

JUMO dTRANS p02

Pressure Transmitter



B 404385.0
Operating Manual



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1.1 Application

General

The type JUMO dTRANS p02 is used to measure the pressure of corrosive and non-corrosive gases, vapors and liquids. The pressure transmitter uses the piezo-resistive effect to make the measurement. The output signal is a proportional DC current which is linearly proportional to the input pressure.

Version with Ex protection

The JUMO dTRANS p02 pressure transmitter in intrinsically safe version marked Ex II 1/2 G Ex ia IIC T6 Ga/Gb, is suitable for mounting within the hazardous area Zone 1 for connection to Zone 0.

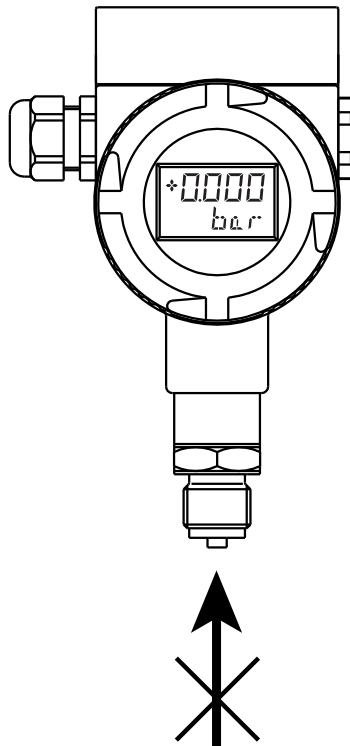
The EC Type-Examination Certificate for the JUMO dTRANS p02 is:
PTB 98 ATEX 2194

If this pressure transmitter is used in areas with potentially explosive atmospheres, the appropriate regulations for installing and operating equipment in such areas must be observed.



CAUTION!

The diaphragms of the JUMO dTRANS p02 pressure transmitter must not be damaged. Do not insert any objects into the bores of the pressure connections!



1 General information

2.1 Warning signs



DANGER!

Failure to follow this manual or failure to follow them precisely may result in **injury!**



CAUTION!

Failure to follow this manual or failure to follow them precisely may result in **damage to instruments or data!**

2.2 Reference signs



NOTE!

This sign is used to draw **special attention** to something.

abc¹

Footnote

Footnotes are remarks that **refer to specific points** in the text. Footnotes consist of two parts:

Markers in the text and the footnote text.

The markers in the text are arranged as sequential superscript numbers.

*

Action instruction

This sign indicates that an **action to be performed** is described.

The individual steps are marked by this asterisk.

Example:

* Loosen Phillips-head screws.

* Press key.

2 Safety information

3 Delivery package

Operating Manual B 404385.0

This operating manual is a comprehensive guide for the installation, electrical connection, commissioning, operation and parameterization of the JUMO dTRANS pO₂ pressure transmitter.

JUMO calibration certificate

A JUMO calibration certificate and a setup print-out comes with each pressure transmitter. These documents contain information on the parameter settings and/or the measured characteristic data for the transmitter concerned.

If this calibration certificate is lost, or should you need an additional one, it can be ordered from JUMO stating the serial No. of the pressure transmitter (see nameplate),

⇒ see **addresses of suppliers** on the back of this operating manual.

Setup program

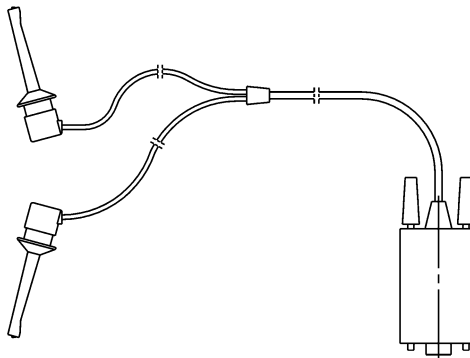
All the parameters of the transmitter can be conveniently checked and adjusted by using the setup program. Furthermore, additional functions are available such as:

- Recording of measurements.
- Graphical display of temperature and pressure.
- Comprehensive diagnostic messages.
- Indication of the complete order code and instrument configuration (for repeat orders).

The setup program is available on request, at extra cost, part no. 00365072.

HART[®] modem

The HART[®] modem serves to connect the JUMO dTRANS pO₂ to a PC. The HART[®] modem is available on request, at extra cost, part no. 00345666.



Power supply

A supply unit with a supply isolator is available on request, at extra cost, part no. 00577948.

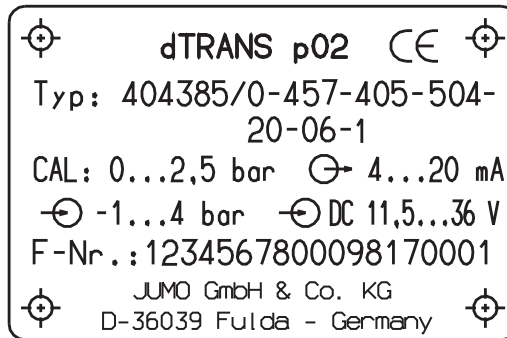
Pressure separator

To suit special applications, where conventional pressure connections cannot be used, see Data Sheets 409770 to 409786.

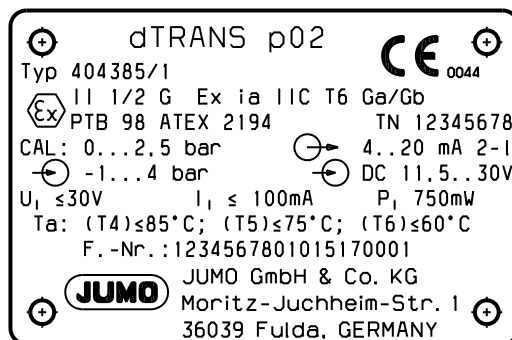
3 Delivery package

4 Instrument identification

4.1 Nameplate



Nameplate on a pressure transmitter **without** approval for use within the hazardous (Ex) area.



Nameplate on a pressure transmitter **with** approval for use within the hazardous (Ex) area.

4 Instrument identification

4.2 Order details

(1) Basic type	
404385/0	JUMO dTRANS p02 - Pressure transmitter
404385/1	JUMO dTRANS p02 - Pressure transmitter with Ex protection Ex II 1/2 G Ex ia IIC T6 Ga/Gb
404385/4	JUMO dTRANS p02 - Pressure transmitter for increased temperature of medium up to 200 °C ^a
(2) Nominal range input	
414	-100 to +100 mbar gauge pressure
453	-0,6 to +0,6 bar gauge pressure
457	-1 to +4 bar gauge pressure
461	-1 to +25 bar gauge pressure
464	-1 to +100 bar gauge pressure ^b
468	-1 to +600 bar gauge pressure ^b
487	0 to +0,6 bar absolute pressure
491	0 to 4 bar absolute pressure
495	0 to +25 bar absolute pressure
(3) Output	
405	4 to 20 mA with HART [®] protocol
(4) Process connection	
504	1/2" pipe to EN 837
512	1/2-14 NPT to EN 837
564	1/2-14 NPT internal
571	3/4" pipe flush to EN 837 ^a
583	M20 (× 1,5) with tap
604	Taper connection with slotted nut DN 25 to DIN 11851 ^c
606	Taper connection with slotted nut DN 40 to DIN 11851 ^c
613	Clamp connection DN 25 to DIN 32676 ^c
616	Clamp connection DN 50 to DIN 32676 ^c
997	JUMO PEKA ^d
(5) Material for process connection	
20	CrNi (stainless steel)
82	NiMo
(6) Electrical connection	
06	Screw terminals
99	Special connection ^e
(7) Filling medium for measuring system	
0	None
1	Silicone oil
(8) Extra code	
000	None
452	Parts in contact with the medium electro-polished, surface roughness Ra ≤ 0.8µm

4 Instrument identification

- ^a Measuring instruments for increased measuring material temperatures are not available with nominal ranges 464 and 468; they are only available with process connections 571, 604, 613, and without protection class Ex ia IIC.
- ^b Measuring instruments with nominal ranges 464 and 468 are available with process connections 504, 512, 564 and 997. A filling of measuring systems with silicone oil is not possible.
- ^c The a. m. process connections are not suitable for protection class Ex ia IIC.
- ^d Suitable process connection adapter, see data sheet 409711.
- ^e Please specify in plain text.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)
Order code		-		-		-		-		-		-		/	
Order example	404385/0	-	453	-	405	-	613	-	20	-	06	-	1	/	000

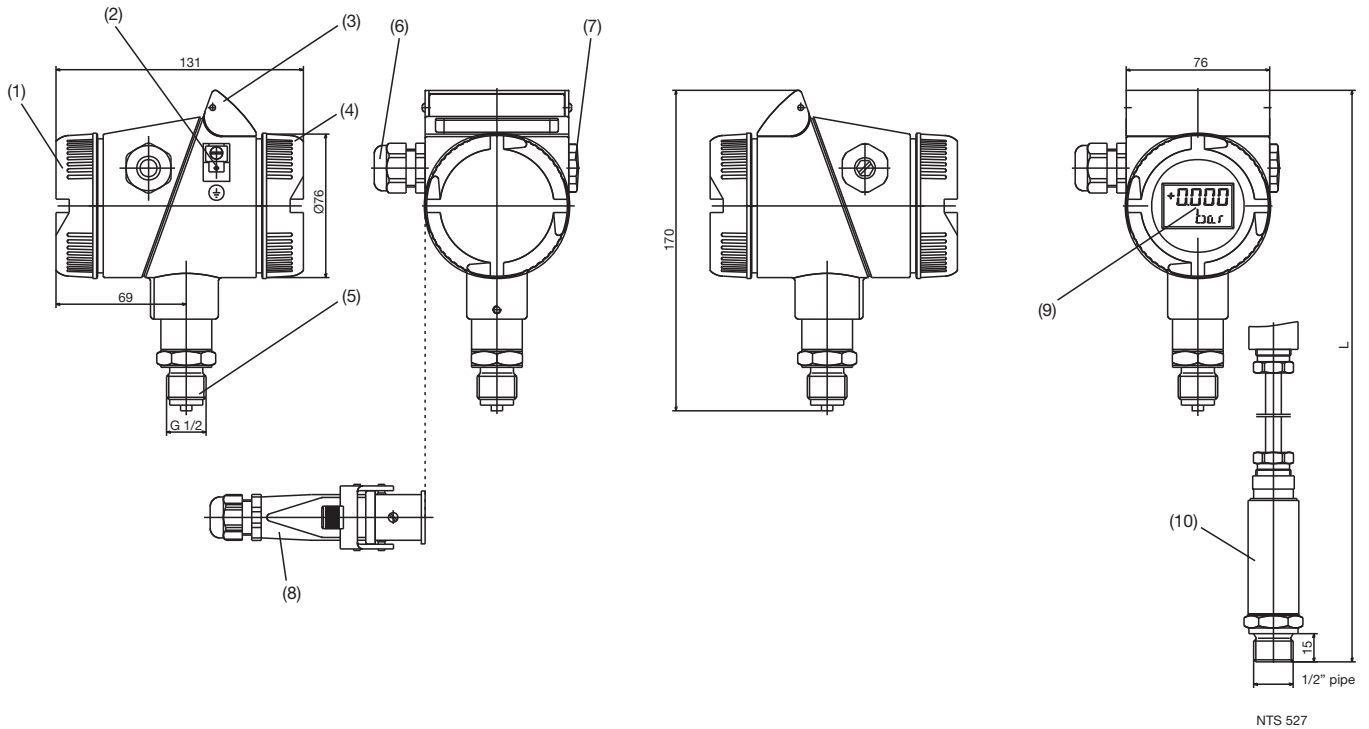
4.3 Accessories

Description	Part no.
Setup program for all instruments in the JUMO dTRANS p02 series	00365072
HART [®] modem USB	00443447
Ex-i Power supply/input isolating amplifier	00577948
2-valve manifold, PN 420, DN 5, version 1/2-NPT or 1/2-NPT	00561605
2-valve manifold, PN 420, DN 5, version 1/2-NPT or G 1/2	00550362

