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# JUMO dTRANS p20 Ex d

## Process pressure transmitter with explosion-proof enclosure

### Brief description

The JUMO dTRANS p20 Ex d pressure transmitter with a HART® interface combines maximum precision with simple operation. It is used to measure the relative or absolute pressures of gases, vapors and liquids. The integrated LCD shows measurements and device data. The explosion-proof pressure transmitter can be mounted in Zone 0.

The enclosure and sensors are made from high-quality stainless steel. Various front-flush process connections are available for applications to meet hygiene requirements, including the EHEDG-certified PEKA connection system (see data sheet 409711).

It is also possible to connect remote seals for special process engineering applications (see data sheets 409772 to 409784).

The transmitter is programmable, making it readily adaptable to a variety of different measurement tasks. A user-friendly setup program is available as an accessory, for operation via the interfaces. A rotary knob ensures highly convenient and fast local, manual operation.

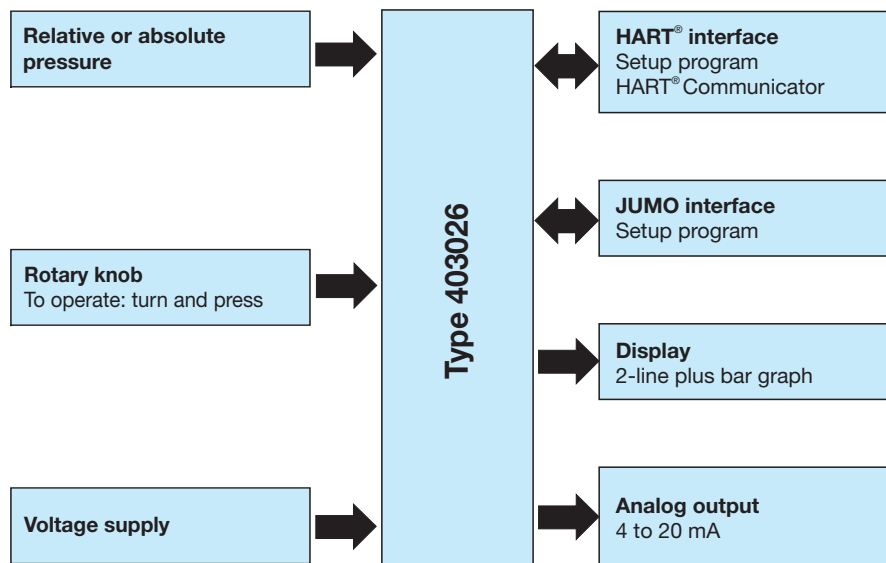
For the "Ex ia" explosion protection version, see data sheet 403025.

For the differential pressure version, see data sheets 403022 and 403023.



Type 403026

### Block diagram



### Key features

- Stainless steel enclosure
- HART® interface
- Ex d explosion protection (gas and dust) according to ATEX, INMETRO and GOST-R
- 0.05 % linearity
- Turn Down 1:50
- Rotary knob for ease of operation
- Setup program
- LCD display with bar graph
- Display scaling with a choice of measurement units
- Display of sensor temperature
- Display of minimum and maximum pressures
- Current sensor function

### Approvals/marks of conformity (see Technical data)



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## Technical data

### General

Reference conditions	DIN 16086, DIN EN 60770 and DIN IEC 770/5.3
Sensor system	Silicon sensor with stainless steel separating diaphragm
Pressure transfer medium	
For measuring system filling medium 0	Without transfer medium
For measuring system filling medium 1	Silicon oil, FDA-compliant
Permissible load change	> 10 million
Location	
Mounting position	Any
Calibration position	Device standing vertically, process connection on bottom
Position-dependent zero point offset	≤ 1 mbar; Zero point correction possible locally or via setup
Display	LCD, two-line with bar graph
Alignment	Display unit can be rotated 90° at a time Housing can be rotated ±160°
Size	Display field 22 × 35 mm/font size 7 mm/5 digits
Color	Black
Measurement unit display options	
Input pressure	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 value	% or scaled with a freely adjustable measurement unit
Output current	mA
Sensor temperature	°C; °F
Additional display data	Minimum pressure, maximum pressure, error, overrange, underrange, operating hours, device parameters
Operation	
Local	With rotary knob and LCD
Setup program	Via interface
Interface	
Standard	JUMO interface <sup>a</sup> , socket on front of instrument
For output 410 (4 to 20 mA with HART®)	JUMO interface <sup>a</sup> and HART® interface

<sup>a</sup> Neither the JUMO interface nor the HART® interface must be used in potentially explosive atmospheres! In this situation, the instrument must only be operated with the rotary knob!

