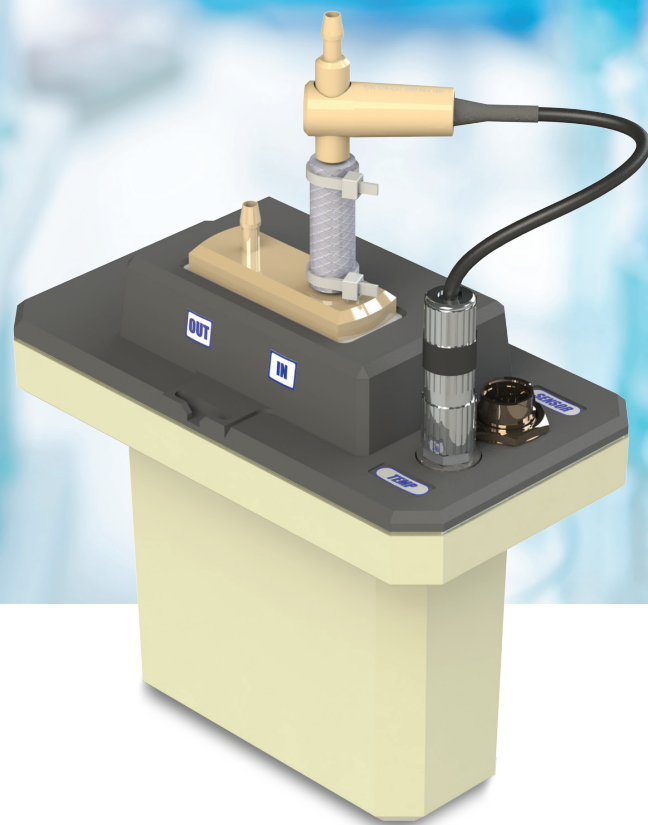


SumoFlo CPFM-8103-U08

ULTRA-LOW FLOW SINGLE-USE CORIOLIS FLOW METER



Extremely low flow rates are achievable from 0.002 kg/min to 0.05 kg/min using the SumoFlo® CPFM 8103 Series Ultra Low Single-Use Coriolis Mass Flow Meter. It has been specially designed for measuring liquids in high-purity bio-pharmaceutical and other applications that require all gamma-sterilizable wetted surfaces. Due to patented Coriolis technology, mass flow rate readings are unaffected by flow regime or variations to the velocity profile, allowing for accurate measurements of bubbly or frothy fluids.

The fluid contacting surfaces of the SumoFlo Ultra Low Flow Coriolis Flow Meter are made of unreinforced PEEK (Polyether ether ketone) that meet USP Class VI, USP 661, and USP 788 standards and is available in a disposable, quick and easy to replenish unit for single-use applications.

FEATURES

- Accuracy: $\pm 1.5\%$ of mass flow reading, or ± 0.3 g/min, whichever is higher, unaffected by flow regime or variations to the velocity profile
- Fluid measurement performance is independent of fluid properties; eliminating the need to calibrate on different fluids
- USP Class VI wetted materials
- Meets UPS 661.2 and USP 788.1 specification
- PEEK sensor is gamma irradiatable to 40 kGy
- Measurement to 2 g/min
- CE marketing certified version available
- Custom sensor mounting cradle available
- Transmitter with integral display options available

* Other flow ranges available. Please consult PSG Biotech for more information

U.S. PATENTS 8404076 & 8887578 & 9677921. JAPANESE PATENT 5602884.
CHINESE PATENT ZL 201480046308.8. TAIWANESE PATENT I657231.
EUROPEAN UNION PATENT 3036083. OTHER PATENTS PENDING
See www.psgdover.com/biotech for latest information

