

Pressure transmitter COMPACT

with threaded connection

Type series CB60../CE61..



Application area

- General process engineering
- Shipping
- General process technology
- Chemical and petrochemical industry

Features

- Measuring ranges: 0...1 bar up to 0...400 bar
- Linearity error including hysteresis $\leq 0.2\%$ f.s.
- Internal diaphragm (type series CB60 . .)
- Flush mounted diaphragm (type series CE61 . .)
- Wetted parts of stainless steel; completely welded
- Stainless steel case as standard or field housing
- Degree of protection IP 65, alternatively IP 67
- Output signal: 4...20 mA
- Media temperature up to 140 °C (for short term during sterilisation)

Options

- Gold coating of sensor diaphragm (thickness 6 μm)
- Approvals / Certificates
 - Explosion protection for gases
 - Classification per SIL2
 - DNV approval
 - Certificate for hydrogen resistance per EN 10204-3.1
- As per UKCA regulations
- Connection to Zone 0 by using the flame arrester MF21xx, see data sheet DB_D6-025

Application

The device converts pressure measurements into a load-independent current signal. Because of their robust design these transmitters are suitable for use in tough environments. The process temperature is allowed up to 140 °C (short term). The flush mounted diaphragm allows dead-zone free measuring. The transmitters have extensive circuitry which ensures electromagnetic compatibility.

Especially for use in hydrogen applications a calculation tool is available with which the suitable sensor diaphragm material (with/without gold plating) can be determined on the basis of the available process data.

Technical data

Constructional design / case

Design:	<ul style="list-style-type: none">■ Field housing IP 65 or IP 67, with cable gland■ Right-angle plug per EN 175301-803-A (DIN 43650, model A), IP 65■ Cable connection IP 67■ Circular connector M12, IP 65
Construction:	Electronics unit encapsulated with silicone
Material:	Stainless steel mat.-no. 1.4301 (304)
Pressure compensation:	Inner chamber aeration for measuring ranges < 16 bar over case thread or connection cable (depending on design)
Weights:	Case with connector approx. 200 g field housing + approx. 260 g with temperature decoupler + approx. 50 g

Process connection

Design:	See order details
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Material wetted parts

Sensor:	Piezoresistive	Thin film
Sensor diaphragm:	1.4404/1.4435 (316L) optional: gold-coated (6 µm)	1.4542 (630)
Socket:	1.4404/1.4435 (316L)	1.4301/1.4404 (304/316L)
Diaphragm:	Stainless steel mat.-no. 1.4404 (316L)	
Socket:	Stainless steel mat.-no. 1.4404 (316L)	

Measuring system

Sensor:	Piezoresistive	Thin film
Sensor filling:	Synthetic oil, free of silicone FD1, FDA listed	Without

Accuracy

Lin./Hyst.:	≤ 0.2 % f.s. ≤ 0.3 % f.s. for $m_r \geq 0 \dots 60$ bar
Adjustment:	Fixed point adjustment < ± 0.2 % f.s.
Temperature effect:	At 0...50 °C: Zero point ≤ 0.2 % / 10K Span ≤ 0.2 % / 10K At -40...0 °C and 50...85 °C: typical 0.3 % / 10K max. 0.5 % / 10 K

Output

Signal:	4...20 mA, 2-wire technology
Adjusting range	approx. ± 5 % f.s., zero point and measuring span separately adjustable
Delay:	≤ 20 ms
Current limitation:	≤ 30 mA
Load, R:	$R \leq (U-6V)/0.02 \text{ A} [\Omega]$ U = supply voltage
Load influence:	for load change 500 Ω: ≤ 0.1 % f.s.

Supply voltage

<u>standard design:</u>	
Nominal voltage:	24 V DC
Functional range:	6...30 V DC
max. allowable:	30 V DC
Influence:	≤ 0.01 % v.E. /V

Temperature ranges

Ambient:	-25...70 °C optional: -40...85 °C
Media:	-10...80 °C With a temperature decoupler the transmitter can be exposed to 140 °C for a short term during sterilisation (operation not possible)
Storage:	-40...90 °C

Further temperature ranges upon request.

Tests and certificates

Ex approval:

ATEX: Explosion protection intrinsically safe
TÜV 00 ATEX 1557 X
Ⓔ II 2G EEx ib IIC T6

$$U_{\max} \leq 30 \text{ V DC}$$

$$I_{\max} \leq 150 \text{ mA}$$

$$P_{\max} \leq 1 \text{ W}$$

$$C_i \leq 49 \text{ nF}$$

$$L_i \leq 33 \text{ } \mu\text{H}$$

Further technical data see Ex-instruction
XA_006.

