

JUMO GmbH & Co. KG

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JUMO Instrument Co. Ltd.

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JUMO Process Control, Inc.

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JUMO MIDAS C08

OEM Pressure Transmitter – Basic

Applications

- compressors
- machinery and plant engineering
- industrial pneumatics
- commercial vehicles
- building technology

Brief description

This pressure transmitter is used as the core product for the MIDAS range for applications requiring reliable implementation of measuring tasks with long-term stability and excellent price-performance ratio. The MIDAS range provides solutions for all applications on the basis of this core product.

The innovative and patented sensor design of the specifically developed ceramic sensor provides excellent long-term stability of < 0.2 %. It can be used for recording relative pressures of 1.6 bar to 60 bar in gaseous or liquid media.



Type 401002 with QUICKON



Type 401002 with M12 × 1 connector

Customer benefits

- **process-reliable**
Through constructive measures, the pressure transmitter achieves excellent vibration resistance and enables application under high vibration load, as occurs in commercial vehicles for example. The throughput through the fully automatic measuring and calibration devices, the diagnostic function of the switching circuit, and the full final inspection complete the high standard of quality.
- **economic**
The QUICKON quick-clamp technology enables quicker and safer installation. The connection is even guaranteed with any temperature fluctuations that may occur thanks to the spring contacts. This electrical connection means that installation times can be shortened and as a result, costs are reduced by 60 % compared to conventional connection options.
- **versatile**
The universal application is reflected by the wide choice of measuring ranges, process connections, and electrical connections.

Special features

- long-term stability < 0.2 %
- new level of quality for the OEM sector
- 60 % quicker device installation with the QUICKON quick-clamp technology
- temperature compensation range increased by 50 % to -20 °C to +100 °C
- 2.5 times more vibration resistance than the industry standard
- made in Germany

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Technical data

General Information

Reference conditions	DIN 16086 and DIN EN 60770
Sensor	
Measuring principle	Thick film on ceramic bodies (piezo-resistive)
Admissible load changes	> 10 million, 0 % to 100 % measuring range
Position	
Mounting position	Any
Calibration position	Device upright, process connection at the bottom

Output

Analog output ^a	
Current	
Output 405	4 mA to 20 mA, 2-wire
Voltage	
Output 412	DC 0.5 V to 4.5 V, 3-wire, ratiometric 10 % to 90 % of the voltage supply
Output 415	DC 0 V to 10 V, 3-wire
Output 418	DC 1 V to 5 V, 3-wire
Output 420	DC 1 V to 6 V, 3-wire
Step response	
T ₉₀	≤ 2 ms
Burden	
Current	
4 mA to 20 mA, 2-wire	$R_L \leq (U_B - 8 \text{ V}) \div 0.02 \text{ A} (\Omega)$
Voltage	
DC 0.5 V to 4.5 V, 3-wire	$R_L \geq 5 \text{ k}\Omega$
DC 0 V to 10 V, 3-wire	$R_L \geq 10 \text{ k}\Omega$
DC 1 V to 5 V, 3-wire	$R_L \geq 10 \text{ k}\Omega$
DC 1 V to 6 V, 3-wire	$R_L \geq 10 \text{ k}\Omega$

^a Further outputs are available upon request.

Mechanical features

Process connection	
Material	Stainless steel 304
for push-in fitting (process connection 383)	Brass, nickel-plated
Process seal	
Material, internal ^a	
Seal 600	EPDM
Seal 601	FPM, standard
Seal 602	CR
Seal 604	FFPM
Seal 609	NBR
Material, external ^a for G 1/4 (process connection 521)	FPM
Sensor	
Material	Ceramic Al ₂ O ₃ 96 %
Case	
Material	Stainless steel 304

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Electrical connection	
Material	
Attached cable (electrical connection 11)	PBT-GF30, PVC
QUICKON (electrical connection 23)	PBT-GF30
Round plug M12 × 1 (electrical connection 36)	PBT-GF30, stainless steel 303 L
Bayonet connector (electrical connection 53)	PBT-GF30
Cable socket (electrical connection 61)	PBT-GF30, PA, silicone
Weight	70 g with process connection 502 (G 1/4)

^a Ensure the medium durability of the seal material!

