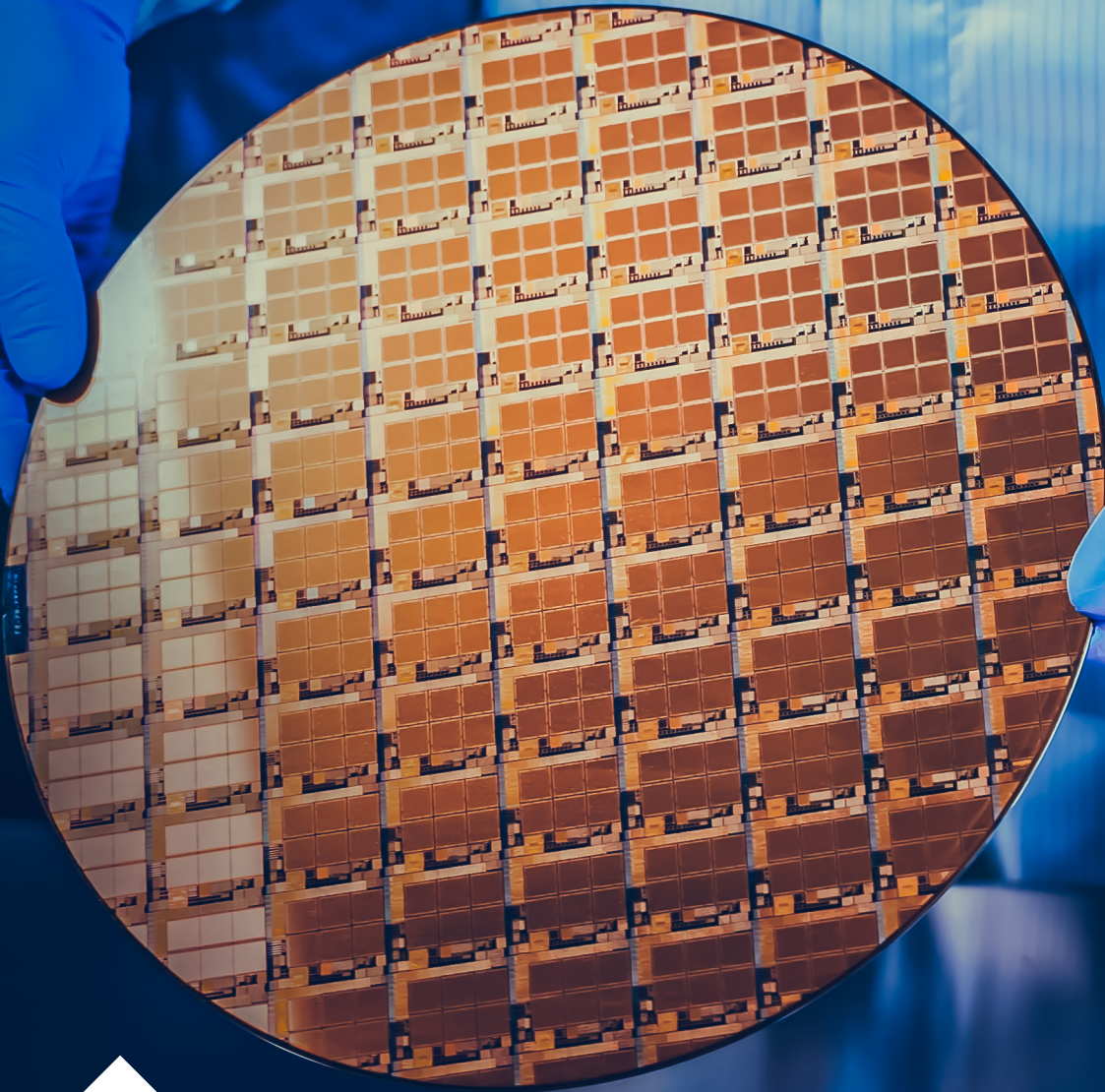


Flow Measurement & Control Solutions for Semiconductor Manufacturing



Where Innovation Flows



Semiconductor Industry



The semiconductor industry, which impacts nearly every aspect of our lives, is the backbone of modern technology and serves as a foundation for innovative breakthroughs. Almost every industry depends on semiconductor power, including consumer electronics, medical devices, communication infrastructure, automobiles and more.

