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**JUMO Instrument Co. Ltd.**

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**JUMO Process Control, Inc.**

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# JUMO MIDAS C18 SW

## OEM pressure transmitter - seawater

### Applications

- Water treatment (reverse osmosis), for example sea water desalination plants, deionized water plants (e.g. to generate pure water)
- Organic acids, for example acetic acid
- Solutions containing chlorides such as sea water, brackish water and salt solutions, for example ballast tanks on ships, offshore applications, tide level measuring systems and above-ground fish farms

### Brief description

The JUMO MIDAS C18 SW pressure transmitter has a resistant and hysteresis-free ceramic measuring cell as well as a titanium housing and process connection.

Titanium was selected as a material due to its extraordinarily high resistance to corrosion, especially compared to organic acids and solutions containing chlorides.

The instrument is able to record relative pressures in the measuring range 1.6 to 100 bar. 4 to 20 mA (two wires) and DC 0 to 10 V (three wires) are available as standard signals.



Type 401012 with round plug

### Customer benefits

#### • Process safety

The high quality of each pressure transmitter is ensured by a 100 % final inspection of a fully automated measuring and calibrating system.

The resistance of the materials that are used leads to high system availability. Together with the oil-free measuring cell, which does not allow any filling oil to escape if the instrument bursts, a high level of process safety is ensured for critical processes, for example reverse osmosis.

#### • Economical

A proven design ensures efficient production, which shortens delivery times. The resistant materials cut down on cleaning and repair processes, reducing system downtimes accordingly as well as associated costs.

The compact and light design opens up many possible applications for users and also makes it easier to decide what to buy when it comes time for a replacement.



Type 401012 with fixed cable

### Special features

- Aluminum oxide ceramic measuring cell
- Titanium enclosure and process connection
- Long-term stability < 0.2 %
- Weighs about 40 % less compared to comparable stainless steel variants
- Encapsulated for protection against vibration, condensation and moisture
- Made in Germany

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## Technical data

### General information

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

### Measuring range

<b>Relative pressure</b>	The measurement ranges start at 0 bar											
Measuring range	1.6	2.5	4	6	10	16	25	40	60	100	bar	
Overload capacity <sup>a</sup>	6	6	12	12	20	50	50	120	120	180	bar	
Bursting pressure	12	12	25	25	38	75	75	200	200	250	bar	
<b>Relative pressure</b>												
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 <sup>a</sup>	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

<b>Analog output<sup>a</sup></b>	
Electrical current	
Output 405	4 to 20 mA, two wires
Voltage	
Output 415	DC 0 to 10 V, three wires
<b>Step response time</b>	
T <sub>90</sub>	≤ 2 ms
<b>Burden</b>	
Electrical current	
4 to 20 mA, two wires	$R_L \leq (U_B - 8 \text{ V})/0.02 \text{ A} (\Omega)$
Voltage	
DC 0 to 10 V, three wires	$R_L \geq 10 \text{ k}\Omega$

a. Additional outputs are available on request.

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## Mechanical properties

<b>Process connection</b>	
Material	Titanium grade 2 3.7035 (Ti2)
<b>Process seal<sup>a</sup></b>	
Seal 601	FPM
<b>Sensor</b>	
Material	Ceramic Al <sub>2</sub> O <sub>3</sub> 96 %
<b>Enclosure</b>	
<b>Material</b>	Titanium grade 2 3.7035 (Ti2)
<b>Electrical connection</b>	
Material	
Fixed cable, electrical connection 11	PBT-GF30, PVC
Round plug M12 × 1, electrical connection 36	PBT-GF30
Terminal box, electrical connection 61	PBT-GF30, PA, silicon
<b>Weight</b>	44 g with process connection 502 (G 1/4) and electrical connection 36 (round plug M12 × 1)

