

Aera

Aera[®] FC-R7800 Series

Mass Flow Controller

Simple, analog control, metal -sealed model



Aera

Benefits

- ▶ Fast response— ≤ 1 sec. flow-settling time between set points
- ▶ Outstanding reliability
- ▶ Easy integration—standard connectors and dimensions
- ▶ Superior results—high-quality thin-film characteristics

Features

- ▶ Corrosion-resistant design
- ▶ Metal seals
- ▶ VCR[®] compatible connections
- ▶ Full-scale flow ranges from 10 SCCM to 200 SLM
- ▶ Normally-closed or normally-open solenoid control valve
- ▶ Leak integrity of 1×10^{-10} atm-cc/sec of He



Hitachi Metals Aera[®] FC-R7800 Series delivers simple, analog flow control, as well as the corrosion resistance and high leak integrity of metal seals, to suit the majority of gas-controlled applications.

This unit is compliant for EU-Rohs Directive.

Fast Response

Advances in the FC-R7800 Series' technical design deliver enhanced operation compared to competing mass flow controller. These advances include a highly sensitive, rapid-response, small-diameter sensor. Further, the FC-R7800 Series' normally-open or normally-closed solenoid design supplies flexibility for many applicable needs, and produce settling time of ≤ 1 sec. between set points. (≤ 3 sec. for FC-R7820CD, FC-R7820D).

Superior Reliability

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

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.

Specifications

Operational	FC-R7800CD/FC-R7800D Series	FC-R7810CD/FC-R7810D Series	FC-R7820CD/FC-R7820D Series
Full-Scale Range	10 SCCM to 5 SLM	6 to 50 SLM	35 to 200 SLM
Response Time	≤ 1 sec to within ±2% of full scale, 0→100%, Typical, SEMI E17-91		≤ 3 sec to within ±2% of full scale, 0→100%, Typical, SEMI E17-91
Flow Accuracy with Calibration Gas @22°C±3°C, Zero <±0.1% of full-scale	≤ ±1% of full scale	≤ ±1% of full-scale flow (< ±2% of full-scale flow greater than ≤ 20SLM)	≤ ±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 ⁻¹⁰ atm-cc/sec (He) max; 1x10 ⁻¹¹ Pa·m ³ /sec (He) max		
Flow Control Range	2 to 100% of full scale ^{**2}		
Normal operating Pressure	49 to 275kPaD	69 to 275 kPaD*	147 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.		

* Normally open valve model

[20SLM < N2 density flow ≤ 30SLM] 147 to 275kPaD

[30SLM < N2 density flow ≤ 50SLM] 196 to 275kPaD

Normally close valve model

[20SLM < N2 density flow ≤ 50SLM] 147 to 275kPaD

**1: Less than ±1% for Full Scale Flow greater than 20SLM

**2: 5~100% for Full Scale Flow greater than 150SLM

**3: 195 to 295kPaD 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-R7800CD/FC-R7800D Series	FC-R7810CD/FC-R7810D Series	FC-R7820CD/FC-R7820D Series
Control Valve Type	Normally-open or normally-closed solenoid		
External seals	Metal—316L		
Materials	Stainless-steel type 316L, 316, PTFE, Magnetic Stainless(Fluoro Rubber, Chloroprene Rubber)*		Stainless-steel type 316L, 316, PTFE, Magnetic Stainless, Fluoro Rubber **
Standard Fittings	1/4" VCR [®] compatible		1/4" VCR [®] , 3/8" VCR [®]
Orientation	May be mounted in any position		
Mass	1.0 kg (2.2 lb)		2.8kg(6.2lb)

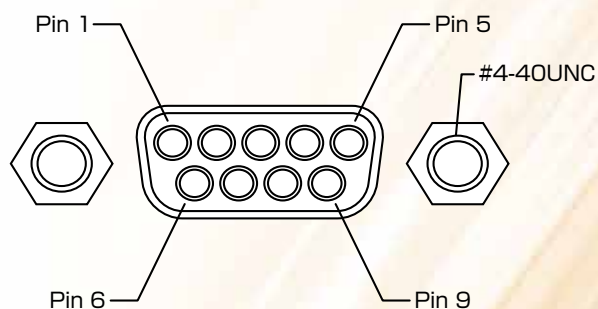
* Fluoro Rubber or Chloroprene Rubber is used in case that the N2 density flow is 11.096SLM or greater and it depends on the applied gas. Contact us to see what material is applied.

** The material depends on the applied gas. Contact us to see whether Fluoro Rubber or out of this material(stainless steel 316) is used.

Electrical	FC-R7800CD/FC-R7800D Series	FC-R7810CD/FC-R7810D Series	FC-R7820CD/FC-R7820D 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
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)

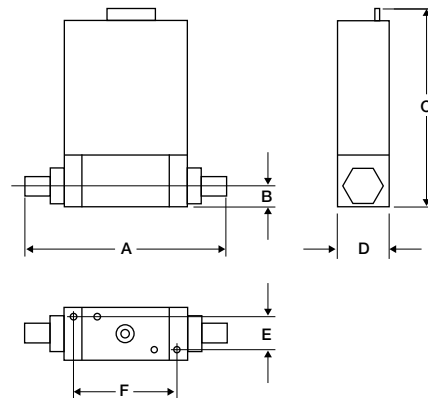
Model and Suffix Codes

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	...	...	7800	...	...	...	...	...
	6 to 50 SLM	...	...	7810	...	...	...	...	...
	51 to 200 SLM	...	...	7820	...	...	...	...	...
Control Valve	Normally-closed	...	...	...	C	...	...	...	...
	Normally-open	...	...	...	(Blank)	...	...	...	...
Connector	Aera® 9-Pin D	...	...	...	...	D	...	...	...
Fittings	1/4" VCR® compatible	...	...	...	...	...	4V	...	...
	3/8" VCR® compatible (782x series only)	...	...	...	...	...	6V	...	...
Gas	Type of gas	...	...	...	...	...	...	N ₂	...
Flow	Flow range of gas (SCCM or SLM)	...	...	...	...	...	...	...	200
Single-Gas Example		FC-	R	7800	C	D	4V	N ₂	200 SCCM

(MFC, RoHS compliant, with 9-pin D connector, normally-closed valve, 1/4" VCR® fittings, N₂ gas, 200 SCCM full-scale range)

Dimensions

	FC-R7800CD/ FC-R7800D Series	FC-R7810CD/ FC-R7810D Series	FC-R7820CD/ FC-R7820D Series
A	124.0 mm (4.88")		1/4" VCR® fittings: 183.7 mm (7.2") 3/8" VCR® fittings: 192.3 mm (7.6")
B	12.7 mm (0.50")		15.0 mm (0.59")
C	132.0 mm (5.20")		155.2mm(6.11")
D	28.6 mm (1.13")		38.0 mm (1.50")
E	18mm(0.71")		25.5 mm (1.00")
F	69.0 mm (2.72")		90.0 mm (3.54")



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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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