

Pressure transmitter/Pressure switch PASCAL CS

for diaphragm seal operation, hygienic

Type series CS2110



Application area

- Pharmaceutical industry
- Food industry
- Biotechnology

Features

- Multifunctional pressure transmitter/pressure switch
- Hygienic case with no notches or indentations
- Degree of protection IP 65
- 4 digit LED display, can be mirror-imaged by 180°
- Indication module rotatable by 300°
- Measuring ranges
 - 0...100 mbar up to 0...40 bar rel.
 - 0...1 bar up to 0...6 bar abs.
- Output signal 4...20 mA, 2-wire technology
- Accuracy $\leq 0,2 \%$
- Easy to program locally (as per VDM standard)
- Galvanic isolation between transmitter and switching outputs
- Various process connections with flush mounted diaphragm, selected connections with EHEDG certificate

Options

- Approvals/Certificates
 - Certificate of measuring equipment for Russian Federation
 - Material certificate as per EN 10204-3.1
 - Calibration certificate as per EN 10204-3.1
 - Roughness height rating with inspection certificate acc. to EN 10204-3.1
- 2 floating contacts
- Switching contacts with high switching current (1A)
- Wetted parts electropolished
- Degree of protection IP 67
- Hygienic design
- EAC declaration (upon request)

Application

The pressure transmitter/pressure switch PASCAL CS is suited for measuring the relative and absolute pressures of gases, vapors and liquids. The multifunctional PASCAL CS displays the measurement; outputs a current signal proportional to the pressure. It has two optional contacts.

Technical data

Constructional design / case

Design:	Hygienic case design, including gasket for seamless design Fully encapsulated electronics unit
Material:	Stainless steel mat.-no. 1.4301 (304) Indication module: macrolon
Degree of protection per EN 60529:	<ul style="list-style-type: none"> ■ IP 65 ■ Optional IP 67
Pressure compensation:	Aeration via sintered filter
Electrical connection:	<ul style="list-style-type: none"> ■ circular connector M12, 4 pin ■ circular connector M12, 8 pin (necessary for devices with switch function) Incl. sealing ring to ensure case is completely sealed
Climatic category per EN 60721 3-4:	4K4H

Process connection

Design:	See order details
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Hygienic design

The surface roughness of the wetted parts made of stainless steel are executed according to EHEDG Doc.8 and ASME BPE SF3.
In case of choosing the additional feature HY, we guarantee the following surface roughness values:

Diaphragm foil:	$Ra \leq 0.38 \mu\text{m}$
Laser welds:	$Ra \leq 0.76 \mu\text{m}$
Turned parts:	$Ra \leq 0.76 \mu\text{m}$

Further versions of hygienic design upon request.

Measuring system

Sensor:	Piezoresistive measuring element
System filling:	Synthetic oil FD1, free of silicone, FDA compliant

Measuring ranges / overload limits

Measuring range / overload limit:	See order details
Vakuum tightness:	Long term vacuum measurements at relative measurement ranges can alter the device characteristics. (piezoresistive measuring system, only)

Zero settings

Zero point:	Easy zero setting max. $\pm 20 \%$.
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Accuracy

Limit point setting:	per DIN 16086
Accuracy (Lin./Hyst./Repr.):	0.2 % v. of mr (mr ≥ 250 mbar) 0.5 mbar (mr < 250 mbar)
Long-term drift:	$\leq 0.1 \%$ / year per EN 61298-1
Temperature influence:	<u>Range: 0...50 °C:</u> $\leq 0.25 \%$ of mr (mr ≥ 400 mbar) $\leq 0.4 \%$ of mr (mr < 400 mbar) $\leq 0.5 \%$ of mr (mr < 160 mbar) <u>Range: -20...0 and 50...85 °C:</u> $\leq 0.4 \%$ of mr (mr ≥ 400 mbar) $\leq 0.6 \%$ of mr (mr < 400 mbar) $\leq 0.8 \%$ of mr (mr < 160 mbar) mr = measuring range

Process connection:

(zero error)

3/4"	10 mbar/10K
DN 25/1"	4.8 mbar/10K
DN 32/1 1/2"	2.3 mbar/10K
DN 40	1.6 mbar/10K
DN 50/2"	0.6 mbar/10K

