Pressure sensors

Grundfos Direct Sensors™

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1. Product overview

This data booklet is for the latest version of Grundfos Direct Sensors™. Customers already buying Grundfos Direct Sensors™ might be buying a sensor with another specification.

Variant	Description	Technical data	
RPI 	Relative Pressure transmitter, Industry • stainless-steel housing.	Pressure range: System pressure range: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 25 bar (0 - 8.7 to 363 psig) Maximum 30 bar (453 psig) -30 to +120 °C (-22 to +248 °F) 4-20 mA (2-wire) 12.5 - 30 VDC IP67
RPI+T 	Relative Pressure transmitter, Industry • combined pressure and temperature measurement • stainless-steel housing.	Pressure range: Temperature range: System pressure: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 25 bar (0 - 8.7 to 363 psig) 0-120 °C (32-248 °F) Maximum 30 bar (453 psig) -30 to +120 °C (-22 to +248 °F) 2 x 0-10 VDC (4-wire) 16.6 - 30 VDC IP67
DPI 	Differential Pressure transmitter, Industry • conventional sensor with two capillaries • stainless-steel and composite housing.	Differential pressure range: System pressure: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 10 bar (0 - 8.7 to 145 psid) Maximum 30 bar (453 psig) -10 to +70 °C (14 to 158 °F) 4-20 mA (3-wire) 12-30 VDC IP55
DPI II 	Differential Pressure transmitter, Industry • G 1/2 connection and one capillary • stainless-steel housing.	Differential pressure range: System pressure: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 16 bar (0 - 8.7 to 232 psid) Maximum 30 bar (453 psig) -30 to +120 °C (-22 to +248 °F) 4-20 mA (2-wire) 12.5 - 30 VDC IP67
DPI II+T 	Differential Pressure transmitter, Industry • G 1/2 connection and one capillary • combined pressure and temperature measurement • stainless-steel housing.	Differential pressure range: Temperature range: System pressure: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 16 bar (0 - 8.7 to 232 psid) 0-120 °C (32-248 °F) Maximum 30 bar (453 psig) -30 to +120 °C (-22 to +248 °F) 2 x 0-10 VDC (4-wire) 12.5 - 30 VDC IP67
RPS 	Relative Pressure sensor, Standard • combined pressure and temperature measurement • composite transmitter.	Pressure range: Temperature range: System pressure: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 16 bar (0 - 8.7 to 232 psig) 0-120 °C (32-248 °F) Maximum 24 bar (348 psig) 0-120 °C (32-248 °F) 2 x 0.5 - 3.5 VDC (4-wire) 5 VDC (PELV) IP44 (with connected cable)
DPS 	Differential Pressure sensor, Standard • combined pressure and temperature measurement • composite transmitter.	Pressure range: Temperature range: System pressure: System temperature: Signal: Power supply: Enclosure class:	0 - 0.6 to 6 bar (0 - 8.7 to 87 psid) 0-120 °C (32-248 °F) Maximum 24 bar (348 psig) 0-120 °C (32-248 °F) 2 x 0.5 - 4.5 VDC (4-wire) 5 VDC (PELV) IP44 (with connected cable)

2. Product introduction

This data booklet describes these Grundfos products:

- industrial relative- and differential-pressure sensors
- standard relative- and differential-pressure sensors.

TM04 5034 2409 - TM04 7865 2410
TM04 7866 2410 - TM05 4752 2512

Fig. 1 Grundfos pressure sensors

Three different types of pressure are used in pressure measurement:

- Absolute pressure: the measured value is zero-referenced against vacuum.
- Relative pressure: the measured value is zero-referenced against the ambient pressure.
- Differential pressure: the measured value is the difference between two pressures.

The Grundfos pressure sensor ranges contain relative- and differential-pressure sensors as well as relative- and differential-pressure sensors combined with temperature measurement capable of measuring temperatures from 0 to 100 °C (32 to 212 °F). This makes Grundfos sensors^{TM} suitable for a wide range of applications.

Relative-pressure sensor

The central part of a relative-pressure sensor is a chip which transforms the pressure into electrical signals. The difference between the ambient air pressure and the system pressure causes the chip to warp which is registered as a change of resistance in the strain gauges of a Wheatstone bridge. The change in resistance is converted into an analog output signal. The sensors incorporating temperature measurement also transform the temperature of the liquid into electrical signals.

The signals are linearised and compensated for the influence of temperature variations.

Differential-pressure sensor

The central part of a differential-pressure sensor is a chip which transforms the differential pressure into electrical signals. The difference between the two system pressures on either side of the chip, called the differential pressure, causes the chip to warp. This is registered as a change of resistance in the strain gauges of a Wheatstone bridge. The change in resistance is converted into an analog output signal. The sensors incorporating temperature measurement also transform the temperature of the liquid into electrical signals.

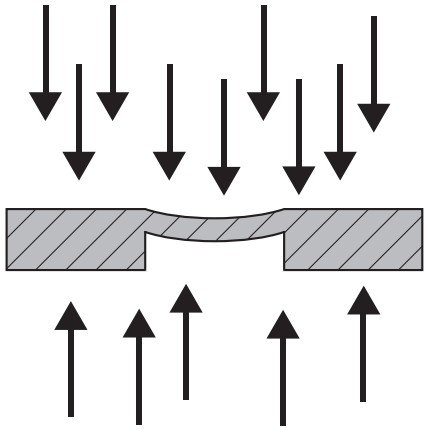

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Fig. 2 Schematic view of how the chip is affected by pressure on both sides

Sensor chip

The steady-state properties of silicon protect the chip against wear and tear. Lifelong nano-coating protection enables direct measurement (wet-wet) in a cost-effective packaging for aqueous media. The secret is a metal-glass alloy coating, Silicoat®, which is extremely resistant to corrosion. Compared to conventional sensor technologies, which encapsulate the unprotected measuring cell to protect it from the liquid, Silicoat® ensures protection of the chip from aqueous media (pH2 - pH11) at temperatures up to 120 °C (248 °F) through the entire life of the product.

Definitions

Burst Pressure

The maximum allowable pressure (relative to ambient) in a system, which will not destroy the sensor or transmitter. Measured in [bar].

Maximum System Pressure

Maximum allowable static pressure (relative to ambient pressure) in a system, where the flow is zero.

3. Relative Pressure transmitters, Industry (RPI and RPI+T)

General data

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Fig. 3 RPI, RPI+T transmitter

Technical overview

The RPI relative-pressure transmitter from Grundfos Direct Sensors™ is designed for industrial applications. The transmitter is designed to be mounted direct on a unit, for example a pump.

The RPI transmitter is fully compatible with aqueous media. The transmitter is based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the transmitter chip.

This makes the RPI transmitter very robust and ideal for pump integration and monitoring in harsh environments. The RPI+T transmitter offers a two-in-one solution with combined pressure and temperature measurement.

Applications

- Pump control
- HVAC systems
- temperature control and chiller systems
- renewable energies such as heat pumps, solar thermals, fresh water and micro-CHP systems
- monitoring and control systems
- water treatment plants
- water utility and distribution systems
- HPC and IT cooling systems.

Features and benefits

- Pressure and temperature measurement in one transmitter (two-in-one solution) for easy and cost-efficient installation (RPI+T)
- MEMS technology
- direct contact with the aqueous media resulting in a fast response time
- plug and play for quick setup
- smart system solution with Grundfos pump controls
- compact and robust design
- compatible with aggressive aqueous medias
- suitable for a wide temperature range.
- suitable for a wide range of applications.

Pressure range

Pressure range	
[bar]	[psig]
0 - 0.6	0 - 8.7
0 - 1.0	0 - 14.5
0 - 1.6	0 - 23.2
0 - 2.5	0 - 36.3
0 - 4.0	0 - 58.0
0 - 6.0	0 - 87.0
0 - 10.0	0 - 145.0
0 - 16.0*	0 - 232.1
0 - 25.0	0 - 362.6

* RPI+T2 is a special 0-16.0 bar Relative Pressure Transmitter, Industry measuring up to 120 C at 10 V intended for Magna3 and TPE3.

Approvals (w/EPDM O-rings)

- WRAS
- KTW
- A4020
- ACS.

Certificates

CE	C, CSA, US	EAC

Electrical connections

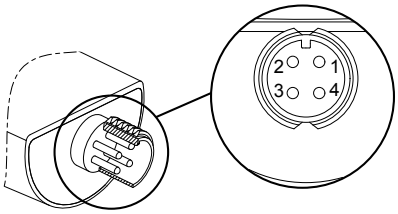

Fig. 4 Electrical connections

RPI

Signal condition: 2-wire (loop-powered)

Pin	1	2	3	4
Wire colour	Brown	White	Blue	Black
I/O	Power supply	Not used	Pressure signal 4-20 mA	Not used

RPI+T

Signal condition: 4-wire

Pin	1	2	3	4
Wire colour	Brown	White	Blue	Black
I/O	Power supply	Pressure signal 0-10 V	GND*	Temperature signal 0-10 V

* Common ground for pressure and temperature signals.
Power supply, screened cable: SELV or PELV.

Directives

The Grundfos Direct Sensors™ are in conformity with these council directives on the approximation of the laws of the EC member states:

- • Low Voltage Directive (2014/35/EU)
  - – Standards used: EN 61010-1:2010
- EMC Directive (2014/30/EU).
  - – Standards used: EN 61326-1:2013 and EN 61326-2-3:2013

The Grundfos Direct Sensors™ are exempted from the Pressure Equipment Directive (PED) according to Article 4, paragraph 3 in the PED 2014/68/EU.

RPI and RPI+T, 0 - 0.6 bar (0 - 8.7 psig)

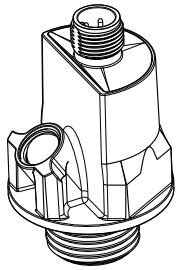

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Fig. 5 RPI and RPI+T transmitter

Dimensions

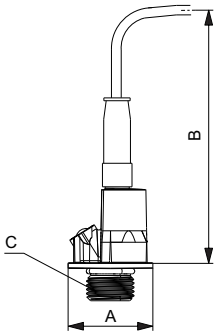

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Fig. 6 Dimensions, RPI and RPI+T

	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals

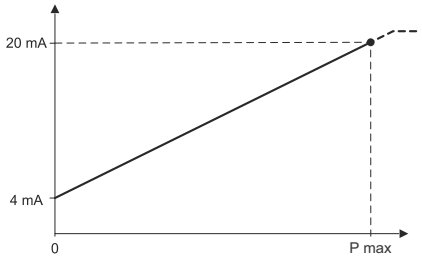

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Fig. 7 Pressure response, RPI

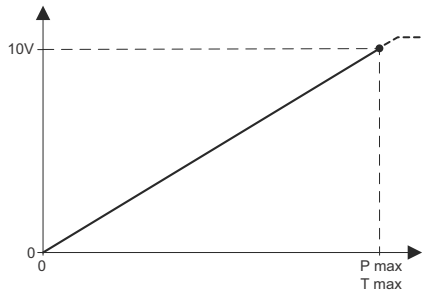

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Fig. 8 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 0.6 bar (0 - 8.7 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI+T with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation, not freezing	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable-connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPI and RPI+T, 0 - 1.0 bar (0 - 14.5 psig)

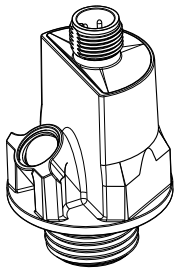

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Fig. 9 RPI and RPI+T transmitter

Dimensions

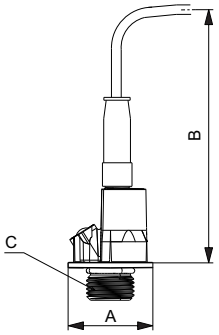

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Fig. 10 Dimensions, RPI and RPI+T

	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals

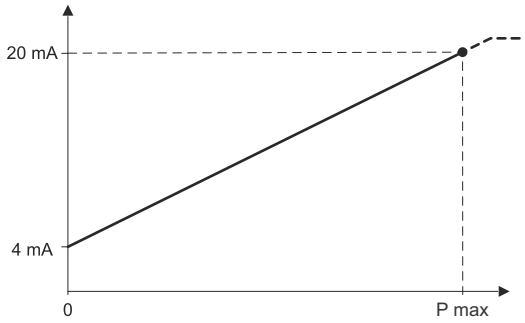

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Fig. 11 Pressure response, RPI

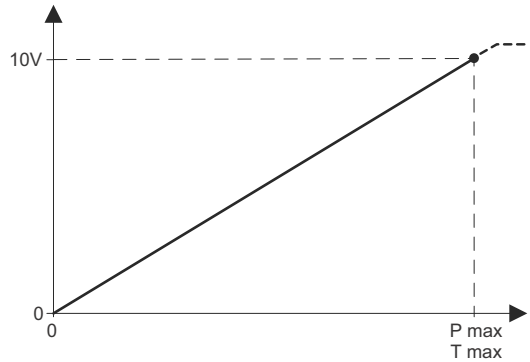

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Fig. 12 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 1.0 bar (0 - 14.5 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPI and RPI+T, 0 - 1.6 bar (0 - 23.2 psig)

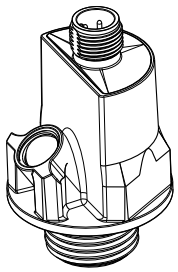

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Fig. 13 RPI and RPI+T transmitter

Dimensions

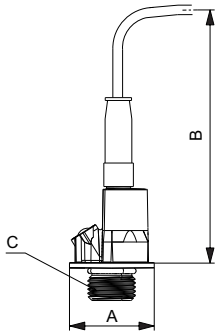

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Fig. 14 Dimensions, RPI and RPI+T

	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals

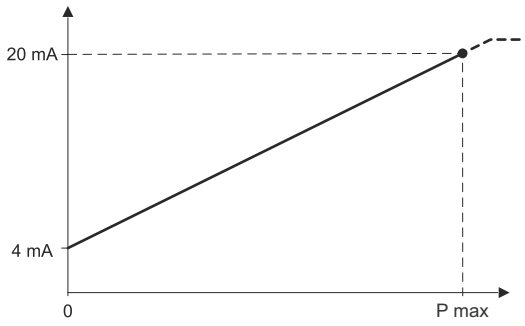

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Fig. 15 Pressure response, RPI

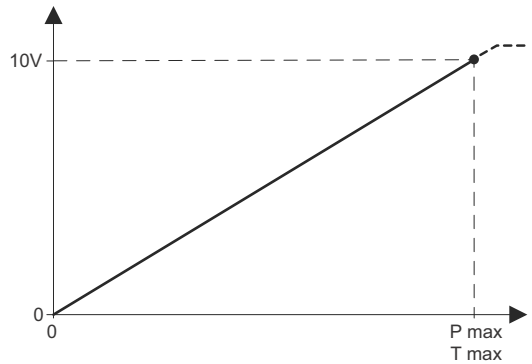

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Fig. 16 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 1.6 bar (0 - 23.2 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 -to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC 11 VDC
Power consumption	Maximum 270 mW
Load impedance	Minimum 10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPI and RPI+T, 0 - 2.5 bar (0 - 36.3 psig)

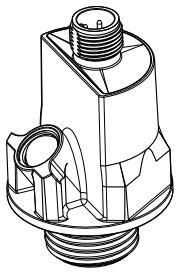

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Fig. 17 RPI and RPI+T transmitter

Dimensions

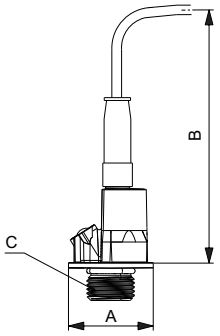

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Fig. 18 Dimensions, RPI and RPI+T