Semiconductors, which have an electrical conductivity between conductors and insulators, are used to make transistors, diodes and integrated circuits (ICs), the building blocks of a wide range of electronic devices vital to modern life.

As the leading manufacturer of meters, controllers, sensors, electronics and process instrumentation for abrasive slurries, surfactants, and high-purity and corrosive chemicals, Malema™ provides customers with the flow measurement & control solutions that deliver the superior metering accuracy required by the semiconductor industry.

About Malema

Malema engineers flow meters, controllers, flow switches and pressure sensors for the semiconductor industry that are safe, accurate and repeatable, all while maintaining the highest standards for purity and cleanliness.

With over 20 patents, full portfolio of flow measurement & control and decades of experience, Malema has built industry leading relationships with all the major semiconductor OEM's and manufacturers. Malema engineers have been involved with multiple OEMs, developing customized flow control solutions for global chemical mechanical planarization (CMP) and Wet Bench Tool manufacturers, as well as chip manufacturers. Malema is well known for offering easy installation, simple maintenance, and readily available upgrades and replacements.

Malema Ultrasonic and Coriolis-Based Flow Measurement and Flow Control Solutions are used in applications throughout the semiconductor manufacturing process, including CMP, post CMP cleaning, wet clean, chillers, etch, lithography, pure chemical supply, slurry management, waste-gas scrubber and wastewater treatment.

Malema is proud to offer flow measurement & control solutions that contribute to developing faster, more efficient and innovative electronic devices, shaping the trajectory of global technological progress.



About PSG®

PSG® is a global pump, metering and dispensing-solution expert, enabling the safe and efficient transfer of critical and valuable fluids that require optimal performance and reliability in applications where it matters most.

Additionally, PSG is a leading provider of flow meters designed to reduce waste and downtime while accurately measuring, monitoring and controlling the distribution of fluids.

Headquartered in Oakbrook Terrace, IL, USA, PSG is comprised of several world-class brands, including Abaque®, All-Flo™, Almatec®, Blackmer®, Ebsray®, em-tec®, Griswold®, Hydro™, Malema™, Mouvex®, Neptune®, PSG® Biotech, Quantex™, Quattroflow®, and Wilden®.

PSG products are manufactured on four continents – North America, Europe, Australia and Asia – in state-of-the-art facilities that practice lean manufacturing and are ISO-certified.

PSG is part of the Pumps & Process Solutions segment of Dover Corporation.



Optimizing the Semiconductor Production Process

1 Chemical Mechanical Planarization

Malema PFA Coriolis and Ultrasonic Flow Controllers offer an extremely high level of accuracy to precisely control the heart of the manufacturing process of semiconductor chips while preserving valuable slurry, and post CMP cleaning chemistries and lowering the number of defective wafers. Malema also provides pressure sensors and interlock devices (MIID), a cutting-edge instrument for stopping valve leaks that guards against cross-contamination between DI water and slurry.

- Ultrasonic Flow Controllers
- Coriolis Flow Controllers
- MIID (Interlock Device)
- Pressure Sensors

2 Chillers

The presence of liquid flow is indicated by Malema Flow Switches installed along the piping flow path of the chillers. Process safeguards can be activated by programming them to trip an alarm and instantly alert operators when flow stops. Paddlewheel and vortex flow meters are also available from Malema to control flow to and from the chillers.

- Paddlewheel Flow Meter
- Vortex Flow Meter
- Stainless Steel Flow Switches

3 Etch (Dry & Wet)

To prevent unnecessary chemical use during the etching process, the Malema MDM-3000 Ultrasonic Dispense Verification provides a controlled method of chemical dispensing. Furthermore, high-purity flow switches composed of PTFE or PFA provide a chemically inert way of monitoring flow while offering resistance to abrasive chemicals.

- MDM-3000 Ultrasonic Dispense Verification Meter
- High Purity Flow Switches

4 Lithography

For applications involving the dispensing of small-volume photoresists, Malema Ultrasonic Flow Meters with PFA wetted parts offer precise flow measurement.