	Data Sheet
Pressure separator with milk pipe fitting DIN 11851	409772
Pressure separator with clamp connection	409774
Pressure separator with DRD flange or Varivent connection	409776
Pressure separator with ISS connection or SMS connection or RJT connection and slotted ring nut	409778
Diaphragm chemical seals 4MDV-10	409780
Pressure separator with male thread ISO 228/1 or ANSI B 1.201	409782
Pressure separator with flange connection EN 1092-1 with sealing lip Form B1	409784
Pressure separator with flange connection to ANSI B 16.5 with sealing lip Form RF	409786

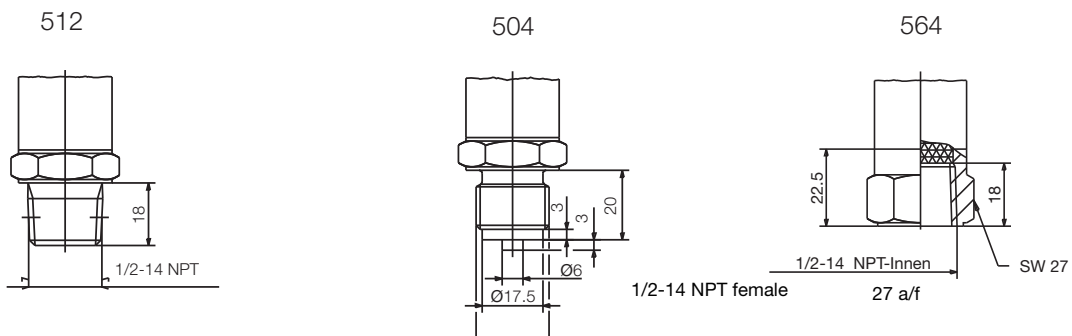
4 Instrument identification

4.4 Dimensions/details



- | | |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| (1) Cover for electrical connection | (2) PE connection |
| (3) Cover flap (keypad underneath) | (4) Bezel |
| (5) Process connection | (6) Electrical connection, M 20 × 1.5 cable gland |
| (7) Blanking plug (electrical connection or instrument mounting possible) | (8) Electrical connection, Harting connector Han 7D/Han 8D (8U) |
| (9) LCD display | (10) Special version "Process connection": pressure sensor connected to indicating unit via attached cable |

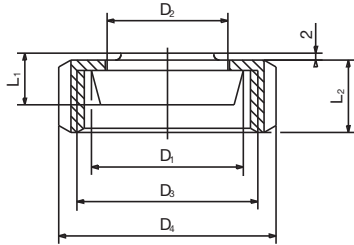
4.5 Dimensions: "non-flush pressure connections"



4 Instrument identification

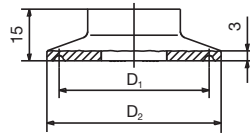
4.6 Dimensions: "flush pressure connections"

604/606
taper connection with slotted ring nut
to DIN 11 851



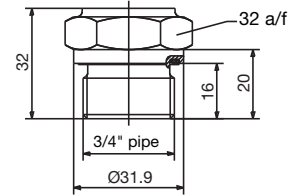
DN	D ₁	D ₂	D ₃	D ₄	L ₁	L ₂	NTS
25	Ø44	Ø35	RD 52x1/6	Ø63	15	21	604
40	Ø56	Ø48	RD 65x1/6	Ø78			606

613/616
to DIN 32676



DN DIN32676	DN (inch)	Nominal Size ISO 2852	Storlek SMS 3017	D ₁	D ₂	NTS
25	1.5" 1"	25	25	Ø50.5	Ø43.5	613
50	2"	51 40	51	Ø64	Ø56.5	616

571



4 Instrument identification

Range

Start and end of range can be adjusted continuously within the measuring range. The measuring span should not go below 10 % of the nominal range.

⇒ Chapter 4.1 "Nameplate", page 11; 

For setting the measurement start or span:

⇒ "Measurement start, blind setting", page 47

⇒ "Measurement span, blind setting", page 48

Mechanical shock

50 g/11 msec

Mechanical vibration

5 g max. at 10 to 2000 Hz

Protection

with connecting cable: IP65 to EN 60529

Material of wetted components

standard: stainless steel, mat. ref. 1.4435, 1.4571

optional: NiMo, mat. ref. 2.4819

for range ≥ 100 bar: stainless steel, mat. ref. 1.4571, 1.4542

Material for housing

aluminium die-casting GDAI Si 12

Permissible temperature of medium

-40 to +120 °C for type 404385/0

-40 to +120 °C for type 404385/1

-40 to +200 °C for type 404385/4

Permissible ambient temperature

to DIN 16086

-40 to +85 °C for type 404385/0

-40 to +60 °C for type 404385/1

-40 to +85 °C for type 404385/4

(at temperatures below -20 °C, the LCD display may not be readable)

Storage temperature

-40 to +85 °C

Overload limit

to DIN 16086

-1 bar and 4× full scale or

-1 bar and 2× full scale with range ≥ 100 bar

Bursting pressure

to DIN 16086

10× full scale, 2000 bar max.

5 Technical data

Explosion protection

Ⓔ II 1/2 G Ex ia IIC T6 Ga/Gb,
to EN 60079-0, EN 60079-11 and EN 60079-26

EC-Type Examination Certificate

PTB 98 ATEX 2194

Permissible ambient temperature

Temperature class		
T4	T5	T6
+85 °C	+75 °C	+60 °C

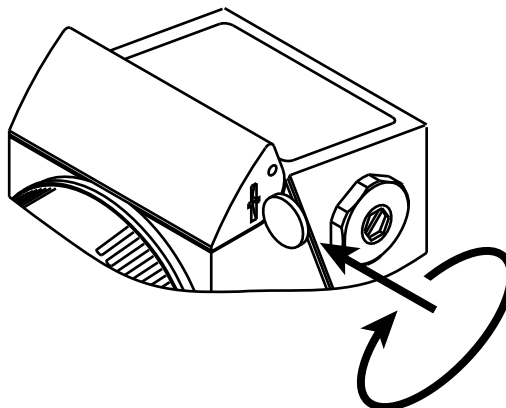
6.1 General

Open cover flap

The cover flap can be opened with a coin.

The keys for operating the JUMO dTRANS p02 are underneath the cover flap. For details on the setting options see:

⇒ Chapter 9.1 "The level concept", page 41ff.



List of functions

* Affix one of the enclosed lists of functions to the cover flap.

6.2 Prior to mounting



CAUTION!

De-pressurize the system before mounting the JUMO dTRANS p02 pressure transmitter!



NOTE!

The installation site should be readily accessible, as close as possible to the measurement point, and largely free from vibration. The permissible ambient temperature limits must be observed (note possible radiant heat).

The JUMO dTRANS p02 pressure transmitter may be mounted above or below the pressure tapping.



NOTE!

The measurement arrangements below serve as an example and can be altered according to the requirements of the measurement task.

6 Mounting

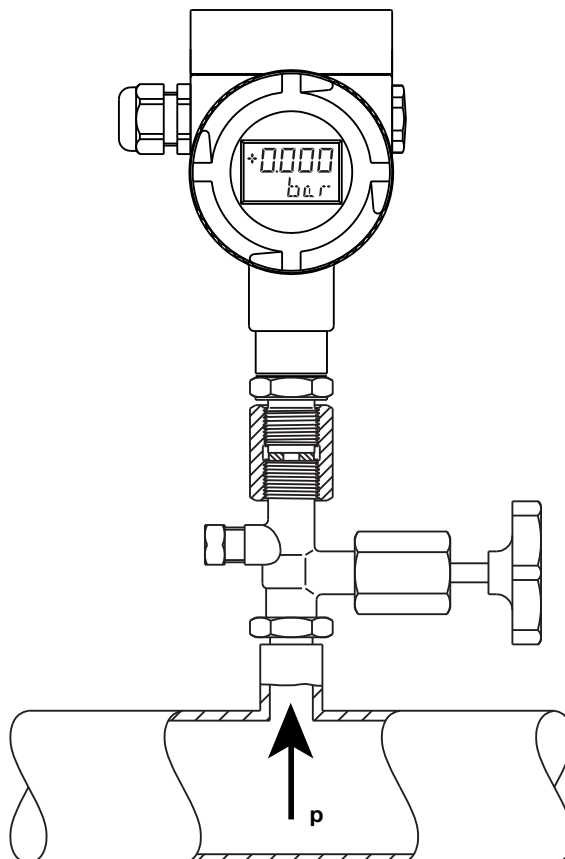
Operating position

The normal operating position of the JUMO dTRANS p02 pressure transmitter is vertically upright.

Depending on the conditions of the measurement site, the pressure transmitter can also be mounted in a different orientation. In accordance with the required operating position, the LCD can be rotated in 90° steps, see

⇒ "Rotating the housing", page 53.

6.3 Mounting by the pressure connection



6.4 Mounting by the housing

There are M20 × 1.5 threads on either side of the housing. One of the threads is used to screw in the cable gland (optionally right or left). The other thread can be used to mount the pressure transmitter.

6.5 Pressure connection

Seals

Seals to EN 837 or DIN 16 258 may be used.

Tightening torque

200 Nm max.

The correct tightening torque depends on the size, material and shape of the seal that is used, as well as on the pressure connection of the pressure transmitter.

Check for tightness

After establishing the pressure connection, it must be checked for tightness.



CAUTION!

Note the sequence when opening or closing the valves!

⇒ Chapter 8.3 "Measuring the absolute pressure", page 34ff

or

⇒ Chapter 8.4 "Measuring the gauge pressure", page 37ff.

6.6 Use inside the Ex area



DANGER!

With intrinsically safe protection EEx ia IIC, when used in Zone 0 with process connection 504, a flat metal gasket ring, e.g. to EN 837 or DIN 16 258, must be used.

6 Mounting

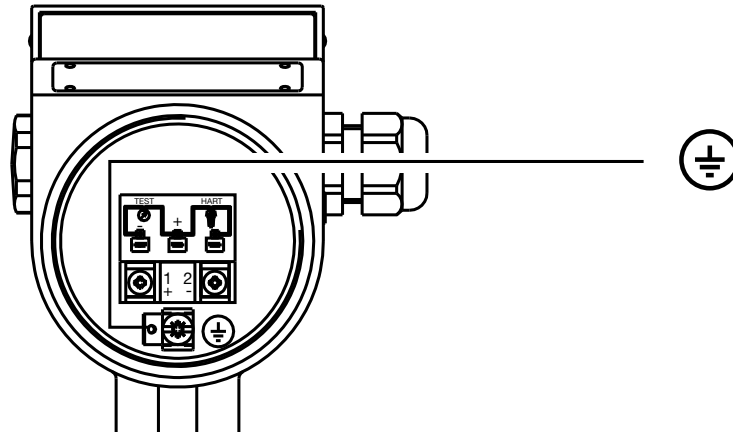
7 Installation

7.1 Electrical connection



NOTE!

Ground the device!



* Unscrew the cover from the housing.

⇒ Chapter 10.1 "Unscrewing the bezel ring or housing cover", page 51

General notes

- Cable diameter 6 to 12 mm.
- Conductor cross-section up to 1.5 mm².
- Route signal lines separately from cables with voltages above > 60 V.
- Use shielded cables with twisted cores.
- Avoid the neighborhood of large electrical systems.
- The full specification according to HART[®], version 5.1, will only be achieved with shielded cables.



