



Features

- Modular pressure transmitter with internal or flush mounted diaphragm
Output signal:
 - 4...20 mA
 - HART® protocol (rev. 6), option
 - PROFIBUS PA, option
- Function modules
 - Multifunctional display with 5-segment digital display and bar graph
 - Switching module with 2 flating channels, maximum 0.5 A switching current, electrically isolated at all sides, without additional auxiliary power
- Function module replacement on site without recalibration "plug and measure"
- Limits of measuring range 0...80 mbar to 0...400 bar
- Accuracy $\leq 0,15\%$
- Turndown 5:1
- Degree of protection IP 66, piezoresistive measuring cell directly aerated

Options

- Approvals/Certificates
 - Explosion protection for gases and dust
 - Certificate of measuring equipment for Russian Federation
 - Material certificate as per EN 10204-3.1
 - Calibration certificate as per EN 10204-3.1
 - Classification per SIL2
- Degree of protection IP 69K



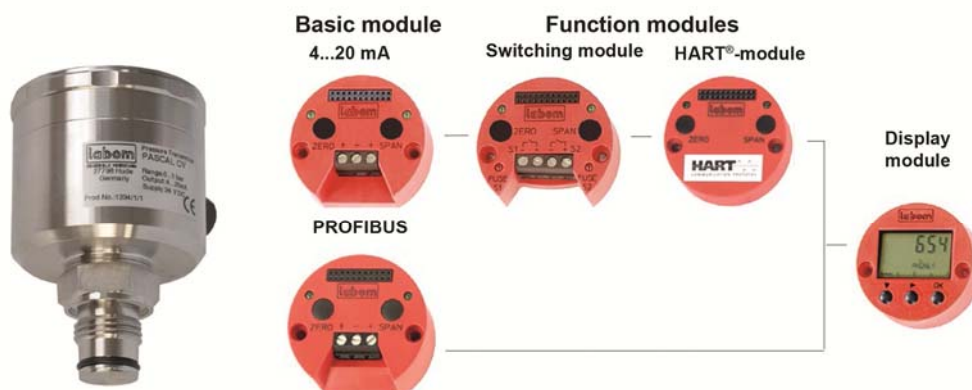
Application area

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

Application

The modular pressure transmitter PASCAL CV is suited for measuring the relative and absolute pressures of gases, vapors and liquids.

PASCAL CV – the modular pressure transmitter



Process connection: all standard thread variants with internal or flush-mounted diaphragm

Technical data

Measuring ranges

nominal range	Turndown	measuring ranges	measuring spans ¹		overload limits	vakuüm tight at < 50 °C ²
			min. span	max. span		
0.4 bar	5:1	-0.4...0.4 bar	80 mbar	0.8 bar	1 bar	400 mbar abs
1 bar		-1...1 bar	0.2 bar	2 bar	3 bar	40 mbar abs
4 bar		-1...4 bar	0.8 bar	5 bar	10 bar	20 mbar abs
16 bar		-1...16 bar	3.2 bar	17 bar	60 bar	20 mbar abs
40 bar		-1...40 bar	8 bar	41 bar	100 bar	20 mbar abs
100 bar		-1...100 bar	20 bar	101 bar	200 bar	20 mbar abs
400 bar		-1...400 bar	80 bar	401 bar	600 bar	-
4 bar abs		0...4 bar abs	0.8 bar abs	4 bar abs	10 bar abs	20 mbar abs
16 bar abs		0...16 bar abs	3.2 bar abs	16 bar abs	60 bar abs	20 mbar abs

¹Long term vacuum measurements at relative measuring ranges may cause changes in the properties of the measurement device.

Vacuum-proof designs are available upon request.

²calibrated measuring span for devices with PROFIBUS PA basic module.



Constructional design / case

Design: Hygienic case design with screw cap, material: st. steel mat.no. 1.4301 (304)

Construction: Two-chamber system, minimum case volume, excellent moisture and condensate protection

Degree of protection:

- IP 66 per EN 60529
- optional: IP 69K

Pressure compensation: PTFE filter system

Window: Non splintering plastic: Makrolon

El. connection: Screw terminal 1 mm²

Cable gland:

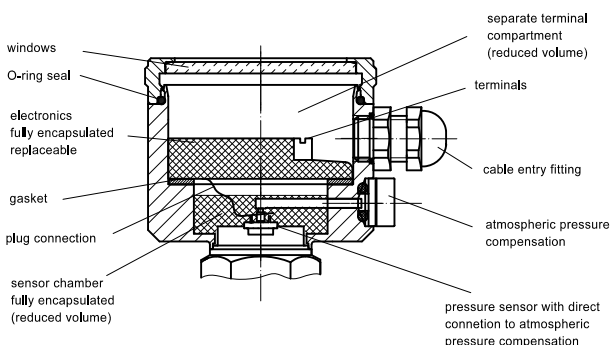
- Cable gland M16, material: PA
- Circular connector M12

Further cable glands upon request.