### Input

Relative pressure					
Nominal measuring range	-600 to +600 mbar rel.	-1 to +4 bar rel.	-1 to +25 bar rel.	-1 to +100 bar rel.	-1 to +600 bar rel.
Overload capacity	6 bar	30 bar	150 bar	300 bar	1200 bar
Bursting pressure	12 bar	60 bar	250 bar	400 bar	2000 bar
Absolute pressure					
Nominal measuring range	0 to 0.6 bar abs.	0 to 4 bar abs.	0 to 25 bar abs.	0 to 100 bar abs.	
Overload capacity	6 bar	30 bar	150 bar	300 bar	
Bursting pressure	12 bar	60 bar	250 bar	400 bar	

### Output

Analog output	
For output 405	4 to 20 mA, two-wire
For output 410	4 to 20 mA, two-wire with HART®
Step response time T <sub>60</sub>	≤ 190 ms without damping
Damping	Adjustable, 0 to 100 s
Burden	
For output 405 (4 to 20 mA)	Burden ≤ (U <sub>B</sub> -11,5 V) ÷ 0,022 A
For output 410 (4 to 20 mA with HART®)	Burden ≤ (U <sub>B</sub> -11,5 V) ÷ 0,022 A; additional: min. 250 Ω, max. 1100 Ω

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**Voltage supply**

Voltage supply	DC 11.5 to 36 V
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**Mechanical properties**

Process connection For material 20  For material 82 Surface Process seal For process connection 512 and 571 For process connection 652 For process connection 997 (JUMO PEKA) For all other process connections	316L at front-flush process connection 316Ti sonst 2.4819 NiMo Ra ≤ 0.8 µm  FPM FPM FDA-compliant: FPM, VMQ, EPDM also available, see data sheet 409711 Without a seal
Measuring membrane For material 20  For material 82 Surface	1.4542 at measuring range 516 316L sonst 2.4819 NiMo Ra ≤ 0.8 µm
Housing Housing material Cover material Control knob material For operation 0 (without control knob) For operation 1 (with control knob)	Precision casting 1.4408 Precision casting 1.4408, FPM seal  - PA
Explosion protection	EC type examination certificate SEV 10 ATEX 0127 X II 1/2G Ex d IIC T6 to T4 Ga/Gb II 1/2D Ex t IIIC T105 °C Da/Db
Weight	Approx. 1.6 kg

**Ambient conditions**

Permissible temperatures Operation	Version	Category	Max. medium temperature	Ambient temperature <sup>a</sup>	Extended ambient temperature (extra code 681) <sup>a, b</sup>
	II 1/2G Ex d	T6	+70 °C	-40 to +60 °C	-50 to +60 °C
		T5	+85 °C	-40 to +70 °C	-50 to +70 °C
		T4	+115 °C	-40 to +85 °C	-50 to +85 °C
	II 1/2D Ex d	T105 °C	+100 °C	-40 to +85 °C	-50 to +85 °C
Storage	-40 to +85 °C				
Permissible relative humidity Operation Storage	100% incl. condensation on instrument outer sleeve 90% without condensation				
Permissible mechanical loading Vibration performance Shock resistance	2 g, 10 to 500 Hz to EN 60770-3 15 g for 6 ms to IEC 60068-2-27				
Electromagnetic compatibility Interference emission Interference resistance	To EN 61326 Class B Industrial				
Protection	IP66 to EN 60529				

<sup>a</sup> Restricted function below -20 °C: stationary use, increased danger of broken cable, display does not function.

<sup>b</sup> In the range from -40 to -50 °C the device must be permanently in operation. Additionally, the lid with the device inspection glass must also be protected against mechanical impact and shock effects. Please contact JUMO for further details.

