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JUMO Process Control, Inc.
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JUMO MIDAS S06 OEM-Pressure transmitter - Low pressure

Applications

- HVAC (Heating, Ventilating and Air Conditioning)
- Filter technology
- Machine and system construction
- Measurement of liquid levels
- Bubbling-through method
- Packaging industry

Brief description

The JUMO MIDAS S06 pressure transmitter is already available with measuring ranges from 100 mbar. The instrument features a silicon sensor that is able to handle extreme overload, even in the lowest measuring ranges, and is capable of millions of pressure cycles.

The high-quality stainless steel welded measuring system with no seals ensures the instrument can be used in almost all media, even under harsh conditions. The design offers optimum safety against process medium escaping.

Customer benefits

• Economical

A high level of automation (digital compensation and calibration of the sensor assembly) reduces production time and manufacturing costs.

• Process safety

The piezoresistive silicon sensor is highly overload-resistant and long-term stable. The high quality of every pressure transmitter is ensured by the 100% final inspection within the fully automated measuring and calibration system.

• Time-saving, uncomplicated and versatile

There is little work involved in mounting the measuring instrument and electrical installation is simple. Universal, thanks to its modular configuration, it can be used in virtually every application.



Type 401011
with terminal box



Type 401011
with M12x1 connector

Key features

- Measuring ranges from 100 mbar
- Suitable for measuring aggressive liquids
- High level of process safety thanks to a welded measuring system with no seals
- Sturdy and maintenance-free measurement technology with extreme overload resistance
- 60% faster device installation with the Quickon fast-connection system
- Parts in contact with media made of stainless steel

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Technical data

General

| | |
|--------------------------------------|--|
| Reference conditions | DIN 16 086 and EN 60770 |
| Sensor | |
| Material | silicon sensor with stainless steel separating diaphragm |
| Pressure transfer medium | synthetic oil |
| Permissible load change | > 10 million |
| Location | |
| Mounting location | any |
| Calibration location | device standing vertically, process connection on bottom |
| Location-dependent zero point offset | ≤ 1,5 mbar, process connection on top |

Measuring range

| | | | | | | | |
|--------------------------|--------------------------------------|---------------|---------|-----------|-----------|--|------|
| Relative pressure | The measuring ranges start at 0 bar. | | | | | | |
| Measuring range | 100 | 160 | 250 | 400 | 600 | | mbar |
| Overload capacity | -0.4 to 0.4 | -0.64 to 0.64 | -1 to 1 | -1 to 1.6 | -1 to 2.4 | | bar |
| Bursting pressure | -0.6 to 0.6 | -0.96 to 0.96 | 1.5 | 2 | 3.6 | | bar |
| Relative pressure | | | | | | | |
| Measuring range | -100 to 100 | -400 to 400 | | | | | mbar |
| Overload capacity | -0.4 to 0.4 | -1 to 1.6 | | | | | bar |
| Bursting pressure | 600 | 2 | | | | | bar |

Output

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

^a Additional outputs are available on request.

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Mechanical properties

| | |
|---|---|
| Process connection | |
| Material | Stainless steel 304 ^a |
| Membrane | |
| Material | Stainless steel 316L |
| Housing | |
| Material | Stainless steel 304 |
| Electrical connection | |
| Material | |
| Fixed cable, Electr. connection 11 | PBT-GF30, PVC |
| Quickon, Electr. connection 23 | PBT-GF30 |
| M12x1 round plug, Electr. connection 36 | PBT-GF30, stainless steel 303 |
| Bayonet connector, Electr. connection 53 | PBT-GF30 |
| Terminal box, Electr. connection 61 | PBT-GF30, PA, silicon |
| Weight | approx. 80 g with process connection 502 (G1/4) |

^a Pressure transmitters with process connection 521 come with an FPM seal.

