

Flow Switches

PRODUCT BROCHURE



Where Innovation Flows



Introduction Flow Switches



Throughout any manufacturing facility, there are vital safety and automation processes that require precision flow solutions, and flow switches play an integral part. By monitoring flow or no flow conditions within your application, flow switches can maintain production standards, protect vital equipment, and prevent waste of valuable materials.

Malema Adjustable and Fixed Set Point Flow Switches feature a piston-style working principle and come in single-pole, single-throw (SPST) and single-pole, dual-throw (SPDT) configurations. Malema Flow Switch offerings are divided into the following categories:

- Fixed Set Point Inline Flow Switch
- Adjustable Flow Switch (Right Angle Flow)
- Explosion-Proof Flow Switch

These switches are available in a variety of flow ranges, sizes and materials. Along with its extremely high level of accuracy and repeatability, the salient feature of buying a Malema Flow Switch is that it comes with a custom-calibration option that can be scaled to precisely suit the needs of your application. Additionally, Malema offers pre-calibrated set point ranges for applications that do not require a custom calibrated range.

The inline and bypass-style configurations, along with standard and custom fittings options, make Malema Flow Switches a versatile flow monitoring solution for various applications that involve the handling and transfer of industrial gases and liquids. Additionally, our small compact design features female NPT ports, providing a smaller profile that fits better in envelope. Malema Flow Switches are also available in explosion-proof designs so that they can be installed in potentially hazardous locations.

As the leading manufacturer of sensors, electronics and process instrumentation for abrasive slurries, surfactants and high-purity and corrosive chemicals, Malema offers a variety of flow meters, controllers, switches, sensors, valves and more for wide array of industrial applications and markets. By improving production processes, Malema products are safe, accurate and repeatable, all while being capable of maintaining the highest standards for purity and cleanliness.



Malema Flow Switches come in a wide variety of materials ensuring optimal compatibility with a wide range of fluids and applications. Some of our available materials* include:

Metals

- Anodized Aluminum
- Brass
- Hastelloy
- Stainless Steel

Plastics

- Acrylic
- PFA
- PTFE
- PVC
- Polypropylene

*Other materials available on request.



Anodized Aluminum



Brass



Hastelloy



Stainless Steel



Acrylic



PFA



PTFE



PVC



Polypropylene

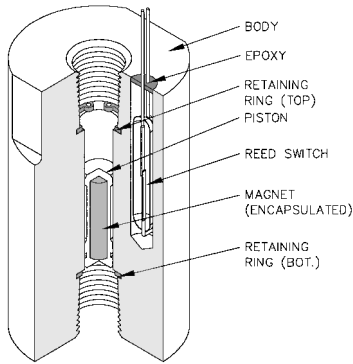
Applications

- Gas and liquid analyzers, biomedical instruments, atmosphere furnaces, gas chromatographs, vacuum systems and industrial fluid lines
- Protects expensive electronic equipment from coolant-flow failure on:
 - Laser Heads • Welders • Power Supplies • High-Speed Spindles • X-Ray Tubes • Semiconductor Equipment • Portable Plasma Cutters/Tables
- Helps assure proper lubrication flow to critical bearings or gears to prevent system downtime on:
 - Presses • Rotating Equipment • Conveyors • Machine Tools • Robotics
- Helps ensure system integrity in processing and dispensing equipment on:
 - Water Purification and Filtering • Beverage Dispensing • Chemical Additives • Gas Sampling • Distilling • Car Wash Fluid Dispensing • Portable Chillers • Vacuum Furnaces • Induction Furnaces
- Works just as well with gases as it does with liquids, including:
 - Hydrogen • Oxygen • Air • Nitrogen • Argon • Helium • and more

Advantages

- Fixed and adjustable set point flow switches available in both explosion proof and non-explosion proof models.
- Extremely high level of accuracy within 10% of the desired set point for fixed set point models, and repeatability of 5% for all models of Malema Flow Switches.
- Female NPT standard on flow switches providing small, compact design.
- All Malema Fixed Set Point Flow Switches can have their own customized set points calibrated at the factory before shipping.
- Standard pre-calibrated set point ranges on Malema Flow Switches are also available for immediate use and distribution.
- Malema application engineers are available for consultations to provide the best possible flow switch options and materials of construction to ensure compatibility.
- Configurations available for single-pole, single-throw (SPST) or single-pole, dual-throw (SPDT) allowing for flexibility different outputs for both the high and low set point.
- Special configurations and different materials of construction are available. Consult the factory for details.

