

# Grundfos Direct Sensor™

Pressure transmitters



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## 1. Product introduction

This data booklet deals with Grundfos pressure transmitters.



Fig. 1 Grundfos pressure transmitters

The Grundfos Direct Sensors™ trademark is owned and controlled by the Grundfos Group.

There are three main ways to measure pressure:

- Absolute pressure is zero-referenced against a perfect vacuum.
- Relative pressure is zero-referenced against the ambient air pressure.
- Differential pressure is the difference between two pressures.

The Grundfos pressure transmitter range contains relative- and differential-pressure transmitters as well as relative- and differential-pressure transmitters combined with temperature transmitters. The latter are able to measure temperatures ranging from 0 to 100 °C, allowing the Grundfos transmitters to be used for a wide range of applications.

### Relative-pressure transmitter (RPI, RPS, RPD)

The central part of a relative-pressure transmitter is a transmitter chip which transforms the pressure into electrical signals. The difference between the ambient air pressure and the measured pressure will cause the transmitter 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 RPI+T also transforms the temperature of the medium into electrical signals.

The signals are calibrated, conditioned and presented analogously or digitally by means of a microprocessor. The pressure signals are temperature-compensated and linearised for the influence of temperature variations.

### Differential-pressure transmitter (DPI, DPI V.2, DPS)

The central part of a differential-pressure transmitter is a transmitter chip which transforms the differential pressure into electrical signals. The difference between the two pressures, called the differential pressure, will cause the transmitter 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 DPI+T V.2 also transforms the temperature of the medium into electrical signals.

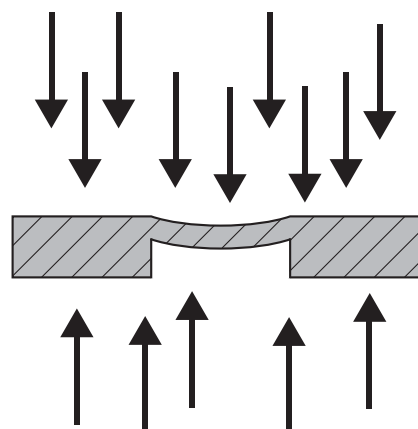


Fig. 2 Schematic view of how the transmitter chip is affected by pressure on both sides

### Transmitter chip

Steady-state properties of silicon secure the transmitter chip against wear and tear. For the first time ever, lifelong nano-coating protection enables direct measurement (wet and wet-wet) in a cost-effective packaging for aggressive media. The secret is a metal-glass alloy coating, Silicoat®, which is extremely resistant to corrosion. Compared to conventional transmitter technologies, which incapsulate the unprotected measuring cell to protect it from the medium, Silicoat® ensures protection of the transmitter chip from aggressive media (pH2 - pH11) at temperatures up to 120 °C for the entire life of the product.

TM04 5034 - TM04 7865 - TM04 7866

TM03 4055 1406

## 2. Relative-pressure transmitter, industry (RPI)

### RPI general data

Relative-pressure transmitter, industry



Fig. 3 RPI / RPI+T transmitter

### Technical overview

Grundfos Direct Sensors™, type RPI, is a series of industrial strength relative-pressure transmitters designed to be mounted directly on the unit, for example a pump. In addition to pressure, the RPI+T version is able to measure temperatures ranging from 0 to 100 °C.

The RPI has a standard M12 connector.

### Applications

- Water treatment and distribution
- light chemical industry
- water management
- pool and water resort
- heating
- air-conditioning
- cooling towers
- condensing units
- solar systems.

### Features

- Pressure ranges of 0 - 0.6, 0 - 1.0, 0 - 1.6, 0 - 2.5, 0 - 4.0, 0 - 6.0, 0 - 10.0, 0 - 16.0 and 0 - 25.0 bar.
- Approved for potable water, i.e. WRAS, ACS, others (pending).
- Wide temperature range of 0 to 100 °C (RPI+T).

### Benefits

- No moving parts
- compatible with wet, aggressive media
- cost-effective and robust design
- system solution with Grundfos pumps
- pressure and temperature measurement in one transmitter (RPI+T).

### Electrical connections

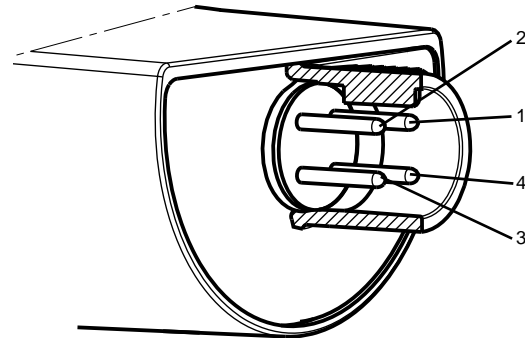


Fig. 4 Electrical connections

Pin	1	2	3	4
Wire colour	Brown	White	Blue	Black
Output 4-20 mA	+	Not used	-	Not used
Output 2 x 0-10 V	+	Pressure signal	.*	Temperature signal

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

**Type key**

Code	Type designation	RPI	/-0-0.6	b	/1	/C	/N	/.....	. /VG6	/..	/..	. /W-1
RPI	<b>Product group</b> Relative-pressure transmitter, industry											
	<b>Range</b> 0 - 0.6											
b	<b>Unit</b> bar											
1	<b>Generation</b> 1st generation											
C	<b>Electrical output type</b> 4-20 mA, 2-wire											
F		2 × 0-10 V										
N	<b>Transmitter connector or cable type and cable connector in transmitter end</b> M12 x 1, 4-pin male											
	<b>Cable length</b> NA											
	<b>Cable connector opposite transmitter</b> NA											
E	<b>Sealing material and class</b> First letter: EPDM (approved for potable water)											
V		FKM (for use in oily media)										
G	Second letter: Gel-filled											
6		Third letter: IP67										
B	<b>Material</b> Brass											
C		Composite										
G		Cast iron										
Q		Stainless-steel flow pipe with composite insert (QT)										
S		Stainless steel										
	<b>Dimension of mechanical connection</b>											
	<b>Mechanical connection type</b>											
W	<b>Packaging</b> Blister packing, standard Grundfos cardboard											
A		Set with pre-assembled components										
1		1 piece										

## RPI, 0 - 0.6 bar, technical data

Relative-pressure transmitter, industry

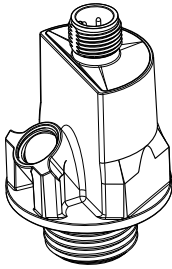


Fig. 5 RPI / RPI+T transmitter

### Dimensions [mm]

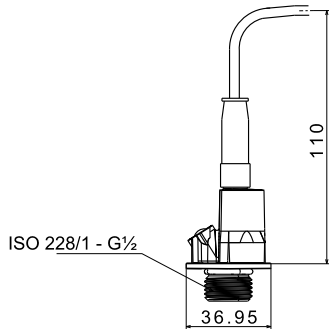


Fig. 6 Dimensions of RPI / RPI+T transmitter

### Output signals

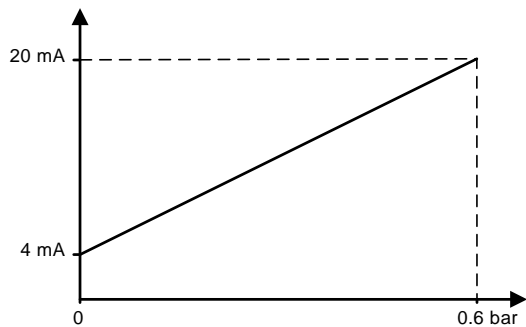


Fig. 7 Pressure response of RPI transmitter

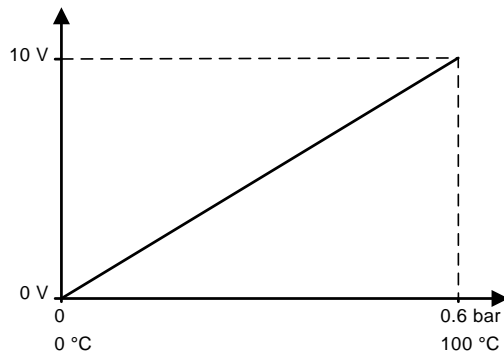


Fig. 8 Pressure and temperature response of RPI+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 0.6 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only RPI with temperature transmitter)</b>	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only RPI without temperature transmitter)</b>	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only RPI with temperature transmitter)</b>	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

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## RPI, 0 - 1.0 bar, technical data

Relative-pressure transmitter, industry

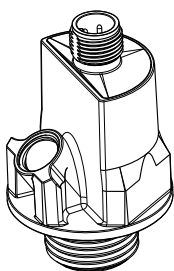


Fig. 9 RPI / RPI+T transmitter

### Dimensions [mm]

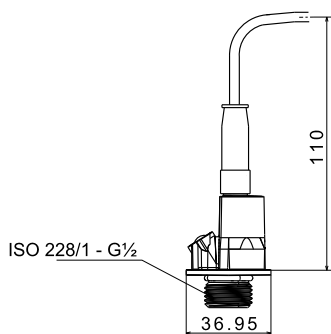


Fig. 10 Dimensions of RPI / RPI+T transmitter

### Output signals

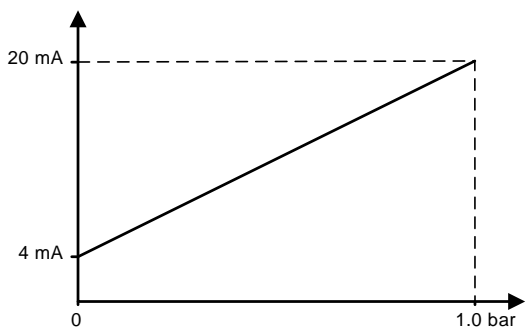


Fig. 11 Pressure response of RPI transmitter

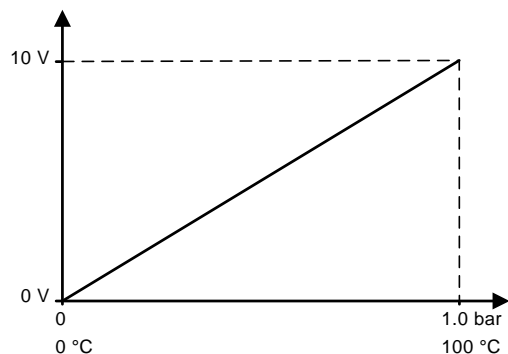


Fig. 12 Pressure and temperature response of RPI+T transmitter

## Specifications

Pressure	
Measuring range	0 - 1.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only RPI with temperature transmitter)	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only RPI without temperature transmitter)	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only RPI with temperature transmitter)	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

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## RPI, 0 - 1.6 bar, technical data

### Relative-pressure transmitter, industry

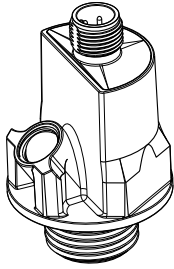


Fig. 13 RPI / RPI+T transmitter

### Dimensions [mm]

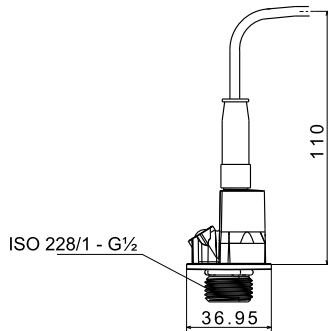


Fig. 14 Dimensions of RPI / RPI+T transmitter

### Output signals

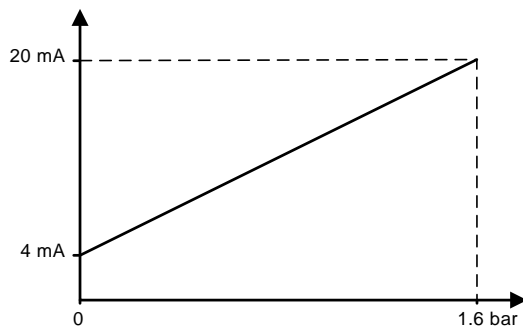


Fig. 15 Pressure response of RPI transmitter

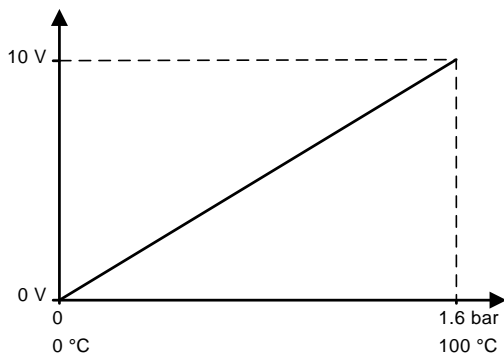


Fig. 16 Pressure and temperature response of RPI+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 1.6 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only RPI with temperature transmitter)</b>	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only RPI without temperature transmitter)</b>	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only RPI with temperature transmitter)</b>	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

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## RPI, 0 - 2.5 bar, technical data

Relative-pressure transmitter, industry

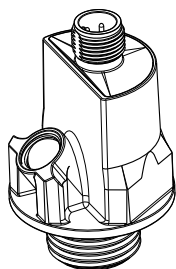


Fig. 17 RPI / RPI+T transmitter

### Dimensions [mm]

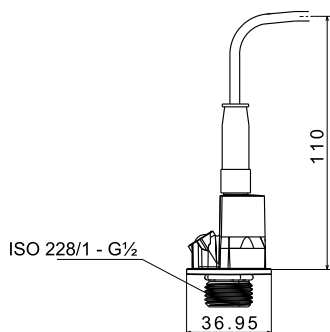


Fig. 18 Dimensions of RPI / RPI+T transmitter

### Output signals

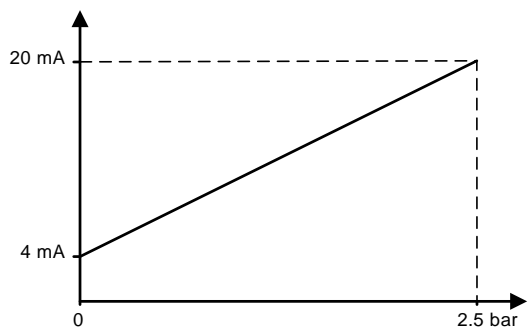


Fig. 19 Pressure response of RPI transmitter

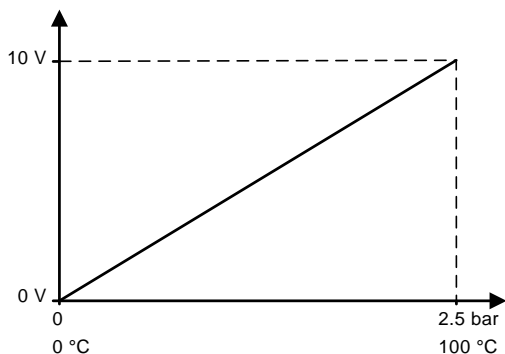


Fig. 20 Pressure and temperature response of RPI+T transmitter

## Specifications

Pressure	
Measuring range	0 - 2.5 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only RPI with temperature transmitter)	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only RPI without temperature transmitter)	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only RPI with temperature transmitter)	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

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TM04 9189 3610

TM04 9190 3610

## RPI, 0 - 4.0 bar, technical data

Relative-pressure transmitter, industry

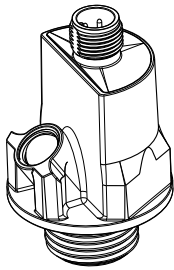


Fig. 21 RPI / RPI+T transmitter

### Dimensions [mm]

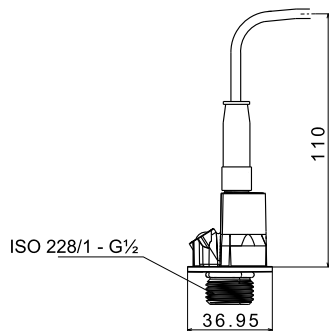


Fig. 22 Dimensions of RPI / RPI+T transmitter

### Output signals

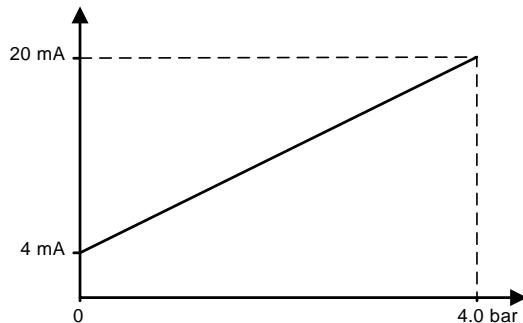


Fig. 23 Pressure response of RPI transmitter

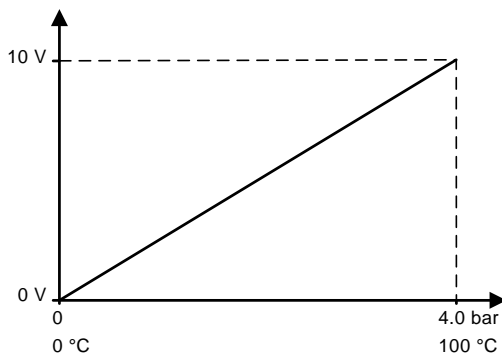


Fig. 24 Pressure and temperature response of RPI+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 4.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only RPI with temperature transmitter)</b>	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only RPI without temperature transmitter)</b>	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA - cut off 21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only RPI with temperature transmitter)</b>	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC - cut off 10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9240 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## RPI, 0 - 6.0 bar, technical data

