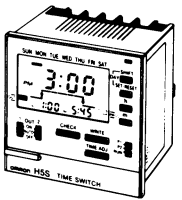
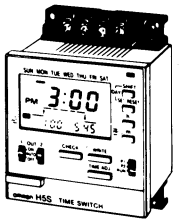
OMRON

Model **H5S** DIGITAL WEEKLY TIME SWITCH

INSTRUCTION MANUAL

Thank you for purchasing this OMRON product. Before using this timer, please study these instructions carefully to familiarize yourself with the product.





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Shimogyo-ku, Kyoto 600, Japan
OMRON Corporation

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Precautions on Safety

● Definition of Safety Indications

⚠WARNING Incorrect product handling may cause serious injury or death.

● Safety Indications

⚠WARNING

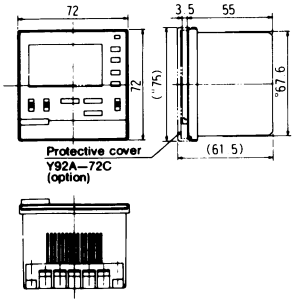
Never disassemble, deform, subject to heat over 100℃ or dispose in fire.
The product has a built-in lithium battery.
Fire, Explosion and Burn Hazard.

Never touch or disassemble the terminals.
Electric Shock Hazard.

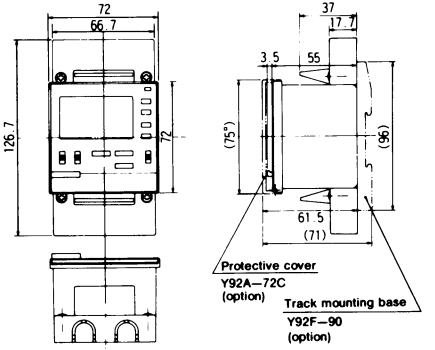
CONTENTS

1 OUTLINED DIMENSIONS

■ H5S—B (Flush Mounting Type)

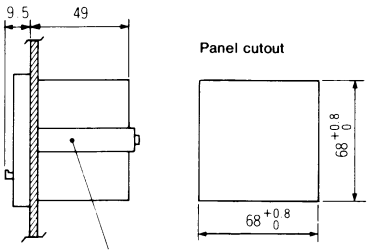


■ H5S—FB (Surface Mounting Type)

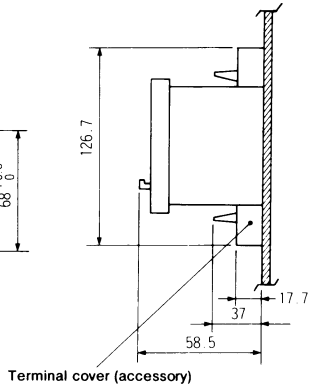


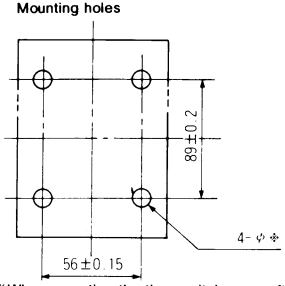
2 MOUNTING DIMENSIONS

■ Flush Mounting (H5S—B)



■ Surface Mounting (H5S—FB)

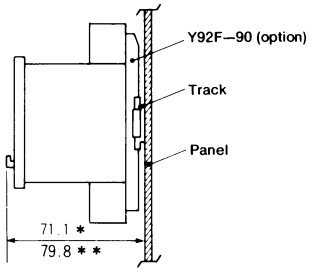




※When mounting the time switch on a soft iron panel with the M4 tapping screws supplied, the diameter of the mounting holes drilled on the panel differs depending on the panel thickness, as follows. If the panel is of diecast aluminum, the hole diameter should be slightly larger.

