



**Design Features**

- Modular pressure transmitter with diaphragm seal technology  
 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
- Various process connections
- Suited for aggressive, highly viscous and crystallizing media.
- 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 up to 350 °C
- Piezoresistive measuring cell, directly aerated, fully welded



**Application**

The pressure transmitter PASCAL CV is suited for measuring the relative and absolute pressures of gases, vapors and liquids. The type series CV3120 has been developed to meet the stringent demands of chemical/ petrochemical industry. Because of various variants of process connections and materials these transmitters are especially suited for pressure measurement with aggressive, highly viscous, solidifying or crystallizing media.

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 3100 for general application
- PASCAL CV 3110 for food/pharmaceuticals/biotechnology

*SMART SOLUTIONS!*

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

**Function modules**  
**HART®-module**



**PROFIBUS**



**Switching module**



**Display module**



Process connection: all standard screw-in, flange and inline connections

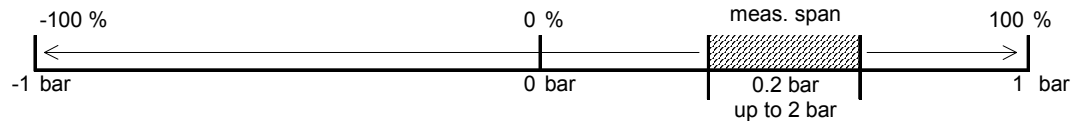
## Technical Data

### 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

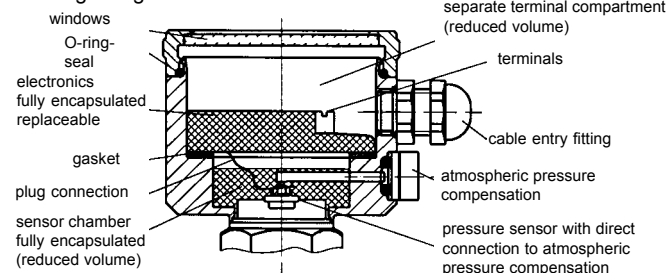
nominal range: e.g. 1 bar



### 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 without diaphragm seal and function modules approx. 0.65 kg

### Housing design



### Process connection

Construction	welded design
Diaphragm	modifications see page 5 or order code
Material	see order code

### Measuring system

Sensor	piezoresistive measuring element
System fill	foodstuff oil FD1 (USDA-H1) according to FDA

### Temperature ranges

Ambient temperature	-20 to 85 °C
Process temperature	
Standard	up to 125 °C, short term up to 140 °C
with temperature decoupler	up to 160 °C
with capillary connection	up to 350 °C
Allowed storage temperature	-40...85 °C
Note safety values as per examination certificate!	

### Supply

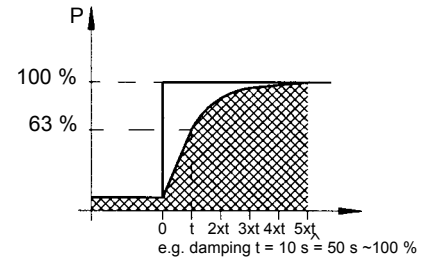
Standard design	12...40 VDC
Ex-proof design	12...30 VDC

### Approval/tests

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

### 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

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

### 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	

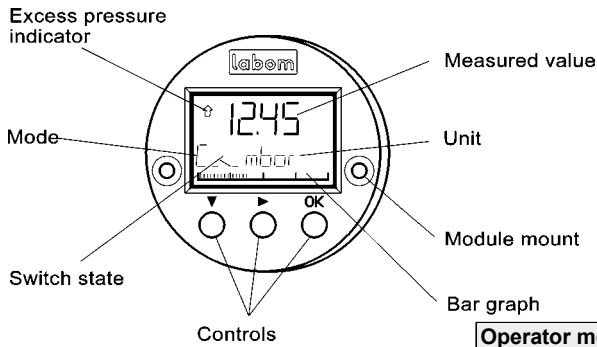
- a) Lower range value / upper range value
- |                          |                               |
|--------------------------|-------------------------------|
| in range 0...60 °C       | ± 0.15%/10 K of nominal range |
| in range < 0 °C, > 60 °C | ± 0.2%/10 K of nominal range  |
- b) process connection (diaphragm seal) depending on design
- |                  |                  |
|------------------|------------------|
| flat diaphragm   | zero point error |
| DN 25/1"         | 4,8 mbar/10 K    |
| DN 32/1 1/2"     | 2,3 mbar/10 K    |
| DN 40            | 1,6 mbar/10 K    |
| DN 50/2"         | 0,6 mbar/10 K    |
| inline diaphragm | zero point error |
| DN 25/1"         | 9,5 mbar/10 K    |
| DN 32/1 1/2"     | 4,1 mbar/10 K    |
| DN 40            | 3,9 mbar/10 K    |
| DN 50/2"         | 3,9 mbar/10 K    |

The specified zero error for the process connection is a guide value for a standard design. We can provide a detailed system calculation upon request. Systems with reduced diaphragm seal errors are also available.

