





An Advance International Group Company

FEATURES

- 350W continuous output power, 500W surge
- Up to 5 fully regulated outputs
- Power factor corrected, universal input
- No derating of continuous output power at low input
- Integral fan cooling
- IEC or screw terminal input connections
- CE marked, EMC compliant
- Current limit and overvoltage protection on all outputs
- 200% current surge capability for disc drives

AVAILABLE OUTPUTS

A Kestrel power supply contains three outputs in the base unit (table 1). Up to two further outputs can be included if required. See tables 2 and 3 for available outputs

Table 1. Base Unit							
Model Number	Output Number	Nominal Voltage	Adjustment Range	Output Current			
VWF350FJJ	1	+3.3V	3.0 – 5.5V	0 – 50A			
	2	+12V	11.4 – 12.6V	0 – 12A [24A]			
	3	F12V	11.4 – 12.6V	0 – 6A			
VWF350GJJ	1	+5.0V	3.0 – 5.5V	0 – 50A			
	2	+12V	11.4 – 12.6V	0 – 12A [24A]			
	3	F12V	11.4 – 12.6V	0 – 6A			

F - Floating, [] - Surge rating

Table 2. Output 4 (floating)						
Nominal	Adjustment	Output	Code			
Voltage	Range	Current				
3.3V	3.0 – 3.5V	0 – 20A	F			
5V	4.75 – 5.25V	0 – 20A	G			
12V	11.4 – 12.6V	0 – 10A	J			
24V	22.8 – 25.2V	0 – 5A	L			

Table 3. Output 5 (floating)

Nominal Voltage	Adjustment Range	Output Current	Code
3.3V	3.0 – 3.5V	0 – 5A	FH
5V	4.75 – 5.25V	0 – 1.5A	G
5V	4.75 – 5.25V	0 – 5A	GH
12V	11.4 – 12.6V	0 – 1.5A	J
12V	11.4 – 12.6V	0 – 3A	JH
24V	22.8 – 25.2V	0 – 1.5A	LH

Other output voltages available shortly. Contact your local sales office or agent for details.

ELECTRICAL SPECIFICATION

INPUT SPECIFICATION

Voltage Range 85 – 264 V a.c.

Frequency

47 - 63Hz.

Supply Type

Single phase TN-S systems (as defined in IEC364).

Input Current

5.7A maximum at 90V input, 350W output 2.3A maximum at 198V input, 350W output.

Inrush Current

10A maximum, hot or cold start.

Power

460W maximum input power when delivering 350W output power.

Power Factor

Greater than 0.95 at 350W output power, 100 to 240V input voltage. Typically 0.99.

Efficiency

Typically 80% at 350W output power, 230V input.

Harmonic Distortion

Complies with the requirements of EN61000-3-2.

OUTPUT SPECIFICATION

Voltage

Nominal output voltages and adjustment ranges are shown in Tables 1 - 3. Adjustment is by means of a 20-turn potentiometer. Outputs are preset to within $\pm 1\%$ of nominal.

Current

Recommended maximum continuous current ratings (I_{MAX}) are shown in Tables 1 – 3. It may not be possible to draw the full rated current from all outputs simultaneously due to the total power rating of the unit. All maximum current ratings are applicable up to 50°C. From 50°C to 70°C derate by 2.5%/°C.

Surge Current

Up to 24A is available from output 2. This is fully supported by a surge power capability of up to 500W total output power. The peak current on output 2 is limited to $26.4A \pm 2.4A$, reducing after about 3s to reach $14.4A \pm 1.8A$ within 8s. The limit then resets to $26.4A \pm$ 2.4A within 1s of removal of the overload. See Fig. 1 and output current limit under 'Protection'. The average current over a 1 minute period must not exceed 12A.

Power

350W continuous up to 50°C. From 50°C to 70°C derate by 2.5%/°C.

Surge Power

Up to 500W surge power is available from the power supply. Typically, the surge power is available for 15 seconds in any 1 minute period.

Load Regulation

 $1\% V_{\text{NOM}}$ maximum for an output current variation of 0 to 100% I_{MAX} with all other outputs loaded to 20% I_{MAX} . The output voltage of any output is independant of the load current on any other output.

Line Regulation

0.2%V_{NOM} maximum for an input variation over the operating range of the unit with all outputs proportionally loaded to provide 350W output power.

Dynamic Regulation

Outputs 1 and 2: 250mV maximum deviation, recovering to 1% of nominal within 1ms.

Outputs 3 to 5: $5\%V_{\text{NOM}}$ maximum deviation, recovering to 1% of nominal within 1ms.

Both of the above apply when the load varies 50% to 100% or 100% to 50% of $I_{\rm MAX}.$

Temperature Coefficient

Typically ±0.02%/°C on all outputs for temperatures within the operating range.

Ripple and Noise

1% or 50mV pk-pk (whichever is the greater) over 500kHz bandwidth, 1% or 100mV (50mV on output 1) whichever is the greater over a 30MHz bandwidth. Measurements are differential with all outputs proportionally loaded to provide 350W output power.

