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ARTESYN TECHNOLOGIES

NFS350 SERIES

Triple and quad output



[2 YEAR WARRANTY]

CE (LVD)

- **Autoranging input**
- **Overvoltage protection on main output**
- **Short circuit protection with auto restart**
- **Power fail detect**
- **VDE, UL, CSA and BABT approved**
- **Floating, fully adjustable fourth output**
- **12VDC fan connection**
- **Conducted noise to EN55022-A, FCC level B**

The NFS350 Series of triple and quad output 350 Watt open frame switchers is designed for use with larger digital systems. High power density allows a very compact system design. The advanced topology yields very well regulated outputs that eliminate the need for inefficient dissipative regulators. The unique floating fourth output allows a user configurable output voltage, adjustable from 4.5V to 30V, either positive or negative, at up to 4A. These supplies are approved to UL, CSA, VDE and BABT and their built-in line filter reduces conducted noise below FCC level B and VDE 0871 level A. NFS350 Series power supplies are suitable for a wide range of general industrial applications, including process automation, robotics, networking, lighting systems and telecoms. They are particularly suited for shelf power in miniature rack systems or subracks.

SPECIFICATION

All specifications are typical at nominal input, full load at 25°C unless otherwise stated

OUTPUT SPECIFICATIONS		
Voltage adjustability	+5V output Auxiliaries	±5.0% ±3.0%
Line regulation	LL to HL, FL Main output	±0.1% max.
Total regulation	See Note 4	±1.0%
Overshoot/undershoot	At turn-on	0%
Transient response	+5.1V (35A to 50A step)	150mV max. dev. 500µs recovery
Temperature coefficient	All outputs	±0.02%/°C
Overvoltage protection	+5V output, note 7	6.25V ±0.5V
Output power limit		550W, min.
Short circuit protection	Foldback See Note 7	Continuous automatic recovery
Remote sense	Main output	Compensate up to 200mV
Fan output current	Note C	12V/0.75A

INPUT SPECIFICATIONS		
Input voltage range	Autoranging	90 to 132VAC 180 to 264VAC
Input frequency range		47Hz to 63Hz
Input surge current	110/230VAC	40A
Safety ground leakage current	110VAC, 60Hz 230VAC, 50Hz	0.6mA, max. 1.6mA, max.

ELECTROMAGNETIC COMPATIBILITY SPECIFICATIONS		
Conducted emissions	EN55022, level A	
Radiated emissions	EN55022	
ESD air	EN61000-4-2, level 3	Perf. criteria 1
ESD contact	EN61000-4-2, level 4	Perf. criteria 1
Surge	EN61000-4-5, level 3	Perf. criteria 1
Fast transients	EN61000-4-4, level 3	Perf. criteria 1
Radiated immunity	EN61000-4-3, level 3	Perf. criteria 1
Conducted immunity	EN61000-4-6, level 3	Perf. criteria 1

GENERAL SPECIFICATIONS		
Hold-up time	230VAC, after power failure 230VAC, after PFD flag	20ms 5ms
Efficiency	230VAC, FL	70% typical
Isolation voltage	Input/output Input/chassis	3000VAC 1500VAC
Switching frequency		Variable
Approvals and standards	Safety	VDE0805, EN60950, IEC950 IEC1010, UL1950, BABT CSA C22.2 No. 950
Weight		1.9kg (67.07oz)
MTBF	MIL-HDBK-217E	66,000 hours

ENVIRONMENTAL SPECIFICATIONS		
Thermal performance	Operating, see curve Non-operating 0°C to 50°C, 30CFM forced air 50°C to 70°C, 30CFM forced air Thermal switch trip temperature, Note 7 Peak power (60s)	0°C to +70°C –40°C to +85°C 350W Derate 8.75W/°C +85°C typical 450W
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating Non-operating	10,000 feet max. 40,000 feet max.
Vibration, 5Hz to 500Hz	Three orthogonal axes random vibration, 10 min. test for each axis	2.4G rms

