



# Solid State Pressure Switch

**Type PS-20** - Vacuum to 15,000 PSI  
**Type PS-21** Flush Diaphragm - Vacuum to 8,000 PSI

## Tronic

- No mechanical components provides high vibration resistance and extended service life
- User-programmable with optional software package
- Available with 1 or 2 NPN or PNP solid state relays
- Stainless steel case and wetted parts
- Can be assembled to WIKAI diaphragm seals

WIKAI PS-20 and PS-21 solid state pressure switches are precision engineered to fit many industrial pressure control applications. Each switch undergoes extensive quality control testing and calibration to achieve an accuracy  $\leq 0.50\%$  full scale. The printed circuit boards use state-of-the-art surface mount technology and are potted in silicone gel for protection against mechanical shock, vibration, and moisture. Each switch is temperature compensated to assure accuracy and long term stability when exposed to severe ambient temperature variations.

The compact design provides a rugged pressure switch suitable for many applications in hydraulics and pneumatics, vacuum, test equipment, liquid level measurement, press control, compressor control, pump protection and numerous other processing and control operations.

By using the optional Windows based **Easy Switch** software and RS-232 cable kit, the switch setpoints, hysteresis, and other parameters can be optimized to meet specific performance requirements. This protects the switch from readjustment by unauthorized persons.

The solid state design prevents output setting changes even when exposed to extreme shock and vibration. Various process and electrical connections are available to meet specific requirements.



### STANDARD RANGES

RANGE	MAXIMUM*	BURST**	RANGE	MAXIMUM*	BURST**
30"-0 HgVac	70 PSI	70 PSI	0-100 PSI(A)	500 PSI	500 PSI
30"-0-30 PSI	250 PSI	250 PSI	0-160 PSI	500 PSI	500 PSI
30"-0-100 PSI	500 PSI	500 PSI	0-200 PSI	500 PSI	500 PSI
30"-0-160 PSI	500 PSI	500 PSI	0-300 PSI	1100 PSI	1100 PSI
0-100 INWC	30 PSI	30 PSI	0-500 PSI	1100 PSI	5800 PSI
0-5 PSI	30 PSI	30 PSI	0-1000 PSI	1750 PSI	8000 PSI
0-10 PSI	60 PSI	60 PSI	0-2000 PSI	4600 PSI	14,500 PSI
0-15 PSI(A)	70 PSI	70 PSI	0-3000 PSI	4600 PSI	14,500 PSI
0-25 PSI(A)	145 PSI	145 PSI	0-5000 PSI	11,600 PSI	25,000 PSI
0-30 PSI	145 PSI	145 PSI	0-8000 PSI	17,400 PSI	35,000 PSI
0-50 PSI(A)	250 PSI	250 PSI	0-10,000 PSI	17,400 PSI	35,000 PSI
0-60 PSI	250 PSI	250 PSI	0-15,000 PSI	21,750 PSI	43,500 PSI

Notes:

\* Maximum pressure, causing no permanent changes in specifications but may lead to zero and span shifts.

\*\* Burst pressure, leading to destruction of switch.

(A) Standard ranges available with absolute pressure reference.

