

**D08-2F, D08-3F, D08-4F
Flow Readout Boxes**

INSTRUCTION MANUAL



A NOTE TO OUR CUSTOMERS

Dear customer,

Thank you for purchasing SEVENSTAR D08 series Flow Readout Boxes.

This user manual is important when installing and doing maintenance. Please keep it carefully.

We strongly recommend that you read this manual thoroughly before you starting to use the product. This user manual introduces the important issues including the proper and safe use of the products.

And please notice the words and section with the symbol . Not in accordance with the user manual for the use of property caused by loss or personal injury, SEVENSTAR may not be responsible.

If you require any additional information or assistant of Sevenstar D08 series Flow Readout Boxes. Please feel free to contact your local Sevenstar Sales Agent or Sevenstar Customer Service at:
(8610)- 6436 2925.

Yours sincerely,
Sevenstar

CONTENTS

1.	APPLICATIONS & FEATURES.....	1	6.1	Preparation.....	8
2.	SPECIFICATIONS.....	1	6.1.1	Control Buttons.....	8
3.	FRONTAL & BACK OPERATION PANELS.....	2	6.1.2	Power Lead Connection.....	9
4.	STRUCTURE INSTRUCTION.....	3	6.1.3	Control Line Connection.....	9
4.1	± 15V Power Supply.....	3	6.2	Operation Method.....	9
4.2	+5.00V Nominal Power Supply.....	3	6.2.1	Turn On.....	9
4.3	Displayer.....	3	6.2.2	Zero Adjustment.....	9
4.4	Valve Controller.....	4	6.2.3	Valve Controller Setting.....	9
4.5	Zero Potentiometer.....	4	6.2.4	Setting.....	9
4.6	Setting Potentiometer.....	4	6.2.5	Turn Off.....	9
4.7	Power Supply Switch.....	4	7.	Parameter Setting.....	9
4.8	Power Supply Connector.....	4	7.1	Range Selection.....	10
4.9	Fuse	4	7.2	Range Adjustment	10
4.10	Setting Selection.....	4	7.3	Radix Point Adjustment.....	10
4.11	MFC “D” Connector	5	8.	MAINTENANCE.....	10
4.12	External Control Connector.....	5	8.1	Internal Potentiometer Adjustment.....	10
4.13	Nameplate.....	5	8.2	Grounding Problem.....	10
5.	INSTALLATION & CONNECTION.....	5	8.3	Substitution.....	11
5.1	Dimension.....	5	9.	PRODUCTION SELECTION.....	11
5.2	MFC Connection.....	6	9.1	Type Selection	11
5.3	External Control Connection.....	7	9.2	Order form.....	12
6.	OPERATION PROCEDURE.....	8			

D08-2F, D08-3F, D08-4F Flow Readout Box

1. APPLICATIONS & FEATURES

Flow Readout Boxes provide operating power supply, operating control, flow setting and flow digital display for the mass flow controller (MFC) and the mass flow meter (MFM). D08 series of Flow Readout Boxes could directly connected with D07 series MFC or MFM without any change. And it can also be used for other models of MFC or MFM.

With standard desk-style section bar chassis, D08-2F, 3F, 4F Flow Readout box can control 2, 3 or 4 MFCs (or MFMs). And each channels have the independent displays and control potentiometers.

2. SPECIFICATIONS

Table1. Technical Specifications of D08-2F, D08-3F & D08-4F Flow Readout Box

No.	Items	D08-2F	D08-3F	D08-4F
1	Output Power Supply	+15V ± 3% 300mA -15V ± 3% 600mA	+15V ± 3% 600mA -15V ± 3% 1.2 A	
2	Nominal Power Supply	+5.00V ± 0.1% 5mA	+5.00V ± 0.1% 10mA	
3	Power Supply	~220V ± 10% 50Hz or ~110V ± 10% 60Hz		
4	Max Consumption	25W	45W	
5	Input & Output Signal	0 ~ +5V		
6	Dimension (mm)	Standard: 440 × 100 × 220 Max: 440 × 115 × 284		
7	Weight (kg)	4.2	4.3	4.4
8	Control Channels Display Number	2 MFCs/MFMs 2 Displays	3 MFCs/MFMs 3 Displays	4 MFCs/MFMs 4 Displays

