

Preliminary

WRA960 SERIES



3PH AC - DC DIN RAIL MOUNTABLE
960W
INDUSTRIAL CONTROL EQUIPMENT

FEATURES

- 3 PHASE AC INPUT VOLTAGE
- COMPACT DESIGN
- HIGH EFFICIENCY UP TO 93%
- PARALLEL FUNCTION

SELECTION CHART

WRA 960 - 24

Wattage $\left\{ \begin{array}{l} 24 : 24VOUT \\ 48 : 48VOUT \end{array} \right.$

MODEL LIST

MODEL NO.	INPUT VOLTAGE	OUTPUT WATTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT	EFF. (min.)	EFF. (typ.)
Single Output Models						
WRA960-24	3 ϕ 340~575VAC	960 WATTS	+ 24 VDC	40A	90%	92%
WRA960-24L	3 ϕ 340~575VAC	960 WATTS	+ 24 VDC	40A	90%	92%
WRA960-48	3 ϕ 340~575VAC	960 WATTS	+ 48 VDC	20A	91%	93%

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL						
Characteristics	Conditions	min.	typ.	max.	unit	
Isolation voltage	Input / Output	3,000			VAC	
Isolation resistance	Input / Output, @ 500VDC	100			M Ω	
Ambient temperature	Operating at Vi nom	-25		+ 71	°C	
Derating	Vi nom, from +61 to +71°C			3.5	% / °C	
Storage temperature	Non operational	-25		+ 85	°C	
Relative humidity	Vi nom, Io nom	20		95	% RH	
Dimension	Screw terminal type	L125.9 x W275.8 x D118.2			mm	
Cooling	Free air convection					
Case material	Metal					



SPECIFICATION

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INPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Nominal Voltage *1			1 ϕ or 3 ϕ 380 / 480 VAC			
Rated input voltage	Io nom		400		500	VAC
Input voltage range	Ta min ... Ta max, Io nom	AC IN	340		575	VAC
		DC IN	480		820	VDC
Rated input current	Io nom	Vi : 380VAC		2.4		A
		Vi : 500VAC		1.6		A
Line frequency	Vi nom, Io nom		47		63	Hz
Inrush current	Vi nom, Io nom, cold start	-24, -48 Models		30		A
		-24L Model		50		A
P.F.C.	Vi : 500VAC, Io nom			0.7		

OUTPUT SPECIFICATIONS

Characteristics	Conditions		min.	typ.	max.	unit
Output voltage accuracy (Adjusted before shipment)	Vi nom, Io max		-0		+ 1	%
Minimum load	Vi nom		0			%
Line regulation	Io nom, Vi min ...Vi max				\pm 1	%
Load regulation	Vi nom, Io min ...Io nom	single mode			\pm 1	%
		parallel mode			\pm 5	%
Temperature coefficient	Vi nom, Io min				\pm 0.02	% / °C
Ripple & noise	Vi nom, Io nom, BW = 20MHz				80	mV
Hold up time	Vi nom, Io nom	400VAC	14	15		ms
		500VAC	28	30		ms
Voltage trim range	Vi nom, Io nom	24V model	22.5		28.5	VDC
		48V model	47		56	VDC
DC ON indicator threshold at start up	Vi nom, Io nom	24V model	17.6		19.4	VDC
		48V model	37		43	VDC
DC LOW indicator threshold after start up	Vi nom, Io nom	24V model	17.6		19.4	VDC
		48V model	37		43	VDC
Parallel operation *2	0.9 Io max				2	unit
Efficiency	Vi nom, Io nom, Po / Pi		Up to 92%			

CONTROL AND PROTECTION

Characteristics	Conditions		min.	typ.	max.	unit
Input fuse			5A / 600VAC internal / phase			
Rated over load protection	Vi nom		110		130	%
Power Rdy *2 (for 24V model only)	Threshold voltage of contact closed(at start up)		17.6		19.4	VDC
	Electrical isolation		500			VDC
	Contact rating at 60VDC				0.3	A
Over voltage protection	Vi nom, Io nom (Shut down O/P voltage, re-power on to recover)	24V model	30		33	V
		48V model	60		68	V
Output short circuit	Vi nom	Continuous	Current limited			
Over temperature	Detect on heatsink, shut down O/P voltage, recovers automatically after temperature goes down.		100		110	°C

*1. Single phase input is permissible, but output is derated to 75%. *2. 24L model no this function.

