



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

Catalog 0808

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.



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



FOR YOUR FREE 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.



Diverse Industries / Shared History

Since 1962, World Magnetics has been successfully building customer relationships that withstand the test of time by delivering speedy custom design and engineering, responsive client-centered service and highly reliable / durable products. Acquiring DuMont Instrumentation in 1984, World Magnetics has gained invaluable knowledge from manufacturing diverse product lines, developed shared strengths and enjoyed unique economies of scale. Privately owned, we nimbly provide our customers uncompromising quality and flexibility without the limitations of shareholder-driven performance expectations. Headquartered in Traverse City, MI, USA, World Magnetics is the parent company of DesignFlex™ pressure switches and Durascan™ magnetic heads. Durascan™ is a leading producer of high-end magnetic heads for high-wear applications. DesignFlex™ is a leading producer of custom designed, ultra-sensitive pressure, vacuum and differential switches.

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Our Mission: To Make Your Great Products Even Better

While our products may be deceptively simple, our mission is not. Our Mission is to make your products better, at a price you can afford. Our ultra-sensitive pressure, vacuum and differential switches integrate more than 50 years of engineering and manufacturing experience. This includes painstaking research, several patents, exacting manufacturing processes, rigorous quality control testing, high-quality raw materials and the best from our highly-skilled technical engineers and deeply experienced manufacturing team. You've invested, taken risks and worked long and hard to build your company, your products and your brand. Let our experience, proven products and total commitment to service help you and your products perform at their very best.

James D. Lievense — President



SWITCH SERIES / PRODUCT OVERVIEW

SWITCH SERIES	KEY FEATURES / BENEFITS	USE	SERIES SET POINT RANGE	ELECTRICAL	PAGE #
PSF100A	 <ul style="list-style-type: none"> • Patented shock / 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) 	<ul style="list-style-type: none"> • Pressure • Vacuum • Differential 	0.1" H ₂ O to 50" H ₂ O	Low Current SPST 30 V, AC/DC Up to 40 mA	P. 7
PSF101	 <ul style="list-style-type: none"> • Many standard ports / mounting options • Custom design / 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 	<ul style="list-style-type: none"> • Pressure • Vacuum • Differential 	0.5" H ₂ O to 50" H ₂ O	Low Current SPST 30 V, AC/DC Up to 40 mA	P. 8-9
PSF102	 <ul style="list-style-type: none"> • Field adjustable set point, from 0.1" H₂O to 25 psi • High resolution / accuracy field adj. 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 	<ul style="list-style-type: none"> • Pressure • Vacuum • Differential 	0.03" H ₂ O to 25 psi	Low Current SPST 30 V, AC/DC Up to 40 mA	P. 10-11
PSF103	 <ul style="list-style-type: none"> • Pressure switch with controllable hysteresis (deadband) • Field adjustable pressure set point, from 2" H₂O 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 • Small size, lightweight, low cost • Dependable long life (10+ million cycles) • Silver contact points (Gold available special order) 	<ul style="list-style-type: none"> • Pressure 	2.0" H ₂ O to 60 psi	High Current SPDT 125/250 VAC Up to 25A	P. 12-13
PSF109S	 <ul style="list-style-type: none"> • Vacuum switch with controllable hysteresis (deadband) • Field adjustable vacuum set point, from -3" H₂O to -12 psi • Snap action basic switch, up to 25A*, 125/250 VAC *Not available on all ranges • Vacuum Port: .250" diameter, 1/8" NPT or quick connect • Small size, lightweight, low cost • Dependable long life (10+ million cycles) • Silver contact points (Gold available special order) 	<ul style="list-style-type: none"> • Vacuum 	-3.0" H ₂ O to -12 psi vacuum	High Current SPDT 125/250 VAC Up to 25A	P. 14-15
GOLDTECH 100/160	 <ul style="list-style-type: none"> • Reliable performance under harsh / adverse conditions • Standard set point models: 0.07" H₂O to 5.0" H₂O • Field adjustable set point models: 0.2" H₂O to 5.0" H₂O • Multi-barb port connections standard: .250in. and .375in. • Lightweight, low cost • Dependable (Tested hundreds of thousands of cycles) • Silver contact points 	<ul style="list-style-type: none"> • Pressure • Vacuum • Differential 	ADJUSTABLE 0.2" H ₂ O to 5.0" H ₂ O FACTORY SET 0.07" H ₂ O to 5.0" H ₂ O	High Current Low Current SPDT 5A 125/250 VAC 3A 125/250 VAC 1/10 HP 125/250 VAC .01A 125/250 VAC	P. 16-17

