Pressure Transmitter M01
Sensors

KEY FEATURES
• Compact and robust design for use in harsh environments
• Pressure transmitter for mobile hydraulics, alternative drives (H2, CNG, LPG) and industrial sectors
• Maximum flexibility through modular design, customization and individualization possible
• Designed for OEM needs
• With ECE type approval
• UL Recognized

**1** Pressure range on request

TECHNICAL DATA
• Pressure ranges from 0...0.25 bar to 0...10 bar (relative and absolute)**1**
• Pressure ranges from 0...10 bar to 0...2000 bar (relative)
• Overload pressure at least 2X nominal pressure
• Media temperatures up to 150 °C / 302 °F
• Ingress Protection Rating up to IP6K9K
• CAN enabled: CANopen, J1939, STW proprietary
• All common analog output signals available

ACCESSORIES
• Optional software package for CAN interface setting parameters

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info@sensor-technik.de
www.stw-mm.com

*Pressure range on request*
### TECHNICAL DATA

<table>
<thead>
<tr>
<th>Pressure range</th>
<th>0 ... 0.25 bar to 0 ... 2000 bar, other ranges available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure reference</td>
<td>relative R (gauge G) / absolute A*1</td>
</tr>
<tr>
<td>Standard pressure range</td>
<td>0.25 bar 0.4 bar 1 bar 1.6 bar 4 bar 10 bar</td>
</tr>
<tr>
<td>Overload pressure</td>
<td>0.63 bar 1 bar 2.5 bar 2.5 bar 10 bar 20 bar</td>
</tr>
<tr>
<td>Bursting pressure</td>
<td>0.75 bar 1.2 bar 3 bar 3 bar 12 bar 30 bar</td>
</tr>
<tr>
<td>Media temperature</td>
<td>−40 ... +85°C / −40 ... +185°F</td>
</tr>
<tr>
<td>Operating and storage</td>
<td>−40 ... +85°C / −40 ... +185°F</td>
</tr>
<tr>
<td>temperature</td>
<td></td>
</tr>
<tr>
<td>Material with medium</td>
<td>Stainless Steel AISI 630 (DIN 1.4542) and Silicon</td>
</tr>
<tr>
<td>contact</td>
<td>(For applications with non-aggressive gases and fluids or substances which do not react with glass or silicon)</td>
</tr>
<tr>
<td>Overall accuracy at</td>
<td>≤ 1.0 %FS (0 ... +85°C) / (32 ... +185°F)</td>
</tr>
<tr>
<td>operating temperature</td>
<td>≤ 2.5 %FS (−40 ... 0°C) / (−40 ... +32°F)</td>
</tr>
<tr>
<td>Thereof linearity,</td>
<td>&lt; 0.25 %FS</td>
</tr>
<tr>
<td>pressure hysteresis</td>
<td>****</td>
</tr>
<tr>
<td>and repeatability</td>
<td>(Linearization with limit point setting)</td>
</tr>
<tr>
<td>Long-run stability</td>
<td>&lt; 0.2 %FS p.a.</td>
</tr>
<tr>
<td>Voltage supply (DC)</td>
<td>$U_{VCC}$: 9 ... 36 V $U_{VCC}$: 14 ... 36 V (for transmitter with 0 ... 10 V voltage output) $U_{VCC}$: 5 V ± 10 % (for transmitter with ratiometric output) allowable ripple at 50 Hz: 10 %</td>
</tr>
</tbody>
</table>

*1 Pressure range on request  
*2 For common-rail applications
## TECHNICAL DATA

**CAN**
- Sampling Rate: 1000 Samples/s (max.)
- Digital Filter: averaging adjustable
- Output protocol: STW-CAN, CANopen, SAE J1939
- Electrical connection: M12 connector, DIN Bayonet (per DIN 72585), DT04 4-pole, cable output

**Analog**
- Output signal: 4 ... 20 mA (2-wire technique), 0/4 ... 20 mA (3-wire technique), 0 ... 10 V, 0 ... 5 V, 1 ... 6 V, 10 ... 90 %VCC (ratiometric output)
  - Other output signals on request
- Electrical connection: M12 connector, DIN bayonet (per DIN 72585); DT04 4-pole; DT04 3-pole, AMP-SuperSeal 1.5; cable output
  - Other connectors on request

**Electrical protection**
- Short circuit protected, signal on GND/VCC and inverse polarity protection (not at ratiometric output)

**Pressure connection**
- G 1/4, 1/4 NPT, G 1/4 with manometer pin, SAE04 (7/16-20UNF), SAE06 (9/16-18UNF),
  - other pressure connectors on request, possible limitations of the pressure range

**Protection class**
- IP6K7 or IP6K9K (depends on the electrical connection)

### Functional safety

- Pressure switch M01 (analog and CAN) **Acc. DIN EN ISO 13849-1: Performance Level b**
  - Cat. = B
  - MTTF$_d$ = High
  - DC = None
  - CCF = Not relevant
TECHNICAL DRAWINGS AND PIN ASSIGNMENTS

