

JUMO dTRANS p20

Process pressure transmitter

Description

The device with the HART interface combines maximum precision with simple operation. It is used to measure the system pressure of gas, steam and liquids. The built-in LCD displays measured values and device data. The device can be installed up to zone 0 in the version with explosion protection "Ex ia (intrinsically safe)".

The housing and sensor are manufactured from high-grade stainless steel. Diaphragm seals can also be connected for specific process technology applications (see data sheets 409772 to 409784).

The pressure transmitter can be programmed and can therefore be flexibly adapted for various measuring tasks. There is an easy-to-use setup program available as an accessory for operation via interfaces. A rotary knob allows for quick and easy on-site manual operation.

The pressure transmitter with 4 to 20 mA and HART protocol was evaluated with regard to functional safety and is certified by exida according to IEC 61508 -1/-2/-3:2010. These measuring devices are suitable for monitoring process level and process pressure up to SIL2. Further details can be found in the Safety Manual.

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-...



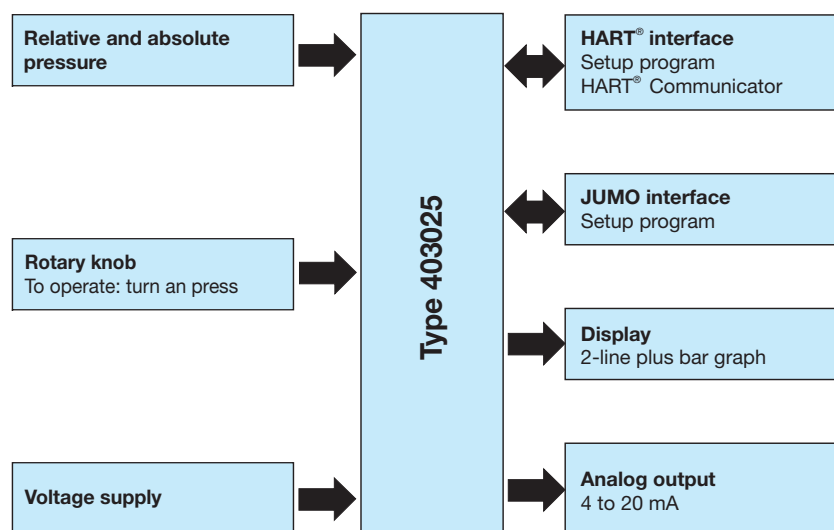
Type 403025/0-0-2-...



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



Block diagram



Special features

- Stainless steel case
- SIL certified (exida)
- HART interface
- Explosion protection Ex ia (gas and dust) according to ATEX and UKEX
- Linearity 0.05 %
- Turn down: 1:50
- Up to 200 °C medium temperature
- Simple operation with rotary knob
- Setup program
- LCD display with bar graph
- Display scaling with a choice of measuring units
- Display of sensor temperature
- Display of minimum and maximum pressures
- Current-generator function

Approval marks and certificates



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Approval marks and certificates

	Designation Testing agency Certificate no. Inspection basis Valid for	ATEX Eurofins Electrosuisse Product Testing AG SEV 09 ATEX 0138 X EN 60079-0, EN 60079-11, EN 60079-26 Type 403025/x-1
	Designation Testing agency Certificate no. Inspection basis Valid for	UKEX Bureau Veritas EPS 22 UKEX 1 369 X EN 60079-0, EN 60079-11, EN 60079-26 Type 403025/x-1 with extra code 085
	Designation Testing agency Certificate no. Inspection basis Valid for	DNV DNV TAA00001KB DNV GL CG-0339 Type 403025/x-1 with extra code 880
	Designation Testing agency Certificate no. Inspection basis Valid for	SIL exida JUMO 2203088 C001 IEC 61508-1/-2/-3:2010 Type 403025 with basic type extension 2
	Designation Testing agency Certificate no. Inspection basis Valid for	EHEDG EHEDG EHEDG-C2000058 Hygienic Equipment Design JUMO PEKA – Hygienic process connection with FPM O-ring, process connection 613 and process connection 616
	Designation Testing agency Certificate no. Inspection basis Valid for	H2 ready – Mobile hydrogen applications KIWA P000415366HGV19 CSA ANSI HGV 3:1:2022 Type 403025 with extra code 1160

Observe "Special conditions for safe use" in hazardous areas.

Certificates for approved device versions are available for download on the manufacturer's website.