Special Materials: FDA food grade, extreme temperature, NSF approved | Special Approvals: International and military standards

ISO: 9001:2000 UL - E41523
MIL-SPEC RoHS Compliant EU
Banned Substances Compliant

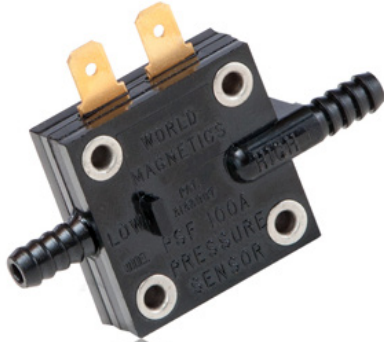
**Kontakt für Rückfragen aus
Deutschland, Österreich und
Schweiz :**



HJK Sensoren + Systeme GmbH & Co. KG

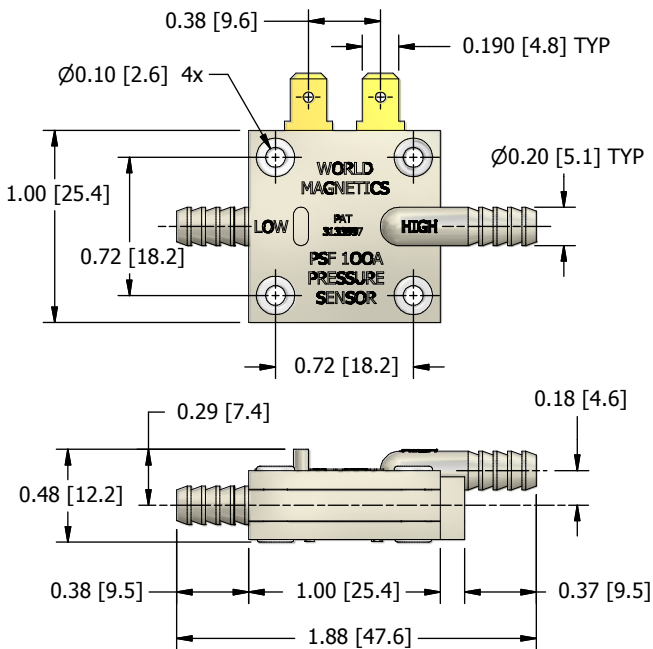
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The rugged yet ultra-sensitive PSF100A pressure switch incorporates a patented dual diaphragm / dual contact design offering protection against false actuation due to shock and vibration. Sample switch available by request.

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 ₂ O or less 15psi: for units where set point is greater than 3.0" H ₂ O 4psi: for units with Teflon® diaphragm of 0.5" H ₂ O or less 8psi: for units with Teflon® diaphragm greater than 0.5" H ₂ O
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	40mA resistive for life in excess of 20 million cycles
Operating Voltage	AC/DC – 30V or less with resistive load; 120 VAC neon lamp load

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)



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 ₂ O	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	29.91	37.36	49.76	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

