

DMK 458

Pressure Transmitter for Marine and Offshore

Ceramic Sensor

accuracy according to IEC 60770:
standard: 0.25 % FSO
option: 0.1 % FSO



Nominal pressure

from 0 ... 40 mbar up to 0 ... 20 bar

Output signals

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

Product characteristics

- ▶ LR-certificate (Lloyd's Register)
- ▶ DNV-GL Approval (Det Norske Veritas)
 - Germanischer Lloyd
- ▶ ABS-certificate (American Bureau of Shipping)
- ▶ CCS-certificate (China Classification Society)
- ▶ high overpressure resistance
- ▶ excellent long term stability

Optional versions

- ▶ IS-version
Ex ia= intrinsically safe for gases
- ▶ diaphragm Al₂O₃ 99.9 %
- ▶ pressure port in CuNiFe

The pressure transmitter DMK 458 has been developed for marine and offshore applications. In addition to thread connections, different flush versions are available, which are especially suitable for pasty, viscous, and polluted media.

Due to the capacitive ceramic sensor developed by BD|SENSORS, which is optionally available in Al₂O₃ 99.9 %, the DMK 458 shows an outstanding accuracy as well as a high overload and temperature resistance.

Preferred areas of use are



Monitoring of pressure during loading and unloading processes



Monitoring of a ship's position and draught

Use in anti-heeling systems



Level measurement in ballast and storage tanks



Pressure ranges																
Nominal pressure ¹	[bar]	0.04	0.06	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	20
Level	[mH ₂ O]	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	200
Overpressure	[bar]	2	2	4	4	6	6	8	8	15	25	25	35	35	45	45
Permissible vacuum	[bar]	-0.2		-0.3		-0.5				-1						

¹ available in gauge and absolute: nominal pressure ranges absolute from 1 bar

¹ available in gauge and absolute; nominal pressure ranges absolute from 1 bar

Output signal / Supply		
Standard	2-wire: 4 ... 20 mA / $V_S = 9 \dots 32 V_{DC}$	$V_{S rated} = 24 V_{DC}$
Option IS-version	2-wire: 4 ... 20 mA / $V_S = 14 \dots 28 V_{DC}$	$V_{S rated} = 24 V_{DC}$

Performance		
Accuracy ²	standard: $\leq \pm 0.25 \%$ FSO	option for $p_N \geq 0.6 \text{ bar}$ ³ : $\leq \pm 0.1 \%$ FSO
Permissible load	$R_{\max} = [(V_S - V_{S \min}) / 0.02 \text{ A}] \Omega$	
Long term stability	$\leq \pm 0.1 \%$ FSO / year at reference conditions	
Influence effects	supply: 0.05% FSO / 10 V	load: 0.05% FSO / k Ω
Turn-on time	700 msec	
Mean response time	< 200 msec	mean measuring rate 5/sec
Max. response time	380 msec	

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

³ Under the influence of disturbance burst according to EN 61000-4-4 (2004) +2 kV accuracy decreases on $\leq \pm 0.25\%$ FSO.

Thermal effects (offset and span)	
Tolerance band	$\leq \pm 1 \%$ FSO
in compensated range	-20 ... 80 °C

Permissible temperatures		medium: -40 ... 125°C electronics / environment: -25 ... 85°C storage: -40 ... 100°C	
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Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to - EN 61326 - DNV•GL (Det Norske Veritas • Germanischer Lloyd)

	EN 61293	DNV GL (Det Norske Veritas)	Germanischer Lloyd
Mechanical stability			
Vibration	4 g (according to DNV•GL: Class B, curve 2 / basis: IEC 60068-2-6)		