SPECIFICATION

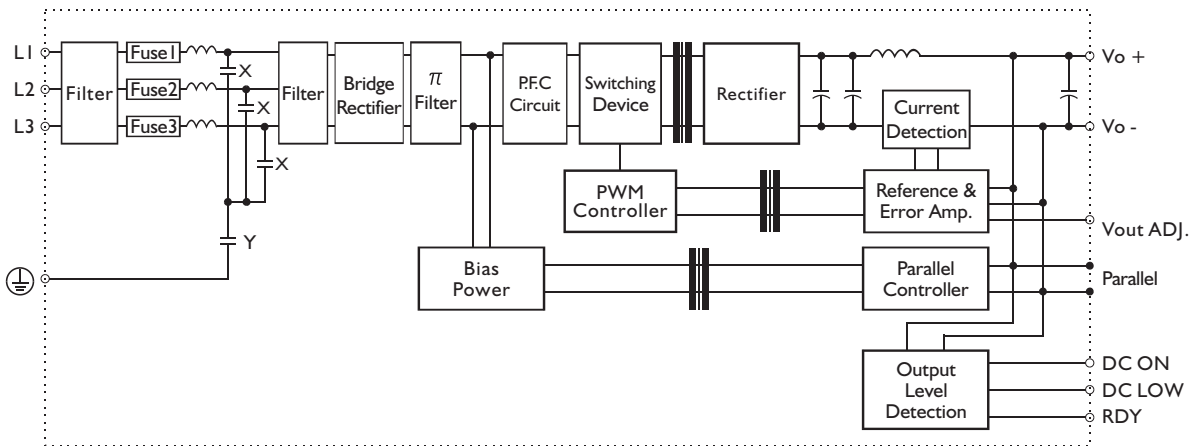
All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

APPROVALS AND STANDARDS

UL / cUL	UL508 Listed, UL60950-1 Recognized
TUV	EN60950-1
CE	EN61000-6-3, EN55022 class B, EN61000-3-2, EN61000-3-3 EN61000-6-2, EN55024