Kontakt für Rückfragen aus
Deutschland, Österreich und
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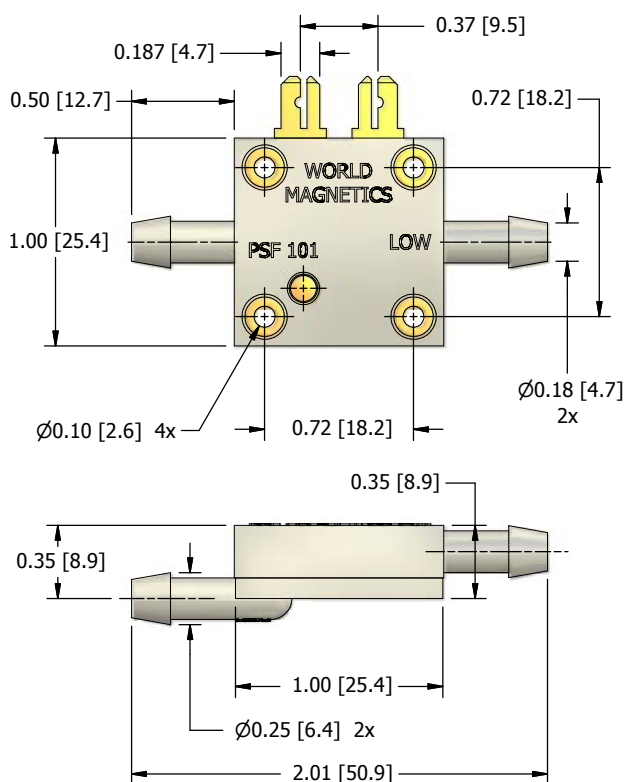


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RoHS

MODEL 865X-XXX SHOWN



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



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 ₂ O or less 15psi: for units where set point is greater than 3.0" H ₂ O 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 overleaf
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	40mA resistive for life in excess of 20 million cycles
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.

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 ₂ O	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	29.91	37.36	49.76	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

LOW PORT OPTIONS

HIGH PORT OPTIONS

1		2		1		2		3	
Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs		Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs		Smooth Port .156" diameter for 1/8" ID tubing		Smooth Port .187" diameter for 5/32" ID tubing		Smooth Port .250" diameter for 7/32" ID tubing	
3		4		5		4		5	
Smooth Port .250" diameter for 7/32" ID tubing w/mtg. lugs		Smooth Port .250" diameter for 7/32" ID tubing w/o mtg. lugs		Barbed Port for 3/16" ID tubing w/mtg. lugs		1/8" NPT Port		Barbed Port for 3/16" ID tubing	
6		7		8		6		7	
Barbed Port for 3/16" ID tubing w/o mtg. lugs		No Port (.060" vent hole) w/mtg. lugs		No Port (.060" vent hole) w/o mtg. lugs		No Port (.060" vent hole)		Flow-Thru Barbed Port for 3/16" ID tubing	
9		0		<div>Diaphragm Options</div> <div>1 Polyurethane (standard)</div> <div>2 Teflon (optional)</div>		8		9	
Barbed Port for 1/8" ID tubing w/mtg. lugs		Barbed Port for 1/8" ID tubing w/o mtg. lugs				Barbed Port for 1/8" ID tubing		1/4" Port for Quick Connect Fitting	

Model Design Guide

For building standard model order number

PSF101 Series Number

8

Low Port Option Number

High Port Option Number

Diaphragm Option Number

Three Digit Set Point Option Number

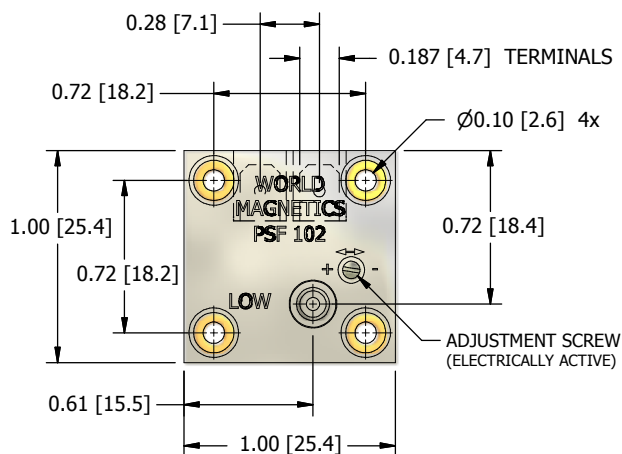
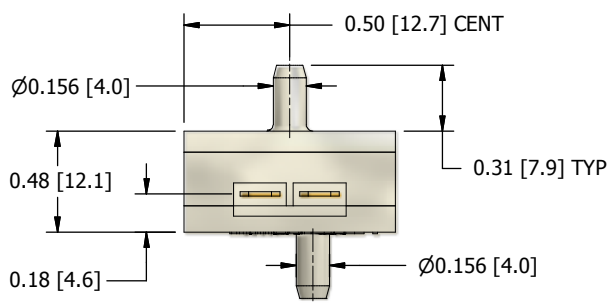


