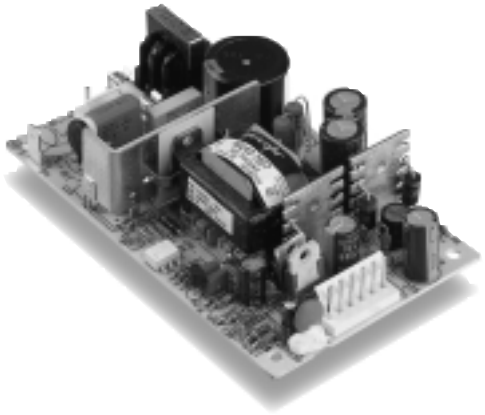
ARTESYN®
TECHNOLOGIES

NAL40 and NAN40 SERIES

Single, dual and triple output



[2 YEAR WARRANTY]

CE (LVD)

- **5.0 x 3.0 x 1.2 inch package (1U applications)**
- **Ideal for high volume designs**
- **Industry standard package**
- **Overvoltage and short circuit protection**
- **40W with free air convection**
- **NAN40: EN55022, EN55011 conducted emissions level B**
- **NAL40: EN55022, EN55011 conducted emissions level A**

The NAL40 and NAN40 series are 40W universal input AC/DC power supplies on a 5 x 3 inch card with a maximum component height of 1.2 inch for use in 1U applications. These series are available with a wide range of models in the industry standard 5 x 3 inch footprint at low cost making the series ideal for new and existing high volume communication and industrial applications. The difference between the NAL40 and NAN40 is their conducted emissions performance - the NAN40 meets EN55022 level B while the NAL40 meets level A. The NAL40 and NAN40 provide 40W of output power with free air convection cooling with a peak output of 50W for a maximum duration of 60 seconds. The NAL40 and NAN40 series are designed for use in high volume low power data networking, computer and telecom applications such as hubs, routers, POS terminals, cable modems and PABX's. This list is not exclusive as the generic feature set of both series with industry standard output configurations provide a solution for most high volume applications including many industrial applications.

SPECIFICATION

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

Line regulation	Main output Auxiliary outputs	±0.5% ±1.0%
Total regulation	Main output Auxiliary outputs	±3.0% ±5.0%
Overshoot/undershoot	At turn-on	≤10%
Transient response	+5.1V (1.5A to 3A step)	±150mV max. dev., 500µs recovery
Temperature coefficient		±0.02%/°C
Overvoltage protection	+5.1V output	6.25V ±0.75Vout
Output power limit	Primary power limited	50W Pout, min. 110W Pin, max.
Short circuit protection	Multiple output Single 12V, 15V, 24V and 48V	30 seconds Continuous automatic recovery
Output voltage trim	NAN40-7662 only	±5% (See Note 10)
Input voltage range	Universal input	90 to 264VAC 120 to 370VDC
Input frequency range		47Hz to 440Hz
Input surge current	110VAC, cold start 230VAC, cold start	15A 32A
Safety ground leakage current	110VAC, 60Hz 230VAC, 50Hz	0.2mA 0.4mA

International Safety Standard Approvals

VDE0805/EN60950/IEC950/IEC1010 File No. 10401-3336-1076
Licence No. 70567, 1076 and 90354

UL1950 File No. E136005

CSA C22.2 No. 950 File No. LR41062C

Certificate No. PS/605108

Conducted emissions	NAL: EN55022, FCC part 15	level A
Conducted emissions	NAN: EN55022, FCC part 15	level B
Radiated emissions	EN55022, FCC part 15	level A
ESD air	EN61000-4-2, level 3	Perf. criteria 2
ESD contact	EN61000-4-2, level 4	Perf. criteria 2
Surge	EN61000-4-5, level 3	Perf. criteria 2
Fast transients	EN61000-4-4, level 3	Perf. criteria 2
Radiated immunity	EN61000-4-3, level 3	Perf. criteria 2
Conducted immunity	EN61000-4-6, level 3	Perf. criteria 2
Hold-up time	110VAC 230VAC	10ms @ 40W 60ms @ 40W
Efficiency		68% min. @ 40W
Isolation voltage	Input/output Input/chassis	3000VAC 1500VAC
Switching frequency		Variable
Approvals and standards (See Note 9)		VDE0805, EN60950, IEC950 BABT, IEC1010, UL1950 CSA C22.2 No. 950
Weight		200g (7.06oz)
MTBF	MIL-HDBK-217F	150,000 Hours
Thermal performance	Operating Non-operating 0°C to 50°C ambient, convection cooled 50°C to 70°C, ambient conv. cooled Peak (0°C to 50°C) max. 60s	0°C to +70°C -40°C to +85°C 40W Derate linearly to half load 50W
Relative humidity	Non-condensing	5% to 95% RH
Altitude	Operating Non operating	10,000 feet max. 30,000 feet max.
Vibration	Three orthogonal axes, random vibration, 10 minute test for each axis	2.4G rms 5Hz to 500Hz

