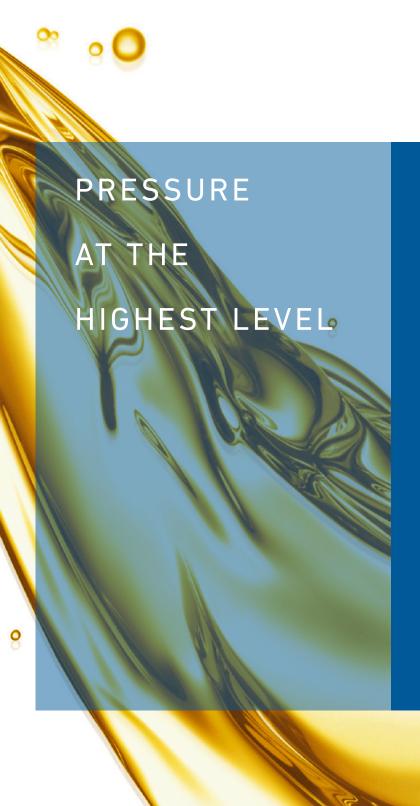
PRESSURE SWITCH

PRODUCT CATALOGUE



PRESSURE at the highest LEVEL.





"Successful medium-sized companies are not successful because they are active in many areas, but rather because they concentrate on one area and do it better than anyone else."

This is our philosophy. That's why BDISENSORS has concentrated on electronic pressure measurement technology from the beginning.

With our unremitting product and and quality strategy we have been successful in becoming a major player on the world market for electronic pressure sensing devices within a few years.

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



With 260 employees at 4 locations in Germany, the Czech Republic, Russia and China BD|SENSORS has solutions from 0.1 mbar to 8000 bar:

| > | pressure sensors, pressure transducers |
|---|--|
| | pressure transmitters |

- > electronic pressure switches
- > pressure measuring devices with display and switching outputs
- > hydrostatic level probes

Two pressure transmitters and a submersible probe, based on a stainless steel silicon sensor were the beginning. To-day the range extends to more than 100 standard products, from economical OEM devices to high-end products with HART® communication or field bus interface.

In addition we have developed hundreds of customer-specific applications, underlining the competence and flexibility of BD|SENSORS. The excellent price/performance ratio of our products is proof of the fact that we are able to meet the toughest demand: Being a problem-solver for our customers.

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| PRESSURE SWITCH WITH DISPLAY | 5-81 |
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| 4 ADVANTAGES | 96 |

For large production batches as well as for small production numbers, no matter for what medium or external factors, with almost any mechanical or electrical connection - we solve your problem

flexibly, quickly and cost-efficiently.

| | PRODU | PRODUCT PREF. APPLIC. | | М | MATERIALS IN CONTACT WITH MEDIA | | | | | | INAL SURE | ACCURACY | CCURACY OUTPUTS | | | DISF | PLAY | CERTIFICATES | | | ES | |
|----------|-------------|--------------------------|---------------------|-------------------|------------------------------------|----------------|-----------------|--------------|-----------|-----------------|--------------|----------|------------------|-----|-------|------------------------|-----------------|--------------|----|----|---------|-------|
| | | | | | | sure ection | meml | Sen brane | | ket | | | | | | ^ | | | | | | |
| | | page | Industrie "general" | Industrie "flush" | metal | plastic | stainless steel | ceramic | elastomer | without, welded | bar min | bar max | % FSO (standard) | 1/2 | 1/2/4 | analogue signal mA / V | steinless steel | plastic | EX | 3A | IO-Link | EHEDG |
| with | display | | | | | | | | | | | | | | | | | | | | | |
| ΨŽ | DS 400 | 5-9 | • | | • | | • | | • | • | 0,1 | 600 | ≤± 0,35 | • | | • | • | | • | | | |
| INDUSTRY | DS 401 | 10-14 | • | | • | • | | • | • | | 0,4 | 600 | ≤± 0,50 | • | | • | • | | • | | | |
| ¥ | DS 350 | 15-19 | • | | • | | • | | • | • | 0,1 | 600 | ≤± 0,50 | | | | | • | | | • | |
| | DS 351 | 20-24 | • | | • | • | | • | • | | 0,4 | 600 | ≤± 0,50 | | | | | • | | | • | |
| | DS 200 | 25-29 | • | | • | | • | | • | • | 0,1 | 600 | ≤± 0,35 | | • | • | | • | • | | | |
| | DS 201 | 30-34 | • | | • | • | | • | • | | 0,4 | 600 | ≤± 0,50 | | • | • | • | • | • | | | |
| | DS 202 | 35-39 | • | | • | | • | | | • | 6 | 600 | ≤± 0,50 | | • | • | | • | • | | | |
| | DS 210 | 40-44 | • | | • | | • | | • | | 0,01 | 1 | ≤± 0,35 | | • | • | | • | • | | | |
| | DS 214 | 45-48 | • | | • | | • | | | • | 600 | 2200 | ≤± 0,35 | | • | • | | • | | | | |
| | DS 233 | 49-53 | • | | • | | • | | • | | 0,006 | 1 | ≤± 0,35 | | | | | • | | | | |
| | DS 400P | 54-59 | | • | • | | • | | • | • | 0,1 | 40 | ≤± 0,35 | • | | • | • | | • | • | | • |
| | DS 350P | 60-64 | | | | | | | | | 0,001 | 40 | ≤± 0,50 | | | | | | | | | |
| | DS 200P | 65-70 | | • | • | | • | | • | • | 0,1 | 40 | ≤± 0,35 | | • | • | | • | • | • | | • |
| | DS 201P | 71-75 | | • | • | | • | | • | | 60 | 400 | ≤± 0,50 | | • | • | | • | • | | | |
| Σ | DS 217 | 76-78 | • | | • | | • | | | • | 6 | 600 | ≤± 0,50 | | | | | • | | | | |
| OEM | DS 230 | 79-81 | • | | • | | | • | • | | 2 | 400 | ≤± 1,50 | | | | | • | | | | |
| with | out display | | | | | | | | | | | | | | | | | | | | | |
| OEM | iS 4 | 82-85 | | | • | | • | | • | | 1 -1 | 10 0 | ≤± 0,50 | • | | | | | | | • | |
| 90 | DS 4 | 86-89 | | | • | | • | | • | | 1 -1 | 10 0 | ≤± 1,00 | • | | | | | | | | |
| | DS 5 | 90-92 | | | • | | • | | | • | 16 | 600 | ≤± 0,50 | | | | | | | | | |
| | DS 6 | 93-95 | | | • | | | • | • | | 2 | 400 | ≤± 1,00 | | | | | | | | | |



Intelligent Electronic Pressure Switch Stainless Steel

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA 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 and dust

- welded pressure sensor
- customer specific versions

The electronic pressure switch DS 400 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 400 offers a PNP contact and a display module, which is mounted rotable in the globe housing. Additional optional versions like e.g. an intrinsically safe version, a second contact and an analogue output complete the profile.

Preferred areas of use are



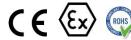
Plant and machine engineering



Heating and air conditioning



Environmental engineering (water – sewage – recycling)









Input pressure range

| iliput pressure range | | | | | | | | | | | | | |
|--|--|---|---|------------------------|--|--------------|---------|-----------------------|-----------|-------|---------|-------------|----------|
| Nominal pressure gauge | [bar] | -1 0 | 0.10 | 0.16 | 0.25 | 0.40 | 0.6 | 0 1 | 1 1 | .6 | 2.5 | 4 | 6 |
| Nominal pressure absolute | e [bar] | - | - | - | - | 0.40 | 0.6 | 0 1 | 1 1 | .6 | 2.5 | 4 | 6 |
| Overpressure | [bar] | 5 | 0.5 | 1 | 1 | 2 | 5 | 5 | 5 1 | 10 10 | | 20 | 40 |
| Burst pressure | [bar] | 7.5 | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 5 7. | .5 1 | 5 | 15 | 25 | 50 |
| Ni | | | | | | | | | | | | | |
| Nominal pressure | [hor] | 10 | 16 | 25 | 40 | 60 | o | 100 | 160 | | 250 | 400 | 600 |
| gauge / absolute | [bar] | 40 | 80 | 90 | 105 | 5 21 | ^ | 210 | 600 | - | 1000 | 1000 | 1000 |
| Overpressure | [bar] | | | 80 | | | _ | | | _ | | | |
| Burst pressure | [bar] | 50 | 120 | 120 | 210 | | :0 | 420 | 1000 | | 1250 | 1250 | 1250 |
| Vacuum resistance | nce p _N ≥ 1 bar: unlimited vacuum resistance p _N < 1 bar: on request | | | | | | | | | | | | |
| Contact ¹ | | | | | | | | | | | | | |
| Number, type | | standard | d: 1 PNF | contact | | | | | | | | | |
| rtamber, type | | option: | | pendent F | PNP cont | acts | | | | | | | |
| Max. switching current | | | | mA, sho | | | Vswitch | $= V_S - 2$ | 2V | | | | |
| Accuracy of contacts ² | | ≤ ± 0.25 | | , | | , | OWILLO | | | | | | |
| Repeatability | | ≤ ± 0.1 ° | | | | | | | | | | | |
| Switching frequency | | 2-wire: | max. | 10 Hz | | | | | | | | | |
| | | 3-wire: | 50 Hz | | | | | | | | | | |
| Switching cycles | | > 100 x | | | | | | | | | | | |
| Delay time | | 0 100 | sec | | | | | | | | | | |
| ¹ with IS-protection max. 1 co. | ntact possi | | | | | | | | | | | | |
| Analogue output (option | | | | | | | | | | | | | |
| 2-wire current signal | uny,, ou | • • • | nΔ / \/a = | = 13 36 | Vac | | | | | | | | |
| 2-wire current signal | | | | $R_{\text{max}} = [(\$ | | .) / 0 02 A | 10 | | | re | esponse | time: < 10 |) msec |
| 2-wire current signal with | | | | = 15 28 | | 1) / 0.02 / | 1] 32 | | | - 10 | зропас | tillio. \ I | 7 111300 |
| IS-protection | | | | R _{max} = [(\ | | .) / 0 02 A | 10 | | | re | esponse | time: < 10 |) msec |
| 3-wire current signal | | 4 20 r | nA / Vs = | = 24 V _{DC} ± | 10 % ad | liustable | turn-c | down of s | span 1:5) | | | | |
| | | | | | | , | (| | | | esponse | time: < 30 |) msec |
| Without analogue output | | | permissible load: R_{max} = 500 Ω response time: < 30 msec V_S = 15 36 V_{DC} | | | | | | | | | | |
| Accuracy ² | | | standard: nominal pressure < 0.4 bar: ≤ ± 0.50 % FSO | | | | | | | | | | |
| nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO | | | | | | | | | | | | | |
| | | option: | nomin | al pressu | re ≥ 0.4 b | oar: ≤±(| 0.25 % | FSO | | | | | |
| ² accuracy according to IEC 6 | | | | | | | | | | | | | |
| ³ with turn-down of span the a | | | sted auton | natically to | the new m | easuring r | ange | | | | | | |
| Thermal effects (offset a | nd span) |) | | | | | | | | | | | |
| Nominal pressure p _N | [bar] | | -1 | | | | < 0.4 | | | | | ≥ 0.40 | |
| Tolerance band | [% FSO] | | ≤ ± 0. | | | | ≤ ± | 1 | | | | ± 0.75 | |
| in compensated range | [°C] | | -20 | 85 | | | 0 | 70 | | | -2 | 0 85 | |
| Permissible temperature | s | | | | | | | | | | | | |
| Medium | | -40 12 | 25 °C | | | | | | | | | | |
| Electronics / environment | | -40 8 | 85 °C | | | | | | | | | | |
| Storage | | -40 100 °C | | | | | | | | | | | |
| Electrical protection | | | | | | | | | | | | | |
| Short-circuit protection | | permane | ent | | | | | | | | | | |
| Reverse polarity protection | n | + • | | lso no fur | nction | | | | | | | | |
| Electromagnetic compatib | | | | nunity acc | | FN 6132 | 26 | | | | | | |
| Mechanical stability | •, | 566101 | | | | | - | | | | | | |
| Vibration | | 10 c DM | S (25 2 | 2000 H-7 | 200050 | ling to DII | NEN | 60068 3 | 6 | | | | |
| | | | | 2000 HZ) | | | | | | | | | |
| Shock | | 500 g / 1 | HISEC | | accord | ling to DII | IN CIN | 00000-2- | -21 | | | | |
| Materials | | | | 1404 (045 | 1. | | | | | | | | |
| Pressure port | | | | 1404 (316 | | | | | | | | | |
| Housing | | | | 1301 (304 | <u>, </u> | | | | | | | | |
| Housing cap | | standard: plastic HDPE for option IS-protection: stainless steel 1.4301 (304) | | | | | | | | | | | |
| Viewing glass | | laminate | d safety (| glass | | | | | | | | | |
| Seals (media wetted) | | standard: FKM on request: welded version ⁴ and others | | | | | | | | | | | |
| Diaphragm | | · · · · · · · · · · · · · · · · · · · | | 1435 (316 | | | | | | | | | |
| Media wetted parts | | | | als, diaphi | | | | | | | | | |
| 4 welded version only for pres | sure ports | | | | | pressure r | anges | _{DN} ≤ 40 ba | ar | | | | |
| | care ports | a Joo an ig t | | ~ 300,DIC 10 | | 2. 000u10 10 | gco | 5,4 = TO DE | | | | | |

| Explosion protection (only for 4 | 1 20 mA / 2-wire) | | | | | |
|---|---|--|--|--|--|--|
| Approval AX14-DS 400 | IBEXU 06 ATEX 1050 X | | | | | |
| | zone 0: II 1G Ex ia IIC T4 Ga | | | | | |
| | zone 20: II 1D Ex ia IIIC T135 °C Da | | | | | |
| Safety techn. maximum values | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i \approx 0 \text{ pF}, L_i \approx 0 \mu\text{H}$ | | | | | |
| Max. switching current ⁵ | 70 mA | | | | | |
| Permissible temperatures for | in zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar | | | | | |
| environment | in zone 1 or higher: -25 70 °C | | | | | |
| ⁵ the real switching current in the application depends on the power supply unit | | | | | | |
| Miscollanoous | | | | | | |

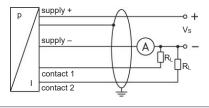
| Miscel | Ianeoi | IIS |
|--------|--------|-----|

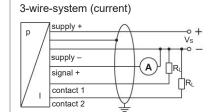
| Miscellaneous | |
|-------------------------------|---|
| Display | 4-digit, 7-segment-LED display; visible range 37.2 x 11 mm; digit height 10 mm; range of indication -1999 +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) |
| Current consumption | 2-wire signal output current: max. 25 mA |
| (without contacts) | 3-wire signal output current: approx. 30 mA + signal current |
| Ingress protection | IP 67 |
| Installation position | any ⁶ |
| Weight | approx. 400 g |
| Operational life | 100 million load cycles |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) 7 |
| ATEX Directive | 2014/34/EU |
| 6 Proceure quitabas are calib | victed in a vertical position with the proceure connection down. If this position is changed an installation |

⁶ Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $p_N \le 1$ bar. ⁷ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams





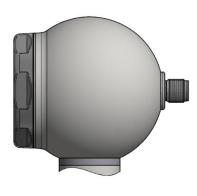


Pin configuration

| Electrical connection | M12x1 / metal (5-pin) |
|------------------------|------------------------------|
| Supply + | 1 |
| Supply – | 3 |
| Signal + (only 3-wire) | 2 |
| Contact 1 | 4 |
| Contact 2 | 5 |
| Shield | plug housing / pressure port |



Designs 8

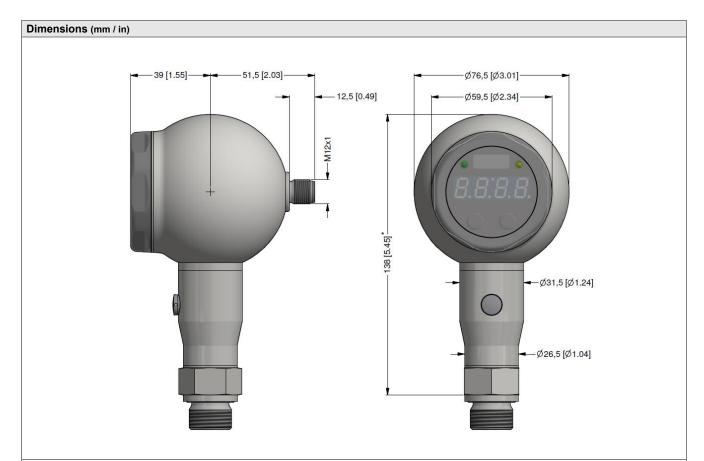




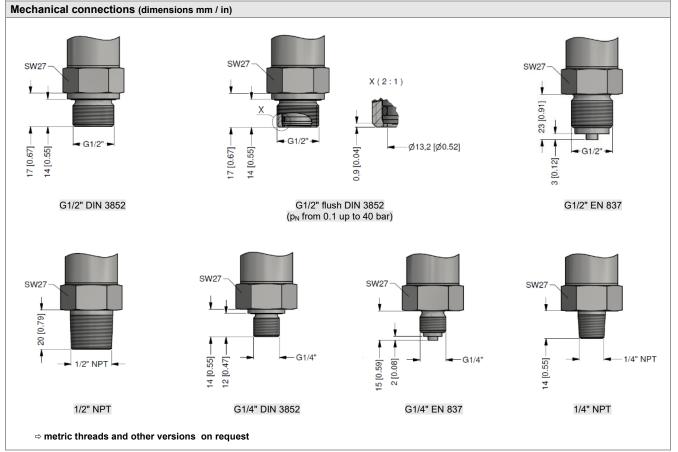


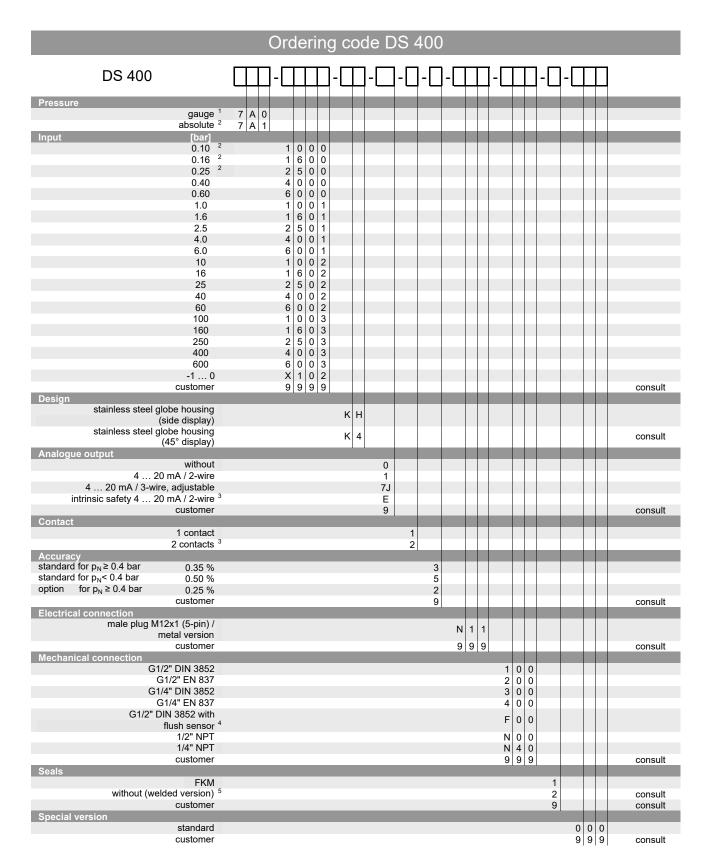
45° display (on request)

⁸ all designs in horizontal rotatable housing as standard



 * for nominal pressure p_{N} > 400 bar increases the length of devices without IS-protection by 19 mm





¹ from 60 bar: measurement starts with ambient pressure

 $^{^{2}}$ absolute pressure possible from 0.4 bar $\,$

³ with IS version max. 1 contact is possible

 $^{^4}$ only possible for nominal pressure ranges $p_N \le 40$ bar

⁵ welded version only with pressure ports according to EN 837; possible for nominal pressure ranges p_N ≤ 40 bar



Intelligent Electronic Pressure Switch Stainless Steel

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 400 mbar up to 600 bar

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA 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 and dust

- pressure port PVDF
- customer specific versions

The electronic pressure switch DS 401 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for universal usage in industry applications; with flush diaphragm the DS 401 is suitable for the usage in viscous, pasty or highly contaminated media. The rotatable stainless steel globe housing is predestined for rough conditions and difficult installing conditions, caused by the high functionality and robustness. As standard the DS 401 offers a PNP contact and is optionally available with a second, independent contact. Additionally the DS 401 could be equipped with an analogue output.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water – sewage – recycling)



Water



Hydraulic oil







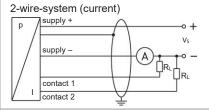


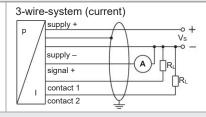
| Input pressure rang | jes | | | | | | | | | | | | | | | | | | |
|---------------------|--|-----|-----|-----|----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Nominal pressure ga | uge [bar] | -10 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Nominal pressure ab | s. [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 | Vacuum resistance $p_N \ge 1$ bar: unlimited vacuum resistance $p_N < 1$ bar: on request | | | | | | | | | | | | | | | | | | |
| 0 1 11 | | | | | | | | | | | | | | | | | | | |
| Contact 1 | | | | | | | | | | | | | | | | | | | |

| | p _N < 1 bar: on request |
|---|--|
| Contact ¹ | |
| Number, type | standard: 1 PNP contact |
| , 31 | option: 2 independent PNP contacts |
| Max. switching current | contact rating 125 mA, short-circuit resistant; V _{Switch} = V _S - 2V |
| Accuracy of contacts ² | ≤ ± 0.5 % FSO |
| Repeatability | ≤ ± 0.2 % FSO |
| Switching frequency | 2-wire: max. 10 Hz / 3-wire: 50 Hz |
| Switching cycles | > 100 x 10 ⁶ |
| Delay time | 0 100 sec |
| ¹ with Ex-protection max. 1 contact p | possible |
| Analogue output (optionally) | / Supply |
| 2-wire current signal | $4 20 \text{ mA} / V_S = 13 36 V_{DC}$ |
| | permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec |
| 2-wire current signal, | $4 20 \text{ mA} / V_S = 15 28 V_{DC}$ |
| IS-protection | permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec |
| 3-wire current signal | 4 20 mA / V_S = 24 V_{DC} ± 10 % adjustable (turn-down of span 1:5) ³ |
| NACO A A | permissible load: $R_{max} = 500 \Omega$ response time: < 30 msec |
| Without analogue output | V _S = 15 36 V _{DC} |
| Accuracy 2 | ≤ ± 0.5 % FSO - limit point adjustment (non-linearity, hysteresis, repeatability) |
| | - limit point adjustment (non-linearity, nysteresis, repeatability) ue signal is adjusted automatically to the new measuring range |
| Thermal effects (offset and sp | pan) |
| Thermal error | ≤ ± 0.2 % FSO / 10 K |
| in compensated range | 0 85 °C |
| Permissible temperatures | |
| Medium ⁴ | -40 125 °C |
| Electronics / environment | -40 85 °C |
| Storage | -40 100 °C |
| ⁴ for pressure port in PVDF the med | ium temperature is -30 60 °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 | , <u>.</u> |
| Pressure port | standard: 1.4404 (316L) |
| Treesare port | option for G1/2" open port (up to 60 bar): PVDF |
| Housing | stainless steel 1.4301 (304) |
| Housing cap | standard: plastic HDPE |
| <u> </u> | for option IS-protection: stainless steel 1.4301 (304) |
| Viewing glass | laminated safety glass |
| Seals | standard: FKM |
| <u> </u> | option: EPDM (p _N ≤ 160 bar) others on request |
| Diaphragm | ceramics Al ₂ O ₃ 96 % |
| Media wetted parts | pressure port, seals, diaphragm |
| Explosion protection (only fo | · |
| Approval AX14-DS 401 | IBEXU06ATEX1050 X |
| Safaty tachnical maximum | zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da |
| Safety technical maximum values | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ |
| Max. switching current ⁵ | 70 mA |
| Permissible temperatures for | in zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar |
| environment | in zone 1 or higher: -25 70 °C |
| ⁵ the real switching current in the ap | plication depends on the power supply unit |

| 4-digit, 7-segment-LED display; visible range 37.2 x 11 mm; digit height 10 mm, | | | | | | | |
|---|--|--|--|--|--|--|--|
| 4-digit, 7-segment-LED display; visible range 37.2 x 11 mm; digit height 10 mm, range of indication -1999 +9999; accuracy 0.1 % ± 1 digit digital damping 0.3 30 sec (programmable) measured value update 0.0 10 sec (programmable) | | | | | | | |
| for p _N ≤ 25 bar:O-ring in FKM Vi 567 (with BAM-approval); permissible maximum values are 25 bar / 150° C | | | | | | | |
| 2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 30 mA + signal current | | | | | | | |
| IP 67 | | | | | | | |
| any | | | | | | | |
| approx. 400 g | | | | | | | |
| 100 million load cycles | | | | | | | |
| EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁷ | | | | | | | |
| 2014/34/EU | | | | | | | |
| | | | | | | | |

Wiring diagrams



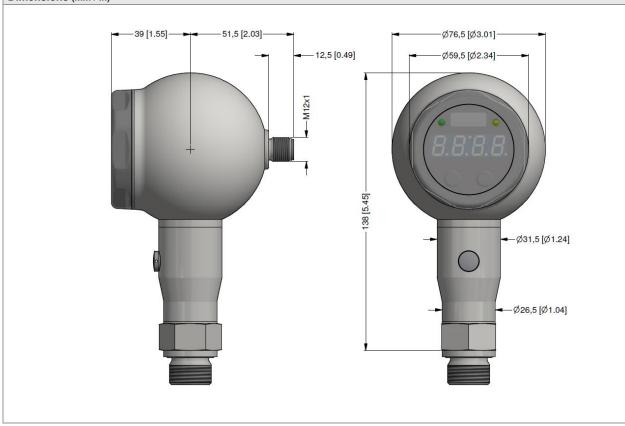


Pin configuration

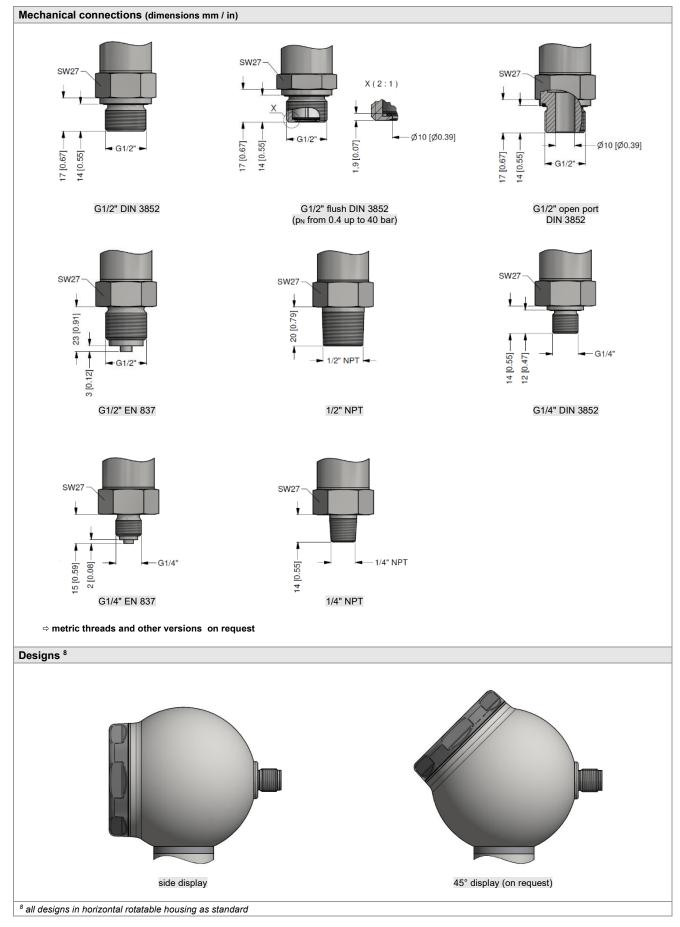
| Electrical connection | M12x1 / metal (5-pin) |
|------------------------|------------------------------|
| Supply + | 1 |
| Supply – | 3 |
| Signal + (only 3-wire) | 2 |
| Contact 1 | 4 |
| Contact 2 | 5 |
| Shield | plug housing / pressure port |



Dimensions (mm / in)



 ⁶ not possible with flush pressure ports
 7 This directive is only valid for devices with maximum permissible overpressure > 200 bar



Ordering Code

| | | | | | (|) Dr | d | eri | ทยู | j (| COC | de | DS | 4 | 10° | 1 | | | | | | | | | | | | |
|--|-------------|-------------|-------------|---------------------------------|----------------------------|-----------------------|---------------------------------|-----|-----|------------|------------------------|------------|-------------|----|-----|---|---|-------------|---------------------|-------------------|-------------|-----|-------------|---|----|-----|-----|---------|
| DS 401 | | | | - | | | | -[| |]- | | - <u> </u> |] -[|]- | -[| | | -[| | |]- <u>[</u> |]-[| | - | -[| | | |
| Input [mH20] 4 0.4 6 0.6 | 7 7 7 | A A A | 2 E 3 | 4 6 | | 0 0 | 0 0 | | | | | | | | | | | | | | | | | | | | | = |
| 10 1.0 16 1.6 25 2.5 40 4.0 60 6.0 100 10 160 16 | | | | 1 1 2 4 6 1 | 0 6 5 0 0 | 0 0 0 0 | 1 1 1 1 1 2 2 | | | | | | | | | | | | | | | | | | | | | |
| 250 25 400 40 600 60 100 160 250 400 | | | | 2 4 6 1 1 2 4 | 5 0 0 0 6 5 | 0 0 0 0 0 | 2 2 2 3 3 3 3 3 | | | | | | | | | | | | | | | | | | | | | |
| 600 -10 customer | | | | 6 | | 0 | 3 | | | | | | | | | | | | | | | | | | | | | consult |
| stainless steel globe housing (side display) stainless steel globe housing (45° display) Analogue output | | | | | | | | | K H | | | | | | | | | | | | | | | | | | | consult |
| without 4 20 mA / 2-wire 4 20 mA / 3-wire, adjustable intrinsic safety 4 20 mA / 2-wire customer | 1 | | | | | | | | | | 0 1 7J E 9 | | | | | | | | | | | | | | | | | consult |
| Contact 1 contact 2 contacts 3 | 1 | | | | | | | | | | | 1 2 | | | | | | | | | | | | | | | | _ |
| 0.5 % FSO customer Electrical connection male plug M12x1 (5-pin) / | | | | | | | | | | | | | (| 5 | N | 1 | 1 | | | | | | | | | | | consult |
| metal version customer Mechanical connection G1/2" DIN 3852 | | | | | | | | | | | | | | | | 9 | | | 1 (| | | L | | | | | | consult |
| G1/2" EN 837 G1/4" DIN 3852 G1/4" EN 837 G1/2" DIN 3852 with flush sensor 2 | 2 | | | | | | | | | | | | | | | | | 3 | 2 (3 (4 (| 0 0 0 0 0 0 0 0 0 | | | | | | | | |
| G1/2" DIN 3852 open pressure port 1/2" NPT 1/4" NPT customer | | | | | | | | | | | | | | | | | | 1 1 1 | H (0 N (2 9 9 | 0 0 0 0 4 0 9 | | | | | | | | consult |
| FKM EPDM 3 customer Pressure port | 3 | | | | | | | | | | | | | | | | | | | | 1 3 9 | 3 | | | | | | consult |
| stainless steel 1.4404 (316L) PVDF 2 customer Diaphragm ceramics Al ₂ O ₃ 96% | 1 | | | | | | | | | | | | | | | | | | | | | | 1 B 9 | 2 | | | | consult |
| customer Special version standard oxygen application ⁵ | 5 | | | | | | | | | | | | | | | | | | | | | | | 9 | 0 | 0 0 | 0 7 | consult |
| customer | | | | | | | | | | | | | | | | | | | | | | | | | 9 | 9 | 9 | consult |

 $^{^1}$ with IS version max. 1 contact is possible 2 G1/2" flush up to 25 bar and nominal pressure abs. on request 3 possible for nominal pressure ranges $p_{\rm N} \le 160$ bar 4 PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar); Ex-protection not possible; permissible medium temperature: -30 ... 60 °C 5 oxygen application with FKM-seal up to 25 bar possible



Electronic Pressure Switch with IO-Link Interface

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.5 % FSO / 0.35 % FSO

0.25 % FSO option:

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Digital output signal

IO-Link according to specification V 1.1 smart sensor profile data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 0 ... 10 V

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module
- parameter settings via IO-Link or menu (VDMA-conform)
- additional information via IO-Link accessible

Optional versions

- different mechanical connections
- customer specific versions

The electronic switch DS 350 pressure interesting for all users in plant and machine engineering, due to the integrated IO-Link interface to exchange process data, diagnostic reports and status messages with a superordinate control level, as standard. In addition, further information can be retrieved that allow conclusions to the application process.

