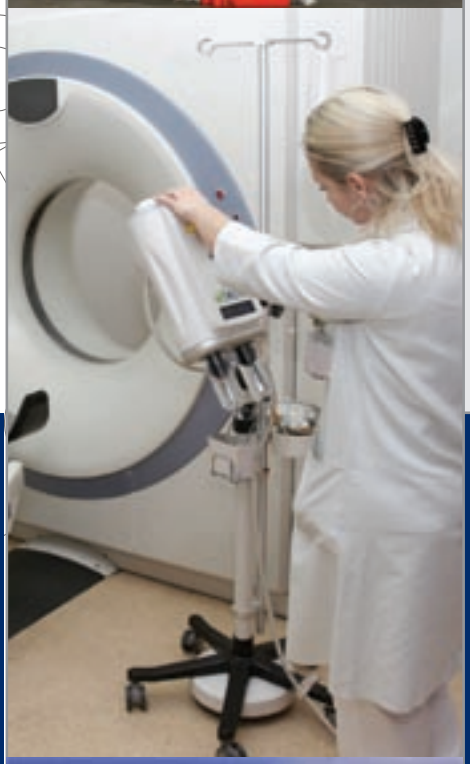
DesignFlex™

Pressure, Vacuum & Differential Switches







CUSTOM DESIGN
VERTICALLY INTEGRATED

From Ocean Depths to Outer Space – Medical Operating Rooms to Living Rooms

www.designflexswitches.com

ISO 9001:2000

RoHS

A World Magnetics Company

Catalog 2013

DesignFlex™ – World Magnetics

LISTENING CONTRIBUTING PARTNERING

The secret of our success is really quite simple; we contribute to yours. We listen, collaborate, engineer affordable solutions and deliver quality crafted products to you... on time. From concept to market, your engineering, design and production needs are met entirely in-house, giving us exacting quality control of your order, the ability to minimize costs and maximize savings, and the ability to respond quickly to your needs. And should you need us in the future, we'll still be listening.

From simple applications to complex projects, our long-term customer relationships and reputation as a world-class manufacturer have earned us an impressive list of customer partners, including Intel, Raytheon, Honeywell, Kodak, Motorola and Hitachi to name just a few.



USA Made / Globally Responsive

DesignFlex™ pressure switch products are made in the USA, engineered and crafted from our global manufacturing facility and world headquarters located in Traverse City, Michigan, USA.

Our passionate customer focus and complete end-to-end manufacturing capabilities provide many customer benefits, including simplified custom engineering; quick service / turn-around; and high-quality, durable product solutions. This approach has successfully built DesignFlex™ and World Magnetics™ into well-known, internationally respected brands, and we enjoy an expanding global customer base crossing the Americas, Europe, Africa, Asia and Oceania.

DesignFlex™ sales / full-service field representatives are headquartered in countries such as Australia, Brazil, Canada, China, Egypt, India, Israel, Italy, Japan, Korea, Malaysia, New Zealand, the United Kingdom / England and the United States of America. Our international customer team responds to inquiries and communications from an average 125 different countries, representing over 50 different languages.

DesignFlex

Ultra-Sensitive Pressure, Vacuum and Differential Pressure Switches

Our field-proven DesignFlex™ switches offer a wide variety of housing, mounting, porting, diaphragm and set point configurations. Our standard in-stock modular components improve your product's reliability, reducing costs and shortening your time to market. Our long life, dependable, ultra-sensitive switches are miniature in size, lightweight and low in relative cost. They feature gold contact points, preventing corrosion and ensuring long life.

We also feature the only shock and vibration resistant switch available in the world (PSF100A); and have recently added a new switch (Pat. Pend.) with controllable deadband (hysteresis) for pressure, vacuum or differential switch applications.

Our manufacturing facilities include die-casting, stamping, injection and compression molding, machining and assembly. We manufacture our own tooling, dies, molds and fixtures, ensuring fast turnaround on your custom designs. Specialty materials for FDA food grade, extreme temperature and NSF approved are available.

Certifications / Environment

ISO:9001:2000 | Military Approved / Certified Military Spec (MIL-SPEC) | UL-Recognized (E41523)(MH29861) | RoHS Compliant | Compliant with European Union (EU) directive on banned substances





WORLD MAGNETICS
Quick Response...Reliable Solutions

FOR YOUR SAMPLE SWITCH, PLEASE CONTACT US TODAY! WE'RE LISTENING...

Many Markets / Industries

INDUSTRY / MARKET APPLICATIONS FOR OUR SWITCHES INCLUDE:

Aerospace, Agriculture, Air Conditioning, Aircraft, Alternative Energy, Aquaculture, Automotive, Commercial Appliance, Computer, Defense, Farm, Heating, Heavy Equipment, Home Appliance, HVAC, Kitchen, Marine, Medical, Military, Office, Safety, Shipping, Surgical and Ventilation.



HVAC

Air proving, ventilation flow, exhaust ducts, cleaning and purification, air filter health / status, fans. Gas furnaces, pellet stove heaters, combustion exhaust venting, exhaust / flue airflow blockage, flue gas, gas pressure, induced draft, heating / venting blower fan, boilers, fuel oil delivery. Refrigeration, cooling fans, air conditioners, freezers. Water heating systems, heat pumps, sump pump / drain control, hot tubs.



MEDICAL

Emergency, intensive care, surgical, rehabilitation. Respiratory therapy, assisted breathing, portable oxygen concentrator, gas level, drug delivery, inhaler / vapor dispenser, nebulizer, alcohol breath analyzer, anesthesia, HEPA filter health, kidney dialysis, reverse osmosis purification. Patient monitors, pulse, breathing rate, blood pressure, intraarticular pressure. Surgical / dental vacuum, suction, air delivery. Sip and puff control.



COMMERCIAL

Gas-fired appliance exhaust venting, liquid product level, fill level / water pressure, chemical dispensing, operating cycle control hot water tank pressure, filter status, control pumps, lights, blowers, burners. Restaurant equipment, deep fryers, convection / pizza ovens, grills, beverage syrup dispensers, coffee machines, dishwashers, ice makers, washers, dryers, food vacuum sealers, vacuum cleaners, pellet wood stoves.



CONSTRUCTION & FARMING

Heavy equipment, earth movers, backhoes, bulldozers, cranes. Tractors, irrigation / harvesting machinery, aquaculture systems, animal care. Heavy duty air / fluid filtering; oil and hydraulic systems, differential, transmission and drivetrain, air, water and oil pumps. Comfort air movement systems, vacuum dairy milking.



AUTOMOTIVE

Passenger cars, vans, sports / race cars, semi trucks, recreational vehicles, boats, motorized vehicles. Emission control, exhaust recirculation control, turbo, manifold vacuum, fuel injection, air and fluid pressure, filter monitoring, pre-cranking lubrication, on-start engine monitoring. Boat / marine bilge pump, trim tab hydraulics.



AEROSPACE

Commercial / military, aircraft, ships, ground transport vehicles, communications and weaponry. NASA astronaut space helmets, cabin pressure, oxygen masks, air speed monitor, holding tanks, vacuum toilet, missile / aircraft guidance, helicopter systems, bombs, tanks. Patriot, Trident, Predator, HMMVW / Humvee.

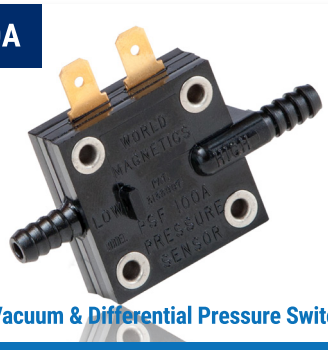
DesignFlex™

Modular & Custom Design, Vertically Integrated Manufacturing

From Ocean Depths to Outer Space – Medical Operating Rooms to Living Rooms

ISO 9001:2015
ROHS Compliant
REACH Compliant
U/L Approved

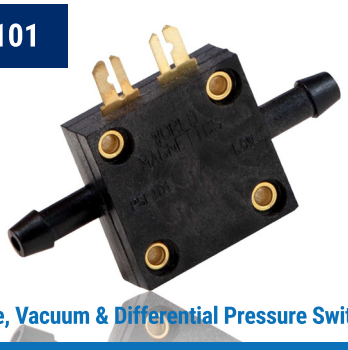
PSF100A



Pressure, Vacuum & Differential Pressure Switch

- Patented shock & vibration approved design
- Set point ranges from 0.1" to 50" H20

PSF101



Pressure, Vacuum & Differential Pressure Switch

- Factory set switch points from 0.5" to 50" H20
- Miniature size, lightweight & low cost

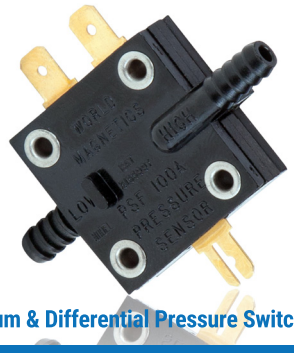
PSF102



Pressure, Vacuum & Differential Pressure Switch

- Field adjustable switch points from 0.03" H20 to 25psi
- Many standard port & mounting options available