- Ultrasonic Flow Meter



5 Pure Chemical Supply

During the pure chemical supply process, the VF-8100 Vortex Flow Meter and the M-2111 Ultrasonic Flow Meter offer precise flow measurement at high flow rates. Every wetted part of these flow meters is made of PFA material, ensuring excellent purity and resistance to corrosion.

- Ultrasonic Flow Meter
- Vortex Flow Meter

6 Slurry Management

For the management of slurry, Malema provides an extensive range of PFA flow and controllers. Every technology offers precise measurement to control usage and ensure accuracy in slurry batch mixing. Measuring foamy liquids, which are present in slurry mixtures, is an additional advantage of the Coriolis flow and controllers.

- Coriolis Flow Meters and Controllers
- Ultrasonic Flow and Controllers
- Vortex Flow Meter

7 Waste-Gas Scrubber

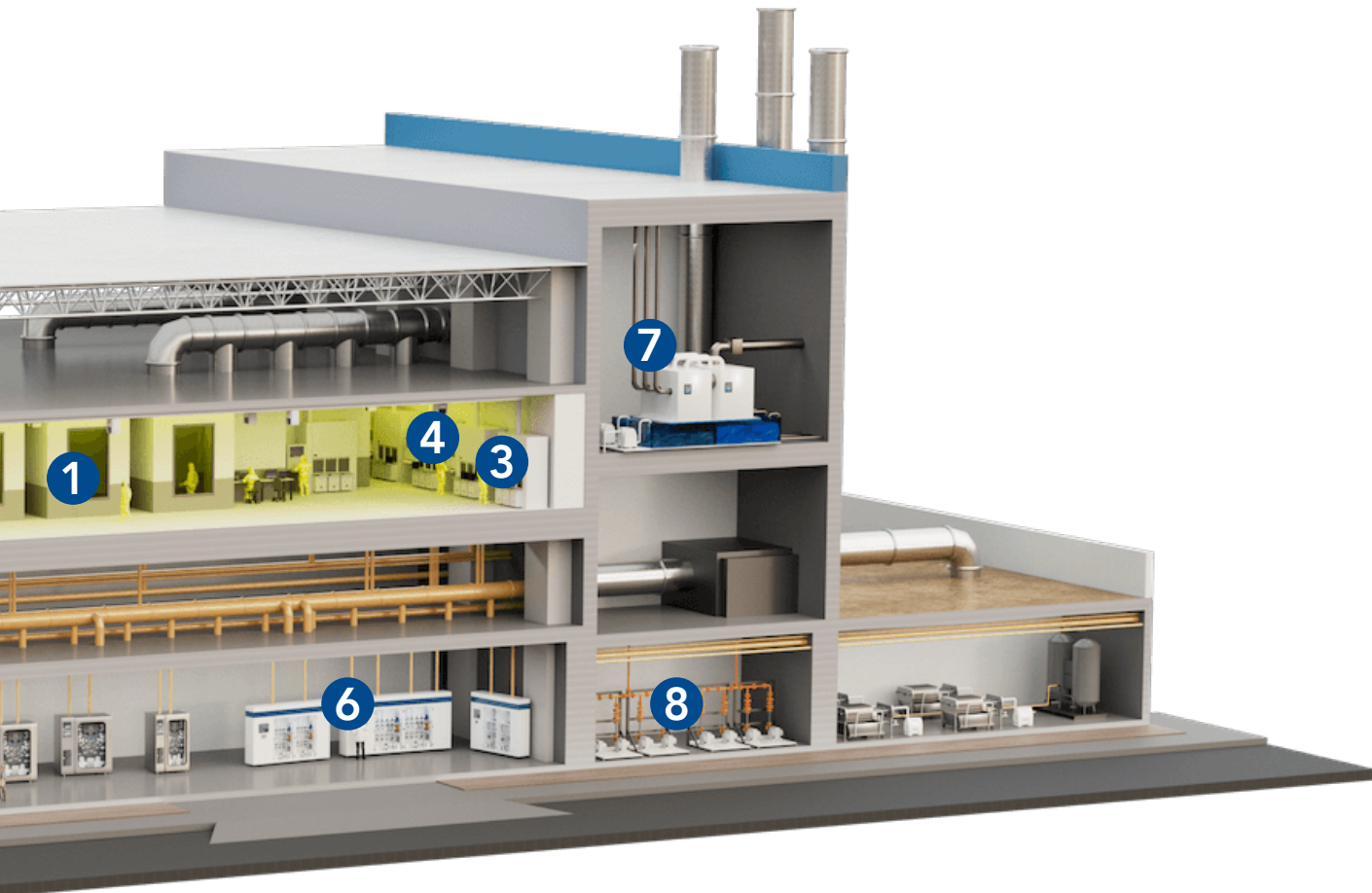
Malema Flow Switches detect and monitor gas flow throughout the waste-gas processing system. ATEX-certified and explosion-proof flow switches are available to monitor potentially explosive gases. These switches are calibrated to trip alarms when no flow is detected.