**APE PS-20**

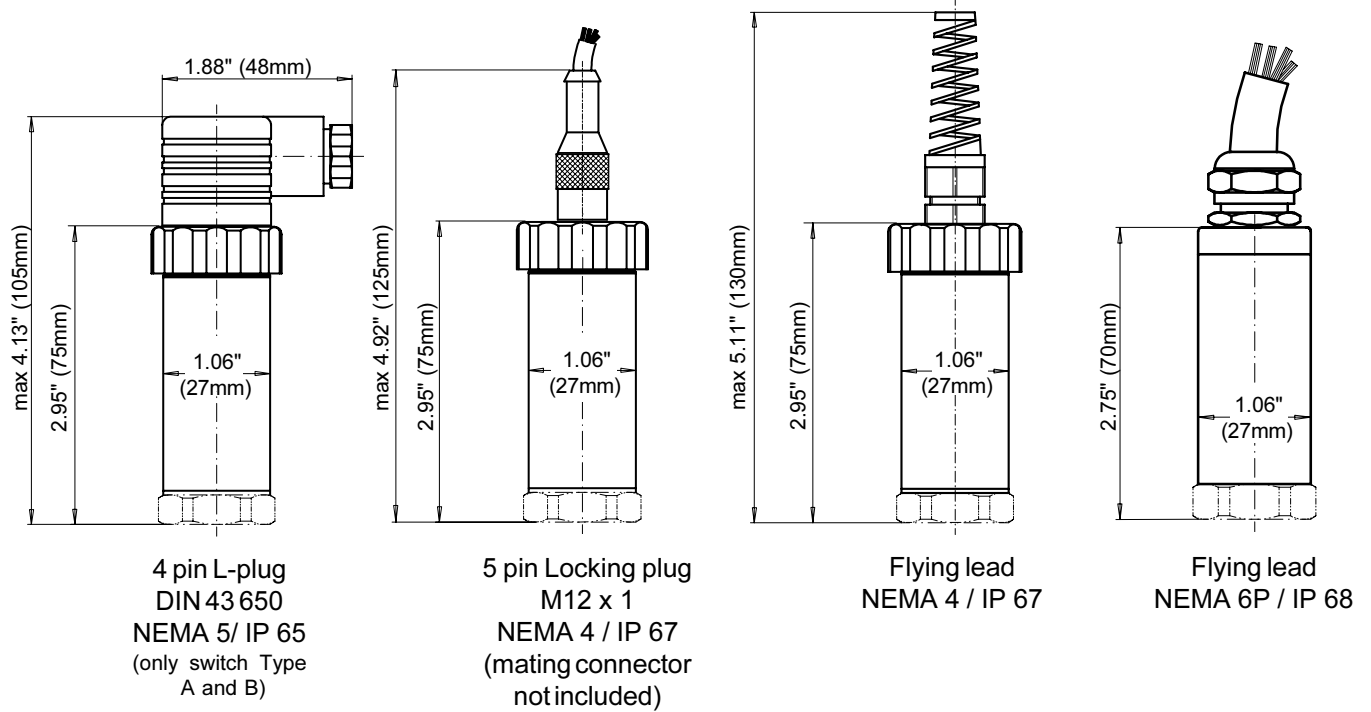
Specifications	Units	Type PS-20 and PS-21																								
Sensing principle Pressure ranges Pressure reference	PSI	piezoresistive up to 300 PSI, thin film > 400 PSI standard ranges as listed {custom ranges available} relative pressure {absolute reference to 500 PSIA}																								
<b>Pressure connection</b> PS-20 for ranges < 15,000 PSI:  PS-21 for ranges 100 INWC to 30 PSI for ranges 50 PSI to 8000 PSI  <b>Material:</b> PS-20 - wetted parts  PS-21 - wetted parts  -case -internal transmitting liquid PS-20  PS-21		1/2" NPT male; (1/4"NPT male, G1/2B, G1/4B) {SAE #4 (7/16-20 UNF J514) male O-ring boss for ranges > 400 PSI} G1B flush diaphragm with O-ring G1/2B flush diaphragm with O-ring  1.4571 and 1.4542 stainless steel (316 ss and PH17-4 ss) {for other materials see WIKA diaphragm seals} 1.4571 (316 ss) and Buna-N O-ring {Viton, Teflon O-rings available} {Hastelloy C-4 or Teflon coated diaphragm}  1.4571 stainless steel (316 ss)  silicone oil for piezoresistive sensors to 300 PSI, {halocarbon oil for oxygen service}, no liquid fill used for thin film sensors > 400 PSI silicone oil {halocarbon for oxygen service} {vegetable oil for food service}																								
<b>Supply voltage</b> U <sub>B</sub>  <b>Switch type</b> Number of switch points Switch current rating (max 30 VDC) Connection type  Switching function  Adjustment of switch points Switch hysteresis Switch window Default values Damping Factory settings Switch response time	DC Volts   DC amps   % of span % of span % of span low / high ms  ms ms	10 to 30 (12 to 30 when the programming module is in use) <table border="1"><thead><tr><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th></tr></thead><tbody><tr><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td><td>1</td></tr><tr><td>4</td><td>0.3</td><td>2</td><td>0.3</td><td>0.3</td><td>0.3</td></tr><tr><td>PNP</td><td>NPN</td><td>PNP/PNP</td><td>NPN/NPN</td><td>PNP/NPN</td><td>Opto<sup>2</sup></td></tr></tbody></table> opening or closing  0 to 100 1 to 99 0 to 100 effective < 20ms after switch is powered up <sup>1</sup> 0 to 500 default settings, see page 4 < 6 for switch type A and C < 10 for switch type B, D, and F	A	B	C	D	E	F	1	1	2	2	2	1	4	0.3	2	0.3	0.3	0.3	PNP	NPN	PNP/PNP	NPN/NPN	PNP/NPN	Opto <sup>2</sup>
A	B	C	D	E	F																					
1	1	2	2	2	1																					
4	0.3	2	0.3	0.3	0.3																					
PNP	NPN	PNP/PNP	NPN/NPN	PNP/NPN	Opto <sup>2</sup>																					
<b>Accuracy</b> Switch setpoints Repeatability 1 year stability	% of span % of span % of span	<0.5% (B.F.S.L.) < 0.25 < 0.2 (under reference conditions)																								
<b>Temperature</b> Media Ambient Storage Compensated range  Maximum additional temperature error within compensated range (ref 70°F) on zero on span	      % of span % of span	-22°F to +212°F (-30°C to +100°C) { -40°F to +257°F (-40°C to +125°C)} -4°F to +176°F (-20°C to +80°C) -40°F to +212°F (-40°C to +100°C) +32°F to +176°F (0°C to +80°C)  +/- 1.0% +/- 1.0%																								
<b>CE</b> conformity		Interference emission and interference immunity per EN 61326																								
Electrical connection   Weight Dimensions  Electrical protection	   lb	4-pin L-plug per DIN 43 650 with cable compression fitting (NEMA 5 / IP 65) {4- pin L-plug with 1/2" female conduit opening} (NEMA 5 / IP 65) (Note: DIN 43 650 only with 1 switching output) 5 pin locking plug M12 x 1 (NEMA 4 / IP 67) {5 foot vented flying lead} (NEMA 4 / IP 67) {submersible, with vented flying lead} (NEMA 6 / IP 68)  approximately 0.4 (0.2 Kg) see drawings  protected against reverse polarity and overvoltage short circuit protection for switch type A and C																								

