358 Series MCW mass flow controllers

Low-pressure-drop laminar mass flow controllers from 0.5 to 5 smL/min full scale

The MCW controller sets and measures gas mass flow and also reports volumetric flow, pressure, temperature and set point on its display. Pressure drop at full scale is 4.8 mbar. RS-232 and Modbus RTU are standard; analogue inputs and outputs and fieldbus interfaces are options.



5 smL/min	0.5–100 %	4.8 mbar	30 ms	98
Largest full scale; the smallest is 0.5 smL/min	Steady-state control range of full scale	Pressure drop at full scale	Typical control response (T63)	Stored gases, plus 20 user-defined mixes

Performance

Reference conditions	Standard 21.11 °C, normal 0 °C, at 1013.25 mbar; configurable
Accuracy [1]	±(0.8 % rd + 0.2 % FS)
High-accuracy option [1]	5 smL/min: ±(0.4 % rd + 0.2 % FS)
Repeatability (2σ)	±(0.2 % rd + 0.02 % FS)
Control range	0.5–100 % FS, steady state
Turndown ratio	200:1
Control response (T63), adjustable	Typically 30 ms
Indication response (T63), adjustable	As fast as 100 ms, flow rate dependent
Sensor response	< 1 ms
Warm-up time	Typically < 1 s
Temperature sensitivity	Zero and span 0.03 % FS/°C from 25 °C
Pressure sensitivity	Zero and span ±(0.08 % rd + 0.02 % FS)/atm from tare pressure
Pressure accuracy [1]	Above 1 atm: ±0.75 % rd Below 1 atm: ±6.9 mbar (±0.1 psia)
Temperature accuracy	±0.75 °C

Operating conditions

Operating pressure	0.79–4.1 bar a (11.5–60 psia)
Damage limits	Line: above 5.5 bar a (80 psia) Differential: above 690 mbar (10 psid)
Temperature	−10 to 60 °C, ambient and gas
Humidity	0–95 % non-condensing

Mechanical

Wetted materials	Stainless steel 302, 303, 304, 316L, 430FR; brass, FKM, alumina ceramic, glass, gold Glass-reinforced PPS, silicon, heat-cured epoxy and silicone rubber
Ingress protection	IP40
Orientation sensitivity	None
Valve	Normally closed
Mounting taps	2× 8-32 UNC, 4.45 mm deep

Electrical and communication

Analogue I/O	4–20 mA, 0–5 V DC, 1–5 V DC or 0–10 V DC; adds ±0.1 % FS uncertainty
Digital I/O	Standard: RS-232 and Modbus RTU Options: RS-485, Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS, PROFINET, IO-Link
Connector	6-pin locking, 8-pin mini-DIN, 8-pin M12, DB-9 or DB-15
Supply [2]	24 V DC, 1 A; add 40 mA with 4–20 mA output
Update rates [2]	Digital: 40 Hz at 19 200 baud Analogue: 1 kHz; display: 10 Hz

Display and gases

Display	Monochrome LCD or colour TFT, touchpad; shows mass and volumetric flow, pressure, temperature, set point
Gas library	98 gases, properties matched to NIST REFPROP 10 across the operating range
Gas mixes	20 user mixes of up to 5 gases, 0.01 % resolution
Totaliser	±0.1 % rd additional uncertainty

Ranges, pressure drop, connections (21.11 °C, 1013.25 mbar)

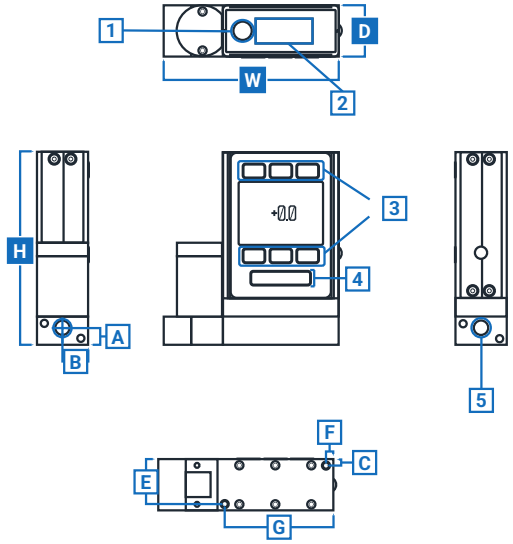
Full scale	Δp, mbar	psid	Process connection
0.5–5 smL/min	4.8	0.07	M5 female

Δp at full scale, venting air to atmosphere. M5 ports are 10-32 compatible.

Standard versions, air (21.11 °C, 1013.25 mbar)

Full scale	Order code
0.5 smL/min	35820MLW
1 smL/min	35821MLW
2 smL/min	35822MLW
5 smL/min	35823MLW

Order from Analyt-MTC with the order codes. Calibrated for air; another gas or a gas mix is selected on the controller. For any other version, contact Analyt-MTC.



1 DC power input
2 Input and output port
3 Controls
4 Backlight switch
5 Process connection

Top view; front, side and rear views; bottom view with mounting taps. The table gives the dimensions.

Options

- High-accuracy calibration, 5 smL/min (see Accuracy)
- Weatherproof housing
- Compression, face-seal, push-to-connect, BSPP or SAE connections
- Swagelok®-compatible tube, VCO® or VCR® connections

Dimensions, mm and kg (21.11 °C, 1013.25 mbar)

Full scale	W	D	H	A	B	C	E	F	G	kg
0.5–5 smL/min	84.8	26.7	99.0	8.5	13.3	3.2	23.5	3.8	56.5	≈ 0.5

Notes

1. rd = of reading, FS = of full scale. Accuracy holds after tare at equilibrium and includes repeatability and linearity. sL/min and smL/min at 21.11 °C, 1013.25 mbar.
2. Fieldbus versions differ in supply and data rates; ask Analyt-MTC for their documentation.

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