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# JUMO dTRANS p20

## Process pressure transmitter

### Brief description

The JUMO dTRANS p20 pressure transmitter with HART® interface combines maximum precision with easy operation. It is used to measure the relative and absolute pressures of gases, vapors and liquids. The integrated LCD shows measurements and device data. In the version with "Ex ia (intrinsically safe)" explosion protection, the pressure transmitter can be fitted up to zone 0.

The housing 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).

A high-temperature version capable of withstanding medium temperatures up to 200°C has been specifically designed for application involving hot media and pipes.

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 d" explosion protection version, see data sheet 403026.

For the differential pressure version, see data sheet 403022.



Type 403025/0-0-1-...

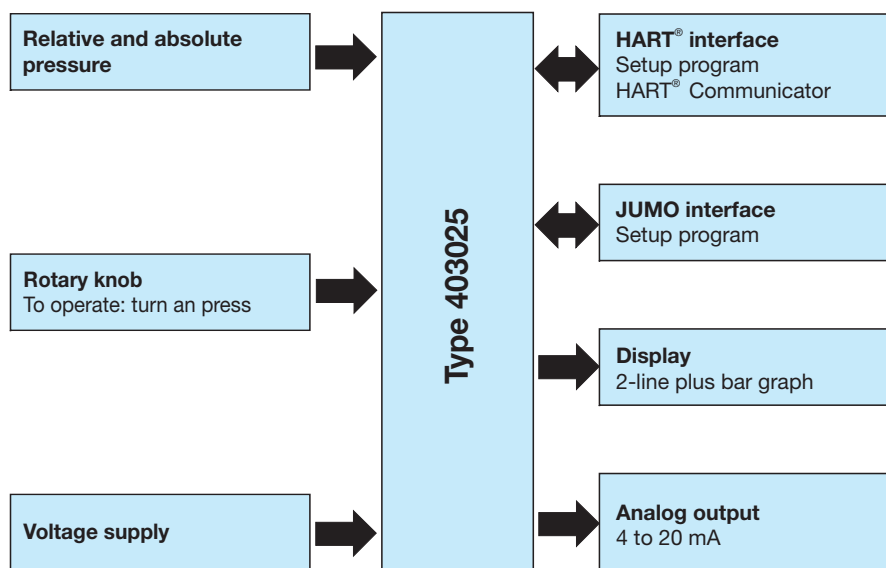


Type 403025/0-0-2-...



Type 403025/0-0-3-...

### Block diagram



### Key features

- Stainless steel housing
- HART® interface
- Ex ia explosion protection (gas and dust) according to ATEX, INMETRO and GOST-R
- 0.05 % linearity
- Turn Down 1:50
- Medium temperature up to 200 °C
- 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
Location-dependent zero point offset	Zero point calibration possible locally or via setup.
For medium temperature 1 (up to 120 °C)	≤ 1 mbar
For medium temperature 2 (up to 200 °C)	≤ 10 mbar
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>
For output 410 (4 to 20 mA with HART®)	JUMO interface <sup>a</sup> and HART® interface

<sup>a</sup> The JUMO interface must not be used for instruments with ATEX Ex ia explosion protection! These instruments can be operated by the rotary knob or via the HART® interface.

### 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
Burst 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	
Burst 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 T60	≤ 190 ms without damping
Damping	adjustable, 0 to 100 s

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Burden For output 405 (4 to 20 mA) For output 410 (4 to 20 mA with HART®)	Burden $\leq (U_B - 11.5 \text{ V}) \div 0.022 \text{ A}$ Burden $\leq (U_B - 11.5 \text{ V}) \div 0.022 \text{ A}$ ; additional: min. 250 $\Omega$ , max. 1100 $\Omega$
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**Voltage supply**