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**Accuracy**

Relative pressure					
Nominal measuring range	-600 to +600 mbar rel.	-1 to +4 bar rel.	-1 to +25 bar rel.	-1 to +100 bar rel.	-1 to +600 bar rel.
Factory setting for measuring range	0 to 600 mbar	0 to 4 bar	0 to 25 bar	0 to 100 bar	0 to 600 bar
Minimum span	60 mbar	0.1 bar	0.5 bar	5 bar	30 bar
Turndown ratio (r)	$r \leq 20$	$r \leq 50$	$r \leq 52$	$r \leq 20$	
Linearity for a linear characteristic as % of the set span	0.1 % for $r \leq 10$	0.05 % for $r \leq 10$			
	$r \times 0.01$ % for $10 \leq r \leq 20$	$r \times 0.005$ % for $10 \leq r \leq 50$	$r \times 0.005$ % for $10 \leq r \leq 52$	$r \times 0.005$ % for $10 \leq r \leq 20$	
Accuracy at 20 °C as % of the set span	0.2 % for $r \leq 10$	0.1 % for $r \leq 10$			
	$r \times 0.02$ % for $10 \leq r \leq 20$	$r \times 0.01$ % for $10 \leq r \leq 50$	$r \times 0.01$ % for $10 \leq r \leq 52$	$r \times 0.01$ % for $10 \leq r \leq 20$	
Accuracy at -40 to +85 °C as % of the set span	0.3% for $r \leq 10^a$	0.2% for $r \leq 10$			
	$r \times 0.03$ % for $10 \leq r \leq 20^a$	$r \times 0.02$ % for $10 \leq r \leq 50$	$r \times 0.02$ % for $10 \leq r \leq 52$	$r \times 0.02$ % for $10 \leq r \leq 20$	
Long-term stability as % of the nominal measuring range	0.1 %/year				

<sup>a</sup> Only to -30 °C.

Absolute pressure				
Nominal measuring range	0 to 0.6 bar abs.	0 to 4 bar abs.	0 to 25 bar abs.	0 to 100 bar abs.
Factory setting for measuring range	0 to 600 mbar	0 to 4 bar	0 to 25 bar	0 to 100 bar
Minimum span	60 mbar	0.1 bar	0.5 bar	5 bar
Turndown ratio (r)	$r \leq 10$	$r \leq 40$	$r \leq 50$	$r \leq 20$
Linearity for a linear characteristic as % of the set span	0.1 % for $r \leq 5$	0.05 % for $r \leq 10$		
	$r \times 0.02$ % for $5 \leq r \leq 10$	$r \times 0.005$ % for $10 \leq r \leq 40$	$r \times 0.005$ % for $10 \leq r \leq 50$	$r \times 0.005$ % for $10 \leq r \leq 20$
Accuracy at 20 °C as % of the set span	0.2 % for $r \leq 5$	0.1% for $r \leq 10$		
	$r \times 0.04$ % for $5 \leq r \leq 10$	$r \times 0.01$ % for $10 \leq r \leq 40$	$r \times 0.01$ % for $10 \leq r \leq 50$	$r \times 0.01$ % for $10 \leq r \leq 20$
Accuracy at -40 to +85 °C as % of the set span	0.3 % for $r \leq 5^a$	0.2% for $r \leq 10$		
	$r \times 0.06$ % for $5 \leq r \leq 10$	$r \times 0.02$ % for $10 \leq r \leq 40$	$r \times 0.02$ % for $10 \leq r \leq 50$	$r \times 0.02$ % for $10 \leq r \leq 20$
Long-term stability as % of the nominal measuring range	0.1 %/year			

<sup>a</sup> Only to -30 °C.

**Approvals/marks of conformity**

Mark of conformity	Testing laboratory	Certificate/ certification number	Test basis	Valid for
ATEX	electrosuisse	SEV 10 ATEX 0127 X	EN 60079-0 EN 60079-1 EN 60079-26 EN 60079-31	403026/...
EHEDG	TUM MAK	03/2006	Document No.8	Process connection 997 (JUMO PEKA)
INMETRO	CEPEL	CEPEL 13.2214X	IEC 60079 IEC 60529	Extra code 227
GOST-R				

