

## Introduction

These operating instructions refer to installation, commissioning, servicing and adjustment. Statutory regulations, valid standards, additional technical details in the relevant data sheet, details of the type plate, and any additional certificates are to be observed along with these operating instructions.



## Safety instructions

- Installation, operation and maintenance of the instrument may be executed by authorized personnel, only, using suitable equipment.
- Warning: If the instrument is used incorrectly it is possible that serious injuries or damage can occur! Due to incorrect installation or adjustment overflow may arise.
- Prior to the disassembly of the pressure transmitter the impulse ducts between the measuring transmitter and the process have to be locked and relieved from pressure.
- The standard nominal pressure rating should be observed for all process connections.
- Pressure transmitters that are mechanically defective can cause injuries or give rise to process faults. Suitable precautions should be taken to avoid this.

## CE marking

The CE marking on the instruments certifies compliance with valid EU directives for bringing products to market within the European Union. The following directives are met:

EMC directives	EMC	2004/108/EG
Pressure Equipment Directive	PED	97/23/EG
Ex directive	ATEX	94/9/EG
Lower Voltage Directive	LVD	2006/95/EG

## Ex approval

Electrical equipment in hazardous areas should only be installed and commissioned by competent personnel. Modifications to devices and connections destroy the operating safety, the ex-proofing and the guarantee. The limit values detailed in the certificate of conformity are to be observed.

certificate no.	TüV 99 ATEX 1414 X
ex-protection intrinsically safe	II 1/2 G EEx ia/ib IIC T4/T5/T6

## Mounting and operating

- Before mounting the instrument ensure that pressure range, overpressure resistance, media compatibility, thermostability and pressure port are suitable for the process at hand.
- Using a 3- or 5-valve manifold allows for easy commissioning, mounting and maintenance without interrupting the process.
- Conduct process installation before electrical installation.
- Measuring instruments that should not have any oil or grease residues in the pressure port are marked „Free of oil and grease“.
- Gaskets must be chosen that are suited to the process connection and resistant to the measured medium. This applies to the use of connecting parts per DIN EN 61518, too. With NPT threads only new PTFE sealing tape has to be used.
- Excess pressure on the minus side of the measuring system can damage the instrument.
- Check for pressure tightness when commissioning the transmitter.
- Process flanges:  
In case of dismounting the process flanges, do not touch the diaphragm.  
To twist the process flanges with respect to the device, undo the flange screws and withdraw them from the bore holes. Then, turn

the process flange to the desired position and tighten the screws to 50 Nm.

- Wire up the instrument with power switched off.
- Instruments with case protection IP67 and pressure ranges to 16 bar/ 250 psi are aerated through the connection cable. Place an aeratable cable in an aeratable connection chamber during mounting. This will compensate for atmospheric variations.
- The mounting position should be taken into consideration when checking the zero output. Standard transmitters are adjusted at the factory for vertical mounting. Changes to the mounting position can cause zero shifts. These drifts can be corrected by adjustment on site.
- When the instrument is opened any contact with the electrical connections can affect the signals. This situation can be avoided by switching off the supply voltage or by disconnecting the signal circuit.
- The types of protection IP67 are only achieved, when both threaded rings have been screwed tight after electrical connection/parameterization.
- The instrument requires no maintenance.
- The instrument can only be protected against electromagnetic interference (EMC) if the conditions for screening, earthing, wiring and potential isolation are met during installation.

## Mounting the mounting angle (optional accessory)

The mounting kit for the mounting angle contains four, 30 mm long, UNF 7/10-20 screws and two stop tubes with washers and nuts. To screw the mounting angle tightly to the device, remove the 1/4" end plug (when you are mounting the angle be sure it is pointing in the right direction!). In other words, when you are working with vertical piping or surface-mounted devices, mount the angle in the vertical direction. Use new sealing tape to seal and screw tight the mounting angle with the transmitter and 1/4" end plug.

When fitting to horizontal piping or for bottom assembly, you should mount the angle in a horizontal position. In this case, place the stop tubes over the stay tube and screw to mounting angle.



## Zero-point correction

Should you need to adjust the zero-point on site, then undo the front threaded ring to gain access to the controls. You will find instructions on using the keyboard in your manual. To set the measuring span, you should apply an accurate reference pressure.

## Transportation and storage

Store and transport pressure transmitters under dry, clean condition and, where possible, in their original packaging.  
Permissible storage temperature: -25°C.....+60°C. Avoid shock and vibrations.

