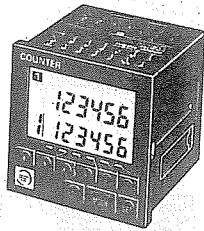


INSTRUCTION MANUAL

Thank you for purchasing the OMRON H8BM Multi-Maintenance Counter. This manual primarily describes precautions required in operating, wiring, and installing the counter. For daily operation, please refer to the enclosed "OPERATION MANUAL".



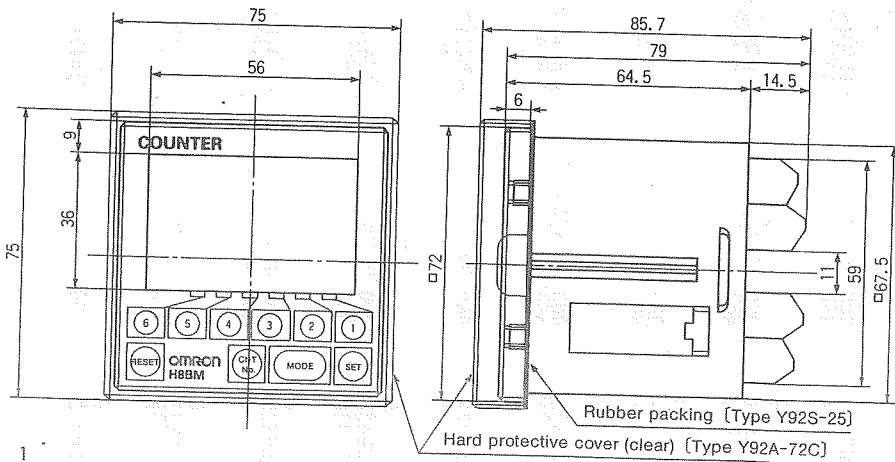
0667723-6A

OMRON Corporation

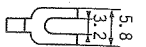
INDEX

1 Dimensions	1	12 All clear	18
2 Mounting methods	2	13 Output indication	19
3 Connections	3	14 Error messages	20
4 Display section and operation section	7	15 Other indications	20
5 To start with	9	16 Operation chart	21
6 Mode selection	9	17 Precautions	23
7 Setting and changing settings	11	18 Ratings and characteristics	25
8 Special settings	15	19 Reminder of the settings	26
9 Resetting of count value	16		
10 Remonitoring of count value	17		
11 Confirmation of count value	18		

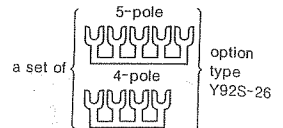
1 Dimensions



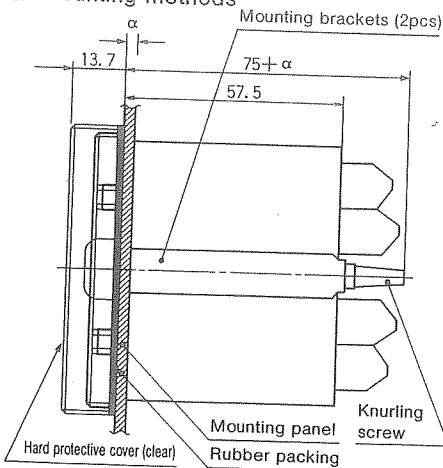
• M 3 × 5 screws are used. Select solderless terminals referring to the figure below.



• When using the counter as single-input multi-step setting type, use the shortbar to short circuit count input 1 to 9 for simple wiring.

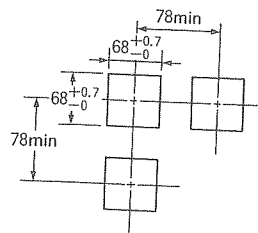


2 Mounting methods

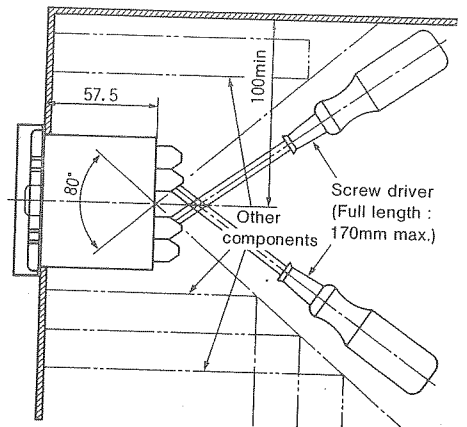


• Attach the two mounting brackets supplied as accessories on both sides of the counter and tighten the knurling screw of the mounting brackets with hand. If any screw other than the knurling screw is used or if the knurling screw is tightened excessively with a tool, the housing of the counter may be damaged.

• Panel cutout
Standard panel cutout, shown right, conforms to DIN 43700. The permissible thickness of the mounting panel is 1 to 5 mm.



