



NV-350 / NV-700

350 - 1150Watts Modular power solution
With up to 1450W peak rating for 10 seconds

- High Efficiency
- High Power Density (up to 19W/in3)
- High Peak Power Rating
- Up to 8 outputs (6 for NV350)
- No minimum load
- Fits 1U applications
- Medical Approval
- 3 Year Warranty

Key Market Segments & Applications

Instrumentation	Broadcast
Medical	ATE
Automation	Industrial Computing
Security	Lifesciences/Laboratory
Network Servers and Routers	

Features and Benefits

Features

- High Efficiency
- Low Profile
- High Power Density

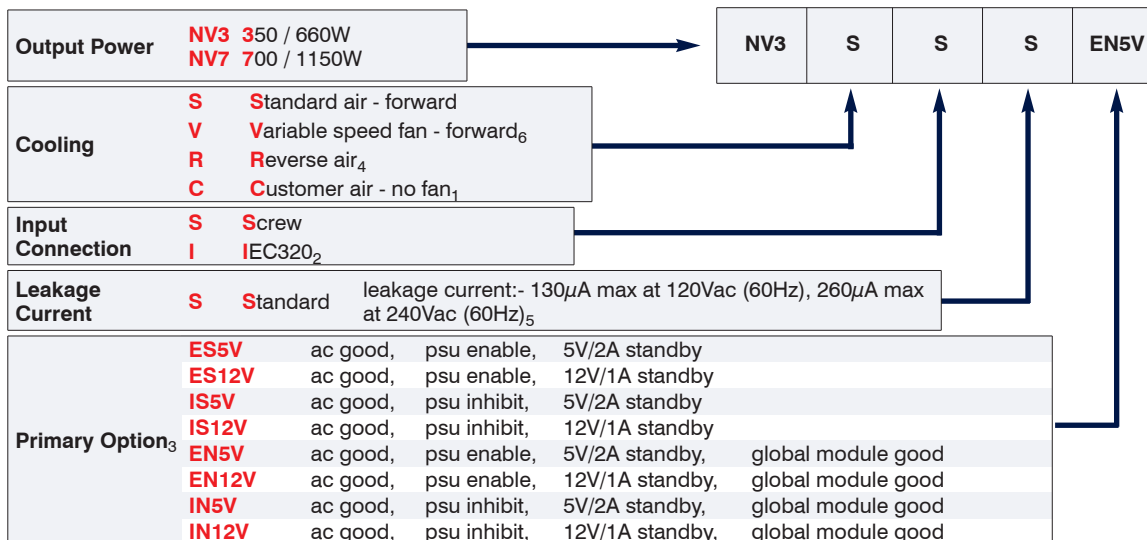
Benefits

- Minimises Heat in System
- Fits 1U Applications
- Less Space

NV350 / NV700 CONFIGURING

The extensive range of output modules and options make it possible to achieve almost any combination of Volts and Amps. You can create your own NV350 or NV700 configuration online at www.nv-power.com. This method checks your configuration and offers the optimum solution. Alternatively, you can do this manually by using the guide below.

1. Calculate total output power to ensure power requirements are within 350W or 1150W, then select required Cooling, Connection and Controls/Signals from the following table:



- 1 - Thermocoupled sample recommended to ensure adequate cooling - consult sales
- 2 - Not with customer air Cooling
- 3 - The Primary Option uses 1 slot
- 4 - Not with NV7
- 5 - Worst case leakage current is less than 300µA at 264Vac, 63Hz Normal Condition (<500µA Single Fault Condition)
- 6 - Recommended for new designs for NV-350. Not with NV7 (variable speed fan standard on NV7).



2. Select Output Modules from the Module Tables below ensuring that no more that 6 slots (NV-350) or 8 slots (NV-700) in total are used.

Example - if you require 13V 20A :-

- a) Select B as closest match for voltage & current and prefix with voltage eg **13BH**
- b) Repeat for other outputs.

