

## D08-1F, D08-1FP, D08-1FM Flow Readout Box

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### Instruction Manual



北京七星华创流量计有限公司  
Beijing Sevenstar Flow Co., Ltd.  
Version July, 2020



## 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

<b>1.</b>	<b>APPLICATIONS &amp; FEATURES</b>	<b>1</b>
<b>2.</b>	<b>SPECIFICATIONS</b>	<b>2</b>
<b>3.</b>	<b>APPEARANCES &amp; OPERATING PANEL</b>	<b>2</b>
<b>4.</b>	<b>STRUCTURE INSTRUCTION</b>	<b>4</b>
4.1	$\pm 15V$ Power Supply	4
4.2	Nominal Power Supply & Flow Setting	4
4.3	Displayer	4
4.4	Valve Controller	4
4.5	Zero Potentiometer	4
4.6	D08-1FP Set point display	4
<b>5.</b>	<b>INSTALLATION &amp; CONNECTION</b>	<b>4</b>
5.1	Dimension	5
5.2	Installation	5
5.3	D08-1F&1FP Connection	6
5.4	D08-1FM Connection	8
5.5	Protection Board	8
5.6	MFC/MFM“D” Connector	9
<b>6.</b>	<b>OPERATION INSTRUCTIONS</b>	<b>9</b>
<b>7.</b>	<b>PARAMETER SETTING</b>	<b>10</b>
7.1	Flow Unit Change	10
7.2	Radix Point Modifying	11
7.3	Displayed Range Adjustment	11
<b>8.</b>	<b>CAUTION</b>	<b>12</b>
<b>9.</b>	<b>TYPE SELECTION</b>	<b>13</b>

D08 SERIES FLOW READOUT BOXES

# Operating Instruction

## 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 mini-style of plastic chassis, due to the small volume, D08-1F, 1FP, 1FM are quite convenient to be installed. Besides the standard 0~+5V signal, there are 4~20mA or 0~10mA current signals of flow input & output signals.

D08-1F Flow Displayer have functions of flow setting and valves drive, it could be operated together with MFC or MFM. Besides the same function as D08-1F, D08-1FP Flow Displayer also has function of set point display.

D08-1FM do not have flow setting and valves drive functions, which is ONLY used with MFM.



Figure 1. Displayer & MFC

## 2. SPECIFICATIONS

Table 1. Specifications of D08-1F, D08-1FP, D08-1FM Flow Readout Boxes

No.	Items	D08-1F&1FP	D08-1FM
1	Output Power Supply	+15V $\pm$ 3% 400mA	-15V $\pm$ 3% 400mA
2	Nominal Power Supply	+5.00V $\pm$ 0.1% 5mA	
3	Power Supply	~85—265 VAC 50/60 Hz	
4	Max Consumption	15 W	
5	Output & Input Signal	Voltage Signal: 0 ~ +5V Electric Signal: 4~20mA (or 0~10mA)	Output Voltage: 0 ~ +5V Output Current: 4~20mA (or 0~10mA)
6	Dimension(mm)	96 $\times$ 96 $\times$ 157	
7	Control Channels	1 MFC/MFM	1 MFM (Without Valve Drive & Setting)
8	EMC	Pass CE certificate	
9	Weight(kg)	1	

## 3. APPEARANCE & OPERATION PANEL

Three models of Flow Readout Box are all applied standard inlay plastic chassis, its appearances and operation panels are showing in figure 2-4.



Figure 2. 1F Flow Readout Box



Figure 3. 1FP Flow Readout Box



Figure 4. 1FM Flow Readout Box

## **4. STRUCTURE INSTRUCTION**

### **4.1 $\pm 15V$ 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  $\pm 15VDC$  has high stability and reliability.

### **4.2 Nominal Power Supply and Flow Setting**

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. 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: 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 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 D08-1FP Setpoint Display Function**

1FM have the same function of 1F. 1FM also has function of setpoint display. When the Selection switch is on “Flow display”, the Displayer displays the real flow. When the Selection switch is on “Setpoint display”, the Displayer displays the setpoint value.

