CHIPREG MFC
Mass Flow Controller

- Ultra compact size < 22mm
- High turndown ratio
- Best performance-to-cost ratio
- Fast time-to-market through complete sub-assemblies
- Analytical clean version available
- No drift, no recalibration required
- For bioreactors, analytical, medical devices and process control applications

Technical features

Sensor:
Thermal MEMS sensor

Flow ranges:
0-0,2 l_s/min
0-0,5 l_s/min
0-1 l_s/min
0-2 l_s/min
0-5 l_s/min
0-10 l_s/min
0-20 l_s/min
Higher and lower flows on request

Operating gas:
Air, N_2, O_2, CO_2, Ar, neutral gas

Accuracy*:
± 0,2% of full scale (0-10% of max flow)
± 2,0% of reading (10%-100% of max flow)

Dynamic range:
Standard: 500:1
Premium: 1000:1 (for 0-200 ml_s/min only)

Response time:
As fast as 100 ms
No warm-up time

Thermal sensitivity:
± 0,004% of full scale per °C (0-10% of max flow)
± 0,04% of reading per °C (10-100% of max flow)

Operating pressure:
Vaccuum - 8 barg (details provided in 'Standard Models' below)

Repeatability:
< 1% of reading

Operating voltage:
24 V d.c. ± 10%

Current supply:
< 100 mA

Electrical connection:
JST Connector BM06B-GHS-TBT

In & output signals:
Analog 0 ... 5 V d.c. & RS485
Analog 0 ... 5 V d.c. & RS232

Digital communication protocol:
IMI FAS proprietary protocol & Modbus RTU

Weight:
125g

Pneumatic connections:
In line version (G1/8'')
Manifold mount

Seal material:
FPM

Gas temperature:
+10 ... +50°C (°50 ... +122°F)

Ambient temperature:
+10 ... +50°C (°50 ... +122°F)

Additional options:
USP class VI seals, stainless steel manifold for bioreactors

* Calibrated under standard conditions: 20°C, P=1 atm. Custom calibration conditions on demand. Accuracy does not include reference error.

File code: LS_DS_CHIPREG-MFC_en/12/25

Technical data – standard models

Flow range	Max. operating pressure	Port type	Digital Communication Interface	kv *1)	Model
(l_s/min)	(barg)				
0 ... 0,2	8	G 1/8	RS485	0,02	40M2002CJ2811 1110000
0 ... 0,5	8	G 1/8	RS485	0,02	40M5002CJ2811 1110000
0 ... 1	8	G 1/8	RS485	0,02	40M0011CJ2811 1110000
0 ... 2	5	G 1/8	RS485	0,12	40M0021CJ2811 1110000
0 ... 5	5	G 1/8	RS485	0,12	40M0051CJ2811 1110000
0 ... 10	5	G 1/8	RS485	0,12	40M0101CJ2811 1110000
0 ... 10	4	G 1/8	RS485	0,55	40M0101CJ2811 2110000 *2)
0 ... 20	4	G 1/8	RS485	0,55	40M0201CJ2811 2110000

*1) Cv = 0,07 kv
*2) This model enables higher flows at lower pressures than above.

Electrical connection (optional)

Electrical connector
JST GHR-06V-S
with 300 mm flying leads

S401.0024

Cable starter kit (optional)

USB to JST cable (incl. RS485 converter)
Power supply, universal input voltage and interchangeable AC blades for global use

S401.0305

Codification and option selector

40M★★★★C★★★11 ★★★★000

Flow range *3)	Substitute
0 ... 200 ml_s/min	2002
0 ... 500 ml_s/min	5002
0 ... 1 l_s/min	0011
0 ... 2 l_s/min	0021
0 ... 5 l_s/min	0051
0 ... 10 l_s/min	0101
0 ... 20 l_s/min	0201
Higher or lower flows on request	

Electric interface	Substitute
RS232 + IN 0 ... 5V + OUT 0 ... 5V	G
RS485 + IN 0 ... 5V + OUT 0 ... 5V	J

Mounting	Substitute
Manifold mount	1
Inline G1/8"	2

Media *4)	Substitute
Nitrogen (N_2), Oxygen (O_2), Air	8
On request:	
Carbon Dioxide (CO_2)	3
Argon (Ar)	5

*3) Flow range of the calibration gas
*4) See gas flow equivalency table below

Calibration gas	Substitute
Calibrated with air, k-factor for other gas	0
Calibrated with specific gas	1