This will create a complete product description eg **NV3SSSE5V 13BH 12/15DB** which represents a three output NV350 with Forward air cooling, Screw input terminals, standard leakage filter, ac good, PSU enable & 5V/2A aux supply
 Output 1 = 13V / 20A. Output 2 = 12V / 13A with screw terminals. Output 3 = 15V / 4A with screw terminals
 Max 350W continuous output power

3. Contact TDK-Lambda to validate configuration and issue a part number.

DUAL OUTPUT MODULES						
Module		Output 1		Output 2		
Code	Slots	Voltage Range	Current	Voltage Range	Current	Max Power
DA	1 ₈	12 (fixed)	3A	-12 (fixed)	1A	48W
DB	2	3.2 - 3.6	25A	3.3 - 5.5	10A	55W
				7 - 15	5A	60W
DB	2	4.75 - 5.5	25A	24 - 32	2A	50W
				3.3 - 5.5	10A	55W
DB	2	5.5 - 6.5	25A	7 - 15	5A	60W
				24 - 32	2A	50W
DB	2	12 - 15	13A ₁	3.3 - 5.5	10A	55W
				7 - 15	5A	60W
DB	2	24 - 28	7A ₂	24 - 32	2A	50W
				3.3 - 5.5	10A	55W
DB	2	24 - 28	7A ₂	7 - 15	5A	60W
				24 - 32	2A	50W

SINGLE OUTPUT MODULES					
Module		Voltage Range		Current	
Code	Slots	Voltage Range	Current	Continuous	Peak
B	2	3.2 - 3.6	40A	40A	40A
		4.75 - 5.5	40A ₃	40A ₃	40A ₃
		7 - 9	22.5A ₄	22.5A ₄	22.5A ₄
BH	2	12 - 15.5	20A ₅	20A ₅	20A ₅
		24 - 28	10A ₆	10A ₆	10A ₆
C	3	12 - 13.2	37.5A ₇	50A ₇	50A ₇
		15 - 16.5	30A ₇	37.5A ₇	37.5A ₇
		24 - 26.4	18.75A ₇	25A ₇	25A ₇
		27 - 32	16.6A ₇	19.7A ₇	19.7A ₇
CM	3	24 - 26.4	18.75A ₇	25A ₇	25A ₇
		24 - 26.4	37.5A ₉	50A ₉	50A ₉
CC	6	30 - 33	30A ₉	37.5A ₉	37.5A ₉
		48 - 52.8	18.75A ₉	25A ₉	25A ₉
CCM	6	54 - 63	16.6A ₉	19.7A ₉	19.7A ₉
		48 - 52.8	18.75A ₉	25A ₉	25A ₉

1. derate linearly from 13A at 12.5V to 10A at 15.5V

2. derate linearly from 7A at 25V to 6A at 28V

3. for NV3 - derate linearly from 40A at 5.2V to 36A at 5.5V

for NV7 - derate linearly from 40A at 5V to 36A at 5.5V

4. derate linearly from 22.5A at 8V to 20A at 9V

5. for NV3 - derate linearly from 20A at 13.2V to 16.5A at 15.5V

for NV7 - derate linearly from 20A at 12.5V to 15.5A at 15.5V

6. for NV3 - derate linearly from 10A at 25.7V to 8.5A at 28V

for NV7 - derate linearly from 10A at 24V to 8.5A at 28V

7. for NV3, 400W max

for NV7, 600W peak for up to 10sec, 450W average

8. Only one per power supply.

9. for NV7 only, 1200W peak for up to 10sec, 900W average

INPUT			
Input Voltage	90-264Vac	Input Frequency	47 - 63 Hz (up to 440Hz with reduced PFC)
Input Harmonics	EN61000-3-2 compliant	Power Factor	0.97 typical
Inrush Current	NV-350 <15A NV-700 <40A	at 25°C and 264Vac (cold start)	Input Fuse NV-350 6.3A NV-700 16A
Leakage Current	130µA max at 120Vac (60Hz), 260µA max at 240Vac (60Hz) Worst case leakage current is less than 300µA at 264Vac, 63Hz (Normal Condition, <500µA Single Fault Condition)		