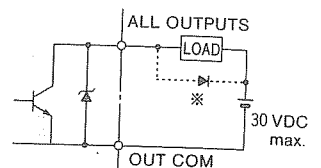
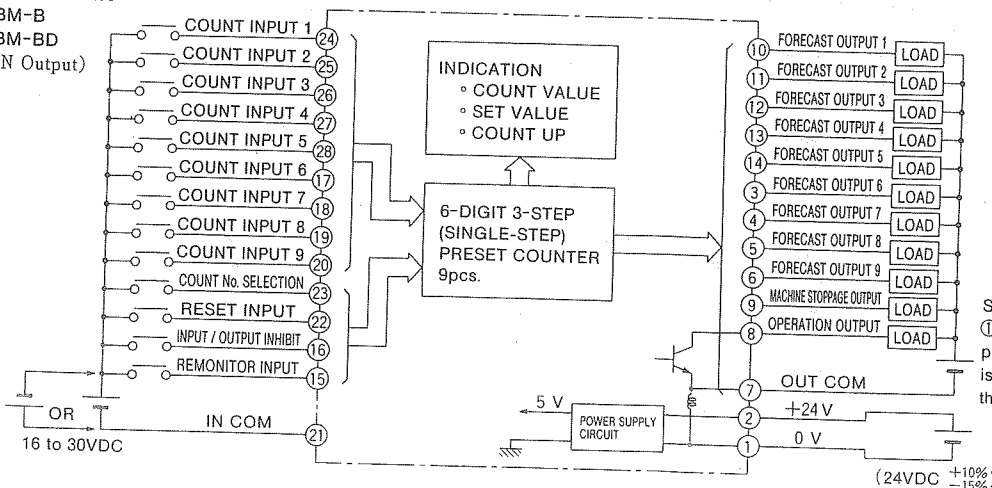
• Leave sufficient space between the counter and other components for wiring.



2

3 Connections

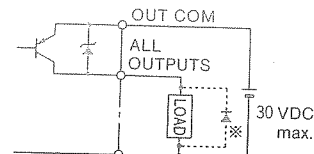
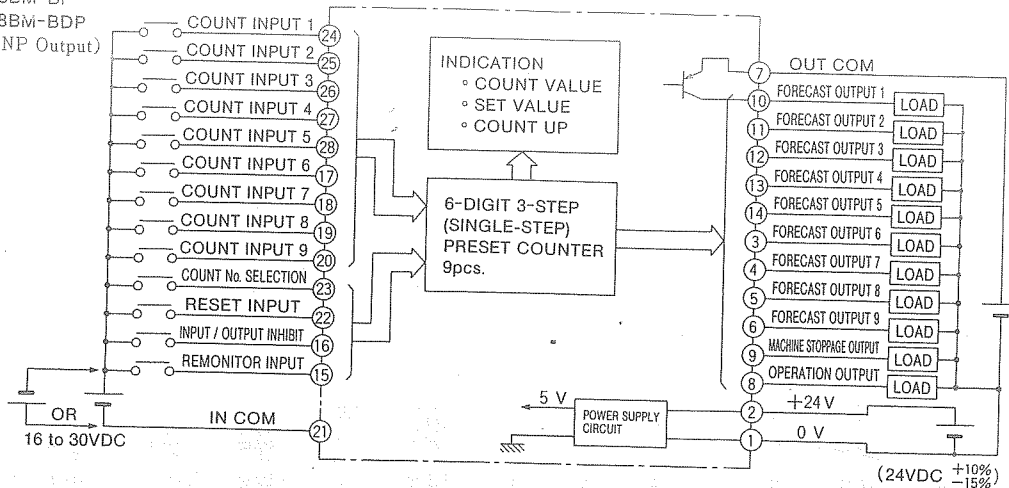
H8BM-B
H8BM-BD
(NPN Output)



※ When using an inductive load, connect a back-surge-absorbing diode. Note that internal circuit damage can result from a short circuit of the load.

	All outputs
Output method	open collector
Application voltage	30V max.
Rated current	100mA
Residual voltage	2V max.
Leakage current	100 μA max.

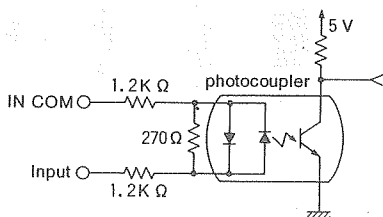
H8Bivi-BP
H8BM-BDP
(PNP Output)



※ When using an inductive load, connect a back-surge-absorbing diode. Note that internal circuit damage can result from a short circuit of the load.

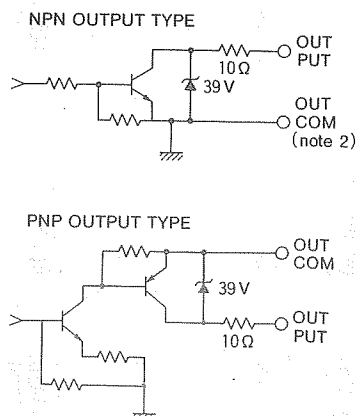
	All-outputs
Output method	open collector
Application voltage	30V max.
Rated current	100mA
Residual voltage	2V max.
Leakage current	100 μ A max.