Relative-pressure transmitter, industry

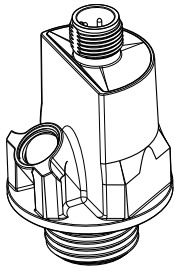


Fig. 25 RPI / RPI+T transmitter

### Dimensions [mm]

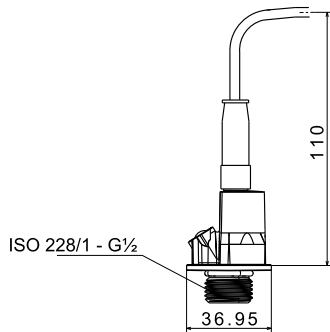


Fig. 26 Dimensions of RPI / RPI+T transmitter

### Output signals

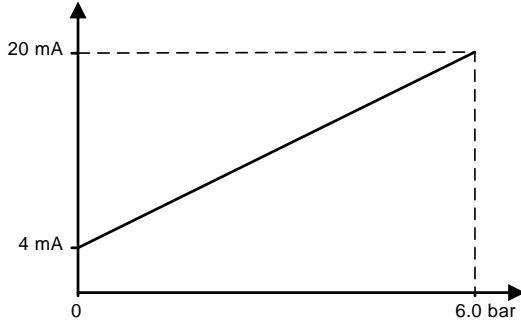


Fig. 27 Pressure response of RPI transmitter

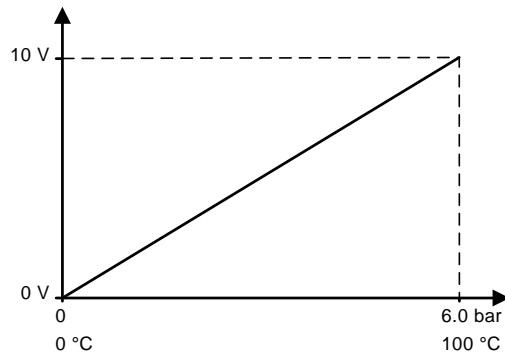


Fig. 28 Pressure and temperature response of RPI+T transmitter

## Specifications

Pressure	
Measuring range	0 - 6.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only RPI with temperature transmitter)	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only RPI without temperature transmitter)	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA - cut off
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only RPI with temperature transmitter)	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC - cut off
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9240 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## RPI, 0 - 10.0 bar, technical data

Relative-pressure transmitter, industry

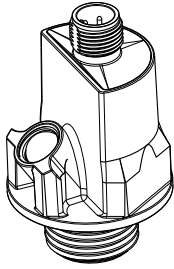


Fig. 29 RPI / RPI+T transmitter

### Dimensions [mm]

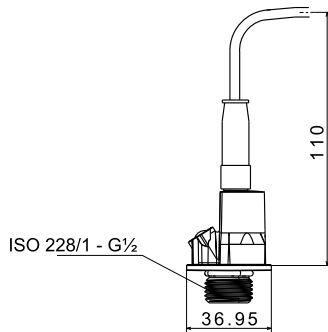


Fig. 30 Dimensions of RPI / RPI+T transmitter

### Output signals

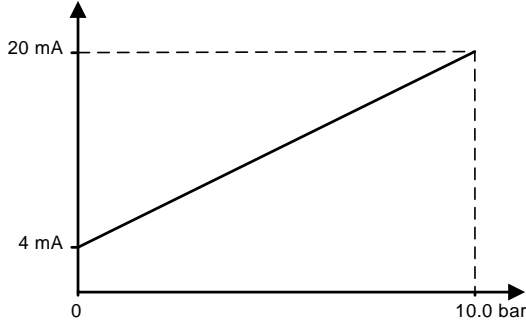


Fig. 31 Pressure response of RPI transmitter

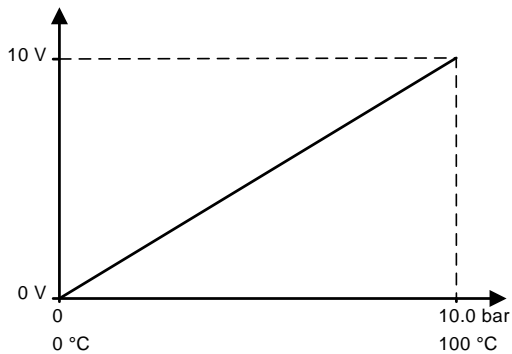


Fig. 32 Pressure and temperature response of RPI+T transmitter

## Specifications

Pressure	
Measuring range	0 - 10.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only RPI with temperature transmitter)	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only RPI without temperature transmitter)	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA - cut off 21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only RPI with temperature transmitter)	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC - cut off 10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9240 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## RPI, 0 - 16.0 bar, technical data

Relative-pressure transmitter, industry

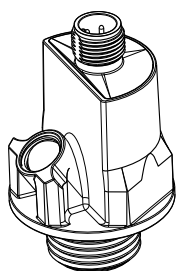


Fig. 33 RPI / RPI+T transmitter

### Dimensions [mm]

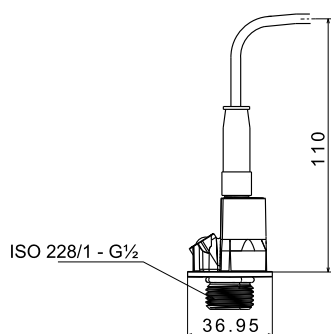


Fig. 34 Dimensions of RPI / RPI+T transmitter

### Output signals

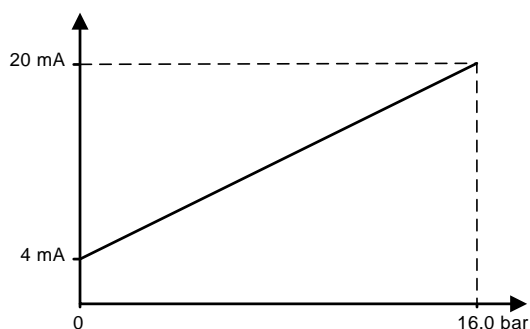


Fig. 35 Pressure response of RPI transmitter

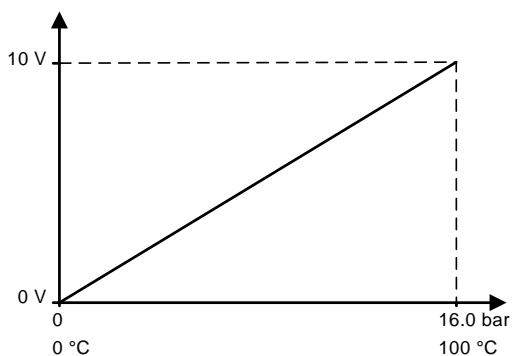


Fig. 36 Pressure and temperature response of RPI+T transmitter

## Specifications

Pressure	
Measuring range	0 - 16.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only RPI with temperature transmitter)	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only RPI without temperature transmitter)	
Power supply RPI	12.5 - 30 VDC
Output signals - cut off	4-20 mA 21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only RPI with temperature transmitter)	
Power supply RPI+T	16.6 - 30 VDC
Output signals - cut off	0-10 VDC 10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9240 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## RPI, 0 - 25.0 bar, technical data

Relative-pressure transmitter, industry

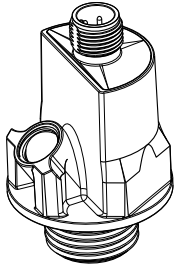


Fig. 37 RPI / RPI+T transmitter

### Dimensions [mm]

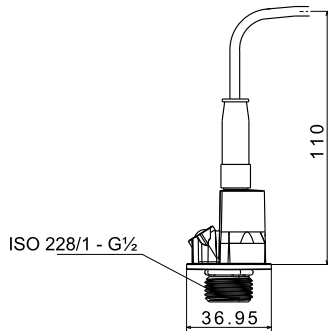


Fig. 38 Dimensions of RPI / RPI+T transmitter

### Output signals

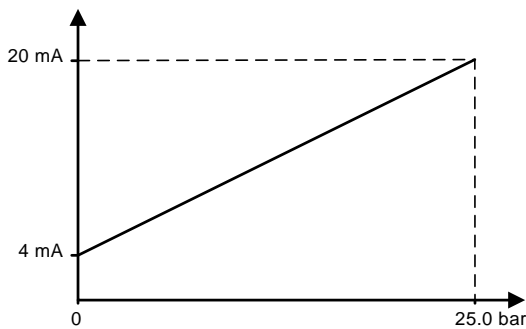


Fig. 39 Pressure response of RPI transmitter

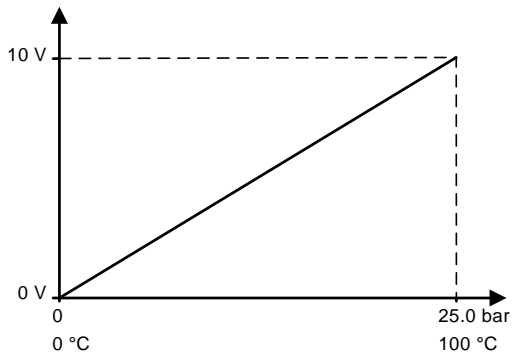


Fig. 40 Pressure and temperature response of RPI+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 25.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only RPI with temperature transmitter)</b>	
Range	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only RPI without temperature transmitter)</b>	
Power supply RPI	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only RPI with temperature transmitter)</b>	
Power supply RPI+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9240 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

### 3. Differential-pressure transmitter, industry (DPI V.2)

#### DPI V.2 general data

Differential-pressure transmitter, industry, V.2



TM04 7866 2510

Fig. 41 DPI V.2 transmitter

#### Technical overview

Grundfos Direct Sensors™, type DPI V.2, is a series of industrial strength differential-pressure transmitters designed to be mounted directly on the unit, for example a pump. In addition to pressure, the DPI V.2+T version is able to measure temperatures ranging from 0 to 100 °C.

The DPI V.2 has a standard M12 connector.

#### Applications

- Water treatment and distribution
- light chemical industry
- water management
- pool and water resort
- heating
- air-conditioning
- cooling towers
- condensing units
- solar systems.

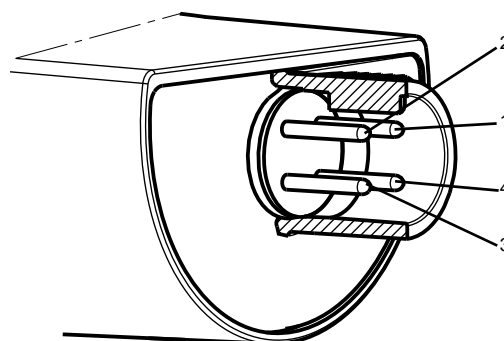
#### Features

- Pressure ranges of 0 - 0.6, 0 - 1.0, 0 - 1.6, 0 - 2.5, 0 - 4.0, 0 - 6.0, 0 - 10.0 and 0 - 16.0 bar.
- Approved for potable water, i.e. WRAS, ACS, others (pending).
- Wide temperature range of 0 to 100 °C (DPI V.2+T).

#### Benefits

- No moving parts
- compatible with wet, aggressive media
- cost-effective and robust design
- system solution with Grundfos pumps
- pressure and temperature measurement in one transmitter (DPI V.2+T).

#### Electrical connections



TM04 7156 1610

Fig. 42 Electrical connections

Pin	1	2	3	4
Wire colour	Brown	White	Blue	Black
Output 4-20 mA	+	Not used	-	Not used
Output 2 x 0-10 V	+	Pressure signal	-*	Temperature signal

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

## Type key

Code	Type designation	DPI	--0-0.6	b	-1	-C	-M	2.000	-X	-VG6	..	..	.	-SW-1
DPI	<b>Product group</b> Differential-pressure transmitter, industry													
	<b>Range</b> 0 - 0.6													
b	<b>Unit</b> bar													
1	<b>Generation</b> 1st generation													
C F	<b>Electrical output type</b> 4-20 mA, 2-wire 2 × 0-10 V													
N	<b>Transmitter connector or cable type and cable connector in transmitter end</b> M12 × 1, 4-pin male													
2.000	<b>Cable length</b>													
M	<b>Cable connector opposite transmitter</b> M12 × 1, female straight, screened 4-wire cable													
E V G 6	<b>Sealing material and class</b> First letter: EPDM (approved for potable water) FKM (for use in oily media) Second letter: Gel-filled Third letter: IP67													
B C G Q S	<b>Material</b> Brass Composite Cast iron Stainless-steel flow pipe with composite insert (QT) Stainless steel													
	<b>Dimension of mechanical connection</b>													
	<b>Mechanical connection type</b>													
S W 1	<b>Packaging</b> Set Blister packing, standard Grundfos cardboard, set with pre-assembled components 1 piece													



## DPI V.2, 0 - 0.6 bar, technical data

Differential-pressure transmitter, industry, V.2

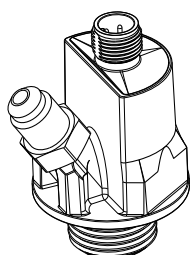


Fig. 43 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

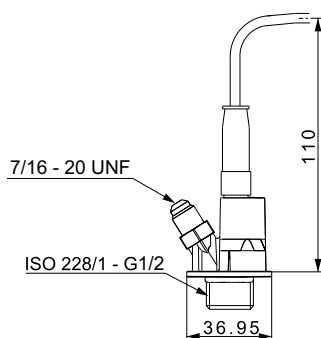


Fig. 44 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

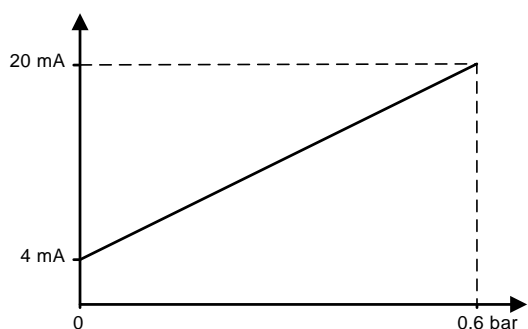


Fig. 45 Pressure response of DPI V.2 transmitter

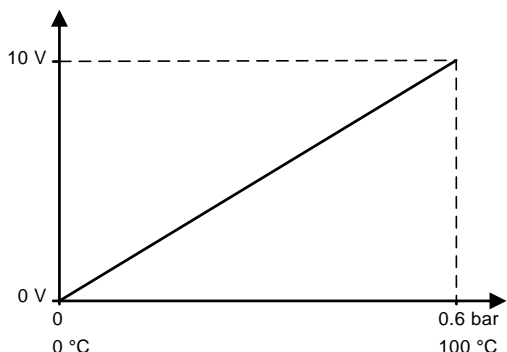


Fig. 46 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

Pressure	
Measuring range	0 - 0.6 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only DPI V.2 with temperature transmitter)	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only DPI V.2 without temperature transmitter)	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only DPI V.2 with temperature transmitter)	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 1.0 bar, technical data