OUTPUT POWER						
		90-115Vac	115-150Vac	150-180Vac	180-264Vac	Comments
NV-350	Continuous ₆	350W	450W	450W	660W	1. 350W average 2. 450W average 3. 600W average 4. 700W average 5. 1150W average 6. 250W for reverse air 7. Not for reverse air
	Peak (10s) ₇	400W ₁	500W ₂	500W ₂	740W ₃	
NV-700	Continuous	700W	700W	1150W	1150W	
	Peak (10s)		850W ₄	1150W	1450W ₅	

OUTPUT		
Voltage / Current	See module tables	
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	up to 90%	configuration dependent
Hold up	16ms min	at 90Vac and 100% rated power (12ms for NV-700 above 700W output power)
Ripple and Noise	<1%	pk-pk, using EIAJ test method & 20MHz bandwidth
Voltage Accuracy	<1%	of set voltage (DA module: +5/-1% for channel 1, +2/-3.5% for channel 2)
Remote Sense	Yes	standard on single o/p + ch1 of dual modules, max 0.5V total line drop (DA module: None)
Minimum Load	No	on any output (DA module: 150mA on channel 1)
Temperature Coefficient	<0.02%	of rated voltage per °C
Load Regulation	<1%	for 0-100% load change (<2% for channel 2) (DA module: <3%)
Line Regulation	<0.1%	for 90-264Vac input change
Cross Regulation	<0.1%	for 100% load change on any output (DA module: 0.2% for channel 1, 3% for channel 2)



OUTPUT - continued		
Transient Response	<4%	of set voltage for 50% load change
Recovery	500µs	for recovery to 1% of set voltage (DA module: 1000µs)
Over Voltage Protection	Yes	
Over Current Protection (singles)	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 & input Voltage.

ISOLATION			
Input to Output	Reinforced	4kV (ac), 5.7kV (dc) type tested to 4kVac (equivalent to 5.7kVdc), production tested to 4.3kVdc	Outputs from C, CC, CM or CCM modules only
	Reinforced	4.3kV (dc) Note: Basic for IEC/EN/UL/CSA60601-1	Units with any other module or primary option
Input to Earth	Basic	2.3kV (dc)	
Output to Earth		200V (dc).	CM and CCM modules are 500Vac

SIGNALS - Standard	
Ch1/Ch2 Module Good	Open collector output. 'On' indicates output is within 90% (±5%) of nominal
Module Inhibit	TTL logic high inhibits the output (both outputs for duals) of the module
Ch2 On/Off (duals only)	TTL logic low inhibits output 2 of the module
	All signals referenced to 0V of channel

GLOBAL INTERFACE SIGNALS - 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
Global module good collector Global module good emitter	Uncommitted optocoupler. Turns on typically 200ms after all outputs are within 90% (±5%) of nominal and off typically 5ms before any channel falls below 90% (±5%) of nominal. Do not connect for ES and IS type primary option.
EN/ES & IN/IS Logic 0	TTL low enables (EN or ES) or inhibits (IN or IS) the entire psu including fan (except standby)
EN/ES & IN/IS Logic 1	TTL high enables (EN or ES) or inhibits (IN or IS) the entire psu including fan (except standby)
Standby Supply	5V / 2A (2.5A peak) or 12V / 1A (1.2A peak)