Dynamic range	Substitute
Standard, 500:1	1
Premium, 1000:1	2

Cleanliness	Substitute
Standard	1
Analytical clean	2

Valve *5)	Substitute
Standard	1
Only for high flow models (kv of 0,55)	2

*5) Standard options are calibrated at 4 barg while high flow models (kv 0,55) are calibrated at 3 barg.
Inlet pressure sensitivity:
≈ -0,6% / bar reading (air)
≈ -1,3% / bar reading (CO_2)

Gas flow equivalency table – flow range

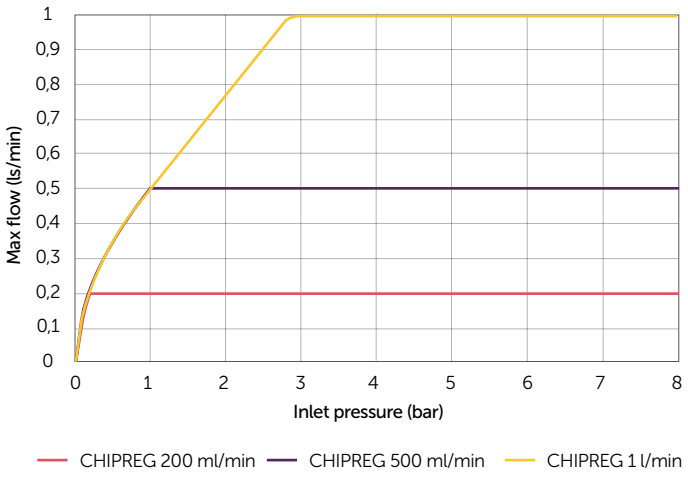
Media	Air / N_2 / O_2	CO_2	CO_2	Ar	Ar
Units	MFC calibrated with air	MFC calibrated with CO_2	MFC calibrated with air	MFC calibrated with Ar	MFC calibrated with air
(ml_s/min)	200	100	100	200	187
(ml_s/min)	500	250	236	450	446
(l_s/min)	1	0,5	0,532	1	0,892
(l_s/min)	2	1	0,97	2	1,78
(l_s/min)	5	2,5	2,43	5	4,46
(l_s/min)	10	5	4,93	8	8,06
(l_s/min)	20	10	9,72	15	15,9
Additional accuracy error when calibrated with air	0	0	± 8% of reading	0	± 8% of reading

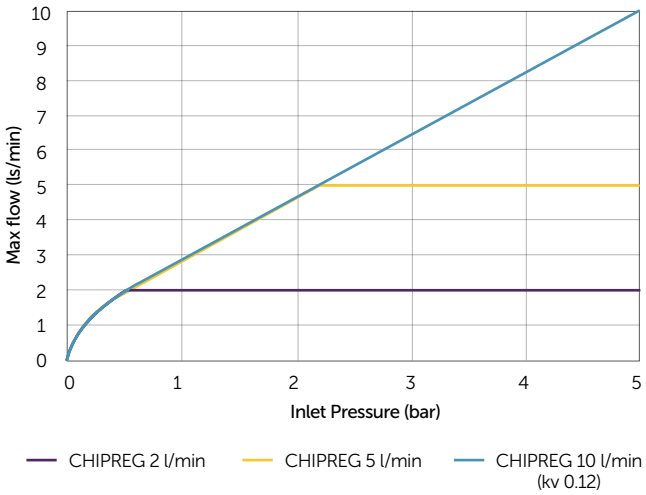
When switching from one gas to another in a single MFC, it is common practice to ensure the system is fully flushed with new gas before starting precise control.

Maximum Flow Rate

Flow rate may be limited by inlet pressure.
Please ensure your inlet pressure is high enough to achieve your desired maximum flow rate as per below curves.

