

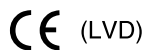
NLP65 TELCO SERIES

Dual and triple output

- **5.0 x 3.0 x 1.26 inch package (1U applications)**
- **Individually regulated outputs**
- **No minimum load required**
- **EN61000-3-2 compliance option**
- **50W with free air convection cooling**
- **EN55022, EN55011 conducted emissions level B**
- **EN61000-4-2, -3, -4, -5, -6 immunity compliant**
- **UL, VDE and CSA safety approvals**



[2 YEAR WARRANTY]



The NLP65 Telco series is a 65W universal input AC/DC power supply on a 5 x 3 inch card with a maximum component height of 1.26 inches for use in 1U applications. The NLP65 Telco series has four multiple output models with the same generic feature set as the standard NLP65 series with one significant extra feature - each output is individually regulated from zero to full load. Standard low power switchers require proportional output loading to deliver adequate auxiliary regulation. The NLP65 Telco series has individual regulation on each output ensuring full regulation down to no load on each output. The series is available in a factory installed enclosure with an IEC connector and output connector on flying leads plus a cover kit for self-installation is also available as an accessory. The NLP65 Telco series is designed for those low power data networking, computer and telecom applications where most of the loading is on the main output and the auxiliary outputs are required for intermittent use or for housekeeping only e.g. a networking hub with the main output driving the CPU and the auxiliary outputs powering the fan.

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

OUTPUT SPECIFICATIONS		
Total regulation (Line and load)	Main output Auxiliary outputs	±2.0% ±5.0%
Rise time	At turn-on	1.0s, max.
Transient response	Main output 25% step at 0.1A/μs	5.0% or 250mV max. dev., 1ms max. recovery to 1%
Temperature coefficient		±0.02%/°C
Overvoltage protection	Main outputs	125%, ±10%
Short circuit protection	Cyclic operation	Continuous
Minimum output current	Main and auxiliary	0A
INPUT SPECIFICATIONS		
Input voltage range (See Note 2)	Universal input	100 to 240VAC 120 to 370VDC -73xx versions only
Input frequency range		50Hz to 60Hz
Input surge current (cold start)	120VAC 230VAC	17A max. 32A max.
Safety ground leakage current	120VAC, 60Hz 230VAC, 50Hz	0.7mA 1.4mA
Input current	120VAC, with PFC 230VAC, with PFC 120VAC, without PFC 230VAC, without PFC	1.05A rms 0.51A rms 1.40A rms 0.80A rms
Input fuse	UL/IEC127	250VAC H 3.15A
EMC CHARACTERISTICS (8,11)		
Conducted emissions	EN55022, FCC part 15	Level B
Radiated emissions	EN55022, FCC part 15	Level A
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

EMC CHARACTERISTICS (8,11)		
Radiated immunity	EN61000-4-3, level 3	Perf. criteria 2
Conducted immunity	EN61000-4-6, level 3	Perf. criteria 2
GENERAL SPECIFICATIONS		
Hold-up time	120VAC, 60Hz 230VAC, 50Hz	16ms @ 65W 78ms @ 65W
Efficiency	120VAC, 50W	70% typical
Isolation voltage	Input/output Input/chassis	3000VAC 1500VAC
Switching frequency	Fixed	100kHz, ±5kHz
Approvals and standards (See Note 12)	EN60950, VDE0805, IEC950, UL1950 CSA C22.2 No. 950, BABT	
Weight	283g (10 oz)	
MTBF (See Note 6)	MIL-HDBK-217F @ 25°C	150,000 hours min.
ENVIRONMENTAL SPECIFICATIONS		
Thermal performance (See Notes 4, 6, 7)	Operating ambient, (See derating curve) Non-operating 50°C to 70°C ambient, convection cooled 0°C to 50°C, ambient, convection cooled 0°C to 50°C ambient, 20CFM forced air Peak (0°C to +50°C, 60s)	0°C to +70°C -40°C to +85°C Derate to 50% load 50W (See Note 1) 70W (See Note 1) (See Note 3)
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating Non-operating	10,000 feet max. 30,000 feet max.
Vibration (See Note 5)	5Hz to 500Hz	2.4G rms peak
Shock	per MIL-STD-810E	516.4 Part IV