Especially in mechanical engineering, great demand for flexible operating conditions have to satisfied. Therefor the multi-rotable display module offers best readability for the user by a quick and easy adjustment. Also, the switchability of the output signal as switching signal or analogue signal (mA/V) increases flexibility and integration in different applications.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water - sewage - recycling)









| Input pressure range | | | | | | | | | | | |
|--|-----------|-----------------------|------------------------|---------------|---------------------|---------------|----------|-------|------|------|------|
| Nominal pressure gauge | [bar] | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 |
| Nominal pressure absolute | [bar] | - | - 0.10 | - 0.23 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 |
| Overpressure (static) | [bar] | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 |
| Burst pressure ≥ | [bar] | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 |
| | [] | | | 1 | | | 1 | | | | |
| Input pressure range | | | | | | | | | | | |
| Nominal pressure | [bar] | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| gauge / absolute Overpressure (static) | [bar] | 40 | 80 | 80 | 105 | 210 | 600 | 600 | 1000 | 1000 | 1000 |
| Burst pressure ≥ | [bar] | 50 | 120 | 120 | 210 | 420 | 1000 | 1000 | 1250 | 1250 | 1800 |
| Vacuum resistance | [bar] | | _ | d vacuum r | _ | 420 | 1000 | 1000 | 1230 | 1230 | 1000 |
| | [] | | r: on reque | | | | | | | | |
| | | | | | | | | | | | |
| Supply | | I | | | | | | | | | |
| Voltage supply | | V _S = 18 | 30 V _{DC} | | | | | | | | |
| Output signals | | I | | | | | | | | | |
| Output signal 1 | | | | / NPN) sw | ritchable | | | | | | |
| Output signal 2 | | | nA / 3-wire | ; | or | | | | | | |
| | | 0 10 V | | | or | | | | | | |
| 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | 1 | PN switcha | ıble | | | | | | | |
| Signal characteristics swit | | | | | | | | | | | |
| Accuracy of switching points | S ' | ≤ ± 0.35 ° | | | | | | | | | |
| Repeatability | | ≤ ± 0.1 % | S FSO | | | | | | | | |
| Max switching current | | 150 mA | | | | | | | | | |
| Switching frequency | | max. 170 |) Hz | | | | | | | | |
| Delay time | | 0.0 50 | .0 sec | | | | | | | | |
| Response time | | < 12 mse | ec | | | | | | | | |
| Signal characteristics ana | logue | signal | | | | | | | | | |
| Accuracy 1 | | standard | | minal press | | 4 bar: | ≤ ± 0.50 | | | | |
| | | | | minal press | | 4 bar: | ≤ ± 0.35 | | | | |
| 1 | | option: | | minal press | | 4 bar | ≤ ± 0.25 | % FSO | | | |
| Long term stability | | | | ar at refere | ence condi | ions | | | | | |
| Load (4 20 mA / 3-wire) | | $R_{\text{max}} = 33$ | | | | | | | | | |
| Load (0 10 V / 3-wire) | | R _{min} = 10 | | | | | | | | | |
| Influence effects | | | 0.05% FSC 30.1 % FS | | | | | | | | |
| A divide a bility | | offset: ± | | U | | | | | | | |
| Adjustability | | span: - | | | | | | | | | |
| ¹ accuracy according to IEC 607 | 770 – lin | | | n-linearity h | vsteresis re | neatahility) | | | | | |
| Thermal effects (offset and | | | Carrotte (1101 | ourry, m | , 5, 6, 6, 6, 7, 6, | o outubility) | | | | | |
| Thermal error | - оран | | S FSO / 10 | K | | | | | | | |
| in compensated range | | -25 85 | | | | | | | | | |
| Permissible temperatures | | | | | | | | | | | |
| Permissible temperatures | | medium: | | | -40 | 125 °C | | | | | |
| T cimiosible temperatures | | | | nment / sto | | | | | | | |
| Electrical protection | | | | 510 | | | | | | | |
| Short-circuit protection | | permane | nt | | | | | | | | |
| Reverse polarity protection | | | | o no functi | on | | | | | | |
| Electromagnetic compatibilit | ·V | | | inity accord | | 61326 | | | | | |
| IO-Link | . , | J.111031011 | and minit | | g to LIV | 0.020 | | | | | |
| Interface | | IO-Link 1 | 1. clave | | | | | | | | |
| | | | | 1.2) | | | | | | | |
| Data transfer | | | sec (COM | (2) | | | | | | | |
| Mode | | SIO / IO- | | | | | | | | | |
| Standard | | IEC 6113 | | | | | | | | | |
| | | 150 0113 | טויט | | | | | | | | |

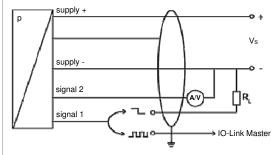
| Mechanical stability | | |
|-------------------------|---|--|
| Vibration | 10 g / 25 Hz 2 kHz | according to DIN EN 60068-2-6 |
| Shock | 500 g / 1 msec | according to DIN EN 60068-2-27 |
| Materials | | |
| Display housing | PA 6.6 | |
| Pressure port / housing | stainless steel 1.4404 (316L) | |
| Seal | standard: FKM options: EPDM welded version (only for others on request | pressure port according to EN 837 with $p_N \le 40$ bar) |
| Diaphragm | stainless steel 1.4435 (316L) | |
| Media wetted parts | pressure port, seal, diaphragm | |
| Miscellaneous | | |
| Display | 4-digit, 7-segment-LED display on digit height 7 mm range of indication -1999 +9999 visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mba LED status display for IO-Link and | ar, PSI, MPa) |
| Operation | 2 buttons | |
| Featured | functions according to VDMA 2457 | 4-1 |
| Turn-on time | 110 msec | |
| Weight | approx. 230 g | |
| Operational life | 100 million load cycles | |
| Current consumption | < 50 mA (without contacts) | |
| Ingress protection | IP 67 | |
| Installation position | any ² | |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 201 | 4/68/EU (module A) ³ |

 ² Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges p_N ≤ 1 bar.
 ³ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams

3-wire-system / configuration of analogue output:

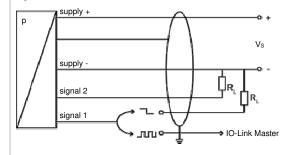
signal 1: IO-Link or contact signal 2: analogue output



3-wire-system / configuration of contact:

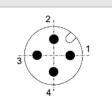
signal 1: IO-Link or contact

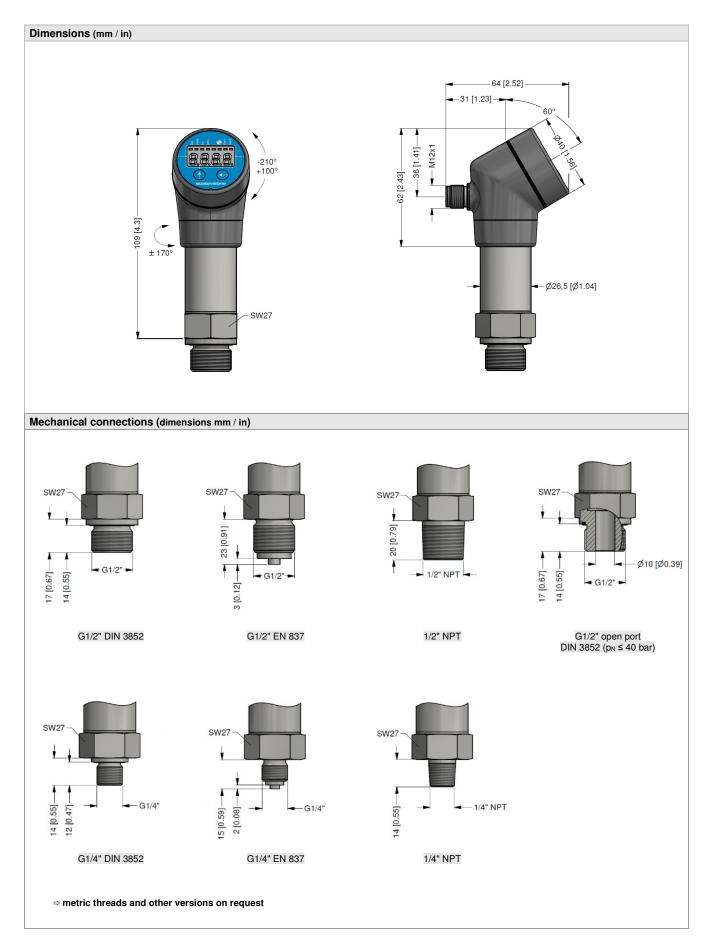
signal 2: contact

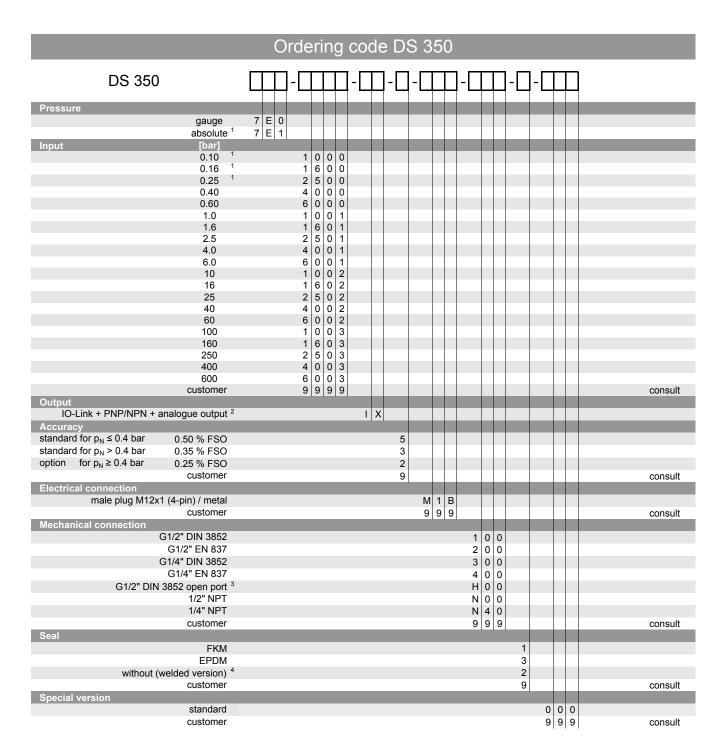


Electrical connection

| Pin configuration | Description | M12x1 (4-pin), metal |
|-------------------|--|----------------------|
| Supply + | supply | 1 |
| Supply – | supply | 3 |
| Output signal 1 | IO-Link / SIO (PNP / NPN) | 4 |
| Output signal 2 | 4 20 mA – 3-wire / 010 V – 3-wire (PNP / NPN) | 2 |
| Shield | shielding | plug housing |







¹ absolute pressure possible from 0.4 bar

 $^{^2}$ contact PNP/NPN switchable; analogue output 0 \dots 10 V / 4 \dots 20 mA switchable

on the possible for nominal pressure p_N > 40 bar

 $^{^4}$ welded version only with pressure ports according to EN 837, possible for $p_{N} \! \leq \! 40$ bar



Electronic Pressure Switch with IO-Link Interface

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 0.4 bar up to 0 ... 600 bar gauge from 0 ... 0.6 bar up to 0 ... 600 bar absolute

Digital output signal

IO-Link according to specification V 1.1 smart sensor profile data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 0 ... 10 V

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module
- parameter settings via IO-Link or menu (VDMA-conform)
- additional information via IO-Link accessible

Optional versions

- different mechanical connections
- pressure port in PVDF
- customer specific versions

The DS 351 has been designed for applications in machine tools or pneumatic and hydraulic systems. In combination with the optionally available PVDF pressure port also the usage in aggressive media is possible, whereby material resistance has to be checked in advance.

It offers an IO-Link interface as standard, which provides process data, diagnostics reports and status messages as well as other features, which are helpful for service / maintenance and condition analysis of a machine or plant.

The parameters are set either also via control level or via VDMA-compliant menu system, which can be carried out in situ by using two buttons.

The multiple, infinitely variable adjustability of the display as well as the individually parameterizable output signal (switching or analogue signal (mA / V)) support the user in realizing the measurement task.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water – sewage – recycling)









| Input pressure range | | | | | | | | | | | | | | | | | | | |
|---------------------------|-------|----------------------|--------|---------|--------|------|---------|------|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| Nominal pressure gauge | [bar] | -10 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Nominal pressure absolute | [bar] | - | - | 0.6 | 1 | 1.6 | 2.5 | 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 | [bar] | p _N ≥ 1 l | oar: u | nlimite | ed vac | cuum | resista | ance | | | | | | | | | | | |
| | | p _N < 1 l | bar: o | n requ | ıest | | | | | | | | | | | | | | |

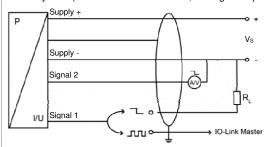
| Supply | | | | |
|--|--|---------------------------------------|---------|----------------------|
| Voltage supply | V _S = 18 30 V _{DC} | | | |
| Output signals | <u>'</u> | | | |
| Output signal 1 | IO-Link / SIO (PNP / NPN) swit | chable | | |
| Output signal 2 | 4 20 mA / 3-wire or | 0 10 V / 3-wire | or | PNP / NPN switchable |
| Signal characteristics switching | ng signal | | | |
| Accuracy of switching points ¹ | ≤ ± 0.5 % FSO | | | |
| Repeatability | ≤ ± 0.1 % FSO | | | |
| Max switching current | 150 mA | | | |
| Switching frequency | max. 170 Hz | | | |
| Delay time | 0.0 50.0 sec | | | |
| Response time | < 12 msec | | | |
| Signal characteristics analogu | e signal | | | |
| Accuracy ¹ | ≤ ± 1 % FSO | | | |
| Long term stability | ≤ ± 0.3 % FSO / year at referer | nce conditions | | |
| Load (4 20 mA / 3- wire) | $R_{\text{max}} = 330 \ \Omega$ | | | |
| Load (0 10 V / 3- wire) | $R_{min} = 10 \text{ k}\Omega$ | | | |
| Influence effects | supply: 0.05% FSO load: ≤ 0.1 % FSO | | | |
| Adjustability | offset: ± 5 % span: -10 % | | | |
| ¹ accuracy according to IEC 60770 - | limit point adjustment (non-linearity, hys | teresis, repeatability) | | |
| Thermal effects (offset and sp | an) | | | |
| Thermal error | ≤ ± 0.3 % FSO / 10 K | | | |
| in compensated range | -25 85 °C | | | |
| Permissible temperatures | | | | |
| Permissible temperatures ² | medium: electronics / environment: storage: | -40 125 °C -40 85 °C -40 100 °C | | |
| · · | um permissible temperature is -30 °C | | | |
| Electrical protection | | | | |
| Short-circuit protection | permanent | | | |
| Reverse polarity protection | no damage, but also no functio | | | |
| Electromagnetic compatibility | emission and immunity accordi | ng to EN 61326 | | |
| IO-Link | | | | |
| Interface | IO-Link 1.1; slave | | | |
| Data transfer | 38.4 kbit/sec (COM 2) | | | |
| Mode | SIO / IO-Link | | | |
| Standard | IEC 61131-2 IEC 61131-9 | | | |
| Mechanical stability | | | | |
| Vibration | 10 g / 25 Hz 2 kHz | according to DIN EN 6000 | | |
| Shock | 500 g / 1 msec | according to DIN EN 6000 | 68-2-27 | |
| Materials | | | | |
| Display housing | PA 6.6 | | | |
| Housing | stainless steel 1.4404 (316L) | | | |
| Pressure port | standard: stainless steel 1.440 option for G1/2" open port (with | (/ | | |
| Seal | standard: FKM option: EPDM (for $p_N \le 160$ others on request | | | |
| Diaphragm | ceramics Al ₂ O ₃ 96 % | | | |
| Media wetted parts | pressure port, seal, diaphragm | | | |

| Miscellaneous | |
|-----------------------|---|
| Display | 4-digit, 7-segment-LED display on black base body, white, blue foil, digit height 7 mm, range of indication -1999 +9999, visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mbar, PSI, MPa) LED status display for IO-Link and contacts |
| Operation | 2 buttons |
| Featured | functions according to VDMA 24574-1 |
| Turn-on time | 110 msec |
| Weight | approx. 230 g |
| Operational life | 100 million load cycles |
| Current consumption | < 50 mA (without contacts) |
| Ingress protection | IP 67 |
| Installation position | any |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ³ |

 $^{^3}$ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

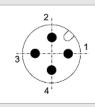
Wiring diagram

3-wire-system (IO-Link / SIO with contact, analogue output)

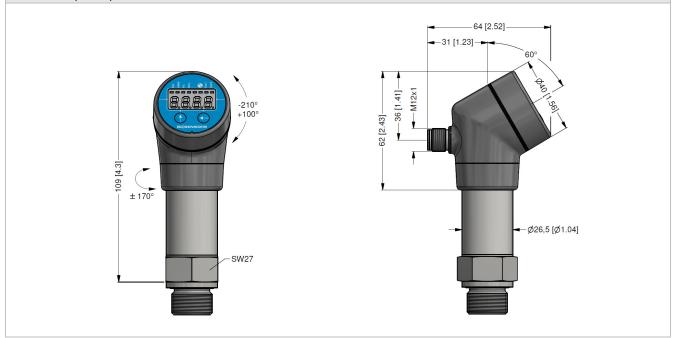


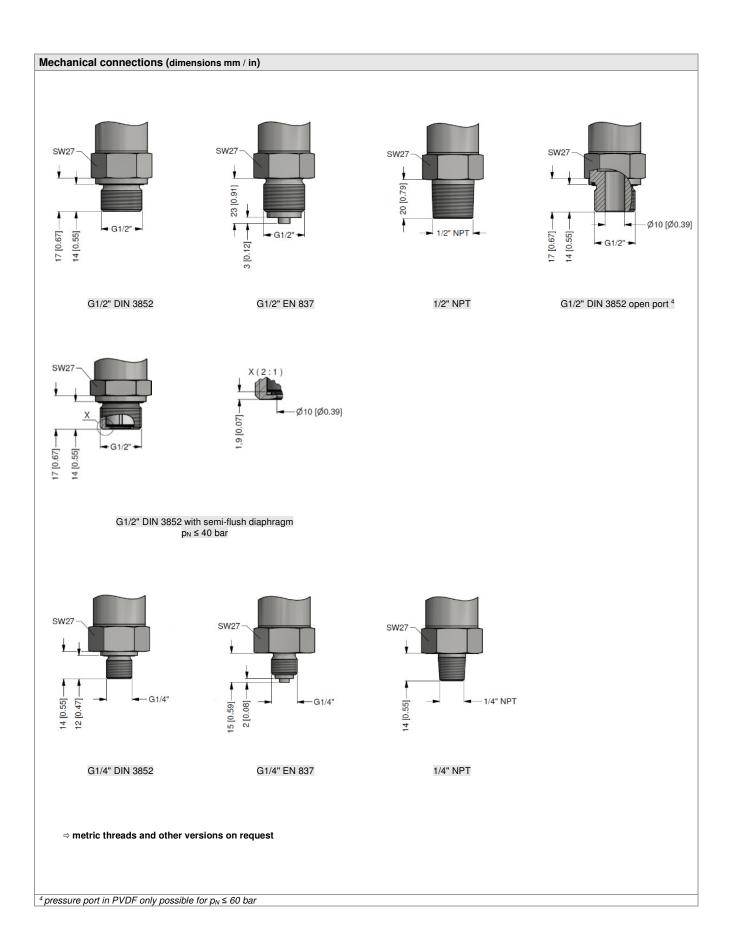
| Electrical | connection |
|------------|------------|
| Electrical | Connection |

| Liectifical confidention | | |
|--------------------------|--|----------------------|
| Pin configuration | Description | M12x1 (4-pin), metal |
| Supply + | supply | 1 |
| Supply – | supply | 3 |
| Output signal 1 | IO-Link / SIO (PNP / NPN) | 4 |
| Output signal 2 | 4 20 mA - 3-wire / 010 V - 3-wire (PNP / NPN) | 2 |
| Shield | shielding | plug housing |
| | | |



Dimensions (mm / in)





Ordering Code

| | | | | O | rd | er | in | g | CO | de | e D | S | 3 | 5 | 1 | | | | | | | | | | |
|-----------------------------|--|---|------|-----|--------------------------|-----|--|-------------|----|-----|-----|--------|---|--------|-----|---|---|--------|-----|-----|----|----|--------|--------|---------|
| DS | S 351 | П | |]-[| | l | | ا- <u>ا</u> | |]-[| □- | П | | 1 | - [| | | -Г | 1-Г | ٦-٢ | 7. | -∏ | Ī | | |
| | | | | | | | | _ | | | _ | Т | | ┫ | | | | | | | | _ | | | |
| Pressure | | | | | | | | | | | | | | | | | | | | | | | | | |
| | gauge absolute | 7 | E 2 | 2 | | | | | | | | | | | | | | | | | | | | | |
| Input | [bar] | , | = < |) | | | | | | | | | | | | | | | | | | | | | |
| mput | only gauge 0.40 | _ | | | 4 0 | 0 | 0 | | | | | | _ | Т | | | | | | | | | | | |
| | 0.60 | | | | 6 0 | 0 | 0 | | | | | | | | | | | | | | | | | | |
| | 1.0 | | | | 1 0 | 0 | | | | | | | | | | | | | | | | | | | |
| | 1.6 | | | | 1 6 | 0 | 1 | | | | | | | | | | | | | | | | | | |
| | 2.5 4.0 | | | | 1 6 2 5 4 0 | 0 | | | | | | | | | | | | | | | | | | | |
| | 6.0 | | | | 6 0 | 0 | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | 1 0 | 0 | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | 1 6 | 0 | 2 | | | | | | | | | | | | | | | | | | |
| | 25 | | | | 2 5 | 0 | 2 | | | | | | | | | | | | | | | | | | |
| | 40 60 | | | | 1 6 2 5 4 0 6 0 | 0 | 2 | | | | | | | | | | | | | | | | | | |
| | 100 | | | | 1 0 | 0 | 2 | | | | | | | | | | | | | | | | | | |
| | 160 | | | | 1 6 | 0 | 3 | | | | | | | | | | | | | | | | | | |
| | 250 | | | | 1 6 2 5 4 0 | 0 | 2 2 2 2 2 3 3 3 3 3 2 9 | | | | | | | | | | | | | | | | | | |
| | 400 | | | | 4 0 | 0 | 3 | | | | | | | | | | | | | | | | | | |
| | 600 | | | | 6 0 | 0 | 3 | | | | | | | | | | | | | | | | | | |
| | -1 0 customer | | | | 6 0 X 1 9 9 | 0 | 2 | | | | | | | | | | | | | | | | | | consult |
| Output | customer | | | | 9 3 | פוי | 19 | | | | | | | | | | | | | | | | | | Consuit |
| | NPN + analogue output 1 | | _ | _ | _ | | | _ | ΙX | | _ | | | Т | | П | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0.5 % FSO | | | | | | | | | | 5 | | | | | | | | | | | | | | |
| | customer | | | | | _ | _ | | | | 9 | | | | | | | | | | | | | | consult |
| Electrical connec | | - | - | - | - | ۰ | - | - | - | - | - | N 4 | 1 | D | - | | | - | | | | | | | |
| male pluç | g M12x1 (4-pin) / metal customer | | | | | | | | | | | М 9 | 9 | a a | | | | | | | | | | | consult |
| Mechanical conn | | | | | | | | | | | | J | J | | | | | | | | | | | | CONSUIT |
| | G1/2" DIN 3852 | | _ | _ | _ | | | _ | _ | _ | | _ | | | 1 | 0 | 0 | | | | | | | | |
| | G1/2" EN 837 | | | | | | | | | | | | | | 2 | 0 | 0 | | | | | | | | |
| | G1/4" DIN 3852 | | | | | | | | | | | | | | 3 | | | | | | | | | | |
| | G1/4" EN 837 | | | | | | | | | | | | | | 4 | 0 | 0 | | | | | | | | |
| $p_N \le 40 \text{ bar}$: | G1/2" DIN 3852 | | | | | | | | | | | | | | F | 0 | 0 | | | | | | | | |
| | with semi-flush sensor /2" DIN 3852 open port | | | | | | | | | | | | | | LI | | | | | | | | | | |
| GI/ | 1/2" NPT | | | | | | | | | | | | | | N | 0 | 0 | | | | | | | | |
| | 1/4" NPT | | | | | | | | | | | | | | N | 4 | 0 | | | | | | | | |
| | customer | | | | | | | | | | | | | | 9 | 9 | 9 | | | | | | | | consult |
| Seal | | | | | | | | | | | | | | | | | | | | | | | | | |
| * 400 ! | FKM | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| $p_N \le 160 \text{ bar}$: | EPDM | | | | | | | | | | | | | | | | | 3 9 | | | | | | | 0.5.5 |
| Pressure port | customer | | | | | | | | | | | | | | | | | 9 | | | | | | | consult |
| | ess steel 1.4404 (316L) | | | | | | | | | | | | | | | | | | 1 | | | | | | |
| Stallife | PVDF ² | | | | | | | | | | | | | | | | | | E | | | | | | |
| | customer | | | | | | | | | | | | | | | | | | 9 | | | | | | consult |
| Diaphragm | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ceramics Al ₂ O ₃ 96 % | | | | | | | | | | | | | | | | | | | | 9 | | | | |
| | customer | | | | | | | | | | | | | | | | | | | | 9 | | | | consult |
| Special version | atandard | | | | | | | | | | | | | | | | | | | | | 0 | _ | | |
| | standard customer | | | | | | | | | | | | | | | | | | | | | 0 | 0 9 | O O | consult |
| | Customel | | | | | | | | | | | | | | | | | | | | | 9 | J | J | CONSUIT |

 $^{^{\}rm 1}$ contact PNP/NPN switchable; analogue output 0 ... 10 V / 4 ... 20 mA switchable

 $^{^2}$ PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar); min. permissible temperature -30 $^\circ$ C



Electronic Pressure Switch

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 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: 4 ... 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 sensor welded
- customer specific versions

The electronic pressure switch DS 200 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 200 offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



Environmental engineering (water - sewage - recycling)