SIL 2: Functional safety per EN 61508, classification per SIL2
TÜV-Reg.-No. 44 799 13190204

DNV GL approval: Per certificate no.: TAA00002MV

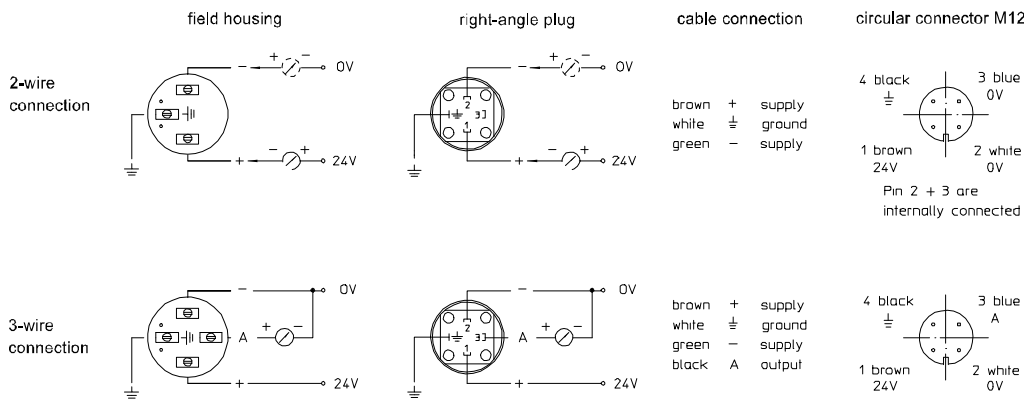
- Certificate for hydrogen resistance per EN 10204-3.1

EMC test

EMC:

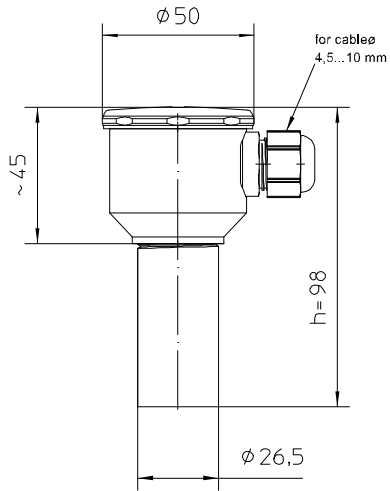
- Noise immunity as per EN 50082, section 2, March 95 issue for industry.
 - Emitted interference as per EN 50081, section 1, 1993 issue for residential and industrial areas.
- The device has no own emission.

Connection diagram

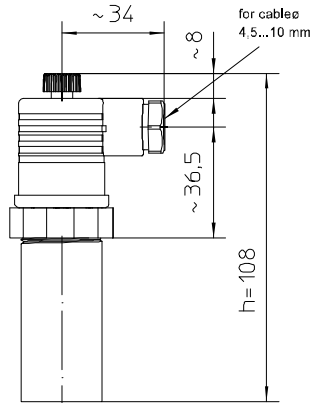


Dimensions

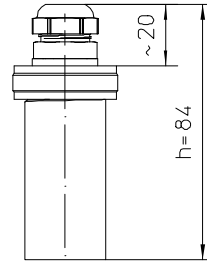
field housing
material stainless steel
degree of protection IP 65
IP 67 (option)



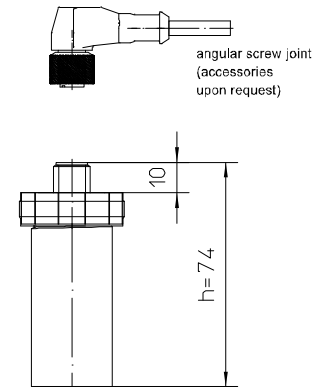
right angle plug
DIN EN 175301-803-A
(DIN 43650 Form A)
degree of protection IP 65



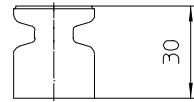
cable connection
degree of protection IP 67
(cable aeration)