Indication

Type:	4 digit, red LED with 7 segments
Digit high:	8.5 mm
Resolution:	-9999...9999 digit
Accuracy:	$\pm 0,2 \%$ ± 1 digit
Temperature-influence:	$\pm 0,1 \%$ /10K
Alignment:	Can be rotated through 300°, Can be mirror-imaged by 180° when installed upside down
Indication:	Visual confirmation for operator when a button is pressed
Decimal point:	Automatic setting depending on measuring range/unit, max. 3 decimal places Or manual setting 0...3 decimal places
	Indication automatically changing from measurement value to measurement unit or indication of unit or value per key-stroke.
Measuring unit:	bar, mbar, PSI, kPa, MPa, %, mA

Output

Signal:	4...20 mA , 2-wire technology
Sampling rate:	10 measurements / second
Current range:	3.8...20.8 mA
Resolution:	2 µA
Current limitation:	≤ 22 mA
Alarm state:	< 3.6 mA
Load, R:	$R \leq (U-14V)/0.02 \text{ A } [\Omega]$ U = supply voltage

Switching output (option)

Type:	2 floating contacts with common ground (low side NPN) or common power supply (high side PNP)
Switching capacity:	200 mA, short-circuit-proof Optional 1 A
Switching status:	breakers or makers, programmable, device off circuit: open contact
Switching function:	window / hysteresis, programmable
Setting range:	within range limits
Hysteresis:	within range limits
Switching delay:	0,0...999.9 s
Repeat accuracy:	0.2 % of full-scale value
Temperature influence:	± 0.1 % / 10K
Galvanic isolation:	between transmitter and outputs
Switching cycles:	> 10 millions
Voltage drop:	< 1 V (< 1.5 V, if current is > 100 mA)
Output state indicator:	red LED per switching output
Parameterisation:	3-key parameterisation

Supply voltage

Functional range:	14...30 V DC
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Temperature ranges

Ambient:	-20...85 °C
Medium:	-20...125° C, short term 140 °C, optional up to 160 °C for 1 h. Higher process temperatures upon request
Storage:	-40...85 °C

Tests and certificates

EMC:	EMC directives 2014/30/EU
■	EAC declaration upon request
■	Certificate of measuring equipment for Russian Federation

Mounting information

Mounting position:	At choice
Calibration position:	Vertical

Parameterisation

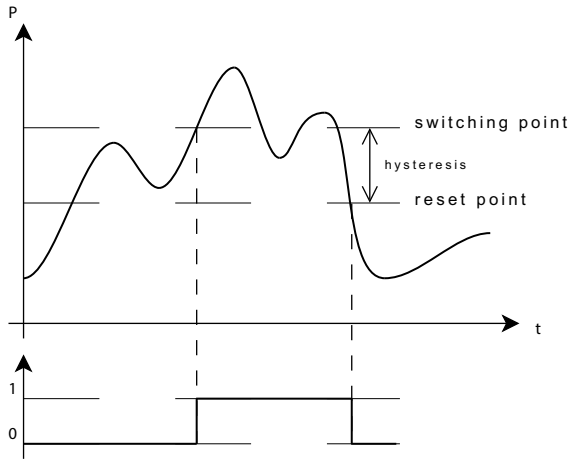
The following parameters can be assigned via 3 keys:

Parameter	Values
unit	Bar, mbar, PSI, kPa, MPa, %, mA
pressure trimming	lower range value/upper range value
min/max-value	between upper range and lower range value, resettable
display time for measurement	1.0...99.9 s
display time for unit	0.0...99.9 s
display rotation	0° / 180° (when installed upside down)
decimal point	automatic, manual 0...3 decimal places
switching function	hysteresis function window function breakers breakers makers makers
switching point	between upper range value and reset point
reset point	between lower range value and switching point
ON delay	0.0...999.9 s
OFF delay	0.0...999.9 s

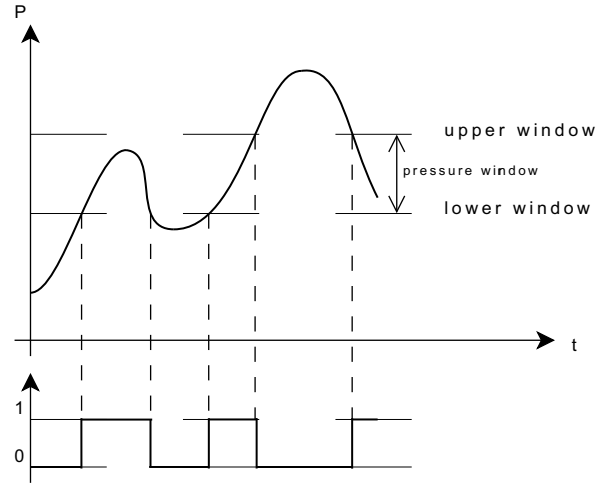
Parameterisation see operating instruction BA_060.