Climatic category: EN 60721 3-4, 4K4H

Weight: standard device with G1/2 without function modules approx. 0.65 kg

case design:



Process connection

Variants / material: See order code

Material wetted parts

Sensor :	Piezoresistive	Thin film
Sensor diaphragm:	1.4404/1.4435 (316L)	1.4542 (630)
Socket:	1.4404/1.4435 (316L)	1.4301/1.4404 (304/316L)
Gasket:	EPDM-FDA listed	

Measuring system

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

Accuracy

General:

Limit point setting: per DIN 16086

Reference conditions: per EN 60770-1

Linearity errors: ≤ 0.15 % of span
TD 5:1 no modification

Hysteresis: ≤ 0.05 % of nominal range

Repeatability: ≤ 0.05 % of nominal range

Calibration position: Vertical mounting position

Influence of mounting position: ≤ 3.5 mbar

Long-term drift: $\leq 0.1\%$ / year of nominal range
(EN 60770-1)

Temperature effect: Case:
Lower range value / upper range value
Range 0...60 °C:
 $\pm 0.15\%$ / 10K of nominal range
Range < 0 °C, > 60 °C:
 $\pm 0.2\%$ / 10K of nominal range

Output

General:

Delay time: approx. 160 ms
Measuring cycle: 6 measurements / second
Measuring range setting: Turndown 5:1

Basic module: 4...20 mA

Signal: 4...20 mA, 2-wire
Current range: 3.8...20.8 mA
Current limitation: approx. 22 mA
Alarm state: < 3.6 mA, optional > 21 mA
Damping: 0...120 seconds
Load R_B : $R_B \leq (U_V - 12V\ DC) / 0,022A$ [Ohm]
 U_V = supply voltage

Basic module: PROFIBUS PA

Signal: digital per IEC 61158-2
Protocol: EN 50170-PROFIBUS PA, Profile 3.0
Sensor address: 0...126 (126 = factory setting)
Power consumption: constantly 11 mA
Fault current: 2 mA
 I_{FDE} :
Damping: 0...300 seconds
Parameterization: SIMATIC PDM

Supply voltage

Basic module:	4...20 mA	PROFIBUS PA
<u>Standard design:</u>		
Functional range:	12...40 V DC	9...32 V DC
<u>Ex-design:</u>		
Functional range:	12...30 V DC	-

Temperature ranges

Ambient: -20...85 °C
Media: -20...90 °C
Storage: -40...85 °C

Note safety values as per examination certificate!

Tests and certificates

Interference emission: per EN 55011
Noise immunity: per EN 61326-1 *, NE21 *
Ex approvals: TÜV 04 ATEX 2387 X
⊗ II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
⊗ II 2G Ex ia IIC T4/T5/T6 Gb
⊗ II 2D Ex ia IIIC Txx °C Db
SIL 2: Functionale safety:
Classification per SIL2 per EN 61508
for basic module 4...20 mA, switching
module, display module und HART®
module
TÜV-Reg.-No. 44 207 09 555548-001

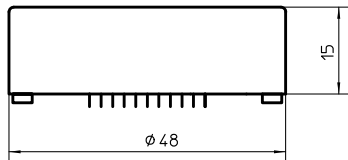
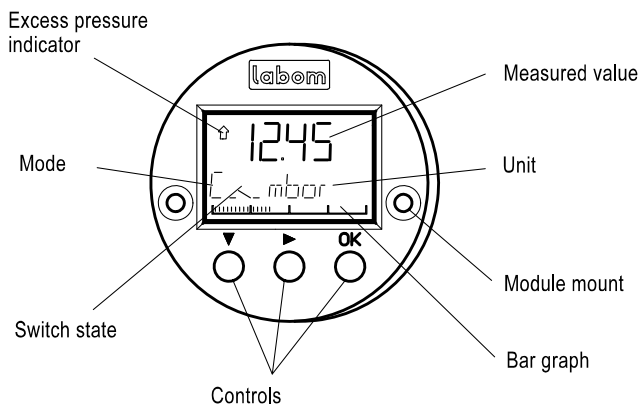
* Devices with cable gland or switching outputs might suffer from a short-time measuring deviation in case of strong electromagnetic fields (EN 61000-4-3).

