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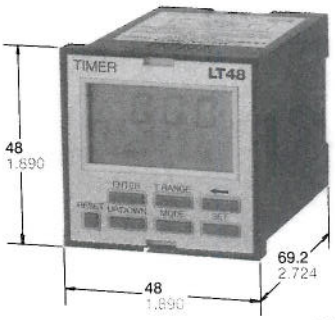
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Find the *Aromat LT48T-24-240V* at our website: *Click HERE*

NAiS

DIN48 SIZE, LCD DIGITAL QUARTZ TIMERS

LT48 Timers



mm inch

- **Multiple time ranges ····· 11 ranges**
- **Addition (UP) or subtraction (DOWN) selectable and seven operation modes**
- **Total time accuracy is ±(0.005%+0.05s) secured by the quartz oscillation microcomputerized control timer**
- **AC or DC power supply**
- **All functions are programmed on the front panel and monitoring is easy**
- **Setting value can be changed even during the timing operation**
- **Two types of control outputs available**
  Relay output type ·····Control capacity is as high as 5A 250V AC
  Transistor output type ·····High frequency switching
  Min. 10^7 operations at 100mA 30V DC
- **7-year power-failure protection**
- **UL recognized, CSA approved**

PRODUCT TYPE

Control output	Part No.	Rated operating voltage	Rated power consumption	Operation mode	Time range
Relay Timed-out 1 Form C	LT48-24-240V	24 to 240V AC/DC	AC power supply: Max. 2.5VA DC power supply: Max. 2.5W	Power ON-delay Signal ON-delay Signal OFF-delay Pulse One-shot Pulse ON-delay Power Flicker Totalizing ON-delay	11 selectable ranges over 0.001s to 9,999h
	LT48-DC12V	12V DC			
Transistor Timed-out Normally OFF	LT48T-24-240V	24 to 240V AC/DC			
	LT48T-DC12V	12V DC			

SPECIFICATIONS

Timing

Time accuracy (max.)	Operating time fluctuation	±(0.005%+50ms) in case of power on start ±(0.005%+20ms) in case of reset or input signal start (at fixed power off time)
	Temperature error	
	Voltage error	
	Setting error	
	Power off time change error	±100ms
Min. power off time		500ms
Time counting direction		Addition (UP)/Subtraction (DOWN) (2 directions selectable by push-key switch)
Min. input signal width		20ms

Time range

11 time ranges	0.001s to 9.999s 0.01s to 99.99s 0.1s to 999.9s 1s to 9,999s 1s to 99min 99s 0.01min to 99.99min 0.1min to 999.99min 1min to 9,999min 1min to 99h 99min 0.1h to 999.9h 1h to 9,999h