PSF200A



Pressure, Vacuum & Differential Pressure Switch

- Dual set points
- Set point ranges from 4" to 50" H20

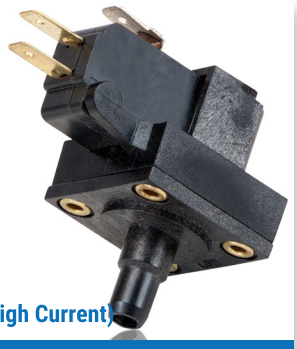
PSF103



Pressure Switch (High Current)

- Field adjustable switch points from 3.0" H20 to 60psi
- Snap action switch design suitable for high current applications

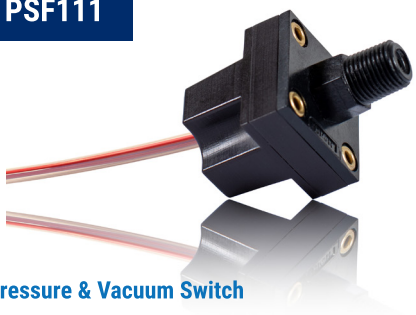
PSF109S



Vacuum Switch (High Current)

- Field adjustable switch points from -3.0" H20 to -12psi
- Vacuum ports available to suit most applications

PSF111



Pressure & Vacuum Switch

- Field adjustable pressure and vacuum set points from -11.9 to 60psi
- Compact, lightweight, environmentally sealed housing

PS100



Pressure, Vacuum & Differential Pressure Switch

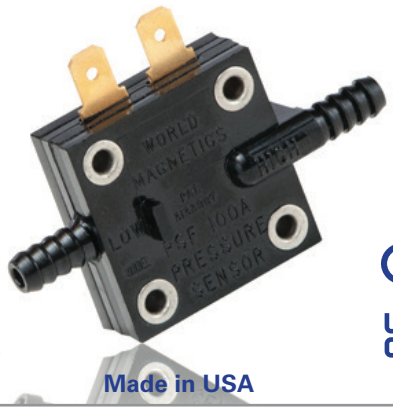
- Settings from 0.1" H20 to 5.0" H20
- Suitable for both high and low current applications

PS160



Pressure, Vacuum & Differential Pressure Switch

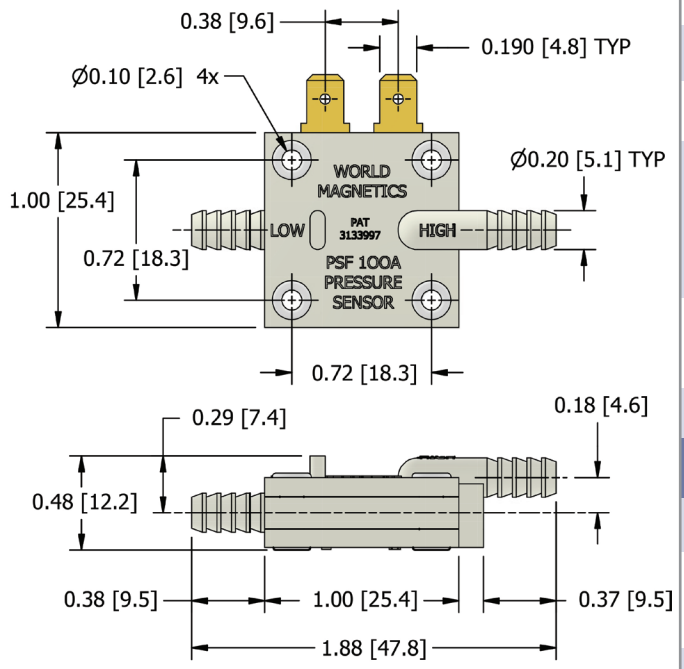
- Factory set points from 0.1" to 2.5" H20
- Reliable performance under harsh conditions



E41523

RoHS

Made in USA



FEATURES / BENEFITS

- Patented shock and vibration resistance
- Miniature size, lightweight, low cost
- Quick response time
- Dependable long life (20+ million cycles)
- Gold contact points (dual)
- Rugged Military Standard (MIL-SPEC)

DesignFLEX

The rugged yet ultra-sensitive PSF100A pressure switch incorporates a patented dual diaphragm / dual contact design offering protection against false actuation due to shock and vibration. Sample switch available by request.

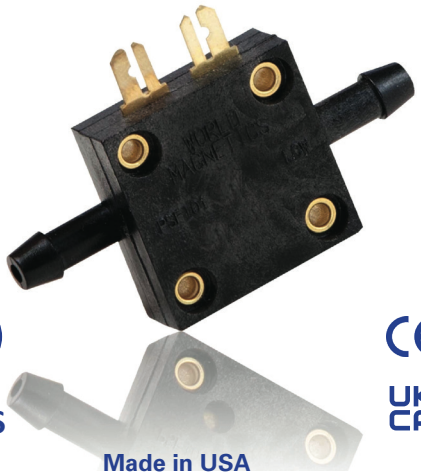
SPECIFICATIONS

MECHANICAL	
Standard Tolerance	±20% (Tighter tolerances available)
Switch Type	SPST normally open | double-make / double-break
Switching Medium	Air; compatible fluids on "High" side
Mechanical Life	More than 20 million cycles
Maximum Operating Pressure	8psi: for units where set point is 3.0" H_2O or less 15psi: for units where set point is greater than 3.0" H_2O 4psi: for units with Teflon® diaphragm of 0.5" H_2O or less 8psi: for units with Teflon® diaphragm greater than 0.5" H_2O
Shock & Vibration	At zero pressure, will not make at 50G's shock, will not make at 10G's, 50 to 2000 Hz vibration
Operating Temp.	+40°F to +150°F (standard) | -46°F to +205°F (contact us)
PHYSICAL	
Case Material	Polycarbonate (other materials available)
Porting Options	Two .200" diameter barbed ports (low / high) for use with 1/8" - 3/16" ID tubing
Diaphragm Material	Polyurethane / Teflon® (other material options available)
Contact Points	Gold (dual)
Electrical Connections	Terminals – .187"x.020" tab-type, for use with quick disconnects (ref. AMP 2-520182-2 or equivalent)
Mounting	Eyeleted for #2 screws; mounting clip available
Weight	Less than 10 grams
ELECTRICAL	
Current Rating	Up to 40mA resistive
Operating Voltage	AC/DC – 30V or less with resistive load; 120 VAC neon lamp load

SET POINT OPTIONS

NOTE: For TEFLON® diaphragm add "T" to set point

	0.5	1.0	1.5	2.0	3.0	4.0	6.0	8.0	10.0	12.0	15.0	20.0	30.0	40.0	50.0
In. H_2O	0.1 - 0.5	1.0	1.5	2.0	3.0	4.0	6.0	8.0	10.0	12.0	15.0	20.0	30.0	40.0	50.0
mbar	0.25 - 1.25	2.49	3.73	4.98	7.47	9.96	14.95	19.92	24.91	29.88	37.36	49.82	74.73	99.63	124.59
psi	0.004 - 0.018	0.036	0.054	0.072	0.108	0.144	0.217	0.289	0.361	0.433	0.541	0.722	1.083	1.444	1.804

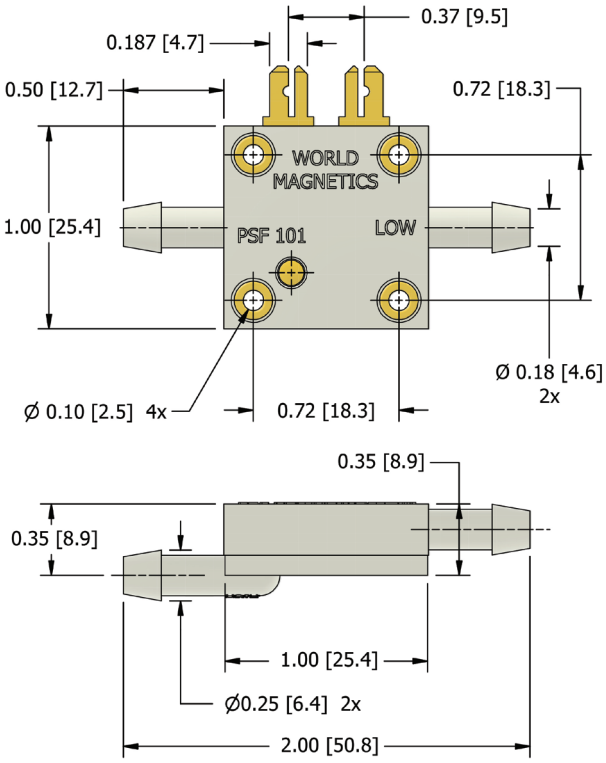


E41523
RoHS
UK CA
Made in USA

FEATURES / BENEFITS

- Many standard port and mounting options
- Custom design and engineering available
- Miniature size, lightweight, low cost
- Quick response time
- Dependable long life (20+ million cycles)
- Gold contact points
- PCB terminals available
- Factory set, tamper proof

MODEL 865X-XXX SHOWN





SPECIFICATIONS

MECHANICAL	
Standard Tolerance	±20% (Tighter tolerances available)
Switch Type	SPST normally open
Switching Medium	Air; compatible fluids on "High" port side
Mechanical Life	More than 20 million cycles
Maximum Operating Pressure	8psi: for units where set point is 3.0" H_2O or less 15psi: for units where set point is greater than 3.0" H_2O 8psi: for units with Teflon® diaphragm
Operating Temp.	+40°F to +150°F (standard) | -46°F to +205°F (contact us)
PHYSICAL	
Case Material	Polycarbonate (optional: Lexan 141, Ryton®, Ultem®, Noryl®)
Porting Options	Many standard ports — see Low Port / High Port Options next page
Diaphragm Material	Polyurethane / Teflon® (other material options available)
Contact Points	Gold
Electrical Connections	Terminals – .187"x.020" tab-type (bifurcated), for use with quick disconnects (ref. AMP 2-520182-2 or equivalent) .020"x.060" (PCB terminals available)
Mounting	#4 Screws through mounting lugs; #2 Screws through eyelets; mounting clip available for specific port arrangement only
Weight	Less than 10 grams
ELECTRICAL	
Current Rating	Up to 40mA resistive
Operating Voltage	AC/DC – 30V or less with resistive load; 120 VAC neon lamp load

Note: For higher load capabilities see our PSF103, PSF109, PSF111 and Goldtech series switches.

