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Find the *Hitachi Metals SFC1570FAMO-4UGL* at our website: *Click HERE*

Materials Magic

HITACHI

SAM

Speedy Accuracy Maintainability

Compact Digital Mass Flow Controllers

SFC1480F Series
SFC1580F Series
SFC1680F Series

CATALOG



Hitachi Metals, Ltd.

Features

1. Original digital control method is applied.

2. Quick response
- Response time of 0.7—1.2 sec (typ.) to all set-point changes.
- Quick recovery from inlet pressure fluctuation.

3. High accurcy by digital multi-point calibration.
- Dual range type is also available. (Maker option)
  - High accurcy at low flow set-points
  - Long-time stability of zero
  - No need to switch gas piping
  - Quick response at low set-points

4. Face-to-face dimentions
- Meets face-to-face dimentions of both 106mm and 124mm.
- Various manufacturers IGS types are also available.

5. Monitoring of operation using digital interface is possible

6. Simple valve structure
- Minimal particle generation
- Minimized dead space
- Long operation life

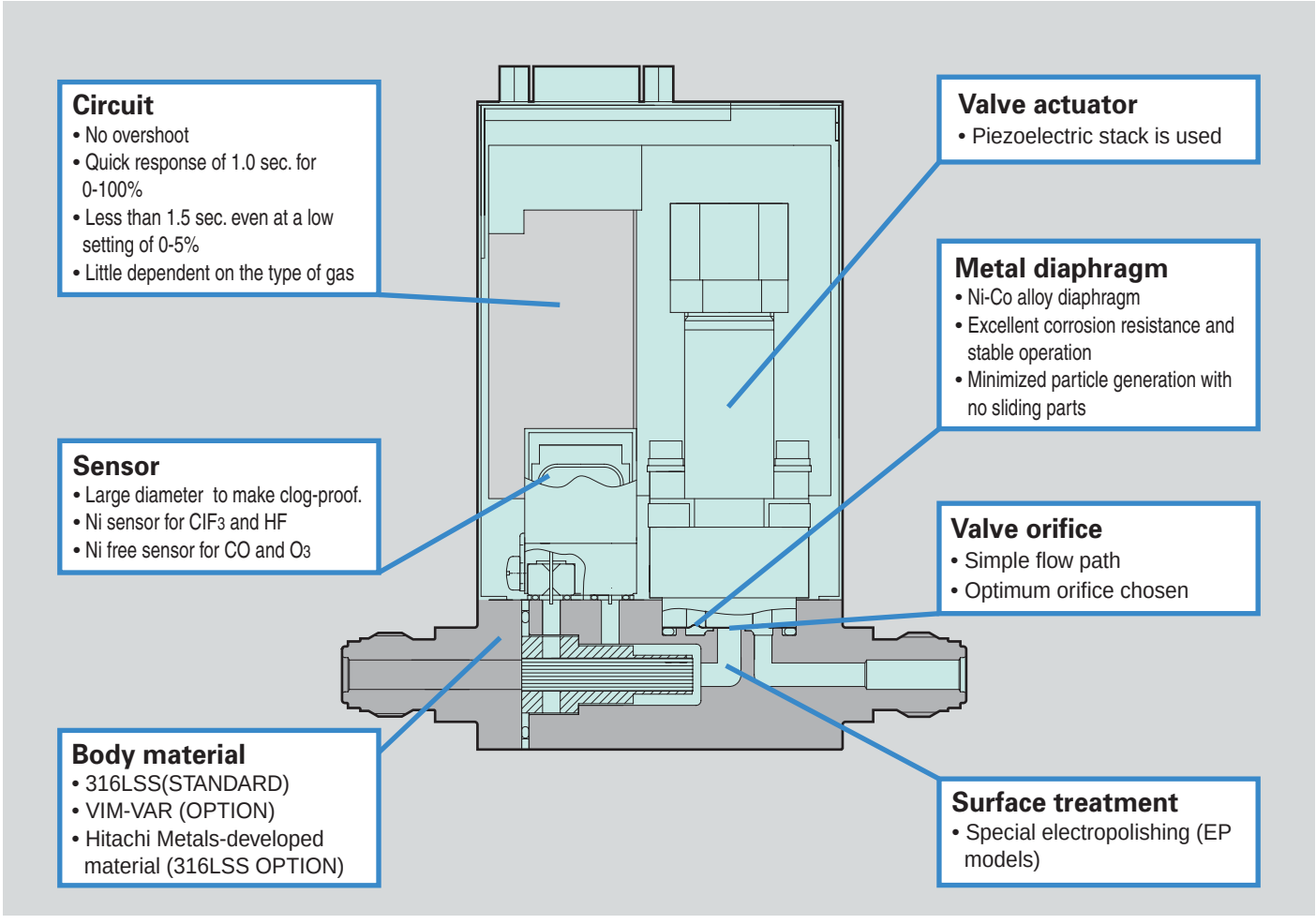
Quick Response

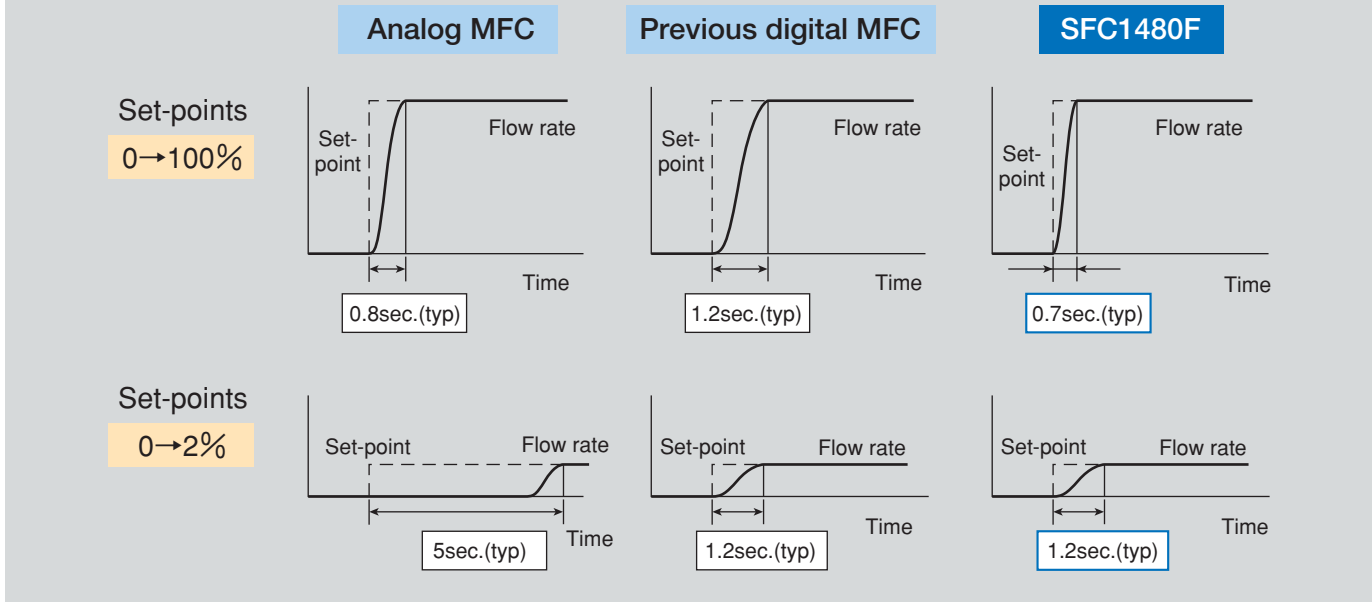
1.Continuous digital sampling time of flow control enables quick response and quick recovery from pressure fluctuation that equals to those of an analog MFC.

2.Switching of PID constants enables elimination of a delay in step response at low set-points.