### Differential-pressure transmitter, industry, V.2

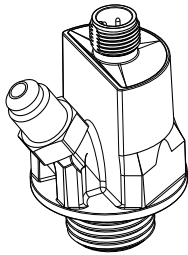


Fig. 47 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

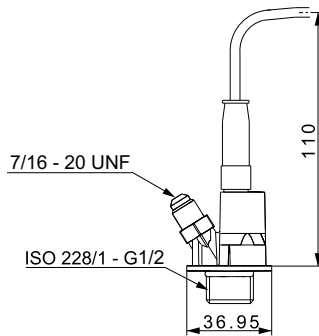


Fig. 48 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

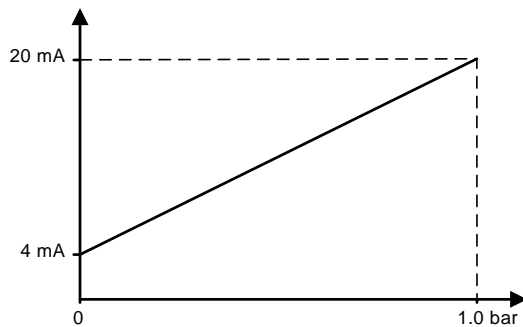


Fig. 49 Pressure response of DPI V.2 transmitter

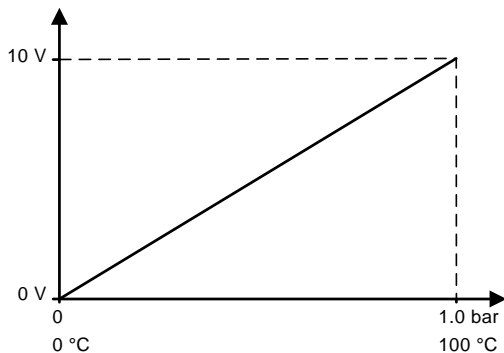


Fig. 50 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

Pressure	
Measuring range	0 - 1.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only DPI V.2 with temperature transmitter)	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only DPI V.2 without temperature transmitter)	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA - cut off 21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only DPI V.2 with temperature transmitter)	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC - cut off 10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 1.6 bar, technical data

Differential-pressure transmitter, industry, V.2

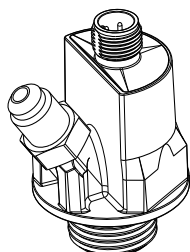


Fig. 51 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

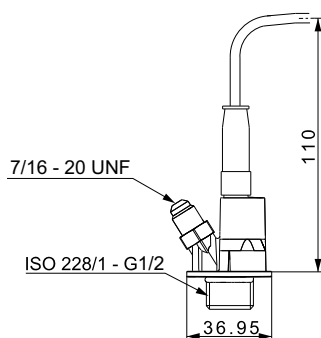


Fig. 52 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

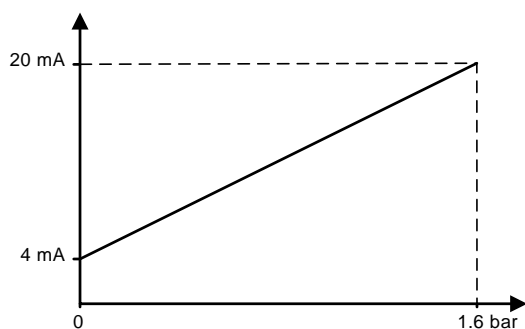


Fig. 53 Pressure response of DPI V.2 transmitter

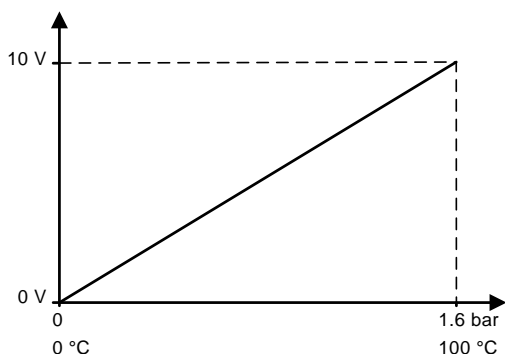


Fig. 54 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

Pressure	
Measuring range	0 - 1.6 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only DPI V.2 with temperature transmitter)	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only DPI V.2 without temperature transmitter)	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only DPI V.2 with temperature transmitter)	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 2.5 bar, technical data

Differential-pressure transmitter, industry, V.2

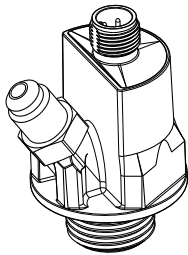


Fig. 55 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

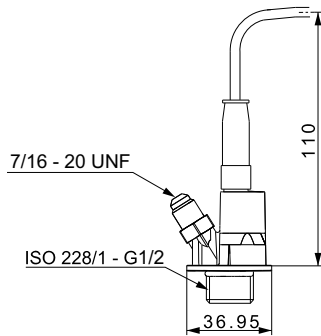


Fig. 56 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

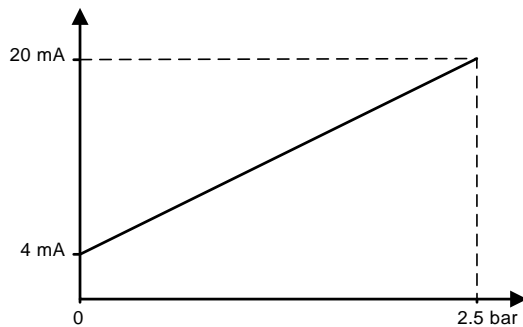


Fig. 57 Pressure response of DPI V.2 transmitter

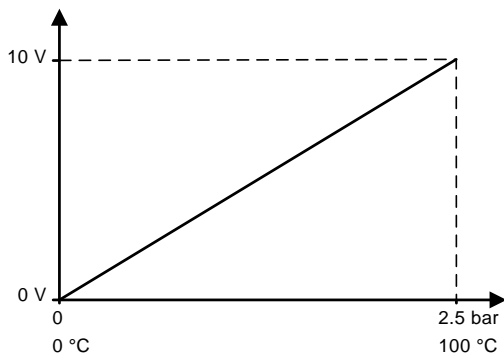


Fig. 58 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 2.5 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only DPI V.2 with temperature transmitter)</b>	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only DPI V.2 without temperature transmitter)</b>	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only DPI V.2 with temperature transmitter)</b>	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 4.0 bar, technical data

Differential-pressure transmitter, industry, V.2

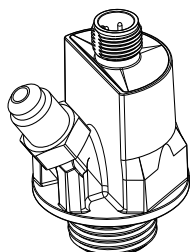


Fig. 59 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

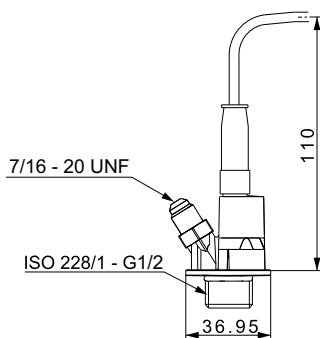


Fig. 60 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

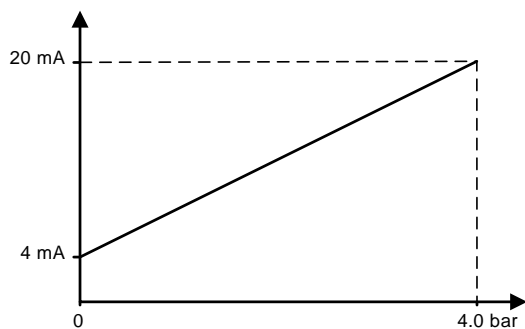


Fig. 61 Pressure response of DPI V.2 transmitter

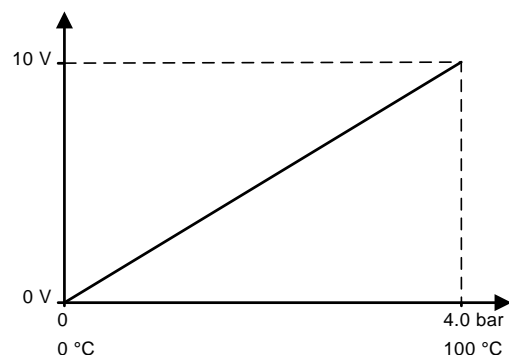


Fig. 62 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

Pressure	
Measuring range	0 - 4.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only DPI V.2 with temperature transmitter)	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only DPI V.2 without temperature transmitter)	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only DPI V.2 with temperature transmitter)	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 6.0 bar, technical data

Differential-pressure transmitter, industry, V.2

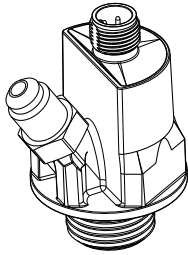


Fig. 63 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

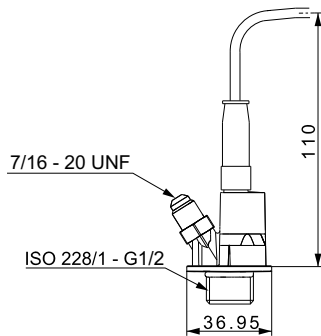


Fig. 64 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

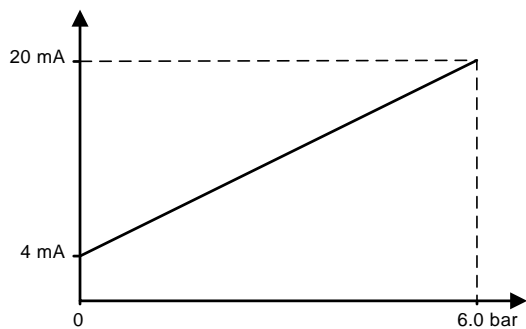


Fig. 65 Pressure response of DPI V.2 transmitter

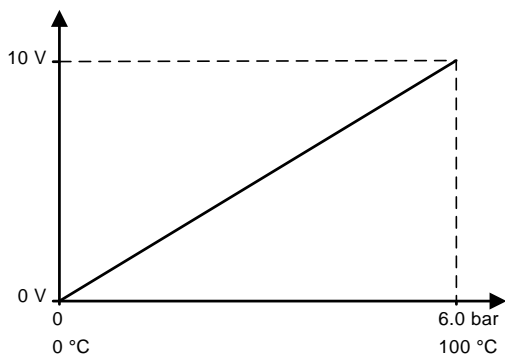


Fig. 66 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 6.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only DPI V.2 with temperature transmitter)</b>	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only DPI V.2 without temperature transmitter)</b>	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only DPI V.2 with temperature transmitter)</b>	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 10.0 bar, technical data

Differential-pressure transmitter, industry, V.2

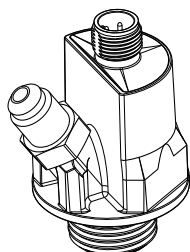


Fig. 67 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

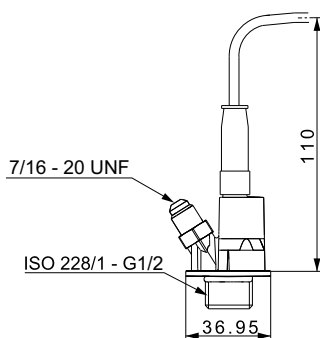


Fig. 68 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

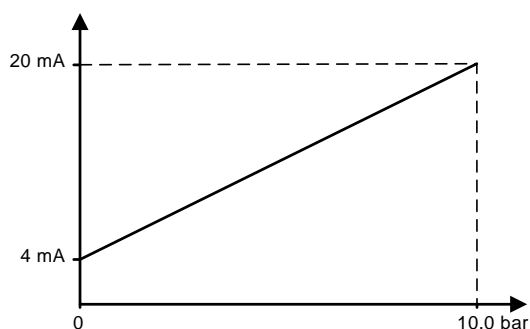


Fig. 69 Pressure response of DPI V.2 transmitter

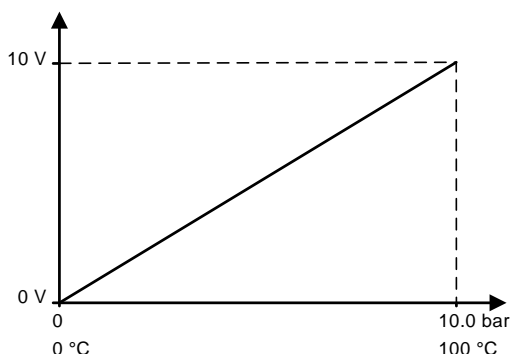


Fig. 70 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

Pressure	
Measuring range	0 - 10.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
Temperature (only DPI V.2 with temperature transmitter)	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
Media and environment	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
Electrical data (only DPI V.2 without temperature transmitter)	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
Electrical data (only DPI V.2 with temperature transmitter)	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
Transmitter materials	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
Environmental standards	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610

## DPI V.2, 0 - 16.0 bar, technical data

Differential-pressure transmitter, industry, V.2

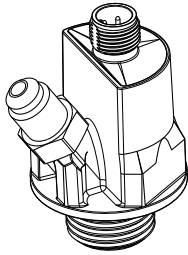


Fig. 71 DPI V.2 / DPI V.2+T transmitter

### Dimensions [mm]

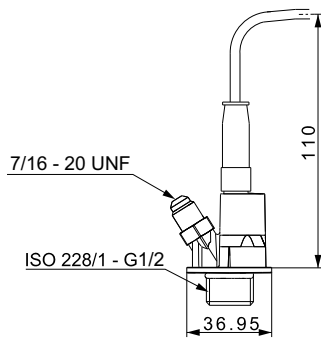


Fig. 72 Dimensions of DPI V.2 / DPI V.2+T transmitter

### Output signals

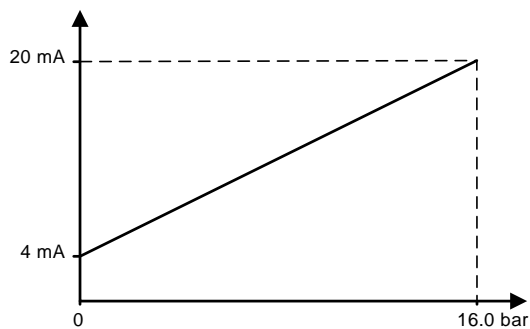


Fig. 73 Pressure response of DPI V.2 transmitter

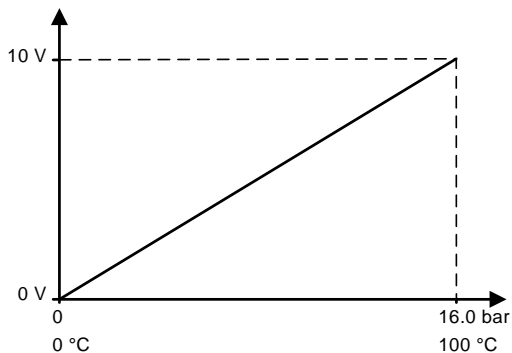


Fig. 74 Pressure and temperature response of DPI V.2+T transmitter

## Specifications

<b>Pressure</b>	
Measuring range	0 - 16.0 bar
Accuracy ( $\pm 1\sigma$ ), 0-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), -30 - +100 °C	$\pm 2.5\%$ FS
Response time	< 100 ms (typical 50 ms)
Resolution	1/1000 FS
<b>Temperature (only DPI V.2 with temperature transmitter)</b>	
Range (relative)	0-100 °C
Accuracy ( $\pm 1$ ), 0-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1$ ), 0-100 °C	$\pm 2$ °C
Response time for transmitter electronics	< 100 ms (typical 50 ms)
Resolution	0.1 °C
<b>Media and environment</b>	
Medium types	Liquids, gasses and air, compatible with the wetted materials
Medium temperature (operation)	-30 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Storage temperature	-55 - +70 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	60 bar
<b>Electrical data (only DPI V.2 without temperature transmitter)</b>	
Power supply DPI V.2	12.5 - 30 VDC
Output signals	4-20 mA
- cut off	21 mA
Power consumption	Max. 660 mW
Load impedance	Max. 60 $\Omega$ at 12.5 VDC Max. 100 $\Omega$ at 13.3 VDC Max. 600 $\Omega$ at 24 VDC Max. 900 $\Omega$ at 30 VDC
<b>Electrical data (only DPI V.2 with temperature transmitter)</b>	
Power supply DPI V.2+T	16.6 - 30 VDC
Output signals	0-10 VDC
- cut off	10.5 VDC
Maximum signal cable length	30 m
Power consumption	Max. 300 mW
Load impedance	Min. 10 k $\Omega$
<b>Transmitter materials</b>	
Measuring element	Silicon-based MEMS transmitter
Packing material	EPDM or FKM rubber
Transmitter housing	Stainless steel 1.4404
Wetted materials	Corrosion-resistant coating EPDM or FKM rubber Stainless steel 1.4404
<b>Environmental standards</b>	
Enclosure class	IP67
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1

TM04 9239 3510

TM04 9237 3510

TM04 9189 3610

TM04 9190 3610



## 4. Differential-pressure transmitter, industry (DPI)

### DPI general data

Differential-pressure transmitter, industry



TM04 4738 0509

Fig. 75 DPI transmitter

### Technical overview

Grundfos Direct Sensors™, type DPI, is a series of industrial strength differential-pressure transmitters. The DPI transmitters are compatible with wet, aggressive media and are available for differential-pressure ranges from 0 - 0.6 to 0 - 10.0 bar.

