Technical details

Piezo-Resistive Sensor
in Oil-Filled Housing
Stainless Steel 303

Type:	0645	0650	0660
Output signal:	0.5 – 4.5 V ratiometric	0 – 10 V (3-wire)	4 – 20 mA (2-wire)
Supply voltage U_B:	5 VDC ±10 % max. 6.5 VDC	12 - 32 VDC	10 - 32 VDC
Permissible loadapparent ohmic resistance:	≥ 4,7 kΩ	≥ 4,7 kΩ	≤ (U_{v+} – 10 V) / 20 mA
Idle power consumption:	approx. 5 mA		< 4 mA

Type:	0645 / 0650 / 0660								
Standard pressure ranges p_{nom}:	-1 -0 bar (vacuum) (-14.5 - 0 psi)	-1-1 bar (compound)	0-1 bar (0 - 14 psi)	0 - 4 bar (0 - 58 psi)	0 - 6 bar (0 - 87 psi)	0 - 10 bar (0 - 145 psi)	0 - 16 bar (0 - 232 psi)	0 - 40 bar (0 - 580 psi)	0 - 100 bar (0 - 1,450 psi)
Overpressure protection p_u [1]	3 bar (43 psi)	3 bar (43 psi)	3 bar (43 psi)	8 bar (116 psi)	12 bar (174 psi)	20 bar (290 psi)	32 bar (464 psi)	80 bar (1,160 psi)	200 bar (2,900 psi)
Burst pressure [1]:	10 bar (145 psi)	10 bar (145 psi)	10 bar (145 psi)	20 bar (290 psi)	30 bar (435 psi)	35 bar (500 psi)	40 bar (580 psi)	100 bar (1,450 psi)	250 bar (3,625 psi)
Mechanical life expectancy:	10,000,000 pulsations at rise rates to 14,500 psi/s (1,000 bar/s) at p_{nom}								
Permitted pressure change rate:	≤ 14,500 psi/ms (≤ 1,000 bar/ms)								
Accuracy:	±0.5 % full scale (FS) at room temperature, ±0.25 % BFSL								
Long term stability:	< ±0.2 % of full scale (FS) per year								
Repeatability [2]:	±0.1 % FS								
Temperature error [2]:	±0.02 % of full scale (FS) / °C; -1 … 1 bar ±0.03 % of full scale (FS) / °C								
Compensated temperature range:	-10 °C . . . +70 °C (+14 °F . . .+158 °F)								
Temperature range ambient:	-40 °C . . . +100 °C (-40 °F . . . +212 °F)								
Temperature range media:	with NBR (BunaN) seal: (-22 °F . . . +212 °F) -30 °C . . . +100 °C								
	with EPDM seal: (-22°F . . . +257 °F) -30 °C . . . +125 °C								
	with FKM (Viton®) seal: (-4 °F . . . +257 °F) -20 °C . . . +125 °C								
Wetted parts material – Housing:	Stainless steel AISI 303 / 1.4305								
Wetted parts material – Measuring cell:	Stainless steel AISI 316L / 1.4404								
Wetted parts material – Seal material:	NBR (BunaN), EPDM or FKM (Viton®)								
Standard sensor oil:	Fluorine oil (not suitable for food applications)								
Insulation resistance:	> 100 MΩ (35 VDC)								
Response time 10 – 90 %:	< 2 ms								
Vibration resistance:	20 g at 4 – 2000 Hz sine wave; DIN EN 60068-2-6								
Shock resistance:	half sine wave 500 m/s², 11ms; DIN EN 60068-2-27								
Protection class	Refer to the electrical connections								
Electromagnetic compatibility:	EMC 2014/30/EU, EN 61000-6-2:2005, EN 61000-6-3:2007								
Max. length of connection cable:	30 m								
Protection against reverse polarity, short-circuit and overvoltage:	Built-in								
Weight:	approx. 2.82 oz / 80 g (DIN EN 175301 approx. 3.88 oz / 110 g, cable output approx. 4.76 oz / 135 g)								

[1] Static pressure. Dynamic value is 30 to 50% lower. Values refer to the hydraulic/pneumatic part of the pressure transducer.

[2] Within the compensated temperature range.