- Certificate of measuring equipment for Russian Federation

Function modules

Display module (multifunctional display) optional

pluggable with automatic module detection - plug and measure -

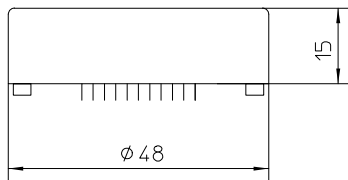
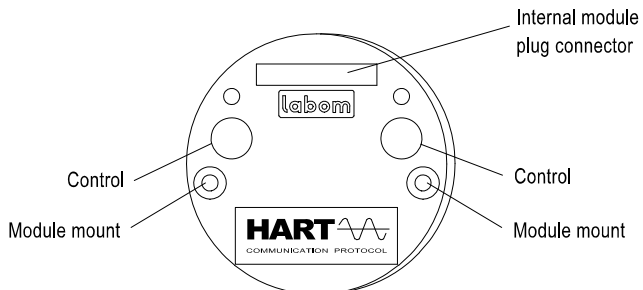


- Module housing made of ABS, encapsulated electronics unit
- Many operating mode menus
- 5-segment pressure read-out with unit
- Read-out display
 - pressure (standard)
 - percent *
 - current *
 - sensor temperature
- Bar graph 36 segment suitable 0...100 %
- Measuring circuit test (current sensing function) 3.55...22 mA *
- Alarm indicator on display
- Switching function indicator*

* not with basic module PROFIBUS PA

Details of the operator menu see parameterisation.

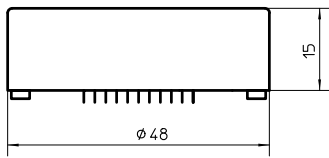
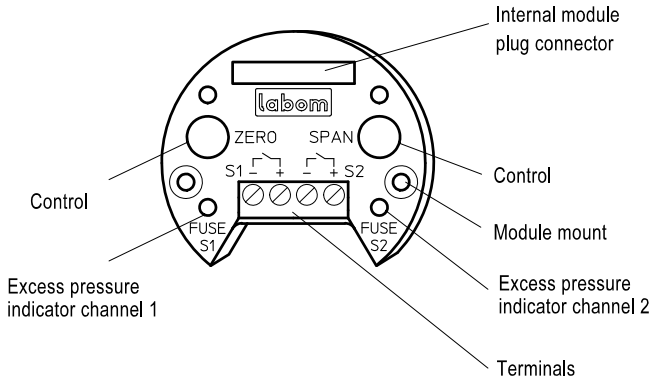
HART® module (for basic module 4...20 mA) optional



- HART®-protocol, revision 6.5
- Response characteristic FSK
- Load with HART® communication
 - with Hart® modem 230...500 Ω
 - with Hart® communicator 230...1100 Ω
- Parameterising by
 - operating elements
 - HART® communication
- PDM 6.0
- AMS
- 375 Field Communicator

Switch module, (not with basic module PROFIBUS PA) optional

pluggable with automatic module detection - plug and measure -

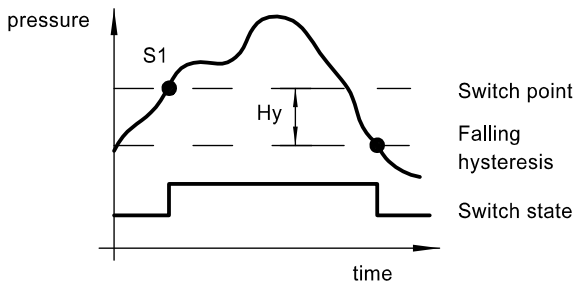


- No additional auxiliary power required
- Module housing made of ABS, encapsulated electronics unit
- Electronic switch for 2 limit values, voltage free, short-circuit-proof
- Switching capacity 30 V DC / 0.5 A ($R_i < 0.3 \Omega$)
- Overload indicator: LED red, overload or short-circuit
- Fusible cut-out at overload / short-circuit with automatic reset
- Switch points: 0.0 - 100.0% adjustable, Standard: 50.0%
- Switching function: maker or breaker, adjustable, Standard: breaker
- Device of circuit: contact open
- Hysteresis: 0.0...100 % adjustable, Standard 0.1 %
 - falling or rising, adjustable, standard: falling
- Switching rate: 6 Hz
- Electrically isolated to all sides, Insulation voltage: 500 V, 2.5 kV/2 sec.
- Electrical connection: terminal blocks 1 mm²

