

# **XL375 Series**

## **375-watt Power Supplies**

Product Specification

704601 Rev. 8

---

## Notices

*N2Power* is a wholly owned subsidiary of Qualstar Corporation.

*N2Power* and the *N2Power* logo are registered trademarks of Qualstar Corporation.

Copyright© 2007, 2008 by Qualstar Corporation — All Rights Reserved

Information contained in this document is copyrighted by Qualstar Corporation and is intended for use by customers and prospective customers to evaluate and integrate our power supplies. Customers and prospective customers may reproduce this document as needed for these purposes. Reproduction in whole or in part for any other purpose or by any other party is prohibited without prior written permission from Qualstar Corporation.

Every effort has been made to keep the information contained in this document current and accurate as of the date of publication or revision. However, no guarantee is given or implied that the document is error-free or that it is accurate with regard to any specification.

*N2Power* reserves the right to modify the design or specification without notice. This specification may not be construed as a contractual obligation except as specifically agreed to by *N2Power* in writing at the time of order.

# Table of Contents

---

---

<b>1.</b>	<b>Introduction.....</b>	<b>1-1</b>
1.1	Introduction.....	1-1
1.2	Agency Compliance.....	1-2
<b>2.</b>	<b>AC Input.....</b>	<b>2-1</b>
2.1	Input Line Requirements.....	2-1
2.2	Input Over Current Protection.....	2-1
2.3	Inrush Current Limiting.....	2-1
2.4	Low Input Voltage.....	2-1
2.5	Leakage Current.....	2-2
2.6	Power Factor.....	2-2
2.7	Safety Warning.....	2-3
<b>3.</b>	<b>DC Outputs.....</b>	<b>3-1</b>
3.1	Output Voltage Regulation.....	3-1
3.2	Grounding.....	3-1
3.3	No Load Operation.....	3-1
3.4	Overshoot at Turn On/Turn Off.....	3-1
3.5	Voltage Trim.....	3-2
3.6	Output Current/Power.....	3-2
3.7	Efficiency.....	3-3
3.8	Unloaded Power Consumption.....	3-4
3.9	Cooling.....	3-4
3.10	Output Ripple/Noise.....	3-5
3.11	Local and Remote Sensing.....	3-6
3.12	V1 Parallel Operation.....	3-7
3.13	Power Supply Protection.....	3-9
3.14	Output Transients.....	3-10
3.15	Capacitive Loading.....	3-11
<b>4.</b>	<b>General Specifications.....</b>	<b>4-1</b>
4.1	Environmental.....	4-1
4.2	Mean Time between Failures.....	4-1
4.3	Component Stress.....	4-1
4.4	Labeling/Marking.....	4-1
4.5	Physical Dimensions.....	4-2
4.6	Weight.....	4-2
4.7	Mating Connectors.....	4-3
4.8	Signal Descriptions and Remarks.....	4-4

---

<b>5.</b>	<b>Timing and Control</b> .....	<b>5-1</b>
5.1	Power Supply Timing .....	5-1
5.2	Power Good Output .....	5-1
5.3	Remote Enable Input.....	5-2
5.4	Voltage Hold-Up Time .....	5-2
5.5	Output Rise Time.....	5-2
<b>6.</b>	<b>Ordering Information</b> .....	<b>6-1</b>

# 1.

# Introduction

## 1.1 Introduction

This specification defines the design and performance characteristics of an open frame single-phase (3 wire) universal input, power factor corrected 375-watt open frame switch mode power supply. The six XL375 models are listed in Table 3-1 and provide either 12V, 24V, 28V, 48V, 54V or 56V DC main outputs.

All models provide a +5V<sub>standby</sub> output (1.0A max.) whenever AC power is applied. The main and +12V<sub>standby</sub> outputs are enabled by grounding the Remote Enable input. The +12V<sub>standby</sub> may be configured to remain on whenever AC power is applied. These single-output models can be used as standalone power supplies or can be used in redundant or N+ 1 configuration with up to 4 units connected in parallel. External power/load sequencing of the main output is required for hot swapping. The +5V<sub>standby</sub> and +12V<sub>standby</sub> outputs may be wired directly together with other XL375s to provide redundancy, but the output currents are still limited to the single-supply values.



## 1.2 Agency Compliance

The XL375 complies with the following international agency standards:





Safety	Complies with Standard	Remarks
United States	UL 60950-1 (2007) Second Edition (Information Technology Equipment)	Leakage Current – see table 2-2 Hi-pot – 2121vdc for 1 second
Canada	CSA 22.2: 60950-1	
EU Council	2006/95/EC	Low Voltage Directive
International	IEC 60950-1 (2005) Second Edition	
EMC	Complies with Standard	Remarks
United States	FCC part 15, subpart B	Conducted emissions Limits per CISPR 22 Class B Tested to ANSI C63.4: 2003
EU Council	2004/108/EC	EMC Directive
International	EN 61204-3 (refers to the following) EN 55022 Class B  EN 55024 (refers to the following) EN 61000-3-2  EN 61000-3-3 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11	Low Voltage Power Supplies – DC Output Conducted emissions Limits per CISPR 22 Class B Immunity Harmonic Current Emissions (Power Factor Correction – PFC) Voltage Fluctuations & Flicker Radiated Susceptibility Fast Transient/Burst Immunity Power Mains Surge Immunity RF Immunity Voltage Dips, Short Interruptions
Reduction of Hazardous Substances (RoHS)	Complies with Standard	Remarks
EU Council	2002/95/EC	RoHS Directive
Marks of Conformance		
United States & Canada	 (Underwriters Laboratories File E211115)	
Demko		
EU Council		
RoHS		

Table 1-1 Agency Compliance

## 2.1 Input Line Requirements

The following table defines the voltage and frequency requirements for the AC line inputs to the XL375 power supply. The XL375 is capable of supplying full rated power in continuous operation throughout the specified ranges of voltages and frequencies. The power supply will automatically recover from AC power loss and is capable of starting under maximum load at the minimum AC input voltage described below.