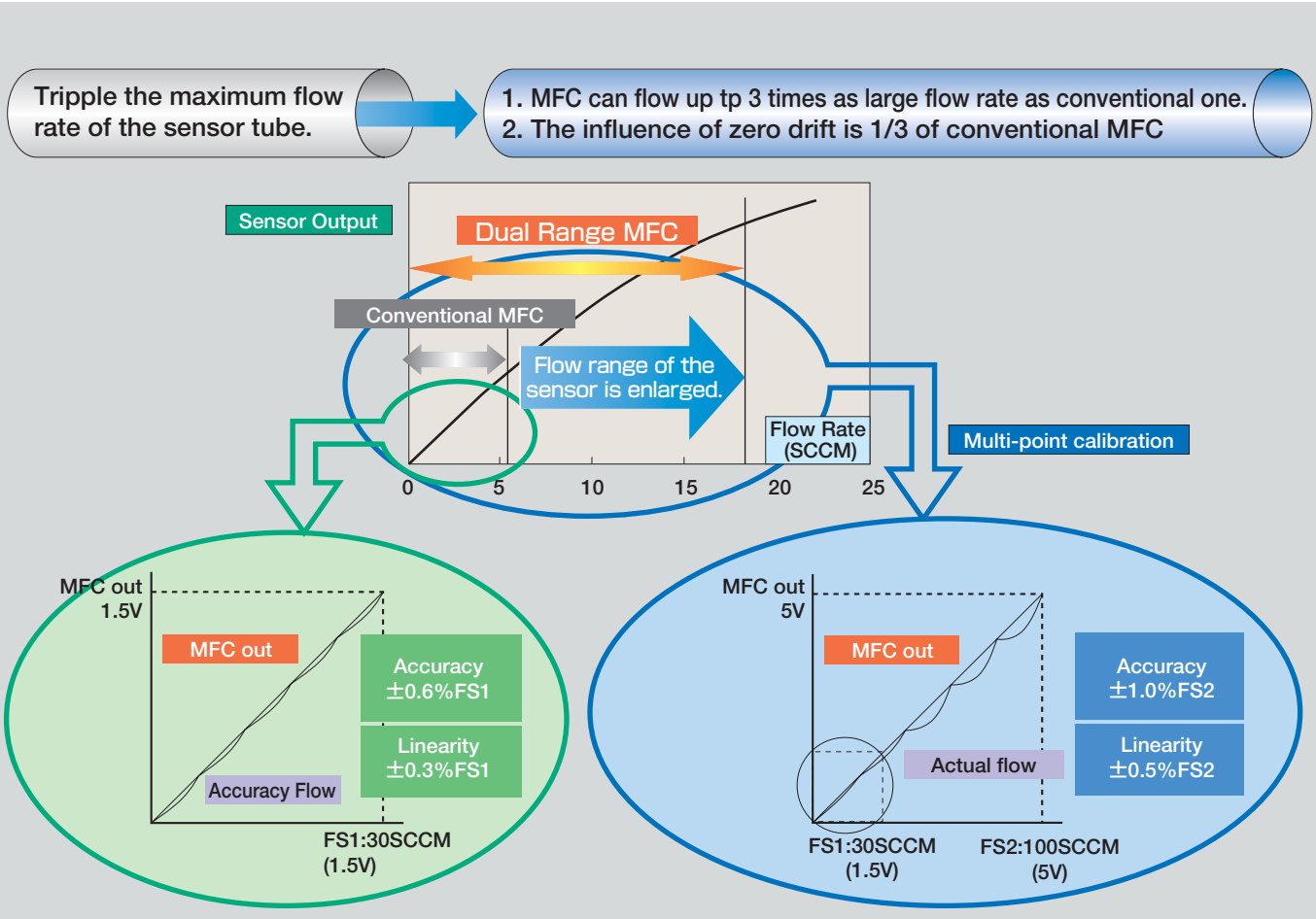
Items	Analog MFC	Previous digital MFC	SFC1480F
Sampling period	0 (continuous)	10msec	0 (continuous)
PID constants	Single	Multiple	Multiple

Structure





◆Dual range MFC (Option)



SFC1480 Series

◆Features

SFC1480F Series is a basic series of compact digital Mass Flow Controllers.

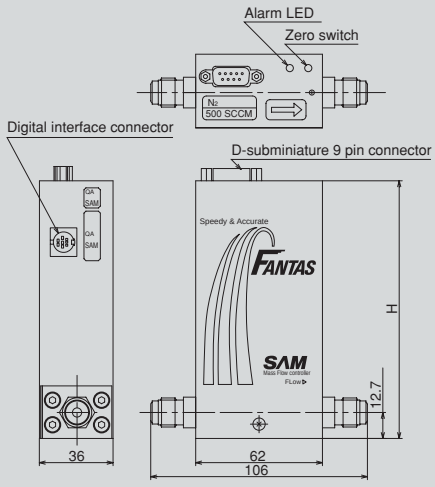
1. Outstanding control characteristics achieved even at very low flow rates.
(Minimum control flow rate : F.S. 1SCCM)

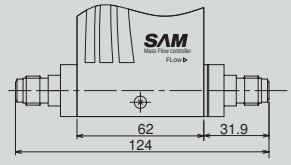
2. Very low differential pressure service of less than 10 Torr is available.
(1) The sensor tube of large ID achieved both the minimized pressure drop and high sensitivity.
(2) Simple valve structure allows high Cv value reserve despite compact dimentions.

