

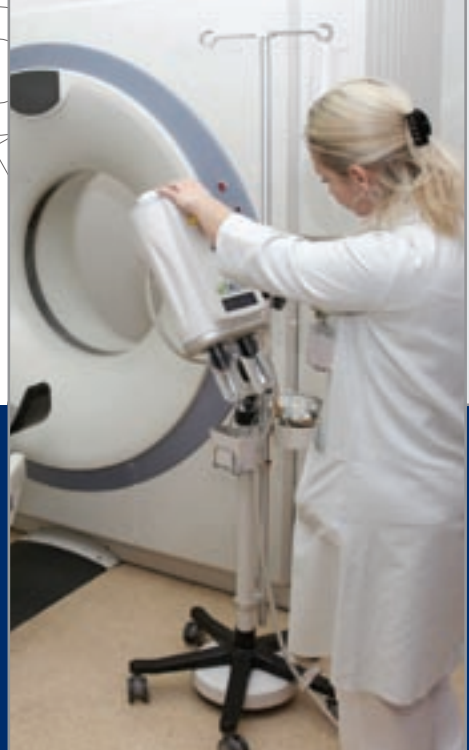
DesignFLEX™

Pressure, Vacuum & Differential Switches

CUSTOM DESIGN VERTICALLY INTEGRATED

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

A World Magnetics Company
Catalog 0808



www.designflexswitches.com

ISO 9001:2000

RoHS

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

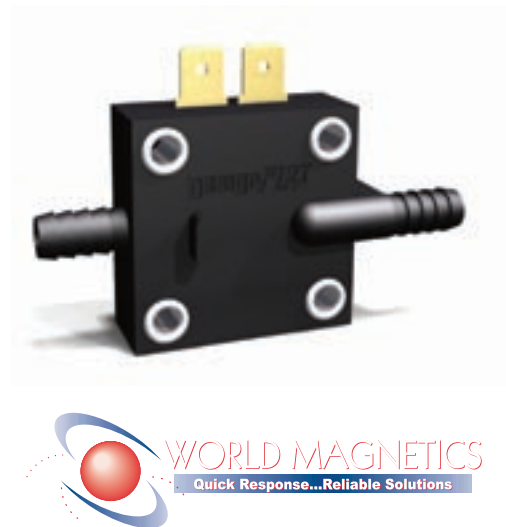
Our field-proven DesignFlex™ switches offer a wide variety of housing, mounting, porting, diaphragm and set point configurations. Our standard in-stock modular components improve your product's reliability, reducing costs and shortening your time to market. Our long life, dependable, ultra-sensitive 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



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, HMMWV / 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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www.designflexswitches.com

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 <small>*Not available on all ranges</small> • 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 <small>*Not available on all ranges</small> • 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



Made in USA

RoHS

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. FREE 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
Proof Pressure	8 psi: for units where set point is 3.0" H ₂ O or less 15 psi: for units where set point is greater than 3.0" H ₂ O 8 psi: for units with Teflon® diaphragm
Shock & Vibration	At zero pressure, will not make at 50G's shock, will not make at 10G's, 50 to 2000 Hz vibration (see diagram on pg 19)
Operating Temp.	+40°F to +150°F (standard) -46°F to +205°F (contact us)

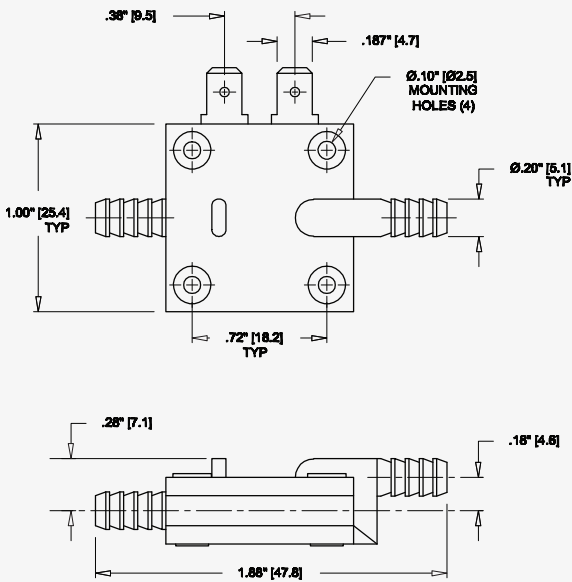
PHYSICAL

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® optional)
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 or bracket available (see page 15)
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 contact DesignFlex for our SRF solid state relay