CIRCUIT SCHEMATIC

• Block diagram for WRA960 series



PHYSICAL CHARACTERISTICS

CASE SIZE

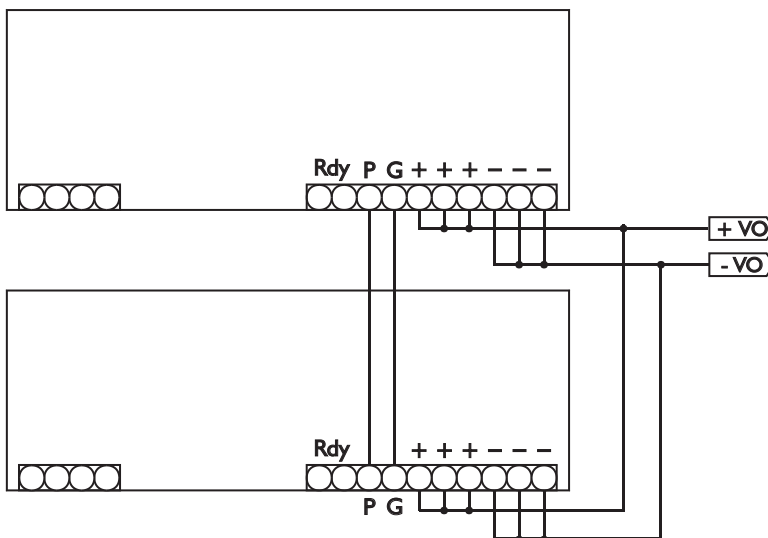
SCREW TERMINAL TYPE

125.9 x 275.8 x 118.2 mm 4.96 x 10.86 x 4.65 inches

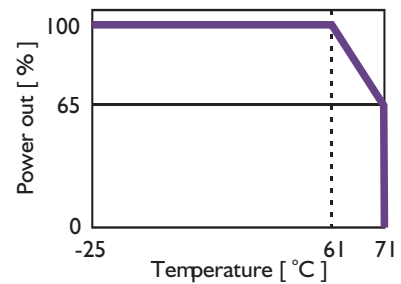
WEIGHT

3.2kg

PARALLEL

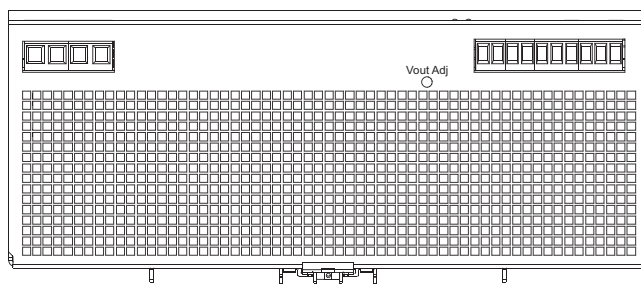
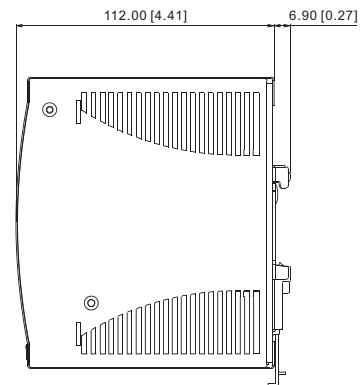
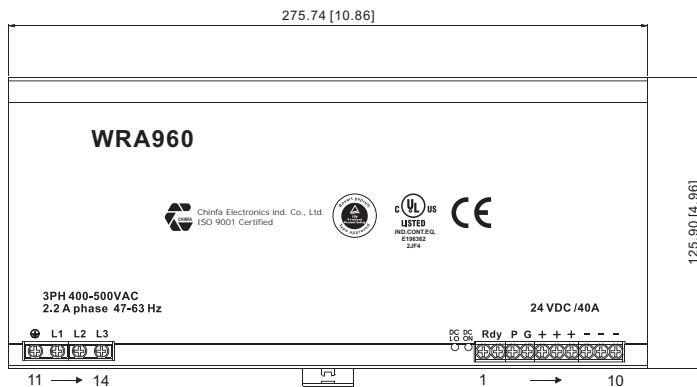


DERATING



MECHANISM & PIN CONFIGURATION

mm [inch]



CONSTRUCTION

Easy snap-on mounting onto the DIN-Rail (TS35/7.5 or TS35/15), unit sits safely and firmly on the rail.

INSTALLATION

Ventilation / Cooling
Normal convection
All sides 25mm free space
For cooling recommended
Connector size range
10-24AWG flexible / solid cable,
8 m/m stripping at cable end recommends

PIN ASSIGNMENT

PIN NO.	Designation	Description
1	RDY	A normal open relay contact for DC ON level control
2	RDY	(Never connect except 24V model)
3	P	Parallel PIN for current share
4	G	Parallel GEN PIN for current share
5	V +	Positive output terminal
6	V +	Positive output terminal
7	V +	Positive output terminal
8	V -	Negative output terminal
9	V -	Negative output terminal
10	V -	Negative output terminal
11	⊕	Ground this terminal to minimize high-frequency emissions
12	L1	Input terminals
13	L2	Input terminals
14	L3	Input terminals
	DC ON	Operation indicator LED
	DC LO	DC LOW voltage indicator LED
	Vout ADJ.	Trimmer-potentiometer for Vout adjustment

* WRA960-24L without PIN 1, PIN 2, PIN 3, PIN 4.