350 Watt
AC/DC universal input switch mode power supplies

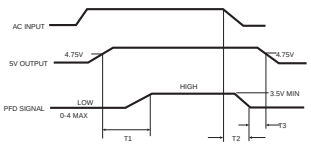
OUTPUT VOLTAGE	OUTPUT CURRENTS			RIPPLE (3)	TOTAL REGULATION (4)	MODEL NUMBER
	MIN	PEAK (1)	FAN (2)			
+5.1V	5.0A	70A	50.0A	50mV	±1%	NFS350-7608P
+12.0V	0.3A	20.0A	12.0A	120mV	±1%	
–12.0V	0.3A	7.0A	5.0A	120mV	±1%	
+5.1V (V1)	5.0A	70A	50.0A	50mV	±1%	NFS350-7625P
+12.0V (V2)	0.3A	20.0A	12.0A	120mV	±1%	
–12.0V (V3)	0.3A	7.0A	5.0A	120mV	±1%	
4.5-16.5 (V4) (5)	0A	–	4.0A	100mV	±1%	
+5.1V (V1)	5.0A	70A	50.0A	50mV	±1%	NFS350-7626P
+12.0V (V2)	0.3A	20.0A	12.0A	120mV	±1%	
–12.0V (V3)	0.3A	7.0A	5.0A	120mV	±1%	
15V-30V (V4) (6)	0A	–	4.0A	100mV	±1%	

PIN CONNECTIONS			
TB1	**NFS350-7608P**	**NFS350-7625P**	**NFS350-7626P**
Term 1	AC Ground	AC Ground	AC Ground
Term 2	AC Neutral	AC Neutral	AC Neutral
Term 3	AC Live	AC Live	AC Live
TB2			
Term 1	+12V, –12V Ret.	+12V, –12V Ret.	+12V, –12V Ret.
Term 2	–12V	–12V	–12V
Term 3	+12V, –12V Ret.	+12V, –12V Ret.	+12V, –12V Ret.
Term 4	+12V	+12V	+12V
Term 5	+12V	+12V	+12V
Stud 1	+5.1V (V1)	+5.1V (V1)	+5.1V (V1)
Stud 2	+5.1V Return	+5.1V Return	+5.1V Return
TB3			
Term 1		V4 Return	V4 Return
Term 2		+Aux Output (V4)	+Aux Output (V4)
J1			
Pin 1	+5.1V Sense	+5.1V Sense	+5.1V Sense
Pin 2	+5.1V Ret. Sense	+5.1V Ret. sense	+5.1V Ret. Sense
Pin 3	PFD	PFD	PFD
Pin 4	PFD Return	PFD Return	PFD Return
Pin 5	Fan +12V Ret.	Fan +12V Ret.	Fan +12V Ret.
Pin 6	Fan +12V	Fan +12V	Fan +12V

Notes

1 Peak output current lasting less than 60 seconds with duty cycle less than 3%. During peak loading, outputs may go outside of total regulation limits. Total peak power may not exceed 450W.
2 Forced air, 30 CFM at 1 atmosphere or 350LFM.
3 Figure is peak-to-peak. Output noise measurements are made across a 50MHz bandwidth using a 12” twisted pair terminated with a 47µF capacitor.
4 Total regulation is defined as the static output regulation at 25°C, including initial tolerance, line voltage within stated limits, load currents within stated limits, and output voltages adjusted to their factory settings.
5 Floating output can be adjusted from 4.5V to 16.5V and referenced as either positive or negative.
6 Floating output can be adjusted from 15V to 30V and referenced as either positive or negative.
7 Output shorts will cause all outputs to fold back, protecting the supply from damage. An overvoltage or overtemperature condition will trip the output crowbar, shorting the outputs and also cause foldback.
When the fault condition is cleared, the supply will automatically recover. This supply can be configured to latch off in the event of any output short. Disconnecting line power for 15 seconds will reset the latch. See mechanical note B.
8 Derating curve is application specific for ambient temperatures > 50°C, for optimum reliability no part of the heatsink should exceed 90°C and no semiconductor case temperature should exceed 100°C.
9 Caution: Allow a minimum of 1 second after disconnecting the power when making thermal measurements.
10 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.

Power fail detect signal
50ms≤T1≤200ms
T2 will vary with line and load
T3≥5ms
Pout: 350W
PFD output is an open collector which will sink ≤40mA in the low state



