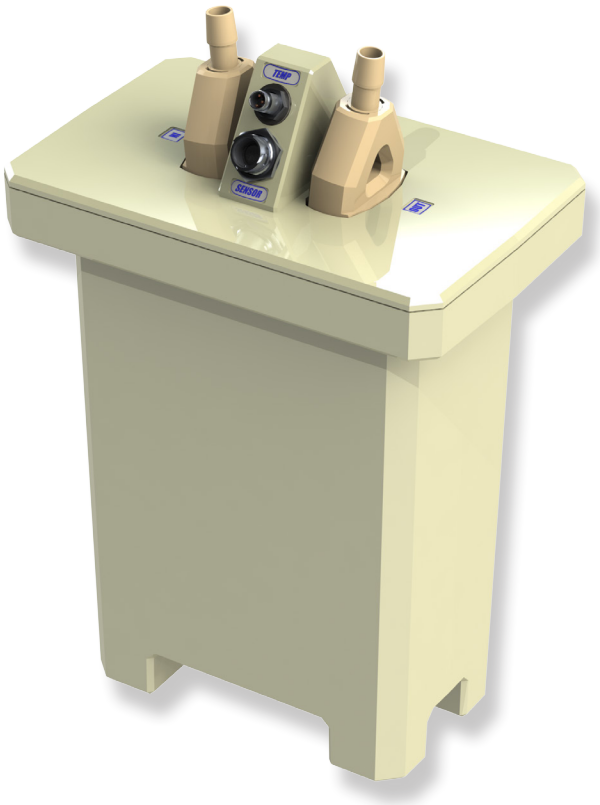


U.S. PATENT 8404076
U.S. PATENT 8887578
JAPANESE PATENT 5602884
OTHER PATENTS PENDING

SUMOflo®

SINGLE-USE CORIOLIS MASS FLOW METER

3/8" Barb Single-Use Sensor for 1,600 – 16,000 g/min

Description

The Malema Sensors® SumoFlo® CPFM-8100-063 series Single-Use Coriolis Mass Flow Meters are specifically designed for measuring liquids in bio-pharmaceutical and other applications that require all gamma-sterilizable wetted surfaces. The fluid contacting surfaces are made of unreinforced polyether ether ketone (PEEK) that meet USP Class VI, USP 661, and USP 788 standards.

The CE compliant SumoFlo® series Coriolis Mass Flow Meters include the single-use sensor assembly, supporting electronics, sensor mounting enclosure, and a graphical user interface (GUI). Optional temperature sensors provide feedback to the electronics that allow temperature compensation to ensure the mass flow accuracy regardless of temperature changes to the application fluid.

Key Features

- Accuracy: ±1% of mass flow rate reading; unaffected by flow regime or variations to the velocity profile
- Flow range 1600 – 16000 g/min*
- Fluid measurement performance is independent of fluid properties
- USP Class VI wetted materials
- PEEK sensor is gamma sterilizable to 50 kGy

*** Other flow ranges available. Please contact Malema for more information**

Measurement Principle

Fluid flows into the sensor consisting of two flow sensitive elements which are vibrated relative to one another – similar to the tines of a tuning fork. Fluid interacts with the sensor dynamically in such a way that the sensor's response is immune to the fluid's chemical and physical properties, flow regime, or variations in flow velocity profile. Fluid mass flow rate is determined by measuring the relative motion of the vibrating flow sensitive elements.