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	.1 - .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	.25 - 1.25	2.49	3.73	4.97	7.46	9.95	14.92	19.89	24.86	29.84	37.30	49.73	74.59	99.46	124.32
psi	.004 - .018	.036	.054	.072	.108	.144	.217	.289	.361	.433	.541	.722	1.083	1.444	1.804



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 normally closed optional
Switching Medium	Air; compatible fluids on "High" port side
Mechanical Life	More than 20 million cycles
Proof Pressure	8 psi: for units where set point is 3.0" H ₂ O or less 15 psi: for units where set point is greater than 3.0" H ₂ O 8 psi: for units with Teflon® diaphragm
Operating Temp.	+40°F to +150°F (standard) -46°F to +205°F (contact us)

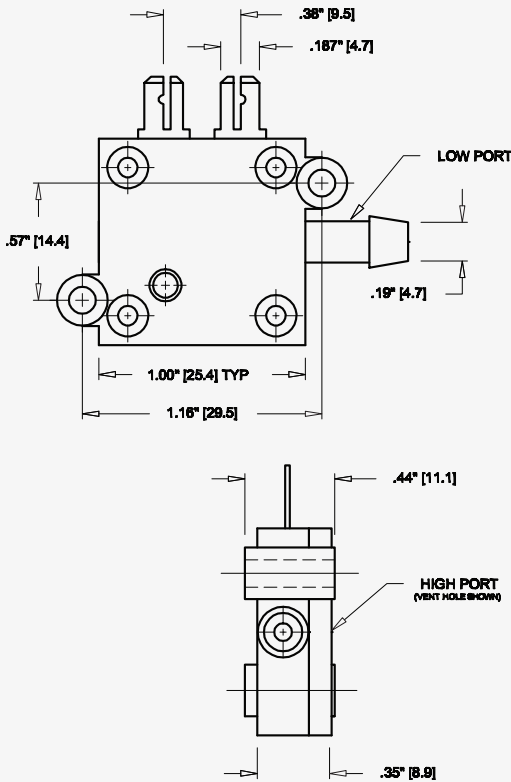
PHYSICAL

Case Material	Polycarbonate (optional: Lexan 141, Supec®, Ultem®, Noryl®)
Porting Options	Many standard ports - see Low Port / High Port Options next page
Diaphragm Material	Polyurethane (Teflon® optional)
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 or bracket available (see page 15)
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.



Shown with Low Port Option #5 / High Port Option #6



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 PSF101 options as shown or contact our vertically integrated in-house design and engineering team for special features and unique application needs. FREE 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	.1 - .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	.25 - 1.25	2.49	3.73	4.97	7.46	9.95	14.92	19.89	24.86	29.84	37.30	49.73	74.59	99.46	124.32
psi	.004 - .018	.036	.054	.072	.108	.144	.217	.289	.361	.433	.541	.722	1.083	1.444	1.084

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 1/8" ID tubing	
9		0		Diaphragm Options 1 Polyurethane (standard) 2 Teflon (optional)		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 Low Port Option Number High Port Option Number Diaphragm Option Number Three Digit Set Point Option Number

8



Made in USA **RoHS**

FEATURES / BENEFITS

- Field adjustable set point - from 0.1" 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 next page
Switch Type	SPST (single pull / single throw) normally open
Switching Medium	Air; compatible fluids on "High" port side
Mechanical Life	More than 20 million cycles
Proof 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)