**Further information required? Hotline +49 (0) 4408 804-444**

## Techn. Data

nominal range	measuring range	measuring spans		overload limits		max. static excess pressure both sides	adjustable engineering units								
		min.	max.	+side max.	-side max.		mbar	bar	mmHg	mWC	KPa	psi	%	mA	
1000 mbar	-1000...1000 mbar	100 mbar	2 bar	6 bar	6 bar	-0.5...75 bar	x		o	o	o	o	o	o	o
4000 mbar	-1000...4000 mbar	400 mbar	5 bar	16 bar	16 bar	-0.5...75 bar	x		o	o	o	o	o	o	o
16 bar	-1...16 bar	1.6 bar	17 bar	30 bar	30 bar	-0.5...75 bar		x		o	o	o	o	o	o

### Case design

stainless steel with hardened surface,  
mat.no. 1.4305  
type of protection with closed case IP 67

### Electrical connection

cable entry conduit thread for cable diameter  
5...10 mm  
terminal screw connection up to 2.5 mm<sup>2</sup>

### Process connection DIN EN 61518

see order details

### Positioning process connection

can be mounted in any position and adjusted to suit with:  
· a housing that can be progressively ( $\pm 170^\circ$ ) rotated  
· adjusted indicating unit (standard orientation: 6 o'clock, options: 3, 9, and 12 o'clock)

### Measuring system

piezoresistive sensor element

### Filling material

silicone-free synthetic oil

### Window

safety glass

### Weight

approx. 4 kg

### Operating temperature range

ambient temperature -10...+55 °C  
process temperature -20...+90 °C

### Allowed storage temperature

-25...+60 °C

### Influence ambient temperature on transmitter

temperature range +10...+30 °C  
lower range value: 0.1 % / 10 K  
upper range value: 0.1 % / 10 K

temperature range +10...+55 °C or +30...+55 °C  
lower range value: 0.2 % / 10 K  
upper range value: 0.2 % / 10 K

### Supply voltage

standard version  
· function range 12...50 V DC  
· max. perm. 50 V DC  
Ex-design  
· perm. voltage range  
function range 12...30 V DC  
max. perm. 30 V DC

### Output signal

output signal (2-wire) 4...20 mA	
lower limit	3.8 mA
upper limit	20.8 mA
malfunction lower limit	< 3.6 mA
malfunction upper limit	> 21 mA

### Output function

adjustable:  
· linear  
· inverse  
· root function  
· function table 12 points

### Load

$R \leq \frac{U - 12 V}{23 mA}$  (Ohm)

### Damping

digital filter (only current output)  
0...30 s selectable in steps of 0.2 s  
basic electrical damping 0.2 s

### Measuring cycle

typ. 0.8 s

### Current sensing function

3.6...21.5 mA selectable in steps of 0.01 mA

### Non-conformity of a curve

with reference of nominal range  
 $\leq 0.2\%$  (fixed point adjustment)  
 $\leq 0.1\%$  as option

### Nominal pressure

max. 75 bar (both sides)

### Long-term drift

with reference to nominal range  
typ.  $\leq 0.1\%$ /year

### Overload influence

$> 0.01\%$  of nominal range x  $\frac{st. pressure}{bar}$

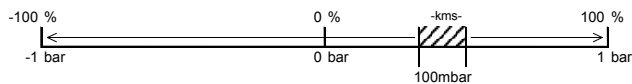
### Certificates/tests

EMC directives 2004/108/EG  
Interference emission EN55011  
Noise immunity EN61000-4-2:2001-  
EN61000-4-6:2001  
EN61000-4-16/  
NAMUR NE21:1998

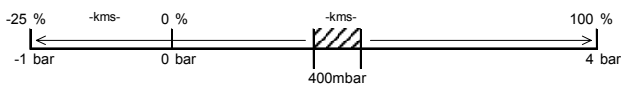
## Adjustment (Example)

nominal range: 1000 mbar rel.

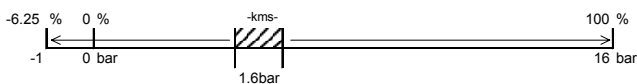
smallest measuring span -kms-



nominal range: 4000 mbar rel.



nominal range: 16 bar rel.



