Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Cerabar S PMC71, PMP71, PMP75

Process pressure measurement
Pressure transmitter with ceramic and metal sensors
Overload-resistant and function-monitored; Communication via HART, PROFIBUS PA or FOUNDATION Fieldbus

Application

The Cerabar S pressure transmitter is used for the following measuring tasks:
- Absolute pressure and gauge pressure in gases, steams or liquids in all areas of process engineering and process measurement technology
- Level, volume or mass measurement in liquids
- High process temperature
  - without diaphragm seals up to 150°C (302°F)
  - with typical diaphragm seals up to 400°C (752°F)
- High pressure up to 700 bar
- International usage thanks to a wide range of approvals

Your benefits

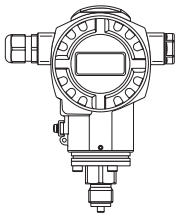
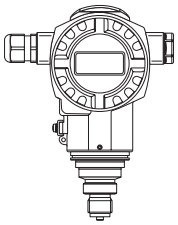
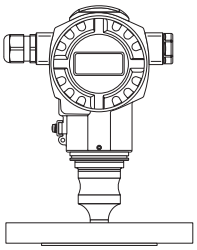
- Very good reproducibility and long-term stability
- High reference accuracy: up to ±0.075%, as PLATINUM version: ±0.05%
- Turn down 100:1, higher on request
- Used for process pressure monitoring up to SIL3, certified according to IEC 61508 by TÜV SÜD
- HistoROM®/M-DAT memory module
- Function-monitored from the measuring cell to the electronics
- Continuous modularity for differential pressure, hydrostatic and pressure (Deltabar S – Deltapilot S – Cerabar S), e.g.
  - replaceable display
  - universal electronic
- Quick commissioning thanks to quick setup menu
- Easy and safe menu-guided operation on-site, via 4...20 mA with HART, via PROFIBUS PA or via FOUNDATION Fieldbus
- Extensive diagnostic functions
- Device versions in conformity with ASME-BPE

TI383P/00/en/08.08
No. 71077557

Endress+Hauser
People for Process Automation

Function and system design

Device selection

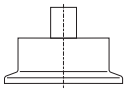
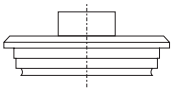
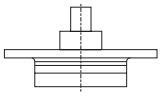
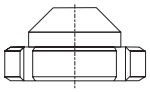
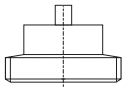
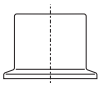
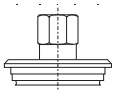
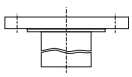
Cerabar S – Product family	**PMC71**  P01-PMC71xxx-16-xx-xx-xx-000 **With capacitive measuring cell and ceramic measuring diaphragm (Ceraphire®)**	**PMP71**  P01-PMP71xxx-16-xx-xx-xx-000 **With piezoresistive measuring cell and metallic welded diaphragm**	**PMP75**  P01-PMP75xxx-16-xx-xx-xx-000 **With diaphragm seal**
Field of application	– Gauge pressure and absolute pressure – Level	– Gauge pressure and absolute pressure – Level	– Gauge pressure and absolute pressure – Level
Process connections	– Diverse thread – DN 32 – DN 80 – ANSI 1 1/2" – 4" – JIS 50 A – 100 A	– Diverse thread – DN 25 – DN 80 – ANSI 1 1/2" – 4" – JIS 25 A – 100 A – Oval flange adapter – Prepared for diaphragm seal mount	– Wide range of diaphragm seals, → see the following section "Overview of diaphragm seal for PMP 75"
Measuring ranges	from –100/0...100 mbar to –1/0...40 bar	from –100/0...100 mbar to –1/0...700 bar	from –400/0...400 mbar to –1/0...400 bar
OPL [1]	max. 60 bar	max. 1050 bar	max. 1050 bar
Process temperature range	–25...+125°C/–20...+150°C [2] (–13...+257°F/–4...+302°F)	–40...+125°C (–40...+257°F)	-70...400°C (-94...+752°F)
Ambient temperature range	–40...+85°C (–40...+185°F)	–40...+85°C (–40...+185°F) [3]	–40...+85°C (–40...+185°F)
Ambient temperature range separate housing	–40 to +60°C (–40 to +140°F)		
Reference accuracy	– Up to ±0.075% of the set span – PLATINUM version: up to ±0.05% of the set span		Up to ±0.075% of the set span
Supply voltage	– For non-hazardous areas: 10.5...45 V DC – EEx ia: 10.5...30 V DC		
Output	4...20 mA with superimposed HART protocol, PROFIBUS PA, FOUNDATION Fieldbus		
Options	– PMP71, PMP75: Gold-Rhodium-coated diaphragm – PMP71, PMP75: NACE-compliant materials – PMC71, PMP71, PMP75: inspection certificate 3.1 – HistoROM®/M-DAT memory module – Separate housing		
Specialities	– Metal-free measurement with PVDF connection – Cleaning of the transmitter for the use in paint shops	– Oil volume-minimised process connections – gas-tight, elastomer-free	– Wide range of diaphragm seals – For high media temperatures – Oil volume-minimised process connections – Completely welded versions