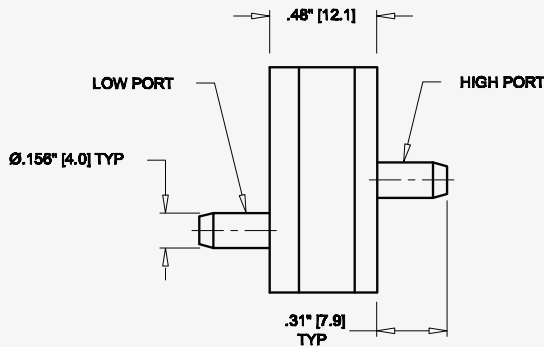
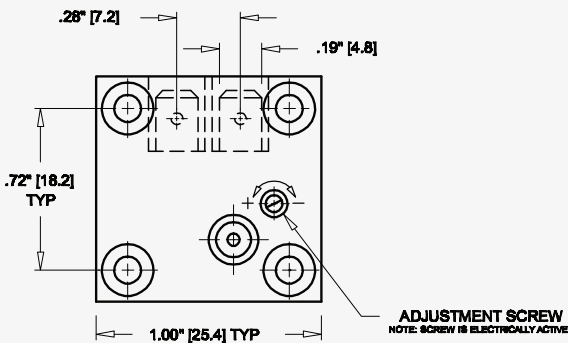
PHYSICAL

Case Material	Polycarbonate (optional: Lexan 141, Superc®, Ultem®, Noryl®)
Porting Options	Many standard ports - see Low Port / High Port Options next page
Diaphragm Material	Polyurethane (Teflon® optional)
Contact Points	Gold
Electrical Connections	Terminals – .187"x.020" spade (recessed) for use with quick disconnects uninsulated (ref. AMP Faston, 187 Series) (PCB terminals available)
Mounting	#4 Screws through mounting lugs; #2 Screws through eyelets; mounting clip or bracket available (see page 15)
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.



Shown with Low Port Option #2 / High Port Option #1



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

		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	available upon request please contact us	0.25 to 1.25	1.25 to 4.98	4.98 to 37.37	37.37 to 149.3	149.3 to 248.8	248.8 to 1723.7
psi		.004 to .018	.018 to .072	.072 to .541	.541 to 2.17	2.17 to 3.60	3.60 to 25.0
Proof Pressure		8 psi	8 psi	8 psi	15 psi	30 psi	30 psi
Tolerance		±0.1 In. H ₂ O	±0.2 In. H ₂ O	±0.5 In. H ₂ O	±10%	±10%	±10%

*Teflon only

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				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				Diaphragm Options 1 Polyurethane (standard) 2 Teflon (optional)		8	
	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
								Three Digit Set Point Option Number	

Model Design Guide

For building standard model order number

PSF102 Series Number

Low Port Option Number

High Port Option Number

Diaphragm Option Number

7

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E41523

Made in USA

RoHS

FEATURES / BENEFITS

- Controllable hysteresis (deadband) (see diagram on page 19)
- 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

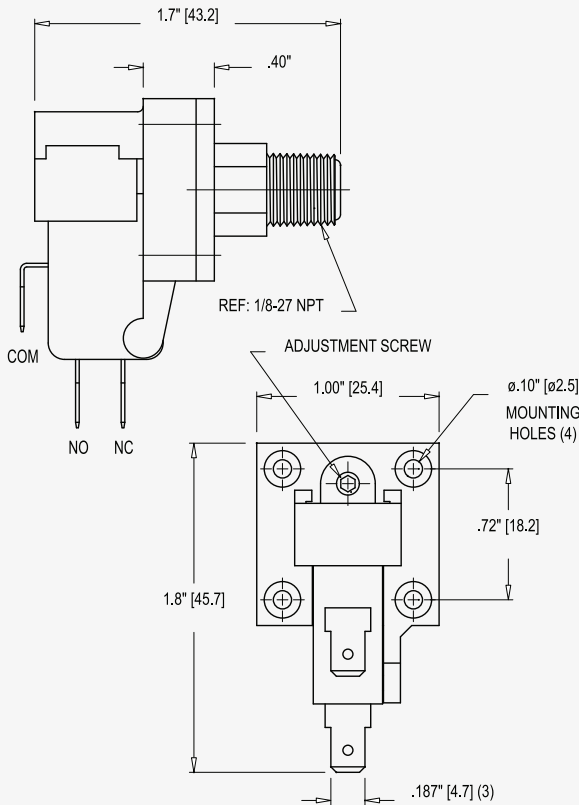
Standard Tolerance	±20% (Tighter tolerances available)
Switch Type	SPDT (single pull / double throw) normally open or normally closed
Switching Medium	Air; compatible fluids
Mechanical Life	More than 10 million cycles
Proof Pressure	Varies by option – see Adjustable Pressure Set Point Options next page
Operating Temp.	+40°F to +150°F (standard) -46°F to +205°F (contact us)