3. A wealth of data resources available
Large amounts of data are available to allow the selection of the optimum mass flow controllers according to service gas type, operation pressure and temperature conditions and necessary.

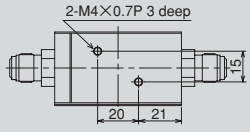
◆Dimentions



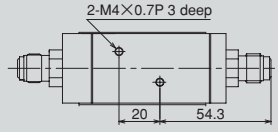




Model	H
14□0F	126
14□1F	146
14□2F	



106mm HMJ



124mm HMJ

Ask us for IGS models

Unit:mm

◆Product specifications ※1

Item			Specifications						
Model			Low flow model	Conventional models			Low differential pressure models		
			SFC1460F※2	SFC1480F	SFC1481F	SFC1482F	SFC1470F	SFC1471F	SFC1472F
Standard full scale flow rate (N2 equivalent)			1/2/3/5/ 10 SCCM	10/20/30/50/ 100/200/300 500 SCCM 1/2/3/5 SLM	10 SLM	20 SLM	To be decided subject to agreement with customer on specified gas, pressure conditions, etc		
Valve operation			Normally closed	Normally closed / Normally open					
Operation pressure		Inlet	0.05—0.3MPa (Gauge)			0.1—0.3MPa (Gauge)	Less than 1.3×10^{-3}MPa is also acceptable (Subject to consultation)		
		Outlet	Vacuum-atmospheric pressure						
Flow control range			2—100% of full scale						
Accuracy			±0.5% of full scale						
Response time			Less than 2.0 sec to full scale(within±2%)	Less than 1 sec to full scale (within ±2%) Less than 1.5 sec to any set-point (within ±2%)					
Proof pressure			1.0MPa (Gauge)						
Temperature		Operation	5—50℃						
		Accuracy guaranteed	15—35℃						
		Baking	80℃						
Leak integrity		Metal seal	Less than 1×10^{-11}Pa・m³/s(He)						
		Rubber seal	Less than 1×10^{-8}Pa・m³/s(He)						
Principle materials		Valve seat	SUS316L						
		Diaphragm	YET101 (Ni-Co alloy)						
		Sensor	SUS316L, Ni-brazing ※3						
	Seal	Metal	Metal O-ring (SUS316L/Ni-plated) ※3						
		Rubber	PTFE, Viton O-ring						
Set-point input			0.1—5VDC (absolute maximum rating ±15VDC)						
Flow signal output			0—5VDC (max:+15VDC, min:—15VDC)						
Power supply			+15VDC (±4%) 100mA (max120mA)						
			—15VDC (±4%) 100mA (max120mA)						
Finish of gas wetted area			Special electropolishing ※4						
Connection			D-Subminiature (9 pin)						
Fittings			1/4"HMJ (UJR) male ※5						

※1 These specifications can be guaranteed in Hitachi Metals' standard measurement condition. They may not be guaranteed in other measurement condition.
※2 Contact us for applicable gases of SFC1460F series.
※3 Ni free models are also available.(except SFC14□2F)
※4 Standard surface finishing for rubber seal models is machine-finish.
※5 Contact us for other fittings.

SFC1580F/SFC1680F Series

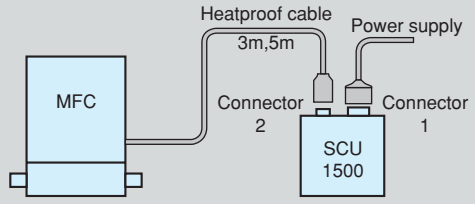
SAM

◆Features

1. Operationg temperature 150˚C, baking temperature 200˚C (SFC1680F Series)
Separation installation type control unit, lower sensor heating temperature, and high temperature piezo-stack are used.