- Stainless Steel Flow Switches
- Explosion Proof Flow Switches

8 Wastewater Treatment

Malema Flow Switches are installed at various points throughout the wastewater treatment process to detect flow. They can be programmed to trip an alarm in the event that they detect no flow, alerting operators of any issues or blockages in the system.

- Stainless Steel Flow Switches



Coriolis Flow Meters & Controllers



Malema offers flow measurement and control solutions that feature Coriolis technology in both flow meters and flow controllers. One of the main benefits of Coriolis technology is its extreme accuracy of $\pm 1\%$ and its accuracy is unaffected by flow regime or bubbles. Constructed with all-PFA wetted surfaces for use in high-purity semiconductor applications, Malema Coriolis Flow Meters and Controllers measure liquids by providing mass flow rate, total mass and temperature output with extreme accuracy. Malema Coriolis technology provides fluid measurement performance that is independent of fluid properties, eliminating the need to calibrate on different fluids. Additionally, the sensors operate and measure in two-phase flow conditions with gas volumetric void fractions in excess of 30%.

Coriolis Flow Meters

	CPFM-5000 Series Featuring an integral electronic transmitter, the CPFM-5000 includes sensor and electronics all in one compact unit.	CPFM-8800 Series The CPFM-8800 Series is designed with separate units for sensor and electronics, allowing for remote sensor electronics.
Accuracy	$\pm 1\%$ of rate (flow rates between 100-10% of MRV)* $\pm 1\%$ of rate Z.O.S. (flow rates below 10% of MRV)*	$\pm 1\%$ of rate (flow rates between 100-10% of MRV)* $\pm 1\%$ of rate Z.O.S. (flow rates below 10% of MRV)*
Repeatability	$\pm 0.5\%$ of flow reading, down to 10% of full scale*	$\pm 0.5\%$ of flow reading, down to 10% of full scale*
Temperature	Ambient: 0 - 50°C Fluid: 18 - 50°C	Ambient: 0 - 50°C Fluid: 18 - 50°C
Operating Pressure	80 psig (max.)	80 psig (max.)
Flow Range	50 - 4,000 g/min	50 - 4,000 g/min

* Accuracy and repeatability statement is based on a room temperature DIW calibration.

Coriolis Flow Controllers

	CMFC-5000 Series Suitable for both chemistries and slurry applications, the CMFC-5000 Series features the choice of two valve options - a pinch valve for slurry applications or a diaphragm valve for chemistries applications.	CMFC-6000 Series Equipped with an integral pressure sensor, the CMFC-6000 Series is suitable for a variety of semiconductor chemistries.
Accuracy	$\pm 1.5\%$ of set point or ± 3 g/min (whichever is larger)*	$\pm 1.5\%$ of set point or ± 3 g/min (whichever is larger)*
Control Repeatability	$\pm 0.5\%$ of set point or ± 0.5 g/min (whichever is larger)*	$\pm 0.5\%$ of set point or ± 0.5 g/min (whichever is larger)*
Temperature	Ambient: 0 - 40°C / 30 - 80% RH, without Dew Fluid: 18 - 50°C	Ambient: 0 - 40°C / 30 - 80% RH, without Dew Fluid: 18 - 50°C
Operating Pressure	50 psig (max.)	50 psig (max.)
Flow Range	50 - 5,000 g/min**	50 - 5,000 g/min**

* Accuracy and repeatability statement is based on a room temperature DIW calibration.