• Input Circuit (note.1)



- Notes :
- 1) Do not perform insulation test or dielectric strength test, though input is electrically isolated from internal circuit.
 - 2) The OUT COM terminal and the 0V terminal of NPN transistor output type are internally connected. Be sure to use transformer whose primary and secondary wirings are insulated and secondary wiring ungrounded as power supply for output devices.

• Output Circuit



• Input wiring example (solid-state switch)

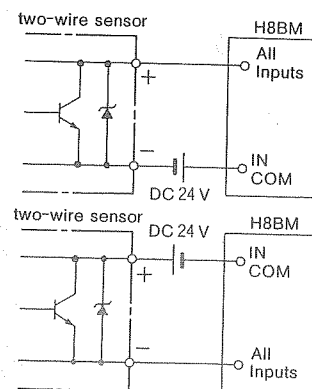
All inputs (count input, counter no. select input, reset input, input / output inhibit, and remonitor input) are turned ON at power application.

※ Use two-wire proximity switch whose spec. satisfy the following.

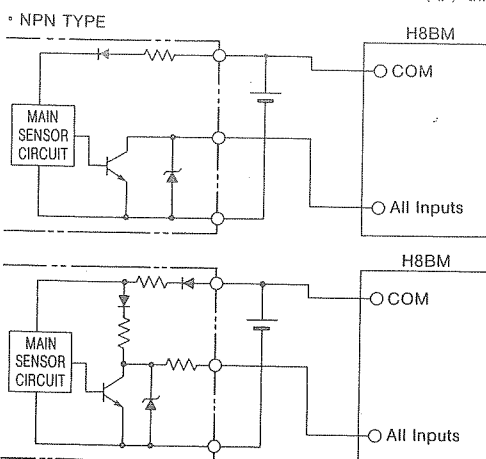
- ①. "H" level : transistor ON
Switching capacity : min. value 5mA max.
Residual voltage : 4V max.
- ②. "L" level : transistor OFF
Leakage current 1.5mA max.
- ③. Supply voltage range : 20.4 to 30VDC

☆Recommended sensor
OMRON TL-XD or E2E-XD-N

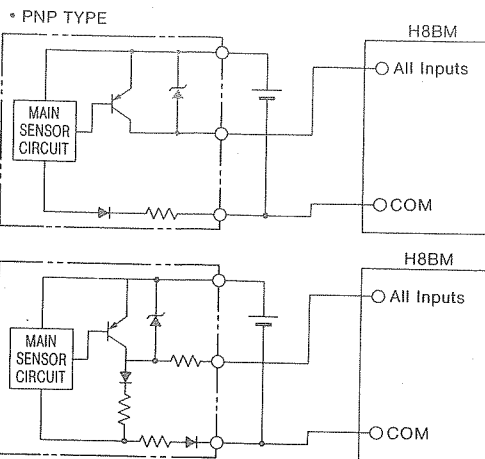
(I) two-wire sensor



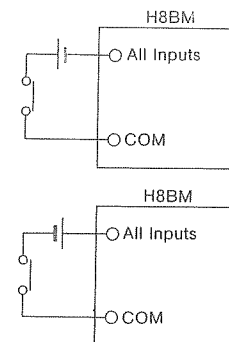
• Input wiring example (solid-state switch)



(II) three-wire sensor



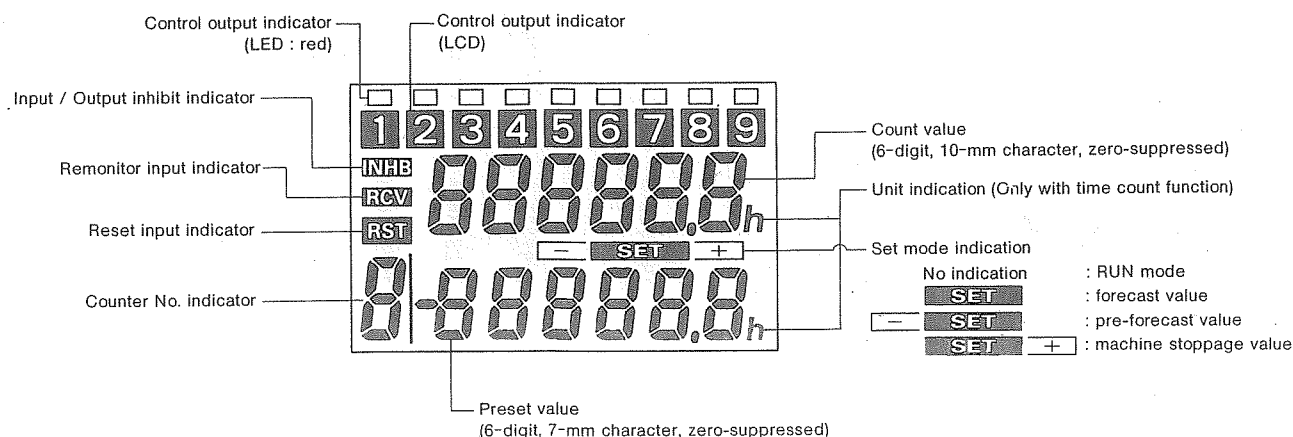
• Input wiring example (contact switch)

