

D08-1K Flow Readout Box

Instruction Manual



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,
Sevenstar

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DOB SERIES FLOW READOUT BOXES

D08-1K

Flow Readout Boxes

1. APPLICATIONS & FEATURES

Flow Readout Boxes provide operating power supply, operating control, flow setting and flow digital display for mass flow controller (MFC) and mass flow meter (MFM). D08 series of Flow Readout Boxes could directly connect with our corresponding D07 series MFC or MFM. Meanwhile, it also possible conjugates to other international models of MFC or MFM.

Flow Display used mini-type of plastic chassis, due to the small volume, which is quite convenient to install it.

D08-1K Flow Display is especially connected with MFC or MFM which is supplied by 24VDC power and has 4~20mA current signal of input and output.



Figure 1. Display & MFC

2. SPECIFICATIONS

Table 1. Specifications of D08-1K Flow Display

No.	Item	Specifications
1	Output Power Supply	24VDC \pm 5% 400mA
2	Power Supply	\sim 85—265 VAC 50/60 Hz
3	Max Consumption	15 W
4	Output & Input Signal	Output Voltage: 1 ~ +5V Output Current: 4~20mA
5	Dimension(mm)	96 \times 96 \times 155
6	Weight (kg)	1
7	Control Channel	1 MFC

3. APPEARANCE & OPERATION PANEL

D08/1K Flow Display is applied standard inlay plastic chassis, its appearance and operation panel are showing in figure 2.

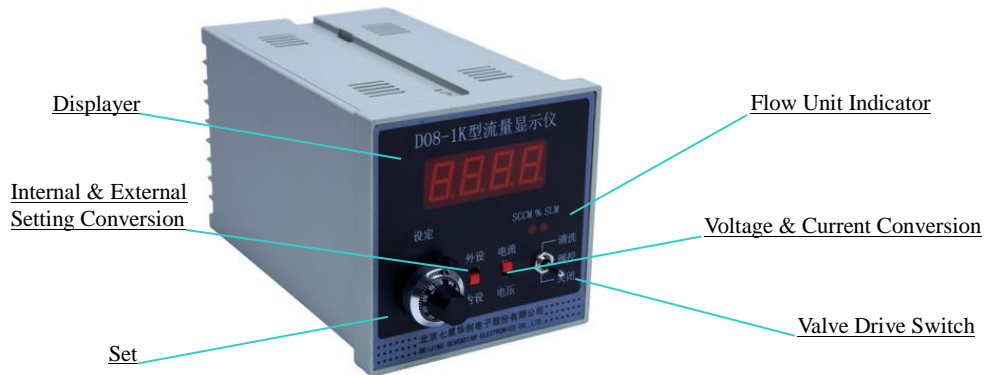


Figure 2. 1K Flow Display

4. STRUCTURE INSTRUCTION

4.1 24VDC Power Supply

Composed by switching modules, the AC power supply has wide input voltage and strong anti-jamming. With over-heat and over load protection, the output voltage +24VDC has high stability and reliability.

4.2 Nominal Power Supply and Flow Setting

There is +5.00V nominal power supply of 1K Display, which is loaded to the setting potentiometer and provides 1~5V presetting voltage outputting by manual adjustment of users to control the MFC (or MFM). There is also voltage & current conversion circuit which converts 1~5V presetting voltage to 4~20mA presetting current. This power supply designed soft-start circuit, in case of power supply turned on, the nominal power supply slowly rises from zero to +5V, soft-start need around 20 seconds.

4.3 Displayer

3 and 1/2 numbers panel can display the readout from MFC (The maximum value: 1999). 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 %F.S. The SLM and SCCM LED 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 Voltage & Current Conversion

“Voltage & Current Conversion” switch is in the display panel, when it is positioned in “Voltage” ,it is operated with 1~5VDC MFC (or MFM); when positioned in “Current”, it is operated with 4~20mA MFC (or MFM).