** Higher flow ranges are available in 3/8" tubing only.

Ultrasonic Flow Meters & Controllers



Malema Ultrasonic Flow Meters and Controllers are designed with transit-time ultrasonic technology with the latest digital signal processing (DSP) to determine accurate and precise measurements for use in a wide variety of high-purity liquids, including DI water, harsh chemicals and CMP polishing slurries. Malema Ultrasonic Flow Meters and Controllers feature all wetted parts made of high-purity PFA providing corrosion resistance, and keeping your applications free from ion or particle contamination.

Ultrasonic Flow Meters

	M-1500MB Series Sensor with remote and integral electronics options.	M-2111 Series Sensor with remote electronics.	M-2700 Series Sensor with integral electronics.
Sensor Configuration	Straight Flow Through Sensor	U or Z Shaped Sensor	U or Z Shaped Sensor
Accuracy	±2% of flow reading*	±1% of flow reading*	±1% of flow reading, down to 10% of full scale*
Repeatability	±1% of flow reading, down to 10% of full scale*	0.5% of flow reading, down to 10% of full scale*	±0.5% of flow reading, down to 10% of full scale*
Temperature	Ambient: 0 - 46°C Fluid: 10 - 60°C	Ambient: 0 - 50°C Fluid: 10 - 60°C	Ambient: 0 - 46°C Fluid: 10 - 60°C
Operating Pressure	70 psig (max.)	70 psig (max.)	70 psig (max.)
Flow Range	4 - 600 ml/min	0 - 80 l/min	0.1 - 20 l/min

* Accuracy and repeatability statement is based on a room temperature DIW calibration.

Ultrasonic Flow Controllers

	LFC-7000 Series Integrated controller with pinch valve for slurries or diaphragm valve for chemistries.	LFC-7650 Series Integrated controller with pressure transducer and diaphragm valve only.
Accuracy	±1% of set point or ±3ml/min (whichever is larger)*	±1% of set point or ±3ml/min (whichever is larger)*
Control Repeatability	±0.5% of set point or ±1.5 ml/min (whichever is larger)*	±1% of set point or ±1 ml/min (whichever is larger)*
Temperature	Ambient: 0 - 40°C (30 - 80% R.H., without Dew) Fluid: 10 - 60°C	Ambient: 0 - 40°C 30 - 80% R.H., without Dew Fluid: 10 - 60°C
Operating Pressure	50 psig (max.)	50 psig (max.)
Flow Range	5 - 12,000 ml/min** Depending on size of sensor selected	5 - 4,000 ml/min** Depending on size of sensor selected

* Accuracy and repeatability are based on room temperature DIW calibration.

** The enclosure footprint may be larger for these flow ranges to meet the pressure drop specification. The minimum differential pressure requirements can be higher for these ranges.

Vortex Flow Meters



An inline flow sensor and electronics are combined into one unit to create the VF-8100 and VF-8200 Vortex Flow Meters. Using ultrasonic sensing technology to measure flow rate, the Vortex Flow Meters come in multiple sizes, and feature no mechanical seals or moving parts. In the semiconductor industry, the VF-8100, with its PFA wetted materials, is an ideal choice for applications requiring corrosion-resistant wetted parts, high purity, and a minimal footprint.

	VF-8100 Vortex Featuring PFA Wetted Materials	VF-8200 Vortex Featuring PPS Wetted Materials
Accuracy	±2% of full scale	±2% of full scale
Repeatability	Within ±0.5% F.S.	Within ±0.5% F.S.
Temperature	Ambient: 0 - 50°C Fluid: 0 - 90°C	Ambient: 0 - 50°C Fluid: 0 - 90°C
Operating Pressure	100 psig (max.)	100 psig (max.)
Flow Range	0.4 - 100 l/min	0.5 - 150 l/min
Sizes	3/8", 1/2", 3/4", 1"	3/8", 1/2", 3/4", 1"

Paddlewheel Flow Meter



The M-10000 Paddlewheel Flow Meter is a flow-sensing device that is compact, easy to install, and accurate. Malema M-10000 Paddlewheel Flow Meter utilizes sophisticated circuitry to foster signal conditioning and features a build in adjustable flow switch, and is available in many different material of construction including PTFE, acetyl copolymer, stainless steel and more.