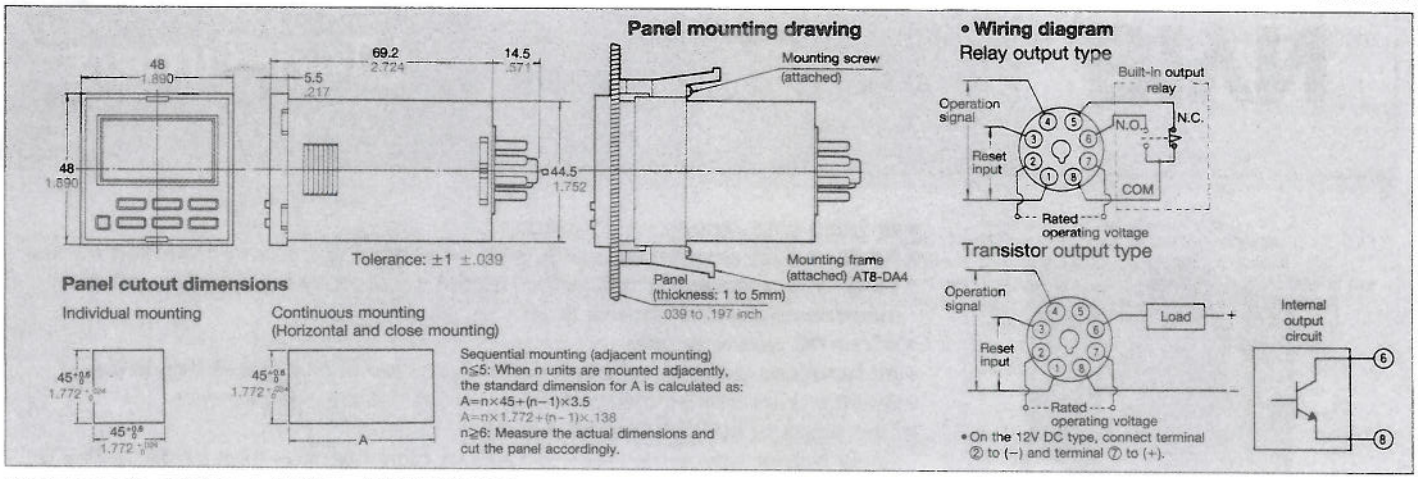
Characteristics

Type		Relay output type		Transistor output type	
		LT48-24-240V	LT48-DC12V	LT48T-24-240V	LT48T-DC12V
Rated operating voltage		24 to 240V AC/DC	12V DC	24 to 240V AC/DC	12V DC
Operating voltage range		AC power supply: 85 to 110% of rated operating voltage DC power supply: 80 to 110% of rated operating voltage			
Rated frequency		50/60Hz common	—	50/60Hz common	—
Power supply ripple		—	Max. 20%	—	Max. 20%
Rated control capacity (resistive)		5A 250V AC		Max. 100mA 30V DC	
UL/CSA rating		5A 250V AC, PILOT DUTY C300		100mA 30V DC	
Output arrangement		Timed-out 1 Form C		Timed-out Normally OFF	
Initial contact resistance, max. (By voltage drop 6V DC 1A)		100mΩ		—	
Expected life (min. operations)	Mechanical	10^7		—	
	Electrical (resistive)	10^5		10^7	
Initial insulation resistance (At 500V DC)		Min. 100MΩ Between input and output Between contacts		Min. 100MΩ Between live and dead metal parts Between input and output	
Initial breakdown voltage		2000Vrms for 1min Between input and output 1000Vrms for 1min Between contacts		2000Vrms for 1min Between live and dead metal parts Between input and output	
Shock resistance	Functional	Min. 10G (4 times on 3 axes)			
	Destructive	Min. 30G (5 times on 3 axes)			
Vibration resistance	Functional	10 to 55Hz: 1 cycle/min double amplitude of 0.5mm (10min on 3 axes)			
	Destructive	10 to 55Hz: 1 cycle/min double amplitude of 0.75mm (1h on 3 axes)			
Max. temperature rise		55 deg.			
Ambient temperature		−10 to 50°C +14 to 122°F			
Ambient humidity		Max. 85% RH			
Power failure compensation		7 years			

Note: If setting is frequently changed during power failure, the power compensation time is shortened. The timing operation is not executed during power failure.