	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals

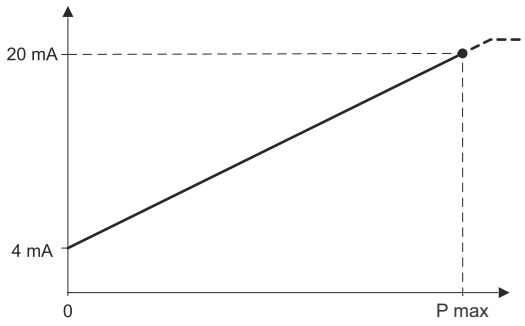

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Fig. 19 Pressure response, RPI

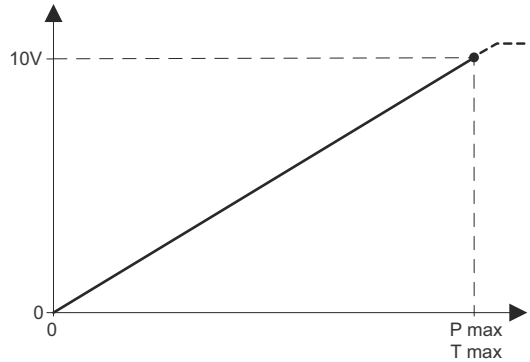

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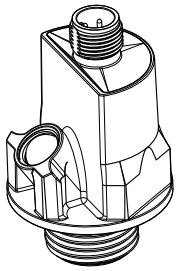
Fig. 20 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 2.5 bar (0 - 36.3 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

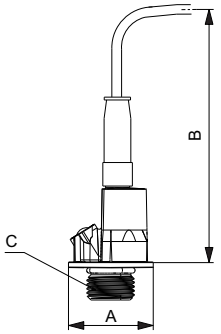
RPI and RPI+T, 0 - 4.0 bar (0 - 58.0 psig)



TM04 9240 3510

Fig. 21 RPI and RPI+T transmitter

Dimensions

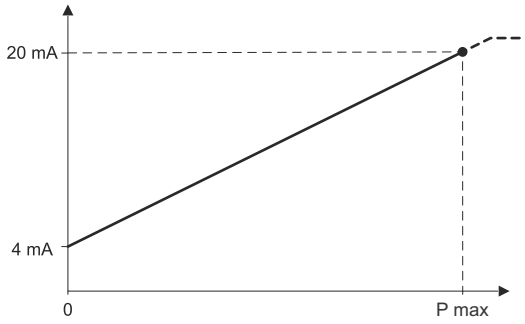


TM04 9237 3510

Fig. 22 Dimensions, RPI and RPI+T

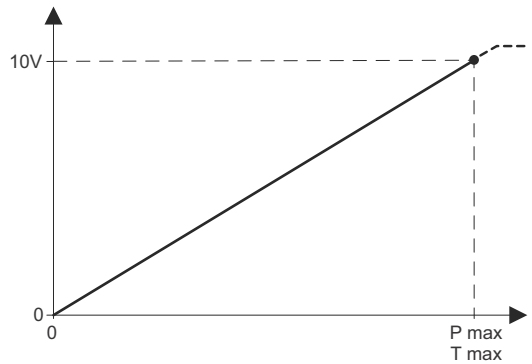
	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals



TM06 3358 1716

Fig. 23 Pressure response, RPI



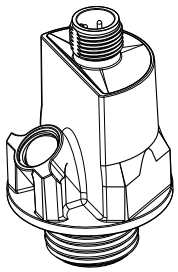
TM06 3359 1716

Fig. 24 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 4.0 bar (0 - 58.0 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

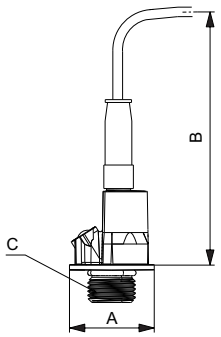
RPI and RPI+T, 0 - 6.0 bar (0 - 87.0 psig)



TM04 9240 3510

Fig. 25 RPI and RPI+T transmitter

Dimensions

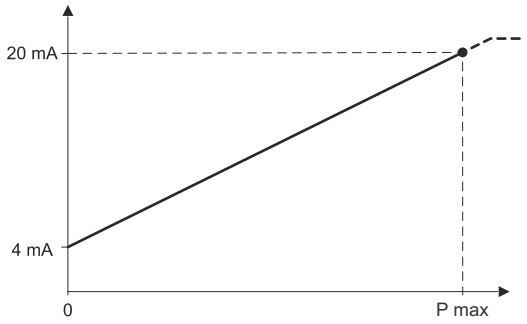


TM04 9237 3510

Fig. 26 Dimensions, RPI and RPI+T

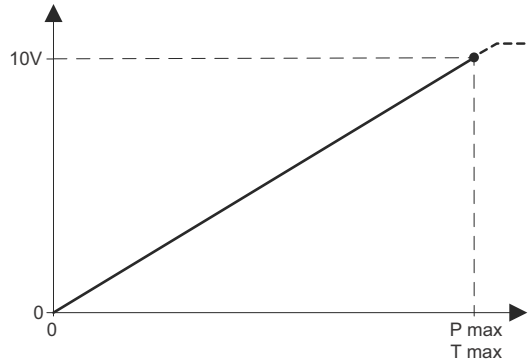
	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals



TM06 3358 1716

Fig. 27 Pressure response, RPI



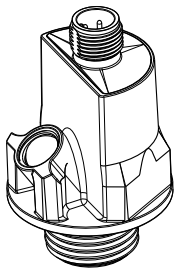
TM06 3359 1716

Fig. 28 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 6.0 bar (0 - 87.0 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	660 mW
Maximum load impedance	660 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

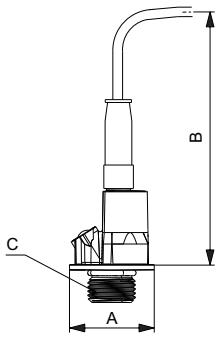
RPI and RPI+T, 0 - 10.0 bar (0 - 145.0 psig)



TM04 9240 3510

Fig. 29 RPI and RPI+T transmitter

Dimensions

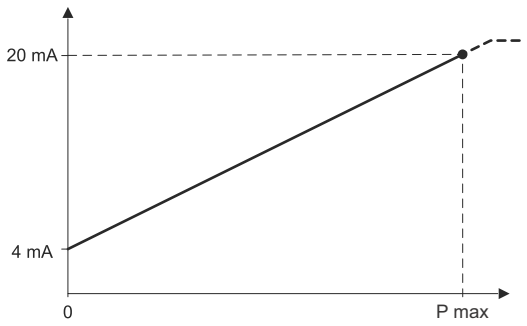


TM04 9237 3510

Fig. 30 Dimensions, RPI and RPI+T

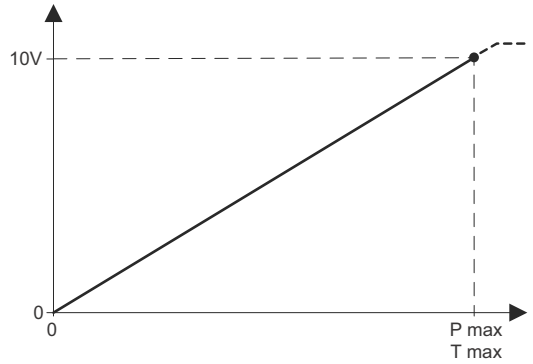
	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals



TM06 3358 1716

Fig. 31 Pressure response, RPI



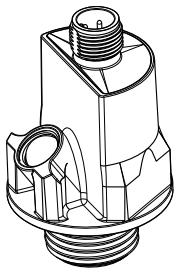
TM06 3359 1716

Fig. 32 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 10.0 bar (0 - 145.0 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	660 mW
Maximum load impedance	660 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

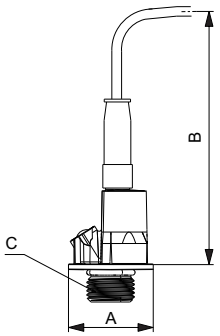
RPI and RPI+T, 0 - 16.0 bar (0 - 232.1 psig)



TM04 9240 3510

Fig. 33 RPI and RPI+T transmitter

Dimensions

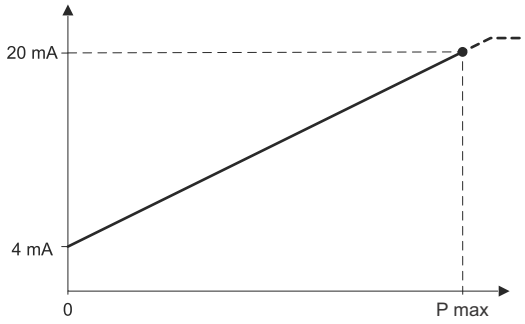


TM04 9237 3510

Fig. 34 Dimensions, RPI and RPI+T

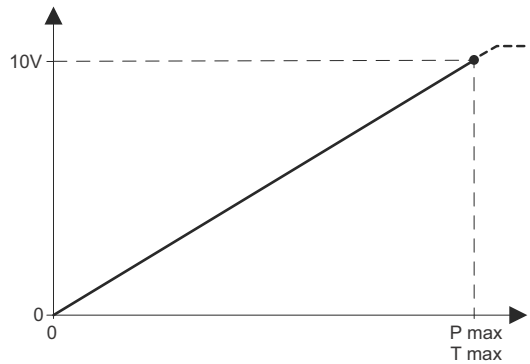
	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals



TM06 3358 1716

Fig. 35 Pressure response, RPI



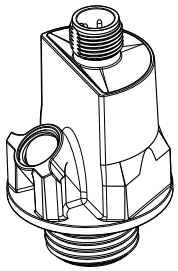
TM06 3359 1716

Fig. 36 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 16.0 bar (0 - 232.1 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	660 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

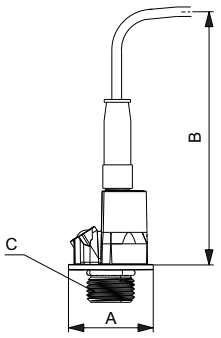
RPI+T2, 0 - 16.0 bar (0 - 232.1 psig)



TM04 9240 3510

Fig. 37 RPI+T transmitter

Dimensions

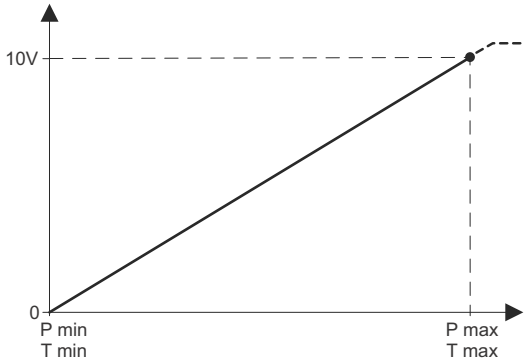


TM04 9237 3510

Fig. 38 Dimensions, RPI+T transmitter

	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals

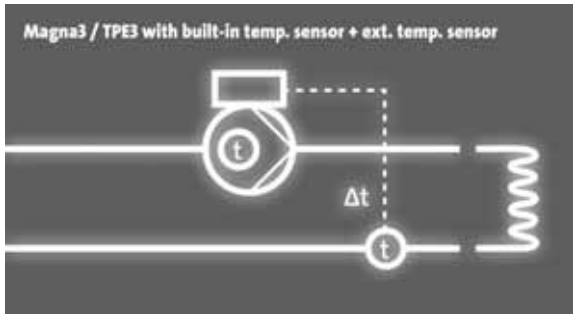


TM07 2422 3518

Fig. 39 Pressure and temperature response, RPI+T

Specifications

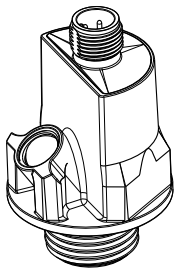
Pressure	
Measuring range	0 - 16.0 bar (0 - 232.1 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +120 °C (-22 to +248 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	-10 to +120 °C (14 to +248 °F)
Accuracy (± 1 σ), -10 to 15 °C (14 to 59 °F) and 90 to 120 °C (194 to 248 °F)	± 1 K
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC (0 V at -10 °C, 10 V at 120 °C)
– Signal cut off	11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1



TM07 2415 3518

Fig. 40 MAGNA3 and TPE3 with RPI+T2 transmitter

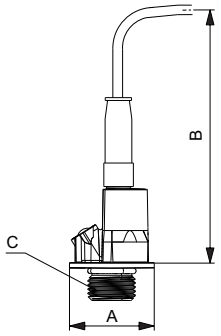
RPI and RPI+T, 0 - 25.0 bar (0 - 362.6 psig)



TM04 9240 3510

Fig. 41 RPI and RPI+T transmitter

Dimensions

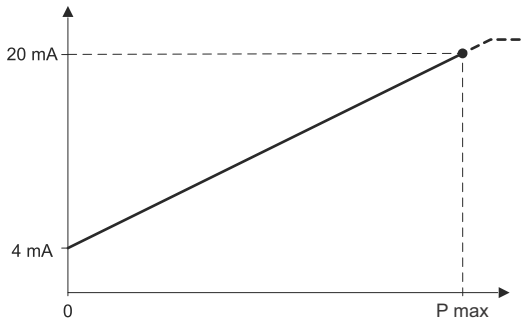


TM04 9237 3510

Fig. 42 Dimensions, RPI and RPI+T

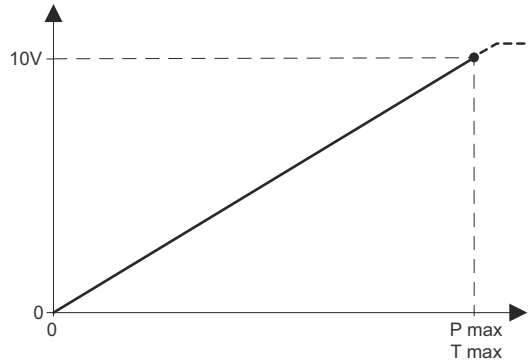
	A	B	C
mm	36.95	110	ISO 228/1 - G 1/2
in	1.45	4.33	

Output signals



TM06 3358 1716

Fig. 43 Pressure response, RPI



TM06 3359 1716

Fig. 44 Pressure and temperature response, RPI+T

Specifications

Pressure	
Measuring range	0 - 25.0 bar (0 - 362.6 psig)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
Resolution	1/1000 FS
Temperature, RPI with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Electrical data, RPI without temperature output	
Power supply, RPI	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, RPI+T with temperature output	
Power supply, RPI+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

4. Differential Pressure transmitter, Industry (DPI I)

General data

TM04 4738 0509

Fig. 45 DPI sensor

Technical overview

The DPI differential-pressure transmitter from Grundfos Direct Sensors™ is designed for industrial purposes.

The DPI transmitter is fully compatible with aqueous media. The sensor is based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.

This makes the DPI transmitter very robust and ideal for pump integration and monitoring in harsh environments.

Applications

- Pump control
- HVAC systems
- temperature control and chiller systems
- renewable energies such as heat pumps, solar thermals, fresh water and micro-CHP systems
- monitoring and control systems
- water treatment plants
- water utility and distribution systems
- HPC and IT cooling systems.

Features and benefits

- MEMS technology
- No wear and tear
- plug and play for quick setup
- smart system solution with Grundfos pump controls
- compact and robust design
- compatible with aqueous media
- suitable for a wide range of applications.

