

“FIP06 Series” AC-DC Power Supply for Industrial Equipment

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In recent years, deployment of industrial machinery such as production line robots and automatic check-in and check-out machines in the service industry has been accelerating in response to chronic labor shortages across all industries. The increasing number of various types of machines has required power supplies to meet the needs of a wide variety of output specifications.

From these backgrounds, Fuji Electric has developed and released the “FIP06 Series” multi-output AC-DC power supply that enables customers to freely select the number of outputs and corresponding voltages (see Fig. 1).

1. Product Specifications

Figure 2 shows the internal configuration of the FIP06 Series, and Table 1 provides an outline of its specifications. The unit receives 100 to 240 V AC and outputs up to 4 DC voltages with a total output of 600 W (peak of 750 W).

These four outputs can be individually equipped with isolated converters called block circuit boards. Therefore, three or four block circuit boards utilizing 12- or 24-V isolated converters can be selected according to the user’s application need. Table 2 provides the specifications of the block circuit boards.



Fig.1 “FIP06 Series”

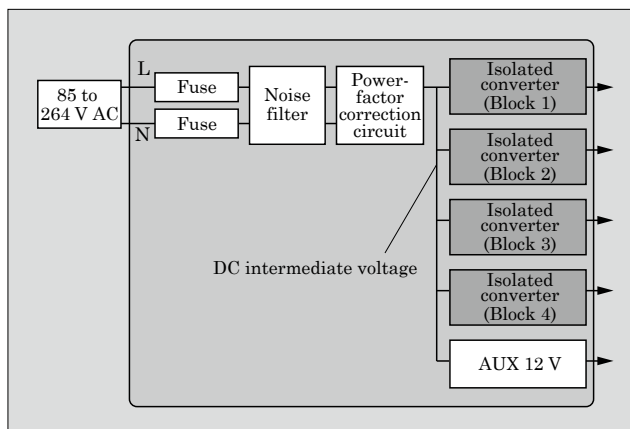


Fig.2 “FIP06 Series” internal configuration diagram

Table 1 “FIP06 Series” outline specifications

Item		Specifications
Input	Rating	Single-phase 100 to 240 V AC, 50/60 Hz
	Range	Single-phase 85 to 264 V AC, 47 to 63 Hz
Output (DC)		Total output 600 W (peak power 750 W, 3 seconds or less)
		The output voltage value depends on the selected block circuit board
Output hold time		20 ms
Instantaneous voltage drop		SEMI-F47 compliant (at single-phase 200 V input)
Operating temperature		-10 °C to +60 °C
EMI		VCCI class A compliant
Protective function		Input overcurrent / Output overvoltage Output overcurrent / Temperature protection
Interface	Input	M4 screw terminals
	Output	M3 screw terminals
	Signal	PUD Series connector (JST) or equivalent
Safety standards		CB certification (IEC 60950-1 Edition 2)
Option		○ Backup function ○ Output hold time extension

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Table 2 Block circuit board specifications

Item		Specifications	
Output voltage (rating)		24.0 V	12.0 V
Voltage tolerance	Static	±2%	
	Dynamic	±5%	
Output current	Rating	10.4 A	
	Peak	13.0 A (3 seconds)	18.0 A (0.1 seconds)
Protective function	Overvoltage	28.8 to 33.6 V	14.4 to 16.8 V
	Overcurrent	13.5 to 18.7 A	13.5 to 18.7 A
Ripple voltage		240 mVpp	120 mVpp

2. Features of the “FIP06 Series”

(1) Overload measures

By increasing the efficiency through the use of a current resonant (LLC) circuit as the conversion method of the block circuit boards, it is possible to supply up to 240 W of power on a single block circuit board. The unit also has two levels of overcurrent protection function that enables it to instantaneously output up to 180% its ratings. This allows a single block circuit board to correspond to loads that require an instantaneous large power, such as motors and heaters.

(2) Block circuit board output isolating measures

The output of a block circuit board is isolated from the AUX output and other block circuit board outputs, power can therefore be supplied to multiple loads without considering the load fluctuation of other block circuit boards or the sneak current from other loads. For example, the power supply can be used for a load in which only one of the outputs has a negative potential with the plus side being grounded.