The DPI transmitters use MEMS sensing technology in combination with a new packaging concept with corrosion-resistant coating on the MEMS sensing element. This makes the DPI transmitters very robust and ideal for pump integration and monitoring in harsh environments.

### Applications

- Pumps and pump control systems
- filters (monitoring)
- cooling and temperature control systems
- water treatment systems
- boiler control systems
- renewable energy systems
- heat exchangers (monitoring of fouling).

### Features

- Differential-pressure ranges of 0 - 0.6, 0 - 1.0, 0 - 1.2, 0 - 1.6, 0 - 2.5, 0 - 4.0, 0 - 6.0 and 0 - 10.0 bar
- designed for harsh environments
- analog output signal
- compact and proven design
- MEMS sensing technology
- approved for the EU, US and Canadian markets.

### Benefits

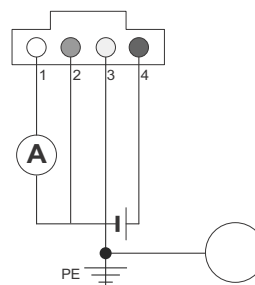
- Compatible with wet, aggressive media
- accurate, linearised output signal
- cost-effective and robust design.

### Type key

The transmitter is labelled with a type designation.

	96561232	- XX	- XXX	XXXXX
Product number				
Version				
Production code (year and week)				
Consecutive number				

### Electrical connections



TM04 9191 3610

Fig. 76 Electrical connections

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

## DPI, 0 - 0.6 bar, technical data

Differential-pressure transmitter, industry



Fig. 77 DPI transmitter

### Dimensions [mm]

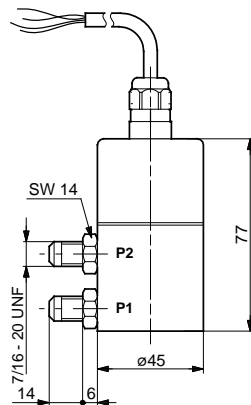


Fig. 78 Dimensions of DPI transmitter

### Output signals

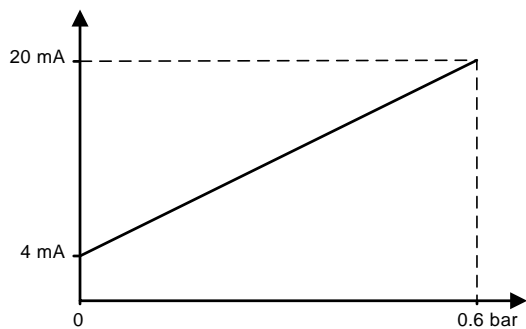


Fig. 79 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 0.6 bar
Accuracy (IEC 61298-2)	3.5 % FS
Response time	< 0.5 s
Static pressure, $p_1$	16 bar
Static pressure, $p_2$	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V Max. 200 kΩ at 16 V Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5034 2409

TM03 2059 3505

TM04 9189 3610

## DPI, 0 - 1.0 bar, technical data

Differential-pressure transmitter, industry



Fig. 80 DPI transmitter

### Dimensions [mm]

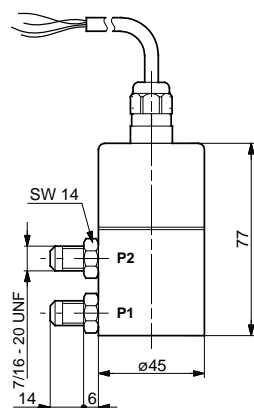


Fig. 81 Dimensions of DPI transmitter

### Output signals

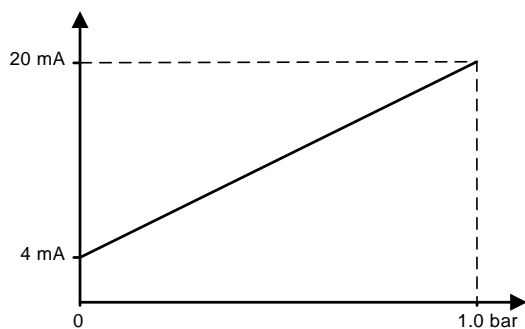


Fig. 82 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 1.0 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, p <sub>1</sub>	16 bar
Static pressure, p <sub>2</sub>	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V
	Max. 200 kΩ at 16 V
	Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5034 2409

TM03 2059 3505

TM04 9189 3610

## DPI, 0 - 1.2 bar, technical data

Differential-pressure transmitter, industry



Fig. 83 DPI transmitter

### Dimensions [mm]

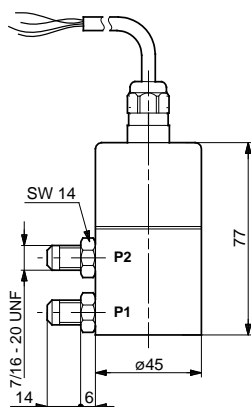


Fig. 84 Dimensions of DPI transmitter

### Output signals

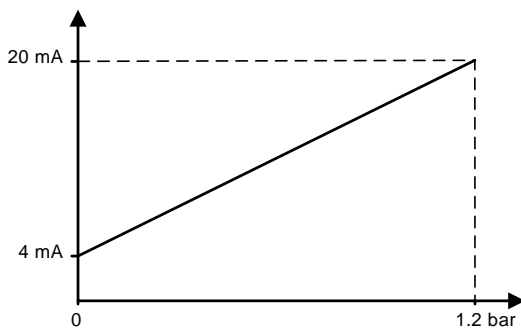


Fig. 85 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 1.2 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, $p_1$	16 bar
Static pressure, $p_2$	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V Max. 200 kΩ at 16 V Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5034 2409

TM03 2069 3505

TM04 9189 3610

## DPI, 0 - 1.6 bar, technical data

Differential-pressure transmitter, industry



Fig. 86 DPI transmitter

### Dimensions [mm]

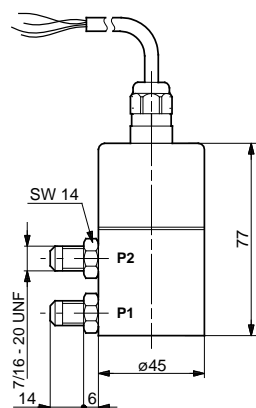


Fig. 87 Dimensions of DPI transmitter

### Output signals

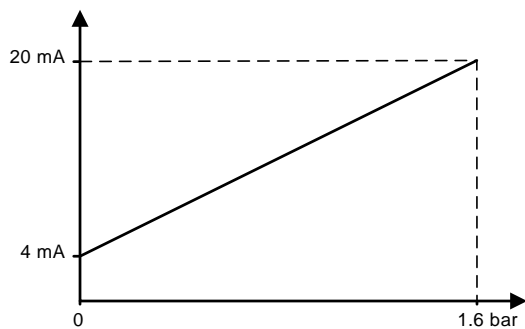


Fig. 88 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 1.6 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, p <sub>1</sub>	16 bar
Static pressure, p <sub>2</sub>	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V Max. 200 kΩ at 16 V Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5034 2409

TM03 2059 3505

TM04 9189 3610

## DPI, 0 - 2.5 bar, technical data

Differential-pressure transmitter, industry



Fig. 89 DPI transmitter

### Dimensions [mm]

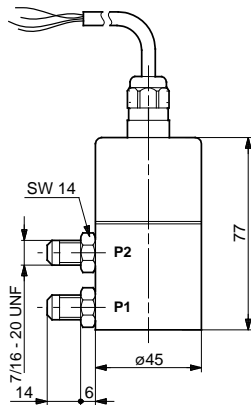


Fig. 90 Dimensions of DPI transmitter

### Output signals

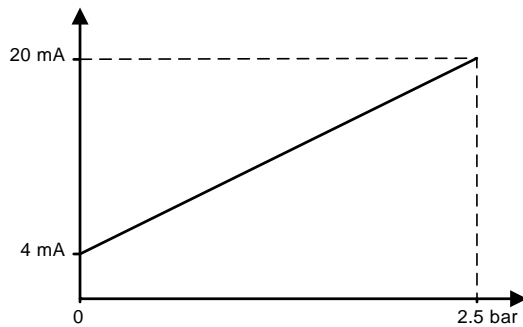


Fig. 91 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 2.5 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, $p_1$	16 bar
Static pressure, $p_2$	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V Max. 200 kΩ at 16 V Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5 034 2409

TM03 2059 3505

TM04 9189 3610

## DPI, 0 - 4.0 bar, technical data

Differential-pressure transmitter, industry



Fig. 92 DPI transmitter

### Dimensions [mm]

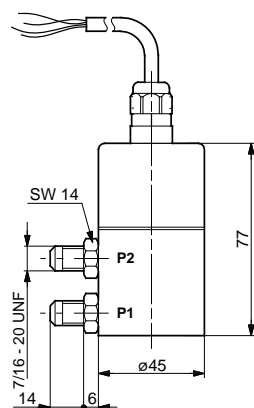


Fig. 93 Dimensions of DPI transmitter

### Output signals

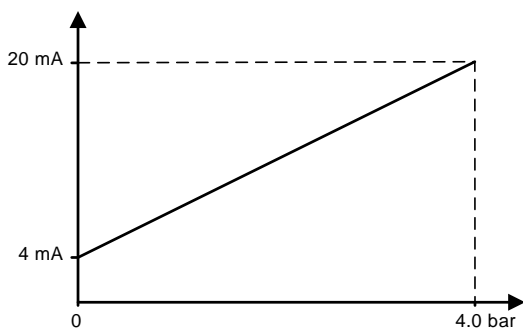


Fig. 94 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 4.0 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, p <sub>1</sub>	16 bar
Static pressure, p <sub>2</sub>	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V Max. 200 kΩ at 16 V Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5034 2409

TM03 2059 3505

TM04 9189 3610

## DPI, 0 - 6.0 bar, technical data

Differential-pressure transmitter, industry



Fig. 95 DPI transmitter

### Dimensions [mm]

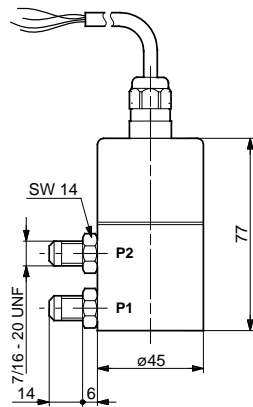


Fig. 96 Dimensions of DPI transmitter

### Output signals

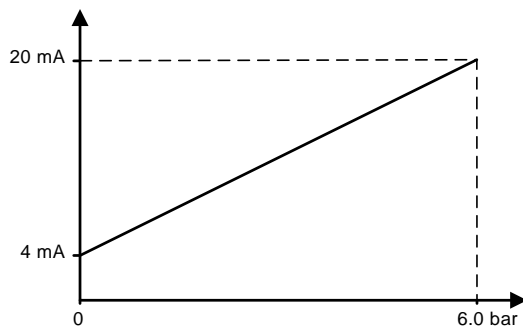


Fig. 97 Differential-pressure response of DPI transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 6.0 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, $p_1$	16 bar
Static pressure, $p_2$	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 k $\Omega$ at 24 V Max. 200 k $\Omega$ at 16 V Max. 100 k $\Omega$ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

TM04 5034 2409

TM03 2059 3505

TM04 9189 3610



## DPI, 0 - 10.0 bar, technical data

Differential-pressure transmitter, industry



Fig. 98 DPI transmitter

TM04 5034 2409

### Dimensions [mm]

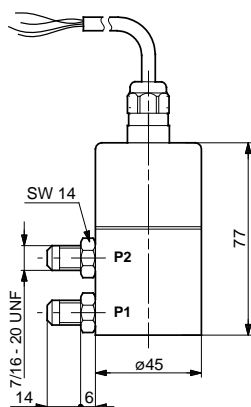


Fig. 99 Dimensions of DPI transmitter

TM03 2059 3505

### Output signals

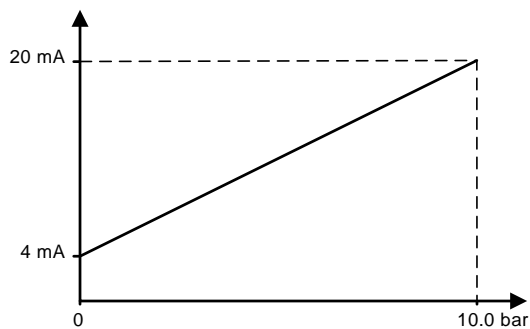


Fig. 100 Differential-pressure response of DPI transmitter

TM04 9189 3610

## Specifications

Pressure	
Measuring range (differential)	0 - 10.0 bar
Accuracy (IEC 61298-2)	2 % FS
Response time	< 0.5 s
Static pressure, p <sub>1</sub>	16 bar
Static pressure, p <sub>2</sub>	10 bar
Maximum system pressure	16 bar
Media and environment	
Media	Liquids, gases and air
Medium temperature (operation)	-10 - +70 °C
Medium temperature (peak)	Up to +80 °C
Ambient air temperature	-40 - +70 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	25 bar
Electrical data	
Power supply	12-30 VDC
Output signals	4-20 mA
Load impedance	Max. 500 kΩ at 24 V Max. 200 kΩ at 16 V Max. 100 kΩ at 12 V
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal	FKM rubber
Housing	EN 1.4305
Wetted materials	FKM and PPS
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

## 5. Relative-pressure transmitter, digital (RPD)

### RPD general data

Relative-pressure transmitter, digital



TM03 8138 0608

Fig. 101 RPD transmitter

### Technical overview

Grundfos Direct Sensors™, type RPD, is a combined relative-pressure and temperature transmitter (two-in-one) designed for high-volume production. The RPD transmitter is fully compatible with wet, aggressive media. The RPD transmitter uses MEMS sensing technology in combination with a new packaging concept with a corrosion-resistant coating on the MEMS transmitter element. This makes the RPD transmitter very robust and ideal for high-volume OEM applications.

### Applications

- Monitoring of domestic hot-water system efficiency
- water level monitoring in central heating systems
- dry-running protection in solar systems and industrial process gas boiler pressure control
- thermal management in solar applications
- pressure and temperature monitoring
- pressure controls for humid atmospheres (pneumatic systems).

### Features

- Pressure range of 0-10 bar
- digital output signal
- designed for harsh environments
- compact and proven mechanical design
- MEMS sensing technology
- approved for potable water.

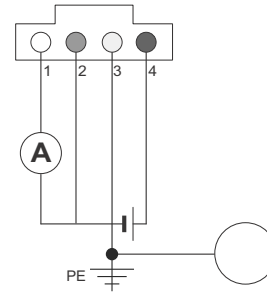
### Benefits

- Pressure and temperature transmitter in one package (two-in-one transmitter)
- compatible with wet, aggressive media
- accurate, linearised and temperature-compensated pressure transmitter
- quick temperature response (direct medium contact)
- cost-effective and robust design
- multi-node transmitter network.

### Type key

	96694226	- XX	- XXX	XXXXX
Product number				
Version				
Production code (year and week)				
Consecutive number				

### Electrical connections



TM03 8203 1908

Fig. 102 Electrical connections of RPD transmitter

Pin	Description	Colour
1	Resol Vbus® A (Master)	Yellow
2	Resol Vbus® B (GND)	White
3	GND (0 V)	Green
4	Voltage supply (+5.5 VDC), PELV	Brown

### Power supply requirements

- 5 VDC
- separated from hazardous live circuitry by double or reinforced insulation
- power limitation of 150 VA; current limitation of 8 A.

