HITACHI

Catalog

Aera

Aera® FC-R7700 Series

Mass Flow Controller

Economical, analog control, elastomer-sealed model

Hitachi Metals, Ltd.

Aera

Benefits

- Fast response— ≤ 2 sec 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 200 SLM
- Normally-closed or normally-open solenoid control valve
- Leak integrity of $1x10^{-6}$ atm-cc/sec of He

As the field-proven standard for a range of applications, Hitachi Metal's Aera® FC-R7700 Series delivers Economical, analog control, elastomer-sealed model.

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 for 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, low noise and low power consumption.

Easy Integration

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

Fast Response

Advances in the FC-R7700 Series' technical design delivery enhanced performance compared to competing mass flow controller (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 a flexibility for many applicable needs and produce a settling time of ≤ 2 sec. between set points. (≤ 3sec. for FC-R7720CD/FC-R7720D)

Unsurpassed Reliability

The usage of less number of the eletric devices than the case of digital model and no usage of the DC-DC converter results the highly- reliable performance in a long-term.

Specifications

Operational	FC-R7700CD/FC-R7700D Series	FC-R7710CD/FC-R7710D Series	FC-R7720CD/FC-R7720D Series
Full-Scale Range	10 SCCM to 5 SLM	N/O: 6 to 20 SLM* N/C: 6 to 50 SLM**	35 to 200 SLM
Response Time	≤ 2 sec. to within ±2% of full scale 0→100%, SEMI E17-91		≤ 3 sec. to within ±2% of full scale 0→100%, SEMI E17-91
Flow Accuracy with calibration gas @22°C ±3°C, Zero <±0.1% FS	≤ ±1% of full scale	≤ ±2% of full scale	
Linearity	≤ ± 0.5% of full scale	≤ ± 0.5% of full scale※1	≤ ±1% of full scale
Repeatability	≤ ± 0.2% of full scale		
Leak Integrity	$1x10^{-6}$ atm-cc/sec (He) max; $1x10^{-7}$ $Pa \cdot m^3$ /sec (He) max		
Flow Control Range	2 to 100% of full scale※2		
Normal operating Pressure	49 to 275kPaD	69 to 275kPaD* 69 to 275kPaD**	145 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.		

* N/O: Normally Open Valve Model, ** N/C: Normally Closed Valve Model [20SLM < N2 density flow ≤ 50SLM: 147 to 275kPaD]
※1: Less than ±1% for Full Scale Flow greater than 30SLM
※2: 5～100% for Full Scale Flow greater than 150SLM
※3: 195 to 295 psiD for Full Scale Flow greater than 150SLM
These specifications are valid only in the condition we measured in our test bench with standard configuration. The performance in the field may not be compliant with this document.

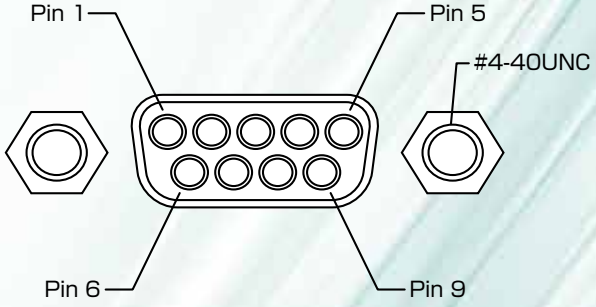
Physical	FC-R7700CD/FC-R7700D Series	FC-R7710CD/FC-R7710D Series	FC-R7720CD/FC-R7720D Series
Control Valve Type	Normally-open or normally-closed solenoid		
External seals	Fluoroelastomer or Chloroprene Rubber		
Materials	Stainless-steel type 316L, 316, PTFE, Magnetic Stainless, Fluoro Rubber, Chloroprene Rubber*		Stainless-steel type 316(L), PTFE, Magnetic Stainless, Fluoro Rubber, Chloroprene Rubber, PCTFE**
Standard Fittings	1/4" VCR®, 1/4" Swagelok® compatible		1/4" VCR®, 3/8"VCR®, 1/4" Swagelok®, 3/8" Swagelok®
Orientation	May be mounted in any position		
Mass	1.0 kg (2.2 lb)		2.8kg (6.2lb)