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Technical data

General Information

Reference conditions	DIN EN 60770, DIN EN 61298
Ambient temperature	22 °C ±5 K
Air pressure	1000 hPa (±25 hPa)
Voltage supply	DC 24 V
Burden	50 Ω
Sensor system	Silicon sensor with stainless steel separating diaphragm/thin film sensor
Pressure transfer medium	
For measuring system filling medium 0	Without transfer medium
For measuring system filling medium 1	Silicon oil, FDA compliant
Admissible load changes	> 10 million
Position	
Mounting position	Any
Calibration position	Device upright, process connection at the bottom
Zero offset depending on position	Relative pressure: a zero offset is possible on-site or via setup. Absolute pressure: manual readjustment is possible.
For medium temperature 1 (up to 120 °C)	≤ 1 mbar
For medium temperature 2 (up to 200 °C)	≤ 10 mbar
Display ^a	LCD, two-line with bar graph
Alignment	Display unit rotatable in 90° steps Housing rotatable ±160°
Size	Display 22 × 35 mm, font size 7 mm, 5 digits
Color	Black
Portrayable measuring units	
Input pressure	mH ₂ O, inH ₂ O, inHg, ftH ₂ O, mmH ₂ O, mmHg, psi, bar, mbar, kg/cm ² , kPa, Torr, MPa
Measured value	% or scaled with freely adjustable measuring unit
Output current	mA
Sensor temperature	°C, °F
Additional display data	Minimum pressure, maximum pressure, error, overrange, underrange, operating hours, device parameters
Operation	
On-site	With rotary knob and LCD
Setup program	Via interface
Interface	
Standard	JUMO interface ^b
For output 410 (4 to 20 mA with HART)	JUMO interface ^b and HART interface

^a Optional; SIL version only available with display.

^b The JUMO interface may not be used in a potentially explosive area! In such a case the device can be operated via the rotary knob or the HART interface.

Ex identification markings

ATEX, UKEX	II 1/2G Ex ia IIC T6 ... T3 Ga/Gb II 1/2D Ex ia IIIC T105 °C Da/Db
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Electrical data

For version	
Explosion protection 0 (without)	DC 12 to 36 V
Explosion protection 1 (ATEX Ex ia)	DC 12 to 28 V
	The voltage supply must be intrinsically safe and must not exceed the following maximum values:
	$U_i \leq \text{DC } 28 \text{ V}$
	$I_i \leq 115 \text{ mA}$
	$P_i \leq 750 \text{ mW}$
	$C_i = 6 \text{ nF}$
	$L_i = 105 \text{ }\mu\text{H}$

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Inputs

Measuring range and accuracy

Relative pressure

	Nominal measuring range			
	-600 to +600 mbar	-1 to +2.5 bar	-1 to +4 bar	-1 to +10 bar
Default measuring range	0 to 600 mbar	0 to 2.5 bar	0 to 4 bar	0 to 10 bar
Smallest MSP ^a	60 mbar	0.1 bar	0.1 bar	0.5 bar
Turndown ratio (r) ^b	$r \leq 20$	$r \leq 35$	$r \leq 50$	$r \leq 22$
Non-linearity for reference conditions ^c	0.06 %	0.04 %	0.04 %	0.04 %
Accuracy in % of the set MSP Range: -20 to +60 °C	$r \times 0.12 \%$ for $1 \leq r \leq 20$	$r \times 0.08 \%$ for $1 \leq r \leq 35$	$r \times 0.08 \%$ for $1 \leq r \leq 50$	$r \times 0.08 \%$ for $1 \leq r \leq 22$
Accuracy in % of the set MSP Range: -40 to -20 °C or 60 to 85 °C	$r \times 0.18 \%$ for $1 \leq r \leq 20^d$	$r \times 0.12 \%$ for $1 \leq r \leq 35$	$r \times 0.12 \%$ for $1 \leq r \leq 50$	$r \times 0.12 \%$ for $1 \leq r \leq 22$
Long-term stability in % as of the nominal measuring range	0.1 %/year			
Overload capability	6 bar	15 bar	30 bar	60 bar
Burst pressure	12 bar	30 bar	60 bar	100 bar

	Nominal measuring range			
	-1 to +25 bar	-1 to +100 bar	-1 to +250 bar	-1 to +600 bar
Default measuring range	0 to 25 bar	0 to 100 bar	0 to 250 bar	0 to 600 bar
Smallest MSP ^a	0.5 bar	5 bar	12.5 bar	30 bar
Turndown ratio (r) ^b	$r \leq 52$	$r \leq 20$	$r \leq 20$	$r \leq 20$
Non-linearity for reference conditions ^c	0.04 %	0.04 %	0.04 %	0.08 %
Accuracy in % of the set MSP Range: -20 to +60 °C	$r \times 0.08 \%$ for $1 \leq r \leq 52$	$r \times 0.08 \%$ for $1 \leq r \leq 20$	$r \times 0.08 \%$ for $1 \leq r \leq 20$	$r \times 0.16 \%$ for $1 \leq r \leq 20$
Accuracy in % of the set MSP Range: -40 to -20 °C or 60 to 85 °C	$r \times 0.12 \%$ for $1 \leq r \leq 52$	$r \times 0.12 \%$ for $1 \leq r \leq 20$	$r \times 0.12 \%$ for $1 \leq r \leq 20$	$r \times 0.24 \%$ for $1 \leq r \leq 20$
Long-term stability in % as of the nominal measuring range	0.1 %/year			
Overload capability	150 bar	300 bar	600 bar	1200 bar
Burst pressure	250 bar	400 bar	700 bar	2000 bar

^a MSP = measuring span

^b r = span of the nominal measuring range ÷ adjusted measuring span

^c Reference conditions: ambient temperature 20 °C (±3 K), air pressure 1000 hPa (±25 hPa)

^d Only up to -30 °C.

