

ReddyIndustrial™



Thermal Mass Flow Meters & Controllers
with a Water Resistant Housing for OEM's



Rock solid **repeatability** with a water resistant housing.

HIGHLIGHTS

- MEMS technology
- Multigas
- Accuracy:
 - +/- 0.3% of full scale
 - +/- 0.5% of reading
- IP67 / NEMA 6 Rating
- ATEX approvals
- Compact footprint
- No-drift sensor warranty
- Array of communication protocols
- NIST Calibration

Engineers in the biopharmaceuticals industry require precise control of the gases used in bioreactors. Sierra's RedyIndustrial thermal mass flow meter delivers optimized microbial growth that ensures exact mixing and distribution of the biomass.

Food and beverage manufacturers can expect the same precision. In fact, the RedyIndustrial provides all of the proven features of Sierra's RedySmart with the addition of a water-resistant housing that allows you to hose it down.

The economical RedyIndustrial meters and controllers contain no moving parts and are unaffected by upstream temperature and pressure fluctuations. The resulting accuracy and repeatability make them the ultimate MFC for OEM applications.



Benefit from a compact footprint, IP67 and ATEX approvals, and a wide array of communications protocols.

No one makes YOU Smarter

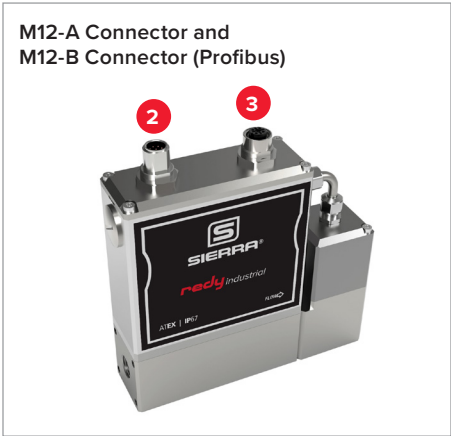
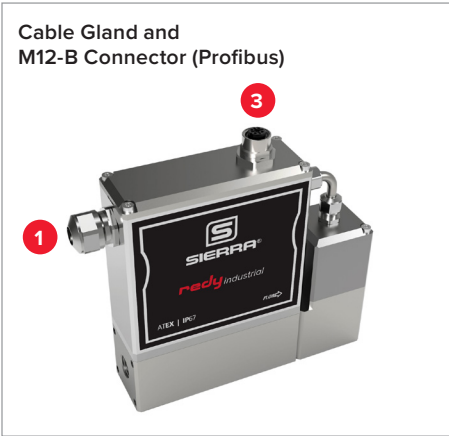
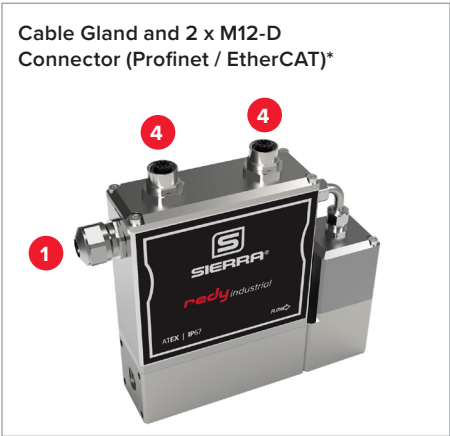
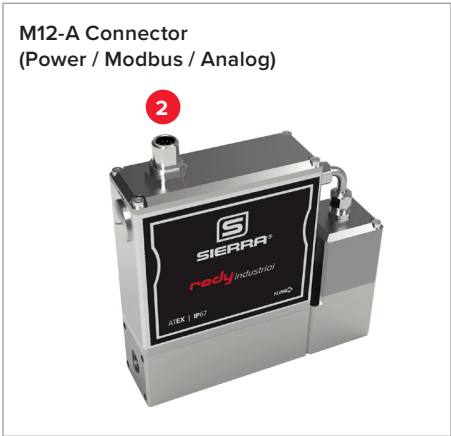
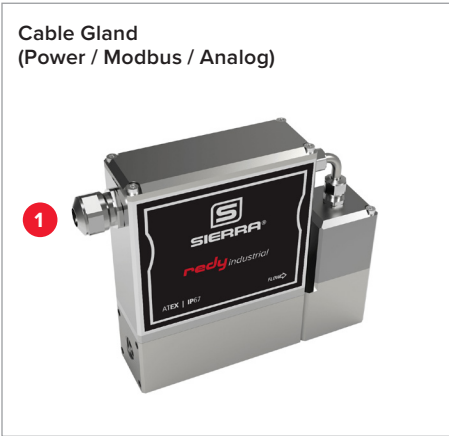
RedyIndustrial's Lifetime No-Drift Sensor Warranty employs high-precision MEMS (Micro-Electro-Mechanical Systems)

technology. It utilizes an advanced, ultra-stable no-drift CMOS (Complementary Metal Oxide Semiconductor) sensor.

