

INSTALLATION MANUAL

- Please read through this instruction manual before starting to use this time switch to be familiar with the proper operation.
- After you read this, please keep it so as to refer it at any time.

Safety precautions

⚠ WARNING

Prohibit

- Do not disassemble nor revamp this time switch. Might cause electric shock, a fire or other failures.
- Do not touch the terminal while supplying power. You may be struck by electricity.

Obey

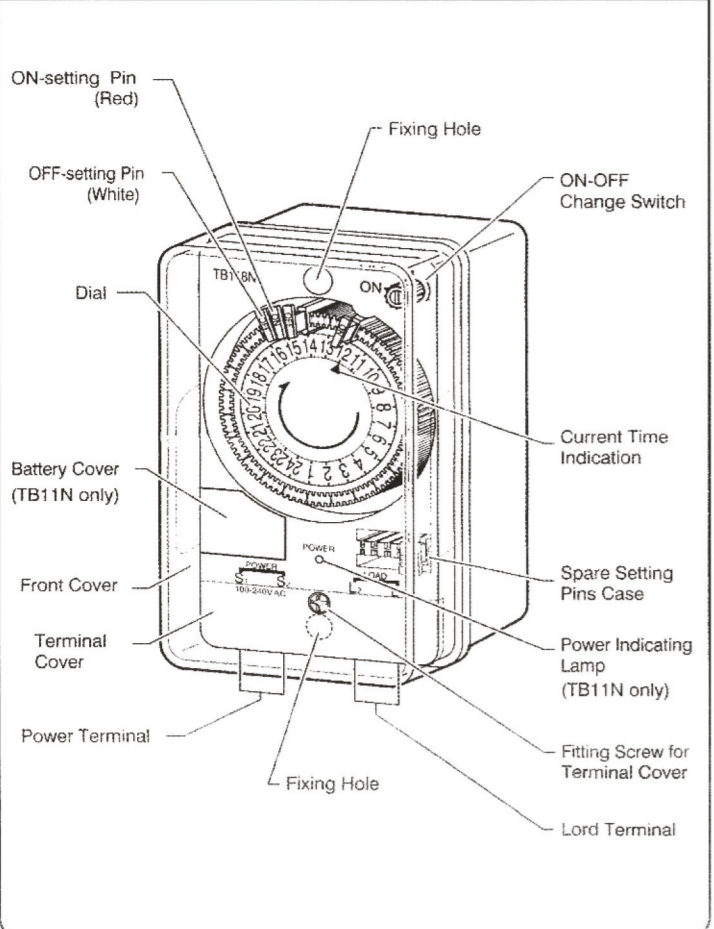
- Do not pour water nor oil. Might cause electric shock, a fire or some other failures.

⚠ CAUTION

Obey

- If found rust at the terminal or the like, replace it as soon as possible. The rust will cause improper contact and then heat and a fire.

Name of each Parts



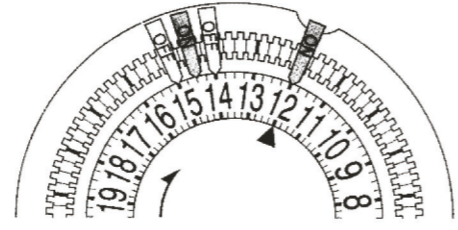
Setting the operating time

- Set the Setting Pin at the required time. Insert the Setting Pin at the division of the required time. Insert the (Red) Setting Pin at the time to be ON and the (White) one at the time to be OFF. (3 ON-OFF setting Pins are each included in this product.)

NOTE

Ensure to insert fully the Setting Pin. Set ON and OFF piece alternately. [Ex] In case shown on the right;

- At 12:00 "ON" At 14:00 "OFF"
- At 14:30 "ON" At 15:00 "OFF"



Adjusting the current time

- Turn the dial in arrow direction (clockwise) to set the dial at the current time indication (▼).

NOTE

Never fail to turn the dial in arrow direction. If turned by force in the opposite direction, it be damaged.

Setting of ON-OFF Change Switch

- Set the load ON and OFF with ON/OFF Switch. With this switch you can make sure ON/OFF status and switch ON or OFF temporarily. Use this for the test after wiring.



