Sevenstar

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D08-2E Flow Readout Boxes
D08-3E Flow Readout Boxes
D08-4E Flow Readout Boxes

INSTRUCTION MANUAL

Sevenstar

Version Jan，2023

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,
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CONTENTS

D08-2E, D08-3E, D08-4E
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 can be 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 mounting aluminum section bar chassis, D08-2E, 3E, 4E Flow Readout box can control 2, 3 or 4 MFCs (or MFMs). And each channels have the independent displays and control potentiometers.

2. SPECIFICATIONS

Table 1. Specifications of D08-2E, D08-3E and D08-4E Flow Displayers

No	Item	D08-2E	D08-3E	D08-4E
1	Output Power Supply	+15V±5% 300mA -15V±5% 600mA	+15V±5% 600mA -15V±5% 1.2A	
2	Nominal Power Supply	+5.00V±0.1% 5mA	+5.00V±0.1% 10mA	
3	Power Supply	~220V±10% 50Hz		
4	Max Consumption	25W	45W	
5	Input & Output Signal	0 ~ +5V		
6	Dimension (mm)	Series Mounting Chassis 483×140×320		
7	Weight (kg)	6	7	7.5
8	Control Channels Display Number	2 MFCs/MFMs 2 Displayers	3 MFCs/MFMs 3 Displayers	4 MFCs/MFMs 4 Displayers

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

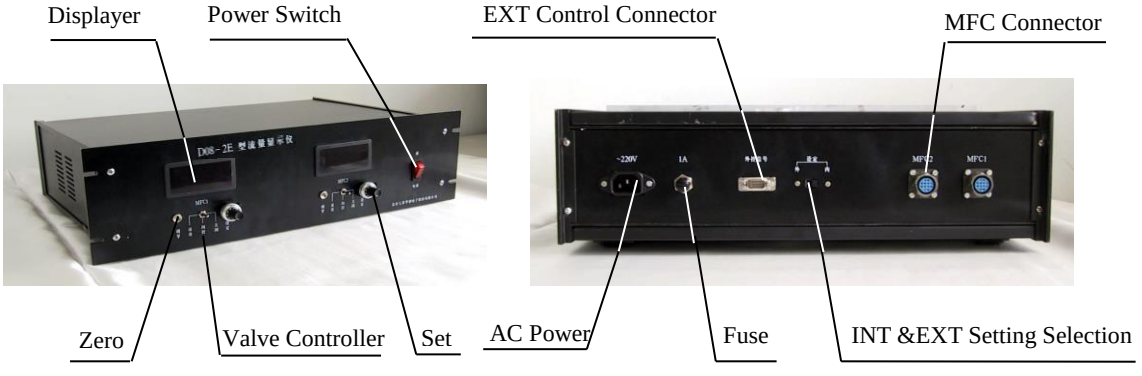

Figure 1. D08-2E Frontal & Back Operation Panels

Figure 2. D08-3E Frontal & Back Operation Panels

Figure 3. D08-4E Frontal & Back Operation Panels

4. STRUCTURE INSTRUCTION

4.1 ±15V Power Supply

Composed by three-terminal integrated stabilized modules, ±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 rises gradually from 0 to +5.00V 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: Power on or off the box.

4.8 Power Supply Connector

AC （~220V±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 “Q” Connector

12pin “Q” connector is used for connection with the MFC/MFM. Every connector (channel) can only be connected to one MFC. Thus, two channel for D08-2E, three channel for D08-3E, and four channel for D08-4E.

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

Dimensions & installations are showing in figure 4.

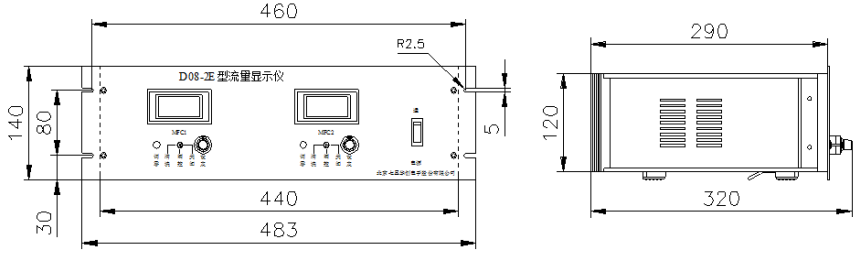

Figure 4. Dimension of 2E/3E/4E

Note: Dimensions are in mm.