PHYSICAL

Case Material	Polycarbonate (optional: Lexan 141, Supec®, Ultem®, Noryl®)
Pressure Port Options	Many standard ports - see Pressure Port / Cover Options next page
Diaphragm Material	Polyurethane (Teflon® optional with limited pressure ranges)
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; mounting bracket available (see page 15)
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



Shown with Pressure Port Option #6



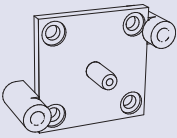
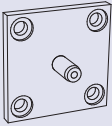
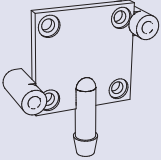
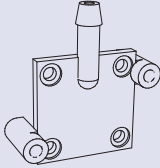
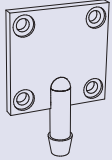
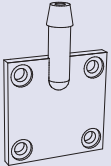
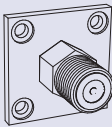
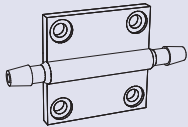
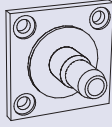
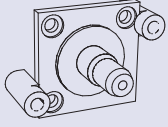
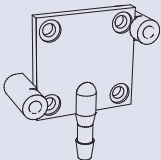
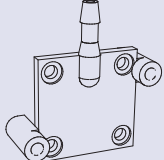
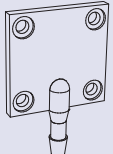
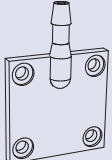
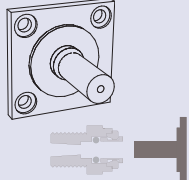
DESIGNFLEX STANDARD OPTIONS

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

ADJUSTABLE PRESSURE SET POINT OPTIONS

	020	902	903	904	905	906	
In. H ₂ O	2 ± 0.5	3 to 10	10 to 28	28 to 111	111 to 416	416 to 1664	
mbar	5	7.5 to 25	25 to 69	69 to 276	276 to 1034	1034 to 4137	
psi	0.1	0.11 to 0.4	0.4 to 1.0	1.0 to 4.0	4.0 to 15.0	15.0 to 60.0*	*Teflon diaphragm 30psi max
Proof Pressure (Polyurethane)	30 psi	30 psi	30 psi	30 psi	100 psi	100 psi	
Proof Pressure (Teflon®)	15 psi	15 psi	30 psi	30 psi	30 psi	30 psi	
Electrical 125/250 VAC	3A	3A	10A	15A	15A	15A	

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



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

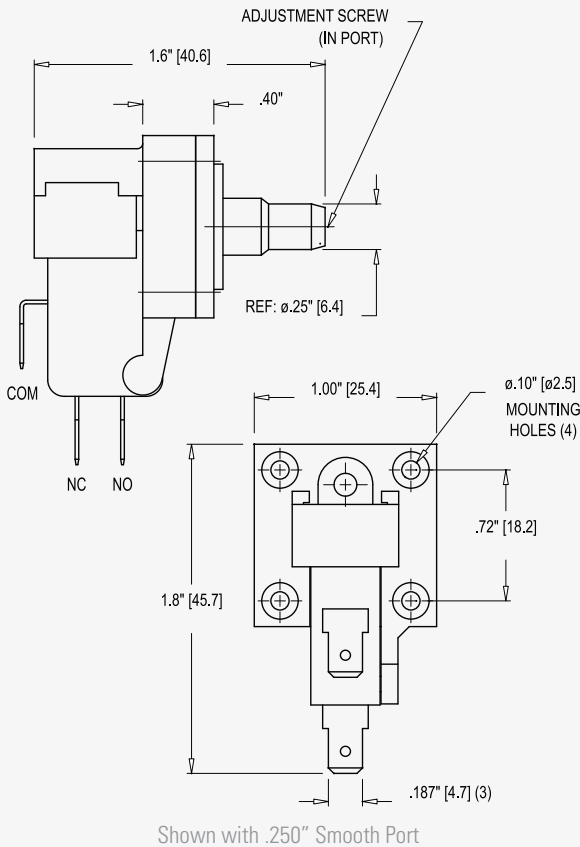
Three Digit Pressure Set Point Option Number