## **5. INSTALLATION & CONNECTION**

## 5.1 Dimension (figure5)

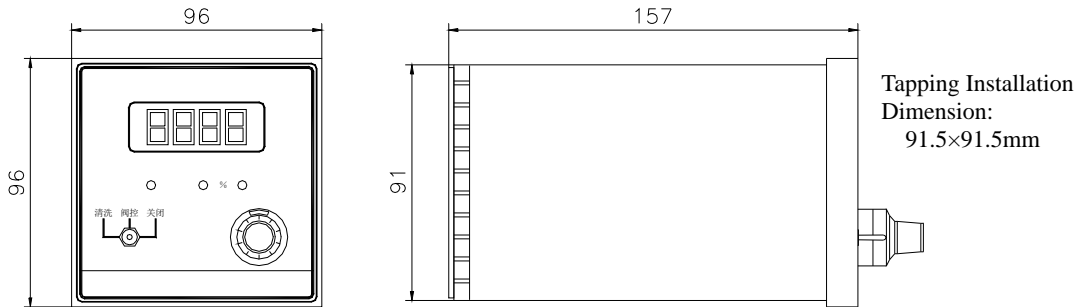


Figure 5. Dimension of 1F, 1FP, 1FM Readout Boxes Chassis

## 5.2 Installation

5.2.1 Accessories include two sets of long bracket, short bracket and bolt (figure6). They are used for fixing the Flow Readout Box on the panel.



Figure 6. Accessories of D08-1F & D08-1FP & D08-1FM

5.2.2 Insert the long bracket into the slot on upside and downside of Flow Readout Box (figure7).

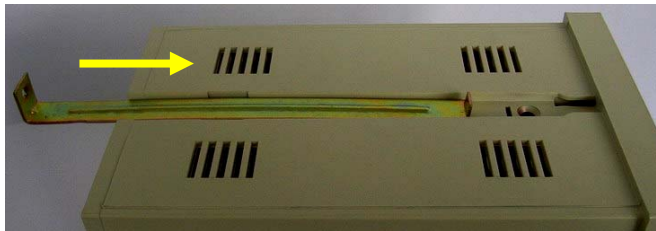


Figure 7. Insert the long bracket



### 5.2.3 Mounting the short bracket (figure8).

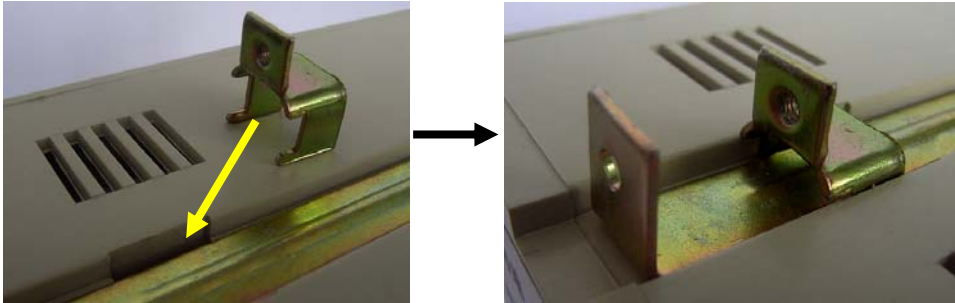
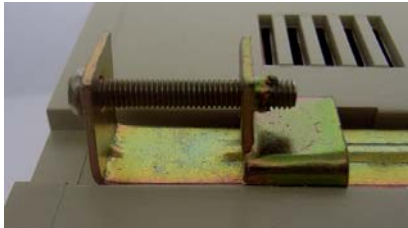


Figure 8. Mounting the short bracket

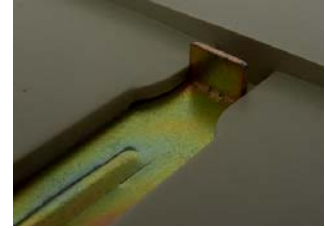
### 5.2.4 Insert the long bracket into the slot on upside and downside of Flow Readout Box (figure9).