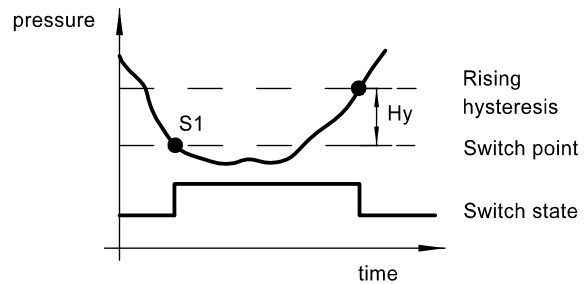
Profibus module description and HART® connection upon request

Hysteresis functions

-falling hysteresis-



-rising hysteresis-



Parameterisation

The module selected determines which parameters can be set.

operating menus	display of display module	parameter		basic module: 4...20 mA				basic module: PROFIBUS PA		
		variability	standard	B M	SM	DM	HM	BM	DM	PDM
zero point*	RANGE/Zero	see instrument ranges	nominal range	x	x	x	x	-	-	x
measuring span*	RANGE/Span	see instrument ranges	nominal range	x	x	x	x	-	-	x
damping	DAMP	4...20 mA : 0...120 sec. Profibus: 0...300 sec.	0 sec.	w	-	x	x	-	-	x
min-max-value	HI/LO	pressure and temperature resettable	-	-	-	x	x	-	x	x
characteristic	FUNC	linear, table	linear	w	-	x	x	-	-	x
pressure unit	UNIT	bar, mbar, kPa, MPa, mmH2O, mH2O, kg/cm ² , PSI	bar	w	-	x	x	-	w	x
measuring circuit test	LOOP	3.55...22 mA	-	-	-	x	x	-	-	-
alarm state	ALARM	< 3.6 mA, > 21 mA	< 3.6 mA	w	-	x	x	-	-	-
current trimming	I-CAL	-2...5 %	-	-	-	x	x	-	-	-
pressure trimming	P-CAL	zero point: -50...50 % span: -10...10 % v.N	-	-	-	x	x	x	x	x
table function	TABLE	2...31 points of table	0 % = 4 mA 100 % = 20 mA	w	-	x	x	-	-	-
system info	INFO	software, serial number, revision level	-	-	-	x	x	-	x	x
factory data reset	RESET	-	-	-	-	x	x	-	x	x
BUS address	BUS	0...126	126	-	-	-	-	w	x	x
switch points	SWCH1(2)	0...100 % v of nominal range	50 %	-	x	x	x	-	-	-
hysteresis	SWCH1(2)/Hyst.	0...100 % v of nominal range	0.1 % hyster. falling	-	w	x	x	-	-	-
switch function	SWCH1(2)/SwTyp	breaker, maker	breaker	-	w	x	x	-	-	-
HART® address	HART®/Adres	0...63	0	-	-	x	x	-	-	-
HART® current	HART®/Curr	fixed/float	Float	-	-	x	x	-	-	-
write protection	-	ON/OFF	OFF	x	x	x	x	x	x	x