Environmental conditions

Admissible temperatures	
Medium	-20 °C to +125 °C
Ambient	-20 °C to +85 °C
Storage	-40 °C to +125 °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 ^a	50 g for 10 Hz to 2000 Hz
Shock resistance ^b	50 g for 3 ms 100 g for 2 ms
Electromagnetic compatibility	
Interference emission ^c	Class B
Interference immunity ^c	Industrial requirement
Protection type ^d	
Attached cable (electrical connection 11)	IP67
QUICKON ^e (electrical connection 23)	IP67
Round plug M12 × 1 ^f (electrical connection 36)	IP67
Bayonet connector ^f (electrical connection 53)	IP67
Cable socket ^{f, g} (electrical connection 61)	IP65

^a IEC 60068-2-6

^b IEC 60068-2-27

^c EN 61326-2-3

^d EN 60529

^e Connecting cable diameter, minimum 3.5 mm, maximum 6 mm

^f The protection type is only achieved with a suitable mounted counter piece.

^g Connecting cable diameter, minimum 6 mm, maximum 8 mm

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**Measuring range and accuracy**

Measuring range bar	Linearity ^a % MSP	Accuracy at			Long-term stability ^b % MSP per year	Overload capacity ^c bar	Burst pressure bar
		20 °C ^d % MSP	-10 °C to +85 °C ^e % MSP	-20 °C to +100 °C ^e % MSP			
0 bar to 1.6 bar relative pressure	0.25	0.35	0.5	1	0.2	6	12
0 bar to 2.5 bar relative pressure						6	12
0 bar to 4 bar relative pressure						12	25
0 bar to 6 bar relative pressure						12	25
0 bar to 10 bar relative pressure						20	38
0 bar to 16 bar relative pressure						50	75
0 bar to 25 bar relative pressure						50	75
0 bar to 40 bar relative pressure						120	200
0 bar to 60 bar relative pressure						120	200
-1 bar to +0.6 bar relative pressure						6	12
-1 bar to +1.5 bar relative pressure						6	12
-1 bar to +3 bar relative pressure						12	25
-1 bar to +5 bar relative pressure						12	25
-1 bar to +9 bar relative pressure						20	38
-1 bar to +15 bar relative pressure						50	75
-1 bar to +24 bar relative pressure						50	75

^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

Auxiliary energy

Voltage supply U_B ^a 4 mA to 20 mA, 2-wire (output 405) DC 0.5 V to 4.5 V, 3-wire (output 412) DC 0 V to 10 V, 3-wire (output 415) DC 1 V to 5 V, 3-wire (output 418) DC 1 V to 6 V, 3-wire (output 420)	DC 8 V to 30 V, rated voltage supply DC 24 V DC 3 V to 5.25 V, rated voltage supply DC 5 V, ratiometric output 10 % to 90 % of the voltage supply DC 11.5 V to 30 V, rated voltage supply DC 24 V DC 8 V to 30 V, rated voltage supply DC 24 V DC 8 V to 30 V, rated voltage supply DC 24 V
Current consumption 4 mA to 20 mA, 2-wire (output 405) DC 0.5 V to 4.5 V, 3-wire (output 412) DC 0 V to 10 V, 3-wire (output 415) DC 1 V to 5 V, 3-wire (output 418) DC 1 V to 6 V, 3-wire (output 420)	≤ 25 mA ≤ 2 mA ≤ 3 mA ≤ 3 mA ≤ 3 mA
Reverse voltage protection	Yes
Electrical circuit	SELV