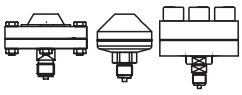
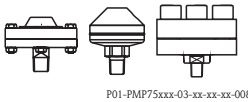
1) OPL = Over pressure limit; dependent on the lowest-rated element, with regard to pressure, of the selected components

2) High temperature version "T" for feature 100 "Additional option 1" or for feature 110 "Additional option 2"

3) lower temperature on request

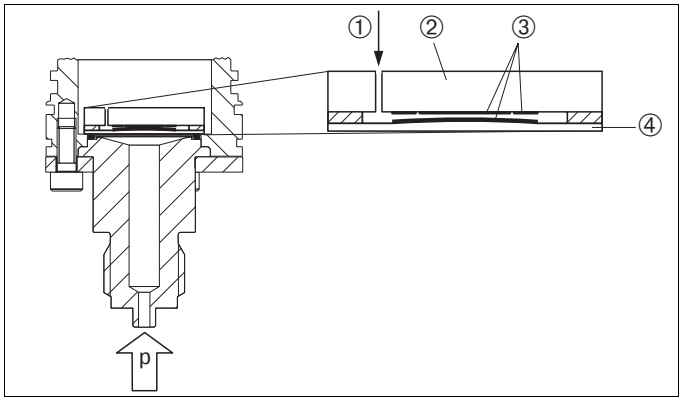
Overview of diaphragm seal for PMP75

Design	Diaphr. seal	Connection	Version	Standard	Nominal diameter	Nom. press./Class
Thread	Membrane diaphragm seal (MDM)	G	 P01-PMP75xxx-03-xx-xx-xx-005	ISO 228	– G 1A – G 1 1/2 A – G 2A	700 bar
		NPT	 P01-PMP75xxx-03-xx-xx-xx-006	ANSI	– 1 MNPT – 1 1/2 MNPT – 2 MNPT	700 bar
Tri-Clamp	Membrane diaphragm seal (MDM)	Clamp	 P01-FMD78xxx-03-xx-xx-xx-005	ISO 2852	– DN 25 (1") – DN 38 (1 1/2") – DN 51 (2") – DN 76.1 (3")	Dependent on the clamp used
	Pipe diaphragm seal (RDM)	Clamp	 P01-FMD78xxx-03-xx-xx-xx-009	ISO 2852	– DN 25 (1") – DN 38 (1 1/2") – DN 51 (2")	Dependent on the clamp used
Hygienic connections	Membrane diaphragm seal (MDM)	Varivent	 P01-FMD78xxx-03-xx-xx-xx-007		Type N for pipes DN 40 – DN 162	PN 40
		DRD	 P01-FMD78xxx-03-xx-xx-xx-006		DN50 (65 mm)	PN 25
		Taper adapter with coupling nut	 P01-FMD78xxx-03-xx-xx-xx-003	DIN 11851	– DN 50 – DN 65 – DN 80	PN 25
		Threaded adapter	 P01-FMD78xxx-03-xx-xx-xx-004	DIN 11851	– DN 50 – DN 65 – DN 80	PN 25
Versions in conformity with ASME-BPE for use in biotechnical processes; wetted surfaces $R_a \leq 0.38$ µm (15.75 µin; 180 grit), electropolished	Membrane diaphragm seal (MDM)	Clamp	 P01-PMP46xxx-03-xx-xx-xx-005	ISO 2852	– DN 25 (1 1/2") – DN 51 (2")	Dependent on the clamp used
		Varivent	 P01-PMP46xxx-03-xx-xx-xx-004		– Type N for pipes DN 40 – DN 162	PN 40
Flange	Membrane diaphragm seal (MDM)	EN/DIN flange	 P01-PMP75xxx-03-xx-xx-xx-001	EN 1092-1/ DIN 2527 and DIN 2501-1	– DN 25, DN 50 – DN 32, DN 40 – DN 80 – DN 100	– up to PN 400 – PN 40 – up to PN 100 – PN 100
		ANSI flange		ANSI B 16.5	– 1", 2" – 1 1/2", 3", 4"	– 2500 lbs – 300 lbs
		JIS flange		B 2220 BL	25A, 50A, 80A, 100A	10 K
Flange with extended diaphragm seal	Membrane diaphragm seal (MDM)	EN/DIN flange	 P01-PMP75xxx-03-xx-xx-xx-002	EN 1092-1/ DIN 2527	DN 50/DN 80 + 50/100/200 mm ext. diaphr. seal	PN 10 – PN 40
		ANSI flange		ANSI B 16.5	2"/3"/4" + 2"/4"/6"/ 8" ext. diaphr. seal	Up to 300 lbs