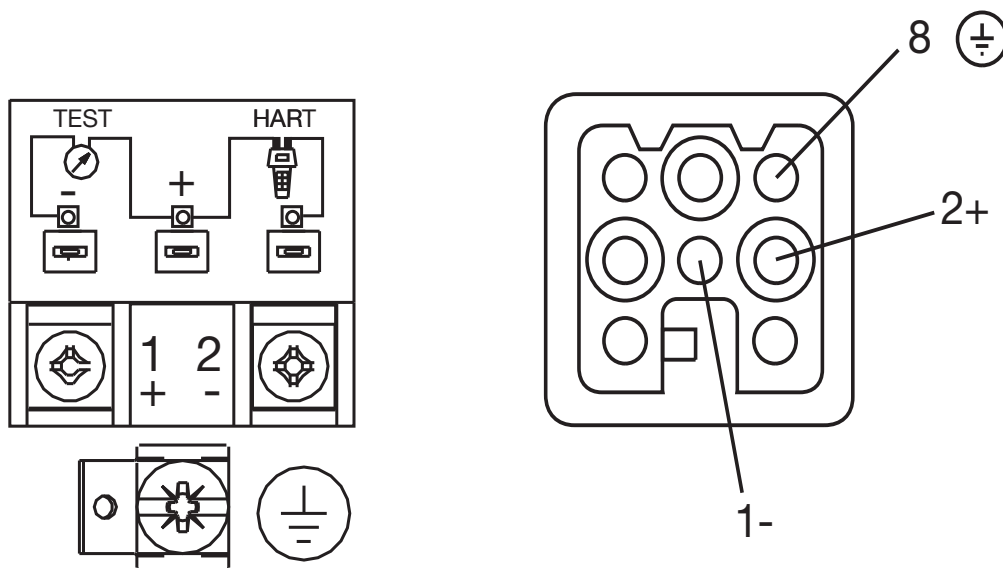
NOTE!

Equipment for potentially explosive areas which contain hybrid mixtures has to be especially checked for this use. Hybrid mixtures are potentially explosive mixtures out of combustible gases, vapors, or mists with combustible dust. The operator bears the responsibility of checking if the equipment is suitable for such uses.

7 Installation

7.1.1 Connection with screw terminals/Harting connector Han 7D/ Han 8D (8U)

Connection diagram

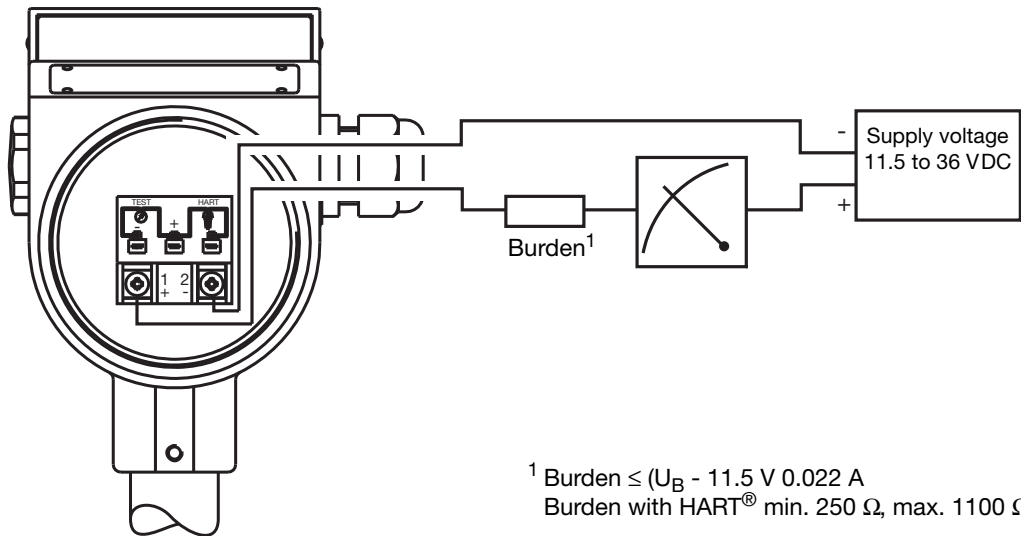


Screw terminals

Harting connector

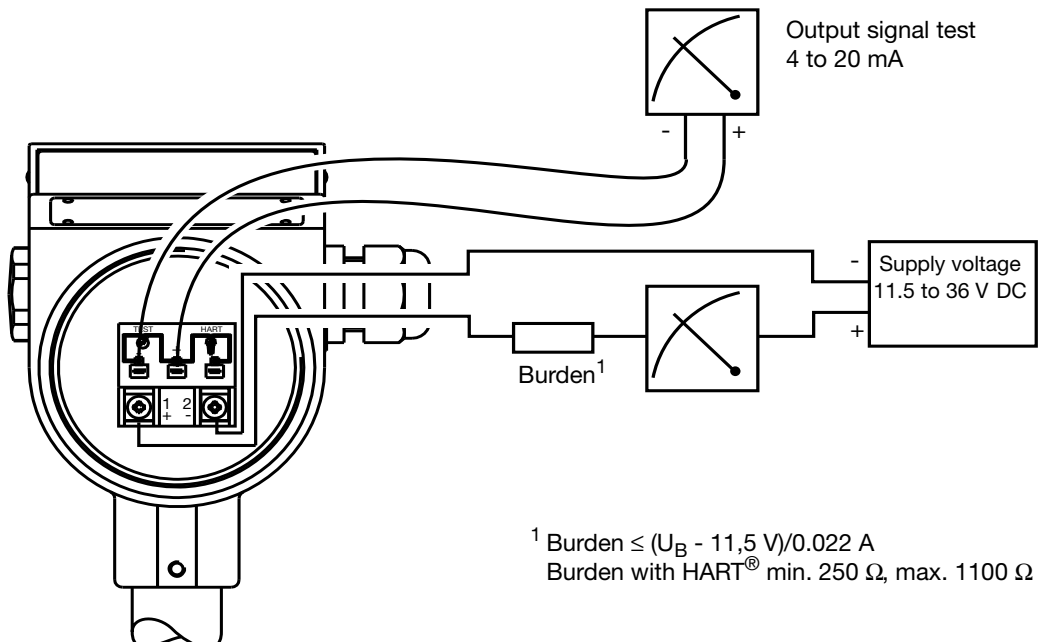
Connection		Terminals
Supply 11.5 to 36 V DC 11.5 to 30 V DC for intrinsically safe version		1 L+ 2 L-
Output 4 to 20 mA 2-wire		1 L+ 2 L- proportional current 4 to 20 mA in supply
Test connection for current output	Internal resistance of ammeter $\leq 10 \Omega$	TEST + TEST -
Test connection for HART [®]	Burden must be present!	TEST + HART [®]
Potential equalization (with intrinsically safe circuit)		
Shield		
Caution: Ground the device! (Pressure connection and screen)		

Connection



- * Unscrew the housing cover
⇒ Chapter 10.1 "Unscrewing the bezel ring or housing cover", page 51.
- * Insert the cable through the cable gland.
- * Make the connection according to the connection diagram.
- * Close the housing cover.

7.2 Testing the output signal



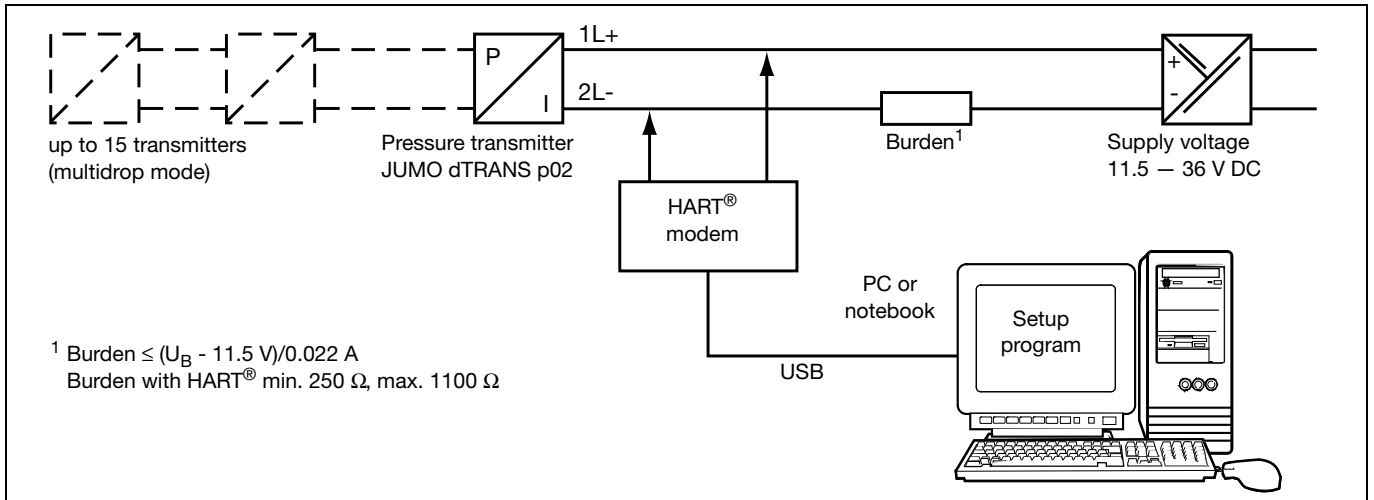
NOTE!

Test connection via faston connectors 2.8 mm × 0.8 mm or test terminals.