Panel thickness (mm)	0.8	1.0	1.2	1.6	2.0	2.6	3.2	4.0
Hole diameter (mm)	φ3.6				φ3.7			

■ Track Mounting (H5S—FB + Y92F—90)

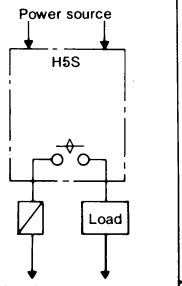
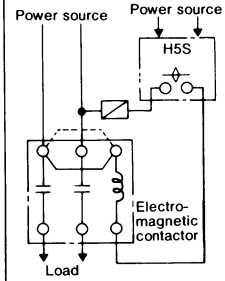
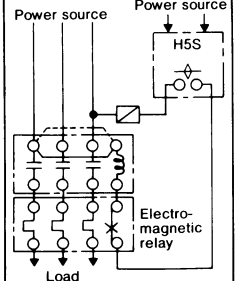


*With mounting track Model PFP—100N or PFP—50N

**With mounting track Model PFP—100N2

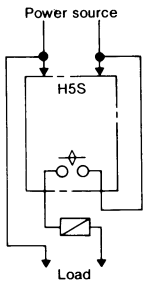
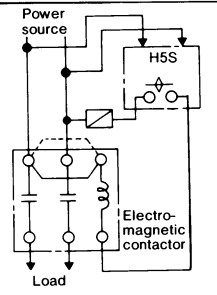
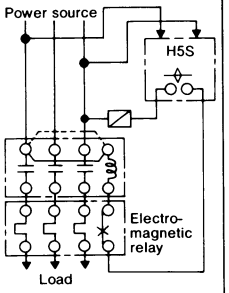
3 WIRING (Be sure to read 17 "PRECAUTIONS" before wiring.)

● With separate power sources for time switch and load

To directly control load with time switch	To use electromagnetic relay or contactor with time switch	
	Single phase	Three phase
		

If the electromagnetic relay or contactor is not internally connected, connect it to the time switch as indicated by the dotted lines in the figures.

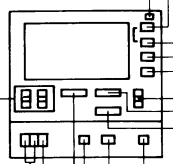
● When time switch and load share power source

To directly control load with time switch	To use electromagnetic relay or contactor with time switch	
	Single phase	Three phase
		

If the electromagnetic relay or contactor is not internally connected, connect it to the time switch as indicated by the dotted lines in the figures.

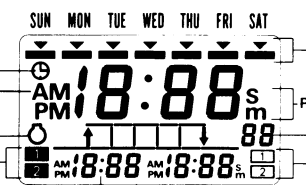
4 NAMES OF RESPECTIVE PARTS

■ Front Panel



- **OUT ON/OFF switch**
  - ON : Forcibly turns on the output.
  - AUTO : Execute an operation as specified.
  - OFF : Forcibly turns off the output.
  - Note) Outputs 1 and 2 can operate independently.
- **OUTPUT setting switch**
  - TIMER : Ordinary timer or cyclic operation.
  - PULSE : Pulse output operation.
  - Note) Circuits 1 and 2 can operate independently.
- **BOOT selection switch**
  - Refer to page 19.
- **Automatic operation indicator**
  - Lights during automatic operation.
- **CHECK key**
  - Monitors the setting while the time switch is operating.
- **CYCLE/PULSE key**
  - Specifies a cyclic operation or a pulse width.
- **DAY SHIFT key**
  - Moves the cursor to specify a day.
- **h key**
  - Sets hours.
- **MODE switch**
  - P1 : Circuit 1 setting mode
  - P2 : Circuit 2 setting mode
  - RUN : RUN mode
- **TIME ADJ key**
  - Adjusts the time.
- **COPY key**
  - Specifies a override day.
- **DAY SET/RESET key**
  - Selects or cancels the day selected by the DAY SHIFT key.
- **m key**
  - Sets minutes.
- **WRITE key**
  - Sets the specified time.
- **CLR key**
  - Clears the parameters set for each circuit and override day operation.

■ Display



Time adjustment mode indicator

Current day/operation day indicators

Display of current time/operation time, time width

Pluse width unit indicator

Power failure indicator

Indicates that a power failure has occurred and thus the time switch is producing no output.

Display for number of remaining steps

Output indicators

Indicate the output states of the outputs 1 and 2, respectively. When either of the indicators lights, it indicates the corresponding output is being produced.

Timing chart display

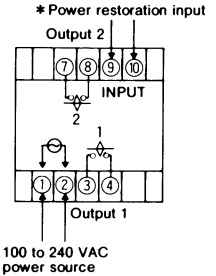
Displays the time at which the next operation will be performed while the time switch is operating. While an operation is being set, displays the set time and time width.

Circuit number indicators

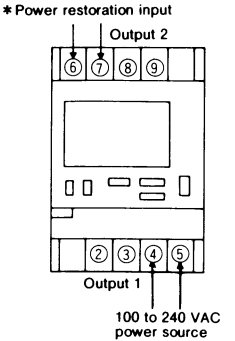
Either of these indicators lights when the circuit corresponding to it is operating and its operation is displayed as a timing chart.