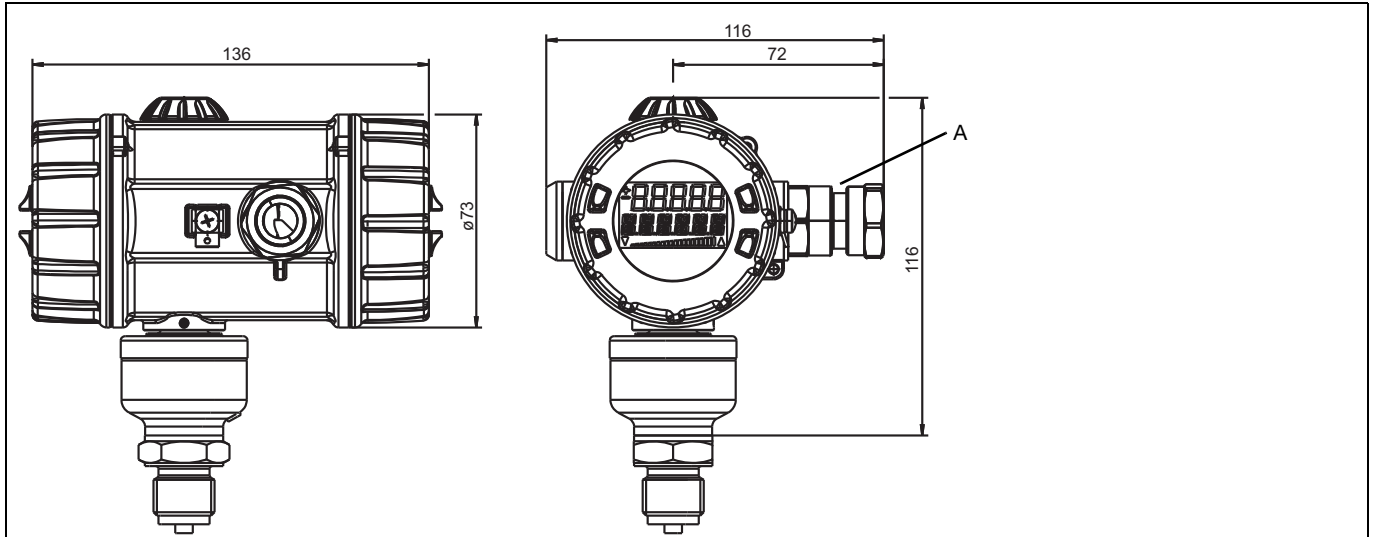
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**Dimensions**



A Cable gland M20 x 1.5

**Process connections**

<p>504 (G 1/2)</p>	<p>512 (1/2-14 NPT)</p>	<p>564 (1/2-14 NPT internal)</p>	<p>571 (G 3/4)</p>
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<p>604 and 606 (tapered adapter with groove union nut to DIN 11851)</p>	<p>613 and 616 (Clamp to DIN 32676)</p>	<p>997 (JUMO PEKA)</p>
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**Dimensions of process connections 604, 606, 613 and 616**

Connection	DN	D1	D2	D3	D4	L1	L2
604	25	ø 44	ø 35	Rd 52 x 1/6"	ø 63	15	21
606	40	ø 56	ø 48	Rd 65 x 1/6"	ø 78		
613	25	ø 43.5	ø 50.5				
616	50	ø 56.5	ø 64				




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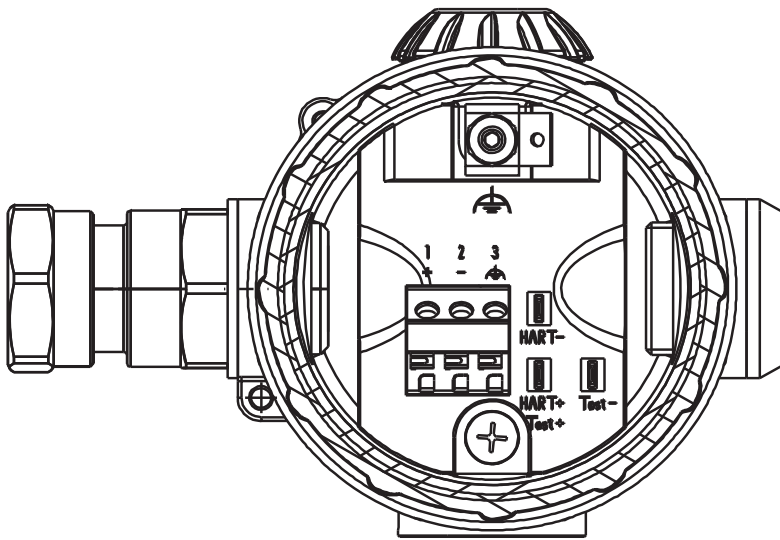
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## Electrical connection