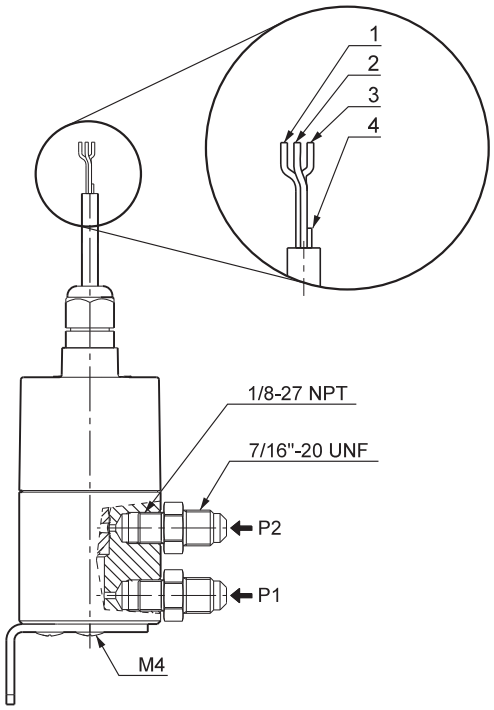
Pressure range

Pressure range	
[bar]	[psid]
0 - 0.6	0 - 8.7
0 - 1.0	0 - 14.5
0 - 1.2	0 - 17.4
0 - 1.6	0 - 23.2
0 - 2.5	0 - 36.3
0 - 4.0	0 - 58.0
0 - 6.0	0 - 87.0
0 - 10.0	0 - 145.0

Certificates

CE	C, CSA, US	EAC

Electrical connections



TM03 2225 3905

Fig. 46 Electrical connections

Pin	Description	Colour
1	12-30 V supply voltage	Brown
2	GND (earth conductor)	Yellow
3	Signal conductor	Green
4	Test conductor The conductor can be cut off during mounting. The conductor must not be connected to the power supply.	White

Directives

The Grundfos Direct Sensors™ are in conformity with these council directives on the approximation of the laws of the EC member states:

- Low Voltage Directive (2014/35/EU)
  - Standards used: EN 61010-1:2010
- EMC Directive (2014/30/EU).
  - Standards used: EN 61326-1:2013 and EN 61326-2-3:2013

The Grundfos Direct Sensors™ are exempted from the Pressure Equipment Directive (PED) according to Article 4, paragraph 3 in the PED 2014/68/EU.

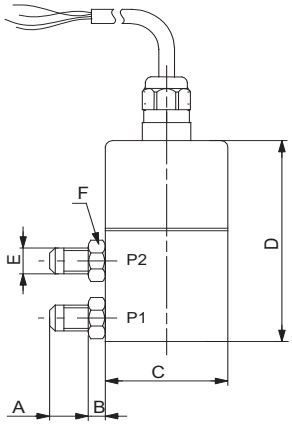
For outside usage, the DPI I is IP55, and may only be used outside in it's 0.9 m. variants powered by a Grundfos pump or the SI power supply (See *Accessories* on page 58).

DPI, 0 - 0.6 bar (0 - 8.7 psid)

TM04 5034 2409

Fig. 47 DPI transmitter

Dimensions

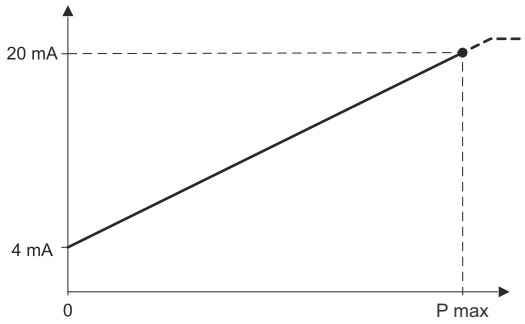


TM03 2059 3505

Fig. 48 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 49 Differential-pressure response, DPI

Specifications

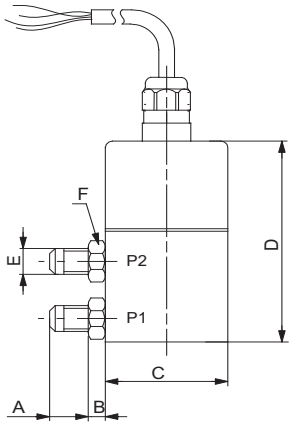
Pressure	
Measuring range	0 - 0.6 bar (0 - 8.7 psid)
Accuracy (IEC 61298-2)	3.5 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 1.0 bar (0 - 14.5 psid)

TM04 5034 2409

Fig. 50 DPI transmitter

Dimensions

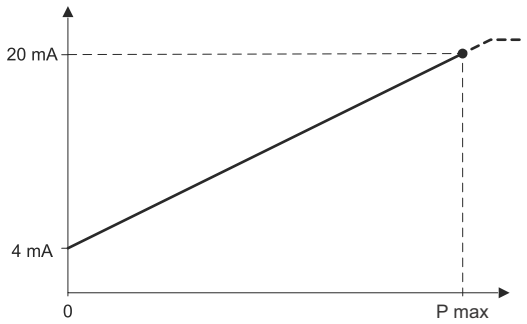


TM03 2059 3505

Fig. 51 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 52 Differential-pressure response, DPI

Specifications

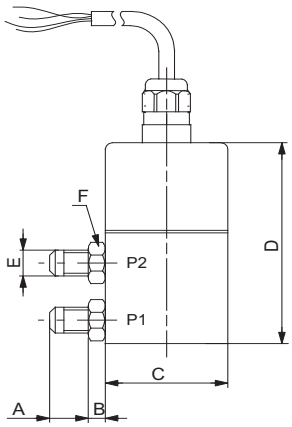
Pressure	
Measuring range	0 - 1.0 bar (0 - 14.5 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 1.2 bar (0 - 17.4 psid)

TM04 5034 2409

Fig. 53 DPI transmitter

Dimensions

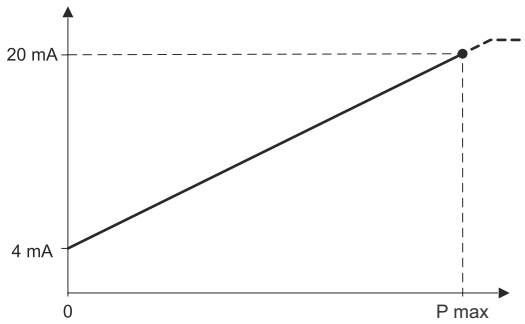


TM03 2059 3505

Fig. 54 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 55 Differential-pressure response, DPI

Specifications

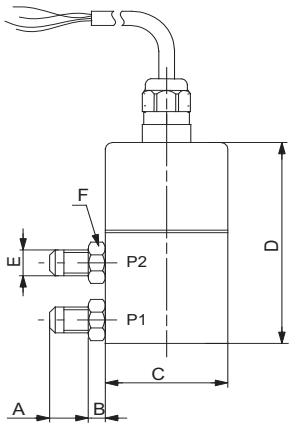
Pressure	
Measuring range	0 - 1.2 bar (0 - 17.4 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 % non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 1.6 bar (0 - 23.2 psid)

TM04 5034 2409

Fig. 56 DPI transmitter

Dimensions

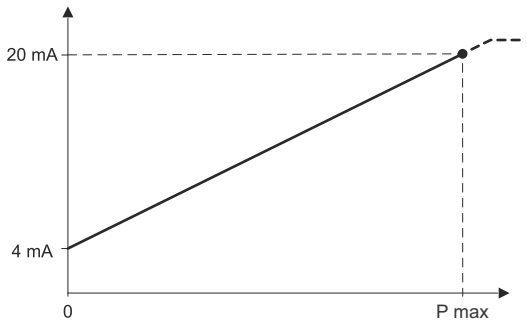


TM03 2059 3505

Fig. 57 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 58 Differential-pressure response, DPI

Specifications

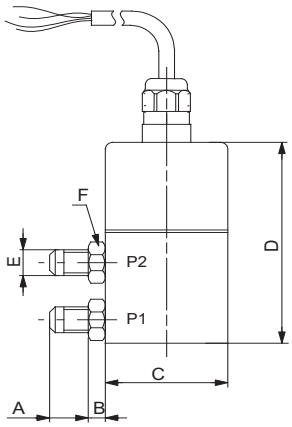
Pressure	
Measuring range	0 - 1.6 bar (0 - 23.2 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 2.5 bar (0 - 36.3 psid)

TM04 5034 2409

Fig. 59 DPI transmitter

Dimensions

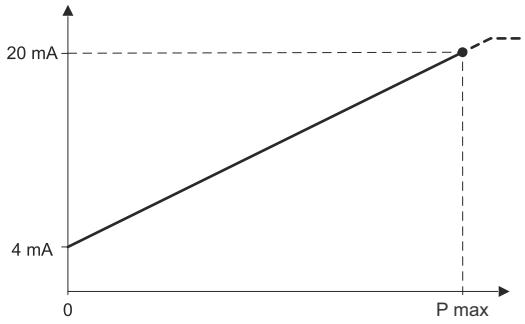


TM03 2059 3505

Fig. 60 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 61 Differential-pressure response, DPI

Specifications

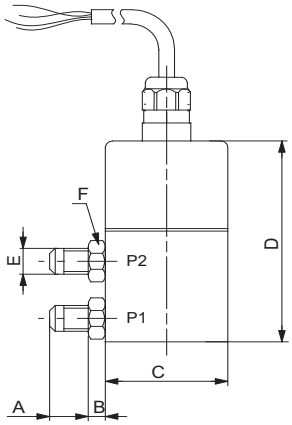
Pressure	
Measuring range	0 - 2.5 bar (0 - 36.3 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 4.0 bar (0 - 58.0 psid)

TM04 5034 2409

Fig. 62 DPI transmitter

Dimensions

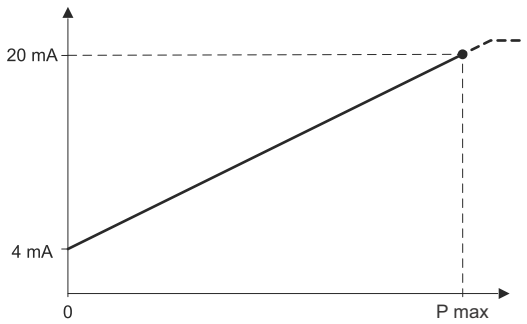


TM03 2059 3505

Fig. 63 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 64 Differential-pressure response, DPI

Specifications

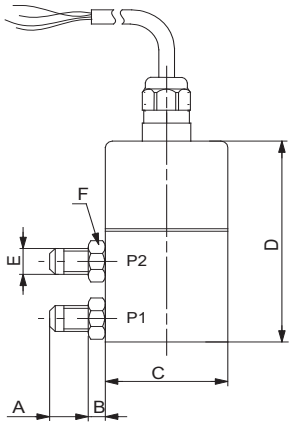
Pressure	
Measuring range	0 - 4.0 bar (0 - 58.0 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 6.0 bar (0 - 87.0 psid)

TM04 5034 2409

Fig. 65 DPI transmitter

Dimensions

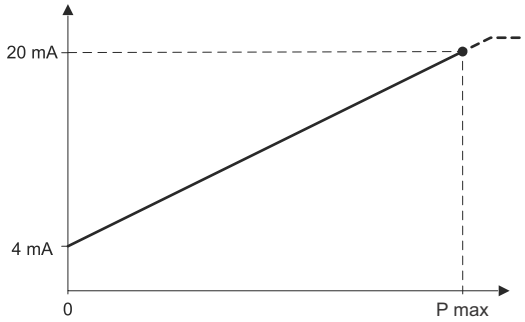


TM03 2059 3505

Fig. 66 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 67 Differential-pressure response, DPI

Specifications

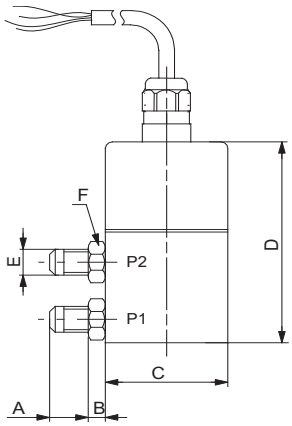
Pressure	
Measuring range	0 - 6.0 bar (0 - 87.0 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to- +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

DPI, 0 - 10.0 bar (0 - 145.0 psid)

TM04 5034 2409

Fig. 68 DPI transmitter

Dimensions

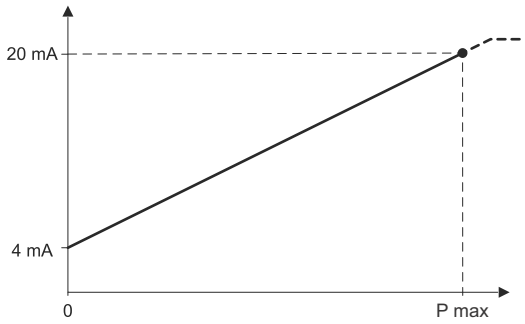


TM03 2059 3505

Fig. 69 Dimensions, DPI

	A	B	C	D	E	F
mm	14	6	∅45	77	7/16 - 20 UNF	SW 14
in	0.55	0.24	∅1.77	3.03	0.25" flare	

Output signals



TM06 3358 1716

Fig. 70 Differential-pressure response, DPI

Specifications

Pressure	
Measuring range	0 - 10.0 bar (0 - 145.0 psid)
Accuracy (IEC 61298-2)	2 % FS
Response time	Less than 0.5 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-10 to +70 °C (14 to 158 °F)
Liquid temperature, peak	Up to 80 °C (176 °F)
Ambient temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	12-30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum load impedance	500 kΩ at 24 V 200 kΩ at 16 V 100 kΩ at 12 V
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	FKM
Housing	Stainless steel 1.4305 (AISI 303)
Wetted materials	FKM, PPS and 1.4305
Environmental standards	
Enclosure class	IP55
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Immunity	EN 61000-6-2
Emission	EN 61000-6-3
Weight	550 g (1.21 lbs)

5. Differential Pressure transmitter, Industry (DPI II and DPI II+T)

General data

TM04 7866 2510

Fig. 71 DPI II transmitter

Technical overview

The DPI II+T combined differential-pressure and temperature transmitter (two-in-one) from Grundfos Direct Sensors™ is designed for industrial applications.

The capillary tube makes it possible to measure the differential pressure.

The DPI II+T transmitter is fully compatible with aqueous media. The transmitter is based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the transmitter chip.

This makes the DPI I+T transmitter very robust and ideal for pump integration and monitoring in harsh environments.

Applications

- Pump control
- HVAC systems
- temperature control and chiller systems
- renewable energies such as heat pumps, solar thermals, fresh water and micro-CHP systems
- monitoring and control systems
- water treatment plants
- water utility and distribution systems
- HPC and IT cooling systems.

Features and benefits

- Differential pressure and temperature measurement in one transmitter (two-in-one solution) for easy and cost-efficient installation (DPI II+T)
- MEMS technology.
- direct contact with the aqueous media resulting in a fast response time
- plug and play for quick setup
- smart system solution with Grundfos pump controls
- compact and robust design
- compatible with aqueous media
- suitable for a wide temperature range
- suitable for a wide range of applications.

Pressure range

Pressure range	
[bar]	[psid]
0 - 0.6	0 - 8.7
0 - 1.0	0 - 14.5
0 - 1.6	0 - 23.2
0 - 2.5	0 - 36.3
0 - 4.0	0 - 58.0
0 - 6.0	0 - 87.0
0 - 10.0	0 - 145.0
0 - 16.0	0 - 232.1

Approvals (w/EPDM O-rings)

- WRAS
- KTW
- AS 4020
- ACS.

Certificates

CE	C, CSA, US	EAC

Electrical connections

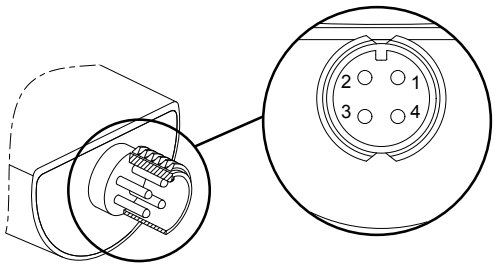


Fig. 72 Electrical connections

DPI II

Signal condition: 2-wire (loop-powered)

Pin	1	2	3	4
Wire colour	Brown	White	Blue	Black
I/O	Power supply	Not used	Pressure signal 4-20 mA	Not used

DPI II+T

Signal condition: 4-wire

Pin	1	2	3	4
Wire colour	Brown	White	Blue	Black
I/O	Power supply	Pressure signal 0-10 V	GND*	Temperature signal 0-10 V

* Common ground for pressure and temperature signals. Power supply, screened cable: SELV or PELV.