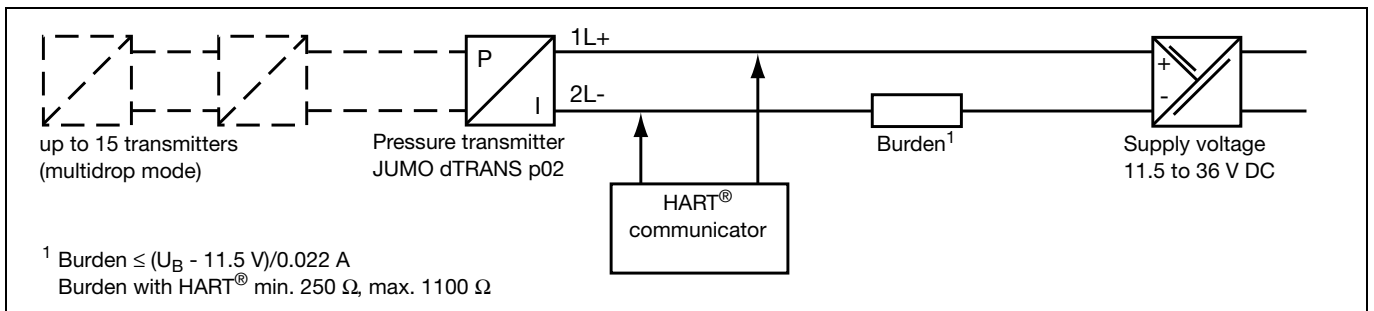
7 Installation

7.3 HART® communication

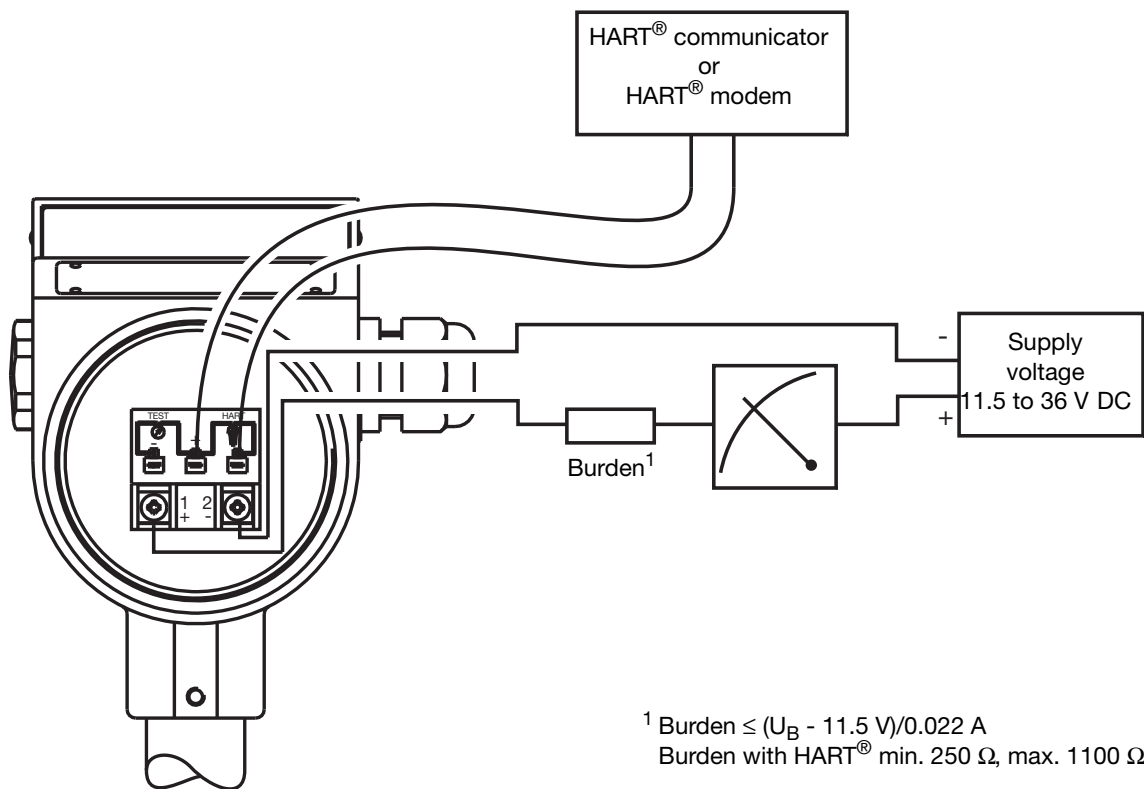
between PC and transmitter



between HART® communicator and transmitter



7.4 Testing the HART[®] communication



NOTE!

Test connection via faston connectors 2.8 mm × 0.8 mm or test terminals.

7 Installation

7.5 Electrical connection in the hazardous (Ex) area

General

The appropriate regulations must be observed when making the electrical connection; inside the area with an explosion hazard this is, in particular:

- The regulations concerning electrical equipment in areas with an explosion hazard (Elex V).
- The regulation for the installation of electrical equipment in areas with an explosion hazard EN 60079-14.
- EC-Type Examination Certificate
- Only certified measuring devices may be used in intrinsically safe circuits!



DANGER!

The HART[®] modem must not be used in the hazardous area!

The supply must be intrinsically safe and must not exceed the following maximum values:

U_i: 30 V DC

I_i: 100 mA

P_i: 750 mW

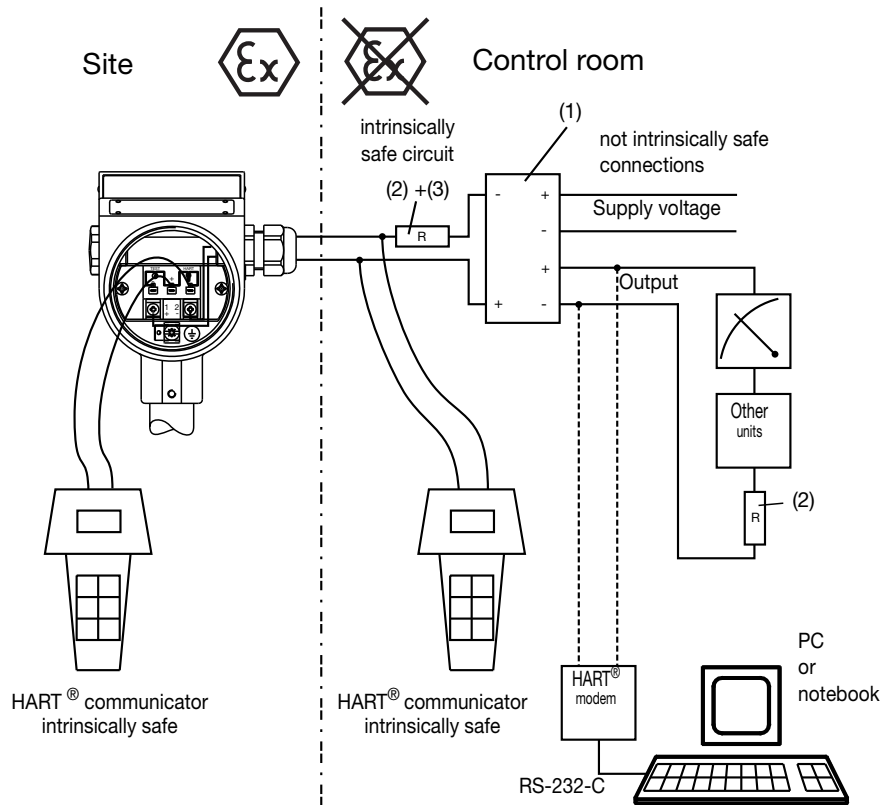


NOTE!

The connection of the HART[®] communicator or the HART[®] modem is optional.

For fault-free communication, the signal circuit must be loaded with a minimum burden of 250 Ω. When supply isolators are used, the burden is in most cases already integrated.

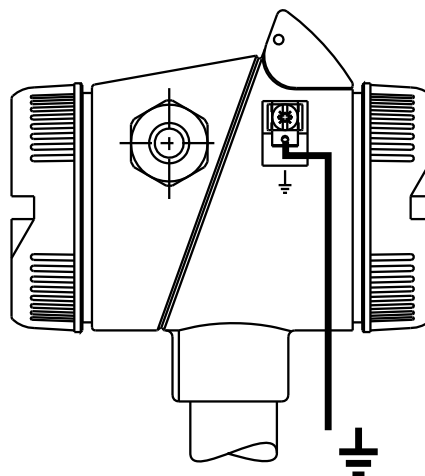
7.5.1 Connection diagram "EX"



- (1) Supply unit with isolating transformer for connecting a transmitter with explosion protection
- (2) Total resistance for HART® communicator or HART® modem: 250 Ω min. 1100 Ω max. The current limiting resistor which is integrated in the supply unit must be included in this calculation.

PE connection

For operating the pressure transmitter in the Ex area, it must be earthed via the external ground terminal. In addition, the ground terminal inside the housing can be used to connect the cable shielding.



7 Installation

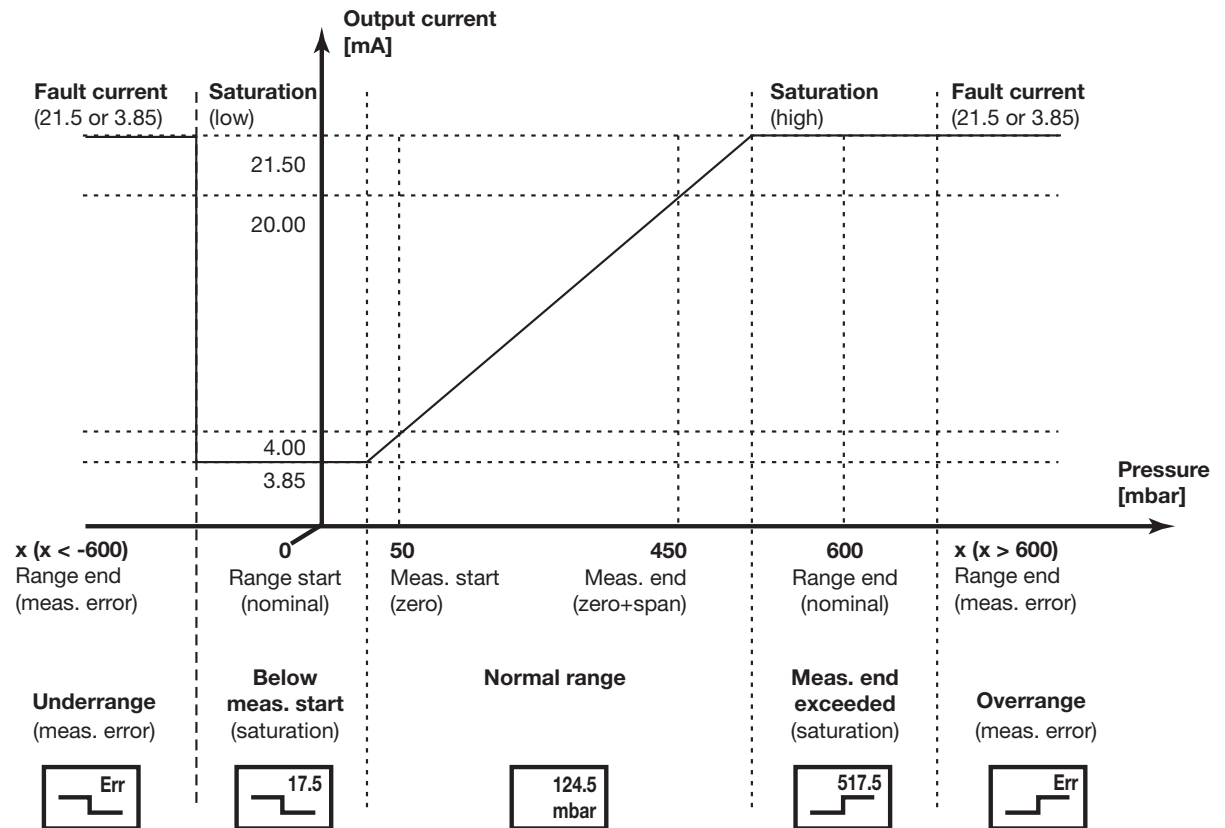
8.1 Characteristic

Output signal and display

Example:

Nominal range 0 to 600 mbar.

Range setting 50 to 450 mbar.



Range limits

Depending on the range setting and the applied pressure, the output signal can lie within different ranges:

- Normal range (the example shows the linear correlation between pressure and output signal)
- Saturation range
- Measurement error range

The different ranges are shown in the display as different symbols,

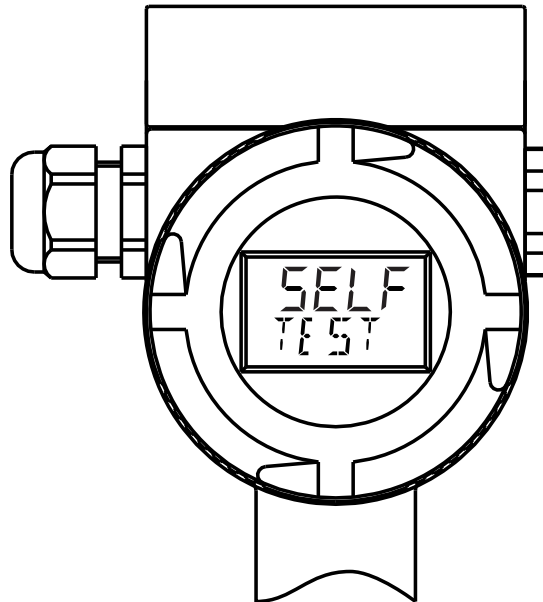
⇒ see above

8 Commissioning

8.2 Self-test

Active

After the supply has been switched on, the pressure transmitter carries out a self-test.