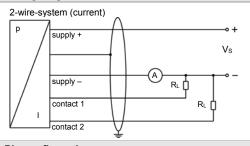
Input pressure range

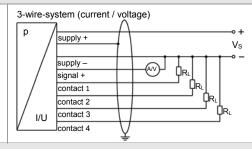
| Input pressure range | | | | | | | | | | | | |
|---|--|--|---|---|---|-----------------------|----------------------------------|-----------------------|------------------|-----------------------------------|-----------------------|---------|
| Nominal pressure gauge ¹ | [bar] | -10 | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 |
| Nominal pressure abs. | [bar] | - | - | - | - | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 |
| Level gauge 1 | [mH ₂ O] | - | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 |
| Overpressure | [bar] | 5 | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 |
| Burst pressure ≥ | [bar] | 7.5 | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 |
| Nominal pressure | | 10 | 16 | 25 | 40 | 6 | 0 1 | 100 | 160 | 250 | 400 | 600 |
| gauge 1 / abs. | [bar] | _ | _ | | | | | | | - | | |
| Level gauge 1 | [mH ₂ O] | 100 | | | | | | | | | - | - |
| Overpressure | [bar] | 40 | 80 | 80 | 105 | | | 210 | 600 | 1000 | 1000 | 1000 |
| Burst pressure ≥ | [bar] | 50 | 120 | 120 | 210 | | | 120 | 1000 | 1250 | 1250 | 1250 |
| Vacuum resistance 1 from 60 bar: measurement | starts with | | | ed vacuur | n resistar | nce; P _N < | 1 bar: on | request | | | | |
| • • • • • | | | | | | | | | | | | |
| Contact ² | | 4 500 | | | | | | | | | | |
| Standard | | 1 PNP co | | 5 , , | | | | | | | | |
| Options | | | | P contacts P contacts | s (poss | | M12x1, 8 e on requ | | 4 20 m | A/3-wire; | | |
| Max. switching current | | 4 20 n 0 10 V | nA / 2- an ′ / 3-wire: | | | | 125 mA, 125 mA, | | | tant; V _{switch} tant | = V _S - 2\ | / |
| Accuracy of contacts ³ | | standard | : P _N < | 0.4 bar: 0.4 bar: | ≤ ± 0.5 % | 6 FSO | | | ≤ ± 0.35 | | | |
| Repeatability | | option: ≤ ± 0.1 % | | U.4 Dal. | ⊒ ± U.25 | /0 F3U | | | | | | |
| Switching frequency | | ≤ ± 0.1 9 max. 10 | | | | | | | | | | |
| Switching cycles | | > 100 x 1 | | | | | | | | | | |
| Delay time | | 0 100 X | | | | | | | | | | |
| ² max. 1 contact for 2-wire cu | ırrent siana | | | s well as 2 | wire curre | nt signal w | ith IS-prote | ection | | | | |
| no contact possible with 3-v | | | | | wii Cuile | sigilai W | 10-pi 010 | 2011011 | | | | |
| Analogue output (option | nallv) / Sı | vlaaı | | | | | | | | | | |
| 2-wire current signal | . ,,, | | A / V. = | 13 36 \ | Vnc | | | | | | | |
| _ mo can one orginal | | | | $R_{\text{max}} = [(V_s)$ | | / 0.02 A1 | Ω | | | respons | e time: < | 10 msec |
| 2-wire current signal with | | | | 15 28 \ | | | | | | | | |
| IS-protection | | permissil | ole load: F | $R_{\text{max}} = [(V_s)]$ | S - V _{S min}) | / 0.02 A] | Ω | | | respons | e time: < | 10 msec |
| 3-wire current signal | | 4 20 m | $A/V_S =$ | 19 30 \ | V _{DC} adjus | table (tur | n-down o | f span 1 | :5) ⁴ | | | |
| | | permissil | ole load: F | $R_{\text{max}} = 500$ | Ω | | | | | | e time: < | |
| 3-wire voltage signal | | | | 5 36 V _I | _{DC} p | ermissibl | e load: R | _{min} = 10 l | (Ω | respons | e time: < | 3 msec |
| without analogue output | | $V_{\rm S}$ = 15 . | | | | | | | | | | |
| Accuracy 3 | | | | .4 bar: ≤ ± | | | P _N ≥ | 0.4 bar: | ≤ ± 0.35 | %FSO | | |
| | | option: | | .4 bar: ≤ ± | | | **** | | | | | |
| 3 | 00770 | | ıstment (no | | | | | | | | | |
| accuracy according to IEC with turn-down of span the | | | | natically to | | Pacurina " | urruc | | | | | |
| ⁴ with turn-down of span the | analogue s | ignal is adju | | natically to | the new m | easuring r | | | | | | |
| ⁴ with turn-down of span the Thermal effects (Offset | analogue s and Spar | ignal is adju | isted autor | | ine new m | easuring r | J | | 1 | | > 0.40 | |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N | analogue s and Spar [bar] | ignal is adju | sted auton | 0 | the new m | easuring r | < 0.40 | | | | ≥ 0.40 (+ 0.75 | |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band | analogue s and Spar [bar] [% FSO] | ignal is adju 1) | -1 ≤ ± 0. | 0 75 | the new m | easuring r | < 0.40 ≤ ± 1 | | | ≤ | ± 0.75 | |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range | analogue s and Spar [bar] [% FSO] [°C] | ignal is adju 1) | sted auton | 0 75 | the new m | neasuring r | < 0.40 | | | ≤ | | |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature | analogue s and Spar [bar] [% FSO] [°C] es | ignal is adju | -1 ≤ ± 0. -20 | 0 75 85 | | | < 0.40 ≤±1 070 | 40 | 05 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures | analogue s and Spar [bar] [% FSO] [°C] es | ignal is adju 1) | -1 ≤ ± 0. -20 | 0 75 85 | | | < 0.40 ≤ ± 1 | -40 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection | analogue s and Spar [bar] [% FSO] [°C] es | ignal is adju | -1 ≤ ± 0. -20 | 0 75 85 | | | < 0.40 ≤±1 070 | -40 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures | analogue s and Spar [bar] [% FSO] [°C] es | ignal is adju | -1 ≤ ± 0. -20 | 0 75 85 | | | < 0.40 ≤±1 070 | -40 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection | analogue s and Spar [bar] [% FSO] [°C] es | medium: | -1 ≤ ± 0.: -20 -40 12 | 0 75 85 | electror | | < 0.40 ≤±1 070 | -40 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection | analogue s and Spar [bar] [% FSO] [°C] es | medium: | -1 ≤±0. -20 -40 12 nt ge, but al | 0 75 85 5 °C | electror | nics / envi | < 0.40 ≤±1 070 | -40 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperatures Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protection | analogue s and Spar [bar] [% FSO] [°C] es | medium: | -1 ≤±0. -20 -40 12 nt ge, but al | 0 75 85 5 °C | electror | nics / envi | < 0.40 ≤±1 070 | -40 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatib Mechanical stability | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission | -1 ≤ ± 0 -20 -40 12 nt ge, but al and imm | 0 75 85 5 °C so no fund unity acco | electron | nics / envi | < 0.40 ≤±1 070 ronment: | | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatible Mechanical stability Vibration | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission | -1 ≤ ± 0.: -20 -40 12 nt ge, but al and imm | 0 75 85 5 °C so no fund unity acco | electror | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatib Mechanical stability Vibration Shock | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission | -1 ≤ ± 0.: -20 -40 12 nt ge, but al and imm | 0 75 85 5 °C so no fund unity acco | electror | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatible Mechanical stability Vibration Shock Materials | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 | -1 ≤±0.: -20 -40 12 nt ge, but al and imm S (25 2 msec | 0 75 85 5 °C so no fund unity acco | electron | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatit Mechanical stability Vibration Shock Materials Pressure port | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless | -1 ≤ ± 02040 12 nt ge, but al and imm S (25 2 msec | 0 75 85 5 °C so no fund unity acco | electron ction ording to accord accord | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| 4 with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatit Mechanical stability Vibration Shock Materials Pressure port Housing | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless stainless | -1 ≤ ± 02040 12 nt ge, but al and imm S (25 2 msec steel 1.4 steel 1.4 | 0 75 85 5 °C so no fund unity acco | electron ction ording to accord accord | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| 4 with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatit Mechanical stability Vibration Shock Materials Pressure port Housing Display housing | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p | -1 ≤ ± 02040 12 nt ge, but al and imm S (25 2 msec steel 1.4 solycarbol | 0 75 85 5 °C so no fund unity acco | electron ction ording to accord accord | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| 4 with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatit Mechanical stability Vibration Shock Materials Pressure port Housing | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p standard | -1 ≤ ± 0.1 -2040 12 nt ge, but al and imm S (25 2 msec steel 1.4 steel 1.4 solycarbor | 0 75 85 5 °C so no fund unity acco | electron ction ording to accord accord | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| 4 with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatit Mechanical stability Vibration Shock Materials Pressure port Housing Display housing | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p | -1 ≤ ± 0.1 -2040 12 nt ge, but al and imm S (25 2 msec steel 1.4 steel 1.4 solycarbor FKM welded | 0 75 85 85 5 °C so no fund unity acco 2000 Hz) 404 (316 I 404 (316 I nate | electron ction ording to accord accord | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| ⁴ with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatible Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seals (media wetted) | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p standard option: | -1 ≤ ± 0.1 -2040 12 nt ge, but al and imm S (25 2 msec steel 1.4 steel 1.4 solycarbor FKM welded others | 0 75 85 85 5 °C so no fund unity acco 2000 Hz) 404 (316 I 404 (316 I nate d version 5 on reques | electron ction ording to accord accord | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |
| 4 with turn-down of span the Thermal effects (Offset Nominal pressure P _N Tolerance band in compensated range Permissible temperature Permissible temperatures Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compatit Mechanical stability Vibration Shock Materials Pressure port Housing Display housing | analogue s and Spar [bar] [% FSO] [°C] es | medium: permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p standard option: stainless | -1 ≤ ± 0.1 -2040 12 nt ge, but al and imm S (25 2 msec steel 1.4 steel 1.4 solycarbor FKM welded others steel 1.4 | 0 75 85 85 5 °C so no fund unity acco 2000 Hz) 404 (316 I 404 (316 I nate | electron ction ording to accord accord L) L) st | EN 61320 | < 0.40 ≤±1 070 ronment: | 68-2-6 | 85 °C | ≤ -2 | ± 0.75 | 100 °C |

| Explosion protection (only fo | r 4 20 mA / 2-wire) |
|---|--|
| Approval AX14-DS 200 | IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) |
| Safety technical maximum values | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ |
| Max. switching current ⁶ | 70 mA |
| Permissible temperatures for environment | -25 70 °C |
| Connecting cables (by factory) | cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m |
| ⁶ the real switching current in the ap | plication 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 % ± 1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) |
| 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 ⁷ |
| Weight | min. 160 g (depending on mechanical connection) |
| Operational life | 100 million load cycles |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁸ |
| ATEX Directive | 2014/34/EU |

⁷ Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $P_N \le 1$ bar. 8 This directive is only valid for devices with maximum permissible overpressure > 200 bar

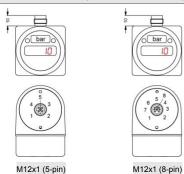
Wiring diagrams





| 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 (IEC 60757) |
| Supply + | 1 | 1 | 1 | 1 | 1 | wh (white) |
| Supply – | 3 | 3 | 3 | 2 | 3 | bn (brown) |
| Signal + (only 3-wire) | 2 | 2 | 2 | 3 | 2 | gn (green) |
| Contact 1 | 4 | 4 | 4 | 3 | 4 | gy (grey) |
| Contact 2 | 5 | 5 | 5 | - | 5 | pk (pink) |
| Contact 3 | - | - | 6 | - | - | bu (blue) |
| Contact 4 | - | - | 7 | - | - | rd (red) |
| Shield | via pressure port | plug housing/ pressure port | via pressure port | ground contact | plug housing/ pressure port | gnye (green-yellow) |

Electrical connections (dimensions in mm)







ISO 4400





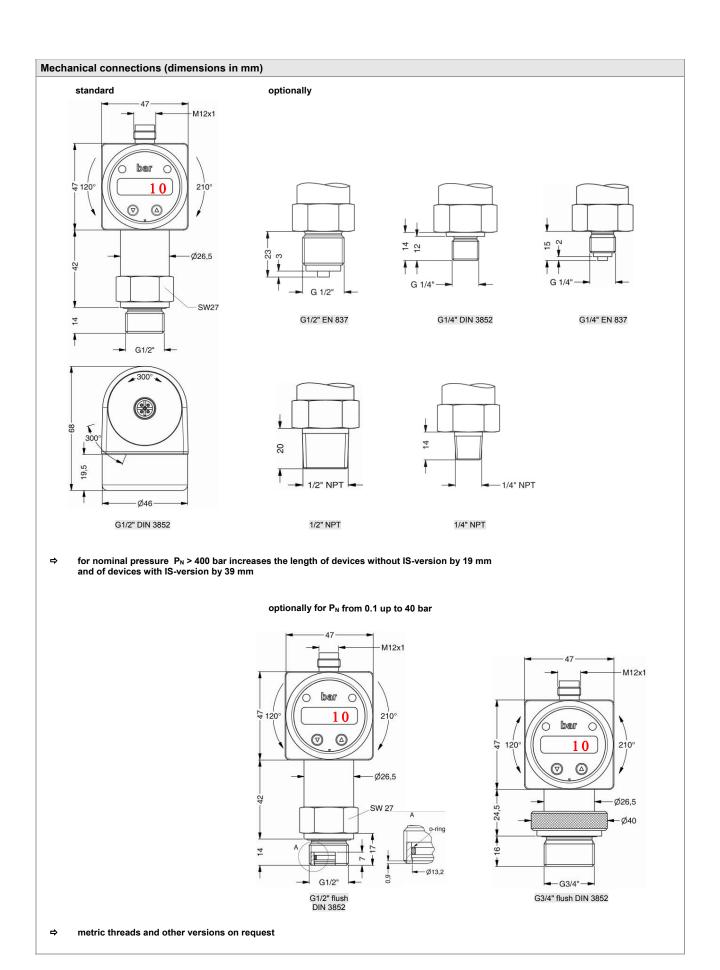
Binder series 723 (5-pin)

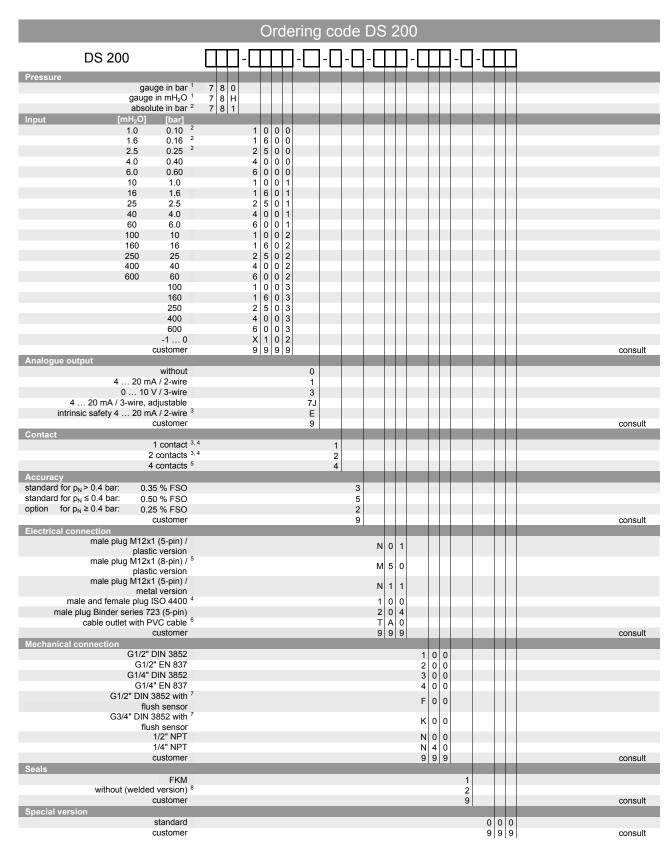


cable outlet PVC Ø = 4.9mm cable outlet PUR Ø = 5.7mm



⁹ different cable types and lengths available; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)





¹ from 60 bar: measurement starts with ambient pressure

² absolute pressure possible from 0.4 bar

 $^{^{\}rm 3}$ with IS version max. 1 contact is possible

⁴ with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

 $^{^{5}}$ 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

⁶ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request

 $^{^7}$ not possible for nominal pressure $p_{\,\text{N}}$ > 40 bar; for G3/4" flush nominal pressure abs. on request

 $^{^8}$ welded version only with pressure ports according to EN 837; possible for nominal pressure ranges p $_{\rm N}$ \le 40 bar



Electronic Pressure Switch

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

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: 4 ... 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

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 polluted media.

As standard the DS 201 offers a PNP contact and a rotable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water - sewage - recycling)









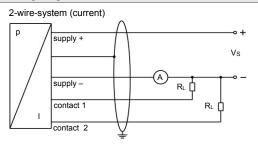
| Input pressure range 1 | | | | | | | | | | | | | | | | | | | |
|---|--|-----|-----|-----|----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Nominal pressure gauge | e [bar] | -10 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 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 | Vacuum resistance $p_N \ge 1$ bar: unlimited vacuum resistance | | | | | | | | | | | | | | | | | | |
| | p _N < 1 bar: on request | | | | | | | | | | | | | | | | | | |
| ¹ PVDF pressure port possible for nominal pressure ranges up to 60 bar | | | | | | | | | | | | | | | | | | | |

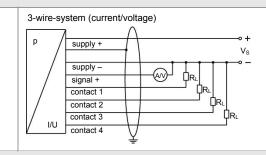
| Contact ² | | | | | | | | |
|--|---|----------------------------------|--|--|--|--|--|--|
| Standard | 1 PNP contact | | | | | | | |
| Options | 2 independent PNP contacts 4 independent PNP contacts (possible with M12x1, 0 10 V/3-wire on re | | | | | | | |
| Max. switching current | 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; V _{Switch} = V _S - 2V contact rating 125 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 s no contact possible with 3-wire in | ignal with plug ISO 4400 as well as 2-wire current signal with combination with plug ISO 4400 | IS-protection | | | | | | |
| Analogue output (optionally) | / Supply | | | | | | | |
| 2-wire current signal | 4 20 mA / V _S = 13 36 V _{DC} | | | | | | | |
| | permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ | respons | e time: < 10 msec | | | | | |
| 2-wire current signal with | 4 20 mA / V _S = 15 28 V _{DC} | <u> </u> | | | | | | |
| IS-protection | permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ | | e 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 k Ω response time: < 3 msec | | | | | | | |
| Without analogue output | V _S = 15 36 V _{DC} | · | | | | | | |
| Accuracy ³ | ≤±0.5 % FSO | | | | | | | |
| ³ accuracy according to IEC 60770 ⁴ with turn-down of span the analog | limit point adjustment (non-linearity, hysteresis, repeatability ue signal is adjusted automatically to the new measuring rang | y) ge | | | | | | |
| Thermal effects (Offset and S | pan) / Permissible temperatures | | | | | | | |
| Thermal error | ≤ ± 0.2 % FSO / 10 K | | | | | | | |
| In compensated range | 0 85 °C | | | | | | | |
| Permissible temperatures ⁵ | medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °C | | | | | | | |
| ⁵ for pressure port in PVDF the med | lium temperature is -30 60 °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 E | N 60068-2-6 | | | | | | |
| Shock | 500 g / 1 msec according to DIN E | | | | | | | |
| Materials | , 5 | | | | | | | |
| Pressure port / housing | | pressure port | housing | | | | | |
| Treasure port/ flouding | standard: option for G1/2" open port (up to 60 bar): options for G3/4" flush (0.6 bar $\leq p_N \leq 25$ 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 ($p_N \le 160$ bar) 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 | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ | | | | | | | | |
| Max. switching current ⁶ | 70 mA | | | | | | | | |
| Permissible temperatures for environment | -25 70 °C | | | | | | | | |
| Connecting cables | cable capacitance: signal line/shield also signal line/signal line: 100 pF/m | | | | | | | | |
| (by factory) | cable inductance: signal line/shield also signal line/signal line: 1 µH/m | | | | | | | | |
| ⁶ the real switching current in the app | olication 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 % ± 1 digit; digital damping 0.3 30 sec (programmable); | | | | | | | | |
| | measured value update 0.0 10 sec (programmable) | | | | | | | | |
| Option oxygen application ⁷ | for $p_N \le 25$ bar: O-ring in FKM Vi 567 (with BAM-approval); | | | | | | | | |
| | permissible maximum values are 25 bar / 150° C | | | | | | | | |
| Current consumption | 2-wire signal output current: max. 25 mA | | | | | | | | |
| (without contacts) | 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 million load cycles | | | | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁸ | | | | | | | | |
| ATEX Directive | 2014/34/EU | | | | | | | | |
| 7 not possible with flush pressure por | rts | | | | | | | | |

⁷ not possible with flush pressure ports

Wiring diagrams

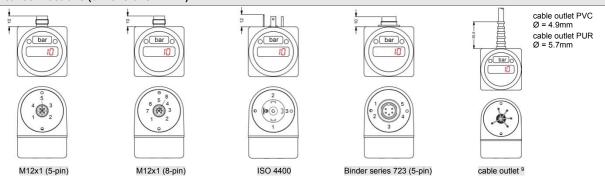




Pin configuration

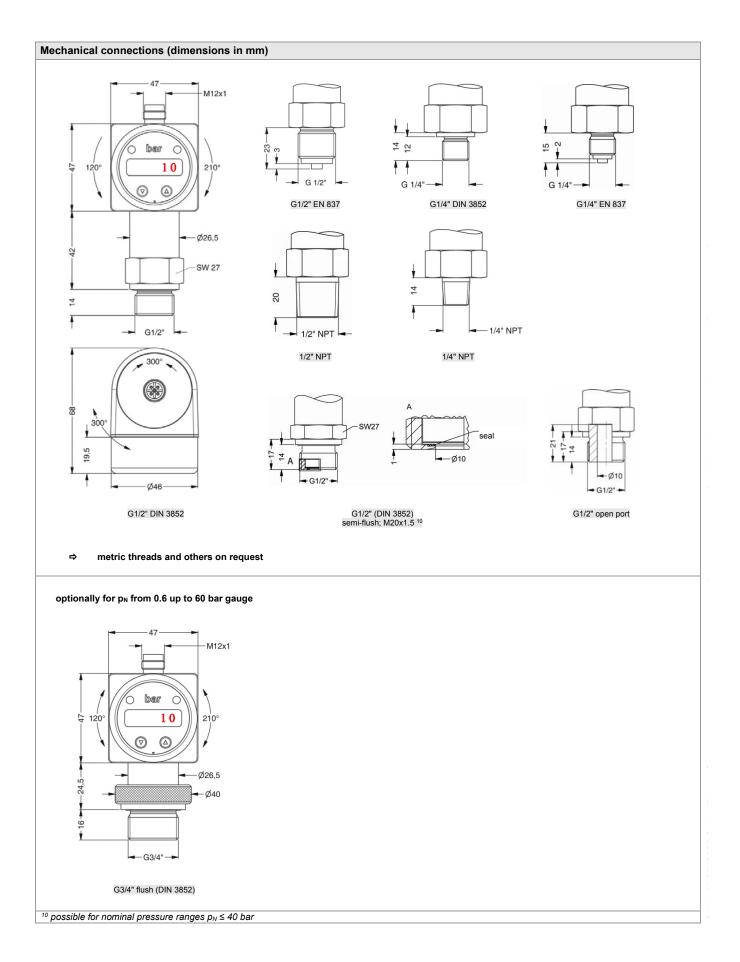
| Electrical connection | M12x1 plastic (5-pin) | M12x1 metal (5-pin) | M12x1 plastic (8-pin) | ISO 4400 | Binder series 723 (5-pin) | cable colours (IEC 60757) |
|------------------------|--------------------------|--------------------------------|--------------------------|----------|---------------------------------|------------------------------|
| Supply + | 1 | 1 | 1 | 1 | 1 | WH (white) |
| Supply – | 3 | 3 | 3 | 2 | 3 | BN (brown) |
| Signal + (only 3-wire) | 2 | 2 | 2 | 3 | 2 | GN (green) |
| Contact 1 | 4 | 4 | 4 | 3 | 4 | GY (grey) |
| Contact 2 | 5 | 5 | 5 | - | 5 | PK (pink) |
| Contact 3 | - | - | 6 | - | - | - |
| Contact 4 | - | - | 7 | - | - | _ |
| Shield | via pressure port | plug housing/ pressure port | via pressure port | ground 🕀 | plug housing/ pressure port | GNYE (green-yellow) |

Electrical connections (dimensions in mm)

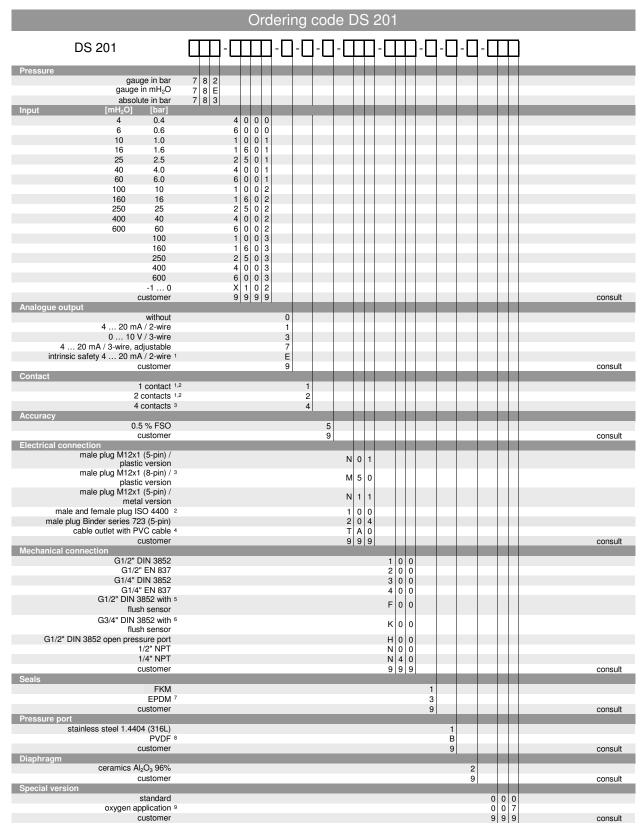


⁹ different cable types and lengths available, permissible temperature depends on kind of cable; standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

⁸ this directive is only valid for devices with maximum permissible overpressure > 200 bar



Ordering Code



¹ with IS 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 $p_N \ge 0.6$ bar up to $p_N \le 25$ bar gauge, absolute on request

⁶ possible for nominal pressure ranges $p_N \ge 0.6$ bar up to $p_N \le 60$ bar gauge

 $^{^{7}}$ possible for nominal pressure ranges $p_{N} \le 160$ bar

⁸ 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); permissible medium temperature: -30 ... 60 °C

⁹ oxygen application with FKM-seal up to 25 bar possible, flush version on request



Electronic Pressure Switch

Welded, Dry Stainless Steel Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 6 bar up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 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
- oxygen application
- customer specific versions

The electronic pressure switch DS 202 is the successful combination of

- robust pressure transmitter
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 202 offers a PNP contact and a rotable display module with 4-digit LED display. The transmitters are suitable for an unrestricted use in oxygen applications up to 600 bar and an intrinsically safe IS-Version.

Preferred areas of use are



Medical technology



Plant and machine engineering



Refrigeration



Oxygen application









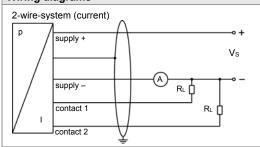
| Input pressure range | | | | | | | | | | | | |
|------------------------|-------|-----------|----|----|-----|-----|-----|-----|-----|-------|-------|-------|
| Nominal pressure gauge | [bar] | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Overpressure | [bar] | 12 | 20 | 32 | 50 | 80 | 120 | 200 | 320 | 500 | 800 | 1 200 |
| Burst pressure ≥ | [bar] | 30 | 50 | 80 | 125 | 200 | 300 | 500 | 800 | 1 400 | 2 000 | 3 000 |
| Vacuum resistance | | unlimited | i | | | | | | | | | |

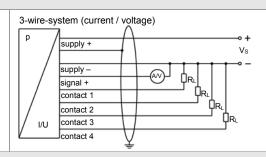
| Contact ¹ | | |
|--|--|------|
| Number, type | standard: 1 PNP contact option: 2 independent PNP contacts 4 independent PNP contacts (possible with M12x1 8-pin for 4 20 mA / 3-wire) | |
| Max. switching current | 4 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; V _{switch} = V _S – 2V contact rating 125 mA, short-circuit resistant | |
| Accuracy of contacts ² | ≤±0.5 % FSO | |
| Repeatability | ≤ ± 0.1 % FSO | |
| Switching frequency | max. 10 Hz | |
| Switching cycles | > 100 x 10 ⁶ | |
| Delay time | 0 100 sec | |
| with IS-protection max. 1 contact po | ossible | |
| Analogue output (optionally) / | ••• | |
| 2-wire current signal | 4 20 mA / V_S = 13 36 V_{DC} permissible load: R_{max} = [($V_S - V_{S min}$) / 0.02 A] Ω response time: < 10 m | nsec |
| 2-wire current signal with | $420 \text{ mA} / V_S = 1528 V_{DC}$ | |
| IS-protection 3-wire current signal | permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 \text{ A}] \Omega$ response time: < 10 r 4 20 mA / $V_S = 19$ 30 V_{DC} adjustable (turn-down of span up to 1:5) ³ | nsec |
| 3-wire voltage signal | permissible load: $R_{max} = 500 \Omega$ response time: < 0.5 s | sec |
| | permissible load: R_{min} = 10 k Ω response time: < 3 m | sec |
| Without analogue output Accuracy ² | $V_{S} = 15 \dots 36 V_{DC}$ $\leq \pm 0.5 \% FSO$ | |
| ² accuracy according to IEC 60770 - I | limit point adjustment (non-linearity, hysteresis, repeatability) e signal is adjusted automatically to the new measuring range | |
| Thermal effects (Offset and Sp | | |
| Thermal error | ± 0.3 % FSO / 10 K | |
| in compensated range | 0 70 °C | |
| Permissible temperatures | | |
| Permissible temperatures | medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °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 | stainless steel 1.4571 (316 Ti) | |
| Housing | stainless steel 1.4404 (316 L) | |
| Display housing | PA 6.6, polycarbonate | |
| Seals (media wetted) | none (welded) | |
| Diaphragm | stainless steel 1.4542 (17-4PH) | |
| Media wetted parts | pressure port, diaphragm | |
| Explosion protection (only for | | |
| Approval AX14-DS 202 | IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) | |
| Safety technical maximum values | U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C ≈ 0 nF, L _i ≈ 0 µH | |
| Max. switching current ⁴ | 70 mA | |
| Permissible temperatures for environment | -25 70 °C | |
| Connecting cables (by factory) | cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m | |
| ⁴ the real switching current in the app | lication depends on the power supply unit | |

| Miscellaneous | |
|--|---|
| Display | 4-digit, red 7-segment-LED display, digit height 7 mm, digit width 4.85 mm (angle 10°); range of indication -1999 +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) |
| 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 | min. 160 g (depending on mechanical connection) |
| Operational life | 100 million load cycles |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁵ |
| ATEX Directive | 2014/34/EU |

⁵ This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

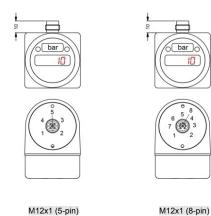




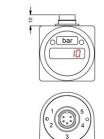
| Pin configuration | | • | | | | |
|------------------------|-----------------------------|---------------------------|-----------------------------|----------|---------------------------------|------------------------------|
| Electrical connection | M12x1 plastic (5-pin) | M12x1 metal (5-pin) | M12x1 plastic (8-pin) | ISO 4400 | Binder series 723 (5-pin) | cable colours (IEC 60757) |
| Supply + | 1 | 1 | 1 | 1 | 1 | wh (white) |
| Supply – | 3 | 3 | 3 | 2 | 3 | bn (brown) |
| Signal + (only 3-wire) | 2 | 2 | 2 | 3 | 2 | gn (green) |
| Contact 1 | 4 | 4 | 4 | 3 | 4 | gy (grey) |
| Contact 2 | 5 | 5 | 5 | - | 5 | pk (pink) |
| Contact 3 | - | - | 6 | - | - | bu (blue) |
| | | | | | | |

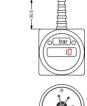
Contact 4 rd (red) via pressure plug housing/ via pressure ground conplug housing/ gnye Shield pressure port port pressure port (green-yellow) port tact

Electrical connections (dimensions in mm)



ISO 4400



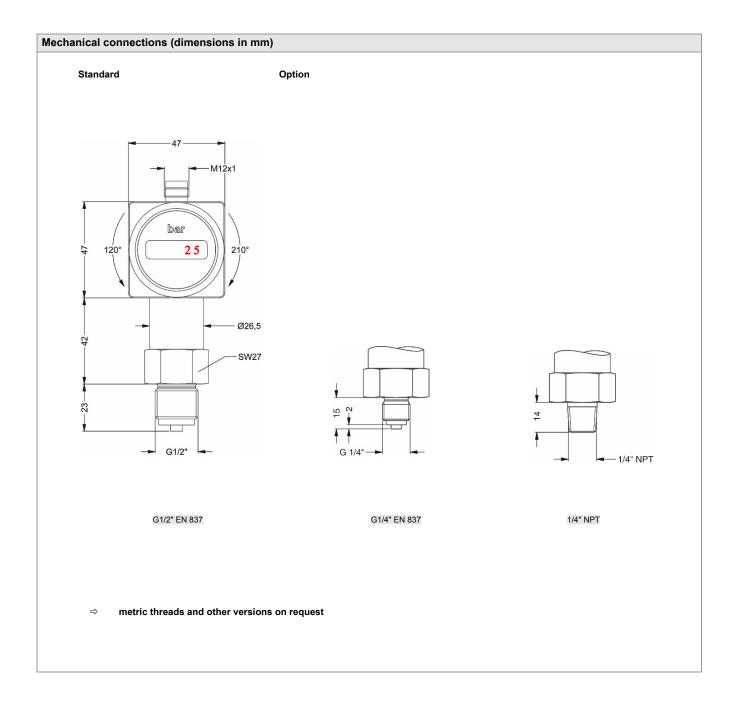


PVC-cable Ø=4.9mm, PUR-cable Ø=5.7mm



Binder series 723 (5-pin) cable outlet 6

⁶ 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 202 | | · | |
|--|--|----------------------|-----------|
| Pressure | | Ordering code DS 202 | |
| Pressure | | | |
| Input (bar) (bar | DS 202 | | |
| Input (bar) (bar | Processing | | |
| Input (bar) (bar | | 7 8 4 | |
| 6 | | | |
| 10 | | 6 0 0 1 | |
| 25 | | 1 0 0 2 | |
| 40 | | 1 6 0 2 | |
| 60 6 0 0 2 1 0 0 3 1 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 3 1 10 0 0 1 10 10 10 10 10 10 10 10 10 1 | | 2 5 0 2 | |
| 100 | | 4 0 0 2 | |
| 160 | | 1003 | |
| 250 | | | |
| Analogue output | | 2 5 0 3 | |
| Consult | | 4 0 0 3 | |
| Analogue output Without | 600 | 6 0 0 3 | |
| Without 0 | | 9 9 9 | consult |
| 4 20 mA / 2-wire | | | |
| O 10 V / 3-wire | | | |
| A 20 mA / 3-wire 7 | | | |
| intrinsic safety 4 20 mA / 2-wire 2 | | 3 7 | |
| Contact | | | |
| Contact | | | consult |
| 2 2 4 4 4 4 4 4 4 4 | Contact | | |
| Accuracy | | | |
| Accuracy | | 2 | |
| Consult | | 4 | |
| Customer 9 | | | |
| Electrical connection | | | aamaydt |
| male plug M12x1 (5-pin) / plastic version N 0 1 I </td <td></td> <td>9 </td> <td>Consuit</td> | | 9 | Consuit |
| Plastic version | | | |
| male plug M12x1 (8-pin) / 3 plastic version male plug M12x1 (5-pin) / metal version male and female plug ISO 4400 4 male plug Binder series 723 (5-pin) 2 0 4 4 | plastic version | N 0 1 | |
| Plastic version M 0 0 0 0 0 0 0 0 0 | male plug M12x1 (8-pin) / ³ | M 5 0 | |
| metal version male and female plug ISO 4400 4 1 0 0 male plug Binder series 723 (5-pin) 2 0 4 cable outlet with PVC cable 5 customer T A 0 Customer 9 9 9 Mechanical connection G1/2" EN 837 customer 2 0 0 customer G1/4" EN 837 customer 4 0 0 customer Customer 9 9 9 9 consult Seals without (welded version) customer 2 customer Special version 2 customer 9 consult Special version 0 0 0 customer 0 0 0 customer | plastic version | IM 5 U | |
| Male and female plug ISO 4400 4 | | N 1 1 | |
| male plug Binder series 723 (5-pin) 2 0 4 0 | | | |
| cable outlet with PVC cable 5 customer T A 0 9 9 9 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 2 0 4 | |
| customer 9 9 9 Consult Mechanical connection G1/2" EN 837 2 0 0 G1/4" EN 837 4 0 0 1/4" NPT N 4 0 customer 9 9 9 Seals without (welded version) 2 customer 9 consult Special version 0 0 0 oxygen application 0 0 0 | cable outlet with PVC cable ⁵ | T A 0 | |
| Mechanical connection | customer | 9 9 9 | consult |
| 1/4" NPT | Mechanical connection | | |
| 1/4" NPT | | 2 0 0 | |
| without (welded version) customer 2 customer 2 consult Special version 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 4 0 0 | |
| without (welded version) customer 2 customer 2 consult Special version 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | N 4 0 | J. |
| without (welded version) customer 2 customer 2 consult Special version 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 | | 9 9 9 | consult |
| customer 9 consult Special version 0 0 standard 0 0 oxygen application 0 0 | | | |
| Special version standard 0 0 0 oxygen application 0 0 7 | | | consult |
| standard 0 0 0 oxygen application 0 0 7 | | 9 | Consult |
| oxygen application 0 0 7 | | 0 0 | 0 |
| customer 9 9 9 consult | | 0 0 | 7 |
| | | 9 9 | 9 consult |

¹ from 60 bar: measurement starts with ambient pressure

² with IS version max. 1 contact is 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 with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

⁵ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C); others on request



DS 210

Electronic Pressure Switch

Without Media Isolation

accuracy according to IEC 60770: 0.35 % FSO

Nominal pressure

from 0 ... 10 mbar up to 0 ... 1000 mbar

Contacts

1, 2 or 4 independent contacts freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 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
- customer specific versions

The electronic pressure switch DS 210 is the successful combination of

- ▶ intelligent pressure switch
- ▶ digital display

and has been specially designed for measuring of very small overpressure and for vacuum applications. Permissible media are gases, pressurized air and thin non aggressive media.