Parameter	Minimum	Rated	Maximum
RMS Input Voltage	90 VAC	100–240 VAC	264 VAC
RMS Input Current	–	–	4.1 A @ 100 V 1.7 A @ 240 V
Input Frequency	47 Hz	50–60 Hz	63 Hz

Table 2-1 XL375 AC Input Parameters

## 2.2 Input Over Current Protection

The XL375 series incorporates a 6.3A primary AC line fuse for input over current protection to prevent damage to the power supply and meet product safety requirements as outlined in Section 1.2.

## 2.3 Inrush Current Limiting

The cold-start inrush current is limited to 9-amps peak at 240 VAC input voltage (see Table 2-1) and 6.5-amps peak at 120 VAC @ 25C. Repetitive ON/OFF cycling of the AC input voltage should not damage the power supply or cause the input fuse to fail.

## 2.4 Low Input Voltage

The application of an input voltage below the minimums specified in Table 2-1 shall not damage the XL375.

## 2.5 Leakage Current

The leakage current from AC line or AC Neutral inputs to Protective Earth varies linearly with the input voltage and frequency (see operating column of Table 2-2). The leakage currents of multiple power supplies are additive. Consult the appropriate electrical safety specification for the maximum leakage current permitted in your product. The leakage current will always go to zero when a DPDT switch simultaneously disconnects both the line and neutral circuits. A single fault can occur when the AC power is applied to only the Neutral input terminal.

Line Voltage Frequency	Operating	Single Fault (see text)
120VAC, 60Hz	0.85 mA	1.15 mA
240VAC, 60Hz	1.80 mA	2.50 mA
240VAC, 50Hz	1.50 mA	2.08 mA

Table 2-2 Leakage Current – Single XL375

## 2.6 Power Factor

The XL375 power factor exceeds 0.95 with loads of 225-watts or greater.

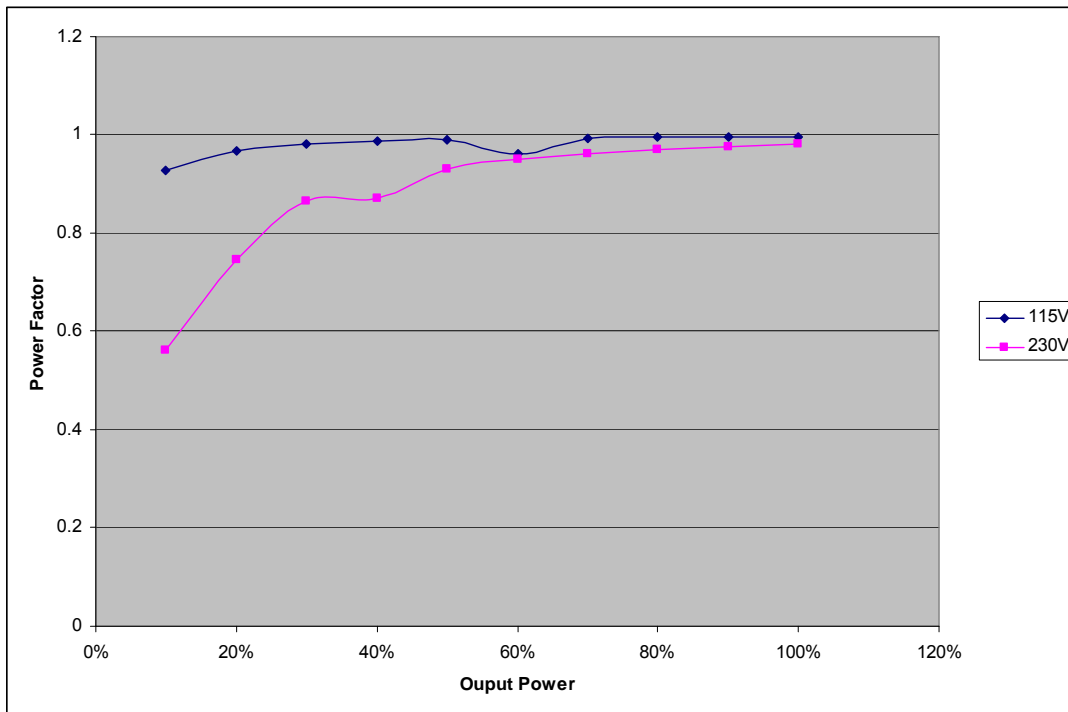


Figure 2-1 Power Factor, Typical

## 2.7 Safety Warning

### **WARNING**

The XL375 is a component, not a stand-alone power supply. It must be mounted inside a protective enclosure to prevent accidental shock by contact with the supply. Lethal voltages are present while and after AC power is applied to the XL375. Allow 1-minute for storage capacitors to discharge after removing AC power before handling the XL375.

The safety ground connection is the chassis itself and it must be connected to Protective Earth.

# 3.

# DC Outputs

## 3.1 Output Voltage Regulation

The DC output voltages shall remain within the minimum and maximum limits of Table 3-1 when measured at the power supply connector under all specified line and environmental conditions contained herein. The regulation accuracy is measured with load currents between zero and the maximum load currents listed in Table 3-3.

Model	Output	Rated Voltage	Regulation	Minimum (VDC)	Nominal (VDC)	Maximum (VDC)	Remote Sense
XL375-3	V1	+12 V	±3%	11.64	12.0	12.36	V1/RTN
XL375-5	V1	+24 V	±3%	23.28	24.0	24.72	V1/RTN
XL375-6	V1	+48 V	±3%	46.56	48.0	49.44	V1/RTN
XL375-7	V1	+56 V	±3%	54.32	56.0	57.68	V1/RTN
XL375-8	V1	+54 V	±3%	52.40	54.0	55.62	V1/RTN
XL375-11	V1	+28 V	±3%	27.16	28.0	28.84	V1/RTN
All	V2	+12 V <sub>standby</sub>	±5%	11.40	12.0	12.60	None
	V3	+5 V <sub>standby</sub>	±5%	4.75	5.0	5.25	None

Table 3-1 XL375 Output Voltage Specifications

## 3.2 Grounding

All DC outputs, status outputs and control inputs share a common DC Return found on all output connectors. DC Return floats from the chassis (Protective Earth) with a 68nF, 630V capacitor between them.