Applications

- Pure water or ultra high purity chemicals
- Chromatography
- Fluids with varying density or viscosity
- Depth Filtration
- Tangential Flow Filtration

Measurement Specifications

Model	**8100-063**
Accuracy	±1% of rate for 10% to 100% of full scale rated flow rate ±(1% of rate + Z.O.S) for < 10% of full scale rated flow rate
Temperature	Ambient: 0° – 50°C Fluid: 2° – 40°C
Operating Pressure	80 psig (max.)
Flow Range	**1,600 – 16,000 g/min**
Zero Offset Stability (Z.O.S.)	4 g/min

* Pressure drop at max. flow range = 10 psi in water (1 cP)

Material Specifications

Model	**8100-063**
Process Connections	3/8” barb connection *
Wetted Materials	Unreinforced PEEK (Polyether ether ketone), Polysulfone (for temperature sensor only), Stainless Steel (for temperature sensor only), Adhesive compliant with ISO 10993. All polymeric wetted materials are USP Class VI compliant.
Interconnecting Cable Length	Standard 3 m; Maximum up to 30 m
Ingress Rating For Connectors	IP65

*Consult the factory for other types of process connection options.

Electrical Specifications

Supply Voltage	24 VDC ±10%
Power Consumption	Max 6 W
Programming	Operator Parameter configuration through configuration port with a PC
Analog Output Module	4–20 mA configurable as Mass Flow Rate or Volumetric Flow Rate*
Digital Input/Output Module	Configurable as Frequency or Digital I/O
Frequency Output	0 to 10 kHz proportional to flow rate
Digital Output over MODBUS**	Mass Flow Rate, Volumetric Flow Rate*, Density*, Temperature***

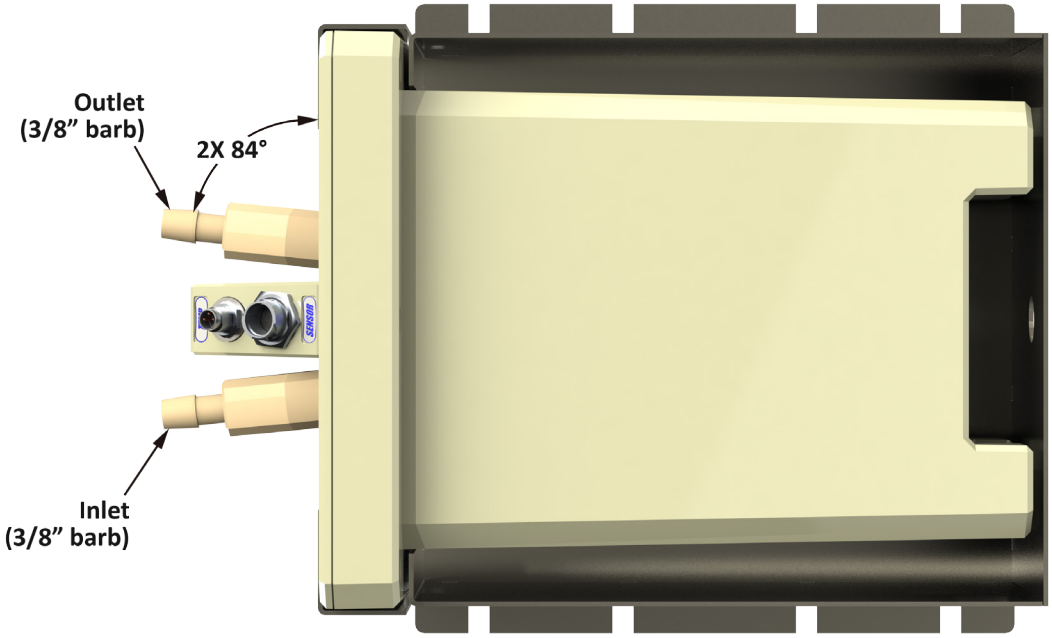
* In preparation
** Requires CELE-8100 model configured for MODBUS communications.
***Requires CELE-8100 and CSEN-8100 models configured for temperature compensation.