## Function modules

### Display module (multifunctional display) optional

pluggable with automatic module detection - plug and measure -

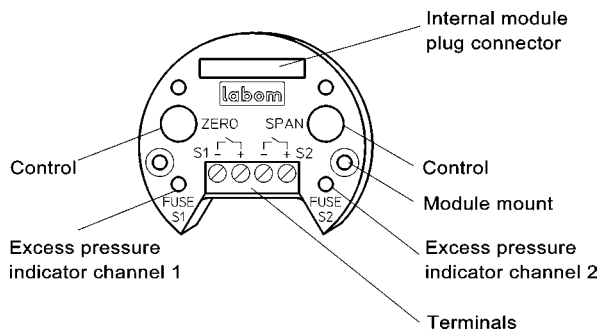


Operator menus
meas. range selection
damping
min-max-value
characteristic
pressure units
measuring circuit test
alarm state
current trimming
pressure trimming
table function
system info
switch points
hysteresis
switching function

- 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

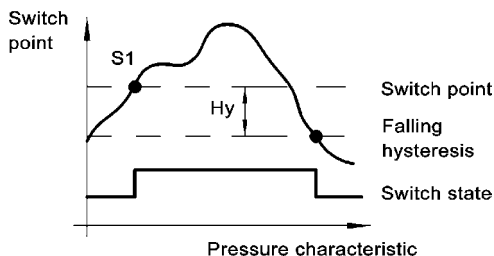
pluggable with automatic module detection - plug and measure -



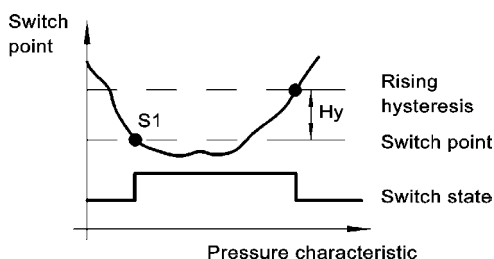
- No additional auxiliary power required
- Module housing made of ABS, encapsulated electronics unit
- 2 limit values, voltage free, short-circuit-proof
- Switching capacity 50 V DC / 500 mA ( $R_i < 1.5 \Omega$ ) or 30 V DC / 1.5 A ( $R_i < 0.3 \Omega$ )
- Overload indicator: LED red, overload or short-circuit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

