



**Design Features**

- Modular pressure transmitter with internal or flush-mounted diaphragm  
Signal output::
  - 4...20 mA, can be retrofitted with optional HART® protocol
  - PROFIBUS PA
- Function modules
  - Multifunctional display with 5-segment digital display and bar graph
  - HART® protocol
  - Switching module with 2 floating channels, maximum 1.5 A switching current, electrically isolated at all sides, without additional auxiliary power
- Function module replacement on site without recalibration "plug and measure"
- Watchdog for electronics modules and measuring cell
- Limits of measuring range 0...80 mbar to 0...100 bar
- Accuracy: < 0.25% (linearity, hysteresis and repeatability)
- Turndown 5:1
- Explosion protection: II 1/2G EEx ia IIC T6
- Medium temperature -20...90 °C
- Piezoresistive measuring cell directly aerated, fully welded, without inside gasket

**Application**

The pressure transmitter PASCAL CV is suited for measuring the relative and absolute pressures of gases, vapors and liquids. Typical applications are to be found in the chemicals and petrochemicals industries, in process engineering, and general process measurement technology.

The modular design of the pressure transmitter allows users to choose the best possible device for his specific operating requirements.

PASCAL CV is equipped with a variety of process connections and uses smart module technology for display, switching and communication purposes. These functional modules can be exchanged or extended with ease without having to remove the transmitter from the process.

Other designs available

- PASCAL CV 3110 for food, pharmaceuticals, biotechnology
- PASCAL CV 3120 for chemicals and petrochemicals

*SMART SOLUTIONS!*

**Basic module**  
4...20 mA

**Function modules**  
HART®-module



**PROFIBUS**



**Switching module**



**Display module**



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

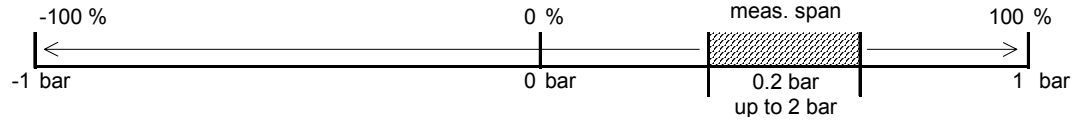
## Technical Data

### Instrument ranges

nominal range	Turndown	measuring ranges	measuring spans		overload limits	vacuum tight at < 50 °C
			min. span	max. span		
0.4 bar	5 : 1	- 0.4...+0.4 bar	80 mbar	0.8 bar	2 bar	400 mbar abs
1 bar		-1 ... + 1 bar	0.2 bar	2 bar	7 bar	40 mbar abs
4 bar		-1 ... + 4 bar	0.8 bar	5 bar	20 bar	20 mbar abs
16 bar		-1 ... + 16 bar	3.2 bar	17 bar	100 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
4 bar abs		0 ... 4 bar abs	0.8 bar abs	4 bar abs	20 bar abs	20 mbar abs
16 bar abs		0 ... 16 bar abs	3.2 bar abs	16 bar abs	100 bar abs	20 mbar abs

### limits of measuring range

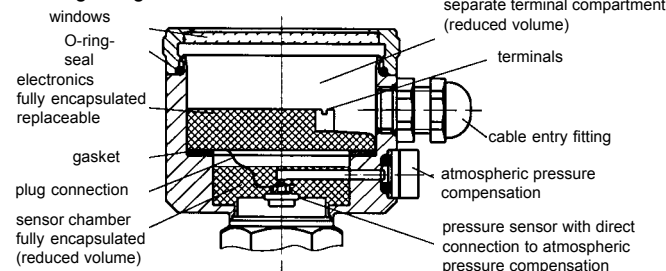
nominal range: e.g. 1 bar



### Housing design

Housing	hygienic housing design with screw cap and window
Material	housing: stainless steel mat.no. 1.4301 window: Macrolon gasket: NBR O-ring
Construction	two-chamber system, minimum housing volume, excellent moisture and condensate protection
Pressure compensation	PTFE filter system
Degree of protection	EN 60529, IP 66
Climatic category	DIN EN 60721 3-4, 4K4H
Electrical connection	· screwed terminals 1 mm <sup>2</sup> , cable entry fitting through screwing · circular plug connector M 12
Weight	standard device with G 1/2 without function modules approx. 0.65 kg

