358 Series MLW mass flow meters

Low-pressure-drop multi-gas laminar mass flow meters from 10 smL/min to 100 sL/min full scale

The MLW meter measures gas mass flow and also reports volumetric flow, pressure and temperature on its display. Pressure drop at full scale stays below 18 mbar. It stores 98 gases and 20 user mixes. RS-232 and Modbus RTU are standard; analogue outputs and fieldbus interfaces are options.



100 sL/min	0.01–100 %	±0.75 % rd	17.2 mbar	98
Largest full scale; the smallest is 10 smL/min	Measurement range of full scale	Accuracy (min. ±0.1 % FS)	Maximum pressure drop at full scale	Stored gases, plus 20 user-defined mixes

Performance

Reference conditions	Standard 21.11 °C, normal 0 °C, at 1013.25 mbar; configurable
Accuracy [1]	±0.75 % rd or ±0.1 % FS, whichever is greater
High-accuracy option [1]	±0.6 % rd or ±0.1 % FS, whichever is greater
Repeatability (2σ)	±(0.1 % rd + 0.02 % FS)
Measurement range	0.01–100 % FS
Turndown ratio	10 000:1
Indication response	Typically 127 ms, user adjustable
Sensor response	< 1 ms
Warm-up time	< 1 s
Temperature sensitivity	Zero: ±0.03 % FS/°C from tare temperature Span: ±0.01 % rd/°C from 25 °C
Pressure sensitivity	Zero and span ±0.1 % rd/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
Totaliser	±0.5 % rd additional uncertainty

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
Humidity	0–95 % non-condensing

Mechanical

Wetted materials	Stainless steel 302 and 303, FKM, glass-reinforced PPS, alumina, glass, gold, silicon, heat-cured epoxy and silicone rubber
Ingress protection	IP40
Orientation sensitivity	None
Mounting taps	10–20 smL/min: 2× 8-32 UNC, 4.45 mm deep 50 smL/min–5 sL/min: 2× 8-32 UNC, 7.62 mm deep 10 sL/min: 2× 8-32 UNC, 8.89 mm deep 20–100 sL/min: 4× 8-32 UNC, 9.53 mm deep

Electrical and communication

Analogue outputs	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]	0–5 V DC output: 9–24 V DC, 40 mA 0–10 V DC output: 12–28 V DC, 40 mA 4–20 mA output: 12–28 V DC, 80 mA
Update rates[2]	Digital: 40 Hz at 19 200 baud Analogue: 1 kHz; display: 10 Hz