Design	Diaphr. seal	Connection	Version	Standard	Nominal diameter	Nom. press./Class
Threaded connection with separator	Membrane diaphragm seal (MDM)	G	 P01-PMP75xxx-03-xx-xx-xx-004	ISO 228/ EN837	– G 1/2 B – G 1/2 A – G 1/2 A	– 40 bar – 160 bar – 400 bar
		NPT	 P01-PMP75xxx-03-xx-xx-xx-008	ANSI	– 1/2 MNPT	– 40 bar – 160 bar – 400 bar
		NPT Off line thread	 P01-PMP75xxx-03-xx-xx-xx-009	ANSI	– 1/2 FNPT – 1 FNPT	250 bar

Measuring principle

Ceramic measuring diaphragm used for PMC71 (Ceraphire®)

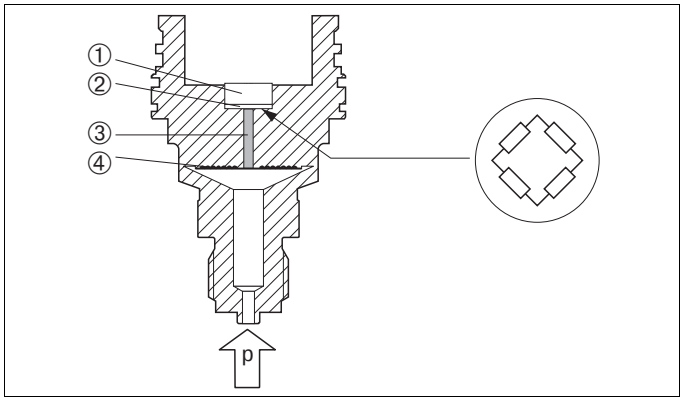


P01-PMC71xxx-03-xx-xx-xx-000

Ceramic sensor

1 Atmospheric vent (gauge pressure only)
2 Ceramic substrate
3 Electrodes
4 Ceramic diaphragm

Metallic measuring diaphragm used for PMP71 and PMP75



P01-PMP7xxxx-03-xx-xx-xx-000

Metal sensor

1 Measuring element
2 Measuring diaphragm with Wheatstone bridge
3 Channel with fill fluid
4 Process diaphragm, Metal separating diaphragm

Ceramic measuring diaphragm used for PMC71 (Ceraphire®)

The ceramic sensor is a dry sensor, i.e. the process pressure acts directly on the robust ceramic diaphragm and deflects it. A pressure-dependent change in capacitance is measured at the electrodes of the ceramic carrier and the diaphragm. The measuring range is determined by the thickness of the ceramic diaphragm.

Advantages:
- Guaranteed overload resistance up to 40 times the nominal pressure
- Thanks to highly-pure 99.9% ceramic (Ceraphire®, see also "www.endress.com/ceraphire")
  - extremely high chemical resistance compared to Alloy
  - less relaxation
  - high mechanical stability
- Suitable for vacuums
- Second process barrier (Secondary Containment) for enhanced integrity
- Process temperature up to 150°C (302°F)

Metallic measuring diaphragm used for PMP71 and PMP75

PMP71

The operating pressure deflects the separating diaphragm and a fill fluid transfers the pressure to a resistance measuring bridge (semi-conductor technology). The pressure-dependent change of the bridge output voltage is measured and evaluated.

Advantages:
- Can be used for process pressure up to 700 bar
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Second process barrier (Secondary Containment) for enhanced integrity
- Significantly less thermal effect compared to diaphragm seal systems

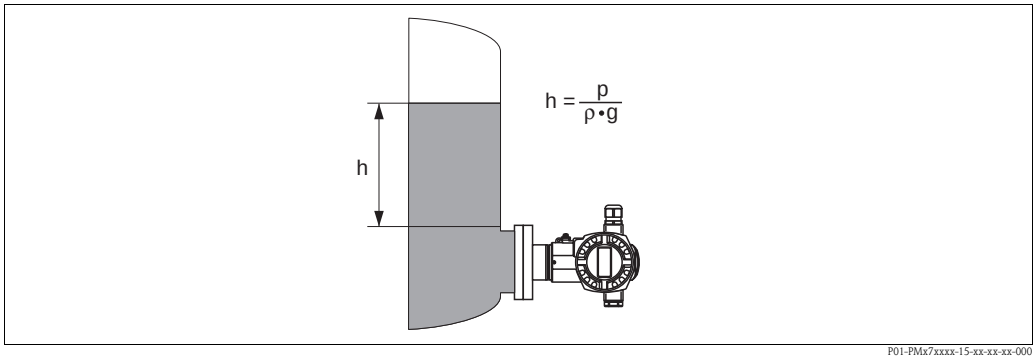
PMP75

The operating pressure acts on the diaphragm of the diaphragm seal and is transferred to the separating diaphragm of the sensor by a diaphragm seal fill fluid. The separating diaphragm is deflected and a fill fluid transfers the pressure to a resistance measuring bridge. The pressure-dependent change of the bridge output voltage is measured and evaluated.