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**Absolute pressure**

	Nominal measuring range			
	0 to 600 mbar	0 to 2.5 bar	0 to 4 bar	0 to 10 bar
Default measuring range	0 to 600 mbar	0 to 2.5 bar	0 to 4 bar	0 to 10 bar
Smallest MSP ^a	60 mbar	0.1 bar	0.1 bar	0.5 bar
Turndown ratio (r) ^b	$r \leq 10$	$r \leq 20$	$r \leq 40$	$r \leq 20$
Non-linearity for reference conditions ^c	0.12 %	0.04 %	0.04 %	0.04 %
Accuracy in % of the set MSP Range: -20 to +60 °C	$r \times 0.24 \%$ for $1 \leq r \leq 10$	$r \times 0.08 \%$ for $1 \leq r \leq 20$	$r \times 0.08 \%$ for $1 \leq r \leq 40$	$r \times 0.08 \%$ for $1 \leq r \leq 20$
Accuracy in % of the set MSP Range: -40 to -20 °C or 60 to 85 °C	$r \times 0.36 \%$ for $1 \leq r \leq 10^d$	$r \times 0.16 \%$ for $1 \leq r \leq 20$	$r \times 0.16 \%$ for $1 \leq r \leq 40$	$r \times 0.16 \%$ for $1 \leq r \leq 20$
Long-term stability in % as of the nominal measuring range	0.1 %/year			
Overload capability	6 bar	15 bar	30 bar	60 bar
Burst pressure	12 bar	30 bar	60 bar	100 bar

	Nominal measuring range	
	0 to 25 bar	0 to 100 bar
Default measuring range	0 to 25 bar	0 to 100 bar
Smallest MSP ^a	0.5 bar	5 bar
Turndown ratio (r) ^b	$r \leq 50$	$r \leq 20$
Non-linearity for reference conditions ^c	0.04 %	0.04 %
Accuracy in % of the set MSP Range: -20 to +60 °C	$r \times 0.08 \%$ for $1 \leq r \leq 50$	$r \times 0.08 \%$ for $1 \leq r \leq 20$
Accuracy in % of the set MSP Range: -40 to -20 °C or 60 to 85 °C	$r \times 0.16 \%$ for $1 \leq r \leq 50$	$r \times 0.12 \%$ for $1 \leq r \leq 20$
Long-term stability in % as of the nominal measuring range	0.1 %/year	
Overload capability	150 bar	300 bar
Burst pressure	250 bar	400 bar

^a MSP = measuring span

^b r = span of the nominal measuring range ÷ adjusted measuring span

^c Reference conditions: ambient temperature 20 °C (±3 K), air pressure 1000 hPa (±25 hPa)

^d Only up to -30 °C.

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Outputs

Analog output For output 405 (4 to 20 mA) For output 410 (4 to 20 mA with HART) Jump response time T_{60} Attenuation	4 to 20 mA, two-wire 4 to 20 mA, two-wire with HART version 7 ≤ 190 ms without attenuation Adjustable 0 to 100 s
Burden For output 405 (4 to 20 mA) For output 410 (4 to 20 mA with HART)	$Burden \leq (U_B - 12 \text{ V}) \div 0.022 \text{ A}$ $Burden \leq (U_B - 12 \text{ V}) \div 0.022 \text{ A}$; additional: min. 250 Ω , max. 1100 Ω

Environmental influences

Admissible temperatures					
Operation	Version	Temperature class	Maximum medium temperature	Ambient temperature ^a	Expanded ambient temperature (extra code 681) ^{a, b, c}
	Standard		120 °C	-40 to +85 °C	-50 to +85 °C
	High temperature		200 °C	10 to 85 °C ^d	—
	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 ^e	175 °C	10 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				
Admissible humidity					
Operation	100 % including condensation on the device outer case				
Storage	90 % without condensation				
Admissible mechanical load	DIN EN 60068-2-6, IEC 60068-2-27				
Vibration strength	2 g, 10 to 2000 Hz				
Shock resistance	15 g for 6 ms				
Electromagnetic compatibility	DIN EN 61326-2-3:2022				
Interference emission	Class B ^f				
Interference immunity	Industry				
Protection type	DIN EN 60529				
For version					
Explosion protection 0 (without)	IP66/67				
Explosion protection 1 (ATEX Ex ia)	IP66				

^a Under -20 °C limited function: stationary use, increased danger of cable break, display without function; under -30 °C operation of the device not possible.