2. Structure to prevent re-condensation
Simple valve structure, which dose not compress and expand gas, prevents re-condensation.

◆Connection



1) Heatproof cable is attached to MFC and can't be removed.
Please specify the length of heatproof cable.The conventional length is 3m and 5m.

2) Specification of connector 2
Model: RM150QPS-10
HRS make
OD 23mm

3) Refer to page 7 for the specification of connector 1.

◆Dimentions



Ask us for IGS models

Unit:mm

◆Product specifications ※1

Item		Specifications					
Model		Conventional models			Low differential pressure models		
		SFC1580F SFC1680F	SFC1581F SFC1681F	SFC1582F SFC1682F	SFC1570F SFC1670F	SFC1571F SFC1671F	SFC1572F SFC1672F
Standard full scale flow rate (N2 equivalent)		10/20/30/50/ 100/200/300 500 SCCM 1/2/3/5 SLM	10 SLM	20/30 SLM	To be decided subject to agreement with customer on specified gas, pressure conditions, etc		
Valve operation		Normally open (Contact us for normally closed models)					
Operation pressure	Inlet	0.05—0.3MPa (Gauge)		0.1—0.3MPa (Gauge)	Less than $1.3x10^{-3}$MPa is also acceptable (Subject to consultation)		
	Outlet	Vacuum-atmospheric pressure					
Flow control range		2—100% of full scale					
Accuracy		±0.5% of full scale					
Response time		Less than 1 sec to full scale (within ±2%) Less than 1.5 sec to any set-point (within ±2%)					
Proof pressure		1.0MPa (Gauge)					
Temperature	Operation	5—80℃ (SFC15xxF)、5—150℃(SFC16xxF)					
	Accuracy guaranteed	Temperature range of ±10 deg in operation temperature					
	Baking	Less than 150℃ (SFC15xxF)、Less than 200℃ (SFC16xxF)					
Leak integrity		Less than $1x10^{-11}$Pa・m^3/s(He)					
Principle materials	Valve seat	SUS316L					
	Diaphragm	YET101 (Ni-Co alloy)					
	Sensor	SUS316L、Ni-brazing ※2					
	Seal	Metal O-ring (SUS316L/Ni-plated) ※2					
Set-point input		0.1—5VDC (absolute maximum rating ±15VDC)					
Flow signal output		0—5VDC (max:+15VDC, min:—15VDC)					
Power supply		+15VDC (±4%) 100mA (max120mA)					
		—15VDC (±4%) 100mA (max120mA)					
Finish of gas wetted area		Special electropolishing					
Connection		D-Subminiature (9 pin)					
Fittings		1/4" HMJ (UJR) male ※3					

※1 These specifications can be guaranteed in Hitachi Metals' standard measurement condition. They may not be guaranteed in other measurement condition.
※2 Ni free models are also available.(except SFC15□2F,SFC16□2F)
※3 Contact us for other fittings.

Mass Flow Meters

◆Features

This series is a basic series of compact digital Mass Flow Meters.