A. put the bolt



B. screw the bolt



C. clamp the panel

Figure 9. Fixing the Flow Readout Box

## 5.3 D08-1F&1FP Connection

The ~220V power supply wire and external signal control terminal of D08-1F&1FP Flow Readout Boxes are showing in figure 5.

Besides providing 0~+5V voltage input and output signals, 1F&1FP also has current input and output signals. It can be converted by the rear of connecting terminals shifts.

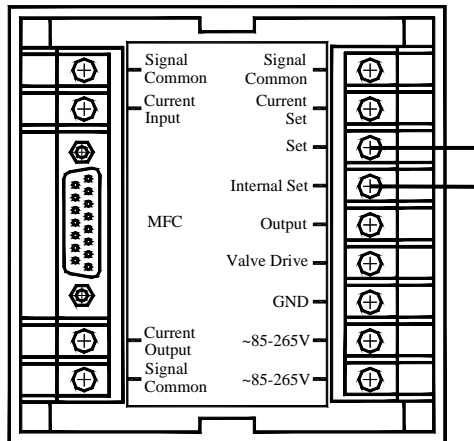
Normally, the flow readout box is set as “Internal Set” function (which is showing as figure 10a), when shorting “Set” and “Internal Set”, the “setting potentiometer” of the box will control the MFC.

When “Set” and “Internal Set” connecting terminals is not connected, the box is in the position of “Voltage Set” and “External Set”, users connect 0~+5.00V voltage which it is provided by himself (PC data module converter) to “Set” and “Signal common” terminals to be the external setting signal to control the MFC (figure 10b). It also external connects a setting converter to function as internal and external setting conversion.

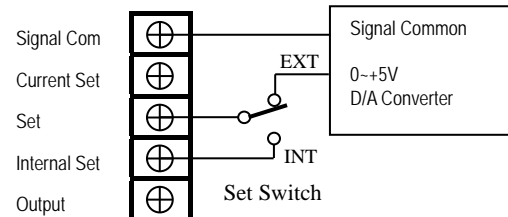
When shorting “Set” and “Current Set” terminal, showing in figure 10c, the box is in the “Current Setting” position, then the input 4~20mA(or 0~10mA) signals of “Current Input” will control the MFC.

No matter what is current setting or voltage setting, the box has current output and voltage output. Terminal of “Current Test” is corresponding with “Signal common” output 0~+5V flow signals; terminal of “Current Output” output 4~20mA(or 0~10mA) flow signals. Whether input and output 4~20mA or 0~10mA, it could depend on users order statements and indicate in the rear of chassis.

a. “Internal Set” Connection



b. Internal & External “Voltage Set” Conversion Connection



c. “Current Set” Connection

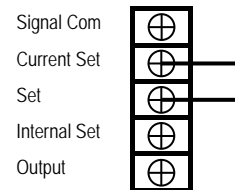
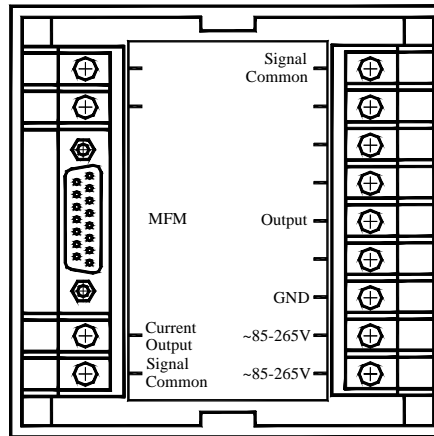


Figure 10. Back View of D08-1F&1FP Connection

## 5.4 D08-1FM Connection

The wire of AC power supply and output signal terminal connection of D08-1FM Readout Box are showing in figure 11.