Advantages:
- Can be used for process pressure up to 400 bar
- High long-term stability
- Guaranteed overload resistance up to 4 times the nominal pressure
- Second process barrier (Secondary Containment) for enhanced integrity

Level measurement (level, volume and mass)

Design and operation mode



Level measurement with Cerabar S

h *Height (level)*
p *Pressure*
ρ *Density of the medium*
g *Gravitation constant*

Your benefits

- Choice of three level operating modes in the device software
- Volume and mass measurements in any tank shapes by means of a freely programmable characteristic curve
- Choice of diverse level units with automatic unit conversion
- A customised unit can be specified
- Has a wide range of uses, as well
  - in the event of foam formation
  - in tanks with agitators of screen fittings
  - in the event of liquid gases

Communication protocol

- 4...20 mA with HART communication protocol
- PROFIBUS PA
  - The Endress+Hauser devices meet the requirements as per the FISCO model.
  - Due to the low current consumption of 13 mA ± 1 mA
    - up to 7 Cerabar S for EEx ia, CSA IS and FM IS applications
    - up to 27 Cerabar S for all other applications, e.g. in non-hazardous areas, EEx nA, etc.

    can be operated at one bus segment with installation as per FISCO.

  Further information on PROFIBUS PA, such as requirements for bus system components, can be found in the Operating Instructions BA034S "PROFIBUS DP/PA: Guidelines for planning and commissioning" and in the PNO guideline.
- FOUNDATION Fieldbus
  - The Endress+Hauser devices meet the requirements as per the FISCO model.
  - Due to the low current consumption of 15 mA ± 1 mA
    - up to 6 Cerabar S for EEx ia, CSA IS and FM IS applications
    - up to 24 Cerabar S for all other applications, e.g. in non-hazardous areas, EEx nA, etc.

    can be operated at one bus segment with installation as per FISCO.

  Further information on FOUNDATION Fieldbus, such as requirements for bus system components can be found in the Operating Instructions BA013S "FOUNDATION Fieldbus Overview".

Input

Measured variable

Absolute pressure and gauge pressure, from which level (level, volume or mass) is derived

Measuring range

PMC71 – with ceramic measuring diaphragm (Ceraphire®) for gauge pressure

Nominal value	Measurement limit		Smallest calibratable Span [4]	MWP [1]	OPL [2]	Vacuum resistance	Versions in the order code [3]
	lower (LRL) [bar]	upper (URL) [bar]	[bar]	[bar]	[bar]	[bar_{abs}]	
100 mbar	–0.1	+0.1	0.005	2.7	4	0.7	1C
250 mbar	–0.25	+0.25	0.005	3.3	5	0.5	1E
400 mbar	–0.4	+0.4	0.005	5.3	8	0	1F
1 bar	–1	+1	0.01	6.7	10	0	1H
2 bar	–1	+2	0.02	12	18	0	1K
4 bar	–1	+4	0.04	16.7	25	0	1M
10 bar	–1	+10	0.1	26.7	40	0	1P
40 bar	–1	+40	0.4	40	60	0	1S

PMC71 – with ceramic measuring diaphragm (Ceraphire®) for absolute pressure

Nominal value	Measurement limit		Smallest calibratable Span [4]	MWP [1]	OPL [2]	Versions in the order code [3]
	lower (LRL) [bar_{abs}]	upper (URL) [bar_{abs}]	[bar]	[bar_{abs}]	[bar_{abs}]	
100 mbar	0	+0.1	0.005	2,7	4	2C
250 mbar	0	+0.25	0.005	3,3	5	2E
400 mbar	0	+0.4	0.005	5,3	8	2F
1 bar	0	+1	0.01	6.7	10	2H
2 bar	0	+2	0.02	12	18	2K
4 bar	0	+4	0.04	16.7	25	2M
10 bar	0	+10	0.1	26.7	40	2P
40 bar	0	+40	0.4	40	60	2S

1) The MWP (maximum working pressure) for the measuring device depends on the weakest element of the components selected with regard to pressure, i.e. the process connection (→ 📄 34 ff) has to taken into consideration in addition to the sensor (→ see Table above). Pay attention to the pressure-temperature dependence also. For the appropriate standards and further information, see → 📄 33, "Pressure specification".
2) OPL: Over Pressure Limit; depends on the weakest link in terms of pressure of the selected components.
3) Versions in the order code → 📄 79 ff, feature 40 "Sensor range; Sensor overload limit (= OPL)"
4) Turn down > 100:1 on request or can be set at the device