50 to 75 Watt AC/DC universal input switch mode power supplies

OUTPUT VOLTAGE	OUTPUT CURRENT				RIPPLE ⁽⁴⁾	TOTAL REG. ⁽¹⁰⁾	NON-HARMONIC CORRECTED ⁽⁹⁾	HARMONIC CORRECTED ⁽⁹⁾	GROUND PIN ⁽¹¹⁾
	MIN ⁽¹⁰⁾	MAX ⁽¹⁾	PEAK ⁽⁴⁾	FAN					
+5V	0A	7.5A	9.1A	9.0A	50mV	±2.0%	NLP65-7308	NLP65-9308	NLP65-X308G
+12V	0A	1.0A	1.0A	1.25A	120mV	±5.0%			
-12V	0A	0.65A	0.65A	0.8A	120mV	±5.0%			
+5V	0A	7.5A	9.1A	9.0A	50mV	±2.0%	NLP65-7310	NLP65-9310	NLP65-X310G
+15V	0A	1.0A	1.0A	1.25A	150mV	±5.0%			
-15V	0A	0.65A	0.65A	0.8A	150mV	±5.0%			
+5V	0A	7.5A	9.1A	9.0A	50mV	±2.0%	NLP65-7320	NLP65-9320	NLP65-X320G
+24V	0A	0.5A	0.5A	0.625A	240mV	±5.0%			
+5V	0A	7.5A	9.1A	9.0A	50mV	±2.0%	NLP65-7329	NLP65-9329	NLP65-X329G
+12V	0A	1.0A	1.0A	1.25A	120mV	±5.0%			

Notes

- Model NLP65-X308 must not exceed 49.5W with natural convection (69.6W with a 20CFM fan). Maximum continuous output power. Models NLP65-X310 must not exceed 49.5W with natural convection (75W with a 20CFM fan). Model NLP65-X320 and NLP65-X329 must not exceed 47W with natural convection (60W with a 20CFM fan).
- When the input voltage is less than 90VAC the operating temperature range is 0°C to +40°C. The ripple and regulation specifications may not be met.
- Peak output current lasting less than 60 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.
- Figure is peak-to-peak for convection power rating. Output noise measurements are made across a 20MHz bandwidth using a 6" twisted pair, terminated with a 10µF electrolytic capacitor and a 0.1µF ceramic capacitor. 150mV for +12V output on NLP65-7608 and NLP65-7629.
- Three orthogonal axes, random vibration 10 minutes for each axis, 2.4G rms 5Hz to 500Hz.
- For optimum reliability, no part of the heatsink should exceed 120°C, and no semiconductor case temperature should exceed 130°C.
- CAUTION: Allow a minimum of 1 second after disconnecting line power when making thermal measurements.
- Conducted and radiated emissions testing were performed using the standard EN55022 set-up with a stand alone NLP65 unit placed on a grounded metal plate with a line choke on the AC input and ground wires (i.e. the wires are looped through an EMI suppression toroid).
- For system compliance it is usually necessary to install an 'off-the-shelf' AC inlet with an integral line filter in the system chassis or to install a line choke on the input wires as close as possible to AC entry point of the system chassis. Please contact the applications group at Artesyn for assistance with EMI compliance.
- These standard models are available with an enclosure. To order an enclosed version see model numbering options below. The enclosure versions have the same thermal performance as the open frame versions. See Note 1.
- No minimum load is required on the auxiliary outputs to maintain stated regulation.
- The NLP65 TELCO units with the suffix 'G' is the ground pin and ground choke option. J2, L6 and JP10 are included. J2 is a safety agency approved grounding pin, L6 is a ground choke and JP10 is a jumper. This option is intended for use in non-metallic chassis applications where grounding is not possible via the mounting screws. The ground choke is provided to assist EMC compliance. When performing conducted emissions testing on stand alone units, the 'G' option is required to meet level B. To order simply add the suffix 'G' to the standard model number, e.g. NLP65-7308G, NLP65-9308G. This option is available for both the harmonic corrected and none-harmonic corrected versions.
- This product is for inclusion by professional installers within other equipment and must not be operated as a stand alone product.

Model Numbering Options

- The enclosure version includes: IEC connector, on/off switch, pigtail output connector and fitted cover. To order, please add the suffix 'E' to the end of the model number, e.g. NLP65-x3xxE. See page 68 for details.
- A Safety earth ground pin and ground choke are available as an option. To order, please add the suffix 'G' to the end of the model number, e.g. NLP65-x3xxG.
- To order a snap-on cover (unfitted), order the part number NLP65C. See page 70 for details.
- To order a mounting bracket (unfitted), order the part number NLP65MB. See page 71 for details.

