

## Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Rated input fuse	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
YAS5	Flyback converter	250	0.13	-	Resister	glass fabric base.epoxy resin		Yes	Yes	*1
YAS10	Flyback converter	200	0.24	-	Resister	glass fabric base.epoxy resin		Yes	Yes	*1
YAW5	Flyback converter	250	0.13	-	Resister	glass fabric base.epoxy resin		Yes	Yes	*1
YAW10	Flyback converter	200	0.24	-	Resister	glass fabric base.epoxy resin		Yes	Yes	*1

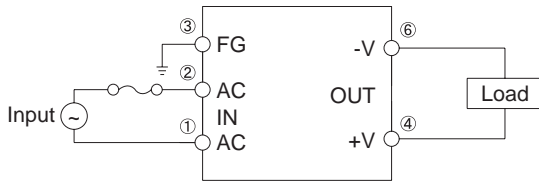
\*1 Refer to Instruction Manual.

<b>1</b>	<b>Pin Connection</b>	YA-12
<b>2</b>	<b>Function</b>	YA-12
2.1	Input voltage range .....	YA-12
2.2	Inrush current limiting .....	YA-12
2.3	Overcurrent protection .....	YA-12
2.4	Isolation .....	YA-12
<b>3</b>	<b>Wiring to Input/Output Pin</b>	YA-13
<b>4</b>	<b>Series Operation and Parallel Operation</b>	YA-13
4.1	Series operation .....	YA-13
4.2	Redundancy operation .....	YA-13
<b>5</b>	<b>Assembling and Installation Method</b>	YA-13
5.1	Installation method .....	YA-13
5.2	Derating .....	YA-14
<b>6</b>	<b>Cleaning</b>	YA-14
<b>7</b>	<b>Soldering</b>	YA-14
<b>8</b>	<b>Input/Output Pin</b>	YA-14
<b>9</b>	<b>External Fuse</b>	YA-14

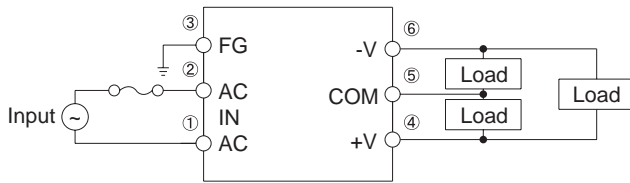
# 1 Pin Connection

No.	Pin connection	Function
①	AC	Input pin AC85 - 264V 1 $\phi$
②	AC	47 - 440Hz or DC110 - 370V
③	FG	Frame ground
④	OUT +V	+Side of output voltage
⑤	OUT COM	GND of output voltage(Only applicable for Dual output)
⑥	OUT -V	-Side of output voltage

## ●Single Output



## ●Dual ( $\pm$ ) Output



# 2 Function

## 2.1 Input voltage range

■ Input voltage range of the power supplies is from AC85-AC264V or DC110-DC370V. In cases that conform with safety standard, input voltage range is AC100-AC240V(50/60Hz).

**YA** ■ AC input voltage must have a range from AC85V to AC264V for normal operation. If the wrong input is applied, the unit will not operate properly and/or may be damaged.

## 2.2 Inrush current limiting

- Inrush current limiting is built-in.
- If a switch on the input side is installed, it has to be the one handling the input current.

## 2.3 Overcurrent protection

■ Overcurrent protection circuit is built-in and comes into effect at over 105% of the rated current. Overcurrent protection prevents the unit from short circuit and over current condition of less than 20 sec. The unit automatically recovers when the fault condition is cleared.

■ If the output voltage drops more than 70% of the rated output voltage in an overcurrent protection mode, the average output current will also be reduced by the intermittent operation.

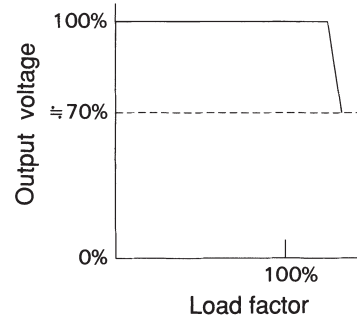
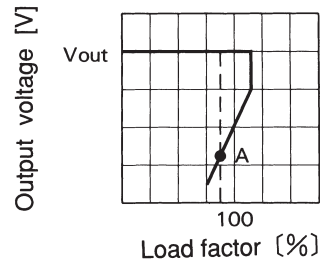


Fig.2.1 Overcurrent protection characteristics

■ The power supply which has a current foldback characteristics may not start up when connected to nonlinear load such as lamp, motor or constant current load. See the characteristics below.