As standard the DS 210 offers a PNP-contact and a rotable display module. Additional features like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



Laboratory techniques







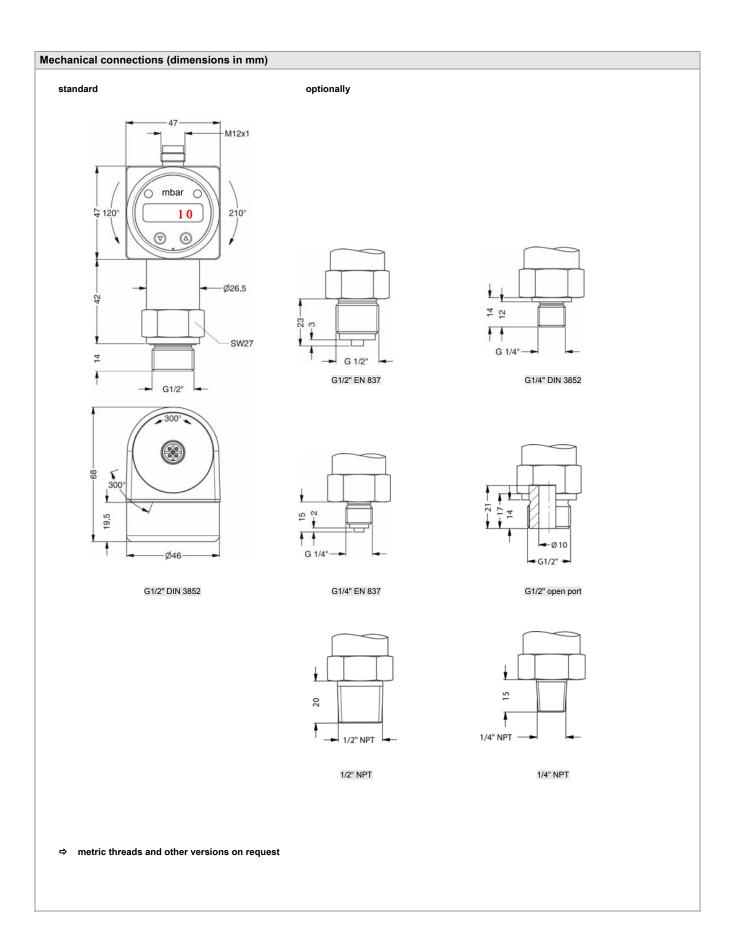


| Input pressure range | | | | | | | | | | | | | |
|------------------------|--------|---------|-----|-----|------|------|------|-----|-----|-----|-----|-----|------|
| Nominal pressure gauge | [mbar] | -1000 0 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 | 1000 |
| Overpressure | [bar] | 3 | 0.2 | 0.2 | 0.5 | 0.5 | 0.5 | 1 | 2 | 3 | 3 | 3 | 3 |
| Burst pressure | [bar] | 5 | 0.3 | 0.3 | 0.75 | 0.75 | 0.75 | 1.5 | 3 | 5 | 5 | 5 | 5 |

| 2 Independent PNP contacts 4 Independent PNP contacts (possible with M12x1, 8-pin for 4 | Contact ¹ | | | | | |
|---|--|--|--|---|--|--|
| 2 independent PNP contacts 4 independent PNP contacts 5 independent PNP contact | Standard | 1 PNP contact | | | | |
| 4 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant. V _{reich} = V ₉ - 2V 0 10 V / 3-wire: contact rating 125 mA, short-circuit resistant v _{eich} = V ₉ - 2V 0 10 V / 3-wire: standard: s ± 0.35 % FSO | Options | 2 independent PNP cont 4 independent PNP cont | acts | 0 10 V/3-wire on reque | est) | |
| | Max. switching current | 4 20 mA / 2- and 3-wi | re: contact rating 125 | mA, short-circuit resistan | t; V _{switch} = V _S – 2V | |
| Switching feequency | Accuracy of contacts ² | | | | | |
| Switching cycles | Repeatability | ≤ ± 0.1 % FSO | | | | |
| Delay time 0 100 sec | Switching frequency | max. 10 Hz | | | | |
| I ana. I contact for 2-wire current signal with play 50 4400 as well as 2-wire current signal with Ex-protection no contact possible with 3-wire in combination with play 50 4400 Analogue output (optionally) / Supply 2-wire current signal 4 20 mA $V_S = 13 38 V_{OC}$ permissible load: $R_{min} = \frac{1}{2}(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec 2-wire current signal with 4 20 mA $V_S = 15 28 V_{OC}$ permissible load: $R_{min} = \frac{1}{2}(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec 3-wire current signal 4 20 mA $V_S = 19 30 V_{OC} adjustable (turn-down of span max. 1:5) \(^3 \) response time: < 3 sec 2-wire voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 500 \Omega response time: < 3 sec 2-wire voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 3-wire voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 4-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 7-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 8-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 9-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 9-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 9-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 9-2 min voltage signal 0 10 \(^1 \) V_S = 15 36 V_{OC} Permissible load: R_{min} = 10 k \Omega response time: < 3 msec 9-2 min voltage sign$ | Switching cycles | > 100 x 10 ⁶ | | | | |
| no contact possible with 3-wire in combination with plug ISO 4400 Analogue output (optionally) / Supply 2-wire current signal | Delay time | 0 100 sec | | | | |
| 2-wire current signal 4 20 mA $I V_s = 13$ 36 V_{Cc} permissible load: $R_{max} = [(V_s - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec 2-wire current signal with 4 20 mA $I V_s = 15$ 28 V_{Cc} response time: < 10 msec 3-wire current signal with 4 20 mA $I V_s = 15$ 28 V_{Cc} response time: < 10 msec 3-wire current signal 4 20 mA $I V_s = 15$ 30 V_{Dc} response time: < 10 msec 3-wire vortage signal 9 10 $V I V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 sec 3-wire voltage signal 0 10 $V I V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} standard: $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} standard: $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} standard: $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 3 msec Without analogue output $V_s = 15$ 36 V_{Dc} permissible load: $R_{min} = 10 \text{ k} \Omega$ response time: < 10 msec 10 min $V_s = 10$ 100 msec | | | : 2-wire current signal with Ex- | -protection | | |
| permissible load: $R_{max} = [(N_s - V_{S mip}) / 0.02 A] \Omega$ response time: < 10 msec Ex-protection | Analogue output (optionally) / So | upply | | | | |
| 2-wire current signal with Exprotection permissible load: $R_{\rm max} = (N_S - V_{\rm Smin})/0.02~{\rm A})\Omega$ response time: < 10 msec Exprotection permissible load: $R_{\rm max} = (S0 - V_{\rm Smin})/0.02~{\rm A})\Omega$ response time: < 3 sec and $V_{\rm S} = 10.00~{\rm A}/{\rm V}_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S}$ permissible load: $R_{\rm max} = 500~{\Omega}$ response time: < 3 sec and $V_{\rm S} = 10.00~{\rm A}/{\rm V}_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S}$ permissible load: $R_{\rm min} = 10~{\rm k}~{\Omega}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S}$ permissible load: $R_{\rm min} = 10~{\rm k}~{\Omega}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S}$ permissible load: $R_{\rm min} = 10~{\rm k}~{\Omega}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm V}_{\rm S} = 10.00~{\rm A}/{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}/{\rm A}$ response time: < 3 sec and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}$ response time: < 3 meso and $V_{\rm S} = 153~{\rm A}/{\rm A}/{\rm A}/{\rm A}/{\rm A}$ response time: < 3 meso and $V_{\rm S} = 153~{\rm A}/{\rm A}/{$ | 2-wire current signal | _ | | respo | onse time: < 10 msec | |
| Ex-protection permissible load: R _{max} = [N(s ~ V _{s.mb}) / 0.02 A) Ω response time: < 10 msec 3-wire current signal 4 20 mA / V _s = 19 30 V _{pC} adjustable (turn-down of span max. 1:5) ³ response time: < 3 sec 3-wire voltage signal 0 10 V / V _s = 15 36 V _{pC} permissible load: R _{min} = 10 k Ω response time: < 3 sec 3-wire voltage signal 0 10 V / V _s = 15 36 V _{pC} permissible load: R _{min} = 10 k Ω response time: < 3 msec villout analogue output V _s = 15 36 V _{pC} permissible load: R _{min} = 10 k Ω response time: < 3 msec villout analogue output V _s = 15 36 V _{pC} permissible load: R _{min} = 10 k Ω response time: < 3 msec villout analogue output V _s = 15 36 V _{pC} permissible load: R _{min} = 10 k Ω response time: < 3 msec villout analogue output V _s = 15 36 V _{pC} permissible load: R _{min} = 10 k Ω response time: < 3 msec villout analogue output V _s = 15 36 V _{pC} permissible to decrease villout analogue output | 2-wire current signal with | | | | | |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | Ex-protection | | | respo | onse time: < 10 msec | |
| 3-wire voltage signal $010 \ V \ V_8 = 1536 \ V_{0c}$ permissible load: $R_{min} = 10 \ k \ \Omega$ response time: $< 3 \ msec$ Without analogue output $V_8 = 1536 \ V_{0c}$ $050 \ V_8 = 1536 \ V_{0c}$ $050 \ V_8 = 1050 \$ | 3-wire current signal | 4 20 mA / V _S = 19 | 30 V _{DC} adjustable (turn-do | own of span max. 1:5) 3 | | |
| Without analogue output | | permissible load: R _{max} = | | | onse time: < 3 sec | |
| Standard: S± 0.35 % FSO nominal pressure ≤ 100 mbar: S± 0.5 % FSO standard: S± 0.5 % FSO nominal pressure ≤ 100 mbar: S± 0.5 % FSO standard: S± 0.5 % FSO S± 0. | 3-wire voltage signal | | S V _{DC} permissible load: | $R_{min} = 10 \text{ k } \Omega$ response | onse time: < 3 msec | |
| nominal pressure ≤ 100 mbar: ≤ ± 0.5 % FSO | Without analogue output | V _S = 15 36 V _{DC} | | | | |
| * accuracy according to IEC 60770 - limit point adjustment (non-linearity, hysteresis, repeatability) **with turn-down of span the analogue signal is adjusted automatically to the new measuring range* **Thermal effects (Offset and Span) Nominal pressure P _N [mbar] -1000 0 ≤ 100 ≤ 400 ≥ 400 **Tolerance band [% FSO] ≤ ± 0.75 ≤ ± 1.5 ≤ ± 1 ≤ ± 0.75 in compensated range processor processo | Accuracy ² | | | | | |
| ** with turn-down of span the analogue signal is adjusted automatically to the new measuring range Thermal effects (Offset and Span) Nominal pressure P _N [mbar] .1000 0 ≤ 100 ≤ 400 > 400 Tolerance band [% FSO] ± 0.75 ≤ ± 1.5 ≤ ± 1 ± 0.75 In compensated range [°C]20 85 0 50 0 70 70 20 85 Permissible temperatures Permissible temperatures medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °C Electrical protection Short-circuit protection permanent modamage, but also no function Electromagnetic compatibility emission and immunity according to EN 61326 modes. 2-27 Materials Pressure port 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 stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Bisplay housing PA 6.6, Polycarbonate Seal (media wetted) FKM Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values U ₁ = 28 V, I ₁ = 93 mA, P ₁ = 660 mW, C ≈ 0 nF, L ₁ ≈ 0 μH Max. switching current 4 70 mA Permissible temperatures for environment -25 70 °C Connecting cables (by factory) cable inductance: signal line/shield also signal line/signal line: 10 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | 2 | | | | | |
| Nominal pressure P_N [mbar] -1000 0 ≤ 100 ≤ 400 > 400 Tolerance band [% FSO] $\le \pm 0.75$ $\le \pm 1.5$ $\le \pm 1$ $\le \pm 0.75$ in compensated range [°C] -20 85 0 50 0 70 -20 85 Permissible temperatures Permissible temperatures medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °C Electrical protection permanent Reverse polarity protection modamage, but also no function Electromagnetic compatibility emission and immunity according to EN 61326 Mechanical stability with a storage Materials Pressure port stainless steel 1.4404 (316L) Housing Stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X Display technical maximum values U ₁ = 28 V, I ₁ = 93 mA, P ₁ = 660 mW, C ≈ 0 nF, L ₁ ≈ 0 μ H Max. switching current 4 70 mA Permissible temperatures for environment Cable inductance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable capacitance: signal line/shield also signal line/signal line/shi | ³ with turn-down of span the analogue s | signal is adjusted automatically | | | | |
| Tolerance band [% FSO] ≤±0.75 ≤±1.5 ≤±1 ≤±0.75 in compensated range [°C] -2085 050 070 -2085 Permissible temperatures Permissible temperatures Permissible temperatures Permissible temperatures medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °C | • | <i>'</i> | | | | |
| compensated range (°C) -20 85 0 50 0 70 -20 85 Permissible temperatures medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °C Electrical protection permanent Reverse polarity protection no damage, but also no function Electromagnetic compatibility emission and immunity according to EN 61326 | | | ≤ 100 | ≤ 400 | > 400 | |
| Permissible temperatures for environment Connecting cables (by factory) Permissible temperatures Permissible temperatures Permissible temperatures Permissible temperatures Permissible temperatures for environment Permissible temperatures Permissible temperatures Pe | Tolerance band [% FSO] | ≤ ± 0.75 | ≤ ± 1.5 | | ≤ ± 0.75 | |
| Permissible temperatures medium: -40 125 °C electronics / environment: -40 85 °C storage: -40 100 °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 60068-2-7 Materials Pressure port stainless steel 1.4404 (316L) Display housing stainless steel 1.4404 (316L) Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values Max. switching current 4 70 mA Permissible temperatures for environment Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | in compensated range [°C] | -20 85 | 0 50 | 0 70 | -20 85 | |
| Electrical protection Short-circuit protection Reverse polarity protection Reverse p | Permissible temperatures | | | | | |
| 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 60068-2-7 Materials Pressure port stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values Max. switching current 4 70 mA Permissible temperatures for environment Connecting cables (by factory) cable inductance: signal line/shield also signal line/signal line: 10 μH/m | Permissible temperatures | medium: -40 125 °C | electronics / environr | ment: -40 85 °C | storage: -40 100 °C | |
| 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 60068-2-7 Materials Pressure port stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values Max. switching current 4 70 mA Permissible temperatures for environment Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | Electrical protection | | | | | |
| 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 60068-2-6 Shock 500 g / 1 msec according to DIN EN 60068-2-6 Shock 500 g / 1 msec according to DIN EN 60068-2-6 Shock 500 g / 1 msec according to DIN EN 60068-2-6 Materials Pressure port stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Seal (media wetted) FKM Seal (media wetted) parts FKM Seal (media wetted) parts pressure port seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 0.6 ATEX 1050 X Cone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum Walles <th co<="" td=""><td>Short-circuit protection</td><td>permanent</td><td></td><td></td><td></td></th> | <td>Short-circuit protection</td> <td>permanent</td> <td></td> <td></td> <td></td> | Short-circuit protection | permanent | | | |
| Mechanical stabilityVibration10 g RMS (25 2000 Hz)according to DIN EN 60068-2-6Shock500 g / 1 msecaccording to DIN EN 60068-2-27MaterialsPressure portstainless steel 1.4404 (316L)Housingstainless steel 1.4404 (316L)Display housingPA 6.6, PolycarbonateSeal (media wetted)FKMSensorstainless steel 1.4404 (316L), silicon, Epoxy or RTV, glassMedia wetted partspressure port, seal, sensorExplosion protection (for 2-wire current signal)Approval AX14-DS 210IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable)Safety technical maximum valuesU _i = 28 V, I _i = 93 mA, P _i = 660 mW, C ≈ 0 nF, L _i ≈ 0 μHMax. switching current 4 Permissible temperatures for | Reverse polarity protection | no damage, but also no | function | | | |
| Wibration 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 stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X zone 1: Il 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values $U_i = 28 \text{ V}, \ I_i = 93 \text{ mA}, \ P_i = 660 \text{ mW}, \ C ≈ 0 \text{ nF}, \ L_i ≈ 0 \text{ µH}$ Max. switching current 4 70 mA Permissible temperatures for environment $^{-25}$ $^{-70}$ °C cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m | Electromagnetic compatibility | emission and immunity a | sccording to EN 61326 | | | |
| Shock 500 g / 1 msec according to DIN EN 60068-2-27 Materials Pressure port stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X Zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values U₁ = 28 V, I₁ = 93 mA, P₁ = 660 mW, C ≈ 0 nF, L₁ ≈ 0 μH Max. switching current ⁴ 70 mA Permissible temperatures for environment -25 70 °C Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | Mechanical stability | | | | | |
| Shock 500 g / 1 msec according to DIN EN 60068-2-27 Materials Pressure port stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X Zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values U₁ = 28 V, I₁ = 93 mA, P₁ = 660 mW, C ≈ 0 nF, L₁ ≈ 0 μH Max. switching current ⁴ 70 mA Permissible temperatures for environment -25 70 °C Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | Vibration | 10 g RMS (25 2000 H | z) according to DIN EN | N 60068-2-6 | | |
| Materials Pressure port stainless steel 1.4404 (316L) Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBEXU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values U₁ = 28 V, I₁ = 93 mA, P₁ = 660 mW, C ≈ 0 nF, L₁ ≈ 0 μH Max. switching current ⁴ 70 mA Permissible temperatures for environment -25 70 °C Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | Shock | | | N 60068-2-27 | | |
| Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X | Materials | | • | | | |
| Housing stainless steel 1.4404 (316L) Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X | Pressure port | stainless steel 1.4404 (3 | 16L) | | | |
| Display housing PA 6.6, Polycarbonate Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X | Housing | · · | | | | |
| Seal (media wetted) FKM Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values U₁ = 28 V, I₁ = 93 mA, P₁ = 660 mW, C ≈ 0 nF, L₁ ≈ 0 μH Max. switching current ⁴ 70 mA Permissible temperatures for environment -25 70 °C Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μH/m | <u> </u> | | , | | | |
| Sensor stainless steel 1.4404 (316L), silicon, Epoxy or RTV, glass Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X | Seal (media wetted) | | | | | |
| Media wetted parts pressure port, seal, sensor Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X | Sensor | | 16L), silicon, Epoxv or RT | V, glass | | |
| Explosion protection (for 2-wire current signal) Approval AX14-DS 210 IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values U _i = 28 V, I _i = 93 mA, P _i = 660 mW, C ≈ 0 nF, L _i ≈ 0 μ H Max. switching current ⁴ 70 mA Permissible temperatures for environment Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μ H/m | Media wetted parts | · · · · · · · · · · · · · · · · · · · | | , 🗸 | | |
| Approval AX14-DS 210 IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) Safety technical maximum values $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ Max. switching current ⁴ 70 mA Permissible temperatures for environment $-25 \dots 70 \text{ °C}$ Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 μ H/m | | | | | | |
| Safety technical maximum values $U_{i} = 28 \text{ V}, I_{i} = 93 \text{ mA}, P_{i} = 660 \text{ mW}, C \approx 0 \text{ nF}, L_{i} \approx 0 \mu\text{H}$ Max. switching current 4 Permissible temperatures for environment $-25 \dots 70 \text{ °C}$ Connecting cables (by factory) $\text{cable capacitance: signal line/shield also signal line/signal line: } 100 \text{ pF/m}$ $\text{cable inductance: signal line/shield also signal line/signal line: } 1 \mu\text{H/m}$ | Approval AX14-DS 210 | IBExU 06 ATEX 1050 X | 4 Gb (connector) / II 2G | Ex ia IIB T4 Gh (cable) | | |
| Max. switching current ⁴ 70 mA Permissible temperatures for environment -25 70 °C Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m | Safety technical maximum | | | | | |
| Permissible temperatures for environment -25 70 °C cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m | | 70 mA | | | | |
| environment -25 70 C Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m | | | | | | |
| Connecting cables (by factory) cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m | environment | -25 70 °C | | | | |
| | Connecting cables (by factory) | | | | | |
| | 4 the real switching current in the applica | | | <u> </u> | | |

| Miscellaneous | | | | | | | | | | | | | | |
|--|--|----------------------------------|--|--|--------------------------------|---|--|--|--|--|--|--|--|--|
| Display | accuracy 0.1 % | ± 1 digit; digital da | y, digit height 7 m amping 0.3 30 s sec (programma | sec (programn | lication -1999 + nable); | 9999; | | | | | | | | |
| Current consumption (without contacts) | 2-wire signal ou 3-wire signal ou 3-wire signal ou | itput current: mitput current: a | ax. 25 mA oprox. 45 mA + siç | | | | | | | | | | | |
| Ingress protection | IP 65 | ilpul vollage. a | oprox. 45 mA | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Installation position | any | | | | | | | | | | | | | |
| Weight | approx. 180 g | | | | | | | | | | | | | |
| Operational life | 100 million load | | | | | | | | | | | | | |
| CE-conformity | | MC Directive: 2014/30/EU | | | | | | | | | | | | |
| ATEX Directive | 2014/34/EU | U14/34/EU | | | | | | | | | | | | |
| Wiring diagrams | | | | | | | | | | | | | | |
| supply + supply - contact 1 contact 2 | A RL RL | ∘ + ∨s ∘ - | supply supply signal contact contact contact contact | 1 2 3 | | ~ + Vs ~ - | | | | | | | | |
| Pin configuration Electrical connection | M12x1 plastic | M12x1 metal | M12x1 | ISO 4400 | Binder series 723 | cable colours | | | | | | | | |
| Liectrical confiection | (5-pin) | (5-pin) | (8-pin) | 100 4400 | (5-pin) | (IEC 60757) | | | | | | | | |
| Supply + Supply – Signal + (only 3-wire) Contact 1 Contact 2 Contact 3 Contact 4 | 1 3 2 4 5 | 1 3 2 4 5 | 1 3 2 4 5 6 7 | 1 2 3 3 - | 1 3 2 4 5 | wh (white) bn (brown) gn (green) gy (grey) pk (pink) bu (blue) rd (red) | | | | | | | | |
| Shield | via pressure port | plug housing/ pressure port | via pressure port | ground contact | plug housing/ pressure port | gnye (green-yellow) | | | | | | | | |
| Electrical connections (dimens | sions in mm) | | | | | | | | | | | | | |
| e e e e e e e e e e e e e e e e e e e | © 8 6 5 /4 7 @ 3 1 2 0 | | _ / / | (a) Solve (b) Solve (c) So | | PVC-cable Ø=4.9mm, PUR-cable Ø=5.7mm | | | | | | | | |
| | | | | | | | | | | | | | | |

⁵ 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)



Ordering Code

| | | | Or | d€ | eri | n | g c | ode | e D | S | 21 | 0 | | | | | | | | | |
|---|---|------------|--------|-----|-----|---|--------|--------|--------|-----|-----|-----|----|-----|-------------------|----|---|----|--------|---|---------|
| DS 210 | П | |]-[| | | | - |]-[|]-[|]-[| | | -[| | |]- | | -[| | | |
| Pressure | | | | | | | | | | | | | | | | | | | | | |
| gauge Input [mbar] | 7 | 8 <i>A</i> | ١ | н | | | | | | | | | | | | _ | | | _ | | |
| 10 | _ | | C | 1 | 0 | 0 | | | | | | | | | | | | | | | |
| 16 | | | C | 1 | 6 | 0 | | | | | | | | | | | | | | | |
| 25 | | | C | | | 0 | | | | | | | | | | | | | | | |
| 40 60 | | | 0 | | | | | | | | | | | | | | | | | | |
| 100 | | | 1 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| 160 | | | 1 | | 0 | 0 | | | | | | | | | | | | | | | |
| 250 400 | | | 2 | 5 | 0 | 0 | | | | | | | | | | | | | | | |
| 600 | | | 6 | | 0 | 0 | | | | | | | | | | | | | | | |
| 1000 | | | 1 | 0 | 0 | 1 | | | | | | | | | | | | | | | |
| -1000 0 | | | X 9 | 1 | 0 | 2 | | | | | | | | | | | | | | | |
| Analogue output customer | - | - | Ę | 1 9 | 9 | 9 | - | | | _ | | | | | - | | | - | | | consult |
| without | | _ | _ | _ | _ | _ | 0 | | | | | _ | | | Т | | | _ | | | |
| 4 20 mA / 2-wire | | | | | | | 1 | | | | | | | | | | | | | | |
| 0 10 V / 3-wire 4 20 mA / 3-wire, adjustable | | | | | | | 3 7 | | | | | | | | | | | | | | |
| intrinsic safety 4 20 mA / 2-wire ¹ | | | | | | | E | | | | | | | | | | | | | | |
| customer | | | | | | | 9 | | | | | | | | | | | | | | consult |
| Contact | 2 | | | | | | | | | | | | | | | | | | | | |
| 1 contact ¹ 2 contacts ¹ | | | | | | | | 1 2 | | | | | | | | | | | | | |
| 4 contacts ³ | | | | | | | | 4 | | | | | | | | | | | | | |
| Accuracy | | | | | | | | | | | | | | | | | | | | | |
| standard for $p_N > 0.1$ bar: 0.35 % FSO | | | | | | | | | 3 | | | | | | | | | | | | |
| standard for p _N ≤ 0.1 bar: 0.5 % FSO customer | | | | | | | | | 5 9 | | | | | | | | | | | | consult |
| Electrical connection | - | | - | | | | | - | 3 | | | | | | | | | | | | Consuit |
| male plug M12x1 (5-pin) / | | | | | | | | | | | N O |) 1 | | | | | | | | | |
| plastic version male plug M12x1 (8-pin) / ³ | | | | | | | | | | | | | | | | | | | | | |
| plastic version | | | | | | | | | | | M 5 | 0 | | | | | | | | | |
| male plug M12x1 (5-pin) / | | | | | | | | | | | N 1 | 1 | | | | | | | | | |
| metal version male and female plug ISO 4400 ² | | | | | | | | | | | 1 0 | | | | | | | | | | |
| male plug Binder series 723 (5-pin) | | | | | | | | | | | 2 0 |) 4 | | | | | | | | | |
| cable outlet with PVC cable ⁴ | | | | | | | | | | | TA | 0 | | | | | | | | | |
| customer | _ | _ | _ | | | | _ | _ | _ | _ | 9 9 | 9 | | _ | _ | _ | | _ | | | consult |
| 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 G1/2" DIN 3852 open pressure port | | | | | | | | | | | | | | 4 H | 0 0 0 0 0 0 | | | | | | |
| 1/2" NPT | | | | | | | | | | | | | | N | 0 0 | | | | | | |
| 1/4" NPT | | | | | | | | | | | | | | N | 0 0 4 0 9 9 | | | | | | |
| customer | | | | | | | | | | | | | | 9 | 9 9 | | | | | | consult |
| Seals FKM | | | | | | | | | | | | | | | | | 1 | | | | |
| customer | | | | | | | | | | | | | | | | | 9 | | | | consult |
| Special version | | | | | | | | | | | | | | | | | | | Ļ | | |
| standard customer | | | | | | | | | | | | | | | | | | 0 | 0 9 | 0 | consult |
| Customer | | | | | | | | | | | | | | | | | | Э | ð | J | CONSUIL |

 $^{^{1}}$ with IS version max. 1 contact is 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



DS 214

Electronic Pressure Switch for Very High Pressure

Thinfilm Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO

Nominal pressure

from 0 ... 600 bar up to 0 ... 2 200 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- pressure sensor welded
- extremely robust and excellent longterm stability

Optional versions

- adjustability of span and offset (4 ... 20 mA / 3-wire)
- customer specific versions

The electronic pressure switch DS 214 for very high pressure up to 2 200 bar has been designed especially for use in plant and machine engineering as well as in mobile hydraulics.

The DS 214 has one 1 contact with standard version, this can optionally be upgraded up to four independent contacts.

Via the rotatable modul with an integrated 4-digit display the DS 214 can be programmed easily and comfortably.