5.2 MFC Connection

For the pin configure of MFC "Q" connector, please refer to Table 2.

Table2. MFC "Q" connector diagram

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

Signals Instruction of Table 2:

① Necessary signals: ± 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)

5.3 External Control Socket Connection

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

a. D08-2E External Control Signal

No.	Specialties
1	+5.00V
2	Signal common
3	External Set Ⅰ
4	External Set Ⅱ
5	Flow Readout Ⅰ
6	Flow Readout Ⅱ
7	Valve Override Ⅰ
8	Valve Override Ⅱ
9	

b. D08-3E External Control Signal

No.	Specialties
1	+5.00V
2	Signal common
3	External Set Ⅰ
4	External Set Ⅱ
5	External SetⅢ
6	
7	Flow Readout Ⅰ
8	Flow Readout Ⅱ
9	Flow ReadoutⅢ
10	
11	Valve Override Ⅰ
12	Valve Override Ⅱ
13	Valve OverrideⅢ
14	
15	

c. D08-4E External Control Signal

No.	Specialties
1	+5.00V
2	Signal common
3	External Set Ⅰ
4	External Set Ⅱ
5	External Set Ⅲ
6	External Set Ⅳ
7	Flow Readout Ⅰ
8	Flow Readout Ⅱ
9	Flow Readout Ⅲ
10	Flow Readout Ⅳ
11	Valve Override Ⅰ
12	Valve Override Ⅱ
13	Valve OverrideⅢ
14	Valve OverrideⅣ
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 INSTRUCTION

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 ~220V±10% 50Hz, 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

Flow rate unit indication & range should be based on MFC (MFM). Normally, we have set it before it lead to the users. If the flow unit is set as percentage "%", general speaking, which could operate together with any kind of flow range MFC (MFM).

Our D08 series products could not support displayer flow range adjustment by users, it should be returned back while needed, or ask for our professional customers service staff. If user wants to change its flow range before operating, we suggest use our D08-1, D08-2 & D08-4 series or D08-1F ~ 4F series products. Therefore, according to our Instruction Manual, users could adjust flow range and unit by themselves.

8. CAUTION

8.1 Inner Potentiometer Adjustment

The inner potentiometer of device is already well adjusted before delivery, users should be better not self-adjust it optionally.

8.2 Grounding Connection

Between Flow Readout Box (Power GND) and MFC, normally, it should be connected with ground and shared the same grounding place. If there is rather distant between them, chassis should separately connect with its rack, but please be sure the power box should be disconnected with ground wire of MFC cable, otherwise ground wire disturbing will happen, even caused to ground wire burning accident.

8.3 Substitution

If use Flow Readout Box connecting with international other model MFC, please be sure it is matched capacity of power supply and could achieve correct wiring and converting. Especially, please be careful the "valve control" and "Zero Potentiometer" function is quite different of other models, when need operating, it should be altered wires or disconnected it.

9. PRODUCTION SELECTION

9.1 Type selection

			Circuit		Cases			Display			Power supply			Output voltage		Other funtions						
Type	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 Commu-nication	Setpoint display	Flow Accumu -lator
1F	√	√	√		√			√					√	√		√	√					
1FM		√	√		√			√					√	√			√					
1FP	√	√	√		√			√					√	√		√	√				√	
1/2/4	√	√	√			√			√			√		√								
2F/3F/4F	√	√	√			√				√	√	√		√								
2B/3B/4B 2E/3E/4E	√	√	√				√			√		√		√								
1K	√	√	√		√			√					√		√			√	1~5V			
1G	√	√		√	√			√					√	√						√		
1GM		√		√	√			√					√	√						√		
8C	√	√		√	√			√					√	√						√		√
8CM		√		√	√			√					√	√						√		√

Note: D08-1JM and D08-1H are custom-built.

“Set” and “Valve Control” is invalid for MFMs.

9.2 Order form

D08– [t] - [o] [p] [c] [b] - [s]

[t] – Type
1F/1FM/1FP
1/2/4
2F/3F/4F
2E/3E/4E
1K
1G/1GM
8C/8CM
AC
1JM/1H

[o] –Input and output signal
-[ ] 0 to 5VDC
-[V] 1 to 5VDC
-[C] 4 to 20mA
-[A] 0 to 10mA

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

[c] – Communication type
-[ ] no communication
-[2] RS232
-[4] RS485

[b] – E series panel color
-[ ] not B series
-[H] Black
-[W] white

[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

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D08 Series

Flow Readout Boxes

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∗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.