* Fluoro Rubber or Chloroprene Rubber is used in case that the N2 density flow is 11.096SLM or greater with normally open valve model and the material depends on the applied gas. Contact us to see what material is applied.
Fluoro Rubber or Chloroprene Rubber is used in case that the N2 density flow is 551SCCM or greater with normally closed valve model and the material depends on the applied gas. Contact us to see what material is applied.
** The material depends on the applied gas. Contact us to see whether Fluoro Rubber or out of this material(stainless steel 316, PCTFE) is used.

Electrical	FC-R7700CD/FC-R7700D Series	FC-R7710CD/FC-R7710D Series	FC-R7720CD/FC-R7720D Series
Input Power	+15 VDC ±2%, 25 mA -15 VDC ±2%, 180 mA		+15 VDC ±2%, 25 mA -15 VDC ±2%, 220 mA
Power Consumption	3.1 W max		3.7 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)



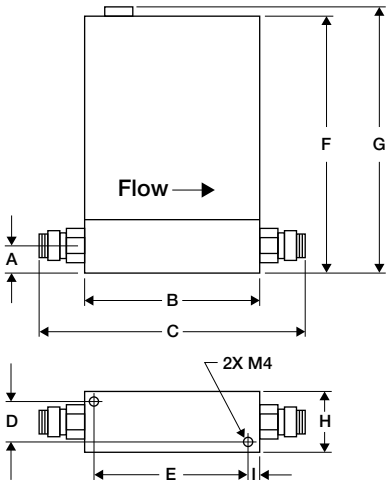
* Connection to +15V OPEN, Connection to -15V : CLOSE (Normally closed valve model)
Connection to +15V CLOSE, Connection to -15V : OPEN (Normally open valve model)

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	…	…	…	…	…
	6 to 50 SLM	…	…	7710	…	…	…	…	…
	35 to 200 SLM	…	…	7720	…	…	…	…	…
Control Valve	Normally-closed	…	…	…	C	…	…	…	…
	Normally-open	…	…	…	(Blank)	…	…	…	…
Connector	Aera® 9-Pin D	…	…	…	…	D	…	…	…
Fittings	1/4" VCR® compatible	…	…	…	…	…	4V	…	…
	3/8" VCR® compatible (772x series only)	…	…	…	…	…	6V	…	…
	1/4" Swagelok® compatible	…	…	…	…	…	4S	…	…
	3/8" Swagelok® compatible (772x series only)	…	…	…	…	…	6S	…	…
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, N2 gas, 200 SCCM full-scale range)									

Dimensions

	FC-R7700CD/ FC-R7700D Series	FC-R7710CD/ FC-R7710D Series	FC-R7720CD/ FC-R7720D Series
A	12.7 mm (0.5")	12.7 mm (0.5")	15.0 mm (0.6")
B	76.0 mm (3.0")	78.5 mm (3.09")	133.5 mm (5.3")
C	124.0 mm (4.9")	124.0 mm (4.9")	1/4" VCR fittings: 184.3 mm (7.2")
			3/8" VCR fittings: 192.5 mm (7.6")
D	18.3 mm (0.72")	18.3 mm (0.72")	25.5 mm (1.0")
E	69.0 mm (2.7")	69.0 mm (2.7")	101.5 mm (4.0")
F	119.0 mm (4.7")	119.0 mm (4.7")	140.5 mm (5.5")
G	125.0 mm (4.92")	125.0 mm (4.92")	144.5 mm (5.7")
H	32.0 mm (1.3")	32.0 mm (1.3")	38 mm (1.5")
I	3.5 mm (0.2")	3.5 mm (0.14")	16 mm (0.63")



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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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VEGETABLE OIL INK

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