■ Connection

• H5S—B (rear view)



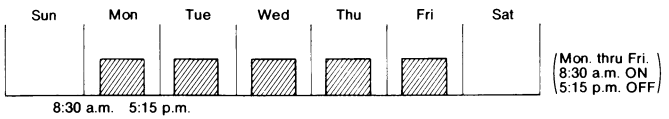
• H5S—FB (front view)



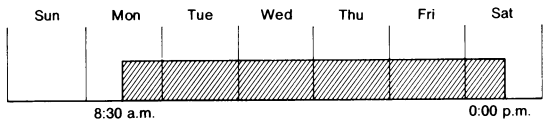
* For details, see page 19.

5 SETTING EXAMPLES

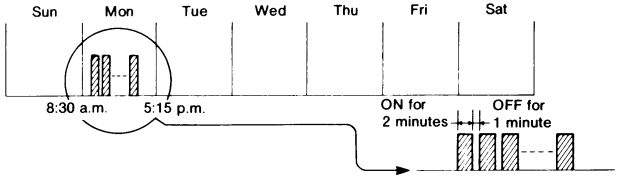
1) For ordinary timer operation (See page 9 for details.)



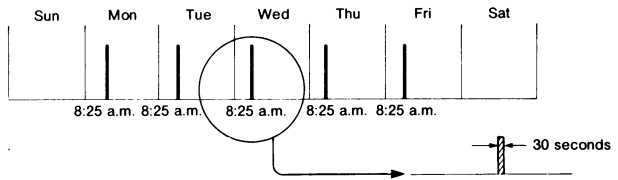
2) For multiple-day operation (See page 10 for details.)



3) For cyclic operation (See page 11 for details.)



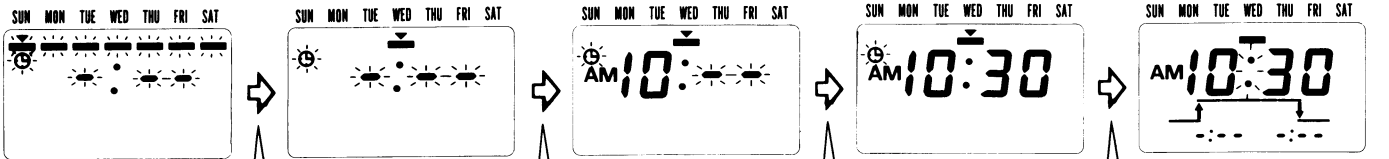
4) For pulse-output operation (See page 12 for details.)



6 TIME ADJUSTMENT

■ The following figures illustrate how to adjust the time to **10:30 a.m., Wednesday.**

OUTPUT setting	MODE
TIMER 1 2 / MODE / PULSE 1 2	P1 / P2 / RUN



(Initial display)

- Press the [SHIFT] key three times to move the cursor (▼) to the **Wednesday** position. (Holding down this key advances the day.)
- Press the [SET] key. The bar (▬) mark will turn on.

- Press the [h] key to adjust the time to "**10 a.m.**". (Holding this key rapidly advances the hour.)

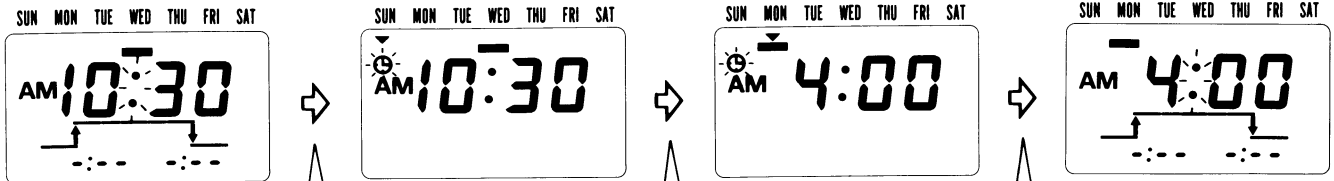
- Press the [m] key to adjust the minute to "**30**". (Holding down this key rapidly advances the minute.)

- Press the [WRITE] key. (When this key is pressed, the time is set to 10:30 a.m., 0 second, and the time switch starts timing.)