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Made in USA

RoHS

MODEL 721X-XXX SHOWN



FEATURES / BENEFITS

- Field adjustable set point ranges — from 0.03" H₂O 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



SPECIFICATIONS

MECHANICAL

Standard Tolerance	Varies by option — see Set Point Options overleaf
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 overleaf
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 overleaf
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	40mA resistive for life in excess of 20 million cycles
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.

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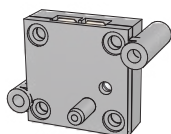
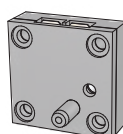
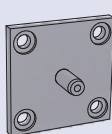
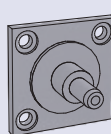
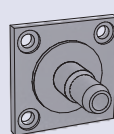
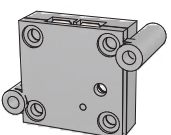
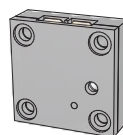

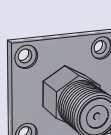
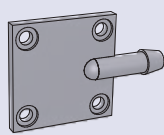
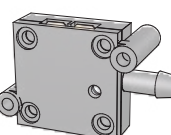
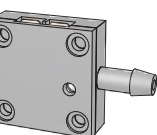
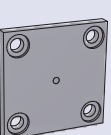
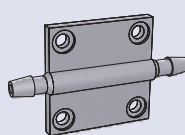
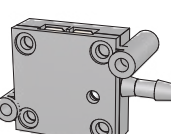
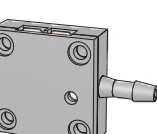
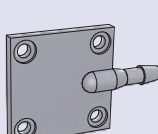
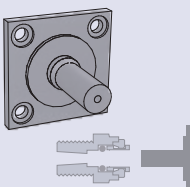
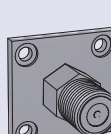
Telefax +49 (0)8233-77 963-11 Internet http://www.hjk.de

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 ₂ O	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" H ₂ O	+/- 0.1" H ₂ O	+/- 0.2" H ₂ O	+/- 0.5" H ₂ O	+/- 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
HIGH PORT OPTIONS

1		2		1		2		3	
Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs		Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs		Smooth Port .156" diameter for 1/8" ID tubing		Smooth Port .187" diameter for 5/32" ID tubing		Smooth Port .250" diameter for 7/32" ID tubing	
3		4				4		5	
No Port (.060" vent hole) w/mtg. lugs		No Port (.060" vent hole) w/o mtg. lugs				1/8" NPT Port		Barbed Port for 3/16" ID tubing	
5		6		<div>Diaphragm Options</div> <div>1 Polyurethane (standard)</div> <div>2 Teflon (optional)</div>		6		7	
Barbed Port for 3/16" ID tubing w/mtg. lugs		Barbed Port for 3/16" ID tubing w/o mtg. lugs				No Port (.060" vent hole)		Flow-Thru Barbed Port for 1/8" ID tubing	
7		8		8		9		0	
Barbed Port for 1/8" ID tubing w/mtg. lugs		Barbed Port for 1/8" ID tubing w/o mtg. lugs		Barbed Port for 1/8" ID tubing		1/4" Port for Quick Connect Fitting		M8 x 1.25 Port	