—: Load characteristics of power supply.  
 .....: Characteristics of load (lamp, motor, constant current load, etc.).  
 Note: In case of nonlinear load, the output is locked out at A point.

Fig.2.2 Current foldback characteristics

## 2.4 Isolation

■ For a receiving inspection, such as Hi-Pot test, gradually increase (decrease) the voltage for the start (shut-down). Avoid using Hi-Pot tester with the timer because it may generate voltage a few times higher than the applied at ON/OFF of a timer.

### 3 Wiring to Input/Output Pin

- To meet with conducted noise CISPR22-B, EN55022-B, connect capacitor  $C_i$  which is more than  $0.1\mu\text{F}$  at AC input terminal.
- To decrease the ripple voltage further, install an external capacitor  $C_o$  at output terminal as shown below.

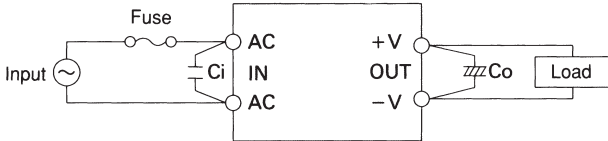


Fig.3.1 Connecting method of external capacitor at output terminal

- When the static capacity of Capacitor  $C_o$  is high, it may unstabilize the operation of power supply, so please refer to table 3.1 for the value of the external capacitor  $C_o$ .

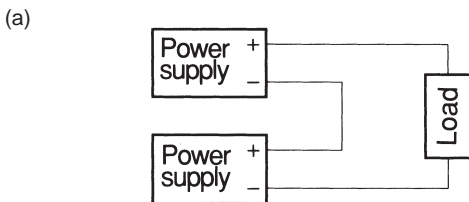
Table 3.1 Capacity of external capacitor at output terminal:  $C_o[\mu\text{F}]$

Output voltage $C_o$	5V	12V	15V
Recommended value	220	100	100
Maximum value	2,200	1,000	1,000

### 4 Series Operation and Parallel Operation

#### 4.1 Series operation

- Series operation is available by connecting the outputs of two or more power supplies, as show below.  
Output current in series connection should be lower than the low-est rated current in each unit.



(b)

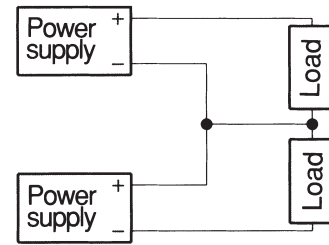


Fig.4.1 Series operation

#### 4.2 Redundancy operation

- Redundancy operation is available by connecting the unit as below.

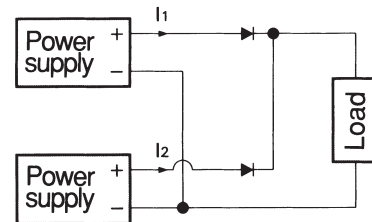


Fig.4.2 Redundancy operation

### 5 Assembling and Installation Method

#### 5.1 Installation method

- The unit can be mounted in any direction. Position them with proper intervals to allow enough air ventilation. Ambient temperature around each power supply should not exceed the temperature range shown in derating curve.
- Avoid placing the AC input line pattern lay out underneath the unit because it will increase the line conducted noise. Make sure to leave an ample distance between the line pattern lay out and the unit. Also, avoid placing the DC output line pattern underneath the unit because it may increase the output noise. Lay out the pattern away from the unit.

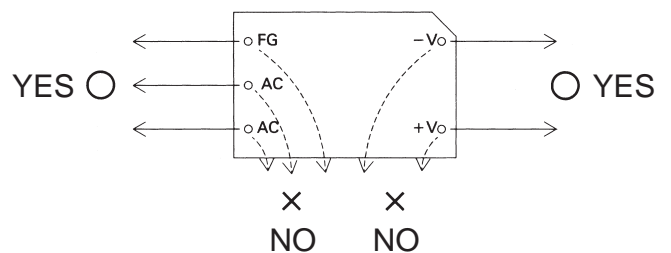


Fig.5.1 Pattern wiring

■When the pattern of DC output line is installed at the same surface of the unit installed, the creepage distance and clearances between primary components of the internal unit does not satisfy the standard of safety, avoid the installation inside the slanted line as below.