4.6 Internal & External Setting Selection

1K Display has “Inner & Outer Setting Conversion” switch, when it is positioned in “Inner setting” ,gas flow is controlled by setting potentiometer in the display panel; when it is positioned in “External Setting”,it could be input external computer signal which is provided by user to the end of “SET” and “Signal common” to control flow rate as presetting signal (showing in figure 4).

4.7 Power Supply

External power supply:~85—265VAC,50/60Hz; max consumption:15W. As showing is figure 5,it is connected to the two terminals of “~85—265V”.The ground of chassis is connected to the end of “GND” .

5. INSTALLATION & CONNECTION

5.1 Dimension & Installation (figure3)

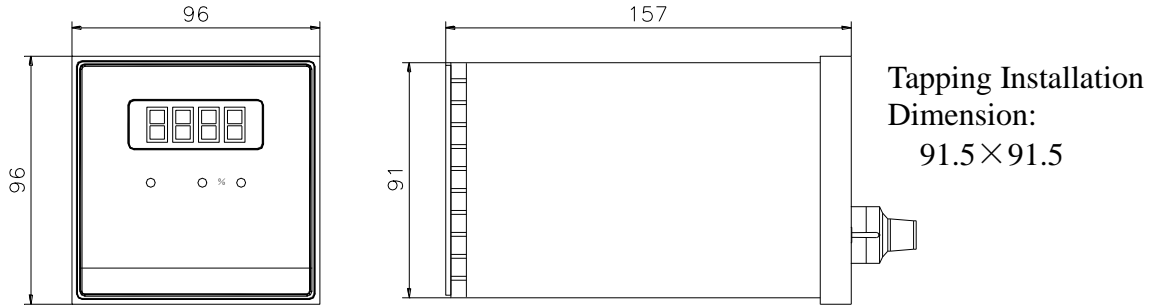


Figure 3. Dimension of 1K Readout Box Chassis

Note: Dimensions are in mm.

5.2 1K Connection

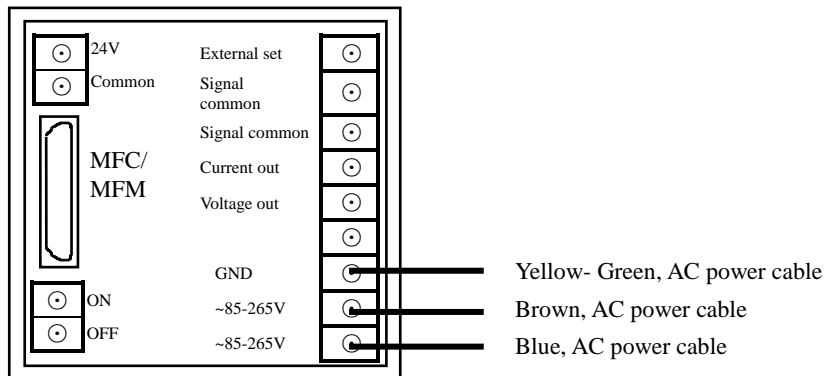


Figure 4. Back View of D08-1K Connection

220V AC wiring: The wire color of three-core AC Power cable includes brown, blue and yellow-green. On the back of D08-1K , two ‘~85-265V’ ports are connected to the brown wire and the blue wire respectively, ‘GND’ port is connected to the yellow-green wire.

The AC power and external signal control terminal of D08-1K Flow Readout Box are showing in figure 4.

The “External set” is a voltage signal (1~+5V) or a current signal (4~20mA). And the selection of “External set” signal must match with the MFM/MFC which connects to the Flow Readout Box. The “Current out” signal is a current signal (4~20mA) of the MFM/MFC. The “Voltage out” signal is a voltage signal (1~+5V) of the MFM/MFC.