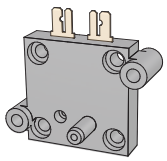
World Magnetics' exclusive DesignFlex™ feature allows you to quickly custom design a proven pressure, vacuum or differential switch for your application. Choose from our standard PSF101 options as shown below or contact our vertically integrated in-house design and engineering team for special features and unique application needs. Sample switch available by request.

SET POINT OPTIONS

	005	010	015	020	030	040	060	080	100	120	150	200	300	400	500
In. H_2O	0.1 - 0.5	1.0	1.5	2.0	3.0	4.0	6.0	8.0	10.0	12.0	15.0	20.0	30.0	40.0	50.0
mbar	0.25 - 1.25	2.49	3.73	4.98	7.47	9.96	14.95	19.92	24.91	29.88	37.36	49.82	74.73	99.63	124.54
psi	0.004 -0.018	0.036	0.054	0.072	0.108	0.144	0.217	0.289	0.361	0.433	0.541	0.722	1.083	1.444	1.806

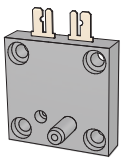
LOW PORT OPTIONS

1



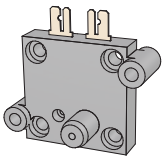
Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs

2



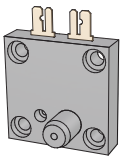
Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs

3



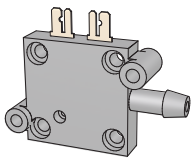
Smooth Port .250" diameter for 7/32" ID tubing w/mtg. lugs

4



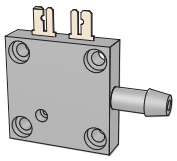
Smooth Port .250" diameter for 7/32" ID tubing w/o mtg. lugs

5



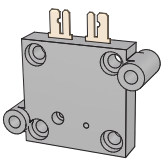
Barbed Port for 3/16" ID tubing w/mtg. lugs

6



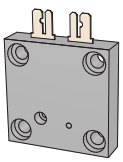
Barbed Port for 3/16" ID tubing w/o mtg. lugs

7



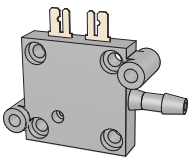
No Port (.060" vent hole) w/mtg. lugs

8



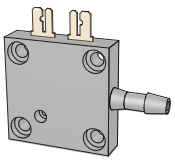
No Port (.060" vent hole) w/o mtg. lugs

9



Barbed Port for 1/8" ID tubing w/mtg. lugs

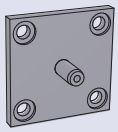
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Barbed Port for 1/8" ID tubing w/o mtg. lugs

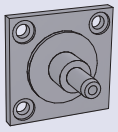
HIGH PORT OPTIONS

1



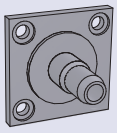
Smooth Port .156" diameter for 1/8" ID tubing

2



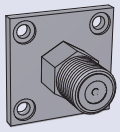
Smooth Port .187" diameter for 5/32" ID tubing

3



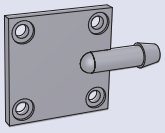
Smooth Port .250" diameter for 7/32" ID tubing

4



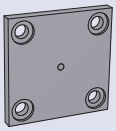
1/8" NPT Port

5



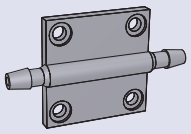
Barbed Port for 3/16" ID tubing

6



No Port (.060" vent hole)

7



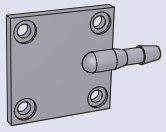
Flow-Thru Barbed Port for 3/16" ID tubing

Diaphragm Options

1 Polyurethane (standard)

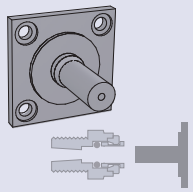
2 Teflon (optional)

8



Barbed Port for 1/8" ID tubing

9



1/4" Port for Quick Connect Fitting

Model Design Guide

For building standard model order number

PSF101 Series Number	Low Port Option Number	High Port Option Number	Diaphragm Option Number	Three Digit Set Point Option Number		
8				—		



E41523

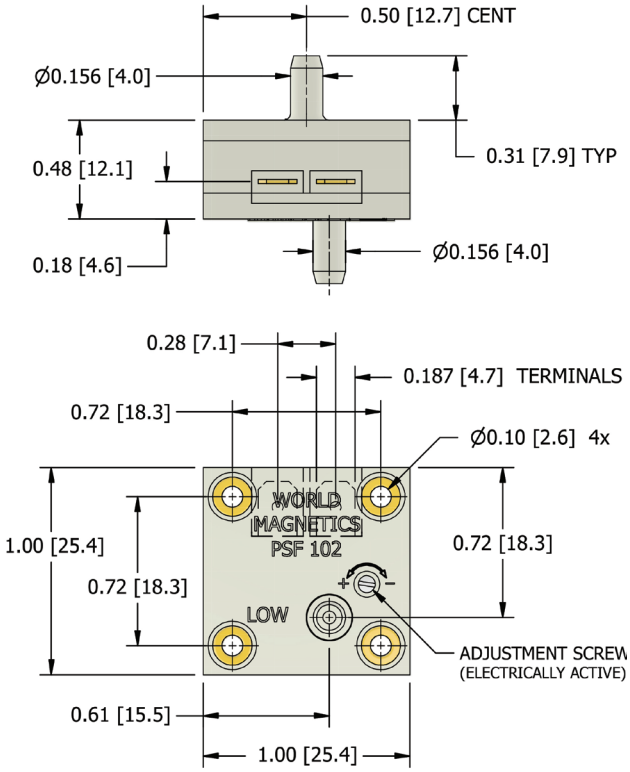
RoHS

Made in USA

FEATURES / BENEFITS

- Field adjustable set point ranges — from 0.03" H_2O to 25 psi
- High resolution / high accuracy field adjustment mechanism
- Many standard ports and mounting options
- Custom design and engineering available
- Miniature size, lightweight, low cost
- Dependable long life (20+ million cycles)
- Gold contact points
- PCB terminals available

MODEL 721X-XXX SHOWN





SPECIFICATIONS

MECHANICAL	
Standard Tolerance	Varies by option – see Set Point Options next page
Switch Type	SPST (single pole / single throw) normally open normally closed option — contact us
Switching Medium	Air; compatible fluids on "High" port side
Mechanical Life	More than 20 million cycles
Maximum Operating Pressure	Varies by option — see Set Point Options next page
Operating Temp.	+40°F to +150°F (standard) | -46°F to +205°F (contact us) +50° - 86°F (700 range)
PHYSICAL	
Case Material	Polycarbonate (optional: Lexan 141, Ryton, Ultem®, Noryl®)
Porting Options	Many standard ports — see Low Port / High Port Options next page
Diaphragm Material	Polyurethane / Teflon® (other material options available)
Contact Points	Gold
Electrical Connections	Terminals – .187"x.020" spade (recessed) for use with quick disconnects uninsulated (ref. AMP Faston, #8-640917-1, 187 Series) (PCB terminals available)
Mounting	#4 Screws through mounting lugs; #2 Screws through eyelets; mounting clip available
Weight	Less than 10 grams
ELECTRICAL	
Current Rating	Up to 40mA resistive
Operating Voltage	AC/DC – 30V or less with resistive load; 120 VAC neon lamp load

Note: For higher load capabilities see our PSF103, PSF109 and Goldtech series switches.

DESIGNFLEX STANDARD OPTIONS

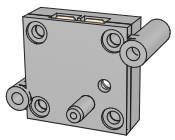
World Magnetics' exclusive DesignFlex™ feature allows you to quickly custom design a proven pressure, vacuum or differential switch for your application. Choose from our standard PSF102 options as shown or contact our vertically integrated in-house design and engineering team for special features.

