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JUMO Instrument Co. Ltd.
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JUMO Process Control, Inc.
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JUMO MIDAS H20 HP

OEM Pressure Transmitter - High Pressure

Applications

- Mobile hydraulics, such as forklifts, harvesters, and construction machinery
- Injection molding machines
- Laundry/cleaning systems
- Welding machines
- Industrial hydraulics

Brief description

The pressure transmitter is used for measuring the pressure of liquid and gaseous media. The product is based on the thin-film measuring principle. The measured pressure is converted into an electrical standard signal of voltage or current and is output via various electrical connections. These include connector variants such as M12, Deutsch DT, Metri-Pack, or AMP. An attached cable and the cable socket are also available.

ECE type approval is available for applications such as those required in mobile hydraulics.

The high degree of resistance to vibration and shock, combined with the high insulation voltage guarantees reliable operation even in difficult conditions. The compact design type of the pressure transmitter provides greater spatial freedom in its use.

Customer benefits

- Impervious to pressure peaks
- Highly resistant to shock and vibration
- Robust product design
- Standard connector variants available
- Can be used in harsh conditions thanks to mechanical and electrical stability
- Welded sensor technology ensures long-term tightness against leaks
- Standardization
- Protection against leaks of oil or other measuring media thanks to high bursting strength
- High accuracy even when used in fluctuating temperature conditions
- Compact design type saves space

Approvals/approval marks



Type 401020 with Metri-Pack connector variant



Type 401020 with AMP connector variant

Special features

- Measuring ranges from 100 to 1000 bar
- Temperature ranges from -40 to +125 °C
- Compact design type from 35 mm in length
- Electric strength of AC 500 V
- Protection types up to IP69K
- ECE type approval

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Technical data

General Information

Reference conditions	DIN 16086 and DIN EN 60770
Sensor	
Measuring principle	Thin-film technology
Admissible load changes	> 10 million
Mounting position	Any
Calibration position	Device upright, process connection at the bottom

Measuring range and accuracy

Measuring range bar	Linearity ^a % MSP ^f	Accuracy at			Long-term stability ^b % MSP per year	Overload capacity ^c bar	Burst pressure bar
		20 °C ^d % MSP	-10 to +85 °C % MSP	-20 to +100 °C ^e % MSP			
0 to 100 bar relative pressure	0.5	0.7	1	1.5	≤ 0.2	200	500
0 to 160 bar relative pressure	0.5	0.7	1	1.5		320	800
0 to 200 bar relative pressure	0.5	0.7	1	1.5		400	1000
0 to 250 bar relative pressure	0.5	0.7	1	1.5		500	1250
0 to 350 bar relative pressure	0.5	0.7	1	1.5		700	1750
0 to 400 bar relative pressure	0.5	0.7	1	1.5		800	2000
0 to 600 bar relative pressure	0.5	0.7	1	1.5		1200	3000
0 to 1000 bar relative pressure	1	1.2	1.5	2		1500	3000

^a Linearity according to limit point setting

^b Reference conditions EN 61298-1

^c All pressure transmitters are vacuum proof.

^d Includes: linearity, hysteresis, repeatability, deviation of measuring range initial value and measuring range end value

^e Includes: linearity, hysteresis, repeatability, deviation of measuring range initial value and measuring range end value, thermal effect on measuring range start and measuring span

^f MSP = measuring span

Output

Analog output	
Current	4 to 20 mA, two-wire (output 405)
Voltage	DC 0.5 to 4.5 V, three-wire, ratiometric output 10 to 90 % of the voltage supply (output 412) DC 0 to 10 V, three-wire (output 415) DC 1 to 5 V, three-wire (output 418) DC 1 to 6 V, three-wire (output 420)
Step response T ₉₀	≤ 3 ms
Burden	
Current	R _L ≤ (U _B - 10 V) ÷ 0.02 A (Ω) at 4 to 20 mA, two-wire (output 405)
Voltage	R _L ≥ 20 kΩ at DC 0.5 to 4.5 V, three-wire (output 412)
(burden connected to „0 V/S-“)	R _L ≥ 10 kΩ at DC 0 to 10 V, three-wire (output 415) R _L ≥ 10 kΩ at DC 1 to 5 V, three-wire (output 418) R _L ≥ 10 kΩ at DC 1 to 6 V, three-wire (output 420)