Figure 11. Back View of D08-1FM Connection



## 5.5 Protection Board

Mounting the protection board after above connection (figure 12).

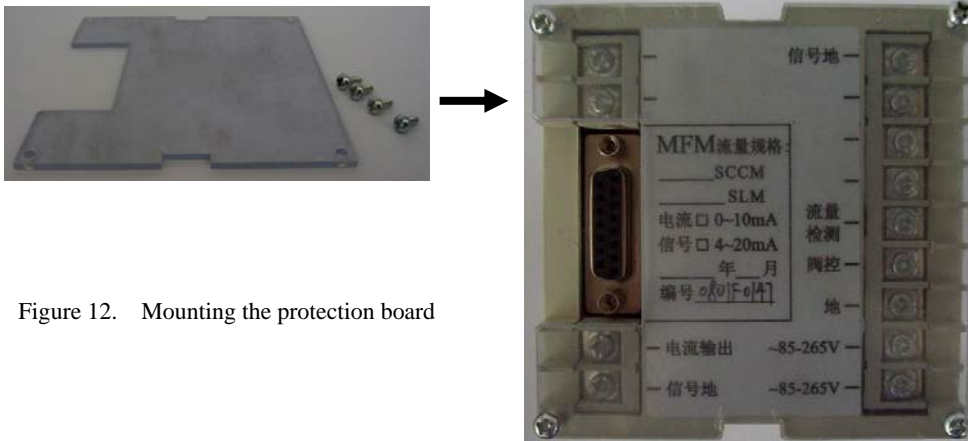
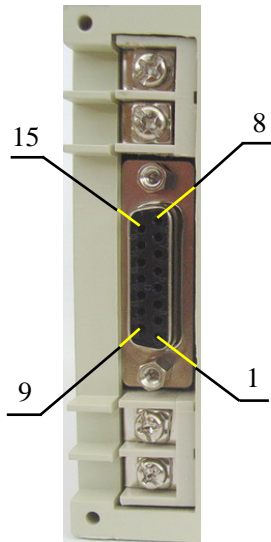


Figure 12. Mounting the protection board

## 5.6 MFC/MFM “D” connector



D08-1F&1FP MFC Signal	
No.	Specialties
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

1FM MFM Signal	
No.	Specialties
1	External Zero
2	
3	Power Common
4	
5	
6	Signal Common
7	Flow Readout
8	GND
9	
10	
11	-15V
12	-15V
13	
14	Common
15	+15V

Figure 13. MFC/MFM “D” Connector diagram

## 6. OPERATION INSTRUCTION

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

- 6.1 Turn On: Connect with power supply, device begin operating (There is no power supply switch of 1F,1FP and 1FM, operates it after external alternating current connecting).
- 6.2 MFC (or MFM) Zero Adjustment: warming up 15 minutes after turning it on, in case of no thru-flow, users could use screwdriver to adjust zero potentiometer of display panel.

- 6.3 There are three phases of valve control switch; it should be positioned in “Valve Control” during its normal operating (1FM could not be functioned as this).
- 6.4 Flow internal setting signals are adjusted by ten-rounded potentiometer of panel (1FM could not have this function).
- 6.5 Shut Off: disconnected its external alternating current.

## 7. PARAMETER SETTING

Flow rate unit indication & range should be based on MFC (or MFM). Normally, we set them before come to the users. If user wants to change them ranges before operating, they can adjust flow range and unit by related switches and potentiometer after open its overall. The related switch and potentiometer are showing in figure 14.