circular connector M12
degree of protection IP 65

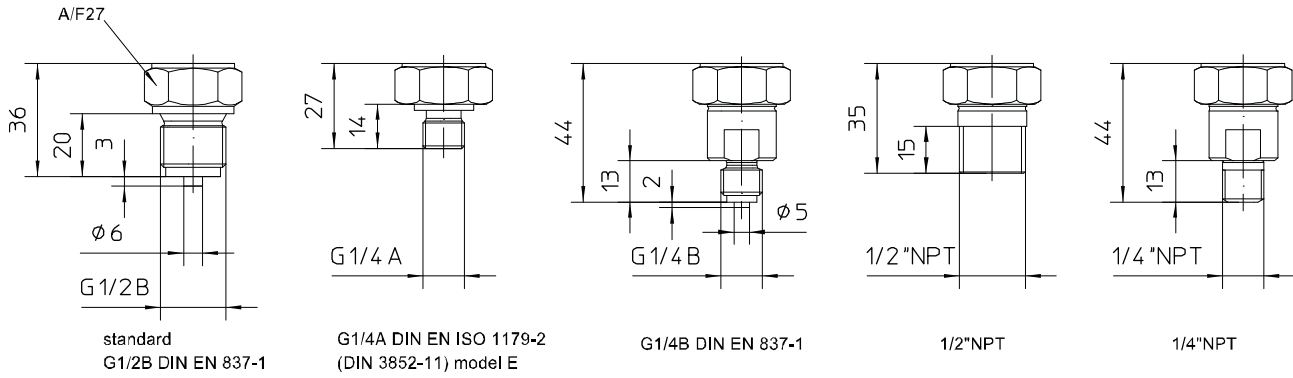


direct
for process temperatures
up to 80°C



temperature decoupler
for process temperatures up to 140°C
(short term, for sterilization)

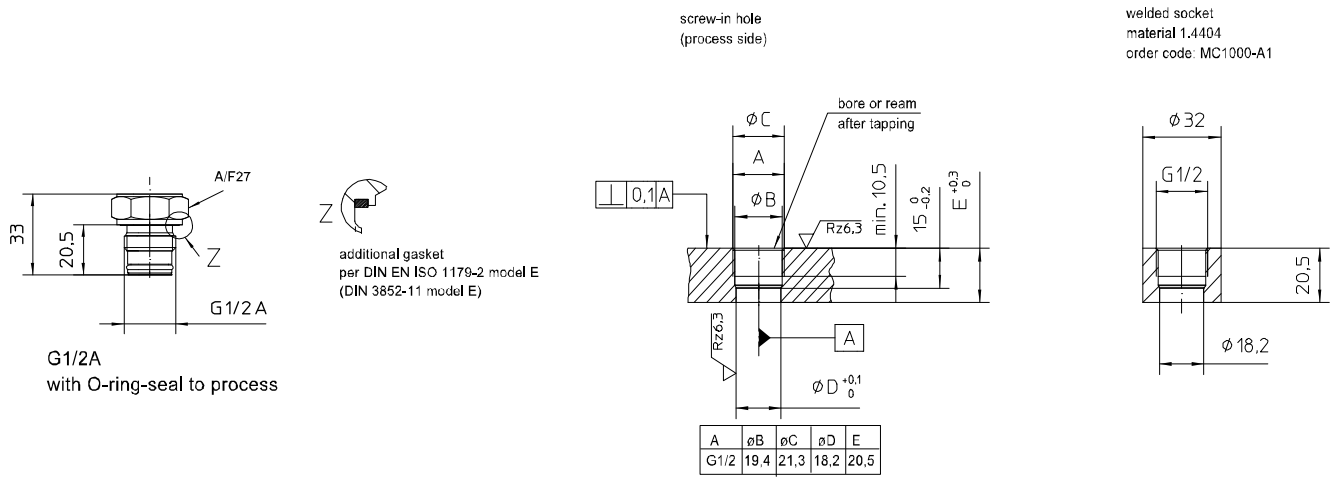
Process connections piezoresistive, internal diaphragm



All dimensions are in mm

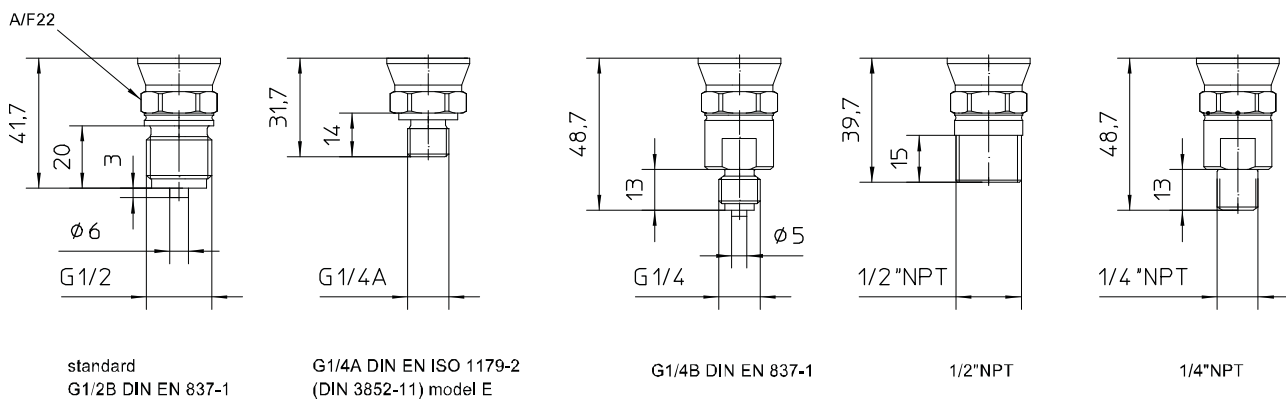
Process connection piezoresistive, flush mounted diaphragm

screw-in hole/welded socket for flush mounted diaphragm
with O-ring (type series CE6100)