TURN ON AND TURN OFF CHARACTERISTICS

Start-up Time

All outputs are above D.C OK threshold within 0.5s of application of input power at 240V, 1.5s at 100V.

Start-up Characteristic

The voltage rise on all outputs is monotonic with no overshoot.

Hold Up

>20ms at 350W output power at any input voltage within the specified range. This is sufficient energy storage to ride through a missing mains cycle.

ELECTRICAL SPECIFICATION

PROTECTION

Input Fuse

Internally fitted fuse rated at 7A t. 250V.

Output Current Limit

The current limit point on outputs 1, 3, 4 and 5 is set to 120% \pm 15% of I_{MAX}, except for output 5 low current modules (1.5A output) at <3.5A. The characteristic is constant current and is non-latching.

Output 2 current is limited to the area shown in figure 1. The cycle is initiated (time = 0) by the output current exceeding the steady state current limit point of $14.4A \pm 1.8A$ (I,). At that time the current limit point is $26.4A \pm 2.4A$ (I₂). After 3s nom., the current limit point ramps down to reach 14.4A ±1.8A (I,) at 8s nom. The current will be limited at this value until the load is reduced to draw less than the limit. The protection circuitry will reset to the higher limit point of 26.4A \pm 2.4A (I₂) within 1s of the overload being removed.

Output Overvoltage

Output 1 has tracking overvoltage at 1V ± 0.25V above the set output voltage.

Outputs 2 to 5 overvoltage trip is set at 120% $\pm\,10\%$ of nominal output voltage (125% $\pm\,5\%$ on 3.3V outputs).

Overvoltage protection is latching and can be reset either by removing the input power from the power supply or by toggling the Inhibit input. An overvoltage condition is indicated by a red LED.

Overtemperature

In the event of thermal overload, the unit will be disabled. Output power will be restored when the unit temperature drops to a safe level. Latching thermal trip is also available when option 1 or option 3 is specified. An overtemperature condition is indicated by a red LED.

AUXILIARY FUNCTIONS

Remote Sense

Available on all outputs except low current output 5 modules (1.5A). Compensates for lead drops of up to 500mV on outputs 1, 2 and 3 and 250mV on outputs 4 and 5.

Parallel Operation

Outputs 1 and 2 may be connected in parallel with the corresponding output of the same voltage rating on another unit.

Active current share: Current sharing, pro rata to the current rating of each output, can be achieved by linking current share pins of linked outputs. Voltages must be set to within 1% of each other for active current share to operate correrctly.

Series Operation

Outputs may be connected in series to provide higher output voltages. Outputs 1 and 2 have a common OV line so cannot be connected in series with each other. Maximum voltage between outputs is 100V d.c. For full protection, each series connected output should have a diode fitted reverse biased across it. The diode must be capable of passing the maximum current available from any of the series connected outputs.

STANDARD SIGNALS

All signals are referenced to -Sense.

Inhibit

TTL compatible input. The output power of a complete power supply may be inhibited by a logic signal applied to this input. Removal of the logic signal reinstates the output voltage. A short pulse on this input (<30ms) will cause the unit to toggle on or off. Pulsing this input will also clear a latched condition caused by overvoltage or overtemperature. The sense of the signal is low to inhibit as standard, but specifying option 2 or 3 will provide an active high inhibit.

Power Fail Signal

An open collector output signal provides warning of impending output failure due to loss of input. At least 5ms warning of output power loss is provided. Output is high for power O.K.





Ref 9FS0137E

ENVIRONMENTAL SPECIFICATION

ENHANCED SIGNALS - OPTION B

DC OK

Available when option B is specified. An open collector output provides a signal indicating that all output voltages are above 90% of nominal. Signal is high for outputs O.K.

+5V Logic Supply

Available when option B is specified. This +5V supply is provided by a standard 78L05 I.C regulator and is capable of delivering up to 100mA. It has integral thermal overload and short circuit protection. The 0V of this supply is connected to "–sense" of output 1. This output remains available even if other outputs are inhibited.

Fan Fail

Available when option B is specified. An open collector output provides a signal indicating that the internal fan speed has dropped below a predetermined fixed level. Output is high for fan OK.

ISOLATION

Primary to Secondary

Reinforced insulation to 3kV a.c. r.m.s. for one minute. Where a safety earth is interposed between primary and secondary, this potential is split equally between input to earth and output to earth. Complete units are tested to 1.5kV a.c. between input and output with all output terminals connected together and connected to earth.

Primary to Earth

Units are tested to 1.5kV a.c. from input to earth.

Secondary to Earth

Units are tested to 700V d.c. from output to earth, with all output and signal ports connected together.

Earth Leakage Current

Earth current under normal operating conditions does not exceed 1.5mA.

Operating Voltages

The maximum operating voltage between any output (power or signal) and earth or between isolated outputs must not exceed 100V d.c.

ELECTROMAGNETIC COMPATIBILITY

Emission

Conducted 0 to 2kHz: Units comply with EN61000-3-2.