### Housing design



### Process connection

Design	sealed design (without internal gasket)
Internal diaphragm	· G 1/2 B · 1/2" NPT
Flush mounted diaphragm	· G 1/2 B with O-ring · G 1 B with O-ring · M 22x1.5 with O-ring · G 1/2 B DIN 3852
Materials	- diaphragm stainless steel material no. 1.4404 - socket stainless steel material no. 1.4404 - gasket EPDM-FDA listed (with flush-mounted diaphragm)

### Measuring system

Sensor	piezoresistive measuring element
System fill	no silicone, synthetical oil

### Temperature ranges

Ambient temperature	-20 to 85°C
Process temperature	-20 to 90°C
Allowed storage temperature	-40 to 85°C

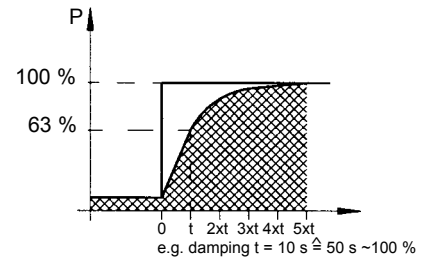
Note safety values as per examination certificate!

### Supply

Standard design	12...40 VDC
Ex-proof design	12...30 VDC

### Output

Signal	4...20 mA, two-wire, optional with HART protocol (not yet available)
Current range	3.8 - 20.8 mA
Current limitation	approx. 22 mA
Alarm state	< 3.6 mA, optional > 21 mA
Delay time	approx. 160 ms
measuring cycle	6 measurements / second
Measuring range setting	turndown 5:1
Damping t	0.0 - 120.0 seconds



### Load

$$R < \frac{U - 12 \text{ V}}{22.5 \text{ mA}} \text{ (Ohm)}$$

### Accuracy

Limit point setting	DIN 16086
Reference conditions	DIN EN 60770-1
Calibration position	vertical mounting position
Linearity errors	< 0.15% of span TD 5:1 no change
Hysteresis	< 0.05% of nominal range
Repeatability	< 0.05% of nominal range
Influence of mounting position	< 3.5 mbar
Long-term drift	< 0.1%/year of nominal range
DIN EN 60770-1	
Temperature effect	
Lower range value / upper range value	
in range 0...60°C	± 0.15%/10 K of nominal range
in range < 0°C, > 60°C	± 0.2%/10 K of nominal range

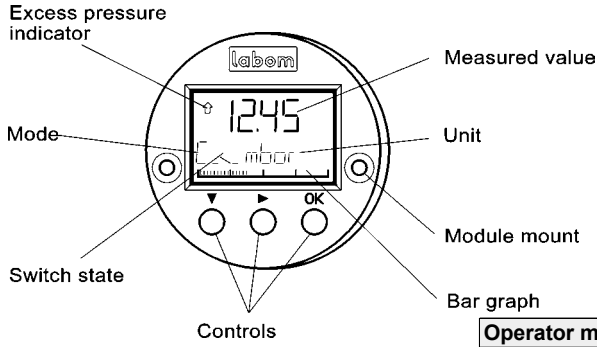
### Approval/tests

Interference emission	EN 50081 section 1
Noise immunity	EN 50082 section 2
EU examination certificate	II 1/2G EEx ia IIC T6