Typical data for air at 20°C





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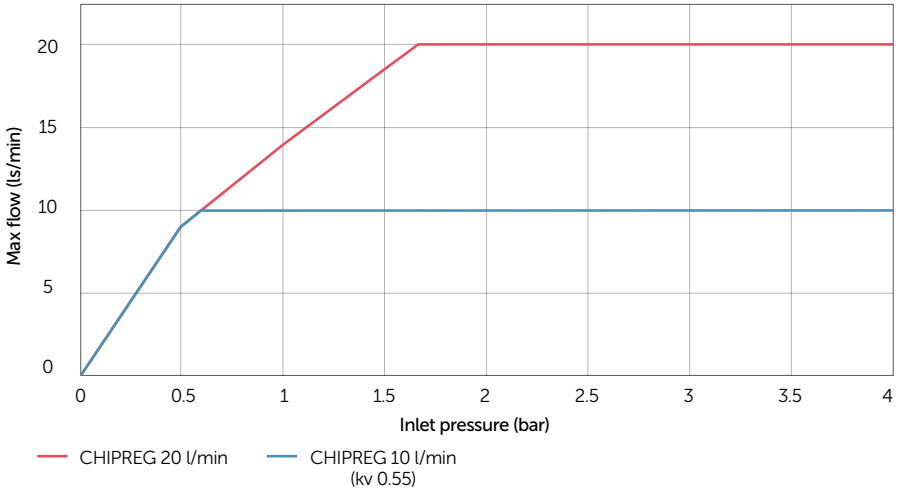
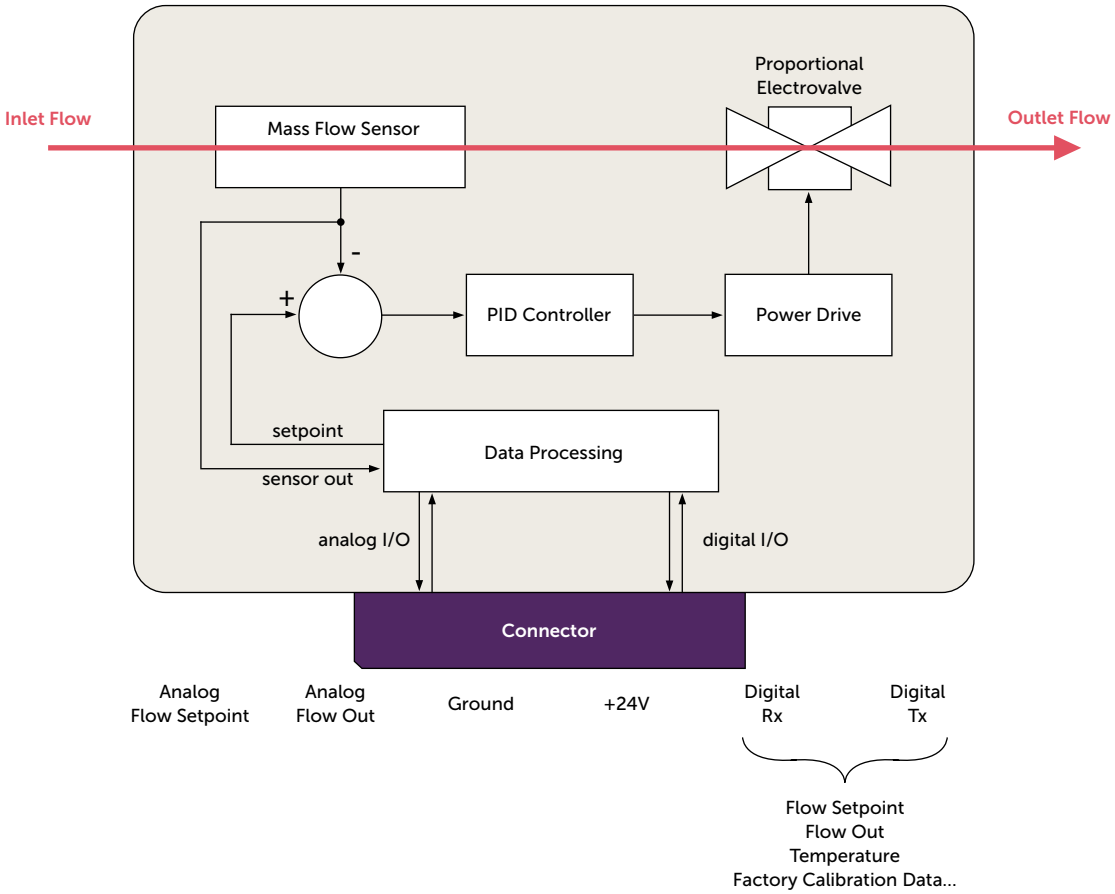