^b In the range from -40 to -50 °C the device must be permanently in operation. The lid with the inspection glass must also be protected against mechanical impact and shock effects.

^c Without SIL.

^d Low ambient temperatures up to -40 °C are possible, but with limited accuracy.

^e Only for high-temperature version (medium temperature 2).

^f The product is suitable for industrial use as well as for households and small businesses.

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Mechanical features

Process connection Material 20 (stainless steel) For front-flush process connections Otherwise Material 82 (HASTELLOY) Surface	316L 316Ti 2.4819/HASTELLOY C-276 $Ra \leq 0.8 \mu m$
Process seal Process connection 571 G 3/4 front-flush) and process connection 652 (tank connection with grooved union nut) Process connection 997 (JUMO PEKA) Otherwise	FPM FDA compliant, see data sheet 409711 No seal
Measuring membranes Material process connection 20 (stainless steel) For -1 to +250 bar relative pressure (measuring range 508) For -1 to +600 bar relative pressure (measuring range 516) Otherwise Material process connection 82 Surface	630 630 316L 2.4819/HASTELLOY C-276 ^a $Ra \leq 0.8 \mu m$
Housing Material Housing 1 (short, stainless steel) Housing 2 (long, stainless steel) Housing 3 (precision casting) Lid 20 (stainless steel) Lid 85 (plastic) Electrical connection 36 (plug connector M12) Electrical connection 82 (cable fitting, plastic) Electrical connection 93 (cable fitting, metal) Operation 0 (without control knob) Operation 1 (with control knob)	1.4404 1.4404, VMQ 1.4408 1.4408, seal FPM PA, seal FPM Brass nickel-plated PA Brass nickel-plated – PA
Weight Type 403025/0-0-1 (housing short) Type 403025/0-0-2 (housing long) Type 403025/0-0-3 (housing precision casting)	~ 550 g ~ 850 g ~ 1600 g

^a Not available in high-temperature version.

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Process connections

Front-flush

Designation	Max. pressure	Temperature range
Taper socket with union nut DN 25 DIN 11851	40 bar	-10 to +140 °C
Taper socket with union nut DN 40 DIN 11851	40 bar	-10 to +140 °C
Tank connection with grooved union nut DN 40	25 bar	Up to 150 °C
	40 bar	Up to 100 °C
G 3/4 front-flush DIN EN ISO 228-1	25 bar	-10 to +150 °C
	40 bar	-10 to +100 °C

Front-flush, with EHEDG certification

Designation	Max. pressure	Temperature range
Clamping socket (clamp) DN 25 DIN 32676	25 bar	-10 to +140 °C
Clamping socket (clamp) DN 50 DIN 32676 (2" ISO 2852)	16 bar	-10 to +140 °C
JUMO PEKA – Hygienic process connection	25 bar	-10 to +200 °C
	40 bar	-10 to +100 °C

