



## **DMP 457**

# **Pressure Transmitter for Shipbuilding and Offshore**

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

#### **Nominal pressure**

from 0 ... 100 mbar up to 0 ... 600 bar

#### **Output signals**

2-wire: 4 ... 20 mA others on request

#### **Special characteristics**

- ▶ LR-certificate (Lloyd's Register)
- GL-certificate (Germanischer Lloyd)
- ▶ DNV-certificate (Det Norske Veritas)
- ABS-certificate (American Bureau of Shipping)
- CCS-certificate (China Classification Society)
- flush pressure port
   G 1/2" from 100 mbar
- excellent thermal behavior

#### **Optional versions**

- IS-version
   Ex ia = intrinsically safe for gases and dusts
- welded pressure port

The pressure transmitter DMP 457 has been especially designed for rough conditions occurring especially in shipbuilding and offshore applications. All gaseous and liquid media, which are compatible with stainless steel 1.4404 (316L) respectively can be used.

Sensor element is a piezoresistive stainless steel sensor with high accuracy and excellent long-term stability. In order to meet the special requirements for shipbuilding and offshore applications extensive tests had to be passed to get the Lloyd's Register (LR), Germanischer Lloyd (GL), Det Norske Veritas (DNV) and China Classification Society (CCS) approvals.

#### Preferred areas of use are



Diesel Engines, Drives Compressors, Pumps Boiler Hydraulic and Pneumatic Control Systems



Fuel and Oil













Input pressure range <sup>1</sup>												
Nominal pressure gauge	[bar]	-1 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6
Level gauge / abs.	[mH <sub>2</sub> O]	-	1	1.6	2.5	4	6	10	16	25	40	60
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50
Nominal pressure gauge	[bar]	10	16	25	40	60	100	160	250	400	60	00
Nominal pressure abs.	[bar]	10	16	25	40	60	100	160	250	400	60	00
Level gauge / abs.	[mH <sub>2</sub> O]	100	160	250	400	-	-	-	-	-		-
Overpressure	[bar]	40	80	80	105	210	600	600	1000	1000	10	00
Burst pressure >	[bar]	50	120	120	210	420	1000	1000	1250	-		-
Vacuum resistance	/acuum resistance P <sub>N</sub> ≥ 1 bar: unlimited vacuum resistance P <sub>N</sub> < 1 bar: on request											
<sup>1</sup> from 60 bar: measurement starts with ambient pressure												

