【 Operation Manual 】

MFC power supply meter

MODEL：SP－833A

Thank you for purchasing this UINICS product.
Please read this Operation Manual carefully in order to ensure that you use the power supply safely and correctly.

⚠ Caution
For professional use only or designed for use by a licensed electrician only.

⚠ Attention
Check if the label (model name) of the unit and your desired product specification correspond before use.

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Scan the QR code to access the website.

Please note that the communication costs shall be borne by the customer.

※All specifications may be changed without notice.

【 The 9th edition　1　Apr. 2024 】
@SP－833A（9）－E

Precautions

Please read this operation manual including the following precautions carefully to ensure safe use of your meter.

⚠ **Warning**・・・The following cases that may cause death or serious injury.

1. Do not wire while power is supplied. There is a risk of electric shock and fire.
2. Do not touch the terminals while power is supplied. There is a risk of electric shock.
3. Do not disassemble or touch the inside of the product.
   There is a risk of electric shock and fire.
4. Do not use the product in places with flammable gas or ignitable substances.
5. Prepare the emergency stop or build a fail-safe system, etc. for when a product is break down or abnormality operating.

⚠ **Caution**・・・That may cause Minor injury or Property damage.

1. Use the product at the rated range power supply voltage and load.
2. Do not use the product at the following environment.
   ・Where there is exposed to metal powder, dust, water, chemicals, oil, etc.
   ・Where there is corrosive gas.
   ・Outdoors or in direct sunshine.
   ・Where condensation occurs.
   ・Temperature and humidity outside the rated range.
   ・Where there is vibration or impact.
3. Do not let metal powder, dust, water, chemicals or oil into the product.
   There is a risk of break down or fire.
4. Check periodically for defects and abnormalities.
5. If the product is break down, firing, emitting smoke, overheating, abnormal noise, etc. turn off the power immediately and stop using it.
6. Do not place the product and wiring near noise sources.
7. If there is a possibility of invasion the lightning surges, install countermeasure parts such as a lightning arrestor in outside.
8. It can be used almost at the same time as the power is turned on, but requires 30 minutes of power to meet all performance requirements.
9. When cleaning, wipe with a dry cloth. Do not use organic solvents such as benzine, thinner and alcohol.
10. Use devices connected to each terminal of the terminal block, that is properly isolated from dangerous live parts.
11. Since this machine has no power-on switch, it will be in an operating state Immediatelyafter power supply impression.
    On the side of your equipment that you equip the machine with, please be prepared to supply the switch and circuit breaker which adapted to IEC/EN60947-2 or IEC/EN60947-3 standard in the position that you can operate immediately in emergency.
    Moreover, please specify that they are interrupting devices.
12. This machine is designed to be used with the panel mounted.
    Otherwise, the protection provided by the device may be impaired.
13. Use power code with the temperature rating 72 ℃ or more.

Contents

1．About confirmation of an attachment and a guaranteed period

About confirmation of an attachment．

When you received as a product, please confirm whether it includes the following.

（1）ＳＰ－８３３Ａ ・・・・・・・・・・・・・・・・・・・・・・・ 1

（2）ＳＰ－８３３Ａ Operation manual （This book） ・・・・・・・・・・ 1

（3）Mounting bracket ・・・・・・・・・・・・・・・・・・・・・・・・1

（4）Flange nut ・・・・・・・・・・・・・・・・・・・・・・・・・・2

（5）The 3-pin terminal block cover ・・・・・・・・・・・・・・・・・ 1

（6）The 10-pin terminal block cover（with 2 mounting screws） ・・・・・ 1

（7）Unit label ・・・・・・・・・・・・・・・・・・・・・・・・・・・ 1

NOTE
（3）and（4）are installed in the main body.

If there are the mistaking parts and the missing parts, please inform a dealer or us.
（There is a case that you don't attach by convenience.）

About a guaranteed period and a guaranteed area

1．Guaranteed period

The period a product guarantees is 4 years from a delivered day.

2．Guaranteed area

If we trouble by responsibility in whole guaranteed period, it's repaired without
charge at our factory. But if a product conflicted in the following matter,
it isn't a guarantee target. Please understand.

① Case of outside of the product specifications.

② Case of User-conducted alterations and modifications of the unit.

③ Case of besides our responsibility.

④ Case of safekeeping and transportation beyond the product specification condition.

⑤ Case due to natural disaster and accident.

2. Introduction

This product can operate and use the mass flow controller (Hereafter referred to as MFC) with one.

This product is integration of the power supply, the adjustment machine, and the display for MFC. A power supply and a necessary signal can be sent and received only by connecting this power supply with the D-SUB cable.

The flow rate set value of Ratemeter and Totalizer can be switched and displayed.

The ±15V power supply of AC 100-240V input type was stored in DIN size 48 × 96mm. There were set machine, a valve open and close switch, and a display in the front side, and it made it to an easy-to-use layout.

Mass flow Power can be used in the range below the rated
  ・±15V Each250mA
  ・+15V 150mA、-15V 350mA
  (Does not correspond +15V 350mA、-15V 150mA)

NOTE

The output of the signal of the VOR (valve open and close switch) of this power supply is a voltage impression method. It is not possible to use it with MFC of a point of contact terminal short method.

Valve open or close signal is output by switching the VOR switch of the front.
  ・The open signal of +15V is output on the open side.
  ・The close signal of -15V is output on the close side.

3. Specifications

【 Standard specifications 】

|	Item	Specifications
Measu rement	measurement contents	Ratemeter／Totalizer
	Operation system	A/D conversion operation Resolution : About 1/7000 (To full scale input)
		Input measurement interval : Approx 20 ms
	Low cut-off	Inputs within 0-29 % (selectable) of the maximum analog input are cut off.
Display	Display	Red LED : 5 digits Character height : 8mm
	Indication change	The Indication of Ratemeter／Totalizer is changed by ▲ (It is necessary to set the mode №4) ※DISP switch is an outside.
	RA Lamp	"RA" LED (RED) lights while displaying MFC flow rate.
	TO Lamp	"TO" LED (RED) lights while displaying MFC flow total value.
	OV Lamp	When indication overflowed, "OV" LED (RED) lights. (When is a right shift display, it blinks.)
	OUT1 Lamp	"OUT1" LED lights while outputting Preset output OUT1.
	OUT2 Lamp	"OUT2" LED lights while outputting Preset output OUT2.
Rate Meter	Measurement accuracy	±0.3%±1digit for analog input (23℃)
	Scaling	Setting the indication value in the maximum analog input (selectable) Range : 0.001-9999
	Indication area	0－9999 (When indication overflowed, 「9999」 flashes on and off.)
	Decimal point	Setting of the maximum indicated value. (Mode №. 1)
	Sampling time	Rate reading averaged by 0.5 sec. (fixation)
	Least significant digit	Real, fixed at 0, or 0/5 (selectable)
Totalizer	Measurement accuracy	±0.3%±1digit for analog input (23℃)
	Scaling	Setting the maximum total per an hour
	Indication area	0-99999
	Decimal point	Displays 1 to 4 decimal points. (selectable)
	Overflow indication	If it becomes more than ″99999″, it will shift to the right automatically. During right shift indication, OV lamp flashes on and off. During right shift indication, it becomes more than ″99999″, OV lamp will light up.
	Offset	Offset value setting can establish the indication value after a reset at the reach of 0-99999. (selectable)
Input	MFC Flow signal (The output signal from the MFC.)	DC 0－5V D－s ub (Input impedance 330KΩ)
	External command input	DC 0－5V Terminal block (Input impedance 330KΩ)
	VOR IN	VOR can be operated from the outside. It will be set to OPEN if the terminal box No. 5 and No. 7 are short-circuited. It will be set to CLOSE if the terminal box No. 6 and No. 7 are short-circuited.