**Pressure connection**

- G 1/4, DIN 3852 T 11 (Form E)

- 1/4 NPT per "Nominal width for US-standard bevelled pipe thread NPT"

- G 1/4 according to EN837-1 (formerly DIN 16288)

- SAE04 - O-Ring

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**Electrical connection, protection class IP per IEC 60529**

- Circular plug-in connector M12x1, 5-pole, IP6K7

- Bayonet connector DIN 72585, 4-pole, IP6K7

- Connector DT04-4P, 4-pole, IP6K7

- Cable output IP69k (Oil-resistant cable on request)

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**Specifications**

- **2-wire technique**
- **3-wire technique**
- **CAN**

<table>
<thead>
<tr>
<th>Pin</th>
<th>2-wire technique</th>
<th>3-wire technique</th>
<th>CAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
<td>VCC</td>
<td>PE housing</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>Signal</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Do not connect the pins marked with "-"!

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**Litz wire**

<table>
<thead>
<tr>
<th>Litz wire</th>
<th>2-wire technique</th>
<th>3-wire technique</th>
<th>CAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>brown</td>
<td>VCC</td>
<td>VCC</td>
<td>PE housing</td>
</tr>
<tr>
<td>white</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>blue</td>
<td>Signal</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>black</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>grey</td>
<td>-</td>
<td>-</td>
<td>CAN, L</td>
</tr>
</tbody>
</table>

Do not connect the litz wires marked with "-"!
TECHNICAL DRAWINGS AND PIN ASSIGNMENTS

Pressure connection

Electrical connection, protection class IP per IEC 60529

<table>
<thead>
<tr>
<th>Pin</th>
<th>2-wire technique</th>
<th>3-wire technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Signal</td>
<td>GND</td>
</tr>
<tr>
<td>2</td>
<td>–</td>
<td>Signal</td>
</tr>
<tr>
<td>3</td>
<td>VCC</td>
<td>VCC</td>
</tr>
</tbody>
</table>

Do not connect the pins marked with „–“!

Recommended terminal layout

2-wire technique

3-wire technique

CAN

Current output load \( R_L \leq \frac{U_{VCC} - 9\,V}{0,02\,A} \) for \( U_{VCC} \geq 24\,V \) additionally \( R_L \geq \frac{U_{VCC} - 24\,V}{0,048\,A} \)

Voltage output load: \( R_L \geq 10\,k\Omega \)
QUALIFICATION

Conformity

CE, UL
E1: All vehicle types with a 12 V resp. 24 V - electrical wiring and battery (−) at the body

EMC industrial (CE)

RF Emission 150 kHz to 30 MHz conducted, 30 MHz to 1 GHz, group 1 class B

Electromagnetic immunity

ESD: 330 Ω / 150 pF; contact: +/-4 kV, air: +/-8 kV
RF immunity: 80-2700 MHz, 10 V/m, 3 m, hor./vert.
Burst: 5/50 ns, 5 kHz; signal wire.: +/-1 kV, power supply wire: +/-2 kV
Surge: 1,2/50 μs; symm., asymm.: +/-0,5 kV
Conducted. RF immunity: 0,15-80 MHz, 10 V, 80 % AM sine 1 kHz

EMC automotive

RF emission 150 kHz to 3 GHz, 1m, 120 kHz bandwidth
RF immunity:
stripline: 0,01 MHz-400 MHz, 200 V/m, 80 % AM sine with 1 kHz;
antenna: 400 MHz - 2 GHz, 50 V/m, PM tON, 577 μs, period 4600 μs
Road vehicles, electrical disturbances, test pulse (power supply wires):
Pulse 1: -600 V, 5000 pulses
• Pulse 2a: +50 V, 5000 pulses, 2 Ω
• Pulse 2b: +20 V, 10 pulses
• Pulse 3a: -200 V, 1 h
• Pulse 3b: +200 V, 1 h
• Pulse 4: -18 V, 2 pulses
• Pulse 5: 62 V, 400 ms, 2 Ω, 1 pulse

FCC, 47 CFR Part15, Subpart B

Equivalent to FCC Docket 92-152

Confirmation

EMC industrial (CE)

EN 61000-6-3 residential, commercial and light-industrial environments
EN 61000-6-2 industrial environments
EN 61000-4-2
EN 61000-4-3
EN 61000-4-4
EN 61000-4-5
EN 61000-4-6
FCC, 47 CFR Part15, Subpart B

Confirmation

EMC automotive

ISO 7637-2:2004-09
QUALIFICATION

EMC automotive

Road vehicles, electrical disturbances, test pulses (data wires):
- Pulse a: -80 V, 1 h
- Pulse b: +80 V, 1 h

Radio disturbance for protection of receivers used on board vehicles, boats und large devices; 0.15 MHz-108 MHz
ISO 7637-3:1995-07

Electrostatic discharge: 2 kΩ / 330 pF, 2 kΩ / 150 pF; contact: +/-8 kV, air: +/-15 kV
ISO 10605:2001-12