MEMS techniques allow both electronic circuits and mechanical devices to be manufactured on a silicon chip, similar to the process used for integrated circuits.



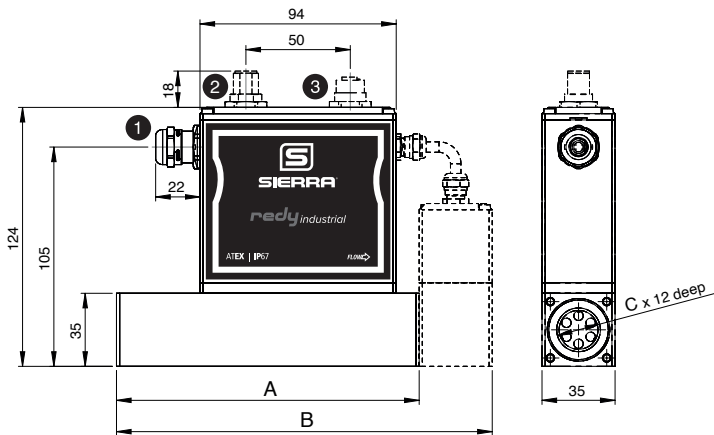
Available Connections RedyIndustrial Series



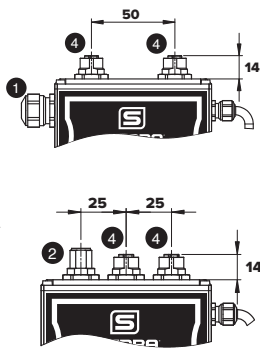
Electrical Connection	
1	Cable gland / cable diameter 6-8mm
2	M12 connector A-Coding 8pol male
3	M12 connector B-Coding 5pol female
4	M12 connector D-Coding 4pol female

*IP-67 only / Profinet RT & EtherCAT option not yet ATEX certified. Please contact your sales partner for further information.

Dimensions RedyIndustrial Series



Profinet / EtherCAT:



	Length (mm)		Process Connection
Type	A	B	C
GIM-A GIM-B GIM-C	94	-	G1/4"
GIM-D	145	-	G1/2"
GIC-A GIC-B GIC-C	-	134	G1/4"
GIC-D	-	198	G1/2"

TECHNICAL DATA

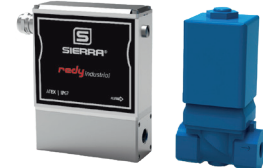
INSTRUMENT TYPES



Industrial Meter GIM
Thermal Mass Flow Meter



Industrial Controller GIC
Thermal Mass Controller



Industrial Controller GIE
Thermal Mass Controller with External Valve

ACCURACY

«Standard»

The economic solution

Accuracy: $\pm 1.0\%$ of full scale(1)
Turndown ratio: 1 : 50

«High Accuracy»

With highest accuracy and turndown ratio
(available for GIM < 200 l/min / GIC < 150 l/min (air))

Accuracy: $\pm 0.3\%$ of full scale + $\pm 0.5\%$ of reading(1)
Turndown ratio: 1 : 100
¹An additional error of $\pm 0.25\%$ may apply for analogue signals

MEASURING RANGES

(Air/Full Scale Freely Selectable)	Type	Measuring Range (Air)		Process Connection
RedyIndustrial Meter GIM	GIM-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G $\frac{1}{4}$ "
	GIM-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G $\frac{1}{4}$ "
	GIM-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G $\frac{1}{4}$ "
	GIM-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G $\frac{1}{2}$ "
RedyIndustrial Controller GIC	GIM-A	from 0 ... 25 ml/min	to 0 ... 600 ml/min	G $\frac{1}{4}$ "
	GIM-B	from 0 ... 600 ml/min	to 0 ... 6000 ml/min	G $\frac{1}{4}$ "
	GIM-C	from 0 ... 6 l/min	to 0 ... 60 l/min	G $\frac{1}{4}$ "
	GIM-D	from 0 ... 60 l/min	to 0 ... 450 l/min	G $\frac{1}{2}$ "