Operation	Mechanism dial (CMDSET)	Mechanism dial with 10 turn function. Minimum value of the scale is 1/50 of 1 turn. Lock lever (Turn and scale are fixed.) Scale of dial is a standard of amount of turn.
	Command setting Potentiometer (CMDSET)	MFC can be set to an arbitrary flowing quantity value. (When it is finished to turn to the right, 5V are output.)
	VOR switch	Switches CONT ： (Usually) OPEN ：+15V Impressoon to VOR output. (Option +24V) CLOSE：-15V Impressoon to VOR output. (Option P.S.common)
	Command switch (COMMAND)	EXT：Let an external setpoint signal be a flow rate set value INT：Let a setup of a CMDSET dial (CMD) be a flow rate set value.
	Display switch (DISP)	SET：Flowing quantity setting value(command) is displayed. OUT：Flowing quantity output value is displayed from MFC. OUT：MFC Flow value、MFC Integrated value Display
	Operation setting switch	MODE、▶、▲、RST Each key switch
Output	MFC power supply	DC±15V Each250mA or DC+15V 150mA、DC-15V 350mA Ripple and Noise：30mV or less
	COMMAND OUT	DC0-5V 5mA D-sub
	External signal output	DC0-5V Terminal block
	Valve open／close output	VOR OPEN DC+15V VOR CLOSE DC-15V
Presetting output・synchronization pulse	Terminal number	Termina11-12（OUT1）、13-12（OUT2）（Sharing common）
	Comparison method	Upper limit・Lower limit（selectable）
	Output mode	Comparison or Synchronization pulse（OUT1：selectable）
	Preset value setting	The Presetting program mode setting is also selectable.
	Output judgment	Judgment output is compared with the indication value by preset value.
	Output circuit	Two-points NPN open collector output. Maximum rating：DC30V 50mA
Others	Data backup	Each mode preset value and an addition measurement value are written in FRAM.
	Mode protect function	Change by mode protect function setting It's possible to change it by 「OFF」 setting. It's impossible to change it by 「ON」 setting.
	Warm up time	After turning on the power, more than 30 minutes.
	AC input	AC100-240V （-15%／+10%） 270mA max 50／60Hz About 35 or less VA
	temperature／humidity conditions	0～50℃ 30～80%RH (Non-condensing)
	Dimensions／weight	W96×H48×D156mm Approx 400g
	Color	Black
	Material of the case	ABS
	usage environment；operating environment	Indoor use Up to an altitude of 2,000m Overvoltage CategoryⅡ Pollution Degree 2
	Low Voltage Directive	EN 61010-1
	EMC	EN61326-1 EN55011(Group1 ClassA)、EN61000-4-2、EN61000-4-3、 EN61000-4-4、EN61000-4-5、EN61000-4-6、EN61000-4-11

4. Meter mount method

How to mount meter

1.
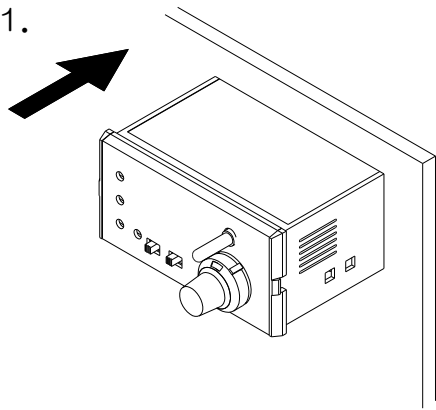
Fig.1

Please insert this Meter in the hole which carried out the panel cut from a front.
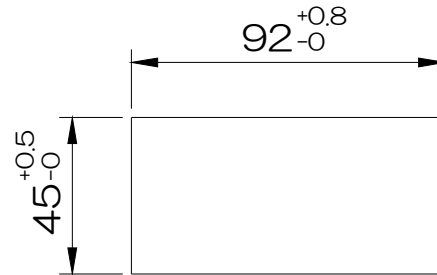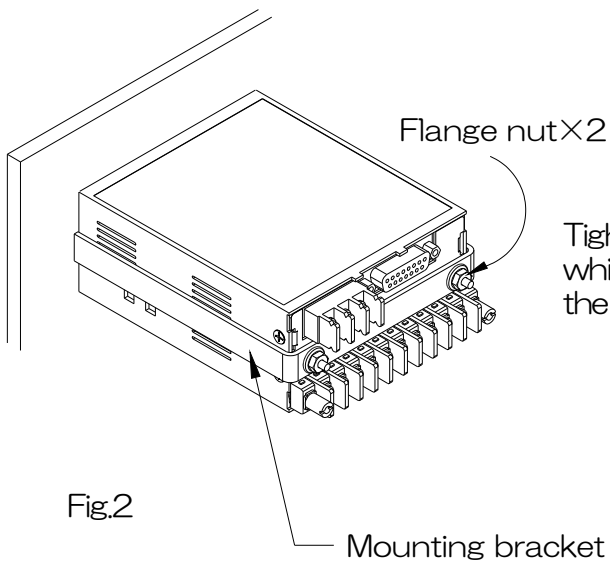
Panel cut size

$92^{+0.8}_{-0}$

$45^{+0.5}_{-0}$

(Unit：mm)

2.

Flange nut×2

Fig.2

Mounting bracket

Tighten with the flange nut (Two places) while suppressing it from the back with the mounting bracket.

・Fit the body on to a panel 1.0 - 4.0 mm in thickness.

(Unit：mm)