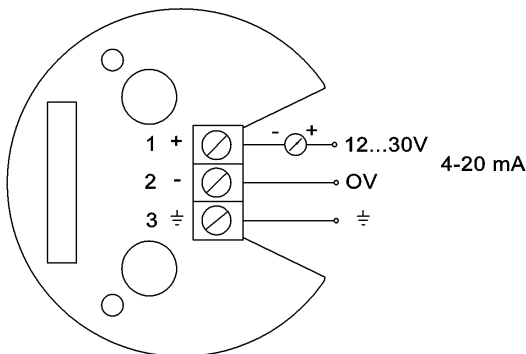
x = configurable

w = factory setting

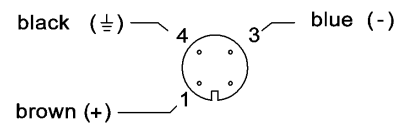
## Connection diagram

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

Internal terminals with cable gland design

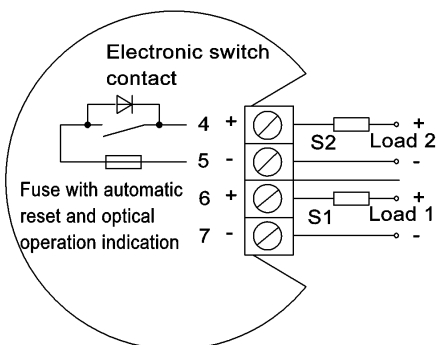


Circular plug connector<sup>1</sup>

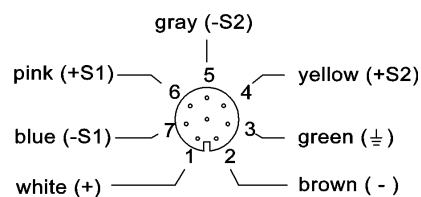


### Switching module

Internal terminals with cable gland design



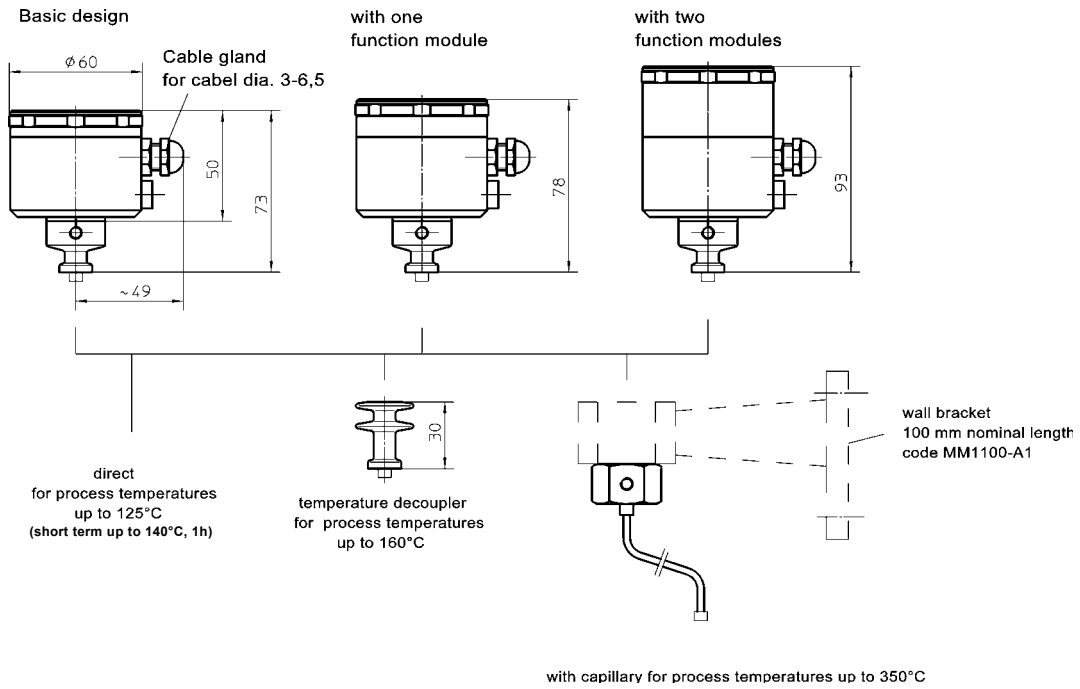
Circular plug connector<sup>1</sup>



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

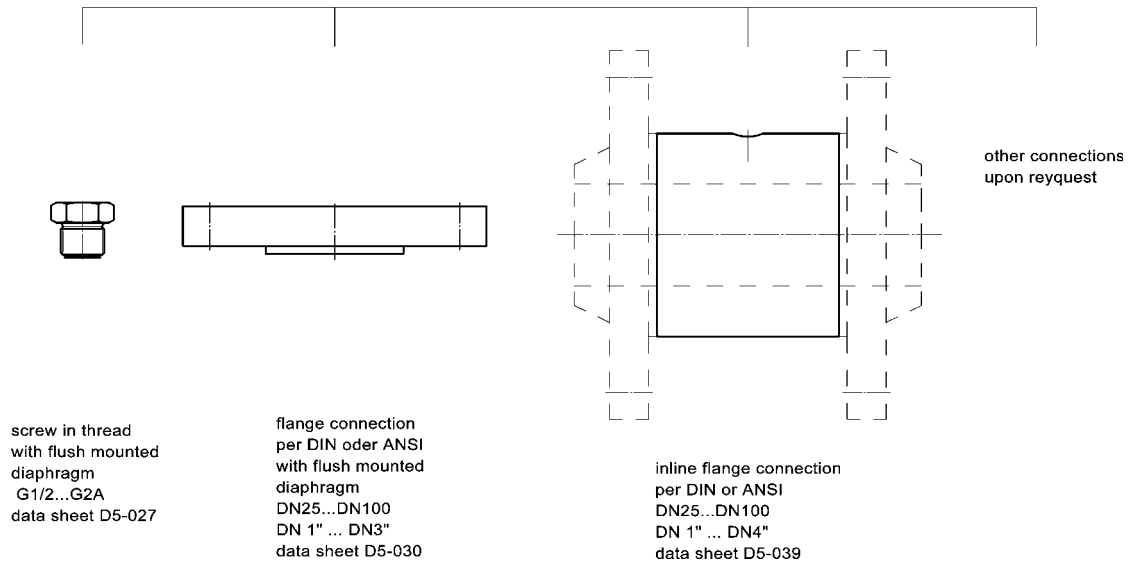
## Dimensions/Designs

### Housing



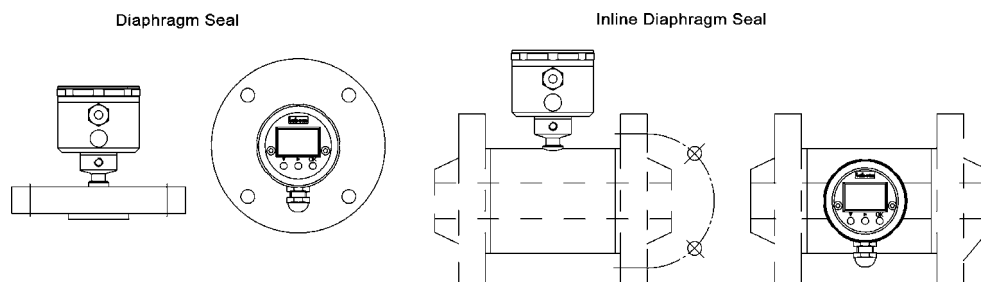
### Process connections

for details see order details and relevant data sheets. product group D5



### Mounting position

Mounting position: any



Standard position of display module and electrical connection. Please state variant arrangement.

