Differential pressure transmitter PASCAL Ci4 Delta P
for general application, Type Series CI4300

Features

- Differential pressure transmitter with metallic diaphragm
- High-resolution graphic display with backlight
- Intuitive 4-button operation
- Comprehensive parameterising functions
- Comprehensive simulation and diagnostic functions
- Quick access to device data
- Development according to SIL2
- Nominal range 0.25 bar to 16 bar
- Turndown up to 100:1
- Measuring rate up to 100 Hz
- Accuracy 0.1 %
- Output signal 4…20 mA with HART® protocol
- Digital communication via PDM, FDT/DTM, 375/475 Field Communicator
- Output functions: linear, invers, square root, table function
- Table function with up to 64 support points
- Stainless steel case in sturdy design, degree of protection IP 65/67
- Media temperature -40…100 °C
- Wetted parts stainless steel

Options

- Approvals/Certificates
  - GOST-R certificate of conformity and declaration
  - Certificate of measuring equipment for Russian Federation
  - Calibration certificate per DIN EN 10204
- Removable display and control unit
- Degree of protection IP 69K
- Front cover of stainless steel with window of non splintering glass

Application area

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

Application

The digital differential pressure transmitter PASCAL Ci4 Delta P is suitable for level measurement and filter monitoring in chemical/petrochemical and in general process engineering.

Technical data

Measuring ranges

Up to a turndown of 100:1 the measuring span can be freely selected.

Nominal range	Measuring range	Measuring span		Overload capacity		Static excess pressure both sides
		min. span	max. span	plus-side	minus-side	
0.25 bar rel.	-0.25…0.25 bar rel.	0.0025 bar	0.5 bar	10 bar rel.	5 bar	75 bar
1 bar rel.	-1…1 bar rel.	0.01 bar	2 bar	20 bar rel.	10 bar	75 bar
4 bar rel.	-1…4 bar rel.	0.04 bar	5 bar	50 bar rel.	25 bar	75 bar
16 bar rel.	-1…16 bar rel.	0.16 bar	17 bar	50 bar rel.	25 bar	75 bar

Constructional design / case

Design:	Two-chamber case, continuously rotatable by ± 170°
Material case:	Stainless steel mat.no. 1.4301 (304) Case surface blasted

Material front cover:
- Polypropylene, black
- Stainless steel

Degree of protection:
- IP 65 / IP 67 per DIN EN 60529
- IP 69K

Material window:
- Macrolon
- Non splintering glass (requires front cover of stainless steel)

Elec. connection:
- Circular connector M12
- Cable gland M16x1.5, PA black
- Cable gland M16x1.5, stainless steel
- Cable gland M20x1.5, PA black
- Cable gland M20x1.5, stainless steel
- 1/2" NPT, PA black

Terminal blocks:
- Spring clamp terminals up to 1.5 mm^2
- Pole terminals up to 2.5 mm^2
- Screwed terminals up to 2.5 mm^2

Type plate: Laser marking

Process connection

Design: Process flange with connection dimension per DIN EN 61518
- Process connection 1/4 – 18 NPT
- Mounting thread 7/16 – 20 UNF

Process flange incl. 1/4" NPT sealing plug, optional with vent valve

Further process connections upon request

Material wetted parts

Process flange:	Stainless steel, mat.-no. 1.4571 (316Ti)
Diaphragm:	Stainless steel, mat.-no. 1.4404/1.4435 (316L)
Gasket:	FKM Viton

Measuring system

Sensor:	Piezoresistive
System filling:	Foodstuff oil as per FDA

Accuracy

Reference cond.:	Per DIN EN 60770-1
Calibration position:	Vertical mounting
Deviation of characteristic:	Refer to the adjusted measuring span (Limit point method per DIN 16086)

Nominal range 1-16 bar

Turndown 5:1	0.1 %
Turndown > 5:1	0.02 % x TD

Nominal range 0.25 bar

Turndown 5:1	0.2 %
Turndown > 5:1	0.04 % x TD

Long-term drift: Refer to nominal range ≤ 0.1 %/Jahr

Temperature influence, case: Refer to nominal range

Ambient temperature -20…80 °C:

