



# Pressure transmitter JUMO dTRANS p02 DELTA

Type 404382

## General application

The JUMO dTRANS p02 DELTA pressure transmitter measures the differential pressure in both corrosive and non-corrosive gases, vapors and liquids. The pressure transmitter makes use of the piezo-resistive effect to make the measurement. The output signal is a DC current which is linearly proportional to the input pressure. With flow-through measurements, it is possible to set up the output signal to be proportional to the square-root of the input pressure.

In the version with Protection EEx ia IIC, the transmitter can be mounted within the hazardous area Zone 1, for connection to Zone 0.

A wide spectrum of pressure separators is available for special applications such as level measurements, or for corrosive media.

### Display options:

- pressure with choice of 13 different units, measurement in % or scaled with freely selectable dimensional unit, output current in mA
- sensor temperature in °C or °F
- measurement error, out-of-range measurement
- minimum and maximum pressures (peak-reading pointer)
- pressure and sensor temperature can be shown simultaneously (2 lines)

### Setting options via keys:

- start and end of measurement with pressure input
- start and end of measurement without pressure input (blind setting)
- damping or time constant
- current generator function
- output signal on error
- key inhibit
- reset min. and max. measured value (peak-reading pointer)
- square-root characteristic (adjustable starting point), or linear
- density correction for different measurement media
- display of temperature of medium in °C or °F

The JUMO dTRANS p02 DELTA pressure transmitter can also be used with a HART® communicator or a PC in conjunction with a HART® modem and the JUMO setup program running under Windows®.

## Accessories

### Setup program

Sales No. 40/00365072.

The setup program for all instruments of the JUMO dTRANS p02 series has been created according to the VDI/VDE 2187-user interface. Together with the HART® modem, the program enables easy operation and parameter setting of the pressure transmitter from a PC.

### HART® modem

Sales No. 40/00345666

The HART® modem provides the link between the JUMO dTRANS p02 transmitter and the serial interface of a PC.

### Bracket for wall and pipe mounting

Sales No. 40/00314729

### Triple valve block

Sales No. 40/00308191  
to DIN 19 213, stainless steel  
other valve types on request.

### Oval flange 1/2" NPT

Sales No. 40/00398914  
to DIN 19 213, stainless steel.  
Set of 2, with M10 screws.  
Other flange types on request.

### Supply isolator for Ex applications, HART® capable

Sales No. 40/00389710,  
see Data Sheet 40.4757

### Pressure separators

for adaptation to special applications, whenever conventional pressure connection cannot be used.  
See Data Sheets 40.9770 to 40.9786



## Technical data

### Explosion protection

to EN 50 014 and EN 50 020  
(CENELEC)

tested to Directive 94/9/EC  
(ATEX 100a)

Protection EEx ia IIC T4-T6,  
Category 1/2G (use in Zone 1, connection to Zone 0)

PTB 98 ATEX 2194

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

Ui = 30V DC

Ii = 100mA

Pi = 750mW

### Reference conditions

as per DIN 16 086 and IEC 770/5.3

### Nominal input range

see Order details

### Range setting

The measurement range can be set from the transmitter keys, by using the setup program or a HART® communicator as described below:

Start and end of the measurement range can be continuously adjusted within the nominal range.

The span should not go below 10% of the nominal range.



#### Displayable units

mH<sub>2</sub>O, inH<sub>2</sub>O, inHg, ftH<sub>2</sub>O, mmH<sub>2</sub>O, mmHg, psi, bar, mbar, kg/cm<sup>2</sup>, kPa, Torr, MPa; Measurement:

% or scaled with freely adjustable unit

Output current:

mA

#### Additional displays

indication of sensor temperature, minimum pressure, maximum pressure.

Indication on overrange and on error.

#### Density correction

adjustable within the range from 0.100 to 5.000 kg/dm<sup>3</sup>

#### Nominal pressure

PN 160

option: PN 420

#### Parts in contact with medium

as standard:

stainless steel, Mat. Ref. 1.4401, 1.4404

flanges: stainless steel, Mat. Ref. 1.4408

O ring: FPM

option: see Order details

#### Pressure connection

see Order details

#### Output

4 – 20 mA burden  $\leq (U_B - 11.5 \text{ V}) / 0.022 \text{ A}$   
burden with HART<sup>®</sup> max. 1100 Ω, min. 250 Ω

with HART<sup>®</sup> protocol V 5.3.

Complies with the Directives of the HCF (HART<sup>®</sup> Communication Foundation)

#### Characteristic

linear or square-root. Adjustable starting point with square-root characteristic (ex-factory is linear up to 9.4%).

#### Burden error

< 0.1%

#### Zero offset / adjustment accuracy

≤ 0.01 mA

#### Effect of static pressure

zero: ≤ 0.015%/10 bar

span: ≤ 0.020%/10 bar

#### Ambient temperature error

within range -20 to +85°C

(compensated temperature range)

zero: ≤ 0.005% per °C typical,

≤ 0.01% per °C max.

span: ≤ 0.005% per °C typical,

≤ 0.01% per °C max.