5. Connection method

<Terminal label>

Fig.3
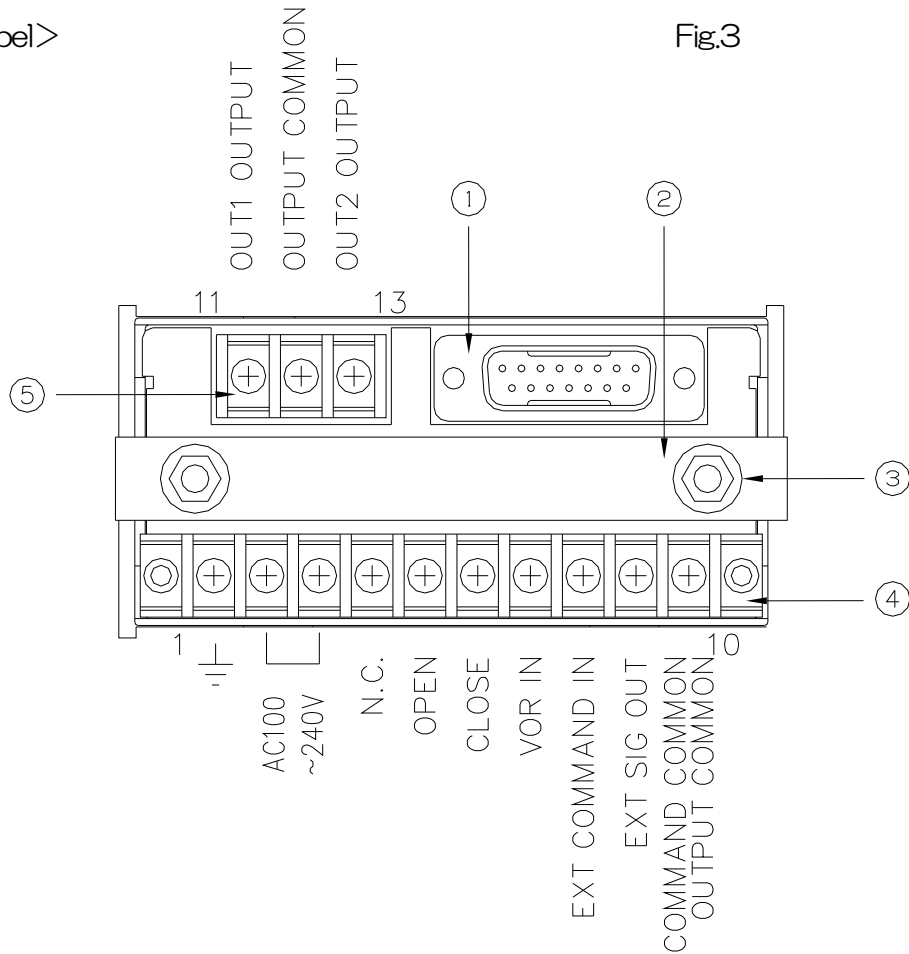
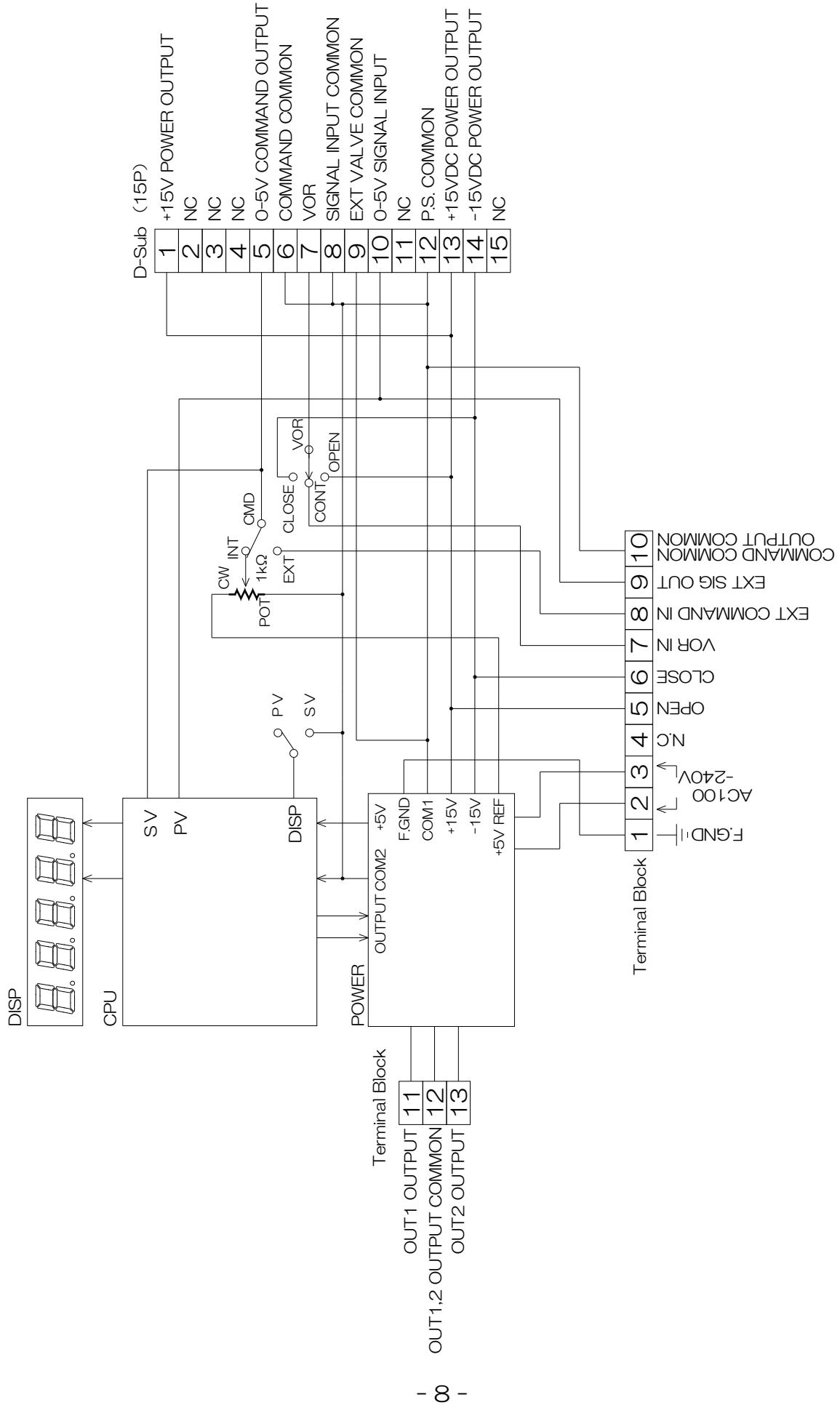| No.		Function
①	D-SUB 15pin	For MFC (HEX-NUT. M2.6)
②	Mounting bracket	Body is fixed at the mount.
③	Flange nut (M4)	Bracket is fixed. (Tightening torque 0.6-0.7N/m)
④	⏚	Earth (Flame ground)
	AC	AC power supply (AC100-240V 50-60Hz)
	AC	AC power supply (AC100-240V 50-60Hz)
	N.C.	Do not connect
	OPEN	Valve open is operated from external
	CLOSE	Valve close is operated from external
	VOR IN	Valve open/close signal is input from external.
	EXT COMMAND IN	Command seting signal is input from external.
	EXT SIG OUT	MFC flowing quantity signal is output external.
	COMMAND COMMON OUTPUT COMMON	Connects with common.
⑤	OUT1 OUTPUT	Preset output1 or Synchronization pulse (Collector)
	OUTPUT COMMON	Preset output1 and 2 common (Emitter)
	OUT2 OUTPUT	Preset output2 (Collector)

<D-Sub 15Pin>

Fig.4
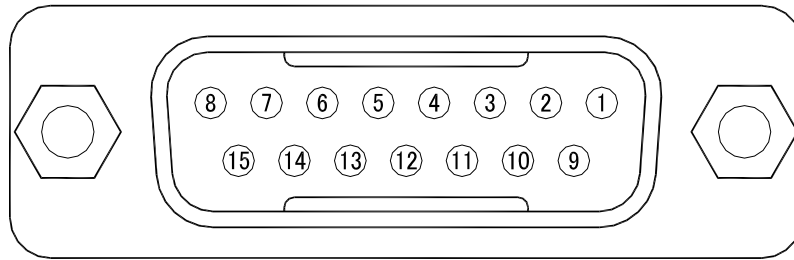
Pin No.	Function
1	+15VDC POWER OUTPUT
2	NC
3	NC
4	NC
5	0-5V COMMAND OUT
6	COMMAND COMMON
7	VOR
8	SIGNAL INPUT COMMON
9	EXT VALVE COMMON
10	0-5VSIGNAL INPUT
11	NC
12	P. S. COMMON
13	+15VDC POWER OUTPUT
14	-15VDC POWER OUTPUT
15	NC