Nominal range 1- 16 bar	0.1 % /10K, max. 0.3 %
Nominal range 0.25 bar	0.2 % /10K, max. 0.6 %

Ambient temperature -40…-20 °C:

Typical 0.2 % /10K

Indication

Display:
- High-resolution graphic display with backlight
- 4-button operation
- Freely configurable display modes
- continuously rotatable by ± 170 (detent every 90°)
- Optional: Remote display and control unit, can be used up to 10 m away from measuring point

Output

Signal:	2-wire technology	4…20 mA
	Lower limit	3.8…4 mA
	Upper limit	20…21 mA
	Lower alarm current	< 3.6 mA
	Upper alarm current	> 21 mA
	Current limitation	22 mA
	Digital communication:	HART ® protocol, version 7

Communication via:

- PDM version 6 and 8
- Pactware or compatible systems (FDT/DTM)
- 375 / 475 Field Communicator

Function: Adjustable:

- Linear
- Inverse response
- By square root
- Table function with up to 64 support points

Turndown:	Max. 100:1
Damping:	0…999.9 s selectable in steps of 0.1 s
Measuring rate:	20 Hz, switchable to 100 Hz

Resolution:	1 µA
Current sensing func.	3.55…21.5 mA selectable in steps of 0.01 mA
Load R_B:	$R_B \leq (U_V\text{-}12V\ DC)/22mA$ [Ohm]
	U_V = supply voltage

Supply

Functional range:	12…30 V DC

Temperature ranges

Environment:	-40…80 ° C
Media	-40…100 °C
Storage:	-40…80 ° C

Tests and certificates

EMC:	Per EN 61326-1
SIL 2:	Development according to SIL 2
GOST:	

- GOST-R certificate of conformity and declaration
- Certificate of measuring equipment for Russian Federation

Parameterisation, simulation and calibration

Parameterisation

Parameter	Values	Default setting
Device		
device ID	16 digits, freely selectable	LABOM PASCAL Ci4
lower range value	at any value within nominal range	0 bar
upper range value	at any value within nominal range	end of nominal range
measuring rate	20 Hz, 100 Hz	20 Hz
damping	0.0…999.9 s	0.0 s
Display and control unit		
pressure unit	mbar, bar, Pa, hPa, kPa, MPa, g/cm^2, kg/cm^2, psi, atm, torr, mmH_2O, mH_2O, inH_2O, ftH_2O, mmHg, inHg	bar
temperature unit	° C,° F, ° R, K	°C
lighting	on, off	on
language	german, english	german
decimal point	auto, x.xxxx, xx.xxx, xxx.xx, xxxx.x, xxxxx	auto
display mode	five values, four values, three values, two values, big display	four values
main value	ΔP, ΔP in mA, ΔP in %, temperature	ΔP
secondary values	ΔP, ΔP in mA, ΔP in %, temperature,device ID, HART-TAG, HART-Descriptor	ΔP in %, ΔP in mA, device ID, <empty>
Current output		
output function	linear, inverse response, by square root, table function	linear
lower current limit	3.8…4.0 mA	3.8 mA
upper current limit	20…21 mA	20.5 mA
alarm current	low (<3.6 mA), high (> 21.0 mA)	low (<3.6 mA)
position correction (mounting position)	on, off	off
Maintenance counter		
maintenance interval	0…9999 days	0 days
status	on, off	off
HART data		
HART address	0…63	0
number of response preambels	5…20	5
current mode	proportional, constant	proportional

Simulation

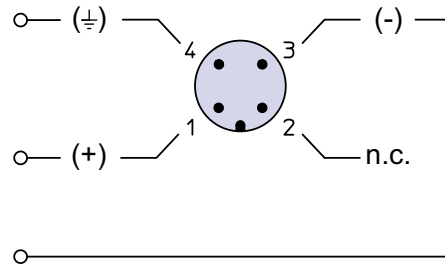| Type	Description	Value range
loop-test	adjustment of fixed output signal	3.55…2.5 mA
pressure simulation	assumes constant pressure value, contrary to loop-test the table function is also taken into consideration	nominal range