Preferred areas of use are



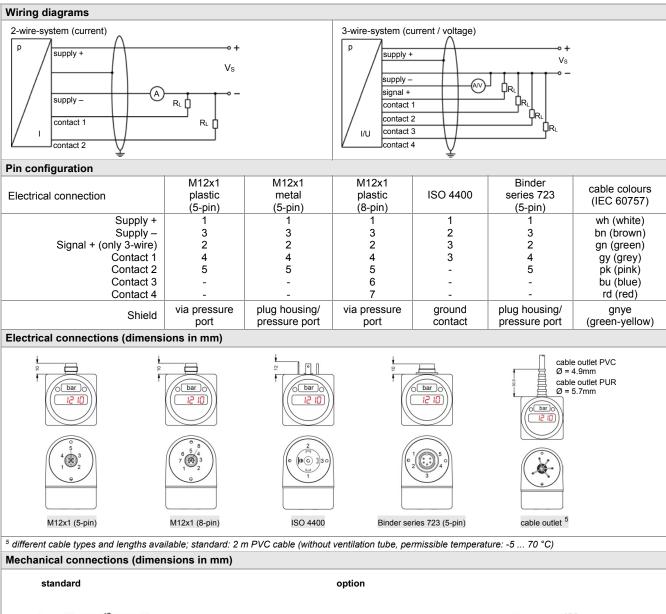
Plant and machine engineering

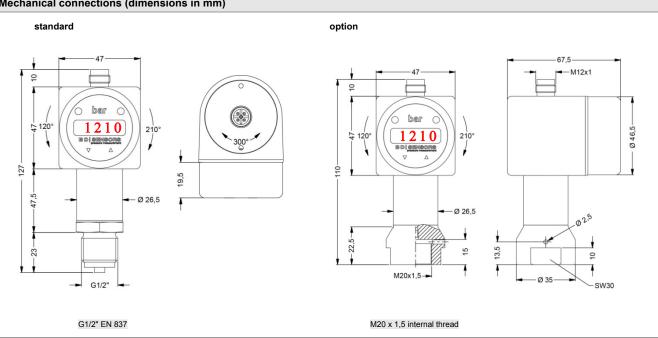


Commercial vehicles and mobile hydraulics

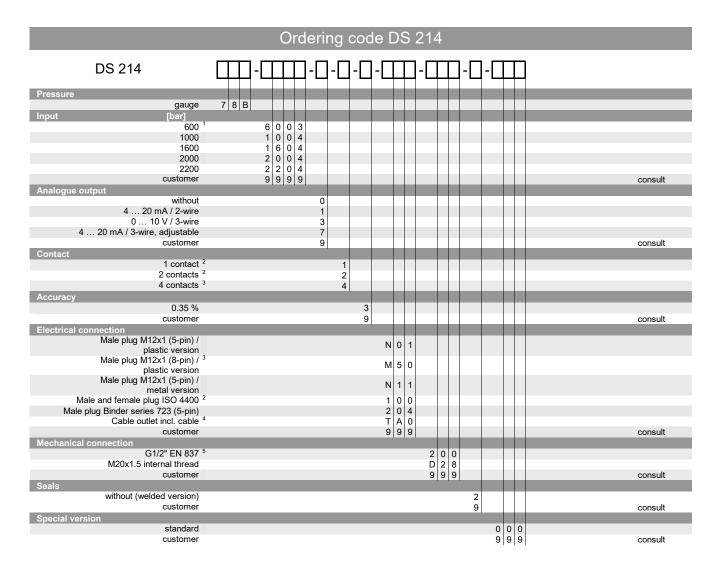


| Input pressure range | | | | | |
|--|---|---|--------------------------------------|--|-----------------------|
| Nominal pressure gauge [bar] | 600 ¹ | 1000 | 1600 | 2000 | 2200 |
| Overpressure [bar] | 800 | 1400 | 2200 | 2800 | 2800 |
| ¹ only available with pressure port G1/2 | " EN 837 | | | | |
| Contact ² | | | | | |
| Standard | 1 PNP contact | | | | |
| Options | 2 independent PNP | | | | |
| | 4 independent PNP | | with M12x1, 8-pin fo | · · · · · · · · · · · · · · · · · · · | |
| Max. switching current | 4 20 mA / 2- and | | | circuit resistant; V _{switch} | = V _S – 2V |
| | 0 10 V / 3-wire: | contact i | ating 125 mA, short-o | circuit resistant | |
| Accuracy of contacts 3 | ≤ ± 0.35 % FSO | | | | |
| Repeatability | ≤ ± 0.1 % 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 signs no contact possible with 3-wire in com | | 400 | | | |
| · | | +00 | | | |
| Analogue output (optionally) / S | | 2 00 1/ | | | |
| 2-wire current signal | 4 20 mA / V _S = 13 | | 02.41.0 | ******** | a tima: < 10 maga |
| 2 wire current cianal | permissible load: R _m | $l_{\text{ax}} = [(V_{\text{S}} - V_{\text{S min}}) / U]$ | .02 AJ Ω le (turn-down of span | | e time: < 10 msec |
| 3-wire current signal | permissible load: R _m | | ie (turri-down or span | | e time: < 3 sec |
| 3-wire voltage signal | 0 10 V / V _S = 15 | | nissible load: R _{min} = 10 | | e time: < 3 sec |
| Without analogue output | $V_S = 15 \dots 36 V_{DC}$ | 30 V _{DC} perii | iissible ioau. R _{min} – It | 7 K22 Tespons | e time. < 3 msec |
| Accuracy ³ | ≤ ± 0.35 %FSO IEC | 60770 | | | |
| ³ accuracy according to IEC 60770 – lii | | | epeatability) | | |
| ⁴ with turn-down of span the analogue | signal is adjusted automa | atically to the new mea | suring range | | |
| Thermal effects (Offset and Spa | n) | | | | |
| Thermal error | , ≤±0.25 % FSO / 10 | K | | | |
| in compensated range | -20 85 °C | | | | |
| Permissible temperatures | | | | | |
| Permissible temperatures | medium: | -40 140 | °C | | |
| r emissible temperatures | electronics / environ | | | | |
| | storage: | -40 100 | | | |
| Electrical protection | otorago. | 10 100 | | | |
| • | normanant | | | | |
| Short-circuit protection | permanent | | | | |
| Reverse polarity protection | no damage, but also | | | | |
| Electromagnetic compatibility | emission and immur | nity according to EN | 61326 | | |
| Mechanical stability | | | | | |
| Vibration | 10 g RMS (25 200 | 00 Hz) | | | |
| Shock | 100 g / 11 msec | | | | |
| Materials | | | | | |
| Pressure port | stainless steel 1.454 | ·2 (17-4 PH) | | | |
| Housing | stainless steel 1.440 | | | | |
| Display housing | PA 6.6, polycarbona | | | | |
| | | | | | |
| Seals (media wetted) | none (welded versio | , | | | |
| Diaphragm | stainless steel 1.454 | | | | |
| Media wetted parts | pressure port, diaph | ragm | | | |
| Miscellaneous | | | | | |
| Display | | | | of indication -1999 | +9999; |
| | | | 0.3 30 sec (progi | rammable); | |
| Current concumption | measured value upd | | | | |
| Current consumption (without contacts) | 2-wire signal output 3-wire signal output | | | | |
| (without contacts) | 3-wire signal output | | 45 mA 7 mA + signal currer | nt | |
| Ingress protection | <u> </u> | vollage. applox. | 7 HIA - Signal Cullet | | |
| Ingress protection | IP 65 | | | | |
| Installation position | any | | | | |
| Weight | min. 200 g (dependi | ng on mechanical co | onnection) | | |
| Operational life | p _N = 600 bar: 100 m | illion load cycles | p _N > 600 bar: 10 | million load cycles | |
| CE-conformity | EMC Directive: 2014 | I/30/EU | Pressure Equipm | ent Directive: 2014/68 | B/EU (module A) |
| · · · · | | | | | - \ |





Ordering Code



¹ only available with pressure port G1/2" EN 837

 $^{^{2}}$ 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

 $^{^{\}rm 4}$ standard: 2 m PVC cable without ventilation tube, others on request

⁵ According to EN 837, the pressure port and the complement, at pressure over 1000 bar must be preferably made of stainless steel with a tensile strength of R_P > 260 N/mm² in accordance with DIN 17440. The maximum allowed pressure is 1600 bar!



DS 233

Differential Pressure Switch for Gases and Compressed Air in Compact Version

Silicon Sensor

accuracy according to IEC 60770: 0.35% FSO

Differential pressure

from 0 ... 6 mbar up to 0 ... 1000 mbar

Output signal

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA 0 ... 10 V

Special characteristics

- aluminium housing
- LED display
- rotatable and configurable display module
- suited for non aggressive gases and compressed air

Optional versions

- 1 / 2 PNP contacts
- customer specific versions

The DS 233 is a differential pressure switch with digital display for non-aggressive gases and compressed air. Because of its compact and robust aluminium housing it is particularly suited for machine and plant engineering.

Basic element of the DS 233 is a piezoresistive silicon pressure sensor, which features high accuracy and excellent long term stability.

As standard the DS 233 offers a PNP contact and a rotatable display module with 4-digit LED display for representing the differential pressure. Optional up to two freely configurable contacts are available.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning





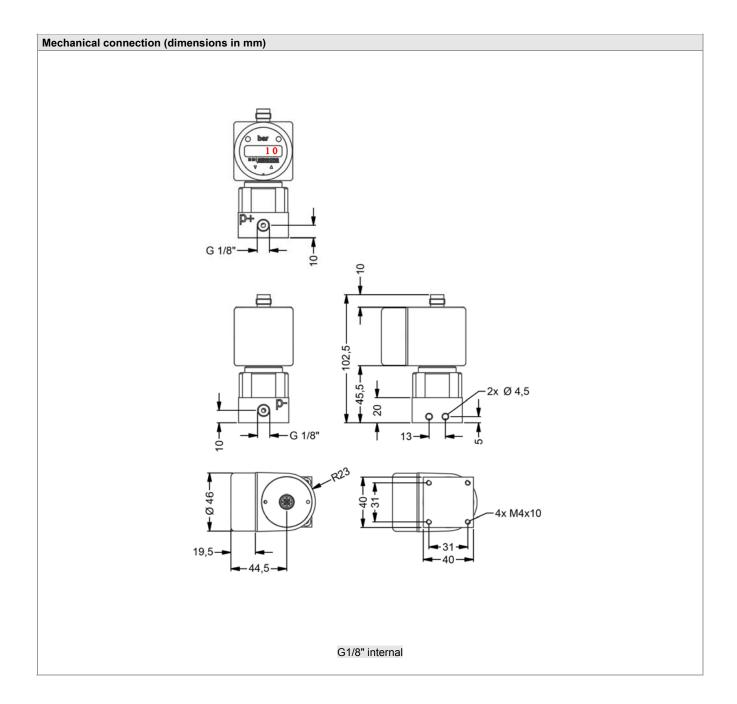


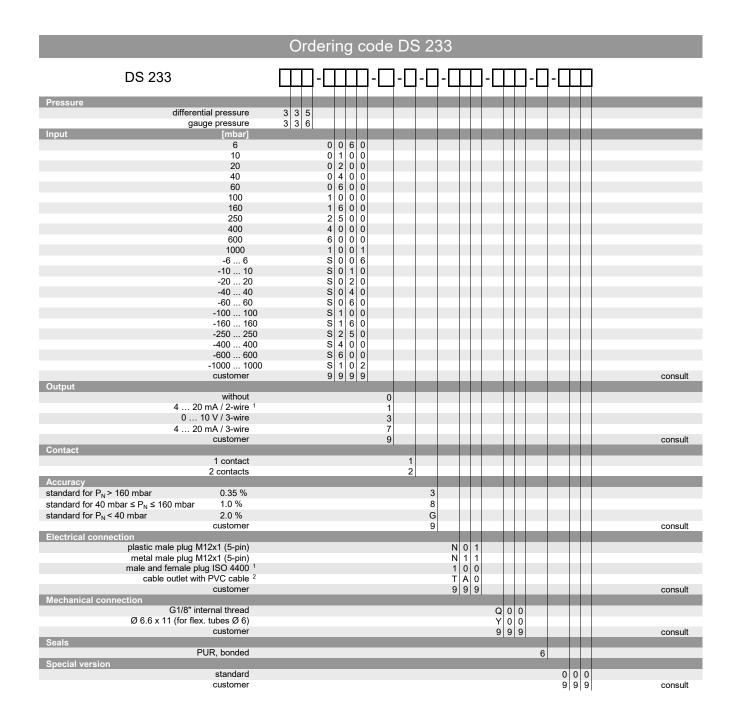
| Input pressure range | | | | | | | | | | | |
|--|-----|------|------|------|------|-------|-------|-------|-------|-------|--------|
| Nominal pressure P _N [mbar] (over, differential pressure) | 06 | 010 | 020 | 040 | 060 | 0100 | 0160 | 0250 | 0400 | 0600 | 01000 |
| Nominal pressure P _N symmetric (differential pressure) [mbar] | ± 6 | ± 10 | ± 20 | ± 40 | ± 60 | ± 100 | ± 160 | ± 250 | ± 400 | ± 600 | ± 1000 |
| Overpressure [mbar] | 100 | 100 | 200 | 350 | 350 | 1000 | 1000 | 1000 | 1000 | 3000 | 3000 |

| Contact ¹ | | | | |
|--|--|---|-------------------------|---|
| Standard | 1 PNP contact | | | |
| Option | 2 independent PNP cont | acts | | |
| Max. switching current | 4 20 mA / 2- and 3-wir | | mA. short-circuit res | istant; V _{Switch} = V _S - 2V |
| | 0 10 V / 3-wire: | | mA, short-circuit res | |
| Accuracy of contacts ² | P _N > 160 mbar: | ≤ ± 0.35 % FSO | | |
| • | 40 mbar ≤ P _N ≤ 160 mba | r: ≤±1% FSO | | |
| | P_N < 40 mbar: | ≤ ± 2 % FSO | | |
| Repeatability | ≤ ± 0.1 % FSO | | | |
| Switching frequency | max. 10 Hz | | | |
| Switching cycles | > 100 x 10 ⁶ | | | |
| Delay time | 0 100 sec | | | |
| ¹ max. 1 contact for 2-wire current s | ignal with plug ISO 4400, no conta | act possible with 3-wire in con | nbination with plug ISO | 4400 |
| Analogue output (optionally) | Supply | | | |
| 2-wire current signal | 4 20 mA / V _S = 13 3 | 36 V _{DC} | | |
| - | permissible load: R _{max} = [| $(V_S - V_{S min}) / 0.02 A] \Omega$ | | response time: < 10 msec |
| 3-wire current signal | 4 20 mA / V _S = 19 3 | 30 V _{DC} adjustable (turn-do | wn of span 1:5) 3 | · |
| | permissible load: R _{max} = 9 | | | response time: < 3 sec |
| 3-wire voltage signal | 0 10 V / V _S = 15 36 | V _{DC} | | |
| | permissible load: R _{min} = 1 | 0 kΩ | | response time: < 3 msec |
| Without analogue output | V _S = 15 36 V _{DC} | | | · |
| Accuracy ² | P _N > 160 mbar: | ≤ ± 0.35 % FSO | | |
| • | 40 mbar ≤ P _N ≤ 160 mba | r: ≤±1% FSO | | |
| | P _N < 40 mbar: | ≤ ± 2 % FSO | | |
| ² accuracy according to IEC 60770 - | | | | |
| ³ with turn-down of span the analogu | e signal is adjusted automatically | to the new measuring range | | |
| Performance | | | | |
| Influence effects | supply: 0.05 % FSO load: 0.05 % FSO | | | |
| Long term stability | ≤ ± 0.2 % FSO / year | | | |
| Thermal effects (Offset and S | oan) / Permissible temperat | ures | | |
| Nominal pressure P _N [mb | oar] ≤ 10 | ≤ 20 | ≤ 250 | > 250 |
| Tolerance band [% FS | SO] ≤ ± 2 | ≤ ± 1.5 | ≤±1 | ≤ ± 0.5 |
| TC, average [% FSO / 10 | - | ± 0.25 | ± 0.15 | ± 0.08 |
| in compensated range | | | 60 °C | |
| Permissible temperatures | medium: | -25 125 °C | | |
| , | electronics / environment | | | |
| | storage: | -40 100 °C | | |
| Electrical protection | | | | |
| Short-circuit protection | permanent | | | |
| Reverse polarity protection | no damage, but also no t | unction | | |
| Electromagnetic compatibility | emission and immunity a | | | |
| Mechanical stability | ,, | <u>-</u> | | |
| Vibration | 10 g RMS (20 2000 Hz | z) according to DIN E | N 60068-2-6 | |
| Shock | 100 g / 11 msec | according to DIN E | | |
| Materials | 100 g / 11 111300 | according to DIN L | 30000 2-0 | |
| | aluminium ailuar an adia | \d | | |
| Pressure port | aluminium, silver anodize | | | |
| Housing Display housing | aluminium, silver anodise | t u | | |
| Display housing | PA 6.6, polycarbonate | | | |
| Seal | PUR | | 1 | |
| Sensor Media wetted parts | | ₂ O ₃ , Epoxy, stainless stee | 91 | |
| | pressure port, housing, s | 1 | | |

| Miscellaneous | | | | | | | | | | |
|---|--|---|--|---|--|--|--|--|--|--|
| Display | accuracy 0.1 % ± 1 digit; | ED display, digit height 7 m digital damping 0.3 30 0.0 10 sec (programma | sec (programmable); | 999 +9999; | | | | | | |
| Current consumption (without contacts) | 2-wire signal output curre 3-wire signal output curre 3-wire signal output volta | ent: max. 25 mA ent: approx. 45 mA + si | | | | | | | | |
| Ingress protection | IP 65 | | | | | | | | | |
| Weight | approx. 350 g | | | | | | | | | |
| Operational life | 100 million load cycles | | | | | | | | | |
| CE-conformity | EMC Directive: 2014/30/ | EU | | | | | | | | |
| Pin configuration | | | | | | | | | | |
| Electrical connection | ISO 4400 | M12x1 plastic (5-pin) | M12x1 metal (5-pin) | cable colours (IEC 60757) | | | | | | |
| Supply + Supply – Signal + (only 3-wire) Contact 1 Contact 2 | 1 2 3 3 - | 1 3 2 4 5 | 1 3 2 4 5 plug housing/ | wh (white) bn (brown) gn (green) gy (grey) pk (pink) gnye | | | | | | |
| Shield | ground contact | via pressure port | pressure port | (green-yellow) | | | | | | |
| Wiring diagrams | | | , - , - , | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | | | |
| 2-wire-system (current) | | 3-wire-system (c | urrent / voltage) | | | | | | | |
| supply + supply - contact 1 contact 2 Electrical connections (dimension | Vs Vs | signa | supply – Vs – Vs – RL – Contact 1 | | | | | | | |
| standard | opti | ion | | | | | | | | |
| | 2 | Dar O | PVC-cable Ø=4.9mm, PUR-cable Ø=5.7mm | | | | | | | |
| ISO 4400 | | M12x1 (5-pin) | cable outlet with PVC-cable ⁴ | | | | | | | |

⁴ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C), optionally cable with ventilation tube





¹ max. 1 contact for 2-wire current signal with plug ISO 4400, no contact possible with 3-wire in combination with plug ISO 4400

 $^{^2}$ standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70 °C)



DS 400P

Intelligent Electronic Pressure Switch Stainless Steel

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotable and configurable display module
- configurable contacts (switch on / switch off points, hysteresis/ window mode, switch on / switch off delay)
- hygienical version

Optional versions

IS-version

Ex ia = intrinsically safe for gases and dusts

customer specific versions

The electronic pressure switch DS 400P is the successful combination of

- intelligent pressure switch
- digital display

and has been developed for process industry; especially for food industry and pharmacy.

As standard the DS 400P offers a PNP contact and a rotable display module with 4-digit LED display.

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

Preferred areas of use are



Food industry



Pharmacy

Material and test certificates

- Inspection certificate 3.1 according to EN 10204
- Test report 2.2 according to EN 10204













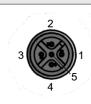
Input pressure range 1

| Input pressure range ¹ | | | | | | | | | | | | | | | | |
|---|-------------------|---------------------------------|--|------------------|-----------|-----------|----------------------|----------------|----------|--------------------|--------------------|---------------------|---------------------|----------------|----------|----------|
| Nominal pressure gauge | [bar] | -1 0 | 0.1 | 0.16 | 0.25 | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 |
| Nominal pressure absolute | [bar] | - | - | - | - | 0.4 | 0.6 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 |
| Overpressure | [bar] | 5 | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 | 40 | 80 | 80 | 105 |
| Burst pressure ≥ | [bar] | 7.5 | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 | 50 | 120 | 120 | 210 |
| Vacuum resistance | | p _N ≥ 1 ba | ar: unli | mited v | /acuun | n resis | tance | | | p | o _N < 1 | bar: on | reque | st | | |
| ¹ consider the pressure resistance | e of fitti | ng and clan | nps | | | | | | | | | | | | | |
| 0 1 1 2 | | | | | | | | | | | | | | | | |
| Contact ² | | | | | | | | | | | | | | | | |
| Number, type | | standard | | 'NP co ndepen | | ND as | | | | | | | | | | |
| Max. switching current | | option: | | | | | | tant. \/ | | | , | | | | | |
| Accuracy of contacts ³ | | contact | | | | | | | | | | process | ro > 0 | 1 hor: | < + 0.2 | E 0/ ESO |
| Accuracy of contacts | | option: | | | | | bar. ≤ bar: ≤ | | | | minai | pressu | re ≥ 0. | 4 bar. | ≥ ± 0.3 | 5 % FSO |
| Repeatability | | ≤ ± 0.1 ° | | | Coourt | J = 0.7 | bui | 0.20 | 7010 | | | | | | | |
| Switching frequency | | 2-wire: r | | | | 1 | | 3-wire | : 50 H | | | | | | | |
| Switching cycles | | > 100 x | | 0112 | | | | 0 11110 | . 00 112 | _ | | | | | | |
| Delay time | | 0 100 X | | | | | | | | | | | | | | |
| ² with IS-protection max. 1 contact | ct noss | | 360 | | | | | | | | | | | | | |
| Analogue output (optionall | | | | | | | | | | | | | | | | |
| | y) / Su | | Λ / \ | / - 12 | 26.1 | . , | | | | | | | | | | |
| 2-wire current signal | | 4 20 r | | | | | .) / 0 | በኃ ለ1 ረ |) | | | | roons | neo ti- | no: - 11 |) maga |
| 2-wire current signal with | | permiss 4 20 r | | | | | min) / U. | 02 H] [| ۷ | | | | respo | nise III | ne: < 10 | HISEC |
| IS-protection | | permissi | | | | |) / n | 02 Δ1 <i>C</i> |) | | | | reenc | nnse tin | ne: < 1(|) msec |
| 3-wire current signal | | | | | | | | | | n of sn | an 1·F | 5) 4 | icspC | nioc III | 11 | J 111366 |
| o wile culterit signal | | | 4 20 mA / V_S = 24 V_{DC} ± 10 % adjustable (turn-down of span 1:5) 4 permissible load: R_{max} = 500 Ω response time: < 30 mse | | | | | | | | | | | |) msec | |
| Without analogue output | | V _S = 15 | | | , 000 | | | | | | | | , cope | | | |
| Accuracy ³ | | | | | essure | < 0.4 | har: < | +059 | % FSC |) / nor | minal r | ressur | e > 0 4 | 1 har | < + 0.35 | % FSO |
| / toodi doy | | option: | | | | | bar: ≤ | | | | ııııaı ş | Jicobai | 0 = 0 | r bui | 0.00 | 70100 |
| ³ accuracy according to IEC 6077 | '0 – lim | it point adju | stment | (non-lir | earity, | hystere | sis, repe | eatabilit | y) | | | | | | | |
| 4 with turn-down of span the anal | ogue si | gnal is adju | sted au | ıtomatic | ally to t | he new | measui | ring ran | ge | | | | | | | |
| Thermal errors (offset and sp | oan) ⁵ | | | | | | | | | | | | | | | |
| Nominal pressure p _N | [bar] | | -1 0 < 0.40 ≥ 0.40 | | | | | | | | | | | | | |
| Tolerance band [% | FSO] | | ≤ <u>+</u> | 0.75 | | | | ≤ | ± 1.5 | | | | | $\leq \pm 0$. | 75 | |
| in compensated range | [°C] | | | | | | | | | | | | | | | |
| ⁵ an optional cooling element can | influen | ce thermal | effects | for offse | et and s | pan dej | pending | on inst | allation | position | and fil | ling con | ditions | | | |
| Permissible temperatures | | | | | | | | | | | | | | | | |
| Filling fluid | | | | s | ilicone | oil | | | | | | food (| compa | tible oi | l | |
| Medium ⁶ | | | | -40 |) 12 | 5 °C | | | | | | -10 |) 12 | 5 °C | | |
| Medium with cooling element | . 7 | | overpr | essure | : -40 | 300 |) °C | | | | overp | ressure | e: -10 |) 250 |) °C | |
| | | | vacuu | m: | -40 | 150 | °C 8 | | | | vacuu | m: | -10 |) 150 | °C 8 | |
| Electronics / environment | | | | | | | | | 8 | | | | | | | |
| Storage | | | | | | | | -40 | 10 | 0°C | | | | | | |
| 6 max. temperature of the mediun 7 max. temperature depends on the 8 also for p_{abs} ≤ 1 bar | | | | | | | | тах. е | nvironn | nental te | empera | ture of 5 | 50 °C | | | |
| Electrical protection | | | | | | | | | | | | | | | | |
| Short-circuit protection | | permane | ent | | | | | | | | | | | | | |
| Reverse polarity protection | | no dama | ige, bu | ıt also | no fun | ction | | | | | | | | | | |
| Electromagnetic compatibility | ' | emission | n and i | mmuni | ty acco | ording | to EN 6 | 31326 | | | | | | | | |
| Mechanical stability | | | | | | | | | | | | | | | | |
| Vibration (DIN EN 60068-2-6 |) | G 1/2": | 20 a R | MS (2 | 5 20 | 00 Hz |) | (| others | excent | G 1/2 | ": 10 o | RMS | (25 | 2000 H | lz) |
| Shock (DIN EN 60068-2-27) | , | G 1/2": | | | | , <u></u> | , | | | | | ": 100 | | | | -/ |
| Filling fluids | | J ./ | g | | _ | | | | 5,5 | sopt | - 1,2 | . 100 | 3, 11 | | | |
| | | ailiaana | اند | | | | | | | | | | | | | |
| Standard Optional | | silicone food con | | ام منا م | oordi- | a to 2 | 10ED4 | 70 257 | 'n | | | | | | | |
| Optional | | (Mobil S | | | | | | | | tration | No · 1 | /1500° | ١ | others | on req | uest |
| Materials | | (IVIODII 3 | . 10 01 | Juo JZ | , Jaiet | JOI Y CO | ou c . 11 | i, inor | regis | auuil | 140 1 | - 1 1000 | , | Jui 161 8 | on requ | ucol |
| | | inch #L | .ad. | | | | | | toin! | 20 ct - | 11 444 | 14 (242 | : 1 \ | | | |
| Pressure port | | inch thre | | mn dia | ırv nine | \/ari\ | /ent®· | | | | | 04 (316 35 (316 | | | | |
| Diaphragm | | stainless | | | | | ront . | • | , can ne | JIEE | ++ | 00 (010 | <i>,</i> _ <i>)</i> | | | |
| Housing / cap | | stainless | | | | | | | | | | | | | | |
| Viewing glass | | | | | | | | | | | | | | | | |
| | | laminate | | | | mond | od for | andi: ::- | tom | orotive | c < 20 | U °C/ | | | | |
| Seals | | standard option: Clamp, d | FF | KM (| recom | mende | ed for n | | | erature erature | | | | others | on req | uest |
| Media wetted parts | | pressure | | | | | | | | | | | | | | |
| | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | _ | |

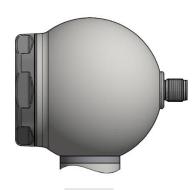
| Explosion protection (only for 4 | 20 mA / 2-wire) | | | | | | | |
|--|---|--|--|--|--|--|--|--|
| Approval AX14-DS 400P | IBExU 06 ATEX 1050 X | | | | | | | |
| | zone 0: II 1G Ex ia IIC T4 Ga | | | | | | | |
| | zone 20: II 1D Ex ia IIIC T135 °C Da | | | | | | | |
| Safety technical maximum values | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ | | | | | | | |
| Max. switching current ⁹ | 70 mA | | | | | | | |
| Permissible temperatures for | in zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar | | | | | | | |
| environment | in zone 1 or higher: -25 70 °C | | | | | | | |
| ⁹ the real switching current in the applica | tion depends on the power supply unit | | | | | | | |
| Miscellaneous | | | | | | | | |
| EHEDG certificate | EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for | | | | | | | |
| Type EL Class I | - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. | | | | | | | |
| | - Varivent® (P41): EPDM-O-ring which is FDA-listed | | | | | | | |
| Diamles | - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH | | | | | | | |
| Display | 4-digit, 7-segment-LED display, visible range 37.2 x 11 mm; digit height 10 mm, range of indication -1999 +9999; accuracy 0.1% ± 1 digit; | | | | | | | |
| | digital damping 0.3 30 sec (programmable); | | | | | | | |
| | measured value update 0.0 10 sec (programmable) | | | | | | | |
| Current consumption | 2-wire signal output current: max. 25 mA | | | | | | | |
| (without contacts) | 3-wire signal output current: approx. 30 mA + signal current | | | | | | | |
| Ingress protection | IP 67 | | | | | | | |
| Installation position | any (standard calibration in a vertical position with the pressure port connection down; | | | | | | | |
| • | differing installation position for $p_N \le 4$ bar have to be specified in the order) | | | | | | | |
| Surface roughness | pressure port R _a < 0.8 µm (media wetted parts) | | | | | | | |
| | diaphragm $R_a < 0.15 \mu m$ | | | | | | | |
| | weld seam R _a < 0.8 μm | | | | | | | |
| Weight | min. 500 g (depending on mechanical connection) | | | | | | | |
| Operational life | 100 million load cycles | | | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU | | | | | | | |
| ATEX Directive | 2014/34/EU | | | | | | | |
| Wiring diagrams | | | | | | | | |
| 2-wire-system (current) | 3-wire-system (current) | | | | | | | |
| supply + supply - contact 1 contact 2 | p supply + vs - signal + contact 1 contact 2 | | | | | | | |

Pin configuration

| · | |
|------------------------|------------------------------|
| Electrical connection | M12x1 / metal (5-pin) |
| Supply + | 1 |
| Supply – | 3 |
| Signal + (only 3-wire) | 2 |
| Contact 1 | 4 |
| Contact 2 | 5 |
| Shield | plug housing / pressure port |



Designs 10

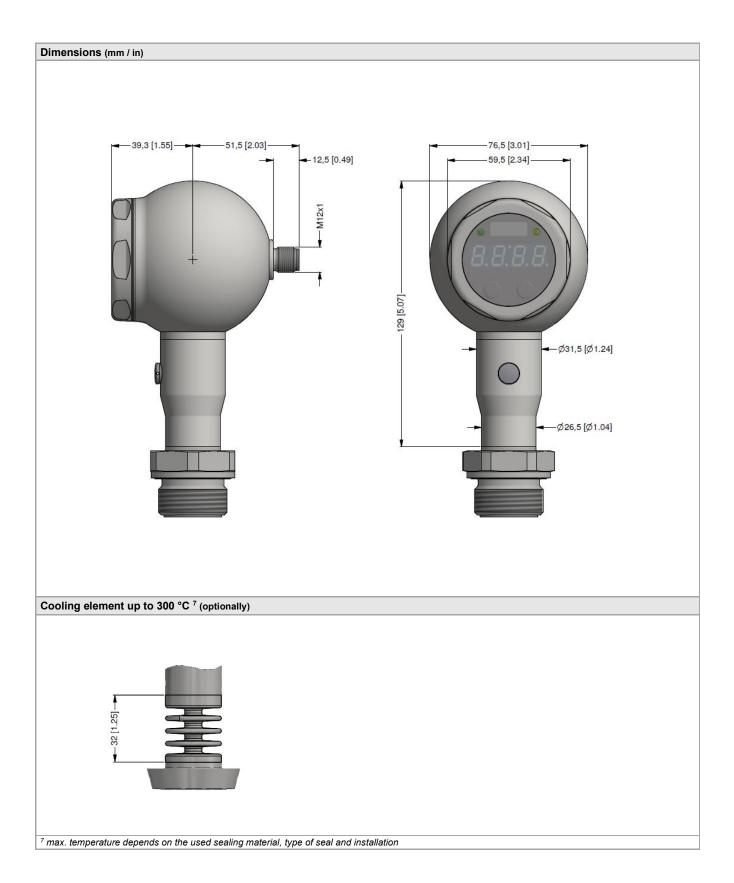


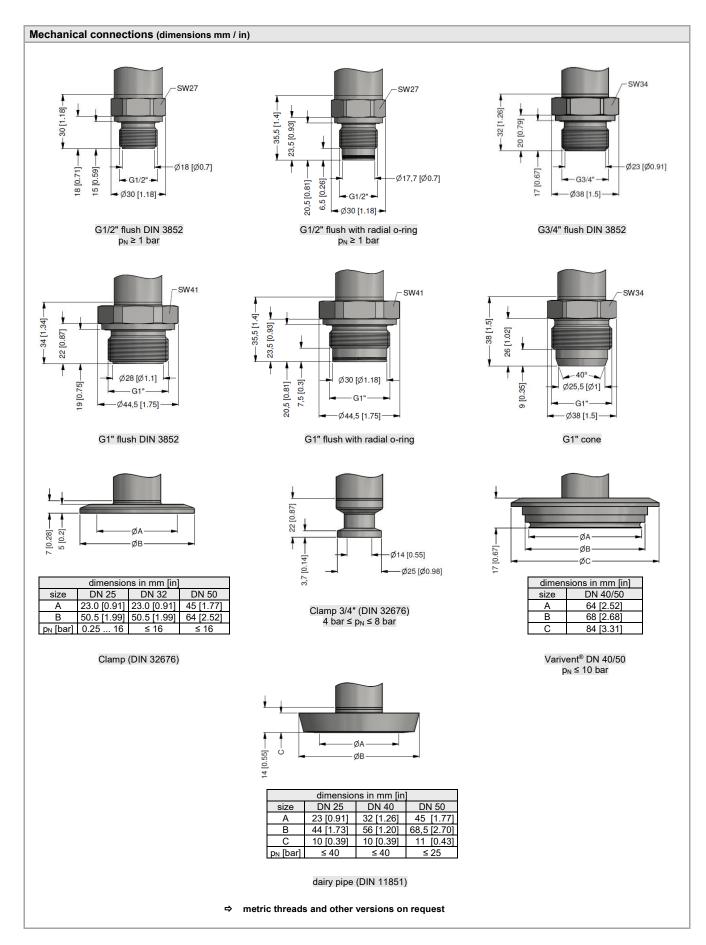


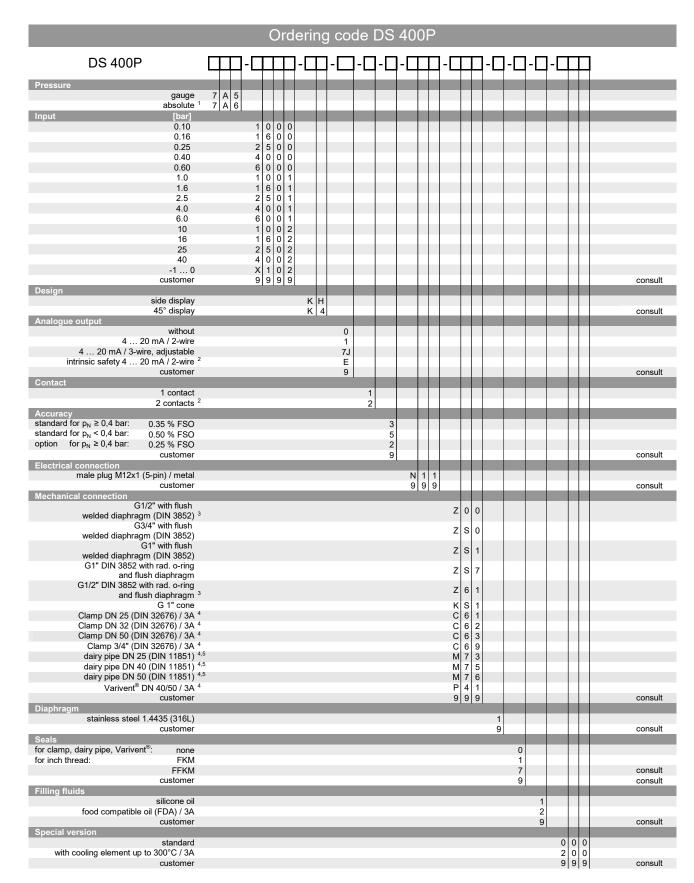


45° display (on request)

¹⁰ all designs in horizontal rotatable housing as standard







¹ absolute pressure possible from 1 bar

² with IS version max. 1 contact is possible

 $^{^3}$ only possible for nominal pressure ranges $p_N \ge 1$ bar

⁴ possible nominal pressure ranges according to data sheet

⁵ The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position. Varivent[®] is a brand name of GEA Tuchenhagen GmbH



DS 350P

Electronic Pressure Switch with IO-Link Interface

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.5 % FSO / 0.35 % FSO

option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Digital output signal

IO-Link according to specification V 1.1 smart sensor profile data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 0 ... 10 V

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module
- parameter settings via IO-Link or menu (VDMA-conform)
- additional information via IO-Link accessible

Optional versions

- different mechanical connections
- cooling element for medium temperatures up to 300 °C
- customer specific versions

The DS 350P is an electronic pressure switch which has been designed for food industry and pharmacy. In addition to a large number of flush process connections, a multi-rotatable display module as standard is offered. This makes it easier for the user to read / operate it also in unusual display positions due to installation conditions on-site.