Ambient conditions

| | | |
|---|--|---|
| Permissible temperatures | Measuring range 100, 160, 250, -100 to 100 mbar | Measuring range ≥ 400 mbar |
| Medium | 0 to +80 °C | -20 to +100 °C |
| Environment | 0 to +80 °C | -20 to +100 °C |
| Storage | -20 to +100 °C | -20 to +100 °C |
| Permissible relative humidity | | |
| In 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 | 20 g, 10 to 2000 Hz | |
| Shock resistance ^b | 50 g for 11 ms | |
| | 100 g for 1 ms | |
| Electromagnetic compatibility | | |
| Interference emission ^c | Class B | |
| Interference immunity ^c | industrial requirements | |
| Enclosure protection^d | | |
| Fixed cable, Electr. connection 11 | IP66 | |
| Relative pressure ranges | IP67 | |
| Absolute pressure ranges | IP66 | |
| Quickon ^e , Electr. connection 23 | IP66 | |
| M12x1 round plug, Electr. connection 36 | IP66 | |
| Bayonet connector, Electr. connection 53 | IP67 | |
| Terminal box ^f , Electr. 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 is min. 3.5 mm, max. 6 mm.

^f Connecting cable diameter is min. 5 mm, max. 7 mm.

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Accuracy

| | | | | | | | |
|---|----------------------------------|------------------|------------------|-----|-----|--|---------|
| Relative pressure | Measuring ranges start at 0 bar. | | | | | | |
| Measuring range | 100 | 160 | 250 | 400 | 600 | | mbar |
| Linearity ^a | 0.35 | 0.3 | 0.3 | 0.3 | 0.3 | | % of FS |
| Accuracy, 20°C ^b | 1.2 | 0.8 | 0.8 | 0.7 | 0.7 | | % of FS |
| Accuracy, -20 to +100°C (80°C) ^c | 2 ^e | 1.9 ^e | 1.8 ^e | 1.7 | 1.6 | | % of FS |
| Relative pressure | | | | | | | |
| Measuring range | -100 to 100 | -400 to 400 | | | | | mbar |
| Linearity ^a | 0.3 | 0.3 | | | | | % of FS |
| Accuracy, 20°C ^b | 1 | 0.7 | | | | | % of FS |
| Accuracy, -20 to +100°C (80°C) ^c | 2 ^e | 1.7 | | | | | % of FS |
| Long-term stability ^d | < 0.2% of FS | | | | | | |

^a Linearity based on limit point setting

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

^c Includes: linearity, hysteresis, repeatability, deviation from initial and full scale values of the measuring range, thermal effect on start of measuring range and span

^d EN 61298-1

^e max. permissible ambient and medium temperatures +80°C

Auxiliary power

| | | | |
|---|--|--|--|
| Supply voltage U_B^a | | | |
| 4 to 20 mA, 2 wires, Output 405 | | | 8 to 30 V DC, nominal supply voltage 24 V DC |
| 0.5 to 4.5 V DC, 3 wires, Output 412 | | | 3 to 5.25 V DC, nominal supply voltage 5 V DC, ratiometric output 10 to 90% of supply voltage |
| 0 to 10 V DC, 3 wires, Output 415 | | | 11.5 to 30 V DC, nominal supply voltage 24 V DC |
| 1 to 5 V DC, 3 wires, Output 418 | | | 8 to 30 V DC, nominal supply voltage 24 V DC |
| 1 to 6 V DC, 3 wires, Output 420 | | | 8 to 30 V DC, nominal supply voltage 24 V DC |
| Power consumption | | | ≤ 25 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!


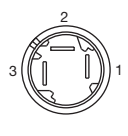
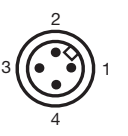
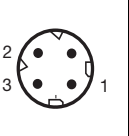
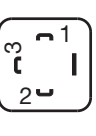
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Connection diagram

