



30W AC/DC power converter with three isolated ground wires and four outputs in the front stage of FHAZ30 series power converter was added with one channel of main output on the basis of FHA30 series and other indicators remain unchanged. There are two channels of master output and two channels of auxiliary output. Generally, two channels of master output are symmetrical of positive and negative, but it also can be only one channel or unsymmetrical of two channels. Master outputs are not isolated with each other, but it is isolated between master output and auxiliary output and between auxiliary outputs. If positive and negative channels of master output are symmetrical of positive and negative, positive and negative channels will adopt feedback stabilized voltage; if positive and negative channels of master output are unsymmetrical, one channel samples 80% and the other channel samples 20% feedback stabilized voltage. The output power of master output is required to be the most among output of four channels in front stage. The output of front stage can freely choose from 1 to 4 channels. The port MOUT in front stage is for master output and ports OUT1 and OUT2 are for auxiliary output. During the use, the voltage output by MOUT is the most stable and its output voltage and ripple do not vary with the variation of itself and auxiliary output. With the precondition that MOUT outputs constant power, the voltage of auxiliary output terminals OUT1 and OUT2 drops by 2% max. with the rise of their output powers. If auxiliary output terminals OUT1 and OUT2 output constant power, their output voltage will rise with the rise of power output by MOUT. For this feature, the output should be specified in using and selecting types. MOUT can be one channel, symmetrical of two channels or unsymmetrical of two channels.

If the output of front stage of FHAZ30 chooses four channels, the maximum output current of each channel will be 1.0A; if the output of front stage chooses three channels, the maximum output current of master output will be 2.0A and the maximum output current of the rest channels will be 1.0A; if the output of front stage choose two channels, the maximum output current of each channel will be 2.0A; if the output of front stage chooses one channel, the maximum output current of this channel will be 4.0A. the conversion efficiency of front stage ranges from 80% to 85%.

Two DC/DC converters in back stage can be connected to any one of output channels in front stage or connected to an output independently. Their input voltage should be equal to or larger than 10V. Output current of FHB1.5A is up to 1.5A and typical efficiency is 92%. The output voltage includes 1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V, 7V, 9V, 12V, 15V and 18V, but input is not isolated from output and input should be 2V more than output. The output of FHP5 is up to three channels with power 5W and typical efficiency 80%. The input is isolated from output, but not isolated between outputs. Its input voltage includes 3.3V, 5V, 7V, 9V, 12V, 15V, 18V, 24V, 36V and 48V. Under the same input and output conditions, the efficiency and size of FHB1.5A are superior to those of FHP5, but it is single channel and not isolated.

The minimum output voltage of front stage is 3.3V and when output demands 1.2V, 1.5V, 1.8V and 2.5V, it will require a back stage. The front stage can stabilize the voltage of MOUT at most and the voltage of OUT1 and OUT2 is not stable. If the stable voltage output of above two channels is needed, it needs back stage to re-stabilize the voltage. There two demands generally are realized by back stage of FHB1.5A.

If the number of output channels of front stage is not enough, these two demands will be realized by FHP5. It can change one channel into four channels and have an isolated ground wire. FHP5 can stabilize one channel or two channels symmetrical with each other.