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

## Ambient conditions

<b>Permissible temperatures</b>	
Medium	-20 to +125 °C
Environment	-20 to +85 °C, -40 to +125 °C on request
Storage	-40 to +125 °C, for version with fixed cable -20 to +100 °C
<b>Permissible relative humidity</b>	
In operation	100 % rel. humidity, incl. condensation on the outer sleeve of the instrument
Storage	90 % relative humidity, no condensation
<b>Permissible mechanical loading</b>	
Vibration resistance <sup>a</sup>	20 g, 15 to 2000 Hz
Shock resistance <sup>b</sup>	100 g for 1 ms
<b>Electromagnetic compatibility</b>	
Interference emission <sup>c</sup>	Class B
Interference immunity <sup>c</sup>	Industrial requirements
<b>Protection<sup>d</sup></b>	
Fixed cable, electrical connection 11	IP67
Round plug M12 × 1, electrical connection 36	IP67
Terminal box, electrical connection 61	IP65

a. IEC 60068-2-6

b. IEC 60068-2-27

c. EN 61326-2-3

d. EN 60529 (when connected with suitable mating piece)

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## Accuracy

Relative pressure										
Nominal measuring range (bar)	0 to 1.6	0 to 2.5	0 to 4	0 to 6	0 to 10	0 to 16	0 to 25	0 to 40	0 to 60	0 to 100
Non-linearity (% of end value) <sup>a</sup>	0.3			0.25						
Total error at 20 °C (% of end value) <sup>b</sup>	0.5									
Total error for -20 to +100 °C (% of end value) <sup>c</sup>	1.6			1.4						
Long-term stability <sup>d</sup>	0.2 % of end value annually									

Relative pressure							
Measuring range (bar)	-1 to 1.6	-1 to 1.5	-1 to 3	-1 to 5	-1 to 9	-1 to 15	-1 to 24
Non-linearity (% of end value) <sup>a</sup>	0.3			0.25			
Total error at 20 °C (% of end value) <sup>b</sup>	0.6		0.5				
Total error for -20 to +100 °C (% of end value) <sup>c</sup>	1.6			1.4			
Long-term stability <sup>d</sup>	0.2 % of end value annually						

a. Non-linearity based on limit point setting

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

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

d. See data sheet 401002

## Auxiliary power

<b>Supply voltage U<sub>B</sub><sup>a</sup></b> 4 to 20 mA, two wires, output 405 DC 0 to 10 V, three wires, output 415	DC 10 to 30 V, nominal power supply DC 24 V DC 11.5 to 30 V, nominal power supply DC 24 V
<b>Power consumption</b> 4 to 20 mA, two wires, output 405 DC 0 to 10 V, three wires, output 415	≤ 25 mA ≤ 3 mA
<b>Reverse polarity protection</b>	YES
<b>Circuit</b>	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