## Function modules

### Display module (multifunctional display) optional

pluggable with automatic module detection - plug and measure -

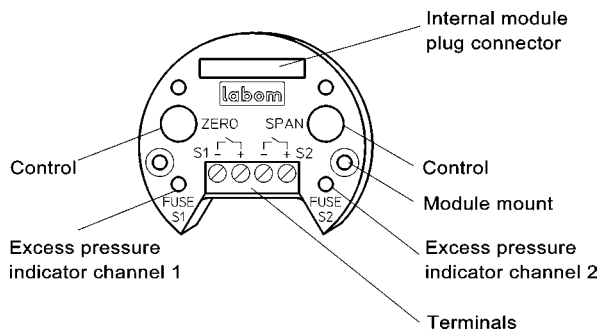


Operator menus
meas. range selection
damping
min-max-value
characteristic
pressure units
measuring circuit test
alarm state
current trimming
pressure trimming
table function
system info
switch points
hysteresis
switching function

- 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 segments  $\hat{=}$  0...100%
- Measuring circuit test (current sensing function) 3.55...22.0 mA
- Alarm indicator on display
- Switching function indicator (with switching module)

### Switching module, optional

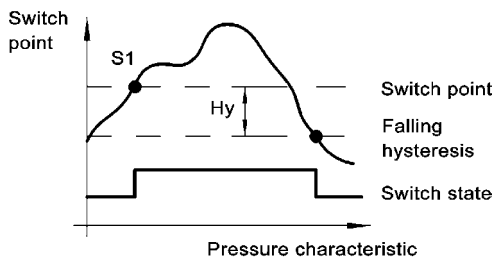
pluggable with automatic module detection - plug and measure -



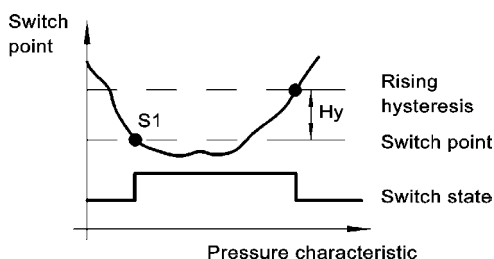
- No additional auxiliary power required
- Module housing made of ABS, encapsulated electronics unit
- 2 limit values, voltage free, short-circuit-proof
- Switching capacity 50 V DC / 500 mA ( $R_i < 1.5 \Omega$ ) or 30 V DC / 1.5 A ( $R_i < 0.3 \Omega$ )
- Overload indicator: LED red, overload or short-circuit
- 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 off circuit: contact open
- Hysteresis: 0.0% to 100.0%, 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 mm<sup>2</sup>

### Hysteresis functions

-falling hysteresis-



-rising hysteresis-



## Parameterizing

The module selected determines which parameters can be set.

operating menus	display of display module	parameter		basic module		function modules		
		variability	standard	4...20 mA	PROFIBUS	switching module	display module	HART <sup>®</sup> -module
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	0.0...120.0 sec.	0.0 sec.	w	x	—	x	x
min-max-values	HI / LO	pressure and temperature resettable	—	—	x	—	x	x
characteristic	FUNC	linear, table	linear	w	—	—	x	x
pressure unit	UNIT	bar, mbar, kPa, MPa, mmH2O, mH2O, kg/cm <sup>2</sup> , psi	bar	w	x	—	x	x
measuring circuit test	LOOP	3.55...22 mA	—	—	—	—	x	x
alarm state	ALARM	< 3.6 mA, > 21.0 mA	< 3.6 mA	w	—	—	x	x
current trimming	I-CAL	-2 %...+ 5 %	—	—	—	—	x	x
pressure trimming	P-CAL	zero point -50...+50% o.n.range span -10...+10 % of nom. range	—	—	x	—	x	x
table function	TABLE	2...31 points in table	0 % = 4 mA 100 % = 20 mA	—	—	—	x	x
system info	INFO	software, serial number revision level	—	—	x	—	x	x
factory data reset	RESET	—	—	—	x	—	x	x
switch points	SWCH1(2)	0.0...100.0 % of nominal range	50 %	—	x	x	x	x
hysteresis	SWCH1(2)/Hyst.	0.0...100.0 % of nominal range	0,1 % hyster.falling	—	x	w	x	x
switching function	SWCH1(2)/SwTyp	breaker, maker	breaker	—	x	w	x	x
write protection	—	ON, OFF	OFF	x	x	x	x	x