## 3.3 No Load Operation

A no load condition will not damage the supply or cause a hazardous condition. The power supply will remain stable and operate normally after application of a load. The Power Good logic output will indicate normal operation when the supply is unloaded.

## 3.4 Overshoot at Turn On/Turn Off

The output voltage overshoot upon the application or removal of the input mains voltage is less than 10% above the nominal voltage. No opposite polarity voltage is present on any output during turn on or turn off.

## 3.5 Voltage Trim

A voltage trim input pin is provided to allow the user to adjust the V1 output up or down by up to 5%. Connecting a resistor between this pin and DC Return will increase the output voltage while connecting a resistor between this pin and the V1 output will decrease the output voltage. The ability of the V1 output to maintain its specified regulation accuracy under severe load or line conditions could be diminished by trimming the output to a higher than nominal voltage. The trim range is limited to +/- 5% as determined by the Up/Down 5% resistor values listed in Table Table 3-2. Only resistance values greater than or equal to those listed should be used.

Model	V1 Up 3%	V1 Up 5%	V1 Down 3%	V1 Down 5%
Connect Trim pin to	to DC Return	to DC Return	V1 Output	V1 Output
XL375-3 (12V)	17.8K	4.32K	124K	68.1K
XL375-5 (24V)	17.8K	4.32K	294K	169K
XL375-6 (48V)	17.8K	4.32K	649K	383K
XL375-7 (56V)	17.8K	4.32K	768K	453K
XL375-8 (54V)	17.8K	4.32K	732K	432K
XL375-11 (28V)	17.8K	4.32K	348K	200K

**Table 3-2 Minimum Trim Resistors for Maximum Trim**

When two or more XL375's are operating in parallel, each unit should be trimmed with the same resistor value connected to the same terminals.

## 3.6 Output Current/Power

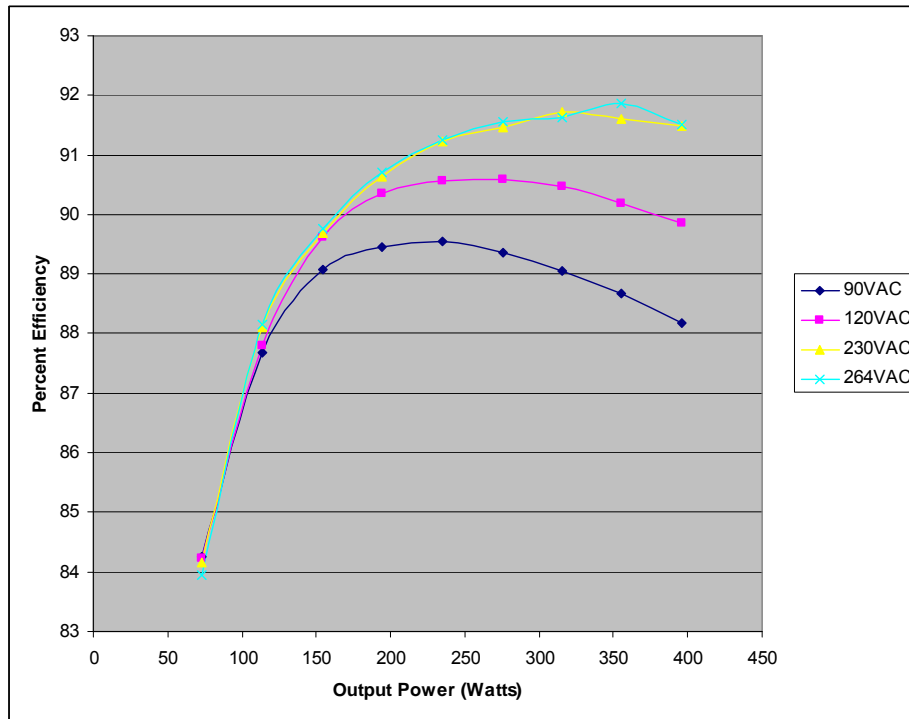
The maximum available output power is always a function of the cooling airflow and its temperature. The maximum of 375-watts combined total power from all outputs is only available with a minimum of 10-CFM of forced air-cooling at no more than 50°C. Each individual output is also limited: V1 output is limited to 360-watts, +12 V<sub>standby</sub> is limited to 12-watts and +5 V<sub>standby</sub> is limited to 5-watts.

Model	Output	Rated Voltage	Maximum Load
XL375-3	V1	12 V	30.0A
XL375-5	V1	24 V	15.0 A
XL375-6	V1	48 V	7.5 A
XL375-7	V1	56 V	6.4 A
XL375-8	V1	54 V	6.7 A
XL375-11	V1	28 V	12.8 A
All	+5 V <sub>standby</sub>	5 V	1.0 A
All	+12 V <sub>standby</sub>	12 V	1.0 A

**Table 3-3 Maximum Individual Load Currents (sum limited to 375W)**

### 3.7 Efficiency

The power supply efficiency varies with the output load and the line voltage. Efficiency for the main output is greater than 90% for 115VAC and 230VAC inputs from 50% to 100% output power.



**Figure 3-1 Typical XL375-3 (12V, worse-case) Efficiency Curves (note expanded Y-axis)**

### 3.8 Unloaded Power Consumption

When completely unloaded and at any normal input voltage, the XL375 consumes about 3-watts with a high (open) Remote Enable input (standby state) and about 9-watts with a low (grounded) Remote Enable input (V1 on but unloaded). The power-factor does not meet its specification under these conditions.

### 3.9 Cooling

The XL375 can operate with convection cooling at temperatures below 50°C when total power output is less than 200 watts and it is mounted open side up. 10-CFM of forced-air cooling at a maximum of 50°C is required when the output power exceeds 200-watts. The cooling airflow must be either co-planar with the circuit board or it must impinge downward in the center of the open topside. The XL375 may be mounted in any attitude when forced-air cooled.