9



Made in USA

RoHS



FEATURES / BENEFITS

- **Controllable hysteresis (deadband)** (see diagram on page 19)
- **Field adjustable vacuum set point, from -3" H₂O to -12 psi** (-2" H₂O available as fixed set point)
- **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 relative 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, Supec®, Ultem®, Noryl®)
Vacuum Port Options	.250" diameter, 1/8" NPT, Quick Connect Fitting Port
Diaphragm Material	Polyurethane (Teflon® optional)
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; mounting bracket available (see page 15)
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)

The versatile high-current PSF109S vacuum switch offers a controllable hysteresis (deadband); 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 provide rapid prototyping and manufacturing turnaround.

PSF109S SERIES

ADJUSTABLE VACUUM SET POINT / PORT / ELECTRIC RATING OPTIONS

	20161	20901	21472	20112	20890	21473	20623	20897	21474
Description	109S-3-8	109S-NPT-3-8	109S-QC-3-8	109S-9-80	109S-NPT-9-80	109S-QC-9-80	109S-81-330	109S-NPT-81-330	109S-QC-81-330
- In. Hg	.2205 to .5878	.2205 to .5878	.2205 to .5878	.6613 to 5.878	.6613 to 5.878	.6613 to 5.878	5.951 to 24.25	5.951 to 24.25	5.951 to 24.25
- In. H ₂ O	3 to 8	3 to 8	3 to 8	9 to 80	9 to 80	9 to 80	81 to 330	81 to 330	81 to 330
- mbar	8 to 20	8 to 20	8 to 20	21 to 199	21 to 199	21 to 199	200 to 822	200 to 822	200 to 822
- psi	0.1 to 0.3	0.1 to 0.3	0.1 to 0.3	0.3 to 2.9	0.3 to 2.9	0.3 to 2.9	2.9 to 11.9	2.9 to 11.9	2.9 to 11.9
Port Style	.250" dia.	1/8" NPT	1/4" QC	.250" dia.	1/8" NPT	1/4" QC	.250" dia.	1/8" NPT	1/4" QC
Electrical 125/250 VAC	3A	3A	3A	10A	10A	10A	15A	15A	15A

FREE SAMPLE SWITCH available by request – Call 1-800-643-3884

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.



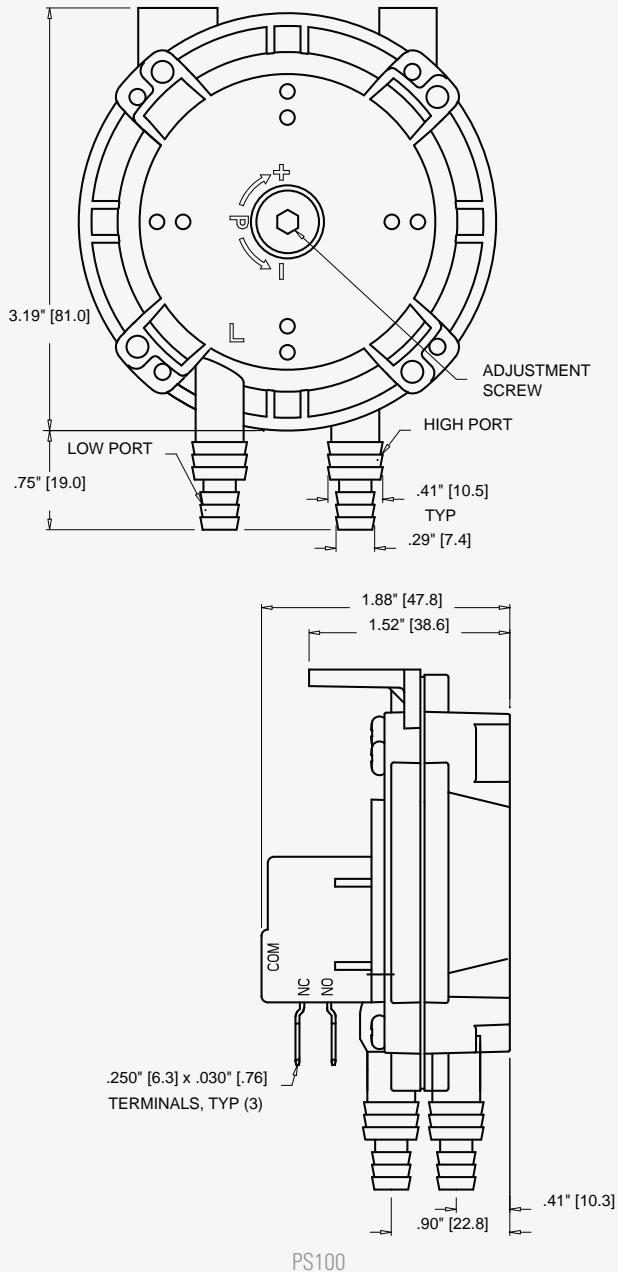
ALSO AVAILABLE: Port Couplings | Port Fittings | Polyurethane Tubing | Tools

