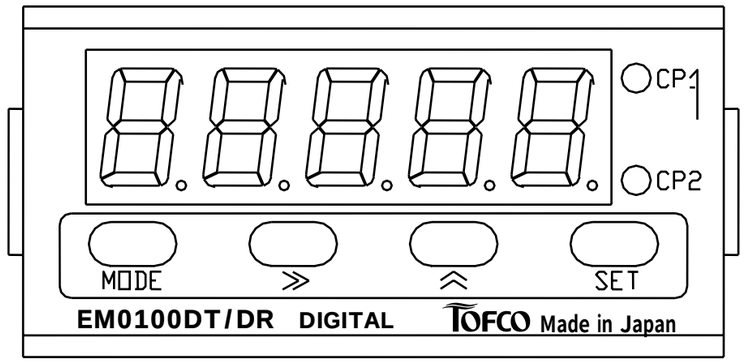
DIGITAL METER

INSTANTANEOUS FLOW INDICATOR

EM0100DT/DR Series

Operation Manual



Thank you for your purchase of the Digital Meter “EM0100DT/DR Series”.
Before use, please read this Operation Manual with caution to achieve peak performance of the product and to ensure safe operation.

Warning

Before use, please read this Operation Manual with caution for your safety operation, as the important matters to be surely observed are contained in this Manual.

① Never use this product in such main loop control systems as medical equipment which has a direct effect on the human lives, space instrumentation, atomic power control machine, marine vessel and the chemical apparatus for the military purpose kept “Export Trade Control Ordinance” under control.

② A great attention shall be paid not to exceed the rated power supply(24VDC±10%). The wiring service should be done, after turning off the power supply. Otherwise it may cause malfunction, damage to the devices or fire.

③ Avoid using the device in the following places, where it may cause fire, explosion, danger in life and damage to the device.

- In places, where the corrosive gases and flammable gases will occur.
- In places, where water and oil splash and where there are much dust, metal powder and where is too saline.
- In places, where is exposed to the direct rays of the sun and where exceeds the ambient temperature ranging from 0℃ to 55℃.
- In places, where is damp and the condensation of humidity will occur due to the abrupt change of temperature.
- In a place, where vibrates and are given impact shock greatly.
- In places, where is near to such devices which produce a strong electromagnetic noises and high-frequency noises.

Precaution before use (Input/output signal lines)

① Do not connect any noise-generating unit to the sensor driver terminal at ＋12VDC.
② Avoid wiring together with such strong noise sources as power line, relay, electromagnetic valve and solenoid operated valve. Due to the triggers it may cause malfunction.

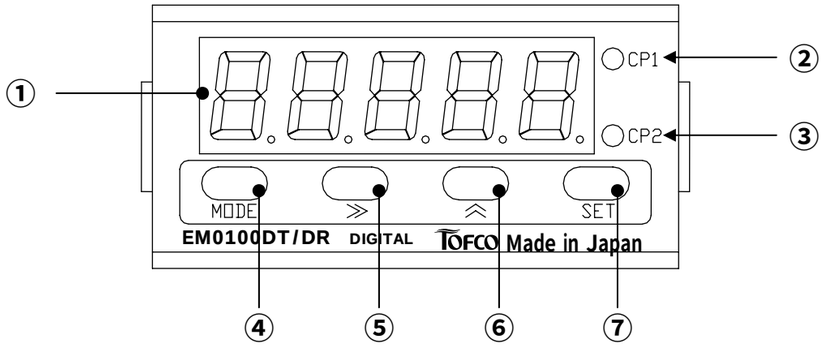
89-R09

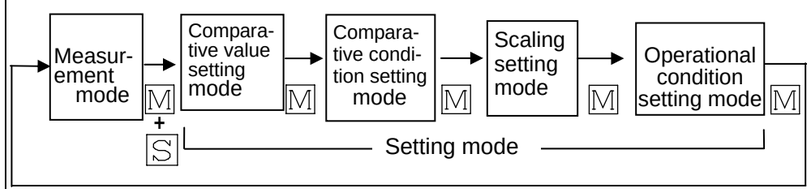
【Main features】

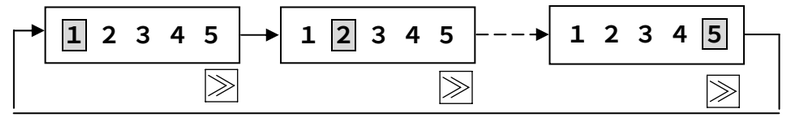
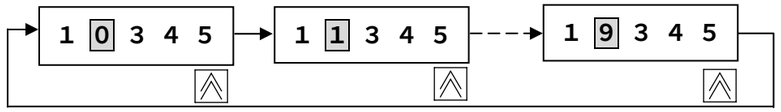
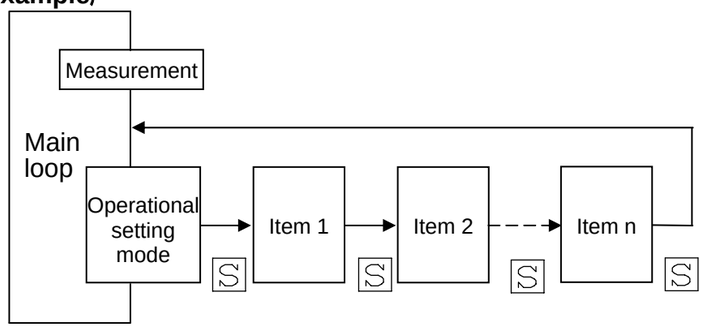
① It can be used for such sensor signal value indications as rotation, circumferential velocity, passing time, speedmeter and the like by means of pulse input.
② Taking advantage of the two staged comparative output functions, it controls the upper/lower limit controls, lower/lower limit controls and upper/upper limit controls.
③ The EM0100DT outputs the comparative output at NPN transistor and the EM0100DR, however, outputs it at relay contact.
④ Conditional settings necessary for operation can all be made by the key switches on the front panel.
⑤ The device is driven at 24VDC(D.C. voltage).
⑥ The driven power source is supplied at 12VDC and at 25mA to the sensor to be externally connected.
⑦ The initial setting conditions can be stored for about ten years by EEPROM at the time of power failure.
⑧ Outside dimensions are 24(H) x 48(W) 【DIN type】.

Contents

Explanations for display unit and their operational keys



Names of functional keys	Functional contents
① Display of measured values	At the time of measuring: It displays measured values(Instantaneous flowrates). And also displays input signal values and comparative output setting values on a monitor by means of key operations. At the time of setting: It displays setting menus and setting parameters. Misc.: It displays error messages on hard ware and setting error.
②Indicator on CP1	At the time of measuring: LED lights up, when turning on comparative output, and also LED blinks, when changing over display to comparative output setting value monitor. At time of setting: LED blinks during setting comparative values and comparative conditions.
③Indicator on CP2	At the time of measuring LED lights up, when turning on comparative output, and also LED blinks, when changing over display to comparative output setting value monitor. At time of setting: LED blinks during setting comparative values and comparative conditions.
④Mode key [M]	By using together with [S] key, it changes over from measuring mode to setting mode and also changes over modes within setting modes. 