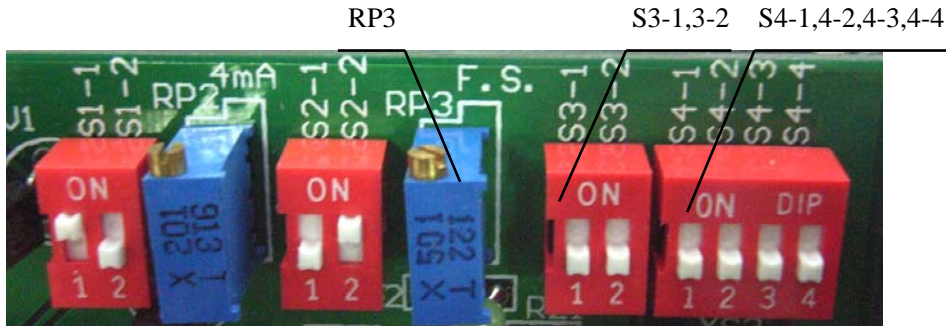


Figure 14. Switches & Potentiometer Positions

### 7.1 Flow Unit Change

“SCCM & SLM” flow unit switches positions are showing in figure 15:

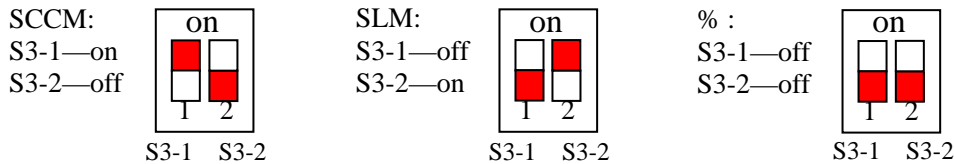


Figure 15. Flow Unit Display Switches Positions

## 7.2 Radix Point Modifying

The radix point position of flow display could be modified by switches S4, as showing in figure16.

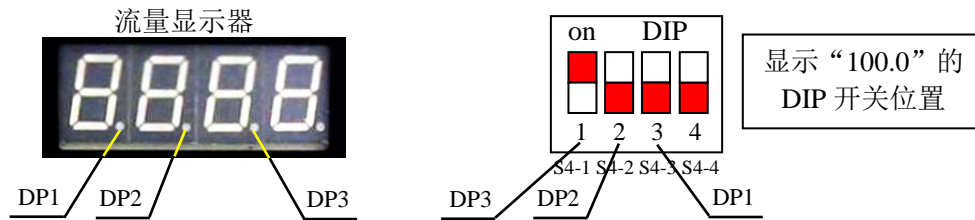


Figure 16. The Related Switches Positions Of Radix Point Modifying

## 7.3 Displayed Range Adjustment

Flow range display adjustment includes display effective data and radix point modifying. The radix point modifying can be referenced as 7.3; display effective data modifying should be followed as:

- Disconnected by power supply, take down the connector and the power wire of MFC/MFM (Take down short wires between “SET” and “Internal Set”), and then open the overall.
- For 1FM, we need input +5.00V voltage between the terminal “Flow Readout” and “Signal Common” of back panel. For 1F&1FP, we need short the terminal of “Flow Readout” & “Internal Set” of back panel and turn the setting potentiometer Clock Wise to maximum (Internal Set output signal is full scale +5.00V)
- Connecting to power supply, after 20 seconds, for the display value, adjust the potentiometer RP3 (showing in figure 10) 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.)
- Disconnect the power supply, for 1FM, it should be cut off external +5.00V voltage; for 1F&1FP Flow Readout Box, it should be cut off the wire of “Flow Readout” from “ Internal Set”.
- After mounting its overall, the range adjustment is terminated (resume the short wire of “Set” from “Internal Set”) 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 15V 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**

D08-1F/1FP/1FM 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**

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 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 funtions						
	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] - [o] - [s]**

**[t] – Type** ←  
1F/1FP/1FM

**[o] –I/O signal** ←  
-[C] 0—5VDC 和 4—20mA  
-[A] 0—5VDC 和 0—10mA

**[s] – Special request** ←  
-[-] Percentage display (100.0), Chinese label.  
-[S] List full scale (see table on right side) and other request.

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





Beijing Sevenstar Flow Co.,Ltd.

## 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.