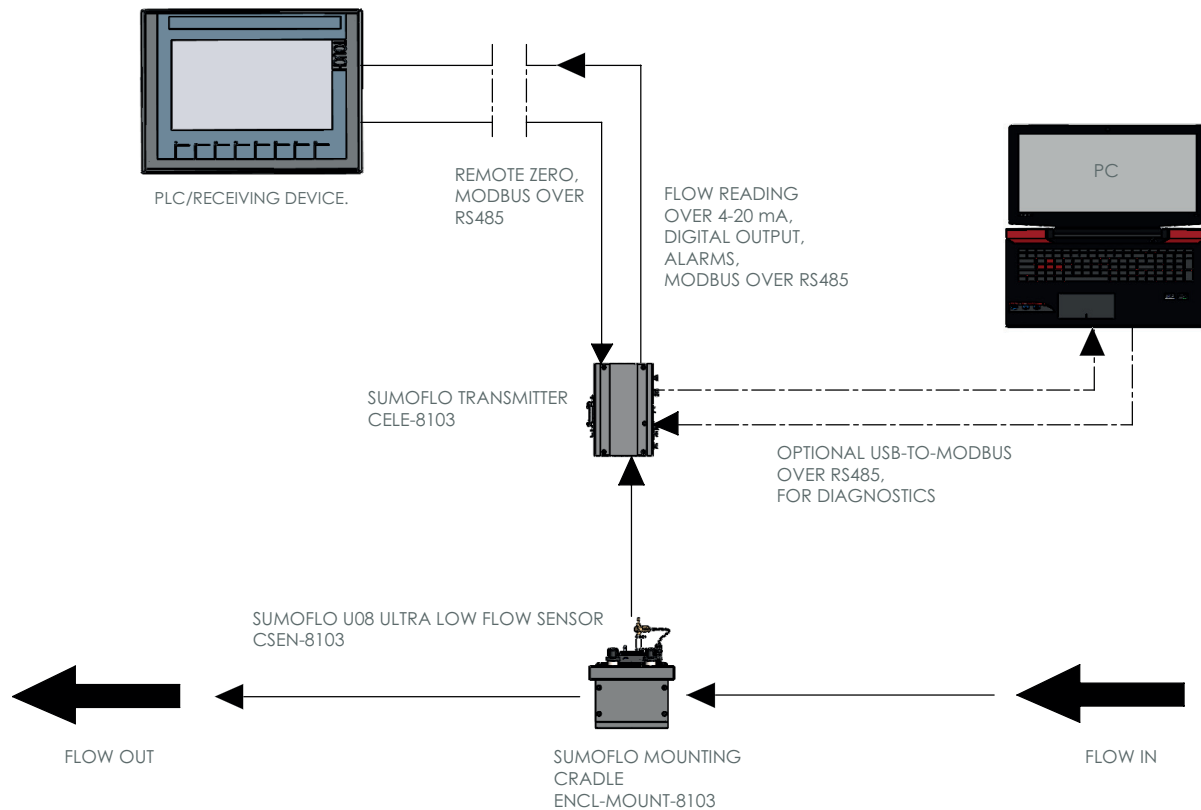
MEASUREMENT PRINCIPLE

Fluid flows into the sensor consisting of one flow sensitive element which is vibrated relative to stationary position detectors – 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 motion of the vibrating flow sensitive element.

APPLICATIONS

- Chromatography
- Fluids with Varying Density or Viscosity
- Depth Filtration
- Tangential Flow Filtration
- Pure Water or Ultra High Purity Chemicals

TYPICAL BLOCK DIAGRAM



An Ultra-Low Flow SumoFlo CPFM-8103-Series Coriolis Flow Meter consists of three components: the single-use Coriolis flow sensor, the durable transmitter, and the sturdy mounting cradle, as well as cables to connect the transmitter to the sensor and the transmitter to the system control device. When properly installed in the mounting cradle, the SumoFlo Flow Meter meets CE specifications.

Optional components include a stand to mount the cradle for stand alone installation, an RS485-to-USB connector, and a Windows 10 Pro laptop computer running the PSG Biotech Coriolis GUI. Stand-alone remote displays for instantaneous flow rate and/or totalized flow are also available. Contact PSG Biotech for additional information.