Names of functional keys	Functional contents
⑤Shift key [≫]	It moves digit of numerical values to set. After selecting setting contents by [≫] key, set it by [S] key. 
⑥Up key [≪]	It changes over setting contents and changes numerical values to set. After selecting setting contents by [≪] key, set it by [S] key. Digit to set blinks, when setting numerical values. By depressing [≪] key, numerical values which is blinking operates incremental operation.  And also it is used for monitoring input signal values during flow measurement.
⑦Set key [S]	It changes over setting items within setting mode. Data and items which is to set are set by [S] key. **(For example)**  And also it is used for monitoring both setting values of CP1 and CP2 during flow measurement.

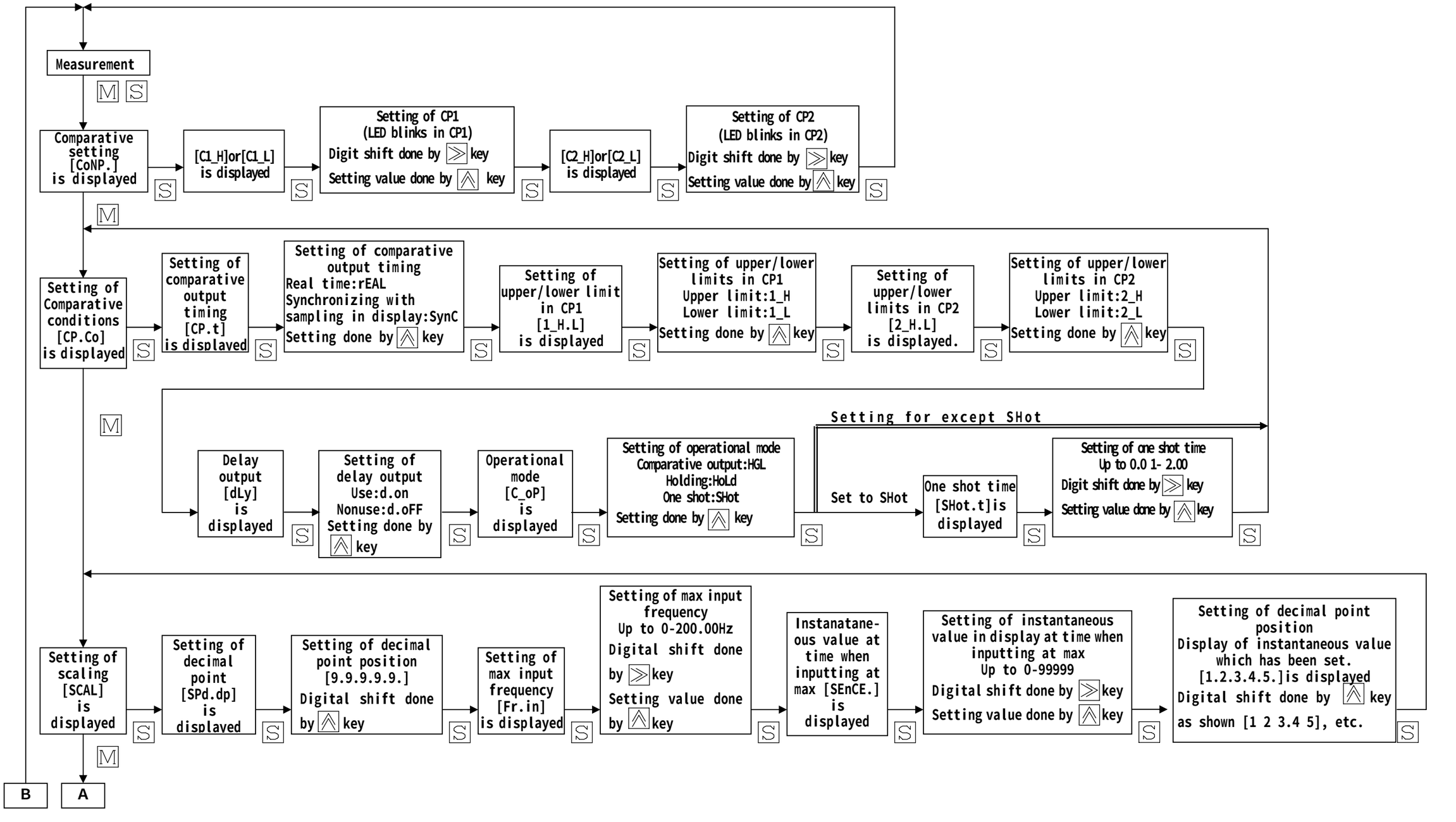
Explanation for each parameter

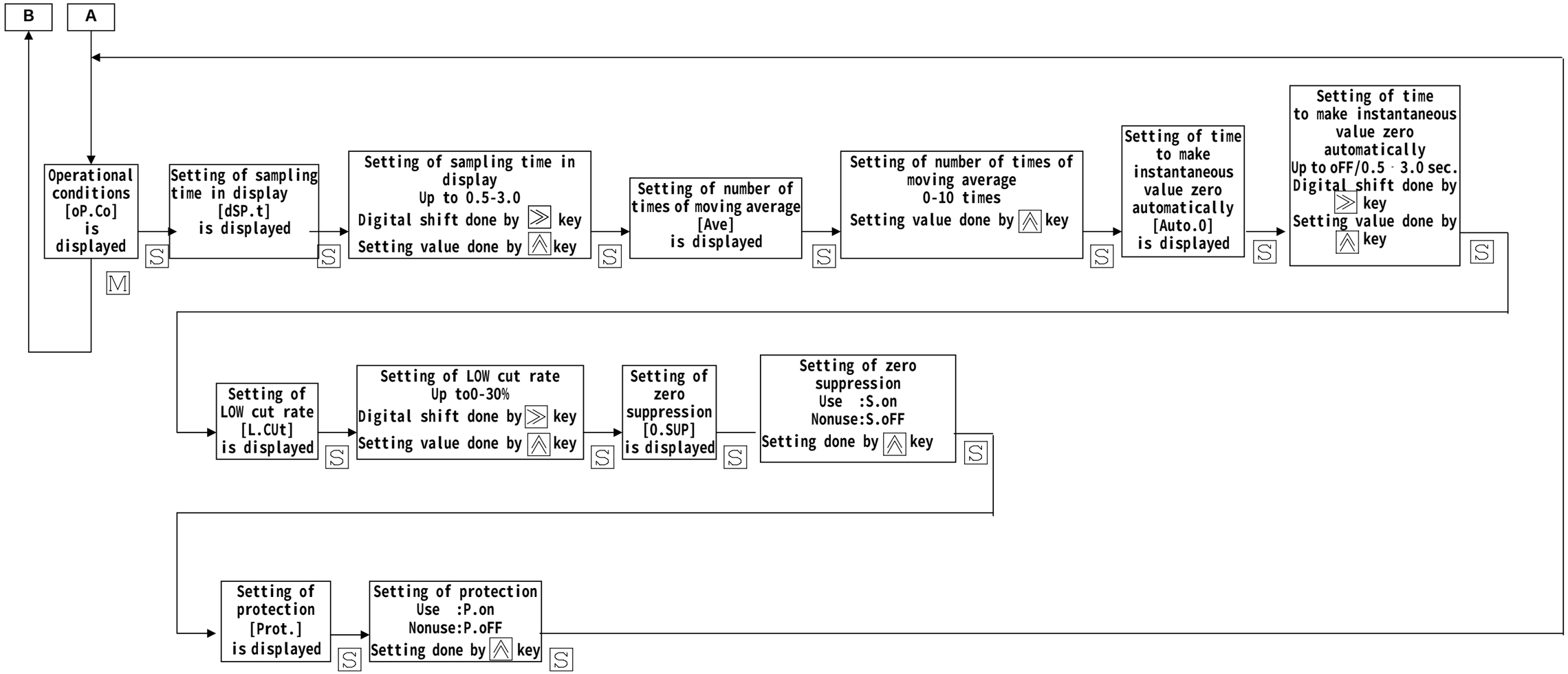
On-screen display	Items	Setting contents	Setting ranges	Initial values
CoNP.	Setting of comparative values			
C1__H or L	Setting of comparative values on CP1	It sets values on CP1 in comparative output.	0 - 99999	0010.0
C2__H or L	Setting of comparative values on CP2	It sets values on CP2 in comparative output.	0 - 99999	0090.0
CP.Co	Setting of comparative conditions			
CP.t	Setting of timing in comparative output	It selects operational timing in comparative output. r EAL: It outputs by internal measuring timing(0.5 sec.) S y n C: It outputs by synchronizing with sampling time in display.	rEAL:Real time SynC:Synchronism	SynC
1__H.L	Setting of upper/lower limits on CP1	It selects operational conditions on CP1 in comparative output. H: Output is turned on, when setting input values ≧ comparative values. L: Output is turned on, when setting input values ≦ comparative values	1__H (Upper limit) 1__L (Lower limit)	1__H
2__H.L	Setting of upper/lower limits on CP2	It selects operational conditions on CP2 in comparative output. H: Output is turned on, when setting input values ≧ comparative values. L: Output is turned on, when setting input values ≦ comparative values	2__H (Upper limit) 2__L (Lower limit)	2__L
dLy	Setting of delay output	It selects use or nonuse of delay output functions. ※ At the time of turning on power, CP1 in comparative output is not outputted, until it has once been turned off, even if power supply has been turned on. Also it operates similarly to CP2 in comparative output.	d.on :Use d.oFF:Nonuse	d.oFF
C__oP	Setting of operational mode	It selects operational mode in comparative output. HGL :It outputs changes of input values to setting values at a real time. HoLd:It holds in a state of turning on the comparative output. SHot:It outputs one shot, when turning on the comparative output.	HGL :Comparative output HoLd:Holding SHot:One shot	HGL
