Digital Mass Flow Controller AFC 202 D & Meter AFM 302 D

Features

For high flow from 30 slm to 400 slm, the highest performances of the digital P.C.B. combined with elastomeric seals on the Qualiflow AFC 202 D and AFM 302 D:

- Full potential of digital technology.
- 100% compatible with analog AFC202 by using the D 15 pin adapter (P/N Q2001733-09 or Q2001733-10)
- Special pressure compensated stainless steel valve for ultra fast flow control.

Accuracy :

During calibration, a polynomial curve (fourth degree) calculated from 6 points gives an accuracy of ± 1% of setpoint if setpoint > 30% of F.S., ± 0.3% of F.S. if setpoint < 30% of F.S.

Less inventory :

Up to 10 calibration curves of different gases can be stored into the memory, easily changeable by user. To keep the benefit of accuracy, the maximum factor between the full scales is 3.

Optimized numerical control :

The control of gas flow is done by a numerical algorithm assuming a control without overshoot at any setpoint and improving the response time. Each calibration curve is stored with its own regulation parameters.

Communication modes :

- Analog mode : the MFC is 100% compatible with analog series, with the advantage to communicate via serial RS232C for maintenance, calibration.
- RS485 option : permits to control up to 32 MFC's under MODBUS protocol (RJ11 connector).
- Devicenet or PROFIBUS high speed fieldbus.

Ratings

Flow Range (equivalent N2) : ..... from 30 slm to 400 slm
Control Range : ..... between 2 and 100% F.S.
Valve Type : ..... Electromagnetic
Valve Rest Position : ..... Normally Open or Closed
Accuracy : +/- 1% of setpoint. if setpoint is higher than 30% of F.S.
+/- 0.3% of F.S. if setpoint is lower than 30% of F.S.
Linearity : ..... +/- 0.2% of F.S.
Repeatability : ..... +/- 0.15% of F.S.
Sensibility to Mounting Position : ..... +/- 0.1% of F.S.
Step Response Time : ..... <= 2.5 sec. (SEMI E17-91)
Temperature Range : ..... between 5 and 50°C
Up to 80°c with separated electronic option
Temperature Coefficient : ..... < 0.05% F.S. /°C
Maximum Inlet Pressure : ..... 10 bar
Minimum Differential Pressure : ..... 1.5 bar for 30 slm F.S.
..... 2.0 bar for 50 slm F.S.
..... 2.5 bar for 100 slm F.S.
..... 3.0 bar for 200 slm F.S.
..... 4.5 bar for 400 slm F.S.
Pressure Coefficient : ..... < 0.1% F.S./bar
Wetted Materials : ..... 316 L Stainless steel, Kel-F, seals material
Surface finish : ..... 0,4µ (16 µinch) Ra max
Leak Integrity : ..... < 2.10^{-8} scc/sec (He)
Standard Seals : ..... Viton, Neoprene
Fittings : ..... 3/8'' VCR, Swagelok, other on request

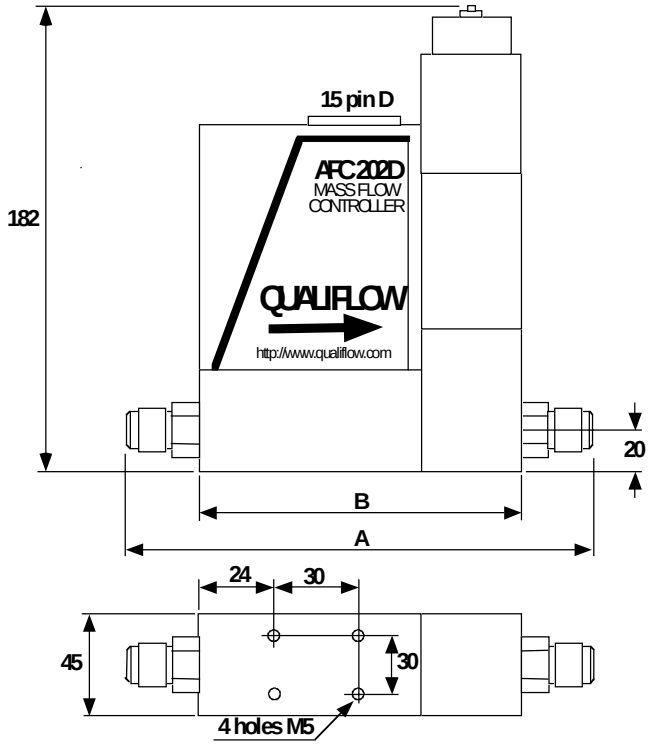
Power Input Requirement :