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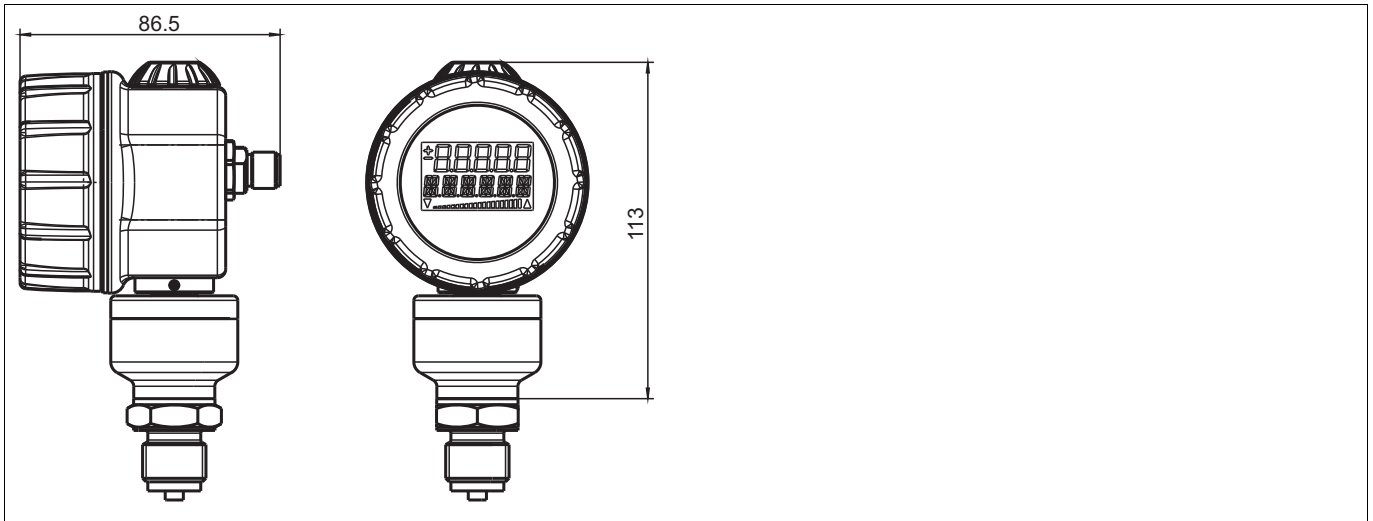
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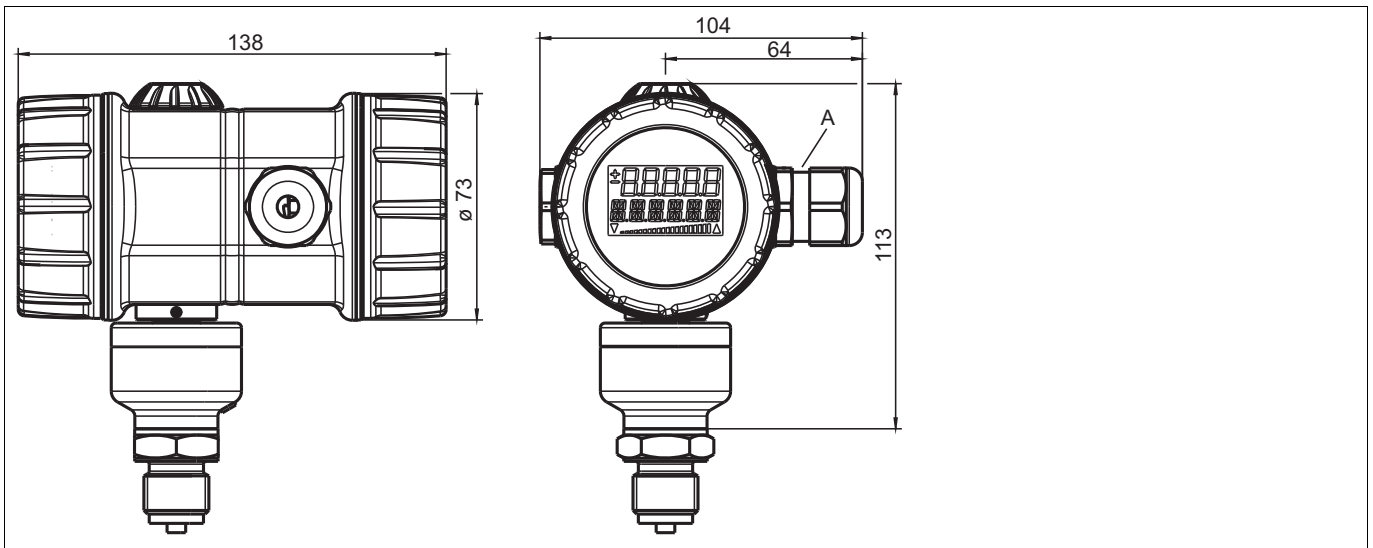
Dimensions

Device

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



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



A M20 × 1.5 cable fitting

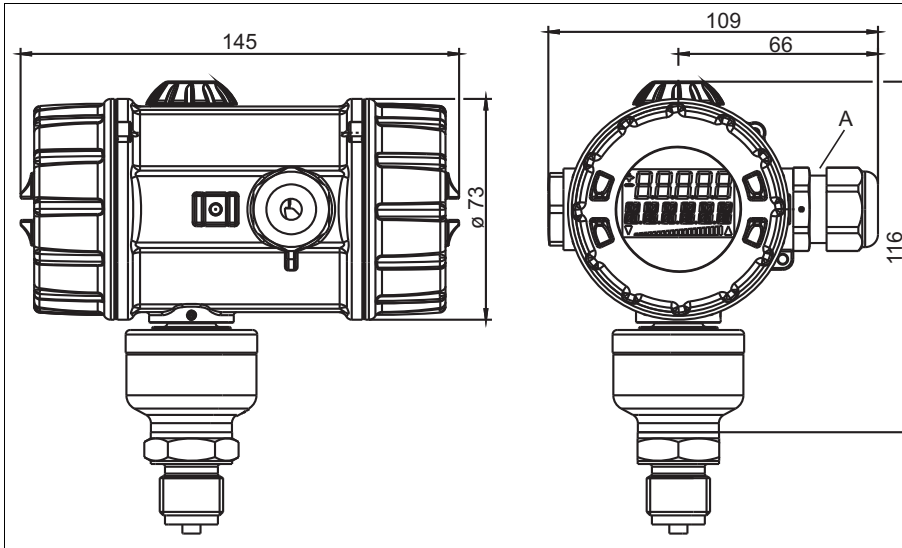
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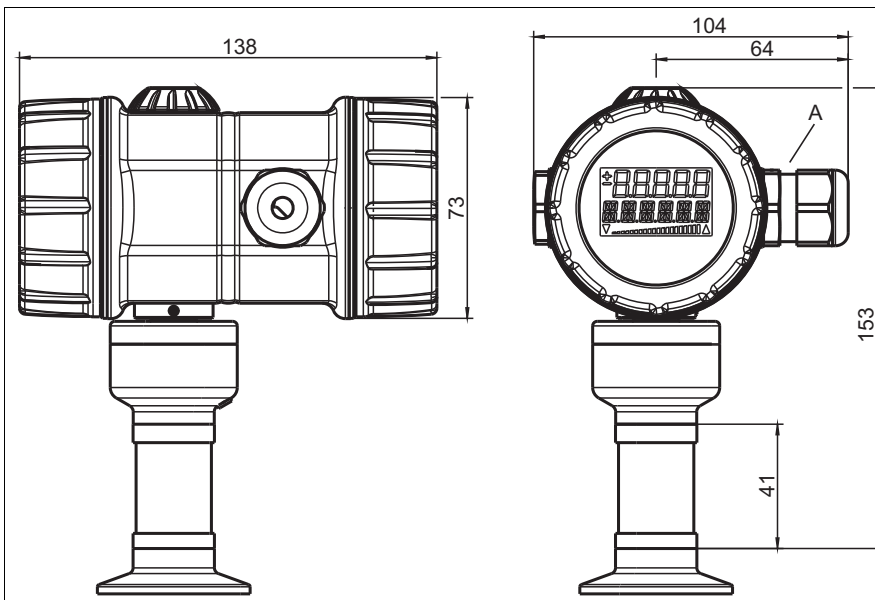
Type 403025/0-0-3 (precision casting, with cable fitting)