SHot.t	Setting of one shot time	It sets up ON-time of one shot (Pulse signal), when setting SHot to the operational mode.	0.01 - 2.00 sec. (Settable at a unit of 0.1 sec.)	0.20

On-screen display	Items	Setting contents	Setting ranges	Initial values
SCAL	Setting of scaling			
SP d. d P	Setting of decimal point position in display of instantaneous values	It sets decimal point position in display of instantaneous values.	∗.∗.∗.∗.∗.	∗∗∗∗.∗
Fr.in	Setting of max input frequency	It sets max values of pulse frequency to input.	0 - 200.00Hz	100.00
SEnCE.	Setting of instantaneous value display at the time of inputting at max	It sets max values in display of instantaneous values. (It sets max instantaneous values to make it display at the time when input signal is at max)	0 - 99999	0100.0
	Setting of decimal point position in “Instantaneous value display at the time of inputting at max”	It sets decimal point position in accordance with the rated value of sensor to be used.	∗.∗.∗.∗.∗.	∗∗∗∗.∗
oP.Co	Setting of operational conditions			
dSP.t	Setting of sampling time in display	It sets the time which updates display contents in instantaneous value display.	0.5 - 3.0sec. (Settable at a unit of 0.1 sec.)	2.0
AvE	Setting of number of times of moving average	It sets number of times of moving average in input signal. ※It functions to restrain from fluctuation of instantaneous value display caused by that of input signal in terms of taking the arithmetic average of past n times and measured values this time.	0 - 10 times (Settable at a unit of once)	10
Auto.0	Setting of time to make it zero automatically	It sets the time compulsorily to make the instantaneous value display zero, if input signal is not inputted even one pulse within setting time. ※If setting is made oFF and pulse input has been gone out, instantaneous values are not updated and it remains to display a present value, until next pulse is inputted.	oFF／0.5 - 3.0 sec. (Settable at a unit of 0.1 sec.)	1.0
L.CUt	Setting of low cut rate	For “setting of max input frequency” it sets Low cut rate to make input signal less than 0-30% zero.	0 - 30% at F.S. (Settable at a unit of 1 %)	00
0.SUP	Setting of zero suppression	It selects use or nonuse of zero suppression function. The higher-order zero than decimal point in instantaneous value display is not made to display, if setting is made effective.	S.on ：Use S.oFF：Nonuse	S.on
Prot.	Setting of protection	It selects use or nonuse of protection function. If having setting effective, setting data can be confirmed, but not changed.	P.on ：Use P.oFF：Nonuse	P.oFF

Setting loop of functions

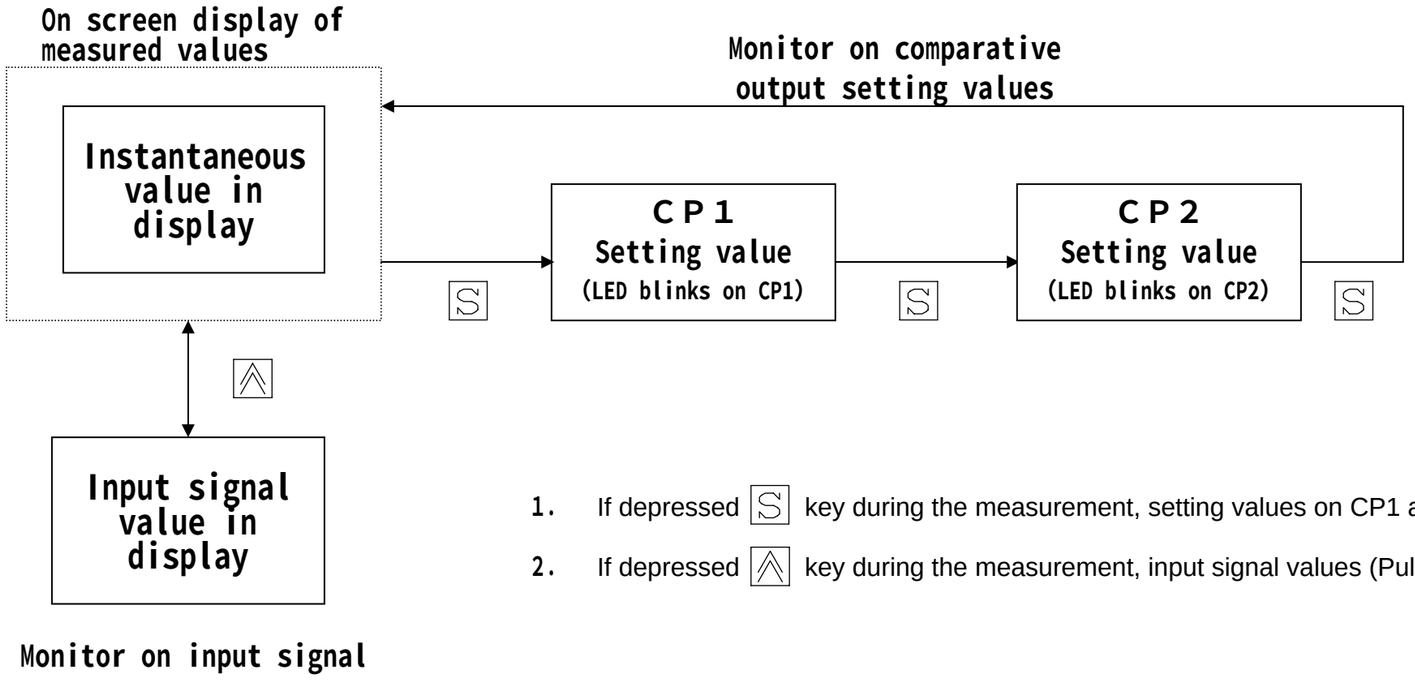
Depress [S] key while depressing [M] key, when moving from measuring mode to setting mode.
Moving of main loop is carried out by [M] key and steps to each item by [S] key.