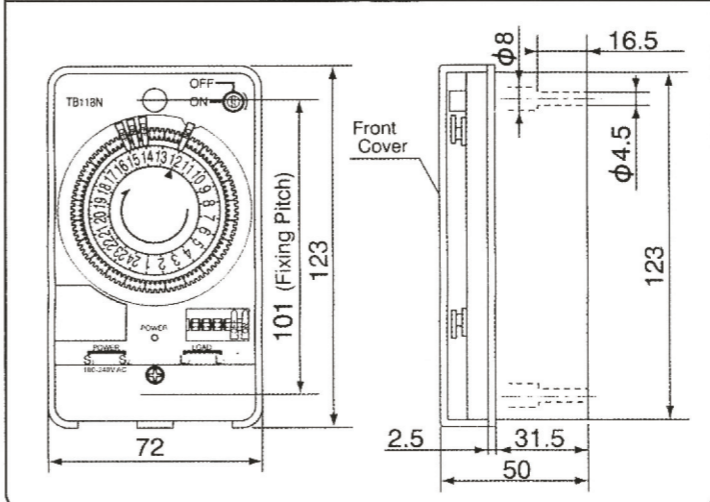
NOTE

- Never fail to turn the switch knob in arrow direction.
- Do not operate ON/OFF Switch in case where the Setting Pin is in the range of 1 hour before/after the current time indication (▼). If operate under such situation, it might cause failure.
- When setting ON (or OFF) in succession for a long time, take all the Setting Pins off the dial and then set the switch knob.

Caution for use

- Ni-MH battery for Power Failure Compensation is built in only TB11 N Series. The Ni-MH battery sometimes maybe reduced in capacity due to the self-discharge when you purchase the present switch. If discharged completely, the clock will not work even when turned on the power supply. In such a case, take one or two hours for charging and then set the current time.

Dimensions (unit: mm)



Before judging failure

Phenomena	Cause and Remedies
The load will not start at the preset time:	This time switch is divided into 24 hours. Don't you mis-set the time in the afternoon into the time in the morning? Make sure the present time of the time switch. This is a mechanical time switch and there might be an error in the range of ± 7.5 minutes. ★ If the wiring is wrong, the Time Switch does not work correctly. Refer to the connecting examples of the reverse side, and wire it correctly.
The clock gets out of order: (case of TB17N)	TB17N doesn't have a Power Failure back-up. In case of the power failure, the clock stops. Set again the present time in such a case.
The clock gets out of order: (case of TB11N)	If the power failure lasts more than the back-up time (300 hours), the clock stops to cause deviation in the present time. Set again the present time in such a case.
Clock stops/Power indication lamp flashes: (case of TB11N)	★ Ni-MH battery is at the end of its life span. The battery need to be replaced with a new one. Please ask the working store. (Parts No. : TB11802459)

NOTE As for the ★-marked items, please ask the working store for replacement.

Rating List

SERIES	TB11N SERIES	TB17N SERIES
MODEL NO.	TB118NE7	TB178NE7
Rated Voltage	100-240 V AC	100-240 V AC
Allowable Operating Voltage	85 ~ 260 V AC	85 ~ 260 V AC
Frequency	50-60 Hz	50-60 Hz
Driving Method	Quartz Motor	Quartz Motor
Power Failure back-up time	300 h (at 20 °C)	—
Time Precision	± 5 s / month (at 25 °C)	± 5 s / month (at 25 °C)
Cycle	24 h	24 h
Power Consumption	2 W	2 W
OUTPUT		
Circuit Quantity	1 circuit	
Circuit Configuration	Same Circuit (voltage-applied contact output)	
Contact Configuration	Single Pole, Single-through (—○—)	
Manual ON/OFF	with ON/OFF Switch	
* Contact Capacity		
Resistance	250 V AC 15 A	
Incandescent Lamp	250 V AC 15 A	
Induction (cosφ=0.6)	250 V AC 12 A	
Motor (cosφ=0.6)	220 V AC 1500 W	
Operation time setting		
Method	Setting pin fitting (red : ON, white : OFF)	
Minimum Setting Unit	15 min Unit	
Minimum Setting Interval	30 min Interval	
Number of Operations	6 for standard, Max. 48	
Ambient operating Temperature	-10 °C ~ 50 °C	
Ambient operating Humidity	85 %RH, or less (no condensing)	
Weight	200 g	200 g
Class of protection		
Pollution degree	2	
Overvoltage category	III	
Classification	1BSTU	1BSTU

