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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
- Machine and system construction
- Industrial pneumatic uses
- Commercial vehicles
- Building services

Brief description

This pressure transmitter is used as a basic product of the MIDAS family in applications requiring reliable implementation of measurement tasks that are stable over a long time with an excellent price-to-performance ratio. Beyond the basic product, the MIDAS family offers a solution for every application.

The innovative and patented sensor design of the internally developed ceramic sensor ensures outstanding long-term stability < 0.2%. Relative pressures from 1.6 bar to 60 bar can be measured in gaseous or liquid measuring materials.

Customer benefits

• Process safety

Special design features give the pressure transmitter extraordinary vibration resistance, facilitating use under high vibration loads such as those common in commercial vehicles. Other features that ensure the highest level of quality include a fully automatic measuring and calibrating system, the diagnostic function of the circuit and a 100% final inspection.

• Economical

The Quickon fast connection system allows for reliable installation with less effort. Contacting by the spring fast contacts is ensured specifically in case of temperature fluctuations. This electrical connection can be used to shorten assembly times, thereby reducing costs by 60% compared to conventional types of connections.

• Diversity

Universal application ensures a wide selection of measurement ranges, process connections and electrical connections.



Type 401002 with QUICKON



Type 401002 with M12x1 connector

Key features

- Long-term stability < 0.2%
- A new level of quality for the OEM sector
- 60% faster device installation with the Quickon fast-connection system
- Temperature compensation range expanded by 50% to -20 to +100 °C
- Vibration performance 2.5 times better than the industry standard
- Made in Germany

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Technical data

General information

Reference conditions	DIN 16086 and DIN EN 60770
Sensor	
Principle of measurement	Thick film on ceramic body (piezoresistive)
Permissible load change	> 10 million, 0 to 100 % measurement range
Location	
Mounting location	Any
Calibration location	Device standing vertically, process connection on bottom

Measuring range

Relative pressure	The measurement ranges start at 0 bar										
Measuring range	1.6	2.5	4	6	10	16	25	40	60		bar
Overload capacity ^a	6	6	12	12	20	50	50	120	120		bar
Bursting pressure	12	12	25	25	38	75	75	200	200		bar
Relative pressure											
Measuring range	-1 to 0.6	-1 to 1.5	-1 to 3	-1 to 5	-1 to 9	-1 to 15	-1 to 24				bar
Overload capacity ^a	6	6	12	12	20	50	50				bar
Bursting pressure	12	12	25	25	38	75	75				bar

^a All pressure transmitters are vacuum-proof

Output

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

^a Additional outputs are available on request.

Mechanical properties

Process connection	
Material	Stainless steel 304
For plug connection, process connection 383	Nickel-plated brass
Process seal	
Internal material ^a	
Seal 600	EPDM
Seal 601	FPM, standard
Seal 602	CR
Seal 604	FFPM
Seal 609	NBR
External material ^a	
for G1/4, Process connection 521	FPM

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Sensor Material	Ceramic Al ₂ O ₃ 96%
Enclosure Material	Stainless steel 304
Electrical connection Material	
Fixed cable, Electr. connection 11	PBT-GF30, PVC
QUICKON, Electr. connection 23	PBT-GF30
Round plug M12x1, Electr. connection 36	PBT-GF30, stainless steel 303L
Bayonet connector, Electr. connection 53	PBT-GF30
Terminal box, Electr. connection 61	PBT-GF30, PA, silicon
Weight	70 g with process connection 502 (G1/4)

^a Other materials are available on request.
 Note the resistance of the selected sealing material!