For version Explosion protection 0 (none) Explosion protection 1 (ATEX Ex ia)	DC 11.5 to 36 V DC 11.5 to 28 V The voltage supply must be intrinsically safe and must not exceed the following maximum values: $U_i \leq \text{DC } 28 \text{ V}$ $I_i \leq 93 \text{ mA}$ $P_i \leq 750 \text{ mW}$
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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 $R_a \leq 0.8 \mu\text{m}$ FPM FPM FDA-compliant, EHEDG approved materials: FPM, VMQ, EPDM option, 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 $R_a \leq 0.8 \mu\text{m}$
Housing Material For housing 1 (short, stainless steel) For housing 2 (long, stainless steel) For housing 3 (precision casting) For cover material 20 (stainless steel) For cover material 85 (plastic) For electrical connection 36 (M12 x 1 round plug) For electrical connection 82 (cable gland, plastic) For electrical connection 93 (cable gland, metal) For operation 0 (without control knob) For operation 1 (with control knob)	Stainless steel 1.4404 Stainless steel 1.4404, VMQ Precision casting 1.4408 Precision casting 1.4408, FPM seal PA, FPM seal Nickel-plated brass PA Nickel-plated brass - PA
Explosion protection For explosion protection 0 (none) For explosion protection 1 (ATEX Ex ia)	The instrument is <b>not</b> approved for use in hazardous (Ex) areas. EC type examination certificate SEV 09 ATEX 0138 X  II 1/2G Ex ia IIC T6 to T3 Ga/Gb II 1/2D Ex ia IIIC T105 °C Da/Db
Weight Type 403025/0-0-1 (short housing) Type 403025/0-0-2 (long housing) Type 4030252/0-0-3 (precision casting housing)	Approx. 550 g Approx. 850 g Approx. 1600 g

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**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>	
	Standard		+120 °C	-40 to +85 °C	-50 to +85 °C	
	High temperature		+200 °C	-40 to +85 °C	-50 to +85 °C	
	II 1/2G Ex ia	T6		+60 °C	-40 to +50 °C	-50 to +50 °C
		T5		+70 °C	-40 to +65 °C	-50 to +65 °C
		T4		+115 °C	-40 to +85 °C	-50 to +85 °C
		T3 <sup>c</sup>		+175 °C	-40 to +85 °C	-50 to +85 °C
II 1/2D Ex ia	T105 °C	+100 °C	-40 to +60 °C	-50 to +60 °C		
Storage	-40 to +85°C					
Permissible relative humidity Operation	100 % incl. condensation on instrument outer sleeve					
Storage	90 % without condensation					
Permissible mechanical loading Vibration performance	2 g, 10 to 2000 Hz to DIN EN 60068-2-6					
Shock resistance	15 g for 6 ms to IEC 60068-2-27					
Electromagnetic compatibility Interference emission	To EN 61326					
Interference resistance	Class B Industry					
Protection Version						
Explosion protection 0 (none)	IP67 to DIN EN 60529					
Explosion protection 1 (ATEX Ex ia)	IP66 to DIN 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.

<sup>c</sup> Only for high temperature version (temperature of medium 2).

**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 ≤ 20	r ≤ 50	r ≤ 52	r ≤ 20	
Linearity for linear characteristic as % of the set span	0.1 % for r ≤ 10	0.05 % for r ≤ 10			
	r × 0.01 % for 10 ≤ r ≤ 20	r × 0.005 % for 10 ≤ r ≤ 50	r × 0.005 % for 10 ≤ r ≤ 52	r × 0.005 % for 10 ≤ r ≤ 20	
Accuracy at 20 °C as % of the set span	0.2 % for r ≤ 10	0.1 % for r ≤ 10			
	r × 0.02 % for 10 ≤ r ≤ 20	r × 0.01 % for 10 ≤ r ≤ 50	r × 0.01 % for 10 ≤ r ≤ 52	r × 0.01 % for 10 ≤ r ≤ 20	
Accuracy at -40 to +85 °C as % of the set span	0.3 % for r ≤ 10 <sup>a</sup>	0.2 % for r ≤ 10		0.2 % for r ≤ 10	
	r × 0.03 % for 10 ≤ r ≤ 20 <sup>a</sup>	r × 0.02 % for 10 ≤ r ≤ 50	r × 0.02 % for 10 ≤ r ≤ 52	r × 0.02 % for 10 ≤ r ≤ 20	
Long-term stability as % of nominal measuring range	0.1 %/year				

<sup>a</sup> Only to -30 °C.

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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 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 $5 \leq r \leq 10^a$	$r \times 0.02$ % 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 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 09 ATEX 0138 X	EN 60079-0 EN 60079-11 EN 60079-26	403025/x-1-...
EHEDG	TUM MAK	03/2006	Document No.8	Process connection 997 (JUMO PEKA)
INMETRO	CEPEL	CEPEL 13.2213X	IEC 60079 IEC 60529	Extra code 227
DNV	Det Norske Veritas AS	A-13300	Testing report 203951/4 dated 2012-06-13	403025/x-1-.../880
GOST-R				