6 TIME ADJUSTMENT

■ The time can also be adjusted or changed while the time switch is operating. In the following example, the currently set time, **10:30 a.m., Wednesday**, is changed to **4:00 a.m., Monday**.

MODE
P1
P2
RUN



(Initial display)

- Hold down the [TIME ADJ] key for 1 second or longer.

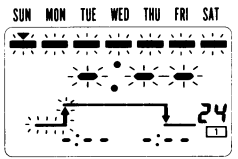
- Using the [SHIFT] and [SET] keys, select **Monday**, so that the bar at the Monday position turns on.
- Adjust the time to "**4:00 a.m.**" with the [h] and [m] keys.

- Press the [WRITE] key. (When this key is pressed, the time is set to 4:00 a.m., 0 second, and the time switch starts timing.)

7 ORDINARY TIMER OPERATION

····· In this example, circuit 1 is to operate at **8:30 a.m.** and stop at **5:15 p.m.** from **Monday** through **Friday**.

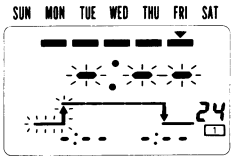
OUTPUT setting	MODE
TIMER / MODE / PULSE	P1 / P2 / RUN



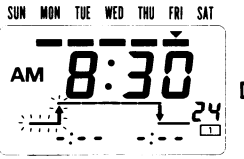
(Initial display)

Number of steps: 2

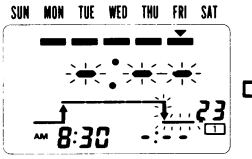
- Select **Monday** through **Friday** with SHIFT and SET keys. (All bars at the positions of Monday through Friday turn on.)



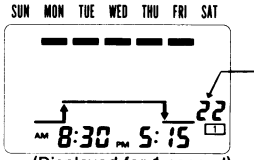
- Set the time to "**8:30 a.m.**" with the h and m keys.



- Press the WRITE key. (If any of the day, hour, or minute has not been set, the specified time and day are not set even when the WRITE key is pressed.)



- Set the time to "**5:15 p.m.**" by using the h and m keys. (When either the h or m key has been pressed, the value same as the ON time is automatically displayed first.)
- Press the WRITE key.



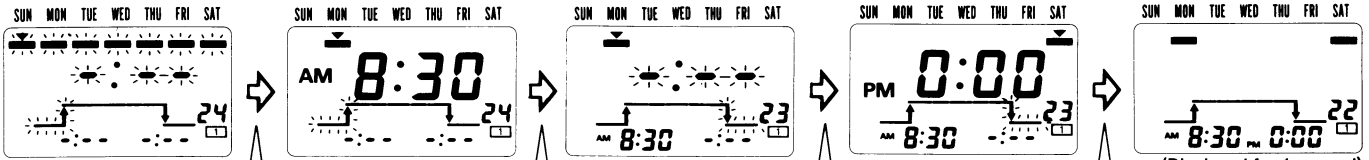
(Displayed for 1 second)

Note: When the MODE switch is set to the P1 or P2 position, the time switch does not operate automatically and the output turns off. To turn on or off the output, use the OUT ON·OFF switch.

8 MULTIPLE-DAY OPERATION

····· The time switch turns **ON** circuit **1** at **8:30 a.m.** on **Monday**, and turns it OFF at **0:00 p.m.** on **Saturday**.

OUTPUT setting	MODE
TIMER / MODE / PULSE	P1 / P2 / RUN



(Initial display)

(Displayed for 1 second)

Number of steps: 2

- Select **Monday** with the SHIFT and SET keys.
- Set the time to "**8:30 a.m.**" with the h and m keys.

- Press the WRITE key.

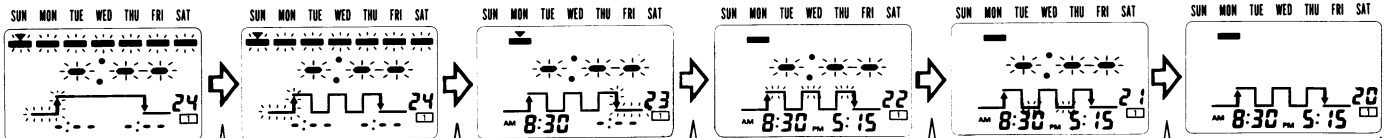
- Cancel **Monday** with the RESET key.
- Select **Saturday** with the SHIFT and SET keys.
- Set the time to "**0:00 p.m.**" with the h and m keys.