Sensor Style	Description	Electrical Connections	Fluid Connections
C	Cradle-Mount Sensor	Top (same side as fluid connections)	Vertical

MEASUREMENT SPECIFICATIONS

Model	8103-U08
Flow Range	2 – 50 g/min
Accuracy	±1.5% of reading or ±0.3 g/min, whichever is higher
Temperature	Ambient: 0°– 50°C Fluid: 2°– 40°C
Operating Pressure	30 psig (max.) (80 psig max upon request)

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

MATERIAL SPECIFICATIONS

Process Connections	1/8" barb connection*
Wetted Materials	Unreinforced PEEK (Polyether ether ketone), Adhesive compliant with ISO 10993, 316L stainless steel. 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 V DC ±10%
Power Consumption	Max 6 W
Programming	Operator Parameter configuration through configuration port with a PC
Analog Output Module	1x 4–20 mA, 2x 4–20 mA, 3x 4–20 mA, or 4x 4–20 mA; configurable as Mass Flow Rate, Temperature
Digital Input/Output Module	0x D/O, 1x D/O, or 2x D/O; Configurable as Frequency or Digital I/O
Frequency Output	0 to 10 kHz proportional to flow rate
Digital Output over MODBUS*	Mass Flow Rate, Temperature

* Requires CELE-8103 model configured for MODBUS communications.

CERTIFICATIONS/COMPLIANCES

USP Class VI Material Certification	CE Compliance via the following testing:
USP 661.2 for Containers/Plastics	1. EN61000-4-2: Electrostatic Discharge
USP 788.1 for Containers/Plastics	2. EN61000-4-3: Radiated Immunity (and Radiated Emissions)
Directive 2011/65/EU (RoHS)	3. EN61000-4-4: Electrical Fast Transients
	4. EN61000-4-5: Surge – Power Line
	5. EN61000-4-6: Conducted Immunity