Calibration

Type	Description
zero point correction	adjusts reading to zero at ambient pressure
position correction	adjusts reading of mounted instrument to zero at ambient pressure
lower adjustment	adjusts reading to applied pressure (affects zero point + span)
upper adjustment	adjusts reading to applied pressure (affects span only)
current adjustment	adjusts current output to achieve 4 resp. 20 mA at the end of the measurement chain

Connection diagram
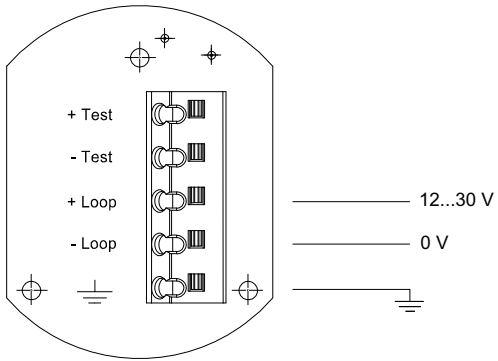
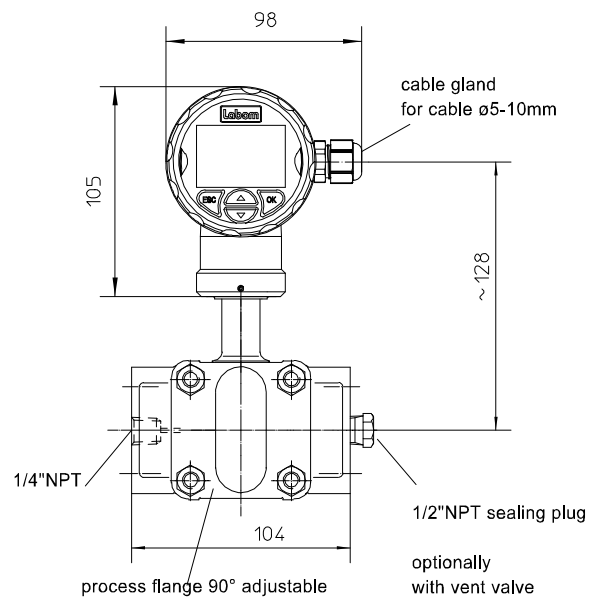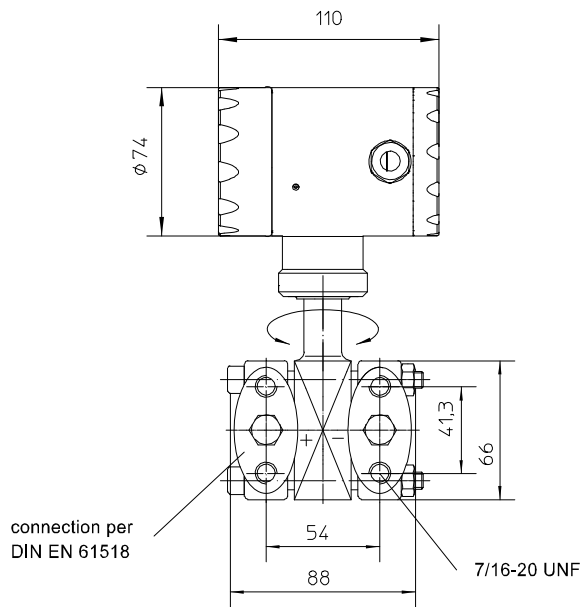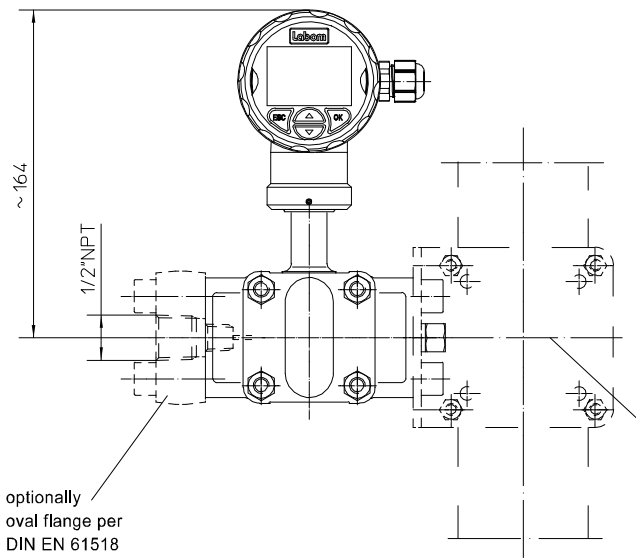Output (2-wire): 4...20 mA