#### 3.9.1 Output Power Derating at Elevated Temperatures

The XL375 can be operated with cooling air temperatures above 50°C by linearly derating the total maximum output power (or current) by 2.5%/°C from 50°C to 70°C (see Figure 3-2).

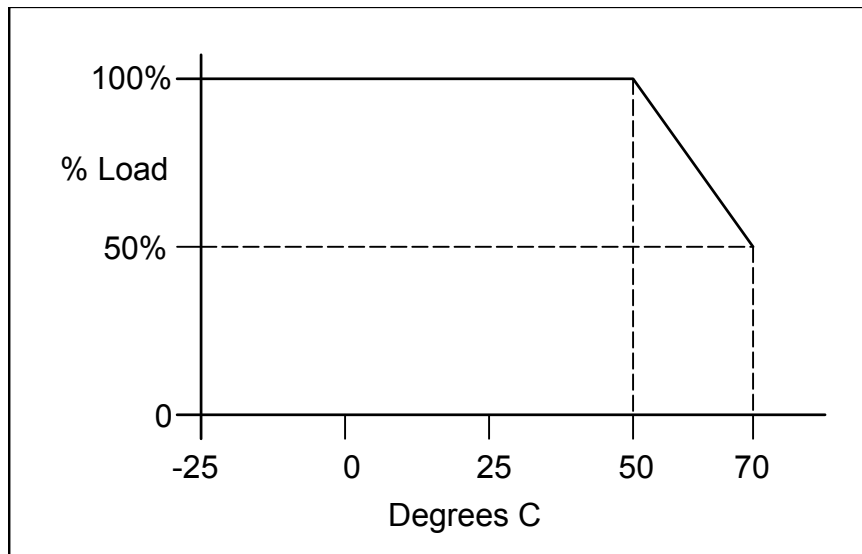


Figure 3-2 XL375 Output Power vs. Ambient Temperature Envelope

#### 3.9.2 Over-temperature Shutdown

The power supply is equipped with an internal temperature sensor. Failure to provide adequate cooling airflow below the maximum operating temperature will result in the power supply shutting down the V1 output while the +5Vstandby and +12Vstandby

outputs will remain operational. The V1 output will be automatically restored when the temperature of the built-in temperature sensor cools adequately.

## 3.10 Output Ripple/Noise

Output ripple voltage and noise are defined as periodic or random signals over a frequency band of 10 Hz to 20 MHz. Measurements are to be made with an oscilloscope with a 20 MHz bandwidth. Outputs should be bypassed at the connector with a 0.1  $\mu$ F ceramic disk capacitor and a 10  $\mu$ F tantalum capacitor to simulate system loading (see Figure 3-3). Ripple and noise shall not exceed the limits specified in the following tables.

The ripple voltage of the output is measured at the pins of the mating connector. Ripple and noise shall not exceed the limits specified in Table 3-4 under any condition of line voltage and frequency specified in Section 2.1 and DC loading specified in Section 3.5.

Model	Output	Rated Voltage	Maximum Ripple+Noise (peak-to-peak)
XL375-3	V1 (main)	+12 V	100 mV
XL375-5	V1 (main)	+24 V	200 mV
XL375-6	V1 (main)	+48 V	200 mV
XL375-7	V1 (main)	+56 V	200 mV
XL375-8	V1 (main)	+54 V	200 mV
XL375-11	V1 (main)	+28 V	200 mV
All	V2 (+12 V <sub>standby</sub> )	+12 V	80 mV
All	V3 (+5 V <sub>standby</sub> )	+5 V	50 mV

**Table 3-4 Ripple + Noise Output Voltage**

### 3.10.1 Ripple/Noise Test Setup

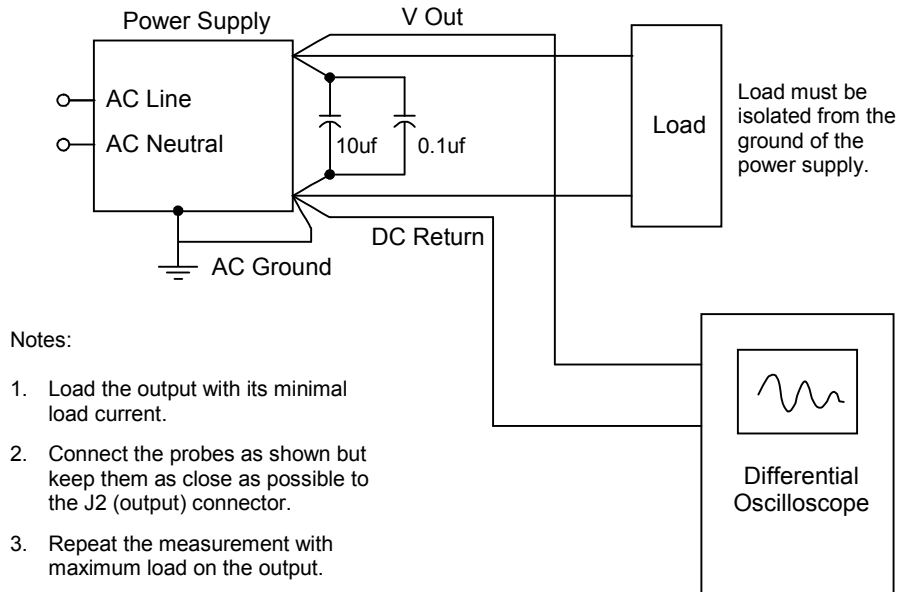


Figure 3-3 Ripple Noise Measurement Setup

### 3.11 Local and Remote Sensing

Remote sensing is provided to compensate for voltage drops in the V1+ Output and the DC Return wiring to the V1 load. The voltage at the remote sense inputs must never be allowed to differ by more than 0.5-volts from their respective terminals. If the Remote Sense inputs are left open, the output voltage at the J14 and J15 terminals will still meet the load regulation specification.