The integrated IO-Link interface provides process data, diagnostics, and status messages as well as other features, which are helpful for service and maintenance.

The switchability of the output signal as switching signal or analogue signal (mA / V) increases flexibility and integration in different applications.

Preferred areas of use are



Food industry



Pharmacy

Material and test certificates

- Inspection certificate 3.1 according to EN 10204
- Test report 2.2 according to EN 10204













DS 350P

Technical Data

Input pressure range 1

Vibration

Optional

Filling fluids Standard

Shock

| input prossure range | | | | | | | | | | | | | | | |
|---|----------------------|--|---------------|-------------|------------|------------|------------|------------|------------------|----------------|------------|-----------|---------|-------|-----|
| Nominal pressure gauge | [bar] | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 |
| Nominal pressure absolute | [bar] | - | - | - | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 |
| Overpressure (static) | [bar] | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 | 40 | 80 | 80 | 105 |
| Burst pressure ≥ | [bar] | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 | 50 | 120 | 120 | 210 |
| Vacuum resistance | [bar] | p _N ≥ 1 bar: unlimited vacuum resistance p _N < 1 bar: on request | | | | | | | | | | | | | |
| ¹ consider the pressure resistant | ce of fitting a | nd clam | os | | | | | | | | | | | | |
| Sumply | | | | | | | | | | | | | | | |
| Supply Voltage supply | | \/ - 1 | 0 20 | 11/ | | | | | | | | | | | |
| Voltage supply | | Vs - I | 8 30 | V DC | | | | | | | | | | | |
| Output signals | | 10.1: | | (DND) | (A IDA I) | | L. I . | | | | | | | | |
| Output signal 1 | | | | | | switcha | | //0 | | | DNIE | . / NIDNI | | -1-1- | |
| Output signal 2 | | | 0 mA / | 3-wire | or | U | 10 \ | / / 3-WI | re | or | PNF | / NPN | switch | able | |
| Signal characteristics swit | | | | | | | | | | | | | | | |
| Accuracy of switching points | 2 | | 35 % F | | | | | | | | | | | | |
| Repeatability | | | 1 % FS | 0 | | | | | | | | | | | |
| Max switching current | | 150 m | A | | | | | | | | | | | | |
| Switching frequency | | | 170 Hz | | | | | | | | | | | | |
| Delay time | | 0.0 | 50.0 s | ec | | | | | | | | | | | |
| Response time | | < 12 n | nsec | | | | | | | | | | | | |
| Signal characteristics anal | logue sign | al | | | | | | | | | | | | | |
| Accuracy ² | | standa | ard: n | ominal | pressu | re < 0 | .4 bar: | ≤ ± (|).50 % I | FSO | | | | | |
| | | | n | ominal | pressu | re ≥ 0. | 4 bar: | ≤±(|).35 % I | FSO | | | | | |
| | | option | | | | re ≥ 0. | | |).25 % I | FSO | | | | | |
| Long term stability | | ≤ ± 0.3 | 3 % FS | O / yea | r at refe | erence (| conditio | ns | | | | | | | |
| Load (4 20 mA / 3-wire) | | R _{max} = | 330 Ω | | | | | | | | | | | | |
| Load (0 10 V / 3-wire) | | R _{min} = | $10\;k\Omega$ | | | | | | | | | | | | |
| Influence effects | | supply: 0.05% FSO load: ≤ 0.1 % FSO | | | | | | | | | | | | | |
| Adjustability | | offset: | ± 5 | % | | | spa | n: -10 |) % | | | | | | |
| ² accuracy according to IEC 607 | 70 – limit poi | nt adjus | tment (n | on-linea | rity, hys | teresis, r | epeatab | ility) | | | | | | | |
| Thermal effects (offset and | d span) ³ | | | | | | | | | | | | | | |
| Nominal pressure p _N | [bar] | | | | < 0.40 | | | | | | | ≥ 0.40 | | | |
| Tolerance band | [%FSO] | | | <u> </u> | ≤ ± 1.5 | | | | | | ≤ | ± 0.75 | | | |
| in compensated range | [°C] | 0 50 -20 85 | | | | | | | | | | | | | |
| ³ an optional cooling element car | n influence ti | nermal e | ffects fo | r offset a | and spar | n depend | ling on ii | nstallatio | on positio | on and fi | illing con | ditions | | | |
| Permissible temperatures | | | | | | | | | | | | | | | |
| Filling fluid | | | | sil | icone o | il | | | | | food c | ompatik | ole oil | | |
| Medium ⁴ | | | | -40 | 125 | °C | | | | | | 125 | | | |
| Medium with cooling elemen | nt ⁵ | overpressure: -40 300 °C overpressure: -10 250 °C | | | | | | | | | | | | | |
| Electronic d'accinence et la | 4 | | vacu | um: | -4(|) 150 | °C | 10 | 05 00 | vacuur | m: | -10 . | 150 ° | C | |
| Electronics / environment / s 4 max. temperature of the mediu. | m for overpr | essure > | · 0 bar: | 150 °C fo | or 60 mii | nutes wit | h a max | | 85 °C nmental | | ture of 5 | 50 °C | | | |
| ⁵ max. temperature depends on | the used sea | aling ma | terial, typ | pe of sea | al and in | stallation | | | | | | | | | |
| Electrical protection | | | | | | | | | | | | | | | |
| Short-circuit protection | | perma | | | | | | | | | | | | | |
| Reverse polarity protection | | | | out also | | | | | | | | | | | |
| Electromagnetic compatibility | у | emiss | on and | Immur | nity acc | ording t | o EN 6 | 1326 | | | | | | | |
| IO-Link | | | | | | | | | | | | | | | |
| Interface | | IO-Lin | k 1.1; S | Slave | | | | | | | | | | | |
| Data transfer | | 38.4 k | bit/sec | (COM | 2) | | | | | | | | | | |
| Mode | | SIO/ | O-Link | | | | | | | | | | | | |
| Standard | | IEC 6 | 1131-2 | IEC 6 | 1131-9 | | | | | | | | | | |
| Mechanical stability | | | | | | | | | | | | | | | |
| Vihantian | | 40 - 5 | NAC (0) | - 00 | 00 11-1 | | | | L. DINI | ENL 000 | 00 0 0 | | | | |

10 g RMS (25 ... 2000 Hz)

100 g / 1 msec

silicone oil

others on request

according to DIN EN 60068-2-6

according to DIN EN 60068-2-27

food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)

DS 350P

Technical Data

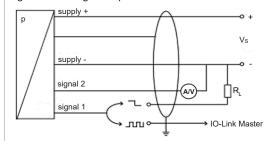
| Materials | |
|-----------------------|---|
| Display housing | PA 6.6 |
| Housing | stainless steel 1.4404 (316 L) |
| Pressure port | stainless steel 1.4404 (316 L) |
| | Clamp, Varivent®, G1" cone: stainless steel 1.4435 (316 L) |
| Diaphragm | stainless steel 1.4435 (316 L) |
| Seal | standard: FKM (recommended for medium temperatures ≤ 200 °C) |
| | option: EPDM (recommended for medium temperatures ≤ 140 °C) |
| | others on request |
| | G1" cone, Clamp, Varivent®: without |
| Media wetted parts | pressure port, seal, diaphragm |
| Miscellaneous | |
| EHEDG certificate | EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for |
| Type EL Class I | - Clamp (C61, C63): T-ring-seal from Combifit International B.V. |
| | - Varivent® (P41): EPDM-O-ring which is FDA-listed |
| Display | 4-digit, 7-segment-LED display on black base body, white, blue foil, |
| | digit height 7 mm, range of indication -1999 +9999, visible range 22.5 x 10.5 mm |
| | 4 LEDs for unit switching (bar, mbar, PSI, MPa) |
| O a matica | LED status display for IO-Link and contacts 2 buttons |
| Operation Featured | 2 3 3 1 1 3 1 3 1 3 1 3 1 3 1 3 1 3 1 3 |
| | functions according to VDMA 24574-1 110 msec |
| Turn-on time | 1.10 1.100 |
| Surface roughness | pressure port R _a < 0.8 µm (media wetted parts) |
| | diaphragm $R_a < 0.15 \mu m$ weld seam $R_a < 0.8 \mu m$ |
| Weight | approx. 250 q |
| Operational life | 100 million load cycles |
| <u> </u> | , |
| Current consumption | < 50 mA (without contacts) |
| Ingress protection | IP 67 |
| Installation position | any ⁶ |
| CE-conformity | EMC Directive: 2014/30/EU |

⁶ The pressure switch is calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $p_N \le 1$ bar.

Wiring diagrams

3-wire-system / configuration of analogue output:

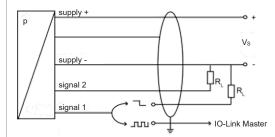
signal 1: IO-Link or contact signal 2: analogue output



3-wire-system / configuration of contact:

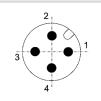
signal 1: IO-Link or contact

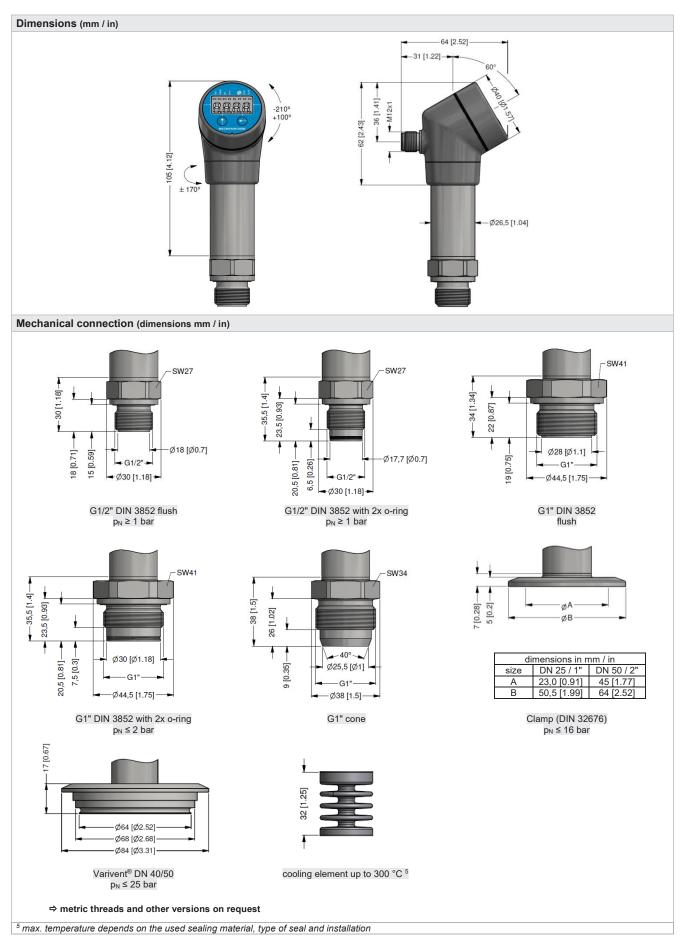
signal 2: contact



Electrical connection

| Pin configuration | | Description | M12x1 (4-pin), metal |
|-------------------|--------------|--|----------------------|
| | Supply + | supply | 1 |
| | Supply – | supply | 3 |
| Out | put signal 1 | IO-Link / SIO (PNP / NPN) | 4 |
| Out | put signal 2 | 4 20 mA – 3-wire / 010 V – 3-wire (PNP / NPN) | 2 |
| | Shield | shielding | plug housing |





Ordering Code

| | Ordering code DS 350P | | | |
|---|---------------------------------------|--------|---------|---------|
| DS 350P | |]-[]-[| |] |
| Pressure | | | | |
| gauge absolute ¹ | 7 E A 7 E C | | | |
| Input [bar] | | | | |
| 0.10 ¹ 0.16 ¹ | 1 0 0 0 1 1 6 0 0 | | | |
| 0.16 0.25 ¹ | 2 5 0 0 | | | |
| 0.40 | 4 0 0 0 | | | |
| 0.60 | 6 0 0 0 | | | |
| 1.0 1.6 | 1 0 0 1 1 1 1 6 0 1 | | | |
| 2.5 | 2 5 0 1 | | | |
| 4.0 | 4 0 0 1 | | | |
| 6.0 | 6 0 0 1 | | | |
| 10 16 | 1 0 0 2 1 6 0 2 | | | |
| 25 | 2 5 0 2 | | | |
| 40 | 4 0 0 2 | | | |
| Output | 9 9 9 9 | | | consult |
| IO-Link + PNP/NPN + analogue output ² | ı x | | | |
| Accuracy | | | | |
| standard for $p_N \le 0.4$ bar 0.50% FSO | 5 | | | |
| standard for $p_N > 0.4$ bar 0.35% FSO option for $p_N \ge 0.4$ bar 0.25% FSO | 3 2 | | | |
| customer | 9 | | | consult |
| Electrical connection | N A D | | | |
| male plug M12x1 (4-pin) / metal customer | M 1 B 9 9 9 | | | consult |
| Mechanical connection | | | | Consuit |
| G1/2" DIN 3852 flush ($p_N \ge 1$ bar) | Z 0 0 | | | |
| G1/2" DIN 3852 with 2x o-ring (p _N ≥ 1 bar) G1" DIN 3852 flush | Z 6 1 Z S 1 | | | |
| G1" DIN3852 with 2x o-ring ($p_N \le 2$ bar) | Z S 7 | | | |
| G1" cone | K S 1 | | | |
| Clamp DN 50 DIN 32676 (p _N ≤ 16 bar) | C 6 1 | | | |
| Clamp DN 50 DIN 32676 ($p_N \le 16 \text{ bar}$) Varivent® DN 40/50 ($p_N \le 25 \text{ bar}$) | C 6 3 P 4 1 | | | consult |
| customer | 9 9 9 | | | consult |
| Diaphragm | | | | |
| stainless steel 1.4435 (316L) customer | 1 9 | | | |
| Seal | 9 | | | |
| for Clamp, cone, Varivent [®] : without | 0 | | | |
| FKM | 1 | | | |
| EPDM customer | 3 9 | | | consult |
| Filling fluids | • • • • • • • • • • • • • • • • • • • | | | CONSUIT |
| silicone oil | | 1 | | |
| food compatible oil (FDA) customer | | 2 9 | | |
| Special version | | 9 | | |
| standard | | | 0 0 | |
| cooling element up to 300 °C customer | | 2 | 0 0 9 9 | |
| customer | | 9 | 9 9 | consult |

¹ absolute pressure possible from 0.4 bar

 $^{^2}$ contact PNP/NPN switchable; analogue output 0 ... 10 V / 4 ... 20 mA switchable Varivent $\!\!^{(\!0)}$ is a brand name of GEA Tuchenhagen GmbH



DS 200P

Electronic Pressure Switch

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotable and configurable display module
- configurable contacts (switch on / switch off points, hysteresis / window mode, switch on / switch off delay)

Optional versions

- IS-version Ex ia = intrinsically safe for gases
- customer specific versions

The electronic pressure switch DS 200P is the successful combination of

- intelligent pressure switch
- digital display

and is suitable for the usage with viscous and pasty media.

As standard the DS 200P offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Food industry



Pharmacy













| Input pressure range ¹ | | | | | | | | | | | | | | | | |
|---|-------------|----------------------|----------|---------|--------|---------|------|-----|-----|------------------|---------|--------|-------|-----|-----|-----|
| Nominal pressure gauge | [bar] | -1 0 | 0.10 | 0.16 | 0.25 | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 |
| Nominal pressure abs. | [bar] | - | - | - | - | 0.40 | 0.60 | 1 | 1.6 | 2.5 | 4 | 6 | 10 | 16 | 25 | 40 |
| Overpressure | [bar] | 5 | 0.5 | 1 | 1 | 2 | 5 | 5 | 10 | 10 | 20 | 40 | 40 | 80 | 80 | 105 |
| Burst pressure ≥ | [bar] | 7.5 | 1.5 | 1.5 | 1.5 | 3 | 7.5 | 7.5 | 15 | 15 | 25 | 50 | 50 | 120 | 120 | 210 |
| Vacuum resistance | | p _N ≥ 1 b | ar: unli | mited v | /acuum | resista | ance | | | p _N · | < 1 bar | on red | quest | | | |
| ¹ consider the pressure resistar | nce of fitt | ing and cla | amps | | | | | | | | | | | | | |

| Vadadiii i Colotai i Co | ph = 1 ball all million vacation resistance |
|--|--|
| ¹ consider the pressure resistance of t | itting and clamps |
| 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 contact rating 125 mA, short-circuit resistant |
| Accuracy of contacts ³ | standard: $p_N < 0.4 \text{ bar}$: ≤ ± 0.5 % FSO $p_N ≥ 0.4 \text{ bar}$: ≤ ± 0.35 % FSO option: $p_N ≥ 0.4 \text{ bar}$: ≤ ± 0.25 % FSO |
| Repeatability | ≤± 0.1 % FSO |
| Switching frequency | max. 10 Hz |
| Switching cycles | > 100 x 10 ⁶ |
| Delay time | 0 100 sec |
| no contact possible with 3-wire in co | nal with plug ISO 4400 as well as 2-wire current signal with IS-protection mbination with plug ISO 4400 imit point adjustment (non-linearity, hysteresis, repeatability) |
| Analogue output (optionally) / | Supply |
| 2-wire current signal | $4 20 \text{ mA} / V_S = 13 36 V_{DC}$ |
| _ | permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec |
| 2-wire current signal with | $4 20 \text{ mA} / V_s = 15 28 V_{DC}$ |
| IS protection | normicable lead: P = [(// //)/0.02.41.0 |

| gue output (optionally) / Sup | |
|--|--|
| current signal 4 | $/ V_{S} = 13 36 V_{DC}$ |
| pe | load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec |
| current signal with 4 | $/ V_{S} = 15 28 V_{DC}$ |
| tection pe | load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec |
| current signal 4 | $/$ V _S = 19 30 V _{DC} adjustable (turn-down of span 1:5) 4 |
| pe | load: R_{max} = 500 Ω response time: < 0.5 sec |
| voltage signal 0 | V_S = 15 36 V_{DC} permissible load: R_{min} = 10 $k\Omega$ response time: < 10 msec |
| ut analogue output V | 86 V _{DC} |
| acy ³ st | $p_N < 0.4 \text{ bar: } \le \pm 0.5 \% \text{ FSO}$ $p_N \ge 0.4 \text{ bar: } \le \pm 0.35 \% \text{ FSO}$ |
| op | p _N ≥ 0.4 bar: ≤ ± 0.25 % FSO |
| per current signal with 4 tection per current signal 4 per current signal 0 voltage signal 0 ut analogue output Voltage 3 st | $\begin{array}{llllllllllllllllllllllllllllllllllll$ |

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

| Thermal errors (offset | and span |) 5 | | |
|---------------------------------|----------|----------|---------|----------|
| Nominal pressure p _N | [bar] | -1 0 | < 0.40 | ≥ 0.40 |
| Tolerance band | [% FSO] | ≤ ± 0.75 | ≤ ± 1.5 | ≤ ± 0.75 |
| in compensated range | [°C] | -20 85 | 0 50 | -20 85 |
| | [-1] | | | |

⁵ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions

| Permissible temperatures | | |
|--|---|---|
| Filling fluid | silicone oil | food compatible oil |
| Medium ⁶ | -40 125 °C | -10 125 °C |
| Medium with cooling element ⁷ | overpressure: -40 300 °C vacuum: -40 150 °C ⁸ | overpressure: -10 250 °C vacuum: -10 150 °C ⁸ |
| Electronics / environment | -40 | 85 °C |
| Storage | -40 | 100 °C |
| 6 | | |

⁶ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C 7 max. temperature depends on the used sealing material, type of seal and installation 8 also for pabs < 1 bar

| Electrical protection |
|------------------------------|
| Short-circuit 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

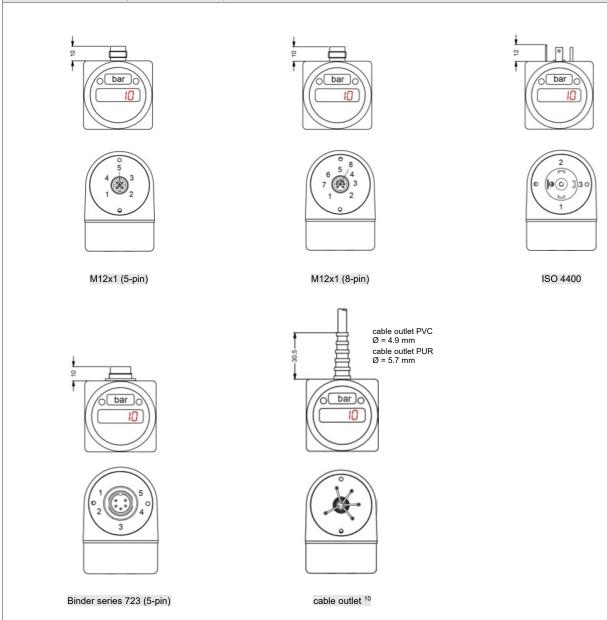
| Shock | 100 g / 11 msec | according to DIN EN 60068-2-27 |
|-----------|----------------------|--------------------------------|
| Vibration | 5 g RMS (25 2000 Hz) | according to DIN EN 60068-2-6 |

| Filling fluids | |
|----------------|---|
| Standard | silicone oil |
| Options | food compatible oil according to 21CFR178.3570 |
| | (Mobil SHC Cibus 32: Category Code: H1: NSF Registration No : 141500) |

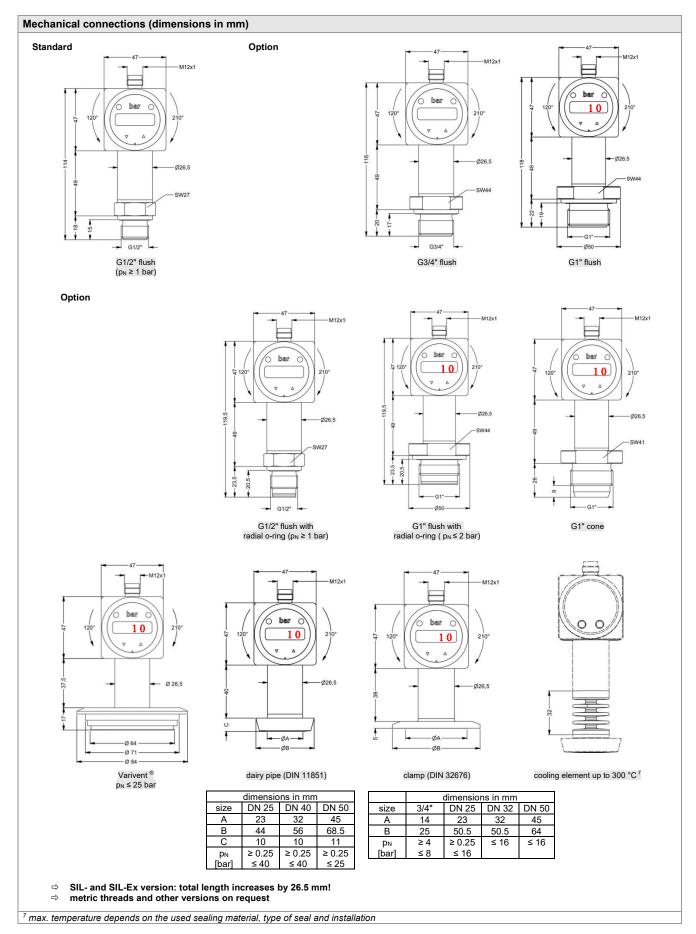
| Materials | |
|---|--|
| Pressure port | stainless steel 1.4435 (316 L) others on request |
| Housing | stainless steel 1.4404 (316 L) |
| Display housing | PA 6.6, Polycarbonate |
| Seals (media wetted) | standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) Clamp, dairy pipe, Varivent [®] : without |
| Diaphragm | standard: stainless steel 1.4435 (316 L) option: Hastelloy® C-276 (2.4819); Tantalum on request |
| Media wetted parts | pressure port, seals, diaphragm |
| Explosion protection (only for 4 | 20 mA / 2-wire) |
| Approval AX14-DS 200P | IBExU06ATEX1050 X zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) |
| Safety technical maximum values | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ |
| Max. switching current ⁹ | 70 mA |
| Permissible temperatures for environment | -25 70 °C |
| Connecting cables (by factory) | cable capacitance: signal line/shield also signal line/signal line: 100 pF/m cable inductance: signal line/shield also signal line/signal line: 1 µH/m |
| | cation depends on the power supply unit |
| Miscellaneous | |
| EHEDG certificate Type EL Class I | EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V Varivent® (P41): EPDM-O-ring which is FDA-listed - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH |
| Display | 4-digit, red 7-segment-LED display; digit height 7 mm; range of indication -1999 +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) |
| 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 (standard calibration in a vertical position with the pressure port connection down; different installation position for $p_N \le 2$ bar have to be specified in the order) |
| Surface roughness | pressure port $R_a < 0.8 \ \mu m$ (media wetted parts) diaphragm $R_a < 0.15 \ \mu m$ weld seam $R_a < 0.8 \ \mu m$ |
| Weight | approx. 160 250 g |
| Operational life | 100 million load cycles |
| CE-conformity | EMC Directive: 2014/30/EU |
| ATEX Directive | 2014/34/EU |
| Wiring diagrams | |
| 2-wire-system (current) p supply + contact 1 contact 2 | 3-wire-system (current / voltage) P supply + supply - signal + contact 1 contact 2 contact 3 contact 4 |

| 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 (IEC 60757) |
| Supply + | 1 | 1 | 1 | 1 | 1 | WH (white) |
| Supply – | 3 | 3 | 3 | 2 | 3 | BN (brown) |
| Signal + (only 3-wire) | 2 | 2 | 2 | 3 | 2 | GN (green) |
| Contact 1 | 4 | 4 | 4 | 3 | 4 | GY (grey) |
| Contact 2 | 5 | 5 | 5 | _ | 5 | PK (pink) |
| Contact 3 | - | - | 6 | _ | - | - |
| Contact 4 | - | - | 7 | _ | - | - |
| Shield | via pressure port | plug housing/ pressure port | via pressure port | ground (| plug housing/ pressure port | GNYE (green-yellow |

Electrical connections (dimensions in mm)



¹⁰ 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)



| | | С |)rde | ering | gco | ode | DS | 3 20 |)0P | | | | | | | | | |
|---|----------------|---------|---------|--------|-----|--------|--------|------------|-----|------------|-----|--------|-----|----|-----|---|---|---------|
| DS 200P | ПТ | -П | П |]-□ | -П | 1-□ | -□ | | I-∏ | | 1-Г | ٦-٢ |]-∏ | -□ | | ٦ | | |
| Pressure | | | | | | | | | | | | | | | | | | |
| gauge absolute | 7 8 5 7 8 6 | | | | | | | | | | | | | | | | | |
| Input [bar] | | 1 0 | 0 0 | | | | | | | | | | | | | | | |
| 0.16 | | 1 6 | 0 0 | | | | | | | | | | | | | | | |
| 0.25 0.40 | | 4 0 | 0 0 | | | | | | | | | | | | | | | |
| 0.60 1.0 | | | 0 0 | | | | | | | | | | | | | | | |
| 1.6 2.5 | | 1 6 | 0 1 | | | | | | | | | | | | | | | |
| 4.0 | | 4 0 | 0 1 | | | | | | | | | | | | | | | |
| 6.0 10 | | | 0 1 | | | | | | | | | | | | | | | |
| 16 25 | | 1 6 2 5 | 0 2 | | | | | | | | | | | | | | | |
| 40 -1 0 | | 4 0 | 0 2 0 2 | | | | | | | | | | | | | | | |
| customer | | | 9 9 | | | | | | | | | | | | | | | consult |
| Analogue output without | | | - | 0 | | | | - | | | | | | | 7 | | | |
| 4 20 mA / 2-wire 0 10 V / 3-wire | | | | 1 | | | | | | | | | | | | | | |
| 4 20 mA / 3-wire, adjustable | | | | 7 | | | | | | | | | | | | | | |
| intrinsic safety 4 20 mA / 2-wire ¹ customer | | | | E 9 | | | | | | | | | | | | | | consult |
| Contact 1 contact 1 | , 2 | - | - | - | 1 | | | - | | | | | | | - | | | |
| 2 contacts ¹ , 4 contacts ³ | , 2 | | | | 2 | | | | | | | | | | | | | |
| Accuracy | | | | | 4 | | | | | | | | | | | | | |
| standard for $p_N > 0.4$ bar: 0.35 % FSO standard for $p_N \le 0.4$ bar: 0.50 % FSO | | | | | | 3 5 | | | | | | | | | | | | |
| option for p _N ≥ 0,4 bar: 0.25 % FSO customer | | | | | | 2 9 | | | | | | | | | | | | consult |
| Electrical connection | | | | | | | | 0 1 | | | | | | | | | | Johnson |
| male plug M12x1 (5-pin) / plastic male plug M12x1 (8-pin) / plastic ³ | | | | | | | М | 0 1 5 0 | | | | | | | | | | |
| male plug M12x1 (5-pin) / metal male and female plug ISO 4400 ² | | | | | | | | 1 1 0 0 | | | | | | | | | | |
| male plug Binder series 723 (5-pin) cable outlet with PVC cable 4 | | | | | | | 2 T | 0 4 A 0 | | | | | | | | | | |
| customer | | | | | | | 9 | 9 9 | | | | | | | | | | consult |
| Mechanical connection G1/2" with flush welded | _ | _ | | | | | | | Z | 0 0 | | | | | 7 | т | _ | |
| diaphragm (DIN 3852) for p _n ≥ 1 bar G3/4" with flush | | | | | | | | | | 3 0 | | | | | | | | |
| welded diaphragm (DIN 3852) G1" with flush | | | | | | | | | | | | | | | | | | |
| welded diaphragm (DIN 3852) G1" DIN 3852 with rad. o-ring | | | | | | | | | | 3 1 | | | | | | | | |
| and flush diaphragm (for $p_n \le 2$ bar) | | | | | | | | | Z | 5 7 | | | | | | | | |
| G1/2" DIN 3852 with rad. o-ring and flush diaphragm (for $p_n \ge 1$ bar) | | | | | | | | | | 6 1 | | | | | | | | |
| G 1" cone Clamp DN 25 / 1" (DIN 32676) / 3A | | | | | | | | | С | 3 1 | | | | | | | | |
| Clamp DN 32 / 1 1/2" (DIN 32676) / 3A Clamp DN 50 / 2" (DIN 32676) / 3A | | | | | | | | | | 6 2 | | | | | | | | |
| Clamp 3/4" (DIN 32676) / 3A dairy pipe DN 25 (DIN 11851) ⁵ | | | | | | | | | С | 6 9 | 1 | | | | | | | |
| dairy pipe DN 40 (DIN 11851) 5 | | | | | | | | | М | 7 5 | , | | | | | | | |
| dairy pipe DN 50 (DIN 11851) ⁵ Varivent [®] DN 40/50 / 3A | | | | | | | | | | 7 6 4 1 | | | | | | | | |
| Diaphragm | _ | - | _ | - | - | - | - | - | 9 | 9 9 | 1 | - | | | 4 | | _ | consult |
| stainless steel 1.4435 (316L) tantalum | | | | | | | | | | | | 1 Г | | | | | | consult |
| Hastelloy® C-276 (2.4819) | | | | | | | | | | | H | 4 | | | | | | |
| Seals | | | | | | | | | | | (| 9 | | | | | | consult |
| for Clamp, dairy pipe, Varivent®: without for inch thread: FKM | | | | | | | | | | | | 0 | | | | | | |
| FFKM | | | | | | | | | | | | 7 | | | | | | |
| customer Filling fluids | | | | | | | | | | | | 9 | | | | | | consult |
| silicone oil food compatible oil (FDA) / 3A | | | | | | | | | | | | | 1 2 | | | | | |
| customer | | | | | | | | | | | | | 9 | | | | _ | consult |
| Special version standard | | | | | | | | | | | | | | | 0 (| | | |
| with cooling element up to 300°C / 3A customer | | | | | | | | | | | | | | | 9 9 | | | consult |
| | | | | | | | | | | | | | | | | - | | |

¹ with IS version max. 1 contact is 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 The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position.
Varivent[®] is a brand name of GEA Tuchenhaoen GmbH. Hastellov[®] is a brand name of Havnes International Inc.