DIMENSIONS

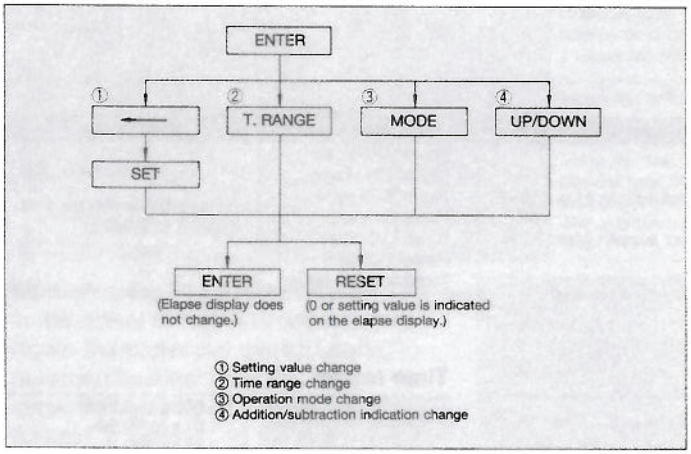
mm inch

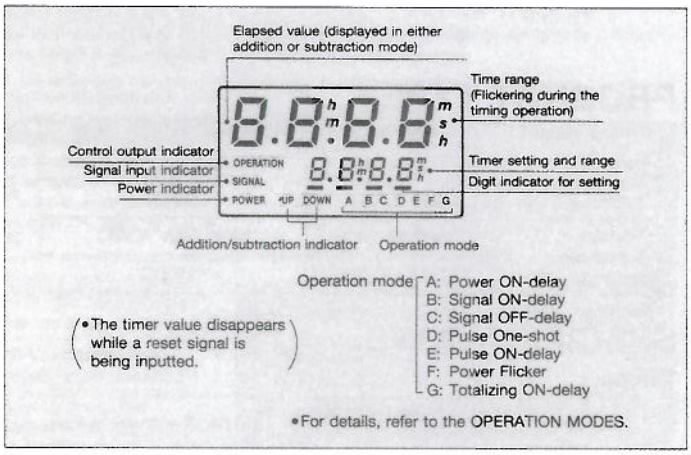


MODES AND TIME SETTING

Setting mode and time range change procedure

Mode change





① Setting value change

1) Push [ENTER].
2) Bring "▬" to a desired digit on the LCD display by pushing [←].
3) Push [SET] to change the number on the desired digit.
4) Push [ENTER] or [RESET].

② Time range change

1) Push [ENTER].
2) Select the desired time range by pushing [T.RANGE].
3) Push [ENTER] or [RESET].

③ Operation mode change

1) Push [ENTER].
2) Select the desired operation mode by pushing [MODE].
3) Push [ENTER] or [RESET].

④ Addition/subtraction indication change

1) Push [ENTER].
2) Select the addition or subtraction mode by pushing [UP/DOWN].
3) Push [ENTER] or [RESET].

* If [ENTER] is pushed after modes and time are set, the timer value is not cleared but continued. If [RESET] is pushed, the timer value before setting is cleared, and "0" is displayed in the addition display mode or the setting value is displayed in the subtraction display mode.
• The setting value, time range, operation mode and addition/subtraction mode can be continuously changed.

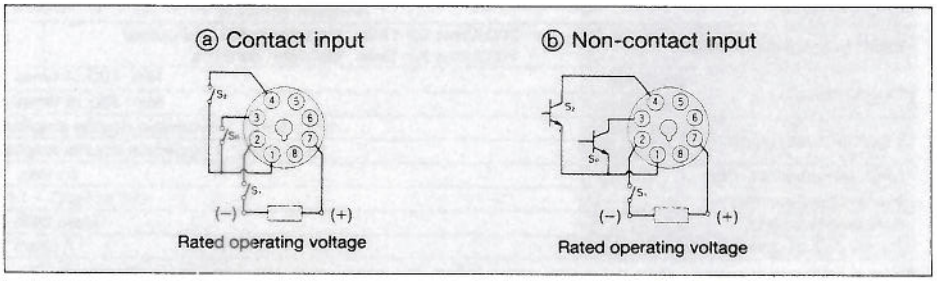
INPUT

1. Operation signal input

1) Terminals ①-④ should be connected as the operation signal terminals for min. 20ms.
Input impedance should be:
Short-circuited condition: Max. 1kΩ
Open-circuited condition: Min. 100kΩ
ⓐ Contact input
Use gold-plated contacts with high-reliability. Since contact bouncing causes errors in the operation, use an input contact without bounce.
ⓑ Open collector input
The characteristics of transistor shall be:
V_{CEO}: Min. 10V, I_C: Min. 10mA,
I_{CBO}: Max. 6μA

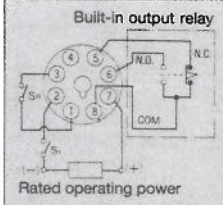
2. Reset input

1) Manual reset
Press the push-key switch for resetting for min. 20ms.
2) Signal reset
Connect terminals ①-③ for min. 20ms.
For other conditions, refer to those on "1. Operation signal".

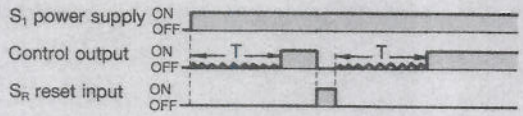


OPERATION MODES T: Setting time, $t_1+t_2+t_3=T$, $t<T$

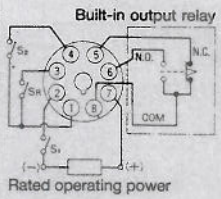
(A) Power ON-delay



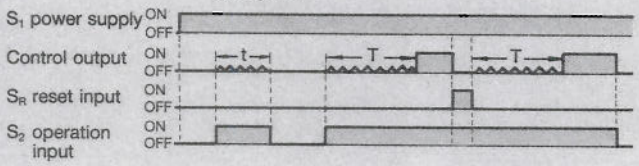
- When power is turned on, the timer value is cleared and the timing operation starts.
- When the setting time is elapsed, the timer stops at the setting time displayed (addition) or at "0" (subtraction).
- The operation signal is ignored. (When the control output is on, it is kept on even though the setting time and mode are changed.)