PERFORMANCE DATA

Gases (real gas calibration)	Air, O ₂ ⁽²⁾ , N ₂ ⁽²⁾ , He, Ar, CO ₂ , H ₂ , CH ₄ , C ₃ H ₈ (other gases and gas mixtures on request) ²O ₂ & N ₂ are calibrated with Air
Response Time	Meter (GIM): $\pm 80\text{ms}$ (3); Controller (GIC): $\pm 500\text{ms}$ (3) 3depending on device configuration & according to SEMI standard E17-1011, 5-100% of range under optimized conditions
Repeatability	$\pm 0.2\%$ of full scale (according to SEMI standard E56-0309)
Longterm Stability	< 1% of measured value / year
Power Supply	24 Vdc (18 – 30 Vdc), 15 Vdc on request
Current Consumption Standard	Meter (GIM): max. 100mA; Controller (GIC): max. 250mA (GIC with valve type 8 max. 490mA)
Current Consumption Profinet RT / EtherCAT	Meter (GIM): max. 100mA; Controller (GIC): max. 340mA (GIC with valve type 8 max. 560mA)
Operation Pressure	0.2 – 11 bar a (GIC with valve type 4.5 and 8 max. 8 bar a)
Temperature (Environment/Gas)	0 – 50°C
Pressure Sensitivity	Less than 0.2% RD per bar (typical N ₂)
Temperature Sensitivity	Less than 0.025% FS per °C (typical N ₂)
Warm-up Time	< 1 sec. for full accuracy

MATERIALS

Body	Stainless steel 316L (see operating instructions for wetted parts)
Electronic Housing	Aluminum
Seals	EPDM (FDA), optional FKM and FFKM

INTEGRATION

In- / Output Signals Analog	0..20 mA, 4..20 mA, 0..5 V, 1..5 V, 0..10 V, 2..10 V
In- / Output Signals Digital	RS-485; Modbus RTU 2 wire (Slave); Lab View-VIs available Option: Profibus DP-V0, DP-V1 / Profinet RT / EtherCAT
Process Connection	G $\frac{1}{4}$ " (BSPP(4) female) up to 60 l/min, G $\frac{1}{2}$ " (BSPP(4) female) up to 450 l/min 4British Standard Pipe Parallel
Inlet Section	None required
Electrical Connection	Cable gland with compression fitting M16x1.5 / Option: M12 plug (DIN-standard) (both connection IP67 protected)
Mounting Orientation	All orientations are possible. We recommend horizontal mounting. Please contact the manufacturer for further information.

SAFETY

Test pressure	16 bara
Leak rate	< 1 x 10 ⁻⁶ mbar l/s He
Ingress Protection Class	IP67 (conforms to NEMA 6)
EMC	CE EN 61326-1
ATEX Certification⁽⁵⁾	Ex II 3G nA IIC T4 Gc (Category 3 / Zone 2) Ex II 3D Ex tc IIIC T100°C Dc (Category 3 / Zone 22)

⁵ Profinet RT & EtherCAT option not yet ATEX certified. Please contact your sales partner for further information.

RedyIndustrial Series

Instrument Type	RedyIndustrial Series (Gas)									
Function	Meter	G	I							M
	Controller									C
	Controller with External Valve									E
Full Scale of Measuring Range (Air) Defined By Manufacturer	Customer-specific (Divider A, up to 600 mln/min)								A	X
	Customer-specific (Divider B, up to 6000 mln/min)								B	X
	Customer-specific (Divider C, up to 60 lln/min)								C	X
	Customer-specific (Divider D, up to 450 lln/min)								D	X
Instruments Version	Standard (±1.0% full scale, 1 : 50)									S
	Hi-Performance (±0.3% full scale, ±0.5% reading, 1 : 100)									T
	Customer-specific / OEM									K
Connection / Materials (body, seals)	Cable Gland / Stainless Steel / EPDM (FDA)**									S
	M12 plug / Stainless steel / EPDM (FDA)									T
	Cable gland / Stainless steel / FKM									U
	M12 plug / Stainless steel / FKM									V
	Customer-specific / OEM									K
Analog Signals (output)	Current 4..20 mA**									B
	Current 0..20 mA									C
	Voltage 0..5 V									D
	Voltage 1..5 V									E
	Voltage 0..10 V									F
	Voltage 2..10 V G									G
	Customer-specific / OEM									K
Analog Signals (input)	Current 4..20 mA**									B
	Current 0..20 mA									C
	Voltage 0..5 V									D
	Voltage 1..5 V									E
	Voltage 0..10 V									F
	Voltage 2..10 V G									G
	Not Defined									N
	Customer-specific / OEM									K
Control Valve (integrated) Defined by Manufacturer	Type 0.1									2 1
	Type 0.2									2 2
	Type 0.5									2 3
	Type 1.2									2 6
	Type 4.5									1 2
	Type 8.0									1 3
	Valve Mounted									9 5
	Customer-specific / OEM									9 9
	No valve									0 0
Type Code		G	I			-				-

**standard



sierrainstruments.com

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