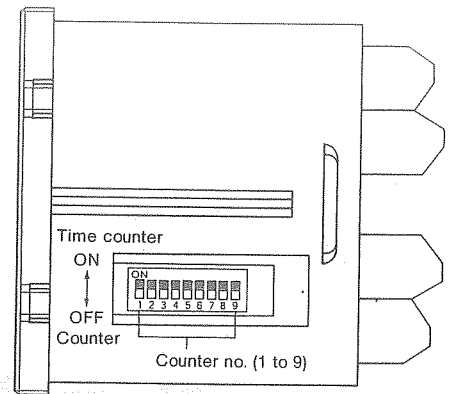
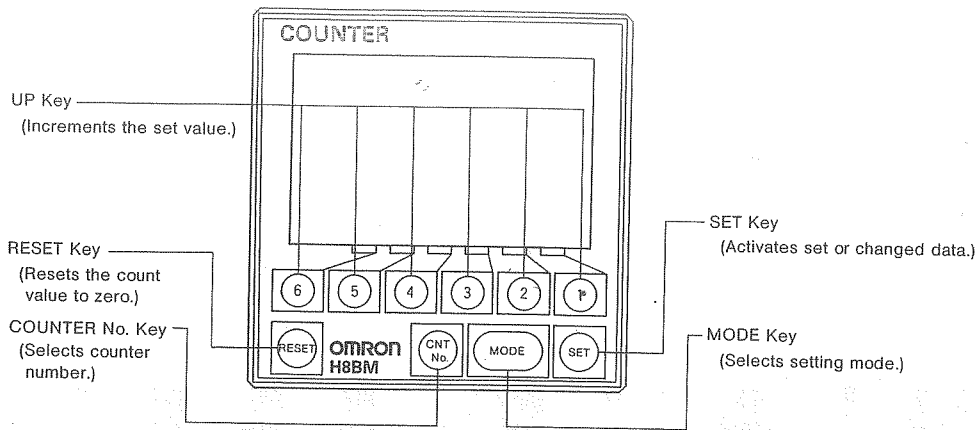


- ※ "H" → contact ON
- ※ Use contact with sufficient capacity to switch 30V, 13mA.

4 Display section and operation section

■ Display section





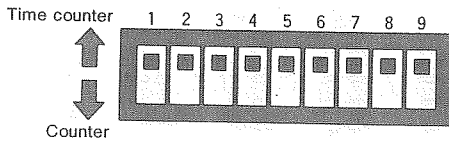
8

5 To start with

Selection between count function and time count function

Open the lid on the side of the counter to select count function or time count function for each counter unit.

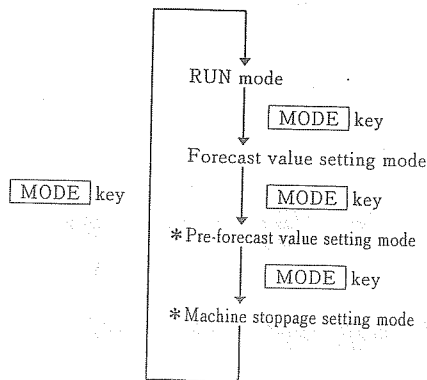
- Time count function adds up the ON time of count input.



※ Set the DIP switches before power application. Setting change during operation is ignored. Be sure to turn the power off and then on again after changing settings.

6 Mode selection

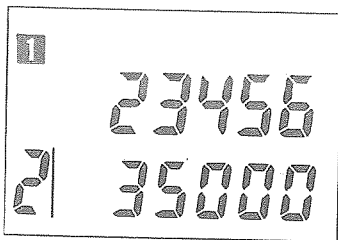
Press Mode key to select modes.



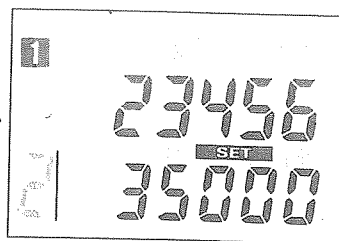
- Notes:
- * marked modes are not available with single-step type (H8BM-BD, -BDP)
 - Input / output operation is continuously performed in any mode.
 - When no key operation is input for 1 min., the mode automatically returns to RUN mode.
 - represents flashing.

9

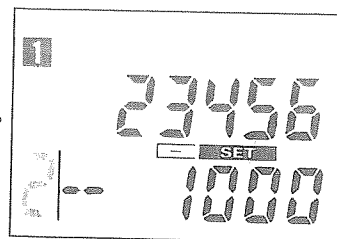
(RUN mode)



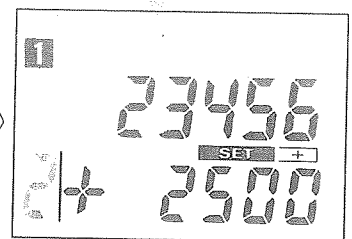
(Forecast value setting mode)



(Pre-forecast value setting mode)



(Machine stoppage value setting mode)



• Indication during operation is displayed.
"0" is displayed for set value and count value at the first power application.