- Press the WRITE key.

9 CYCLIC OPERATION

····· Circuit 1 is set to turn **ON** for 2 minutes and **OFF** for 1 minute repeatedly from **8:30 a.m.** to **5:15 p.m.** on **Monday.**

OUTPUT setting	MODE
TIMER / MODE / PULSE	P1 / P2 / RUN



(Initial display)

(Displayed for 1 second)

Number of steps: 4

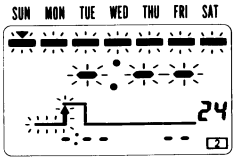
- Press the CYCLE key.
- Select Monday with the SHIFT and SET keys.
- Set the time to "**8:30 a.m.**" with the h and m keys.
- Press the WRITE key.
- Set the time to "**5:15 p.m.**" with the h and m keys.
- Press the WRITE key.
- Set "**0:02**" with the h and m keys.
- Press the WRITE key.
- Set "**0:01**" with the h and m keys.
- Press the WRITE key.

Note : Neither the ON nor the OFF time can be set to "0:00".

10 PULSE-OUTPUT OPERATION

····· Circuit 2 is turned **ON** for **30 seconds** at **8:25 a.m.**, **Monday** through **Friday**.

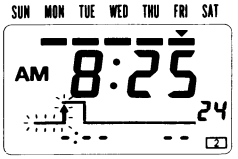
OUTPUT setting	MODE
TIMER / MODE / PULSE	P1 / P2 / RUN



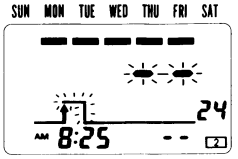
(Initial display)

Number of steps: 1

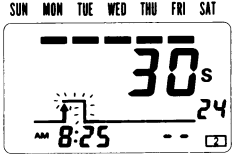
- Select **Monday** through **Friday** with the SHIFT and SET keys.
- Set the time to "**8:25 a.m.**" with the h and m keys.



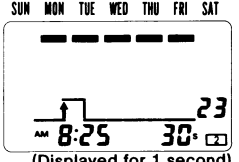
- Press the WRITE key.



- Press the PULSE key to set "**30s**". (Holding down this key rapidly advances the second.)



- Press the WRITE key.

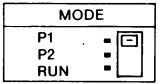


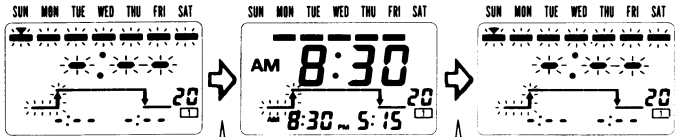
(Displayed for 1 second)

Note : If the pulse width (i. e., the second) was set previously, that pulse width is displayed.

11 CHECKING THE SET TIME

■ The set times can be checked and, if necessary, changed in the sequence they were set. In this example, the times set for circuit 1 are checked.





(Initial display)

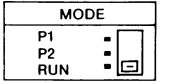
- Press the WRITE key. If it is necessary to change the setting, do so with the necessary keys and press the WRITE key. (Each time the WRITE key is pressed, the subsequent set times are displayed in the sequence they were set.)

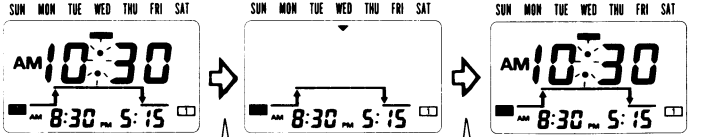
- Press the WRITE key. After all the set times have been displayed, the first set time is displayed again.

Note : When the (MODE) switch is set to the P1 (or P2) position, the output is turned off. To turn on the output, use the (OUT ON/OFF) switch.

11 CHECKING THE SET TIME

■ The set times can be checked in the time sequence the time switch is to operate. In the following example, the times set for today are checked.