How They Work

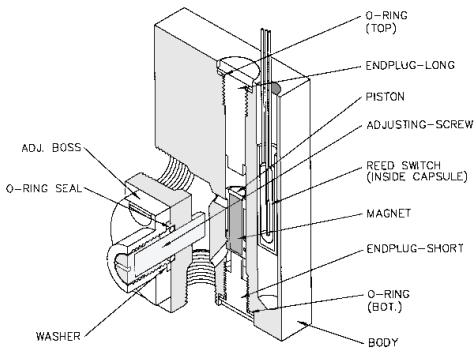
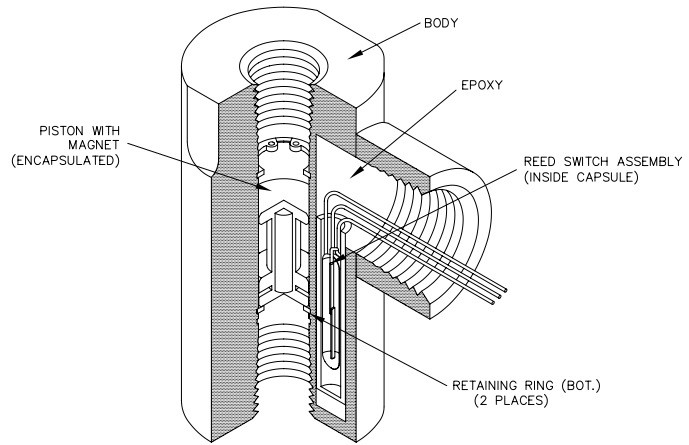


Fixed Set Point Inline Flow

The operating principle is based on a free-floating magnetic piston that responds only to the motion of fluids within the line, not to static or system pressures. In the presence of fluid flow, controlled movement of the piston actuates an external hermetically sealed reed switch that produces the required signal circuit.

Fixed Set Point Inline Flow Explosion-Proof

The operating principle is based on a free floating magnetic piston which responds only to the motion of fluids within the line, not to static or system pressures. In the presence of fluid flow, controlled movement of the piston actuates an external hermetically sealed reed switch thus opening or closing the required signal circuit. This signal can be used to actuate audible or visual alarms as well as relays or other controls. Piston travel is short, which helps ensure low hysteresis. Pressure drop across the flow switch varies from 0.035 to 2 psi (at maximum flow rates for air and liquid). Universal mounting units are outfitted with a spring that resets the piston. The spring is held in place using a perforated disc.

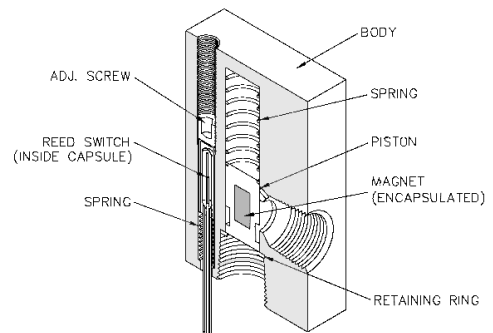


Adjustable Set Point Right Angle Flow (M-100)

For the M-100 Flow Switch, the magnetic piston rests at the bottom of the switch with no flow present. Once flow is established, the piston moves upward responding to a by-pass flow and actuates the reed switch. The by-pass flow is controlled by a manual adjusting screw controlling the variable orifice. When flow decreases, the piston moves downward and the reed switch deactuates. Universal mounted units are outfitted with a spring which resets the piston.

Adjustable Set Point Right Angle Flow (M-200)

The M-200 Flow Switch is activated by flow forcing a piston kept in place by a spring to travel past a reed switch. This provides a positive signal after a certain amount of travel. Set-point adjustment is controlled by adjusting the positioning of the reed switch.



Fixed Set Point Flow Switches

Extreme accuracy is a highlight of Malema Fixed Set Point Flow Switches models. When triggered, the models will be within 10% of the desired set point, all while offering repeatability of 5%.

Malema Fixed Set Point Flow Switch models offer a custom set point calibration option that can be programmed at our Malema facility before shipping. Standard pre-calibrated set point ranges on Malema Flow Switches are also available for immediate use and distribution. Options for SPST and SPDT configurations are available. Use the table below for information on sizes, ranges, and available materials for Malema Fixed Set Point Flow Switches.



Fixed Set Point Flow Switches					
Model	Port Size	Flow Range Water	Flow Range Air*	Connection Type	Available Materials
M-50	1/8"	1 - 170 CCM (0.0002 - 0.04 GPM)	50 - 5000 SCCM	FNPT	316SS, Acrylic, Anodized Aluminum, Brass, PP, PTFE
	1/4"				
M-55	1/8"	170 - 750 CCM (0.04 - 0.19 GPM)	5 - 25 SLPM	FNPT	316SS, Acrylic, Anodized Aluminum, Brass, PP, PTFE
M-60	1/4"	750 - 1600 CCM (0.19 - 0.42 GPM)	25 - 55 SLPM	FNPT	316SS, Acrylic, Brass, Anodized Aluminum, PP, PTFE, PVC
M-61	1/4"	20 - 7600 CCM (0.005 - 2 GPM)	300 - 55000 SCCM	FLARE	PFA
	3/8"				
M-62	1/4"	20 - 1200 CCM (0.005 - 0.31 GPM)	0.3 - 55 SLPM	FLARE	PFA
	3/8"				
M-64	3/8"	0.4 - 26 LPM (0.10 - 7 GPM)	28.5 - 1980 SLPM	FNPT	316SS, Brass, PTFE, PVC
	1/2"				
M-701	3/4"	1 - 19 LPM (0.26 - 5 GPM)	-	FNPT	Fiberglass infused PP

* With applications featuring gases, ranges may vary.