International Safety Standard Approvals

 VDE0805/EN60950/IEC950 File No. 10401-3336-1096
Licence No. 93678

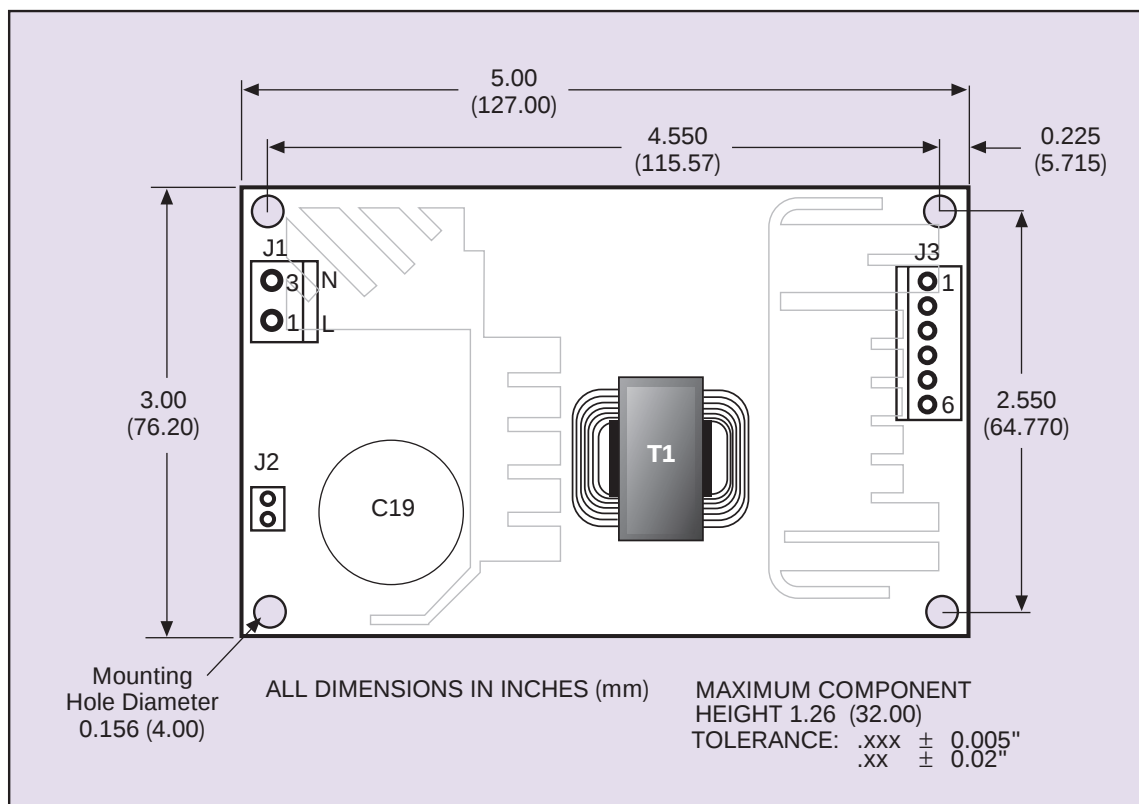
 UL1950 File No. E136005

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

 Approval No. 606975

50 to 75 Watt AC/DC universal input switch mode power supplies

Mechanical description - open frame NLP65 TELCO



INPUT PIN CONNECTIONS		OUTPUT PIN CONNECTIONS			
J1		J3	SINGLE	DUAL	TRIPLE
Pin 1	AC Live	Pin 1	No Pin	V (B)	V (B)
Pin 2	No Pin	Pin 2	V (A)	V (A)	V (A)
Pin 3	AC Neutral	Pin 3	V (A)	V (A)	V (A)
J2 (OPTIONAL)		Pin 4	Return	Return	Return
Pin 1	Safety Earth	Pin 5	Return	Return	Return
		Pin 6	No Pin	No Pin	V (C)

Input and output connectors

AC (J1) connector type
Molex 26-60-4030 type.

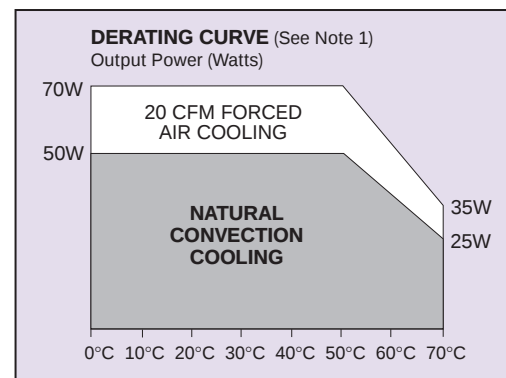
DC (J3) connector type
Molex 26-60-4060 type.

Mating connectors

AC (J1) mating connector type
Molex 09-50-3031 or equivalent with Molex 08-50-0105 or equivalent crimp terminals.