	M-10000 Paddlewheel
Accuracy	±5% of full scale*
Repeatability	±0.5%*
Temperature	All electrical components are extended industrial range components rated from -40 - 90°C
Operating Pressure	100 - 300 psig**
Materials of Construction	PTFE, Acetyl Copolymer, Stainless Steel
Flow Range	0.1 - 225 l/min

*Accuracy and repeatability is based on room temperature DIW calibration.

**Depending on component materials.

Pressure Relief Valve



With an all-PFA molded body, the M-VF-F Series Pressure Relief Valve is suitable for installation on pressurized systems applications involving semiconductors, ultra-pure water and strong chemicals. Featuring 1/4" male flare size ports, these high purity pressure relief valves come with bubble tight seal and are factory set for relief pressure.

M-VF-F Pressure Relief	
Set Point Accuracy	±5%
Repeatability	±2.5%
Calibration Range	The product can be set at a cracking pressure in the range of 30 - 90 psi (2.1 - 6.2 bar) with bubble-tight shut off.*
Cracking Pressure	30 - 90 psi (2.1 - 6.2 bar)
Hysteresis	30%
Connection Sizes	1/4" Male Flare

*Consult factory for lower settings.

Pressure Sensors



Available in PFA and PTFE, Malema Pressure Sensors are designed to meet the requirements of contamination-free wetted parts, minimum dead-volume and resistance to tough chemicals used in semiconductor and high-purity applications. These pressure sensors are available as a single port or inline flow through design with tube connections or with options for flare or pillar type connections.

Pressure Sensors	
Measurement Range	0 - 50 psig 0 - 75 psig
Accuracy	±1% of full scale
Allowable Maximum Pressure	120 psig
Operating Temperature Range	10 - 80°C
Operating Humidity Range	25 - 89% RH (no condensation inside sensor)
Connection Sizes	1/4", 3/8", 1/2", 3/4", 1"

MIID Malema Interconnect Interlock Device



The patented Malema Interconnect Interlock Device (MIID-1000) By-Pass Leak Detection and Prevention System features all high purity PTFE and PFA construction of the wetted components and was developed especially for use in CMP tools. With built-in leak detection, monitoring, and optical valve position sensing, the MIID Interlock Device provides backflow protection and prevents internal bypass leaks in bulk chemical and high-purity water applications.

MIID Interlock Device	
Media Pressure	0 - 80 psig
Pneumatic Actuation Pressure	60 - 120 psig
Media Temperature	-17.7 - 130°C
Ambient Temperature	-17.7 - 65.5°C (no freezing liquids)

Flow Switches



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. Designed for the semiconductor industry, Malema has three all PFA flow switches built for use in high-purity applications.

- M-61-F PFA Fixed Set Point Flow Switch with Right Angle Flow
- M-62-F PFA Fixed Set Point Flow Switch with Inline Flow
- M-200-F PFA Adjustable Flow Switch with Right Angle Flow

PFA Flow Switches						
Model	Set Point Type	Port Size	Flow Range Water	Flow Range Air*	Connection Type	Available Materials
M-61	Fixed	1/4"	20 - 7600 CCM (0.005 - 2 gpm)	0.3 - 55 SLPM	Flare	PFA
		3/8"				
M-62	Fixed	1/4"	20 - 1200 CCM (0.005 - 0.31 gpm)	0.3 - 55 SLPM	Flare	PFA
		3/8"				
M-200F	Adjustable	3/8", 1/2", 3/4"	113 to 38,000 CCM (0.03 to 10 gpm)	28 to 2,800 SLPM	Flare	PFA

* With applications featuring gases, ranges may vary.