International Safety Standard Approvals

VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-1050
Licence No. 3613

UL1950 Reg. File No. E136005

CSA C22.2 No. 950 File No. LR41062C/LR50913/LR101320

Certificate No. PS/603177

350 Watt
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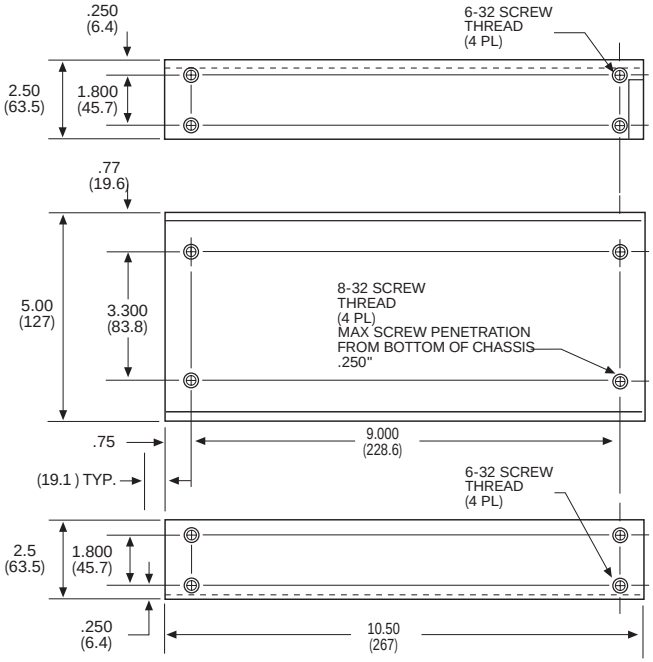
TB1 Connector
Kulka P/N 4597A-03 or equivalent.

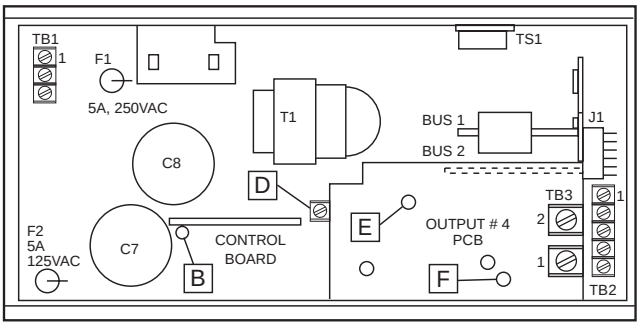
TB2 Connector
Kulka P/N 4597A-05 or equivalent, $^1/_4$-20 studs, $^1/_2$ inch max. penetration.

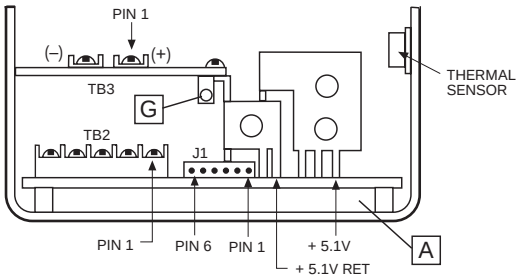
TB3 Connector
Use #6 fork terminal connector or equivalent.

J1 Connector
Molex 22-05-3061. Mating connector is Molex 22-01-2067 or equivalent with Molex 08-50-0114 or equivalent crimp terminal, see Note C.

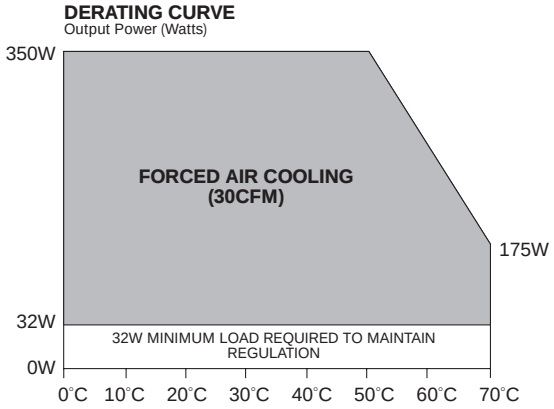
Mechanical notes
A Minimum clearance distance to any external grounded metal plate or chassis is 2mm.
B Removing R15 causes the power supply to latch off in the event of output short, over-voltage or over-temperature. Removing the line power for 15 seconds will reset the latch.
C Fan current must be subtracted from the available +12V current.
D +5V output adjustment pot.
E +12V output adjustment pot is located on the main PCB, and can be accessed through this hole. Use a Philips head plastic adjustment tool.
F –12V output adjustment pot is located on the main PCB, and can be accessed through this hole. Use a Philips head plastic adjustment tool.
G Auxiliary fourth output adjustment pot.
H A standard cover and fan assembly can be added during manufacturing. Details are on page 65. To order, add suffix 'CF' to the model number. **e.g. NFS350-7608PCF**.







ALL DIMENSIONS IN INCHES (mm)





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