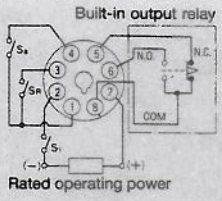
(B) Signal ON-delay



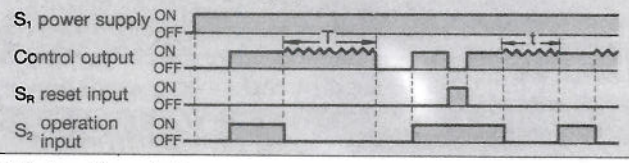
- When power is turned on, the timer value is cleared.
- When the operation signal is turned on, the timing operation starts, and when the operation signal is turned off, the timer is reset.
- If the operation signal is already on when reset is turned off or power supply is turned on, the timing operation immediately starts. (When the control output is on, it is kept on as it is even though the setting time and mode are changed.)



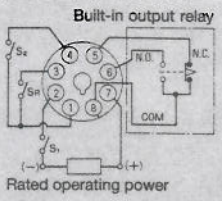
(C) Signal OFF-delay



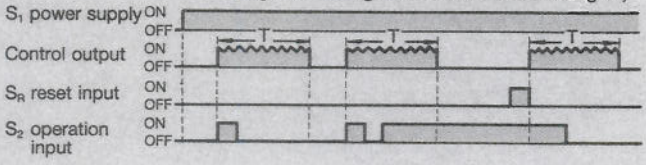
- When power is turned on, the timer value is cleared.
- When the operation signal is turned on, the control output is turned on, and when the operation signal is turned off, the timing operation starts. When the setting time is elapsed, the control output is turned off and the timer value is cleared.
- The timer value is cleared when the operation signal is turned on during the timing operation. (When the control output is on, it is kept on as it is even though the setting time and mode are changed.)



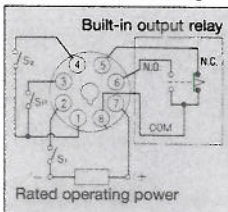
(D) Pulse One-shot



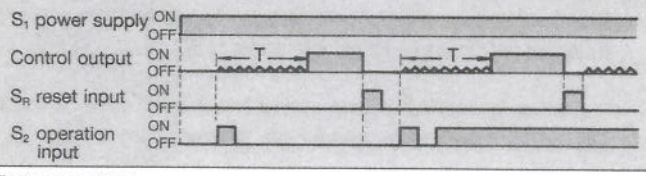
- When power is turned on, the timer value is cleared.
- When the operation signal is turned on, the timing operation starts, and the control output is turned on.
- After the setting time elapsed, the control outut is turned off and the timer value is cleared.
- The operation signal is ignored during the timing operation. (When the control output is on, it is kept on even though the setting time and mode are changed.)



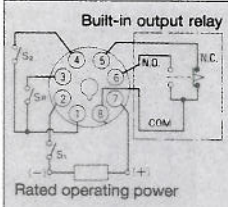
(E) Pulse ON-delay



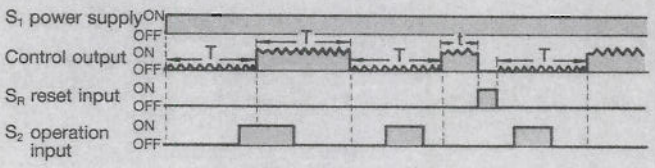
- When power is turned on, the timer value is cleared.
- When the operation signal is turned on, the timing operation starts.
- After the setting time has elapsed, the control output is turned on.
- The control output is turned off by the reset input.
- The operation signal is ignored during the timing operation. (When the control output is on, it is kept on even though the setting time and mode are changed.)



