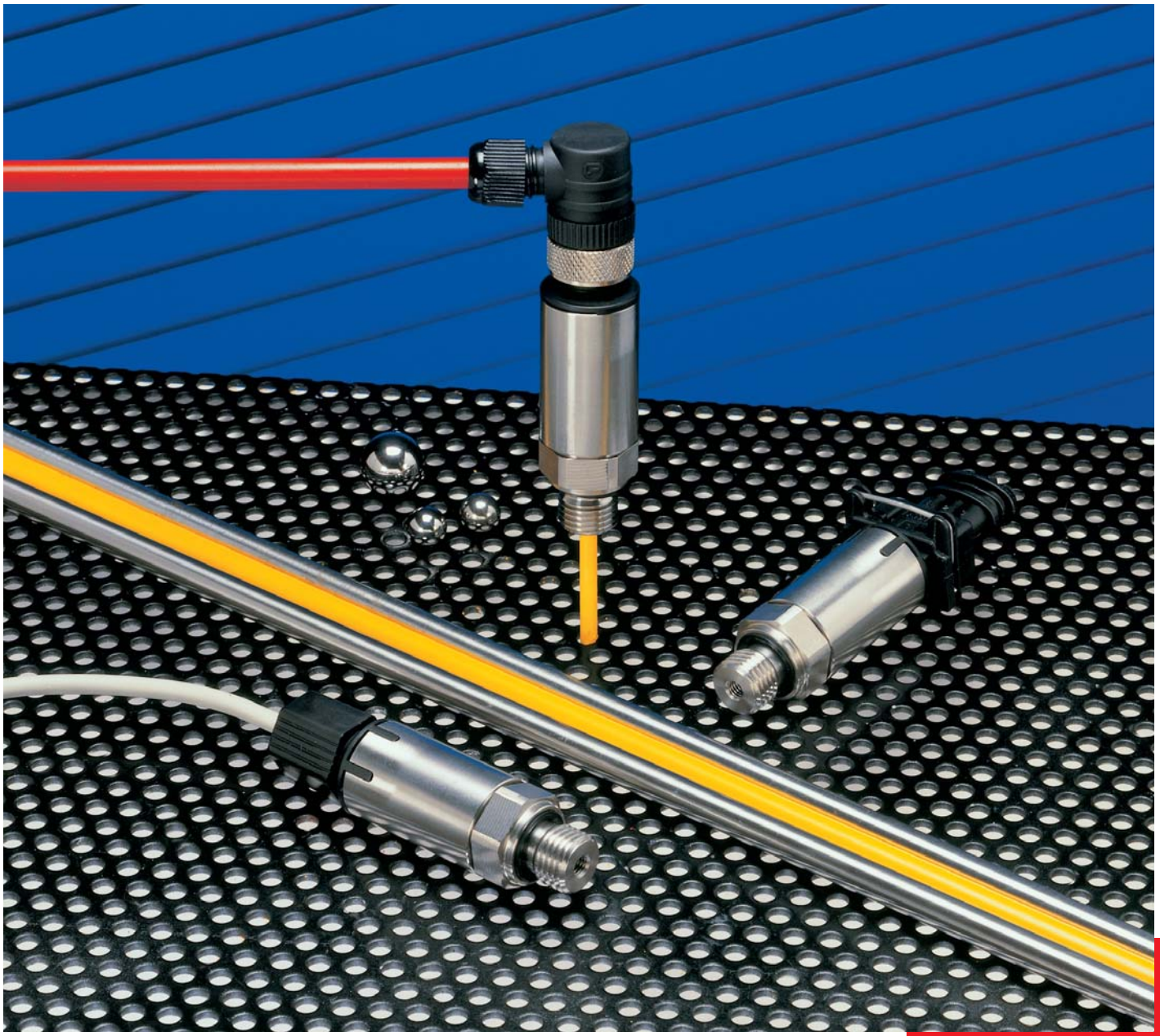
511

OEM
Electronic pressure switch
Relative –1 ... 600 bar
Absolute 0 ... 25 bar



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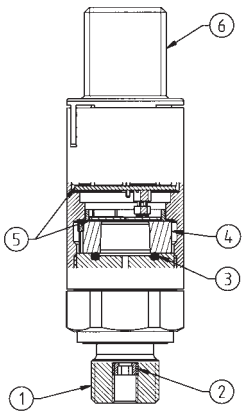
Huba Control

FOR FINE PRESSURE AND FLOW MEASUREMENT

Technical overview

These compact OEM pressure switchs type series 511 meet the highest specification for mechanical stress, EMC compatibility, and operational reliability, which means that this range is particulary suitable for all demanding industrial applications.
Switching loads up to 150 mA resp. 500 mA are possible because of an electronic semiconductor switch. The upper and lower switching point ist free eligible between 5 and 100% fs in function N/C and N/O.
This sensor utilises a ceramic technology, developed by Huba Control and for the last 10 years, in millions of applications, used in combination with unique integrated electronic design, means that the type 511 series have a high degree of accuracy for all temperature ranges. These units are available in small or production quantities, with an excellent price to performance ratio.