#### Deviation from characteristic

limit point adjustment:

≤ 0.1% of full scale of nominal range;

as per DIN 16 086

#### Hysteresis

≤ 0.02% of full scale; as per DIN 16 086

#### Reproducibility

≤ 0.02% of full scale; as per DIN 16 086

#### Response time

150 msec approx., no damping

#### Damping

adjustable from 0 – 100 sec

#### Stability per year

≤ 0.1% of full scale (for nominal range at reference conditions as per IEC 770)

#### Supply

11.5 – 36V DC

11.5 – 30V DC (for intrinsically safe version)

Supply unit for output signal transmission with or without HART<sup>®</sup> communication, in intrinsically safe version, see Data Sheet 40.4757.

#### Note:

Minimum 17V DC (250Ω) for communication via HART<sup>®</sup> protocol.

#### Supply voltage error

≤ 0.1% of full scale per 10 V change

(nominal supply voltage 24 V DC)

#### Permissible ambient temperature

-40 to +85°C; as per DIN 16 086

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

With intrinsically safe version:

+85°C with temperature class T4

+75°C with temperature class T5

+60°C with temperature class T6

#### Storage temperature

-40 to +85°C

#### Permissible temperature of medium

-40 to +100°C

(with halogenized filling oil -10 to +100°C)

#### Electromagnetic compatibility

(EMC)

as per EN 61 326

#### Mechanical shock

50g/11 msec

#### Mechanical vibration

5g max. at 10 – 2000Hz

#### Protection

with connecting cable

IP65 to EN 60 529

#### Insulation resistance

100 MΩ; 50 V DC

#### Breakdown strength

≥ 500 V<sub>eff.</sub>

#### Housing

aluminium die-casting GDAISI12

#### Flange screws

steel, yellow-chromed

option: stainless steel

#### Climatic conditions

≤ 80% rel. humidity with condensation, annual mean

#### Electrical connection

clamping case with screw cover, 2-pole and earthing terminal, plastic cable gland M20 x 1.5 for cable diameters 6 to 12 mm

#### Nominal position

ex-factory: upright vertical

(pressure cell below)

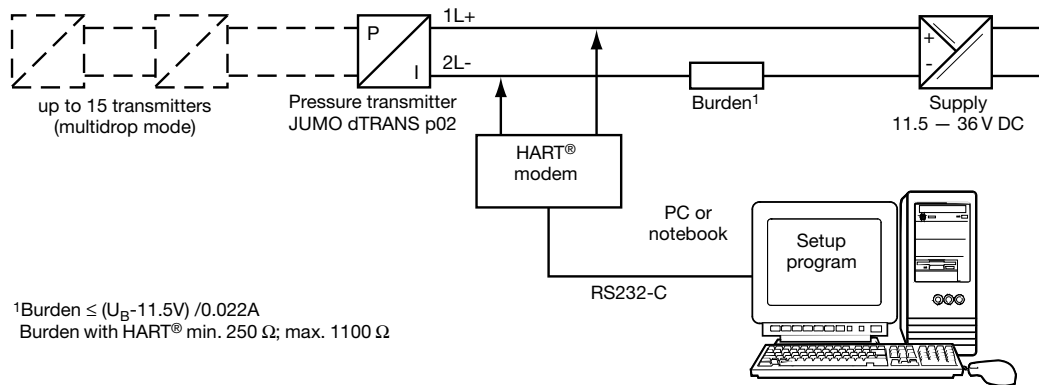
any operating position

#### Weight

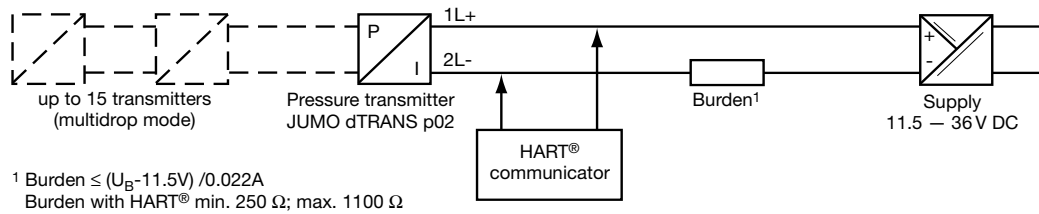
3.9 kg approx.