1. Surface finish of the gas wetted area is electoropolishing (except rubber seal models).

2. Clog free sensor
The sensor tube of large ID achived both the minimized pressure drop and high sensitivity.

3. Operationg temperature 150˚C, baking temperarure 200˚C for high temperarure models. (FMT1680F Series)

4. Very low flow models
Mass flow meter with full scale of 1 SCCM is also available.



◆Product specifications ※1

Item			Specifications						
Model			Low flow model	Conventional models			High temperature models		
			FMT1460F	FMT1480F	FMT1481F	FMT1482F	FMT1580F FMT1680F	FMT1581F FMT1681F	FMT1582F FMT1682F
Standard full scale flow rate (N2 equivalent)			1/2/3/5/ 10 SCCM	10/20/30/50/ 100/200/300 500 SCCM 1/2/3/5 SLM	10 SLM	20/30 SLM	10/20/30/50/ 100/200/300 500 SCCM 1/2/3/5 SLM	10 SLM	20/30 SLM
Flow ditection range			2—100% of full scale						
Accuracy			±0.5% of full scale						
Proof pressure			1.0MPa (Gauge)						
Temperature	Operation		5—50℃				5—80℃ (FMT15xxF) 5—150℃(FMT16xxF)		
	Accuracy guaranteed		15—35℃				Temperature range of ±10 deg in operation temperature		
	Baking		80℃				Less than 150℃ (FMT15xxF) Less than 200℃ (FMT16xxF)		
Leak integrity	Metal seal		Less than $1x10^{-11}$Pa・m^3/s(He)						
	Rubber seal		Less than $1x10^{-8}$Pa・m^3/s(He)				—		
Principle materials	Sensor		SUS316L, Ni-brazing ※2						
	Seal	Metal	Metal O-ring (SUS316L/Ni-plated) ※2						
		Rubber	PTFE, Viton O-ring				—		
Flow signal output			0—5VDC (max:+15VDC, min:—15VDC)						
Power supply			+15VDC (±4%) 100mA (max120mA)						
			—15VDC (±4%) 100mA (max120mA)						
Finish of gas wetted area			Special electropolishing ※3						
Connection			D-Subminiature (9 pin)						
Fittings			1/4" HMJ (UJR) male ※4						
Dimensions			The same as SFC1480F series				The same as SFC1580F/1680F series		

※1 These specifications can be guaranteed in Hitachi Metals' standard measurement condition. They may not be guaranteed in other measurement condition.
※2 Ni free models are also available.(except FMT14□2F,FMT15□2F,and FMT16□2F)
※3 Standard surface finishing for rubber seal models is machine-finish.
※4 Contact us for other fittings.

◆Additional Functions

Function	Contents	Setting / commamd
Alarm function	See “Alarm function”	
Conversion factor selection	Conversion factor can be changed from 0.75—1.4 of original value	Command
Zero adjust	Zero can be reset	Command, TTL input, or push button swith
Fast/Slow response	Response speed can be selected between fast (less than 1.5 sec) and slow (4 sec).	Command
2% closed, 2% hold	The operation for flow setting below 2% FS can be selected. (1) Valve closed (2) 2% hold (3) Normally controlled	Command
Valve voltage output	Valve voltage output (0—5VDC)	Analog output
Valve close or full-open	Valve close / Full-open	Command or terminal connection

◆Alarm Function

Alarm conditions	Alarm LED
Normal operation	Green:Blinks at 1-sec interval.
Discrepancy between input and output	Red:On
+15V power supply drop	OFF
EEPROM access error	Red:ON
Control status change (from the preset value) (1) Pressure (2) Operation temperature (3) Clogging of valve or sensor in MFC (4) Flow rate change due to other reasons	Red:Blinks at 0.5-sec interval

※ There are two types of TTL outputs. Alarm A and Alarm B can also be monitored with LEDs on the top of the MFC.
※ Alarm B is output when the valve voltage or sensor current in the MFC circuit changes beyond a permissible value from the initial setting. The permissible value can be selected freely.

◆Connectors

1. Analog Interface

MFC connector　D—Subminiature 9 pins
Cable connector　17JE-13090-02(D8B)(DDK) or equivalent

L type

Pin No.	Function
1	Valve open/close
2	Output (0—5VDC)
3	+15VDC
4	COM (±15V)
5	—15VDC
6	Input (0.1—5VDC)
7	COM (Output)
8	COM (Input)
9	Valve voltage (0-5VDC)

Notes
1) ALL COM lines are connected inside of the MFC.
2) Valve open/close
Inner valve will be fully open when +15VDC is applied to pin #1 and fully closed when —15V is applied to pin #1.

Q type

Pin No.	Function
1	Valve Full-open
2	Output (0—5VDC)
3	+15VDC
4	COM (±15V)
5	—15VDC
6	Input (0.1—5VDC)
7	COM (Output)
8	COM (Input)
9	Valve Full-close

Notes
1) ALL COM lines are connected inside of the MFC.
2) Valve full-close and full-open function when these terminals are connected to COM.