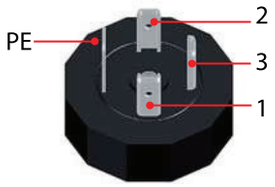
T.2

hex 22
stainless steel
1.4305 / AISI 303

0645 / 0650 / 0660

Electrical connectors and threads

DIN EN 175301-803-A



Pin	0645 / 0650	0660
1	Uv+	Uv+
2	Gnd	I_{out}
3	U_{out}	nc
PE	⏚	⏚

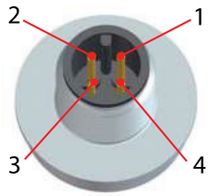
IP65

x ~ 60 mm without coupler socket
x ~ 76 mm with coupler socket

d ~ Ø 30 mm

Connection code: 013

M12 – DIN EN 61076-2-101 A



Pin	0645 / 0650	0660
1	Uv+	Uv+
2	U_{out}	nc
3	Gnd	I_{out}
4	nc	nc

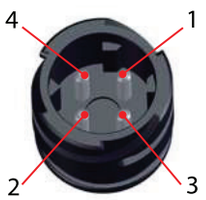
IP67

x ~ 54 mm

d ~ Ø 22 mm

Connection code: 002

ISO 15170 - A1 - 4.1



Pin	0645 / 0650	0660
1	Uv+	Uv+
2	Gnd	nc
3	U_{out}	I_{out}
4	nc	nc

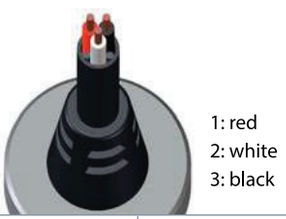
IP67

x ~ 65 mm

d ~ Ø 27 mm

Connection code: 004

Cable connection



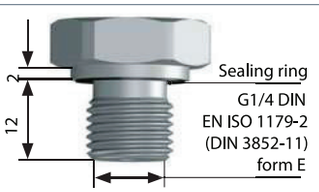
Pin	0645 / 0650	0660
1	Uv+	Uv+
2	U_{out}	nc
3	Gnd	I_{out}

IP67

x ~ 44 mm (+ 20 mm bend relief)
Cable length ~ 2 m

d ~ Ø 22 mm

Connection code: 011



Thread code: 41

RoHSII compliant

0645 / 0650 / 0660

Article matrix for pressure transmitters

	Type	Pressure range	Pressure connection	Seal material	Electrical connection
	↓	↓	↓	↓	↓

0.5 - 4.5 V ratiometric	0645
0 - 10 V, 3-wire	0650
4 - 4 mA, 2-wire	0660

Pressure range	Max. Overpressure [1]	
-1 – 0 bar (Vacuum, approx. -29.6 inHg)	3 bar (14.5 psi)	000
-1- 1 bar (Compound pressure range)	3 bar (14.5 psi)	V01
0 - 1 bar (approx. 14.5 PSI)	3 bar (14.5 psi)	100
0 - 4 bar (approx. 58 PSI)	8 bar (116 psi)	400
0 - 6 bar (approx. 87 PSI)	12 bar (174 psi)	600
0 - 10 bar (approx. 145 PSI)	20 bar (290 psi)	101
0 - 16 bar (approx. 232 PSI)	32 bar (464 psi)	161
0 - 40 bar (approx. 580 PSI)	80 bar (1,160 psi)	401
0 - 100 bar (approx. 1,450 PSI)	200 bar (2,900 psi)	102

Pressure connection

BSPP 1/4 – DIN EN ISO 1179-2 (DIN 3852-11), form E	41

Seal material – Application areas

NBR	Hydraulic/machine oil, heating oil, air, nitrogen, water, etc.	-22 °F … +212 °F (-30 °C … +100 °C)	1
EPDM [2]	Brake fluid, water, acetylene, hydrogen, etc.	-22 °F … +257 °F (-30 °C … +125 °C)	2
FKM	Hydraulic fluids (HFA, HFB, HFD), petrol/gasoline, etc.	-4 °F … +257 °F (-20 °C … +125 °C)	3

Electrical connection

DIN EN 175301-803-A (DIN 43650-A); socket device included	013
M12x1 - DIN EN 61076-2-101-A	002
Bayonet ISO 15170-A1-4.1 (DIN 72585-A1-4.1)	004
Cable connection (length of cable 2 m standard)	011

	Type	Pressure range	Pressure connection	Seal material	Electrical connection
	↓	↓	↓	↓	↓
Article number:	06XX	XXX	41	X	XXX

[1] Static pressure, dynamic pressure 30 to 50% lower. Values refer to the hydraulic or pneumatic part of the pressure transmitter.
[2] For oxygen applications, the EPDM diaphragm can only be used up to 10 bar and a media temperature of max. +60°C.

T.2

hex 22
stainless steel
1.4305 / AISI 303

Robust pressure transmitters

Stainless steel housing (1.4305 / AISI 303, hex 22)

- Pressure transmitters especially for low pressures, including vacuum applications
- High overpressure protection (up to 3 x)
- Long life time even under high pressure change rates
- Housing and wetted parts are made of stainless steel providing excellent media compatibility
- Suitable for hydrogen and oxygen applications[1)]
- The highly-sensitive piezo-resistive sensor in the measuring cell filled with oil guarantees high level of accuracy, repeatability and long-term stability
- The availability of different sealing materials enables deployment in a broad temperature range with a diverse array of media

[1)] For oxygen applications, the EPDM diaphragm can only be used up to 10 bar and a media temperature of max. +60°C.