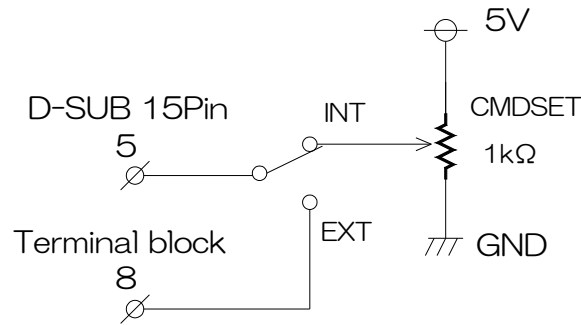# 6. Internal wiring diagram

Fig.5

7. Input circuit and output circuit

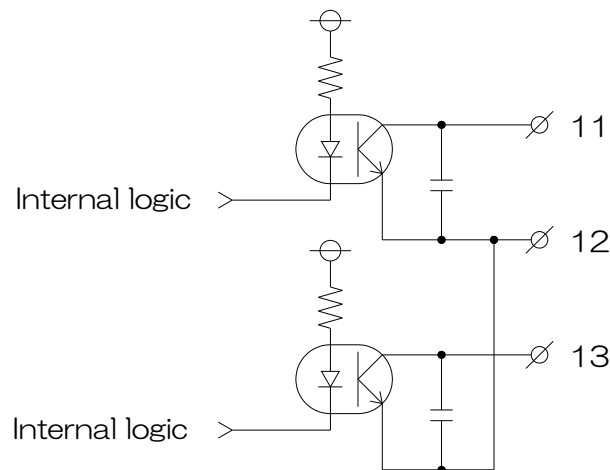1. Input signal (MFC Flow signal, external setting signal.)　　　　Fig.6
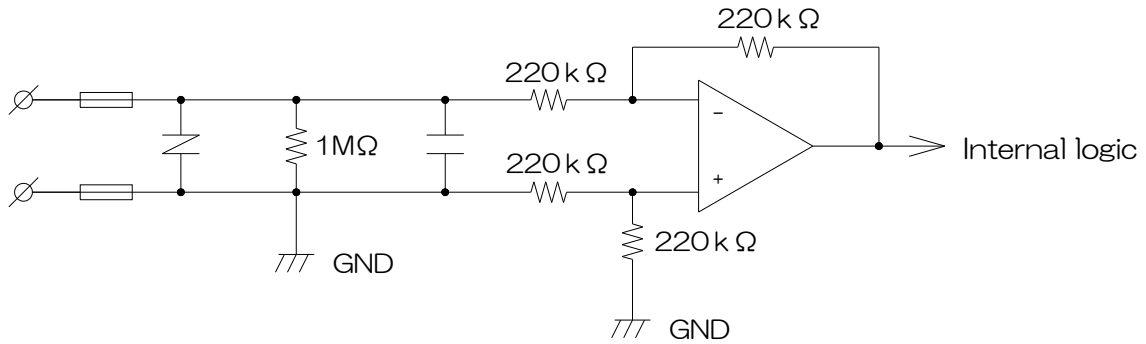
2. CMDSET output (0-5V Voltage output)　　　　Fig.7

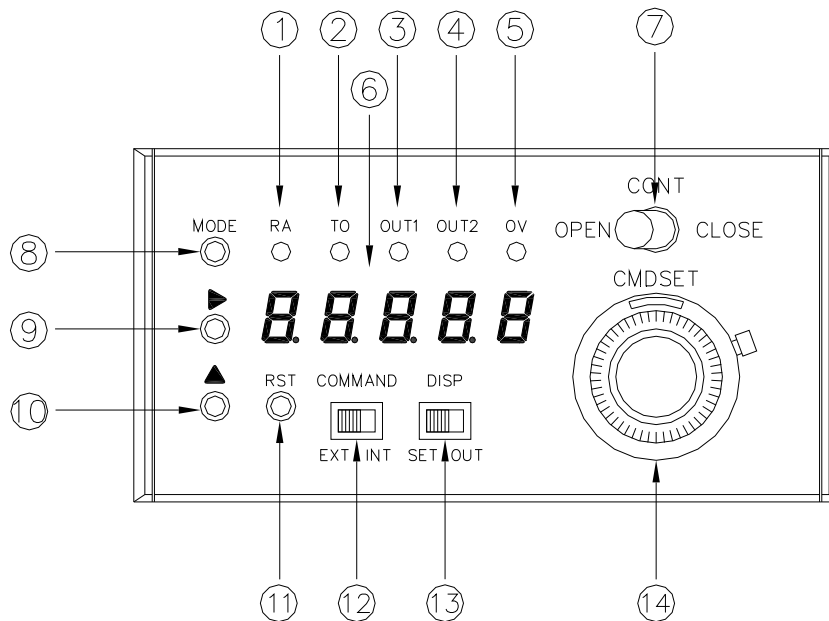3. Preset output (NPN Open collector)　　　　Fig.8

8. Front (Name and function)

Fig.9

①RA lamp (Red)

Measurement state : It lights while displaying MFC flow rate.

Setting state : It turns it off.

②TO lamp (Red)

Measurement state : It lights while displaying MFC flow total value.

Setting state : It turns it off.

③、④Alarm OUT LED (Red)

Measurement state : The lamp is activated when an alarm (OUT1,OUT2) is outputted.

Setting state : The presetting output LED lights up at the time of the presetting output value setting.

⑤OV [over] indicator LED (Red)

When the MFC flowing quantity value, the integrated value, and the flowing quantity setting value exceed it, it lights.

When the MFC totalizer value is a right shift display, it blinks.

⑥Display (7segmentLED , 5figures)

Measurement state : A measured value is indicated.

Setting state : Mode № is indicated and the present set value is indicated.

         : Whole pre-set value setting indicates the present set value.

         : Whole offset value setting indicates the offset value.

         : It indicates "L-oFF" and "L-on" at the time of mode protect function setting.

         : the present bit value are indicated at the time of analog input adjustments mode setting.

⑦VOR switch (Valve Override switch)

CONT (Center)   : VOR signal to MFC becomes floating. External VOR signal becomes effective.

OPEN (Left)   : The VOR signal to MFC becomes +15V, and it becomes a compulsion valve opening. External VOR signal becomes invalid.

CLOSE (Right)   : The VOR signal to MFC becomes -15V, and it becomes a compulsion valve close. External VOR signal becomes invalid.

⑧MODE key (**MODE** and the notation)

Turning on the   : When a power supply is supplied while is
 power state   pushing down MODE , a test mode functions.
          (A stop of the test mode function is power supply off.)

Measurement state : When ▶ is pressing for 2 sec or more, while is pushing down MODE , mode setting is called.

         : When MODE is pressing for 2 sec or more, pre-set value is called.

         : When ▲ is pressing for 2 sec or more, while is pushing down MODE , offset value setting is called.

Setting state : Mode No. (indicator A) is switched.
               (1→2→3・・・7→1→2→3　　Rise)

         : OUT1,2 is switched at the time of pre-set value setting.

         : A-d is switched at the time of analog input adjustments mode setting.

⑨SHIFT key (▶ and the notation)

Measurement   : ▶ is used to call the mode setting.
   State   (It's on for more than 2 seconds with **MODE**.)

         : ▶ is used to call the mode protect function,
             or used to change it.
      (It's on for more than 2 seconds.
      →The state indicates it. →It's on
       for more than 8 seconds just as it is. →Change)
      《L-oFF ⇔ L-on》

Setting state : ▶ moves the flash figure when each setting, to the right

⑩UP key （ ▲ and the notation）

Turning on the : When a power supply is supplied while is
power state Pushing ▲, analog input adjustments mode setting.
(A stop of the analog input and analog output
adjustments mode setting is power supply off.)

Measurement state : ▲ is used to call the offset value setting.
(It's on for more than 2 seconds with **MODE**)

: ▲ is used to switch the MFC ratemeter／MFC totalizer.
(″Mode No.4″ in setting is needed.)

Setting state : ▲ changes the flash figure when each setting.

: While ▲ is being pressed, can confirm the registered bit
value at an adjusting analog input .

⑪RESET key （ **RST** and the notation）

Turning on the : Throw power supply in with RST pressed to
power state initialize the settings.

