Catalog

Aera™

Aera FC-R7700 Series

Mass Flow Controller

Economical, analog control, elastomer-sealed model

Kuwana Metals, Ltd.

Aera™

Benefits

- Fast response— ≤ 2 s flow-settling time
- Easy integration—standard connectors and dimensions

Features

- Elastomer seals
- VCR™ and Swagelok™ compatible connections
- Full-scale flow ranges from 10 SCCM to 50 SLM
- Normally-closed or normally-open solenoid control valve
- Leak integrity of $1x10^{-6}$ atm-cc/s of He

As the field-proven standard for a range of applications, Aera FC-R7700 Series delivers Economical, analog controlled, elastomer-sealed mass flow control performance.

For process and equipment engineers working in the semiconductor, flat panel display, data storage, industrial vacuum, and industrial coating markets, this series provides high reliability and superior performance for non-corrosive gas applications, including CVD, PVD, etch, ion implantation, sputtering, thermal oxidation, optical glass coating, optical fiber, surface treatment, and other coating processes.

This unit is compliant with the EU-RoHS Directive.

Low Cost

Custom-made for applications that require top performance but not the corrosion resistance or high leak integrity of metal seals, the FC-R7700 Series is cost-effective, with low noise and low power consumption.

Easy Integration

This model features standard electrical connectors and critical dimensions to easily fit in existing systems with lower noise and lower power consumption than digital models.

Fast Response

Advances in the FC-R7700 Series' technical design deliver enhanced performance compared to competing mass flow controllers (MFC). These advances include a highly sensitive, rapid-response, small-diameter sensor. With normally-open and normally closed solenoid designs, the FC-R7700 Series provides flexibility for many needs, with a settling time of ≤ 2 sec.

Unsurpassed Reliability

With fewer electronic components than digital MFCs, and no DC-DC converter, the FC-R7700 provides outstanding long-term reliability.

Specifications

Operational	FC-R7700CD/FC-R7700D Series	FC-R7710CD/FC-R7710D Series
Full-Scale Range	10 SCCM to 5 SLM	N/O: 5 to 20 SLM* N/C: 5 to 50 SLM**
Response Time	≤ 2 s to within ±2% of full scale 0→100%, SEMI E17-91	
Flow Accuracy with calibration gas @22°C ±3°C	≤ ±1% of full scale	≤ ±2% of full scale
Linearity	≤ ± 0.5% of full scale	≤ ± 0.5% of full scale※1
Repeatability	≤ ± 0.2% of full scale	
Leak Integrity	$1x10^{-6}$ atm-cc/s (He) max; $1x10^{-7}$ Pa·m^3 /s (He) max	
Flow Control Range	2 to 100% of full scale	
Normal operating Pressure	49 to 275kPaD	69 to 275kPaD※2 69 to 275kPaD※3
Maximum Operating Pressure	490kPaG	
Proof Pressure	1MPaG	
Operating Temperature Range	5 to 45°C (41 to 113°F) Gas temperature needs to be the same as the atmospheric temperature.	

※1: Less than ±1% for Full Scale Flow greater than 30SLM
※2: N/O: Normally Open Valve Model
※3: N/C: Normally Closed Valve Model [20 SLM < N_2 density flow ≤ 50 SLM: 147 to 275 kPaD]
These specifications are valid only in lab conditions used in factory testing, with standard configuration. Performance in the field may not be compliant with this document.

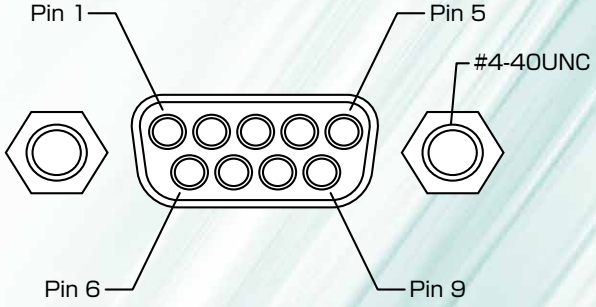
Physical	FC-R7700CD/FC-R7700D Series	FC-R7710CD/FC-R7710D Series
Control Valve Type	Normally-open or normally-closed solenoid	
External seals	Fluoroelastomer or Chloroprene Rubber	
Materials	Stainless-steel type 316L, 316, PTFE, Magnetic Stainless, Fluoro Rubber, Chloroprene Rubber*	
Standard Fittings	1/4" VCR™, 1/4" Swagelok™ compatible	
Orientation	May be mounted in any position	
Mass	1.0 kg (2.2 lb)	