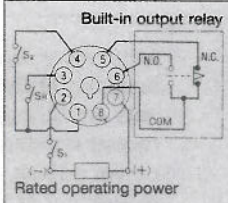
(F) Power Flicker



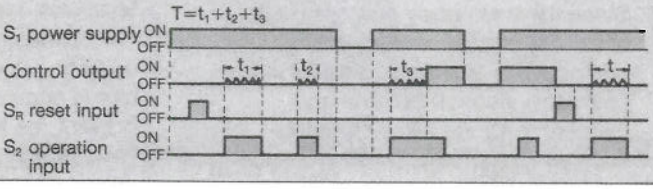
- When power is turned on, the timer value is cleared and the timing operation starts.
- After the setting time has elapsed, the control outut is reversed, the timer value is cleared and the timing operation starts again.
- The operation signal is ignored. (When the control output is on, it is kept on even though the setting time and mode are changed.)



(G) Totalizing ON-delay



- When power is turned on, the timer value is not cleared. (Power failure compensation function)
- When the output is on, the state is held even if power is turned off and turned on again. (When the control output is on, it is kept on even though the setting time and mode are changed.)
- When operation signal is turned on for a total period of time greater than time setting, the control output is turned on.



Note: Securely connect the terminals without errors referring to the wiring diagram. Do not apply external voltage to terminals ①, ③ and ④.

DATA

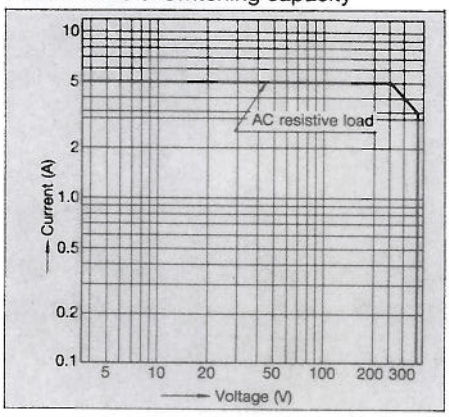
1. Load control capacity and life

2. Time accuracy

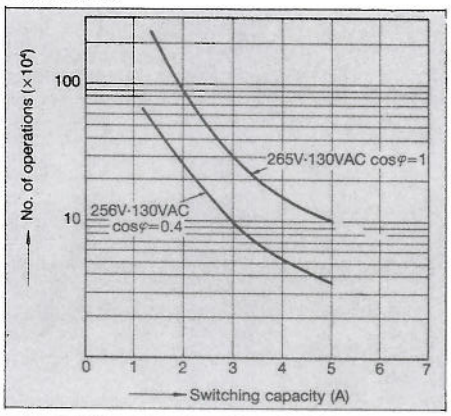
This is the time accuracy in the power ON-delay operation mode. This accuracy is not exceeded in the other operation modes.

- Frequency error test: No error

- Max. value of switching capacity

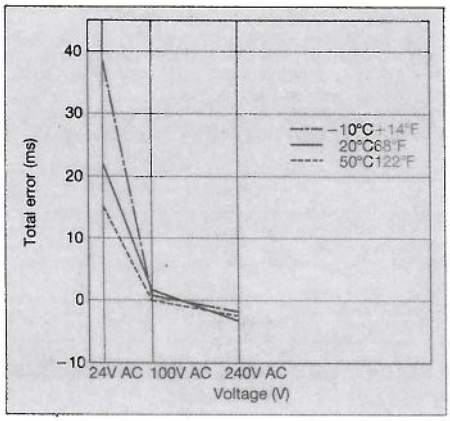


- Life curve



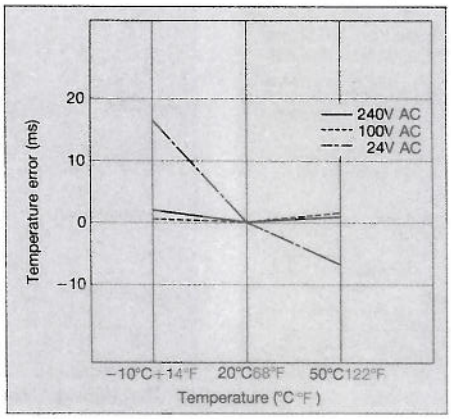
- Total error test (typical characteristics)