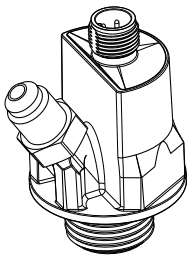
Directives

The Grundfos Direct Sensors™ are in conformity with these council directives on the approximation of the laws of the EC member states:

- Low Voltage Directive (2014/35/EU)
  - Standards used: EN 61010-1:2010
- EMC Directive (2014/30/EU).
  - Standards used: EN 61326-1:2013 and EN 61326-2-3:2013

The Grundfos Direct Sensors™ are exempted from the Pressure Equipment Directive (PED) according to Article 4, paragraph 3 in the PED 2014/68/EU.

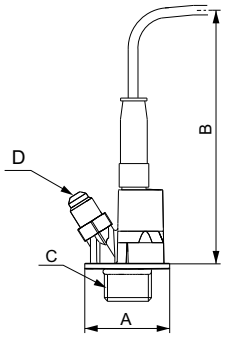
DPI II and DPI II+T, 0 - 0.6 bar (0 - 8.7 psid)



TM04 9239 3510

Fig. 73 DPI II and DPI II+T transmitter

Dimensions

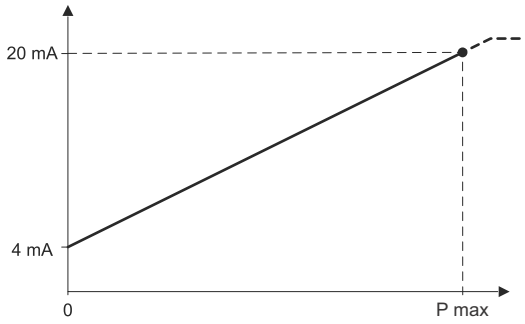


TM04 9238 0415

Fig. 74 Dimensions, DPI II and DPI II+T

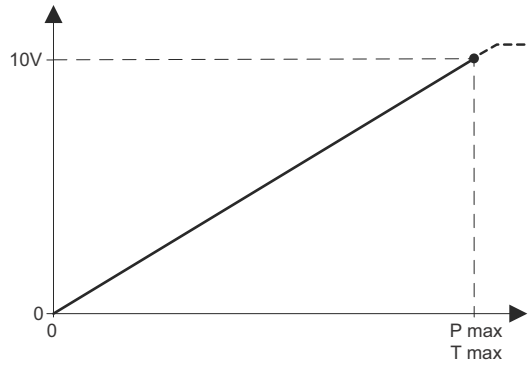
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 75 Pressure response, DPI II



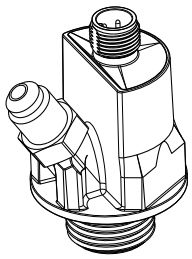
TM06 3359 1716

Fig. 76 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 0.6 bar (0 - 8.7 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-100 °C (32-212 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-100 °C (32-212 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

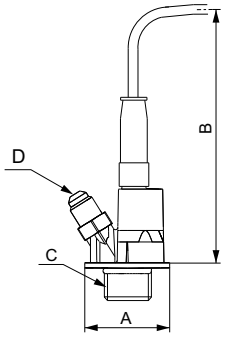
DPI II and DPI II+T, 0 - 1.0 bar (0 - 14.5 psid)



TM04 9239 3510

Fig. 77 DPI II and DPI II+T transmitter

Dimensions

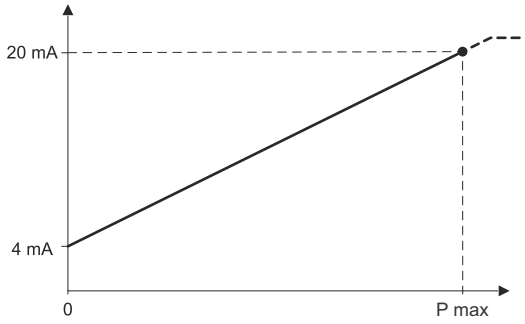


TM04 9238 0415

Fig. 78 Dimensions, DPI II and DPI II+T

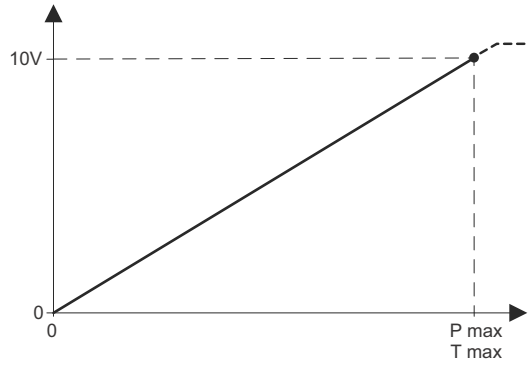
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 79 Pressure response, DPI II



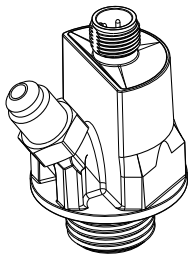
TM06 3359 1716

Fig. 80 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 1.0 bar (0 - 14.5 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

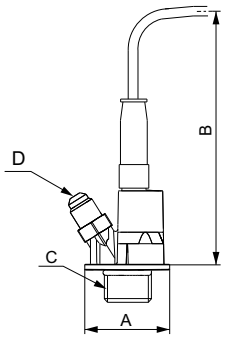
DPI II and DPI II+T, 0 - 1.6 bar (0 - 23.2 psid)



TM04 9239 3510

Fig. 81 DPI II and DPI II+T transmitter

Dimensions

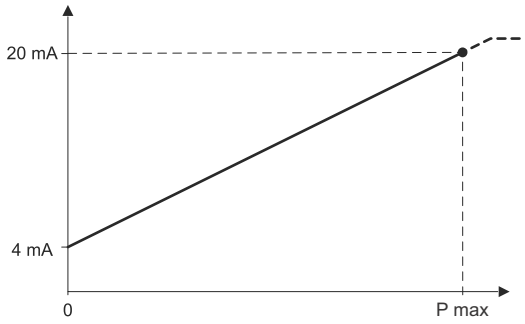


TM04 9238 0415

Fig. 82 Dimensions, DPI II and DPI II+T

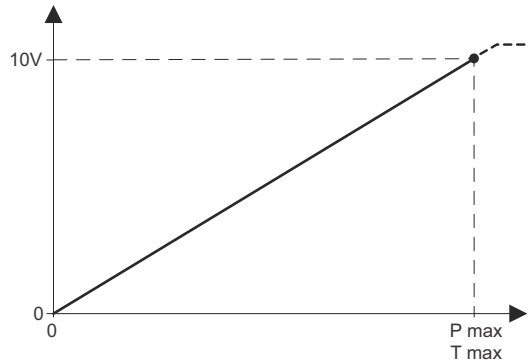
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 83 Pressure response, DPI II



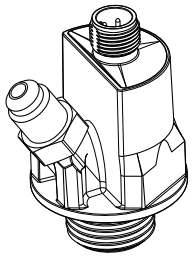
TM06 3359 1716

Fig. 84 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 1.6 bar (0 - 23.2 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

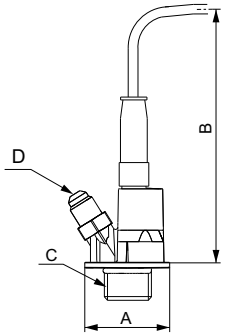
DPI II and DPI II+T, 0 - 2.5 bar (0 - 36.3 psid)



TM04 9239 3510

Fig. 85 DPI II and DPI II+T transmitter

Dimensions

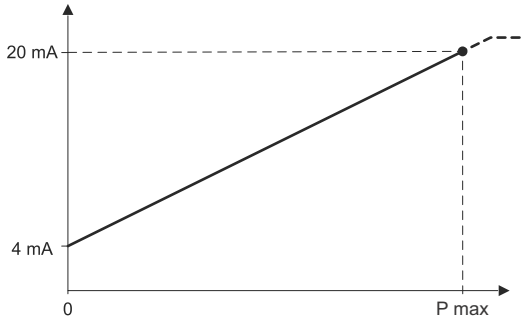


TM04 9238 0415

Fig. 86 Dimensions, DPI II and DPI II+T

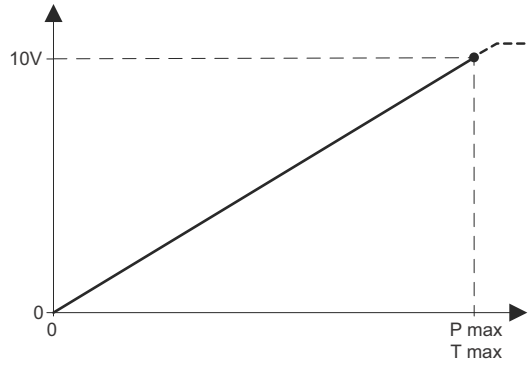
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 87 Pressure response, DPI II



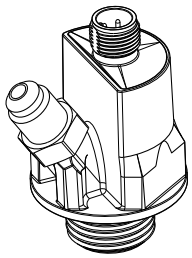
TM06 3359 1716

Fig. 88 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 2.5 bar (0 - 36.3 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

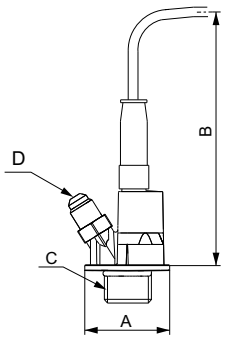
DPI II and DPI II+T, 0 - 4.0 bar (0 - 58.0 psid)



TM04 9239 3510

Fig. 89 DPI II and DPI II+T transmitter

Dimensions

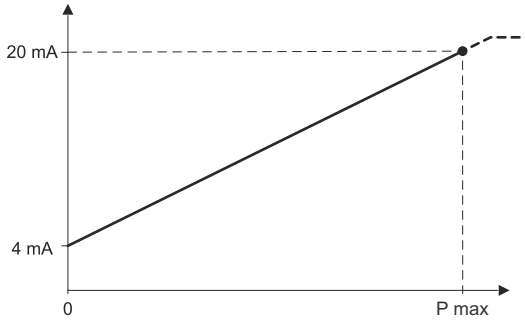


TM04 9238 0415

Fig. 90 Dimensions, DPI II and DPI II+T

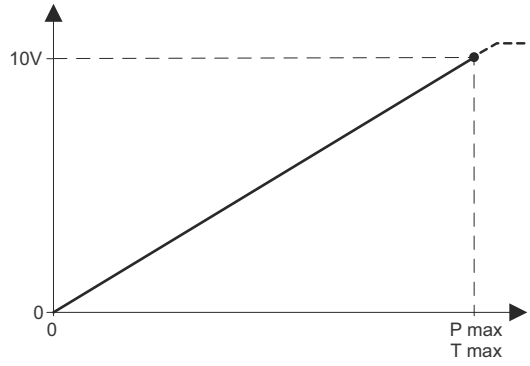
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 91 Pressure response, DPI II



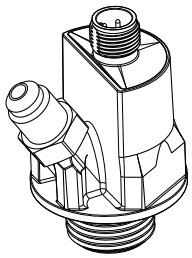
TM06 3359 1716

Fig. 92 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 4.0 bar (0 - 58.0 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

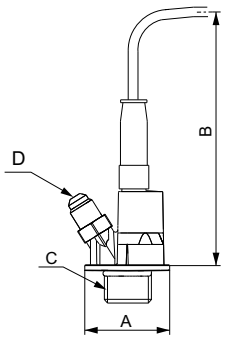
DPI II and DPI II+T, 0 - 6.0 bar (0 - 87.0 psid)



TM04 9239 3510

Fig. 93 DPI II and DPI II+T transmitter

Dimensions

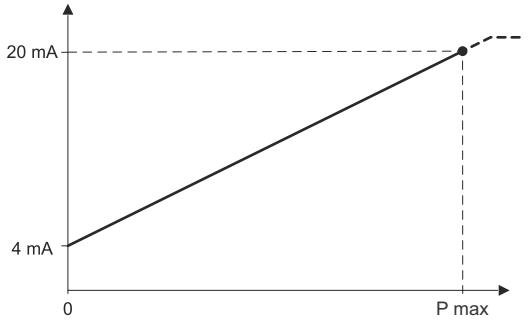


TM04 9238 0415

Fig. 94 Dimensions, DPI II and DPI II+T

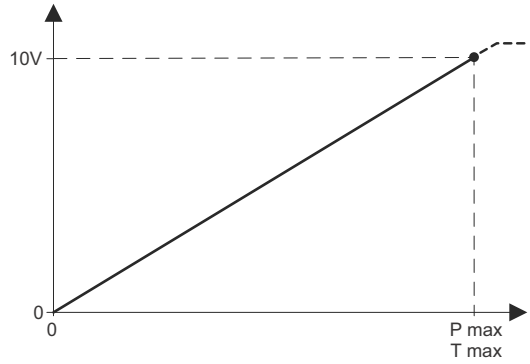
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 95 Pressure response, DPI II



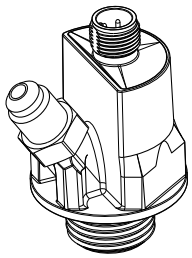
TM06 3359 1716

Fig. 96 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 6.0 bar (0 - 87.0 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

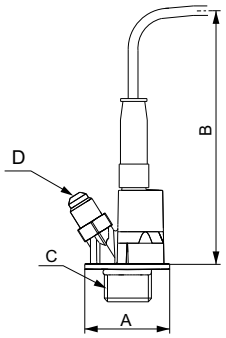
DPI II and DPI II+T, 0 - 10.0 bar (0 - 145.0 psid)



TM04 9239 3510

Fig. 97 DPI II and DPI II+T transmitter

Dimensions

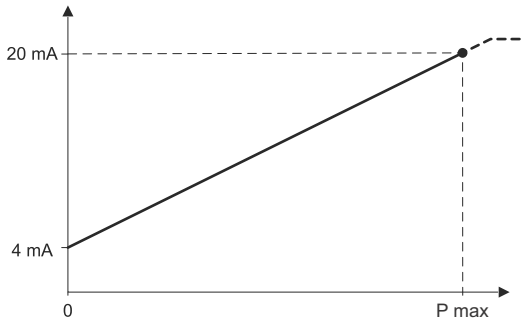


TM04 9238 0415

Fig. 98 Dimensions, DPI II and DPI II+T

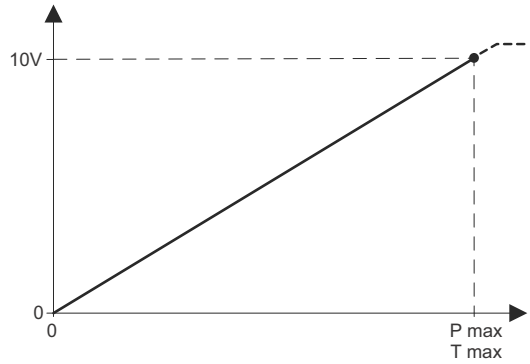
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 99 Pressure response, DPI II



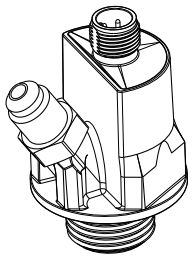
TM06 3359 1716

Fig. 100 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 10.0 bar (0 - 145.0 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 2.5 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

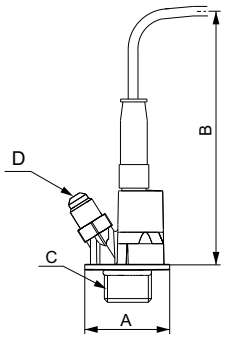
DPI II and DPI II+T, 0 - 16.0 bar (0 - 232.1 psid)



