15	0 ... 16	0 ... 20	0 ... 25	0 ... 30
	Overpressure limit	20	20	32	32	50	50	80
	Burst pressure	100	100	160	160	250	250	400
	Measuring range	0 ... 35	0 ... 40	0 ... 45	0 ... 50	0 ... 60	0 ... 100	0 ... 160
	Overpressure limit	80	80	120	120	120	200	320
	Burst pressure	400	400	550	550	550	800	1,000
psi	Measuring range	0 ... 100	0 ... 150	0 ... 200	0 ... 250	0 ... 300	0 ... 350	0 ... 400
	Overpressure limit	290	290	460	460	720	720	720
	Burst pressure	1,450	1,450	2,300	2,300	3,600	3,600	3,600
	Measuring range	0 ... 450	0 ... 500	0 ... 550	0 ... 600	0 ... 650	0 ... 700	0 ... 750
	Overpressure limit	1,100	1,100	1,100	1,100	1,100	1,700	1,700
	Burst pressure	5,800	5,800	5,800	5,800	5,800	7,900	7,900
	Measuring range	0 ... 800	0 ... 850	0 ... 1,500	0 ... 2,400			
	Overpressure limit	1,700	1,700	2,900	4,600			
	Burst pressure	7,900	7,900	11,600	14,500			

Vacuum and +/- measuring range						
bar	Measuring range	-1 ... +7	-1 ... +9	-1 ... +10	-1 ... +15	-1 ... +20
	Overpressure limit	20	20	20	32	50
	Burst pressure	100	100	100	160	250
	Measuring range	-1 ... +25	-1 ... +29	-1 ... +45	-0.5 ... +7	-0.5 ... +10
	Overpressure limit	50	80	120	20	20
	Burst pressure	250	400	550	100	100
psi	Measuring range	-30 InHg ... +100	-30 InHg ... +145	-30 InHg ... +200	-30 InHg ... +250	-30 InHg ... +300
	Overpressure limit	290	290	460	460	720
	Burst pressure	1,450	1,450	2,300	2,300	3,600
	Measuring range	-30 InHg ... +350	-30 InHg ... +400	-30 InHg ... +450	-30 InHg ... +500	-30 InHg ... +550
	Overpressure limit	720	1,100	1,100	1,100	1,100
	Burst pressure	3,600	5,800	5,800	5,800	5,800
	Measuring range	-30 InHg ... +600				
	Overpressure limit	1,700				
	Burst pressure	7,900				

Other measuring ranges on request

Vacuum tightness

Yes

Output signals

Signal type	Signal
Current (2-wire)	4 ... 20 mA
Voltage (3-wire)	DC 1 ... 5 V DC 0 ... 10 V
Ratiometric (3-wire)	DC 0.5 ... 4.5 V

Other output signals available on request

Load in Ω

- Current output (2-wire):
 $\leq (\text{power supply} - 7 \text{ V}) / 0.02 \text{ A}$
- Voltage output (3-wire):
> maximum output signal / 1 mA
- Ratiometric output (3-wire):
> maximum output signal / 1 mA

Voltage supply

Power supply

The power supply depends on the selected output signal

- 4 ... 20 mA: DC 7 ... 30 V
- DC 1 ... 5 V: DC 8 ... 30 V
- DC 0 ... 10 V: DC 14 ... 30 V
- DC 0.5 ... 4.5 V: DC 4.5 ... 5.5 V

Reference conditions (per IEC 61298-1)

Temperature

15 ... 25 °C

Atmospheric pressure

860 ... 1,060 mbar

Humidity

45 ... 75 % relative

Power supply

DC 24 V

Nominal position

Calibrated in vertical mounting position with pressure connection facing downwards.

Accuracy data

Accuracy at reference conditions

$\leq 2 \%$ of span

Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2).

Temperature error at -25 ... +85 °C

- Mean temperature coefficient of zero point:
typical $\leq \pm 0.5\%$ of span/10 K
- Mean temperature coefficient of span:
 $\leq 0.3 \%$ of span/10 K

Settling time

$\leq 5 \text{ ms}$

Long-term drift (per IEC 61298-2)

$\leq 0.3 \%$ of span/year

Operating conditions

Ingress protection (per IEC 60529)

The ingress protection depends on the type of electrical connection.