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

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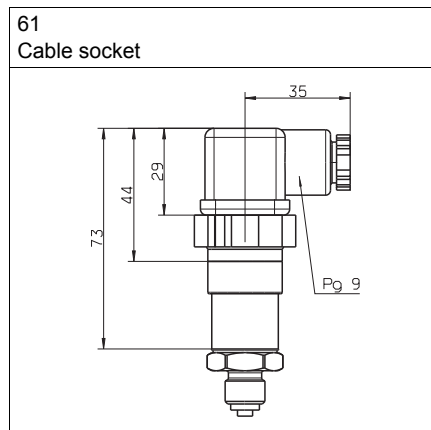
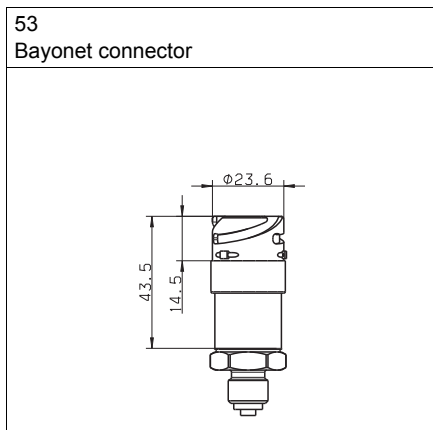
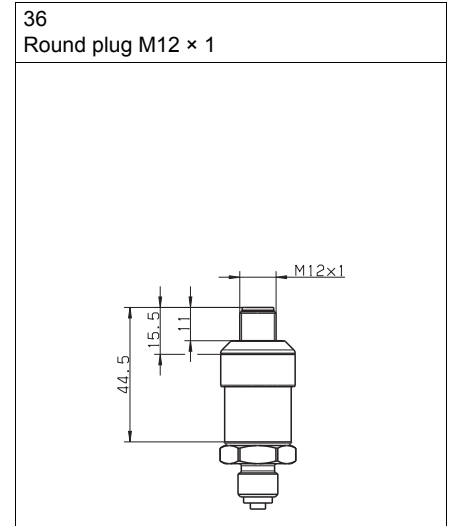
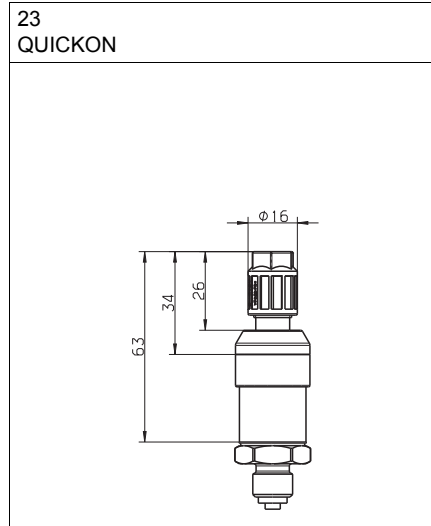
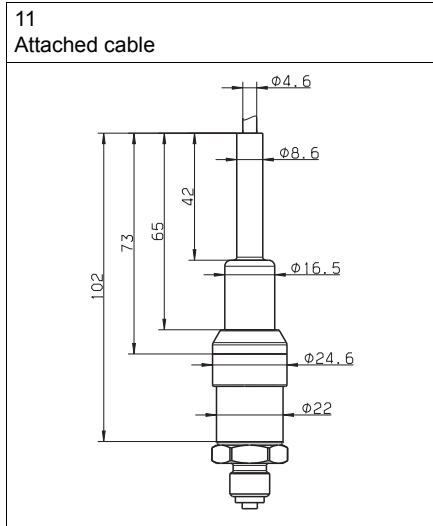
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Dimensions