A M20 × 1.5 cable fitting

Device in high-temperature version (medium temperature 2)

Pressure transmitters that are suitable for medium temperatures up to 200 °C have an extended shaft through which the increased temperature is discharged. The total height of all pressure transmitters in this version increases by 41 mm as shown in the following figure.



A M20 × 1.5 cable fitting

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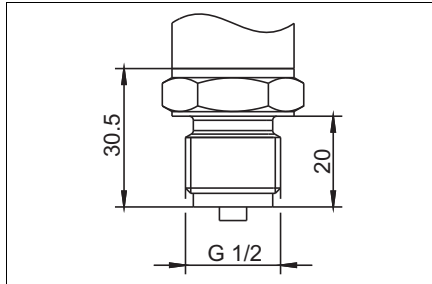
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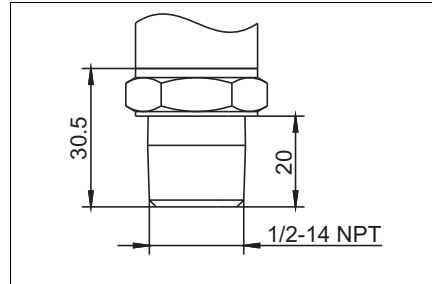
Process connections

Not front-flush

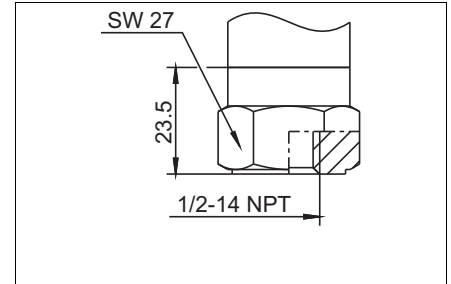
G 1/2
 DIN EN 837



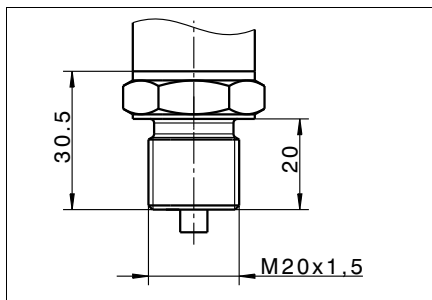
1/2" – 14 NPT
 DIN EN 837



1/2" – 14 NPT internal

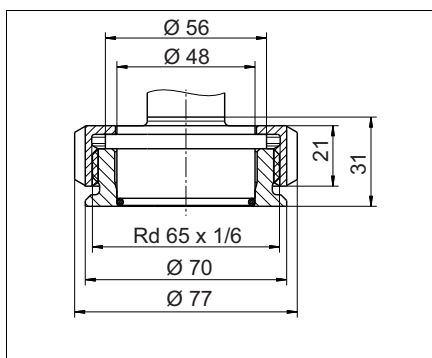


M20 (× 1.5) with pin

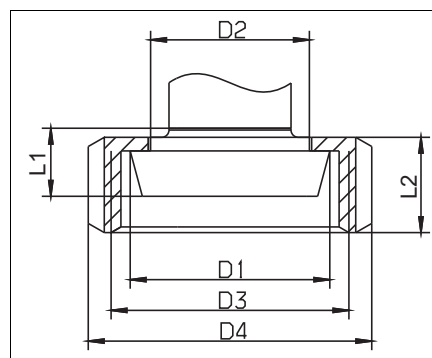


Front-flush

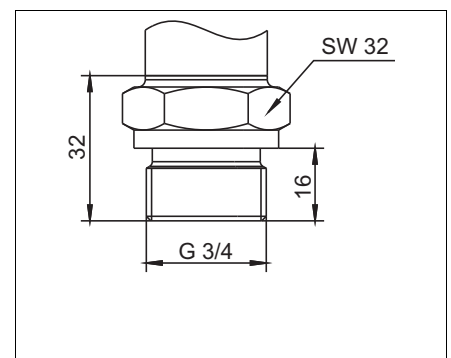
Tank connection with grooved union nut
 DN 40



Taper socket with union nut
 DIN 11851



G 3/4
 DIN EN ISO 228-1



Connection	DN	D1	D2	D3	D4	L1	L2
Taper socket with union nut DIN 11851	25	Ø 44	Ø 35	Rd 52 × 1/6"	Ø 63	15	21
	40	Ø 56	Ø 48	Rd 65 × 1/6"	Ø 78		

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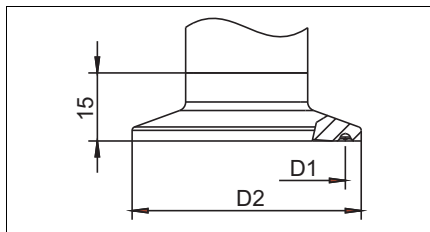
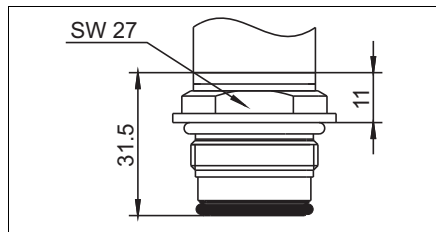
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Front-flush, with EHEDG certification

JUMO PEKA –
 Hygienic process connection

Clamping socket (clamp)
 DIN 32676



Connection	DN	D1	D2
Clamping socket (clamp)	25	Ø 43,5	Ø 50.5
DIN 32676	50	Ø 56,5	Ø 64

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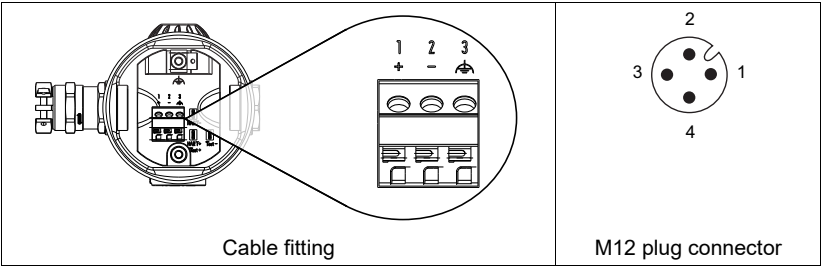
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Connection elements

The connection elements in the data sheet provide information on product selection.
For the electrical connection, only use the installation instructions or the operating manual.



