358 Series MCQ mass flow controllers

Laminar mass flow controllers for line pressures to 22.1 bar a, 10 smL/min to 20 sL/min full scale

The MCQ controller sets and measures gas mass flow and also reports volumetric flow, pressure and temperature on its display. It operates at line pressures up to 22.1 bar a. It stores 98 gases and 20 user mixes. RS-232 is standard; analogue I/O, RS-485, Modbus and fieldbus interfaces are options.



20 sL/min	0.5–100 %	from 100 ms	98	22.1 bar a
Largest full scale; the smallest is 10 smL/min	Steady-state control range of full scale	Typical control response (T63)	Stored gases, plus 20 user-defined mixes	Operating pressure, full scale (320 psia)

Performance

Reference conditions	Standard 21.11 °C, normal 0 °C, at 1013.25 mbar; configurable
Accuracy [1]	±0.6 % rd or ±0.1 % FS, whichever is greater
Repeatability	±0.1 % FS
Control range	0.5–100 % FS, steady state
Control response (T63), adjustable, flow dependent	As fast as 100 ms
Indication response	Typically < 10 ms, flow rate dependent
Sensor response	< 1 ms
Warm-up time	Typically < 1 s
Temperature sensitivity	Zero: ±0.01 % FS/°C from tare temperature, per atm Span: ±0.01 % rd/°C from 25 °C, per atm
Pressure sensitivity	Zero: ±0.01 % FS/atm from tare pressure Span: ±0.1 % rd/atm from calibration conditions
Pressure accuracy	Above 1 atm: ±0.5 % rd Below 1 atm: ±4.8 mbar (±0.07 psia)
Temperature accuracy	±0.75 °C
Totaliser	±0.5 % rd additional uncertainty

Operating conditions

Operating pressure	Minimum: 0.79 bar a (11.5 psia), common mode Full scale: 22.1 bar a (320 psia) The differential pressure must exceed the controller's pressure drop
Damage limits	Line: above 27.6 bar a (400 psia) Differential: above 5.17 bar (75 psid)
Temperature	−10 to 60 °C
Humidity	0–95 % non-condensing

Mechanical

Wetted materials	Stainless steel 302, 303, 304, 316L, 430FR; brass, FKM, alumina ceramic, glass, gold Silicon, polyamide, heat-cured epoxy and silicone rubber
Ingress protection	IP40
Valve	Normally closed
Mounting taps	2× 8-32 UNC, 4.45 mm

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 Options: RS-485, Modbus RTU (over RS-232 or RS-485), Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS
Connector	6-pin locking, 8-pin mini-DIN, 8-pin M12, DB-9 or DB-15
Supply [2]	12–24 V DC, 250 mA; 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

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

Full scale	Δp, mbar	psid	Process connection
10 smL/min	193	2.8	M5 female
50 smL/min	69	1.0	M5 female
100–500 smL/min	69	1.0	1/8" NPT female
1 sL/min	103	1.5	1/8" NPT female

Full scale	Δp, mbar	psid	Process connection
2 sL/min	207	3.0	1/8" NPT female
5 sL/min	138	2.0	1/8" NPT female
10 sL/min	379	5.5	1/8" NPT female
20 sL/min	1379	20.0	1/8" NPT female

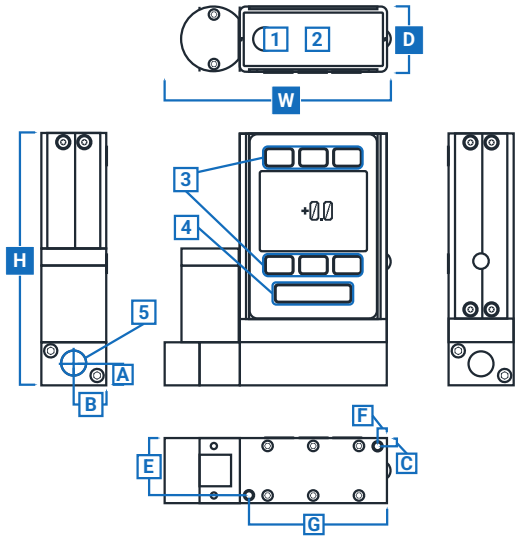
Δp at full scale, standard valve venting air to atmosphere. M5 ports: 10-32 compatible, shipped with Buna-N O-ring face-seal adapters to 1/8" female NPT.

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

Full scale	Order code
10 smL/min	35824Q
20 smL/min	35825Q
50 smL/min	35826Q
100 smL/min	35827Q
200 smL/min	35828Q
500 smL/min	35829Q

Full scale	Order code
1 sL/min	35830Q
2 sL/min	35831Q
5 sL/min	35832Q
10 sL/min	35833Q
20 sL/min	35834Q

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, front, side and bottom views of the 10 smL/min to 20 sL/min controllers, with the dimension letters of the table.

Options

- Weatherproof housing
- Operation below 0.79 bar a
- Compression, face-seal, push-to-connect, BSPP or SAE connections
- Swagelok® tube, VCO® or VCR® connections

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

Full scale	H	W	D	A	B	C	E	F	G	kg
10–50 smL/min	98.98	84.79	26.67	8.53	13.34	3.18	23.50	3.81	56.52	≈ 0.5
100 smL/min–20 sL/min	103.30	91.14	26.67	8.89	13.34	3.18	23.50	3.81	56.52	≈ 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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