



## DS 201

### Electronic Pressure Switch with Ceramic Sensor

- ▶ 1 analogue output and up to 2 contacts
- ▶ display and housing rotatable
- ▶ nominal pressure ranges from 0 ... 0.6 bar up to 0 ... 600 bar

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

- pressure transmitter
- intelligent pressure switch
- digital display device

Use in media such as viscous, pasty or highly contaminated fluids is possible.

Compared to the universally used basic type DS 200, the DS 201 has a mechanically and chemically robust ceramic sensor instead of a stainless steel sensor. The 4-digit LED display shows the system pressure and supports programming the DS 201 using the foil keys. The software has several functions such as access protection, configuration of the display and the switch outputs, etc. Set and reset points are freely configurable in the range 0 to 100 % of nominal pressure. Display and housing of the DS 201 are rotatable, so that the position of the display can be easily adapted to unusual installation conditions.

The optional PVDF pressure port covers applications for most of aggressive media where stainless steel is not resistant. Additionally there is an oil and fat free version for applications with oxygen.

- ▶ configuration of display, including
  - current value
  - decimal point
- ▶ contacts adjustable, including
  - switch on / switch off points
  - hysteresis / window mode
  - switch on / switch off delay
- ▶ special functions / administration
  - access protection
  - min. / max. value memory
- ▶ option Ex-version (only for 4 ... 20 mA / 2-wire) TÜV 02 ATEX 1841 option: oxygen application
- ▶ option: oxygen application

Functions



DS 201

Electronic Pressure Switch

### Input pressure range

Nominal pressure gauge [bar]	-1...0	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
Permissible overpressure [bar]	3	3	3	7	7	12	12	25	50	50	120	120	250	500	500	600	750

### Output signal / Supply

#### Analogue output

Standard	2-wire: 4 ... 20 mA / $V_s = 18 \dots 41 V_{DC}$	Ex protection: $V_s = 17 \dots 28 V_{DC}$
Optional	3-wire: 0 ... 10 V / $V_s = 15 \dots 36 V_{DC}$	4 ... 20 mA / $V_s = 19 \dots 30 V_{DC}$ (on request)
Accuracy	IEC 60770 <sup>1</sup> : $\leq \pm 0.5\%$ FSO	BFSL: $\leq \pm 0.25\%$ FSO
Permissible load	current 2-wire: $R_{max} = [(V_s - V_{smin}) / 0.02] \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$	
Response time	< 10 msec <sup>2</sup>	

#### Contact <sup>3,4</sup>

Number, type	1 or 2 independent PNP contacts	
Switching current	standard: contact rating max. 125 mA, short-circuit resistant Ex-protection: max. switching current <sup>5</sup> : 70 mA; max. permissible inductivity: 4.7 mH	
Accuracy of contacts	IEC 60770 <sup>1</sup> : $\leq \pm 0.5\%$ FSO	BFSL: $\leq \pm 0.25\%$ FSO
Repeatability	$\leq \pm 0.2\%$ FSO	
Switching frequency	max. 10 Hz	
Switching cycles	> 100 x 10 <sup>6</sup>	
Delay time	0 ... 100 sec	

### Thermal effects

Thermal error for offset and span in compensated range	$\leq \pm 0.2\%$ FSO / 10 K -25 ... 85 °C
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### Electrical protection

Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Option Ex-protection AX11-DS 201	zone (0) 1: II (1) 2 G EEx ia IIC T4 (only with 4 ... 20 mA / 2-wire) safety technical maximum values: $V_i = 28 V$ , $\Sigma I_i = 93 mA$ , $\Sigma P_i = 660 mW$

### Display

Type	4-digit, red LED display, digit height 7 mm, digit width 4.85 mm (angle 10 °)
Range	-1999 ... +9999
Accuracy	0.1 % $\pm$ 1 digit
Digital damping	0.3 ... 30 sec (programmable)
Measured value update	0.0 ... 10 sec (programmable)