- If depressed M key while setting item within one setting mode, it moves to setting mode next to main loop.
- For changing setting data, they are updated by depressing S key after changing the data on display.
  Even if changed data on display only and if passing by setting loop by M key without depressing S key, the previous data remain unchanged as it was.
- During setting mode it stops measuring and the comparative operation is held.

Overview of screen display and how to change over



1. If depressed [S] key during the measurement, setting values on CP1 and CP2 in comparative output can be monitored.
2. If depressed [∧] key during the measurement, input signal values (Pulse signal [Hz]) can be monitored.

※On-screen display returns to display of instantaneous values automatically, when key operations stops for one minute while displaying various kinds of monitor.
※Comparative output always operates, even if displaying various kinds of monitor.

Initialization of the settings

It functions compulsorily to return all the setting contents to a state of initial setting.

1) Continue to press [M] key for five seconds while pressing [≫] key in displaying state of setting modes such as “CoNP.”, “CP. Co” and “SCAL”, or “oP.Co”.

2) It enters initial setting mode, displays “i n i t” on screen and blinks.

3) If pressing [S] key, all setting parameters return to initial setting values as shown in a table of the initial setting values.
If not initializing settings, press any other key than [S] key, and returns to the setting mode without initializing.

※ The initial setting values of EM0100DT/DR purchased together with a set of our Flowmeter are not applicable to that of contents listed right. When initializing settings, be sure to make a copy of all parameters which are set at present.
The setting values necessary for such scaling as “Setting of max input frequency ” and “Setting of Instantaneous value display at the time when it is at max” vary with types.

Initial setting values

Setting items	Contents
Setting of comparative values on CP1	0010.0
Setting of comparative values on CP2	0090.0
Setting of comparative output timing	S y n C
Setting of upper/lower limits on CP1	H
Setting of upper/lower limits on CP2	L
Setting of delay output	o F F
Setting of comparative output operating mode	H G L
Setting of one shot time	0.20[second]
Setting of decimal point position in display of instantaneous values	∗∗∗∗.∗
Setting of max input frequency	100.00[Hz]
Setting of instantaneous value display at the time when inputting at max.	0100.0 (100.0L/min)
Setting of decimal point position for “Setting of Instantaneous value display at the time when inputting at max”	∗∗∗∗.∗
Setting of sampling time	2.0[seconds]
Setting of number of times of moving average	10[times]
Setting of time automatically to zero	1.0 [seconds]
Setting of Low cut rate	00[%]
Setting of zero suppression	o n
Setting of protection	o F F

How to set scaling

Setting of instantaneous value display at the time of inputting at max ： 10 is set when using a flowmeter whose max flowrate is 10 L/min.

Setting of max input frequency ： Pulse frequency obtained from a flowmeter whose max flowrate is 10 L/min is set.

Setting for contents described above

Scaling functions

Instantaneous values on display are scaled at setting values whose input signal is set at “Setting of instantaneous value display at time when inputting at max”

Input corresponding to max ones is a value set at “Setting of max input frequency”.

- Values on display

$$\text{Values on display} = \frac{\text{Input signal frequency}}{\text{“Setting of max input frequency”}} \times \text{“Setting of instantaneous value display at the time of inputting at max”}$$

Instantaneous value display is expressed in terms of L/min.
When setting the scaling value in terms of “Setting of instantaneous value display at the time of inputting at max”, the decimal point position is also set in accordance with rating value of sensor to be used.

instantaneous value display functions

With respect to the signal input whose measuring signal input pins are currently impressed, the instantaneous value display is shown at the values which have been made scaling by the setting scaling values (set value by “Setting of instantaneous value display at the time of inputting at max”).

- Position of decimal point is displayed by the decimal place where has been set at “Setting of decimal point place in displayed value”.
  (It is settable independently of decimal point place set at “Setting of decimal point place in instantaneous value display at the time of inputting at max”)
- Display contents are updated by the time set at “Setting of display sampling time”.
- “Zero” display higher than decimal point place is not displaced, when “Setting of zero suppression” is signified.
- The unit of instantaneous value display is expressed in terms of “L/min”.
- Instantaneous value display blinks, when input signal and digit of instantaneous value display overflows.

On-screen display	Key operations	Explanatory comments
Measured value display	MODE + SET	When screen of measuring value display appears, press SET key, while pressing MODE key.
CoNP	MODE	Comparative value setting screen appears. Press MODE key to go to next setting screen.
CP.Co	MODE	Comparative conditions setting screen appears. Press MODE key to go to next setting screen.
SCAL	SET	Scaling setting screen appears. Press SET key to go to scaling details setting screen.
SPd.dP	SET	“Setting of decimal point position in instantaneous value display” appears. Press SET key to go to setting screen of decimal point position.
9999.9	 SET	Decimal point position moves, every time  key is pressed. Press SET key to update the settings and to go to next setting screen.
Fr.in	SET	“Setting of max input frequency” appears. Press SET key to go to numerical value setting screen.
100.00	SET	Blinking digit moves, every time key is pressed, and also numerical value of blinking digit runs incremental operation, every time key is pressed. Press SET key to update the settings and to go to next setting screen.
SEnCE	SET	“Setting of instantaneous value display at the time of inputting at max” appears. Press SET key to go to numerical value setting screen.
0100.0	  SET	Blinking digit moves, every time  key is pressed, and also numerical value of blinking digit runs incremental operation, every time  key is pressed. Press SET key to update the settings and to go to next setting screen of decimal point position in “Setting of instantaneous value display at the time of inputting at max”.
0100.0	 SET	Decimal point position moves, every time  key is pressed. Press SET key to update and go to next setting screen.
SCAL	MODE	Scaling setting screen appears. Press MODE key to go to next setting screen.