• Forecast value can be set or changed.

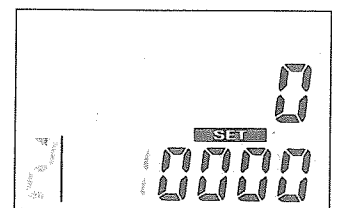
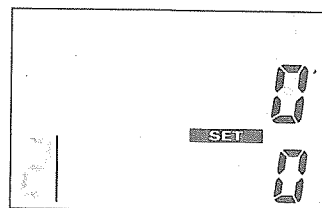
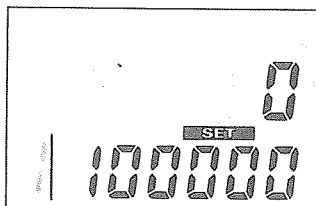
• Minus value to the forecast value can be set or changed.

• Plus value to the forecast value can be set or changed.

10

7 Setting and changing the settings (Three-step setting type)

[1] How to set or change the forecast value



① Press **MODE** key to enter forecast value setting mode.

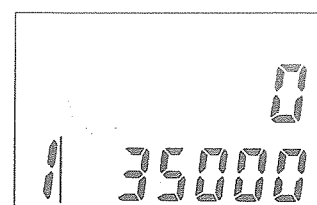
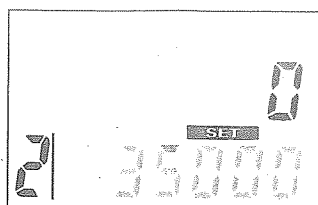
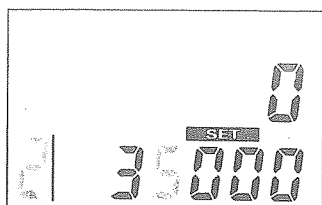
- The counter number displayed in RUN mode is displayed.

② Press **COUNTER No.** key (or input counter no. select) to select counter number to which setting or change is applied.

- With each key press-down, the counter number increments as ;
→ 1 → 2 → → 8 → 9

③ Press **UP** key (**1** to **6**) to change numeral of each individual digit.

- If a key is pressed, the corresponding digit starts to flash.
- Preset value is zero-suppressed.
- With each key press-down, the numeral increments as ;
→ 0 → 1 → 2 → → 8 → 9



ex. How to set forecast value of 35000 to counter No.2.]

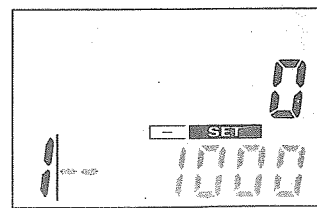
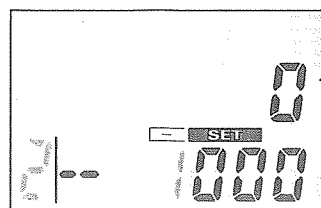
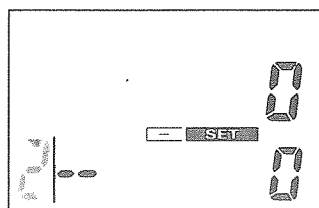
④ Press **SET** key to define set value.

- If no key operation is input for 5 sec. after pressing **SET** key the mode automatically returns to RUN mode.
- Any key operation is effective during this 5 sec.

12

[2] How to set or change pre-forecast value

(ex. When setting value 1000 minus to forecast value 35000)



① Press **MODE** key and enter pre-forecast value setting mode.

- The counter number displayed in forecast value setting mode is displayed.
- -- is automatically displayed.
(minus)

② Press **COUNTER No.** key (or input counter no. selection) to select the desired counter number.

- Set or change the value using up keys (**1** to **5**).
- No key operation is required when counter number is not changed.

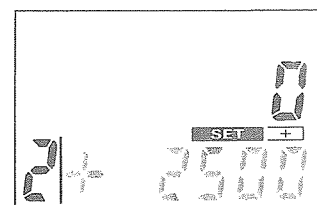
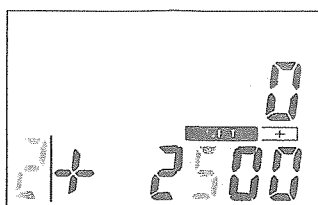
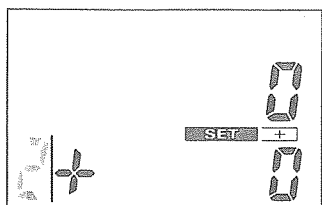
③ Press **SET** key to define set value.

- If no key operation is input for 5 sec. after pressing **SET** key, the mode automatically returns to RUN mode.
- Any key operation is effective during this 5 sec.

13.

[3] How to set or change Machine stoppage value

(ex. When setting value 2500 plus to forecast value 35000)



① Press **MODE** key and enter machine stoppage value setting mode.

- The counter number displayed in pre-forecast value setting mode is displayed.
- + is automatically displayed.
(plus)

② Press **COUNTER No.** key (or input counter no. selection) to select the desired counter number.