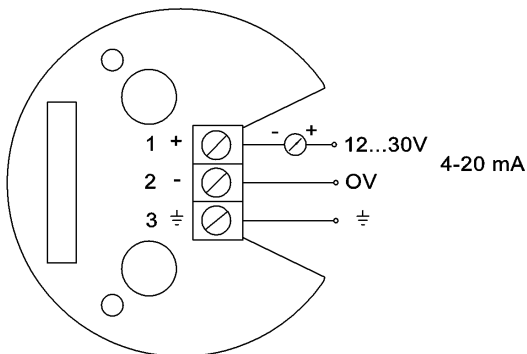
x = configurable

w = factory setting

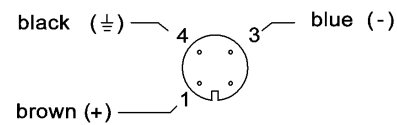
## Connection diagram

### Basic module: 4...20 mA

Internal terminals with cable gland design

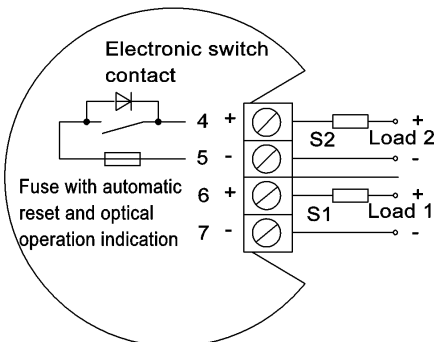


Circular plug connector<sup>1</sup>

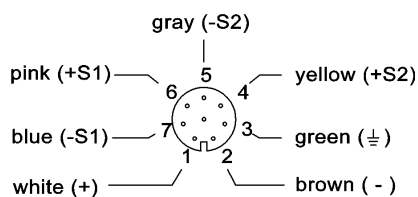


### Switching module

Internal terminals with cable gland design

