

# Aera

## Aera<sup>®</sup> FC-R7800 Series

Mass Flow Controllers

Precise, reliable, metal-sealed design



# 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<sup>®</sup>, Swagelok<sup>®</sup> compatible connections
- ▶ Full-scale flow ranges from 10 sccm to 200 slm
- ▶ Normally-closed or normally-open solenoid control valve
- ▶ Leak integrity of  $1 \times 10^{-10}$  atm-cc/sec of He



Hitachi Metals Aera<sup>®</sup> FC-R7800 series delivers precise flow control, as well as the corrosion resistance and high leak integrity of metal seals, to suit the majority of gas-controlled applications.

Convenience-enhancing features, such as standard electrical connectors and standardized critical dimensions allow quick-and-easy replacement of existing mass flow controllers (MFCs).

## Fast Response

Advances in the FC-R7800 series' technical design deliver enhanced operation compared to competing mass flow controllers. These advances include a highly sensitive, rapid-response, small-diameter sensor. Further, the FC-R7800 series' normally-open or normally-closed solenoid design supplies superior response times. These speed enhancements minimize over-shoot and under-shoot, and produce an actual-flow settling time of < 1 sec between set points. (Less than 3sec for FC-R7820CD,FC-R7820D).

## Superior Reliability

High-quality electronic components and a robust, minimal-parts design stand up to the effects of strong RF fields and other operational demands, delivering outstanding long-term zero-drift stability — < 0.5% of full-scale flow over one year. With over 70,000 units delivered in FC78X FCR78X series MFCs, < 0.5% are returned within a year of shipment.

## Easy Integration

Obtain the performance and reliability advantages of Aera MFCs by replacing other brands—with no installation hassles. Certain models feature standard electrical connectors and critical dimensions to easily fit existing systems.

## 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	N/O: 6 to 20 slm* N/C: 6 to 50 slm**	35 to 200 slm
Response Time	< 1 sec to within $\pm 2\%$ of full scale		< 3 sec to within $\pm 2\%$ of full scale
Accuracy	$\leq \pm 1\%$ of full scale		$\leq \pm 2\%$ of full scale
Linearity	$\leq \pm 0.5\%$ of full scale	$\leq \pm 0.5\%$ of full scale** <sup>1</sup>	$\leq \pm 1\%$ of full scale
Repeatability	$\leq \pm 0.2\%$ of full scale		
Leak Integrity	$1 \times 10^{-10}$ atm-cc/sec (He) max; $1 \times 10^{-11}$ Pa·m <sup>3</sup> /sec (He) max		
Control Range	2 to 100% of full scale** <sup>2</sup>		
Differential Pressure	7 to 40 psiD	10 to 40 psiD 14 to 40 psiD	21 to 40 psiD** <sup>3</sup>
Normal Operating Pressure	70 psig		
Maximum Inlet Pressure	140 psig		
Temperature Range	5 to 45°C (41 to 113°F)		

\* N/O: Normally Open Valve Model, \*\* N/C: Normally Closed Valve Model

\*\*<sup>1</sup>: Less than  $\pm 1\%$  for Full Scale Flow greater than 30SLM

\*\*<sup>2</sup>: 5~100% for Full Scale Flow greater than 150SLM

\*\*<sup>3</sup>: 28~43 psiD for Full Scale Flow greater than 150SLM

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		
Seals	Metal—316L		
Materials	Stainless-steel type 316(L), 316, PTFE, Magnetic Stainless(Fluoro Rubber, Chloroprene Rubber)		
Standard Fittings	1/4" VCR <sup>®</sup> and Swagelok <sup>®</sup> compatible		1/4" VCR <sup>®</sup> , 3/8" VCR <sup>®</sup>
Attitude Sensitivity	May be mounted in any position		Top Connector Position Recommended
Weight	1.0 kg (2.2 lb)	1.5 kg (3.3 lb)	2.27 kg (5.0 lb)

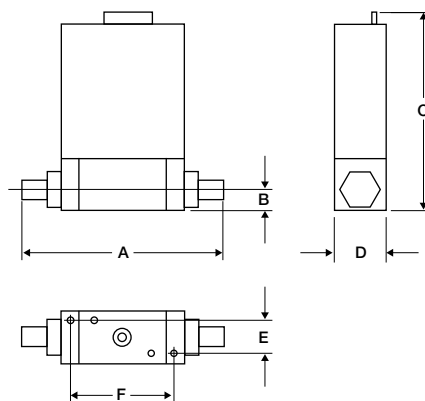
Electrical	FC-R7800CD/FC-R7800D Series	FC-R7810CD/FC-R7810D Series	FC-R7820CD/FC-R7820D Series
Input Power	+15 VDC $\pm 2\%$ at 25 mA -15 VDC $\pm 2\%$ at 180 mA		+15 VDC $\pm 2\%$ at 25 mA -15 VDC $\pm 2\%$ at 200 mA
Power Consumption	3.1 W max		3.5 W max
Command Signal	0 to 5 VDC		
Output Indication	0 to 5 VDC		

## 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	...	...
	1/4" Swagelok® compatible	...	...	...	...	...	4S	...	...
	3/8" Swagelok® compatible (782x series only)	...	...	...	...	...	6S	...	...
Gas	Type of gas	...	...	...	...	...	...	N <sub>2</sub>	...
Flow	Flow range of gas (sccm or slm)	...	...	...	...	...	...	...	200
Single-Gas Example		FC-	R	7800	C	D	4V	N <sub>2</sub>	200 sccm
(MFC, RoHS compliant, with 9-pin D connector, normally-closed valve, 1/4" VCR® fittings, N <sub>2</sub> 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: 183.8 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")		152.0 mm (5.98")
D	28.6 mm (1.13")		38.0 mm (1.50")
E	18.6 mm (0.73")		25.5 mm (1.00")
F	69.0 mm (2.72")		90.0 mm (3.54")



## Hitachi Metals, Ltd.

<http://www.hitachi-metals.co.jp>

### Headquarters

SEAVANS North Bldg., 2-1, Shibaura 1-chome, Minato-ku, Tokyo 105-8614, Japan  
Tel +81-3-5765-4000 Fax +81-3-5765-8311

### Piping Components Company

#### Fine Flow Division

2971-8 Ishikawa-cho, Hachioji-shi, Tokyo 192-0032, Japan  
Tel +81-42-645-8753 Fax +81-42-660-0320

### Hitachi Metals America, Ltd.

#### San Jose Office

1920 Zanker Road, San Jose, California 95112, U.S.A.  
Tel +1-408-467-8900 Fax +1-408-467-8901  
E-mail : aerasales-USA@hitmet.com

### Hitachi Metals Europe GmbH

Immermannstrasse 14-16, 40210 Duesseldorf, Germany  
Tel +49-211-16009-0 Fax +49-211-16009-29  
E-mail : aerasales-europe@hitachi-metals-europe.com



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

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The addresses and contact points listed in this catalog are as of December 2011. Because changes may occur, if the telephone or fax number you are trying to reach is not in service, please contact us at the following.

**Hitachi Metals, Ltd.** (Corporate Communications Office)  
Tel +81-3-5765-4076 Fax +81-3-5765-8312  
E-mail : hmcc@hitachi-metals.co.jp