3. FRONTAL & BACK OPERATION PANELS (Figure 1~3)

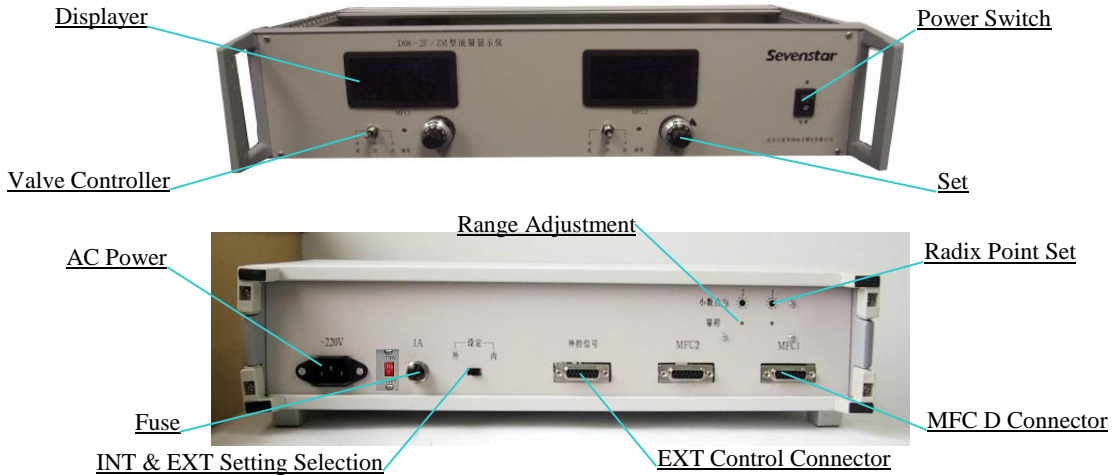


Figure 1. Frontal & Back Operation Panels of D08-2F



Figure 2. Frontal & Back Operation Panels of D08-3F



220VAC / 110VAC



Figure 3. Frontal & Back Operation Panels of D08-4F

4. STRUCTURE INSTRUCTION

4.1 $\pm 15V$ Power Supply

Composed by three-terminal integrated stabilized modules, $\pm 15V$ power supply with the simple connection, high stability and reliability are available as well as over-heat and over-load protections in the integrated stabilized electric circuit.

4.2 +5.00V Nominal Power Supply

From the +5.00V nominal power supply, the 0~5V voltage output which is adjusted by its set potentiometer can be used for controlling MFCs. Because of the soft-start circuit, the voltage will rise gradually from 0 to +5V for avoiding the overshoot of MFC responding. The time of soft-start will cost 20 seconds approximately.

4.3 Displayer

3 and 1/2 numbers panel can display the readout from MFC (The maximum value: 1800). Flow rate can be displayed by “SCCM”, “SLM” or “%FS”. Normally, the default flow range and unit of Flow Displayer will be set to the user want to. If the user cannot give MFC flow specifications, the default will be set as %FS. The SLM and SCCM LBD in the frontal panel will indicate the flow unit. Two LBD off means that flow unit is %FS. The radix point, unit of every channel could be adjusted respectively.

4.4 Valve Controller

Valve Controller is used for selecting working status of MFC. When MFC is operated normally, it should be “Valve Control”. If MFC valve need to be full opened, it should be “Purge”. MFC valve will be closed if it is “OFF”. Caution: This function can be only available for D07 series MFC without any problems. For other MFC products, please do NOT connect “ Valve Control” pin.

4.5 Zero Potentiometer

“Zero Potentiometer” can only adjust zero in a small range for D07 series MFC/MFM products. It will be useless for other MFC products.

4.6 Setting Potentiometer

The user can use “setting potentiometer” to send the voltage (0-5V) to MFC for setpoints.

4.7 Power Supply Switch

Power on or off the box.

4.8 Power Supply Connector

AC ($\sim 220V \pm 10\%$ 50Hz) should be imported by this connector.