### Mechanical stability

Vibration	5 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 msec

<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

<sup>2</sup> with 3-wire version 4 ... 20 mA the response time is 1 sec

<sup>3</sup> with connector DIN 43650 and output 4 ... 20 mA / 2-wire max. 1 contact possible; with 0 ... 10 V / 3-wire no contact possible

<sup>4</sup> with Ex-protection max. 1 contact possible

<sup>5</sup> the real switching current in the application depends on the power supply unit

# DS 201

Electronic Pressure Switch

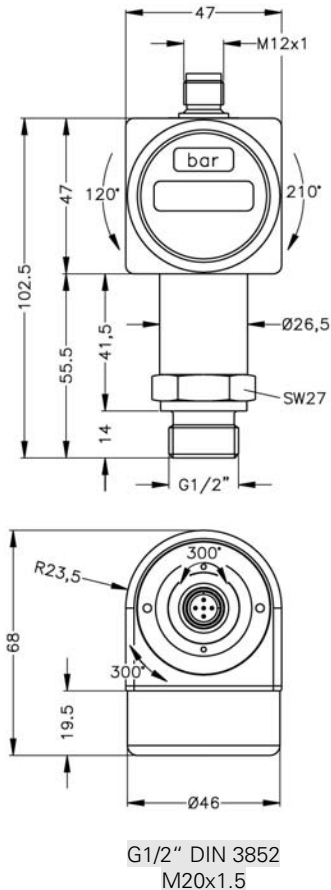
Technical Data

## Permissible temperatures

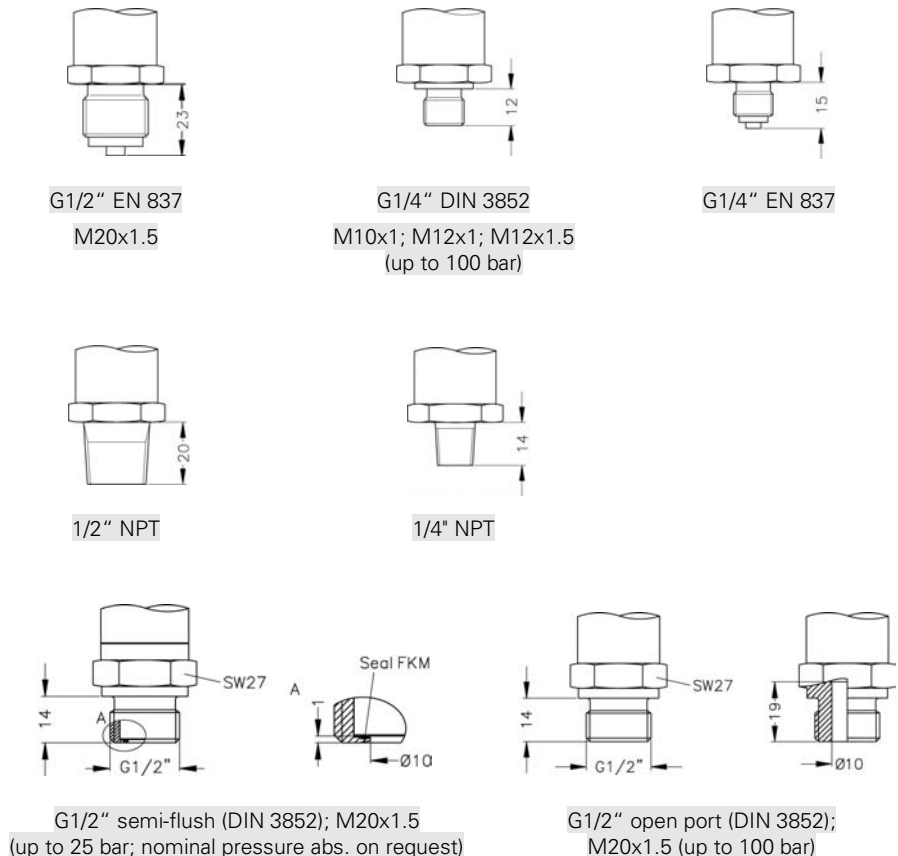
Medium	-25 ... 135 °C	
Electronics / environment	-25 ... 85 °C	Ex-protection: -25 ... 70 °C
Storage	-40 ... 85 °C	

## Mechanical connection

### Standard



### Optional



⇒ Ex-protection: total length increases by 18 mm!