- Set or change machine stoppage value using up keys (**1** to **5**).
- No key operation is required when counter number is not changed.

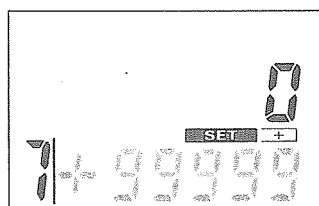
③ Press **SET** key to define set value.

- If no key operation is input for 5 sec. after pressing **SET** key, the mode automatically returns to RUN mode.
- Any key operation is effective during this 5 sec.

14

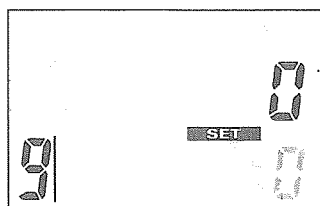
[8] Special settings

[1] When not using machine stoppage function



Set machine stoppage value as +99999 (+9999.9h) to the desired counter : machine stoppage signal will not be output from the counter.

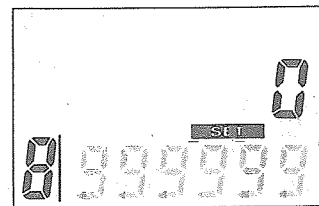
[2] When not using specific counter



Set forecast value as 0 (0.0h) to the desired counter : the counter function will be invalid.

- By setting forecast value as 0 (0.0h) , pre-forecast value and machine stoppage value are automatically set to 0 (0.0h).

[3] When using totalizing counter / totalizing time counter function

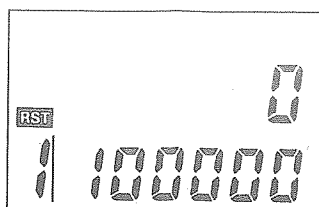
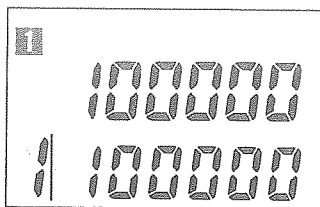


Set forecast value as 999999 (99999.9h) to the desired counter : the counter will function as totalizing counter or totalizing time counter.

- Machine stoppage signal will not be output from the counter.
- With totalizing counter function, the forecast output of the counter will give 20ms one-shot output as carry signal when count value changes as 999999 → 0.

Resetting of count value

[1] Reset per counter unit

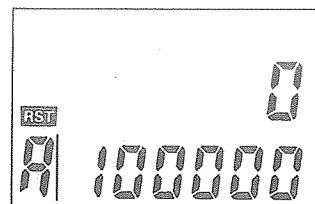


① Press **COUNTER No.** key (or input counter no. selection) to select the desired counter number.

- Count value can be reset in any mode.

② Press **RESET** key (or input reset) and count value of the specified counter returns to 0.

[2] Batch reset



① Press **COUNTER No.** key and **RESET** key simultaneously for 3 seconds and count value of all counters return to 0.

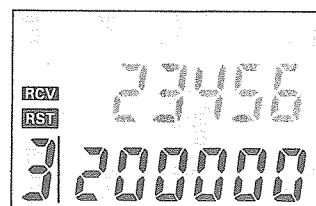
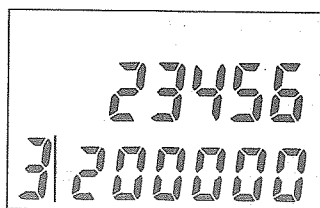
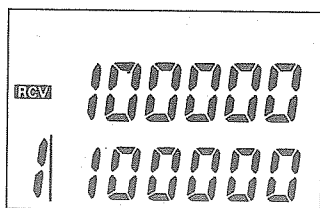
- Simultaneous input of counter no. select input and reset input for 3 seconds will also batch reset the count values.

16

10 Remonitoring of count value

Count value which was reset intentionally or by mistake can be remonitored.

(ex. Recover previously reset count value "23456" of counter no.3)



① Turn on remonitor input.

- Once reset count value is displayed.
- The display change does not influence internal counting operation.
- The counter no. display does not change.

② Press **COUNTER No.** key (or input counter no. selection) to select the desired counter to be remonitored.

The following procedure is only necessary when recovering of the count value is not required.

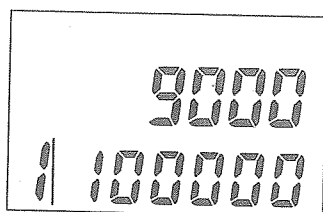
③ Press **RESET** key (or input reset) and remonitored value flashes for 3 times and the count value is recovered.

- The displayed value will not change from the previously reset value after flashing has ceased but the internal counting operation is performed starting from the recovered value.

④ Turn off remonitor input to return to the normal operation.

17

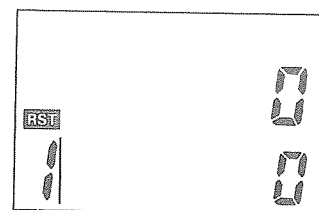
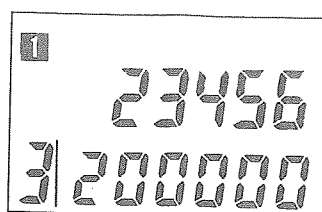
11 Confirmation of count value (in RUN mode)



Press **COUNTER No.** key (or input counter no. selection) to confirm count value of each counter while in RUN mode.