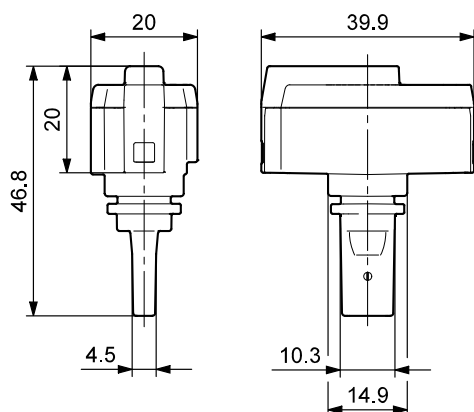
### Output signals

Pressure output: 10<sup>-2</sup> bar linear.

Temperature output: 10<sup>-2</sup> °C linear.

## RPD, 0-10 bar, technical data

### Dimensions [mm]



TM03 8136 0607

Fig. 103 Dimensions of RPD

### Specifications

Pressure	
Measuring range (relative)	0-10 bar
Accuracy ( $\pm 1\sigma$ ), 0-100 °C, water	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 20-80 °C, Tyfocur LS	$\pm 3\%$ FS
Pressure refresh rate	250 ms
Resolution	20 mbar
Temperature	
Measuring range	0-120 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1\text{ °C}$
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 3\text{ °C}$
Accuracy 100-120 °C	Reading/indication only
Temperature refresh rate	250 ms
Response time	< 4 s (depending on mounting)
Resolution	0.4 °C
Media and environment	
Medium types	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % RH, non-condensing
System burst pressure	> 30 bar
Electrical data	
Power supply	5.5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended (PELV)
Output signals	Resol VBus® Protocol version 3
Pressure signal	Resol VBus® Protocol version 3
Temperature signal	Resol VBus® Protocol version 3
Resol VBus® refresh rate	250 ms
Data rate	9600 baud
Power consumption transmitter	< 50 mW
Power for Resol VBus® operation	See Resol VBus® Protocol version 3
Pin configurations	See fig. 102
Recommended female connector	Molex No 5557-04R <a href="http://www.molex.com">www.molex.com</a>
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS, PA66)
Vortex tube	PPA 40-GF
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Approved for potable water	Transmitter/insert => OK
Dimensions	
Sensing element	47 x 40 x 20 mm. See fig. 103

\* Specification valid for water media only.

## 6. Relative-pressure transmitter, standard (RPS)

### RPS general data

Relative-pressure transmitter, standard



TM03 8138 0607

Fig. 104 RPS transmitter

### Technical overview

Grundfos Direct Sensors™, type RPS, is a series of combined pressure and temperature transmitters (two-in-one) designed for high-volume production. The RPS transmitters are fully compatible with wet, aggressive media and are available for pressure ranges from 0 - 0.6 to 0 - 10.0 bar (relative pressure). The RPS transmitters use MEMS sensing technology in combination with a new packaging concept with corrosion-resistant coating on the MEMS transmitter element. This makes the RPS transmitters very robust and ideal for high-volume OEM applications.

### Applications

- Monitoring of domestic hot-water system efficiency
- water level monitoring in central heating systems
- dry-running protection in solar systems and gas boilers
- pressure and temperature monitoring.

### Features

- Pressure ranges of 0 - 0.6, 0 - 1.0, 0 - 1.6, 0 - 2.5, 0 - 4.0, 0 - 6.0 and 0 - 10.0 bar
- voltage output (ratiometric, ideal for use with microcontroller)
- compact and proven mechanical design
- approved for potable water, i.e. WRAS, KTW, W270, ACS.

### Benefits

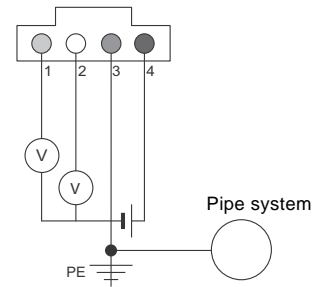
- Pressure and temperature transmitter in one package (two-in-one transmitter)
- compatible with wet, aggressive media
- accurate, linearised and temperature-compensated pressure transmitter
- quick temperature response (direct medium contact).

### Type key

The transmitter is labelled with a type designation.

96XXXXXX - XX - XXX XXXXX	
Product number	
Version	
Production code (year and week)	
Consecutive number	

### Electrical connections



TM05 2253 4711

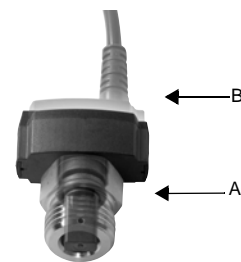
Fig. 105 Electrical connections

Pin	Description	Colour
1	Temperature signal (0.5 to 3.5 V relative to pin 3)	Yellow
2	Pressure signal (0.5 to 3.5 V relative to pin 3)	White
3	GND (0 V)	Green
4	Voltage supply (+5 VDC), PELV	Brown

### Power supply requirements

- 5 VDC
- separated from hazardous live circuitry by double or reinforced insulation
- power limitation of 150 VA; current limitation of 8 A.

### Options



TM03 8139 0607

Fig. 106 Transmitter options

Pos.	Description
A	1/2" nipple, stainless steel (316L) or 3/8" composite
B	Overmoulded or simple connector

## RPS, 0 - 0.6 bar, technical data

Relative-pressure transmitter, standard



Fig. 107 RPS transmitter

### Dimensions [mm]

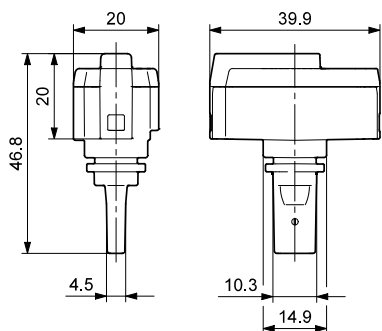


Fig. 108 Dimensions of RPS transmitter

### Output signals

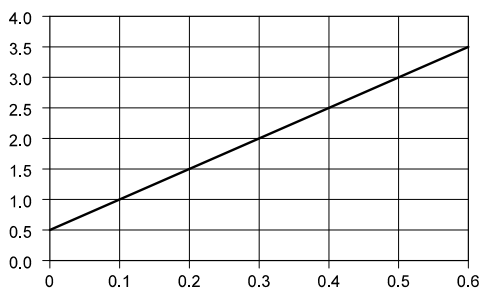


Fig. 109 Pressure response of RPS transmitter

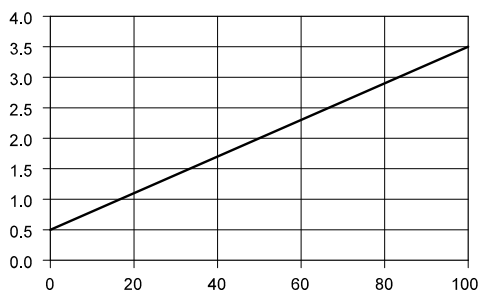


Fig. 110 Temperature response of RPS transmitter

## Specifications

Pressure	
Measuring range (relative)	0 - 0.6 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 3\%$ FS
Response time	< 0.5 s
Resolution	5 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1\%$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2\%$ °C
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	> 30 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Transmitter	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Transmitter	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8141 0607

TM03 8149 0607

## RPS, 0 - 1.0 bar, technical data

### Relative-pressure transmitter, standard



Fig. 111 RPS transmitter

### Dimensions [mm]

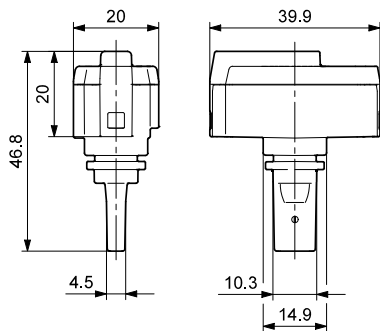


Fig. 112 Dimensions of RPS transmitter

### Output signals

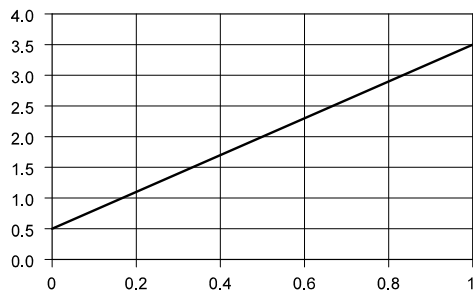


Fig. 113 Pressure response of RPS transmitter

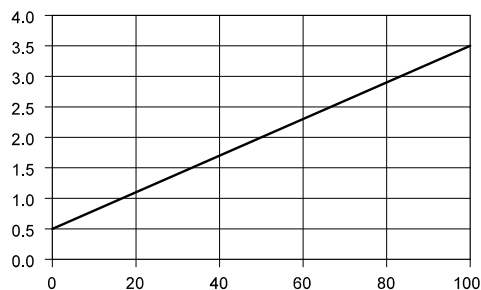


Fig. 114 Temperature response of RPS transmitter

## Specifications

Pressure	
Measuring range (relative)	0 - 1.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 3\%$ FS
Response time	< 0.5 s
Resolution	5 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1\%$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2\%$ °C
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	> 30 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Transmitter	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Transmitter	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8142 0607

TM03 8149 0607

## RPS, 0 - 1.6 bar, technical data

Relative-pressure transmitter, standard



Fig. 115 RPS transmitter

### Dimensions [mm]

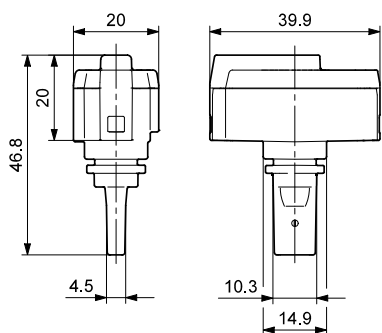


Fig. 116 Dimensions of RPS transmitter

### Output signals

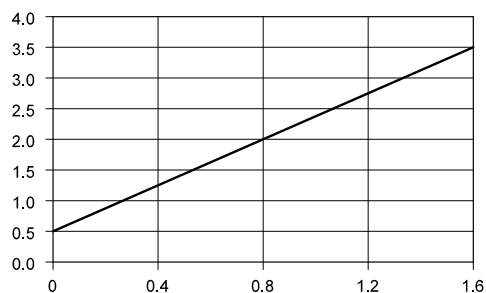


Fig. 117 Pressure response of RPS transmitter

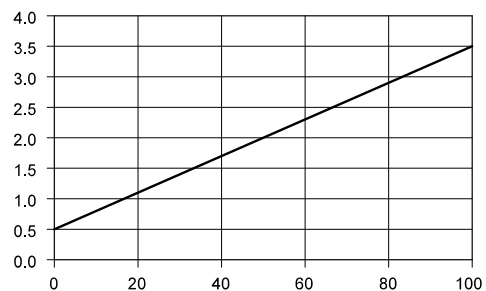


Fig. 118 Temperature response of RPS transmitter

## Specifications

Pressure	
Measuring range (relative)	0 - 1.6 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.5\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
Resolution	5 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2$ °C
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Relative humidity	0-95 %, non-condensing
System burst pressure	> 30 bar
Electrical interface	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Transmitter	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Transmitter	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8143 0607

TM03 8149 0607

## RPS, 0 - 2.5 bar, technical data

### Relative-pressure transmitter, standard



Fig. 119 RPS transmitter

### Dimensions [mm]

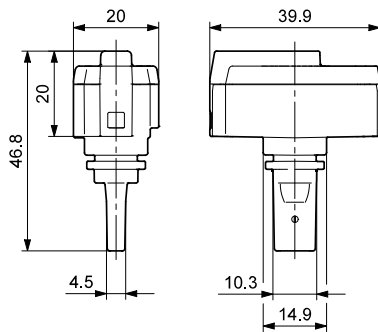


Fig. 120 Dimensions of RPS transmitter

### Output signals

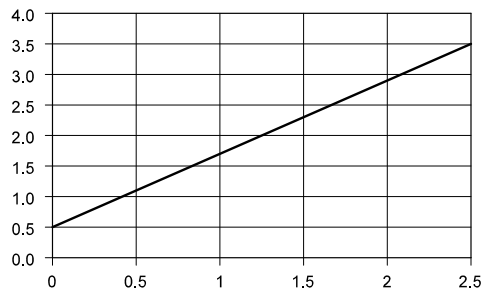


Fig. 121 Pressure response of RPS transmitter

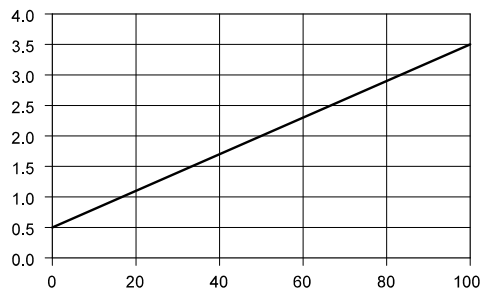


Fig. 122 Temperature response of RPS transmitter

## Specifications

<b>Pressure</b>	
Measuring range (relative)	0 - 2.5 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.5\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2\%$ FS
Response time	< 0.5 s
Resolution	20 mbar
<b>Temperature</b>	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5$ °C
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
<b>Media and environment</b>	
Media	Liquids
Medium temperature (operating)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operating)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	> 30 bar
<b>Electrical data</b>	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW > 10 k $\Omega$
<b>Transmitter materials</b>	
Transmitter	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
<b>Environmental standards</b>	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
<b>Dimensions</b>	
Transmitter	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8144 0607

TM03 8149 0607



## RPS, 0 - 4.0 bar, technical data

Relative-pressure transmitter, standard



Fig. 123 RPS transmitter

### Dimensions [mm]

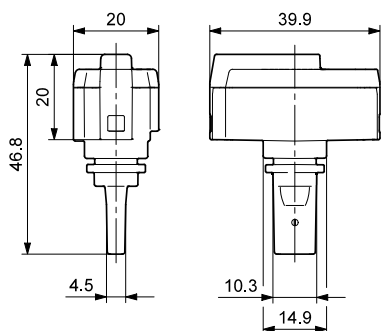


Fig. 124 Dimensions of RPS transmitter

### Output signals

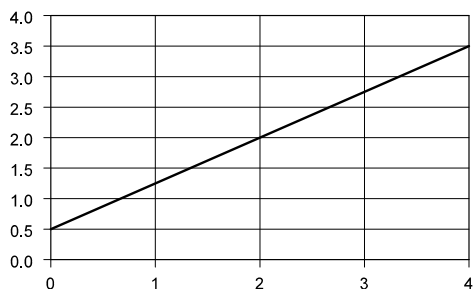


Fig. 125 Pressure response of RPS transmitter

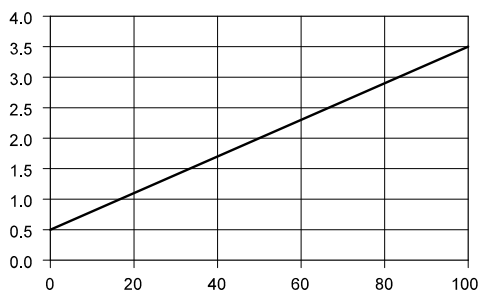


Fig. 126 Temperature response of RPS transmitter

### Specifications

Pressure	
Measuring range (relative)	0 - 4.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
Resolution	20 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1\text{ }^\circ\text{C}$
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2\text{ }^\circ\text{C}$
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	> 30 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Transmitter	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Transmitter	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8145 0607

TM03 8149 0607

## RPS, 0 - 6.0 bar, technical data

### Relative-pressure transmitter, standard



Fig. 127 RPS transmitter

### Dimensions [mm]

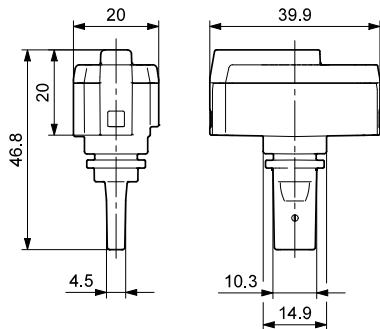


Fig. 128 Dimensions of RPS transmitter

### Output signals

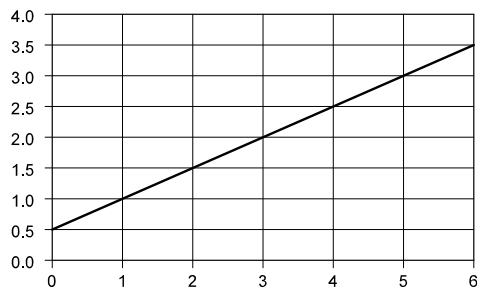


Fig. 129 Pressure response of RPS transmitter

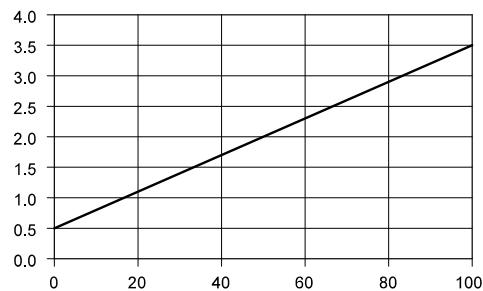


Fig. 130 Temperature response of RPS transmitter

## Specifications

Pressure	
Measuring range (relative)	0 - 6.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
Resolution	20 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1\%$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ °C
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	> 30 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Transmitter	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Transmitter	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8146 0607