Materials	
Pressure port	standard: stainless steel 1.4404 (316 L) option for inch thread G1/2" open pressure port (not possible with field housing): CuNi10Fe1Mn
Housing	stainless steel 1.4404 (316 L)
Option field housing	stainless steel 1.4404 (316 L) cable gland: absolute, sealed gauge: brass, nickel plated gauge: polyamide (with integrated pressure reference); others on request
Cable sheath for option cable outlet	TPE -U (flame-resistant, halogen free, increased resistance against oil and gasoline, resistant against salt, sea water, heavy oil)
Seals (media wetted)	FKM others on request
Diaphragm	standard: ceramics Al ₂ O ₃ 96 % option: ceramics Al ₂ O ₃ 99.9 %
Media wetted parts	pressure port, seals, diaphragm

Category of the environment				
Lloyd's Register (LR)	EMV1, EMV2, EMV3 ⁴ , EMV4			number of certificate: 13/20055
Det Norske Veritas •	temperature: D	vibration: B	number of certificate: TAA00001GR	
Germanischer Lloyd (DNV•GL)	humidity: B	enclosure: D		
	electromagnetic compatibility:	B		

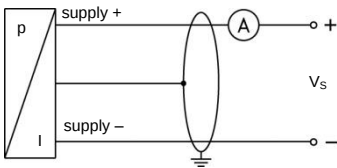
⁴ not valid for IS-version (DX14A-DMK 458)

Explosion protection	
Approval DX14A-DMK 458	IBExU 07 ATEX 1180 X field housing zone 0: II 1G Ex ia IIC T4 Ga ISO 4400, M12x1, cable outlet: zone 0: II 1G Ex ia IIB T4 Ga
Safety technical maximum values	$U_i = 28 \text{ V}$; $I_i = 93 \text{ mA}$; $P_i = 660 \text{ mW}$; $L_i = 0 \text{ } \mu\text{H}$ field housing: $C_i = 52.3 \text{ nF}$; 90.2 nF opposite GND ISO 4400, M12x1, cable outlet: $C_i = 105 \text{ nF}$; 140 nF opposite GND
Permissible temperatures for environment	in zone 0: $-20 \dots 60 \text{ }^\circ\text{C}$ with p_{atm} 0.8 bar up to 1.1 bar zone 1 and higher: $-25 \dots 70 \text{ }^\circ\text{C}$
Permissible temperatures for medium	$-40 \dots 85 \text{ }^\circ\text{C}$

medium	
Miscellaneous	
Ingress protection	IP 65, IP 67, IP 68
Installation position	any
Current consumption	max. 21 mA
Weight	min. 400 g (depending on housing and mechanical connection)
Operational life	100 million load cycles
CE conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU

Wiring diagram

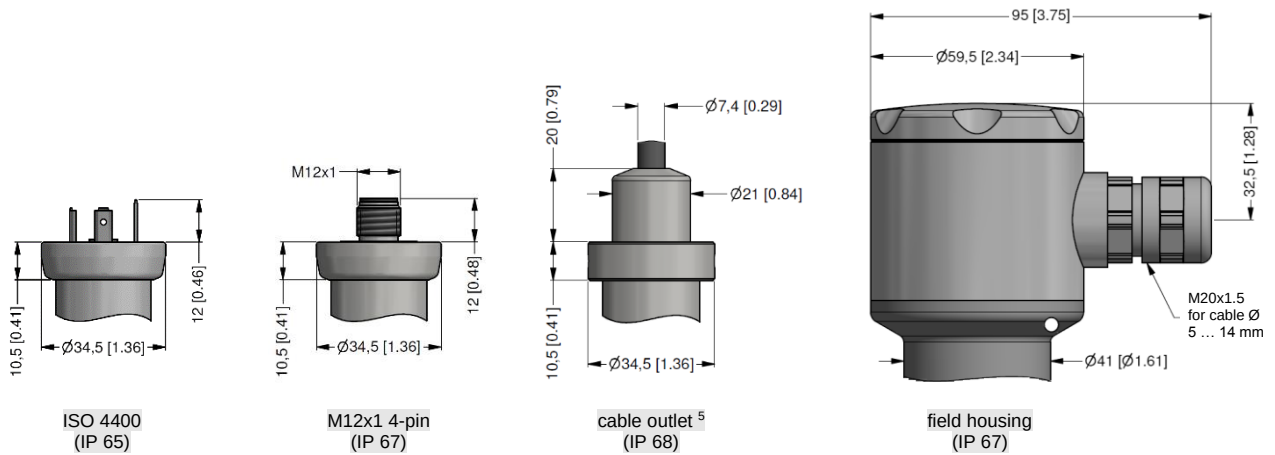
2-wire-system (current)