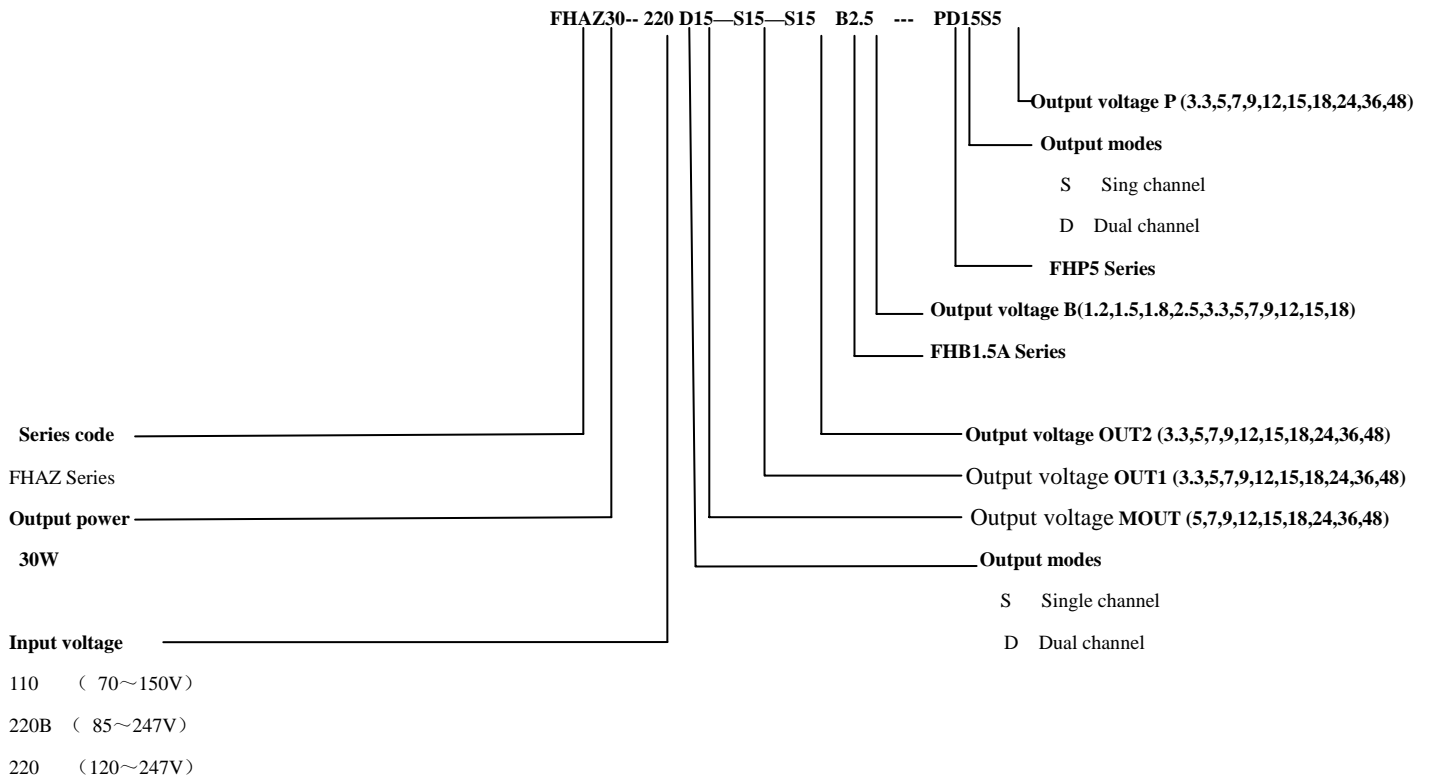
FHAZ30 series power-supply converter contains an in-built LC network, which can effectively reduce the fluctuations of the input current and the output voltage, and connect EMI between front and back stages.

FHAZ30 series power-supply converter contains the output short circuit and overload automatic cut-off circuit. When the output backs for 0.1s and exceeds 120% of the rated output power, the converter cuts off all outputs. After the over-current fault is removed, it automatically enters soft-start mode and restores the output voltage. If the overload duration of output is less than 0.1s, the converter will not act.

Key components used for FHAZ30 series power-supply converter are purchased in military level and completely pass the in-factory test in strict accordance with the national military product quality standard. The factory test includes

24 ~ 72-hour live aging and screening under the temperature of +175°C. All finished products have experienced 8-hour full-load operation under the temperature of +175 °C before delivery so as to fully check the damage to the components during the production process and hence ensure the reliability of products.

## Type Selection:



NOTE: “—” in model refers to the meaning of isolation. If the master output is single channel, there is no—SOUT1—SOUT2; if it is double channel, there is no —SOUT2. When FHB1.5A and FHP5 are connected to the output of a channel, then its model will be represented with the output it closes to. If the channel connected to FHB1.5A and FHP5 is not introduced, then it is marked with -B or NP.

### Model naming and real examples

**FHAZ30-220D15--PS5D12 --S5--S12B1.8.** The power source of this model is 220V AC input and output has four ground wires totaling four groups. The first group is MOUT:±15V; the second group is +5V and ±12V converted from the first group; the third group is OUT1:5V and the fourth group is OUT2: +12V and +1.8V re-converted from +12V.

**FHAZ30-220S15B3.3S24--PS5D12 --S5--S12B1.8.** The power source of this model is 220V AC input and output has four ground wires totaling four groups. The first group includes MOUT: +15V, +3.3V converted from MOUT: +15V and MOUT: master output +24V; the second group includes +5 and ±12V converted from +24V; the third group is OUT1:5V; and the fourth group is OUT2:+12V and +1.8V converted from +12V.

**FHAZ30-220D15--B1.2--S12.** The power source of this model is 220V AC input and output has three ground wires totaling three groups. The first group is master output MOUT: ±15V; the second group is connected to +1.2V converted from OUT1 and the third group is OUT2: +12V.

**FHAZ30-220D15--NP9--S12.** The power source of this model is 220V AC input and output has three ground wires totaling three groups. The first group is master output MOUT: ±15V; the second group is connected to +9V converted from OUT1 and the third group is OUT2: +12V.