SET POINT OPTIONS

	700	710	711	712	713	723	714
In. H_2O	0.03 to 0.1	0.1 to 0.5	0.5 to 2.0	2.0 to 15.0	15.0 to 60.0	60.0 to 100.0	100.0 to 692.0
mbar	0.07 to 0.25	0.25 to 1.25	1.25 to 4.98	4.98 to 37.36	37.36 to 149.5	149.5 to 249.0	249.0 to 1723.5
psi	0.001 to 0.004	0.004 to 0.018	0.018 to 0.072	0.072 to 0.542	0.542 to 2.17	2.17 to 3.61	3.61 to 25.0
Maximum Operating Pressure	2psi	4psi	8psi	8psi	15psi	30psi	30psi
Tolerance	+/- 0.03" H20	+/- 0.1" H_2O	+/- 0.2" H_2O	+/- 0.5" H_2O	+/- 10%	+/- 10%	+/- 10%
Diaphragm Material	PUR only	Teflon only	PUR or Teflon	PUR or Teflon	PUR or Teflon	PUR or Teflon	PUR or Teflon

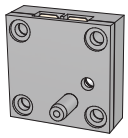
LOW PORT OPTIONS

1



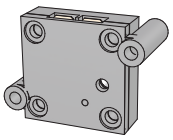
Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs

2



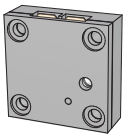
Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs

3



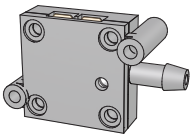
No Port (.060" vent hole) w/mtg. lugs

4



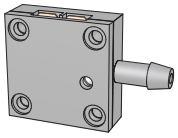
No Port (.060" vent hole) w/o mtg. lugs

5



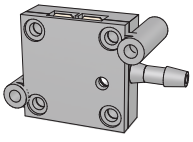
Barbed Port for 3/16" ID tubing w/mtg. lugs

6



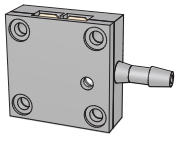
Barbed Port for 3/16" ID tubing w/o mtg. lugs

7



Barbed Port for 1/8" ID tubing w/mtg. lugs

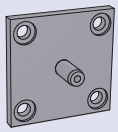
8



Barbed Port for 1/8" ID tubing w/o mtg. lugs

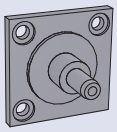
HIGH PORT OPTIONS

1



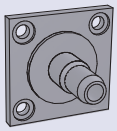
Smooth Port .156" diameter for 1/8" ID tubing

2



Smooth Port .187" diameter for 5/32" ID tubing

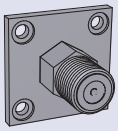
3



Smooth Port .250" diameter for 7/32" ID tubing

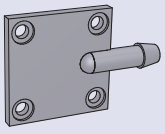


4



1/8" NPT Port

5



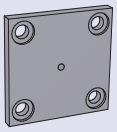
Barbed Port for 3/16" ID tubing

Diaphragm Options

1 Polyurethane (standard)

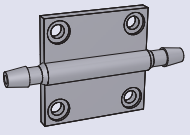
2 Teflon (optional)

6



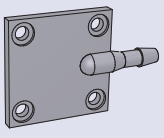
No Port (.060" vent hole)

7



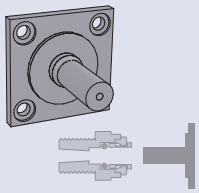
Flow-Thru Barbed Port for 1/8" ID tubing

8



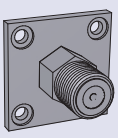
Barbed Port for 1/8" ID tubing

9



1/4" Port for Quick Connect Fitting

0

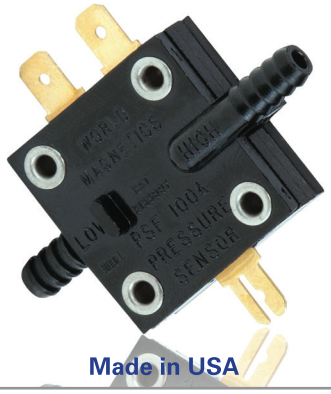


M8 x 1.25 Port

Model Design Guide

For building standard model order number

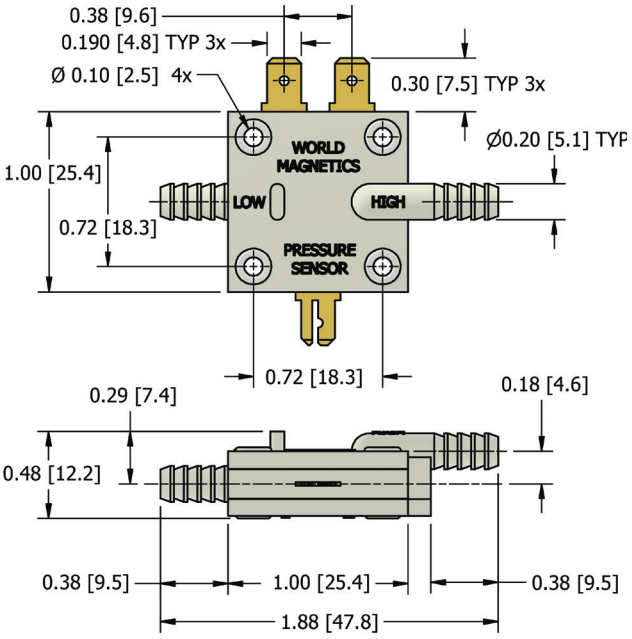
PSF102 Series Number	Low Port Option Number	High Port Option Number	Diaphragm Option Number	Three Digit Set Point Option Number		
7			—			



E41523

RoHS

Made in USA





FEATURES / BENEFITS

- Dual Set Point
- Miniature size, lightweight, low cost
- Quick response time
- Dependable long life (20+ million cycles)
- Gold contact points

SPECIFICATIONS

MECHANICAL	
Standard Set Point Tolerance	±20% (Tighter tolerances available)
Switch Type	SPST normally open
Switching Medium	Air; compatible fluids on "High" side
Mechanical Life	More than 20 million cycles
Maximum Operating Pressure	15psi: for units with polyurethane diaphragm 8psi: for units with Teflon® diaphragm
Operating Temp.	+40°F to +150°F (standard) | -46°F to +205°F (contact us)
PHYSICAL	
Case Material	Polycarbonate (other materials available)
Porting Options	Two .200" diameter barbed ports (low / high) for use with 1/8" - 3/16" ID tubing
Diaphragm Material	Polyurethane / Teflon® (other material options available)
Contact Points	Gold
Electrical Connections	Terminals – .187"x.020" tab-type, for use with quick disconnects (ref. AMP 2-520182-2 or equivalent)
Mounting	Eyeleted for #2 screws;
Weight	Less than 10 grams
ELECTRICAL	
Current Rating	Up to 40mA resistive
Operating Voltage	AC/DC – 30V or less with resistive load; 120 VAC neon lamp load

SET POINT OPTIONS (Choose Any Two)

	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	30.0	35.0	40.0	45.0	50.0
In. H_2O	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	25.0	30.0	35.0	30.0	45.0	50.0
mbar	9.96	14.94	19.92	24.90	29.88	34.86	39.84	44.82	49.80	62.27	74.70	87.18	99.63	112.09	124.54
psi	0.144	0.216	0.288	0.360	0.432	0.504	0.576	0.650	0.722	0.900	1.080	1.260	1.440	1.620	1.806



E41523

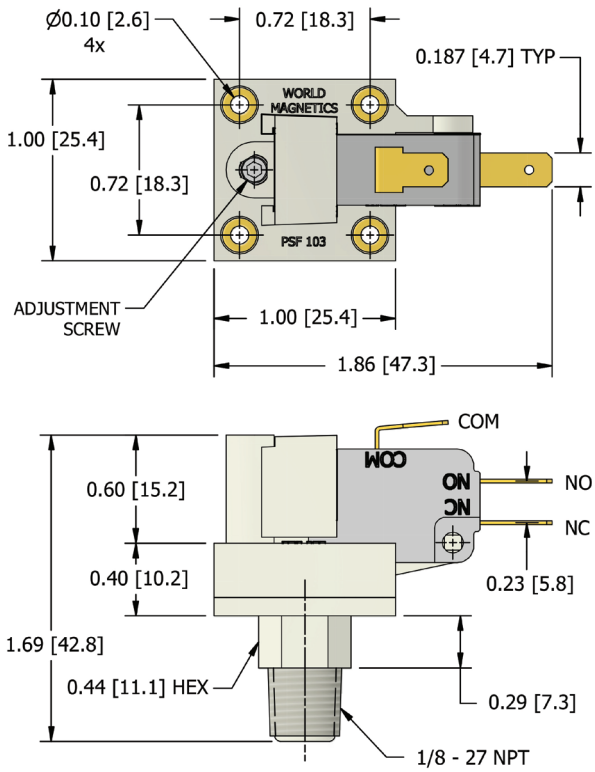
RoHS

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FEATURES / BENEFITS

- Field adjustable pressure set point, from 3" H_2O to 60 psi
- Snap action basic switch, up to 25A*, 125/250 VAC
  *Not available on all ranges
- Many standard pressure ports and mounting options
- Custom design and engineering available
- Small size, lightweight, low cost
- Dependable long life (10+ million cycles)