24 to 240V AC/DC: 10-second setting Power off time 1 s



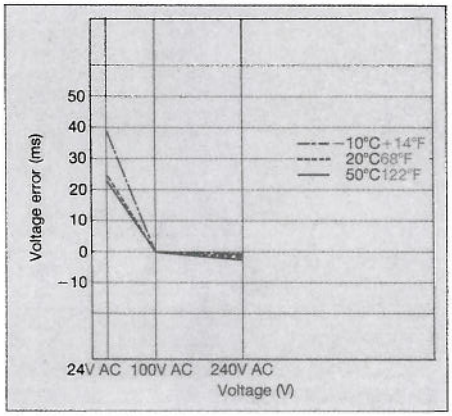
- Temperature error test (typical characteristics)

24 to 240V AC/DC: 10-second setting Power off time 1 s



- Voltage error test (typical characteristics)

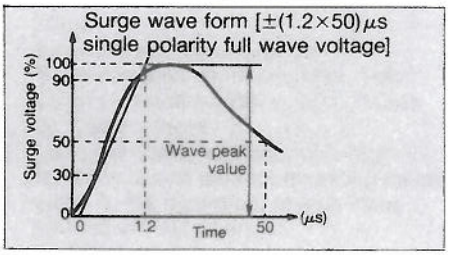
24 to 240V AC/DC: 10-second setting Power off time 1 s



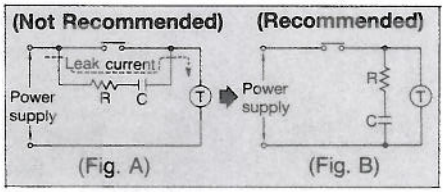
CAUTIONS

1. Prevent using the timer in such places where flammable or corrosive gas is generated, a lot of dust exists, oil is splashed or considerable shock and vibration occur.
2. Since the main body cover is made of polycarbonate resin, prevent contact with organic solvents such as methyl alcohol, benzine and thinner, or strong alkali materials such as ammonia and caustic soda.
3. External surge protection may be required if the following values are exceeded. Otherwise, the internal circuit will be damaged.

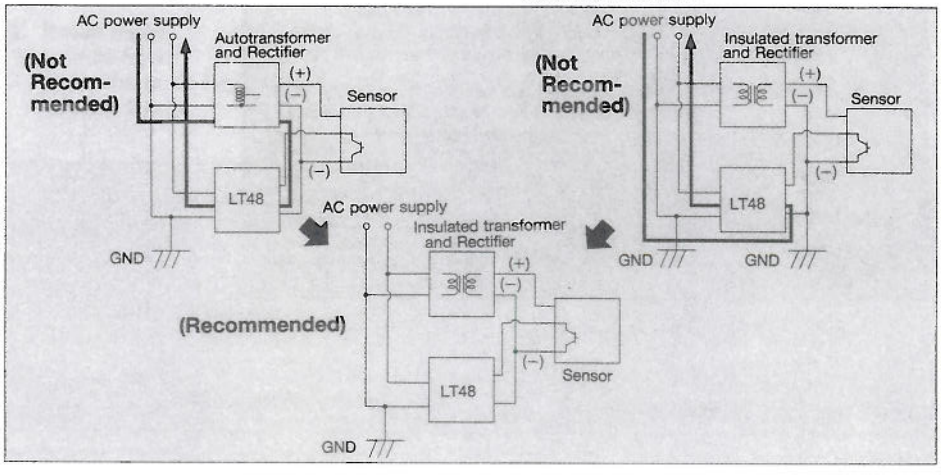
Operating voltage	Surge voltage
24 to 240V AC/DC type	4,000V
12V DC type	500V



4. Power supply
   - The LT48 timers operate over wide voltage range regardless of AC or DC power. Be careful to prevent induced voltages or residual voltages from occuring at the power supply terminals. (If the power supply cables are routed together with high voltage or power cables, an induced voltage may occur at the power supply terminals, causing misoperation.)
5. For connecting and disconnecting operating voltage to the timer, a circuit should be used which will prevent the flow of leakage current. For example, a circuit for contact protection as shown in Fig. A will permit leakage current to flow through R and C, causing erroneous operation of the timer. Instead, the circuit shown in Fig. B should be used.



6. Since the LT48 timers use a transformerless power supply system, the input equipment must have the power supply transformer in which the secondary side is not grounded with the primary and secondary sides insulated, in order to prevent interference of the power supply circuit when connecting the external input circuit. Be sure not to use an autotransformer.



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