4.9 Fuse

1A fuse tube is used. Please check the fuse if power of the box failure.

4.10 Setting Selection

“Setting selection” is used for selecting where the setting signal comes from. If it is set to “INT”, the “setting potentiometer” of the box will control the MFC. Comparably if it is set to “EXT”, the control signal of MFC will come from the “EXT control connector”.

4.11 MFC “D” Connector

15pin D connector is used for connection with the MFC/MFM. Every connector (channel) can only be connected to one MFC. Thus, two channel for D08-2F, three channel for D08-3F, and four channel for D08-4F.

4.12 External Control Connector

The 0-5V voltage can be used for external control signal Please refer table 3 for connection.

4.13 Nameplate

Nameplate indicates the actual situation of each MFC (or MFM) channel when flow readout box connected with MFC (or MFM), for example the full scales and flow units.

5. INSTALLATION & CONNECTION

5.1 Dimension (Figure 4.)

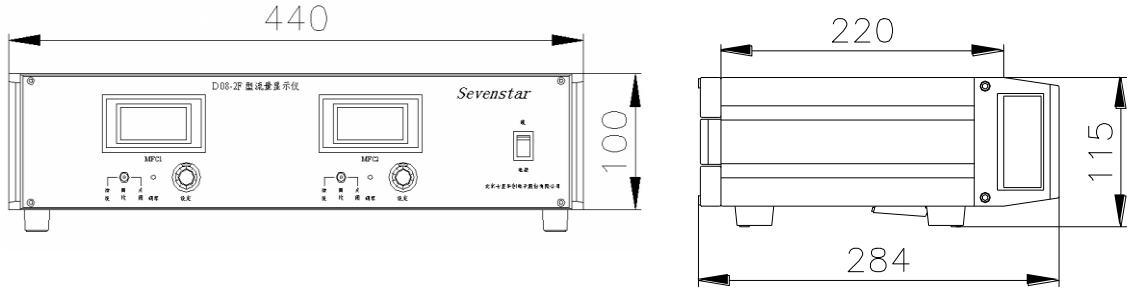


Figure 4. Chassis Dimension

Note: Dimensions are in mm.

5.2 MFC Connection

For the pin configure of MFC “D” connector, please refer to Table 2.

Table2. MFC “D” connector diagram

MFC Controller Signal	
No.	Functions
1	External Zero
2	
3	Power Common
4	Set
5	Valve Drive
6	Signal Common
7	Flow Readout
8	GND
9	
10	
11	-15V
12	-15V
13	
14	Common
15	+15V

Signals Instruction of Table 2:

- ① Necessary signals: $\pm 15V$, Power Common, Set, Flow Output and Signal Common. These signals must be connected correctly.
- ② “Valve Drive” and “ External Zero Adjustment” signals are only for D07 series MFC products. For other MFC products, please do NOT connect
- ③ GND Line normally is disconnected. (Please refer to the MAINTENANCE information)
- ④ For MFM, “Valve Drive ”and “Set” is invalid.
- ⑤ If you provide your own cable for other MFC products, we suggest that you only connect necessary signals as in ①.

5.3 External Control Connection

For External Control Connection, please refer to Table 3. PC or other external control equipments can control the MFC by external control connector.

Table 3. External Control Connection

a. D08-2F	
External Control Signal	
No.	Functions
1	+5.00V
2	Signal Common
3	External SetI
4	External SetII
5	
6	
7	Flow ReadoutI
8	Flow ReadoutII
9	
10	
11	Valve OverrideI
12	Valve OverrideII
13	
14	
15	

b. D08-3F	
External Control Signal	
No.	Functions
1	+5.00V
2	Signal Common
3	External SetI
4	External SetII
5	External SetIII
6	
7	Flow ReadoutI
8	Flow ReadoutII
9	Flow Readout III
10	
11	Valve OverrideI
12	Valve OverrideII
13	Valve Override III
14	
15	

c. D08-4F	
External Control Signal	
No.	Functions
1	+5.00V
2	Signal Common
3	External SetI
4	External SetII
5	External SetIII
6	External Set IV
7	Flow ReadoutI
8	Flow ReadoutII
9	Flow Readout IV
10	Flow Readout III
11	Valve OverrideI
12	Valve OverrideII
13	Valve Override III
14	Valve Override IV
15	