ENVIRONMENT	
Temperature	0° to 50° operational, -40° to 85°C storage (max 12 months)
Derating	50°C _a to 70°C derate total output power and each output current by 2.5% per °C
Low Temperature Start-up	-20°C
Humidity	5-95% RH non condensing
Shock	±3 x 30g shocks in each plane, total 18 shocks 30g shock = 11ms (±0.5ms), half sine conforms to EN60068-2-27, EN60068-2-47, IEC68-2-27, IEC68-2-47, JIS C0041-1987.
Vibration	Single axis 10 - 500Hz at 2g (sweep and endurance at resonance) in all 3 planes
Altitude	3,000 metres operational (5,000 metres non operational)
Pollution	Degree 2, Material group IIIb
a - 45°C for NV7 with input voltage below 100Vac	

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 (ac input)	EN61000-4-4	Level 4	tested to 4.4kV	A
Fast / Burst Transient (dc output)	EN61000-4-4	Level 4	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 EN61000-6-3:2001, EN60601-1-2:2001

Radiated Electric Field	EN55011, EN55022	(as per CISPR.11/22) Class B, FCC47 part 15 subpart B see app note for details
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

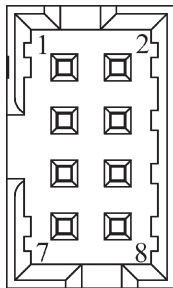
	Date	Amendments	Date	Amendments
EN 60950-1	2006		EN 61010-1	2001
UL 60950-1	2003		IEC 61010-1*	2001
CSA22.2 No 60950-1	2003		IEC 60601-1*	1988 A1, A2
IEC 60950-1*	2005		EN 60601-1	1990 A1, A2, A13
CE Mark	LV Directive 2006/95/EC (EN60950-1)		UL 60601-1	2003 with revisions 2006

* CB Certificate and report available on request Please check with Technical Sales for status of approvals

PRIMARY OPTION / DA MODULE

DA Module

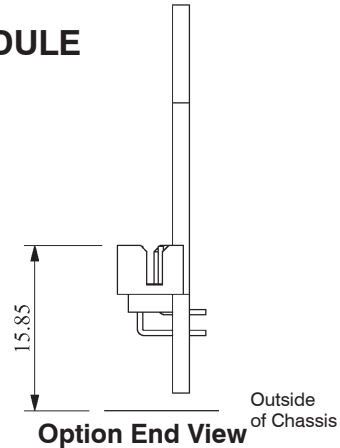
- 1 +12V (channel 1)
- 2 +12V (channel 1)
- 3 +12V (channel 1)
- 4 0V (common ch1 / ch2)
- 5 0V (common ch1 / ch2)
- 6 0V (common ch1 / ch2)
- 7 -12V (channel 2)
- 8 -12V (channel 2)



Primary Option

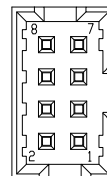
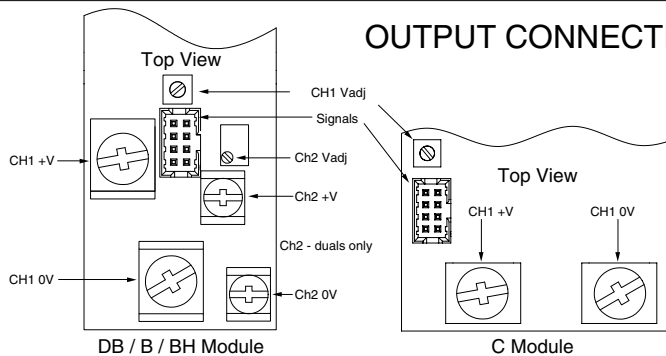
- 1 +V Standby
- 2 0V Standby
- 3 EN/ES & IN/IS Logic 1
- 4 EN/ES & IN/IS Logic 0
- 5 Global Module Good Collector
- 6 Global Module Good Emitter
- 7 AC good Collector
- 8 AC good Emitter