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Legend to cross-section drawing

1 Connection fitting
2 Protection of media leakage
3 Sealing
4 Ceramic cell
5 Electronic with EMC-protection
6 Electrical connection (example Quickon)

Pressure ranges

Absolute pressure
Relative pressure (gage)
(differential measurement of pressure relative to ambient pressure).

The distinct advantages

- Compact, rugged construction for highest operational reliability
- Protection IP 67 standard
- No media egress when exceeding rupture pressure (patented)
- Negligible temperature influence on accuracy
- Excellent EMC-capacity
- Saving time by quick cable mounting by the customer with Quickon-System

Overload

3.0x Full scale at – 1 … 4 bar
2.5x Full scale at 6 … 600 bar
but as a maximum 900 bar
Higher overload on request

Rupture pressure

3.0x Full scale at – 1 … 4 bar
2.5x Full scale at 6 … 600 bar
but as a maximum 900 bar
Higher rupture pressure on request
Patented media stop system to prevent media egress when exceeding rupture pressure range (≥ 40 bar nominal value)

Accuracy

Repeatability < +/– 0.1% fs
Accuracy of switching point adjustments
< +/– 1% fs

Housing material

Casing:
Stainless steel 1.4305 (AISI 303)

Materials in contact with the medium

Ceramic Al_2O_3/
Stainless steel 1.4305 (AISI 303)
Media stopper: PPS
Sealing material:
optionally FPM, NBR,
others on request

Application temperature

Medium temperature with sealing:
FPM – 15 … + 125 °C
NBR – 25 … + 85 °C
FPM spec. – 40 … + 150 °C
Ambient temperature: 85 °C

Temperature influences

TC zero point < +/– 0.015% fs/K
TC sensitivity < +/– 0.015% fs/K
temperature range – 40 … + 85 °C

Load cycle

≤ 100 Hz

Dynamic response

Suitable for static and dynamic measurements.
Response time < 2 ms, 1 ms typ.

Pressure connections

See order code selection table

Weight

Version inside thread 85 grams
Version outside thread 95 grams

Installation arrangement

Unrestricted

Power supply

8 … 33 VDC

Output

Semiconductor switching output:
Highside-Switch (PNP) max. 150 mA
Lowside-Switch (NPN) max. 500 mA
at max. power supply voltage
Output with self-resetting thermal excess-current release
Leak currency < 20 µA
Short circuit-proof and protected against polarity reversal. Each connection against other with max. +/– supply voltage.

Current consumption

< 4 mA

Electrical connections / Protection

See order code selection table

Tests / Admissions

Shock acc. IEC 68-2-27
100 G, 11 ms half sine wave, all 6 directions. Free fall from 1 m on concrete (6x).
Constant shock acc. IEC 68-2-29
40 G for 6 ms, 1000x all 3 directions.
Vibration acc. IEC 68-2-6
20 G, 9 ... 2000 Hz, 2 ... 9 Hz with amplitude +/– 15 mm, 1 Octave / min. all 3 directions, 50 constant load.
EMV-behaviour see on the back.
UL according to standard 873

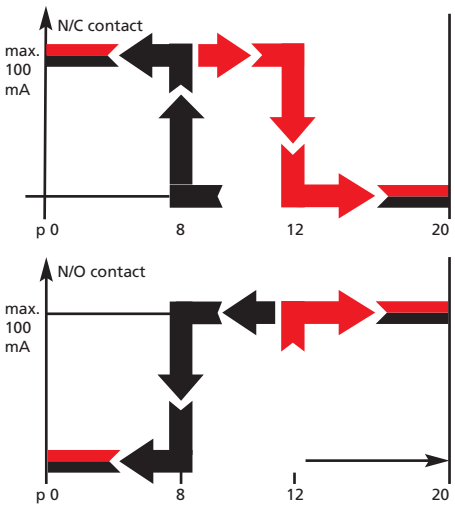
Adjustment of switching points

Factory set
Upper switching point 8 …100% fs
Lower switching point 5 … 97% fs
Min. hysteresis 3%

Operation / Switch status indication

N/C contact: When pressure is applied ($p_0 \rightarrow p_{max}$) the switch will disconnect the applied load as soon as the upper switching point is reached. As the pressure falls ($p_{max} \rightarrow p_0$) the switch will connect the load as soon as the lower switching point is reached.
N/O contact: When pressure is applied ($p_0 \rightarrow p_{max}$) the switch will connect the applied load as soon as the upper switching point is reached. With a fall in pressure ($p_{max} \rightarrow p_0$) the switch will disconnect the load as soon as the lower switching point is reached.