Ambient conditions

Permissible temperatures	
Medium Environment	-20 to +125 °C, on request up to -40 to +135 °C
Storage	-20 to +85 °C, on request up to -40 to +125 °C
Permissible relative humidity	
Operation	100% rel. humidity, incl. condensation on the outer sleeve of the instrument
Storage	90% relative humidity, no condensation
Permissible mechanical loading	
Vibration strength ^a	50 g, 10 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 ^d	Industrial requirements
Protection ^e	
Fixed cable, Electr. connection 11	IP67
QUICKON, Electr. connection 23	IP67
Round plug M12x1, Electr. connection 36	IP67
Bayonet connector, Electr. connection 53	IP67, on request IP69
Terminal box, Electr. connection 61	IP65

^a IEC 60068-2-6
^b IEC 60068-2-27
^c EN 61326-2-3
^d EN 61326-2-3
^e EN 60529 (with suitable mating piece when connected)

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Accuracy

Relative pressure	
Linearity^a	0.25% of end val.
Accuracy at +20°C ^b at -10 to +85°C ^c at -20 to +100°C ^c	0.35% of end val. 0.5% of end val. 1% of end val.
Long-term stability^d	0.2% of end val. per year

^a Linearity based on limit point setting

^b Includes: linearity, hysteresis, repeatability, deviation from initial and final values of measuring range

^c Includes: linearity, hysteresis, repeatability, deviation from initial and final values of measuring range, thermal effect on initial value of measuring range and span.

^d with reference conditions to EN 61298-1

Auxiliary power

Supply voltage U_B^a	
4 to 20 mA, 2 wires, Output 405	DC 8 to 30 V, Nominal power supply DC 24 V
DC 0.5 to 4.5 V, 3 wires, Output 412	DC 3 to 5.25 V, Nominal power supply DC 5 V
DC 0 to 10 V, 3 wires, Output 415	DC 11.5 to 30 V, Nominal power supply DC 24 V
DC 1 to 5 V, 3 wires, Output 418	DC 8 to 30 V, Nominal power supply DC 24 V
DC 1 to 6 V, 3 wires, Output 420	DC 8 to 30 V, Nominal power supply DC 24 V
Power consumption	
4 to 20 mA, 2 wires, Output 405	≤ 25 mA
DC 0.5 to 4.5 V, 3 wires, Output 412	≤ 2 mA
DC 0 to 10 V, 3 wires, Output 415	≤ 3 mA
DC 1 to 5 V, 3 wires, Output 418	≤ 3 mA
DC 1 to 6 V, 3 wires, Output 420	≤ 3 mA
Reverse polarity protection	YES
Circuit	SELV

^a Residual ripple: Peak voltages must **not** exceed or fall below the values specified for the supply voltage!

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Connection diagram

Connection		Terminal assignment ^a					
		11 Fixed cable	23 Quickon	36 Round plug M12x1	53 Bayonet	61 Terminal box	
4 to 20 mA, 2 wires, output 405							
Power supply	DC 8 to 30 V	UB/S+ 0 V/S-	White Brown	1 3	1 3	1 2	1 2
DC 0.5 to 4.5 V, ratiometric, output 412							
Power supply	DC 3 to 5.25 V	UB 0 V/S- S+	White Brown Yellow	1 2 3	1 2 3	1 2 3	1 2 3
DC 0 to 10 V DC, 3 wires, output 415							
Power supply	DC 11.5 to 30 V	UB 0 V/S- S+	White Brown Yellow	1 2 3	1 2 3	1 2 3	1 2 3
DC 1 to 5 V DC, 3 wires, output 418							
DC 1 to 6 V DC, 3 wires, output 420							
Power supply	DC 8 to 30 V	UB 0 V/S- S+	White Brown Yellow	1 2 3	1 2 3	1 2 3	1 2 3

^a Illustration: Connection on pressure transmitter

Color assignment: Round plug M 12	1 bn Brown	4 bk Black	The color assignment applies only to A-coded standard cables!
	2 wh White	5 gy Gray	
	3 bu Blue		

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Dimensions

Electrical connection

11 Fixed cable	23 Quickon	36 Round plug M12x1	53 Bayonet connector	61 Terminal box

Process connection

383 Plug-in screw connection Ø6 mm	502 G1/4	504 G1/2	511 1/4 - 18 NPT

A = Plug-in screw connection for DN6 hose (external diameter 6 mm)