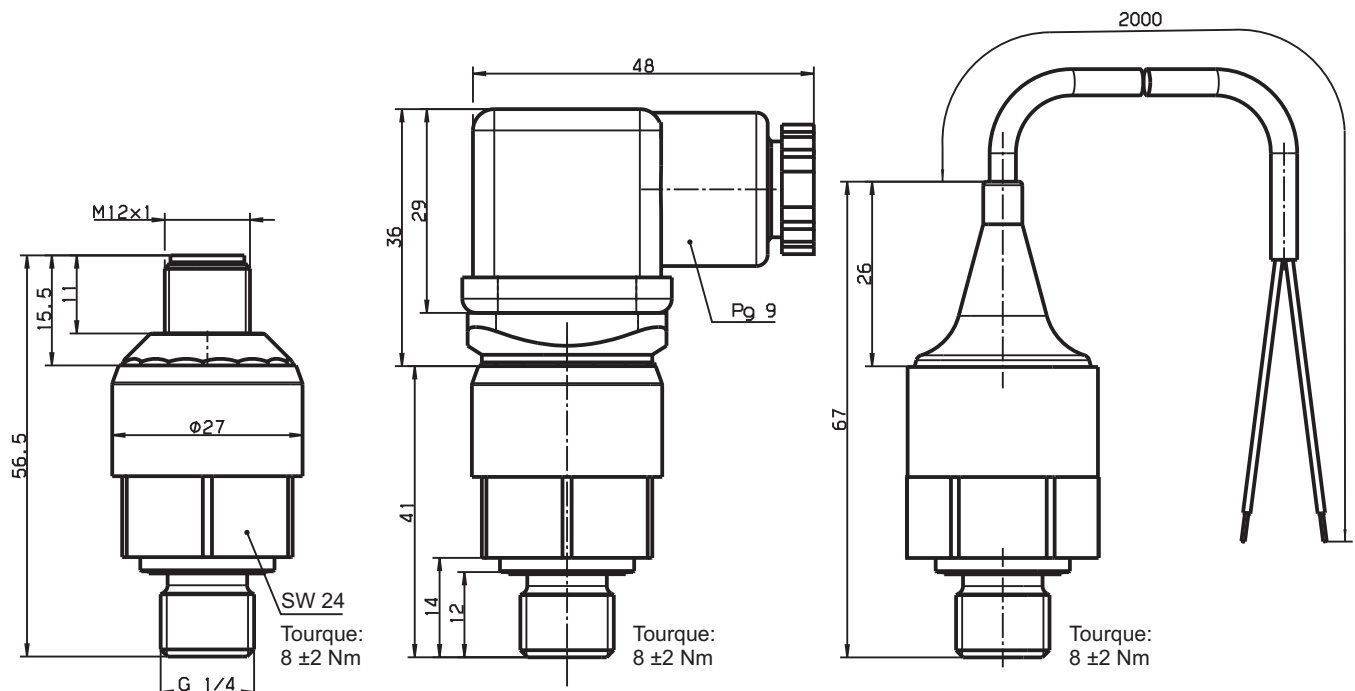
Connection		Terminal assignment <sup>a</sup>		
		11 Fixed cable	36 Round plug M12 x 1	61 Terminal box
<b>4 to 20 mA, two wires, output 405</b>				
Supply voltage DC 8 to 30 V	U <sub>B</sub> /S+ 0 V/S-	White Brown	1 3	1 2
<b>DC 0 to 10 V, three wires, output 415</b>				
Supply voltage DC 11.5 to 30 V	U <sub>B</sub> 0 V/S- S+	White Brown Yellow	1 2 3	1 2 3

a. Illustration: Connection on pressure transmitter

<b>Color assignment: Round plug M12 x 1</b>	1 bn Brown	4 bk Black	The color assignment applies <b>only</b> to A-coded standard cables!
	2 wh White	5 gy Gray	
	3 bu Blue		

## Dimensions

### Electrical connection and process connection



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## Order details

- 401012 **(1) Basic type**  
 JUMO MIDAS C18 SW  
 OEM pressure transmitter - seawater
- (2) Basic type extension**  
 000 None  
 999 Special design
- (3) Relative pressure measuring 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  
 464 0 to 100 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 measuring range
- (4) Output**  
 405 4 to 20 mA, two wires  
 415 DC 0 to 10 V, 3 wires
- (5) Process connection**  
 521 G 1/4 DIN EN 837<sup>a</sup>
- (6) Process connection material**  
 60 Titanium
- (7) Seal material**  
 601 FPM<sup>b</sup>
- (8) Electrical connection**  
 11 Fixed cable, 2 m (other lengths available on request)  
 36 Round plug M12 × 1  
 61 Terminal box EN 175301-803, Form A, ex DIN 43650
- (9) Extra codes**  
 000 None  
 630 Enlarged pressure channel Ø 8 mm

a. Only available in combination with extra code 630, enlarged pressure channel.

b. as standard

**Order code**    (1)    /    (2)    -    (3)    -    (4)    -    (5)    -    (6)    -    (7)    -    (8)    /    (9)    ...  
**Sample order**    401012    /    000    -    460    -    405    -    521    -    60    -    601    -    11    /    630

## Accessories

Item	Part no.
4-pin cable connector, straight, M12 × 1 with 2 m PVC cable	00404585
4-pin cable connector, angled, M12 × 1 with 2 m PVC cable	00409334