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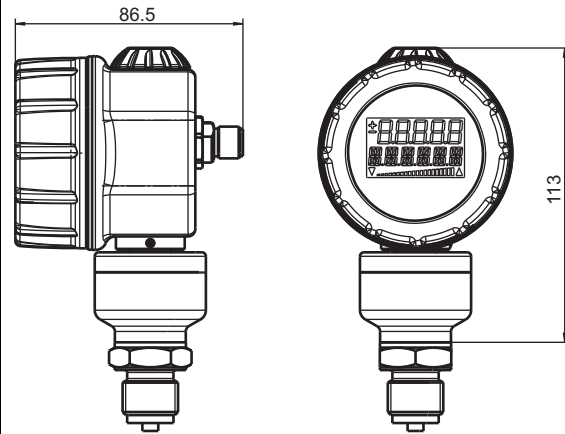
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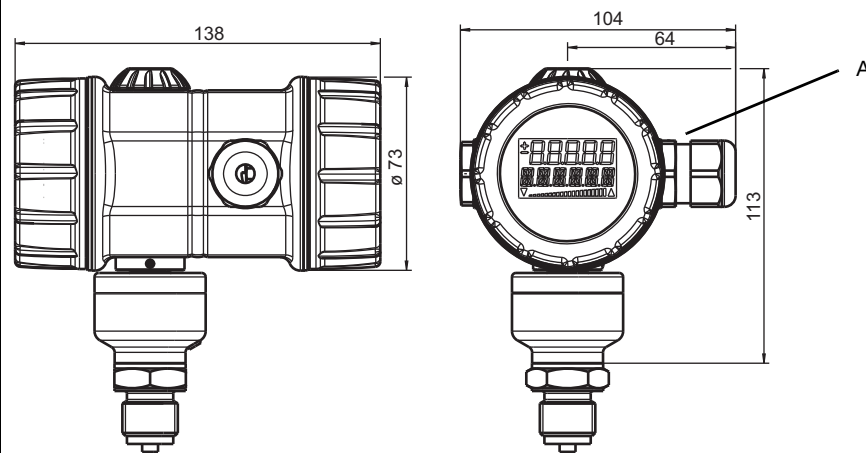


## Dimensions

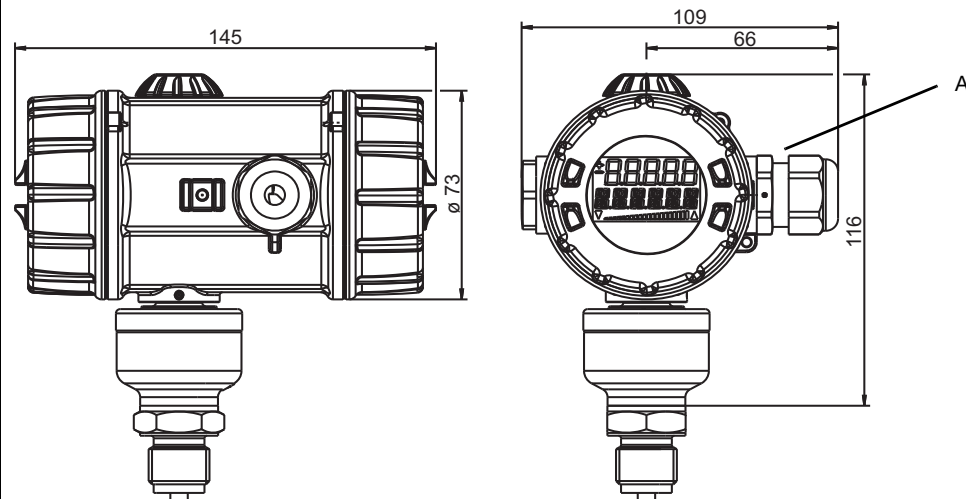
**Type 403025/0-0-1 (short, stainless steel, with M12 connection)**