Model Design Guide

For building standard model order number

PSF102 Series Number

7

Low Port Option Number

High Port Option Number

Diaphragm Option Number

—

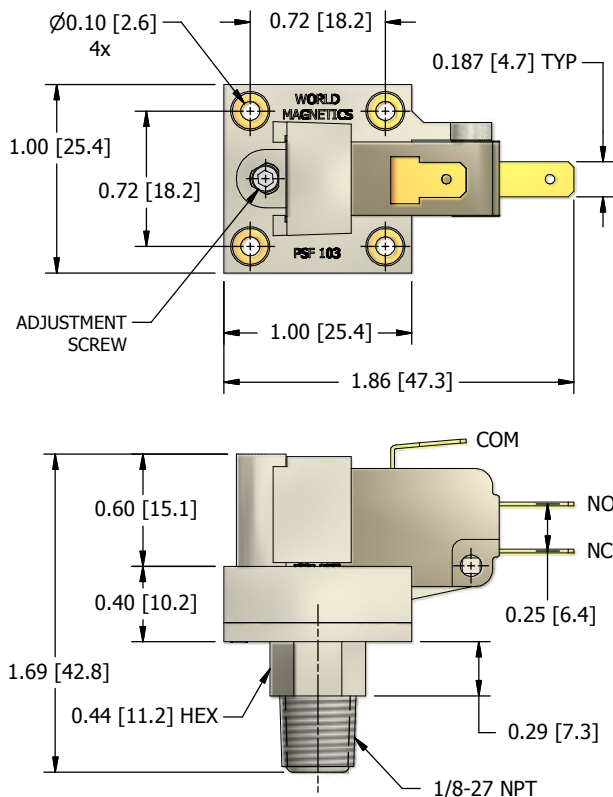
Three Digit Set Point Option Number



Made in USA

RoHS

MODEL 906X-XXX SHOWN



FEATURES / BENEFITS

- Field adjustable pressure set point, from 3" H₂O 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)



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 overleaf
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 overleaf
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 overleaf
Operating Voltage	See Adjustable Pressure Set Point Options overleaf



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 ₂ O	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 69	69 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 Resistive Load	3A	3A	3A	10A	15A	15A	15A

*Non adjustable

PRESSURE PORT/COVER OPTIONS

00		01		02		03		04	
	Smooth Port .156" diameter for 1/8" ID tubing w/mtg. lugs		Smooth Port .156" diameter for 1/8" ID tubing w/o mtg. lugs		Barbed Port for 3/16" ID tubing on terminals side w/mtg. lugs		Barbed Port for 3/16" ID tubing opposite terminals w/mtg. lugs		Barbed Port for 3/16" ID tubing on terminals side w/o mtg. lugs
05		06		07		08		09	
	Barbed Port for 3/16" ID tubing opposite terminals w/o mtg. lugs		1/8" NPT Port		Flo-Thru Barbed Port for 1/8" ID tubing w/o mtg. lugs		Smooth Port .250" diameter for 7/32" ID tubing w/o mtg. lugs		Smooth Port .250" diameter for 7/32" ID tubing w/mtg. lugs
10		11		12		13		14	
	Barbed Port for 1/8" ID tubing on terminals side w/mtg. lugs		Barbed Port for 1/8" ID tubing opposite terminals w/mtg. lugs		Barbed Port for 1/8" ID tubing on terminals side w/o mtg. lugs		Barbed Port for 1/8" ID tubing opposite terminals w/o mtg. lugs		1/4" Port for Quick Connect Fitting
15						Diaphragm Options 1 Polyurethane (standard) 2 Teflon (optional)		OTHER / CUSTOM PORTING AND MOUNTING OPTIONS AVAILABLE	
	M8 x 1.25 Port								