Electrical connection



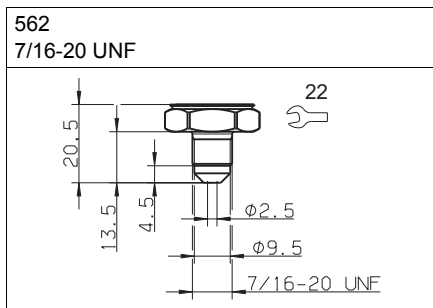
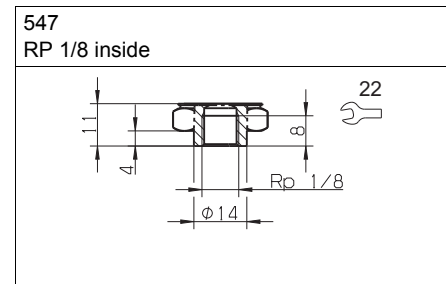
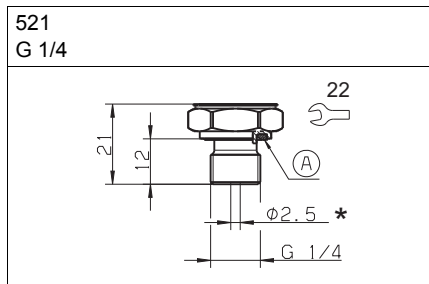
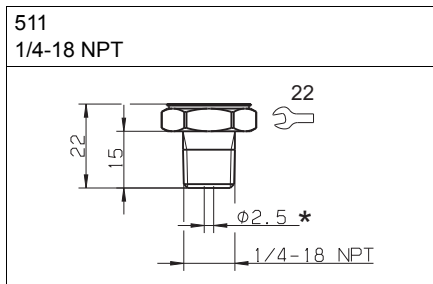
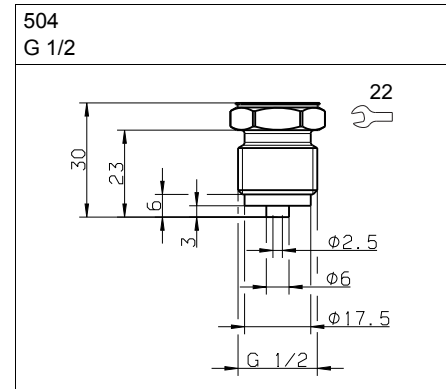
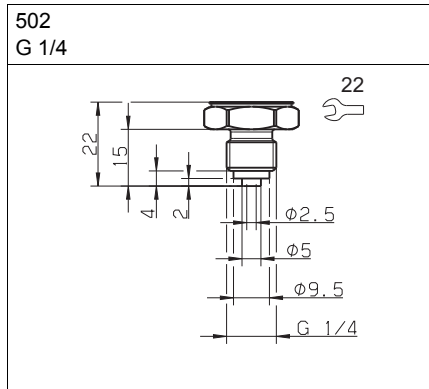
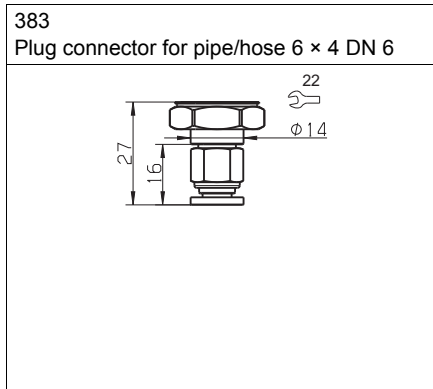
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Process connection



- A Profile seal G 1/4
- * Extra code 630 pressure channel Ø 8 mm

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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 execution of the safety information/instructions contained in these documents are mandatory for installation, electrical connection, startup, and for safety during operation.

Connection		Terminal assignment ^a				
		11 Attached cable	23 QUICKON	36 Round plug M12 x 1	53 Bayonet connector	61 Cable socket
4 mA to 20 mA, 2-wire (output 405)						
Voltage supply DC 8 to 30 V	U _B /S+	WH	1	1	1	1
	0 V/S-	BN	3	3	2	2
DC 0.5 V to 4.5 V ratiometric (output 412)						
Voltage supply DC 3 V to 5.25 V	U _B	WH	1	1	1	1
Ratiometric output 10 % to 90 % of the voltage supply	0 V/S-	BN	2	2	2	2
	S+	GN	3	3	3	3
DC 0 V to 10 V, 3-wire (output 415)						
Voltage supply DC 11.5 V to 30 V	U _B	WH	1	1	1	1
	0 V/S-	BN	2	2	2	2
	S+	GN	3	3	3	3
DC 1 V to 5 V, 3-wire (output 418)						
DC 1 V to 6 V, 3-wire (output 420)						
Voltage supply DC 8 V to 30 V	U _B	WH	1	1	1	1
	0 V/S-	BN	2	2	2	2
	S+	GN	3	3	3	3
Functional bonding conductor FB ^b		-	-	4	-	-