TM03 8149 0607

## RPS, 0 - 10.0 bar, technical data

Relative-pressure transmitter, standard



Fig. 131 RPS transmitter

### Dimensions [mm]

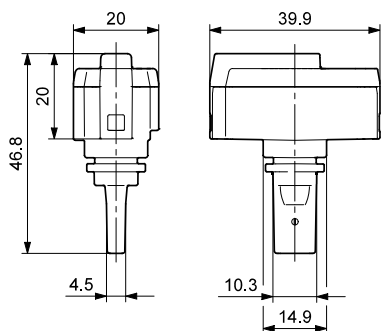


Fig. 132 Dimensions of RPS transmitter

### Output signals

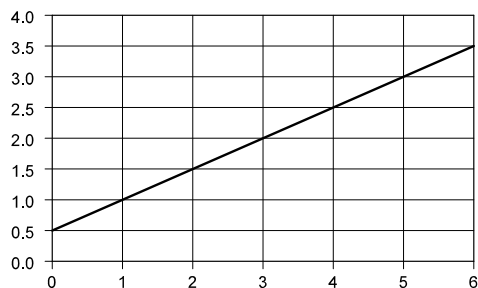


Fig. 133 Pressure response of RPS transmitter

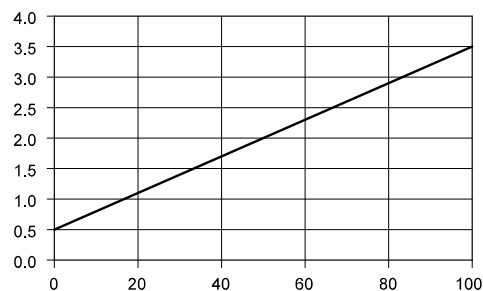


Fig. 134 Temperature response of RPS transmitter

### Specifications

Pressure	
Measuring range (relative)	0 - 10.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 1.0 / 1.5 s
Resolution	20 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1\%$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ °C
Response time (63.3 % at flow velocity > 2 m/s)	< 1.5 s
Resolution	0.5 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temperature (operation)	-25 - +60 °C
Ambient air temperature (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
System burst pressure	> 30 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply recommended.
Output signals	Ratiometric
Pressure signal	0.5 - 3.5 V
Temperature signal	0.5 - 3.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Transmitter element	Silicon-based MEMS transmitter
Seal (transmitter to housing)	EPDM rubber
Housing	Composites (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class	IP44 (non-overmoulded IP20)
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Physical properties	
Transmitter dimensions	47 x 40 x 20 mm

TM05 2254 4711

TM03 8136 0607

TM03 8146 0607

TM03 8149 0607

## 7. Differential-pressure transmitter, standard (DPS)

### DPS general data



Fig. 135 DPS transmitter

TM04 4457 1309

### Technical overview

Grundfos Direct Sensors™, type DPS, is a series of combined differential-pressure and temperature transmitters (two-in-one). The DPS transmitters are fully compatible with wet, aggressive media.

The DPS transmitters use MEMS sensing technology in combination with a new packaging concept with corrosion-resistant coating on the MEMS sensing element. This makes the DPS transmitters very robust and ideal for high-volume OEM applications.

### Applications

- Pump and pump control systems
- water treatment systems
- filters (monitoring)
- underfloor heating
- valve-controlled systems
- cooling and temperature control systems
- building management systems.

### Features

- Differential-pressure ranges of 0 - 0.6, 0 - 1.0, 0 - 1.6, 0 - 2.5, 0 - 4.0 and 0 - 6.0 bar
- high burst pressure
- compact and proven mechanical design
- voltage output (ratiometric, ideal for use with microcontroller)
- approved for potable water, i.e. WRAS, KTW, ACS
- designed for harsh environments.

### Benefits

- Differential-pressure and temperature transmitter in one package (two-in-one transmitter)
- compatible with wet, aggressive media
- accurate, linearised and temperature-compensated differential-pressure transmitter
- quick temperature response (direct medium contact).

### Type key

96XXXXXX - XX - XXXX XXXXX			
Product number			
Version			
Production code (year and week)			
Consecutive number			

### Electrical connections

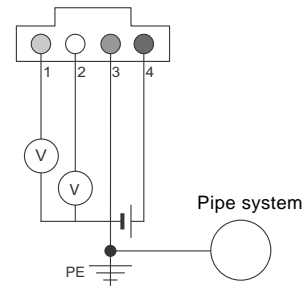


Fig. 136 Electrical connections

TM05 2253 4711

Pin	Description	Colour
1	Temperature signal (0.5 to 4.5 V relative to pin 3)	Yellow
2	Pressure signal (0.5 to 4.5 V relative to pin 3)	White
3	GND (0 V)	Green
4	Voltage supply (+5 VDC), PELV	Brown

### Power supply requirements

- 5 VDC
- separated from hazardous live circuitry by double or reinforced insulation
- power limitation of 150 VA; current limitation of 8 A.

### Options

Part		
Housing for DPS		
Fitting 6 mm		Tube connection
Fitting 8 mm		Tube connection
Fitting 6 mm	AISI 316	Cutting ring
Fitting 8 mm		Cutting ring
Wall bracket (housing for DPS)		
Transmitter overmoulded		

### DPS, 0 - 0.6 bar, technical data

Differential-pressure transmitter, standard, series 100



Fig. 137 DPS transmitter

#### Dimensions [mm]

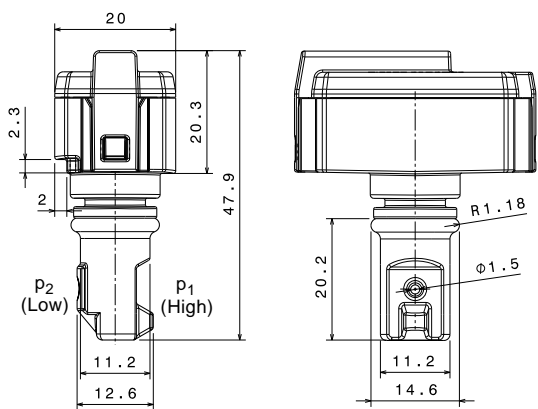


Fig. 138 Dimensional sketches of sensing element (p<sub>1</sub> is the high-pressure side)

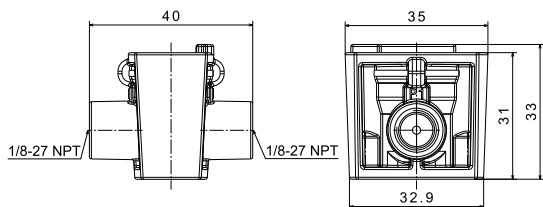


Fig. 139 Isometric view of DPS housing

#### Output signals

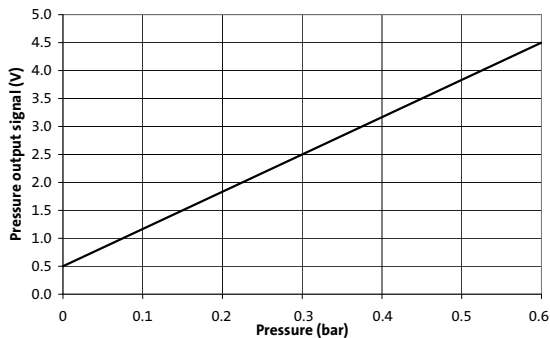


Fig. 140 Differential-pressure response of DPS transmitter

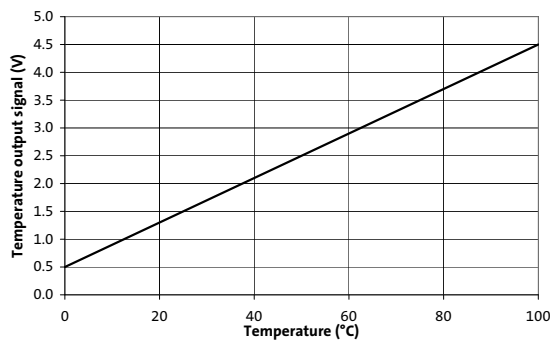


Fig. 141 Temperature response of DPS transmitter

### Specifications

Pressure	
Measuring range (differential)	0 - 0.6 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 3.0\%$ FS
Response time	< 0.5 s
System pressure deviation	6 mbar/bar
Resolution	1.2 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.0$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.0$ °C
Response time, sensing element to output change	< 1.0 s
Resolution	0.2 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temp. (operation)	-25 - +60 °C
Ambient air temp. (peak)	-55 - +90 °C
Humidity (relative)	0-95 %, non-condensing
Application pressure, p <sub>1</sub>	Max. 16 bar at 70 °C Max. 12 bar at 100 °C
Differential pressure, p <sub>1</sub> - p <sub>2</sub>	Max. 10 bar
Burst pressure, p <sub>1</sub>	Max. 30 bar
Burst pressure, p <sub>2</sub>	Max. 10 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ). Grounding of the transmitter supply is required.
Output signals	Ratiometric
Pressure signal	0.5 - 4.5 V
Temperature signal	0.5 - 4.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Sealing cap	EPDM rubber
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class (overmoulded)	IP44
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Sensing element	47 x 40 x 20 mm

## DPS, 0 - 1.0 bar, technical data

Differential-pressure transmitter, standard, series 100



Fig. 142 DPS transmitter

### Dimensions [mm]

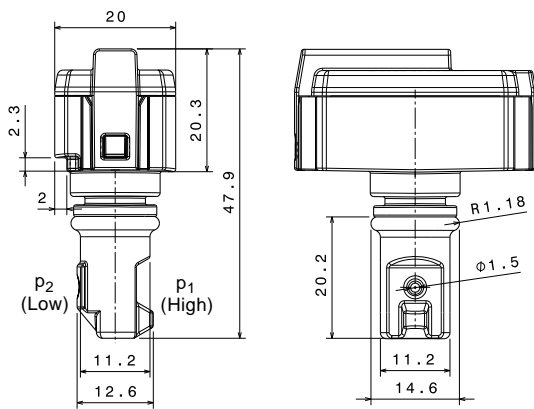


Fig. 143 Dimensional sketches of sensing element ( $p_1$  is the high-pressure side)

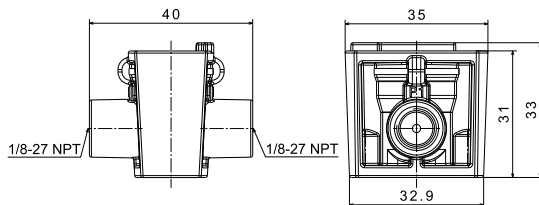


Fig. 144 Isometric view of DPS housing

### Output signals

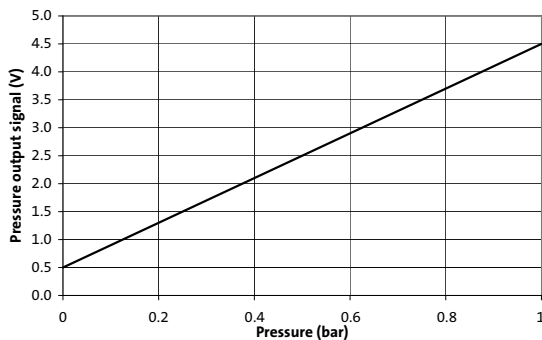


Fig. 145 Differential-pressure response of DPS transmitter

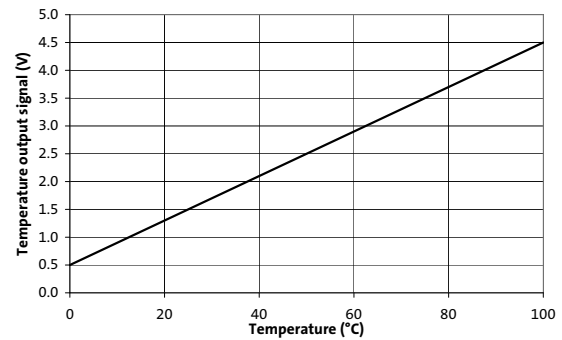


Fig. 146 Temperature response of DPS transmitter

### Specifications

Pressure	
Measuring range (differential)	0 - 1.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 3.0\%$ FS
Response time	< 0.5 s
System pressure deviation	6 mbar/bar
Resolution	1.3 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.0$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.0$ °C
Response time, sensing element to output change	< 1.0 s
Resolution	0.2 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temp. (operation)	-25 - +60 °C
Ambient air temp. (peak)	-55 - +90 °C
Humidity (relative)	0-95 %, non-condensing
Application pressure, $p_1$	Max. 16 bar at 70 °C Max. 12 bar at 100 °C
Differential pressure, $p_1 - p_2$	Max. 10 bar
Burst pressure, $p_1$	Max. 30 bar
Burst pressure, $p_2$	Max. 10 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply required.
Output signals	Ratiometric
Pressure signal	0.5 - 4.5 V
Temperature signal	0.5 - 4.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Sealing cap	EPDM rubber
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class (overmoulded)	IP44
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Sensing element	47 x 40 x 20 mm

TM04 4457 1309

TM04 4456 1309

TM04 4455 1309

TM04 4450 1309

TM04 4458 1309

## DPS, 0 - 1.6 bar, technical data

Differential-pressure transmitter, standard, series 100



Fig. 147 DPS transmitter

### Dimensions [mm]

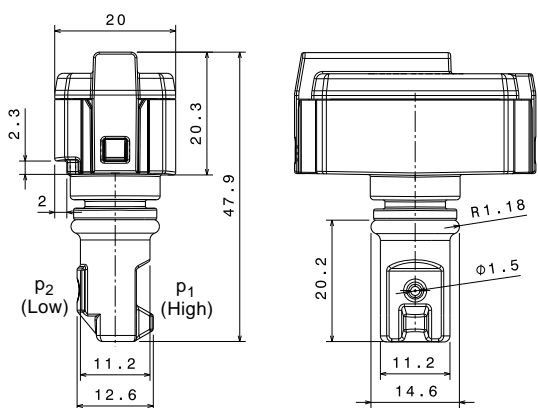


Fig. 148 Dimensional sketches of sensing element (p<sub>1</sub> is the high-pressure side)

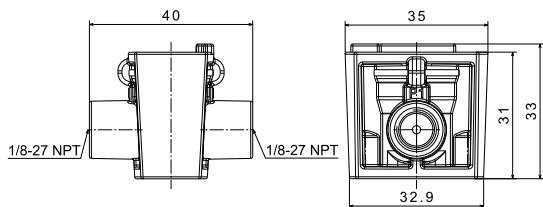


Fig. 149 Isometric view of DPS housing

### Output signals

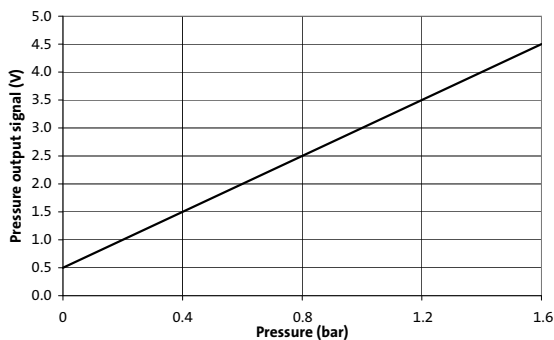


Fig. 150 Differential-pressure response of DPS transmitter

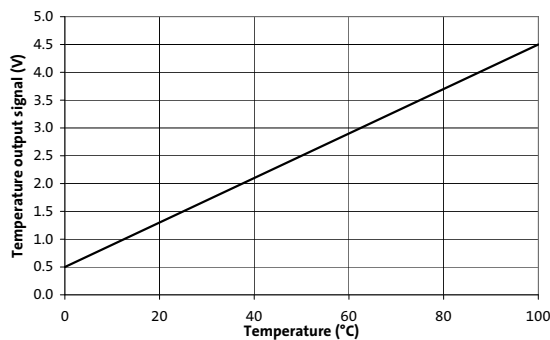


Fig. 151 Temperature response of DPS transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 1.6 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
System pressure deviation	6 mbar/bar
Resolution	1.6 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.0$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.0$ °C
Response time, sensing element to output change	< 1.0 s
Resolution	0.2 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temp. (operation)	-25 - +60 °C
Ambient air temp. (peak)	-55 - +90 °C
Humidity	0-95 % (relative), non-condensing
Application pressure, p <sub>1</sub>	Max. 16 bar at 70 °C Max. 12 bar at 100 °C
Differential pressure, p <sub>1</sub> - p <sub>2</sub>	Max. 10 bar
Burst pressure, p <sub>1</sub>	Max. 30 bar
Burst pressure, p <sub>2</sub>	Max. 10 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply required.
Output signals	Ratiometric
Pressure signal	0.5 - 4.5 V
Temperature signal	0.5 - 4.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Sealing cap	EPDM rubber
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class (overmoulded)	IP44
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Sensing element	47 x 40 x 20 mm