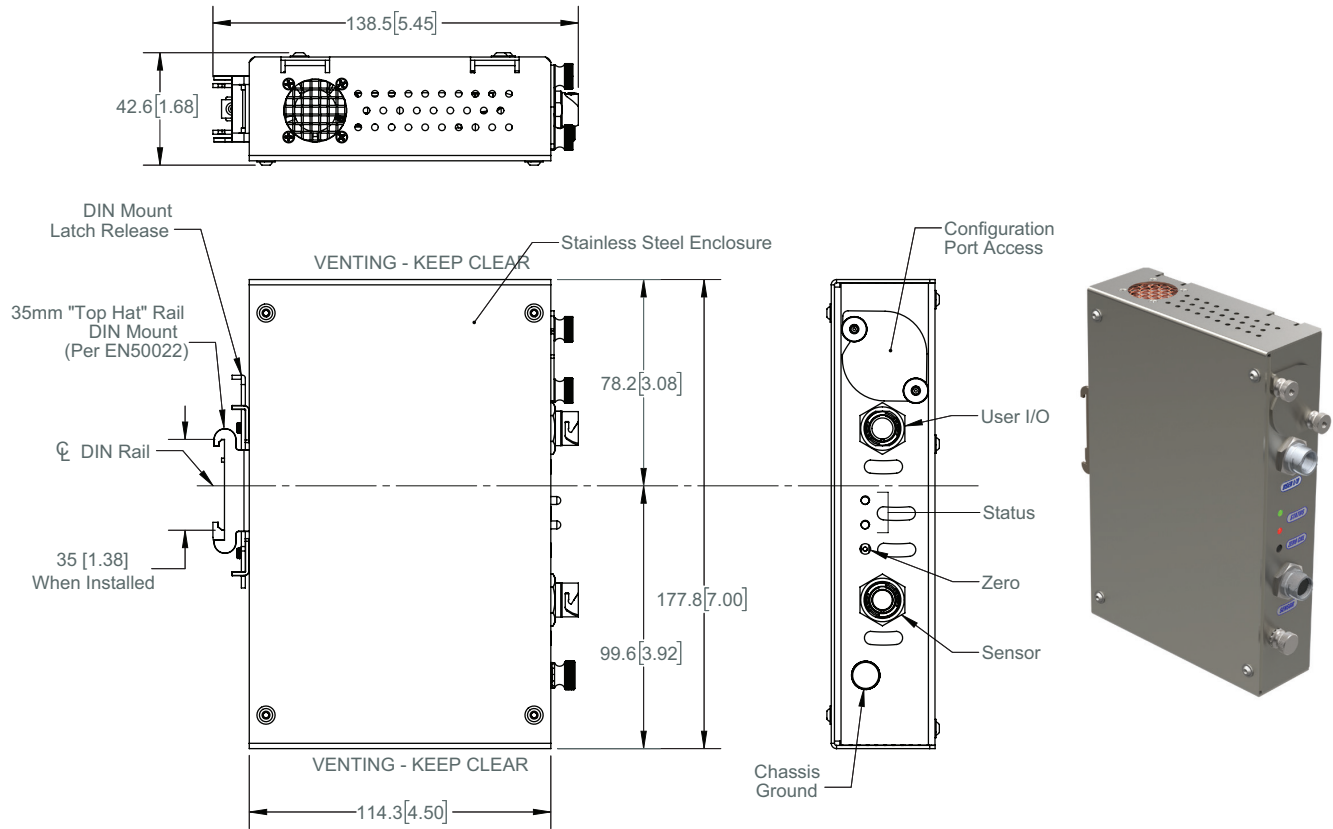
MOUNTING ORIENTATION

The PSG Biotech SumoFlo Series Coriolis Mass Flow Meters with range codes U08 should be mounted in a vertical orientation ONLY, with the fluid connections pointing up (see installation drawings). Mounting of the flow sensor in a stainless steel enclosure is required for CE compliance.

DIMENSIONAL DRAWINGS

For reference only

ELECTRONICS



DISPLAY

Three Display options available for the SumoFlo Sensor. These include a panel mounted transmitter in a 1/2 DIN cutout with a 4-line display, a Tabletop mounted in a NEMA 4X Stainless Steel enclosure, and a Tabletop transmitter and display with an integrated SumoFlo sensor cradle.



Panel mounted transmitter in a 1/2 DIN cutout with a 4-line display



Tabletop mounted in a NEMA 4X Stainless Steel enclosure



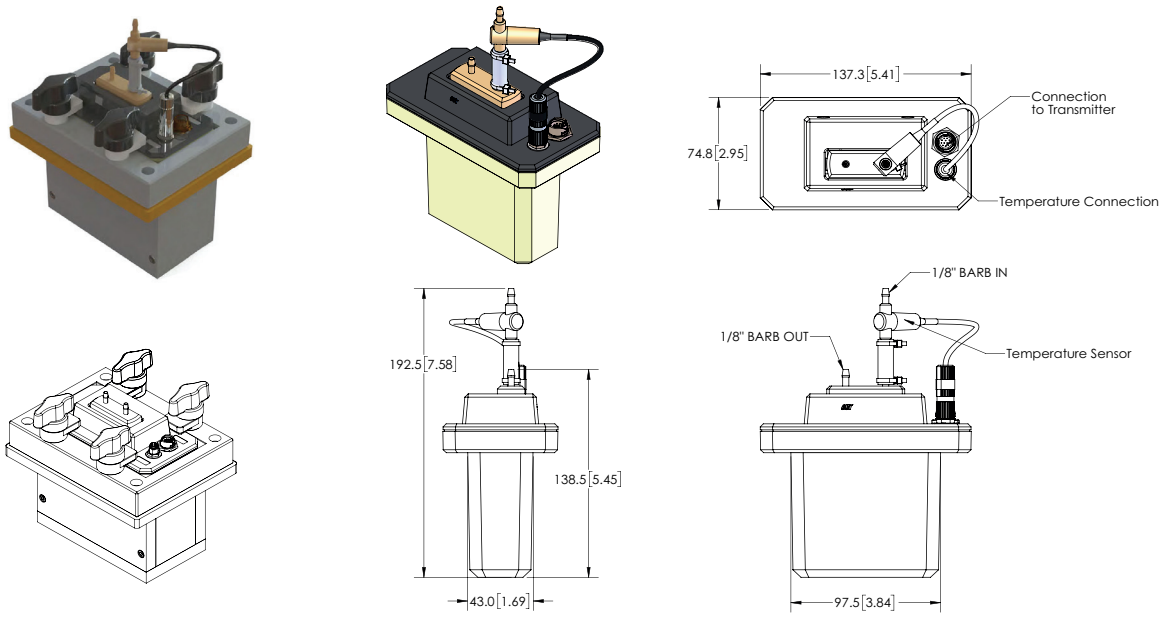
Tabletop transmitter and display with an integrated SumoFlo sensor cradle