Pin configuration

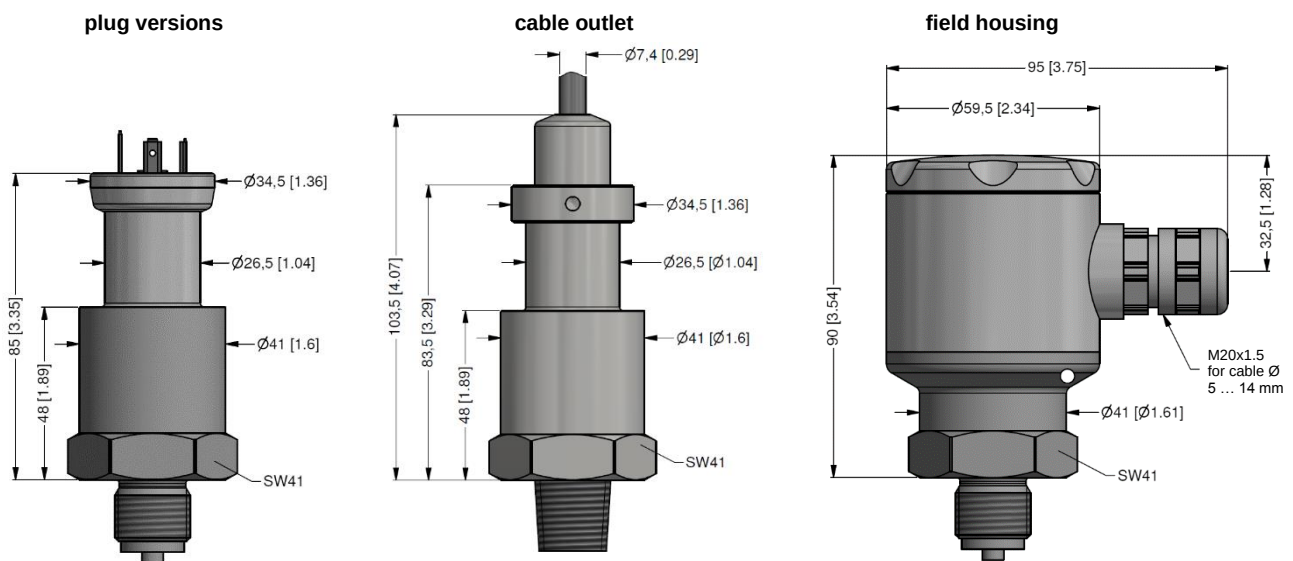
Electrical connections	ISO 4400	field housing (clamp section: 2.5 mm ²)	M12x1 (4-pin), metal	cable colours (IEC 60757)
Supply +	1	VS+	1	WH (white)
Supply -	2	VS-	2	BN (brown)
Shield	ground pin		4	GYNE (green-yellow)

Electrical connections (dimensions mm / in)