| Connection | | Terminal assignment ^a | | | | |
|--|-----------------|---|--|---|---|---|
| | |  |  |  |  |  |
| | | 11 Fixed cable | 23 Quickon | 36 Round plug, M12x1 | 53 Bayonet | 61 Terminal box |
| 4 to 20 mA, two wires, output 405 | | | | | | |
| Supply voltage 8 to 30 V DC | UB/S+ 0 V/S- | white brown | 1 3 | 1 3 | 1 2 | 1 2 |
| 0.5 to 4.5 V DC, ratiometric, output 412 | | | | | | |
| Supply voltage 3 to 5.25 V DC | UB | white | 1 | 1 | 1 | 1 |
| Ratiometric output 10 to 90% of supply voltage | 0 V/S- S+ | brown yellow | 2 3 | 2 3 | 2 3 | 2 3 |
| 0 to 10 V DC, 3 wires, output 415 | | | | | | |
| Supply voltage 11.5 to 30 V DC | UB | white | 1 | 1 | 1 | 1 |
| | 0 V/S- S+ | brown yellow | 2 3 | 2 3 | 2 3 | 2 3 |
| 1 to 5 V DC, 3 wires, output 418 1 to 6 V DC, 3 wires, output 420 | | | | | | |
| Supply voltage 8 to 30 V DC | UB | white | 1 | 1 | 1 | 1 |
| | 0 V/S- S+ | brown yellow | 2 3 | 2 3 | 2 3 | 2 3 |

^a Illustration shows the pressure transmitter connector

| | | | | |
|--|--|------------|------------|--|
| Color assignment: Round plug, M12x1 | | 1 bn Brown | 4 bk Black | The color assignment only applies 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 M12 round plug | 53 Bayonet connector | 61 Terminal box |
|-------------------|---------------|----------------------|-------------------------|--------------------|
| | | | | |

Process connection

| 501 G1/8 | 502 G1/4 | 504 G1/2 | 511 1/4 - 18 NPT |
|-------------|-------------|-------------|---------------------|
| | | | |

| 521 G1/4 | 562 7/16-20 UNF | 563 7/16 UNF inside |
|-------------|--------------------|------------------------|
| | | |

A = G1/4 profile seal

B = 7/16-20 UNF inside, with valve opener

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Order details

(1) Basic type

401011/000 JUMO MIDAS S06 pressure transmitter
 401011/999 JUMO MIDAS S06 pressure transmitter, special design

(2) Input

414 0 to 100 mbar relative pressure
 415 0 to 160 mbar relative pressure
 451 0 to 250 mbar relative pressure
 452 0 to 400 mbar relative pressure
 453 0 to 600 mbar relative pressure

 446 -100 to 100 mbar relative pressure
 447 -400 to 400 mbar relative pressure

999 Special measuring range for relative pressure

(3) Output

405 4 to 20 mA, 2-w
 412 0.5 to 4.5 V DC, 3-w
 415 0 to 10 V DC, 3-w
 418 1 to 5 V DC, 3-w
 420 1 to 6 V DC, 3-w

(4) Process connection

501 G1/8 EN 837
 502 G1/4 EN 837
 504 G1/2 EN 837
 511 1/4-18 NPT DIN 837
 521 G1/4 DIN 3852-11
 562 7/16 - 20 UNF
 563 7/16 - 20 UNF inside with valve opener

(5) Process connection material

20 CrNi (stainless steel)

(6) Electrical connection

11 With fixed cable^a
 23 Quickon
 36 Round plug, M12x1
 53 DIN 72585 bayonet instrument connector^b
 61 Terminal box EN 17501-803, Form A, ex DIN 43650

(7) Extra codes

000 No extra code
 591 Throttle in pressure channel
 624 Free of oil and grease
 630 Enlarged pressure channel^c

Notes on the order details

^a Electrical connection 11

As standard: 2 m fixed cable

^b Electrical connection 53

Bayonet connector DIN 72585-A1-3.1-Sn/K1

^c Extra code 630

6 mm diameter for process connections 501

8 mm diameter for process connections 511 and 521

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (7) |
|---------------|----------------------|-----|----------------------|-----|----------------------|-----|----------------------|------------------------------|
| Order code | <input type="text"/> | - | <input type="text"/> | - | <input type="text"/> | - | <input type="text"/> | / <input type="text"/> , ... |
| Order example | 401011/000 | - | 454 | - | 405 | - | 504 | - 20 - 61 / 591 , 624 |

Minimum order quantity for production orders: 5 pieces

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Accessories

| Designation | Part No. |
|--|----------|
| cable connector, straight, 4-pin, M12x1 with 2 m PVC cable | 00404585 |
| cable connector, angled, 4-pin, M12x1 with 2 m PVC cable | 00409334 |