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

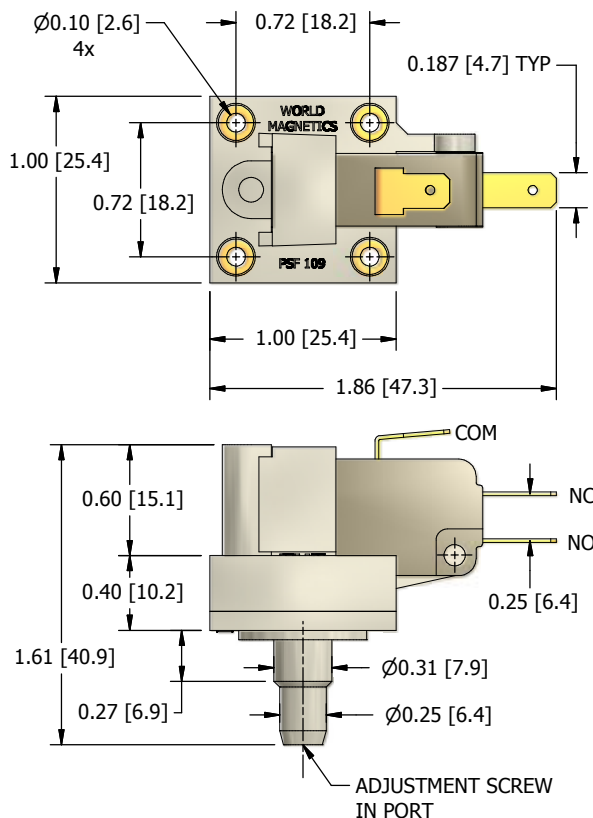
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Made in USA

RoHS

MODEL PSF109S



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" H₂O 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)



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

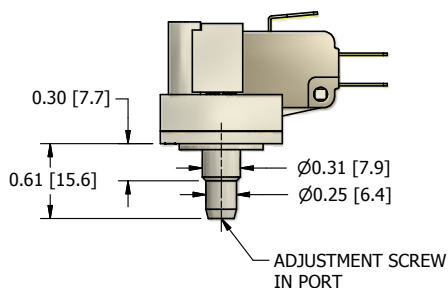
Current Rating	Varies by option – see Adjustable Vacuum Set Point Options overleaf
Operating Voltage	125/250 VAC– see Adjustable Vacuum Set Point Options (overleaf)

ADJUSTABLE VACUUM SET POINT / PORT / ELECTRIC RATING OPTIONS

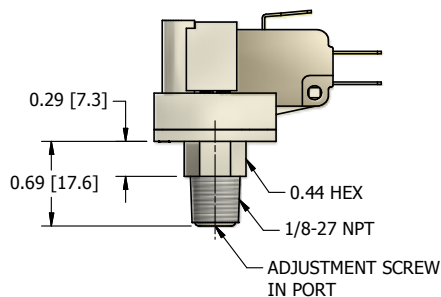
	20161	20112	20623
Description	109S-3-8	109S-9-80	109S-81-330
- In. Hg	0.2205 to 0.5885	0.6613 to 5.878	5.951 to 24.25
- In. H ₂ O	3 to 8	9 to 80	81 to 330
- mbar	7.5 to 20	22 to 199	202 to 822
- psi	0.1 to 0.30	0.30 to 2.90	2.9 to 11.9
Port Style (see drawing below)	A	A	A
Electrical 125/250VAC Resistive 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 5885	0.6613 to 5.878	5.951 to 24.25
- In. H ₂ O	3 to 8	9 to 80	81 to 330
- mbar	7.5 to 20	22 to 199	202 to 822
- psi	0.10 to 0.30	0.30 to 2.90	2.9 to 11.9
Port Style (see drawing below)	B	B	B
Electrical 125/250VAC Resistive 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 5885	0.6613 to 5.878	5.951 to 24.25
- In. H ₂ O	3 to 8	9 to 80	81 to 330
- mbar	7.5 to 20	22 to 199	202 to 822
- psi	0.10 to 0.30	0.30 to 2.90	2.9 to 11.9
Port Style (see drawing below)	C	C	C
Electrical 125/250VAC Resistive Load	3A	10A	15A