How to awake HoLd(Holding) in comparative output

1) Continue to press [^] key for more than five seconds while pressing [M] key in a stat of on-screen of measuring value display (On-screen of instantaneous value display).

2) It enters comparative output awaking mode, displays “CP. rES” on screen and blinks.

3) Press [S] key to awake the holding state(ON) in comparative output.
If not awoken, press any key other than [S] key to return to the on-screen of measuring value display (On-screen of instantaneous value display) without awaking holding state.

Functions of overflow display

If the signal whose measuring signal input pin is impressed exceeded input ranges(Pulse input：200Hz), or if instantaneous value display exceeded a possible display digit, instantaneous value display which is currently displayed blinks and shows overflow, but measured values are displayed, if including measuring ranges(Approx 10% of span area)even at time when overflowing.

Functions of error display

When error occurred, error number is displayed and blinks on measuring value display screen(Instantaneous value display screen).

Error No.	Contents	Countermeasures and their actions to take
Er01	Mask ROM memory error	MPU is out of order. It is necessary to repair hardware.
Er02	Backup memory error	Backup of EEPROM is out of order. It is necessary to repair hardware.
Er04	Backup memory error (Interface signal)	Backup of EEPROM is out of order. It is necessary to repair hardware.
Er10	Setting error at setting values	Erroneous setting values are inputted. Press M key and retype parameters.

Setting of comparative output operation and characteristics of output patterns

Setting of comparative conditions

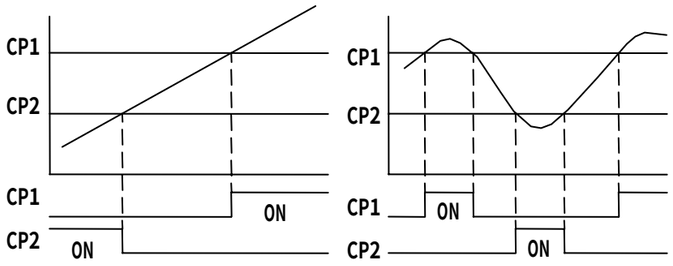
A	Setting of comparative output timing	rEAL	Sync	
B	Setting of upper/lower limits on CP1	H	L	
C	Setting of upper/lower limits on CP2	H	L	
D	Setting of delay output	on	oFF	
E	Setting of operational mode	HGL <Comparative output>	HoLd <Holding>	SHot <One shot output>
F	Setting of one shot time	Up to 0.01-2.00 seconds		

If it is a type of EM0100DR ： CP1＝CP1－a、CP2＝CP2－a

Setting examples for comparative condition operations

	Pattern 1	Pattern 2	Pattern 3	Pattern 4	Pattern 5	Pattern 6
Setting A	rEAL	rEAL	rEAL	rEAL	rEAL	rEAL
B	H	H	H	H	L	H
C	L	H	L	L	L	L
D	oFF	oFF	oFF	on	on	oFF
E	HGL	SHot	SHot	HGL	HGL	HoLd
F	—	0.2	0.2	—	—	—

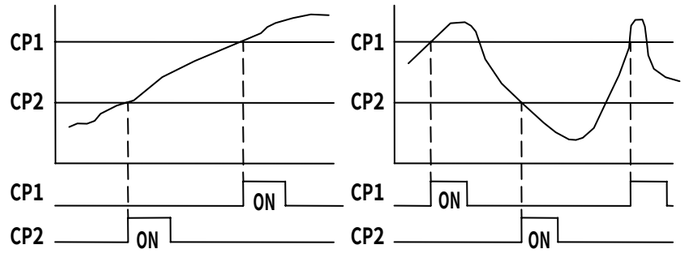
Comparative output operation



(Pattern 1)

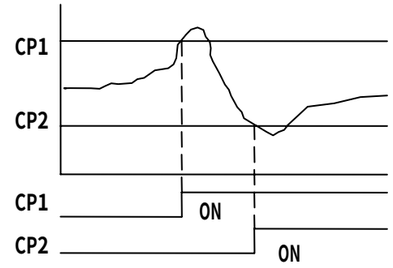
One shot operation

Upper/upper limits one shot **Upper/lower limits one shot**



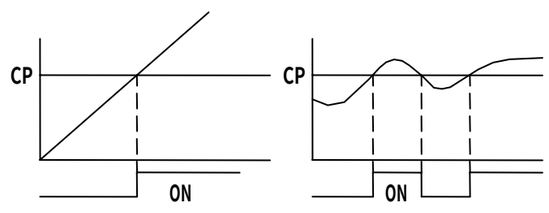
(Pattern 2) (Pattern 3)

Holding operation



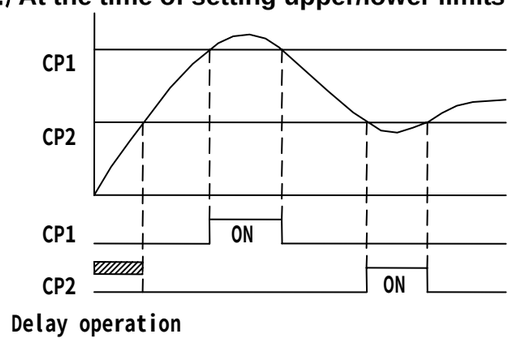
(Pattern 6)

1) At the time of setting upper limit



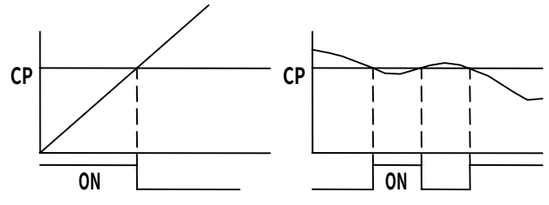
Delay operation

1) At the time of setting upper/lower limits

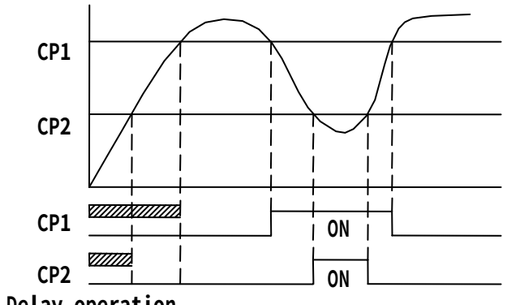


(Pattern 4)