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Mechanical features

Material	
Process connection	Stainless steel 304 ^a
Membrane	Stainless steel 630
Housing	Stainless steel 304
Attached cable (electrical connection 11)	PBT-GF30, PVC, PE
Round plug M12 × 1 (electrical connection 36)	PBT-GF30
Metri-Pack (electrical connection 52)	PBT-GF30
Cable socket (electrical connection 61)	PBT-GF30, PA, silicone
Deutsch DT04 (electrical connection 89)	PBT-GF30
AMP Superseal (electrical connection 77)	PBT-GF30
Weight	55 g with G 1/4 (process connection 521) and round plug M12 × 1 (electrical connection 36)

^a Process transmitters with process connections G 1/4 (process connection 521) and 7/16-20 UNF-2A (process connection 544) are supplied with an FKM seal. Ensure the medium durability of the seal material!

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Environmental influences

Medium temperatures for electrical connection	
Attached cable	-40 to +125 °C
Round plug M12 × 1	-40 to +125 °C
Metri-Pack	-40 to +125 °C
Cable socket	-40 to +125 °C
AMP Superseal	-40 to +125 °C
Deutsch DT04	-40 to +125 °C
Ambient temperatures for electrical connection	
Attached cable	-30 to +100 °C At ambient temperature of -30 °C restricted function; only use when stationary, risk of cable break
Round plug M12 × 1	-40 to +100 °C
Metri-Pack	-40 to +100 °C
Cable socket	-40 to +100 °C
AMP Superseal	-40 to +100 °C
Deutsch DT04	-40 to +100 °C
Storage temperatures for electrical connection	
Attached cable	-30 to +100 °C
Round plug M12 × 1	-40 to +100 °C
Metri-Pack	-40 to +100 °C
Cable socket	-40 to +100 °C
AMP Superseal	-40 to +100 °C
Deutsch DT04	-40 to +100 °C
Admissible humidity	
Operation	100 % rel. humidity including condensation on the device outer case
Storage	90 % rel. humidity without condensation
Admissible mechanical load	
Vibration resistance	20 g at 10 to 2000 Hz, according to IEC 60068-2-6
Shock resistance	50 g for 11 ms, 500 g for 1 ms, according to IEC 60068-2-27
Electromagnetic compatibility	
Interference emission	Class A ^a , according to EN 61326-2-3 UN ECE R10
Interference immunity	Industrial requirement, according to EN 61326-2-3 UN ECE R10
Insulation voltage	AC 500 V
Protection type for electrical connection	According to EN 60529
Attached cable	IP67/69K
Round plug M12 × 1	IP67
Metri-Pack	IP67
Cable socket	IP65
AMP Superseal	IP67
Deutsch DT04	IP67

^a The product is only suitable for industrial use.

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Auxiliary power

Voltage supply U_B^a 4 to 20 mA, two-wire (output 405) DC 0.5 to 4.5 V, three-wire (output 412) DC 0 to 10 V, three-wire (output 415) DC 1 to 5 V, three-wire (output 418) DC 1 to 6 V, three-wire (output 420)	DC 10 to 30 V, rated voltage supply DC 24 V DC 4.5 to 5.5 V, rated voltage supply DC 5 V, ratiometric output 10 to 90 % of the voltage supply DC 12 to 30 V, rated voltage supply DC 24 V DC 9 to 30 V, rated voltage supply DC 24 V DC 9 to 30 V, rated voltage supply DC 24 V
Current consumption incl. load 4 to 20 mA, two-wire (output 405) DC 0.5 to 4.5 V, three-wire (output 412) DC 0 to 10 V, three-wire (output 415) DC 1 to 5 V, three-wire (output 418) DC 1 to 6 V, three-wire (output 420)	≤ 25 mA ≤ 10 mA ≤ 5 mA ≤ 5 mA ≤ 5 mA
Reverse voltage protection 4 to 20 mA, two-wire (output 405) DC 0.5 to 4.5 V, three-wire (output 412) DC 0 to 10 V, three-wire (output 415) DC 1 to 5 V, three-wire (output 418) DC 1 to 6 V, three-wire (output 420)	Yes No Yes Yes Yes
Electrical circuit Requirements	SELV The device must be equipped with an electrical circuit that meets the requirements of EN 61010-1 with regard to "Limited-energy circuits".