Notes: Items in curved brackets { } are available as special order options

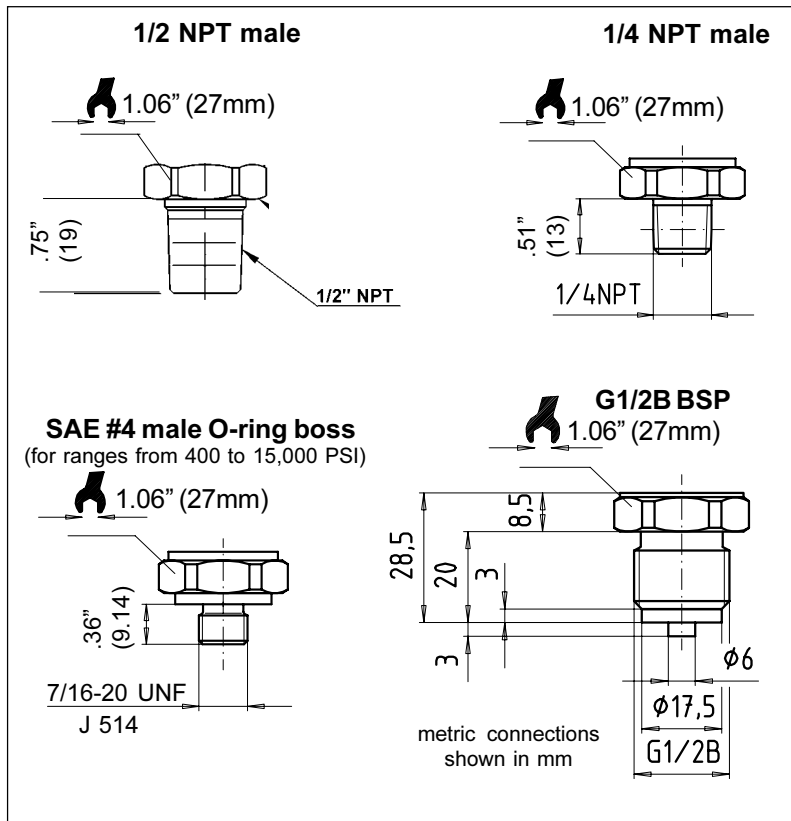
<sup>1</sup> defines the switch state when powered up with pressure applied within the programmed hysteresis range