Remote sense lines can be extended through bulkhead connectors and right to the critical load within a user's system. Unplugging the remote sense lines will cause a droop in the voltage at the load. Connecting the remote sense lifts the voltage at the load to within the regulation specification but may increase the V1 voltage at J14 and J15 above the regulation limits. See Figure Figure 3-4.

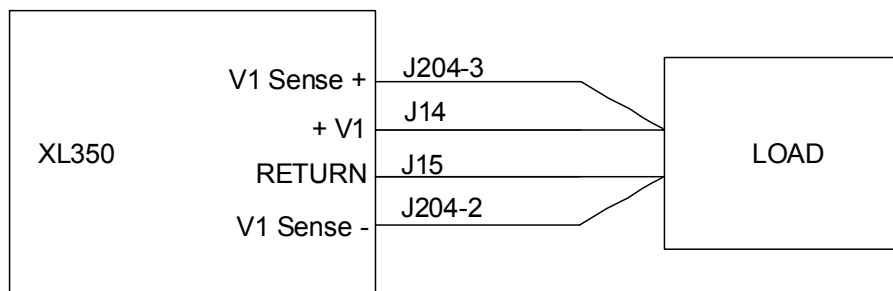


Figure 3-4 Remote Sense Wiring

### 3.12 V1 Parallel Operation

The V1 output of two, three or four XL375 power supplies may be connected in parallel to provide higher V1 output power. They can also be used in an N+1 configuration to provide higher output power and greater reliability. Remote sensing may still be used in parallel operation.

XL375s running in parallel are capable of starting with a total load that exceeds the capability of an individual unit. They will tolerate the dramatic load fluctuations encountered in an N+1 redundant configuration when supplies are removed and replaced.

Because of the XL375's highly-efficient design, connecting any output of an operating unit to the like output of an unpowered unit will cause a substantial momentary dip in the output voltage. The user's system must be capable of dealing with this characteristic or provide a means of applying AC power before connecting the DC outputs together.

Because of the inherent limitations of current sharing, it is recommended that the total load not exceed 92%-94% of the sum of the rated outputs (see Table 3-5). Only the main output is capable of current sharing. The following table lists possible main output power.

Number of XL375s	N+1 Configuration
2	670 watts
3	995 watts
4	1325 watts

**Table 3-5 Main Output Power in N+1 Configurations**

#### 3.12.1 Current Sharing Connections

The Current Share signal (V1 I-Share) of each supply operating in parallel must be connected together. Power sharing does not require the Remote Sense signals be connected together, but the sharing accuracy will be reduced unless they are all connected together.

Individual Power Good signals must not be wire ORed together. Each individual Power Good signal should be monitored separately by the user's system.

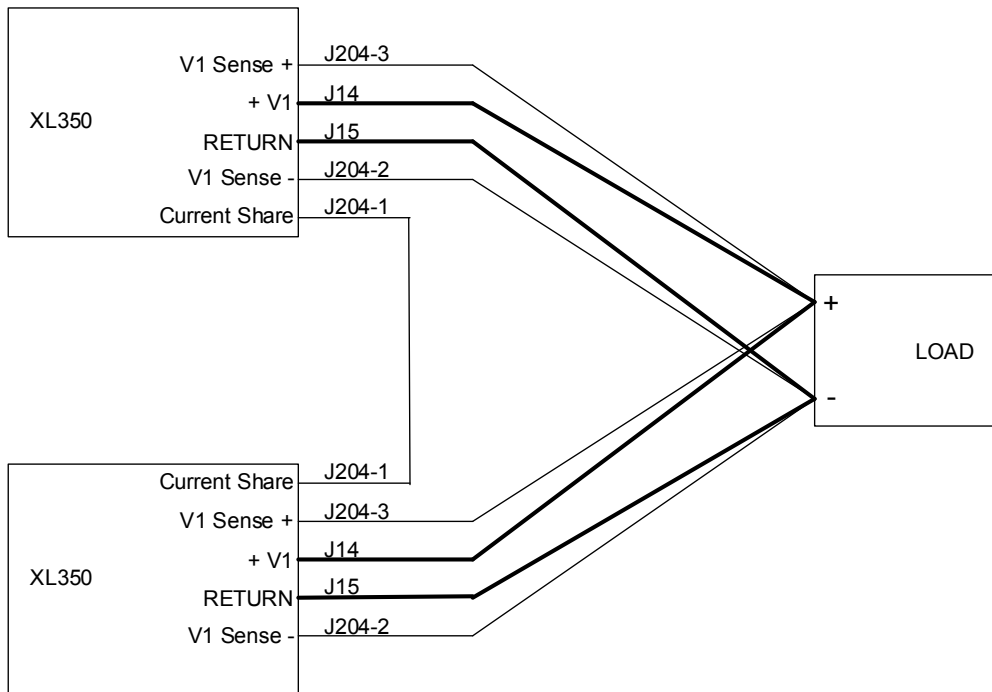


Figure 3-5 Current Sharing Wiring Example

### 3.12.2 Current Share Accuracy

When all the current share signals are connected together and all the Remote Sense signals are connected together, the load delivered by any two of the sharing supplies will not vary by more than 10% at full load.

### 3.12.3 +5 V<sub>standby</sub> Parallel Operation

The +5 V<sub>standby</sub> output has a series Schottky rectifier just before the output connector that allows this output to be connected in parallel with the same output on like supplies. By doing so, the +5 V<sub>standby</sub> output will remain alive as long as one of the paralleled supplies is functioning. The output current rating does not increase beyond the single supply rating.

### 3.12.4 +12 V<sub>standby</sub> Parallel Operation

The +12 V<sub>standby</sub> output has a series Schottky rectifier just before the output connector that allows this output to be connected in parallel with other the same output on like supplies. By doing so, the +12 V<sub>standby</sub> output will remain alive as long as one of the paralleled supplies is functioning. The output current rating does not increase beyond the single supply rating.

### 3.12.5 Transients

The output rise time and monotonic requirements of Section 5.5 may not be met when the main load exceeds 360-watts, because of the difference in start-up times of the paralleled power supplies.