DIMENSIONAL DRAWINGS

For reference only

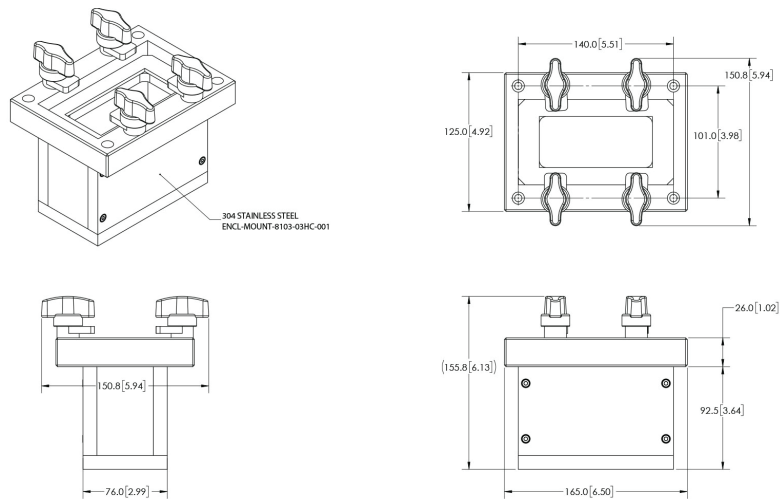
Note: Mounting Cradle is required for CE compliance

MODEL CSEN-8103-C-U08 SENSOR (2 – 50 g/MIN, 1/8" BARB)



ENCL-MOUNT-8103-03HC-XXX

Heavy Cradle for 1/8" Sensors



HOLD-UP VOLUMES AND PRESSURE DROP IN WATER

Model CSEN-8103-C-U08	
Flow Rate	Pressure Drop
5 g/min	0.025 psi
10 g/min	0.10 psi (0.69 kPa)
33.8 g/min	1.60 psi (4.90 kPa)
45.25 g/min	2.40 psi (19.61 kPa)

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

ORDERING INFORMATION – SENSOR

Model Ordering Code											Description	
CELE-8103	-	*	-	***	*	*	*	*	*	-	***	PEEK Sensor
Sensor Type	C											CE Compliant Sensor
	-											
Range Code	U08											2 – 50 g/min
Temperature Sensor	W											External Temperature Sensor
Sterilization	0											No Sterilization
	1											Gamma Irradiated to 40 kGy
	2											Other Requests (Consult Factory)
Fluid Connections	A											1/8" Hose Barb
	B											1/8" Hose Barb with Tubing
	*											Other Options Available. Please Consult Factory
Mounting Orientation	V											Vertical (flow ports pointing upwards)*
Calibrations and Outputs	1											Calibrated for Mass Flow Rate Only
Firmware	D											Compatible with Versions 3.3.5R, 3.3.6R, 3.3.7R
	XXX											Unique PN Identifier

* Factory recommended option

ORDERING INFORMATION – MOUNTING CRADLES

Model Ordering Code					Description
ENCL-MOUNT-8103	-	***	-	***	Mounting Cradle
Size	U08				For use with Sensor Range Code U08
	-				
	XXX				Unique PN Identifier

ORDERING INFORMATION – ELECTRONICS

Model Ordering Code													Description						
CELE-8103	-	*	-	*	*	*	*	*	X	X	X	-	***	Transmitter					
		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											1x 4–20mA, 1x D/O					
			2											1x 4–20mA, 2x D/O					
			3											1x 4–20mA, 1x D/O, MODBUS (RS485)					
			8											2x 4–20 mA, 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)					
Measurement									X					For Use with Sensors Calibrated for Mass Flow Rate Only					
										X					Reserved for Factory				
											X					Reserved for Factory			
Firmware												D					Compatible with Versions 3.3.5R, 3.3.6R, 3.3.7R		
													XXX					Unique PN Identifier	

CELE-8103 C AND D ELECTRICAL SPECIFICATIONS

Supply Voltage	24 V DC
Power Consumption	CELE-8103-C: Max 6W. CELE-8103-D: Max 7.5 W
Programming	Operator Parameter configuration through configuration port with a PC
Analog Output Module	1x 4–20 mA, 2x 4–20 mA, 3x 4–20 mA, or 4x 4–20 mA; configurable as Mass Flow Rate, Temperature
Digital Input/Output Module	0x D/O, 1x D/O, or 2x D/O; 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***, Rezeroing, Totalizer Reset; via MODBUS RTU/ASCII over RS485

* Requires CELE-8103 model configured for MODBUS communications.