^a Figure: Connection to the pressure transmitter

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

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
401002	JUMO MIDAS C08 – OEM pressure transmitter – basic
	(2) Basic type extension
000	None
999	Special version
	(3) Input
455	0 bar to 1.6 bar relative pressure
456	0 to 2.5 bar relative pressure
457	0 bar to 4 bar relative pressure
458	0 bar to 6 bar relative pressure
459	0 bar to 10 bar relative pressure
460	0 bar to 16 bar relative pressure
461	0 bar to 25 bar relative pressure
462	0 bar to 40 bar relative pressure
463	0 bar to 60 bar relative pressure
479	-1 bar to +0.6 bar relative pressure
480	-1 bar to +1.5 bar relative pressure
481	-1 bar to +3 bar relative pressure
482	-1 bar to +5 bar relative pressure
483	-1 bar to +9 bar relative pressure
484	-1 bar to +15 bar relative pressure
485	-1 bar to +24 bar relative pressure
999	Special measuring range for relative pressure
	(4) Output
405	4 mA to 20 mA, 2-wire
412	0.5 V to 4.5 V, 3-wire, ratiometric
415	0 V to 10 V, 3-wire
418	1 V to 5 V, 3-wire
420	1 V to 6 V, 3-wire
999	Special version
	(5) Process connection
383	Push-in fitting for pipe/hose 6 × 4 DN 6
502	G1/4 DIN EN 837
504	G1/2 DIN EN 837
511	1/4-18 NPT DIN EN 837
521	G1/4 DIN
547	Rp 1/8 inside
562	7/16-20 UNF
	(6) Process connection material
20	CrNi (stainless steel)
	(7) Material seal
600	EPDM
601	FPM ^a
602	CR
604	FFPM
609	NBR
999	Special material
	(8) Electrical connection
11	Attached cable ^b

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21	Quickon
36	Round plug M12 × 1
53	Bayonet connector DIN 72585-A.1-3.1-Sn/K1
61	Cable socket DIN EN 175301-803, Form A, ex DIN 43650
99	Special version
(9) Extra codes	
000	None
591	Choke in the pressure channel
624	Oil and grease free
630	Enlarged pressure channel ^c
876	Test report

^a Standard^b The standard cable length is 2 m. Further lengths are available upon request.^c Diameter Ø 8 mm for process connection 511 and 521;
ean enlarged pressure channel is only available in connection with the seal material 601.

Order code (1) (2) (3) (4) (5) (6) (7) (8) (9) , ...^a
Order example 401002 / 000 - 460 - 412 - 504 - 20 - 600 - 36 / 591

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

Minimum order volume for manufacturing devices: 5 pieces

Minimum order volume for warehouse devices: 1 piece

Stock versions

Item	Description	Part no.
401002/000-456-405-502-20-601-23/000	0 bar to 2.5 bar, 4 mA to 20 mA, G 1/4, FPM, QUICKON	00542718
401002/000-458-405-502-20-601-23/000	0 bar to 6 bar, 4 mA to 20 mA, G 1/4, FPM, QUICKON	00542740
401002/000-459-405-502-20-601-23/000	0 bar to 10 bar, 4 mA to 20 mA, G 1/4, FPM, QUICKON	00541743
401002/000-460-405-502-20-601-23/000	0 bar to 16 bar, 4 mA to 20 mA, G 1/4, FPM, QUICKON	00542746
401002/000-461-405-502-20-601-23/000	0 bar to 25 bar, 4 mA to 20 mA, G 1/4, FPM, QUICKON	00542748
401002/000-456-405-502-20-601-61/000	0 bar to 2.5 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546113
401002/000-457-405-502-20-601-61/000	0 bar to 4 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546119
401002/000-458-405-502-20-601-61/000	0 bar to 6 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546120
401002/000-459-405-502-20-601-61/000	0 bar to 10 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546121
401002/000-460-405-502-20-601-61/000	0 bar to 16 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546122
401002/000-461-405-502-20-601-61/000	0 bar to 25 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546123
401002/000-462-405-502-20-601-61/000	0 bar to 25 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546124
401002/000-481-405-502-20-601-61/000	-1 bar to +3 bar, 4 mA to 20 mA, G 1/4, FPM, cable socket	00546125



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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