MODEL 906X-XXX SHOWN





SPECIFICATIONS

MECHANICAL	
Standard Tolerance	±20% (Tighter tolerances available)
Switch Type	SPDT (single pole / double throw) normally open or normally closed
Switching Medium	Air; compatible fluids
Mechanical Life	More than 10 million cycles
Maximum Operating Pressure	Varies by option – see Adjustable Pressure Set Point Options next page
Operating Temp.	+40°F to +150°F (standard) | -46°F to +205°F (contact us)
PHYSICAL	
Case Material	Polycarbonate (optional: Lexan 141, Ryton®, Ultem®, Noryl®) 905 — 906 range use PPS wetted parts
Pressure Port Options	Many standard ports — see Pressure Port / Cover Options next page
Diaphragm Material	Polyurethane (Teflon® optional with limited pressure ranges) other options available
Contact Points	Silver (Gold available on special order)
Electrical Connections	Terminals – .187"x.020" tab-type for use with quick disconnects (ref. AMP #2-520182-2 or equivalent) .250" available — contact us
Mounting	#4 Screws through mounting lugs; #2 Screws through eyelets
Weight	Less than 20 grams
ELECTRICAL	
Current Rating	Varies by option – see Adjustable Pressure Set Point Options next page
Operating Voltage	See Adjustable Pressure Set Point Options next page

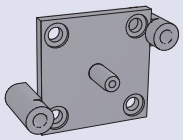
DESIGNFLEX™ STANDARD OPTIONS — Choose from our standard PSF103 options as shown below or contact our vertically integrated in-house design and engineering team for special features and unique application needs. Sample switch available by request.

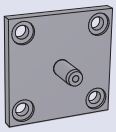
ADJUSTABLE PRESSURE SET POINT OPTIONS

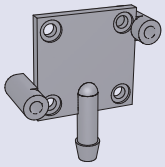
	010*	020*	902	903	904	905	906
In H_2O	0.5 to 2.0	1.5 to 2.5	3 to 10	10 to 28	28 to 111	111 to 416	416 to 1664
mbar	1.2 to 5.0	5.0	7.5 to 25	25 to 70	70 to 276	276 to 1036	1036 to 4144
psi	0.018 to.072	0.072	0.11 to 0.4	0.4 to 1.0	1.0 to 4.0	4.0 to 15	15.0 to 60.0*
Max. Operating Pressure (PUR)	30psi	30psi	30psi	30psi	30psi	70psi	70psi
Max. Operating Pressure (Teflon®)	15psi	15psi	15psi	30psi	30psi	30psi	30psi
Electrical 125/250 VAC Resitive Load	3A	3A	3A	10A	15A	15A	15A

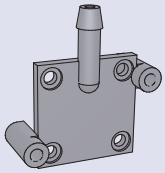
*Non adjustable

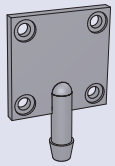
PRESSURE PORT/COVER OPTIONS

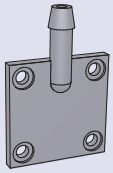
00 
Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs

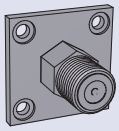
01 
Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs

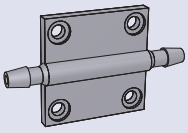
02 
Barbed Port for 3/16" ID tubing on terminals side w/mtg. lugs

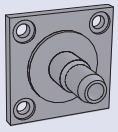
03 
Barbed Port for 3/16" ID tubing opposite terminals w/mtg. lugs

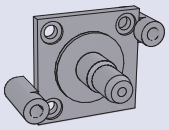
04 
Barbed Port for 3/16" ID tubing on terminals side w/o mtg. lugs

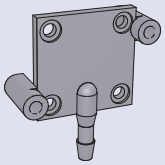
05 
Barbed Port for 3/16" ID tubing opposite terminals w/o mtg. lugs

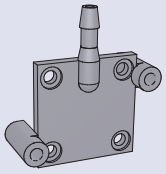
06 
1/8" NPT Port

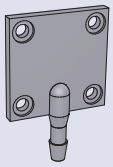
07 
Flo-Thru Barbed Port for 1/8" ID tubing w/o mtg. lugs

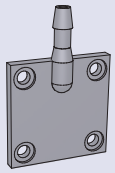
08 
Smooth Port .250" diameter for 7/32" ID tubing w/o mtg. lugs

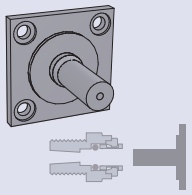
09 
Smooth Port .250" diameter for 7/32" ID tubing w/mtg. lugs

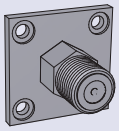
10 
Barbed Port for 1/8" ID tubing on terminals side w/mtg. lugs

11 
Barbed Port for 1/8" ID tubing opposite terminals w/mtg. lugs

12 
Barbed Port for 1/8" ID tubing on terminals side w/o mtg. lugs

13 
Barbed Port for 1/8" ID tubing opposite terminals w/o mtg. lugs

14 
1/4" Port for Quick Connect Fitting

15 
M8 x 1.25 Port



Diaphragm Options

1 Polyurethane (standard)

2 Teflon (optional)

OTHER / CUSTOM PORTING AND MOUNTING OPTIONS AVAILABLE

Model Design Guide

For building standard model order number

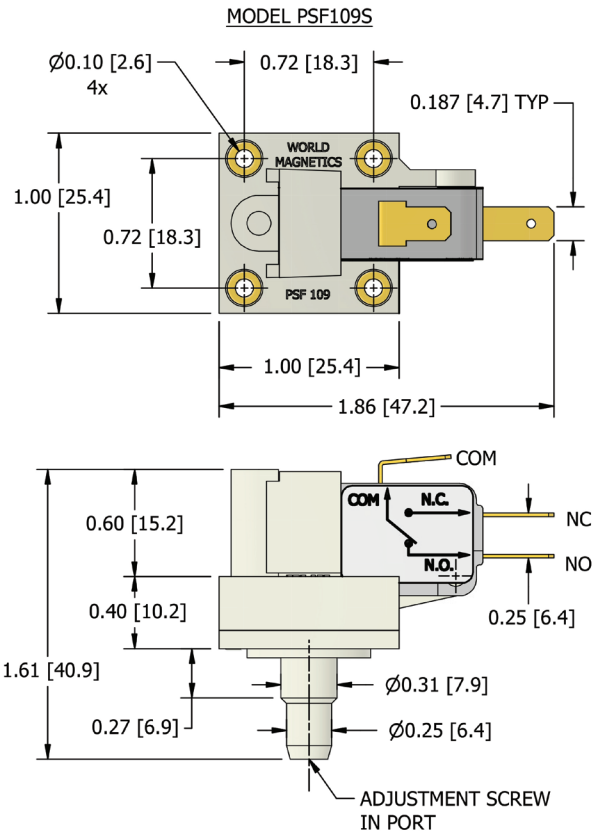
PSF103 Series Number	Pressure Port/Cover Option Number	Diaphragm Option Number	Three Digit Pressure Set Point Option Number			
9			—			



E41523

RoHS

Made in USA



The versatile high-current PSF109S vacuum switch offers a wide-range field adjustable set point; snap action; and choice of standard vacuum port design options. For custom applications, our in-house design and engineering team provides rapid prototyping and manufacturing turnaround.

FEATURES / BENEFITS

- Field adjustable vacuum set point ranges, from -3" H_2O to -12 psi
- Snap action basic switch, up to 25A*, 125/250 VAC
  *Not available on all ranges
- .250" diameter; 1/8" NPT; or 1/4" Quick Connect Fitting port
- Custom design and engineering available
- Small size, lightweight, low cost
- Dependable long life (10+ million cycles)

DesignFLEX

SPECIFICATIONS

MECHANICAL	
Standard Tolerance	±20% (Tighter tolerances available)
Switch Type	SPDT normally open or normally closed
Switching Medium	Air; compatible fluids
Mechanical Life	More than 10 million cycles
Operating Temp.	+40°F to +150°F (standard) | -46°F to +205°F (contact us)
PHYSICAL	
Case Material	Polycarbonate (optional: Lexan 141, Ryton, Ultem®, Noryl®)
Vacuum Port Options	.250" diameter, 1/8" NPT, Quick Connect Fitting Port
Diaphragm Material	Polyurethane / Teflon® (other material options available)
Contact Points	Silver (Gold available on special order)
Electrical Connections	Terminals – .187"x.020" tab-type for use with quick disconnects (ref. AMP #2-520182-2 or equivalent) .250" available — contact us
Mounting	#2 Screws through eyelets
Weight	Less than 20 grams
ELECTRICAL	
Current Rating	Varies by option – see Adjustable Vacuum Set Point Options next page
Operating Voltage	125/250 VAC– see Adjustable Vacuum Set Point Options (next page)