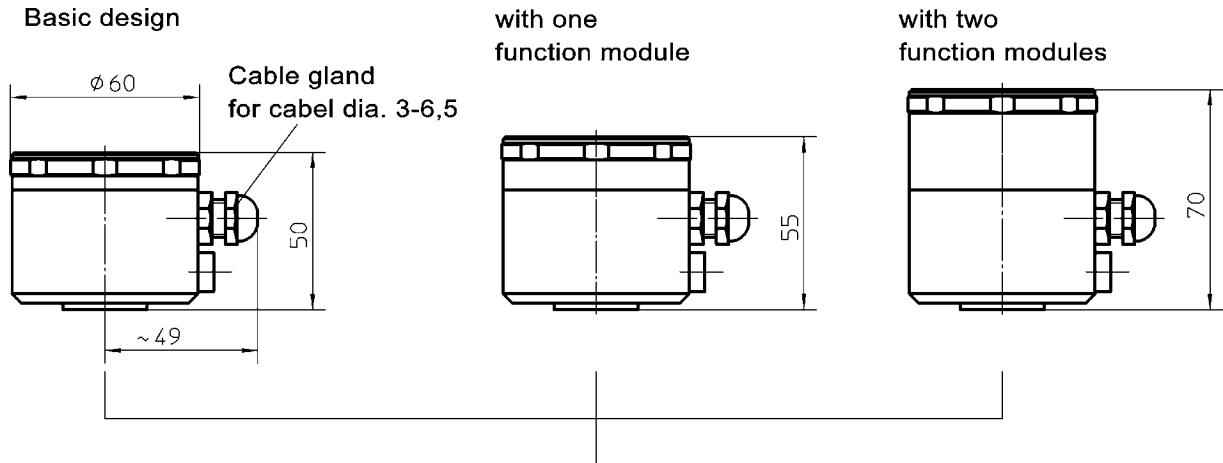


Circular plug connector<sup>1</sup>

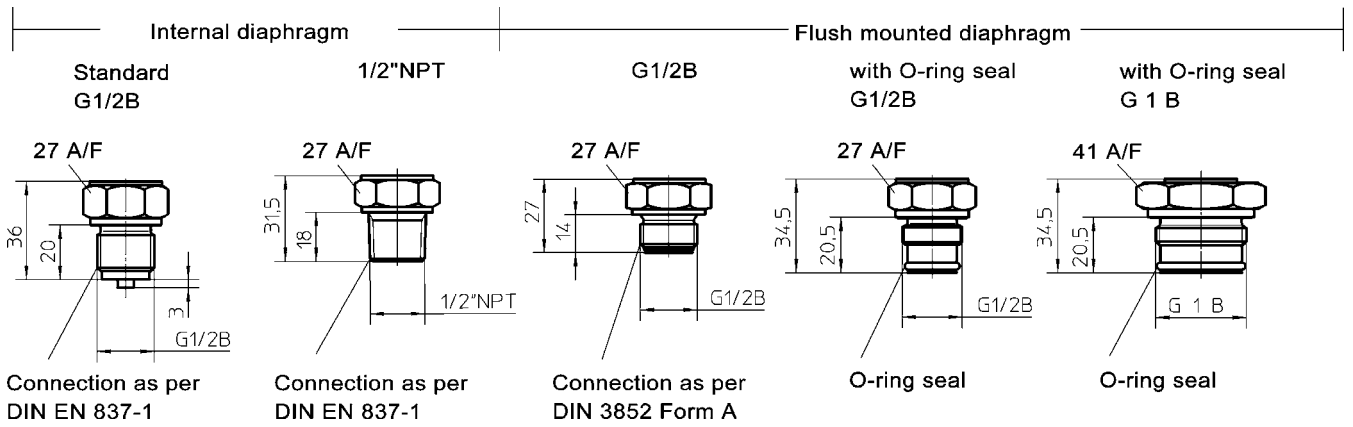


<sup>1</sup> color code as Binder series 763

**Housing**

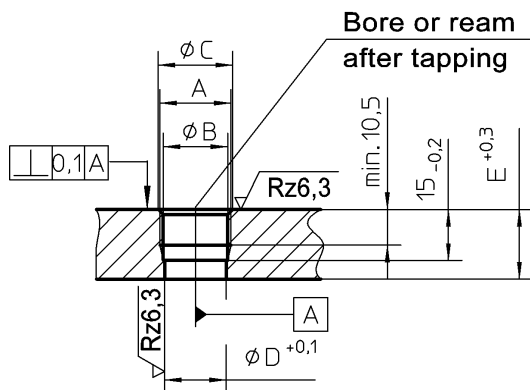


**Process connections**



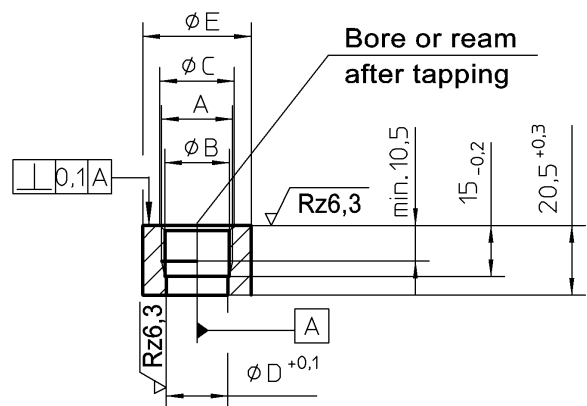
**Screw-in hole/welding nipple for flush mounted diaphragm with O-ring**