## 3.13 Power Supply Protection

There are several different protection circuits designed to protect the load and the XL375 from component failures and extraordinary circumstances.

### 3.13.1 Over Temperature Protection

If the XL375 is operated without adequate cooling, it will sense an over-temperature condition and shut down the V1 (main) output. It will restart after it has cooled down to below its maximum operating temperature.

### 3.13.2 Over-Voltage Protection

Over-voltage protection is only provided on the V1 (main) output. No single internal fault is able to cause a sustained over voltage condition on the V1 output. When an over-voltage condition occurs, the power supply will shut down and will not restart until AC power is turned off and back on. The XL375 will shut down under the following over voltage conditions:

Model	Main Output	Over-Voltage Protection Threshold		
		Minimum	Nominal	Maximum
XL375-3	12 V	13.5 V	14.0 V	14.5 V
XL375-5	24 V	27.0 V	28.0 V	29.0 V
XL375-6	48 V	54.0 V	56.0 V	58.0 V
XL375-7	56 V	63.0 V	65.3V	67.7 V
XL375-8	54 V	60.7 V	62.9V	65.2 V
XL375-11	28V	31.5 V	32.7 V	33.8 V

**Table 3-6 Over Voltage Protection Limits**

### 3.13.3 Over Current Protection

V1 load currents in excess of 115% of the rated output lasting more than 4-milliseconds will cause the V1 output to limit the current to about 115% of the nominal value for about 3 seconds and then the output will be inhibited for about 6 seconds. This on/off cycling continues until the excessive load is removed.

### 3.13.4 Short Circuit Protection

A short circuit will cause no damage to the power supply. A short circuit on any output may cause the power supply to shutdown. The power supply will periodically attempt to restart until the short circuit condition is removed. After successfully restarting, the power supply will operate normally.

### 3.13.5 Over-Power Protection

The XL375 will shutdown when its input power exceeds approximately 460-watts. This condition will cause no damage to the power supply. It will then attempt to restart periodically and will remain on when the input is below the trip value. After successfully restarting, the power supply will operate normally.

## 3.14 Output Transients

The maximum output voltage transient caused by step load changes will not exceed the output voltage regulation limits by more than 5%. With an AC input as specified in Section 2.1, the power supply will remain stable when subjected to the load transients described below with capacitive loading per Table 3-7:

- Load changes between 75% and 100% on any output
- Load changing repetition of 50 to 333 cycles per second
- Transient load slew rate = 1.0 A/microsecond

### 3.15 Capacitive Loading

The XL375 will startup and operate normally with load capacitances simultaneously present on the all outputs not exceeding those listed in Table 3-7.

<b>Output</b>	<b>XL375-3</b>	<b>XL375-5</b>	<b>XL375-6</b>
V1 (12 V)	4,000 $\mu$ F		
V1 (24 V...28 V)		2,000 $\mu$ F	
V1 (48 V...56 V)			500 $\mu$ F
V2 (+12 V <sub>standby</sub> )	180 $\mu$ F	180 $\mu$ F	180 $\mu$ F
V3 (+5 V <sub>standby</sub> )	220 $\mu$ F	220 $\mu$ F	220 $\mu$ F

**Table 3-7 XL375 Capacitive Loading**

# 4.

# General Specifications

## 4.1 Environmental

The XL375 meets or exceeds the following environmental specifications:

Parameter	Conditions	Specification	Remarks
Temperature	Operating	-25°C to 50°C	See cooling requirements
	Non-Operating	-40°C to 85°C	
Relative Humidity	Operating	85% Maximum	Non-Condensing
	Non-Operating	95% Maximum	Non-Condensing
Altitude	Operating	10,000 feet MSL Max.	3048 meters
	Non-Operating	50,000 feet MSL Max.	15,240 meters
Vibration	No damage	2.4G RMS Maximum	5-500Hz, 10-min. each axis
Mechanical Shock	No damage	15G half-sine, 11mS	Six shocks each axis

Table 4-1 Environmental Specifications

## 4.2 Mean Time between Failures

The calculated MTBF of the power supply is equal to or greater than 200,000 hours of continuous operation at maximum output loading and worst case input line voltage with forced-air cooling as prescribed in Section 3.7. N2Power does not warrant the MTBF to be representative of any particular unit. The MTBF of the power supply is calculated with an 80% confidence level in accordance with Bellcore, TR-332, Issue 6. Actual failure rates vary from unit to unit.

## 4.3 Component Stress

The XL375 was designed with the following component-derating guidelines at an operating ambient temperature of 50°C: semiconductor junction temperatures shall not exceed ninety 90 % of manufacturer's rating. Inductor winding temperatures shall not exceed safety agency requirements. Electrolytic capacitor case temperatures shall not exceed 95% of rated temperature. Resistor power dissipation shall not exceed 70% of rated while other components will not be operated at more than 90% of their rated voltage or current.

## 4.4 Labeling/Marking

The power supply is marked and labeled with the N2Power logo model number, part number, input and output specifications, production code, appropriate safety agency logos, CE mark, and country of origin. A typical label is pictured below.



Figure 4-1 Sample XL375 Label

## 4.5 Physical Dimensions

3D CAD models are available by contacting [sales@n2power.com](mailto:sales@n2power.com).