Circular connector M12 x 1

Dimensions

Case and process connections

connection per DIN EN 61518

7/16-20 UNF

cable gland for cable ø5-10mm

1/4"NPT

1/2"NPT sealing plug

optionally with vent valve
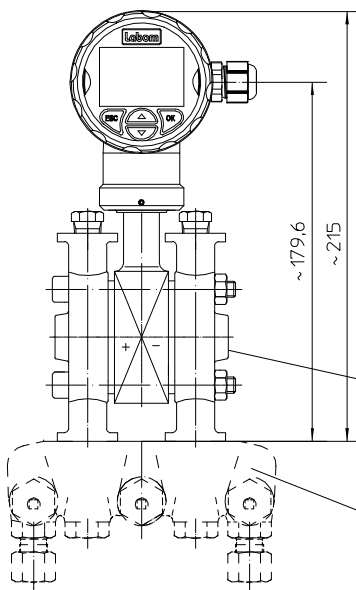
process flange 90° adjustable

Follow-up case and process connections
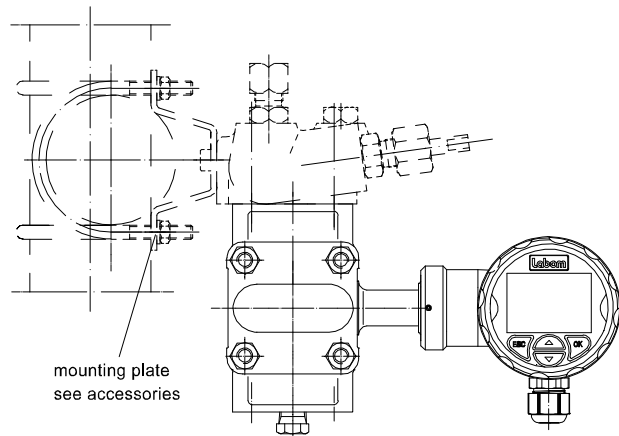
~ 164

