Medical Industrial Test Broadcast Comms Renewable

350W Front End Power Supply.

Features	Benefits
• High Efficiency	Minimises heat in system
• Low Profile	Fits 1U Applications
• High Power Density	Requires less space
• Medical Approval	Simplifies use in medical systems
• 3 Year Warranty	Low cost of ownership

Input

Input Voltage	90-264Vac	Input Frequency	47 - 63Hz (440Hz with reduced PFC - consult factory)
Input Harmonics	EN61000-3-2 compliant	Power Factor	0.97 typical
Input Fuse	6.3A HBC Fast acting (not user accessible)	Inrush Current	<15A at 25°C and 230Vac (cold start)
Earth Leakage Current	130µA at 120Vac (60Hz), 260µA max at 240Vac (60Hz) Worst case leakage current is less than 300µA at 264Vac, 63Hz (normal condition, 0.5mA Single Fault Condition)		

How To Create A Product Description

It is possible to create your own NV-350FEP configuration online at www.nv-power.com or by using the following guide.

1. Ensure total power requirement is 350W or less.
2. Select required Cooling, Connection and Controls/Signals from the following table.

Converter	**NF3**	350W

Cooling	**S**	**S**tandard air - forward
	R	**R**everse air
	C	**C**ustomer air - no fan[a]

Input Connection	**S**	**S**crew
	I	**I**EC320[b]

Leakage Current	**S**	**S**tandard	130µA max at 120Vac (60Hz), 260µA max at 240Vac (60Hz)

Primary Option[c]	**ES5V**	ac good,	psu enable,	5V/2A standby
	ES12V	ac good,	psu enable,	12V/1A standby
	IS5V	ac good,	psu inhibit,	5V/2A standby
	IS12V	ac good,	psu inhibit,	12V/1A standby

NF3	S	S	S	EN5V		Vout	FE

	Voltage Range	Maximum Current	Maximum Power
Ch1 output	11.5 - 13.2V	29.2A	350W

a - Thermocoupled sample recommended to ensure adequate cooling - consult sales
b - Not with customer air Cooling
c - Leave blank for no primary option.

3. Select output voltage required for ch1 and follow with 'FE' for the module type. Ensure the voltage is inside the allowable voltage range.
4. Note, Channel 2 is fixed at 12V / 2A
5. Contact TDK-Lambda to issue a part number.

Output Specification

Voltage / Current	See guide on previous page	
Turn on time	1.5s max	at 90Vac and 100% rated output power
Rise time	<50ms	to 90% of voltage, monotonic rise above 10%
Efficiency	90%	typical
Hold up	16ms min	at 90Vac and 100% rated power
Ripple and Noise	<1%	pk-pk, using EIAJ test method & 20MHz bandwidth
Voltage Accuracy	<1%	of set voltage (± 5% for channel 2)
Remote Sense	Yes	standard on ch1, max 0.5V total line drop
Minimum Load	No	on any output
Temperature Coefficient	<0.02%	of rated voltage per °C
Total Regulation	1%	Including:- Load Regulation for 0-100% and Line Regulation for 90-264Vac input change (<2% for channel 2)
Transient Response	<4%	of set voltage for 50% load change
Recovery	500µs	for recovery to 1% of set voltage
Over Voltage Protection (ch1)	15 - 16V	
Over Current Protection (ch1)	110-150%	of module current. Hiccup mode. Module primary side protected
Power Limit (duals)	110-150%	of max Power ch1 + ch2. Hiccup mode. Module primary side protected (DA module: 110-220% for channel 1, 110-170% for channel 2)
Short Circuit Protection	Yes	
Over Temperature Protection	Yes	cycle ac off/on to reset. Shutdown temperature varies according to ambient, output power and input voltage.