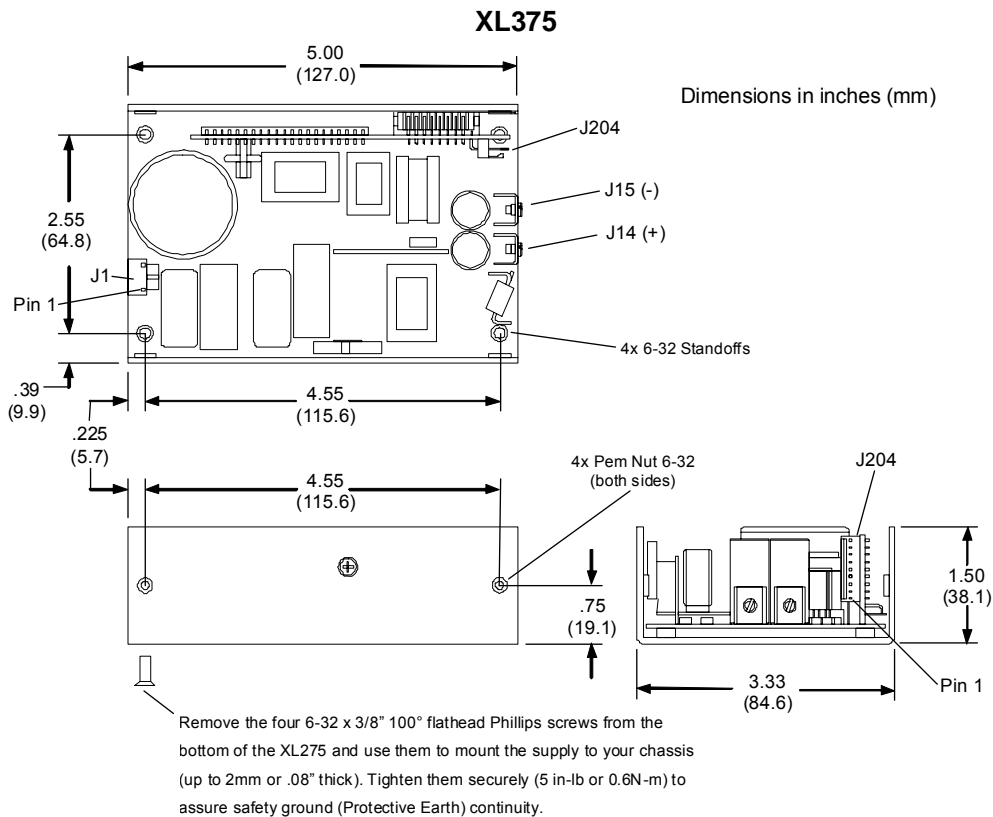


Figure 4-2 XL375 Series Dimensions

## 4.6 Weight

Units	Net Weight
Pounds	0.94
Ounces	15
Kilograms	0.43

Table 4-2 XL375 Weight

## 4.7 Mating Connectors

The user must furnish all mating connectors. The mating connectors must meet the requirements of all applicable safety agencies (notably UL).

Note that the female contacts that mate to the power supply are only rated for 25-30 mating cycles. Excessive mating cycles causes dramatically increased terminal resistance and heating resulting in the eventual failure of the mating terminal and possibly the header on the power supply.

### 4.7.1 AC Input Mating Connector (J1)

The AC input connector to the XL375 is a 3-pin Molex™ (Molex is a trademark of the Molex Corporation) KK style header with 0.156" centers. The center pin is omitted to provide adequate insulation spacing. The Molex part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers. A minimum of AWG 18 wire is recommended.

J1	Molex P/N
Connector Circuits (pins)	2 of 3
XL375 Header (tin)	26-62-4030
Mating Housing	09-50-8031
Rated Contact Current	7.0 A
Crimp Terminal (tin)	08-50-0113
Rated Wire Size	AWG 18 or 20

Table 4-3 J1 Mating Connector

### 4.7.2 Protective Earth (J2)

The chassis must be connected to protective earth at either J2 or the mounting hole next to J2. J2 is a quarter-inch male push-on (Faston) terminal.

### 4.7.3 DC Output Terminals (J14 and J15)

The DC output terminals are designed to accept a ring-lug terminal. There are many sources available. A minimum of AWG 16 wire is recommended. The lugs must have a minimum I.D. of 0.140" [3.53mm] and a maximum O.D. of 0.32" [8.1mm]. The lugs must be contaminant free and should be tightened to a torque of approximately 8-inch-pounds [0.9 N-m]. The positive terminal is on the left. These terminals use 6-32 UNC screws.

## 4.7.4 Auxiliary Connector (J204)

The auxiliary connector on the XL375 is a Molex KK header with 0.100" centers. The Molex part numbers for the mating housing and crimp-style snap-in terminals are listed below. There may be equivalent connectors available from other manufacturers.

J204	Molex P/N
Connector Circuits (pins)	9
J204 Header	22-12-2094
Mating Housing	22-01-3097
Crimp terminal (selective gold)	08-55-0102
Rated Contact Current	2.5 A
Rated Wire Size	AWG 22 thru 30

Table 4-4 J204 Mating Connectors

## 4.8 Signal Descriptions and Remarks

All outputs and inputs are referenced to DC Return.

Signal	Description/Remarks
AC Line	Highest in potential compared to earth ground. Should be connected to the AC power switch.
AC Neutral	Closest in potential to earth ground. Should not be connected to a single-pole power switch.
DC Return	XL375 ground for all outputs and status/control signals.
V1	The main output (+)
V1 Sense (+)	Remote sense for V1 at load (compensates for wiring losses)
V1 Sense (-)	Remote sense for DC Return at load (affects V1, see above)
V1 Trim	Adjusts V1 output voltage up to +/- 5% using an external resistor. See Section 3.5
V1 I-Share	Current Share Signal common to all sharing XL375s
V2 (+12V <sub>standby</sub> )	Provides 1A of 12V power for fans. Uses common ground DC Return.
V3 (+5 V <sub>standby</sub> )	Provides 1A of 5V power whenever AC power is presents. Uses common ground DC Return
Remote Enable	Low-true logic input enables V1 output
Power Good	A high-logic level (4.5V) indicates the output power is in regulation for at least the next 2mS. See Section 5.2

Table 4-5 Signal Descriptions and Remarks

Pin	Signal
J1-1	AC Line
J1-2	No Pin
J1-3	AC Neutral
Pin	Signal
J2	Protective Earth
Pin	Signal
J14	V1 + Output
J15	V1 DC Return (Output Ground)
Pin	Signal
J204-1	V1 I-Share
J204-2	V1 Sense (-)
J204-3	V1 Sense (+)
J204-4	V3 (+5V <sub>standby</sub> )
J204-5	V1 Trim Input
J204-6	V2 (+12V <sub>standby</sub> )
J204-7	DC Return (Output Ground)
J204-8	Remote Enable (logic input, low-true)
J204-9	Power Good (logic output, high-true)