^a Residual ripple: the voltage peaks must not exceed or fall below the specified voltage supply values!

Approvals/approval marks

Approval mark	Test facility	Certificate/certification number	Inspection basis	Valid for
E24	NSAI (National Standards Authority of Ireland)	E24 10R-051971	UN ECE R10	Type 401020
c UL us	Underwriters Laboratories	E201387	UL 61010-1 (3. Ed.), CAN/CSA-22.2 No. 61010-1 (3. Ed.)	Only in connection with extra code 061; observe order details

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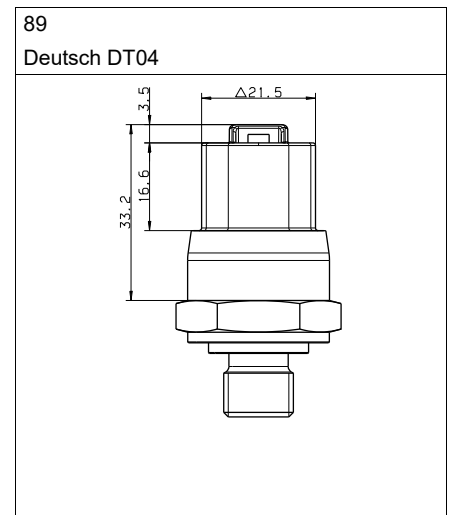
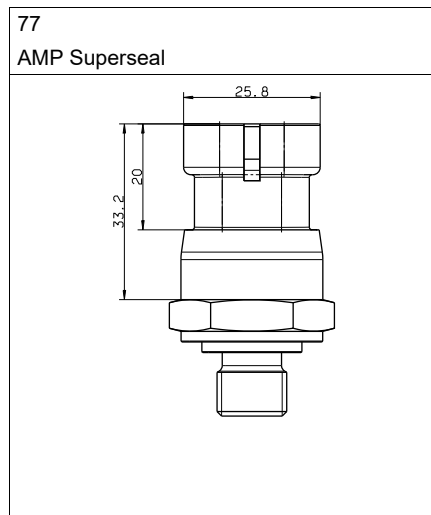
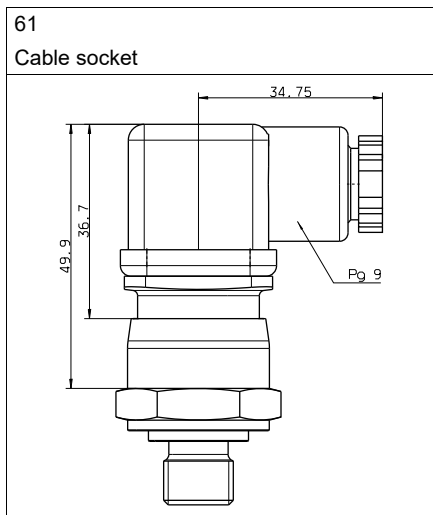
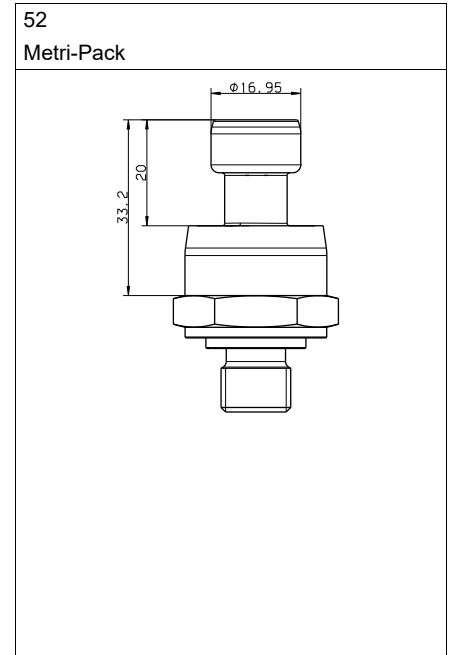
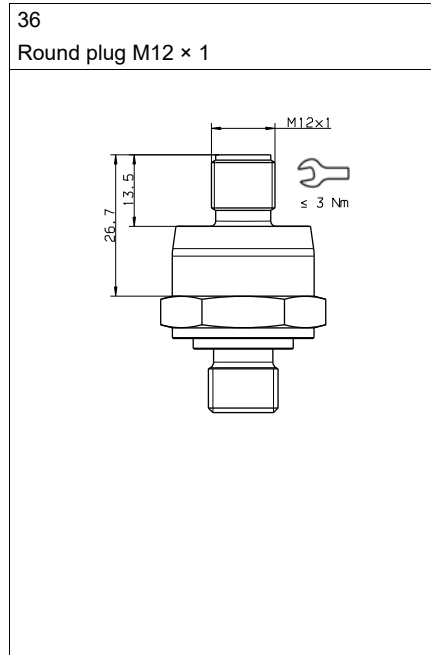
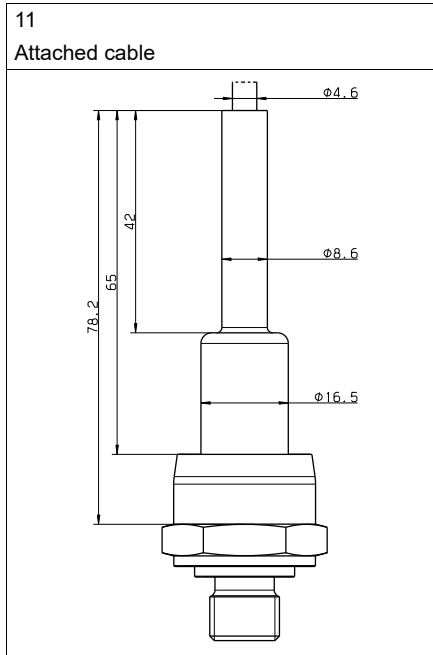
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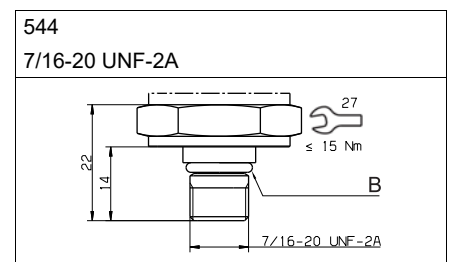
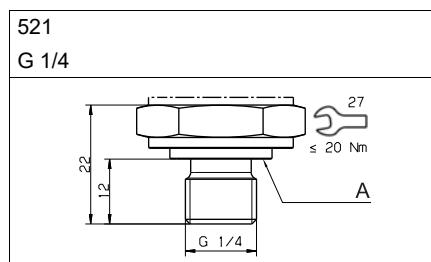
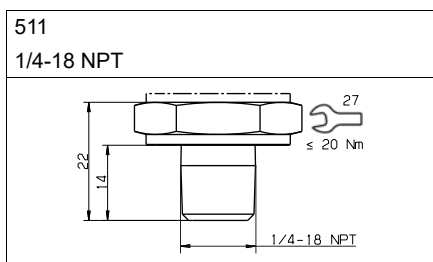


Dimensions

Electrical connection



Process connection



A Profile seal G 1/4

B O-ring

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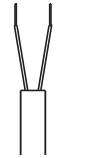
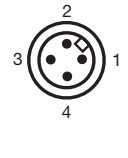
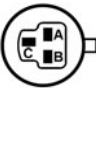
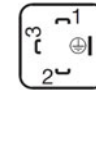
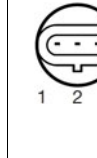
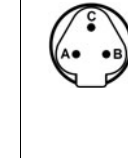


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Connection diagram

The connection diagram in the data sheet provides preliminary information about the connection options. For the electrical connection, only use the installation instructions or the operating manual. The knowledge and the correct technical compliance with the safety information and warnings contained in these documents are mandatory for mounting, electrical connection, and startup as well as for safety during operation.