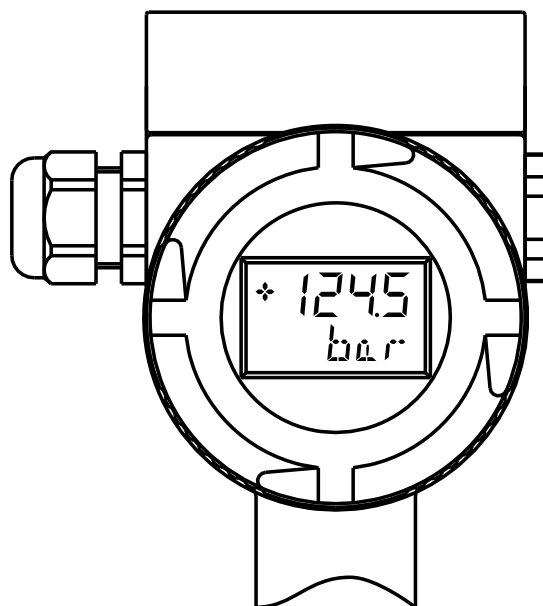


OK

If the result of the self-test is positive, the display that was most recently selected at the display level will be shown after approx. 20 seconds (on new pressure transmitters, the display "pressure with unit").

⇒ Chapter 9.1 "The level concept", page 41ff.

The 4 to 20 mA signal that is available on the output side is proportional to pressure.



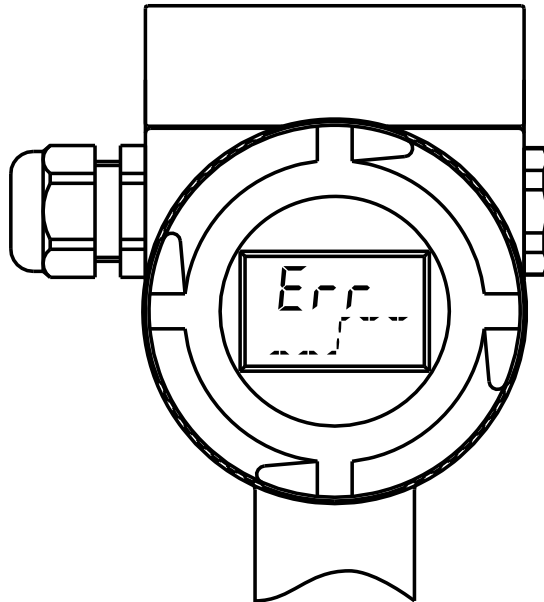
Error

On over/underrange, an error signal appears,

⇒ see below

and

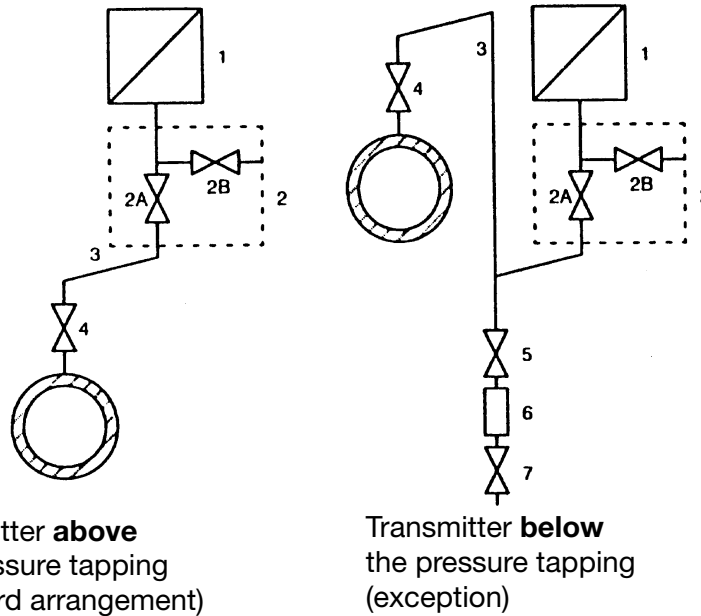
⇒ Chapter 12.1 "Trouble-shooting", page 55



8 Commissioning

8.3 Measuring the absolute pressure

Gases



- | | |
|--------------------|-----------------------------------------------------------------------------------------------|
| (1) Transmitter | (2) Shut-off fitting
2A shut-off valve to process
2B shut-off valve for test connection |
| (3) Pressure line | (4) Shut-off valve |
| (5) Shut-off valve | (6) Condensation vessel |
| (7) Purge valve | |

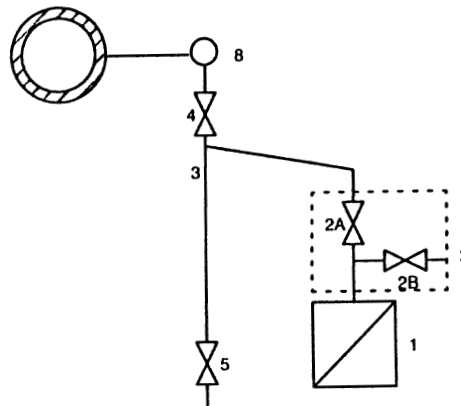
Pressure application

Initial state: all valves closed

Operate the shut-off fittings in the following order:

- * Open shut-off valve (4) at the pressure tapping.
 - * Open shut-off valve (2A).
 - * Check measurement start.
 - * Close shut-off valve (2A).
 - * Open shut-off valve (2B).
 - * Apply a pressure that corresponds to the measurement start to the transmitter, via the test connection of the shut-off fitting (2).
 - * Check output current at the measurement start and correct it if required.
- ⇒ „Output current, measurement start and end“, page 47
- * Close shut-off valve (2B).
 - * Open shut-off valve (2A).

Vapors



- | | |
|---------------------|-----------------------------------------------------------------------------------------------|
| (1) Transmitter | (2) Shut-off fitting
2A shut-off valve to process
2B shut-off valve for test connection |
| (3) Pressure line | (4) Shut-off valve |
| (5) Blow-down valve | (8) Pressure equalization reservoir |

Pressure application

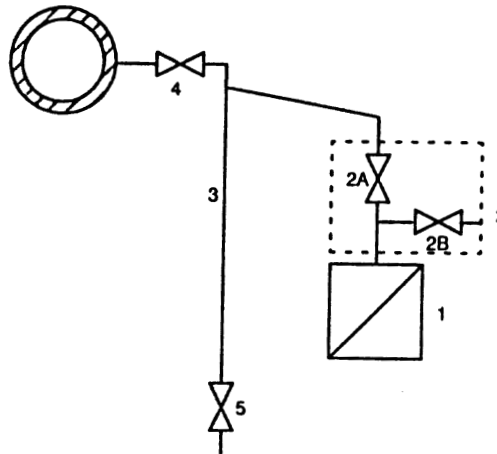
Initial state: all valves closed.

Operate the shut-off fittings in the following order:

- * Open shut-off valve (4) at the pressure tapping.
 - * Wait until steam has condensed in the pressure line.
 - * Open shut-off valve (2A).
 - * Check measurement start.
 - * Close shut-off valve (2A).
 - * Open shut-off valve (2B).
 - * Open drain/purge valve on the transmitter (1) and drain liquid.
 - * Close drain/purge valve on the transmitter (1).
 - * Apply a pressure that corresponds to the measurement start to the transmitter (1), via the test connection of the shut-off fitting (2).
 - * Check output current at the measurement start and correct it, if required.
- ⇒ „Output current, measurement start and end“, page 47
- * Close shut-off valve (2B).
 - * Open shut-off valve (2A).

8 Commissioning

Liquids



- | | |
|---------------------|-----------------------------------------------------------------------------------------------|
| (1) Transmitter | (2) Shut-off fitting
2A shut-off valve to process
2B shut-off valve for test connection |
| (3) Pressure line | (4) Shut-off valve |
| (5) Blow-down valve | |

Pressure application

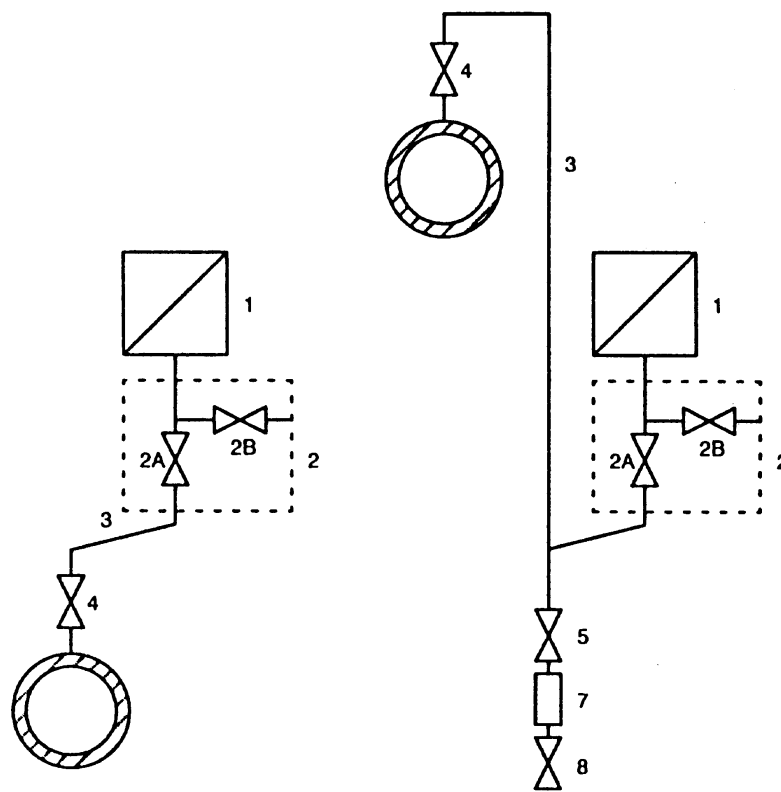
Initial state: all valves closed

Operate the shut-off fittings in the following order:

- * Open shut-off valve (4) at the pressure tapping.
 - * Open shut-off valve (2A).
 - * Check measurement start.
 - * Close shut-off valve (2A).
 - * Open shut-off valve (2B).
 - * Open drain/purge valve on the transmitter (1) and drain liquid.
 - * Close drain/purge valve on the transmitter (1).
 - * Apply a pressure that corresponds to the measurement start to the transmitter (1), via the test connection of the shut-off fitting (2).
 - * Check the output current at the measurement start and correct it, if required.
- ⇒ „Output current, measurement start and end“, page 47
- * Close shut-off valve (2B).
 - * Open shut-off valve (2A).

8.4 Measuring the gauge pressure

Gases



Transmitter **above**
the pressure tapping
(standard arrangement)

Transmitter **below**
the pressure tapping
(exception)

- | | |
|-------------------------|----------------------------------------------------------------------------------------------------------------|
| (1) Transmitter | (2) Shut-off fitting
2A shut-off valve to process
2B shut-off valve for test connection
or vent screw |
| (3) Pressure line | (4) Shut-off valve |
| (5) Shut-off valve | (7) Condensation vessel |
| (7) Condensation vessel | (8) Purge valve |

Pressure application

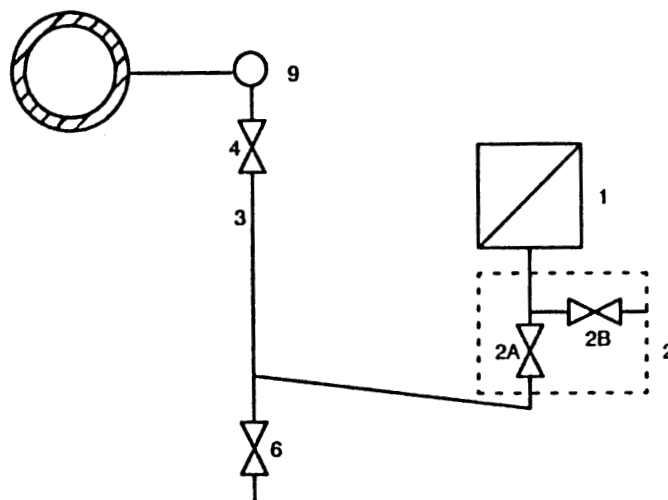
Initial state: all valves closed

Operate the shut-off fittings in the following order:

- * Open shut-off valve (2B).
 - * Apply a pressure that corresponds to the measurement start to the transmitter, via the test connection of the shut-off fitting (2).
 - * Check measurement start and correct it, if required.
- ⇒ „Output current, measurement start and end“, page 47
- * Close shut-off valve (2B).
 - * Open shut-off valve (4) on the pressure tapping.
 - * Open shut-off valve (2A).