**Table 4-6 Pin Assignments in Pin Order**

# 5.

# Timing and Control

## 5.1 Power Supply Timing

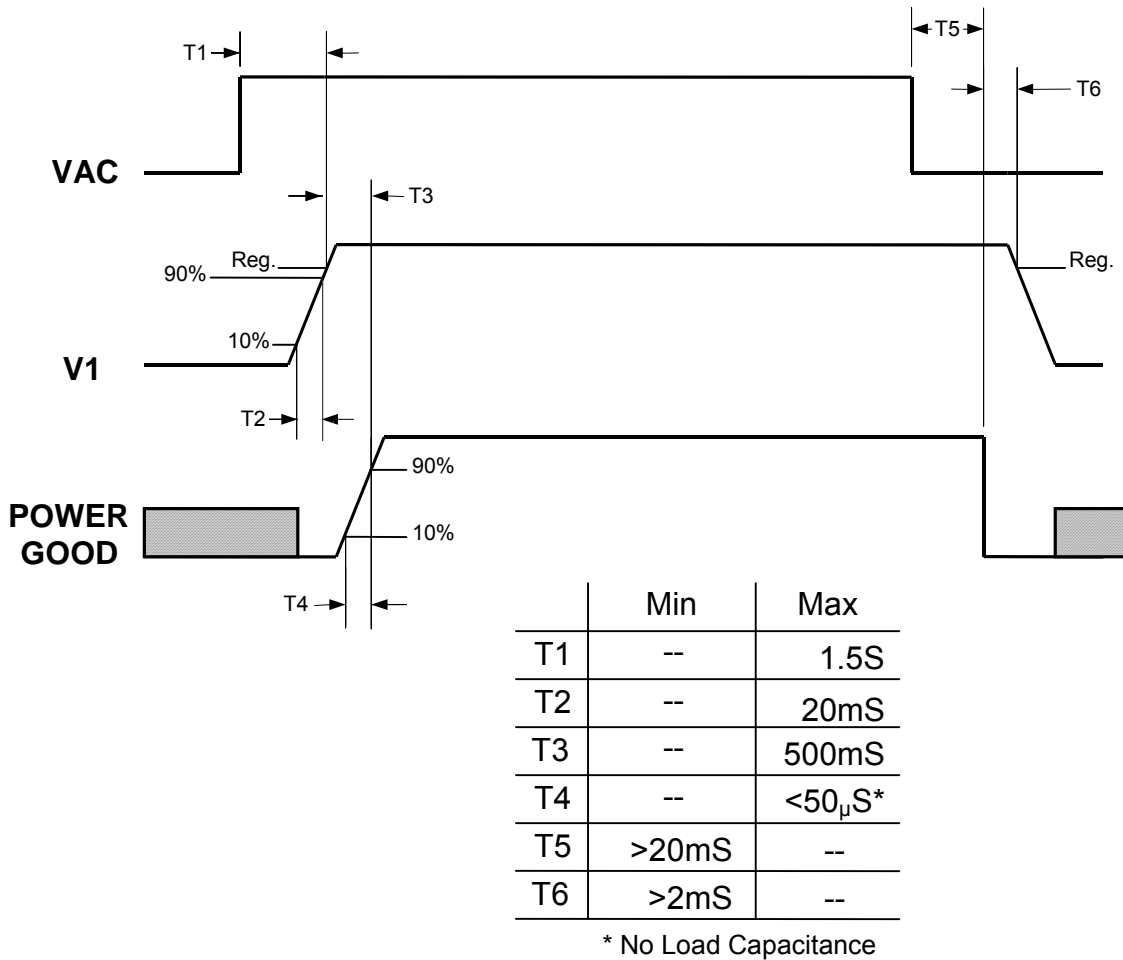


Figure 5-1 XL375 Timing Diagram

## 5.2 Power Good Output

The Power Good signal provides a high logic level to indicate the DC outputs are within their regulation limits and that sufficient mains energy is stored by the power supply to ensure continuous power operation within specification for the duration of the hold-up time. When the AC mains power is removed for a period longer than 20ms, the Power Good signal transitions to a low logic level. The Power Good signal is capable of sinking 20mA or sourcing 20mA from an internal 5.0V supply.

### **5.3 Remote Enable Input**

This input must be grounded to enable the V1 (main) output. It has no effect on the +5V<sub>standby</sub> and +12V<sub>standby</sub> outputs. It is pulled-up to 5.0V through a 7.5K-ohm resistor. The input voltage must be less than 0.4V to activate the V1 output and higher than 3.0V to disable the output.

### **5.4 Voltage Hold-Up Time**

The power supply will maintain output regulation per Table 3-1 despite a loss of input power at 100VAC/50Hz and 230VAC/50Hz at maximum continuous output load for a minimum of 22-milliseconds.

### **5.5 Output Rise Time**

All output voltages from a single XL375 shall rise monotonically (always positive slope) from 10% to 90% of their nominal output voltage (as specified in Table 3-1) within 0.2ms to 20ms under any loading conditions specified in Table 3-3. The rise of the shared V1 output from two or more XL375s operating in parallel may not be monotonic.

# 6.

# Ordering Information

---

The following table provides the N2Power part numbers that should appear on your purchase order and will appear on any N2Power correspondence:

<b>Model Number</b>	<b>V1</b>	<b>N2Power Part Number</b>
XL375-3	12 V	400040-01-0
XL375-5	24 V	400041-01-8
XL375-6	48 V	400042-01-6
XL375-7	56 V	400043-01-4
XL375-8	54 V	400044-01-2
XL375-11	28 V	400052-01-5

**Table 6-1 XL375 Part Numbers**

All XL375 power supplies are RoHS compliant.

Direct all questions, orders or requests for quotation as follows:



3005 Avenida Simi, Simi Valley, CA 93063  
TEL: (805) 582-2804 FAX: (805) 582-2308