DS 201P

Electronic Pressure Switch

Pressure Port with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 60 bar up to 400 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 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
- ▶ cooling element up to 300 °C
- customer specific versions

The electronic pressure switch DS 201P is the successful combination of

- intelligent pressure switch
- digital display

and is designed for universal applications in the mechanical engineering and other industries where a flush stainless steel diaphragm is necessary. This can be the case, for example, with higher viscous or slightly polluted fluids. For usage with higher media temperature optionally a cooling element up to 300 °C is available.

Preferred areas of use are



Plant and machine engineering



Food industry

Preferred used for



Viscous and pasty media







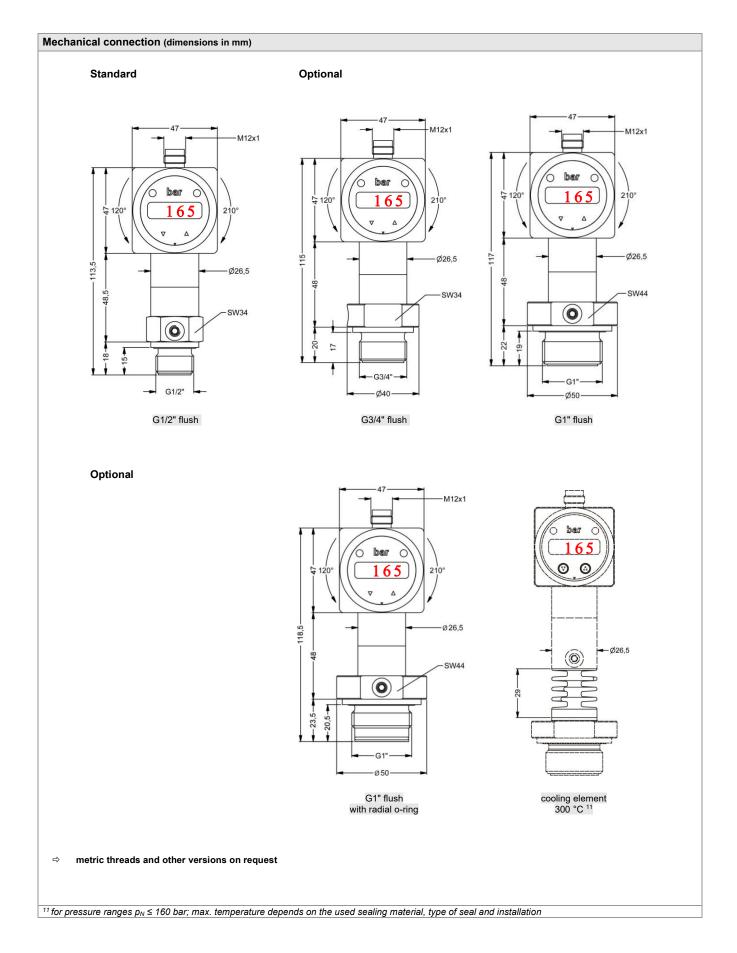


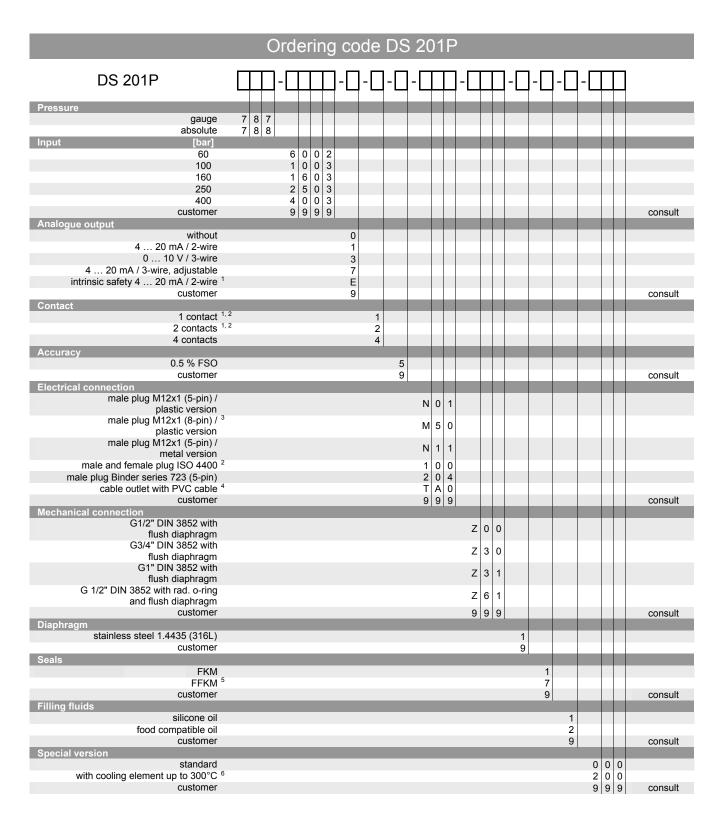
| ır] 60 | 100 | 160 | 250 | 400 |
|---------|--------|------------|----------------|--------------------|
| r] 100 | 200 | 400 | 400 | 600 |
| ır] 120 | 250 | 500 | 500 | 650 |
| | r] 100 | r] 100 200 | r] 100 200 400 | r] 100 200 400 400 |

| Burst pressure ≥ | [bar] 120 | 250 | 500 | 500 | 650 |
|---|---|---|---|---|---|
| 0 | | | | | |
| Contact 1 | 4.50.5 | | | | |
| Standard | 1 PNP conta | | | | |
| Options | | | ossible with M12x1, 8 10 V/3-wire on req | 3-pin for 4 20 mA/3-v uest) | vire; |
| Max. switching current | 4 20 mA / 0 10 V / 3 | 2- and 3-wire: co | ntact rating 125 mA, | short-circuit resistant; \ short-circuit resistant | V _{switch} = V _S - 2V |
| Accuracy of contacts ² | ≤ ± 0.5 % F | 30 | | | |
| Repeatability | ≤ ± 0.2 % F | 30 | | | |
| Switching frequency | max. 10 Hz | | | | |
| Switching cycles | > 100 x 10 ⁶ | | | | |
| Delay time | 0 100 sed | ; | | | |
| max. 1 contact for 2-wire current with plug ISO 4400 accuracy according to IEC 60770 | , , | | | tion no contact possible w | ith 3-wire in combinatio |
| Analogue output (optionally | | , , , | | | |
| 2-wire current signal | | / V _S = 13 36 V _{DC} | | | |
| o a o o.ga. | | load: $R_{max} = [(V_S - V_{Sm})]$ | _{nin}) / 0.02 A] Ω r | esponse time: < 10 ms | sec |
| 2-wire current signal with | 4 20 mA | / V _S = 15 28 V _{DC} | • | | |
| Ex-protection | | load: $R_{max} = [(V_S - V_{Sm})]$ | | esponse time: < 10 ms | ec |
| 3-wire current signal | | / V_S = 19 30 V_{DC} adj load: R_{max} = 500 $Ω$ | | f span max. 1:5) ³ esponse time: < 0.5 se | |
| 3-wire voltage signal | | $V_{\rm S} = 15 \dots 36 V_{\rm DC}$ | [1 | esponse time. < 0.5 se | ;C |
| 5-wife voltage signal | | load: $R_{min} = 10 \text{ k}\Omega$ | r | esponse time: < 10 ms | sec |
| Without analogue output | V _S = 15 3 | | | <u></u> | , <u></u> |
| Accuracy ² | ≤ ± 0.5 % F | | | | |
| ³ with turn-down of span the analog | | | easuring range | | |
| Thermal error (offset and sp | | <u> </u> | • • | | |
| Thermal error | ≤ ± 0.2 % FS | 3O / 10 K | | | |
| in compensated range | 0 85°C | | | | |
| ⁴ an optional cooling element can i | influence thermal effects | s for offset and span depe | ending on installation po | sition and filling conditions | 3 |
| Permissible temperatures | | | | | |
| Filling fluid | | silicone oil | | food compat | ible oil |
| Medium ⁵ | | -40 125 °C | | -10 125 | 5 °C |
| Medium with cooling element | 6 overp vacuu | ressure: -40 300 ° um: -40 150 ° | °C | | 250 °C 150 °C |
| Electronics / environment | | | -40 85 °C | | |
| Storage | | | -40 100 °C | | |
| max. temperature of the medium max. temperature depends on th | | | | tal temperature of 50 °C | |
| Electrical protection | <u>, , , , , , , , , , , , , , , , , , , </u> | ,, | | | |
| Short-circuit protection | permanent | | | | |
| Reverse polarity protection | | but also no function | | | |
| Electromagnetic compatibility | | d immunity according t | to EN 61326 | | |
| Mechanical stability | | | | | |
| Vibration | 5 g RMS (25 | 5 2000 Hz) | according to DIN EN | V 60068-2-6 | |
| Shock | 100 g / 11 m | | according to DIN EN | | |
| Filling fluids | , , | | | | |
| Standard | silicone oil | | | | |
| Optional | | tible oil with FDA appro | oval | | |
| • | | Cibus 32; Category Co | | ration No.: 141500) | |
| Materials | | | | | |
| Pressure port | | el 1.4435 (316 L) | | | |
| Housing | | el 1.4404 (316 L) | | | |
| Display housing | PA 6.6, Poly | | | | |
| Seals | | FKM ⁷ (recommende | ed for medium temper ed for medium tempe | | others on reques |
| Diaphragm | stainless ste | | | | |
| Media wetted parts | pressure po | rt, seals, diaphragm | | | |
| | | | | | |

| Explosion protection (only for 4 | 20 mA / 2-wire) | | | | | | | | |
|--|---|--|-----------------------------------|----------------------------|-----------------------|--|--|--|--|
| Approval AX14-DS 201P | IBExU06ATEX1 | 050 X | | | | | | | |
| | zone 1: II 2G Ex ia IIC T4 Gb (connector) / II 2G Ex ia IIB T4 Gb (cable) | | | | | | | | |
| Safety technical maximum values | $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$ | | | | | | | | |
| Max. switching current 8 | 70 mA | 70 mA | | | | | | | |
| Max. temperatures for environment | -25 70 °C | | | | | | | | |
| Connecting cables | cable capacitan | | ield also signal li | | | | | | |
| (by factory) | cable inductanc | | nield also signal li | ne/signal line: | 1 μH/m | | | | |
| 8 the real switching current in the application | on depends on the p | ower supply unit | | | | | | | |
| Miscellaneous | | | | | | | | | |
| Display | accuracy 0.1 % | gment-LED displa ± 1 digit; digital da update 0.0 10 | amping 0.3 30 sec (programma | sec (programr | | -9999; | | | |
| Current consumption | 2-wire signal ou | | ax. 25 mA | | | | | | |
| (without contacts) | 3-wire signal ou 3-wire signal ou | | pprox. 45 mA + si pprox. 45 mA | gnal current | | | | | |
| Ingress protection | IP 65 | | | | | | | | |
| Installation position | | alibration in a verti | • | the pressure po | ort connection dow | /n) | | | |
| Weight | 0 (1 | ending on mechar | nical connection) | | | | | | |
| Operational life | 100 million load | | | | | | | | |
| CE-conformity | EMC Directive: | 2014/30/EU | Pressu | re Equipment [| Directive: 2014/68/ | EU (module A) 9 | | | |
| ATEX Directive | 2014/34/EU | | | | | | | | |
| ⁹ This directive is only valid for devices wit | h maximum permiss | ible overpressure > 2 | 200 bar. | | | | | | |
| Wiring diagrams | | | | | | | | | |
| 2-wire-system (current) | | | 3-wire-system (c | urrent/voltage) | | | | | |
| supply - A RL contact 1 contact 2 | P supply + Vs Supply - Signal + Contact 1 Contact 2 Contact 3 Contact 4 | | | | | | | | |
| Pin configuration | | | | | | | | | |
| riii comiguration | M12x | M12x | M12x | 1 | Binder | | | | |
| Electrical connection | plastic (5-pin) | metal (5-pin) | plastic (8-pin) | ISO 4400 | series 723 (5-pin) | cable colours (IEC 60757) | | | |
| Supply + Supply – Signal + (only for 3-wire) Contact 1 Contact 2 Contact 3 Contact 4 | 1 3 2 4 5 | 1 3 2 4 5 | 1 3 2 4 5 6 7 | 1 2 3 3 - - | 1 3 2 4 5 | WH (white) BN (brown) GN (green) GN (grey) PK (pink) | | | |
| Shield | via pressure | plug housing/ | via pressure | ground 📳 | plug housing/ | GNYE | | | |
| Electrical connections (dimensions | port | pressure port | port | pin 🛡 | pressure port | (green-yellow) | | | |
| | , | | | | cable | outlet PVC | | | |
| | | | | | Ø = 4 | .9mm outlet PUR 5.7mm | | | |
| (4 (5) 3 (1) 2 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1) | | 0 (00) 300 | 02 | 5 40 | | | | | |
| M12x1 (5-pin) M1 | M12x1 (5-pin) M12x1 (8-pin) | | Binder series | 723 (5-pin) | cable outlet 10 | | | | |

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)





¹ with IS version max. 1 contact is 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 \dots 70 °C), others on request

⁵ possible for nominal pressure ranges p_N ≤ 100 bar

⁶ cooling element up to 300°C not possible for pressure range p_N > 160 bar



Pressure Switch with welded Stainless Steel Sensor

Characteristics:

- accuracy according to IEC 60770: 0.5 % FSO
- ► nominal pressure ranges from 0 ... 6 bar up to 0 ... 600 bar
- ► 1 analogue output and up to 2 contacts
- ▶ display and housing rotatable
- suitable for oxygen applications



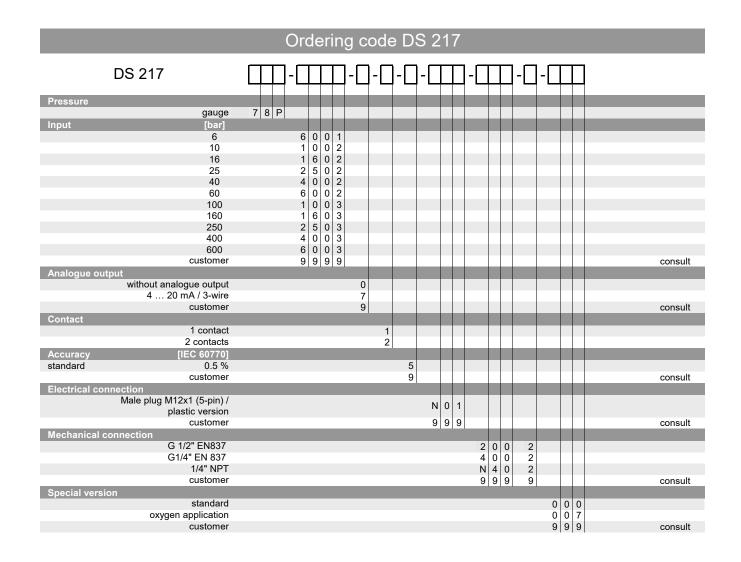




| | | | | | | | | | | | - | |
|---|--------------------|---------------------------|-------------------------|----------------------|-----------|-------------|-------------|---------|--------|-------|-------|-------|
| | | | | | | | | | | | | |
| Input pressure range | | | | | | | | | | | | |
| Nominal pressure gauge | [bar] | 6 | 10 | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Overpressure (static) | [bar] | 12 | 20 | 32 | 50 | 80 | 120 | 200 | 320 | 500 | 800 | 1 200 |
| Burst pressure ≥ | [bar] | 30 | 50 | 80 | 125 | 200 | 300 | 500 | 800 | 1 400 | 2 000 | 3 000 |
| Vacuum resistance | | unlimite | b | | | | | | | | | |
| Contact | | | | | | | | | | | | |
| Number / type | | standard | standard: 1 PNP contact | | | | | | | | | |
| <u> </u> | | optional | ly: ı | max. 2 inc | depender | nt PNP co | ntact; 1 a | nalogue | output | | | |
| Switching current | | standard | d: contact | t rating m | ax. 125 n | nA, short- | circuit res | istant | | | | |
| Accuracy of switching points | s ¹ | ≤ ± 1.5 ° | % FSO | | | | | | | | | |
| Repeatability | | ≤ ± 0.5 ° | % FSO | | | | | | | | | |
| Switching frequency | | max. 10 | | | | | | | | | | |
| Switching cycles | | > 100 x 10 ⁶ | | | | | | | | | | |
| Delay time 0 100 sec | | | | | | | | | | | | |
| Analogue output (optiona | ally) / S | Supply | | | | | | | | | | |
| 3-wire current signal | | 4 20 r | nA / V _S = | 24 V _{DC} : | ± 10 % | | | | | | | |
| Accuracy ¹ | | ≤ ± 0.5 ° | % FSO | | | | | | | | | |
| Permissible load | | | $R_{max} = 5$ | | | | | | | | | |
| Influence effects | | supply: 0.05 % FSO / 10 V | | | | | | | | | | |
| | | load: 0.05 % FSO / kΩ | | | | | | | | | | |
| Measuring rate | | 10 Hz | | | | | | | | | | |
| ¹ accuracy according to IEC 607 | | | | | | sis, repeat | ability) | | | | | |
| Thermal effects (Offset an | d Spa | n) / Perm | issible t | emperatı | ıres | | | | | | | |
| Thermal error | | ≤ ± 0.5 ° | % FSO / | 10 K | | • | l range -2 | 5 85 °C |) | | | |
| Permissible temperatures | medium | - | | -25 125 °C | | | | | | | | |
| | | | | ronment: | | | | | | | | |
| | storage: -40 85 °C | | | | | | | | | | | |
| Electrical protection | | | | | | | | | | | | |
| Short-circuit protection | | permane | | | | | | | | | | |
| Reverse polarity protection | 1 1 | | | | | | | | | | | |
| Electromagnetic compatibility emission and immunity according to EN 61326 | | | | | | | | | | | | |

| Mechanical stability | | | | | | |
|--|--|--|--|--|--|--|
| Vibration | 10 g (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 | stainless steel 1.4571 (316 Ti) / stainless steel 1.4301 (304) | | | | | |
| Display housing | PA 6.6, polycarbonate | | | | | |
| Seal sensor | none (welded) | | | | | |
| Diaphragm | stainless steel 1.4542 (17-4PH) | | | | | |
| Media wetted parts | pressure port, seal pressure port, diaphragm | | | | | |
| Miscellaneous | | | | | | |
| Weight | approx. 160 g | | | | | |
| Display | 4-digit, red LED display, digit height 7 mm, digit width 4.85 mm (angle 10°); range of indication -1999 +9999; accuracy 0.1% ± 1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) | | | | | |
| Long term stability | ≤ ± 0.3 % FSO / year at reference conditions | | | | | |
| Operational life | 100 million load cycles | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ² | | | | | |
| ² This directive is only valid for device | es with maximum permissible overpressure > 200 bar. | | | | | |
| Wiring diagrams | | | | | | |
| 3-wire-system (current) | | | | | | |
| p Supply + Supply - Signal + Contact 1 Contact 2 | R _L | | | | | |
| Dia confinementian | | | | | | |
| Pin configuration | MAO. A (F = in) wheating | | | | | |
| Electrical connections | M12x1 (5-pin) plastic | | | | | |
| supply + supply – | 1 3 | | | | | |
| signal + (only for 3-wire) | 2 | | | | | |
| contact 1 | 4 | | | | | |
| contact 2 | 5 | | | | | |
| shield | via pressure port | | | | | |
| Connections (dimensions in r | nm) | | | | | |
| 47 00 00 00 00 00 00 00 00 00 00 00 00 00 | SW24 G1/4" EN 837 | | | | | |
| 300° — 30 | M12x1 (5-pin) | | | | | |

Ordering Code





Electronic OEM Pressure Switch

Applications:

- pneumatics
- pumps and hydraulic machines

Characteristics:

- nominal pressure ranges from 0 ... 2 bar up to 0 ... 400 bar
- ▶ display and housing rotatable
- ▶ up to 2 contacts
- ► configurable via display
- optional: analogue output



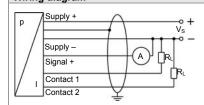




| Input pressure range | | | | | | | | | |
|--|---------|--------------------------|---------------------------|--------------|----------------|---------------|---------|-------------|----------|
| Nominal pressure gauge | [bar] | 2 | 5 | 10 | 20 | 50 | 100 | 250 | 400 |
| Overpressure | [bar] | 4 | 10 | 20 | 40 | 100 | 200 | 400 | 600 |
| Burst pressure | [bar] | 7 | 15 | 35 | 70 | 150 | 250 | 450 | 650 |
| Supply | Supply | | | | | | | | |
| Supply voltage V _S | | 24 V _{DC} ±10 | % | | | | | | |
| Current consumption | | < 40 mA (w | rithout analog | gue output a | nd without co | ntacts) | | | |
| Output signal | | • | | | | | | | |
| Number, type | | standard: optional: | 1 PNP cont max. 2 inde | | P contacts; 1 | analogue o | utput | | |
| Contact (Standard) | | | | | | | | | |
| Switching current | | standard: c | ontact rating | max. 125 m | A, short-circu | uit resistant | | | |
| Accuracy of contacts 1 | | | ≤±1.5 % FSO BFSL | | | | | | |
| Repeatability 1 | | ≤ ± 0.5 % F | ≤±0.5 % FSO BFSL | | | | | | |
| Switching frequency | | max. 100 H | lz | | | | | | |
| Switching cycles | | > 100 x 10 ⁶ | • | | | | | | |
| Functions | | hysteresis- n/o / n/c | / compare m | ode | | | | | |
| Delay time | | 0 99.99 | sec | | | | | | |
| Analogue output (optional | ly) | | | | | | | | |
| Signal output | | 4 20 mA | (3-wire) | | | | | | |
| Linearity, hysteresis, repeatability | | ≤ ± 0.5 % F | SO BFSL | | | | | | |
| Calibration accuracy | | ≤±1%FS | O BFSL (2 % | FSO) | | | | | |
| Permissible load | | R _{max} = 500 | Ω | | | | | | |
| Response time | | < 10 msec | | | | | | | |
| ¹ depending on nominal pressu | | | | | | | | | |
| Thermal effects (Offset and | d Span) | | <u> </u> | | | | | | |
| Thermal error for offset | | ≤ ± 0.5 % F | SO / 10 K | in com | pensated rar | nge 0 | . 85 °C | | |
| Permissible temperatures | | medium: -2 | 5 125 °C | electro | onics / enviro | nment: -25 | . 85 °C | storage: -4 | 40 85 °C |

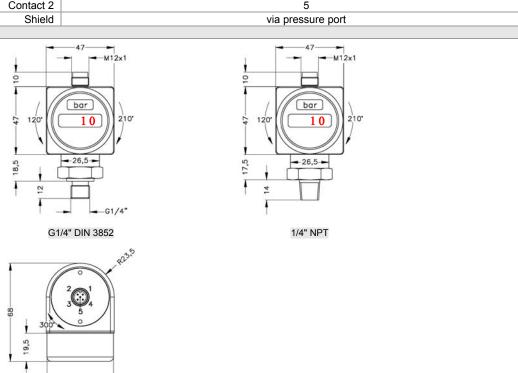
| Electrical protection | | | | |
|--|---|--|--|--|
| Short-circuit protection | permanent | | | |
| Reverse polarity protection | no damage, but also no function | | | |
| Electromagnetic compatibility | emission and immunity according to EN 61326 | | | |
| Mechanical stability | | | | |
| Vibration | 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 | stainless steel 1.4301 (304) | | | |
| Display housing | PA 6.6, Polycarbonate | | | |
| Seals (media wetted) | FKM others on request | | | |
| Diaphragm | ceramic Al ₂ O ₃ 96 % | | | |
| Touchpad | polyester | | | |
| Media wetted parts | pressure port, seals, diaphragm | | | |
| Miscellaneous | | | | |
| Display | 4-digit, red LED display, digit size 7 mm, digit width 4.85 mm (angle 10 °); range of indication -1999 +9999; accuracy 0.3 % ±1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) | | | |
| Weight | approx. 180 g | | | |
| Installation position | any | | | |
| Ingress protection | IP 65 | | | |
| Operational life | 100 million load cycles | | | |
| CE-conformity | EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ² | | | |
| ² This directive is only valid for device | es with maximum permissible overpressure > 200 bar | | | |

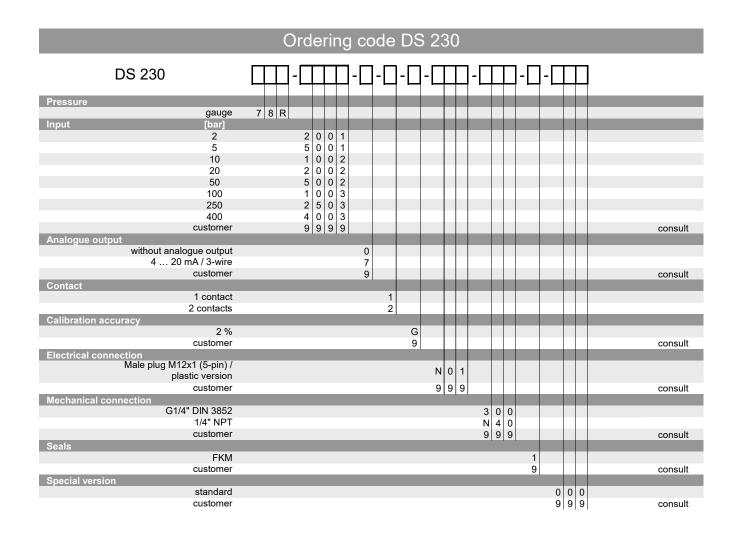
Wiring diagram



| Pin configuration | |
|-----------------------|------------------------|
| Electrical connection | M12x1 (5-pin), plastic |
| Supply + | 1 |
| Supply – | 3 |
| Signal + | 2 |
| Contact 1 | 4 |
| Contact 2 | 5 |
| Shield | via pressure port |

Dimensions (in mm)







iS 4

Electronic OEM Pressure Switch Pneumatics with IO-Link Interface

Applications:

- **Pneumatics**
- Vacuum technology

Characteristics:

- nominal pressure ranges from 0 ... 1 bar up to 0 ... 10 bar also -1 ... 0 bar
- compact design
- IO-Link according to specification V 1.1







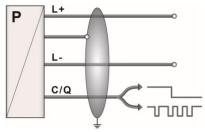
| Input pressure range | | | | | |
|------------------------|-------|------|---|-----|----|
| Nominal pressure gauge | [bar] | -1 0 | 1 | 3.5 | 10 |
| Overpressure | [bar] | 2 | 2 | 7 | 13 |

| Output signal / Supply | | | | |
|------------------------|---|--|--|--|
| Standard | IO-Link (measured value and status transmission) / V _S = 18 30 V _{DC} SIO (switching output), status indication via LED (green) | | | |
| IO-Link | V 1.1 / Slave / Smart Sensor Profile | | | |
| Data transfer | COM2 38.4 kbit/s | | | |
| Mode | SIO / IO-Link (COMx) | | | |
| Standard | IEC 61131-2, IEC 61131-9 | | | |

| Performance | | | | | |
|--|--|------------------------------|--------------------|--|--|
| Accuracy 1 | ≤ ± 0.5 % FSO | | | | |
| Switching current (SIO-Mode) | max. 200 mA | | | | |
| Switching frequency | max. 200 Hz | | | | |
| Switching cycles | > 100 x 10 ⁶ | | | | |
| Long term stability | ≤ ± 0.3 % FSO / year at reference of | conditions | | | |
| Turn-on time | SIO mode: ca. 20 msec | | | | |
| Response time | SIO mode: < 4 msec | | | | |
| Measuring rate | 400 Hz | 400 Hz | | | |
| ¹ accuracy according to IEC 60770 – lim | it point adjustment (non-linearity, hystere: | sis, repeatability) | | | |
| Thermal effects (Offset and Spar | n) / Permissible temperatures | | | | |
| Tolerance band | ≤ ± 2 % FSO | in compensated range 0 50 °C | | | |
| TC, average | ≤ ± 0.4 % FSO / 10 K | in compensated range 0 50 °C | | | |
| Permissible temperatures | medium / electronics / environment | :: -25 85 °C | storage: -40 85 °C | | |
| Electrical protection | | | | | |
| Short-circuit protection | permanent | | | | |
| Reverse polarity protection | no damage, but also no function | | | | |
| Electromagnetic compatibility | emission and immunity according to | o EN 61326 | | | |

| Mechanical stability | | | |
|-----------------------|--------------------------------|--------------------------------|--|
| Vibration | 10 g RMS (20 2000 Hz) | according to DIN EN 60068-2-6 | |
| Shock | 100 g / 11 msec | according to DIN EN 60068-2-27 | |
| Materials | | | |
| Pressure port | aluminium | | |
| Housing | PA 6.6 black | | |
| Seal (media wetted) | NBR | | |
| Sensor | silicon, RTV | | |
| Media wetted parts | pressure port, seal, sensor | | |
| Miscellaneous | | | |
| Media | compressed air, non-aggressive | gases | |
| Weight | approx. 25 g | | |
| Current consumption | max. 15 mA | | |
| Operational life | 100 million load cycles | | |
| Installation position | any | | |
| Ingress protection | IP 54 | | |
| CE-conformity | EMC Directive: 2014/30/EU | | |