**Screw-in hole (process)**



A	$\phi B$	$\phi C$	$\phi D$	E
G 1/2	19,4	21,3	18,2	20,5
G 1	30,5	33,5	30,1	20,5
M22x1,5	19,4	22,6	18,2	21

**Welding nipple Stainless steel**



A	$\phi B$	$\phi C$	$\phi D$	E	Bestellcode
G 1/2	19,4	21,3	18,2	32	MC 1000-A1
G 1	30,5	33,5	30,1	48	MC 1000-A3

**Order Details**

- please give additional specifications for models not listed -

PASCAL CV pressure transmitter for general application						CV310							
explosion protection	· without						0						
	· explosion protection: II 1/2G EEx ia IIC T6						1						
nominal range	nominal range (Turndown 5:1)	connection	connection with O-ring	connection with O-ring	connection DIN 3852								
		G 1/2 B / 1/2 NPT	G 1/2 B / M22x1.5	G 1 B	G 1/2 B								
	0,4 bar	-	-	X	-		A1051						
	1 bar	X	X	X	-		A1053						
	4 bar	X	X	X	X		A1056						
	16 bar	X	X	X	X		A1059						
	40 bar	X	X	-	X		A1061						
	100 bar	X	-	-	X		A1063						
	4 bar abs	X	X	X	X		B1056						
	16 bar abs	X	X	X	X		B1059						
measuring range	0 to nominal range, unit: bar (Standard)						F10						
	0 to nominal range, unit: mbar						F11						
	0 to nominal range, unit: kPa						F22						
	0 to nominal range, unit: MPa						F23						
	0 to nominal range, unit: mmH2O						F30						
	0 to nominal range, unit: mH2O						F32						
	0 to nominal range, unit: kg/cm²						F41						
	0 to nominal range, unit: psi						F50						
	set from... to... unit ( please fill in details )						F80						
adjusted and calibrated from .... to ....., unit (pls.fill in details), see below for calibration report						F81							
output signal	4...20 mA, rising characteristic (standard)						H11 ..						
	20...4 mA, falling characteristic						H15 ..						
	4...20 mA with HART function module not yet available						H21 ..						
	PROFIBUS PA not yet available						H41 ..						
	setting 1)	damping	0.0 sec. (Standard)				0						
			0.0...120.0 sec., set to .... ( please fill in )				1						
alarm state	< 3.6 mA (standard)				0								
	> 21.0 mA				1								
display module	without						M1						
	multifunctional display with 5-position digital display and bar graph, pluggable						M2						
switching module	without switching module						N10						
	switching module with 2 contacts, pluggable	switching capacity 50V DC / 500 mA				N4 .							
		switching capacity 30V DC / 1.5A				N5 .							
	setting 1)	standard, s."Techn. description of switching module"				0							
at the factory, specify as required				1									
electrical connection	cable gland M 12x1.5	PA black (standard)				T10							
		brass nickel-plated				T11							
		stainless steel				T12							
	circular plug connector	M 12 x1.4 pin				T30							
M 12 x1.8 pin ( required for switching module )				T31									
process connection	internal diaphragm	G 1/2 B (standard)				K1010							
		1/2"NPT				K1070							
	flush mounted diaphragm	with O-ring made of EPDM (FDA listed)	G 1/2 B		K1110								
			G 1 B		K1120								
			M22x1.5		K1130								
DIN 3852		G 1/2 B		K1150									
order code (example):						CV3100	A1051	F10	H1100	M2	N10	T10	K1010
<b>additional feature</b>													
certificates						W1 . .							
materials certificate as per EN 10204-3.1B, wetted parts						. . 020							
Inspection certificate as per EN 10204- 3.1B calibration certificate with 5 measuring points						. . 201							
<b>accessories</b>													
stainless steel welding nipple	· G 1/2"					MC1000-A1							
	· G 1"					MC1000-A3							

1) Extensive parameterization is possible when the transmitter is operated with the display module, the HART function module or the PROFIBUS module.