- Circular connector M12 x 1: IP 67
- Metri-Pack series 150: IP 67
- Cable outlet: IP 69K

The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

Temperatures

- Medium: -40 ... +100 °C -40 ... +212 °F
- Ambient: -25 ... +85 °C -13 ... +185 °F
- Storage: -25 ... +85 °C -13 ... +185 °F

Resistance

The pressure transmitter is resistant to the industrial standard refrigerants

Process connections

Standard	Thread size
EN 837	G ¼ B
ANSI/ASME B1.20.1	⅛ NPT ¼ NPT
ISO 7	R ¼
KS	PT ¼
SAE	7/16-20 UNF-2A taper 90° 7/16-20 UNF-2B Schrader female

Electrical connections

Short-circuit resistance

S₊ vs. 0V

Reverse polarity protection

U_B vs. 0V

Overvoltage protection

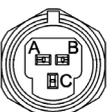
maximum DC 36 V

Insulation voltage

DC 500 V

Connection diagrams

Circular connector M12 x 1 (4-pin)			
	2-wire	3-wire	
	U _B	1	1
	0V	3	3
	S ₊	-	4

Metri-Pack series 150			
	2-wire	3-wire	
	U _B	B	B
	0V	C	A
	S ₊	-	C

Cable outlet			
	2-wire	3-wire	
	U _B	brown	brown
	0V	green	green
	S ₊	-	white

Wire cross-section 3 x 0.14 mm²

Cable diameter 3.2 mm

Cable lengths: 0.5 m, 1 m, 2 m, 5 m

Materials

Wetted parts

Sensor and process connection from stainless steel

Non-wetted parts

- Case from stainless steel
- Electrical connection from highly resistant, glass-fibre reinforced plastic PBT GF 30

Approvals, directives and certificates

Approvals

cRUus (recognition)

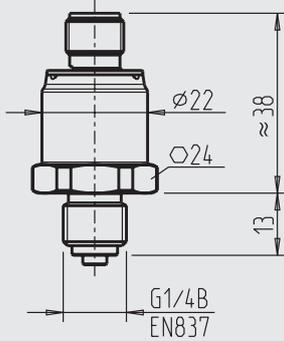
CE conformity

EMC directive 2004/108/EC, EN 61326 emission (group 1, class B) and immunity (industrial application)

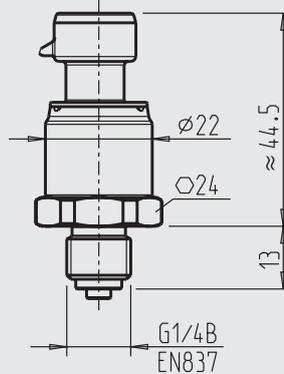
Dimensions in mm

Pressure transmitters

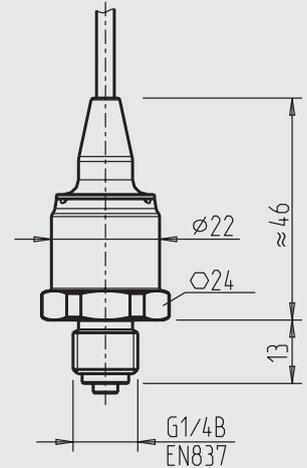
with circular connector M12 x 1



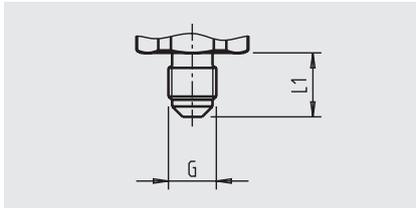
with Metri-Pack series 150



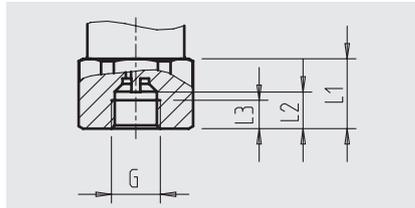
with cable outlet



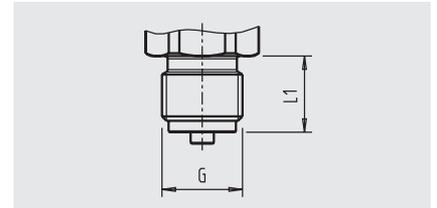
Process connections



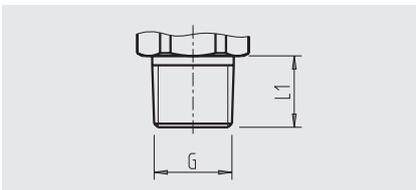
G	L1
7/16-20 UNF-2A taper 90°	15



G	L1	L2	L3
7/16-20 UNF-2B	16	8.4	6.5



G	L1
G 1/4 B EN 837	13



G	L1
1/8 NPT	10
1/4 NPT	13
PT 1/4	13
R 1/4	13

For information on tapped holes and welding sockets, see Technical Information IN 00.14 at www.wika.com.

Ordering information

Model / Measuring range / Output signal / Electrical connection / Process connection

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