Housing: Molex 51110-0860
Crimp pin: 50394
Hand crimp tool: 69008-0959



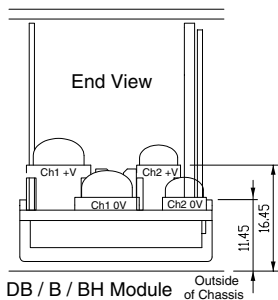
Option End View

OUTPUT CONNECTIONS

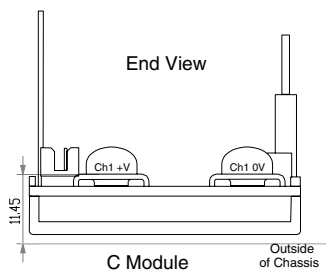


- Signals
- 1 Ch2 0V
 - 2 Ch2 Output Good
 - 3 Ch2 On/Off
 - 4 Module Inhibit
 - 5 Ch1 0V
 - 6 Ch1 Output Good
 - 7 Ch1 Remote Sense -
 - 8 Ch1 Remote Sense +

Housing: Molex 51110-0860
Crimp pin: 50394 Hand crimp tool: 69008-0959
Note: Do not connect pins 1-3 on single output modules

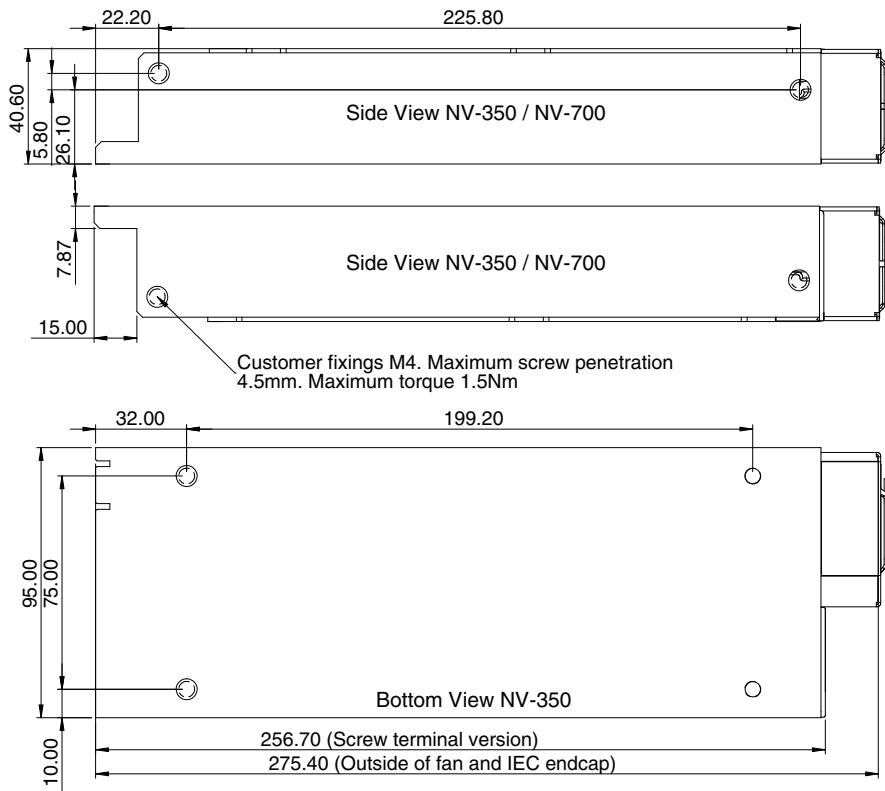


DB / B / BH Module Outside of Chassis



C Module Outside of Chassis

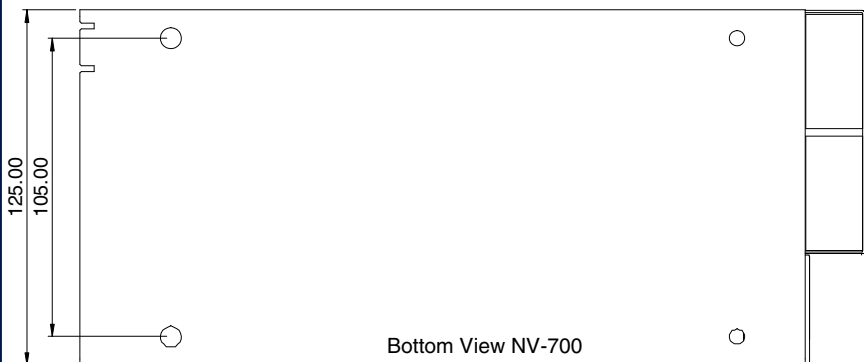