PMP71 and PMP75 – with metallic measuring diaphragm for gauge pressure

Nominal value	Measurement limits		Smallest calibratable Span [5]	MWP [1]	OPL [2]	Vacuum resistance [3]	Versions in the order code [4]
	lower (LRL)	upper (URL)				Silicone oil/ Inert oil	
	[bar]	[bar]	[bar]	[bar_{rel}]	[bar_{rel}]	[bar_{abs}]	
400 mbar	–0.4	+0.4	0.005	4	6	0.01/0.04	1F
1 bar	–1	+1	0.01	6.7	10	0.01/0.04	1H
2 bar	–1	+2	0.02	13.3	20	0.01/0.04	1K
4 bar	–1	+4	0.04	18.7	28	0.01/0.04	1M
10 bar	–1	+10	0.1	26.7	40	0.01/0.04	1P
40 bar	–1	+40	0.4	100	160	0.01/0.04	1S
100 bar	–1	+100	1.0	100	400	0.01/0.04	1U
400 bar	–1	+400	4.0	400	600	0.01/0.04	1W
700 bar [6]	–1	+700	7.0	700	1050	0.01/0.04	1X

PMP71 and PMP75 – with metallic measuring diaphragm for absolute pressure

Nominal value	Measurement limits		Smallest calibratable Span [5]	MWP [1]	OPL [2]	Vacuum resistance [3]	Versions in the order code [4]
	lower (LRL)	upper (URL)				Silicone oil/ Inert oil	
	[bar_{abs}]	[bar_{abs}]	[bar]	[bar_{abs}]	[bar_{abs}]	[bar_{abs}]	
400 mbar	0	+0.4	0.005	4	6	0.01/0.04	2F
1 bar	0	+1	0.01	6.7	10	0.01/0.04	2H
2 bar	0	+2	0.02	13.3	20	0.01/0.04	2K
4 bar	0	+4	0.04	18.7	28	0.01/0.04	2M
10 bar	0	+10	0.1	26.7	40	0.01/0.04	2P
40 bar	0	+40	0.4	100	160	0.01/0.04	2S
100 bar	0	+100	1.0	100	400	0.01/0.04	2U
400 bar	0	+400	4.0	400	600	0.01/0.04	2W
700 bar [6]	0	+700	7.0	700	1050	0.01/0.04	2X

1) The MWP (maximum working pressure) for the measuring device depends on the weakest element of the components selected with regard to pressure, i.e. the process connection (→ 📄 34 ff) has to taken into consideration in addition to the sensor (→ see Table above). Pay attention to the pressure-temperature dependence also. Pay attention to the pressure-temperature dependence also. For the appropriate standards and further information, → 📄 33, "Pressure specifications".
2) OPL: Over pressure limit (= Sensor overload limit)
3) The vacuum resistance applies to the measuring cell at a reference conditions. The pressure and temperature application limits of the selected filling oil must also be observed for the PMP75. → 📄 71, section "Diaphragm seal filling oils".
4) Versions in the order code → 📄 79 ff, feature 40 "Sensor range; Sensor Overload limit (= OPL)"
5) Turn down > 100:1 on request or can be set at the device
6) PMP71 only, PMP75 on request

Explanation of terms

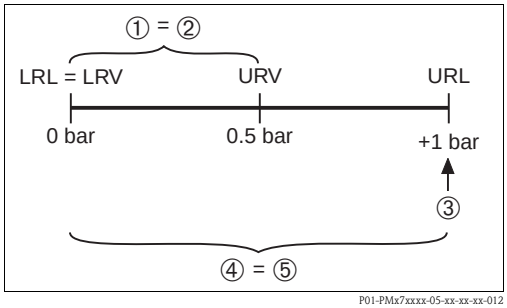
Explanation of terms: Turn down (TD), set span and on zero based span

Case 1:
- \|Lower range value (LRV)\| ≤ \|Upper range value (URV)\|

Example:
- Lower range value (LRV) = 0 bar
- Upper range value (URV) = 0.5 bar
- Nominal value (URL) = 1 bar

Turn down:
- TD = URL / \|URV\| = 2:1

set span:
- URV – LRV = 0.5 bar
  This span is based on the zero point.