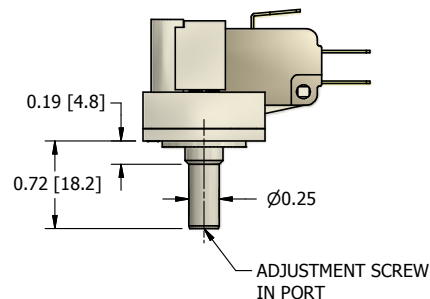
SAMPLE SWITCH available by request – Call 1-800-643-3884
PORT STYLE A

Ø 0.25 STEPPED AXIAL PORT


PORT STYLE B

1/8-27 NPT PORT


PORT STYLE C

 JOHN GUEST
(QUICK DISCONNECT)

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

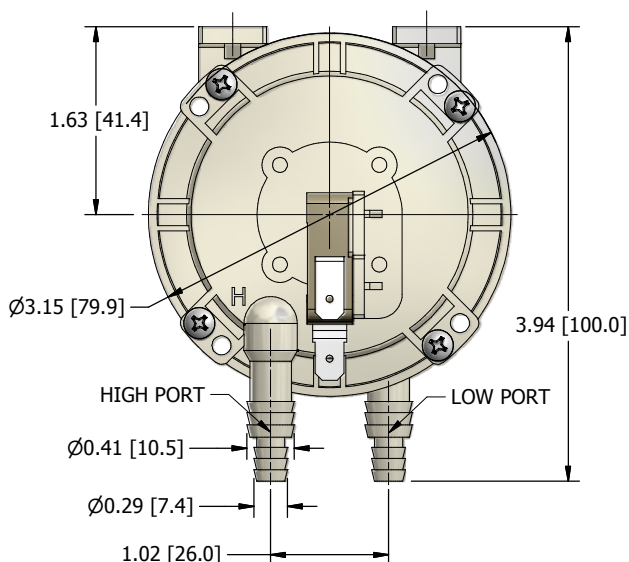
PS100

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" H₂O to 5.0" H₂O
- Multi-barb port connections standard tubing: 0.250 in. and 0.375 in.
- Orifices, bleed holes and various mounting configurations available on all models
- Lightweight, low cost
- Rigorously tested – Exceeds UL-508 / UL-353 Pilot Duty requirements (Tested hundreds of thousands of cycles)
- Silver contact points
- Different sized electric terminations available for same unit



PS100



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 +221°F

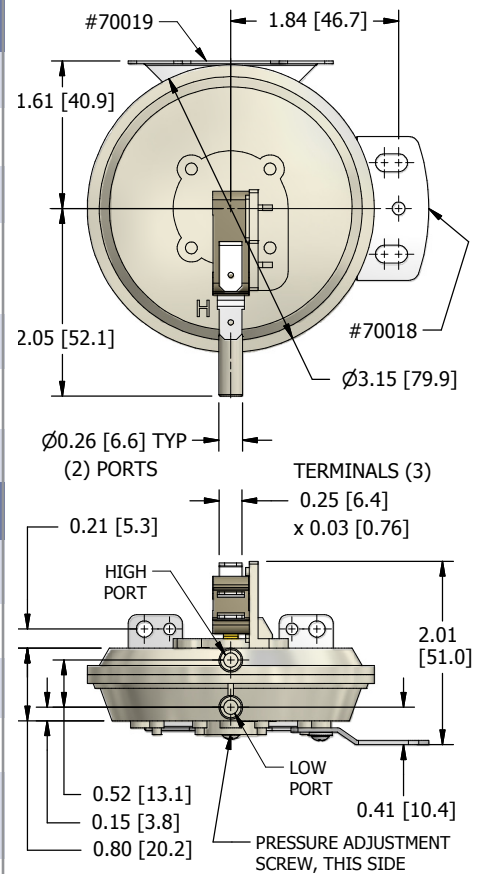
PHYSICAL

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 <small>(see brackets shown below)</small>	PS100 Series: Vertical mount recommended PS160 Series: Variable position vertical mounting brackets available. <small>Note: Always mount with diaphragm in vertical position unless otherwise specified</small>
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/VDE Approved MH29861 Related: UL 353, UL 508, BS EN 1854: 1997