Terminal assignment

Voltage supply for device version without Ex DC 12 to 36 V for device version with Ex DC 12 to 28 V		1 L+ 2 L-	1 L+ 3 L-
Output 4 to 20 mA, two-wire Impressed current 4 to 20 mA in voltage supply		1 L+ 2 L-	1 L+ 3 L-
Current output test connection Inherent resistance of ammeter $\leq 10\ \Omega$		TEST + TEST -	
HART test connection Burden must be present!		HART + HART -	
Functional ground		3	4

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Order details

	(1) Basic type
403025	JUMO dTRANS p20 - process pressure transmitter
	(2) Basic type extension
0	None
2	SIL ^{a, b}
	(3) Explosion protection
0	None
1	ATEX Ex ia ^c
	(4) Housing
1	Short, stainless steel, with M12 connection ^d
2	Long, stainless steel, with cable fitting
3	Precision casting, with cable fitting M20
	(5) Electrical connection
36	M12 plug connector ^c
82	Plastic cable fitting
93	Metal cable fitting
	(6) Cover material
20	CrNi (stainless steel)
85	Plastic
	(7) Display
0	None
1	Display (LCD)
	(8) Operation
0	None
1	Control knob
	(9) Input – nominal measuring range
450	-600 to +600 mbar relative pressure
473	-1 to +2.5 bar relative pressure
513	-1 to +4 bar relative pressure
472	-1 to +10 bar relative pressure
514	-1 to +25 bar relative pressure ^e
515	-1 to +100 bar relative pressure ^f
508	-1 to +250 bar relative pressure ^f
516	-1 to +600 bar relative pressure ^f
487	0 to 0.6 bar absolute pressure
490	0 to 2.5 bar absolute pressure
491	0 to 4 bar absolute pressure
493	0 to 10 bar absolute pressure
495	0 to 25 bar absolute pressure ^e
507	0 to 100 bar absolute pressure ^e
	(10) Output
405	4 to 20 mA, two-wire
410	4 to 20 mA, two-wire with HART protocol
	(11) Process connection
504	G 1/2 according to DIN EN 837
512	1/2" – 14 NPT according to DIN EN 837
559	M20 × 1.5 according to DIN 3852-11
564	1/2" – 14 NPT internal
571	G 3/4 front-flush according to DIN EN ISO 228-1