Signals Instruction of Table 3:

- a. The voltages between External Set I ~IV and signal common will be used for setting the 1~4 channel MFC respectively. If external potentiometer is used for setting, a 3.3K potentiometer can be connected with “+5.00V” and “Signal common”, and its tap can be connected with “External Set”. The user can connect D/A of computer to external control connector for the automatic control. Please make sure input impedance should be more than 10KΩ.
- b. 0~+5V voltage signals from flow readout I ~IV will indicate the flow rate from channel I~IV respectively.
- c. Valve Override I ~IV are ONLY available for D07 series MFC products without any problems. If valve Override is connected to +15V, valves will be shut off. If valve Override is connected to -15V, valves will be full opened. Valves will be in the automatic control status if valve Override is not connected. Caution: if the user wants to use external (PC control) function, “Valve Controller ” switch should be in the middle.

6. OPERATION PROCEDURE

6.1 Preparation

6.1.1 Control Button

- a. Power Supply: OFF
- b. Valve Controller: OFF
- c. Setting Potentiometer: Minimum
- d. Internal & External Setting Selection

If setting potentiometer of the box will control MFC directly, the selection should be “INT” (internal setting). If controlled by the computer, the selection should be “EXT”(external setting).

6.1.2 Power Supply Connection

One terminal of power lead should be connected with power connector of the back panel. And another one should be connected with AC power. (Please make sure power supply should be $\sim 220V \pm 10\%$ 50Hz, and the ground terminal of three-phase plug has been connected to the ground properly ,otherwise flow readout box maybe operate incorrectly.)

6.1.3 Control Line Connection

Please use the appropriate cable to connect the MFC/MFM according to the configure

6.2 Operation Method

Please refer to the related technical instruction of MFC (or MFM).

6.2.1 Turn On

Connect with power supply and switch on.

6.2.2 Zero Adjustment:

The “Zero Potentiometer” is ONLY available for D07 series MFC/MFM. After warming up by 15 minutes, without flow passing, “Zero Potentiometer” could be adjusted by a small screwdriver.

6.2.3 Valve controller Setting:

For normal operating, it should be “Valve Control”. And it can be used to drive valve full open or close.

6.2.4 Setting

Adjusting ten-rounded potentiometer of panel will give setpoint to the MFC.

6.2.5 Turn Off:

AC power should be shut off after using.

7. PARAMETER SETTING

Please select the appropriate flow unit and range for the MFC/MFM. If necessary, the user can change flow unit and range by “radix point”, “Unit set” and “range adjustment” for D08-2F/3F/4F.

7.1 Range Selection

High accuracy will be acquired by the appropriate range and radix. Normally the full range should be 1,000. For example, if the full scale of MFC/MFM is 30SCCM or 30SLM, the full scale range of the box should be 30.0 (one decimal place) instead of 30. Another one, if full scale of MFC/MFM is 1SLM, the full scale range of the box should be 1.000. And if full scale of MFC/MFM is 10SCCM or 10SLM, the full scale range of the box should be 10.00.

7.2 Range Adjustment

Please select “INT”, and short the pin 4(set) and pin 7(flow readout) of without connection with the MFC/MFM firstly. And adjust the “Set” potentiometer to maximum value. Then, adjust the “Range adjustment” potentiometer to the value you want.

7.3 Radix Point Adjustment

Figure 5 shows the configuration of radix point adjustment. The corresponded relations are showed in Table 4.

Figure 5. Radix Point Position Switch

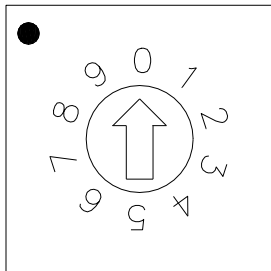


Table 4. Radix Point Position Table

Pointer Position	Radix Point Position
0or 8	XXXX
1or 9	X.XXX
2	XX.XX
4	XXX.X

8. MAINTENANCE

8.1 Internal Potentiometer Adjustment

All internal potentiometers in the device have been already adjusted before delivery. Please do NOT adjust it.