Measurement state : Resets the totalizer without interrupting or resetting
the rate reading. It also resets the presetting output.

.

Setting state : RST is used to register and make it measurement status.

: The bit value of "A〜d" is registered at the time of
analog output adjustment mode setting.

⑫COMMAND switch

ＥＸＴside : Let an external setpoint signal be a flow rate set value.
ＩＮＴside : Let a setup of a CMDSET dial (CMD) be a flow rate set value.
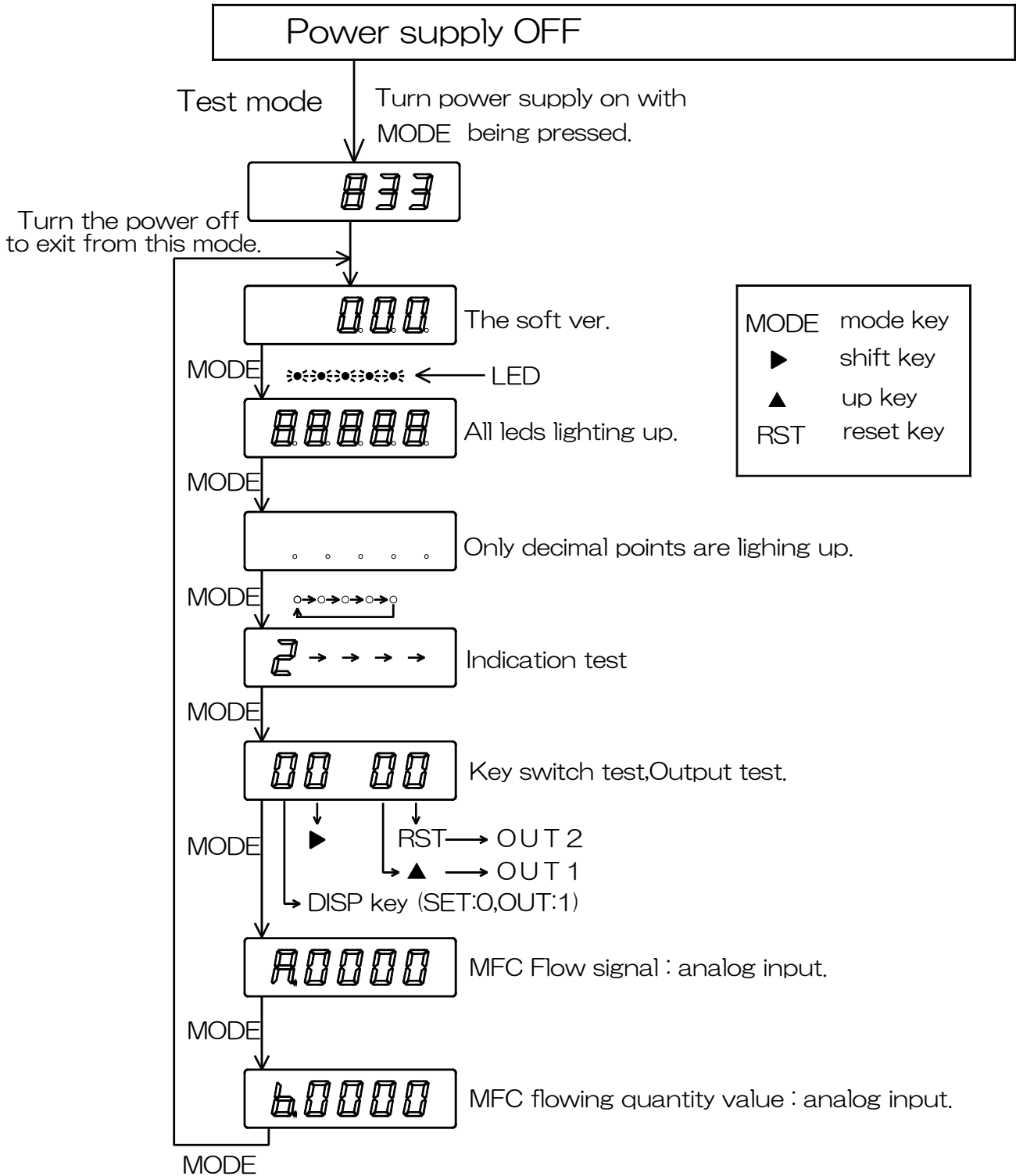
⑬DISP switch

ＳＥＴside : A flow rate set value is displayed.
ＯＵＴside : MFC flow rate value , MFC totalizer valuee are displayed..

⑭CMDSET dial

Potentiometers for command adjustment. Flowing quantity setting signal can be fine-tuned by 10
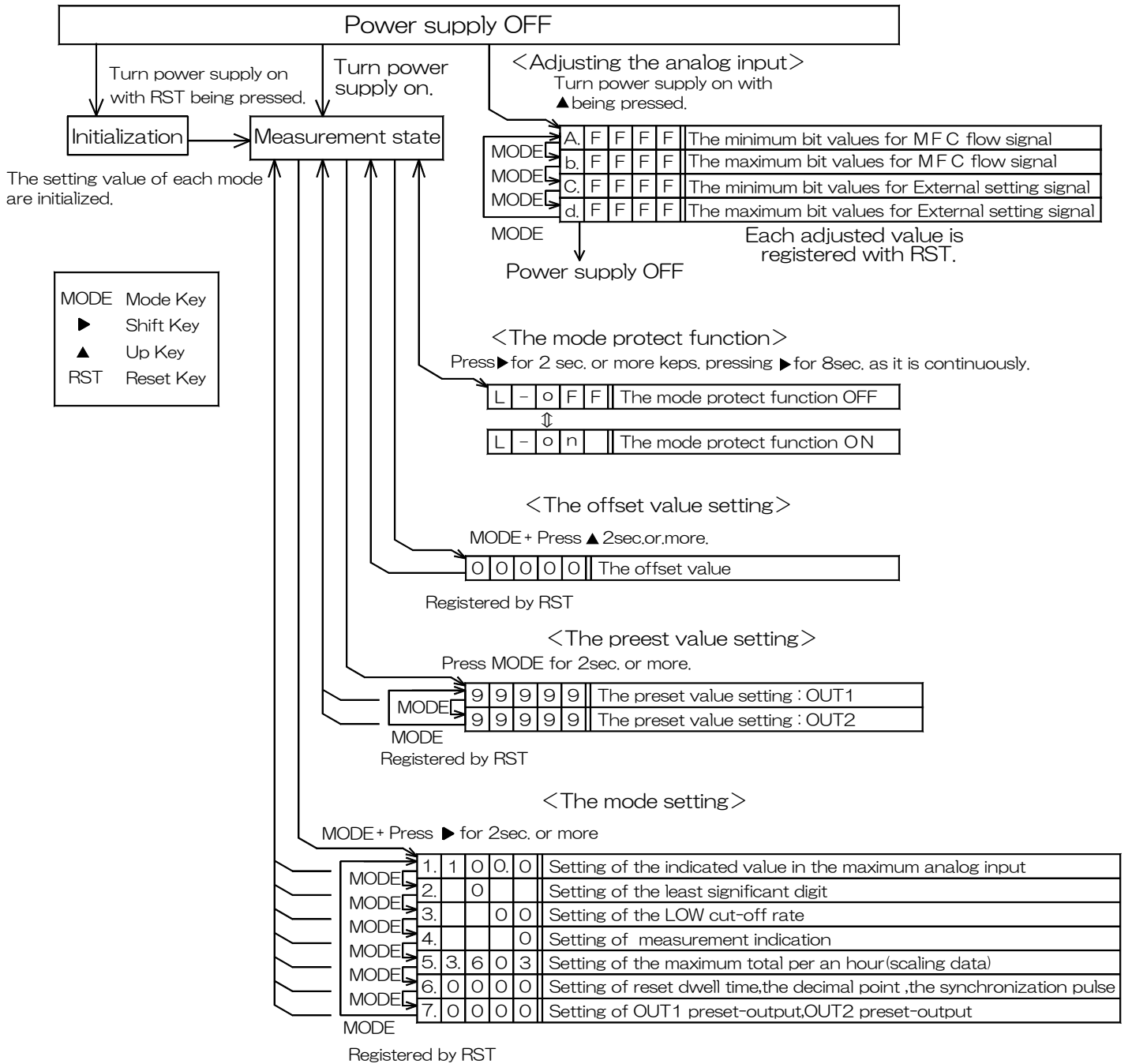turn function.