Conducted 0.15 to 30MHz Units comply with EN55022B.

Radiated 0.03 to 1GHz Units comply with EN55022B.

Immunity

Fast transients: Units comply with IEC1000-4-4-B.

ESD: Units comply with IEC1000-4-2-A.

RF field: Units comply with ENV50140-A at 3V/m.

Conducted RF: Units comply with ENV50121-A.

Surge: Units comply with ENV50142-B.

ENVIRONMENTAL CONDITIONS

Ambient Temperature

0°C to 70°C operating. Above 50°C, derate power and current by 2.5%/°C. -40°C to +85°C non-operating.

Humidity

0 - 85% R.H. non-condensing operating.

0 - 95% R.H. non-condensing non-operating.

Altitude

0 to 3,000m operating.

0 to 10,000m non-operating.

Pollution

These power supplies are designed for use in office type environments. i.e. pollution degree 2 environments, as defined in EN60950.

RELIABILITY

MTBF In excess of 100,000 calculated to MIL217 and HRD4.

INTERNATIONAL SAFETY APPROVALS

The Kestrel Range of units have been designed, tested and approved to the following safety specifications.

CE marked to the low voltage directive

EN60950

UL1950 – approved by CSA under the NRTL scheme.

CSA 22.2 No. 234

GUARANTEE

All Advance Power products are guaranteed against faulty manufacture and faulty components for a period of twelve months from the date of dispatch. See conditions of sale for full details.

MECHANICAL SPECIFICATION

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Mounting Orientation

Units may be mounted in any orientation without derating.

Ventilation and Cooling

Units are cooled by an integral fan and require free air flow in the area of the fan at the rear of the power supply and over the ventilated front face of the power supply. Air direction is entering at the fan end and exiting at the terminal end.

External Dimensions

All dimensions are nominal and are in mm (inches).

127 (5.0) x 63.5 (2.5) x 241.3 (9.5) + 15.8 (0.62) for terminals.

Mass

Typically 2kg (4.4lb).

Fixings

8 x universal fixings accepting either M4 ISO or 8-32 UNC fasteners are provided and are marked "a" on the outline drawing. There are two fixings on each side and four on the base.

CONNECTORS

The following connectors are fitted to the power supply:

Input

Standard IEC connector. Screw terminal block with integral cover is available by specifying option J.

Output 1

Two busbars with M5 ISO standard screws.

Outputs 2 and 3

Beau Eurostyle 86 series 8-way connector. Mating half is Beau 860508 or Klippon 152936.

Output 4 and 5

Beau Eurostyle 86 series 6-way connector. Mating half is Beau 860506 or Klippon 152916.

Standard signals

Remote sense and current share for outputs 1 and 2, power fail and inhibit signals.

Molex 7478 series 8-way wafer. Mating half is Molex 6471 series #22-01-2085.

Remote sense for output 3, 4 or 5

Molex 7478 series 2-way wafer. Mating half is Molex 6471 series #22-01-2025.

Enhanced signals

DC OK, fan fail and +5V logic supply.

Molex 7478 series 4-way wafer. Mating half is Molex 6471 series #22-01-2045.

Connector Kits

All connectors are available as accessory kits:

Input connector with 2 metre open ended cable: VKI10A02

Input connector with 2 metre cable fitted with a 13A UK style plug: VKI13A01

Output and signals: VKC501. Includes housings and crimps for sense and signal connections in addition to power connections for outputs 2 to 5 and crimps for output 1.

The output and signals connectors are also available by specifying option K when ordering a VWF350 power supply.

Figure 2 Connectors, controls and indicators



KESTREL VWF350 OUTLINE DRAWING

All dimensions are nominal and are in mm [inches].

Figure 3 Outline Drawing



ORDERING INFORMATION

ORDERING INFORMATION

The order code consists of up to 10 fields as follows:



The fields defining series, range and outputs 1 to 3 specify one base unit from table 1.

Outputs 4 and 5 are selected from those available as required. If no output 4 is required but output 5 is required, then '0' must be inserted in output 4 position to indicate that that output is omitted.

Examples:

Page 8

For a three output unit with 5V 50A, 12V 12A, 12V 6A, the model number is: VWF350GJJ. Outputs 4 and 5 are not required and so are not specified

For a four output unit with 5V 50A, 12V 12A, 12V 6A, 24V 5A and a DC OK signal, the model number is: VWF350GJJL/B. Output 5 is not required and is therefore not specified.

For a four output unit with 5V 50A, 12V 12A, 12V 6A, 5V 1.5A the model number is: VWF350GJJ0G. As only 1.5A is required from the auxiliary 5V output, the fifth output is used and the fourth output is not fitted, this is indicated by the '0' in the fourth output position in the part number.

For a five output unit with 5V 50A, 12V 12A, 12V 6A, 24V 5A, 5V 5A, Fan Fail signal and latching overtemperature trip, the model number is: 1VWF350GJJLGH/B1



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