Wiring diagram



| Pin configu | ration |
|-------------|--------|
|-------------|--------|

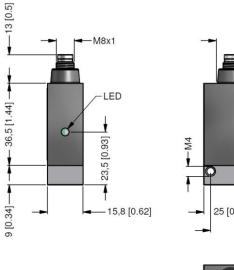
| Elec | ctrical connection | M8x1 / metal (4-pin) |
|------|-------------------------|----------------------|
| (L | +) Supply + | 1 |
| (L |) Supply – | 3 |
| C/ | /Q IO-Link (COMx) / SIO | 4 |
| | Shield | housing |

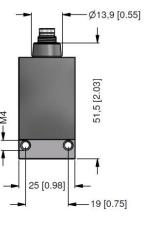
Dimensions (mm / in)

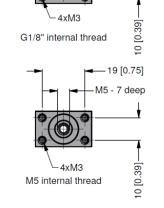
Mechanical connections (view X)

19 [0.75]

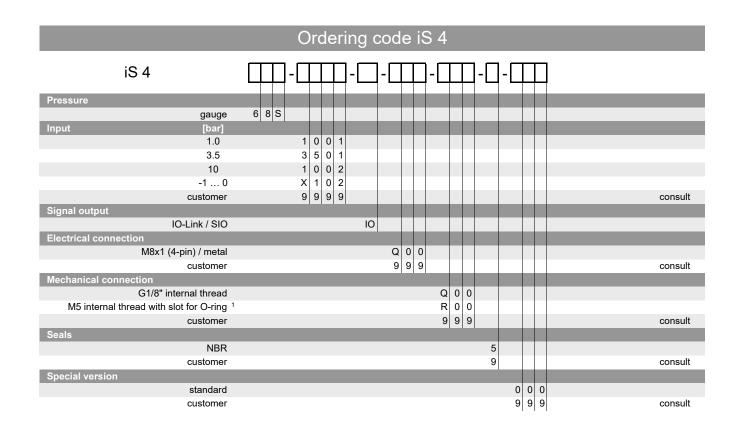
G1/8" - 6,5 deep







| IO-Link inter | | \n | 4 Process data | | | | | | | |
|---|--------------------------------------|---|---|---|--|--------------------|--------|-----------------|--|--|
| 1. General device information Baud rate COM2 (38.4 kbit/s) | | 4. Process data | | | | | | | | |
| nput process | | COM2 (38.4 kbit/s) | The process data length of the sensor is 16 bits. The switch state (BCD1) as well as the current measured | | | | | | | |
| nput process Vinimum cycle | | 2 byte 5 msec | values are transmitted. The | | | | | | | |
| O-Link versio | | V 1.1 | 15 bit | 14 | 2 | 1 | 1 | 0 | | |
| SIO mode | | yes | Signed Bit | measure | | 0 | BDC1 | / output 1 | | |
| | | • | | measure | silient | <u> </u> | DDC1 | / Output 1 | | |
| | e (standard IO m | • | 5. Error message | | | | | | | |
| | | s like a normal pressure | Error Codes | | Description | 1 | | | | |
| | 4 of the connector | als. The digital output is | 0x8011 | | Index not av | /ailable | | | | |
| aiwaya on i iii | 4 of the confidetor | plug. | 0x8012 | | Subindex no | ot available | | | | |
| | | | 0x8023 | | Access Den | ied | | | | |
| | | | 0x8030 | | Parameter \ | /alue out of Range | | | | |
| | | | | | | | | | | |
| | | | 0x8033 | | | ength overrun | | | | |
| | | | 0x8034 | | Parameter I | ength underrun | | | | |
| 3. IO-Link m | node (communic | ation mode) | 6. Event codes | | | | | | | |
| he pressure | sensor switches in | to IO-Link communica- | | Event-Codes | Event-Codes | Davies status | Ι | Tuno | | |
| | | an IO-Link master. IO- | | IO-Link 1.1 | IO-Link 1.0 | Device status | | Гуре | | |
| ink communi | cation is only possi | ible via Pin connector. | No malfunction | 0x0000 | 0.0000 | 0 | Not | ification | | |
| | | | | | 0x0000 | | 1 | | | |
| | | | General malfunction- unknown error | 0x1000 | 0x1000 | 4 | 1 | Error | | |
| | | | Process variable | | | | | | | |
| | | | range over-run - | 0x8C10 | 0x8C10 | 2 | w | arning | | |
| | | | Process Data uncertain | | | | | | | |
| | | | Process variable | | | | | | | |
| | | | range under-run. | 0x8C30 | 0x8C10 | 2 | W | arning | | |
| | | | Process Data uncertain | | | | | | | |
| 7. Paramete | r data (The paran | neter data for the press | ure sensor correspond to t | he Smart Senso | r profile.) | | | | | |
| Index hex | Subindex hex | Object name | Single Value | | | Default | Comme | nt | | |
| | | | 0x81 = delete Min-/Max-W | ert | | | The | e action | | |
| 0x02 | 0x00 | System Commands | 0x82 = res | 011 | | | | xecuted | | |
| | | -, | 0xA0 = Set0 | | | | | writing | | |
| | | | | | | | in the | subindex | | |
| | | | 0x01: Upload Start | | | | | | | |
| 0x03 | 0x00 | Data Storago Indov | 0x02: Upload End | | | | | | | |
| 0x03 | UXUU | Data Storage Index | 0x03: Download Start | | | | | | | |
| | | | 0x04: Download End | | | | | | | |
| | | | 0x05: Datastorage Break | | | | | | | |
| | | | 0x00: Unlocked | | | | | | | |
| | | | 0x01: IO-Link Lock | | | | | | | |
| | | | 0x02: Datastorage Lock 0x04: Parameterization Lo | ale | | | | | | |
| | | | 0x08: User Interface Lock | CK | | | | | | |
| | | | | staraga Lagir | | | | | | |
| 0x0C | 0x00 | Device Access Lock | 0x03: IO-Link Lock + Data: 0x05: IO-Link Lock + Para: | • | | 0x00: | | | | |
| UNUC | UXUU | Device Access Lock | 0x05: IO-Link Lock + Parai | | Unlocked | | | | | |
| | | | | | | | | | | |
| | | | 0x06: Datastorage Lock + | | | | | | | |
| | | | 0x0A: Datastorage Lock + 0x07: Datastorage Lock + | | | | | | | |
| | | | 0x07: Datastorage Lock + | | | | | | | |
| | | | Interface Lock | IO-LIIN LOCK T U | | | | | | |
| | | | 0x00 Device is operating p | ronerly | | | | | | |
| 0x24 | 0x00 | Device Status | 0x02 Out-of-Specification | openy | | | | | | |
| UA24 | 0.000 | Device Glatus | 0x04 Failure | | | | | | | |
| | | | 0x80: Hysteresis NO | | | | | | | |
| 1 | | | 0x81: Hysteresis NC | | | | | | | |
| | | Switch Point mode | 0x82: Window NO | | | 0x80: HNo | | | | |
| 0x3D | 0x02 | | UNUE. VYIIIUUW INO | | | | | | | |
| 0x3D | 0x02 | | 0x83: Window NC | | | 0 | Unit | Defau | | |
| | | Ohio et | 0x83: Window NC | Lawrith | | | Unit | LICTOIL | | |
| Index hex | Subindex hex | Object name | Access | Length | Value Range | Gradient | 0 | | | |
| Index hex 0x3C | Subindex hex 0x01 | SetPoint 1 = SP | Access R/W | 2 Byte | Process Data | Gradient | | 100% | | |
| 0x3C 0x3C | Subindex hex 0x01 0x02 | SetPoint 1 = SP SetPoint 2 = rP | Access R/W R/W | 2 Byte 2 Byte | Process Data Process Data | | | 100% | | |
| Index hex 0x3C | Subindex hex 0x01 | SetPoint 1 = SP | Access R/W | 2 Byte | Process Data | 0.1 | sec | 100% | | |
| 0x3C 0x3C 0xD0 | Subindex hex 0x01 0x02 0x00 | SetPoint 1 = SP SetPoint 2 = rP | Access R/W R/W R/W | 2 Byte 2 Byte 2 Byte | Process Data Process Data 0 500 | 0.1 | sec | 100% 0% 0 | | |
| Index hex 0x3C 0x3C | Subindex hex 0x01 0x02 | SetPoint 1 = SP SetPoint 2 = rP Delay Switching Time | Access R/W R/W | 2 Byte 2 Byte | Process Data Process Data | | | 100% 0% | | |
| 0x3C 0x3C 0xD0 | Subindex hex 0x01 0x02 0x00 | SetPoint 1 = SP SetPoint 2 = rP Delay Switching Time Delay Back Switching | Access R/W R/W R/W | 2 Byte 2 Byte 2 Byte | Process Data Process Data 0 500 | 0.1 | sec | 100% 0% 0 | | |
| 0x3C 0x3C 0x3C 0xD0 | 0x01 0x02 0x00 0x00 | SetPoint 1 = SP SetPoint 2 = rP Delay Switching Time Delay Back Switching Time | Access R/W R/W R/W R/W | 2 Byte 2 Byte 2 Byte 2 Byte 2 Byte 2 Byte | Process Data Process Data 0 500 0 500 | 0.1 | sec | 100% 0% 0 | | |
| 0x3C 0x3C 0x3C 0xD0 0xD1 0xD1 | 0x01 0x02 0x00 0x00 0x00 | SetPoint 1 = SP SetPoint 2 = rP Delay Switching Time Delay Back Switching Time Min Pressure Value | Access R/W R/W R/W R/W R/W | 2 Byte 2 Byte 2 Byte 2 Byte 2 Byte | Process Data Process Data 0 500 0 500 Process Data | 0.1 | sec | 100% 0% 0 | | |



¹ suitable for flange installation



Electronic OEM Pressure Switch Pneumatics

Applications:

- Pneumatics
- Vacuum technology

Characteristics:

- nominal pressure ranges from 0 ... 1 bar up to 0 ... 10 bar also -1 ... 0 bar
- ▶ 1 or 2 contacts
- ▶ compact design
- ▶ configurable via PC or programming device P6







| Input pressure range | | | | | |
|------------------------|-------|------|---|-----|----|
| Nominal pressure gauge | [bar] | -1 0 | 1 | 3.5 | 10 |
| Overpressure | [bar] | 2 | 2 | 7 | 13 |

| Supply | | | | | | | |
|---|---|--|--|--|--|--|--|
| Supply voltage | V _S = 12 30 V _{DC} | | | | | | |
| Current consumption | max. 14 mA (without contacts) | | | | | | |
| Output signal / Contact 1 | | | | | | | |
| Number | standard: 1 | | | | | | |
| | option: 2 | | | | | | |
| Туре | PNP | | | | | | |
| Switching performance | max. 300 mA, short-circuit proof | | | | | | |
| Accuracy of contacts ² | ≤±1% FSO | | | | | | |
| Repeatability | ≤ ± 0.2 % FSO | | | | | | |
| Status indication | SP 1: green | | | | | | |
| | SP 2: yellow | | | | | | |
| Switching function ³ | standard: n/o | | | | | | |
| | option: n/c | | | | | | |
| Switching mode ³ | standard: hysteresis mode | | | | | | |
| | option: window mode | | | | | | |
| Switch on point ³ | standard: factory setting 80 % FSO | | | | | | |
| | others: specify on order; adjustable range 0 100 % FSO | | | | | | |
| Switch off point 3 | standard: factory setting 75 % FSO | | | | | | |
| | others: specify on order; adjustable range 0 100 % FSO | | | | | | |
| Switch on / switch off delay ³ | standard: off | | | | | | |
| | others: specify on order, adjustable range from 10 msec up to 90 sec (step 10 msec) | | | | | | |
| Switching frequency | 200 Hz (without switching delay) | | | | | | |
| Switching cycles | > 100 x 10 ⁶ | | | | | | |
| 1 with optional analogue output max. | 1 contact possible | | | | | | |

with optional analogue output max. 1 contact possible

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

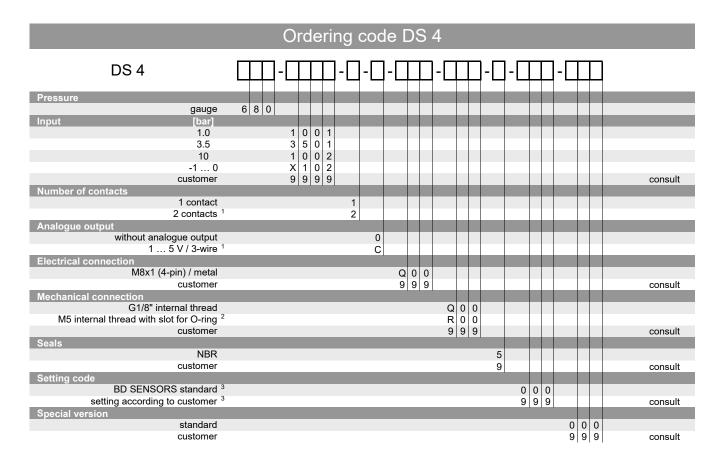
3 Parameters can be programmed by customer either with the programming kit CIS680/CIS681 or with the programming device P6 (available as accessories).

| Output signal / Analogue output | ¹ (optionally) | | | | | | | | |
|--|---|-------------------------------------|--|--|--|--|--|--|--|
| Analogue output | 1 5 V / 3-wire | | | | | | | | |
| Accuracy ² | ≤ ± 2 % FSO | | | | | | | | |
| Permissible load | $R_{min} = 10 \text{ k}\Omega$ | | | | | | | | |
| with optional analogue output max. 1 | with optional analogue output max. 1 contact possible accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability) | | | | | | | | |
| | | eresis, repeatability) | | | | | | | |
| Thermal effects (offset and span | | | | | | | | | |
| Tolerance band | ≤ ± 2 % FSO | in compensated range 0 50 °C | | | | | | | |
| TC, average | ≤ ± 0.4 % FSO / 10 K | in compensated range 0 50 °C | | | | | | | |
| Permissible temperatures | | | | | | | | | |
| Medium | -25 85 °C | | | | | | | | |
| Electronics / environment | -25 85 °C | | | | | | | | |
| Storage | -40 85 °C | | | | | | | | |
| Electrical protection | | | | | | | | | |
| Short-circuit protection | permanent | | | | | | | | |
| Reverse polarity protection | no damage, but also no function | 1 | | | | | | | |
| Electromagnetic compatibility | emission and immunity according | ng to EN 61326 | | | | | | | |
| Mechanical stability | | | | | | | | | |
| Vibration | 10 g RMS (20 2000 Hz) | according to DIN EN 60068-2-6 | | | | | | | |
| Shock | 100 g / 11 msec | according to DIN EN 60068-2-27 | | | | | | | |
| Materials | | | | | | | | | |
| Pressure port | aluminium | | | | | | | | |
| Housing | PA 6.6 black | | | | | | | | |
| Seal (media wetted) | NBR | | | | | | | | |
| Sensor | silicon, RTV | | | | | | | | |
| Media wetted parts | pressure port, seal, sensor | | | | | | | | |
| Miscellaneous | 1 2 2 | | | | | | | | |
| Media | compressed air, non-aggressive | 2 12565 | | | | | | | |
| Weight | approx. 50 g | 94000 | | | | | | | |
| Installation position | any | | | | | | | | |
| Operational life | 100 million load cycles | | | | | | | | |
| Ingress protection | IP 54 | | | | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU | | | | | | | | |
| Wiring diagrams | 1 | | | | | | | | |
| | | | | | | | | | |
| 1 contact, without analogue output | | 2 contacts, without analogue output | | | | | | | |
| supply + | — | supply + 0 + | | | | | | | |
| P / | Vs | p / vs | | | | | | | |
| supply – | | / supply – | | | | | | | |
| | ∐ R | R R | | | | | | | |
| Contact | _ | contact 1 | | | | | | | |
| / | Contact 2 | | | | | | | | |
| <u> </u> | | | | | | | | | |
| 1 contact, with analogue output | | | | | | | | | |
| supply + | | | | | | | | | |
| / | | | | | | | | | |
| | p / Vs | | | | | | | | |
| supply – | | | | | | | | | |
| signal + | ₽R | | | | | | | | |
| / V J | | | | | | | | | |
| contact | | | | | | | | | |
| | | | | | | | | | |

| Pin configuration Electrical connection | | M8x1 / metal (4-pin) | | | | |
|---|---|--|------------------------------------|-----|--|--|
| | 1 contact | 2 contacts | 1 contact, 1 analogue output | 2 4 | | |
| Supply + Supply – | 1 3 | 1 3 | 1 3 | | | |
| Signal + | - | - | 2 | | | |
| Contact 1 | 4 | 4 | 4 | 1 3 | | |
| Contact 2 | - | 2 | - | | | |
| Shield | housing | housing | housing | | | |
| Dimensions (mm / in) | | | | | | |
| [2.03]. | M8x1 LED2 LED2 LED1 [66:0] 3:6 [7:1] 66 — 16 [0.62] | 14 [0.55] Projection of the second of the s | | | | |
| Mechanical connections (dimensi | ons mm / in) | | | | | |
| 19 [0.75] G1/8 - 6.5 deep | 10 [0.39] | | 19 [0.75] 5 - 7 deep (4x) M3 | | | |

M5 internal thread

G1/8" internal thread



¹ with optional analogue output max. 1 contact possible

² suitable for flange installation

³ Parameters can be programmed by customer either with the programming kit CIS 680 / CIS 681 or with the programming device P6 (available as accessories).



Electronic OEM Pressure Switch Heavy Duty

Applications:

- mobile hydraulics
- presses
- oxygen application

Characteristics:

- ▶ stainless steel sensor, welded
- ▶ nominal pressure ranges from 0 ... 16 bar up to 0 ... 600 bar
- configurable via PC or programming device P6
- ▶ optionally: oil and grease free version



electronics / environment / storage: -40 ... 85 °C





Technical Data

| Input pressure range | | | | | | | | | | |
|------------------------|-------|-----|-----|-----|-----|-----|-----|------|------|------|
| Nominal pressure gauge | [bar] | 16 | 25 | 40 | 60 | 100 | 160 | 250 | 400 | 600 |
| Overpressure (static) | [bar] | 50 | 50 | 80 | 120 | 200 | 320 | 500 | 800 | 1200 |
| Burst pressure ≥ | [bar] | 125 | 125 | 200 | 300 | 500 | 800 | 1250 | 2000 | 2000 |

| Supply | | | | | | | | |
|--|--|---|--|--|--|--|--|--|
| Supply voltage | V _S = 12 30 V _{DC} | V _S = 12 30 V _{DC} | | | | | | |
| Current consumption | max. 14 mA (without contacts) | max. 14 mA (without contacts) | | | | | | |
| Contacts | | | | | | | | |
| Number | standard: 1 | option: 2 | | | | | | |
| Туре | PNP | | | | | | | |
| Switching performance | max. 300 mA, short-circuit proof | | | | | | | |
| Accuracy of contacts | IEC 60770: ≤ ± 1 % FSO | | | | | | | |
| Repeatability | ≤ ± 0.2 % FSO | ≤±0.2 % FSO | | | | | | |
| Minimum hysteresis of contacts | ≤ ± 0.5 % FSO | | | | | | | |
| Status indication | SP 1: green | SP 2: yellow | | | | | | |
| Switching function ¹ | standard: n/o | option: n/c | | | | | | |
| Switching mode ¹ | standard: hysteresis mode | option: window mode | | | | | | |
| Switch on point ¹ | standard: factory setting 80 % FS | | | | | | | |
| | | table range 5 100 % FSO | | | | | | |
| Switch off point ¹ | standard: factory setting 75 % FS | | | | | | | |
| | | table range 5 100 % FSO | | | | | | |
| Switch on / switch off delay ¹ | standard: off | | | | | | | |
| | | table range from 10 msec up to 90 sec (step 10 msec) | | | | | | |
| Switching frequency | 200 Hz (without switching delay) | | | | | | | |
| Switching cycles | > 100 x 10 ⁶ | | | | | | | |
| ¹ Parameters can be programmed by o | customer either with the programming kit | CIS-G or with the programming device P6 (available as accessories). | | | | | | |
| Thermal effects (Offset and Spa | an) / Permissible temperatures | | | | | | | |
| Thermal error | ≤±0.2 % FSO / 10 K | in compensated range -20 80 °C | | | | | | |

medium: -40 ... 125 °C

Permissible temperatures

14,5 [0.57]

| 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 (20 2000 Hz) | according to DIN EN 60068-2-6 | | | | | | |
| Shock | 100 g / 11 msec | according to DIN EN 60068-2-27 | | | | | | |
| Materials | 100 g / 11 mese | according to Birt Lit 00000 L Li | | | | | | |
| | stainless steel 1.4404 (316L) | | | | | | | |
| Pressure port | stainless steel 1.4404 (310L) | | | | | | | |
| Housing | FKM | athawa an wagusat | | | | | | |
| Seal of pressure port | | others on request | | | | | | |
| Seal of sensor | none (welded) | | | | | | | |
| Sensor | stainless steel 1.4548 (17-4PH) | | | | | | | |
| Media wetted parts | pressure port, seal, sensor | | | | | | | |
| Miscellaneous | | | | | | | | |
| Option for mechanical connections 1/4" NPT, R 1/4" and 7/16"-20 UNF | oxygen application | | | | | | | |
| Weight | approx. 90 g | | | | | | | |
| Installation position | any | | | | | | | |
| Operational life | 100 million load cycles | | | | | | | |
| Ingress protection | IP 67 | | | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU | Pressure Equipment Directive: 2014/68/EU (module A) ² | | | | | | |
| • | ith maximum permissible overpressure > 200 | | | | | | | |
| Wiring diagrams | | | | | | | | |
| 1 contact | 2 con | tooto | | | | | | |
| supply – | RL L | supply – Contact 1 RL RL Contact 2 | | | | | | |
| Pin configuration | | <u> </u> | | | | | | |
| Electrical connection | M12x1 (4-pin), metal | | | | | | | |
| Supply + | 1 | 4 | | | | | | |
| Supply – | 3 | | | | | | | |
| Contact 1 | 4 | | | | | | | |
| | | | | | | | | |
| Contact 2 | 2 | 2 | | | | | | |
| Shield | plug housing | | | | | | | |
| Dimensions / Mechanical connec | tions (mm / in) | | | | | | | |
| M12x1 | Ø23,5 [Ø0.93] G1/4 | SW24 | | | | | | |
| 1 | 2=3,0 [20.00] | .26] | | | | | | |

7/16-20 UNF --

7/16-20 UNF female thread

R 1/4"

⊸ R1/4"

SW24

14 [0.55]

Ordering Code

| Ordering code DS 5 | | | | | | | | |
|--|------------|--------------------------|-------|-----|--------------------------|-----------|---------------|-----------|
| DS 5 | П-П | <u> </u> | | - 🔲 | □-□ | - | | |
| Pressure | | | | | | | | |
| gauge | 6 8 M | | | | | | | |
| Input [bar] | | | | | | | | |
| 16 | 1 6 2 5 | 0 2 0 2 0 2 0 2 | | | | | | |
| 25 | 2 5 4 0 | 0 2 | | | | | | |
| 40 | 4 0 | 0 2 | | | | | | |
| 60 | 6 0 | 0 2 | | | | | | |
| 100 | 1 0 | 0 3 | | | | | | |
| 160 | 1 6 | 0 3 | | | | | | |
| 250 | 2 5 4 0 | 0 3 | | | | | | |
| 400 | 4 0 | 0 3 | | | | | | |
| 600 | 6 0 | 0 3 | | | | | | |
| customer | 9 9 | 9 9 | | | | | | consult |
| Number of contacts | | | | | | | | |
| 1 contact | | 1 | | | | | | |
| 2 contacts | | 2 | | | | | | |
| Electrical connection | | | | | | | | |
| M12x1 (4-pin), metal | | | M 1 3 | | | | | |
| customer | | | 9 9 9 | | | | | consult |
| Mechanical connection / Seal | | | | | | | | |
| G1/4" DIN 3852 / | | | | 3 0 | 0 P | | | |
| on pressure port: FKM | | | | | | | | |
| 1/4" NPT / without | | | | N 4 | 0 2 | | | |
| R1/4" / without | | | | R 4 | 0 2 0 2 1 2 9 9 | | | |
| 7/16"-20 UNF female thread / without | | | | S 0 | 1 2 | | | lu lu |
| customer | | | | 9 9 | 9 9 | | | consult |
| Setting code BD SENSORS standard ¹ | | | | | | | | |
| | | | | | | 0 0 0 9 9 | | 11 |
| setting according to customer 1 | | | | | | 9 9 9 | | consult |
| Special version standard | | | | | | | | |
| oxygen application ² | | | | | | | 0 0 0 0 0 0 7 | |
| oxygen application 2 oil and grease free | | | | | | | 0 0 7 | |
| oli and grease free customer | | | | | | | 0 0 8 9 9 | aana: ili |
| customer | | | | | | | 9 9 9 | consult |

¹ Parameters can be programmed by customer either with the programming kit CIS-G or with the programming device P6 (available as accessories).
² not possible with G1/4* DIN 3852



Electronic OEM Pressure Switch

Applications:

- mechanical engineering / hydraulics
- measuring, control and process technology

Characteristics:

- ▶ nominal pressure ranges from 0 ... 2 bar up to 0 ... 400 bar
- ▶ 1 or 2 contacts
- configurable via PC or programming device P6
- optional:oil- and fat free version



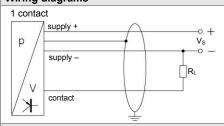


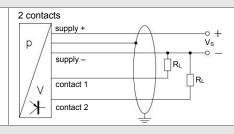


| Input pressure range | | | | | | | | | | |
|--|----------|---|--|---------------|----------------|---------------|-----------------|-----------------|---------|--|
| Nominal pressure gauge | [bar] | 2 | 2 5 10 20 50 100 200 400 | | | | | | | |
| | [bar] | 2 | 5 | 10 | 20 | 50 | 100 | 200 | 400 | |
| | [bar] | 7 | 12 | 25 | 50 | 120 | 250 | 400 | 600 | |
| Supply | | | | | | | | | | |
| Supply voltage | | V _S = 12 3 | 0 V _{DC} | | | | | | | |
| Current consumption | | max. 14 mA | (without co | ntacts) | | | | | | |
| Contacts | | | , | , | | | | | | |
| Number | | standard: 1 | | | | optio | n: 2 | | | |
| Type | | PNP | | | | | | | | |
| Switching performance | | max. 300 m | max. 300 mA, short-circuit proof | | | | | | | |
| Accuracy of contacts | | IEC 60770: ≤ ± 1 % FSO | | | | | | | | |
| Repeatability | | ≤±0.2 % FSO | | | | | | | | |
| Minimum hysteresis of conta | icts | ≤±0.5 % FSO | | | | | | | | |
| Status indication | | SP 1: green SP 2: yellow | | | | | | | | |
| Switching function ¹ | | standard: n | /o | | | optio | n: n/c | | | |
| Switching mode ¹ | | standard: h | ysteresis mo | ode | | optio | n: window m | ode | | |
| Switch on point ¹ | | standard: factory setting 80 % FSO others: specify on order; adjustable range 5 100 % FSO | | | | | | | | |
| Switch off point 1 | | | standard: factory setting 75 % FSO | | | | | | | |
| Switch on / switch off delay 1 | l | standard: off others: specify on order, adjustable range from 10 msec up to 90 sec (step 10 msec) | | | | | | | | |
| Switching frequency | | 200 Hz (witl | | | | | , | • | | |
| Switching cycles | | > 100 x 10 ⁶ | | | | | | | | |
| ¹ Parameters can be programme | ed by cu | stomer either v | ith the progra | mming kit CIS | -G or with the | orogramming o | device P6 (avai | lable as access | ories). | |
| Thermal effects (Offset and | d Spar | n) / Permissi | ole tempera | tures | | | | | | |
| Thermal error | | ≤±0.3 % F | SO / 10 K | | | in co | mpensated ra | ange 0 85 ° | С | |
| Permissible temperatures | | medium / el | nedium / electronics / environment: -25 85 °C storage: -40 85 °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 (20 2000 Hz) | according to DIN EN 60068-2-6 | | | | | |
| Shock | 100 g / 11 msec according to DIN EN 60068-2-27 | | | | | | |
| Materials | | | | | | | |
| Pressure port | stainless steel 1.4301 (304) | | | | | | |
| Housing | stainless steel 1.4305 (303) | stainless steel 1.4305 (303) | | | | | |
| Seals (media wetted) | standard: FKM | option: EPDM | | | | | |
| Diaphragm | ceramic Al ₂ O ₃ 96 % | | | | | | |
| Media wetted parts | pressure port, seals, diaphragm | | | | | | |
| Miscellaneous | | | | | | | |
| Weight | approx. 90 g | | | | | | |
| Installation position | any | | | | | | |
| Operational life | 100 million load cycles | | | | | | |
| Ingress protection | IP 67 | | | | | | |
| CE-conformity | EMC Directive: 2014/30/EU | Pressure Equipment Directive: 2014/68/EU (module A) ² | | | | | |
| ² This directive is only valid for device | es with maximum permissible overpressure | e > 200 bar | | | | | |
| Wiring diagrams | | | | | | | |

Wiring diagrams





Pin configuration

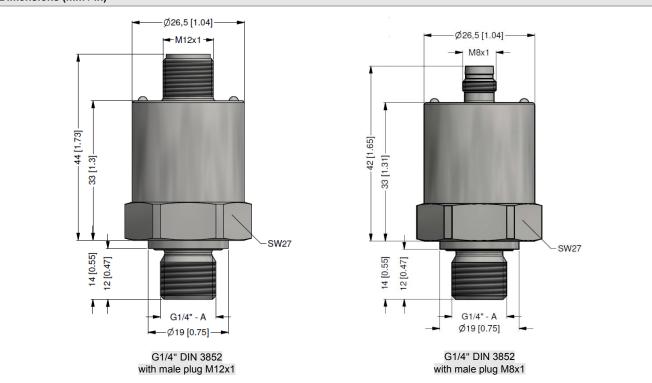
| Electrical connection | M12x1 (4-pin), metal |
|-----------------------|----------------------|
| Supply + | 1 |
| Supply – | 3 |
| Contact 1 | 4 |
| Contact 2 | 2 |
| Shield | plug housing |

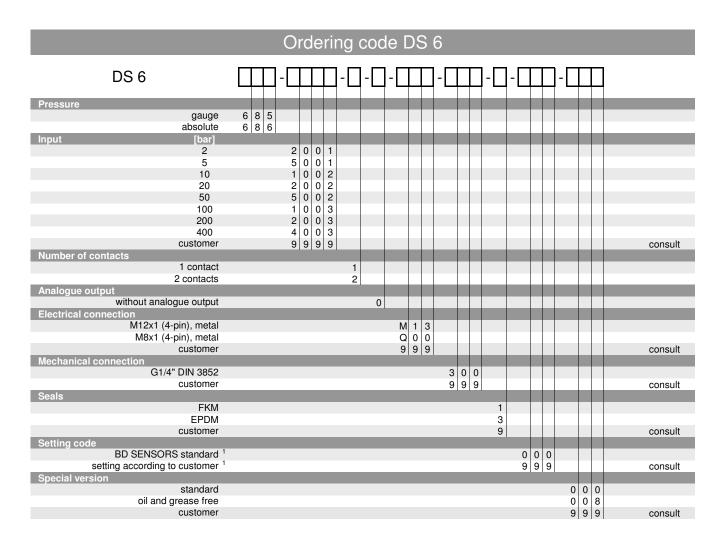


| M8x1 (4-pin), metal |
|---------------------|
| 1 |
| 3 |
| 4 |
| 2 |
| plug housing |



Dimensions (mm / in)





¹ Parameters can be programmed by customer either with the programming kit CIS-G or with the programming device P6 (available as accessories).

COMPETENCE

Industrial pressure measurement technology from 0.1 mbar up to 8000 bar

PRICE / PERFORMANCE

Pressure measurement at the highest level

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refrigeration



calibration techniques



laboratory techniques



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vehicles and mobile hydraulics



oil and gas industry



pharmaceutical industry



marine / shipbuilding / offshore



heavy industry



environmental industry



packaging and paper industry

MEDIA



sewage



aggressive media



colours



gases



fuels and oils



pasty and viscous media



oxygen



water



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