9．Setting menu

≪Test mode≫

Power supply OFF

Test mode | Turn power supply on with MODE being pressed.

833

Turn the power off to exit from this mode.

000　The soft ver.

MODE

LED

88888　All leds lighting up.

MODE

．　．　．　．　．　Only decimal points are lighing up.

MODE

2 → → → →　Indication test

MODE

00　00　Key switch test,Output test.

MODE | ▶ | RST → OUT 2 | ▲ → OUT 1 | DISP key (SET:0,OUT:1)

A0000　MFC Flow signal : analog input.

MODE

b0000　MFC flowing quantity value : analog input.

MODE

MODE	mode key
▶	shift key
▲	up key
RST	reset key

≪Setting menu≫

Power supply OFF

Turn power supply on with RST being pressed.

Turn power supply on.

<Adjusting the analog input>
Turn power supply on with ▲ being pressed.

Initialization	→	Measurement state

The setting value of each mode are initialized.

MODE	A.	F	F	F	F	The minimum bit values for MFC flow signal
MODE	b.	F	F	F	F	The maximum bit values for MFC flow signal
MODE	C.	F	F	F	F	The minimum bit values for External setting signal
MODE	d.	F	F	F	F	The maximum bit values for External setting signal

MODE

Power supply OFF

Each adjusted value is registered with RST.

MODE	Mode Key
▶	Shift Key
▲	Up Key
RST	Reset Key

<The mode protect function>
Press ▶ for 2 sec. or more keps. pressing ▶ for 8sec. as it is continuously.

L	–	o	F	F	The mode protect function OFF

⇕

L	–	o	n		The mode protect function ON

<The offset value setting>

MODE + Press ▲ 2sec. or. more.

0	0	0	0	0	The offset value

Registered by RST

<The preest value setting>
Press MODE for 2sec. or more.

MODE	9	9	9	9	9	The preset value setting : OUT1
	9	9	9	9	9	The preset value setting : OUT2

MODE

Registered by RST

<The mode setting>

MODE + Press ▶ for 2sec. or more

MODE	1.	1	0	0.	0	Setting of the indicated value in the maximum analog input
MODE	2.		0			Setting of the least significant digit
MODE	3.			0	0	Setting of the LOW cut-off rate
MODE	4.				0	Setting of measurement indication
MODE	5.	3.	6	0	3	Setting of the maximum total per an hour(scaling data)
MODE	6.	0	0	0	0	Setting of reset dwell time,the decimal point ,the synchronization pulse
MODE	7.	0	0	0	0	Setting of OUT1 preset-output,OUT2 preset-output

MODE

Registered by RST

Please recommend to take notes of the value setting of each mode.

１０．Initial setting values and initialization

If the specifications desired by the user are requested prior to shipment, the meter will be set these settings. Otherwise, the regular factory settings are shown below.

Value setting of each Mode   Table 1

Mode No.	Initial setting				Note				Mode contents
A	B	C	D	E	B	C	D	E	
1.	1	O	O.	O					Setting of the indication value in the maximum analog input.
2.		O			—		—	—	Setting of the least significant digit.
3.			O	O	—	—			Setting of the LOW cut-off rate
4.				O	—	—	—		Setting of measurement indication.
5.	3.	6	O	3					Setting of the maximum total per an hour(scaling data)
6.	O	O	O	O					Setting of reset dwell time, the decimal point, the synchronization pulse
7.	O	O	O	O					Setting of OUT1 preset-output, OUT2 preset-output

Preset value setting of each alarm output   Table 2

Alarm No.	Initial setting					Notes				
	A	B	C	D	E	A	B	C	D	E
OUT1	9	9	9	9	9					
OUT2	9	9	9	9	9					

Offset value setting   Table 3

Offset	Initial setting					Notes				
	A	B	C	D	E	A	B	C	D	E
MFCIndication	O	O	O	O	O					

Initialization : Power on RET key being pressed to initialize the settings.
            After the initialization, the set values will be as shown in Table 1-3.
※A set value of the analog input adjustment mode is not initialized.

⚠Note : Since an initialization changes all existing setting values to the initial
        setting values, be sure to record all the setting values before an initialization.

※ In case the computer froze when unusual functioning occurred with the normal operation,initialize
   according to the above procedure and set the desired value again.

11. Setting the mode

Calling up and modifying the mode setting

When a mode is set, operate each key according to the following table.

Operating key	Display unit	Operation procedure
MODE + ▶	A B C D E 1. **1** O O O.	While holding down the MODE key, press the ▶ key for 2 seconds or more. "1." appears in displays A and the value setting for mode 1 is shown.
▶	A B C D E 1. 1→**O**→O→O.	Change the blinking indication position (figure). Every press moves the position to the right by a figure.
▲	A B C D E 1. 1 **1** O O. ↑ 0→9	Change the blinking numeral value. Every press raises the value by ones. (0 → 1 → 2・・・9 → 0・・・)
MODE	A B C D E **2**. 1 O ↑ 1~7	Change the mode number. Every press raises the number by one. There are 7 modes in total. When it reaches 7, it returns to 1. （1→2→・・・→7→1→2・・・）
RST		After adjusting the setting, make registration with this key. It returns to the measuring mode after registration.

⚠ <Note>
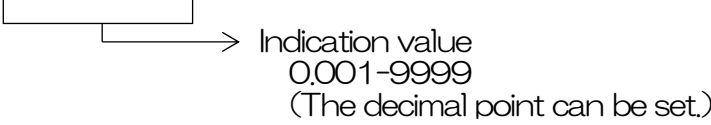
※In case you change mode setting, turn OFF mode protect.
If it is turned ON, change of mode setting will be made impossible.
Refer to 12 Mode protect function.
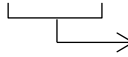
Contents of modes and setting values

Mode No.	MFC Ratemeter : Setting of the indication value in the maximum analog input
1	A B C D E 1. 1 0 0. 0 → Indication value 0.001-9999 (The decimal point can be set.) ※Please do not use 0000. <hr>Please set the indication value which is at the time of the maximum analog input. It's indicated at the gradient between 2 points from "0". ⚠ \<Caution\> ※MFC Ratemeter is displayed in the position of this decimal point. <hr>〔Ex.〕It'll be the following setting to make it indication for "1.234" at the maximum analog input. 4 digits and decimal point A B C D E Mode No.1 1. 1. 2 3 4

Mode No.	M F C Ratemeter : Setting of the least significant digit

2	A B C D E
	┌─────────────┐
	│ 2. O │
	└─────────────┘
	                    └──→ **Least significant digit**
	                       O : Real
	                       1 : Fixed at O
	                       2 : O or 5
	
	〖Least significant digit〗
	　The form of indication for the least significant digit
	　（digit on the right end） is selected.
	