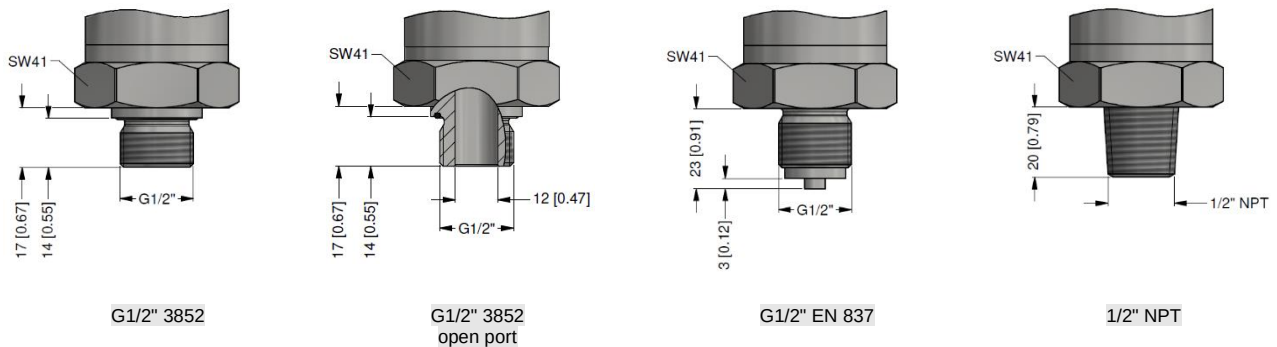
⁵ cable versions are delivered with shielded cable (different lengths available);
for gauge pressure cable with ventilation tube required; tested at 4 bar or 40 mH₂O for 24 hours

Dimensions (mm / in)

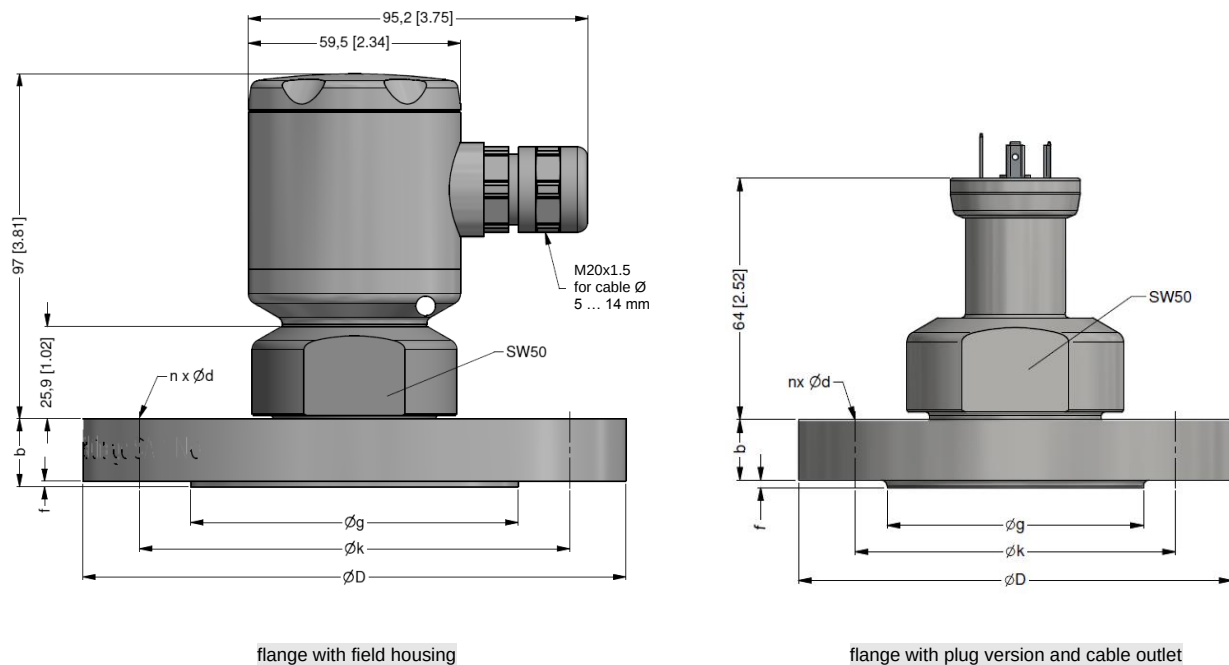


Mechanical connections (dimensions mm / in)

inch thread



flange



size	DIN 2501				ANSI	
	DN25/PN40	DN40/PN40	DN50/PN40	DN80/PN16	2"/150 lbs	3"/150 lbs
b	18	18	20	20	19.1	23.9
d	14	18	18	18	19.1	19.1
D	115	150	165	200	152.4	190.5
f	2	3	3	3	2	2
g	68	88	102	138	91.9	127
k	85	110	125	160	120.7	152.4
n	4	4	4	8	4	4
p _N [bar]	≤ 40	≤ 40	≤ 40	≤ 16	≤ 10	≤ 10