Certifications/Compliances

USP Class VI Material Certification	CE Compliance via the following testing: 1. EN61000-4-2: Electrostatic Discharge 2. EN61000-4-3: Radiated Immunity (and Radiated Emissions) 3. EN61000-4-4: Electrical Fast Transients 4. EN61000-4-5: Surge – Power Line 5. EN61000-4-6: Conducted Immunity
USP 661 for Containers/Plastics	
USP 788 for Containers/Plastics	
Directive 2011/65/EU (RoHS)	

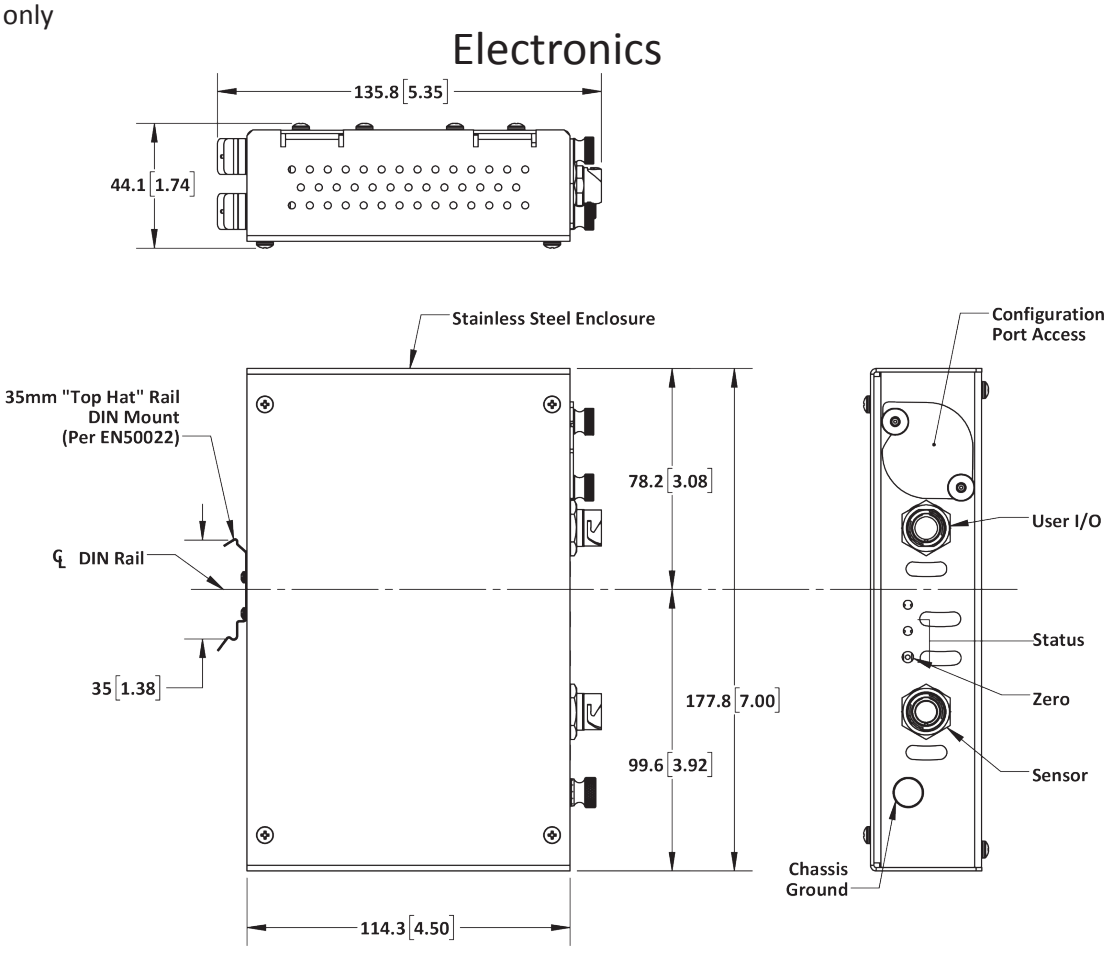
Mounting Orientation

The Malema Sensors® SumoFlo® series Coriolis mass flow meters can be mounted in any orientation. When the flow sensor is mounted horizontally — as shown below — the angled fluid inlet and outlet ports allow for self-draining in one direction.