8 Commissioning

Vapors



- | | |
|---------------------|-----------------------------------------------------------------------------------------------------------------|
| (1) Transmitter | (2) Shut-off fitting
2A shut-off fitting to process
2B shut-off fitting for test connection or vent screw |
| (3) Pressure line | (4) Shut-off valve |
| (6) Blow-down valve | (9) Pressure equalization reservoir |

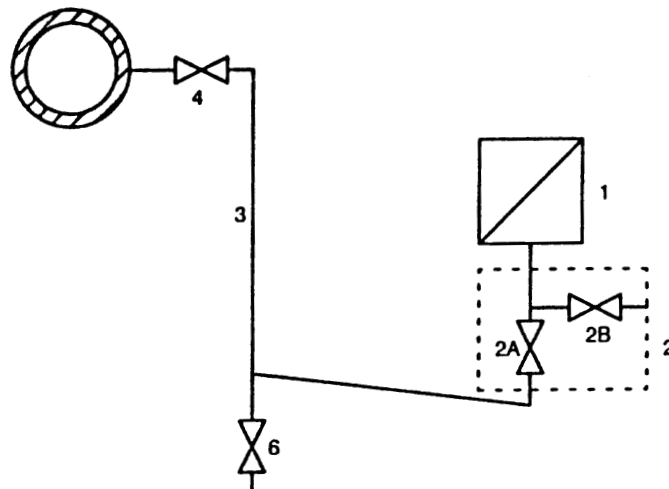
Pressure application

Initial state: all valves closed

Operate the shut-off fittings in the following order:

- * Open shut-off valve (2B).
 - * Apply a pressure that corresponds to the measurement start to the transmitter, via the test connection of the shut-off fitting (2).
 - * Check measurement start and correct it, if required.
- ⇒ „Output current, measurement start and end“, page 47
- * Close shut-off valve (2B).
 - * Open shut-off valve (4) on the pressure tapping.
 - * Open shut-off valve (2A).

Liquids



- | | |
|---------------------|-------------------------------------------------------------------------------------------------------------|
| (1) Transmitter | (2) Shut-off fitting
2A shut-off valve to process
2B shut-off valve for test connection or vent screw |
| (3) Pressure line | (4) Shut-off valve |
| (6) Blow-down valve | |

Pressure application

Initial state: all valves closed

Operate shut-off fitting in the following order:

- * Open shut-off valve (2B).
 - * Apply a pressure that corresponds to the measurement start to the transmitter, via the test connection of the shut-off fitting (2).
 - * Check measurement start and correct it, if required.
- ⇒ „Output current, measurement start and end“, page 47
- * Close shut-off valve (2B).
 - * Open shut-off valve (4) on the pressure tapping.
 - * Open shut-off valve (2A).

8 Commissioning

9.1 The level concept

Two levels

In order to make the operation of the pressure transmitter simple and transparent, the functions of the JUMO dTRANS p02 have been divided into two levels.

Both levels can be accessed from the keypad of the transmitter.

**NOTE!**

The keypad can be found underneath the cover flap of the pressure transmitter.

⇒ "Open cover flap", page 19.

**NOTE!**

As an alternative to operation from the keys, all the measured values and parameters can be easily displayed and/or set up using the setup program. The setup program is available on request, at extra cost.

⇒ "Setup program", page 9

Display level

In normal operation, the instrument is in the display level.

The display options are: pressure, measurement, output current, sensor temperature or peak-reading pointer. Step through with the ▲ or ▼ keys.

**NOTE!**

After applying the supply voltage, and after the end of the self-test, the instrument is in the display level. The display that was most recently selected will be shown (for new instruments ex-works, this is "Pressure with unit").

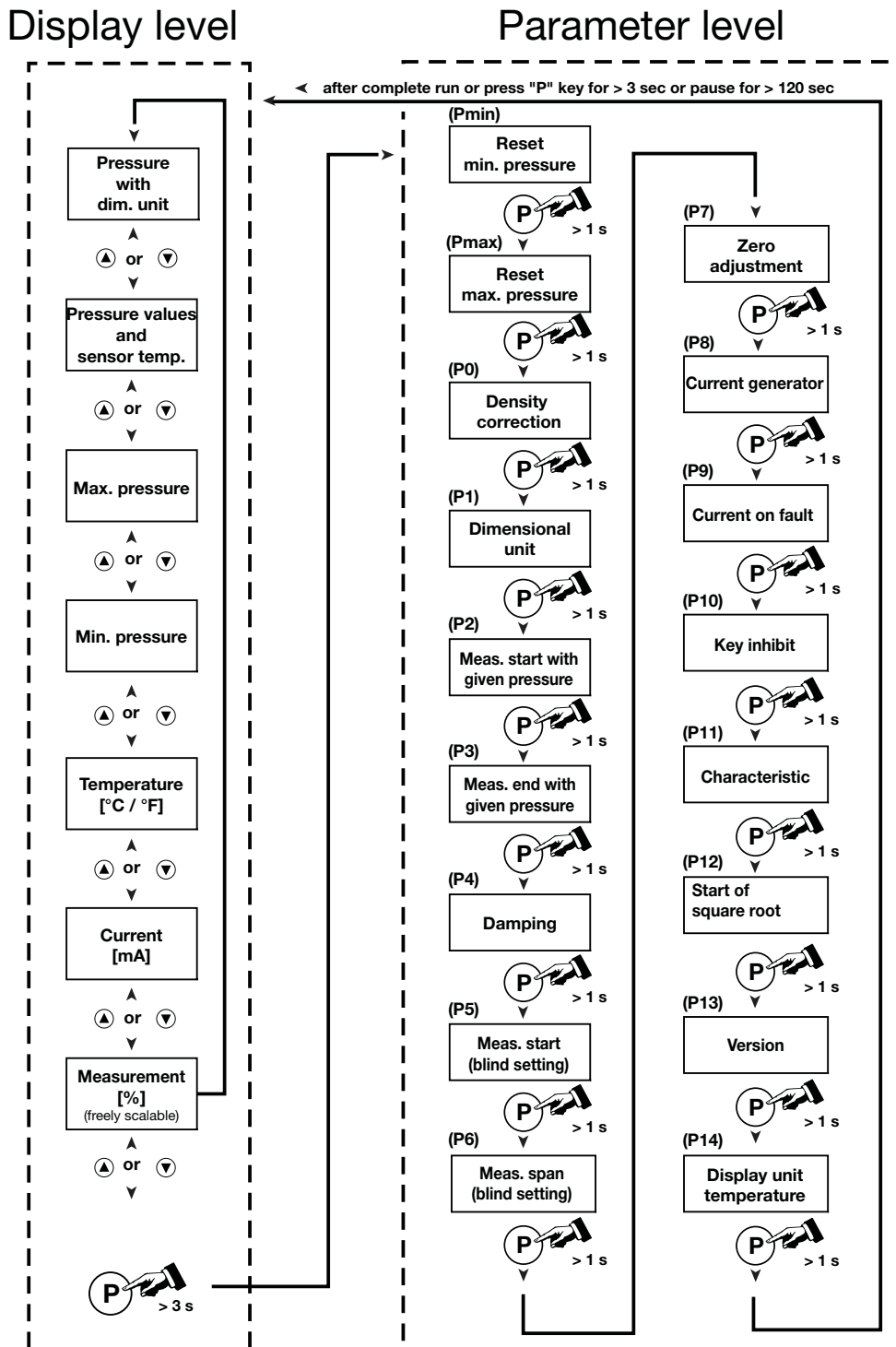
Parameter level

At this level, the parameters that can be checked or altered include the following: measurement start, measurement end, zero, dimensional unit, damping and output current in a fault situation.

9 Adjustment options

9.2 Sequence for keypad operation

Layout



NOTE!

Every altered value is accepted after modification (signalled by a brief display switch-off). The function "Adjust zero point" is inactive on transmitters for absolute pressure.

9.3 Display level



NOTE!

After switching on the pressure transmitter, the last display that was selected will be shown at the display level.

Sequence






























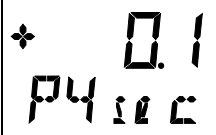


Action ^a	Function	Display (Example)
	Display of pressure with dimensional unit	+ 1422 bar
	Display of pressure value and sensor temperature in the units selected	+ 1422 23.1
	Display of the stored maximum pressure	+ 4.730 mA
	Display of the stored minimum pressure	- 0.354 mA
	Display of the sensor temperature in °C or °F	+ 23.1 °C
	Display of the output current in mA	+ 13.1 mA
	Display of measurement in % ^b or scaled with freely selectable dim. unit	+ 56.9 %

^a The sequence can also be stepped through in the opposite direction by using the key.























^b Factory setting: measurement in %. On request, freely scalable through setup program (0 to 100 % as -9999 to +9999). Unit can be set (maximum 5 digits, restricted ASCII character set).

9 Adjustment options














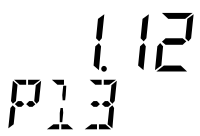

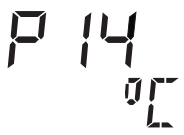


9.4 Parameter level

Action	Function	Display (Example)	Possible setting	with keys	"Detailed explanations", page 47ff.
 > 1 second	Reset the stored minimum pressure		reset	 +  > 2 seconds	"Peak-readingpointer", page 47.
 > 1 second	Reset the stored maximum pressure		reset	 +  > 2 seconds	"Peak-readingpointer", page 47.
 > 1 second	Display and set density correction		0.100 to 5.000	 or 	"Unit of temperature display", page 50.
 > 1 second	Display and set dimensional unit of pressure		mbar bar psi mmHg mmH ₂ O ftH ₂ O inHg inH ₂ O mH ₂ O MPa Torr kPa kgcm ²	 or 	"Density correction", page 47.
 > 1 second	Display or set output current at measurement start (with pressure input)		3.85 to 21.50 mA 4 mA	 or   +  > 2 seconds	"Output current, measurement start and end", page 47.
 > 1 second	Display or set output current at measurement end (with pressure input)		3.85 to 21.50 mA 20 mA	 or   +  > 2 seconds	"Output current, measurement start and end", page 47.
 > 1 second	Display or set damping (time constant)		0.0 to 100.0 sec	 or 	"Damping", page 47.

9 Adjustment options

Action	Function	Display (Example)	Possible setting	with keys	"Detailed explanations", page 47ff.
 > 1 second	Display or set measurement start (blind setting)		-110 % to +110 % ^a or -10 to +110 % ^b of nominal range	 or 	"Measurement start, blind setting", page 47.
 > 1 second	Display or set measurement span (blind setting)		-210 % to +210 % of nominal range	 or 	"Measurement span, blind setting", page 48.
 > 1 second	Zero adjustment (not for absolute-pressure transmitters)		0.000	 +  > 2 seconds	"Zero adjustment", page 48.
 > 1 second	Set and activate current generator		Select: 3.85 mA 4.00 mA 12.00 mA 20.00 mA 21.50 mA and: activate	 or   +  > 2 seconds	"Current generator", page 48.
 > 1 second	Display and set output current in fault situation		21.5 mA 3.85 mA	 or 	"Output current in fault situation", page 48.