Hysteresis functions

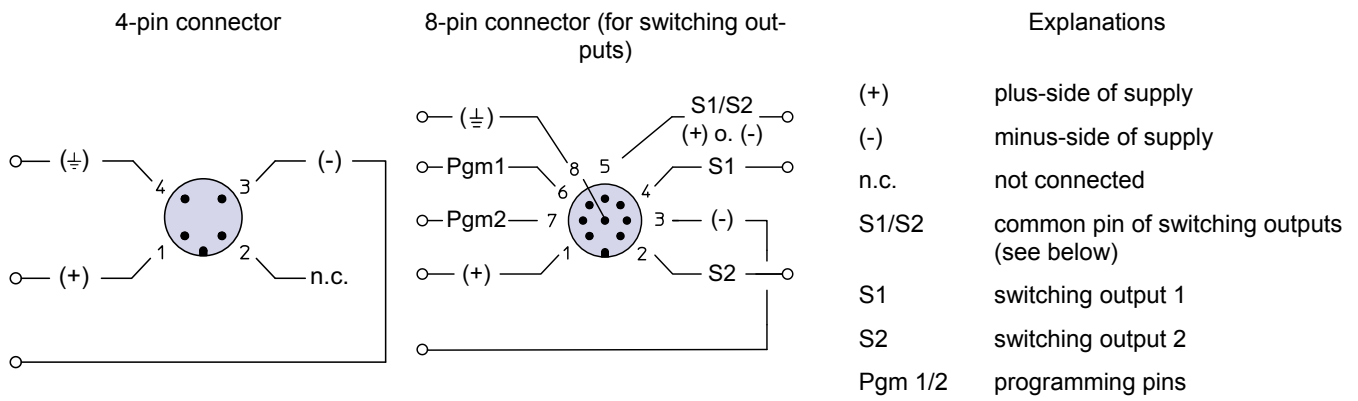
Hysteresis function



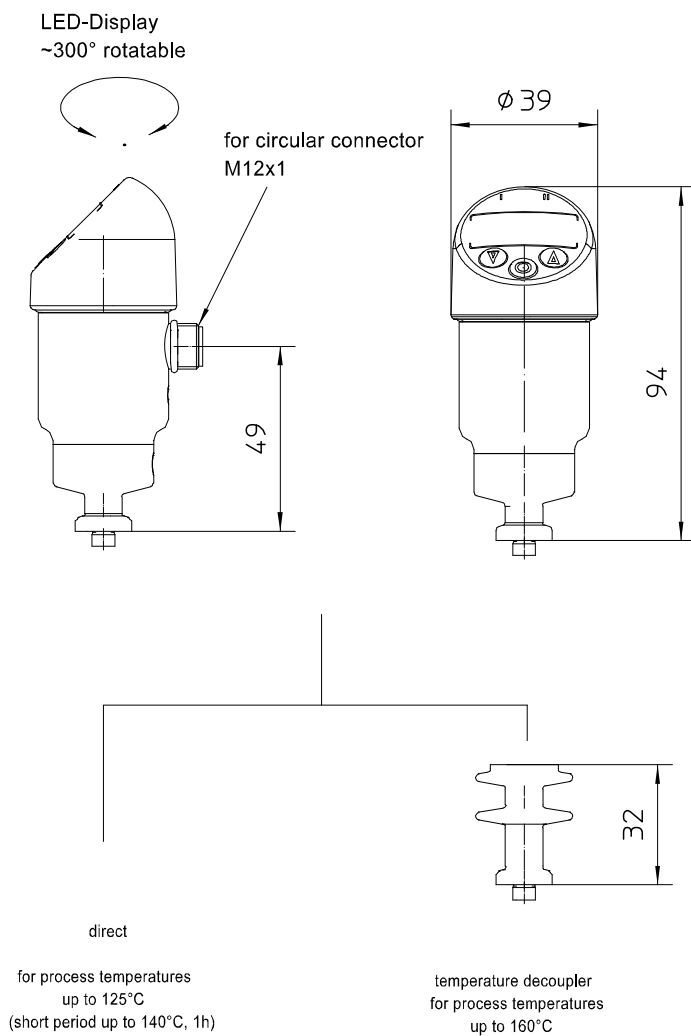
Window function



Connection diagram

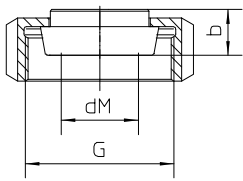


Dimensions

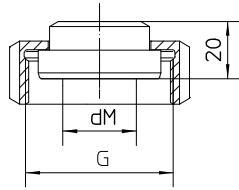


All dimensions are in mm

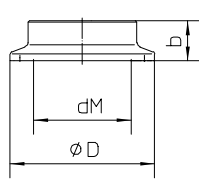
Process connection



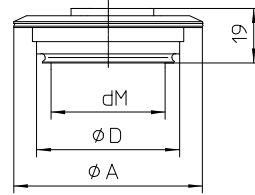
sanitary connection with coupling nut per DIN 11851