### Technical Parameters:

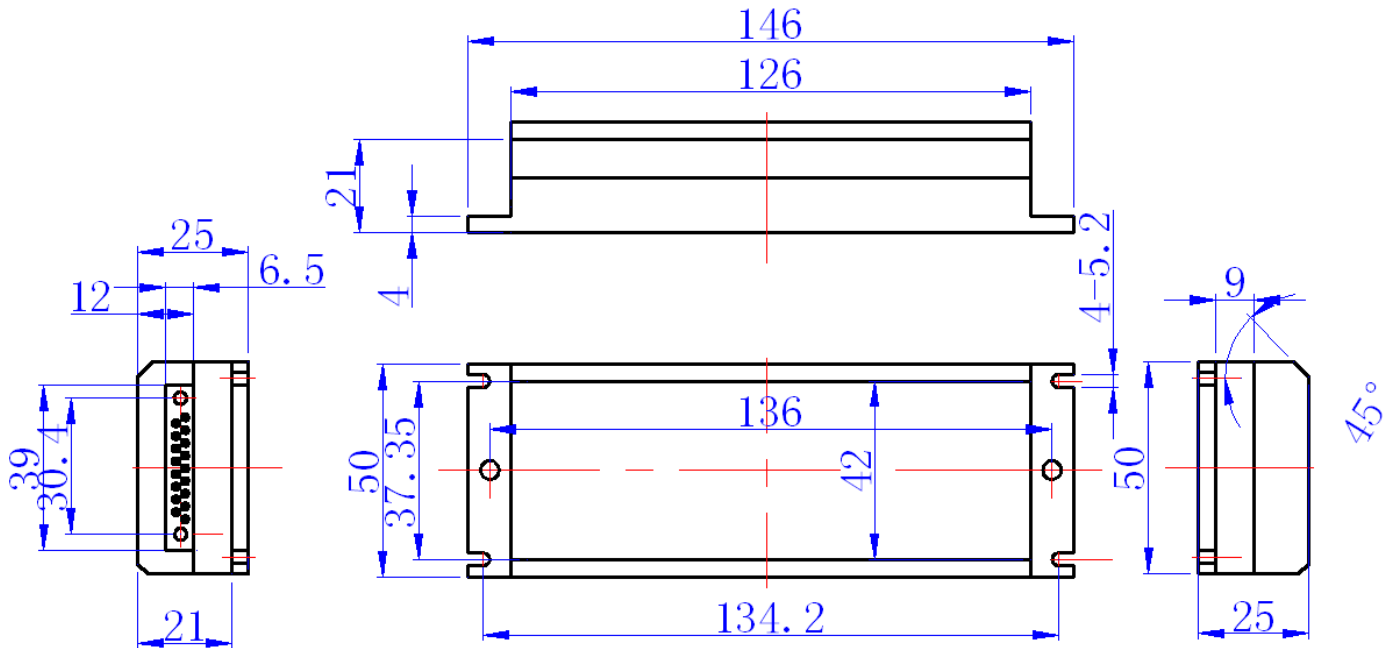
- (1) Working temperature:  $-55^{\circ}\text{C} \sim +175^{\circ}\text{C}$  Max. shell temperature:  $+204^{\circ}\text{C}$ .
- (2) Input voltage: AC70~150V, AC85~247V and AC120~247V
- (3) Input AC frequency: 0Hz~400Hz
- (4) Output voltage: Free combination of ten channels and five isolated ground wires (1.2V, 1.5V, 1.8V, 2.5V, 3.3V, 5V, 7V, 9V, 12V, 15V, 18V, 24V, 36V and 48V)
- (5) Output ripple: Less than 50mVp-p, typical 20mVp-p
- (6) Output power: 30W
- (7) Temperature stability: less than  $\pm 2.5\%$ , typical  $\pm 1\%$
- (8) Shock resistance: 25G, 0 ~ 300Hz
- (9) Conversion efficiency: 75-80%
- (10) Static power consumption: 0.8W Max.
- (11) Size: L126.0×W50.0×H25mm
- (12) Isolation voltage between input and output: 1000V
- (13) Voltage output type: High temperature 17-pin socket

### Service Requirements:

As the power converter has nearly 5W power consumption under the condition of full-load operation and its size are small, good medium is necessary to be added between the shell of the power converter and the radiator so as to ensure the temperature of the converter shell to be less than  $204^{\circ}\text{C}$ .

The shell of the converter is isolated from the input and output. During the use, it is directly installed on radiator. If the ripple cannot be filtered with capacitance or LC network, then this ripple is electro magnetic interference (EMI). Thus, an EMI filtering converter is necessary to be added to input and output terminals of FHAZ30. To function properly, the shell of filtering converter should be suspended not to connect with radiator, input GND and output GND. If it is connected to either of them, EMI filtering converter will not function properly. As we have added EMI network to input and output terminals inside converter, so long as the shell is suspended, it will function. If the ripple is still large, it is needed to externally connect input or output EMI filter outside the shell. To suspend shell, it ordinarily put heat-conducting pad, ceramics backing or silicon rubber pad between the shell and radiator.

### Outline Diagram:



(产品性能和可靠性不断改进, 资料随之不断更新, 恕不另行通知)

2013年10月14日

(Product performance, reliability and information are subject to change without prior notice.)

October 14, 2013