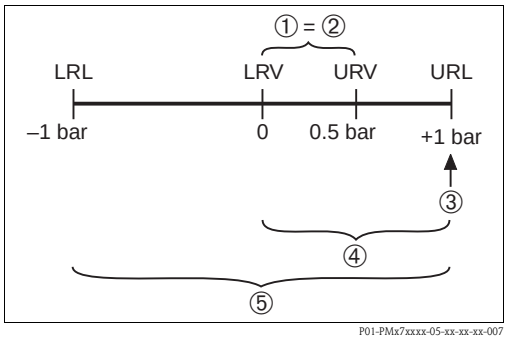
Example: 1 bar measuring cell

Case 2:
- \|Lower range value (LRV)\| ≤ \|Upper range value (URV)\|

Example:
- Lower range value (LRV) = 0 bar
- Upper range value (URV) = 0.5 bar
- Nominal value (URL) = 1 bar

Turn down:
- TD = URL / \|URV\| = 2:1

set span:
- URV – LRV = 0.5 bar
  This span is based on the zero point.



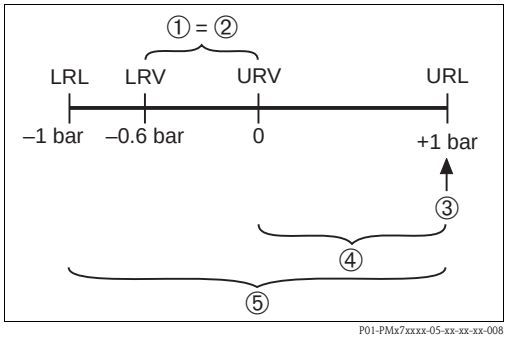
Example: 1 bar measuring cell

Case 3:
- \|Lower range value\| ≥ \|Upper range value\|

Example:
- Lower range value (LRV) = –0.6 bar
- Upper range value (URV) = 0 bar
- Nominal value (URL) = 1 bar

Turn down:
- TD = URL / \|LRV\| = 1,67:1

set span:
- URV – LRV = 0.6 bar
  This span is based on the zero point.



Example: 1 bar measuring cell

1 Set span
2 Zero based span
3 Nominal value ≙ Upper range limit (URL)
4 Nominal measuring range
5 Sensor measuring range
LRL Lower range limit
URL Upper range limit
LRV Lower range value
URV Upper range value

Output

Output signal

- 4...20 mA with superimposed digital communication protocol HART 5.0, 2-wire
- Digital communication signal PROFIBUS PA (Profile 3.0)
  - signal coding: Manchester Bus Powered (MBP); Manchester II
  - data transmission rate: 31.25 KBit/s, voltage mode
- Digital communication signal FOUNDATION Fieldbus, 2-wire
  - signal coding: Manchester Bus Powered (MBP); Manchester II
  - data transmission rate: 31.25 KBit/s, voltage mode

