



DS 201

Electronical Pressure Switch

Ceramic Sensor

accuracy according to IEC 60770:
0.5 % FSO

Electronic Pressure Switch

Nominal pressure

from 0 ... 400 mbar
up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP contacts,
freely configurable

Analogue output

2-wire: 4 ... 20 mA
3-wire: 0 ... 20 mA / 0 ... 10 V
others on request

Special characteristics

- ▶ indication of measured values on a 4-digit LED display
- ▶ rotatable and configurable display module

Optional versions

- ▶ **IS-version**
Ex ia = intrinsically safe for gases
- ▶ pressure port PVDF
- ▶ customer specific versions

DS 201



The electronic pressure switch DS 201 is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and has been specially designed for universal usage in industry applications. The DS 201 is available with flush pressure ports for viscous, pasty and highly contaminated media.

As standard the DS 201 offers a PNP contact and a rotatable display module with 4-digit LED display.

Optional versions like e.g. an intrinsically safe version, max. 4 contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and Machine Engineering



Environmental Engineering
(water – sewage – recycling)

| Input pressure range ¹ | | | | | | | | | | | | | | | | | | |
|--|---|-----|-----|----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Nominal pressure gauge [bar] | -1...0 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Nominal pressure abs. [bar] | - | - | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Level gauge [mH ₂ O] | - | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 | - | - | - | - | - |
| Overpressure [bar] | 4 | 1 | 2 | 2 | 4 | 4 | 10 | 10 | 20 | 40 | 40 | 100 | 100 | 200 | 400 | 400 | 600 | 800 |
| Burst pressure ≥ [bar] | 7 | 2 | 4 | 4 | 5 | 5 | 12 | 12 | 25 | 50 | 50 | 120 | 120 | 250 | 500 | 500 | 650 | 880 |
| Vacuum resistance | P _N ≥ 1 bar: unlimited vacuum resistance P _N < 1 bar: on request | | | | | | | | | | | | | | | | | |

¹ PVDF pressure port possible for nominal pressure ranges up to 60 bar

| Contact ² | |
|-----------------------------------|---|
| Standard | 1 PNP contact |
| Options | 2 independent PNP contacts 4 independent PNP contacts (possible with M12x1, 8-pin for 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request) |
| Max. switching current | 4 ... 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; V _{Switch} = V _S - 2V 0 ... 10 V / 3-wire: contact rating 500 mA, short-circuit resistant |
| Accuracy of contacts ³ | ≤ ± 0.5 % FSO |
| Repeatability | ≤ ± 0.2 % FSO |
| Switching frequency | max. 10 Hz |
| Switching cycles | > 100 x 10 ⁶ |
| Delay time | 0 ... 100 sec |

² max. 1 contact for 2-wire current signal with plug ISO 4400 as well as 2-wire current signal with IS-protection
no contact possible with 3-wire in combination with plug ISO 4400

| Analogue output (optionally) / Supply | |
|--|---|
| 2-wire current signal | 4 ... 20 mA / V _S = 13 ... 36 V _{DC} permissible load: R _{max} = [(V _S - V _{Smin}) / 0.02 A] Ω response time: < 10 msec |
| 2-wire current signal with IS-protection | 4 ... 20 mA / V _S = 13 ... 28 V _{DC} permissible load: R _{max} = [(V _S - V _{Smin}) / 0.02 A] Ω response time: < 10 msec |
| 3-wire current signal | 4 ... 20 mA / V _S = 19 ... 30 V _{DC} adjustable (turn-down of span 1:5) ⁴ permissible load: R _{max} = 500 Ω response time: < 0,5 sec |
| 3-wire voltage signal | 0 ... 10 V / V _S = 15 ... 36 V _{DC} permissible load: R _{min} = 10 kΩ response time: < 10 msec |
| Without analogue output | V _S = 15 ... 36 V _{DC} |
| Accuracy ³ | ≤ ± 0.5 % FSO |

³ accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

⁴ with turn-down of span the analogue signal is adjusted automatically to the new measuring range

| Thermal effects (Offset and Span) / Permissible temperatures | |
|---|---|
| Thermal error | ≤ ± 0.2 % FSO / 10 K |
| in compensated range | -25 ... 85 °C |
| Permissible temperatures ⁵ | medium: -40 ... 125 °C electronics / environment: -40 ... 85 °C storage: -40 ... 100 °C |

⁵ for pressure port of PVC the maximum permissible temperature is 50 °C

| Electrical protection | |
|-------------------------------|---|
| Short-circuit protection | permanent |
| Reverse polarity protection | no damage, but also no function |
| Electromagnetic compatibility | emission and immunity according to EN 61326 |

| Mechanical stability | |
|-----------------------------|---|
| Vibration | 10 g RMS (25 ... 2000 Hz) according to DIN EN 60068-2-6 |
| Shock | 500 g / 1 msec according to DIN EN 60068-2-27 |

| Materials | | | |
|-------------------------|--|--|--|
| Pressure port / housing | Standard: | pressure port | housing |
| | Option for G1/2" open port (up to 60 bar): Options for G3/4" flush (0.6 bar ≤ P _N ≤ 25 bar): | stainless steel 1.4404 PVDF PVDF | stainless steel 1.4404 stainless steel 1.4404 PVDF |
| Display housing | PA 6.6, polycarbonate | | |
| Seals (media wetted) | standard: FKM option: EPDM (P _N ≤ 160 bar), NBR others on request | | |
| Diaphragm | ceramics Al ₂ O ₃ 96 % | | |
| Media wetted parts | pressure port, seals, diaphragm | | |