x = configurable

w = factor setting

* = calibrated measuring span for devices with PROFIBUS PA basic module

DM = display module

SM = switching module

BM = basic module

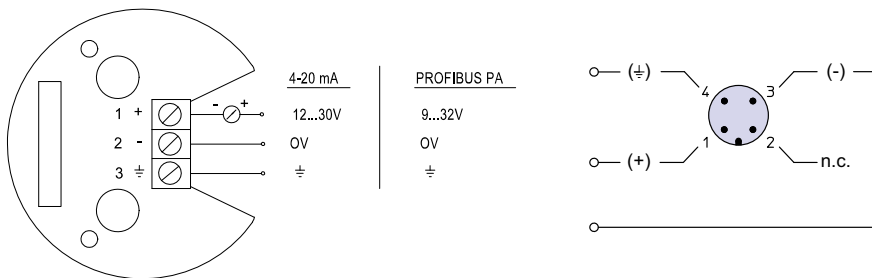
HM = HART-module

Connection diagram

Basic module: 4...20mA / PROFIBUS PA

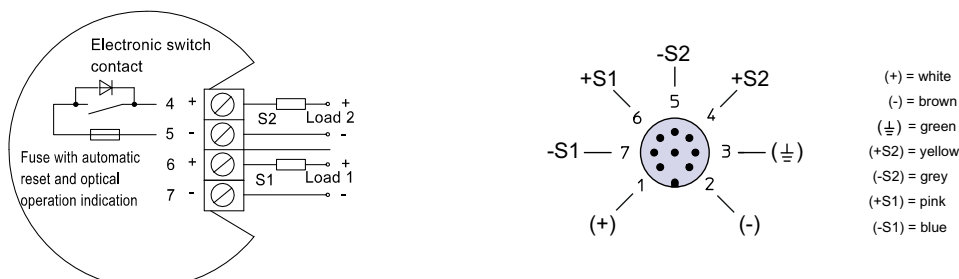
Internal terminals with cable gland design

Circular connector ¹



Switching module: (only with basic module 4...20 mA)

Circular connector ¹



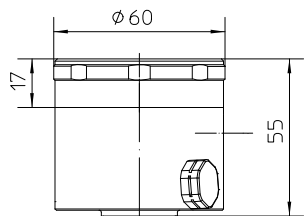
¹ color code as Binder series 763

Dimensions

Housing

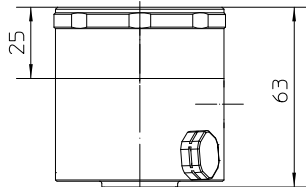
housing design type 17

- basic module: 4...20 mA
- with one function module (optional)
- basic module: PROFIBUS PA



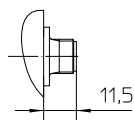
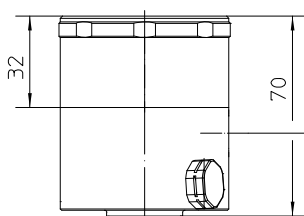
housing design type 25

- basic module: PROFIBUS PA
- with display module (optional)

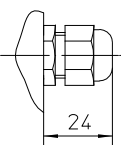


housing design type 32

- basic module: 4...20 mA
- with two function modules (optional)



for circular connector
M12x1; 4 pole/8 pole
for 4...20 mA/PROFIBUS PA

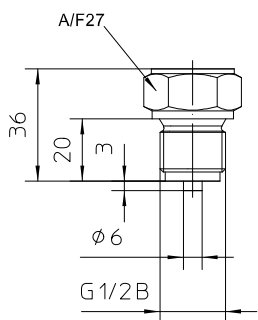


cable gland
M16x1,5 f. cable \varnothing 4,5-10

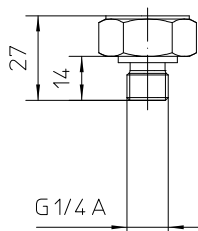
Instruments without LCD module come with closed cover
(with no glass face cover).

All dimensions are in mm

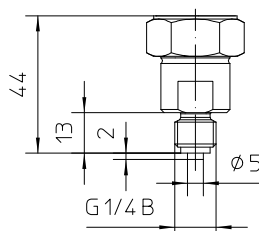
Process connections piezoresistive, internal diaphragm



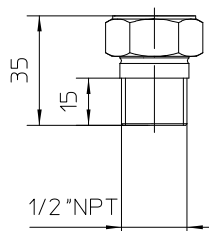
standard
G1/2B DIN EN 837-1



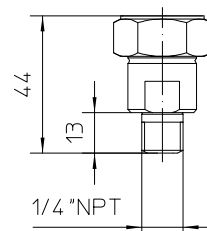
G1/4A DIN 3852-11
model E



G1/4B DIN EN 837-1

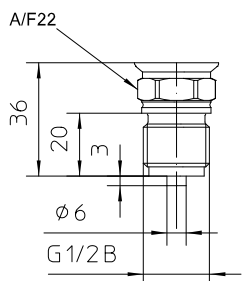


1/2"NPT

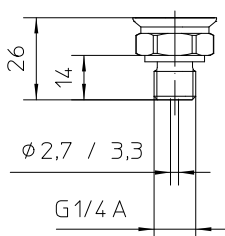


1/4"NPT

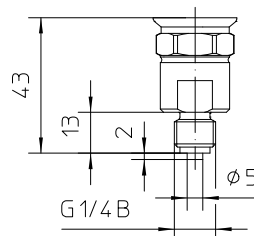
Process connections thin film, internal diaphragm