## Electrical connection



<sup>6</sup> different cable types and lengths available; standard : 2 m PVC cable (without ventilation tube), optionally cable with ventilation tube

### Materials

Pressure port	standard: stainless steel 1.4571 (316Ti) option for G1/2" open port with pressure ranges $P_N \leq 60$ bar: PVDF others on request
Housing	stainless steel 1.4301 (304)
Display housing	PA 6.6, Polycarbonate
Seals (media wetted)	$P_N < 100$ bar: FKM / $P_N \geq 100$ bar: NBR / others on request
Diaphragm	ceramic $Al_2O_3$ 96 %
Media wetted parts	pressure port, seals, diaphragm

### Miscellaneous

Optionally up to 160 bar: oxygen application	for $P_N \leq 50$ bar: O-ring in V747-75 (with BAM-approval); permissible maximum values are 40 bar / 130° C and 50 bar / 100° C for $P_N > 50$ bar: O-ring in FKM 90 (approved by the scientific coal research institute in Ostrava – CZ up to max. 95 °C and 215 bar)
Current consumption (without contacts)	signal output current: max. 25 mA signal output voltage: max. 18 mA
Weight	approx. 200 g
Installation position	any
Ingress protection	IP 65

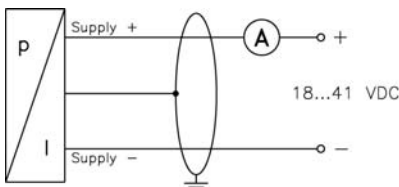
### Pin configuration

Electrical connection		M12x1 plastic (5-pin)	M12x1 metal (5-pin)	DIN 43650	cable colours (DIN 47100)
2-wire-system	Supply +	1	1	1	white
	Supply -	3	3	2	brown
	Contact 1	4	4	3	grey
	Contact 2	5	5	-	pink
	Ground	via pressure port	plug housing	ground contact	yellow / green (shield)
3-wire-system	Supply +	1	1	1	white
	Supply -	3	3	2	brown
	Signal +	2	2	3	green
	Contact 1	4	4	-	grey
	Contact 2	5	5	-	pink
Ground	via pressure port	plug housing	ground contact	yellow / green (shield)	

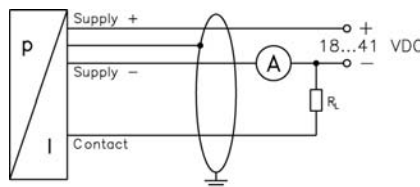
### Wiring diagrams

2-wire-system (current) (for Ex protection: supply  $V_s = 17 \dots 28 V_{DC}$ ; max. 1 contact possible)

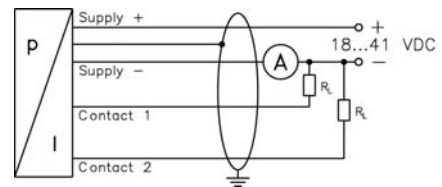
without contact



1 contact

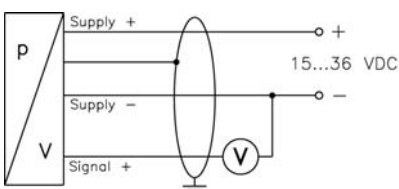


2 contacts

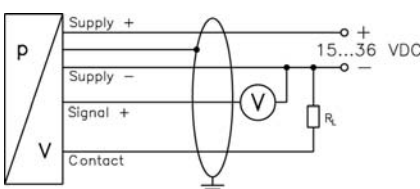


3-wire-system (voltage)

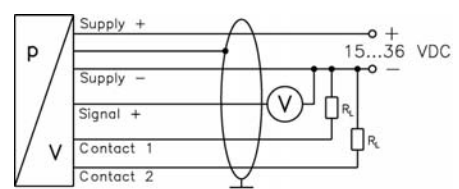
without contact



1 contact



2 contacts



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