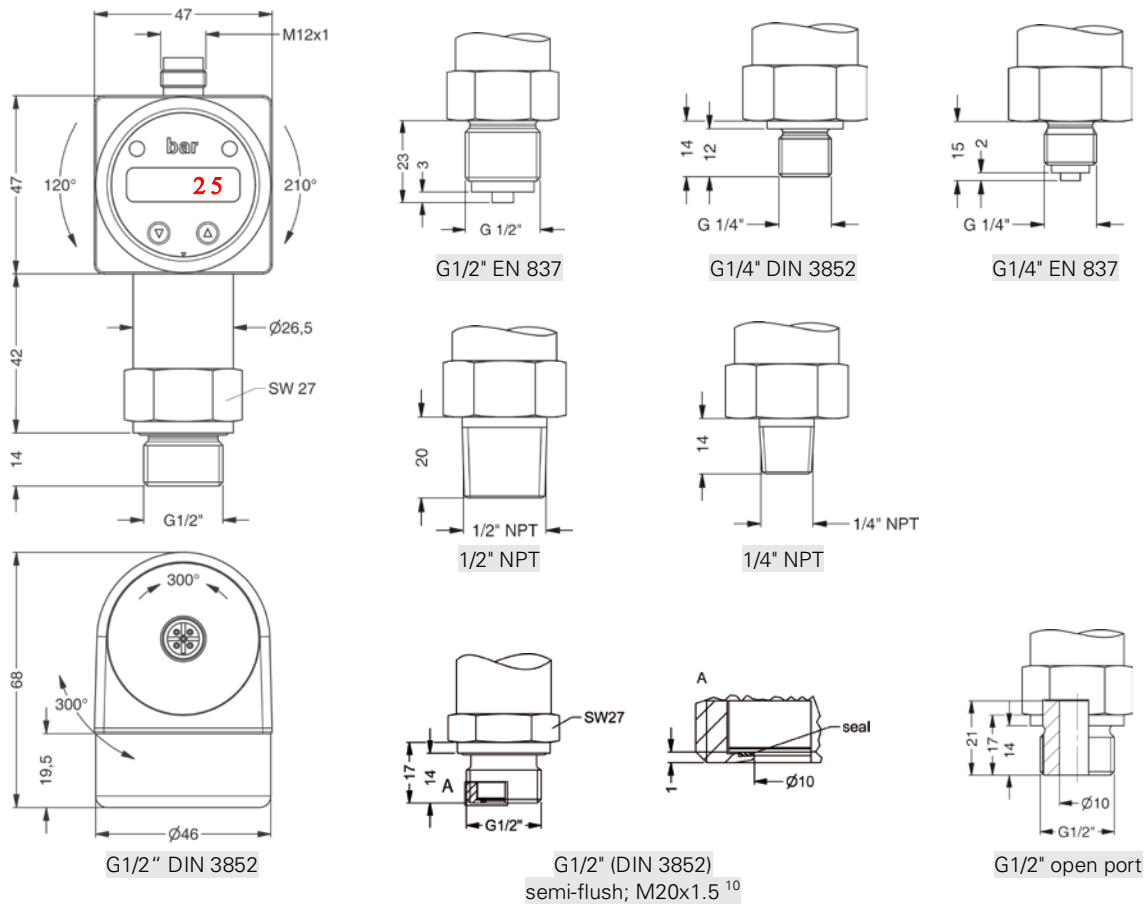
| Explosion protection (only for 4 ... 20 mA / 2-wire) | | | | | | |
|--|--|----------------------------|--|----------------|----------------------------|---------------------------|
| Approval AX14-DS 201 | IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) | | | | | |
| Safety tech. maximum values | $U_i = 28\text{ V}$, $I_i = 93\text{ mA}$, $P_i = 660\text{ mW}$, $C \approx 0\text{ nF}$, $L_i \approx 0\text{ }\mu\text{H}$ | | | | | |
| Max. switching current ⁶ | 70 mA (max. permissible inductivity: 4.7 mH) | | | | | |
| Permissible temperatures for environment | -20 ... 70 °C | | | | | |
| Connecting cables (by factory) | cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance: signal line/shield also signal line/signal line: 1 $\mu\text{H}/\text{m}$ | | | | | |
| ⁶ the real switching current in the application depends on the power supply unit | | | | | | |
| Miscellaneous | | | | | | |
| Display | 4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 ... +9999; accuracy 0.1 % \pm 1 digit; digital damping 0.3 ... 30 sec (programmable); measured value update 0.0 ... 10 sec (programmable) | | | | | |
| Option oxygen application ⁷ | for $P_N \leq 25\text{ bar}$: O-ring in special material with oxygen-approval | | | | | |
| Current consumption (without contacts) | 2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 45 mA + signal current 3-wire signal output voltage: approx. 45 mA | | | | | |
| Ingress protection | IP 65 | | | | | |
| Installation position | any | | | | | |
| Weight | approx. 200 g | | | | | |
| Operational life | $> 100 \times 10^6$ cycles | | | | | |
| CE-conformity | EMC Directive: 2004/108/EC | | Pressure Equipment Directive: 97/23/EC (module A) ⁸ | | | |
| ⁷ not possible with flush pressure ports | | | | | | |
| ⁸ This directive is only valid for devices with maximum permissible overpressure $> 200\text{ bar}$ | | | | | | |
| Wiring diagrams | | | | | | |
| 2-wire-system (current) | | | 3-wire-system (current / voltage) | | | |
| | | | | | | |
| Pin configuration | | | | | | |
| Electrical connection | M12x1 plastic (5-pin) | M12x1 metal (5-pin) | M12x1 plastic (8-pin) | ISO 4400 | Binder series 723 (5-pin) | cable colours (DIN 47100) |
| Supply + | 1 | 1 | 1 | 1 | 3 | wh (white) |
| Supply - | 3 | 3 | 3 | 2 | 4 | bn (brown) |
| Signal + (only 3-wire) | 2 | 2 | 2 | 3 | 5 | gn (green) |
| Contact 1 | 4 | 4 | 4 | 3 | 2 | gr (grey) |
| Contact 2 | 5 | 5 | 5 | - | 1 | pn (pink) |
| Contact 3 | - | - | 6 | - | - | - |
| Contact 4 | - | - | 7 | - | - | - |
| Shield | via pressure port | plug housing/pressure port | via pressure port | ground contact | plug housing/pressure port | gn/ye (green/yellow) |
| Electrical connections (dimensions in mm) | | | | | | |
| | | | | | | |
| ⁹ different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C) | | | | | | |