TM04 9239 3510

Fig. 101DPI II and DPI II+T transmitter

Dimensions

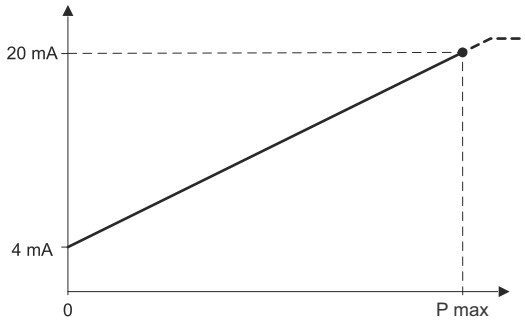


TM04 9238 0415

Fig. 102 Dimensions, DPI II and DPI II+T

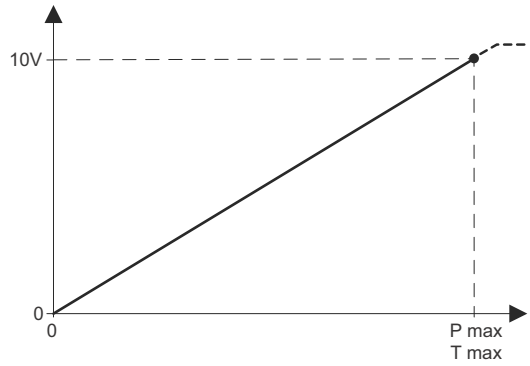
	A	B	C	D
mm	36.95	110	ISO 228/1 - G 1/2	7/16 - 20 UNF
in	1.45	4.33		0.25" flare

Output signals



TM06 3358 1716

Fig. 103 Pressure response, DPI II



TM06 3359 1716

Fig. 104 Pressure and temperature response, DPI II+T

Specifications

Pressure	
Measuring range	0 - 16.0 bar (0 - 232.1 psid)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 2.5 % FS
Accuracy (± 1 σ), -30 to +100 °C (-22 to +212 °F)	± 3 % FS
Response time	Less than 100 ms (typically 50 ms)
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1/1000 FS
Temperature, DPI II+T with temperature output	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 0-80 °C (32-176 °F)	± 1 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 K
Response time for sensor electronics	Less than 100 ms (typically 50 ms)
Resolution	0.1 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	-30 to +120 °C (-22 to +248 °F)
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Storage temperature	-55 to +70 °C (-67 to +158 °F)
Humidity, relative	0-95 % RH, non-condensing
Maximum system pressure	30 bar (435 psig)
Burst pressure	40 bar (580 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data, DPI II without temperature output	
Power supply, DPI II	12.5 - 30 VDC
Output signals – Signal cut off	4-20 mA 21 mA
Maximum power consumption	660 mW
Maximum load impedance	60 Ω at 12.5 VDC 100 Ω at 13.3 VDC 600 Ω at 24 VDC 900 Ω at 30 VDC
Maximum cable length	30 m (98 ft)
Electrical data, DPI II+T with temperature output	
Power supply, DPI II+T	16.6 - 30 VDC
Output signals – Signal cut off	0-10 VDC (0 V at 0 °C, 10 V at 100 °C) 11 VDC
Maximum power consumption	270 mW
Minimum load impedance	10 kΩ
Maximum cable length	30 m (98 ft)
Materials	
Sensing element	Silicon-based MEMS
O-ring	EPDM or FKM
Housing	Stainless steel 1.4404 (AISI 316 L)
Wetted materials	Corrosion-resistant coating, EPDM or FKM Stainless steel 1.4404 (AISI 316 L)
Environmental standards	
Enclosure class	IP67, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

6. Relative Pressure sensor Standard, RPS

General data

TM06 1286 2214
TM06 1287 2214

Fig. 105RPS sensor

Technical overview

The RPS is a combined pressure and temperature sensor (two-in-one) from Grundfos Direct Sensors™.

The RPS sensor is fully compatible with wet, aqueous media. The sensor is based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.

Applications

- Pump control
- HVAC systems
- temperature control and chiller systems
- renewable energies such as heat pumps, solar thermals, fresh water and micro-CHP systems
- monitoring and control systems
- water treatment plants
- water utility and distribution systems
- HPC and IT cooling systems.

Features and benefits

- Pressure and temperature measurement in one sensor (two-in-one solution) for easy and cost-efficient installation
- MEMS technology.
- direct contact with the aqueous media resulting in a fast response time
- plug and play for quick setup
- smart system solution with Grundfos pump controls
- compact and robust design
- compatible with aqueous media
- suitable for a wide temperature range
- suitable for a wide range of applications.

Pressure range

Pressure range	
[bar]	[psig]
0 - 0.6	0 - 8.7
0 - 1.0	0 - 14.5
0 - 1.6	0 - 23.2
0 - 2.5	0 - 36.3
0 - 4.0	0 - 58.0
0 - 6.0	0 - 87.0
0 - 10.0	0 - 145.0
0 - 16.0	0 - 232.0

Approvals (w/EPDM O-rings)

- WRAS
- KTW
- AS 4020
- ACS.

Certificates

CE	C, CSA, US	EAC

Electrical connections

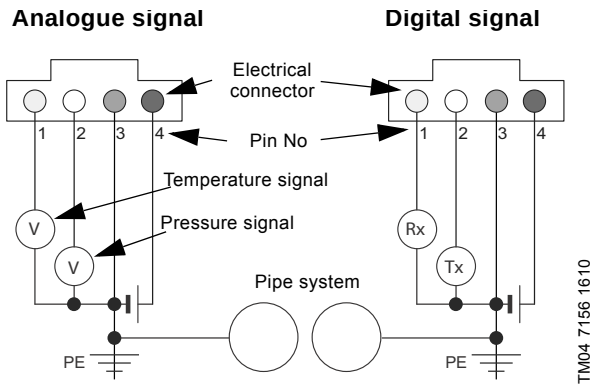


Fig. 106 Electrical connections

Pin	Description Analogue signal	Description Digital signal	Colour
1	Temperature signal	Rx	Yellow
2	Pressure signal	Tx	White
3	GND, 0 V PELV	GND, 0 V PELV	Green
4	Voltage supply, +5 VDC	Power supply, +5 VDC	Brown

Power supply requirements

- VDC ± 5 % PELV (Ratiometric)
- The sensor must be separated from hazardous live circuitry by double or reinforced insulation
- Maximum 10 mV ripple, 50 Hz
- Minimum output current 25 mA
- Grounding of sensor supply is required

Options

Fig. 107 Sensor options

Description
1/2" nipple, stainless steel (316L)

Differential Temperature

The differential temperature is between two standard Direct Sensors™ from Grundfos.

Directives

The Grundfos Direct Sensors™ are in conformity with these council directives on the approximation of the laws of the EC member states:

- Low Voltage Directive (2014/35/EU)
  - Standards used: EN 61010-1:2010
- EMC Directive (2014/30/EU).
  - Standards used: EN 61326-1:2013 and EN 61326-2-3:2013

The Grundfos Direct Sensors™ are exempted from the Pressure Equipment Directive (PED) according to Article 4, paragraph 3 in the PED 2014/68/EU.

Remarks

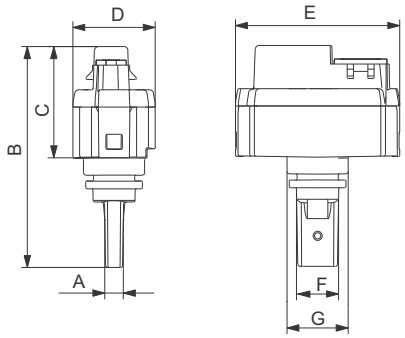
For RPS sensors with condensation protection, the protection applied has a maximum influence on the pressure accuracy of up to ± 0.22 bar for transient temperature changes of up to dT 15 °C. However, for RPS 0-16, the maximum influence is ± 0.80 bar. For compensation in the controller, please request the RPS Gel Compensation Note from your sensor representative.

RPS, 0 - 0.6 bar (0 - 8.7 psig)

TM06 1287 2214

Fig. 108 RPS sensor

Dimensions

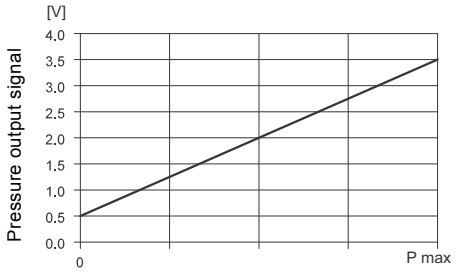


TM05 4669 2512

Fig. 109 Dimensions, RPS

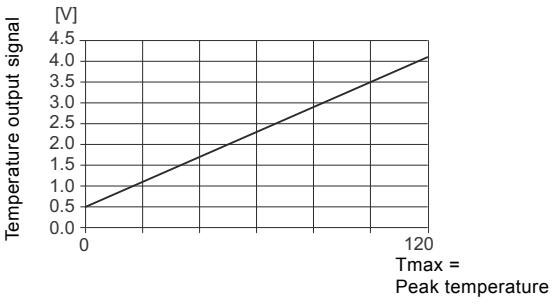
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 110 Pressure response in Analogue mode



TM06 3354 5214

Fig. 111 Temperature response in Analogue mode

Specifications

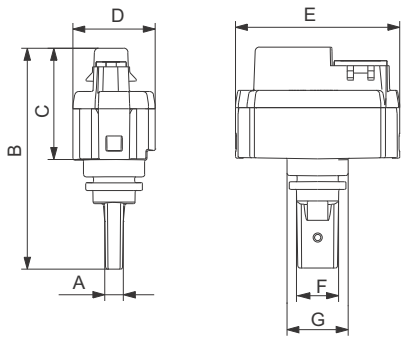
Pressure	
Measuring range	0 - 0.6 bar (0 - 8.7 psig)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite, PPS
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2", EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 1.0 bar (0 - 14.5 psig)

TM06 1287 2214

Fig. 112RPS sensor

Dimensions

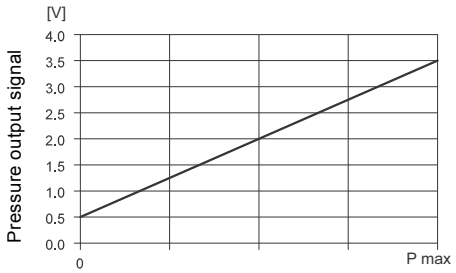


TM05 4669 2512

Fig. 113 Dimensions, RPS

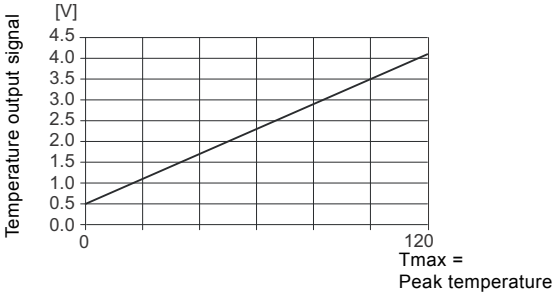
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 114 Pressure response in Analogue mode



TM06 3354 5214

Fig. 115 Temperature response in Analogue mode

Specifications

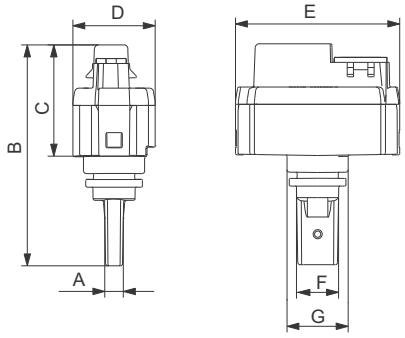
Pressure	
Measuring range	0 - 1.0 bar (0 - 14.5 psig)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 2 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2" EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 1.6 bar (0 - 23.2 psig)

TM06 1287 2214

Fig. 116 RPS sensor

Dimensions

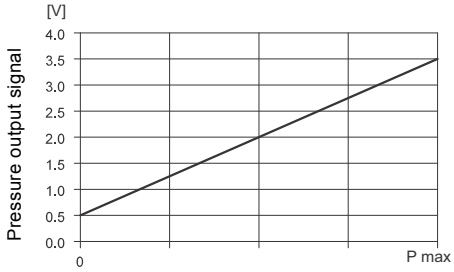


TM05 4669 2512

Fig. 117 Dimensions, RPS

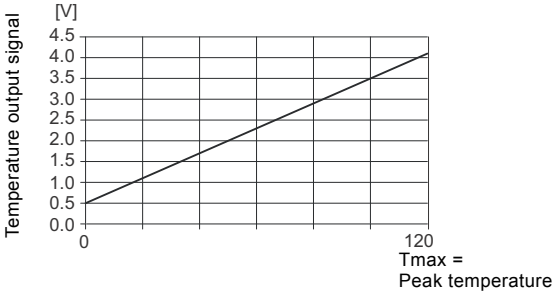
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 118 Pressure response in Analogue mode



TM06 3354 5214

Fig. 119 Temperature response in Analogue mode

Specifications

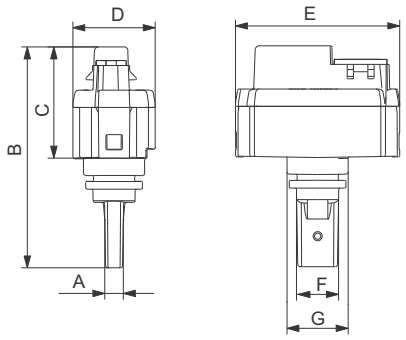
Pressure	
Measuring range	0 - 1.6 bar (0 - 23.2 psig)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1.5 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite, PPS
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2", EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 2.5 bar (0 - 36.3 psig)

TM06 1287 2214

Fig. 120RPS sensor

Dimensions

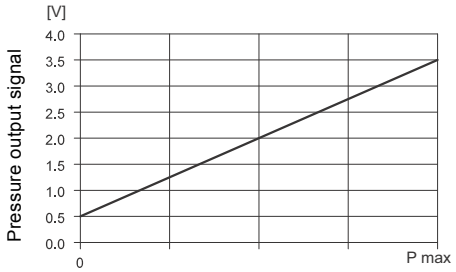


TM05 4669 2512

Fig. 121 Dimensions, RPS

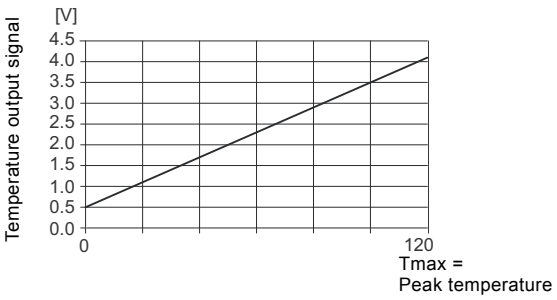
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 122 Pressure response in Analogue mode



TM06 3354 5214

Fig. 123 Temperature response in Analogue mode

Specifications

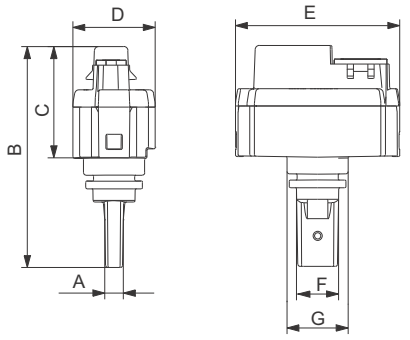
Pressure	
Measuring range	0 - 2.5 bar (0 - 36.3 psig)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1.5 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite, PPS
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2", EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 4.0 bar (0 - 58.0 psig)

TM06 1287 2214

Fig. 124RPS sensor

Dimensions

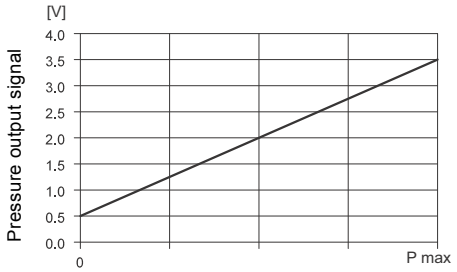


TM05 4669 2512

Fig. 125 Dimensions, RPS

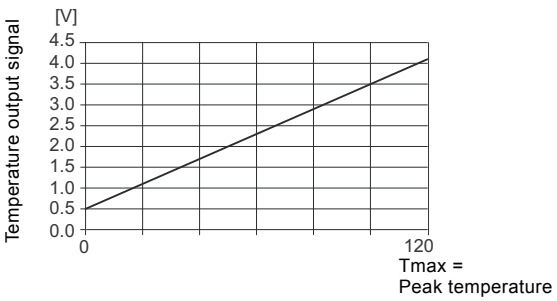
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 126 Pressure response in Analogue mode