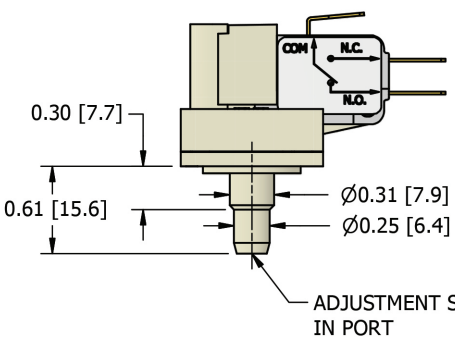
ADJUSTABLE VACUUM SET POINT / PORT / ELECTRIC RATING OPTIONS

	20161	20112	20623
Description	109S-3-8	109S-9-80	109S-81-330
- In. Hg	0.2205 to 0.5885	0.6613 to 5.878	5.951 to 24.25
- In. H_2O	3 to 8	9 to 80	81 to 330
- mbar	7.5 to 20	22 to 199	202 to 822
- psi	0.1 to 0.29	0.32 to 2.89	2.9 to 11.9
Port Style (see drawing below)	A	A	A
Electrical 125/250VAC Resisitive Load	3A	10A	15A

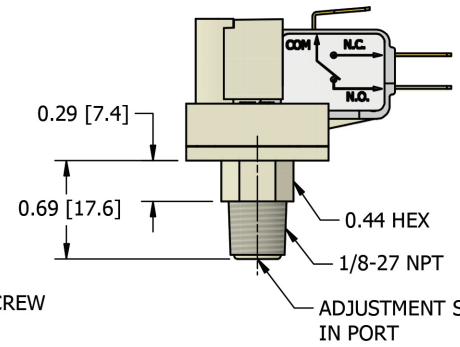
	20901	20890	20897
Description	109S-NPT-3-8	109S-NPT-9-80	109S-NPT-81-330
- In. Hg	0.2205 to 0.5885	0.6613 to 5.878	5.951 to 24.25
- In. H_2O	3 to 8	9 to 80	81 to 330
- mbar	7.5 to 20	22 to 199	202 to 822
- psi	0.10 to 0.29	0.32 to 2.89	2.9 to 11.9
Port Style (see drawing below)	B	B	B
Electrical 125/250VAC Resisitive Load	3A	10A	15A

	21472	21473	21474
Description	109S-QC-3-8	109S-QC-9-80	109S-QC-81-330
- In. Hg	0.2205 to 0.5885	0.6613 to 5.878	5.951 to 24.25
- In. H_2O	3 to 8	9 to 80	81 to 330
- mbar	7.5 to 20	22 to 199	202 to 822
- psi	0.10 to 0.29	0.32 to 2.89	2.9 to 11.9
Port Style (see drawing below)	C	C	C
Electrical 125/250VAC Resisitive Load	3A	10A	15A

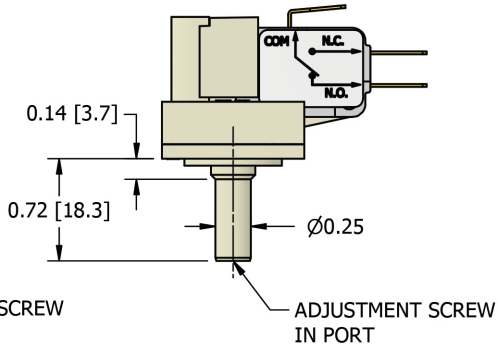
PORT STYLE -A-
Ø 0.25 STEPPED AXIAL PORT

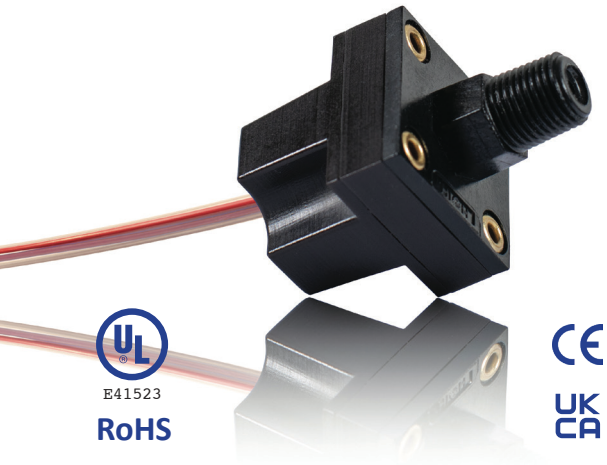


PORT STYLE -B-
1/8-27 NPT PORT



PORT STYLE -C-
JOHN GUEST™
(QUICK DISCONNECT)



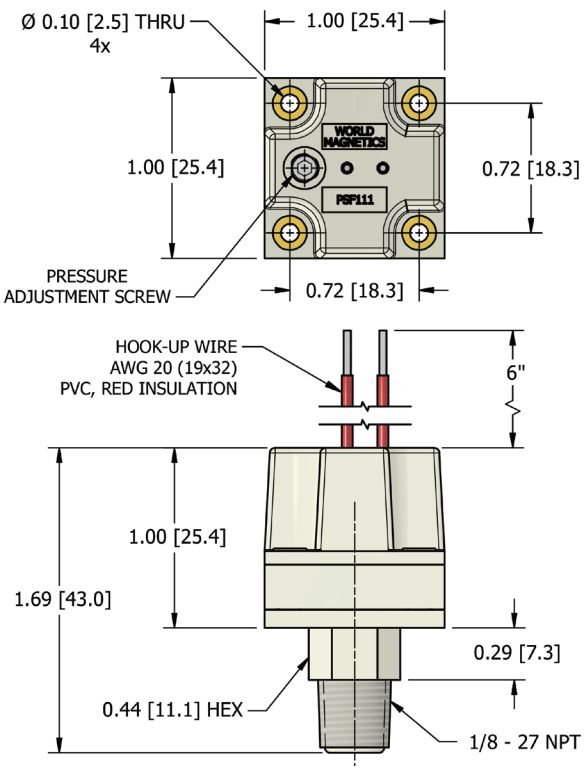


Made in USA

FEATURES / BENEFITS

- Compact, lightweight, environmentally sealed housing
- Field adjustable pressure and vacuum set points from -11.9 to 60psi
- Many standard pressure port and mountings options
- Custom design and engineering available
- Custom electrical lead lengths with option to add electrical connector

MODEL PSF111 - (NPT OPTION SHOWN)



The versatile PSF111 pressure and vacuum switch offers a wide range of field adjustable set points, port options and electrical connections. Using a waterproof snap-action microswitch and the new DesignFlex protective housing, this switch is ideal for use in hostile environments where dust and water ingress may be an issue.

SPECIFICATIONS

MECHANICAL	
Standard Tolerance	±20% (Tighter tolerances available)
Switch Type	SPDT (single pole / double throw) normally open (std.) | normally closed (opt.)
Switching Medium	Air; compatible fluids
Mechanical Life	More than 1 million cycles
Maximum Operating Pressure	Varies by option – see Adjustable Pressure Set Point Options next page
Operating Temp.	-40°F to +185°F
PHYSICAL	
Case Material	Polycarbonate (optional: Lexan 141, Ryton®, Ultem®, Noryl®) 112 – 113 range use PPS wetted parts
Pressure Port Options	Many standard ports — see Pressure Port / Cover Options next page
Diaphragm Material	Polyurethane (Teflon® optional with limited pressure ranges) other options available
Contact Points	Silver (Gold available on special order)
Electrical Connections	6" AWG 20 PVC wire (2 or 3 wire) other length and connector options available
Mounting	#4 Screws through mounting lugs; #2 Screws through eyelets; See Cover Options below
Weight	Less than 20 grams
ELECTRICAL	
Current Rating	3 AMP standard | 4 AMP available
Operating Voltage	12 VDC / 125 VAC

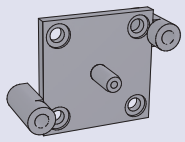
DESIGNFLEX™ STANDARD OPTIONS — Choose from our standard PSF111 options as shown below or contact our vertically integrated in-house design and engineering team for special features and unique application needs. Sample switch available by request.

ADJUSTABLE PRESSURE SET POINT OPTIONS

11X available pressure ranges P = pressure, V = vacuum	110 P	111 P	112 P	113 P	114 V	115 V	116 V
In H_2O	30 to 60	60 to 135	135 to 416	416 to 1661	15 to 45	45 to 110	110 to 330
mbar	75 to 149	149 to 336	336 to 1036	1036 to 4137	37 to 112	112 to 274	274 to 822
psi	1.1 to 2.2	2.2 to 4.9	4.9 to 15	15 to 60	0.54 to 1.63	1.63 to 4.0	4.0 to 11.9
Max. Operating Pressure (PUR)	30psi	30psi	70psi	70psi	14.7psi	14.7psi	14.7psi
Max. Operating Pressure (PTFE)	15psi	15psi	30psi	30psi	14.7psi	14.7psi	14.7psi
Electrical 125 VAC, Resitive Load (SEALED spdt)	3A std. 4A avail.	3A std. 4A avail.	3A std. 4A avail.	3A std. 4A avail.	3A std. 4A avail.	3A std. 4A avail.	3A std. 4A avail.