Ordering code DMK 458

DMK 458

[illegible]

Pressure					
	in bar, gauge	5	9	A	
	in bar, absolute ¹⁾	5	9	B	
	in mH ₂ O, gauge	5	9	C	
	in mH ₂ O, absolute ¹⁾	5	9	D	consult
Input	[mH ₂ O]	[bar]			
	0.4	0.04	0	4	0 0
	0.6	0.06	0	6	0 0
	1.0	0.1	1	0	0 0
	1.6	0.16	1	6	0 0
	2.5	0.25	2	5	0 0
	4.0	0.40	4	0	0 0
	6.0	0.60	6	0	0 0
	10	1.0	1	0	0 1
	16	1.6	1	6	0 1
	25	2.5	2	5	0 1
	40	4.0	4	0	0 1
	60	6.0	6	0	0 1
	100	10	1	0	0 2
	160	16	1	6	0 2
	200	20	2	0	0 2
	customer		9	9	9 consult
Output					
	4 ... 20 mA / 2-wire			1	
	intrinsic safety 4 ... 20 mA / 2-wire			E	
	customer			9	consult
Accuracy					
standard:	0.25 % FSO			2	
option for p _N ≥ 0.6 bar:	0.1 % FSO			1	
	customer			9	consult
Electrical connection					
	male and female plug ISO 4400 ²⁾ (for cable Ø 4 ... 6 mm)		G	1	0
	male and female plug ISO 4400 GL ²⁾ (for cable Ø 10 ... 14 mm)		G	0	0
	male and female plug ISO 4400 GL ²⁾ (for cable Ø 4.5 ... 11 mm)		G	0	1
	male plug M12x1 (4-pin) / metal version		M	1	0
	cable outlet with TPE-U-cable (with ventilation tube)		T	R	3
	field housing stainless steel 1.4404 (316L)		8	8	0
	customer		9	9	9 consult
Mechanical connection					
	G 1/2" DIN 3852			1	0 0
	G 1/2" EN 837			2	0 0
	1/2" NPT			N	0 0
	G1/2" DIN 3852 open pressure port			H	0 0
	flange DN 25 / PN 40 (DIN 2501)		F	2	0
	flange DN 40 / PN 40 (DIN 2501)		F	2	2
	flange DN 50 / PN 40 (DIN 2501)		F	2	3
	flange DN 80 / PN 16 (DIN 2501) ³⁾		F	1	4
	flange DN 2" / 150 lbs (ANSI B 16.5) ³⁾		F	3	2
	flange DN 3" / 150 lbs (ANSI B 16.5) ³⁾		F	3	3
	customer		9	9	9 consult
Seals					
	FKM			1	
	andere			9	consult
Pressure port					
	stainless steel 1.4404 (316L)			8	
	copper-nickel-alloy (CuNi10Fe1Mn) ⁴⁾			K	consult
	customer			9	consult
Diaphragm					
	ceramics Al ₂ O ₃ 96 %			2	
	ceramics Al ₂ O ₃ 99.9 %			C	
	customer			9	consult
Special version					
	standard				0 0 0
	customer				9 9 9 consult

¹ nominal pressure ranges absolute from 1 bar² female plug is GL-approved

³ DN80/P_N16 possible for nominal pressure ranges P_N ≤ 16 bar; 2"/150 lbs and 3"/150 lbs possible for nominal pressure ranges P_N ≤ 10 bar

⁴ CuNi10Fe1Mn only in combination with G 1/2" open pressure port (code H00); not possible with field housing (code 880)