TM06 3354 5214

Fig. 127 Temperature response in Analogue mode

Specifications

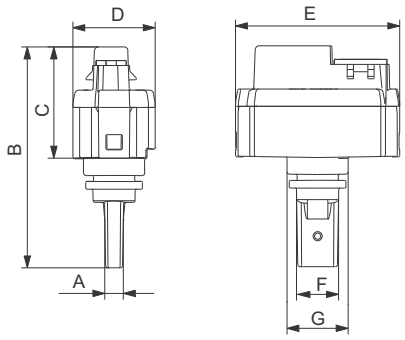
Pressure	
Measuring range	0 - 4.0 bar (0 - 58.0 psig)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1.5 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite, PPS
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2" EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 6.0 bar (0 - 87.0 psig)

TM06 1287 2214

Fig. 128RPS sensor

Dimensions

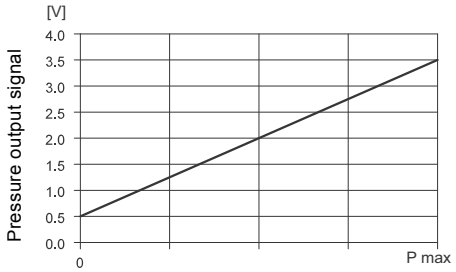


TM05 4669 2512

Fig. 129 Dimensions, RPS

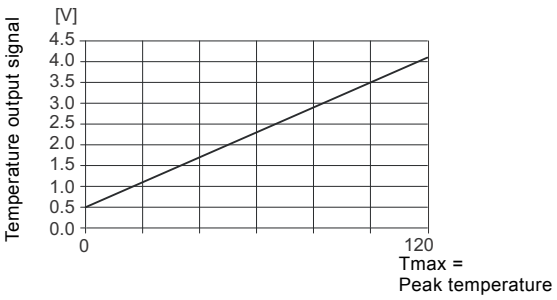
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 130 Pressure response in Analogue mode



TM06 3354 5214

Fig. 131 Temperature response in Analogue mode

Specifications

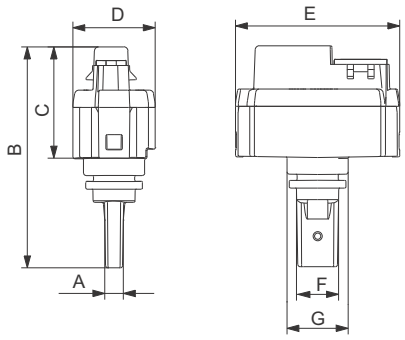
Pressure	
Measuring range	0 - 6.0 bar (0 - 87.0 psig)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1.5 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2" EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 10.0 bar (0 - 145.0 psig)

TM06 1287 2214

Fig. 132RPS sensor

Dimensions

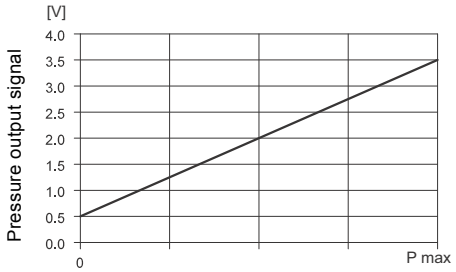


TM05 4669 2512

Fig. 133 Dimensions, RPS

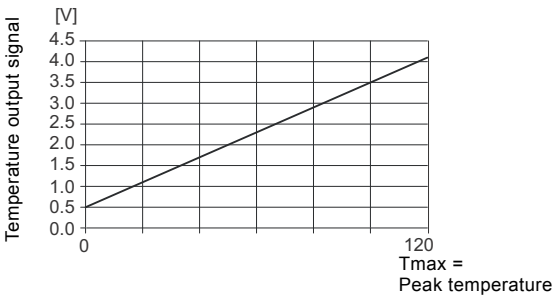
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 134 Pressure response in Analogue mode



TM06 3354 5214

Fig. 135 Temperature response in Analogue mode

Specifications

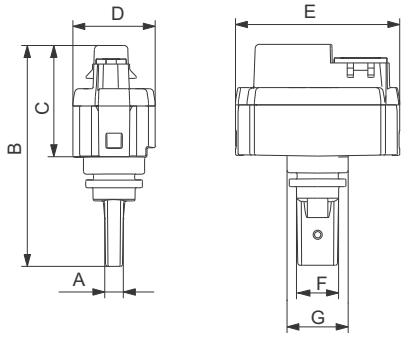
Pressure	
Measuring range	0 - 10.0 bar (0 - 145.0 psig)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1.5 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite, PPS
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2" EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

RPS, 0 - 16.0 bar (0 - 232.1 psig)

TM06 1287 2214

Fig. 136RPS sensor

Dimensions

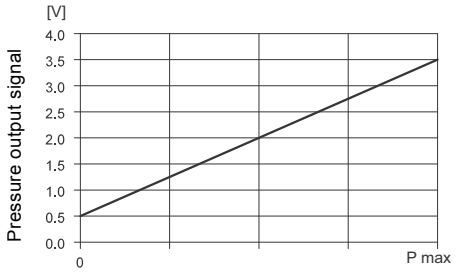


TM05 4669 2512

Fig. 137 Dimensions, RPS

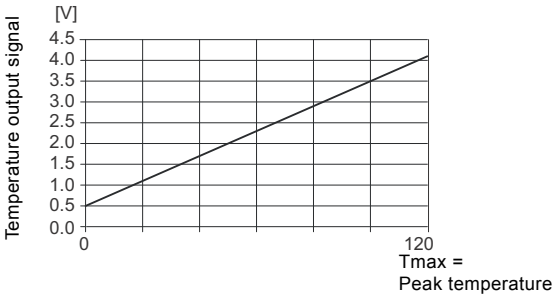
	A	B	C	D	E	F	G
mm	4.5	53.7	27	20	39.9	10.2	14.8
in	0.18	2.11	1.06	0.79	1.57	0.40	0.58

Output signals



TM06 3360 5214

Fig. 138 Pressure response in Analogue mode



TM06 3354 5214

Fig. 139 Temperature response in Analogue mode

Specifications

Pressure	
Measuring range	0 - 16.0 bar (0 - 232.1 psid)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 1 % FS
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1.5 % FS
Response time	Less than 1 s
Resolution	0.6 mbar (0.009 psig)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig)
Burst Pressure	30 bar (435 psig)
Electrical data	
Power supply	5 VDC (± 5 %), PELV Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensor	Silicon-based MEMS
Sealing	EPDM O-rings, FKM O-rings or EPDM sealing cap with FKM O-rings
Housing	Composite, PPS
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM Adapter ISO 7/1 - R1/2" and NPT 1/2" EN 1.4408 (AISI 316)
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

7. Differential Pressure sensor Standard, DPS

General data

TM06 1682 2614

Fig. 140DPS sensor

Technical overview

The DPS is a combined differential-pressure and temperature sensor (two-in-one) from Grundfos Direct Sensors™.

The DPS sensor is fully compatible with aqueous media. The sensor is based on MEMS sensing technology in combination with the corrosion-resistant Silicoat® coating technology on the sensor chip.

Applications

- Pump control
- HVAC systems
- temperature control and chiller systems
- renewable energies such as heat pumps, solar thermals, fresh water and micro-CHP systems
- monitoring and control systems
- water treatment plants
- water utility and distribution systems
- HPC and IT cooling systems.

Features and benefits

- Differential pressure and temperature measurement in one sensor (two-in-one solution) for easy and cost-efficient installation
- MEMS technology
- direct contact with the aqueous media resulting in a fast response time
- plug and play for quick setup
- smart system solution with Grundfos pump controls
- compact and robust design
- compatible with aqueous media
- suitable for a wide temperature range
- suitable for a wide range of applications.

Pressure range

Pressure range	
[bar]	[psid]
0 - 0.6	0 - 8.7
0 - 1.0	0 - 14.5
0 - 1.6	0 - 23.2
0 - 2.5	0 - 36.3
0 - 4.0	0 - 58.0
0 - 6.0	0 - 87.0

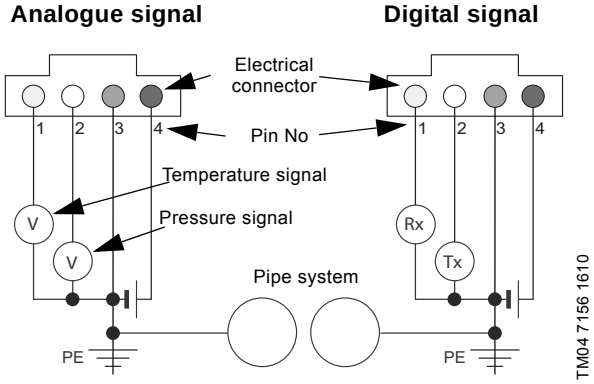
Approvals (w/EPDM O-rings)

- WRAS
- KTW
- ACS.

Certificates

CE	C, CSA, US	EAC

Electrical connections



TM04 7156 1610

Fig. 141 Electrical connections

Pin	Description Analogue signal	Description Digital signal	Colour
1	Temperature signal	Rx	Yellow
2	Pressure signal	Tx	White
3	GND, 0 V PELV	GND, 0 V PELV	Green
4	Voltage supply, +5 VDC	Power supply, +5 VDC	Brown

Power supply requirements

- VDC ± 5 % PELV (Ratiometric)
- The sensor must be separated from hazardous live circuitry by double or reinforced insulation
- Maximum 10 mV ripple, 50 Hz
- Minimum output current 25 mA
- Grounding of sensor supply is required

Options

	Part		
	Stainless steel adapter		
	Fitting, 6 mm (0.23") Fitting, 8 mm (0.31")	1.4408 (AISI 316)	Tube fitting
	Fitting, 6 mm (0.23") Fitting, 8 mm (0.31")		Compression fitting
	Wall bracket for DPS with stainless steel adapter		

Differential Temperature

The differential temperature is between two standard Direct Sensors™ from Grundfos.

Directives

The Grundfos Direct Sensors™ are in conformity with these council directives on the approximation of the laws of the EC member states:

- Low Voltage Directive (2014/35/EU)
  - Standards used: EN 61010-1:2010
- EMC Directive (2014/30/EU).
  - Standards used: EN 61326-1:2013 and EN 61326-2-3:2013

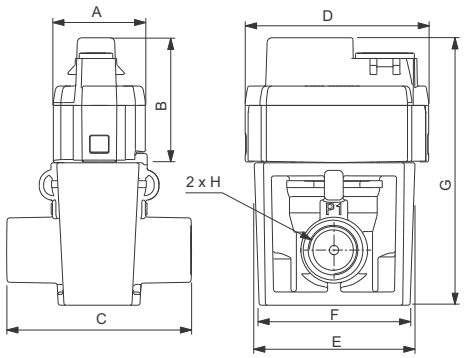
The Grundfos Direct Sensors™ are exempted from the Pressure Equipment Directive (PED) according to Article 4, paragraph 3 in the PED 2014/68/EU.

DPS, 0 - 0.6 bar (0 - 8.7 psid)

TM06 1682 2614

Fig. 142DPS sensor

Dimensions

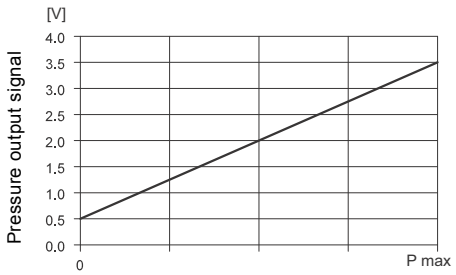


TM06 3455 0115

Fig. 143 Dimensions, DPS

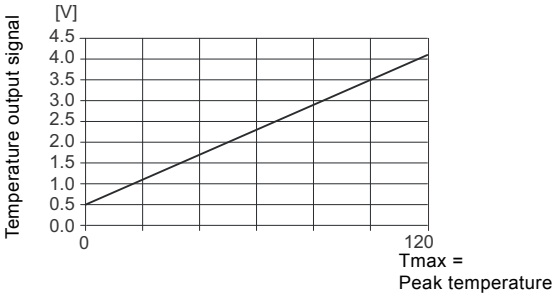
	A	B	C	D	E	F	G	H
mm	20	29.9	40	39.9	35	32.9	57.9	1/8 - 27 NPT
in	0.79	1.18	1.57	1.57	1.38	1.30	2.28	

Output signals



TM06 3360 5214

Fig. 144 Pressure response in Analogue mode



TM06 3354 5214

Fig. 145 Temperature response in Analogue mode

Specifications

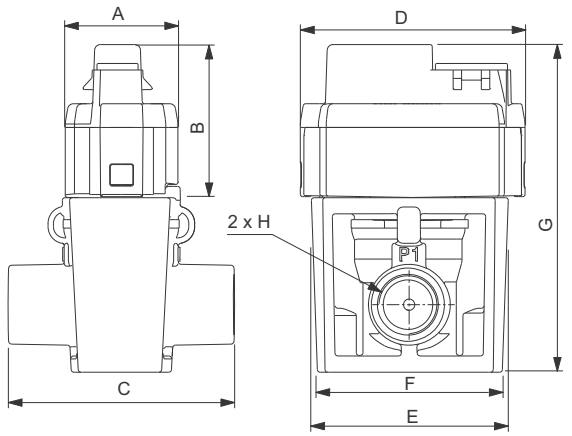
Pressure	
Measuring range	0 - 0.6 bar (0 - 8.7 psid)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1.2 mbar (0.02 psid)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig) 16 bar (232 psig) at 70 °C (158 °F) 12 bar (145 psig) at 100 °C (212 °F)
Burst Pressure	30 bar (435 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	5 VDC (± 5 %), PELV. Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing cap	EPDM
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM,
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

DPS, 0 - 1.0 bar (0 - 14.5 psid)

TM06 1682 2614

Fig. 146DPS sensor

Dimensions

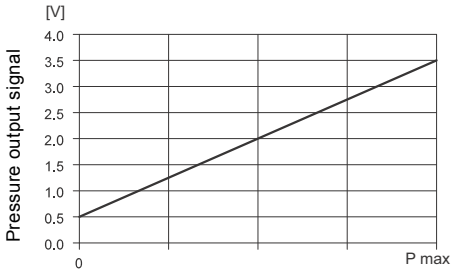


TM06 3455 0115

Fig. 147 Dimensions, DPS

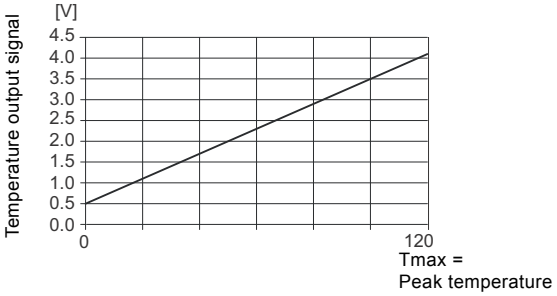
	A	B	C	D	E	F	G	H
mm	20	29.9	40	39.9	35	32.9	57.9	1/8 - 27 NPT
in	0.79	1.18	1.57	1.57	1.38	1.30	2.28	