The terminals of “ON” and “OFF” are external valve control. When “Valve Controller” switch in the 1K Flow Display panel is “ Valve Auto”, external computer can implement “PURGE” or “OFF” function by the terminal of “ON” or “OFF”. When the terminal of “ON” is connected to “24V”, the valve is open, implementing “PURGE” function; when the end of “OFF” is connected to “Power Common”, the valve is “OFF”. Attention: to MFC such as D07-9F, if “PURGE” and “OFF” work in the mean time, MFC is in the “PURGE” state.

5.3 MFC/MFM Signal Connection

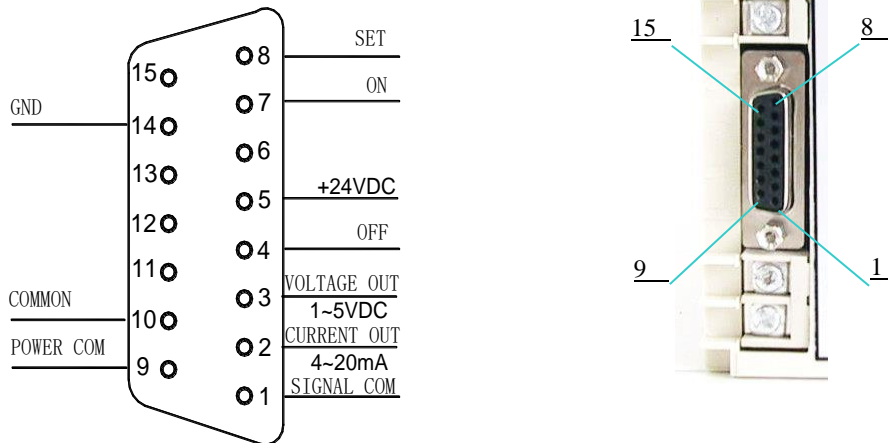


Figure 5. MFC/MFM Signal Socket and Connection

6. OPERATION INSTRUCTION

The operation details of Flow Display and MFC (or MFM) connection is referenced in related MFC(MFM) operation instruction.

- 6.1 Turn On: connect with power supply (There is no power supply switch of 1K, operates it after AC connecting).
- 6.2 Zero Adjustment: warming up 15 to 30 minutes after turning it on, in case of no thru-flow, users could use screwdriver to adjust zero potentiometer of MFC/MFM.
- 6.3 There are three phases of valve control switch, it should be positioned in “Auto” during its normal operating.
- 6.4 Flow internal setting signals are adjusted by ten-rounded potentiometer of panel.
- 6.5 Shut Off: disconnected AC power.

7. PARAMETER SETTING

Flow rate unit indication & range should be based on MFC (MFM). Normally, we set it before it come to the users. If user wants to change its ranges before operating, you could adjust flow range and unit by related switch and potentiometer after open its overall. The related switch and potentiometer are showing in figure 6.

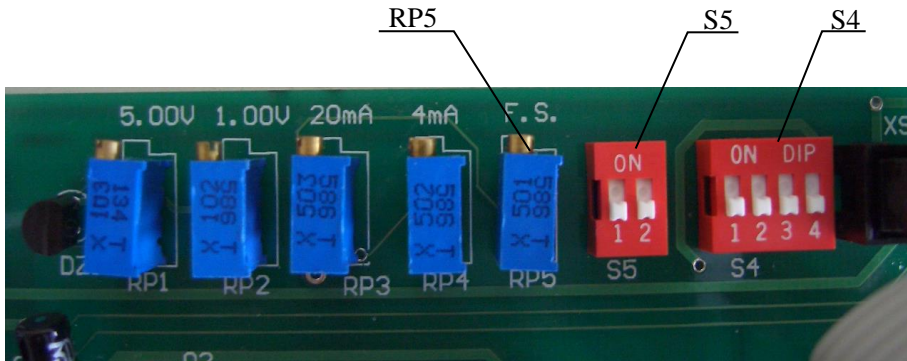


Figure 6. Switches & Potentiometer Positions

7.1 Flow Unit Change

“SCCM & SLM” flow unit switch S5 position is showing in figure 7:

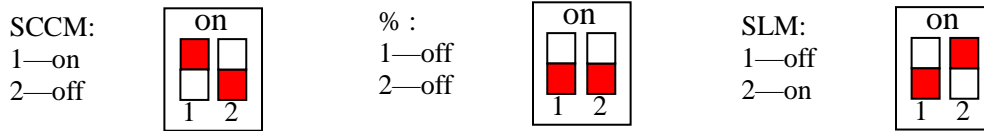


Figure 7. Flow Unit Display Switch Position

7.2 Radix Point Modifying

The radix point position of flow display could be modified by switch S4, as showing in figure 8.