(Initial display)

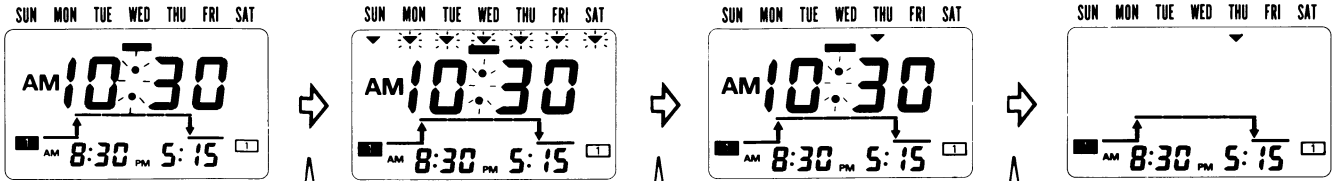
- Press the CHECK key.
  - Each time this key is pressed, the operation schedule is displayed in the time sequence.
  - First, the ON times and OFF times set for circuit 1 are displayed starting from the earliest ON time. Then the times set for circuit 2 are displayed.

- Press the CHECK key. After all the set times have been displayed, the first set time is displayed again.

Note :
If the time switch is left untouched for 20 seconds during checking, the display automatically returns to the RUN mode. If the timer is set to perform cyclic operation, press the CHECK key twice to check one operation.

11 CHECKING THE SET TIME

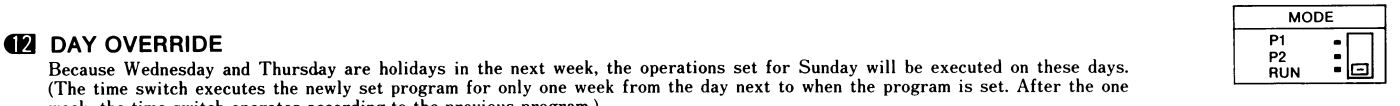
■ It is possible to check the timing operations in the sequence they are to be executed. In this example, the operations to be performed on **Thursday** are checked.



Note : If the time switch is left untouched for 20 seconds during checking, the display automatically returns to the RUN mode. If the timer is set to perform cyclic operation, press the CHECK key twice to check one operation.

12 DAY OVERRIDE

Because Wednesday and Thursday are holidays in the next week, the operations set for Sunday will be executed on these days. (The time switch executes the newly set program for only one week from the day next to when the program is set. After the one week, the time switch operates according to the previous program.)



(Initial display)

- Hold down the COPY key for 1 second or longer.
  If a override day has already been set, the fourth screen is displayed. To change the setting of that day, cancel it once and specify the new setting.

- Select **Wednesday** and **Thursday** with the SHIFT and SET keys.
- Press the WRITE key.

- Select **Sunday** with the SHIFT and SET keys.

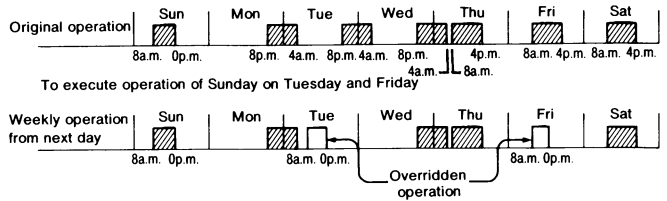
- Press the WRITE key.

Note : This function has an effect on both circuits 1 and 2. If either of the following operations is executed while executing the day overridden function, the set day is canceled :
1) Changing day by adjusting the time
2) Addition or change of the setting related to the function.

12 DAY OVERRIDE

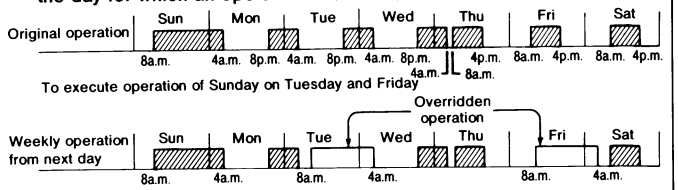
■ By using the day override function, if the operation of one day is to be executed on another, and if the time switch is programmed to operate over several days on the day which is the source or destination of the override, the operation is performed as follows :

● If the time switch is programmed to operate over several days on the day whose operation is to be overridden



The ON/OFF operation of the output for the overridden day is valid. In this case, the operation of Sunday is to be performed on Tuesday and Friday ; so, the Sunday operation takes precedence. On Tuesday, therefore, the operation of Sunday, which is to turn on the output at 8:00 a.m. and off at 0:00 p.m., is executed after the original operation (turning on the output at 8:00 p.m. on Monday and off at 4:00 a.m. on Tuesday) has been performed. However, on Friday, the output is turned on at 8:00 a.m., as the original operation, but it does not turn off at 4:00 p.m., and instead, is turned off at 0:00 p.m.