Signal range – 4...20 mA HART

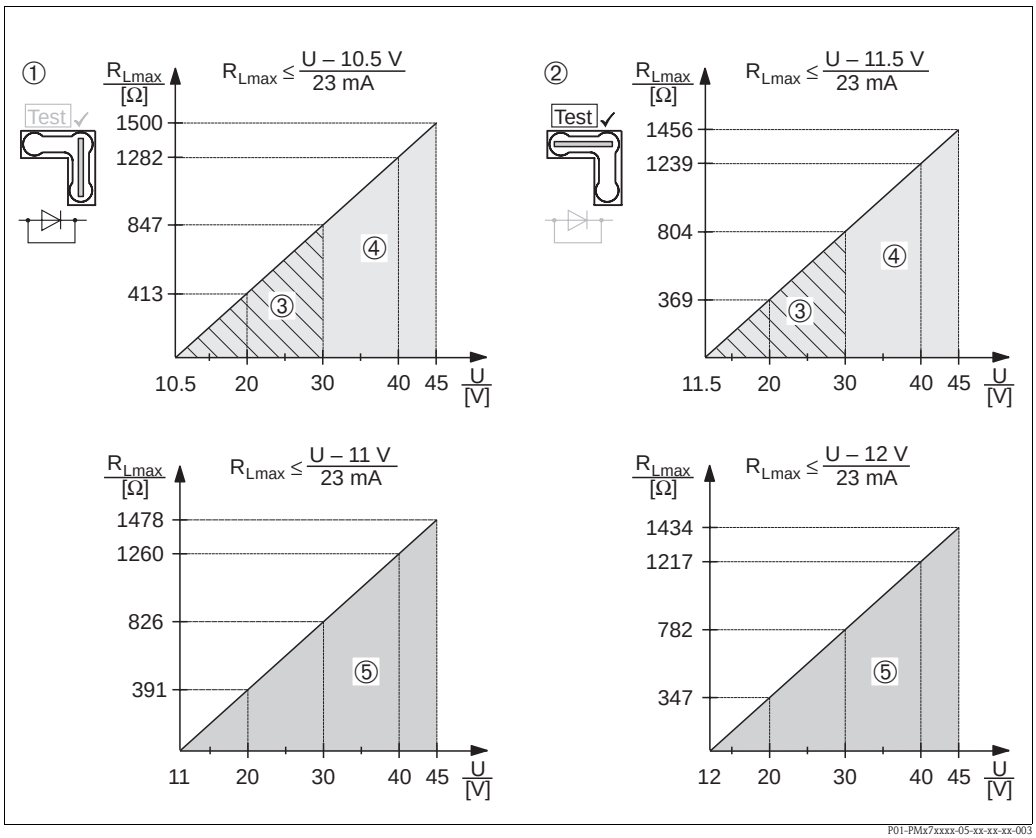
3.8 mA to 20.5 mA

Signal on alarm

- 4...20 mA HART
  Options:
  - Max. alarm*: can be set from 21...23 mA
  - Keep measured value: last measured value is kept
  - Min. alarm: 3.6 mA

  * Factory setting: 22 mA
- PROFIBUS PA: can be set in the Analog Input block,
  options: Last Valid Out Value, Fsafe Value (factory setting), Status bad
- FOUNDATION Fieldbus: can be set in the Analog Input Block,
  options: Last good Value, Fail Safe Value (factory setting), Wrong Value

Load – 4...20 mA HART



P01-PMx7xxxx-05-xx-xx-xx-003

Load diagram, observe the position of the jumper and the explosion protection. (→ 19, section "Taking 4...20 mA test signal" .)

1 Jumper for the 4...20 mA test signal inserted in "Non-test" position
2 Jumper for the 4...20 mA test signal inserted in "Test" position
3 Supply voltage 10.5 (11.5)...30 V DC for 1/2 G, 1 GD, 1/2 GD, FM IS, CSA IS, IECEx ia, NEPSI Ex ia
4 Supply voltage10.5 (11.5)...45 V DC for devices for non-hazardous areas, 1/2 D, 1/3 D, 2 G EEx d, 3 G EEx nA, FM XP, FM DIP, FM NI, CSA XP, CSA Dust-Ex, NEPSI Ex d
5 Supply voltage 11 (12)...45 V DC for PMC71, EEx d[ia], NEPSI Ex d[ia]
R_{Lmax} Maximum load resistance
U Supply voltage

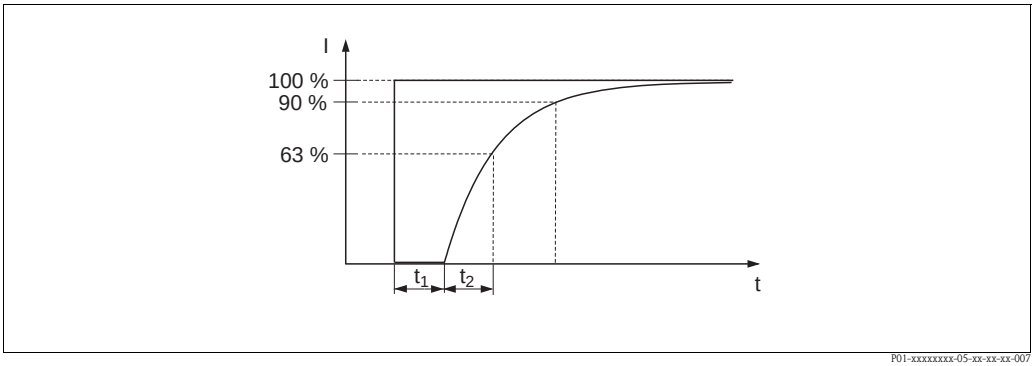
Note!
When operating via a handheld terminal or via PC with an operating program, a minimum communication resistance of 250 Ω must exist within the loop.

Resolution

- Current output: 1 μA
- Display: can be set (setting at the factory: presentation of the maximum accuracy of the transmitter)

Dynamic behavior current output

Dead time, Time constant (T63)



Presentation of the dead time and the time constant

Type	Dead time t_1	Time constant (T63), t_2
PMC71	90 ms	120 ms
PMP71	45 ms	■ 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Dynamic behavior HART

Dead time, Time constant (T63)

A typical parametrization for the PLC of 3 to 4 values per second results in the following total dead time:

Type	Dead time t_1	Time constant (T63), t_2
PMC71	90 ms	120 ms
PMP71	45 ms	■ 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Reading cycle

- HART commands: on average 3 to 4 per second on average.
  The Cerabar S commands the BURST MODE functionfor cyclic value transmission via the HART communication protocol.

Response time

≤ 250 ms

Cycle time (Update time)

On average 250...330 ms.

Dynamic behavior PROFIBUS PA

Dead time, Time constant (T63)

A typical cyclic parametrization for the PLC of 20 values per second results in the following total dead time:

Type	Dead time t_1	Time constant (T63), t_2
PMC71	340 ms	120 ms
PMP71	295 ms	■ 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Response time

- cyclic: approx. 10 ms per request
- acyclic: < 50 ms

All values are typical values.