Additionally, Malema Flow Switches come in a wide range of other materials, including stainless steel, PTFE, PP, Aluminum, Acrylic and others.

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.

Key Features

- Fixed and adjustable set point flow switches are 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 of different outputs for both the high and low set point
- Special configurations and different materials of construction are available. Consult the factory for details

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 programed 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)	.05 to 5 SLPM	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-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.

Explosions Proof Flow Switches with Fixed Set Point					
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)	.05 to 5 SLPM	FNPT	316SS, Hastelloy
	1/4"				
M-60X	1/4"	750 - 1600 CCM (0.19 - 0.42 gpm)	25 - 55 SLPM	FNPT	316SS, Hastelloy

* With applications featuring gases, ranges may vary.

Explosion Proof Flow Switches with Adjustable Set Point					
Model	Port Size	Flow Range Water	Flow Range Air*	Connection Type	Available Materials
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.

PSG brand, Almatec AOODD Pumps

Advantages for Semiconductor Production



Almatec offers two AOODD-pump models for use in critical semiconductor-manufacturing applications.

E-Series AOODD Pumps

E-Series pumps build on the legacy of the Almatec original A-Series model, with the advancements within the E-Series' design including a new ring-tightening structure; optimized flow pattern for increased flow capacity; decreased air consumption; reduced noise levels; and a pulsation dampener suitable for flanged connections.

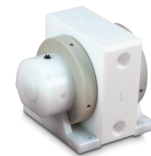
FUTUR Series AOODD Pumps

FUTUR Series pumps are designed for use in high-purity liquid-handling applications. They feature completely metal-free design that allows liquids to flow straight through product chambers within the center housing, which reduces the number of flow bends to only two, resulting in minimized surface area while eliminating the need for sliding parts in the product chambers, along with O-rings in the wetted area.

FUTUR pumps also feature no fastening elements, such as tie rods or clamps, with contactless cascade sealing between the product chambers improving the pump's structural integrity. All of these design enhancements work to minimize the generation of particulate matter as the pump operates.

Four models of FUTUR pumps are available for different applications:

- **FUTUR T:** Corrosion resistance and higher tensile strength for handling acids and caustics
- **FUTUR H:** For high-temperature applications involving acids and caustics
- **FUTUR E:** Abrasion-resistant for handling semiconductor polishing slurries and CMP
- **FUTUR S/SH:** Constructed of solid-block 316L stainless steel for use with solvent mixtures and strippers



Features and Benefits

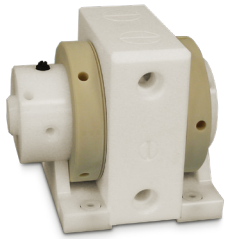
	E-SERIES	FUTUR SERIES
Compact and simple design with few parts and small footprint	✓	✓
Housing and diaphragms machined from solid blocks for long-life operation	✓	✓
Suitable for acids, alkalis and solvents	✓	✓
One-piece full PTFE diaphragms with optimized geometry		✓
All plastic models contain no metal (T, H, E)		✓
Contactless cascade sealing between the product chambers		✓
No O-ring sealing in wetted areas		✓
Straight-through flow pattern, only one wetted housing part		✓
No elements to fix, such as tie rods or clamps		✓
Assembled in a cleanroom line		✓
Temperature range up to 200°C/392°F (Futur H)	(120°C)	✓
PERSWING P® air control system requires no lubrication or maintenance	✓	✓
Separate pulsation damper available, can be retrofitted without dismantling of pump and piping	✓	✓
Self-priming	✓	✓
Available in ATEX version	✓	✓
Optional diaphragm and/or stroke sensors	✓	✓
Cylinder valves with surface sealing	✓	✓
Insensitive to changing temperatures	Expansion compensation (optional)	✓
Low noise level	✓	✓