TM04 4457 1309

TM04 4456 1309

TM04 4455 1309

TM04 4451 1309

TM04 4458 1309

## DPS, 0 - 2.5 bar, technical data

Differential-pressure transmitter, standard, series 100



Fig. 152 DPS transmitter

### Dimensions [mm]

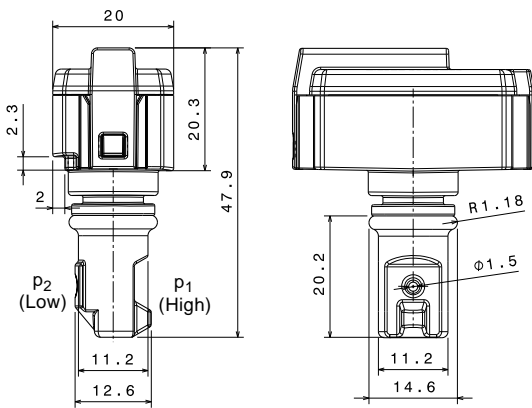


Fig. 153 Dimensional sketches of sensing element ( $p_1$  is the high-pressure side)

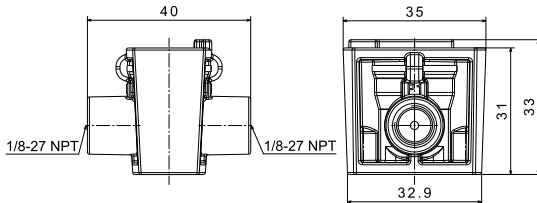


Fig. 154 Isometric view of DPS housing

### Output signals

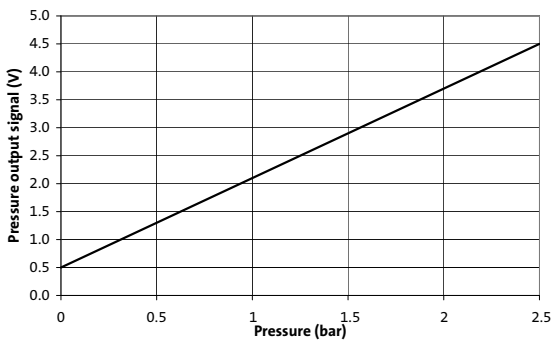


Fig. 155 Differential-pressure response of DPS transmitter

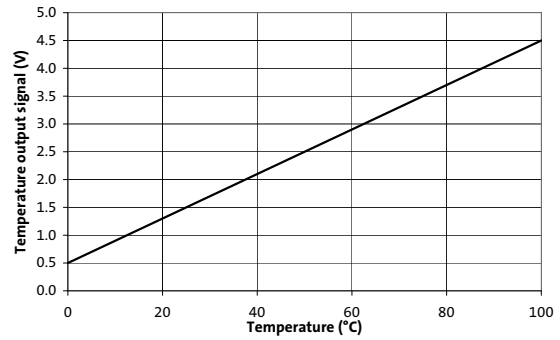


Fig. 156 Temperature response of DPS transmitter

### Specifications

Pressure	
Measuring range (differential)	0 - 2.5 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
System pressure deviation	6 mbar/bar
Resolution	2.5 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.0$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.0$ °C
Response time, sensing element to output change	< 1.0 s
Resolution	0.2 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temp. (operation)	-25 - +60 °C
Ambient air temp. (peak)	-55 - +90 °C
Humidity (relative)	0-95 %, non-condensing
Application pressure, $p_1$	Max. 16 bar at 70 °C Max. 12 bar at 100 °C
Differential pressure, $p_1 - p_2$	Max. 10 bar
Burst pressure, $p_1$	Max. 30 bar
Burst pressure, $p_2$	Max. 10 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply required.
Output signals	Ratiometric
Pressure signal	0.5 - 4.5 V
Temperature signal	0.5 - 4.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Sealing cap	EPDM rubber
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class (overmoulded)	IP44
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Sensing element	47 x 40 x 20 mm

TM04 4457 1309

TM04 4456 1309

TM04 4455 1309

TM04 4452 1309

TM04 4458 1309



## DPS, 0 - 4.0 bar, technical data

Differential-pressure transmitter, standard, series 100



Fig. 157 DPS transmitter

### Dimensions [mm]

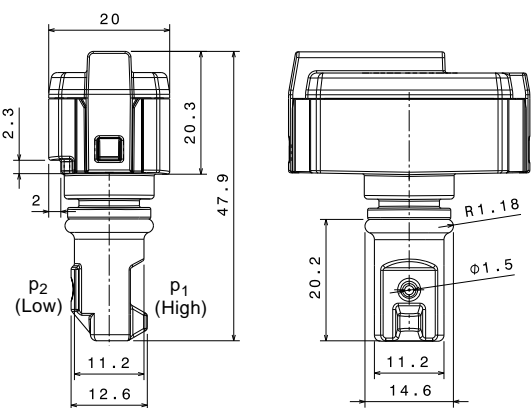


Fig. 158 Dimensional sketches of sensing element (p<sub>1</sub> is the high-pressure side)

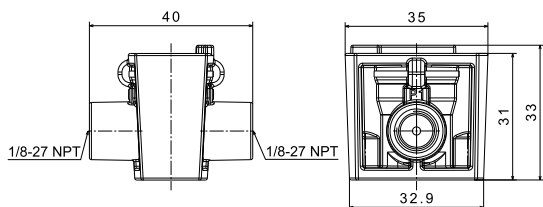


Fig. 159 Isometric view of DPS housing

### Output signals

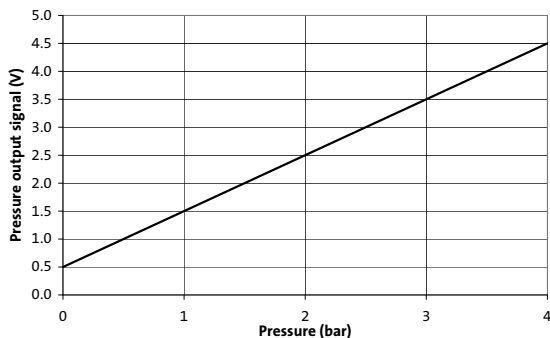


Fig. 160 Differential-pressure response of DPS transmitter

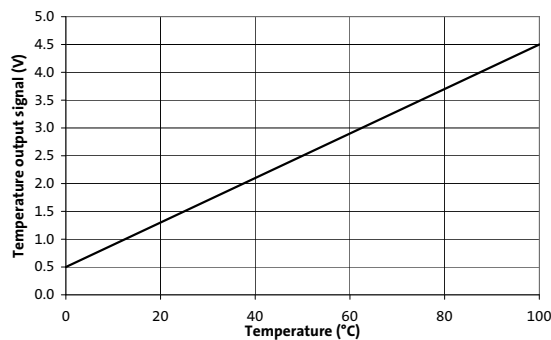


Fig. 161 Temperature response of DPS transmitter

## Specifications

Pressure	
Measuring range (differential)	0 - 4.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
System pressure deviation	6 mbar/bar
Resolution	4.0 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.0$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.0$ °C
Response time, sensing element to output change	< 1.0 s
Resolution	0.2 °C
Media and environment	
Media	Liquids
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temp. (operation)	-25 - +60 °C
Ambient air temp. (peak)	-55 - +90 °C
Humidity (relative)	0-95 %, non-condensing
Application pressure, p <sub>1</sub>	Max. 16 bar at 70 °C Max. 12 bar at 100 °C
Differential pressure, p <sub>1</sub> - p <sub>2</sub>	Max. 10 bar
Burst pressure, p <sub>1</sub>	Max. 30 bar
Burst pressure, p <sub>2</sub>	Max. 10 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply required.
Output signals	Ratiometric
Pressure signal	0.5 - 4.5 V
Temperature signal	0.5 - 4.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Sealing cap	EPDM rubber
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class (overmoulded)	IP44
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Sensing element	47 x 40 x 20 mm

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TM04 4455 1309

TM04 4453 1309

TM04 4458 1309

## DPS, 0 - 6.0 bar, technical data

Differential-pressure transmitter, standard, series 100



Fig. 162 DPS transmitter

### Dimensions [mm]

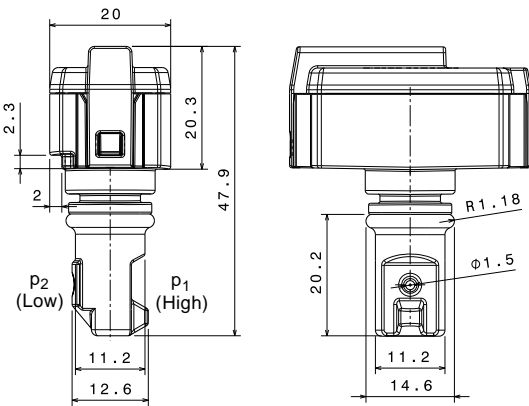


Fig. 163 Dimensional sketches of sensing element ( $p_1$  is the high-pressure side)

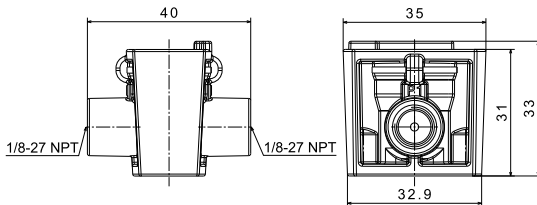


Fig. 164 Isometric view of DPS housing

### Output signals

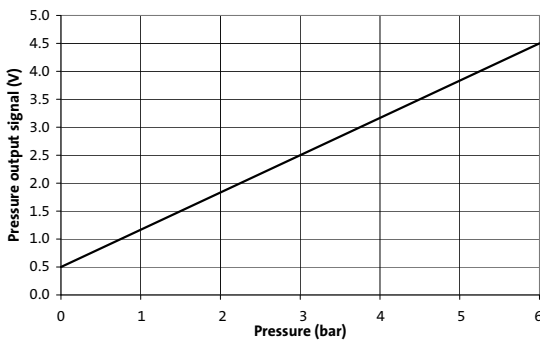


Fig. 165 Differential-pressure response of DPS transmitter

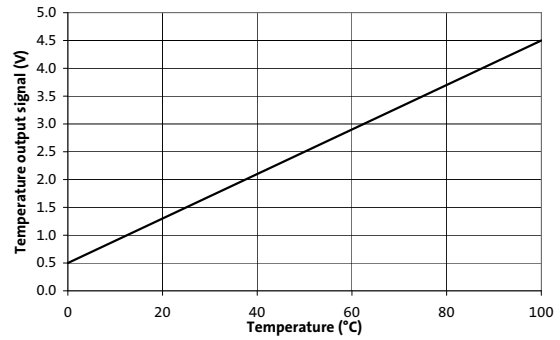


Fig. 166 Temperature response of DPS transmitter

### Specifications

Pressure	
Measuring range (differential)	0 - 6.0 bar
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 2\%$ FS
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.5\%$ FS
Response time	< 0.5 s
System pressure deviation	6 mbar/bar
Resolution	6.0 mbar
Temperature	
Measuring range	0-100 °C
Accuracy ( $\pm 1\sigma$ ), 25-80 °C	$\pm 1.0$ °C
Accuracy ( $\pm 1\sigma$ ), 0-100 °C	$\pm 2.0$ °C
Response time, sensing element to output change	< 1.0 s
Resolution	0.2 °C
Media and environment	
Media	Liquids.
Medium temperature (operation)	0-100 °C
Medium temperature (peak)	-25 - +120 °C, non-freezing
Ambient air temp. (operation)	-25 - +60 °C
Ambient air temp. (peak)	-55 - +90 °C
Humidity (relative)	0-95 %, non-condensing
Application pressure, $p_1$	Max. 16 bar at 70 °C Max. 12 bar at 100 °C
Differential pressure, $p_1 - p_2$	Max. 10 bar
Burst pressure, $p_1$	Max. 30 bar
Burst pressure, $p_2$	Max. 10 bar
Electrical data	
Power supply	5 VDC ( $\pm 5\%$ ) Grounding of transmitter supply required.
Output signals	Ratiometric
Pressure signal	0.5 - 4.5 V
Temperature signal	0.5 - 4.5 V
Power consumption	< 50 mW
Load impedance	> 10 k $\Omega$
Transmitter materials	
Sensing element	Silicon-based MEMS transmitter
Sealing cap	EPDM rubber
Housing	Composite (PPS)
Wetted materials	Corrosion-resistant coating, EPDM, PPS
Environmental standards	
Enclosure class (overmoulded)	IP44
Temperature cycling	IEC 68-2-14
Vibration (non-destructive)	20-2000 Hz, 10 G, 4 h
Electromagnetic compatibility	EN 61326-1
Dimensions	
Sensing element	47 x 40 x 20 mm

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TM04 4455 1309

TM04 5111 1309

TM04 4458 1309

## 8. Product range

### RPI transmitter

Scope of delivery:

- RPI transmitter
- quick guide.

Complete product range	Pressure range [bar]	Thread	Temperature measurement	O-ring		Product number
				EPDM	FKM	
RPI-0-0.6b-1-C-N-EG6-W1	0 - 0.6	G 1/2		•		97748907
RPI-0-0.6b-1-C-N-VG6-W1				•	97748948	
RPI-0-0.6b-1-F-N-EG6-W1			•	•	97748926	
RPI-0-0.6b-1-F-N-VG6-W1			•	•	97748957	
RPI-0-1.0b-1-C-N-EG6-W1	0 - 1.0	G 1/2		•		97748908
RPI-0-1.0b-1-C-N-VG6-W1				•	97748949	
RPI-0-1.0b-1-F-N-EG6-W1			•	•	97748928	
RPI-0-1.0b-1-F-N-VG6-W1			•	•	97748958	
RPI-0-1.6b-1-C-N-EG6-W1	0 - 1.6	G 1/2		•		97748909
RPI-0-1.6b-1-C-N-VG6-W1				•	97748950	
RPI-0-1.6b-1-F-N-EG6-W1			•	•	97748929	
RPI-0-1.6b-1-F-N-VG6-W1			•	•	97748959	
RPI-0-2.5b-1-C-N-EG6-W1	0 - 2.5	G 1/2		•		97748910
RPI-0-2.5b-1-C-N-VG6-W1				•	97748951	
RPI-0-2.5b-1-F-N-EG6-W1			•	•	97748930	
RPI-0-2.5b-1-F-N-VG6-W1			•	•	97748960	
RPI-0-4.0b-1-C-N-EG6-W1	0 - 4.0	G 1/2		•		97748921
RPI-0-4.0b-1-C-N-VG6-W1				•	97748952	
RPI-0-4.0b-1-F-N-EG6-W1			•	•	97748941	
RPI-0-4.0b-1-F-N-VG6-W1			•	•	97748961	
RPI-0-6.0b-1-C-N-EG6-W1	0 - 6.0	G 1/2		•		97748922
RPI-0-6.0b-1-C-N-VG6-W1				•	97748953	
RPI-0-6.0b-1-F-N-EG6-W1			•	•	97748942	
RPI-0-6.0b-1-F-N-VG6-W1			•	•	97748962	
RPI-0-10b-1-C-N-EG6-W1	0 - 10.0	G 1/2		•		97748923
RPI-0-10b-1-C-N-VG6-W1				•	97748954	
RPI-0-10b-1-F-N-EG6-W1			•	•	97748944	
RPI-0-10b-1-F-N-VG6-W1			•	•	97748963	
RPI-0-16b-1-C-N-EG6-W1	0 - 16.0	G 1/2		•		97748924
RPI-0-16b-1-C-N-VG6-W1				•	97748955	
RPI-0-16b-1-F-N-EG6-W1			•	•	97748945	
RPI-0-16b-1-F-N-VG6-W1			•	•	97748964	
RPI-0-25b-1-C-N-EG6-W1	0 - 25.0	G 1/2		•		97748925
RPI-0-25b-1-C-N-VG6-W1				•	97748956	
RPI-0-25b-1-F-N-EG6-W1			•	•	97748946	
RPI-0-25b-1-F-N-VG6-W1			•	•	97748965	

## DPI V.2 transmitter

Scope of delivery:

- DPI V.2 transmitter
- open 2 m cable with M12 connection in one end
- capillary tube with fitting
- quick guide.