Output signals



TM06 3360 5214

Fig. 148 Pressure response in Analogue mode



TM06 3354 5214

Fig. 149 Temperature response in Analogue mode

Specifications

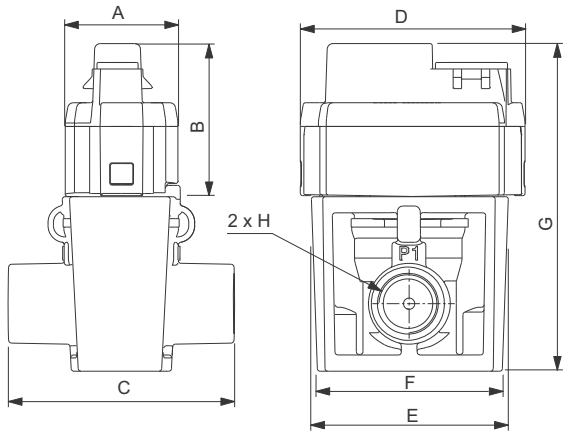
Pressure	
Measuring range	0 - 1.0 bar (0 - 14.5 psid)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1.2 mbar (0.02 psid)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig) 16 bar (232 psig) at 70 °C (158 °F) 12 bar (145 psig) at 100 °C (212 °F)
Burst Pressure	30 bar (435 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	5 VDC (± 5 %), PELV. Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing cap	EPDM
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM,
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

DPS, 0 - 1.6 bar (0 - 23.2 psid)

TM06 1682 2614

Fig. 150DPS sensor

Dimensions

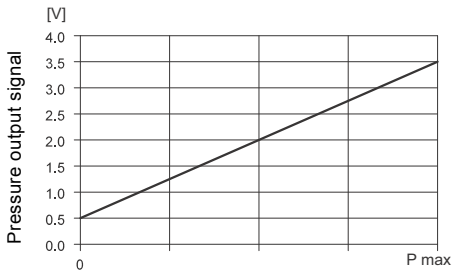


TM06 3455 0115

Fig. 151 Dimensions, DPS

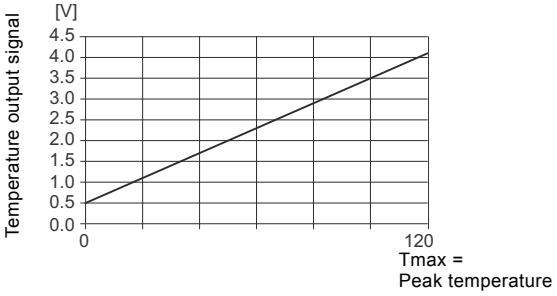
	A	B	C	D	E	F	G	H
mm	20	29.9	40	39.9	35	32.9	57.9	1/8 - 27 NPT
in	0.79	1.18	1.57	1.57	1.38	1.30	2.28	

Output signals



TM06 3360 5214

Fig. 152 Pressure response in Analogue mode



TM06 3354 5214

Fig. 153 Temperature response in Analogue mode

Specifications

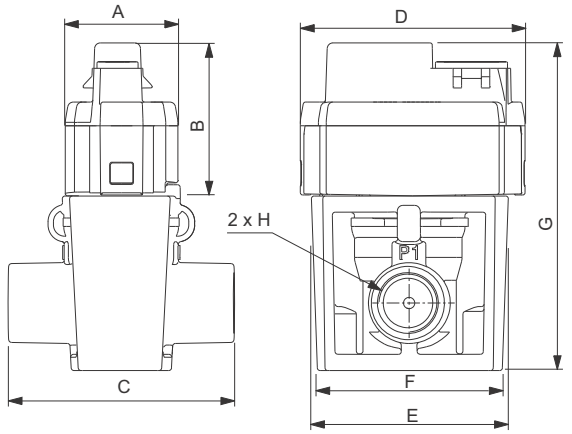
Pressure	
Measuring range	0 - 1.6 bar (0 - 23.2 psid)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1.2 mbar (0.02 psid)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig) 16 bar (232 psig) at 70 °C (158 °F) 12 bar (145 psig) at 100 °C (212 °F)
Burst Pressure	30 bar (435 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	5 VDC (± 5 %), PELV. Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing cap	EPDM
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM,
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

DPS, 0 - 2.5 bar (0 - 36.3 psid)

TM06 1682 2614

Fig. 154DPS sensor

Dimensions

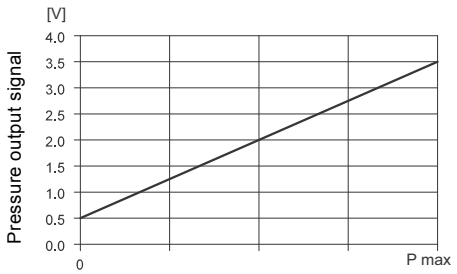


TM06 3455 0115

Fig. 155 Dimensions, DPS

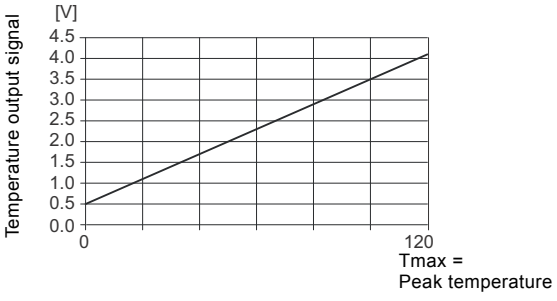
	A	B	C	D	E	F	G	H
mm	20	29.9	40	39.9	35	32.9	57.9	1/8 - 27 NPT
in	0.79	1.18	1.57	1.57	1.38	1.30	2.28	

Output signals



TM06 3360 5214

Fig. 156 Pressure response in Analogue mode



TM06 3354 5214

Fig. 157 Temperature response in Analogue mode

Specifications

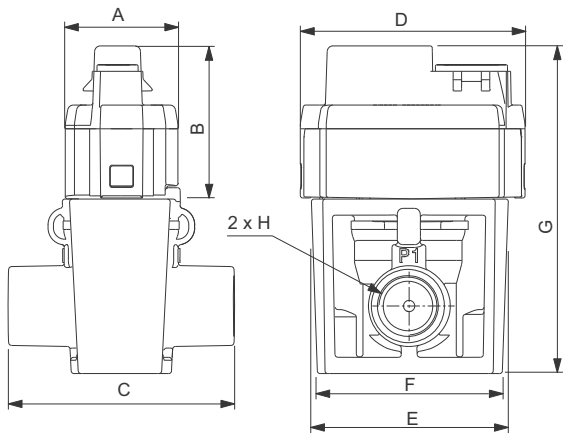
Pressure	
Measuring range	0 - 2.5 bar (0 - 36.3 psid)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1.2 mbar (0.02 psid)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig) 16 bar (232 psig) at 70 °C (158 °F) 12 bar (145 psig) at 100 °C (212 °F)
Burst Pressure	30 bar (435 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	5 VDC (± 5 %), PELV. Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing cap	EPDM
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM,
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

DPS, 0 - 4.0 bar (0 - 58.0 psid)

TM06 1682 2614

Fig. 158DPS sensor

Dimensions

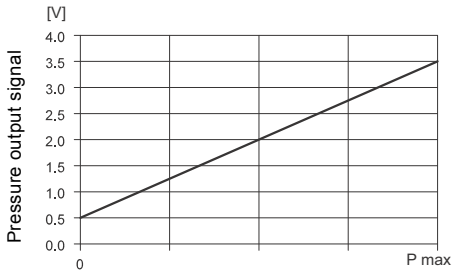


TM06 3455 0115

Fig. 159 Dimensions, DPS

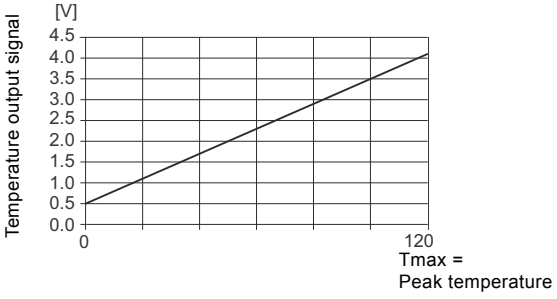
	A	B	C	D	E	F	G	H
mm	20	29.9	40	39.9	35	32.9	57.9	1/8 - 27 NPT
in	0.79	1.18	1.57	1.57	1.38	1.30	2.28	

Output signals



TM06 3360 5214

Fig. 160 Pressure response in Analogue mode



TM06 3354 5214

Fig. 161 Temperature response in Analogue mode

Specifications

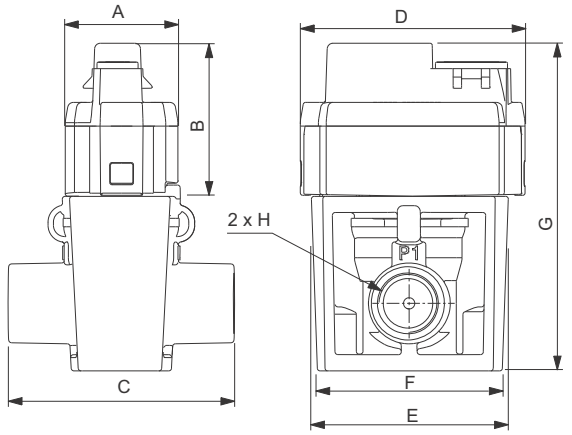
Pressure	
Measuring range	0 - 4.0 bar (0 - 58.0 psid)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1.2 mbar (0.02 psid)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig) 16 bar (232 psig) at 70 °C (158 °F) 12 bar (145 psig) at 100 °C (212 °F)
Burst Pressure	30 bar (435 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	5 VDC (± 5 %), PELV. Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing cap	EPDM
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM,
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

DPS, 0 - 6.0 bar (0 - 87.0 psid)

TM06 1682 2614

Fig. 162DPS sensor

Dimensions

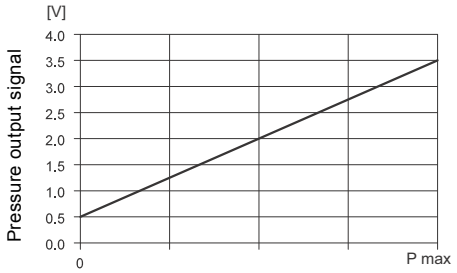


TM06 3455 0115

Fig. 163 Dimensions, DPS

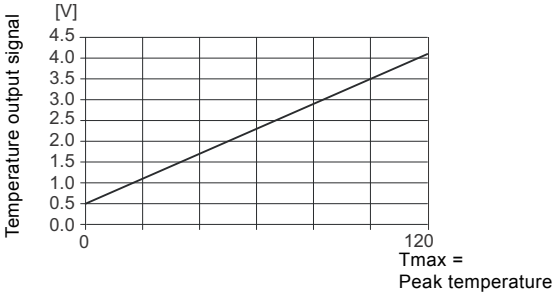
	A	B	C	D	E	F	G	H
mm	20	29.9	40	39.9	35	32.9	57.9	1/8 - 27 NPT
in	0.79	1.18	1.57	1.57	1.38	1.30	2.28	

Output signals



TM06 3360 5214

Fig. 164 Pressure response in Analogue mode



TM06 3354 5214

Fig. 165 Temperature response in Analogue mode

Specifications

Pressure	
Measuring range	0 - 6.0 bar (0 - 87.0 psid)
Accuracy (± 1 σ), in water, 15-90 °C (59-194 °F)	± 1.5 % FS
Accuracy (± 1 σ), in water, 0-120 °C (32-248 °F)	± 2 % FS
Response time (63.2 %)	Less than 1 s
System pressure deviation	6 mbar/bar (0.09 psid/psig)
Resolution	1.2 mbar (0.02 psid)
Temperature	
Measuring range	0-120 °C (32-248 °F)
Accuracy (± 1 σ), 15-90 °C (59-194 °F)	± 0.5 K
Accuracy (± 1 σ), 0-120 °C (32-248 °F)	± 1 K
Response time for sensor electronics	250 ms
Resolution	0.008 K
Differential Temperature	
Accuracy 15-90 °C (59-194 °F)	0.3 K
Accuracy 0-120 °C (32-248 °F)	0.5 K
System conditions and environment	
Liquid types	Aqueous media compatible with wetted materials
Liquid temperature, operation	0-120 °C (32-248 °F)
Liquid temperature, peak	-25 to +120 °C (-13 to +248 °F), non-freezing
Ambient temperature, operation	-25 to +60 °C (-13 to +140 °F)
Ambient temperature, peak	-55 to +90 °C (-67 to +194 °F)
Humidity, relative	0-95 %, non-condensing
Maximum system pressure	24 bar (348 psig) 16 bar (232 psig) at 70 °C (158 °F) 12 bar (145 psig) at 100 °C (212 °F)
Burst Pressure	30 bar (435 psig)
Maximum p1-p2 pressure	16 bar (232 psid)
Maximum p2-p1 pressure	10 bar (145 psid)
Electrical data	
Power supply	5 VDC (± 5 %), PELV. Grounding of sensor supply required.
Output signals	Ratiometric
Digital output signals	Grundfos open data protocol
Analog output signals	0.5 - 3.5 V for pressure (zero at 0.5 V) 0.5 - 4.1 V for temperature (zero at 0.5 V and 100 °C at 3.5 V)
Power consumption	Appr. 75 mW
Load impedance	> 47 kΩ
Maximum cable length	3 m (9.10 ft)
Materials	
Sensing element	Silicon-based MEMS
Sealing cap	EPDM
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, PPS, EPDM or FKM,
Environmental standards	
Enclosure class	IP44, cable connected
Temperature cycling	IEC 68-2-14
Vibration, non-destructive	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

8. Product range

RPI transmitter

Scope of delivery:

- RPI transmitter
- 2 m (6.5 ft) cable
- quick guide.

Complete product range	Pressure range	Thread	Temperature measurement	O-ring		Outside usage
				EPDM	FKM	
RPI/--0-0.6b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 0.6 bar (0 - 8.7 psig)	G 1/2		•		•
RPI/--0-0.6b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/--0-0.6b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/--0-0.6b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/--0-1.0b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 1.0 bar (0 - 14.5 psig)	G 1/2		•		•
RPI/--0-1.0b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/--0-1.0b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/--0-1.0b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/--0-1.6b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 1.6 bar (0 - 23.2 psig)	G 1/2		•		•
RPI/--0-1.6b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/--0-1.6b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/--0-1.6b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/--0-2.5b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 2.5 bar (0 - 36.3 psig)	G 1/2		•		•
RPI/--0-2.5b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/--0-2.5b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/--0-2.5b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/--0-4.0b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 4.0 bar (0 - 58.0 psig)	G 1/2		•		•
RPI/--0-4.0b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/--0-4.0b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/--0-4.0b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/--0-6.0b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 6.0 bar (0 - 87.0 psig)	G 1/2		•		•
RPI/--0-6.0b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/--0-6.0b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/--0-6.0b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/---0-10b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 10.0 bar (0 - 145.0 psig)	G 1/2		•		•
RPI/---0-10b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/---0-10b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/---0-10b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/---0-16b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 16.0 bar (0 - 232.1 psig)	G 1/2		•		•
RPI/---0-16b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/---0-16b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/---0-16b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
RPI/---0-25b/1/C/M2.00-X/EG6/--/03P/SD-1	0 - 25.0 bar (0 - 362.6 psig)	G 1/2		•		•
RPI/---0-25b/1/C/M2.00-X/VG6/--/03P/SD-1					•	•
RPI/---0-25b/1/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
RPI/---0-25b/1/F/M2.00-X/VG6/--/03P/SD-1			•		•	•

DPI II and DPI II+T transmitter

Scope of delivery:

- DPI II and DPI II+T transmitter
- 2 m (6.5 ft) cable
- capillary tube with fitting
- quick guide.