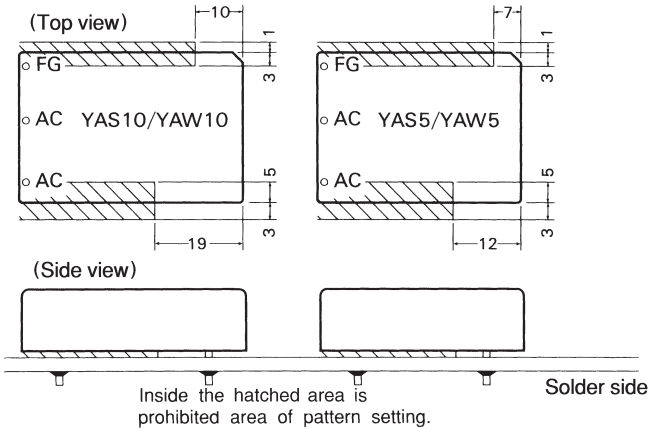


Fig.5.2 Prohibited area of pattern arrangement

### 5.2 Derating

- By derating the output current, it is possible to operate the unit from -10°C to +65°C.
- When unit mounted any way other than in drawings below, it is required to consider ventilated environment by forced air cooling or temperature/load derating. For details, please consult our sales or engineering departments.

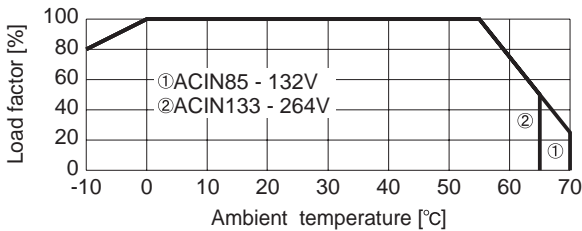


Fig.5.3 Derating curve

■The temperature increase of case surface at full load is shown by below table as referenced data.

Table 5.1 The surface temperature of case increase data  
(Unit: deg)

Input voltage	Output voltage	5W	10W
AC100V	5V	35	40
	12V	24	34
	±12V	28	42
	±15V	29	37

## 6 Cleaning

- Clean it with a brush. Prevent fluid from getting inside the unit.
- Do not apply pressure to the lead and name plate with a brush or scratch it during the cleaning.
- After cleaning, dry them enough.

## 7 Soldering

- Flow soldering : 260°C less than 15 seconds.
- Soldering iron (26W) : 450°C less than 5 seconds.

## 8 Input/Output Pin

- When too much stress is applied on the input/output pins of the unit, the internal connection may be weakened. As below Fig.8.1, avoid applying stress of more than 9.8N (1kgf) on the pins horizontally and more than 19.6N (2kgf) vertically.
- The input/output pins are soldered on PCB internally, therefore, do not pull or bend them with abnormal forces.
- When additional stress is expected to be put on the input/output pins because of vibration or impacts, fix the unit on PCB (using silicone rubber or fixing fittings) to reduce the stress onto the input/output pins.

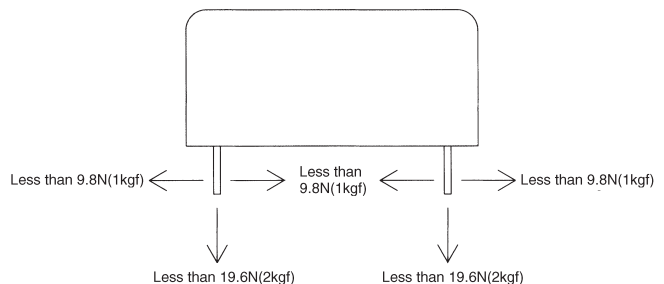


Fig.8.1 Stress onto the pins

## 9 External Fuse

■Fuse is not built-in on the input side. In order to secure the safety of the unit, install a slow-blow type fuse on the input side.

Table 9.1 The rated current of fuse (Slow-blow type)

Model	YAS 5(E) · YAW 5(E)	YAS10(E) · YAW10(E)
Rated current	2A	2A