521 G1/4	547 Rp 1/8	562 7/16 UNF

B = Profile seal G1/4

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Order details

401002	(1) Basic type	JUMO MIDAS C08 OEM pressure transmitter - Basic
000	(2) Basic type extension	None
999		Special design
	(3) Relative pressure measurement range	
	Overpressure	
455		0 to 1.6 bar
456		0 to 2.5 bar
457		0 to 4 bar
458		0 to 6 bar
459		0 to 10 bar
460		0 to 16 bar
461		0 to 25 bar
462		0 to 40 bar
463		0 to 60 bar
	Negative overpressure	
479		-1 to +0.6 bar
480		-1 to +1.5 bar
481		-1 to +3 bar
482		-1 to +5 bar
483		-1 to +9 bar
484		-1 to +15 bar
485		-1 to +24 bar
999		Special measurement range
	(4) Output	
405		4 to 20 mA, 2 wires
412		DC 0.5 to 4.5 V, 3 wires, ratiometric
415		DC 0 to 10 V, 3 wires
418		DC 1 to 5 V, 3 wires
420		DC 1 to 6 V, 3 wires
	(5) Process connection	
383		Plug-in screw connection \varnothing 6 mm
502		G 1/4 DIN EN 837
504		G 1/2 DIN EN 837
511		1/4-18 NPT DIN EN 837
521		G 1/4 DIN 3852 T11
547		Rp 1/8
562		7/16 UNF
	(6) Process connection material	
20		Stainless steel
	(7) Seal material	
600		EPDM
601		FPM ^a
602		CR
604		FFPM
609		NBR
999		Special material

^a Standard

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(8) Electrical connection

- 11 Fixed cable, 2 m^a
- 23 Quickon
- 36 Round plug M12x1
- 53 Bayonet connector DIN 72585-A1-3.1-Sn/K1
- 61 Terminal box DIN EN 175301-803, Form A, ex DIN 43650

(9) Extra codes

- 000 None
- 591 Throttle in pressure channel
- 624 Free of oil and grease
- 630 Enlarged pressure channel ø8 mm^b

^a Other lengths on request

^b Only for process connection 511, 521 and material of FPM seal

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(9)
Order code										
Sample order	401002	/ 000	- 460	- 412	- 504	- 20	- 600	- 36	/ 591	, 624

Accessories

Designation	Sales No.
4-pin cable connector, straight M12x1 with 2-m PVC cable	40/00404585
4-pin cable connector, angled M12x1 with 2-m PVC cable	40/00409334

Stock instruments

Delivery in 3 working days after receipt of order

Type	Version	Sales No.
401002/000-456-405-502-20-601-23/000	0 to 2.5 bar, 4 to 20 mA, G 1/4, FPM, Quickon	40/00542718
401002/000-458-405-502-20-601-23/000	0 to 6 bar, 4 to 20 mA, G 1/4, FPM, Quickon	40/00542740
401002/000-459-405-502-20-601-23/000	0 to 10 bar, 4 to 20 mA, G 1/4, FPM, Quickon	40/00542743
401002/000-460-405-502-20-601-23/000	0 to 16 bar, 4 to 20 mA, G 1/4, FPM, Quickon	40/00542746
401002/000-461-405-502-20-601-23/000	0 to 25 bar, 4 to 20 mA, G 1/4, FPM, Quickon	40/00542748
401002/000-456-405-502-20-601-61/000	0 to 2.5 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546113
401002/000-457-405-502-20-601-61/000	0 to 4 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546119
401002/000-458-405-502-20-601-61/000	0 to 6 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546120
401002/000-459-405-502-20-601-61/000	0 to 10 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546121
401002/000-460-405-502-20-601-61/000	0 to 16 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546122
401002/000-461-405-502-20-601-61/000	0 to 25 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546123
401002/000-462-405-502-20-601-61/000	0 to 40 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546124
401002/000-481-405-502-20-601-61/000	-1 to +3 bar, 4 to 20 mA, G 1/4, FPM, terminal box	40/00546125