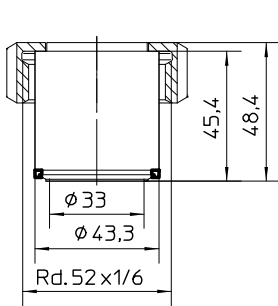
aseptic screw joint collar connection with union nut per DIN 11864-1 type A



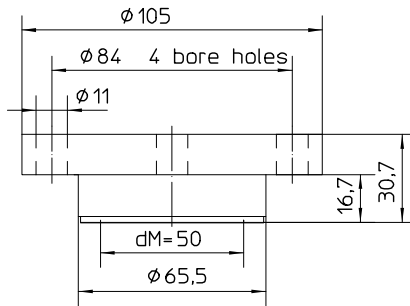
clamp connection per DIN 32676/ISO 2852



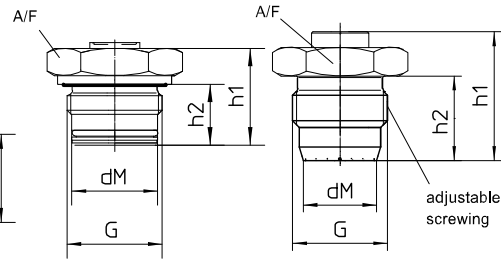
VARIVENT® connection for VARINLINE® case



HYGENIC-Tubus *
ø43,3 with screwing
DN25/PN40



DRD-connection DN50 PN40 *



Screw-in thread *
with o-ring-gasket
and additionally gasket
per DIN EN ISO 1179-2
model E (DIN 3852)

HYGENIC-screw-in thread *
no gasket
tightening torque
20 Nm, max. nominal pressure 10 bar
50 Nm, max. nominal pressure 50 bar

* weld-in adapter
see data-sheet D6-037

All dimensions are in mm

Sanitary pipe connection with union nut per DIN 11851

DN	PN	dM	b	G
25	40	27	16	Rd.52x1/6"
32	40	34	16	Rd.58x1/6"
40	40	40	16	Rd.65x1/6"
50	25	51	17	Rd.78x1/6"

Aseptic screw joint collar connection with union nut per DIN 11864-1 type A

DN	PN	dM	G
25	40	24	Rd.52x1/6"
32	40	30	Rd.58x1/6"
40	40	34	Rd.65x1/6"
50	25	48	Rd.78x1/6"

Clamp connection per DIN 32676 model A (metric) for pipes per EN 10357 (DIN 11850)

DN	PN	dM	b	D
25	25	22.6	14	50.5
32	25	27	12	50.5
40	25	34	12	50.5
50	16	46	14	64

Clamp connection per DIN 32676 model B (OD, ISO) for pipes per DIN EN ISO 1127

DN	PN	dM	b	D
26.9	25	22.6	14	50.5
33.7	25	27	12	50.5
42.4	25	34	12	64
48.3	16	40	14	64

Clamp connection per DIN 32676 model C (Tri-Clamp) for pipes per ASME BPE

DN	PN	dM	b	D
3/4"	25	15.5	15	25
1"	25	22.6	14	50.5
1 1/2"	25	34	12	50.5
2"	16	46	14	64

Clamp connection per ISO 2852 for pipes per ISO 2037

DN	PN	dM	b	D
25	16	22.6	14	50.5
38	16	34	12	50.5
51	16	46	14	64

VARIVENT® connection for VARINLINE® access unit

Connection	PN	dM	A	D
Form F	25	40	66	50
Form N	25	58	84	68

HYGIENIC screw-in thread, gasket without elastomer

G	PN (bar)	dM	h1	h2	SW
G1 A	50	24	45	28.5	36

Screw-in thread with O ring gasket

G	PN (bar)	dM	h1	h2	SW
G1/2 A	200	15.5	33	20.5	27
G1 A	50	24	33	20.5	41

Order details

Pressure transmitter PASCAL CS for diaphragm seal operation, hygienic Type series CS2110