Adjustable Set Point Flow Switches

Adjustable Malema Flow Switches with right angle flow can be configured at the factory with a specific set points, and further adjusted in the field (by turning the adjustment screw) to meet changing requirements. These extremely accurate flow switches provide repeatability of 5%, and have options for SPST or SPDT configurations. Malema applications engineers can help size the proper switch for each customer's exact requirements. Use the table below for information on sizes, ranges, and available materials for Malema Adjustable Set Point Flow Switches.



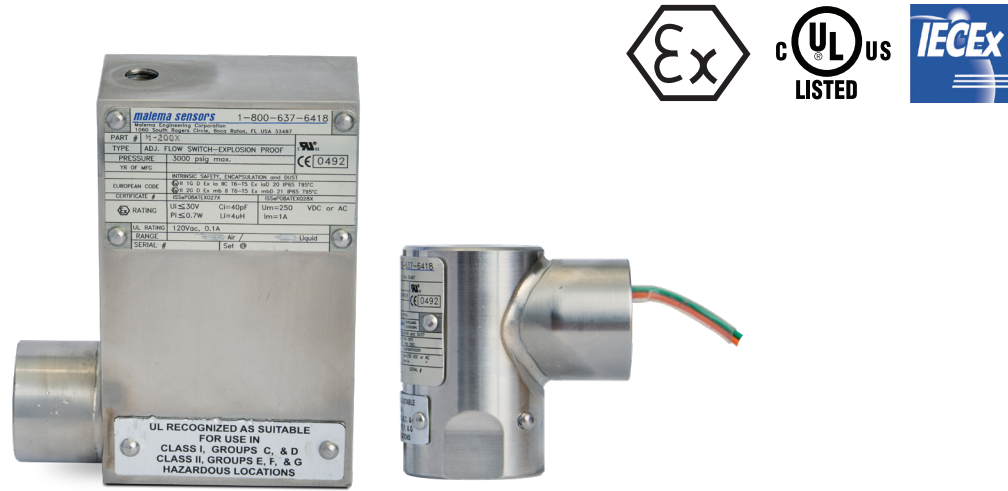
Adjustable Set Point Flow Switches					
Model	Port Size	Flow Range Water	Flow Range Air*	Connection Type	Available Materials
M-100	1/8"	1 - 170 CCM (0.0002 - 0.04 GPM)	0.05 - 60 SLPM	FNPT	316SS, Acrylic, Anodized Aluminum, Brass, PP, PTFE
	1/4"				
M-200	3/8"	0.15 - 19 LPM (0.03 - 5 GPM)	28.5 - 1415 SLPM	FNPT	316SS, Acrylic, Anodized Aluminum, Brass, PTFE
	1/2"				
	3/4"	0.75 - 37 LPM (0.19 - 10 GPM)	56.5 - 2830 SLPM		

* With applications featuring gases, ranges may vary.

Explosion-Proof Flow Switches

Stainless Steel Malema Explosion-Proof Flow Switches, are available in fixed (M-50X & M-60X) and adjustable (M-100X & M-200X) set point models. These extremely sensitive explosion-proof flow switches are engineered to monitor vital sample flow parameters for instrumentation in process control and inert blanket gases. When triggered, the fixed set point models will be within 10% of the desired set point, while all models offer repeatability of 5%. Malema Explosion-Proof Flow Switches offer custom set point calibration that can be programmed at our Malema facility before shipping.

Standard pre-calibrated set point ranges on these flow switches are also available for immediate use and distribution. These switches come in SPST or SPDT configurations and are UL listed, ATEX and IECEx certified.



Explosion Proof Flow Switches					
Model	Port Size	Flow Range Water	Flow Range Air*	Connection Type	Available Materials
M-50X	1/8"	1 - 170 CCM (0.0002 - 0.04 GPM)	50 - 5000 SCCM	FNPT	316SS, Hastelloy
	1/4"				
M-60X	1/4"	750 - 1600 CCM (0.19 - 0.42 GPM)	25 - 55 SLPM	FNPT	316SS, Hastelloy
M-100X	1/8"	1 - 200 CCM (0.0002 - 0.05 GPM)	0.02 - 1 SLPM	FNPT	Hastelloy, 3316SS
	1/8"	3 - 650 CCM (0.0007 - 0.17 GPM)	0.05 - 40 SLPM		
	1/4"	3 - 950 CCM (0.0007 - 0.25 GPM)	0.2 - 60 SLPM		
M-200X	3/8"	0.2 - 40 LPM (0.05 - 11 GPM)	56.5 - 2830 SLPM	FNPT	316SS
	1/2"				
	3/4"				

* With applications featuring gases, ranges may vary.



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