2. Digital Interface

MFC connector　:TCS-7588-01-201(Hoshiden)
Cable connector :TCS-8580-01-010(Hoshiden) or TCP-8080-01-520(Hoshiden)

《Pin assignment (RS-232C type)》

Pin No	Signal	Function
1	Alarm B	Open collector output for Alarm B
2	Txd	RS-232C transmission
3	Alarm A	Open collector output for Alarm B
4	+15VDC	Power supply for interface adaptors
5	Rxd	RS-232C reception
6	+5VDC	Power supply for interface adaptors
7	Preset input for Alarm B	Preset Alarm B when connected to COM
8	Zero adjust	Reset zero when connected to COM
Shell	COM	Power supply and signal COM

《Pin assignment (RS-485 type)》

Pin No	Signal	Function
1	Alarm B	Open collector output for Alarm B
2	+RS	+signal of RS-485 I/O
3	Alarm A	Open collector output for Alarm B
4	+15VDC	Power supply for interface adaptors
5	—RS	—signal of RS-485 I/O
6	+5VDC	Power supply for interface adaptors
7	Preset input for Alarm B	Preset Alarm B when connected to COM
8	Zero adjust	Reset zero when connected to COM
Shell	COM	Power supply and signal COM

Ordering Information

	Series	Flow range	Series	Option	Seal material	Operation		Fittings	Connector	Mounting position	Connection valves	Special	EP	Face-to-face dimension	Digital communication
SFC	148	0	F		M	C	–	4V	L						
	(1)	(2)		(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)

(1)

Symbol	Series
146	Very low flow rate models
147	Conventional low differential pressure models
148	Conventional models
157	High temperature (80℃) low differential pressure models
158	High temperature (80℃) Conventional models
167	High temperature (150℃) low differential pressure models
168	High temperature (150℃) conventional models

(2)

Symbol	Flow range (N2 equivalent)
0	10 / 20 / 30 / 50 / 100 / 200 / 300 / 500SCCM 1 / 2 / 3 / 5SLM
1	10SLM
2	20 / 30SLM

Notes: This option doesn't apply to following models SFC1460F, iow differential pressure models

(3)

Symbol	Option
Blank	None
PD	Dual range model
A	IGS model

(4)

Symbol	Seal
M	Metal
R	Rubber

(5)

Symbol	Operation
O	Normally open
C	Normally closed

(6)

Symbol	Fittings
4V	1/4" HMJ (UJR) male
	Contact us for IGS models

(7)

Symbol	Connector
L	D-sub 9-pins(Valve open/close-connected to ±15VDC type)
Q	D-sub 9-pins(Valve open/close-connected to COM. type)

(8)

Symbol	Mounting position	
Blank	Not specified	
H	specified	Horizontal
A		Vertical Inlet Up
Z		Vertical Inlet Down

(9)

Symbol	Connection valves
Blank	None
C1	Inlet pneumatic valve (NC)
O1	Inlet pneumatic valve (NO)
C2	Outlet pneumatic valve (NC)
O2	Outlet pneumatic valve (NO)

(10)

Symbol	Special
Blank	None Special item
N	Ni sensor
W	Ni free model

Note: Models with flow range of "2" use Ni sensor only

(11)

Symbol	EP
Blank	EP
K	Without EP

(12)

Symbol	Face-to-face dimension
Blank	106mm
24	124mm

(13)

Symbol	Digital communcation
Blank	RS-232C
B	RS-485

Model name of MFM is FMT in stead of SFC and without (5).

Safety Information
For your safety, please refer to the relevant instruction manual before using any of the products described in this catalog.
*Contents of this catalog are subject to change without notice. When placing an order with us, please inquire.
*Our address and your contact indicated in this catalog are those as of Jul. 2005.

Hitachi Metals, Ltd.
Head Office SEAVANS North Bldg.
2-1, 1-chome, Shibaura, Minato-ku,
Tokyo 105-8614, Japan
Tel. +81-3-5765-4296
Fax.+81-3-5765-8313

Hitachi Metals Europe GmbH
Head Office Immermannstrasse 14-16, 40210 Düsseldorf,
Germany
Tel. +49-211-16009-0
Fax.+49-211-16009-29

Hitachi Metals America, Ltd.
Head Office & New York Office
2 Manhattanville Road, Suite 301, Purchase,
NY 10577-2103, U.S.A.
Tel. +1-914-694-9200
Fax.+1-914-694-9279
San Jose Office 2107 North First Street, Suite 500, San Jose,
CA 95131-2028, U.S.A.
Tel. +1-408-467-8900
Fax.+1-408-467-8901

Hitachi Metals Singapore Pte. Ltd.
12 Gul Avenue Singapore 629656
Tel. +65-6861-7711
Fax.+65-6861-9554

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