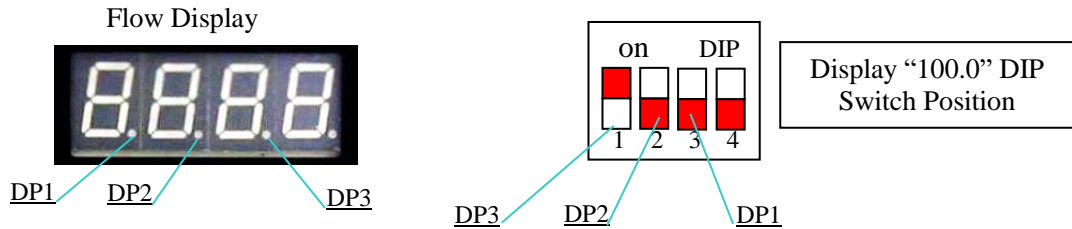


Figure 8. The Related Switches Positions Of Radix Point Modifying

7.3 Displayed Range Adjustment

Display flow range adjustment includes display effective data and radix point modifying. The radix point modifying could be referenced as 7.2, display effective data modifying should be followed as:

- Disconnected by power supply, take down the connector and the power wire of MFC/MFM, and then open its overall;
- The “Internal & External Setting Conversion” switch of front panel should be positioned in “Internal Set”, and the “Voltage & Current Conversion” switch of front panel should be positioned in “Voltage”. Short the “VOLTAGE OUT” and “SET” of back panel, and turn the setting potentiometer clockwise to maximum (Internal Set output voltage scale is 1~5.00VDC)

- c. Connecting to power supply, after 20 seconds, for the display value, it could be adjusted potentiometer RP5 (showing in figure 6) by screwdriver to match the same full scale value of bypass (Please be attention, the display data range is 0~1999 of corresponding 3 and 1/2 digital voltage meter and simultaneously matching position of radix point.)
- d. Disconnect the power supply, then cut off the wire of “VOLTAGE OUT” from “SET”
- e. After mount its overall, the range adjustment is terminated (resume the right position of “Internal & External Setting Conversion” switch and “Voltage & Current Conversion” switch) to normal operation.

8. CAUTION

8.1 Forbidden Item

All internal potentiometers in the device have been already adjusted before delivery, please do NOT adjust it. The maximum 24V power should not be overload.

8.2 Flow Range Adjustment

Flow range adjustment should be under controlled or advised by our professional maintainer and customer service staff. It should be especially careful operating while it was open or connected by power.

8.3 Fuse Change

D08-1K Flow Readout Box power fuse is inside box chassis, in case of no display indicated by power connecting, it could be checked for fuse situation. In this time, it should be loosen the bolt of chassis and lift down the overall to change the fuse.

8.4 Grounding Connection Problem

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.

8.5 Substitution

If use Flow Readout Box connecting with international other model MFC, please be sure is it matched capacity of power supply and could achieve correct wiring and converting. Especially, please be careful the valve control 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

Type	Circuit				Cases			Display			Power supply			Output voltage		Other funtions							
	MFC	MFM	Ana.	Dig.	Mini-Type	Desk-style	Rack-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] - [o] [p] [c] [b] - [s]

[t] – Type ←

1F/1FM/1FS
1/2/4
2F/3F/4F
2B/3B/4B
1K
1G/1GM
8C/8CM

[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] – B 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

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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.