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. **FREE** sample switch available by request.



FEATURES / BENEFITS

- Reliable performance under harsh / adverse conditions
- Larger diameter diaphragm / Conventional snap action
- 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: .250 in. and .375 in.
- Orifices, bleed holes and various mounting configurations available on all models
- Piggy-back design allows different snap-acting switches
- 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



SPECIFICATIONS

MECHANICAL

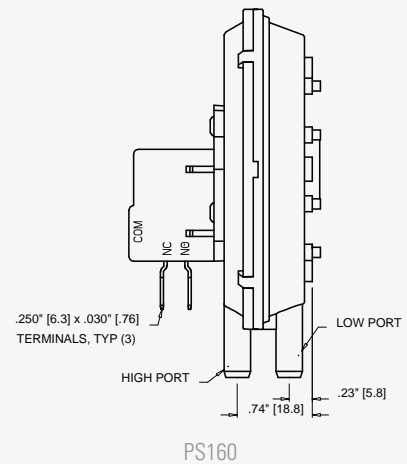
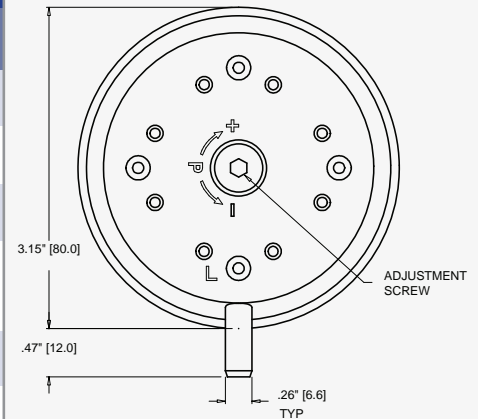
Standard Tolerance	Varies by set point - contact us
Switch Type	SPDT
Switching Medium	Air; compatible fluids
Mechanical Life	Tested hundreds of thousands of cycles Exceeds UL-508 / UL-353 Pilot Duty requirements
Proof Pressure	1.0 psi
Burst Pressure	3.5 psi
Operating Temp.	- 40°F to +185°F

PHYSICAL

Case Material	Noryl® (PPO)
Porting Options	Multi-barb .250 in. and .375 in. (PS100) / .26 in. (PS160)
Diaphragm Material	Post-Cured Silicon
Contact Points	Silver
Electrical Connections	Terminals – .035" x .250" or .02" x .187" 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. 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/VDE Approved MH29861 Related: UL 353, UL 508, BS EN 1854: 1997



Bracket #70018



Bracket #70019



PS160



MH29861

RoHS

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."

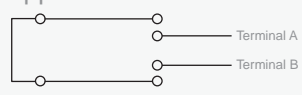
Temperature, Shift - A change in switch set point due to changes in surrounding temperature.

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

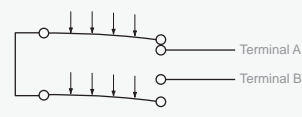
Notes _____

Shock and Vibration: How the PSF100A Works

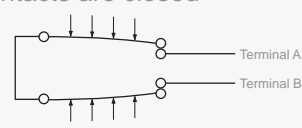
Normal state, no pressure applied: Both contacts of the double make/double break circuit configuration are open.