Connection		Terminal assignment (figure: Connection to the pressure transmitter)					
							
		Attached cable	Round plug M12 x 1	Metri-Pack	Cable socket	AMP Superseal	Deutsch DT04
4 to 20 mA, two-wire (output 405)							
Voltage supply DC 10 to 30 V	U _B /S+ 0 V/S-	WH BN	1 3	B A	1 2	3 1	A B
DC 0.5 to 4.5 V, ratiometric (output 412)							
Voltage supply DC 4.5 to 5.5 V Ratiometric output 10 to 90 % of the voltage supply	U _B 0 V/S- S+	WH BN GN	1 2 3	B A C	1 2 3	3 1 2	A B C
DC 0 to 10 V, three-wire (output 415)							
Voltage supply DC 12 to 30 V	U _B 0 V/S- S+	WH BN GN	1 2 3	B A C	1 2 3	3 1 2	A B C
DC 1 to 5 V, three-wire (output 418) DC 1 to 6 V, three-wire (output 420)							
Voltage supply DC 9 to 30 V	U _B 0 V/S- S+	WH BN GN	1 2 3	B A C	1 2 3	3 1 2	A B C
Functional bonding conductor FB ^a		-	4	C ^b		2 ^c	C ^c

^a The pressure transmitter has to be connected to the potential equalization system of the plant via the electrical connection or process connection.

^b Only for two-wire

Colour coding: connecting cable round plug M12 x 1	1 BN	Brown
	2 WH	White
	3 BU	Blue
	4 BK	Black
The colour coding is only valid for A-coded standard cables!		

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Order details

(1) Basic type	
401020	JUMO MIDAS H20 HP – OEM pressure transmitter – high pressure
(2) Basic type extension	
000	none
999	Special version
(3) Input (measuring range)	
464	0 to 100 bar relative pressure
465	0 to 160 bar relative pressure
511	0 to 200 bar relative pressure
466	0 to 250 bar relative pressure
517	0 to 350 bar relative pressure
467	0 to 400 bar relative pressure
468	0 to 600 bar relative pressure
469	0 to 1000 bar relative pressure
999	Special measuring range for relative pressure
(4) Output	
405	4 to 20 mA, two-wire
412	0.5 to 4.5 V, three-wire, ratiometric
415	0 to 10 V, three-wire
418	1 to 5 V, three-wire
420	1 to 6 V, three-wire
(5) Process connection	
511	1/4-18 NPT according to DIN EN 837
521	G 1/4 according to DIN 3852-11 ^a
544	7/16-20 UNF-2A ^b
(6) Process connection material	
20	CrNi (stainless steel)
(7) Electrical connection	
11	Attached cable
36	Round plug M12 × 1
52	Metri-Pack series 150, 3-pin
61	Cable socket DIN EN 175301-803, Form A
77	AMP Superseal, 3-pin
89	Deutsch DT04, 3-pin
(8) Extra code	
000	none
061	UL approval ^c
591	Choke in the pressure channel
624	Oil and grease free

^a The process connection G 1/4 (process connection 521) is only available with measuring range end up to 400 bar.

^b The process connection 7/16-20 UNF (process connection 544) is only available with measuring range end up to 600 bar.

^c The UL approval stipulates use of the pressure transmitter indoors. Special measuring ranges (input) are not allowed to exceed the 1000 bar limit.

Order code (1) (2) (3) (4) (5) (6) (7) (8)
 / - - - - - - / , ...^a
Order example 401020 / 000 - 467 - 415 - 521 - 20 - 36 / 000

^a List extra codes in sequence, separated by commas.

Minimum order volume:

5 pieces



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Accessories

Item	Description	Part no.
Cable box, straight 	The PVC connecting cable is 2 m in length and has a 4-pin, straight M12 × 1 connector with gold-plated contacts on the device side.	00404585
Cable box, angled 	The PVC connecting cable is 2 m in length and has a 4-pin, angled M12 × 1 connector with gold-plated contacts on the device side.	00409334