2) At the time of setting lower limit



2) At the time of setting lower/lower limits

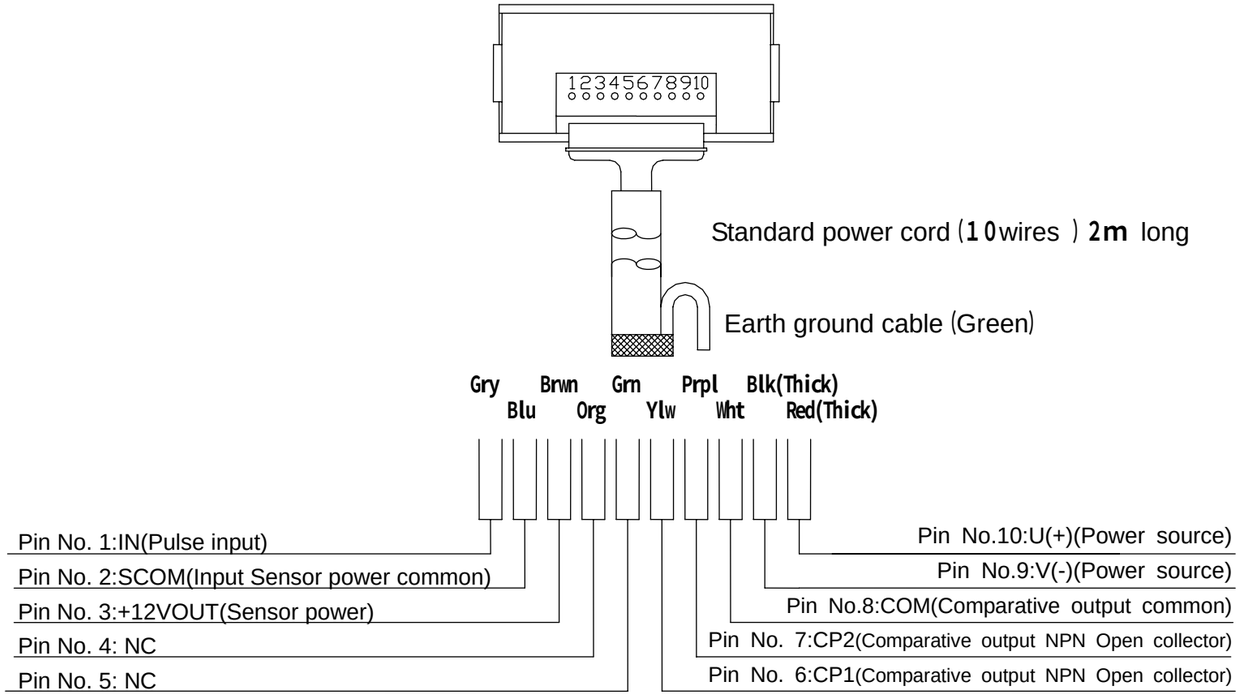


(Pattern 5)

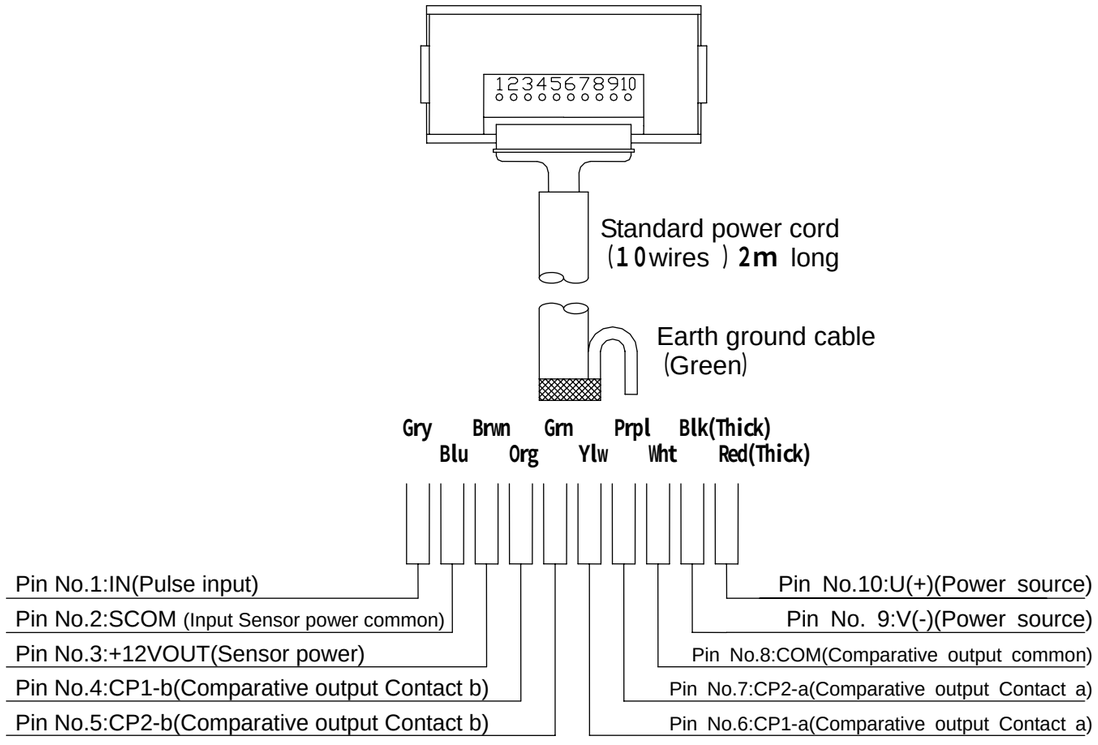
If it is EM0100DR：CP1＝CP1－a、CP2＝CP2－a

Explanation for external input/output pins

Rear view of EM0100DT



Rear view of EM0100DR



※ Pin No.4 and No.5 are empty terminals in EM0100DT. Do not connect any.

Pin No.	Names of signals	Standard cable colors	Functional contents	
1	IN	Gray	Input pin for measuring signal. Inputs pulse signal coming from sensor is inputted.	
2	SCOM	Blue	Common pins to measuring signal input and power source for sensor	
3	＋12VOUT	Brown	Output pin for sensor at power source of ＋12VDC. It supplies sensor with 12VDC and 25mA(at max).	
4	NC	Orange	Anything is not connected.	EM0100DT
	CP1－b		Comparative output pin on CP1. It outputs in term of contact b of relay.	EM0100DR
5	NC	Green	Anything is not connected.	EM0100DT
	CP2－b		Comparative output pin on CP2. It outputs in term of contact b of relay.	EM0100DR
6	CP1	Yellow	Comparative output pin on CP1. It outputs in term of NPN open collector.	EM0100DT
	CP1－a		Comparative output pin on CP1. It outputs in terms of contact a of relay.	EM0100DR
7	CP2	Purple	Comparative output pin on CP2. It outputs in terms of NPN open collector.	EM0100DT
	CP2－a		Comparative output pin on CP2. It outputs in terms of contact a of relay.	EM0100DR
8	COM	White	Common pin in comparative output	
9	V（－）	Black（Thick）	Input pin for power source. It supplies with power source for driving from outside. Connection is made to “0V” of power source.	
10	U（＋）	Red（Thick）	Input pin for power source. It supplies with power source for driven from outside. Connection is made to “＋24V” of power source.	

① Third class of ground shall be used for grounding（Below １００Ω）.

② Pulse input is a single end type.

③ SCOM pin and COM pin are independent common pin respectively.

④ Pin No.4 and 5 are empty terminals in EM0100DT. Do not connect any.

⑤ Standard cable color is black.

How to connect wires

Warning

Wiring shall be done under the condition that power source is securely turned off. If not, it may cause operating failure and damage of devices, or fire.

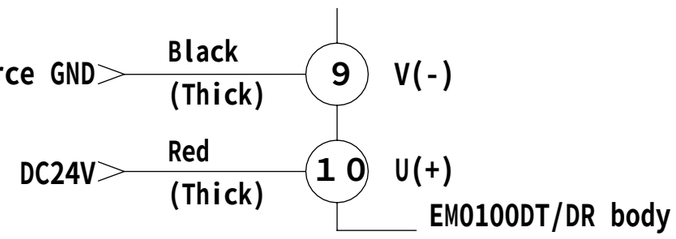
If connector treatment is done by our user for reasons of wiring, use the following parts.