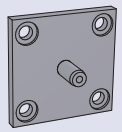
PRESSURE PORT/COVER OPTIONS

P 00



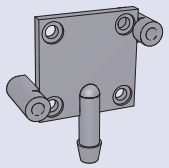
Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs

P 01



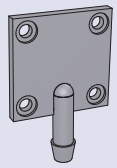
Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs

P 02



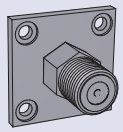
Barbed Port for 3/16" ID tubing w/mtg. lugs

P 04



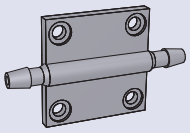
Barbed Port for 3/16" ID tubing w/o mtg. lugs

P 06 V



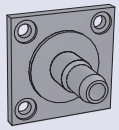
1/8" NPT Port w/o mtg. lugs

P 07



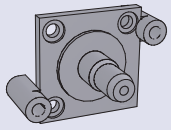
Flo-Thru Barbed Port for 1/8" ID tubing w/o mtg. lugs

P 08 V



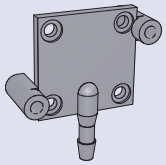
Smooth Port .250" diameter for 7/32" ID tubing w/o mtg. lugs

P 09



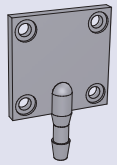
Smooth Port .250" diameter for 7/32" ID tubing w/mtg. lugs

P 10



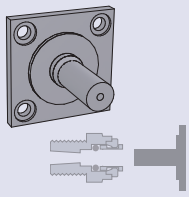
Barbed Port for 1/8" ID tubing w/mtg. lugs

P 12



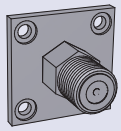
Barbed Port for 1/8" ID tubing w/o mtg. lugs

P 14 V



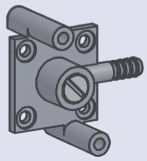
1/4" Port for Quick Connect Fitting w/o mtg. lugs

P 15 V



M8 x 1.25 Port w/o mtg. lugs

16 V



Barbed Port .200 dia. for 3/16" ID tubing w/mtg. lugs



Diaphragm Options

1 Polyurethane (standard)

2 Teflon (optional)

Model Design Guide

For building standard model order number

PSF111 Series Number	Pressure Port / Cover Option Number		Diaphragm Option Number		Three Digit Set Point Option Number	
6			—			

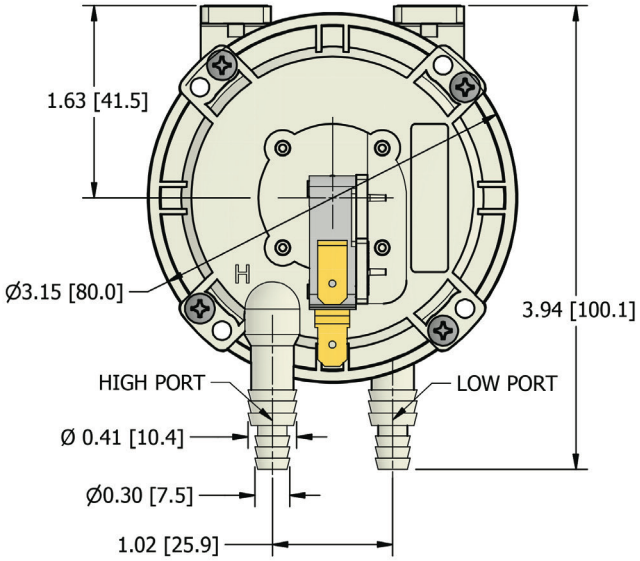
PS100

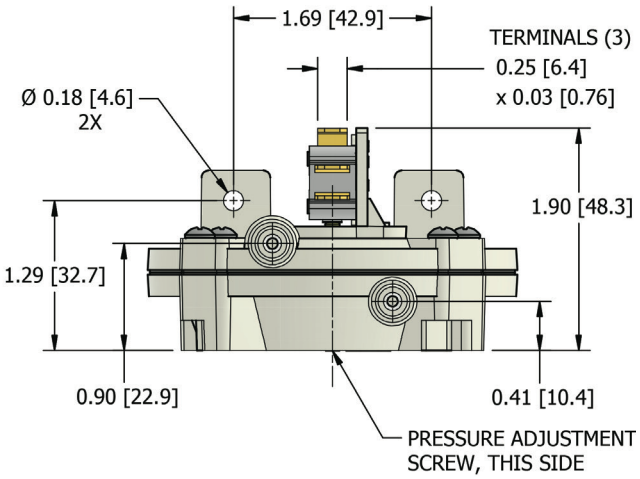


MH29861

RoHS

The rugged yet ultra-sensitive Goldtech™ PS100 and PS160 series pressure switches feature a larger diameter diaphragm and incorporate a conventional snap action switch element. This design assures reliable performance under harsh and adverse conditions, while remaining low in relative cost. Sample switch available by request.





FEATURES / BENEFITS

- Reliable performance under harsh / adverse conditions
- Larger diameter diaphragm / Conventional snap action
- Standard set point ranges from: 0.07" H_2O to 5.0" H_2O
- Multi-barb port connections standard tubing: 0.250 in. and 0.375 in.
- Orifices, bleed holes and various mounting configurations available on all models; vertical mounting required
- Lightweight, low cost
- Rigorously tested – Exceeds UL-508 / UL-353 Pilot Duty requirements (Tested hundreds of thousands of cycles)
- Silver contact points
- Termination 1/4" tab (6.4mm) industry standard

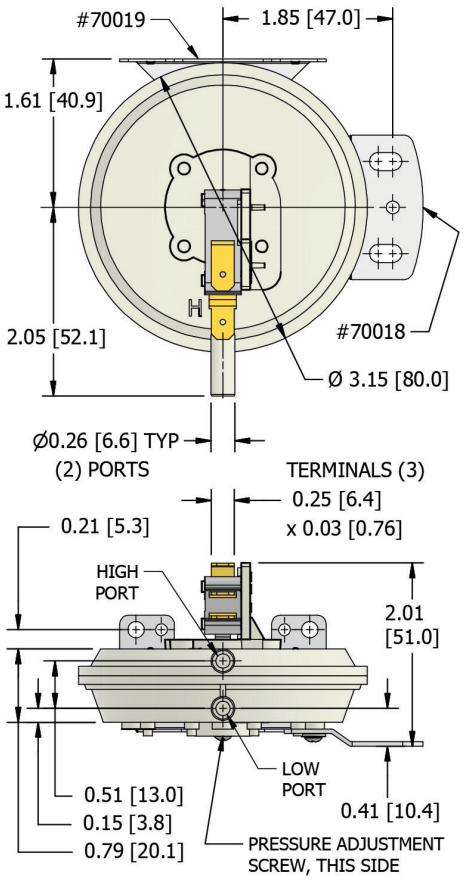


810 Hastings Street • Traverse City, MI, USA 49686 • Phone: 231-946-3800 • Toll Free: 800-643-3884 • www.worldmagnetics.com

SPECIFICATIONS

MECHANICAL	
Standard Tolerance	Varies by set point — contact us
Switch Type	SPDT
Switching Medium	Air; compatible fluids
Mechanical Life	Tested hundreds of thousands of cycles; Exceeds UL-508 / UL-353 Pilot Duty requirements
Max Operating Pressure	PS160 - 0.5psi / PS100 - 1.0psi
Burst Pressure	3.5psi
Operating Temperature	PS160 -40°F to +185°F / PS100 -13°F to +221F
PHYSICAL	
Case Material	Noryl® (PPO)
Porting Options	Multi-barb 0.250 in. and 0.375 in. tubing ID (PS100) / 0.25 tubing ID. (PS160)
Diaphragm Material	Post-Cured Silicon
Contact Points	Silver
Electrical Connections	Terminals – 0.250 in. x 0.30 in. tab-type for use with quick disconnects
Mounting (see brackets shown below)	PS100 Series: Vertical mount recommended PS160 Series: Variable position vertical mounting brackets available. Note: Always mount with diaphragm in vertical position unless otherwise specified
Weight	Less than 80 grams average (varies with snap switch / brackets)
ELECTRICAL	
Current / Voltage Rating	5A 125/250 VAC Standard | 3A 125/250 AC | 1/10 HP 125/250 VAC .01A 125/250 VAC
Rated Standards	(UL 1054, EN 61058) | UL Approved MH29861 Related: UL 353, UL 508, BS EN 1854: 1997

MOUNTING BRACKET STYLE MUST BE SELECTED
(ONLY ONE IS REQUIRED)



PS160

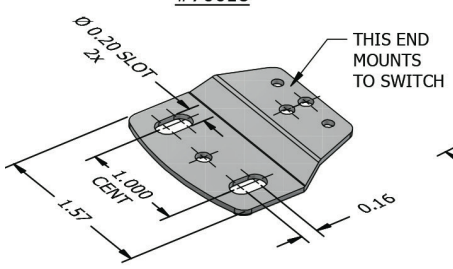


MH29861

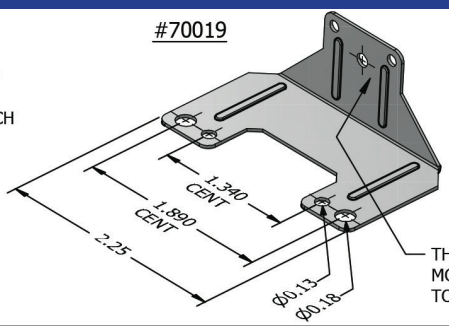
RoHS

UK CA

#70018



#70019



Accuracy - The limit of deviation from the set point of the switch. It is normally defined in either points per square inch or percentage of full scale.