### HART® communication

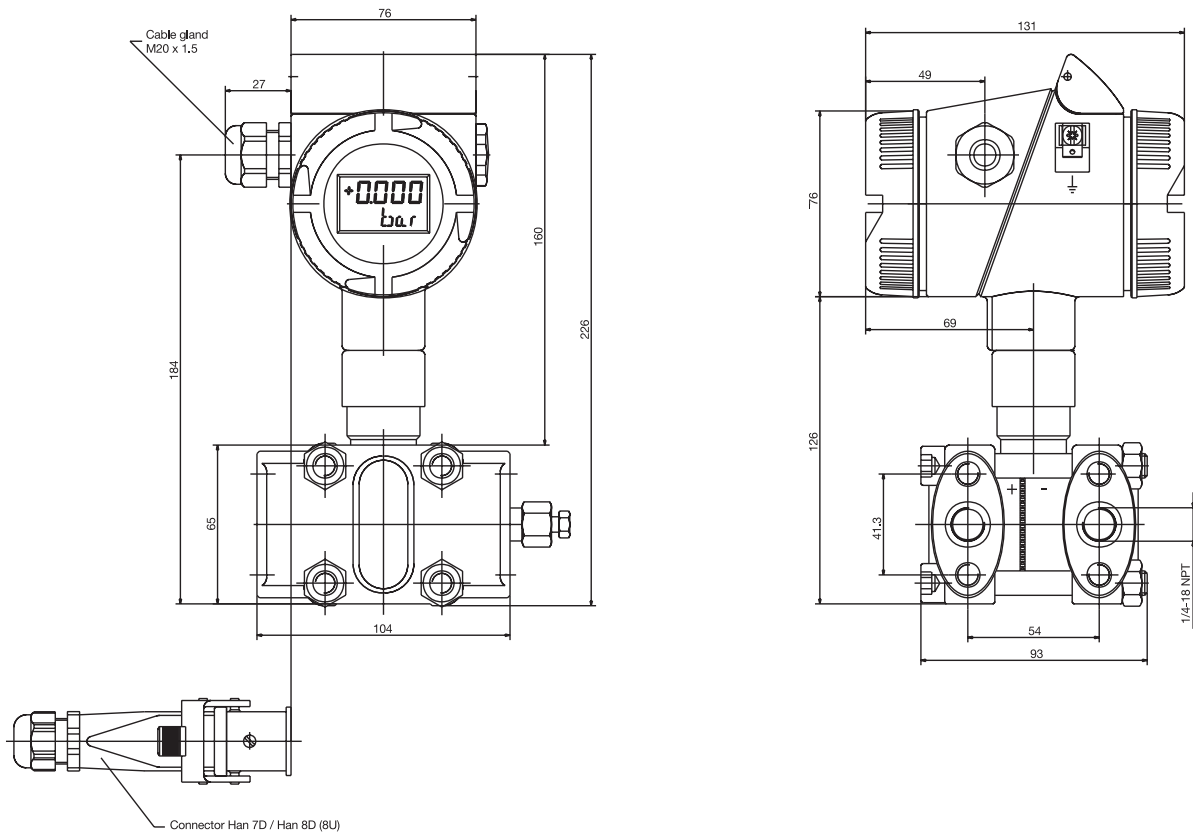
#### between PC and pressure transmitter



#### between HART® communicator and pressure transmitter



### Dimensions



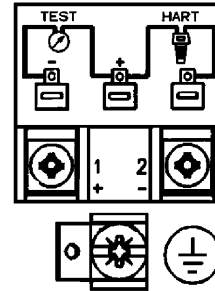
## Electrical connection

Connection		Terminals
Supply 11.5 – 36 V DC		1 L+ 2 L-
Output 4 – 20 mA 2-wire		1 L+    proportional current 4 – 20 mA 2 L-    in supply
Test connection for current output	internal resistance of ammeter ≤ 10 Ω	TEST + TEST -
Test connection for HART®	burden must be present!	TEST + HART®
Potential equilibration (for intrinsically safe circuit)		
Shielding		

### Caution:

Earth instrument!  
(pressure connection and shielding)

### Terminal assignment



## Order details

404382	<b>Basic type</b> pressure transmitter dTRANS p02 DELTA
	<b>Basic type extension</b>
0	none
1	Protection EEx ia II C (PTB 98 ATEX 2194)
5	increased nominal pressure PN 420
	<b>Nominal input range</b>
413	60 mbar differential pressure
451	250 mbar differential pressure
454	1 bar differential pressure
457	4 bar differential pressure
461	25 bar differential pressure
	<b>Output</b>
405	4 – 20 mA with HART® protocol
	<b>Process connection</b>
511	2 x pressure connection 1/4-18 NPT, DIN 837
998	suitable for connection to diaphragm-type pressure separators
	<b>Material for process connection</b>
20	stainless steel, Mat. Ref. 1.4401, 1.4404, flange Mat. Ref. 1.4408
82	special chrome-nickel alloy C276 + Mat. Ref. 2.4819, flange Mat. Ref. 1.4408
83	Monel, Mat. Ref. 2.4360, flange stainless steel Mat. Ref. 1.4408
	<b>Fastening thread</b>
113	M10 <sup>1</sup> (standard)
117	M12 (PN 420)
152	7/16-20 UNF
	<b>Seals</b>
601	FPM
603	PTFE (suitable for comestibles)
604	FFPM
	<b>Meas. system filling medium</b>
1	silicone oil
2	halogenized filling oil for oxygen applications
	<b>Flange screws</b>
2	stainless steel
404382 / [ ] - [ ] - 405 - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ]	<b>Order code</b>

### Factory setting:

Please specify the measurement range to be set and the dimensional unit in plain text.

<sup>1</sup> not for "increased nominal pressure PN420" (404382/5-....)