	　O : Real・・・・・・・・Synchronized at the sampling time.
	　1 : Fixed at O ・・・・・Always, ″O″.
	　2 : O or 5・・・・・・・O-4 are expressed as O, and 5-9 as 5.
	
	　⚠ ＜Caution＞
	　　※ This setting is effective in avoiding flickering of least
	　　　significant least significant digit.

Mode No.	MFC Ratemeter : Setting of the LOW cut-off rate

3	A B C D E
	┌─────────────┐
	│ 3. O O │
	└─────────────┘
	                └──→ **LOW cut-off rate**
	                   0～29% （″00″ is a shut down.）
	
	〖LOW cut-off rate〗
	In cases where inputs falling below a certain percentage of the current/
	voltage input are not needed, the % value is inputted.　Inputs of this value
	or lower are disregarded without being included in rate and total readings.
	
	〔Ex.〕 When it's set the low cut rate ″10%″ by ″0-5V″ input type,
	　　　does not measure by less than 0.5V of voltage input.

Mode No.	Setting measurement indication
4	A B C D E `4.        0` └→**Indicator** 　　0 : Rate meter/totalizer is switched. 　　1 : Rate meter is fixed. 　　2 : Totalizer is fixed. 【Indicator】 　0 : Rate meter/totalizer is switched. 　　 Rate meter/totalizer is switched in ▲ 　1 : Rate meter is fixed. 　　 Rate meter is fixed and indicated. 　2 : Totalizer is fixed. 　　 Totalizer is fixed and indicated.

Mode No.	Totalizer : Setting of the maximum total per an hour (scaling data)

5	A B C D E
	`5. 3. 6  0  3`
	└→**Exponential value** (10^n)　n= 0 - 5
	└→**Scaling data**
	　　0.01-9.99 (Fixed decimal place)
	　(Do not specify 0.00)
	
	The total value per an hour in the maximum analog input is specified by inputting a 3-digit value for B-D, and the exponential value (power of 10) for E.The setting range is 0.01-999000.
	
	〔Ex.〕　In case of the maximum total per an hour is ″1000″.
	