* A standard of number of lamps to be connected with mercury vapor lamp or fluorescent lamp load is as follows.
H: High Power Pin L: Low Power Pin

TYPE	Mercury Vapor Lamp															
	40 W		100 W		200 W		250 W		300 W		400 W		700 W		1000 W	
Power Factor	H	L	H	L	H	L	H	L	H	L	H	L	H	L	H	L
100 V AC	26	11	10	5	5	2	5	2	2	2	2	0	0	—	0	—
200 V AC	37	32	18	15	10	7	9	7	8	6	6	4	3	—	2	—

TYPE	Fluorescent Lamp											
	10 W		20 W		30 W		40 W		60 W		110 W	
Power Factor	H	L	H	L	H	L	H	L	H	L	H	L
100 V AC	65	65	52	40	27	22	25	15	17	10	10	—
200 V AC	—	—	—	—	—	—	40	35	20	11	—	—

Life span

The average life span under normal conditions is as follows;

- Contact Switching Times: 50,000 times (Resistance load: 250 V AC 15 A)
- Duration of Service: 3 years (at 25°C, Relative Humidity 65 %)
- Ni-MH battery: 3 years (at 25°C, Relative Humidity 65 %)

We suggest you, if the product reaches either of the above described, to replace it with a new one.

Repair parts (for damage, loss, replacement)

PARTS NAME	PARTS NO.	REMARKS
Front Cover	TB17803127	
Panel Fixture	TB1782	Fixture: 1, Fitting Screws: 2
Setting Pin Set	TB1781	ON-setting & OFF-setting 1 each
Ni-MH battery	TB11802459	TB11N only

About for repair, check out and repair parts, please ask selling or working store.



Time Switch

TB11N series
TB118NE7(50-60 Hz)

For storage Use
Quartz Power-Failure Compensation

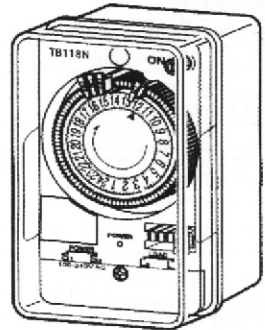
TB17N series

AC Motor

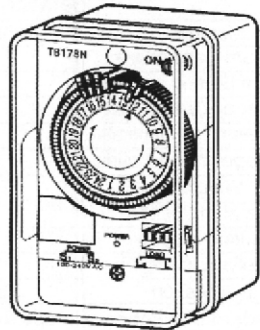
TB178NE5(50 Hz exclusive use) TB178NE6(60 Hz exclusive use)

INSTALLATION MANUAL

- Before starting to use this switch, please read through this instruction manual to be familiar with the working procedure.
- The personnel for constructing the present machine shall be qualified electric worker.
- The back is an instruction manual for the customer, and never fail to hand this to him or her after the electric work.



TB11N



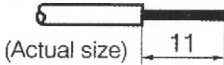

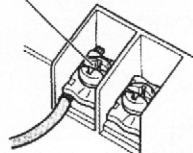
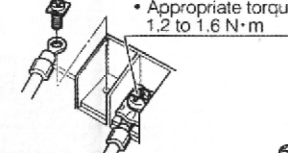

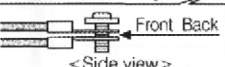
TB17N

Precautions for installation

- Do not set up in a place with following conditions to prevent wrong operation, failure and fault current.
 - a place at -10 °C or less, +50 °C or more
 - outdoor and exposed to rain or direct sunlight
 - a place to cause bedewing
 - a place with corrosive gasses such as sulfurous acid or ammonia
 - a place full of humidity or dust
 - a place causing oscillation or impact
 - a place with high frequency, electric field or strong magnetic field
- The output circuit configuration is a same circuit type (voltage-applied contact output). The same voltage as the power terminal is applied to the output terminal.
- Do not confuse the power terminal and the output terminal. If confused, shortcircuit, wrong operation or some other failures may occur at the load circuit.
- In case of the load capacity over the rated or of three-phase, use an electromagnetic contactor.
- After the installation, never fail to make sure the connection is correct. Then turn on the main power supply to make a performance test.
- After the installation, never fail to use this time-switch without the terminal cover. Might cause electric shock.