1/2"NPT

optionally
oval flange per
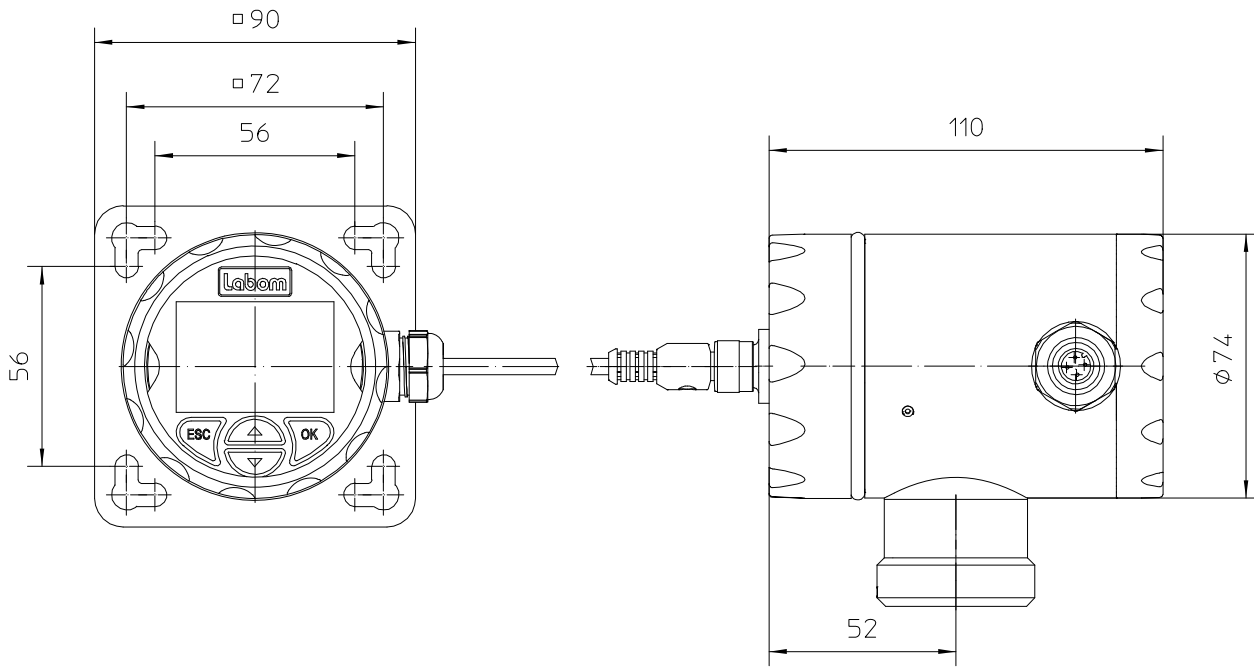DIN EN 61518

optionally
mounting angle
see accessories

~ 179,6

~ 215
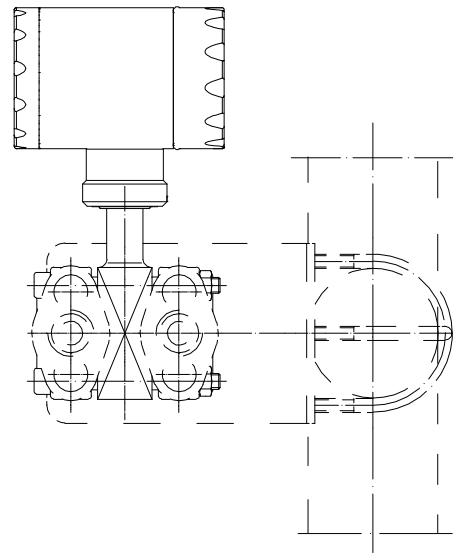
process flange 90°
adjustable

optionally
3- or 5-valve manifold
connetion per
DIN EN 61518
see product group D6

mounting plate
see accessories

Remote display and control unit (Type series MC1140)

Mounting angle for wall and pipe-mounting (Type series MM1500)

drilling diagram
for pipe ø35-50   ø2" (60,3)
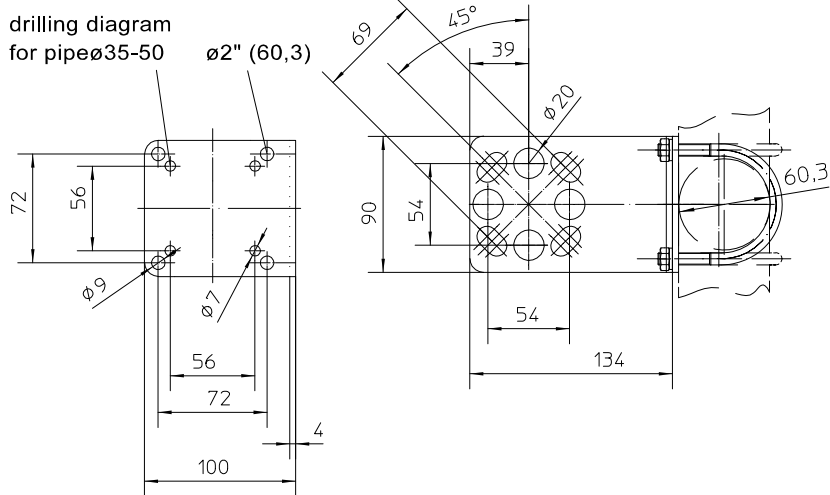
Order details