Isolation

Input to Output	Reinforced	2 x MOOPs (3rd edition 60601) 4.3kVdc (Basic for 2nd edition 60601)
Input to Earth	Basic	2.3kVdc
Output to Earth		200Vdc

Signals (all signals referenced to 0V of channel 1)

Ch1 Good	Open collector output. 'On' indicates output is within 90% (± 5%) of nominal
Ch1 Remote sense -/+	Connections for remote sense. Up to 0.5V total line drop can be compensatied. If remote sense is not required, do not connect either 'Sense -' or 'Sense +'

Global Interface Signals - units fitted with primary option

AC good collector AC good emitter	Uncommitted optocoupler. Turns on typically 5ms after ac is good and off typically 5ms before any channel falls below 95% of nominal
EN/ES and IN/IS Logic 0	TTL low enables (ES) or inhibits (IS) the entire psu including fan (except standby)
EN/ES and IN/IS Logic 1	TTL high enables (ES) or inhibits (IS) the entire psu including fan (except standby)
Standby Supply	5V / 2A (2.5A peak) or 12V / 1A (1.2A peak)

Environment

Temperature	0°C to 50°C operational, -40°C to 70°C storage (max 12 months).
Derating	50°C to 70°C derate total output power and each output current by 2.5% per °C
Low Temp Startup	-20°C
Humidity	5 - 95% RH non condensing
Shock	±3 x 30g shocks in each plane, total 18 shocks 30g shock = 11ms (+/-0.5msec), half sine Conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987.
Vibration	Single axis 10 - 500 Hz at 2g (sweep and endurance at resonance) in all 3 planes
Altitude	3000 metres operational (5000m non operational)
Pollution	Degree 2, Material group IIIb

Immunity EN61000-6-2:2005, EN60601-1-2:2001				Criteria
Electrostatic Discharge	EN61000-4-2	Level 4	Air discharge 15kV, Contact discharge 8kV	A
Electromagnetic Field	EN61000-4-3	Level 3	12V/m	A
Fast / Burst Transient	EN61000-4-4	Level 4	ac input tested to 4.4kV, dc output tested to 2.2kV	A
Surge Immunity	EN61000-4-5	Level 3	Common mode - 2.2kV, Differential - 1.1kV	A
Conducted RF Immunity	EN61000-4-6	Level 3	12V	A
Power Frequency Magnetic Field	EN61000-4-8	Level 4	30A/m	A
Voltage Dips, Variations, Interruptions	EN61000-4-11	Class 3	Criteria B for 5 sec interruption	A
Voltage Fluctuations	EN61000-4-14	Class 3	For 100 - 240V Nominal	A

Emissions EN61000-6-3:2007, EN60601-1-2:2001

Radiated Electric Field	EN55011, EN55022	(as per CISPR.11/22) Class B, FCC47 part 15 subpart B see application note for details. Additional filtering required for IEC inlet version.
Conducted Emissions	EN55011, EN55022	(as per CISPR.11/22) Class B, FCC47 part 15 subpart B
Conducted Harmonics	EN61000-3-2	Class A
Flicker	EN61000-3-3	Compliant - d_{max} only

Safety Approvals

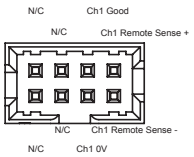
	Notes
IEC/EN 60950-1, UL60950-1 / CSA 22.2 No 60950-1	File E135494
IEC/EN 60601-1, UL/CSA 60601-1, ANSI/AAMI ES60601-1 CAN/CSA-C22.2 No 60601-1-08	File E349607
IEC/EN 61010-1	File E331788
CE Mark (EN60950-1)	LV Directive 2006/95/EC
CB certificate and Report available on request	*Please check with technical sales for status of approvals*

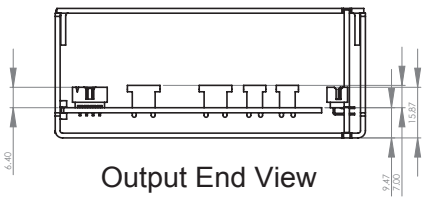
Connection Guidelines
Ring Tags: Up to 50A. AMP PIDG terminals
Red: M3 36151, M4 320551, M5 130660
Blue: M3 320561, M4 320560, M5 130663
Yellow: M4 320568, M5 130167
Crimp tool: 16900 Die set 169404

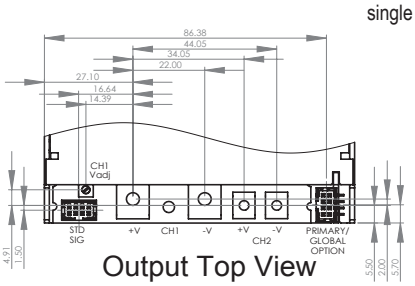
OUTPUT CONNECTIONS

Housing: Molex 51110-0860
Crimp pin: 50394
Hand crimp tool: 69008-0959
1 housing + 8 crimps available as a single part (94158) from TDK-Lambda

Standard Signals







Primary/Global Option