* Fluoro Rubber or Chloroprene Rubber is used when N_2 density flow is 11.096 SLM or greater with normally open valve models. Material used also depends on the applied gas. Contact factory for information on what material is used.
Fluoro Rubber or Chloroprene Rubber is used when N_2 density flow is 551 SCCM or greater with normally closed valve models. Materials used also depends on the gas. Contact factory for information on what material is used.

Electrical	FC-R7700CD/FC-R7700D Series	FC-R7710CD/FC-R7710D Series
Input Power	+15 VDC ±2%, 25 mA −15 VDC ±2%, 180 mA	
Power Consumption	3.1 W max	
Input Command Signal	0 to 5 VDC Input impedance > 1MΩ	
Output signal	0 to 5 VDC Load impedance > 2kΩ	

Electrical Connections

9-Pin D-sub, pin contact connector	
1	VALVE OPEN/CLOSE*
2	OUTPUT(DC 0～5V/0-100%)
3	POWER DC +15V
4	COMMON
5	POWER DC -15V
6	CONTROL (DC 0～5V/0-100%)
7	COMMON
8	COMMON
9	VALVE TEST PT.(DC 0～-13V)



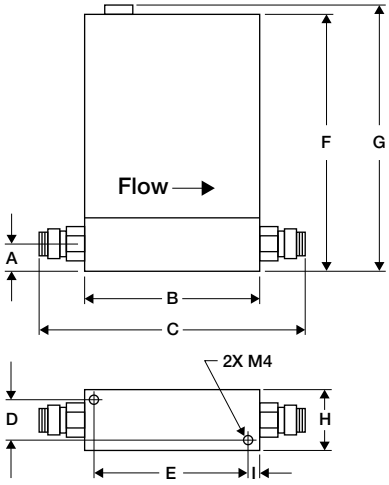
* Connection to +15V OPEN, Connection to -15V : CLOSE (Normally closed valve model)
Connection to +15V CLOSE, Connection to -15V : OPEN (Normally open valve model)

Model and Suffix Codes

Category	Description	Suffix Codes							
Product Type	Mass flow controller	FC-	…	…	…	…	…	…	…
RoHS Compliance	Compliant with RoHS directives	…	R	…	…	…	…	…	…
Full-Scale Range	10 SCCM to 5 SLM	…	…	7700	…	…	…	…	…
	5 to 50 SLM	…	…	7710	…	…	…	…	…
Control Valve	Normally-closed	…	…	…	C	…	…	…	…
	Normally-open	…	…	…	(Blank)	…	…	…	…
Connector	Aera 9-Pin D	…	…	…	…	D	…	…	…
Fittings	1/4" VCR™ compatible	…	…	…	…	…	4V	…	…
	1/4" Swagelok™ compatible	…	…	…	…	…	4S	…	…
Gas	Type of gas	…	…	…	…	…	…	N_2	…
Flow	Flow range of gas (SCCM or SLM)	…	…	…	…	…	…	…	200
Single-Gas Example		FC-	R	7700	C	D	4V	N_2	200 SCCM
(MFC, RoHS compliant, 9-pin D connector, normally-closed valve, 1/4" VCR™ fittings, N_2 gas, 200 SCCM full-scale range)									

Dimensions

	FC-R7700CD/ FC-R7700D Series	FC-R7710CD/ FC-R7710D Series
A	12.7 mm (0.5")	12.7 mm (0.5")
B	76.0 mm (3.0")	78.5 mm (3.09")
C	124.0 mm (4.9")	124.0 mm (4.9")
D	18.3 mm (0.72")	18.3 mm (0.72")
E	69.0 mm (2.7")	69.0 mm (2.7")
F	119.0 mm (4.7")	119.0 mm (4.7")
G	125.0 mm (4.92")	125.0 mm (4.92")
H	32.0 mm (1.3")	32.0 mm (1.3")
I	3.5 mm (0.2")	3.5 mm (0.14")



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⚠ Safety Precaution

Before using any of the products introduced in this catalog, please read the respective user manuals thoroughly.

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