	　　1000=1.00 ×10 ^{3}　　Setting will be as follows.
	　　　　　↑　　　↑
	　　　　BCD　　E
	
	　　A B C D E
	　　`5. 1. 0  0  3`

Mode No.	MFC Totalizer : Reset time, decimal point position setting, the sync pulse output
| 6 | ```
A   B   C   D   E
6.  0   0   0   0
```<br><br>↳ **Decimal point**<br>0 : 0<br>1 : 0. 0<br>2 : 0. 00<br>3 : 0. 000<br>4 : 0. 0000<br>**Reset time**<br>→ 0 : 2 sec.<br>1 : Immediate（at ON edge）<br><br>→ Sync pulse output width setting.<br>0 :  10m sec<br>1 : 100m sec<br>2 :   1sec<br><br>→ Synchronization pulse output digit<br>0 : 1st digits<br>1 : 2nd digits<br>2 : 3rd digits<br>3 : 4th digits<br>4 : 5th digits |

【Synchronization pulse output digit】

　　The digit whose change is to trigger the pulse output is specified.

　　　※ 　synchronization pulse is output from the OUT1.

　　　　 Before usage, please select the sync pulse on the sync

　　　　 pulse mode 7-B.

【Sync pulse output width setting.】

　　The output pulse width is set.

【Reset time】

　　Reset time for the front Reset key is specified.

　　0 : 2sec

　　　　After the **RST** key is pressed for 2 seconds or longer, the reading

　　　　is reset.（Returns to the offset value.）

　　1 : Immediate（at ON edge）

　　　　The reading is reset immediately when the **RST** key is pressed.

　　　　（Returns to the offset value.）

⚠ **＜Caution＞**

　※The MFC flowing quantity value is not reset though the

　　MFC integrated value is reset.

　※It enters the state of the input prohibition for the MFC multiplication

　　value measurement while the reset key is being pushed

　（state of turning on）while measuring it.

The MFC flowing quantity value measurement is not prohibiting inputting.

【Decimal point】

　The location of the decimal point setting.（Totalizer）

Mode No.	Setting of OUT1 and OUT2　preset-output

| 7 | A B C D E
7. 0 0 0 0

→**OUT 2 : Upper or lower limit selection**
　　0 : Upper limit
　　1 : Lower limit
→**OUT 2 : Output selection**
　　0 : Disable
　　1 : MFC Flow value
　　2 : MFC Totalizer value
→**OUT 1 : Upper or lower limit selection**
　　0 : Upper limit
　　1 : Lower limit
→**OUT 1 : Output selection**
　　0 : Disable
　　1 : MFC Flow value
　　2 : MFC Totalizer value
　　3 : Synchronization pulse |

The presetting output compares display value with the preset value, and outputs it by the result.
Refer to "14. Calling up and modifying the preset value setting " for setting the preset values.

〔Output selection〕
A display to compare with a preset value is chosen.
0 : Disable
Output is disabled.

1 : MFC Rate meter
MFC Rate meter is compared with a preset value.

2 : MFC Totalizer
MFC Totalizer is compared with a preset value.

3 : Synchronization pulse output（OUT 1 only）
It functions as a synchronization pulse output（Please set Mode No.6）
※　The factory setting is a function stop
Please change to the setting matched to the usage when you use the alarm output.

〔Upper or lower limit selection〕
Output condition is specified.
0 : Upper limit
It outputs, 「Indication value ≧ Preset value」
1 : Lower limit
It outputs, 「Indication value ≦ Preset value」

【Chart at the timing of the presetting output】

Fig.10

(Indication)

Preset value

Indication

Upper limit

Lower limit

(Indication value)

(Time)

12. Mode protect function

When the mode protect function is made effective, ▲ operation is invalid by mode setting. Therefore the set value can't be changed.

In an early stage, the mode protect function is invalid.

When doing the mode protect function setting, please operate as follows.

≪Operation of the mode protect≫

Operation key	Indication	Procedure
▶	A B C D E L － o F F ↑ (The mode protect : present)	Press the key for 2 sec. or more. The present mode protect state is displayed . 〔The regular factory setting is "L-off" .〕
▶	A B C D E L － o n ↑ (The mode protect : change)	Keep pressing ▶ for 8 sec as it's continuously, the state of mode protect is changed. ※" OFF → ON" or "ON → OFF"
▶		It usually returns when ▶ is stopped being pressed.

⚠<Caution>

※The preset value setting and the offset value setting always can be changed.
※The mode protection function becomes "OFF" , when it's initialized.

１３． Offset value setting

The preset totalizer reading value to be displayed directly following a reset is specified.

For example, if the offset value is set at "01000", the reading becomes "1000" when reset, and the count resumes from "1000".
In order to start the count from "0", the offset value should be set as "00000".

The possible range for offset is 0-99999.
The procedure for setting the offset value is described below.

≪Operation of the offset value setting≫
　　　※When there are no customer requests,the initial value setting is "00000".

Operation key	Indication	Procedure
MODE + ▲	A　B　C　D　E 0　0　0　0　0	While pushing down **MODE** key, press ▲ for 2 sec. or more. "TO" LED lights up and the present offset value is displayed.
▶	A　B　C　D　E 0→0→0→0→0 └ ─ ─ ← ─ ─ ┘	Shifts the flashing indication to the digit to the right. Each time　▶　is pressed, shifts the indication to one right.
▲	A　B　C　D　E 0　1　0　0　0	Changes the value of the flashing digit. Each time ▲ is pressed, the number goes up by one. （0→1→・・・→9→0→・・・）
RST		After adjusting the setting, use **RST** to **register it.** **The display returns to the readings following registration.**

≪After registration≫

RST	A　B　C　D　E 1　0　0　0	The registered offset value can be displayed by pressing **RST**. The totalizer count is resumed from this value.

⚠ ＜Caution＞
　　　※The mode protection function is invalid.
　　　　（Please refer to "12. The mode protect function ".）
　　　※The decimal point is interlocked with the mode №6.

14. Preset value setup (Preset Output)

Set the preset values. "OUT1 , OUT2".
The setting ranges are 0-99999.
The procedure for setting the preset value is described below.

≪Operation of the preset value setting≫

Operation key	Indication	Procedure
MODE	OUT1 OUT2 　●　　○ A　B　C　D　E 9　9　9　9. 9	Press **MODE** for 2 sec. or more. "OUT1" LED lights up and the present preset value is displayed.
▶	OUT1 OUT2 　●　　○ A　B　C　D　E 9→9→9→9.→9 └———←———┘	Shifts the flashing indication to the digit to the right. Each time the key is pressed, shifts the indication to one right.
▲	OUT1 OUT2 　●　　○ A　B　C　D　E 9　0　9　9. 9	Changes the value of the flashing digit. Each time ▲ is pressed, the number goes up by one. (0→1→・・・→9→0→・・・)
▶ ▲	OUT1 OUT2 　○　　● A　B　C　D　E 9　9　9　9. 9	The OUT2 led lights up and the preset value setting for OUT2 is shown. Press ▶ and ▲ to set the desired setting value.
RST		After adjusting the setting, use **RST** to register it. **The display returns to the readings following registration.**

⚠ ＜Caution＞

※Which of the totalizer or rate meter is the preset values used by must be selected according to the mode №7.

※The decimal point is interlocked with the mode №1 for rate meter and the mode №6 for totalizer.

※The mode protection function is invalid.
（Please refer to "12. The mode protect function".）

15. Analog input adjustment

⚠ <Caution>

※It's being adjusted according to an analog input type and an analog output option, but when being adjusted by yourself, please setting it with the following procedure.

When a power supply is supplied while is pressing ▲, analog input and analog output adjustments mode setting.

Operation key	Indication	Procedure
▲	A B C D E | A. X X X X | (X is a hexadecimal numbe)	When ▲ is pressed, "A.XXXX" is displayed. An analog input adjustment (minimum) is performed.
▲	「A.-d. common」 A B C D E | A. X X X X. | When indicating the registered bit value, it lights up.	While ▲ is being pressed, the registered bit value can check it. (It functions by "A. -d. ") ※When indicating the registered bit value, a decimal point of a least significant digit lights up.
▲	A B C D E | A. 0 1 2 3. | ↖ (The bit values)	When ▲ is pressed, the bit value of minimum MFC flow signal is indicated.
RST		When RST is pressed while inputting analog minimum input , the bit value by the minimum MFC flow signal input is registered.
MODE	A B C D E | b. X X X X |	When MODE is pressed, "b.XXXX" is displayed. An analog input adjustment (maximum) is performed.
▲	A B C D E | b. X X X X. | ↖ (The bit values)	When ▲ is pressed, the bit value of maximum MFC flow signal is indicated.
RST		When RST is pressed while inputting analog maximum input , the bit value by the maximum MFC flow signal input is registered.

MODE	A B C D E C. X X X X	When MODE is pressed, ″C.XXXX″ is displayed. External setting　input adjustment (minimum) is performed.
▲	A B C D E C. X X X X. ↖ (The bit values)	When ▲ is pressed, the bit value of minimum External setting is indicated.
RST		When RST is pressed while inputting analog minimum input , the bit value by the minimum External setting input is registered.
MODE	A B C D E d. X X X X	When MODE is pressed, ″d.XXXX″ is displayed. External setting　input adjustment (maximum) isperformed.
▲	A B C D E d. X X X X. ↖ (The bit values)	When ▲ is pressed, the bit value of maximum External setting is indicated.
RST		When RST is pressed while inputting analog maximum input , the bit value by the maximum External setting input is registered.
MODE	A B C D E A. X X X X	When MODE is pressed, ″A.XXXX″ is displayed. An analog input adjustment (minimum) is performed.
Turn the power "OFF"		After registration , the power supply state is "OFF".
Turn the power "ON"	A B C D E Measurement state	When the power supply state is "ON" onceagain, a measured value indicates.

External dimensions   Fig.11

(Unit : mm)

Panel cut size and installation interval

Fig.12

When you mount the machine, please provide a space of at least 20mm
from the wall in the direction of up and down, right and left and rear
(terminal stand side).

17. Noise countermeasure

When influence of noise occurred, please be careful about the following.

When doing a blackout and a malfunction by influence of noise, please be
initialized. (Refer to page 15)
Please take notes of the value setting of each modes.
If it becomes normal, please take the following measure.
And please setting it once again.

(1) Please use shielding wire for a Signal wire and D-Sub code , separate as much as
possible from a source of noise.

(2) Please avoid a source of noise (power supply line and inverter), make it
as short as possible. After that,please install a Signal wire and D-Sub code.

(3) Please separate from a power supply line,in a case affected by noise.
And please install a EMI filter.

(4) The manner of the Signal wire and D-Sub code installation.
When there is a power supply line near the Signal wire and D-Sub code,
a surge and noise are influenced.
Therefore , install a Signal wire and D-Sub code independently or for
50 cm or more.

(5) When being affected than other   Fig.1 3
equipment, please use a spark killer
like Fig.1 3 and take a measure.

Spark killer

Tact actuator

(6) If there is an unclear point, please even consult with use about a dealer
or us.

18. Troubleshooting

No.	Problem	Checking point	Solution
1	Display does not appear at all.	→Has it connected with the rear terminal correctly? Is the screw tightened certainly?	→Connect correctly according to "Connecting terminal boards" (Refer to page 6-9). ↓ When display still does not appear, have it serviced.
2	Unusual LED lighting, key switch operation, preset output.	→Check with the test mode (Refer to page 13).	→Once, do the initialization. (Refer to page 15). ↓ When it still does not resume normal status, have it serviced.
3	Rate meter remains at "0" and does not count.	→Is the setting of the DISP switch correct? →Is the position of the COMMAND switch correct? →Is the setting for each mode correct? ↓ →Is the input signal normal? ↓ ↓ ↓ ↓ →Is the output signal from MFC normal? ↓ →Does the input method of the meter match an output signal method of the MFC?	→Check whether to be set at the position where each switch is proper. →Scaling data is small or the low cut has started. →Please the connection of the input signal is reconfirmed. The MFC input analog input is tested according to the static test mode. (Refer to page 13.) ↓ →Please confirm the manual. ↓ When it still does not resume normal status, make a contact to a dealer or us.
4	OV lamp remains lit.	→Check whether the scaling is not too large. (MFC Flow rate measurement value) ↓ →Overflow indication. (Totalizer) ↓ →Influence of noise.	→Change the scaling data. (Refer to page 17 for mode No.1, page 20 for mode No.6 and page 21 for mode No.7.) →Refer to page 28 for "About a noise countermeasure". ↓ When it still does not resume normal status, make a contact to a dealer or us.

■EMC standard (EN61326-1:2021)

Emission
EN55011 Group 1 Class A
This product complies with EMC standards for industrial environments.
When used in a residential or light industrial environment, it may cause electromagnetic interference to other equipment.

Immunity
EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11
This product complies with EMC standards for industrial environments. Users should pay particular attention to the electromagnetic immunity listed below.
• Power supply quality • Electrostatic discharge • Radiated noise
• Conducted noise • Magnetic field noise • Surge noise