How to wire

Applicable wire: Single wire; $\varnothing 1.2$ to 2.0 mm
Twisted-wire; 1.25 to 2.5 mm²

When using a single wire	When using a twisted wire
<ul style="list-style-type: none"> • Strip the cover back 11 ± 1 mm.  <p>(Actual size) 11</p>	<ul style="list-style-type: none"> • Crimp a round terminal with an M4 insulation tube onto the wire. It must meet the following conditions. <p>More than $\varnothing 4.3$ mm Less than 8 mm</p> 
<ul style="list-style-type: none"> • Tighten the wire as shown below. <p>• Appropriate torque: 1.2 to 1.6 N·m</p> 	<ul style="list-style-type: none"> • Put the terminal screw through the hole in the crimp terminal and tighten the screw on the terminal block securely. <p>• Appropriate torque: 1.2 to 1.6 N·m</p> 
<p>CAUTION</p> <ul style="list-style-type: none"> • When tightening two separate lines, insert them both from the side of the screw, as shown on the right. 	<p>CAUTION</p> <ul style="list-style-type: none"> • When tightening two separate lines with crimping terminals, put them back to back and tighten them as shown on the right.  <p>Front Back <Side view></p>

Do not put 3 or more wires on one terminal. The heat generated may cause a fire if the connections are not good enough.

The time switch is intended to be incorporated into equipment / built-in into control box e.t.c.

In case of surface mounting the terminal area may need to be covered by external panel, to fulfill the requirements of class II.

Replacing the nickel-hydrogen battery (TB11N only)

- Power Failure Compensating Time
TB11N series are equipped with a built-in NI-MH battery to work in service interruption.
 - When turned on the time switch, the NI-MH battery is to be charged automatically.
 - The battery is charged fully to be able to compensate power failure for 300 hours when supplied power 3 days in succession.

NOTE

Frequent power failure and service interruption for a long time will shorten the life span of the storage battery.

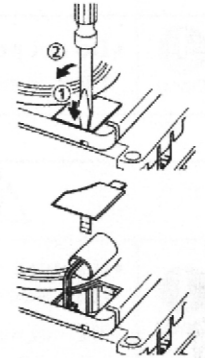
Replacement

The life span of the Ni-MH battery is about 3 years. However, the hotter the service temperature, the shorter the life. Please replace with a new one earlier. (Parts No.: TB11802459)

CAUTION

Never fail to turn off the power when replacing the cell. You might be struck by electricity.

1. Open the battery cover with flathead screwdriver. (screwdriver size: less than 4.5 mm width)
2. Take the nickel-hydrogen battery out of the battery compartment and disconnect the connector.
3. Connect the connector to the new battery, and store the battery in the compartment.
4. Make sure to put the battery cover back on. Parts No. of battery : TB11802459



Safety precautions

WARNING

- Prohibit** • Do not use this product for the machinery which will affect people's life or the society seriously if it gets out of order (medical equipment or large-scale facility, for instance)
- Obey** • Never fail to reserve safety margin in rating and performance, and to build in safety devices such as redundant circuit when this product is used for the machine (heater, refrigerator etc.) which may affect the property if the switch gets out of order.
- Prohibit** • Do not use this switch at a place to cause bedewing. Might cause electric shock, a fire or other failures.
- Prohibit** • Do not disassemble nor revamp this time switch. Might cause electric shock, a fire or other failures.
- Prohibit** • Do not use this switch for a location exposed to water or oil. Might cause electric shock, a fire or other failures.
- Obey** • Never fail to turn off the power supply when installing or checking out. If installed or checked without turning off the power, the operator may be struck by electricity.