Complete product range	Pressure range	Thread	Temperature measurement	O-ring		Outside usage
				EPDM	FKM	
DPI/--0-0.6b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 0.6 bar (0 - 8.7 psid)	G 1/2		•		•
DPI/--0-0.6b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/--0-0.6b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/--0-0.6b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/--0-1.0b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 1.0 bar (0 - 14.5 psid)	G 1/2		•		•
DPI/--0-1.0b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/--0-1.0b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/--0-1.0b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/--0-1.6b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 1.6 bar (0 - 23.2 psid)	G 1/2		•		•
DPI/--0-1.6b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/--0-1.6b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/--0-1.6b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/--0-2.5b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 2.5 bar (0 - 36.3 psid)	G 1/2		•		•
DPI/--0-2.5b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/--0-2.5b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/--0-2.5b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/--0-4.0b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 4.0 bar (0 - 58.0 psid)	G 1/2		•		•
DPI/--0-4.0b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/--0-4.0b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/--0-4.0b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/--0-6.0b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 6.0 bar (0 - 87.0 psid)	G 1/2		•		•
DPI/--0-6.0b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/--0-6.0b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/--0-6.0b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/---0-10b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 10.0 bar (0 - 145.0 psid)	G 1/2		•		•
DPI/---0-10b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/---0-10b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/---0-10b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•
DPI/---0-16b/2/C/M2.00-X/EG6/--/03P/SD-1	0 - 16.0 bar (0 - 232.1 psid)	G 1/2		•		•
DPI/---0-16b/2/C/M2.00-X/VG6/--/03P/SD-1					•	•
DPI/---0-16b/2/F/M2.00-X/EG6/--/03P/SD-1			•	•		•
DPI/---0-16b/2/F/M2.00-X/VG6/--/03P/SD-1			•		•	•

DPI I transmitter

The DPI I transmitter is available as an individual packaged transmitter as well as in sets with capillary tubes.

As standard, the scope of delivery includes: (for outside usage only powered by Grundfos pump or the SI power supply. See accessory section for more information.)

- DPI I transmitter
- cable with bracket
- installation and operating instructions.

See table below for sets with special parts.

Product description	Pressure range	Cable length	Wall bracket	Motor bracket	Capillary tube	Reducing piece 7/16-20 UNF - R 1/4	Service instructions	Outside usage
DPI/--0-0.6b/1/G/D.900-B/V-5/--/---/VC-1	0 - 0.6 bar (0 - 8.7 psid)	0.9 m (2.9 ft)	•					•
DPI/--0-1.0b/1/G/D.900-B/V-5/--/---/VC-1	0 - 1.0 bar (0 - 14.5 psid)	0.9 m (2.9 ft)	•					•
DPI/--0-1.6b/1/G/D.900-B/V-5/--/---/VC-1	0 - 1.6 bar (0 - 23.2 psid)	0.9 m (2.9 ft)	•					•
DPI/--0-2.5b/1/G/D.900-B/V-5/--/---/VC-1	0 - 2.5 bar (0 - 36.3 psid)	0.9 m (2.9 ft)	•					•
DPI/--0-4.0b/1/G/D.900-B/V-5/--/---/VC-1	0 - 4.0 bar (0 - 58.0 psid)	0.9 m (2.9 ft)	•					•
DPI/--0-6.0b/1/G/D.900-B/V-5/--/---/VC-1	0 - 6.0 bar (0 - 87.0 psid)	0.9 m (2.9 ft)	•					•
DPI/---0-10b/1/G/D.900-B/V-5/--/---/VC-1	0 - 10.0 bar (0 - 145.0 psid)	0.9 m (2.9 ft)	•					•
DPI/--0-0.6b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 0.6 bar (0 - 8.7 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/--0-1.0b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 1.0 bar (0 - 14.5 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/--0-1.6b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 1.6 bar (0 - 23.2 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/--0-2.5b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 2.5 bar (0 - 36.3 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/--0-4.0b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 4.0 bar (0 - 58.0 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/--0-6.0b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 6.0 bar (0 - 87.0 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/---0-10b/1/G/D.900-B/V-5/-B/02B/SD-1	0 - 10.0 bar (0 - 145.0 psid)	0.9 m (2.9 ft)	•	•	•	•	•	•
DPI/--0-1.2b/1/G/D5.00-B/V-5/-B/02B/TD-1	0 - 1.2 bar (0 - 17.4 psid)	5 m (16.4 ft)	•		•	•		
DPI/--0-2.5b/1/G/D5.00-B/V-5/-B/02B/TD-1	0 - 2.5 bar (0 - 36.3 psid)	5 m (16.4 ft)	•		•	•		
DPI/--0-4.0b/1/G/D5.00-B/V-5/-B/02B/TD-1	0 - 4.0 bar (0 - 58.0 psid)	5 m (16.4 ft)	•		•	•		
DPI/--0-6.0b/1/G/D5.00-B/V-5/-B/02B/TD-1	0 - 6.0 bar (0 - 87.0 psid)	5 m (16.4 ft)	•		•	•		
DPI/---0-10b/1/G/D5.00-B/V-5/-B/02B/TD-1	0 - 10.0 bar (0 - 145.0 psid)	5 m (16.4 ft)	•		•	•		

RPS and DPS sensors

Grundfos offers a wide range of custom-built RPS and DPS sensors.

The RPS and DPS sensors can be customised depending on the application.

Therefore, contact Grundfos Direct Sensors™ when proceeding to selection.

9. Accessories

SI power supply

The SI power supply from Grundfos Direct Sensors™ is an external power supply for the DPI I transmitter.

Use the external power supply where the distance between the sensor and the controller is longer than 30 m (98 ft).

TM04 4194 0809

Fig. 166SI power supply

Specifications:

- Voltage range: 110-400 VAC.
- Frequency: 50-60 Hz.
- Ambient temperature: -20 to +50 °C (-4 to +122 °F).
- Enclosure class: IP54.

Part
SI power supply

M12 cable

4-wire screened cable with M12 connector in the sensor end and open end in the equipment end. Use the cable for the industrial sensor series such as RPI, DPI II and VFI.

	Description	Length
	Cable, industry, M2.000X	2 m (6.6 ft)
	Cable, industry, M5.000X	5 m (16.4 ft)

Capillary tube

Use the capillary tube together with the DPI I, DPI II and DPI II+T to connect the transmitter to the low-pressure side of the equipment.

The capillaries are available in copper and stainless steel as well as in various lengths.

	Description
	Capillary tube, 7/16 - 20 UNF

Adapter

Use the adapter together with the capillary tube. The adapter enables the connection of the tube to the system.

	Description
	Fitting, G 1/4 - 7/16, 20 UNF

Adapter for Grundfos CR pumps

This adapter is required when fitting the RPI, RPI+T or DPI II, DPI II+T on Grundfos CR pumps.

Pump type	Grundfos CR pump size											
	1	3	5	10	15	20	32	45	64	90	120	150
CR, CRE	-	-	-	-	❍	❍	❍	•	•	•	•	•
CRI, CRIE	-	-	-	-	❍	❍	•	•	•	•	•	•
CRN, CRNE	-	-	-	-	❍	❍	❍	•	•	•	•	•

- An adapter is not required.
❍ An adapter is required if the sensor and coupling guard are in direct contact. This will create unnecessary acoustic noise.
• An adapter is always required.

	Description
	Adapter for RPI, RPI+T and DPI II and DPI II+T

Snap-on cable

Cable with snap-on connection in the sensor end and different variants in the equipment end, such as open end, ferrules and various types of connectors.

Use the cable for the standard sensor series such as VFS, RPS and DPS.

The cable is available in various lengths, mainly 1.2 m and 2.9 m.

	Description	Length [mm]
	Ferrules, 1.2 m	1.200
	Ferrules, 2.9 m	2.900

SI converter

The SI converter from Grundfos Direct Sensors™ is an external power supply, signal amplifier and signal converter for Grundfos standard sensors: RPS, VFS and DPS.

The SI converter has built-in precision resistors enabling the sensor to transmit 4-20 mA, 1-5 V and 2-10 V output signals.

Use the SI converter in applications incorporating sensors from the standard product range. The sensor interface delivers a 4-20 mA input signal to external controllers.

TM04 4882 2209

Fig. 167SI converter

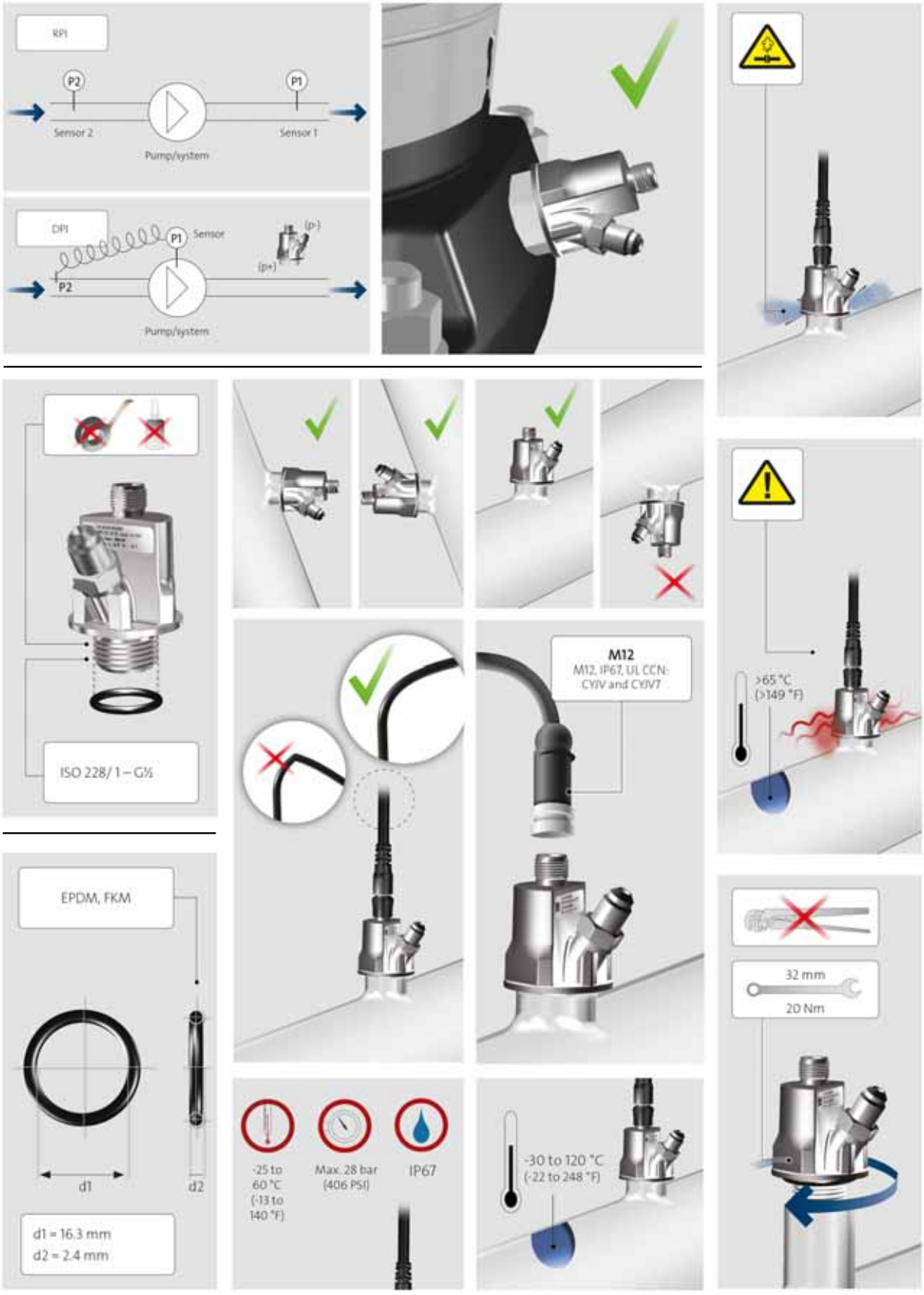
Specifications:

- Voltage range: 115-230 VAC ± 10 % or 24 VDC.
- Frequency: 50-60 Hz.
- Power consumption: Maximum 2.5 W.
- Ambient temperature: -20 to +50 °C (-4 to +122 °F).
- Enclosure class: IP20.

Part
SI converter, IP20

10. Appendix

Installation of RPI and DPI II transmitters



TM07 2421 3518

11. Grundfos Product Center

Online search and sizing tool to help you make the right choice.

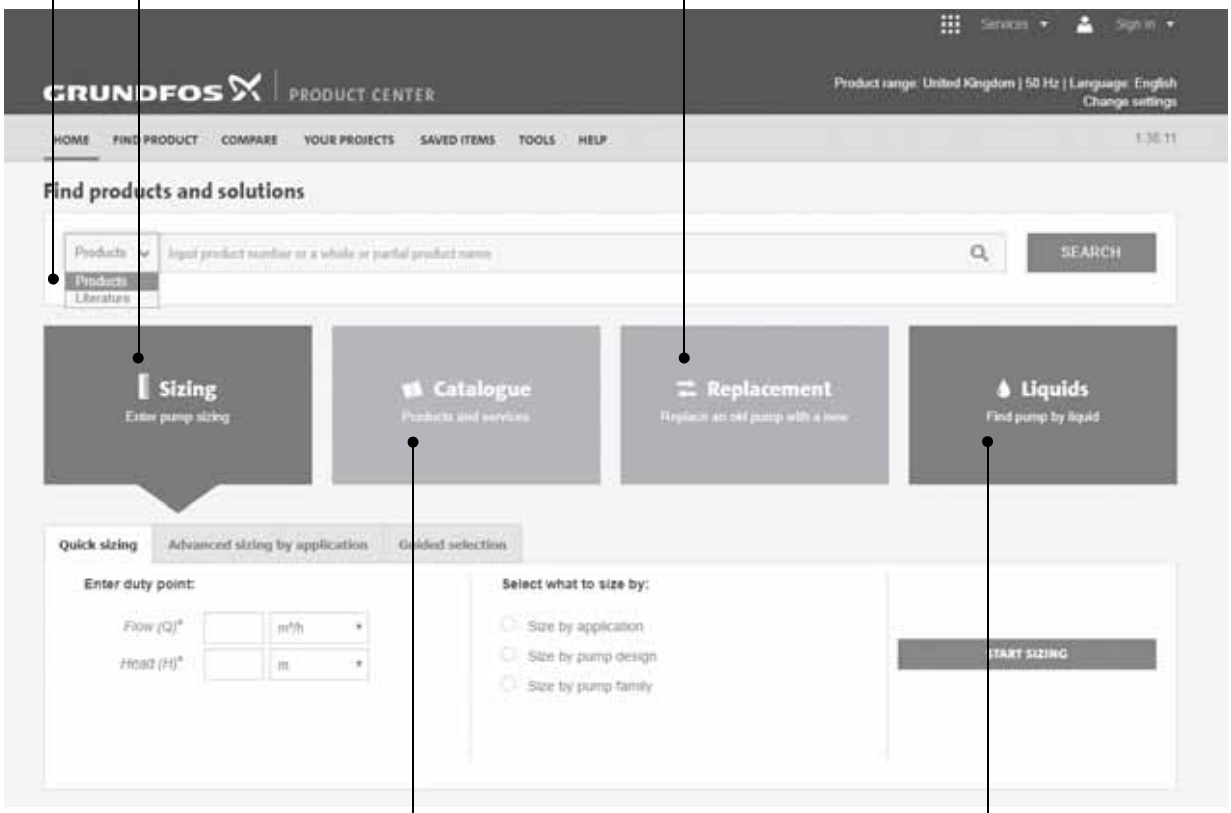
http://product-selection.grundfos.com

This drop-down menu enables you to set the search function to "Products" or "Literature".

"SIZING" enables you to size a pump based on entered data and selection choices.

"REPLACEMENT" enables you to find a replacement product. Search results will include information on the following:

- the lowest purchase price
- the lowest energy consumption
- the lowest total life cycle cost.



"CATALOGUE" gives you access to the Grundfos product catalogue.

"LIQUIDS" enables you to find pumps and sensors designed for aqueous media or other special liquids.

All the information you need in one place

Performance curves, technical specifications, pictures, dimensional drawings, motor curves, wiring diagrams, spare parts, service kits, 3D drawings, documents, system parts. The Product Center displays any recent and saved items - including complete projects - right on the main page.

Downloads

On the product pages, you can download installation and operating instructions, data booklets, service instructions, etc. in PDF format.

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