DS 201

Electronic Pressure Switch

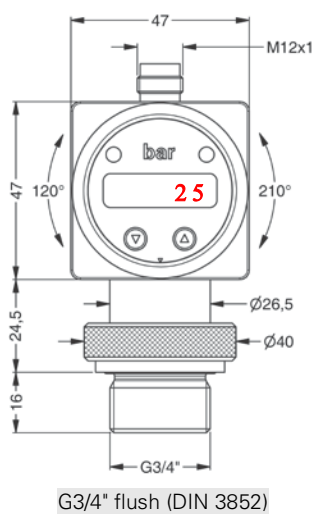
Technical Data

Mechanical connections (dimensions in mm)



⇨ metric threads and others on request

optionally for P_N from 0.6 up to 60 bar gauge



¹⁰ possible for nominal pressure ranges $P_N \leq 40$ bar

This data sheet contains product specification, properties are not guaranteed. Subject to change without notice.

Ordering code DS 201

| DS 201 | | [][] - [][][][] - [][] - [][] - [][][][] - [][][][] - [][] - [][][][] | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|--|--|--|--|--|--|--|
| Pressure | | | | | | | | | | | | | | | |
| | gauge in bar | 7 | 8 | 2 | | | | | | | | | | | |
| | gauge in mH ₂ O | 7 | 8 | E | | | | | | | | | | | |
| | absolute in bar | 7 | 8 | 3 | | | | | | | | | | | |
| Input | | | | | | | | | | | | | | | |
| | [mH ₂ O] | [bar] | | | | | | | | | | | | | |
| | 4 | 0.4 | 4 | 0 | 0 | 0 | | | | | | | | | |
| | 6 | 0.6 | 6 | 0 | 0 | 0 | | | | | | | | | |
| | 10 | 1.0 | 1 | 0 | 0 | 1 | | | | | | | | | |
| | 16 | 1.6 | 1 | 6 | 0 | 1 | | | | | | | | | |
| | 25 | 2.5 | 2 | 5 | 0 | 1 | | | | | | | | | |
| | 40 | 4.0 | 4 | 0 | 0 | 1 | | | | | | | | | |
| | 60 | 6.0 | 6 | 0 | 0 | 1 | | | | | | | | | |
| | 100 | 10 | 1 | 0 | 0 | 2 | | | | | | | | | |
| | 160 | 16 | 1 | 6 | 0 | 2 | | | | | | | | | |
| | 250 | 25 | 2 | 5 | 0 | 2 | | | | | | | | | |
| | 400 | 40 | 4 | 0 | 0 | 2 | | | | | | | | | |
| | 600 | 60 | 6 | 0 | 0 | 2 | | | | | | | | | |
| | 100 | 10 | 1 | 0 | 0 | 3 | | | | | | | | | |
| | 160 | 16 | 1 | 6 | 0 | 3 | | | | | | | | | |
| | 250 | 25 | 2 | 5 | 0 | 3 | | | | | | | | | |
| | 400 | 40 | 4 | 0 | 0 | 3 | | | | | | | | | |
| | 600 | 60 | 6 | 0 | 0 | 3 | | | | | | | | | |
| | -1 ... 0 | customer | X | 1 | 0 | 2 | | | | | | | | | |
| | | | 9 | 9 | 9 | 9 | | | | | | | | | |
| Analogue output | | | | | | | | | | | | | | | |
| | without | | | | | 0 | | | | | | | | | |
| | 4 ... 20 mA / 2-wire | | | | | 1 | | | | | | | | | |
| | 0 ... 10 V / 3-wire | | | | | 3 | | | | | | | | | |
| | 4 ... 20 mA / 3-wire, adjustable | | | | | 7 | | | | | | | | | |
| | Intrinsic safety 4 ... 20 mA / 2-wire | ¹ | | | | E | | | | | | | | | |
| | customer | | | | | 9 | | | | | | | | | |
| Contact | | | | | | | | | | | | | | | |
| | 1 contact | ^{1,2} | | | | 1 | | | | | | | | | |
| | 2 contacts | ^{1,2} | | | | 2 | | | | | | | | | |
| | 4 contacts | ³ | | | | 4 | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | | | |
| | 0.5 % | | | | | 5 | | | | | | | | | |
| | customer | | | | | 9 | | | | | | | | | |
| Electrical connection | | | | | | | | | | | | | | | |
| | Male plug M12x1 (5-pin) / plastic version | | | | | N | 0 | 0 | | | | | | | |
