

FLEXI-FLOW Compact

FF-M11

Built-to-order mass flow and pressure meter



Technical specifications

Measurement & control

Type of media	Gases
Flow range	0.5 / 2 / 5 / 20 l/min
Accuracy	up to $\pm 0.5\%$ Rd plus $\pm 0.1\%$ FS (flow); $\pm 0.5\%$ FS (pressure) (FS relates to the instrument max. FS)
Repeatability	$< \pm 0.2\%$ Rd
Turndown ratio	up to 1:1000
Multi fluid capability	embedded gas data for 22 unique gases plus any mixture of these gases
Pre-installed gases	C2H2, Air, C3H4, Ar, CO2, CO, C3H6, D2, C2H6, C2H4, He, H2, Kr, CH4, Ne, N2, N2O, O2, C3F8, C3H6, C3H8, C3H4
Response time (sensor)	< 30 ms (T63)
Operating temperature	0...+50 °C (32 - 122°F)
Temperature sensitivity	Flow sensor: zero 0.015% FS/°C; span 0.05% Rd/°C; Pressure sensors: zero 0.16 mbar/°C; span 0.05% Rd/°C
Leak integrity, outboard	tested $< 2 \times 10^{-9}$ mbar l/s He
Long term stability	$< 0.5\%$ FS over period of 3 years, then $< 0.2\%$ FS per year
Pressure sensitivity	standard: $< 0.15\%$ Rd/bar typical N2; with pressure correction: typical factor 5 improved
Pressure range sensor	0...17 bar(a)
Mounting	any position, attitude sensitivity negligible
Warm-up time	30 min
Storage/transport conditions	0...+50°C, max. 95% RH (non-condensing)

Approvals

Marking	CE, RoHS, WEEE, REACH
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Mechanical specs

Pressure rating (PN) - in barg	16
Ingress protection	IP40
Surface roughness wetted parts	$< 1.6 \mu\text{m Ra}$ ($< 0.8 \mu\text{m Ra}$ for stainless steel body)
Material wetted parts	aluminium, stainless steel, silicon nitride, epoxy, aluminiumoxide, glas, FKM
Sealing material	FKM 51415; for other materials contact factory
Process connections	1/8" BSPP female thread (ISO1179-1); compression type, push-in or face seal (VCR/VCO) couplings
Weight	225 g with Aluminium body, 325 g with SS 316 body; add 50 g for Ethernet interface

Electrical properties

Power supply	+24 Vdc $\pm 10\%$
Power consumption	0.5 Watt typical, add 0.9 Watt for EtherNet communication
Digital communication	Modbus-RTU, Modbus-ASCII, FLOW-BUS, EtherCAT®, EtherNet/IP, Modbus-TCP, POWERLINK, PROFINET

Electrical interfaces

Service interface	USB-C, Bluetooth
Power (main connector)	9-pin D-sub (male)
Function (instrument connector)	RS485
Modbus RTU/ASCII/FLOW-BUS	9-pin D-sub (male)
Modbus TCP / EtherNet/IP / EtherCAT® / PROFINET / POWERLINK	2x RJ45