Almatec® E Series | Technical Data



Pump Size		E 08	E 10	E 15	E 25	E 40	E 50
Dimensions, mm (in.):	length	88 (3.5)	110 (4.3)	166 (6.5)	220 (8.7)	304 (12.0)	399 (15.7)
	width	128 (5.0)	147 (5.8)	189 (7.4)	255 (10.0)	353 (13.9)	430 (16.9)
	height	129 (5.1)	169 (6.7)	240 (9.4)	320 (12.6)	432 (17.0)	552 (21.7)
Nominal port size Air connection	NPT	1/4"	3/8"	1/2"	1"	1 1/2"	2"
	BSP	R 1/8	R 1/8	R 1/4	R 1/4	R 1/2	R 1/2
Weight, kg (lb):	PE	-	-	7 (15)	15 (33)	34 (75)	66 (146)
	PTFE	2 (4)	5 (11)	12 (26)	29 (64)	69 (152)	131 (289)
Max. particle size of solids for pumps with ball valves	mm (in.)	2 (0.08)	3 (0.12)	4 (0.16)	6 (0.24)	9 (0.35)	11 (0.43)
Suction lift dry, mWC (ft):	cylinder valves ball valves	1 (3.3)	2 (6.6)	3 (9.8)	4 (13.1)	5 (16.4)	5 (16.4)
Suction lift dry, mWC (ft):		0,5 (1.6)	1 (3.3)	2 (6.6)	3 (9.8)	4 (13.1)	4 (13.1)
Suction lift wet, mWC (ft):		9 (29.5)	9 (29.5)	9,5 (31.2)	9,5 (31.2)	9,5 (31.2)	9,5 (31.2)
Max. driving and operating pressure	bar (psig)	7 (100)	7 (100)	7 (100)	7 (100)	7 (100)	7 (100)
Max. operating tempera- ture, °C (F):	PE	-	-	70 (158)	70 (158)	70 (158)	70 (158)
	PTFE	100 (212)	100 (212)	120 (248)	120 (248)	120 (248)	120 (248)

These technical data apply to ALMATEC E-Series standard pumps without optional equipment and dampers.



The FUTUR is currently available in four materials:

- Four sizes made of PTFE/PE for acids and caustics up to 130°C (266°F) (FUTUR T model)
- Two sizes made of PTFE for hot applications with acids and caustics up to 200°C (392°F) (FUTUR H model)
- Two sizes made of PE for slurries (FUTUR E models)
- Two sizes made of SS316L for solvents (FUTUR S and SH models)

Almatec® Futur Series | Technical Data

Pump Size		10	20	50	100
Dimensions for plastic pumps in mm (inch)	length	185 (7.3)	201 (7.9)	246 (9.7)	303 (11.9)
	width	114 (4.5)	150 (5.9)	200 (7.9)	260 (10.2)
	height	131 (5.2)	168 (6.6)	216 (8.5)	266 (10.5)
Dimensions for stainless-steel pumps in mm (inch)	length	—	199 (7.8)	245 (9.6)	—
	width	—	124 (4.9)	174 (6.9)	—
	height	—	154 (6.1)	196 (7.7)	—
Nominal port size (NPT) Air connection (NPT)*		3/8"	1/2"	1"	1 1/4"
		1/4"	1/4"	1/4"	1/4"
Suction head, dry in mWC (ft.)		1 (3.3)	2.5 (8.2)	3.5 (11.5)	4 (13.1)
Suction head, wet in mWC (ft.)		8 (26.2)	9 (29.5)	9 (29.5)	9 (29.5)
Max. permissible driving pressure bar (psig)		6 (87)	6 (87)	6 (87)	6 (87)

Max. permitted operating temperature

Pump Model	H	T	E	S	SH
at max. 6 bar (87 psig)	100°C 212°F	100°C 212°F	70°C 158°F	80°C 176°F	130°C 266°F
at max. 5 bar (73 psig)	130°C 266°F	110°C 230°F	70°C 158°F	80°C 176°F	130°C 266°F
at max. 4 bar (58 psig)	150°C 302°F	120°C 248°F	70°C 158°F	80°C 176°F	130°C 266°F
at max. 3 bar (44 psig)	180°C 356°F	130°C 266°F	70°C 158°F	80°C 176°F	130°C 266°F
at max. 2 bar (29 psig)	200°C 392°F	130°C 266°F	70°C 158°F	80°C 176°F	130°C 266°F

* Futur S/SH: BSP



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