Furthermore, the block circuit boards come with a built-in current balance function, and multiple block circuit boards can be connected in parallel. This makes it possible to handle large loads by simply connecting the output terminals.

(3) Various system configurations

Each block circuit board has a remote on-off function, it is possible to freely set the order of starting and stopping the output. It also has a status notification function and various protection functions (overvoltage, overcurrent, overheating). When a malfunction occurs to one of the loads, this function makes it possible to choose to stop the other non-malfunctioning outputs or continue operation.

(4) Overvoltage category III compliance

The power supply is compliant with overvoltage category III*¹, and it can be directly connected to input systems with low protection levels (systems susceptible to high transient voltages).

3. Optional Functions

As shown in Fig. 3, the FIP06 Series can be equipped with various options to support a stable and continuous supply of output even when connecting to an unstable input system or when experiencing input malfunction due to power outage or other problem. Tables 3 and 4 show the options. The features of each option are as follows:

(1) Backup option

This is an option for charging and discharging the battery. When the external battery is properly selected, the required power can be backed up for as long as necessary.

Furthermore, this option is connected between the DC intermediate voltage and the battery, so that it is possible to back up the output of all block circuit

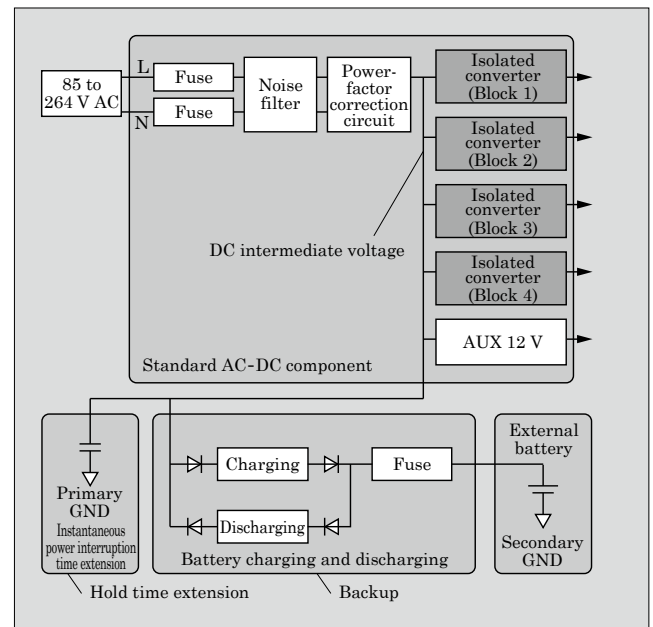


Fig.3 Diagram of internal configuration with options

Table 3 Backup specifications

Item		Specification
Charging specifications	Voltage	27.3 V (during CV operation)
	Current	1.0 A (during CC operation)
	Time	Charging complete within 24 hours (depending on battery capacity)
Discharge specifications	Total output 300 W	
	The output voltage value depends on the selected block	
Compatible battery	24-V battery (recommended capacity 5 to 15 Ah)	

*1: Overvoltage category III is a 4-stage classification that specifies the transient voltage tolerance of equipment based on IEC. Overvoltage category III is the category to apply to equipment that requires high reliability and effectiveness.

Table 4 Output hold time extension specifications

Item	Specifications
Output hold time (at 600 W output)	70 ms/120 ms/170 ms
Remarks	<ul style="list-style-type: none"> ○ Adjustable in 3-steps ○ Longer when output power is small ○ (Inversely proportional to output)

boards.

(2) Output hold time extension option

This is an option to add extra capacitance to the DC intermediate capacitor inside of the power supply. When long time backup with batteries is not needed but the output is needed to be held for a few hundred milliseconds, this option minimizes cost.

The two options mentioned above can also be used together, making it possible to construct a suitable backup system that corresponds to the input and load to be connected.

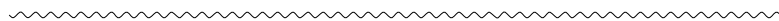
Launch time

May 2019: AC-DC component

January 2020: With options (scheduled)

Product Inquiries

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