EN

FLEXI-FLOW Compact

FF-C11

Built-to-order mass flow and pressure controller

Bronkhorst®

Technical specifications

Measurement & control

Type of media	Gases
Flow range	0.5 / 2 / 5 / 20 ln/min
Accuracy	up to ±0.5% Rd plus ±0.1% FS (flow); ±0.5% FS (pressure) (FS relates to the instrument max. FS)
Repeatability	< ±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
Settling time (in control, typical)	< 150 ms
Control stability	< ± 0.1% FS (typical for 1 ln/min N2)
Response time (sensor)	<30 ms
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 x 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)
Leak-by through closed valve	typical < $1 \cdot 10^{-4}$ mbar·l/s He
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

Mechanical specs

Pressure rating (PN) - in barg	16
Ingress protection	IP40
Surface roughness wetted parts	<1.6 µm Ra (<0.8 µm 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
Plunger material	FFKM with PI (polyimide) foil
Process connections	1/8" BSPP female thread (ISO1179-1); compression type, push-in or face seal (VCR/VCO) couplings
Max. ΔP	16 bar(d)
Weight	200 g with Aluminium body, 300 g with SS 316 body; add 50 g for Ethernet interface

Electrical properties

Power supply	+24 Vdc ± 10%
Power consumption	2.5 Watt (typical, in control); 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

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