● If the time switch is programmed to operate over several days on the day for which an operation is overridden



The output is turned on at 8:00 a.m. on Tuesday and is held on until it was originally intended to be turned off, i. e., at 4:00 a.m. on Wednesday. On Friday, it is turned on at 8:00 a.m., but instead of being turned off at 4:00 p.m., as originally scheduled, it is kept on and turned off at 4:00 a.m. on Saturday.

13 CANCELING THE SETTING

■ All the operations of circuit 1 or 2 can be canceled. In the following example, all the operations of circuit 1 are canceled.

(Initial display)

(Displayed for 1 second)

• Press the CLR key.

Note: To cancel all the operations of circuit 2, set the (MODE) switch to the P2 position, and do the same as above.

13 CANCELING THE SETTING

■ In the following example, a overridden operation is canceled.

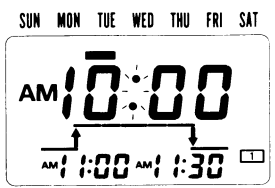
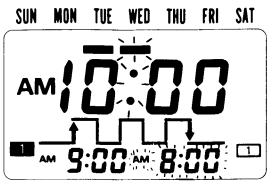
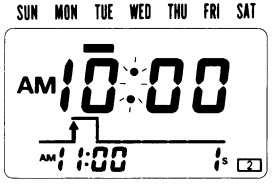
(Initial display)

• Press the COPY key for 1 second or longer.

• Press the CLR key.

14 DISPLAY DURING OPERATION

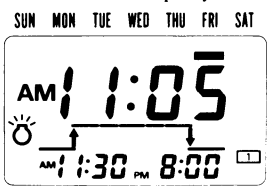
■ While the time switch is operating, it displays the next operation for circuit 1 to be performed. If the next operation in the day is not programmed for circuit 1, the next operation of circuit 2 is displayed.

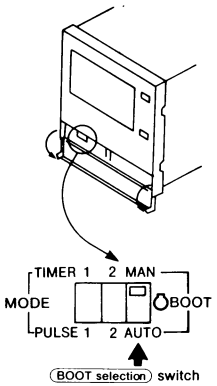
Ordinary timer operation		Cyclic operation		Pulse-output operation	
					
Current time	Tuesday, 10:00 a.m.	Current time	Tuesday, 10:00 a.m.	Current time	Tuesday, 10:00 a.m.
Next operation	ON at 11:00 a.m. and OFF at 11:30 a.m.	Next operation	Cyclic operation being performed from 9:00 a.m. is stopped at 8:00 a.m. on Wednesday.	Next operation	No operation for circuit 1 today. Circuit 2 operates for 1 second at 11:00 a.m.
Output condition	Both 1 and 2 are OFF.	Output condition	1 is ON and 2 is OFF.	Output condition	Both 1 and 2 are OFF.

15 IN CASE OF POWER FAILURE

If a power failure takes place, the output of the time switch is turned off. What processing is to be performed after power recovery differs depending on the setting of the (BOOT selection) switch.

- With the switch set to "AUTO"
  The time switch resumes its operation as programmed after power recovery.
- With the switch set to "MAN"
  A keyhole mark (Ō) is displayed and blinks as shown below after power recovery. The time switch does not turn on the output yet. To start the output, either change the (BOOT selection) switch to the "AUTO" position once, or input a signal to the power failure recovery terminal by referring to the next paragraph.

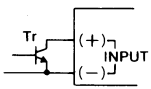




■ How to Input Signal

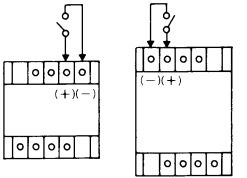
- To input the signal, use a switch or a relay. (Use a reliable switch or relay such as the one having gold-plated contacts because the current flow out from the internal circuitry is as low as 0.1 mA.)
- To input the signal by a solid-state output device such as a transistor, pay attention to the following points :

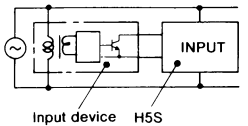
1) Connect the correct polarities.