Example: p_{FS} 20 bar
Upper switching point 12 bar
Lower switching point 8 bar



Dimensions in mm / Electrical connections

A	 B	 C	 D
E	 F	 G	 H

A –

B – Connector AMP

C – Quickon

D – Ouickon cable screwing

E –

F – Female Connector AMP
Junior Power Timer

G – Cable 1.5 meters

H – Outside thread
G 1/4

Order code selection table

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		X	X	X	X	X	X	X	X	X	X
Relative pressure		9									
Absolute pressure		8									
Pressure ranges in bar[1]	−1 ... + 0 bar	9	0	0							
	0 ... + 1 bar		1	1							
	0 ... + 1.6 bar		1	2							
	0 ... + 2.5 bar		1	4							
	0 ... + 4 bar		1	5							
	0 ... + 6 bar		1	7							
	0 ... + 10 bar		3	0							
	0 ... + 16 bar		3	1							
	0 ... + 25 bar		3	2							
	0 ... + 40 bar	9	3	3							
	0 ... + 60 bar	9	4	0							
	0 ... + 100 bar	9	4	1							
	0 ... + 160 bar	9	4	2							
	0 ... + 250 bar	9	4	3							
	0 ... + 400 bar FPM seal only	9	5	4	6						
	0 ... + 600 bar FPM seal only	9	5	5	6						
Pressure ranges in psi[1]	-30 … 0” hg		A	0							
	0 … + 15 psi		B	1							
	0 … + 30 psi		B	4							
	0 … + 60 psi		B	5							
	0 … + 100 psi		B	7							
	0 … + 200 psi		C	1							
	0 … + 300 psi		C	2							
	0 … + 500 psi	9	C	3							
	0 … + 750 psi	9	D	0							
	0 … +1000 psi	9	D	1							
	0 … +2000 psi	9	D	2							
	0 … +3000 psi	9	D	3							
	0 … +5000 psi FPM seal only	9	E	4	6						
	0 … +7500 psi FPM seal only	9	E	5	6						
Sealing materials[2]	FPM Fluoro-elastomer – 15 … + 125 °C				0						
	NBR butadiene-acrylic nitrile-caoutchouc – 25 … + 85 °C				2						
	FPM Fluoro-elastomer spec. – 40 … + 150 °C				6						
Switching contact	Contact N/O Highside switch PNP					2	L				
	Contact N/C Highside switch PNP					2	M				
	Contact N/O Lowside switch NPN					2	N				
	Contact N/C Lowside switch NPN					2	P				
Electrical connections	Cable, 1.5 meters (Photo G, Quickon) IP 67 max. 85 °C							0			
	Quickon, **cable screwing inclusive** IP 67 max. 85 °C							1			
	Connector AMP (without female connector) IP 67 max. 125 °C							2			
	Connector M12x1 (without female connector) IP 67 max. 85 °C							5			
Pressure connections[3]	Inside thread G 1/4 with O-ring sealing								1		
	Outside thread G 1/4 sealed at back DIN 3852/E								4		
	Outside thread 1/4-18 NPT								3		
	Outside thread R 1/4, DIN 2999								7		
	Outside thread M 12 x 1.5								5		
	Outside thread M 14 x 1.5								6		
Process connection	without pressure tip orifice									1	
	with pressure tip orifice (standard from ≥ 40 bar on)									2	
	without pressure tip orifice, free of oil and grease										
	(only seal FPM, not compound-filled, up to 160 bar)									3	
	with pressure tip orifice (standard from ≥ 40 bar on),										
	free of oil and grease										
	(only seal FPM, not compound-filled, up to 160 bar)									4	
Switching points	Indicate W and mention switching points on order										W

Accessories	Female connector for connector M12 x 1	(not included in delivery)	1 0 6 9 7 5
	Female connector AMP (Junior Power Timer) 2-wire	(not included in delivery)	1 1 0 4 4 2
	Female connector AMP (Junior Power Timer) 3-wire	(not included in delivery)	1 0 8 7 6 7
	Quickon cable screwing	(included in delivery)	1 0 7 3 5 9

Packaging

Mention on order:
- single packaging / • multiple packaging (25 pcs)
- Single packaging, accessories integrated
- Multiple packaging (25 pcs), Quickon cable screwing enclosed

1 Other pressure ranges on request.
2 According to ISO standard R 1629, other sealing materials on request.
3 Other pressure connections and materials on request.