Cycle time (Update time)

The cycle time in a bus segment in cyclic data communication depends on the number of devices, on the segment coupler used and on the internal PLC cycle time.

Dynamic behavior FOUNDATION Fieldbus

Dead time, Time constant (T63)

If the macro cycle time (Hostsystem) is set to a typical value of 250 ms, the following total dead time results:

Type	Dead time t_1	Time constant (T63), t_2
PMC71	340 ms	120 ms
PMP71	295 ms	■ 400 mbar measuring cell: 70 ms ■ measuring cells ≥ 1 bar: 35 ms
PMP75	PMP71 + influence from the diaphragm seal	

Reading cycle

- cyclic: up to 5/s, dependent on the number and type of function blocks used in a closed-control loop
- acyclic: 10/s

Response time

- cyclic: < 80 ms
- acyclic: < 40 ms

All values are typical values.

Cycle time (Update time)

250 ms

Damping

A damping affects all outputs (output signal, display).

- Via on-site display, handheld terminal or PC with operating program, continuous from 0...999 s
- Additionally for HART and PROFIBUS PA: via DIP-switch on the electronic insert, switch position "on" = set value and "off"
- Factory setting: 2 s

Data of the FOUNDATION Fieldbus interface

Basic Data

Device Type	1007F (hex)
Device Revision	06 (hex)
DD Revision	01 (hex)
CFF Revision	01 (hex)
ITK Version	5.0
ITK-Certification Driver-No.	IT054600
Link-Master (LAS) cabable	yes
Link Master / Basic Device selectable	yes; Default: Basic Device
Number VCRs	44
Number of Link-Objects in VFD	50

Virtual communication references (VCRs)

Permanent Entries	44
Client VCRs	0
Server VCRs	5
Source VCRs	8
Sink VCRs	0
Subscriber VCRs	12
Publisher VCRs	19

Link Settings

Slot time	4
Min. Inter PDU delay	12
Max. response delay	10

Transducer Blocks

Block	Content	Output values
TRD1 Block	contains all parameters related to the measurement	■ Pressure or level (channel 1) ■ Process temperature (channel 2)
Service Block	contains service information	■ Pressure after damping (channel 3) ■ Pressure drag indicator (channel 4) ■ Counter for max. pressure transgression (channel 5)
Diagnostic Block	contains diagnostic information	Error code via DI channels (channel 0 to 16)
Display Block	contains parameters to configure the local display	no output values

Function Blocks

Block	Content	Number of Function Blocks	Execution time	Functionality
Resource Block	The Resource Block contains all the data that uniquely identifies the field device. It is an electronic version of a nameplate of the device.			enhanced
Analog Input Block 1 Analog Input Block 2	The AI block takes the manufacturer's input data, selected by channel number, and makes it available to other function blocks at its output. Enhancement: digital outputs for process alarms, fail safe mode		45 ms	enhanced
Digital Input Block	This block contains the discrete data of the diagnose block (selectable via a channel number 0 to 16) and provides them for the blocks at the output.		40 ms	standard
Digital Output Block	This block converts the discrete input and thus initiates an action (selectable via a channel number) in the dp flow block or in the service block. Channel 1 resets the counter for max. pressure transgressions..		60 ms	standard
PID Block	The PID block serves as proportional-integral-derivative controller and is used almost universally to do closed-loop-control in the field including cascade and feedforward. Input IN can be indicated on the display. The selection is performed in the display block (DISPLAY_MAIN_LINE_CONTENT).		120 ms	standard
Arithmetic Block	This block is designed to permit simple use of popular measurement math functions. The user does not have to know how to write equations. The math algorithm is selected by name, chosen by the user for the function to be done.		50 ms	standard
Input Selector Block	The input selector block provides selection of up to four inputs and generates an output based on the configured action. This block normally receives its inputs from AI blocks. The block performs maximum, minimum, middle, average and 'first good' signal selection. INPUT IN1 to IN4 can be indicated on the display. The selection is performed in the display block (DISPLAY_MAIN_LINE_CONTENT).		35 ms	standard
Signal Characterizer Block	The signal characterizer block has two sections, each with an output that is a non-linear function of the respective input. The non-linear function is determined by a single look-up table with 21 arbitrary x-y pairs.		30 ms	standard
Integrator Block	The Integrator Function Block integrates a variable as a function of the time or accumulates the counts from a Pulse Input block. The block may be used as a totalizer that counts up until reset or as a batch totalizer that has a setpoint, where the integrated or accumulated value is compared to pre-trip and trip settings, generating discrete signals when these settings are reached.		35 ms	standard
Analog Alarm Block	This block contains all process alarm conditions (working like a comparator) and represents them at the output.		35 ms	standard

Additional Function Block informations:

Instantiate Function Block	YES
Number of instantiate blocks	15

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