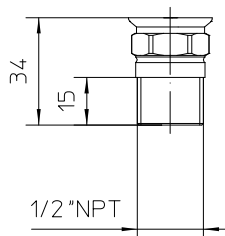
standard
G1/2B DIN EN 837-1



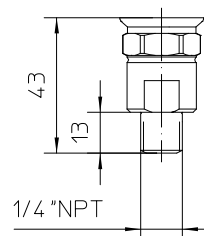
G1/4A DIN 3852-11
model E



G1/4B DIN EN 837-1



1/2"NPT



1/4"NPT

All dimensions are in mm

Order details

Pressure transmitter PASCAL CV for general application Type series CV3100, CV3101

Order details PASCAL CV3100, CV3101					
CV310.	Pressure transmitter PASCAL CV for general application				
0	design	standard			
1		Ex-protection, types of ex-protection as follows			
	nominal range	nominal range (Turndown 5:1)	overload limit	sensor type	
A1051		0,4 bar	1 bar	piezoresistive	
A1053		1 bar	3 bar		
A1056		4 bar	10 bar		
A1059		16 bar	60 bar		
A1061		40 bar	100 bar		
A1063		100 bar	200 bar		
A3066		400 bar	600 bar	thin film	
B1056		4 bar abs	10 bar	piezoresistive	
B1059		16 bar abs	60 bar		
F10	measuring range	0 to nominal range, unit: bar (standard)			
F11		0 to nominal range, unit: mbar			
F22		0 to nominal range, unit: kPa			
F23		0 to nominal range, unit: MPa			
F30		0 to nominal range, unit: mmH2O			
F32		0 to nominal range, unit: mH2O			
F41		0 to nominal range, unit: kg/cm ²			
F50		0 to nominal range, unit: PSI			
F80		set from... to... unit (please fill in details) not with PROIBUS PA			
F81		adjusted and calibrated from to, unit (please fill in details), see below for calibration report			
H11	output signal	4...20 mA, rising characteristic (standard)			
H15		20...4 mA, falling characteristic			
H21		4...20 mA with HART® function module, HART® protocol rev. 6			
0		setting ¹	damping	0.0 sec. (standard)	
1				0.0...120 sec., set to (please fill in	
0		alarm state		< 3.6 mA (standard)	
1				> 21 mA	
H41	Profibus PA, IEC 61158-2, Profil 3.0				
M1	display module	without			
M2		multifunctional display with 5-position digital display and bar graph, pluggable			
N10	switching module ^{2,3}	without switching module			
N5.		switching module with 2 contacts, pluggable, switching capacity 30 V DC / 0.5 A			
0		setting ¹	standard		
1			at the factory, specify as required		
T30	electrical connection	circular connector	M12x1 (4 pin)		
T31			M12x1 (8 pin - required for switching module)		
T20		cable gland M16x1,5	polyamide black		
T21			brass nickel-plated		
T22			stainless steel		
K1002			process connection	internal diaphragm	G1/4 B per EN 837-1
K1010		G1/2 B per EN 837-1			
K1024	G1/2 A per DIN 3852-11, Form E				
K1070	1/2" NPT				
K1072	1/4" NPT				

additional features (to be indicated in case of need, only):		
S68	Ex-marking ²	⊕ II 2G Ex ia IIC T4/T5/T6 Gb, ⊕ II 2D Ex ia IIIC Txx°C Db
S66		⊕ II 1/2G Ex ia IIC T4/T5/T6 Ga/Gb
T4	degree of protection	IP 69K
Z61	PROFIBUS PA	factory setting, please specify
Z62		measuring-point number/identification max. 32 characters, please specify
Z63		measuring-point text max. 32 characters, please specify
W1020	material certificate	per EN 10204-3.1, wetted part ⁴
W1201	calibration certificate	per EN 10204-3.1, 5 measuring point
W2602	functional safety per EN 61508, classification per SIL2, TÜV-reg.-no. 44 799 13190201 ³	
W2673	certificate of measuring equipment for Russian Federation ⁵	

accessories		
MC1020	HART® Modem	RS 232-Interface
MC1040		USB-Interface
MC1041		USB-Interface, Ex
MC1000-A1	stainless steel welded socket G1/2"	

Order code (example): CV3100 – A1051 – F10 – H1100 – M2 – N10 – ...

¹ parameterization see page 5

² Ex-design not possible with switching module

³ not with PROFIBUS PA

⁴ only for piezoresistive measuring systems

⁵ not for devices with Ex-protection