Dimensional Drawings

For reference only



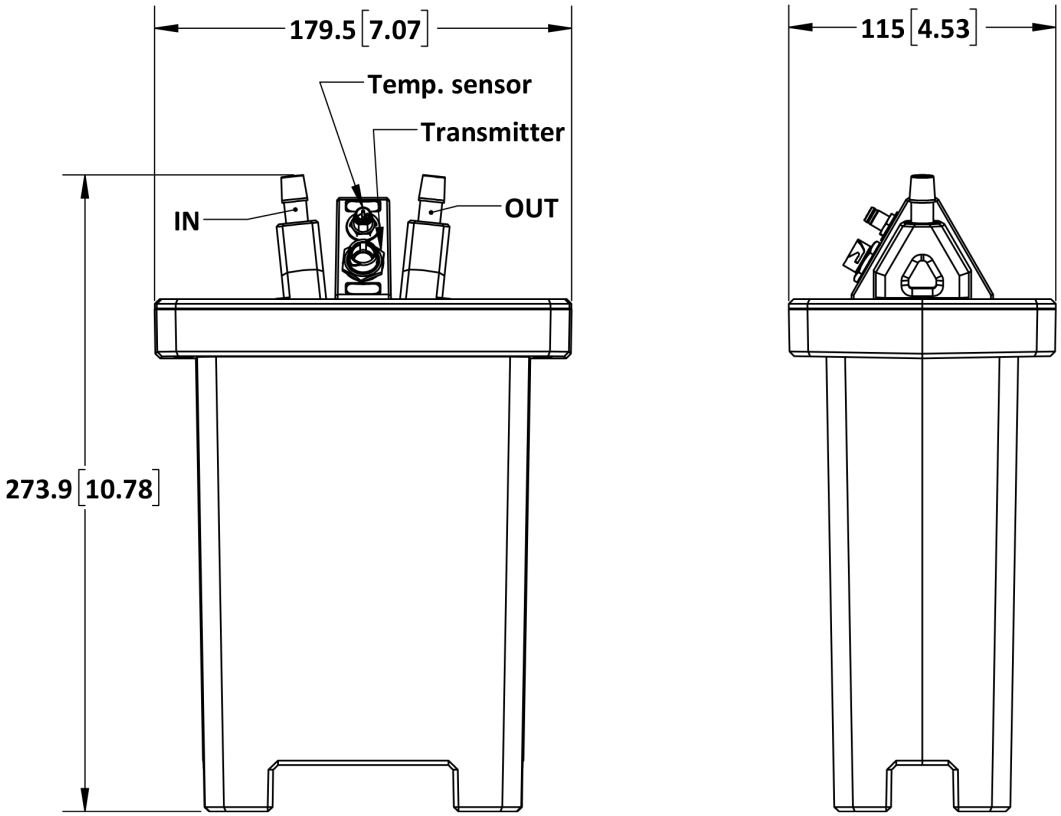
Dimensional Drawings

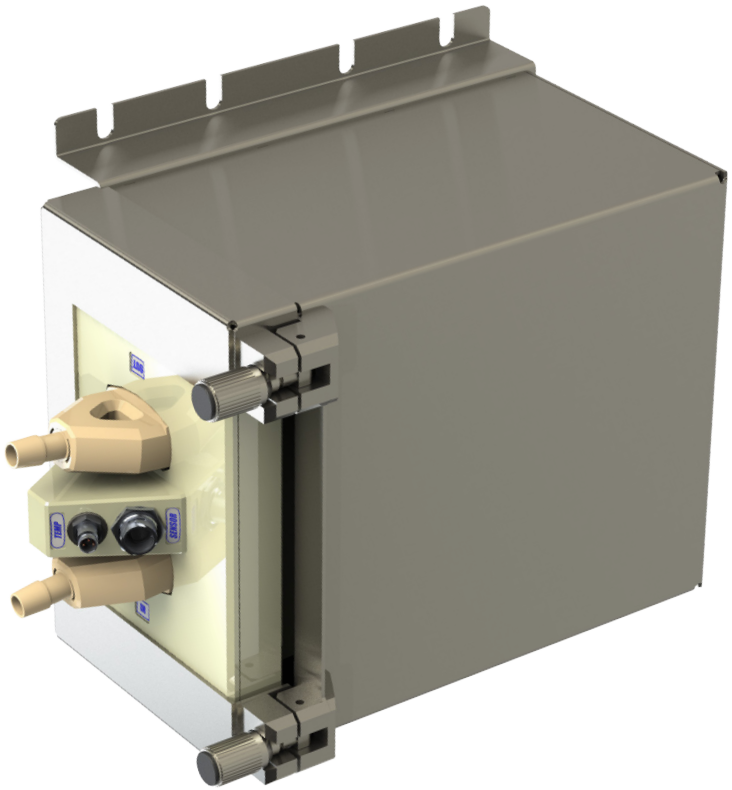
For reference only

Note: Mounting Cradle is required for CE compliance

Model 8100-063 Sensor (1600 – 16000 g/min, 3/8” barb)

Parallel Configuration





Pressure Drop in DI Water

Flow Rate	Pressure Drop
1600 g/min	0.10 psi (0.69 kPa)
3000 g/min	0.35 psi (2.42 kPa)
4000 g/min	0.63 psi (4.31 kPa)
6000 g/min	1.40 psi (9.70 kPa)
9000 g/min	3.16 psi (21.82 kPa)
12000 g/min	5.63 psi (38.78 kPa)
16000 g/min	10 psi (68.95 kPa)

Note: For DI water at 20°C; viscosity = 1 cP.

Ordering Information for Electronics

Model Ordering Code														Description
CELE-8100	-	*	-	*	*	*	*	*	X	X	X	-	***	Transmitter
Style		C												DIN Rail Mounting (Non Display Only; CE)
		Z												Custom (Consult Factory)
			-											
Temperature Compensation				N										Standard for Non-Temperature Comp Sensors
				T										Use with Temperature Comp Sensors
				Z										Custom (Consult Factory)
Output					1									4-20mA, 1x D/O
					2									4-20mA, 2x D/O
					3									4-20mA, 1x D/O, MODBUS (RS485)
					Z									Custom (Consult Factory)
I/O Cable						0								Standard I/O Cable
						Z								Custom (Consult Factory)
I/O Cable Length							A							3 m
							Z							Custom (Consult Factory)
Interconnecting Cable Length								A						3 m
								Z						Custom (Consult Factory)
									X					Reserved for Factory