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583	M20 × 1.5 with pin
604	Taper socket with union nut DN 25 according to DIN 11851 (dairy pipe fitting)
606	Taper socket with union nut DN 40 according to DIN 11851 (dairy pipe fitting)
613	Clamping socket (clamp) DN 25 according to DIN 32676
616	Clamping socket (clamp) DN 50 according to DIN 32676 (2" ISO 2852)
652	Tank connection with grooved union nut DN 25
997	JUMO PEKA – Hygienic process connection
998	Diaphragm seal version, screwed
(12) Medium temperature	
1	Up to 120 °C
2	Up to 200 °C
(13) Process connection material	
20	CrNi (stainless steel)
82	NiMo ^g
(14) Measuring system, filling medium	
00	None ^h
01	Silicon oil
(15) Extra codes	
000	None
085	UKEX
100	Customer-specific factory setting ⁱ
374	Inspection certificate 3.1 DIN EN 10204 Material
452	Electrolytically polished parts
591	Choke in the pressure channel
624	Oil and grease free
630	Enlarged pressure channel
634	TAG number
635	NACE manufacturer's declaration ^j
681	Expanded admissible ambient temperature
691	Improved moisture and vibration protection
870	Inspection certificate 3.1 Surface roughness (Ra)
871	Inspection certificate 3.1 Accuracy DIN EN 10204
880	DNV approval ^k
1160	H2 ready – Mobile hydrogen applications ^l

^a Only available with output 410 and display 1. Not available with input 507, 508, 516, process connection 998 or extra code 681.

^b Only available with material process connection 20.

^c Only available with output 410. Not available with electrical connection 82, cover material 85 or process connection 997. The medium temperature 1 is valid until 115 °C. The medium temperature 2 is valid until 175 °C.

^d The housing 1 is only available with electrical connection 36 and vice versa.

^e Not available with process connection 616.

^f Not available with process connection 571, 604, 606, 613, 616, 997.

^g Not available with input 450, 472, 473, 487, 490, 491, 493, 513.

^h Only available with input 508, 516.

ⁱ Specify in plain text. Default setting see "Measuring range and accuracy".

^j Only available with process connection 512, 564 and process connection material 82. Not available with input 450, 487.

^k Only available with explosion protection 1. Not available with input 516.

^l Only available with process connection 504 or 512, process connection material 20 and medium temperature 1.

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Order code (1) (2) (3) (4) (5) (6) (7) (8)
 Order example 403025 / 0 - 0 - 2 - 82 - 85 - 1 - 1 -

(9) (10) (11) (12) (13) (14) (15)
 514 - 405 - 504 - 1 - 20 - 1 / 000

Stock versions

Order code	Input	Part no.
403025/0-1-1-36-20-1-1-514-410-504-1-20-01/000	-1 to +25 bar relative pressure	00572278

Accessories

Designation	Part no.
Line socket, 4-pole, M12 × 1, straight, length 2 m	00404585
Line socket, 4-pole, M12 × 1, angled, length 2 m	00409334
PC interface with USB/TTL converter	00456352
HART modem, USB	00443447
Ex-i repeater power supply and input isolating amplifier	00577948
Measuring device holder for wall and 2" pipe	00597711
Calibration of the mechanical measurement value pressure on site (also DAkKS)	00758363
Designation	Data sheet
Valve blocks	409706
JUMO PEKA – Hygienic process connection	409711
Diaphragm seal with dairy pipe fitting	409772
Diaphragm seal with clamp connection	409774
Diaphragm seal with DRD flange or Varivent socket	409776
Diaphragm seal with ISS/SMS/RJT socket and (grooved) union nut	409778
Diaphragm seal with membrane	409780
Diaphragm seal with screw-in thread DIN ISO 228/1 or ANSI B 1.201	409782
Diaphragm seal with flange connection according to DIN EN 1092-1 with sealing strip form B1	409784
Diaphragm seal with flange connection according to ANSI B 16.5 with sealing strip type RF	409786
Ex-i repeater power supply and input isolating amplifier	707530

The PC interface cable is the connection between the JUMO interface of the differential pressure transmitter and the USB interface of a PC.

The HART modem is the connection between the HART interface of the differential pressure transmitter and the USB interface of a PC.

Software

Designation	Part no.
JUMO setup dTRANS p20 series	00537577
SW Device Type Manager (DTM) 403025 DTM	00738288

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