Use a transistor having the following characteristics :
Vceo≧30 V
Ic≧10 mA
Iceo≦ 5 μA

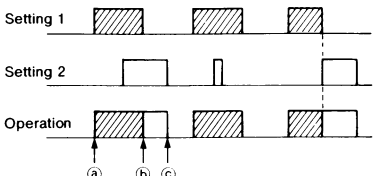
2) Use a power supply that has an insulated transformer with secondary coil not grounded for the input device. Or, isolate the input circuit by a photocoupler.





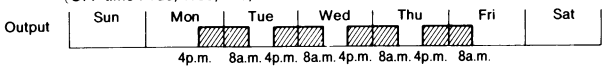
16 OTHER FUNCTIONS

• The earlier ON time takes precedence.

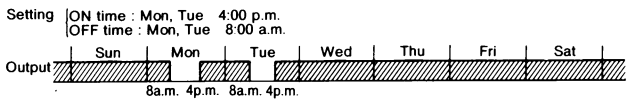


If both the setting 1 and 2 is for an ON/OFF operation or pulse operation, the output is continuously produced without being interrupted. If setting 1 is for cyclic operation, while 2 is for an ON/OFF operation, for example, the cyclic operation is performed during period of ⓐ to ⓑ, and the ON/OFF operation is performed from ⓑ to ⓒ.

• To set the time switch to operate over several days, the operations can be programmed all at once by specifying the ON and OFF times.



• If more than one day is specified and when the output is turned on, it is turned off on the day when the first OFF time is set.



- If an ON time and an OFF time have been set at the same time of the same day (such setting is possible), no operation is performed.

- If the (MODE) switch is set to the P1 (or P2) position, the output is not produced. Therefore, after setting has been done, set the (MODE) switch to the "RUN" position and confirm that the automatic operation indicator lights.

- The set data may be erased when the (OUTPUT setting) switch is moved between the TIMER and PULSE positions after the data has been set.

17 PRECAUTIONS

- The load capacity differs depending on the load type. Refer to the ratings and make sure that the capacity of your load is within the range of the ratings.
- To use a heater, be sure to incorporate a thermal switch in the load circuit.
- Do not use the time switch in the following locations :
  Where the temperature is below −10°C or above +55°C
  Where is subject to dust and humidity
  Where corrosive gas is generated
  Where is subject to heavy shock and vibration
  Where is subject to splash of water, oil, and direct sunlight
- When installing the time switch where much electric noise is generated, provide as long a distance as possible between the time switch and its input signal lines, and the noise source and the power lines on which noise is superimposed.
- To use the time switch to break an inductive load, connect a surge absorber to the time switch to protect it from malfunctioning or damages.
- The coating of the time switch may be corroded by organic solvents (such as thinner and benzine), strong alkali (such as ammonia and caustic soda), and strong acid substances.

Danger

About built-in battery The H5S has a built-in lithium battery. Do not throw the exhausted litium battery in fire. Be sure to dispose of the old battery as nonflammable garbage.

18 RATING AND CHARACTERISTICS

Model			H5S— B	H5S— B—31
			H5S—FB	H5S—FB—31
Supply voltage			AC 100-240 V	DC 24 V
Power consumption			Approx. 3 VA	Approx. 0.8 W
Load	Number of circuits		2 independent circuits	
	Circuit		Separated from power circuit	
	Capacity	Resistive	250 V, 15 A	
		Incad. lamp	100 V • 300 W	
		Inductive (cos ϕ =0.7)	250 V, 10 A	
		Motor (cos ϕ =0.7)	100 V-400 W, 200 V-750 W	
	Configuration		Two pairs of single-pole, single-throw contacts	
Variation due to voltage change			85 to 110% of rated voltage	
External input			By short-circuiting/opening	

Model			H5S— B	H5S— B—31
			H5S—FB	H5S—FB—31
Setting	Minimum interval		1 minute	
	Number of operations	ON/OFF operation	24 (12 sets of ON/OFF operations)	
		Pulse operation	24	
		Cyclic operation	6 sets	
	Number of remaining operations indication		When an operation has been set, the number of remaining operations is displayed.	
	Pulse width		Setting can be done in units of 1 second from 1 to 59 seconds or in units of 1 minute from 1 to 60 minutes.	
Memory protection			5 years (at 25°C)	
Monthly error			±15 seconds (at 25°C)	
Ambient operating temperature			−10~+55°C	
Ambient strage temperature			−25~+65°C	
Setting error			±0.01%±50 ms max.	