Order details PASCAL CS2110

CS2110	Pressure transmitter PASCAL CS for diaphragm seal operation, hygienic		
		measuring range	overload limit
A1008	measuring ranges	0...100 mbar	1 bar
A1009		0...160 mbar	1 bar
A1010		0...250 mbar	3 bar
A1011		0...400 mbar	3 bar
A1012		0...600 mbar	3 bar
A1053		0...1 bar	10 bar
A1054		0...1.6 bar	10 bar
A1055		0...2.5 bar	10 bar
A1056		0...4 bar	20 bar
A1057		0...6 bar	20 bar
A1058		0...10 bar	100 bar
A1059		0...16 bar	100 bar
A1060		0...25 bar	100 bar
A1061		0...40 bar	100 bar
A1025		-100...0 mbar	1 bar
A1026		-160...0 mbar	1 bar
A1027		-250...0 mbar	3 bar
A1028		-400...0 mbar	3 bar
A1552		-600...0 mbar	3 bar
A1086		-1...0 bar	10 bar
A1087		-1...0.6 bar	10 bar
A1088		-1...1.5 bar	10 bar
A1089		-1...3 bar	20 bar
A1090		-1...5 bar	20 bar
A1091		-1...9 bar	100 bar
A1092		-1...15 bar	100 bar
A1093		-1...24 bar	100 bar
B1053		0...1 bar abs	10 bar
B1054		0...1.6 bar abs	10 bar
B1055		0...2.5 bar abs	10 bar
B1056		0...4 bar abs	20 bar
B1057		0...6 bar abs	20 bar
A9999			variant as in writing
H11	output signal	4...20 mA, 2-wire technology	
N10	switching output	without	
N70		2 floating contacts	with common ground (NPN), switching capacity 30 V DC, 200 mA
N70.1			with common ground (NPN), switching capacity 30 V DC, 1 A
N71			with common power supply (PNP) switching capacity 30 V DC, 200 mA
N71.1			with common power supply (PNP) switching capacity 30 V DC, 1 A
T30	electrical connection	circular connector M12	4 pin
T31			8 pin ¹

K1085	design	standard	
K2085		with temperature decoupler	
K102	process connection ² material: ASTM 316L	Sanitary pipe connection with union nut per DIN 11851 ^{3,4}	DN 25
K103			DN 32
K104			DN 40
K105			DN 50
K162			DN 25
K163		DN 32	
K165		DN 40	
K166		DN 50	
K124		Clamp connection per ISO 2852 for pipes per ISO 2037 ^{3,4}	DN 25 (1")
K126			DN 38 (1 1/2")
K127			DN 51 (2")
K144		Clamp connection per DIN 32676, model A (metric) for pipes per EN 10357 (DIN 11850) ^{3,4}	DN 25
K146			DN 32
K147			DN 40
K148			DN 50
K213			DN 26.9
K214		Clamp connection per DIN 32676, model B (OD, ISO) for pipes per EN ISO 1127 ^{3,4}	DN 33.7
K215			DN 42.4
K216			DN 48.3
K134			DN 3/4" ⁵
K136		Clamp connection per DIN 32676, model C (Tri-Clamp) for pipes per ASME BPE ^{3,4}	DN 1"
K137			DN 1 1/2"
K138			DN 2"
K152			Form F (D=50) for VARINLINE® access unit
K153		VARIVENT® connection ^{3,4}	Form N (D=68) for VARINLINE® access unit
K172		HYGIENIC Tubus	Ø 43.3 mm with screwing DN 25/PN 40
K185		DRD-connection	nominal width DN 50 / nominal pressure PN 40
K195		Screw-in thread	G1 A with O-ring gasket ⁶
K80	G1 A hygienic sealing (no elastomer)		
	surface roughness	standard	
HY	(wetted parts)	Hygienic version as per EHEDG Doc.8 and ASME BPE SF3	

Additional features (to be indicated if required)		
F2	parameterization	as in writing
T1	case degree of protection	IP 67
W1020	material certificate	per EN 10204-3.1, wetted parts (stainless steel)
W2673	certificate of measuring equipment for Russian Federation	

Order code (example): CS2110 - A1086 - N70.1 - T30 - K136 - HY - ...

¹ necessary for devices with switching contact

² further process connections (pressure transmitter) upon request

³ EHEDG certified only in connection with hygienic design (order code option HY)

⁴ EHEDG certificate valid only if gaskets are used that are listed in the "EHEDG position paper"

⁵ possible for measuring ranges ≥ 250 mbar. For a function calculation and optimum system design it is necessary to specify the operation temperature

⁶ hygienic design not possible