- Applicable wire：0.06 - 0.33sq(AWG22－28 equivalent)、Use cord of 1.2-1.9mm in diameter.
- Applicable connector: Use hausing (Model:XHP-10) and contact(Model: BXH-001T-0.6) made by NICHIATSU K.K.

1. Connecting power source

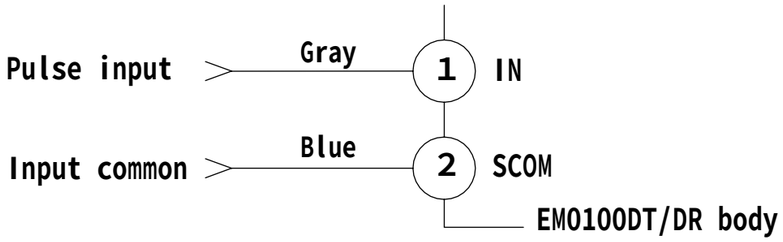
No.9(Black/Thick) and No.10(Red/Thick) are for the use of power source connections.

- Power source voltage：DC24V（±10%）



2. Connecting input signal

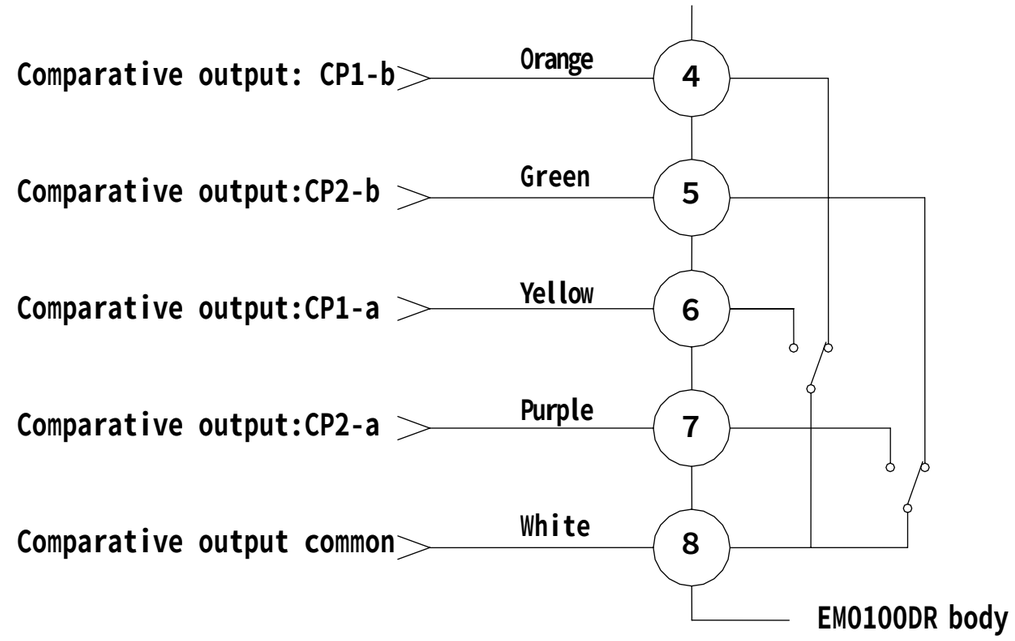
No.1(Gray) and 2(Blue) are for use in input signal connections.



3. Connecting comparative output(In case of EM0100DR)

No.6 (Yellow) and No.8(White) are for use in connection of CP1-a in comparative output.
No.4 (Orange) and No.8(White) are for use in connection of CP1-b in comparative output.
No.7(Purple) and No.8(White) are for use in connection of CP1-a in comparative output.)
No.7(Purple) and No.8(White) are for use in connection of CP1-b in comparative output.

- Kind of contact：One transfer contact （Contact c ）
- Contact capacity：DC35V・0.1A (Load resistance)

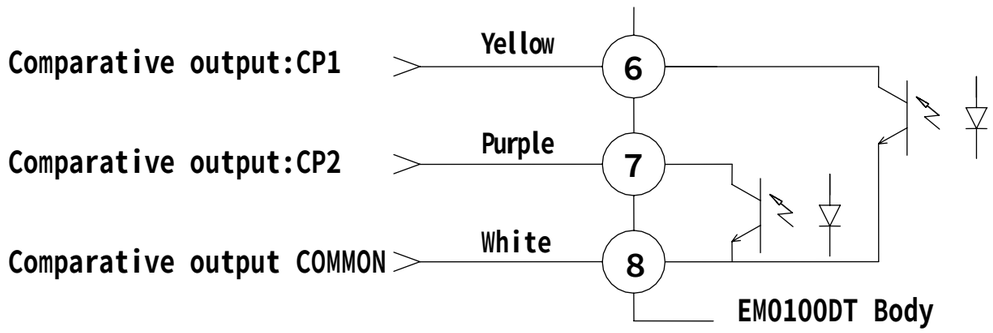


4. Connecting comparative output (in case of EM0100DT)

No.6 (Yellow) and No.8(White) are for use in connection of CP1 in comparative output.

No.7 (Purple) and No.8(White) are for use in connection of CP2 in comparative output.

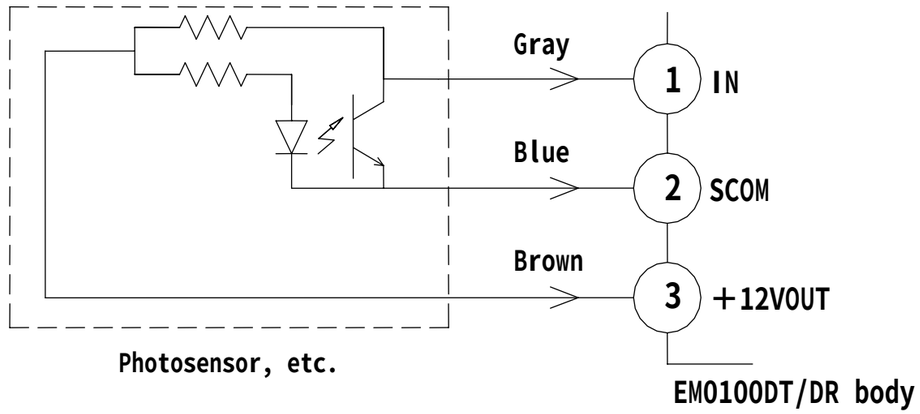
- Output impressing voltage：Below 35VDC、Sink current：Below 100mA(Vol=1.3V)