Climatic and mechanical tests

Temperature range
-40 °C ... +125 °C /
-40 °F ... +257 °F

Thermal-cycling test na: -40 °C / -40 °F and 125 °C / 257 °F; 10 cyc.; retaining of limit temperature for 1 h; temperature change rate 30 sec., active
DIN EN 60068-2-14:2000-08

Thermal-cycling test na: -50 °C / -58 °F and 125 °C / 257 °F; 216 cyc.; retaining of limit temperature for 0.5 h; temperature change rate 30 sec., passiv
DIN EN 60068-2-14:2000-08

Thermal-cycling test nb: -40 °C /-40 °F und 125 °C / 257 °F; 10 cyc.; retaining of limit temperature for 1 h; temperature change rate 3 K/min., active
DIN EN 60068-2-14:2000-08

Cold test -40 °C / -40 °F, duration: 96 h, active
DIN EN 60068-2-1:1995-03

Dry heat +125 °C / 257 °F, duration: 96 h, active
DIN EN 60068-2-2-1994-08
DIN EN 60068-2-2/A2 :1995-01

Damp heat, steady state: 21 days at 40 °C / 104 °F and 96 % r.F.
DIN EN 60068-2-78:2002-09

Damp heat cyclic 25 °C / 77 °F to 55 °C / 131 °F; at 96 % r.F.; 6 cycles each 24 h, active
DIN EN 60068-2-30:2000-02,
DIN 50018:1962-12

Climatic and mechanical tests

Free fall: 1m free fall on iron plate, 6 axes
DIN EN 60068-2-32:1995-03

Degree of protection (water/dust) IP6K7 and IP69K; depending on connector type
DIN EN 60529:2000-09,
DIN 40050-9:1993-05

Vibration (sinusoidal) 20 g, test with temperature variation, 5-2000-5 Hz, 1oct/min., -40 °C...125 °C / -40 °F...257 °F; 3 K/min, tv=15 min, tw=60 min, 2 temp. cycles/axis (->3x5h)
DIN EN 60068-2-6
DIN EN 60068-2-14Nb

Shock: 50 g / 11 ms; sine; 3 shocks per axis; not active
DIN EN 60068-2-27:1995-03

Shock 500 g, 1-2 ms, 18 shocks, 6/axis
DIN EN 60068-2-27:1995-03

Bump: 30 g / 6 ms, sine, 1000 bumps per axis
DIN EN 60068-2-29:1995-03

Salt mist, cyclic (sodium chloride solution): 5 %NaCl, 4 cycles a 24 h, 35 °C / 95 °F, 2 h/22 h
DIN EN 60068-2-52:2000-02

Immersion and splash: gasoline, diesel, degreaser, antifreezing agent, afterwards drying at 125 °C / 257 °F for 48h
SAE J 1211 part 4.4:1978-11

Chemical resistance: diesel, motor oil, hydraulic oil, gear oil, bio-diesel, E10, urea “Caelo” afterwards drying at 70 °C / 158 °F for 48h
ISO 16750-5

Ice-water shock test
ISO16750-4

Flowing mixed gas corrosion test: sulfur dioxide SO2, hydrogen sulfide H2S, nitrogen dioxide NO2, chlorine Cl2
DIN EN 60068-2-60 (16750-4)
## ORDER CODES

<table>
<thead>
<tr>
<th>model</th>
<th>pressure range</th>
<th>unit</th>
<th>reference</th>
<th>output</th>
<th>pressure connection</th>
<th>electrical connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 0 1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>pressure</th>
<th>connection</th>
<th>electrical</th>
</tr>
</thead>
<tbody>
<tr>
<td>bar</td>
<td>4-20 mA</td>
<td>M12 (plastic)</td>
</tr>
<tr>
<td></td>
<td>(2-wire-technique)</td>
<td></td>
</tr>
<tr>
<td>psi</td>
<td>0-20 mA</td>
<td>0-4</td>
</tr>
<tr>
<td></td>
<td>(3-wire-technique)</td>
<td>¼&quot; NPT</td>
</tr>
<tr>
<td></td>
<td>4-20 mA</td>
<td>0-8</td>
</tr>
<tr>
<td></td>
<td>(3-wire-technique)</td>
<td>½&quot; with manometer</td>
</tr>
<tr>
<td></td>
<td>0...10 V</td>
<td>0-9</td>
</tr>
<tr>
<td></td>
<td>0...5 V</td>
<td>SAE04 (7/16-20 UNF with cone)</td>
</tr>
<tr>
<td></td>
<td>1...6 V</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>10...90 % VCC</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td>0 CANopen</td>
<td>0-8</td>
</tr>
<tr>
<td></td>
<td>SAE J1939</td>
<td>0-9</td>
</tr>
<tr>
<td></td>
<td>STW-CAN</td>
<td>1-1</td>
</tr>
<tr>
<td></td>
<td>custom specific</td>
<td>9-9</td>
</tr>
<tr>
<td></td>
<td>custom specific</td>
<td>9-9</td>
</tr>
</tbody>
</table>

Subject to change without notice