All dimensions are in mm

Process connection thin film, internal diaphragm



All dimensions are in mm

Order details

Pressure transmitter COMPACT with threaded connection							
CB601 .	design	internal diaphragm	for media temperature up to 80 °C				
CB602 .			for media temperature up to 140 °C ^{1,2}				
CE611 .		flush mounted diaphragm	for media temperature up to 80 °C				
CE612 .			for media temperature up to 140 °C ¹				
0	Ex-protection	without					
1		⊕ II 2G EEx ib IIC T6					
	measuring range	measuring range	overload limit	CB60.. connection	CE61.. connection with O-ring	sensor type	
A1053		0..1 bar	3 bar	x	x	piezoresistive	
A1054		0...1.6 bar	10 bar	x	x		
A1055		0...2.5 bar	10 bar	x	x		
A1056		0...4 bar	20 bar	x	x		
A1057		0...6 bar	60 bar	x	x		
A1058		0...10 bar	60 bar	x	x		
A1059		0...16 bar	60 bar	x	x		
A1060		0...25 bar	60 bar	x	x		
A1061		0... 40 bar	100 bar	x	x		
A1062		0...60 bar	200 bar	x	x		
A1063		0...100 bar	200 bar	x	-		
A1064		0...160 bar	250 bar	x	-		
A3064.7		0...160 bar	250 bar	x	-		thin film
A3065		0...250 bar	600 bar	x	-		
A3066		0...400 bar	600 bar	x	-		
A1086		-1...0 bar ³	3 bar	x	x	piezoresistive	
A1087		-1...0.6 bar ³	10 bar	x	x		
A1088		-1...1.5 bar ³	10 bar	x	x		
A1089		-1...3 bar ³	20 bar	x	x		
A1090		-1...5 bar ³	20 bar	x	x		
A1091		-1...9 bar ³	60 bar	x	x		
A1092		-1...15 bar ³	60 bar	x	x		
B1053		0...1 bar abs	3 bar	x	x		
B1054		0...1.6 bar abs	10 bar	x	x		
B1055		0...2.5 bar abs	10 bar	x	x		
B1056		0...4 bar abs	10 bar	x	x		
B1057		0...6 bar abs	60 bar	x	x		
B1058		0...10 bar abs	60 bar	x	x		
B1059		0...16 bar abs	60 bar	x	x		
B1060		0...25 bar abs	60 bar	x	x		
H1		output signal	4...20 mA, 2-wire technology				
K1002		process connection material stainless steel	internal diaphragm (type series CB60..)	G1/4 B per EN 837-1			
K1010	G1/2 B per EN 837-1						
K1024	G1/4 A per DIN EN ISO 1179-2 (DIN 3852-11) model E						
K1030	1/2" NPT						
K1072	1/4" NPT						
K1010	flush mounted diaphragm (type series CE61..)		G1/2 A with O-ring				
T410	case electrical connection	field housing of stainless steel, with cable gland	IP 65, measuring ranges ≤ 16 bar, only ⁴				
T420			IP 67				
T110		right angle plug according to EN 175301-803-A (DIN 43650 model A), IP 65					
T310		cable connection IP 67	2 m cable length				
T311			5 m cable length				
T312			10 m cable length				
T319			cable length as in writing				
T120		circular connector M12, IP 65 ⁵					

Additional features (to be indicated if required)	
J304	gold coating of internal sensor diaphragm (thickness 6 µm), for hydrogen applications ⁶
U11	ambient temperature -40...85 °C ⁷
W1251	certificate per EN 10204-3.1, for hydrogen applications
W2602	functional safety per EN 61508, classification per SIL2
W2652	DNV GL approval
W2660	as per UKCA regulations

Accessories	
MC1000-A1	welded socket of stainless steel G 1/2" ⁸

Order code (example): **CB6011 – A1053 – H1 - K1010 - ...**

¹ With a temperature decoupler the transmitter can be exposed to 140 °C for a short term during sterilisation (operation not possible).

² Not possible for measuring range 0...600 bar.

³ Negative relative pressure ranges (e.g. -1...+1 bar) are adjusted at works to 0...100 %, e.g. 4...20 mA. Long term vacuum measurements at relative measuring ranges may cause changes in the properties of the measurement device. Vacuum-proof designs are available upon request.

⁴ Not valid for absolute pressure.

⁵ Connectors with cable connection see product group D6.

⁶ Possible for piezoresistive nominal ranges up to 100 bar only.

⁷ Not for Ex design and not in combination with SIL2.

⁸ Only suitable for process connection K1010 (flush mounted diaphragm).

For information on definitions of terms regarding the Pressure Equipment Directive, see Technical Instruction TA_068.