8.2 Grounding Connection

In principle, the ground of the Flow Readout Box (Power GND) and the cover of MFC (or MFM) should be connected for sharing the same grounding place. But they can be connected with the bases respectively, if the connection cable is too long. In this way, please make sure the box must NOT be connected with ground of the MFC because ground wire may be broken, even burning.

8.3 Substitution

If the Flow Readout Box is used for other model MFC (or MFM), please make sure the capability of power supply and the correct connections firstly. Especially, please be very careful for the valve control function and connections because it is quite different according to the different models.

9. PRODUCTION SELECTION

9.1 Type selection

Type	Circuit				Cases			Display			Power supply			Output voltage		Other functions							
	MFC	MFM	Ana.	Dig.	Mini-Type	Desk-style	Rack-desk-style	1 channel 1 Display	Multi-Channel 1 Display	Multi-Channel Multi-Display	~110 VAC	~220 VAC	~85-265 VAC	±15 VDC	+24 VDC	4~20mA/0~10mA I input	4~20mA/0~10mA I output	4~20mA / 1~5V Input Signal	4~20mA / 1~5V Output Signal	RS232/RS485 Communication	Setpoint display	Flow Accumulator	
1F	✓	✓	✓		✓			✓					✓	✓		✓	✓						
1FM		✓	✓		✓			✓					✓	✓		✓							
1FP	✓	✓	✓		✓			✓					✓	✓		✓	✓					✓	
1/2/4	✓	✓	✓			✓			✓				✓	✓									
2F/3F/4F	✓	✓	✓			✓					✓	✓		✓									
2B/3B/4B		✓	✓				✓							✓									
2E/3E/4E	✓	✓	✓											✓									
1K	✓	✓	✓		✓			✓					✓		✓			✓	1~5V				
1G	✓	✓		✓	✓			✓					✓	✓						✓			
1GM		✓		✓	✓			✓					✓	✓						✓			
8C	✓	✓		✓	✓			✓					✓	✓						✓			✓
8CM		✓		✓	✓			✓					✓	✓						✓			✓

9.2 Order form

D08- [t] - [p] - [s]

[t] – Type
2F/3F/4F

[p] – Power supply
 -[] ~220VAC ± 10% 50Hz
 include ~85–265VAC wide voltage input
 -[D] ~110VAC ± 10% 60Hz

[s] – Special request
 -[] percentage display (%FS) for each channel,
 -[S] List full scale of each channel (see table on right side) and other request.
 If only one channel needs %FS unit, please fill in “S”.

scale	code
5sccm	A
10sccm	B
20sccm	C
30sccm	D
50sccm	E
100sccm	F
200sccm	G
300sccm	H
500sccm	J
1slm	K
2slm	L
3slm	M
5slm	N
10slm	P
20slm	Q
30slm	R
50slm	U
100slm	V
150slm	W
200slm	X
250slm	Y
300slm	Z
percentage display	S



Beijing Sevenstar Flow Co.,Ltd.

D08 Series Flow Readout Boxes

Beijing Sevenstar Flow Co., Ltd.

Address: No.8 Wenchang Avenue Beijing Economic-Technological
Development Area
Post code: 100176
Tel: (+86) 10-56178088
Fax: (+86) 10-56178099
Homepage: www.mfcsevenstar.cn
E-Mail: mfcsales@sevenstar.com.cn

Shanghai Office: Room 802-803, Building 3, No. 88 Shengrong Road, Pudong
New District, Shanghai
Tel: (+86)-21-63532370

Shenzhen Office: Room 202,Section B, No. 1 Chuangjin, No.125 Chuangye
Erlu, 28th Section, Baoan District, Shenzhen
Tel: (+86)-755-88290258
Fax: (+86)-755-88294770

*Description may be changed following improvements to product. The information contained in this document is subject to change without notice.
*If there is any mistake in this uses manual, please feel free to contact us.