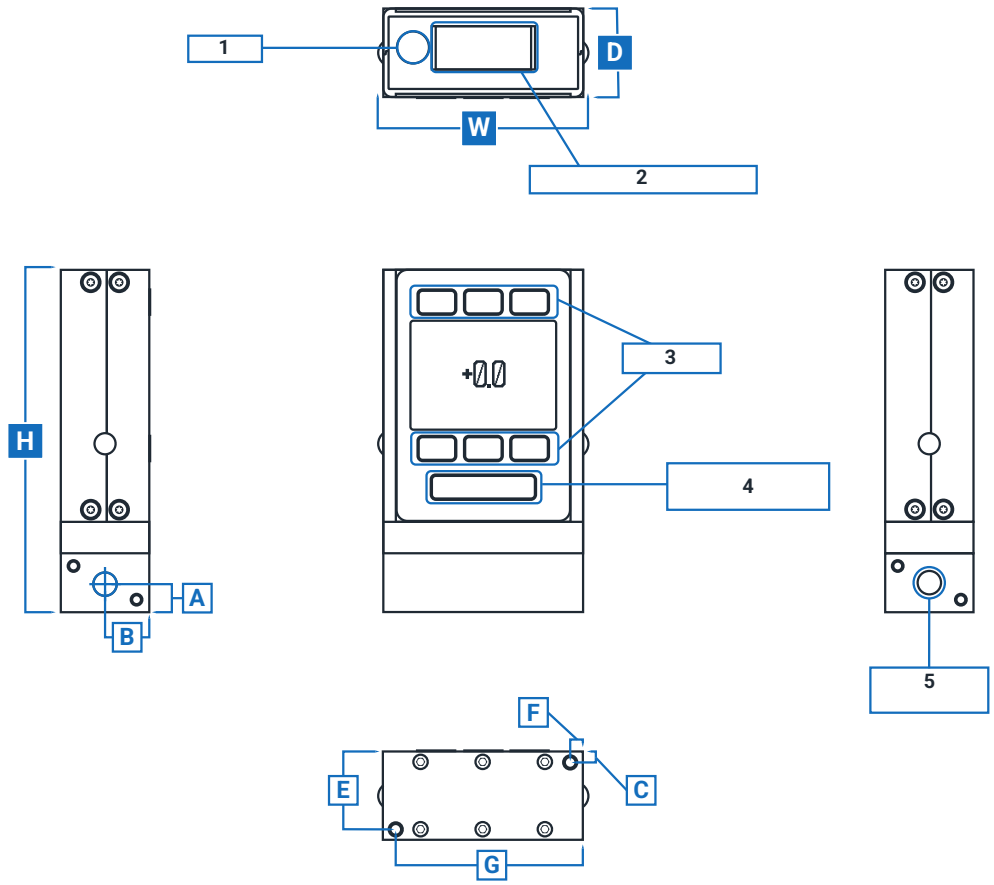
Display and gases

Display	Monochrome LCD or colour TFT, touchpad; shows mass and volumetric flow, pressure, temperature
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
10–20 smL/min	4.8	0.07	M5 female
50 smL/min–5 sL/min	4.8	0.07	1/8" NPT female
10 sL/min	5.5	0.08	1/4" NPT female
20 sL/min	17.2	0.25	1/4" NPT female
40 sL/min	8.3	0.12	1/2" NPT female
50 sL/min	9.7	0.14	3/4" NPT female
100 sL/min	16.5	0.24	3/4" NPT female

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



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

Top view: W, D; side and front views: H, A, B; bottom view: C, E, F, G. Values in the dimension tables.

Dimensions in mm, 10 smL/min to 5 sL/min

Full scale	W	D	H	A	B	C	E	F	G	Weight, kg
10–20 smL/min	60.3	26.7	99.0	8.5	13.3	3.2	23.5	3.8	56.5	≈ 0.4
50 smL/min–2 sL/min	60.3	26.7	103.3	8.9	13.3	3.2	23.5	3.8	56.5	≈ 0.5
5 sL/min	60.3	26.7	105.8	8.9	13.3	3.2	23.5	3.8	56.5	≈ 0.6

Dimensions in mm, 10 to 100 sL/min

Full scale	W	D	H	A	B	C	E	F	G	Weight, kg
10 sL/min	66.7	26.7	106.9	9.1	13.3	3.2	23.5	7.0	59.7	≈ 1.1
20 sL/min	101.6	40.6	110.9	12.7	20.3	4.4	36.2	19.1	82.6	≈ 1.1
40–100 sL/min	101.6	40.6	–	20.3	20.3	4.4	36.2	19.1	82.6	≈ 1.5

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

Full scale	Order code
10 smL/min	35804MLW
20 smL/min	35805MLW
50 smL/min	35806MLW
100 smL/min	35807MLW
200 smL/min	35808MLW
500 smL/min	35809MLW
1 sL/min	35810MLW

Full scale	Order code
2 sL/min	35811MLW
5 sL/min	35812MLW
10 sL/min	35813MLW
20 sL/min	35814MLW
50 sL/min	35815MLW
100 sL/min	35816MLW

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

Options and accessories

High-accuracy calibration (see Accuracy)	
Weatherproof housing	
Compression, face-seal, push-to-connect, BSPP, SAE or Swagelok-compatible connections	
Universal benchtop baseplate	35780
RS-232 cable, 8-pin mini-DIN to DB-9, 1.8 m	35754
USB to RS-232 adapter	35782
Inline filter, 1/8" NPT, 20 µm	ILF-1/8-20
Inline filter, 1/4" NPT, 40 µm	ILF-1/4-40
Inline filter, 1/2" NPT, 40 µm	ILF-1/2-40
Inline filter, 3/4" NPT, 40 µm	ILF-3/4-40
Rugged transport case	1200-000-110E

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.
3. H for 40–100 sL/min: ask Analyt-MTC.

ANALYT-MTC Messtechnik GmbH
Sales, service and calibration

www.analyt-mtc.com

German Headquarters
Klosterrunsstraße 18, 79379 Müllheim
+49 7631 5545
info@analyt-mtc.de

French Subsidiary
175 Avenue d'Alsace, 68000 Colmar
+33 3 89 41 47 78
info@analyt-mtc.fr

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