** Requires CELE-8103 and CSEN-8103 models configured for density measurement.

*** Requires CELE-8103 and CSEN-8103 models configured for temperature compensation.

CELE-8103 B AND I ELECTRICAL SPECIFICATIONS

Supply Voltage	100 - 240 V AC, 50/60 Hz
Power Consumption	Max 15 W
Programming	Graphical user interface on Windows 10 PC through USB port for operation programming and reporting
Analog Output Module	1x 4–20 mA or 2x 4–20 mA
Digital Input/Output Module	1x D/O or 2x D/O; Configurable as Frequency or Digital I/O; 1 D/I for sensor zeroing
Frequency Output	0 to 10 kHz proportional to flow rate
Digital Output over MODBUS*	Mass Flow Rate, Volumetric Flow Rate*, Density*, Temperature**, Rezeroing, Totalizer Reset; via MODBUS RTU/ASCII over RS485

* Requires CELE-8103 and CSEN-8103 models configured for density measurement.

** Requires CELE-8103 and CSEN-8103 models configured for temperature compensation.

ORDERING INFORMATION - ELECTRONICS WITH DISPLAY

Model Ordering Code						Description										
CELE	-	Series Code	-	Mounting	-	Temperature Compensation	Output	I/O Cable	I/O Cable Length	Interconnecting Sensor Cable Length	Density	Power Cable and Plug	Reserved	Reserved	Unique ID	
CELE	-	8103	-	D												To be Used With CSEN-8103
				B												1/2 DIN Cutout Panel Mount with 4-line Display
				I												1/2 DIN Cutout with 4-line Display mounted in NEMA 4X Stainless Steel Enclosure
				Z												1/2 DIN Cutout with 4-line Display mounted in NEMA 4X Stainless Steel Enclosure with integral sensor Cradle ENCL-MOUNT-8103-03
					-	T										Custom (Consult Factory)
						Z										Use with Temperature Comp Sensors
							D									Custom (Consult Factory)
								3								4x 4-20mA, 2 D/O, MODBUS (RS485) 32-pin connector (CELE-8103-D only)
									8							1x 4-20mA, 1 D/O, MODBUS (RS485) 12-pin Hirose connector (CELE-8103-B and I only)
										Z						2x 4-20mA, 1 D/O, MODBUS (RS485) 12-pin Hirose connector (CELE-8103-B and I only)
																Custom (Consult Factory)
																No I/O Cable
																I/O cable included for Mounting version B and I
																Custom (Consult Factory)
																No I/O Cable Supplied
																3 m I/O cable with 90° connector on Transmitter side and Free leads on the other side
																Custom (Consult Factory); where Z = Length in m

ORDERING INFORMATION - ELECTRONICS WITH DISPLAY

Model Ordering Code							Description								
CELE	-	Series Code	-	Mounting	-	Temperature Compensation	Output	I/O Cable	I/O Cable Length	Interconnecting Sensor Cable Length	Density	Power Cable and Plug	Reserved	Reserved	Unique ID
CELE															
										1					1 m Interconnecting cable with 90° connector at Transmitter end
										3					3 m Interconnecting cable with 90° connector at Transmitter end
										Z					Custom (Consult Factory); where Z = Length in m
											D				Density Measurement Enabled
											X				Density Not Enabled
												B			Type B NEMA 5-15 AC Power Cable (US), 6-ft length
												E			Type E/F Hybrid CEE 7/7 AC Power Cable (EU), 2m length
												G			Type G BS1363 AC Power Cable (UK), 2m length
												X			No Cable Provided
												-			For other options, please consult factory
													X		Reserved
														-X	Reserved
															S01 Standard Configuration
															XXX For Customized Options the Factory will assign a 3-digit ID instead of XXX
CELE	-	8103	-	D	-	T	D	0	0	0	D	X	X	-X	S01

Designed and Assembled in California, USA, from American and imported materials. This product is protected by U.S. and International patents.

For high flow ranges up to 100 kg/min SumoFlo sensors are also available in seven other models.

PBT-M-20001-F-01

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