9 Adjustment options

Action	Function	Display (Example)	Possible setting	with keys	"Detailed explanations", page 47ff.
 > 1 second	Display and set key inhibit		0: no inhibit LA: all inhibited LALL: all inhibited (adjustable via setup program only) LS: all inhibited except measurement start and end LO: all inhibited except measurement start	 or 	"Keys inhibited", page 49.
 > 1 second	Display and set characteristic		Lin: linear SLin: square root, linear up to starting point SoFF: square root, switched off up to starting point	 or 	"Characteristic", page 49.
 > 1 second	Display and set starting point of square-root characteristic in percent of range		5.0 % to 15.0 %	 or 	"Characteristic", page 49
 > 1 second	Display instrument version				"Instrument version", page 49.
 > 1 second	Display and set unit of temperature		°C °F	 or 	"Unit of temperature display", page 50.

^a Only with transmitters for relative pressure, Chapter 4 "Instrument identification", page 11ff.

^b Only with transmitters for absolute pressure, Chapter 4 "Instrument identification", page 11ff.

9.5 Detailed explanations

Peak-readingpointer

Minimum and maximum pressures are saved. Both values can be individually displayed and deleted.

**NOTE!**

If the damping is set to 0.0 sec, minimum and maximum pressures will not be saved.

⇒ "Detailed explanations", page 47

If the damping is 0.0sec, or after a reset of the display, "- - - -" will be shown.

Density correction

Density correction is important for the hydrostatic level measurement for media with densities other than 1 (e.g. pure water).

Possible range setting: 0.100 to 5.000 (kg/dm³).

Example

Range: 0 to 1 bar

Scaling: 0 to 100 % => 0 to 5000 l

Medium	Density	Measured pressure	Output current	Display LCD
Water	1.0	0.5 bar	12 mA	2500 liters
Gasoline	0.8	0.5 bar	14 mA	3125 liters

Dimensional unit

The pressure can be indicated directly in bar or in another pressure unit.

Output current, measurement start and end

The output current (in mA) that is available at the start (or end) of the measurement can be set within the range +3.85 to +21.5 mA. At the same time, the pressure applied is saved as measurement start or end.

Damping

To dampen an unsteady display caused by rapidly changing pressures, the time constant for the display, T_{63} , can be adjusted from 0.0 to 100.0 sec.

**NOTE!**

At a damping of 0.0 sec, the pressure transmitter will **not** save the minimum and maximum pressures, i.e. the peak-reading pointer function is switched off.

Measurement start, blind setting

The measurement start can be set in % of the nominal pressure range. The nominal measurement range is given on the nameplate.

⇒ "Nameplate", page 11

Example:

The pressure transmitter has a nominal range of 0 to 25 bar, but the output signal needs to be proportional in the range 5 to 20 bar.

9 Adjustment options

The necessary setting for the measurement start is derived as follows:

Nominal range:	0 to 25 bar
Meas. start required:	5 bar, corresponding to 20 % of the nominal range
Setting:	20 %

Measurement span, blind setting

The measurement span can be set in % of the nominal measurement range.

Example 1:

The pressure transmitter has a nominal measurement range from 0 to 25 bar, but the output signal needs to be proportional in the range 5 to 20 bar.

The necessary setting for the measurement span is derived as follows:

Nominal range:	0 to 25 bar
Range required:	5 to 20 bar => required span: 15 bar
Span required:	15 bar, corresponding to 60 % of the nominal range
Setting:	60 %

Example 2:

Nominal range:	0 to 600 mbar
Range required:	-300 to +300 mbar
Measurement start:	-50 %
Span:	100 %

Zero adjustment

When a zero adjustment is made, the transmitter display is set to 0.000. The preset measurement start remains unaffected.

Setting the measurement start:

⇒ "Output current, measurement start and end", page 47.



NOTE!

This function is inhibited for absolute-pressure transmitters.

⇒ "Nameplate", page 11

Current generator

If the "current generator" function is selected, an adjustable constant current is present at the transmitter output.



HINWEIS!

There is no time-out for this function; the current can remain indefinitely.

This function can only be ended by pressing the **(P)** key. It is **not** possible in multidrop mode.

⇒ "HART® communication", page 26

In this case, a constant current of 4 mA is present at the output.

Output current in fault situation

In order to indicate measurement errors in the event of over/underrange, or other errors, (e.g. for a connected PLC), the pressure transmitter gives out either 3.85 mA or 21.5 mA.

⇒ "Output signal and display", page 31.

9 Adjustment options

Keys inhibited

To prevent an unauthorized modification of parameters, some or all of the parameters can be inhibited.



NOTE!

To remove an inhibit (LA, L0, LS), the **(P)** key must be pressed for longer than 5 seconds in the display "Output current in fault situation" (P9).

The inhibit "LALL" can only be set or deleted in the setup program.

Characteristic

The characteristic of the output current can be selected as:

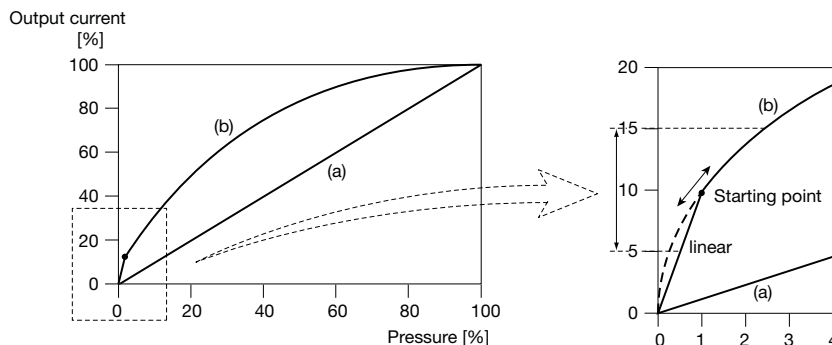
- Lin: linear (proportional to pressure).
- SLin: linear up to the starting point, then square root (proportional to flow-through),
- SoFF: square-root (proportional to flow), but switched off up to the starting point.



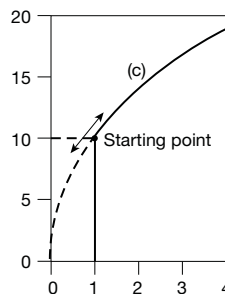
NOTE!

The starting point of the square-root characteristic can be adjusted between 5.0 and 15.0 % of the output current.

Characteristics



- (a) = Lin = linear
(b) = SLin = square root, linear up to starting point
(c) = SoFF = square root, switched off up to starting point



Instrument version

Display format: xx.yy

xx = hardware version

yy = software version

9 Adjustment options

Unit of temperature display

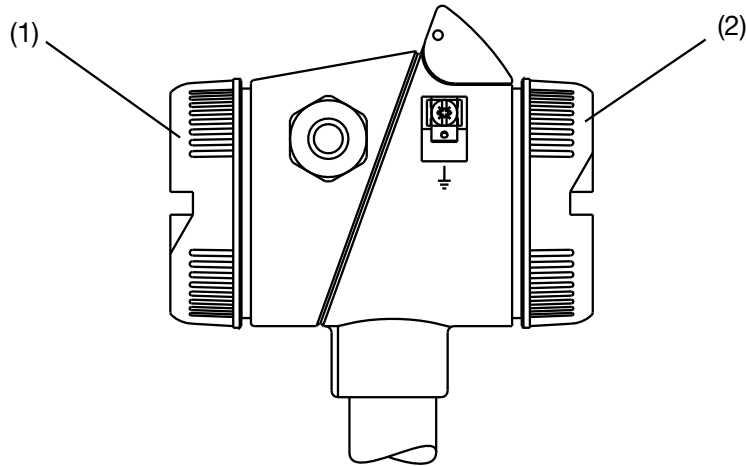
The display unit of the measured sensor temperature can be selected as:

- °C
- °F

10 Opening the instrument

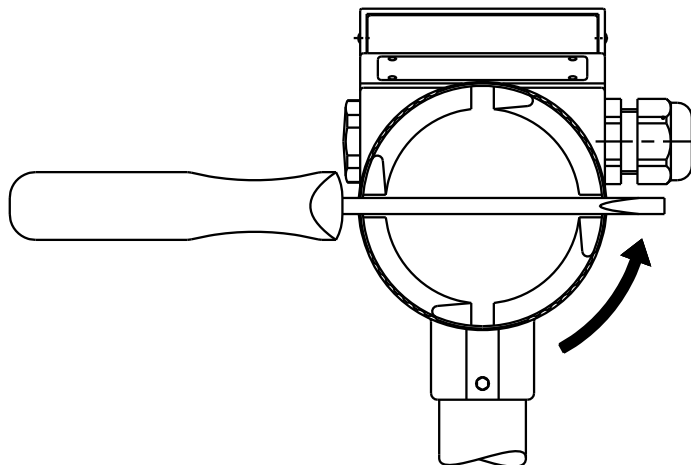
10.1 Unscrewing the bezel ring or housing cover

The bezel ring and the rear housing cover can be unscrewed.



(1) Housing cover

(2) Bezel ring



- * Open with a screwdriver
- * Close by hand **without** any tools

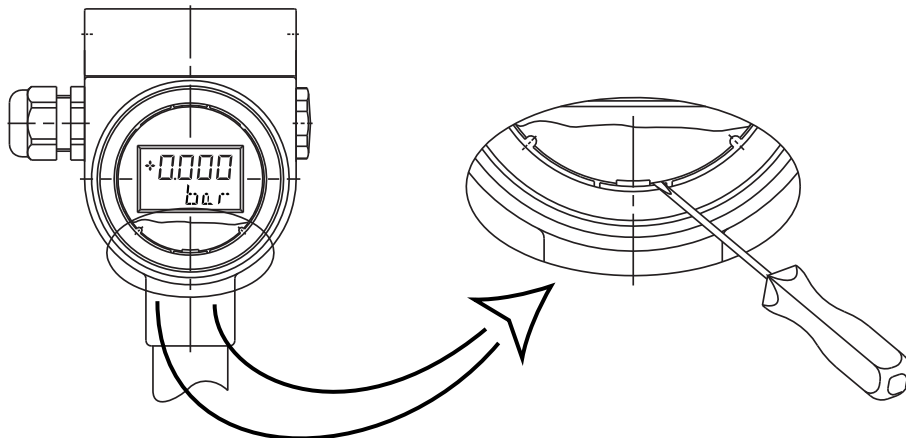
10 Opening the instrument

11 Rotating the instrument

11.1 Rotating

Rotating the LCD display

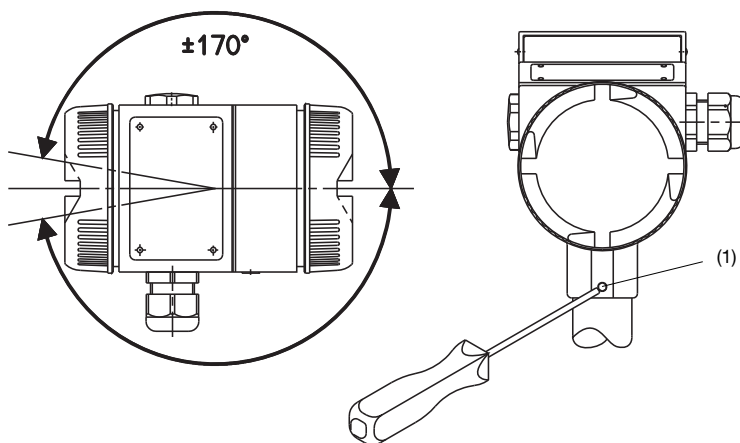
Depending on the operating position required, the LCD display can be rotated in steps of 90°.



- * Unscrew the bezel ring.
- ⇒ "Unscrewing the bezel ring or housing cover", page 51.
- * Use a small-bladed screwdriver to carefully push out the catch of the LCD fixing and lever out the display board.
- * Set the LCD display to the required position (90° steps) in the notches provided.
- * Screw on the bezel ring finger-tight, rotate housing

Rotating the housing










The housing can be rotated through $\pm 170^\circ$.