Pressure transmitter PASCAL Ci4 Delta P
for general application, Type series CI4300

Order details PASCAL Ci4 Delta P CI4300			
CI4300	Pressure transmitter PASCAL Ci4 Delta P for general application		
A1078	measuring range	0.25 bar	
A1053		1 bar	
A1056		4 bar	
A1059		16 bar	
F1	parameterisation	factory settings (standard)	
F2		as per customer's specification (pls. specify)	
H21	output signal	4…20 mA, with HART-Protokoll	
Y1.	material case	stainless steel mat.-no. 1.4301 (304)	
1	material front cover	polypropylene (black), window Macrolon	
2		stainless steel, window non splintering glass	
T20.		cable gland M16 x 1.5 polyamide, for cable Ø 4.5-10	
T22.		cable gland M16 x 1.5 stainless steel, for cable Ø 5-9.5	
T15.		cable gland M20 x 1.5 polyamide, for cable Ø 7-13	
T17.	electrical connection	cable gland M20 x 1.5 stainless steel, for cable Ø 8-13	
T27.		cable gland 1/2" NPT polyamide, for cable Ø 6-12	
0		cable clamps	spring clamp terminals up to 1.5 mm^2
5			pole terminals 2.5 mm^2
6			screwed terminals 2.5 mm^2
T30		circular connector M12 x 1 (4-polig)	
K41..	process connection	process flange with connection dimension per DIN EN 61518 - process connection 1/4 – 18 NPT - mounting thread 7/16 – 20 UNF	
1		with sealing plug of stainless steel mat.-no.1.4571 (316Ti)	
2		with vent valve of stainless steel mat.-no.1.4571 (316Ti)	
1		gasket of FKM Viton	
G1	diaphragm material	Stainless steel mat.-no. 1.4404 / 1.4435 (316L)	

Additional features (to be indicated in case of need, only)		
T4	degree of protection	IP 69K
M1	display	without display
W1201	calibration certificate	per DIN EN 10204-3.1, 5 measuring points
W2670	GOST	GOST-R certificate of conformity and declaration
W2672		certificate of measuring equipment for Russian Federation

Accessories		
MM1500-A11	mounting angle	for wall and pipe-mounting Ø 35-50 mm of stainless steel, incl. screws 7/16-20 UNF
MM1500-A12		for wall and pipe-mounting Ø 2" of stainless steel, incl. screws 7/16-20 UNF
MC1060-A132	oval flange	oval flange 1/2-14 NPT per DIN EN 61518, modal A of stainless steel mat.-no. 1.4404 (316L), incl. 2 screws 7/16-20 UNF, material stainless steel, incl. gasket PTFE
MC1060-A133		oval flange 1/2-14 NPT per DIN EN 61518, modal A of stainless steel mat.-no. 1.4404 (316L), incl. 2 screws 7/16-20 UNF, material stainless steel, incl. gasket FKM Viton

MC1140	PASCAL Ci4 remote display and control unit including wall bracket	
	material stainless steel, incl. front ring with seal and blind cap with circular connector M12x1	
A1.	connection cable	length: 10 m, material: PUR, with connector M12 x1
1		spring clamp terminals up to 1.5 mm^2
2	internal cable clamps	pole terminals 2.5 mm^2
3		screwed terminals 2.5 mm^2
T1	degree of protection	IP 65 / IP 67 (standard)
T4		IP 69K

MZ8120-A11	mounting set for wall bracket	2 mounting brackets for pipe and frame mounting Ø 30-50 mm, incl. nuts and washers
MZ8120-A12		2 mounting brackets for pipe and frame mounting Ø 40-64 mm, incl. nuts and washers
MC1020	HART-Modem	RS 232 -interface
MC1040		USB-interface

Bestellbeispiel: CI4300 – A1056 – F1 – H21 – Y12 – T200 – K4111 – G1 - …