**Type 403025/0-0-2 (long, stainless steel, with cable gland)**



**Type 403025/0-0-3 (precision casting, with cable gland)**



A Cable gland M20 x 1.5

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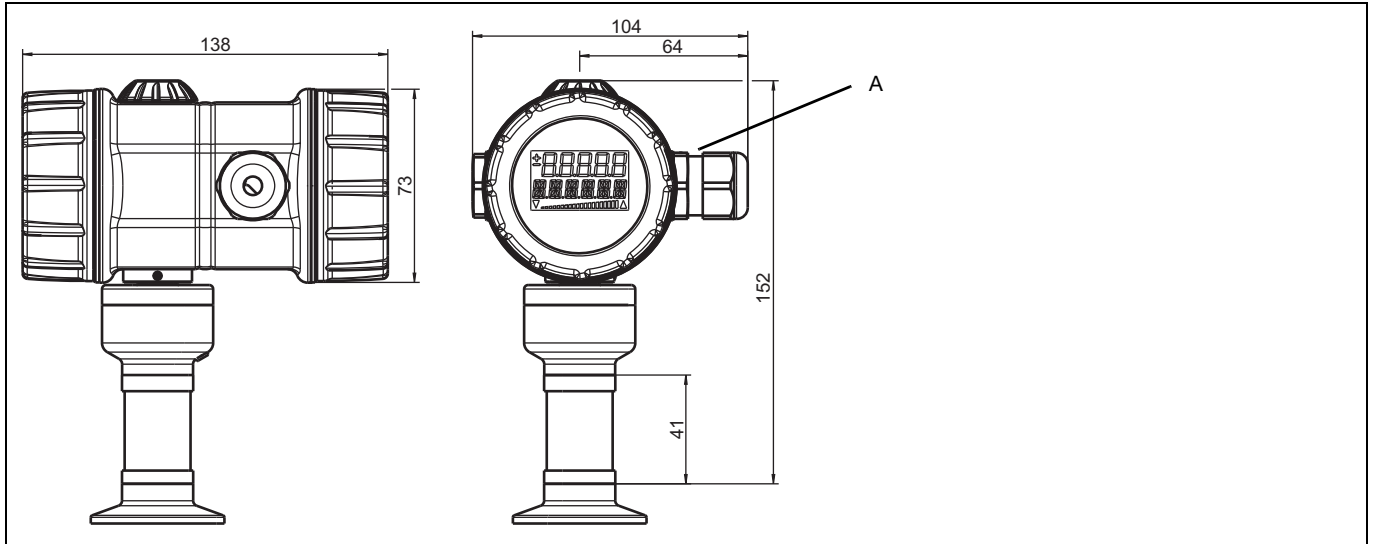
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**Dimensions for medium temperature 2 (high-temperature version)**

In pressure transmitters suitable for medium temperatures up to 200°C, the increased temperature is dissipated over an extended shaft. The overall height of all the pressure transmitters in this version increases as in the diagram below, by 41 mm.



A Cable gland M20 x 1.5

**Process connections**

504 (G1/2)	512 (1/2-14 NPT)	564 (1/2-14 NPT internal)	571 (G3/4)

604 and 606 (taper connection nut to DIN 11851)	613 and 616 (clamp to DIN 32676)	997 (JUMO PEKA)

**Dimensions of process connections 604, 606, 613 and 616**

Connection	DN	D1	D2	D3	D4	L1	L2
604	25	ø44	ø35	Rd 52 x 1/6"	ø63	15	21
606	40	ø56	ø48	Rd 65 x 1/6"	ø78		
613	25	ø43.5	ø50.5				
616	50	ø56.5	ø64				

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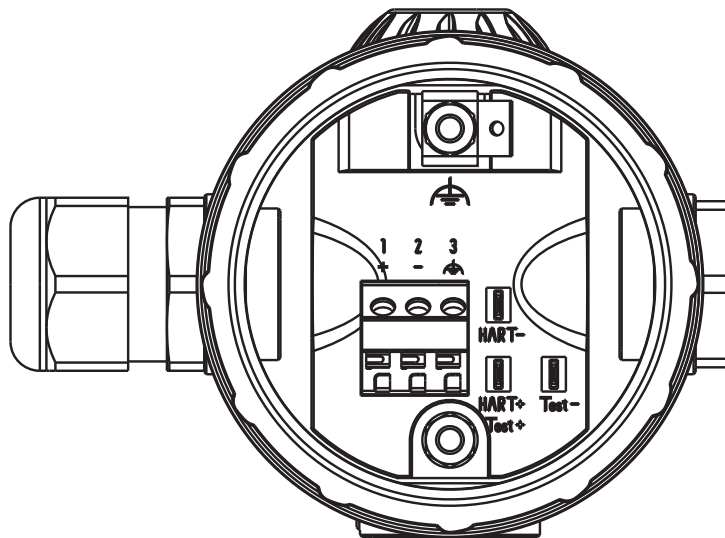
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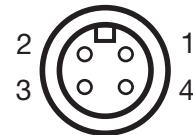
## Electrical connection

Connection	Terminal assignment	
	Cable gland	Round plug, M12 x 1
Voltage supply for <b>non</b> Ex version DC 11.5 to 36 V for Ex version DC 11.5 to 30 V		1 L+ 2 L-
Output 4 to 20 mA two wire Impressed current 4 to 20 mA in voltage supply		1 L+ 3 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 4