Dimensions in mm / Electrical connections

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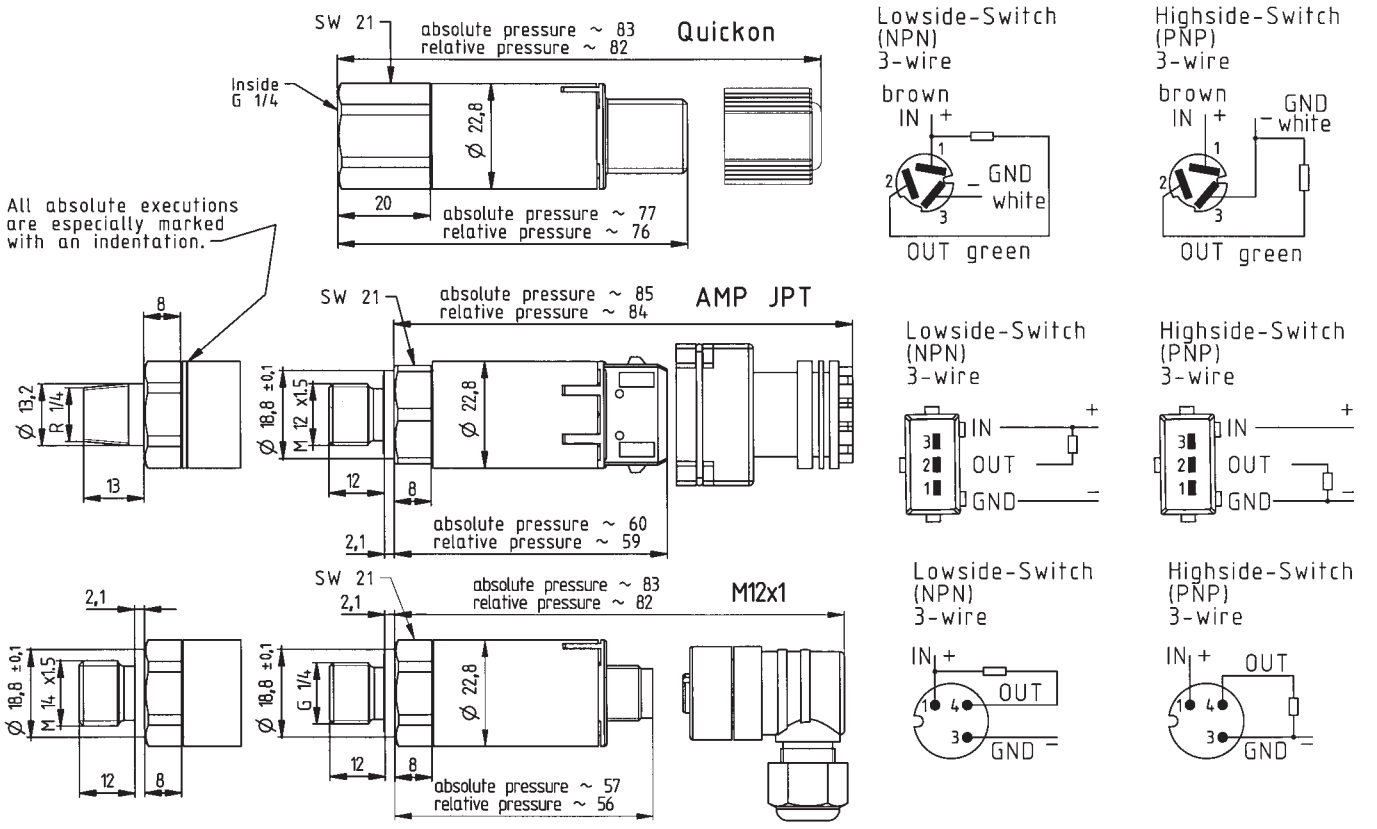

Electromagnetic compatibility:
CE conformity to EC directive 89/336 (EMC) by application of harmonized standards: Interference stability EN 61000-6-2 and EN 61326-1, interference emit EN 61000-6-3, EN 61326-1

Interference stability	**Test standard**	**Effects**
Electrostatic discharge (ESD)	EN 61000-4-2 15 kV air, 8 kV contact	No effect
High-frequency electromagnetic radiation (HF)	EN 61000-4-3 200 V/m, 80 … 1000 Mz	No effect
Conducted HF interference	EN 61000-4-6 30 V, 0.15 ... 80 MHz	No effect
Fast transients (burst)	EN 61000-4-4 4 kV	No effect
Surge	EN 61000-4-5 Line-Line, Line-Case 500 V, 12 Ohm, 9 µF 1 kV, 42 Ohm, 0.5 µF Ratiometric Line-Line 500 V, 2 Ohm, 18 µF	No failure
Magnetic fields	EN 61000-4-8 30 A/m, 50 Hz	No effect
Insulation voltage	500 VDC (optional 1000 VDC) 350 VAC (optional 700 VAC)	No effect
Interference emit	**Test standard**	**Effects**
Conducted interference Radiation from housing	EN 55022 (CISPR 22) 0.15... 30 MHz 30...1000 MHz, 10 meters	 No emission No emission

Technical data subject to change.

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