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

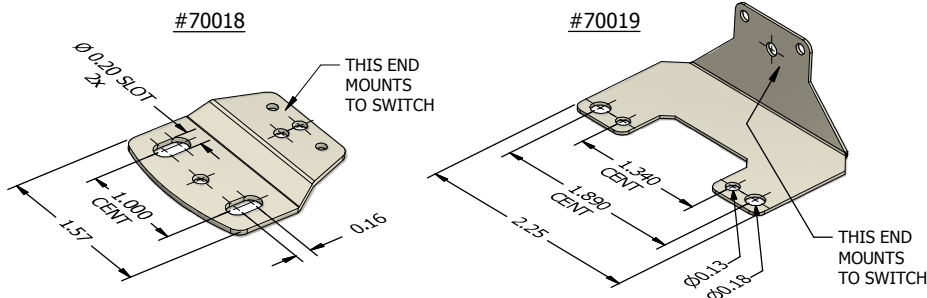


PS160



RoHS

PS100 & PS160



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

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 of mercury or 408 inches of water, above absolute "0" ("0" PSIA).
Pressure, Barometric	- Actual atmospheric pressure in a specific location and altitude. The standard is 29.92 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.

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



The graph illustrates the relationship between Actuation/Deactuation (arbitrary units) on the Y-axis and Time (arbitrary units) on the X-axis. The Y-axis ranges from 0 to 100, and the X-axis ranges from 0 to 100. A solid line represents the 'Actuation of Switch', and a shaded area represents the 'Typical Deactuation Range'.

Time (arbitrary units)	Actuation of Switch (arbitrary units)	Typical Deactuation Range (arbitrary units)
0	0	0
20	20	10
40	40	20
60	60	30
80	80	40
100	100	50

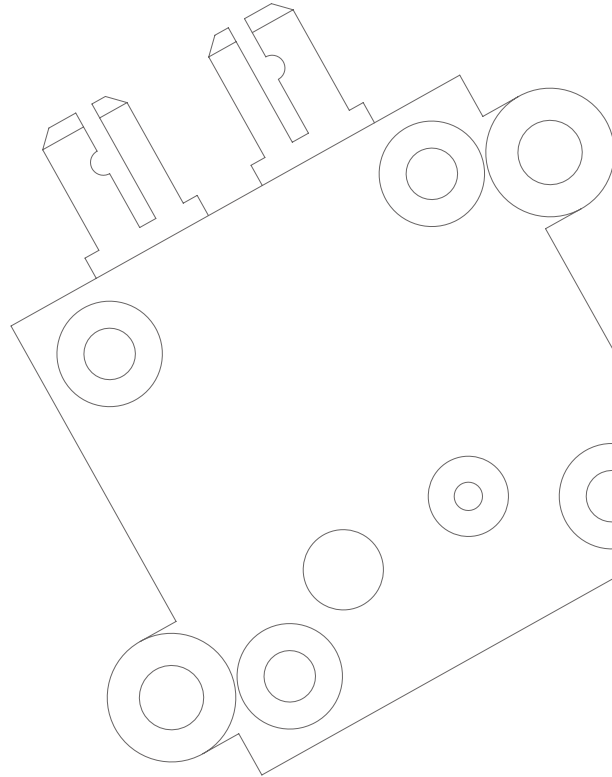
CCW ◀ Adjustability Range of Switches ▶ CW

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

PSF102 Exploded View

- Eyelets
- Pressure Cover
- Gasket
- Diaphragm
- Rivet
- Contact
- Rivet
- Adjustment Arm Contact
- Housing
- Terminals
- Terminal Cover
- Adjustment Set Screw

810 Hastings Street - Traverse City, MI, USA 49686
Phone: 231-946-3800 - Fax: 231-946-0274 - Toll Free: 800-643-3884



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Pressure, Vacuum & Differential Switches

Eco-Friendly Design / Application

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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