										X				Reserved for Factory
											X			Reserved for Factory
												-		
													XXX	Unique PN Identifier

Ordering Information for Sensors

Model Ordering Code												Description
CSEN-8100	-	*	-	***	*	*	*	*	*	-	***	PEEK Sensor
Sensor Type		C										Cradle Mount CE Compliant Sensor
			-									
Range Code				063								1,600 – 16,000 g/min
Temperature Sensor					S							Without Temp. Comp.; Temp. Sensor Not Required
					W							With Temp. Comp.; External Temp. Sensor Required
					I							With Temp. Comp.; Integral Temp. Sensor
					Z							Custom (End User Specified)
Sterilization						0						No Sterilization
						1						Gamma Sterilized to 50 kGy
						Z						Other Requests (Consult Factory)
Connection							H					3/8” Hose Barb
							J					3/8” Hose Barb with tubing
							*					Other options available. Please consult factory.
Mounting Orientation								H				Horizontal *
								V				Vertical (flow ports pointing upwards)
								A				Angled 45° (flow ports pointing downwards)
									X			Reserved for Factory
										-		
											XXX	Unique PN Identifier

*** Factory recommended option**

Corporate Headquarters
1060 S Rogers Circle
Boca Raton, FL 33487
P: (561) 995-0595 F: (561) 995-0622

West Coast Headquarters
2329 Zanker Road
San Jose, CA 95131
P: (408) 970-3419 F: (408) 970-3426

Asia Pacific Headquarters
35 Marsiling Industrial Estate 3, Unit #02-06
Singapore 739257
P: (65) 6482-3533 F: (65) 6484-4231