### Cable gland



### M12 x 1 round plug





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**Order details**

	<b>(1) Basic type</b>
403025	dTRANS p20 process pressure transmitter
	<b>(2) Basic type extension</b>
0	None
9	Special design
	<b>(3) Explosion protection</b>
0	None
1	ATEX Ex ia <sup>a</sup>
	<b>(4) Housing</b>
1	Short, stainless steel, with M12 connection
2	Long, stainless steel, with cable gland
3	Precision casting, with cable gland
	<b>(5) Electrical connection</b>
36	Round plug, M12 x 1 <sup>b</sup>
82	Cable gland, plastic
93	Cable gland, metal
	<b>(6) Cover material</b>
20	CrNi (stainless steel)
85	Plastic
	<b>(7) Display</b>
0	Without display (LCD)
1	With display (LCD)
	<b>(8) Operation</b>
0	Without control knob
1	With control knob
	<b>(9) Nominal measuring range</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>c</sup>
513	-1 to +4 bar relative pressure
514	-1 to +25 bar relative pressure
515	-1 to +100 bar relative pressure <sup>c</sup>
516	-1 to +600 bar relative pressure <sup>d</sup>
	<b>(10) Output</b>
405	4 to 20mA, two wire
410	4 to 20mA, two wire with HART <sup>®</sup> protocol
	<b>(11) 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 837
583	M20 (x 1.5) with adapter
604	Taper connection with union nut DN 25 to DIN 11851 (milk cone)
606	Taper connection with union nut DN 40 to DIN 11851 (milk cone)
613	Clamp DN 25 to DIN 32676
616	Clamp DN 50 to DIN 32676/2" ISO 2852
997	JUMO PEKA with EHEDG approval
998	Process connection for pressure separator

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**JUMO Process Control, Inc.**  
 6733 Myers Road  
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 1-800-554-5866  
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<b>(12) Temperature of medium</b>	
1	Up to 120°C <sup>e</sup>
2	Up to 200°C <sup>f</sup>
<b>(13) Process connection material</b>	
20	CrNi (stainless steel)
82	NiMo
<b>(14) Measuring system filling medium</b>	
00	None
01	Silicon oil
<b>(15) Extra codes</b>	
000	None
100	Customized setting <sup>g</sup>
226	With GOST R approval
227	With INMETRO approval
452	Parts in contact with the medium are electropolished, surface roughness Ra ≤ 0.8 μm
591	Throttle in pressure channel
624	Free of oil and grease
630	Enlarged pressure channel
634	With TAG number
635	With manufacturer declaration NACE <sup>h</sup>
681	Extended permissible ambient temperature
691	Improved humidity/vibration protection
880	With DNV certification <sup>i</sup>

- <sup>a</sup> ATEX Ex ia does not apply in connection with a cable gland made out of plastic (82), a cover material made out of plastic (85) and the output 4 to 20 mA (405).
- <sup>b</sup> The case is only available with a round plug M12×1 (36) as electrical connection.
- <sup>c</sup> This inputs specified above are not available with the process connections 604, 606, 613, 616.
- <sup>d</sup> This input is not available with the process connections 571, 604, 606, 613, 616, 997.
- <sup>e</sup> For ATEX Ex ia 115 °C max.
- <sup>f</sup> For ATEX Ex ia 175 °C max.
- <sup>g</sup> Please specify required setting in plain text. For factory setting see "Accuracy" section in data sheet.
- <sup>h</sup> Only with process connection material 82 (NiMo) and process connection 512 or 564.
- <sup>i</sup> Only with explosion protection 1 (ATEX Ex ia) and not with nominal measuring range 516.

**Order code**                    (1)    (2)    (3)    (4)    (5)    (6)    (7)    (8)    (9)    (10)    (11)    (12)    (13)    (14)    (15)  
 [ ] / [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] - [ ] / [ ]  
**Order example**            403025 / 0 - 0 - 2 - 82 - 85 - 1 - 1 - 514 - 405 - 504 - 1 - 20 - 1 / 000

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**Accessories**

Article	Part no.
PC interface with USB/TTL converter <sup>a</sup>	00456352
HART <sup>®</sup> modem USB <sup>b</sup>	00443447
4-pole terminal box, straight, M12 × 1, with 2 m PVC cable	00404585
4-pole terminal box, angled, M12 × 1, mit 2 m PVC cable	00409334
5-pole terminal box M12 × 1, straight, without cable	00419130
5-pole terminal box M12 × 1, angled, without cable	00419133
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