Mass Flow Controller : ..... +/- 15 VDC, 600 mA
Mass Flow Meter : ..... +/- 15 VDC, 25 mA
Analog Set Point Signal : ..... from 0 to 5 VDC
Analog Flow Output Signal : ..... from 0 to 5 VDC
Digital control : ..... RS232C, active full time
Electrical Connector : ..... Sub-D 15 pins Male

Options :

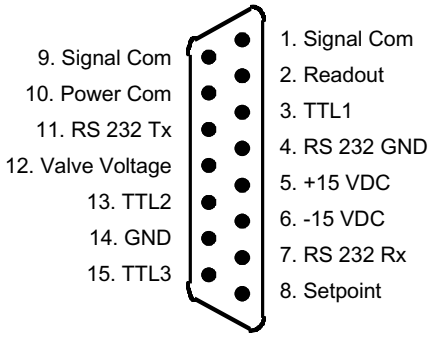
- Separated electronics
- Devicenet fieldbus connection
- Profibus fieldbus connection
- RS485/Modbus with 2 RJ11 connections
- External readout
- Kalrez seals

Table of Dimension (mm)



	AFC 202		AFM 302	
	VCR 3/8" MM	Swagelok 3/8	VCR 3/8" MM	Swagelok
A (mm)	181,4	183,3 (incl. nuts)	141.9	143.8 (incl. nuts)
B (mm)	123	123	83.5	83.5

Connections



Example of ordering information

202 O V EE 100L 007 H - D

- VALVE : N.O.
- SEALS : VITON
- FITTINGS : 3/8" VCR M-M
- POSITION : HORIZONTAL
- GAS : HYDROGEN
- FLOW : 100 SLM

Gas Process Number

Symbol	Gas Name	Number	Density SEMI E52-0298	Sp. Heat [g / l]	C [cal/g/°C]
	Air	8	1.2929	0.2401	1.000
NH3	Ammonia	29	0.7710	0.519	0.68
Ar	Argon	4	1.7842	0.1246	1.453
AsH3	Arsine	35	3.481	0.1178	0.666
BCl3	Boron Trichloride	70	5.26	0.130	0.40
CO	Carbon Monoxide	9	1.2500	0.495	1.000
CCl4	Carbon Tetrafluoride	101	6.86	0.141	0.309
Cl2	Chlorine	19	3.209	0.116	0.83
B2H6	Dibirane	58	1.24	0.495	0.44
SiH2Cl2	Dichlorosilane	67	4.54	0.141	0.43
CHF3	Fluoroform	49	3.125	0.173	0.506
CCl2F2	Freon-12	84	5.5	0.149	0.34
CF4	Freon-14	63	3.96	0.167	0.41
GeH4	Germane	43	3.423	0.138	0.58
He	Helium	1	0.1788	1.242	1.454
H2	Hydrogen	7	0.0899	3.400	1.016
HCl	Hydrogen Chloride	11	1.635	0.1937	0.981
C2F6	Hexafluoroethane	118	6.16	0.185	0.24
Kr	Krypton	5	3.73	0.0596	1.45
CH4	Methane	28	0.7166	0.528	0.722
CH3SiCl3	Methyltrichlorosilane	183	6.670	0.164	0.250
N2	Nitrogen	13	1.2503	0.2484	1.000
NO2	Nitrogen Dioxide	26	6.675	0.194	0.41
NF3	Nitrogen Trifluoride	53	3.173	0.178	0.434
N2O	Nitrous Oxide	27	1.98	0.206	0.206
O2	Oxygen	15	1.429	0.2183	0.996
O3	Ozone	30			
PH3	Phosphine	31	1.523	0.2607	0.688
C3H8	Propane	89	1.98	0.392	0.35
SiH4	Silane	39	1.438	0.3188	0.596
SiF4	Silicon Tetrafluoride	88	4.68	0.168	0.35
Si2H6	Disilane	97			
SO2	Sulphur Dioxide	32	2.91	0.149	0.67
SF6	Sulphur Hexafluoride	110	6.5	0.1590	0.27
TiCl4	Titanium Tetrachloride	114	8.465	0.22	0.30
C4F8	Octafluorocyclodutane	129			
SiHCl3	Trichlorosilane	147	6.047	0.130	0.348