Actuation Point - See Set Point.

Actuation Value - The difference between the set point and the reset point.

Adjustable Range - The range between the lowest or highest point, within which the switch can be set. It is normally expressed in PSI, inches of mercury or inches of water column.

Deadband - The difference between the increasing and decreasing readings when the switch is operated between set point and reset point.

Differential - The mechanical motion lost within the electrical switch element while it reverses itself. This is usually greater in high amperage switches than in low amperage switches.

Electrical Switching Element - Opens or closes an electrical circuit in response to movement from the pressure or vacuum sensing element. Single pole, double throw (SPDT) snap action switches are standard, may be used as single pole, single throw (SPST). NO/NC circuitry is selectable, but it must be specified at order time.

Hysteresis - The difference between the increasing and decreasing readings when the switch is operated between set point and reset point.

Normally Closed Switching Element - Current flows through the switch until it is broken by a pressure or vacuum change.

Normally Open Switching Element - No current flows through the switch until contact is made by a pressure or vacuum change.

Pressure, Absolute - A pressure scale based on PSIA "0" or a perfect vacuum.

Pressure, Ambient - The pressure immediately surrounding a pressure switch.

Pressure, Atmospheric - The pressure caused by the actual weight of the earth's atmosphere. At sea level atmospheric pressure equals 14.7 PSI, 30 inches or mercury or 408 inches or water, above absolute "0" ("0" PSIA).

Pressure, Barometric - Actual atmospheric pressure in a specific location and altitude. The standard is 29.22 inches of mercury at sea level at 70°F.

Pressure, Differential - The difference between a reference pressure and a variable pressure.

Pressure, Gauge - Uses atmospheric pressure as a zero reference point so there is no compensation for changes in barometric pressure.

Pressure, Maximum System - System pressure including surges or spikes.

Pressure, Proof - The maximum pressure which can be applied to a pressure switch without causing irreparable damage. It is usually 150% of the pressure sensing element's rated maximum system pressure.

Pressure, System - Normal system pressure level not including surges or spikes.

Pressure Sensing Element - The portion of the pressure switch that moves with a change in system fluid pressure.

Pressure Switch - An instrument that converts a pressure change to an electrical function.

Repeatability - The ability of the switch to actuate repeatedly at the desired set point within sensor tolerance.

Reset Point - After the pressure has reached set point and operated the electrical switch, it must return to the reset point before the electrical switch returns to its original position.

Reset Point Range - The difference between the set point and the reset point. It is caused by the hysteresis of the pressure or vacuum sensing element and the differential of the electrical switch.

Response Time - The amount of time taken between a change in the pressure of the system and the change in the electrical signal.

Set Point - The exact point at which the electrical switching element functions. This is generally expressed in PSI, inches of mercury or inches of water column.

Set Point Range - The range within which the switch can be set from the lowest to the highest point, usually expressed in PSI, inches of mercury or inches of water column.

Switching Current, Maximum - The maximum amperage load that the electrical switch will carry.

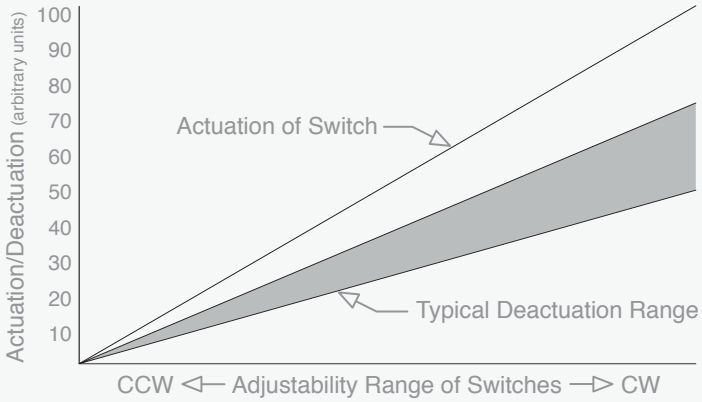
Temperature, Ambient - 21° C or 70° F. Also known as "room temperature."

Temperature, Shift - A change in switch set point due to changes in surrounding temperature.

Vacuum - Gauge pressure less than ambient pressure using ambient pressure as a reference.

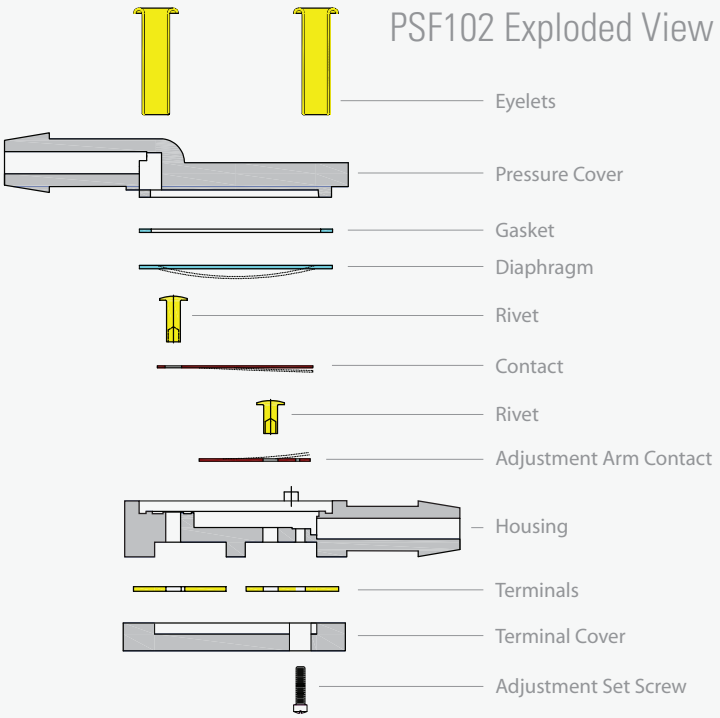
Notes

Typical Hysteresis (for reference only)



PSF103 and PSF109 switches typically have a reset point that is 50% to 75% of their set point.

PSF102 Exploded View

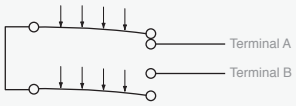


Shock and Vibration: How the PSF100A Works

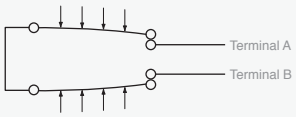
Normal state, no pressure applied: Both contacts of the double make/double break circuit configuration are open.



No pressure applied, subjected to shock or vibration: the contact arms move together in parallel; since at least one contact is always open, the circuit cannot close in error.



Pressure applied: Both contacts are closed completing the circuit.



DESIGNFLEX™ SWITCHES
A World Magnetics Company

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SWITCH ACCESSORIES

We carry a variety of pressure switch product accessories. Our most popular are listed below. For more information about our full line of accessories, please contact us or visit our web site.

MOUNTING CLIP Part# 70012

The Mounting Clip can be used with models PSF100A, PSF101 or PSF102 Series switches. The universal clip also allows interchangeability with other products. Double-sided tape included.



MOUNTING BRACKET Part# 70018

The Mounting Bracket can be used with our PSF100A, PSF101, PSF102, PSF103, PSF109 or PS160 Series switches. The bracket also allows interchangeability with other products.



RIGHT-ANGLE MOUNTING BRACKET Part# 70019

The Right-Angle Mounting Bracket can be used with our PSF100A, PSF101, PSF102, PSF103, PSF109 or PS160 Series switches. The bracket also allows interchangeability with other products.



TERMINAL CONNECTORS

Part# 70000 Compatible with PSF100A, PSF101, PSF103, & PSF109 Series.
Amp part #2-520182-2 or equivalent.

Part# 70005 Compatible with PSF102 Series. Amp part #8-640917-1 or equivalent.



PRECISION ADJUSTMENT TOOLS

Part# 70015 Precision adjustment screwdriver for field adjustable DesignFlex™ switches.
1/32 inch, Slotted blade, Instrument quality.

Part# 70013 Precision Allen wrench for field adjustable DesignFlex™ and Goldtech™ switches.



ALSO AVAILABLE: Port Couplings | Port Fittings | Polyurethane Tubing | Tools







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Pressure, Vacuum & Differential Switches

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DesignFlex™ switch products save valuable energy by using electrical power only when activated by pressure, vacuum or differential pressure. Our eco-conscious switch designs are employed in a wide variety of alternative energy and environmentally friendly applications.

Alternative Energy: Hybrid vehicles, electric automobiles, fuel cells, batteries, on-demand systems, alternative fuel heaters, wood and corn pellet stoves, wind turbine and solar energy battery systems, sustainable energy products.

Environmentally Conscious: Ozone generators, air quality monitors, air and water filtration / purification, no-flush waste systems, energy conserving products.

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