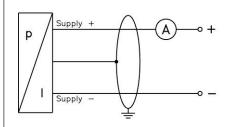
<sup>1</sup> from 60 bar: measurement starts with	ambient pressure					
Output signal / Supply						
Standard	2-wire: 4 20 mA / V <sub>S</sub> = 8	3 32 V <sub>DC</sub>				
Option IS-protection	2-wire: 4 20 mA / V <sub>S</sub> = 10					
Performance						
Accuracy <sup>2</sup> Standard: Nominal pressure < 0.4 bar: ≤ ± 0.5 % FSO						
	Nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO					
	Option: Nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO					
Permissible load	$R_{\text{max}} = \left[ \left( V_{\text{S}} - V_{\text{S min}} \right) / 0.02 \text{ A} \right] \Omega$					
Influence effects	supply: 0.05 % FSO / 10 V load: 0.05 % FSO / kΩ					
Long term stability	≤ ± 0.1 % FSO / year by reference conditions					
Response time	< 10 msec					
<sup>2</sup> accuracy according to IEC 60770 – lim	nit point adjustment (non-linearity, hystere	esis, repeatability)				
Thermal effects (Offset and Spar	ı) / Permissible temperatures					
Nominal pressure P <sub>N</sub> [bar]	-1 0	< 0.4	≥ 0.40			
Tolerance band [% FSO]	≤ ± 0.75	≤ ± 1	≤ ± 0.75			
in compensated range [°C]	-20 85	0 70	-20 85			
Permissible temperatures	medium: -40 125°C electronics / environment: -40 85°C storage: -40 100					
Electrical protection						
Short-circuit protection	permanent					
Reverse polarity protection no damage, but also no function						
Electromagnetic	emission and immunity according to					
compatibility	compatibility - EN 61326 - Germanischer Lloyd (GL) - Det Norske Veritas (DNV)					
Mechanical stability						
Vibration	4 g (according to GL: curve 2 / acc	cording to DNV: Class B / basis: IE	EC 60068-2-6)			
Materials						
Pressure port	stainless steel 1.4404 (316L)					
Housing	standard: stainless steel 1.4404 (316L)					
	option field housing: stainless steel 1.4404 (316L), with cable gland					
Cable sheath	TPE -U (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil)					
Seals (media wetted)	standard: FKM					
	option: welded ve	ersion <sup>3</sup>	others on request			
Diaphragm	stainless steel 1.4435 (316L)					
Media wetted parts	pressure port, seals, diaphragm ts according to EN 837; possible for nominal pressure ranges $P_N \le 40$ bar					
	s according to EN 837; possible for nomi	inal pressure ranges P <sub>N</sub> ≤ 40 bar				
Category of the environment						
Lloyd's Register (LR)	EMV1, EMV2, EMV3, EMV4		number of certificate: 13/20055			
Germanischer Lloyd (GL)	D, F, EMC 1		number of certificate: 24 288 - 04 HH			
Det Norske Veritas (DNV)	temperature: D humidity: I		vibration: B			
	electromagnetic compatibility: B	number of certific	cate: A-12144			
IS-protection						
Approvals DX 19-DMP 457	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X  zone 0: for version with field housing and cable outlet: II 1G Ex ia IIB T4 Ga for version with ISO 4400: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da					
Safety technical maximum values	$U_i$ = 28 V, $I_i$ = 93 mA, $P_i$ = 660 mW, $C_i$ = 105 nF, $L_i$ = 5 $\mu$ H, with field housing $C_i$ = 105 nF, with cable outlet $C_i$ = 84.7 nF, with ISO 4400 $C_i$ = 62.2 nF, the supply connections have an inner capacity of max. 90 nF (140 nF with field housing) to the housing					
Ambient temperature range	bient temperature range in zone 0: -20 60 °C bei p <sub>atm</sub> 0.8 bar bis 1.1 bar in zone 1 or higher: -20 70 °C					
Connecting cables (by factory)	ables cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance:signal line/shield also signal line/signal line: 1μH/m					

Miscellaneous					
Current consumption	max. 25 mA				
Weight	approx. 140 g (with ISO 4400)				
Installation position	any 4				
Operational life	> 100 x 10 <sup>6</sup> pressure cycles				
CE-confomity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) 5			
ATEX Directive	2014/34/EU				

Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation

#### Wiring diagram

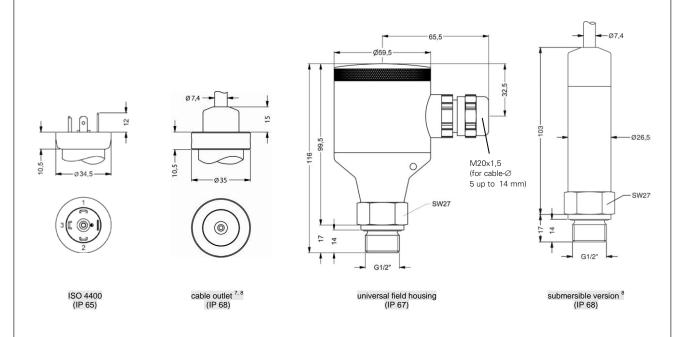
2-wire-system (current)



#### Pin configuration

Electrical connection	ISO 4400	field housing	cable colours (IEC 60757)
Supply +	1	IN +	wh (white)
Supply –	2	IN –	bn (brown)
Shield	ground pin	<u></u>	gnye (green-yellow)

### Electrical connections <sup>6</sup> (dimensions in mm)



 <sup>&</sup>lt;sup>6</sup> Generally shielded cable has to be used! Cable versions are delivered with shielded cable. For ISO 4400 the use of shielded cable is compulsory.
 <sup>7</sup> tested at 4 bar or 40 mH<sub>2</sub>O for 24 hours
 <sup>8</sup> shielded cable with integrated air tube for atmospheric reference (for nominal pressure ranges absolute, the air tube is closed); different lengths available

there can be slight deviations in the zero point for pressure ranges  $P_N \le 1$  bar. <sup>5</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar

## Mechanical connection (dimensions in mm) Standard © 2016 BDJSENSORS GmbH - The specifications given in this document represent the state of engineering at the time of publishing. We reserve the right to make modifications to the specifications and materials. Ø26,5 91 SW27 4 G1/2" G1/2" DIN 3852 Option 15 4 2 G 1/4 G 1/2" G 1/4" G1/2" EN 837 G1/4" DIN 3852 G1/4" EN 837 20 4 1/4" NPT 1/2" NPT 1/4" NPT O-Ring 4 -Ø13,2 ⊢Ø10 G1/2" +G1/2" → G1/2" flush DIN 3852 (up to 40 bar) G1/2" open port DIN 3852 (up to 40 bar)

Tel Fax



#### Ordering code DMP 457 **DMP 457** Pressure 6 0 0 6 0 1 in bar, gauge in bar, absolute 2 in mH<sub>2</sub>O, gauge 1 6 0 2 in mH<sub>2</sub>O, absolute <sup>2</sup> 6 0 3 [mH<sub>2</sub>O] [bar] 0 0 0 6 0 0 5 0 0 0 0 0.1 1.6 0.16 2.5 0.25 2 4 0.4 4 6 0.6 6 0 0 6 5 0 0 10 0 16 1.6 0 2.5 0 25 0 40 4 0 60 6 0 © 2015 BD/SENSORS GmbH - The specifications given in this document represent the state of engineering at the time of publishing. We reserve the right to make modifications to the specifications and mate 0 0 2 100 10 0 2 160 16 0 2 0 2 5 250 25 400 40 0 0 2 0 3 60 6 100 6 0 3 5 0 3 0 0 3 0 0 3 1 0 2 9 9 9 160 2 250 4 400 600 -1 ... 0 customer consult Output 4 ... 20 mA / 2-wire 1 Intrinsic safety 4 ... 20 mA / 2-wire F customer consult 9 standard for $P_N \ge 0.4$ bar 0.35 % 3 standard for $P_N < 0.4$ bar 0.50 % option for $P_N \ge 0.4$ bar 0.25 % 2 customer consult Electrical connection Male and female plug ISO 4400 3 1 G 0 (for cable Ø 4...6 mm) Male and female plug ISO 4400 GL 3, 4 G 0 0 (for cable Ø 10...14 mm) Male and female plug ISO 4400 GL 3, 4 G 0 (for cable Ø 4,5...11 mm) Cable outlet (TPE-U-cable) 5 R Т 3 8 0 Field housing stainless steel 8 Submersible version (1.4404 / 316L) Т Т 3 with TPE-U-cable 5 customer 9 9 9 Mechanical connection G1/2" DIN 3852 0 0 1 G1/2" EN 837 0 0 G1/4" DIN 3852 3 0 0 G1/4" EN 837 0 G 1/2" DIN 3852 with 6 F 0 0 flush sensor G1/2" DIN 3852 open pressure port <sup>6</sup> 0 0 Н N 0 0 N 4 0 9 9 9 1/2" NPT 1/4" NPT customer consult FKM without (welded version) 2 9 customer consult Special version 0 0 0 9 9 9 standard customer consult 1 from 60 bar: measurement starts with ambient pressure

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<sup>&</sup>lt;sup>2</sup> absolute pressure possible from 0.4 bar

<sup>&</sup>lt;sup>3</sup> Shielded cable has to be used! Cable versions are delivered with shielded cable.

<sup>&</sup>lt;sup>4</sup> female plug is GL-approbated

 $<sup>^{5}</sup>$  cable with integrated  $\,$  air tube for atmospheric pressure reference; different lengths deliverable

<sup>&</sup>lt;sup>6</sup> possible up to 40 bar

 $<sup>^{7}</sup>$  welded version only with pressure ports according to EN 837; possible with pressure ranges  $P_N \le 40$  bar