<sup>2</sup> Potential free opto-relay

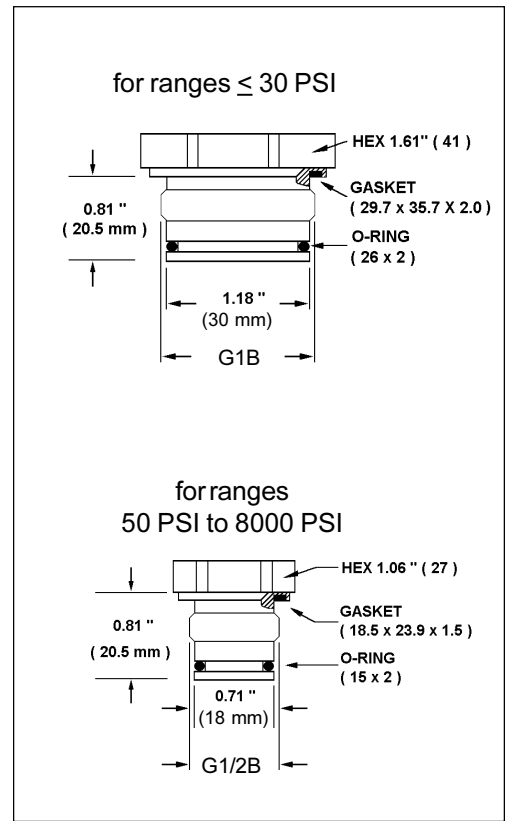
# Dimensions



## PS-20 process connections

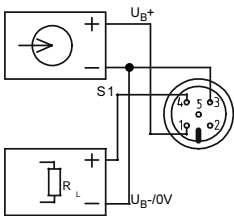


## PS-21 flush diaphragm process connections

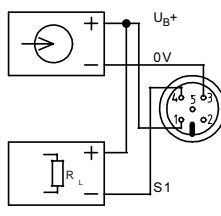


## Electrical connections

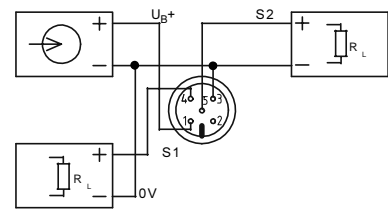
5 pin locking plug M12 x 1



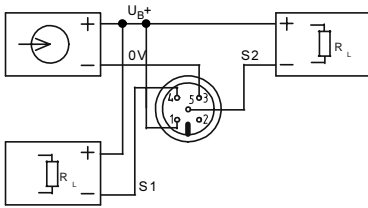
Type A (PNP)



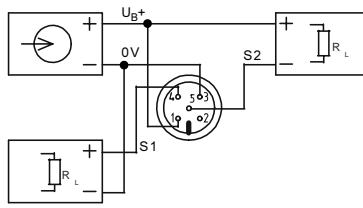
Type B (NPN)



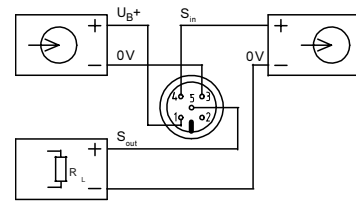
Type C (PNP/PNP)



Type D (NPN/NPN)



Type E (PNP/NPN)



Type F (potential free opto-relay)

## Electrical connections

Connection	Flying lead	DIN 43 650	M12 x1 locking plug
power supply (UB+)	brown	1	1
0 V	green	2	3
Switch output 1 (S01)	white	3	4
Switch output 2 (S02)	yellow	-	5

## Factory default switch settings

Switches are shipped with the following factory settings when custom settings are not specified on the order.

Switch 1 (SO1): Opening  
 Switching point 1: 40% of span  
 Switching point 2: 60% of span  
 Damping: 0 ms

Default settings SO1:  
 Type 0 = closed  
 Type 1 = open  
 Type 2 = closed  
 Type 3 = open

Switch 2 (SO2): Closing  
 Switching point 1: 40% of span  
 Switching point 2: 60% of span  
 Damping: 0 ms

Default settings SO2:  
 Type 0 = closed  
 Type 1 = open  
 Type 2 = closed  
 Type 3 = open

## Order Information

Maximum pressure range	See pricelist for available standard pressure ranges	
Pressure connection	1/2 NPT   1/4 NPT   #4 SAE   PS-21 flush   others	
Select switch output	Type: A   B   C   D   E   F	
Number of switch outputs	1   1   2   2   2   1	
Switch current (typical)	4.0 A   0.3 A   2.0 A   0.3 A   0.3 A   0.3 A	
Switch type	PNP   NPN   PNP/PNP   NPN/NPN   PNP/NPN   PF <sup>1)</sup>	
<sup>1)</sup> PF = Potential-Free contact in opto-relay design		
Electrical connection	L-Plug DIN 43650 (Only available with output types A and B) 5 pin plug M 12x1 (5-pin) Cable other other connections on request	
Switch output SO1	Switch hysteresis: 0 = opening, 1 = closing; or switch window: 2 = Low-window, 3 = High-window	
Pressure value for lower switching point SP1		
Pressure value for higher switching point SP2		
Default setting on power failure A = open / B = closed		
Damping value (0 ms / 20 ms / 100 ms / 200 ms / 500 ms)		
Switching output SO2 (not available for Type A, B, F)	Switch hysteresis: 0 = opening, 1 = closing; or switch window: 2 = Low-window, 3 = High-window	
Pressure value for lower switch point SP1		
Pressure value for higher switch point SP2		
Default setting on power failure A = open / B = closed		
Damping value (0 ms / 20 ms / 100 ms / 200 ms / 500 ms)		
Programming module with RS-232 cable and software	yes   no	U.S.A.   U.K.   Europe country-specific version

## Ordering Information:

State computer part number (if available) / type number / size / range / connection size and location / options required.

Specifications given in this data sheet represent the state of engineering at the time of printing. Modifications may take place and the specified materials may change without prior notice

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