5. Connecting power source for sensor

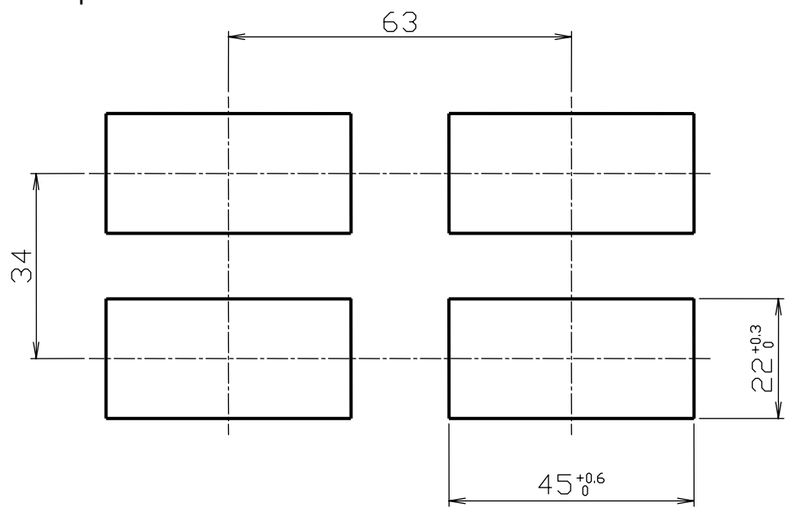
Pin No.2(Blue) and pin No.3(Brown) are for use in connection of power source for sensor at ＋12V.

It supplies sensor with 12VDC，25mA at max.



Dimensions for panel cut-out

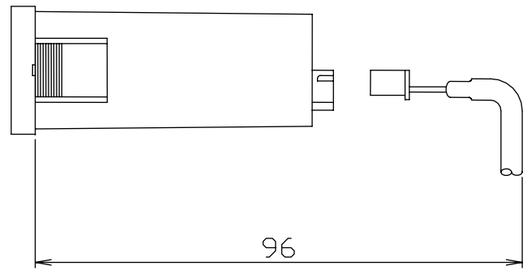
- Dimensions for panel cut-out



※Panel in thickness：0.5mm-4mm

- Panel in depth

Take a mounting space of 96mm and more for panel depth considering Installing and removing connectors.



Specifications

1. Measuring input

Items	Conditions	Specifications
Input form	—	Single end input (Isolated from power source)
Pulse input	—	Open collector input Input responding frequency 0～200Hz(duty50%)
Allowable excessive input	—	DC35V
Pulse measuring form	—	Periodic measuring form
Periodic measuring sampling	—	0.5 sec. (Sampling time puts off according to input frequency in lower frequency)
Scaling form	—	Digital scaling form In terms of “Setting of max input frequency” and “Setting of instantaneous value display at the time of inputting at max”.
Max input frequency	—	Setting ranges：0-200Hz
Number of times of moving average	—	Setting ranges：0～10 times
Instantaneous value measurement	Ta＝+23℃±5℃ 35-85%RH,Setting of scaling for one year (99999)	±(0.05% of F.S.+1digit)
Instantaneous value temperature drift	Ta＝0 - +50℃	±(100ppm of F.S.)/℃

2. Display

Items	Conditions	Specifications
Instantaneous flowrate display	—	Five digits are displayed(99999) Character height:8 ㎜ by red LED display
Comparative output display	Two staged display	LED lamp lights up when turning on comparative output. Green LED lamp display
Display sampling time	—	Setting ranges：0.5-3.0 sec.
Decimal point position in Instantaneous value display	—	Setting position：*.*.*.*.*.
Overflow display	—	LED blinks in inst. value display
_Zero suppression	—	Zero suppression is made in higher digit than that of decimal point.

3. Comparison

Items	Conditions	Specifications
Comparative operation	—	
Setting of comparative value	Two staged setting	Setting ranges：0～99999
Comparative output (EM0100DT)	—	Transistor NPN open collector output Output impressed voltage：Below 35VDC Sink current：Below 100mA(Vol=1.3V)
Comparative output (EM0100DR)	Life of contact： 1,800 times/hour at the time of making and breaking Mechanical life： 36,000 times/hour at the time of making and breaking	Relay contact output Kind of contact：One transfer contact(Contact c) Contact capacity：DC35V・0.1A (Load resistance) Life of contact ：More than 100 thousand times (DC35V・0.1A、Load resistance) Mechanical life：More than 50 million times

4. Functions

Items	Conditions	Specifications
Guarantee against power failure	EEPROM	Backup of each setting data Writable number of times：Approx one million times Storage life：Approx 10 years
LOW cut rate	—	Setting ranges：0-30% at F.S.
Input signal monitoring function	—	Displayed at raw value of signal input
Comparative output monitoring function	—	Selecting display from setting values in CP1 and CP2 in comparative output
Protective function	—	Selective setting from protection of setting values.

5. Power source for sensor

Items	Conditions	Specifications
Output voltage	Ta=+23℃±5℃	DC12V±10%
Output current	—	25mA max

6. Supply power source

Items	Conditions	Specifications
Voltage	—	DC24V±10%
Current	—	Approx. 110mA

7. Environment

Items	Conditions	Specifications
Operating temperature	—	0 - +55℃
Operating relative humidity	—	35 - 85%RH (No condensation)
Storage temperature	—	-20 - +70℃

8. Miscellaneous

Items	Conditions	Specifications
Noise resistance (Impulse)	DC24V VS 0V Power source VS Panel Panel VS SCOM	Power source line：800V (Power source noise in normal mode) Common mode：600V (Power source noise in common mode) Common mode：600V(Common mode noise)
Withstand voltage	Power source VS Alarm output Live part VS Case	AC500V・ for one minute
Insulating resistance	Power source VS Alarm output Live part VS Case	Measured at DC500Vmegger. 20MΩ and more
Withstand vibration	—	Number of vibrations：10～55Hz、Double amplitude：1.5mm X,Y,Z each direction for 2 hours、Sweep time： For one minute (In terms of JIS-C0911-1984)
Withstand shock	—	Strength of shock：294m/s^2(Approx 30G) Duration of shock pulse：11ms X,Y,Z six directions for 3 times (JIS-C0912-1984)
Outside dimensions	—	24H×48W×approx 62D(mm)
Weight	—	Approx 37g
Case	—	Made of plastic molding

Warranty

- The warranty period of the product shall be one year commencing on the date of delivery.
  We will repair or replace any faults occurred during this period which is obviously liable for us at a cost of no charge.
- As to how to repair, we are kindly requesting you to send back the faulty product to our company and to let us do the take-back repair.
- To avoid processing delays, please be sure to put the memoranda on the faulty contents in detail on the product.
- Please approve that the following items shall be excluded from the warranty.
  - Any fault or damage caused by abuse or improperly handling by user side.
  - Any fault or damage caused by other reasons except for cases for which our company is liable.
  - Any fault caused by remodeling or repairing except done by our company.
  - Any fault or damage caused by such disasters as fire, earthquake or flood damage.
  - Any damage triggered by the fault of this product

《Judgment based on the attached sheet the first to Export Trade Control Ordinance》

This product is an electronic digital indicator which measures the direct-current electricity and voltage. Relating to the said goods above for which we have carefully checked in accordance with a list of the permitted items regulated under control in the attached sheet the first to Export Trade Control Ordinance, we hereby judged that the product are no correspondence items and also that they have no technology regulated under control in ministerial ordinance, and we judged it as goods to be out of strategic goods exporting control.

Judgment: nonrelevant products

Self-judgment date: July 17, 2002

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