- With each key press-down (or input turn-on), the numeral increments as;
1 → 2 → → 8 → 9
- However, inhibited counters (with forecast value set to 0) are skipped.

12 All clear



Press **RESET** key and **SET** key simultaneously for 3 seconds to reset count value, pre-forecast value, forecast value, and machine stoppage value of all counters to 0.

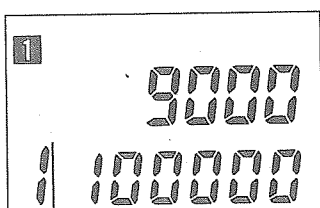
- The displayed counter number returns to "1" automatically after all clear.

18

13 Output indication

Pre-forecast output, forecast output, machine stoppage output will be displayed as follows.

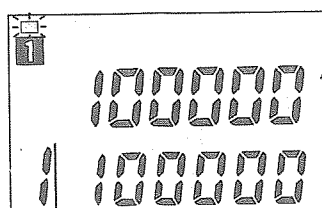
[1] Pre-forecast indication



The number of the counter which has reached the pre-forecast value is displayed.

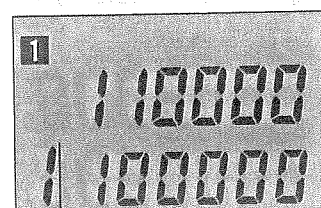
- Pre-forecast value is given only as indication. There will be no actual output.

[2] Forecast output



The number of the counter which has reached the forecast value is displayed. The red indicator lights at the upper area of the display and output is turned ON.

[3] Machine stoppage output



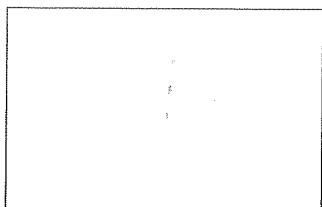
The number of the counter which has reached the machine stoppage value flashes. The background color of the display alternates between red and green.

* When any of the pre-forecast, forecast, machine stoppage output is turned on with any counter, the counter number and its count value are automatically displayed. (Only in RUN mode)

14 Error messages

There are 2 error messages.

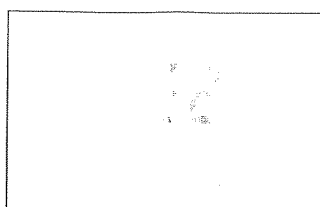
[1] CPU error



E1 is displayed when CPU error is detected.

- All input / outputs are inhibited.
- Press **[RESET]** key to cancel CPU error and to return set values and count values to those before error detection.

[2] Memory error

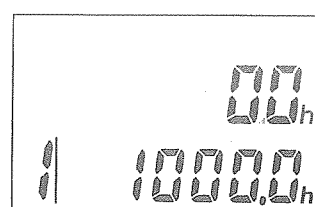


E2 is displayed when memory error is detected.

- All input / outputs are inhibited.
- All set values (pre-forecast, forecast, machine stoppage) return to 0.
- Press **[RESET]** key to cancel memory error and to return count values of all counters to 0.

15 Other indications

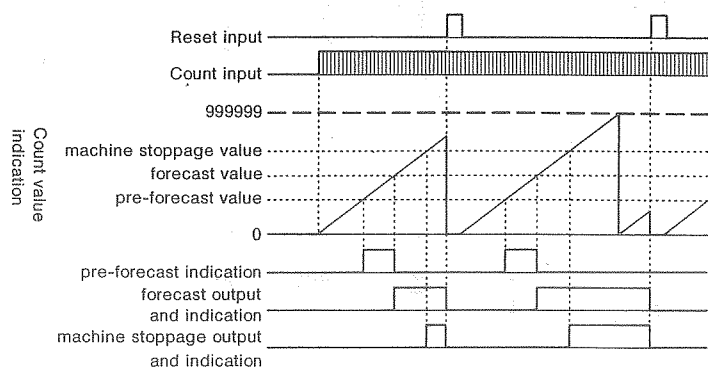
Indication under time counter operation.



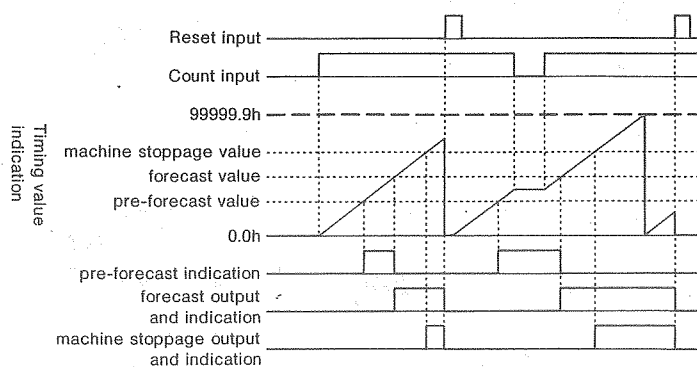
When count input is turned on, "h" of the timing value flashes.