40 Watt
AC/DC universal input switch mode power supplies

OUTPUT VOLTAGE	OUTPUT CURRENT			RIPPLE (4)	TOTAL REG. (5)	MODEL NUMBER (B)	
	MAX (1)	PEAK (2)	FAN (3)				
+ 5.1V (I_A)	3A	7A	4A	50mV	±3.0%	NAL40-7608 (5)	NAN40-7608 (5)
+12V (I_B)	2A	3A	2A	120mV	±5.0%		NAN40-7662 (10)
–12V (I_C)	0.35A	1A	0.5A	120mV	±5.0%		
+5.1V	3A	7A	4A	45mV	±3.0%	NAL40-7628 (8)	NAN40-7628 (8)
+12V	0.35A	3A	0.5A	110mV	±5.0%		
–12V	0.35A	1A	0.5A	110mV	±5.0%		
+5.1V (I_A)	3A	7A	4A	50mV	±3.0%	NAL40-7607 (5)	NAN40-7607 (5)
+12V (I_B)	2A	3A	2A	120mV	±5.0%		
–5V (I_C)	0.35A	1.0A	0.5A	50mV	±5.0%		
+5.1V (I_A)	3A	7A	4A	50mV	±3.0%	NAL40-7610 (5)	NAN40-7610 (5)
+15V (I_B)	1.5A	3A	1.5A	160mV	+13% –0%		
–15V (I_C)	0.35A	1A	0.5A	150mV	±5.0%		
+5.1V (I_A)	3A	7A	4A	50mV	±3.0%	NAL40-7629 (5)	NAN40-7629 (5)
+12V (I_B)	2A	3A	2A	120mV	±5.0%		
5V	6A	10A	8A	50mV	±3.0%	NAL40-7605	NAN40-7605
12V	3.3A	5A	4A	120mV	±3.0%	NAL40-7612	NAN40-7612
15V	2.6A	4A	3.3A	150mV	±3.0%	NAL40-7615	NAN40-7615
24V	1.6A	2.5A	2A	240mV	±3.0%	NAL40-7624	NAN40-7624
48V	0.8A	1A	1A	480mV	±3.0%	NAL40-7617	NAN40-7617

Notes

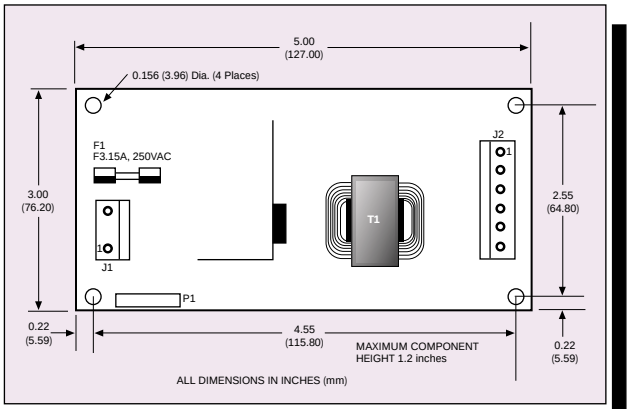
1 Natural convection cooling (40W maximum).
2 Peak output current lasting less than 60 seconds with duty cycle less than 5%. During peak loading, output voltage may exceed total regulation limits.
3 Forced air, 20CFM at 1 atmosphere, 50W maximum.
4 Figure is peak-to-peak. Output noise measurements are made across a 50MHz bandwidth using a 12 inch twisted pair, terminated with a 47µF capacitor.
5 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. For multiple output units to maintain stated regulation then:
$0.25 \leq I_A / I_B \leq 5$, for $I_B > 0.3A$
$0.50 \leq I_A / I_B \leq 5$, for $I_B < 0.3A$
Minimum load must also be 4W to achieve design MTBF.
For maximum output current I_C on triple-output models, i.e. for:
I_C = IMax., then I_A min. ≥ 0.5A and $I_B \geq I_C$.
This does not apply to NAL40-7628 and NAN40-7628. Those products have separately regulated outputs, see note 8.
6 Derating curve is application specific for ambient temperatures >50°C, for optimum reliability, no part of the heatsink should exceed 120°C, and no semiconductor case temperature should exceed 130°C.
7 Caution: allow a minimum of 1 second after disconnecting line power when making thermal measurements.
8 The NAL40-7628 and NAN40-7628 have a separately linear regulated +12V and -12V outputs. The loading conditions in note 5 do not apply.
9 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
10 Trim adjustment (NAN40-7662 only) on +5V by VR1, trim adjustment on +5V to ±5.0% for output accuracy and control of auxiliaries.

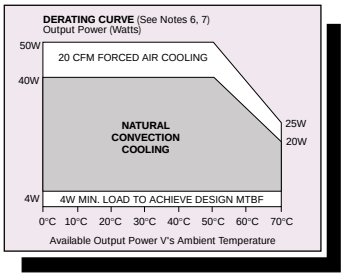
INPUT PIN CONNECTIONS	
J1	
Pin 1	AC Neutral
Pin 2	No Pin
Pin 3	AC Line
P1	
Pin 1	Safety Ground

OUTPUT PIN CONNECTIONS			
J2	SINGLE	DUAL	TRIPLE
P1	+Vout	+12V	V (B)
P2	+Vout	+5.1V	V (A)
P3	+Vout	+5.1V	V (A)
P4	Return	Return	Return
P5	Return	Return	Return
P6	Return	N/C	V (C)

Mechanical notes

A Ground pad encircling mounting hole near P1 allows system grounding through a metal stand-off of up to 8mm max. diameter to metal chassis.
B A standard L-bracket and cover is available for mounting, which contains all screws, connectors and necessary mounting hardware. Details are on page 72. Order part number 'NAL40 COVER KIT'.





AC (J1) mating connector
Molex 09-50-3031 or equiv. with Molex 08-50-0105 or equiv. crimp terminals.
DC (J2) mating connector
Molex 09-50-3061 or equiv. with Molex 08-50-0164 or equiv. crimp terminals.