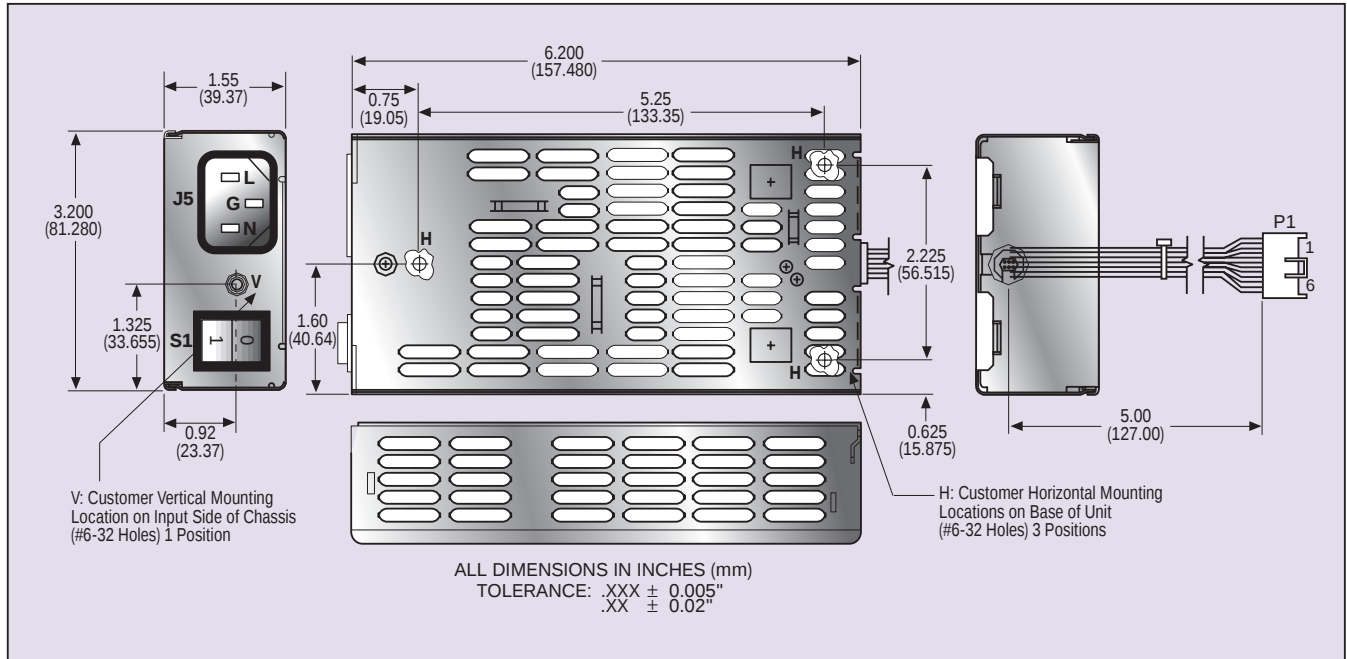
DC (J3) mating connector type
Molex 09-50-3061 with Molex 2478 phosphor bronze crimp terminals or equivalent.

Note: The input and output connectors are the same as those used on NFS40, NFN40, NAL40, NAN40 and NLP40.



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Mechanical description - enclosed NLP65 TELCO series with IEC320 connector



INPUT PIN CONNECTIONS	
J5	
Pin 1, L	AC Line
Pin 2, G	Ground
Pin 3, N	AC Neutral

OUTPUT PIN CONNECTIONS		
P1	DUAL	TRIPLE
Pin 1	V (B)	V (B)
Pin 2	V (A)	V (A)
Pin 3	V (A)	V (A)
Pin 4	Return	Return
Pin 5	Return	Return
Pin 6	No Pin	V (C)

Input and output connectors

AC (J5) inlet connector type
IEC320 AC receptacle.

DC (P1) connector type
Molex 90331-0003 with Molex 03-50-0106 crimp terminals or equivalent.

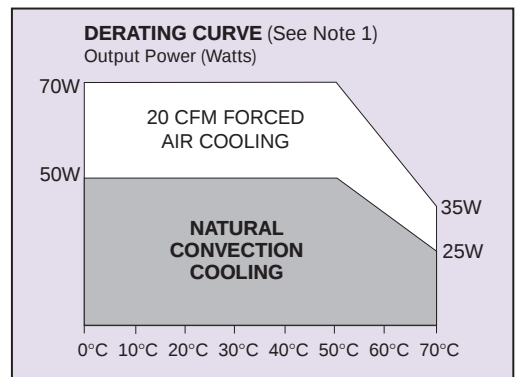
On/off switch (S1)

Position 0 = off
Position 1 = on

Mating connectors

AC (J5) inlet mating connector type
IEC320 AC plug.

DC (P1) mating connector type
Molex 15-48-0408 or equivalent.



Model Numbering Options

- The enclosure version includes: IEC connector, on/off switch, pigtail output connector and fitted cover. To order, please add the suffix 'E' to the end of the model number, e.g. NLP65-x3xxE.