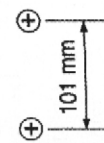
CAUTION

- Obey** • Never control directly the load over the rated. Might cause electric shock, a fire or other failures. In such a case, use an electromagnetic contactor
- Obey** • Use proper cable. If used improper cable or wire, it will cause a burn or a fire.
- Obey** • Clamp firmly the terminal screws. If loosened, a fire might break out.
- Prohibit** • Never connect to the power source out of the rated. Might cause a fire or other failures.

How to install

- 1 When mounted (exposed) on a surface

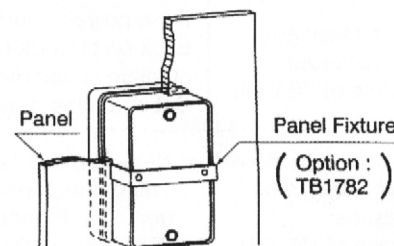
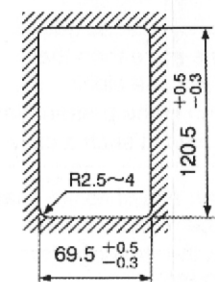
Take off the protective cover fix the switch to the main body with screws of 30 mm long or the M4 screw or the like. When fixing with another device, reserve enough space for the cover to be removed.



Dimensional Drawing of Fixing Pitch

- 2 When fixing to the panel
Use panel fixture (TB1782), optional one, to fix with.

Dimensional Drawing of Panel Cutting (Unit:mm)

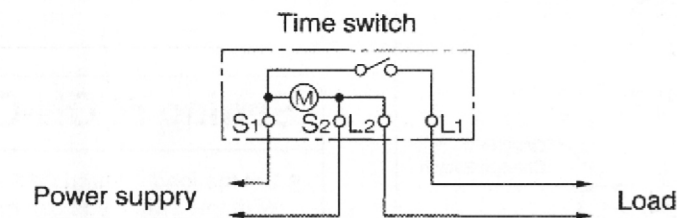


Can be fixed to the panel up to 6 mm thick.

Wiring examples

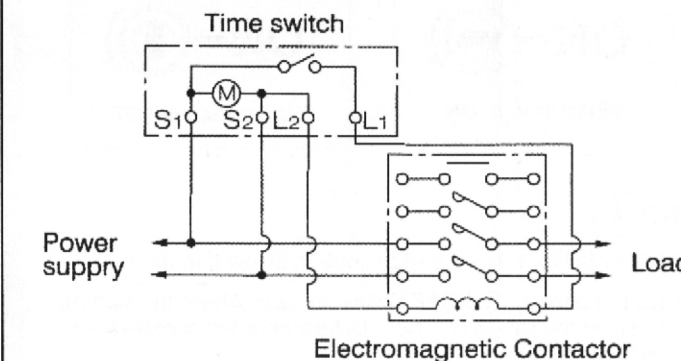
- Before wiring, draw the connecting diagram of the whole system including the devices to be controlled by the time switch.

In case the time switch controls directly load.

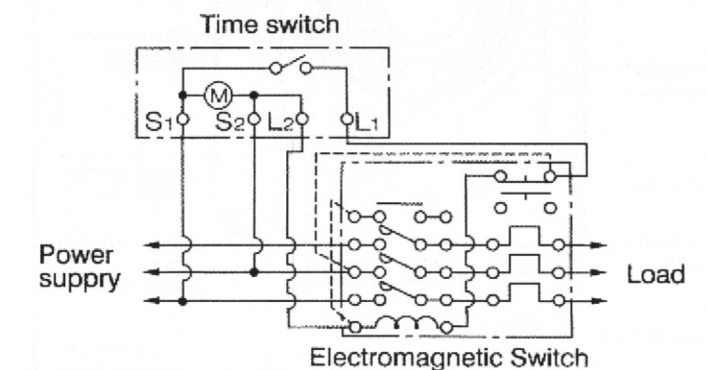


In case of load over the rated capacity or three-phase load control.

Single phase



Three phase



NOTE

Take off the jumper line shown with the dotted line "..." connected to the electromagnetic switch. If connected as such, the switching apparatus will not function properly.