## Type plate

manufacturer → **labom**  
INDUSTRIELLE MESSTECHNIK  
27798 HUDE / GERMANY

type designation → **Differential pressure transmitter PASCAL DELTA P CI1301**

certificate number → TÜV 99 ATEX 1414 X  
type of ex-protection → II 1/2G Ex ia IIC T4/T5/T6

marking → **CE** **Ex**  
0044

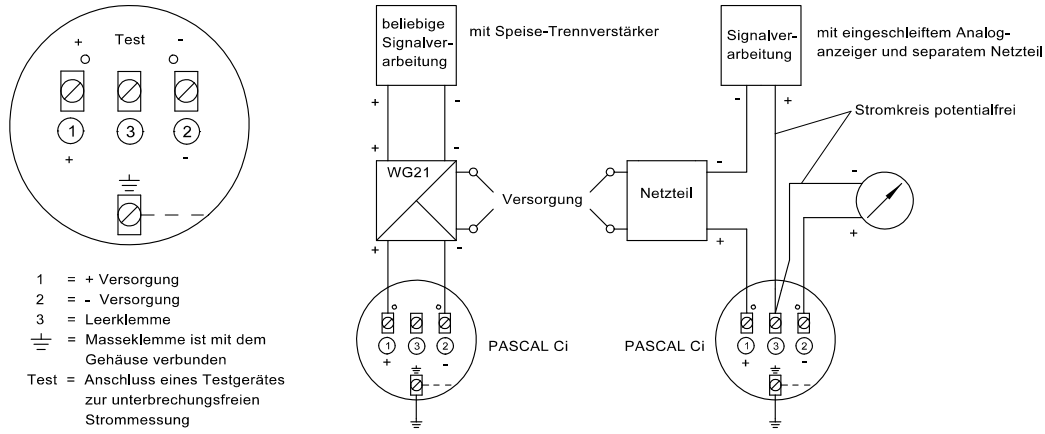
Software 5.5  
Made in Germany

limit values → **Ui ≤ 30 VDC**  
**li ≤ 150 mA**  
**Pi ≤ 1.0 W**  
**Ta ≤ 40°C**  
**Tm ≤ 40°C**

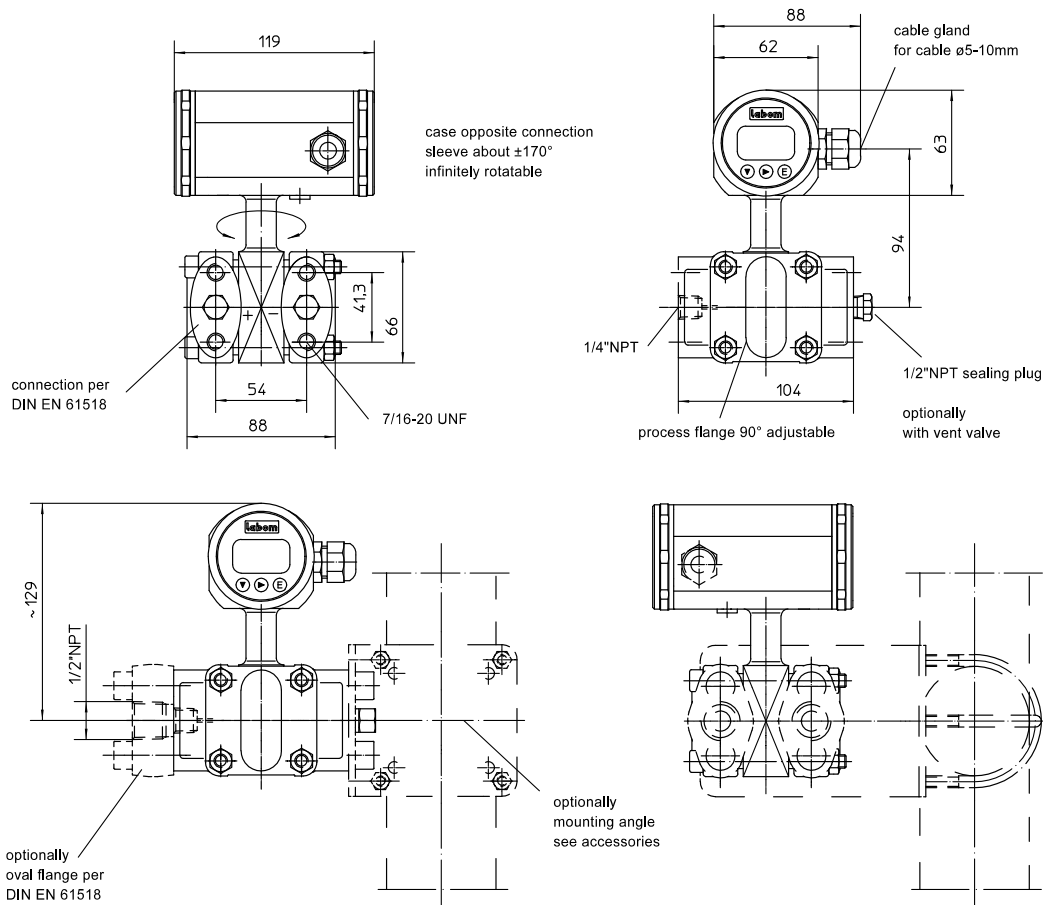
technical description → **Nominal range: 4000 mbar**  
**Meas. range: 0...4000 mbar**  
**Overpress. limit: 16 bar**  
**Output: 4...20 mA**  
**Syst. filling: FD1**