Complete product range	Pressure range [bar]	Thread	Temperature measurement	O-ring		Product number
				EPDM	FKM	
DPI-0-0.6b-2-C-M2.000X-EG6-...-SW*1	0 - 0.6	G 1/2		•		97747194
DPI-0-0.6b-2-C-M2.000X-VG6-...-SW*1				•	97747215	
DPI-0-0.6b-2-F-M2.000X-EG6-...-SW*1			•		97747202	
DPI-0-0.6b-2-F-M2.000X-VG6-...-SW*1			•	•	97747244	
DPI-0-1.0b-2-C-M2.000X-EG6-...-SW*1	0 - 1.0	G 1/2		•		97747195
DPI-0-1.0b-2-C-M2.000X-VG6-...-SW*1				•	97747216	
DPI-0-1.0b-2-F-M2.000X-EG6-...-SW*1			•		97747203	
DPI-0-1.0b-2-F-M2.000X-VG6-...-SW*1			•	•	97747245	
DPI-0-1.6b-2-C-M2.000X-EG6-...-SW*1	0 - 1.6	G 1/2		•		97747196
DPI-0-1.6b-2-C-M2.000X-VG6-...-SW*1				•	97747218	
DPI-0-1.6b-2-F-M2.000X-EG6-...-SW*1			•		97747204	
DPI-0-1.6b-2-F-M2.000X-VG6-...-SW*1			•	•	97747246	
DPI-0-2.5b-2-C-M2.000X-EG6-...-SW*1	0 - 2.5	G 1/2		•		97747197
DPI-0-2.5b-2-C-M2.000X-VG6-...-SW*1				•	97747219	
DPI-0-2.5b-2-F-M2.000X-EG6-...-SW*1			•		97747205	
DPI-0-2.5b-2-F-M2.000X-VG6-...-SW*1			•	•	97747247	
DPI-0-4.0b-2-C-M2.000X-EG6-...-SW*1	0 - 4.0	G 1/2		•		97747198
DPI-0-4.0b-2-C-M2.000X-VG6-...-SW*1				•	97747220	
DPI-0-4.0b-2-F-M2.000X-EG6-...-SW*1			•		97747206	
DPI-0-4.0b-2-F-M2.000X-VG6-...-SW*1			•	•	97747249	
DPI-0-6.0b-2-C-M2.000X-EG6-...-SW*1	0 - 6.0	G 1/2		•		97747199
DPI-0-6.0b-2-C-M2.000X-VG6-...-SW*1				•	97747241	
DPI-0-6.0b-2-F-M2.000X-EG6-...-SW*1			•		97747207	
DPI-0-6.0b-2-F-M2.000X-VG6-...-SW*1			•	•	97747250	
DPI-0-10b-2-C-M2.000X-EG6-...-SW*1	0 - 10.0	G 1/2		•		97747200
DPI-0-10b-2-C-M2.000X-VG6-...-SW*1				•	97747242	
DPI-0-10b-2-F-M2.000X-EG6-...-SW*1			•		97747208	
DPI-0-10b-2-F-M2.000X-VG6-...-SW*1			•	•	97747251	
DPI-0-16b-2-C-M2.000X-EG6-...-SW*1	0 - 16	G 1/2		•		97747201
DPI-0-16b-2-C-M2.000X-VG6-...-SW*1				•	97747209	
DPI-0-16b-2-F-M2.000X-EG6-...-SW*1			•		97747209	
DPI-0-16b-2-F-M2.000X-VG6-...-SW*1			•	•	97747252	

## DPI transmitter

The DPI transmitter is available as a single transmitter as well as in sets with capillary tubes.

Scope of delivery:

- DPI transmitter
- screws, nuts and washers for installation
- cable pin, 0.34 mm
- installation and operating instructions for Grundfos DPI transmitter.

See table below for special parts for each set.

Product description	Pressure range [bar]	Cable length [m]	Wall bracket	Motor bracket	Capillary tube	Reducing piece UNS 7/16"-R 1/4	Service instructions	Product number
DPI 0-0.6 Complete	0 - 0.6	1.5	•					96561232
DPI 0-1.0 Complete	0 - 1.0	1.5	•					96573681
DPI 0-1.6 Complete	0 - 1.6	1.5	•					96573682
DPI 0-2.5 Complete	0 - 2.5	1.5	•					96573683
DPI 0-4.0 Complete	0 - 4.0	1.5	•					96573684
DPI 0-6.0 Complete	0 - 6.0	1.5	•					96573685
DPI 0-10.0 Complete	0 - 10.0	1.5	•					96573686
DPI 0-0.6 Set 1	0 - 0.6	1.5	•	•	•	•	•	96611522
DPI 0-1.0 Set 1	0 - 1.0	1.5	•	•	•	•	•	96611523
DPI 0-1.6 Set 1	0 - 1.6	1.5	•	•	•	•	•	96611524
DPI 0-2.5 Set 1	0 - 2.5	1.5	•	•	•	•	•	96611525
DPI 0-4.0 Set 1	0 - 4.0	1.5	•	•	•	•	•	96611526
DPI 0-6.0 Set 1	0 - 6.0	1.5	•	•	•	•	•	96611527
DPI 0-10.0 Set 1	0 - 10.0	1.5	•	•	•	•	•	96611550
DPI 0-1.2 Set 2	0 - 1.2	5	•		•	•		96760247
DPI 0-2.5 Set 2	0 - 2.5	5	•		•	•		96760248
DPI 0-4.0 Set 2	0 - 4.0	5	•		•	•		96760249
DPI 0-6.0 Set 2	0 - 6.0	5	•		•	•		96760250
DPI 0-10.0 Set 2	0 - 10.0	5	•		•	•		96829235

## 9. Accessories

### Transmitter interface, SI 001 PSU

The SI 001 PSU from Grundfos Direct Sensors™ is an external power supply for the DPI and other transmitters with a supply voltage of 24 VDC.

The power supply must be used where the distance between the transmitter and the controller is longer than 30 m.



TM04 4194 0809

Fig. 167 Transmitter interface, SI 001 PSU

**Specifications:**

Voltage range: 110-400 VAC.

Frequency range: 50-60 Hz.


Ambient temperature: -20 to +50 °C.

Enclosure class: IP54.

Part	Product number
Transmitter interface, SI 001 PSU	96915820


### M12 cable

4-wire screened cable with M12 connector in transmitter end and open ends in equipment end.

Description	Length [m]	Product number
 Cable, industry M2.000X	2.00	96841343
Cable, industry M5.000X	5.00	96841344

### Capillary tube

The capillary tube is used together with the DPI / DPI+T to connect the transmitter to the low-pressure side of the equipment.


Description	Product number
 Capillary tube UNS 7/16"	00ID5225

### Adaptor for mounting in Grundfos CR pumps

This adaptor is required when mounting the RPI / RPI+T or DPI / DPI+T in certain variants of CR pumps.

Pump type	Grundfos CR pump size											
	1	3	5	10	15	20	32	45	64	90	120	150
CR(E)	•	•	•	•	○	○	○	-	-	-	-	-
CRl(E)	•	•	•	•	○	○	-	-	-	-	-	-
CRN(E)	•	•	•	•	○	○	○	-	-	-	-	-

- Does not require an adaptor.
- Requires an adaptor if the transmitter and coupling guard are in direct contact (will create unnecessary acoustic noise).
- Always requires an adaptor.

Description	Product number
 Extension adaptor for RPI / RPI+T and DPI / DPI+T	98255224

## Transmitter interface, SI 010 CNV

The SI 010 CNV from Grundfos Direct Sensors™ is an external power supply, signal amplifier and signal converter for Grundfos transmitters.

The SI 010 CNV has built-in precision resistors enabling the transmitter to send 4-20 mA, 1-5 V and 2-10 V output signals.

The SI 010 CNV should be used in applications where transmitters from the standard product range are used, but the controller requires a 4-20 mA input signal.



TM04 4882 2209

**Fig. 168** Transmitter interface, SI 010 CNV

### Specifications:

Voltage range: 115-230 VAC  $\pm$  10 % or 24 VDC.

Frequency range: 50-60 Hz.

Power consumption: max. 2.5 W.

Ambient temperature: -20 to +50 °C.

Enclosure class: IP20.

Part	Product number
Transmitter interface, SI 010 CNV	96983684

# 10. Appendix

## Temperature response of DPI V.2+T / RPI+T

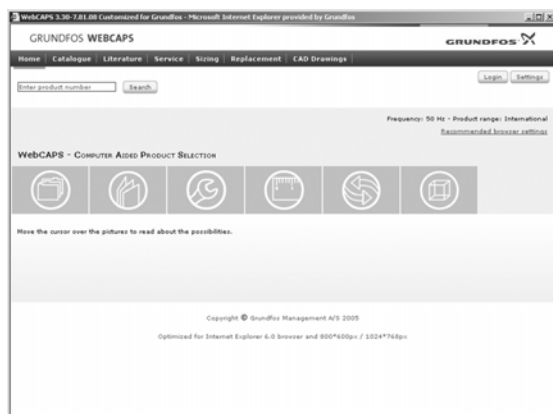
The diagram illustrates the correct and incorrect installation methods for the Grundfos Direct Sensor. It includes the following information:

- Temperature Response:** A graph shows the sensor's output signal (0-100%) versus temperature. The operating range is from -30 to 120 °C (-22 to 248 °F). A warning indicates that temperatures above 65 °C (>149 °F) are not recommended.
- Installation Guidelines:**
  - Correct installation is shown with a checkmark (✓) for a flush, secure fit.
  - Incorrect installation is shown with a cross (✗) for protruding or loose fitting.
  - Warnings include a high-temperature symbol and a warning symbol.
- Material and Sealing:** The sensor uses EPDM and FKM seals. The connection is made using an ISO 228/1-G½ fitting.
- Torque and Tools:** A torque wrench should be used to tighten the fitting to 20 Nm. A 32 mm wrench is specified. The use of pliers is prohibited.
- Dimensions:** The sensor has an outer diameter (d1) of 16.3 mm and an inner diameter (d2) of 2.4 mm.
- Material Specifications:** The sensor is rated for a temperature range of -25 to 60 °C (-13 to 140 °F), a maximum pressure of 28 bar (406 PSI), and has an IP67 rating.
- Wiring:** The sensor is an M12 connector, compatible with IP67, UL CCN: CYIV and CYIV7.



# 11. Further product documentation

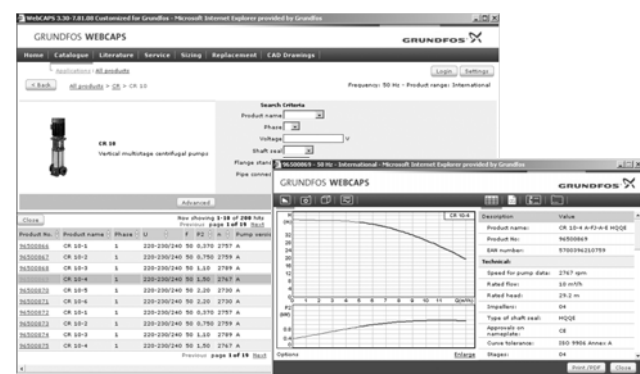
## WebCAPS



WebCAPS is a **Web-based Computer Aided Product Selection** program available on [www.grundfos.com](http://www.grundfos.com). WebCAPS contains detailed information on more than 220,000 grundfos products in more than 30 languages.

Information in WebCAPS is divided into six sections:

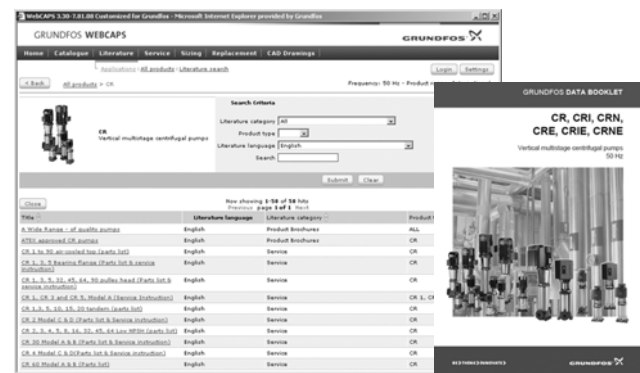
- Catalogue
- Literature
- Service
- Sizing
- Replacement
- CAD drawings.



### Catalogue

Based on fields of application and pump types, this section contains the following:

- technical data
- curves (QH, Eta, P1, P2, etc.) which can be adapted to the density and viscosity of the pumped liquid and show the number of pumps in operation
- product photos
- dimensional drawings
- wiring diagrams
- quotation texts, etc.



### Literature

This section contains all the latest documents of a given pump, such as

- data booklets
- installation and operating instructions
- service documentation, such as Service kit catalogue and Service kit instructions
- quick guides
- product brochures.



### Service

This section contains an easy-to-use interactive service catalogue. Here you can find and identify service parts of both existing and discontinued grundfos pumps. Furthermore, the section contains service videos showing you how to replace service parts.



**Sizing**

This section is based on different fields of application and installation examples and gives easy step-by-step instructions in how to size a product:

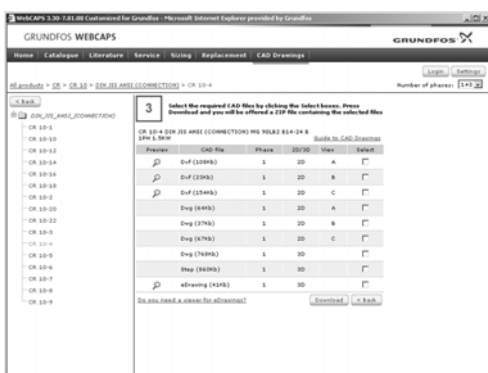
- Select the most suitable and efficient pump for your installation.
- Carry out advanced calculations based on energy, consumption, payback periods, load profiles, life cycle costs, etc.
- Analyse your selected pump via the built-in life cycle cost tool.
- Determine the flow velocity in wastewater applications, etc.



**Replacement**

In this section you find a guide to selecting and comparing replacement data of an installed pump in order to replace the pump with a more efficient Grundfos pump. The section contains replacement data of a wide range of pumps produced by other manufacturers than Grundfos.

Based on an easy step-by-step guide, you can compare Grundfos pumps with the one you have installed on your site. When you have specified the installed pump, the guide will suggest a number of Grundfos pumps which can improve both comfort and efficiency.



**CAD drawings**

In this section, it is possible to download 2-dimensional (2D) and 3-dimensional (3D) CAD drawings of most Grundfos pumps.

These formats are available in WebCAPS:

- 2-dimensional drawings:
- .dxf, wireframe drawings
  - .dwg, wireframe drawings.
- 3-dimensional drawings:
- .dwg, wireframe drawings (without surfaces)
  - .stp, solid drawings (with surfaces)
  - .eprt, E-drawings.

**WinCAPS**



Fig. 169 WinCAPS DVD

WinCAPS is a **Windows-based Computer Aided Product Selection** program containing detailed information on more than 220,000 Grundfos products in more than 30 languages.

The program contains the same features and functions as WebCAPS, but is an ideal solution if no internet connection is available.

WinCAPS is available on DVD and updated once a year.

## GO CAPS

Mobile solution for professionals on the GO!



CAPS functionality on the mobile workplace.



Subject to alterations.

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