- * Loosen the grub screw (1) with a 2 mm hexagon socket wrench (about half a turn is enough).
- * Rotate the housing into the required position.
- * Screw up grub screw **tightly**.

11 Rotating the instrument

12.1 Trouble-shooting

Error/fault	Possible cause	Remedy
Display: none	no supply voltage	switch on supply
	instrument faulty	send instrument to supplier for repair
Display: 	overrange, excessive pressure	bring pressure back to within range, or adjust range
Display: 	underrange, pressure too low	bring pressure back to within range, or adjust range
Display: 	pressure can no longer be measured; overrange, excessive pressure	bring pressure back to within range, or use instrument with a wider nominal range
	instrument faulty	send instrument back to the supplier for repair
Display: 	pressure can no longer be measured; overrange, pressure too low.	bring pressure back to within range, or use instrument with a wider nominal range
	instrument faulty	send instrument to supplier for repair
Display: 	an error in the electronics was detected during the last self-test	send instrument to supplier for repair
Display: 	temperature probe faulty	send instrument to supplier for repair
Display: 	span too small	increase span (at least 5%) ⇒ "Measurement start, blind setting", page 47.
	instrument faulty	send instrument to supplier for repair
Display: 	span too small	increase span (at least 5%) ⇒ "Measurement start, blind setting", page 47.
	instrument faulty	send instrument to supplier for repair
 key not responding	instrument faulty	send instrument to supplier for repair

12 Maintenance

⬆ key or	keys inhibited	reset key inhibit ⇒ "Keys inhibited", page 49.
⬇ key not responding	instrument faulty	send instrument to supplier ^a for repair

^a You can find the supplier addresses on the back page of this operating manual.

13.1 Settings


NOTE!

Individual settings can be recorded in this table.

Function	LCD display	Factory setting	Customer's setting
Min. value (peak-reading pointer)	P min	–	not adjustable
Max. value (peak-reading pointer)	P max	–	not adjustable
Density correction	P0	1.000	
Dimensional unit	P1	bar or mbar	
Measurement start	P2 mA	4.00	
Measurement end	P3 mA	20.00	
Damping	P4 sec	0.1	
Measurement start (blind setting)	P5 %	0 ^a	
Measurement span (blind setting)	P6 %	100 ^a	
Zero adjustment	P7	0.000	
Current generator	P8 mA	3.85	
Output current in fault situation	P9 mA	21.50	
Key/function locking	P10	0	
Characteristic	P11	Lin	
Starting point (EP = Entry Point)	P12 %	9.400	
Version display	P13	01.12	not adjustable
Display unit for temperature	P14	°C	

^a Different factory settings are possible in accordance with customers' specification!

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Internet: www.jumo.net



More than **sensors + automation**

EU-Konformitätserklärung

EU declaration of conformity / Déclaration UE de conformité

Dokument-Nr. <i>Document No. / Document n°.</i>	CE 690	
Hersteller <i>Manufacturer / Etabli par</i>	JUMO GmbH & Co. KG	
Anschrift <i>Address / Adresse</i>	Moritz-Juchheim-Straße 1, 36039 Fulda, Germany	
Produkt <i>Product / Produit</i>		
Name <i>Name / Nom</i>	Typ <i>Type / Type</i>	Typenblatt-Nr. <i>Data sheet no. / N° Document d'identification</i>
JUMO dTRANS p02	404385	404385

Wir erklären in alleiniger Verantwortung, dass das bezeichnete Produkt die Anforderungen der Europäischen Richtlinien erfüllt.

We hereby declare in sole responsibility that the designated product fulfills the requirements of the European Directives.

Nous déclarons sous notre seule responsabilité que le produit remplit les Directives Européennes.

Richtlinie 1

Directive / Directive

Name EMC
Name / Nom

Fundstelle 2014/30/EU
Reference / Référence

Bemerkung
Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 1998

Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Dokument-Nr.
Document No. / Document n°.

CE 690

EU-Konformitätserklärung

Seite: 1 von 4

14 Declaration of conformity

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Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle <i>Reference / Référence</i>	Ausgabe <i>Edition / Édition</i>	Bemerkung <i>Comment / Remarque</i>
EN 61326-1	2013	
EN 61326-2-3	2013	

Gültig für Typ

Valid for Type / Valable pour le type

404385/...

Richtlinie 2

Directive / Directive

Name <i>Name / Nom</i>	ATEX
Fundstelle <i>Reference / Référence</i>	2014/34/EU
Bemerkung <i>Comment / Remarque</i>	Mod. B+D
Datum der Erstanbringung des CE-Zeichens auf dem Produkt <i>Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit</i>	1998

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle <i>Reference / Référence</i>	Ausgabe <i>Edition / Édition</i>	Bemerkung <i>Comment / Remarque</i>
EN 60079-0	2012+A11:2013	
EN 60079-11	2012	
EN 60079-26	2015	

Gültig für Typ

Valid for Type / Valable pour le type

404385/1-...

Dokument-Nr.
Document No. / Document n°.

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EU-Konformitätserklärung

Seite: 2 von 4

14 Declaration of conformity

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EU-Baumusterprüfbescheinigung 2.1

EU type examination certificate / Certificat d'examen de type UE

Fundstelle PTB 98 ATEX 2194 Ausgabe: 1

Reference / Référence

Benannte Stelle Physikalisch-Technische-Bundesanstalt (PTB)

Notified Body / Organisme notifié

Kennnummer 0102

Identification no. / N° d'identification

Anerkannte Qualitätssicherungssysteme der Produktion

Recognized quality assurance systems of production / Systèmes de qualité reconnus de production

Benannte Stelle

Notified Body / Organisme notifié

TÜV NORD CERT GmbH

Kennnummer

Identification no. / N° d'identification

0044

Richtlinie 3

Directive / Directive

Name RoHS

Name / Nom

Fundstelle 2011/65/EU

Reference / Référence

Bemerkung

Comment / Remarque

Datum der Erstanbringung des CE-Zeichens auf dem Produkt 2017

Date of first application of the CE mark to the product / Date de 1ère application du sigle sur le produit

Angewendete Normen/Spezifikationen

Standards/Specifications applied / Normes/Spécifications appliquées

Fundstelle

Reference / Référence

VDK Umweltrelevante Aspekte V1

bei der Produktentwicklung und -gestaltung

Ausgabe

Edition / Édition

Bemerkung

Comment / Remarque

Dokument-Nr.

Document No. / Document n°.

CE 690

EU-Konformitätserklärung

Seite: 3 von 4

14 Declaration of conformity

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Gültig für Typ

Valid for Type / Valable pour le type

404385/...

Aussteller

Issued by / Etabli par

Ort, Datum

Place, date / Lieu, date

Rechtsverbindliche Unterschriften

Legally binding signatures /

Signatures juridiquement valable

JUMO GmbH & Co. KG

Fulda, 2018-06-15

Bereichsleiter Vertrieb Inland / Globales
Produkt- und Branchenmanagement
ppa. Dimitrios Charisiadis

Qualitätsbeauftragter und Leiter Qualitätswesen
i. V. Harald Gienger

Dokument-Nr.
Document No. / Document n°.

CE 690

EU-Konformitätserklärung

Seite: 4 von 4

15 Type Examination Certificate



(1) **EU-TYPE EXAMINATION CERTIFICATE**
(Translation)

(2) Equipment or Protective Systems Intended for Use in
Potentially Explosive Atmospheres - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number:

PTB 98 ATEX 2194

Issue: 1

(4) Product: Pressure transducer, type dTRANS p02
and type dTRANS p02 DELTA

(5) Manufacturer: JUMO GmbH & Co. KG

(6) Address: Moritz-Juchheim-Straße 1, 36039 Fulda, Germany

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 17 of the Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential Test Report PTB Ex 18-27147.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0:2012 + A11:2013

EN 60079-11:2012

EN 60079-26:2015

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:

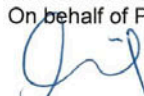


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Konformitätsbewertungsstelle, Sektor Explosionsschutz

Braunschweig, May 22, 2018

On behalf of PTB:


Dr.-Ing. F. Lienesch
Direktor und Professor



ZSEx001e c

sheet 1/3

EU-Type Examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • 38116 Braunschweig • GERMANY

15 Type Examination Certificate



(13)

SCHEDULE

(14) **EU-Type Examination Certificate Number PTB 98 ATEX 2194, Issue: 1**

(15) Description of Product

The pressure transducers of types dTRANS p02 and dTRANS p02 DELTA are used for the conversion of a measurand into an electrical standardized signal. The equipment is intended for the application inside the hazardous area.

The enclosure for the electronics system is installed in areas requiring equipment of category 2. The process connection elements are mounted into the partition that separates areas from each other where equipment of category 2 or category 1 is required.

The maximum permissible ambient temperature depends on the temperature class as follows:

Temperature class	Ambient temperature
T4	85 °C
T5	75 °C
T6	60 °C

Electrical data

Supply circuit
(terminals P601 +, P602 -,
or plug connector)

type of protection Intrinsic Safety Ex ia IIC
only for connection to a certified intrinsically
safe circuit.

Maximum values: $U_i = 30 \text{ V}$
 $I_i = 100 \text{ mA}$
 $P_i = 750 \text{ mW}$
 $C_i = 11 \text{ nF}$
 $L_i = 170 \text{ } \mu\text{H}$

Display circuit

system-internal circuit of type of protection
Intrinsic Safety Ex ia IIC

Sensor circuit

type of protection Intrinsic Safety Ex ia IIC, system-
internal or for connection to the associated sensor using
the associated permanently mounted cable.

sheet 2/3

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15 Type Examination Certificate



SCHEDULE TO EU-TYPE EXAMINATION CERTIFICATE PTB 98 ATEX 2194, Issue: 1

Modifications pertaining to previous editions

- Introduction of a new flexprint that interconnects the sensor unit and the electronic module.
- Revision of the type label
- Revision and actualization of the test documents
- Summarization of all specifications from the initial certificate and its supplements 1 through 5 as well as the modifications mentioned above, to represent the current state of production.

(16) Test Report PTB Ex18-27147


(17) Specific conditions of use
none

(18) Essential health and safety requirements
Met by compliance with the aforementioned standards.

According to Article 41 of Directive 2014/34/EU, EC-type examination certificates which have been issued according to Directive 94/9/EC prior to the date of coming into force of Directive 2014/34/EU (April 20, 2016) may be considered as if they were issued already in compliance with Directive 2014/34/EU. By permission of the European Commission supplements to such EC-type examination certificates and new issues of such certificates may continue to hold the original certificate number issued before April 20, 2016.

Konformitätsbewertungsstelle, Sektor Explosionsschutz
On behalf of PTB:

Braunschweig, May 22, 2018


Dr.-Ing. F. Lienesch
Direktor und Professor




sheet 3/3

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15 Type Examination Certificate

 产品组别 Product group: 404385 部件名称 Component Name		产品中有害物质的名称及含量 China EEP Hazardous Substances Information					
		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
外壳 Housing (Gehäuse)	○	○	○	○	○	○	
过程连接 Process connection (Prozessanschluss)	○	○	○	○	○	○	
螺母 Nuts (Mutter)	○	○	○	○	○	○	
螺钉 Screw (Schraube)	○	○	○	○	○	○	

本表格依据SJ/T 11364的规定编制。
 This table is prepared in accordance with the provisions SJ/T 11364.
 ○：表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
 Indicate the hazardous substances in all homogeneous materials' for the part is below the limit of the GB/T 26572.
 x：表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
 Indicate the hazardous substances in at least one homogeneous materials' of the part is exceeded the limit of the GB/T 26572.



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