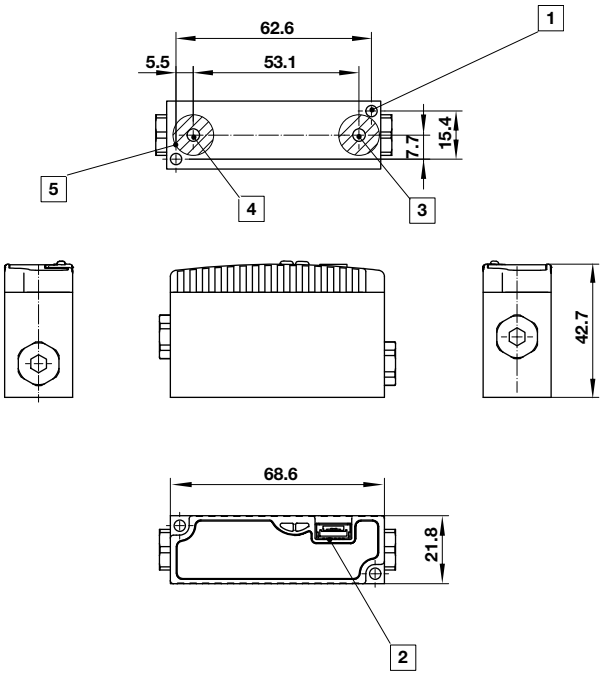
Block diagram



Dimensions

Manifold mount

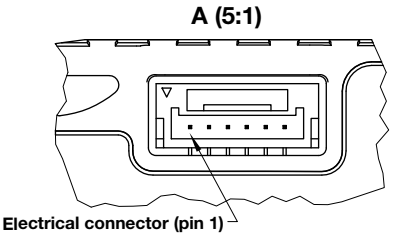
Dimensions in mm
Projection/first angle



1 ø 3,6 mm through hole (2x)
2 Connector JST BM06B-GHS-TBT (First pin on the left)
3 INLET ø 4 mm
4 OUTLET ø 4 mm
5 ø 13 (2x) sealing area /Ra 0,8

Electrical connection

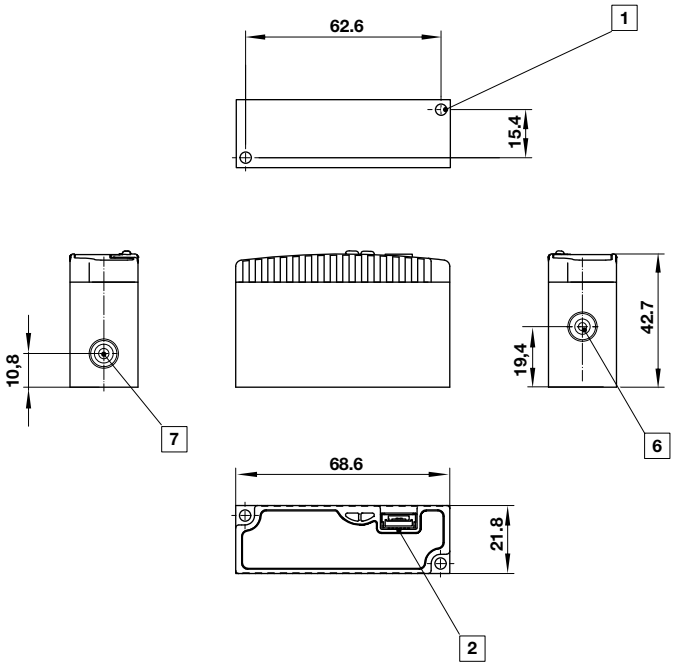
Pin#	Description (RS232)	Description (RS485)
1	+24V	+24V
2	Ground	Ground
3	Rx	A
4	Tx	B
5	Analog flow out	Analog flow out
6	Analog flow setpoint	Analog flow setpoint



Dimensions

Inline version (G1/8'')

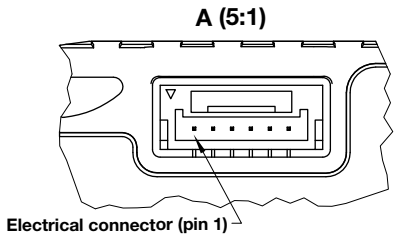
Dimensions in mm
Projection/first angle



1 ø 3,6 mm through hole (2x)
2 Connector JST BM06B-GHS-TBT (First pin on the left)
6 OUTLET G1/8'' Thread depth 9 mm
7 INLET G1/8'' Thread depth 9 mm

Electrical connection

Pin#	Description (RS232)	Description (RS485)
1	+24V	+24V
2	Ground	Ground
3	Rx	A
4	Tx	B
5	Analog flow out	Analog flow out
6	Analog flow setpoint	Analog flow setpoint



Warning

These products are intended for use with aggressive sensitive media, Please contact FAS MEDIC SA for more compatibility requests.
Do not use these products where pressures and temperatures can exceed those listed under **„Technical features/data"**. Before using these products with fluids other than those specified, for non-industrial applications, life-support systems or other applications not within published specifications, consult FAS MEDIC SA.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure. System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.