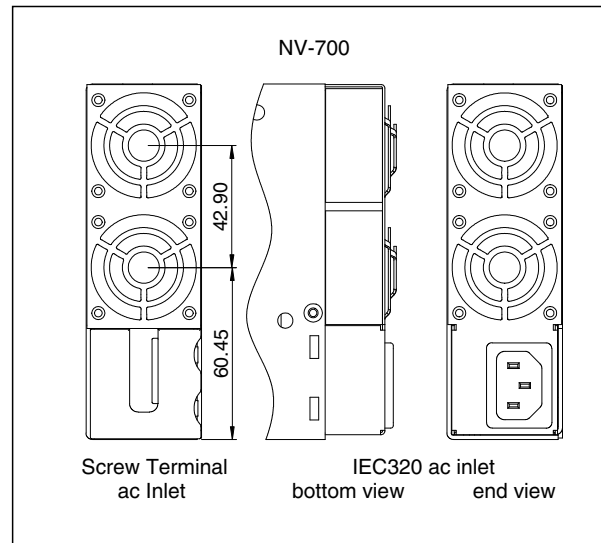
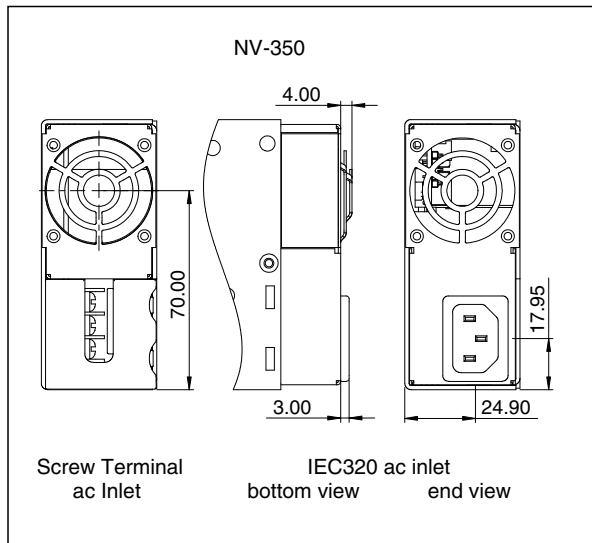
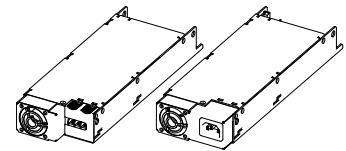
Connection Guidelines
Ring Tags: Up to 50A, AMP PIDG terminals
Red: M3 36151, M4 320551, M5 130660
Blue: M3 320561, M4 320560, M5 130663
Yellow: M3 M4 320568, M5 130167
Crimp tool: 16900 Die set 169404



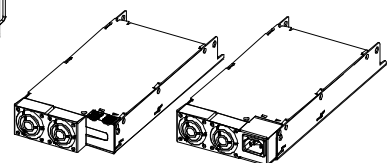
NOTES

- 1) Dimensions in mm
- 2) Tolerances:
Edge to edge/Edge to centre, +/-0.5
Centre to centre +/-0.2

NV-350 Screw Terminal NV-350 IEC Inlet



NV-700 Screw Terminal NV-700 IEC Inlet





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