16 Operation chart

[1] Counter : 3-step preset operation (H8BM-B, H8BM-BP)



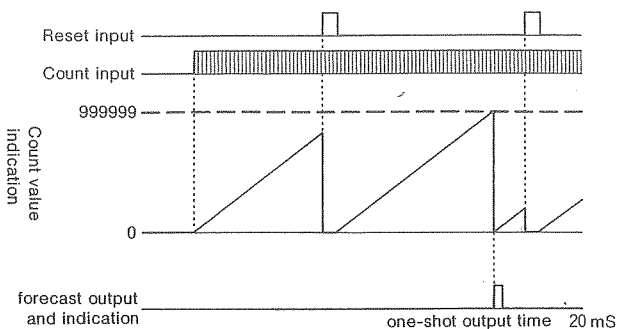
[2] Time counter : 3-step preset operation (H8BM-B, H8BM-BP)



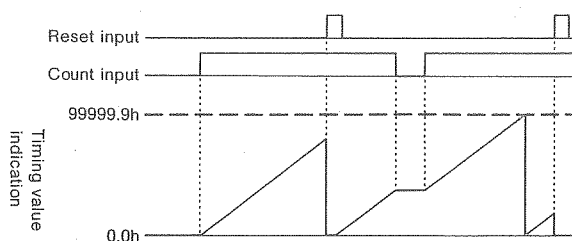
※With single-step type, the operation will be the same as that of forecast output.

21

[3] Totalizing count operation (All models)



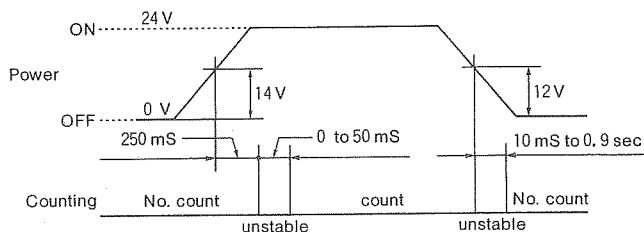
[4] Totalizing time count operation (All models)



17 Precautions

(Power supply)

- Input circuit is electrically insulated from power circuit and output circuit inside the counter.
- Input signals will not be counted, or will not be counted properly just after power is turned on and off. The unstable time will vary within the ranges shown below, according to the power supply voltage and load on the external power supply.



- Turn the power on and off all at once using a contact such as a switch or relay.

(Ambient conditions)

- Although the front of the counter resists water and oils (IP54F), extended exposure to large amounts of either can adversely affect internal components. Provide protection with hard protective cover and rubber packing.
- The counter, input signal lines, and the input device must be separated as far as possible from any sources of electrical noise, such as high-voltage power lines. Shielded input signal lines can also be effective in suppressing noise.
- The exterior of the counter must not be exposed to organic solvents (eg. paint thinner or benzene), strong alkalis, or strong acids though comparatively resistant material is used for the housing.

22

23

(Others)

- Always isolate the counter from external circuits or short all the terminals before measuring dielectric strength between electric circuits and non-charged metal parts or performing similar testing with the counter mounted in a control panel. This is to prevent internal circuit damage that might occur if the test voltage enters the counter due to dielectric strength or insulation failure in control panel devices.
- Do not perform insulation test or dielectric strength test, though input is electrically insulated from internal circuits.
- Be sure to use transformer whose primary and secondary wirings are insulated and secondary wiring ungrounded as power supply for output devices.

Warning

Fire, Explosion, and Severe Burn Hazard
The H8BM has a built-in lithium battery. Be sure to dispose of the old H8BM properly, as lithium batteries are likely to explode if incinerated.

Electrical Shock Hazard
Never touch the input terminals of any H8BM Multi-Maintenance Counter while power is being applied to the Multi-Maintenance Counter.

18 Ratings and characteristics

Model	H8BM-B	H8BM-BD	H8BM-BP	H8BM-BDP
Supply voltage	24VDC			
Operating voltage range	85 to 110% of rated supply voltage			
Power consumption	approx. 1.8W		approx. 2.2W	
Max. counting speed	30cps. min. signal width 16.7ms (ON : OFF = 1 : 1)			
Input	"H" level 16 to 30VDC "L" level 0 to 3VDC Input current approx.6.2mA (at 24VDC)			
Output	Open collector output • Output capacity : 30VDC max. 100mA max. NPN output		PNP output	

Model	H8BM-B	H8BM-BD	H8BM-BP	H8BM-BDP
Power failure compensation	10 years (at 25°C)			
Ambient operating temperature	-10 to +55°C			
Ambient operating humidity	35 to 85%RH			
Storage temperature	-25 to +65°C			
Housing	Munsell 5Y3/1 (dark grey)			
Weight	Approx. 290g			

25

19 Reminder of the settings

Counter No.	Application	pre-forecast	forecast	machine stoppage
1				
2				
3				
4				
5				
6				
7				
8				
9				

26