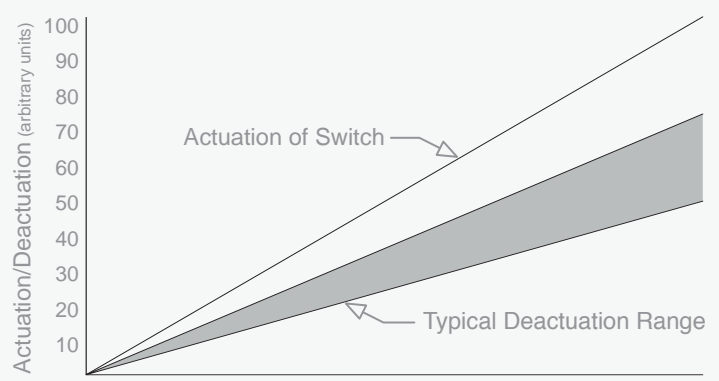
No pressure applied, subjected to shock or vibration: the contact arms move together in parallel; since at least one contact is always open, the circuit cannot close in error.



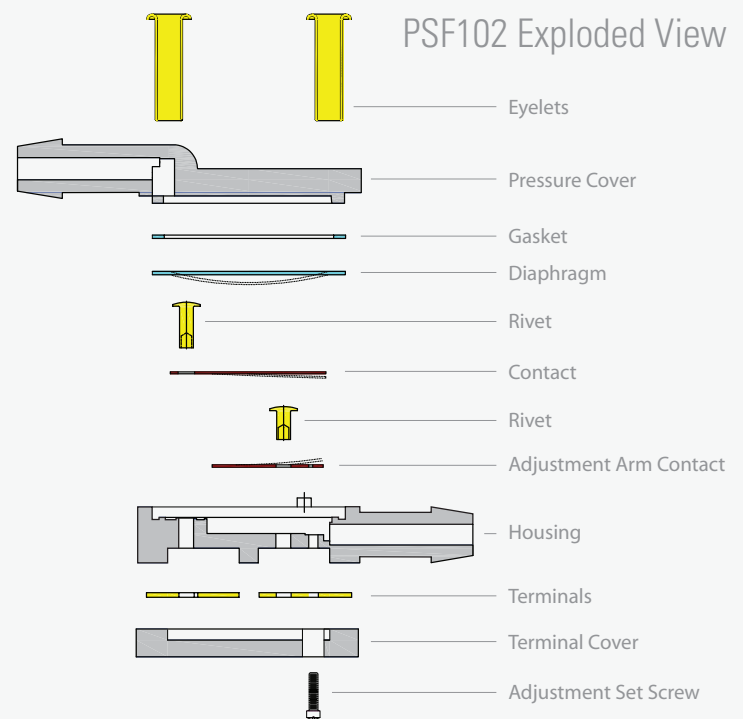
Pressure applied: Both contacts are closed completing the circuit.



Typical Hysteresis (for reference only)



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

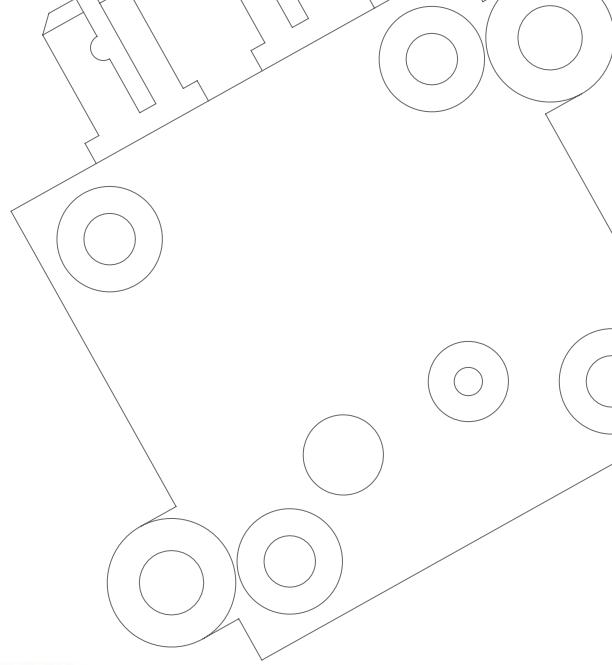


DESIGNFLEX™ SWITCHES

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 Phone: 231-946-3800 - Fax: 231-946-0274 - Toll Free: 800-643-3884

www.designflexswitches.com
info@designflexswitches.com



DesignFLEX

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.