serial number → **Order No.: 0600000/01/001**

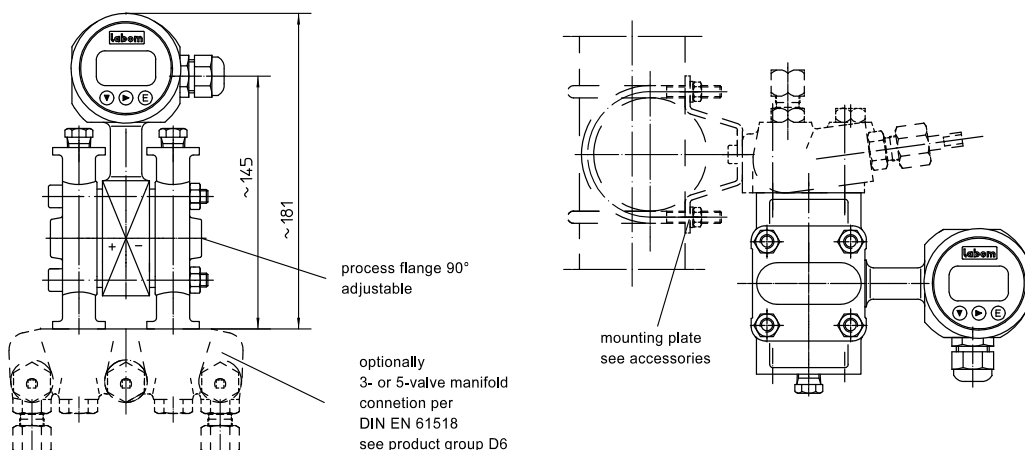
## Connection diagram/connection examples



## Dimensions and design modifications



## Mounting of manifold (example)





1. Supplement to EC Type-Examination Certificate No. TÜV 99 ATEX 1414 X

Translation

1. SUPPLEMENT to

EC TYPE-EXAMINATION CERTIFICATE No. TÜV 99 ATEX 1414 X

of the company: labom Mess- und Regeltechnik GmbH  
 Im GewerbePark 13  
 D-27798 Hude

In the future, the pressure transmitter type Cl...1 S..6. may also be manufactured according to the test documents listed in the test report. The changes refer to the construction of the pressure sensor and the sensor circuit board as well as to the electrical data.

The pressure port may be erected in explosion hazardous areas that require apparatus of the category 1.

The maximum permissible ambient temperature on the housing  $T_a$ , the maximum permissible medium temperature on the pressure port  $T_M$  and the temperature class then have to be taken from the following table:

$T_a$ [°C]	$T_M$ [°C]	Temperature class
40°C	40°C	T6
60°C	50°C	T5
70°C	60°C	T4

Extension of the temperature range: see "Special conditions for safe use"

Electrical data

Input circuit ..... in type of protection „Intrinsic safety“ EEx ia IIC  
 (Terminals 1+, 2- and GND)

only for connection to a certified intrinsically safe circuit

Maximum values:

$U = 30V$

$I_i = 150 mA$

$P_i = 1 W$

The effective internal inductances and capacitances are negligibly small.

The pressure transmitter type Cl...1 S..6. also meets the requirements of EN 50 020:2002 and EN 50 284:1999 .

The marking of the pressure transmitter according to this 1. supplement reads II 1/2 G EEx ia IIC T6.

Special conditions for safe use

1. The pressure port of the pressure transmitter type Cl...1 S..6. is allowed to be operated in an explosion hazardous atmosphere, which requires apparatus of the category 1, only if atmospheric conditions exist (Temperature from -20°C to 60°C, pressure from 0.8 bar to 1,1 bar).

If the explosion hazardous atmosphere does not require apparatus of the category 1, the maximum permissible ambient temperature in the area of the pressure port  $T_M$  may be taken from the following table:

$T_a$ [°C]	$T_M$ [°C]	Temperaturklasse
40°C	40°C	T6
60°C	60°C	T5
70°C	70°C	T4

Operating temperatures and -pressures have to be taken from the regarding data of the manufacturer (manual), if no explosion hazardous gas mixtures exist.

2. It has to be ensured, that potential compensation exists in the complete course of the wiring.

Test documents are listed in the test report N° 03YEX550256.

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Hannover, 2003-11-12