| | Male plug M12x1 (8-pin) / plastic version | ³ | | | | M | 5 | 0 | | | | | | | |
| | Male plug M12x1 (5-pin) / metal version | | | | | N | 1 | 0 | | | | | | | |
| | Male and female plug ISO 4400 | ² | | | | 1 | 0 | 0 | | | | | | | |
| | Male plug Binder series 723 (5-pin) | | | | | 2 | 0 | 0 | | | | | | | |
| | Cable outlet incl. cable | ⁴ | | | | T | A | 0 | | | | | | | |
| | customer | | | | | 9 | 9 | 9 | | | | | | | |
| Mechanical connection | | | | | | | | | | | | | | | |
| | G1/2" DIN 3852 | | | | | 1 | 0 | 0 | | | | | | | |
| | G1/2" EN 837 | | | | | 2 | 0 | 0 | | | | | | | |
| | G1/4" DIN 3852 | | | | | 3 | 0 | 0 | | | | | | | |
| | G1/4" EN 837 | | | | | 4 | 0 | 0 | | | | | | | |
| | G1/2" DIN 3852 with flush sensor | ⁵ | | | | F | 0 | 0 | | | | | | | |
| | G3/4" DIN 3852 with flush sensor | ⁶ | | | | K | 0 | 0 | | | | | | | |
| | G1/2" DIN 3852 open pressure port | | | | | H | 0 | 0 | | | | | | | |
| | 1/2" NPT | | | | | N | 0 | 0 | | | | | | | |
| | 1/4" NPT | | | | | N | 4 | 0 | | | | | | | |
| | customer | | | | | 9 | 9 | 9 | | | | | | | |
| Seals | | | | | | | | | | | | | | | |
| | FKM | | | | | 1 | | | | | | | | | |
| | EPDM | ⁷ | | | | 3 | | | | | | | | | |
| | NBR | | | | | 5 | | | | | | | | | |
| | customer | | | | | 9 | | | | | | | | | |
| Pressure port | | | | | | | | | | | | | | | |
| | Stainless steel 1.4404 (316L) | | | | | 1 | | | | | | | | | |
| | PVDF | ^{8,9} | | | | B | | | | | | | | | |
| | customer | | | | | 9 | | | | | | | | | |
| Diaphragm | | | | | | | | | | | | | | | |
| | Ceramics Al ₂ O ₃ 96% | | | | | 2 | | | | | | | | | |
| | customer | | | | | 9 | | | | | | | | | |
| Special version | | | | | | | | | | | | | | | |
| | standard | | | | | 0 | 0 | 0 | | | | | | | |
| | oxygen application | ¹⁰ | | | | 0 | 0 | 7 | | | | | | | |
| | customer | | | | | 9 | 9 | 9 | | | | | | | |

¹ with Ex version max. 1 contact possible
² with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
³ 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request
⁴ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), others on request
⁵ possible for nominal pressure ranges P_N ≥ 0.6 bar up to P_N ≤ 25 bar gauge, absolute on request
⁶ possible for nominal pressure ranges P_N ≥ 0.6 bar up to P_N ≤ 60 bar gauge
⁷ possible for nominal pressure ranges P_N ≤ 160 bar
⁸ PVDF only with G3/4" DIN 3852 with flush sensor (0.6 bar ≤ P_N ≤ 25 bar)
⁹ PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar) and G3/4" DIN 3852 with flush sensor (0.6 bar ≤ P_N ≤ 25 bar)
¹⁰ oxygen application possible up to 25 bar and only with FKM-seal, flush version on request

This price list contains product specifications; properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.