Connection		Terminal assignment
Voltage supply DC 11.5 to 36 V		1 L+ 2 L-
Output 4 to 20 mA, two wires Impressed current 4 to 20 mA in voltage supply		1 L+ 2 L-
Current output test connection Inherent resistance of ammeter $\leq 10 \Omega$		TEST + TEST -
HART® test connection The burden must be present!		HART + HART -
Functional ground		3
Grounding or equipotential bonding		outside, on the enclosure

## Cable gland



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**Order details**

<b>(1) Basic type</b>	
403026	JUMO dTRANS p20 Ex d
<b>(2) Basic type extension</b>	
0	None
9	Special design
<b>(3) Display</b>	
0	Without display
1	With display
<b>(4) Operation</b>	
0	Without control knob
1	With control knob
<b>(5) Nominal measuring range of input</b>	
450	-600 to +600 mbar relative pressure
487	0 to 0.6 bar absolute pressure
491	0 to 4 bar absolute pressure
495	0 to 25 bar absolute pressure
507	0 to 100 bar absolute pressure <sup>a</sup>
513	-1 to +4 bar relative pressure
514	-1 to +25 bar relative pressure
515	-1 to +100 bar relative pressure <sup>a</sup>
516	-1 to +600 bar relative pressure <sup>b</sup>
<b>(6) Output</b>	
410	4 to 20mA, two wire with HART®
<b>(7) Process connection</b>	
504	G 1/2 to EN 837
512	1/2-14 NPT to DIN 837
564	1/2-14 NPT internal
571	G 3/4 front-flush to DIN EN ISO 228-1
583	M20( × 1.5) with tap
604	Tapered adapter with groove union nut DN 25 to DIN 11851 (milk cone)
606	Tapered adapter with groove union nut DN 40 to DIN 11851 (milk cone)
613	Clamp DN 25/32/40 to DIN 32676
616	Clamp DN 50 to DIN 32676/2" ISO 2852
997	JUMO PEKA with EHEDG approval
998	Suitable for connecting to a diaphragm seal
<b>(8) Process connection material</b>	
20	CrNi (stainless steel)
82	NiMo
99	Special process connection material
<b>(9) Measuring system filling medium</b>	
00	Without filling medium
01	Silicon oil
<b>(10) Extra codes</b>	
000	None
100	Customized setting <sup>c</sup>
226	With GOST R approval
227	With INMETRO approval
374	Material inspection certificate 3.1 DIN EN 10204 Material
452	Parts in contact with the medium are electropolished, surface roughness Ra ≤ 0.8 μm
591	Throttle in pressure channel

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624	Free of oil and grease
630	Enlarged pressure channel
634	With TAG number
635	With manufacturer declaration NACE <sup>d</sup>
681	Extended permissible ambient temperature

<sup>a</sup> This inputs specified above are not available with process connections 604, 606, 613, 616.

<sup>b</sup> This input is not available with process connections 571, 604, 606, 613, 616, 997.

<sup>c</sup> Please specify required setting in plain text. For factory setting, see Accuracy section.

<sup>d</sup> Only with process connection material 82 (NiMo) and process connection 512 or 564.

**Order code**      (1)      (2)      (3)      (4)      (5)      (6)      (7)      (8)      (9)      (10)  
 /         /  , ...  
**Order example**      403026 / 0 - 1 - 1 - 514 - 410 - 504 - 20 - 1 / 000

**Accessories**

Article	Part no.
PC interface with USB/TTL converter <sup>a</sup>	00456352
HART <sup>®</sup> modem USB <sup>b</sup>	00443447
Mounting bracket for 2" pipe and wall	00597711

	Data Sheet
Manifolds	409706
JUMO PEKA - Process connection adapter with EHEDG approval	409711
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
Ex-i Power supply/input isolating amplifier	707530

<sup>a</sup> The PC interface cable is the connection between the JUMO interface of the pressure transmitter and the USB interface of a PC.

<sup>b</sup> The HART<sup>®</sup> modem is the connection between the HART<sup>®</sup> interface of the pressure transmitter and the USB interface of a PC.

**Software**

Article	Part no.
JUMO Setup dTRANS p20 series	00537577