

6000VA DC/AC THREE-PHASE SINE INVERTER

24Vdc, 48Vdc, 72Vdc, 110Vdc, 115Vdc, 127Vdc
to 400Vac three phase outputs

GENERAL FEATURES:

Sine wave output voltage
Suitable for motors control
Adjustable output frequency
Adjustable output voltage
High input-output isolation 3000Vrms
Remote off opto-coupled
Alarm by isolated relay contacts
Configurable input: Reverse or Mid power

Paralleable output (optional) Railway

version EN50155 (optional) Fire and
smoke: EN45545-2 approved



Available models

	24Vdc 16.8 ... 30V	48Vdc 33.6 ... 60V	72Vdc 50.4 ... 90V	110Vdc 77 ... 138V
400Vac	3500 W	6000 W	6000 W	6000 W

Version and order code:

WRHD-DC/AC in - 400 - 4500 - 3PH : DC-AC Three-phase sine converter

in : Input DC voltage (24Vdc, 48Vdc, 72Vdc, 110Vdc, 127Vdc) +/-20%

Output AC voltage : 400Vac

Output power : 6000W

Mounting : **-WM** Wall mounting (standard)

WRHD-DC-AC-6000W-3PH



INPUT

Input voltage range	-30, +25% Vin nom
Maximum input ripple	5% Vin nom (Vrms, 100Hz)

OUTPUT

Nominal output voltage (Von)	See table
Output voltage range	20...100% of Von (adjust via remote control)
Output frequency	50 / 60Hz via DIP-switch, 5...75Hz via RS-232
Load regulation	< 4.5%
Line regulation	< 2% Vin -25% ... +25% < 10% Vin -30% ... +30% < 20 % Vin -40 % ... +40 % (100ms)
Output wave distortion THD	< 2% (average of 16 samples)
Output HF ripple	< 2.5%

ENVIRONMENTAL

	Options B and T	Option L (Note-1)
Storage temperature	-25 ... 80 °C	-40 ... 80 °C
Operating temperature: Full load	-25 ... 55 °C (EN50155 OT1)	-40 ... 55 °C (EN50155 OT2)
Operating temperature: 62.5 % load	-25 ... 70 °C (EN50155 OT3)	-40 ... 70 °C (EN50155 OT4)
Operating temperature: 25 % load	-25 ... 85 °C (EN50155 OT5)	-40 ... 85 °C (EN50155 OT6)
Relative humidity without condensation	5 ... 95%	
Maximum altitude	2000m at full load, 2500m at 95% of load	
Cooling	Internal controlled internal fan	
Shock and Vibrations according to	EN61393:2011 Category 1 Class B body mounted	
MTBF (MIL-HDBK-217-E; Gb, 25°C)	100.000 h	

EMC

Immunity according	EN61000-6-2, EN50121-3-2
Emissions according	EN61000-6-4, EN50121-3-2

SAFETY

Dielectric strength: Input /output	3000Vrms / 50Hz / 1min
Dielectric strength: Output / Earth	1500Vrms / 50Hz / 1min
Dielectric strength: Input / Earth	500Vrms / 50Hz / 1min
Safety according to	EN60950-1, EN62368-1
Fire and smoke	EN45545-2 approved (only for options T and L , railway versions)

MECHANICAL

Weight	< 8950 g
Protection degree	IP20

PROTECTIONS

Against overloads	Current and I ² T limited (see overload protection curve)
Against over-temperature	Shutdown with auto-recovery

CONTROL

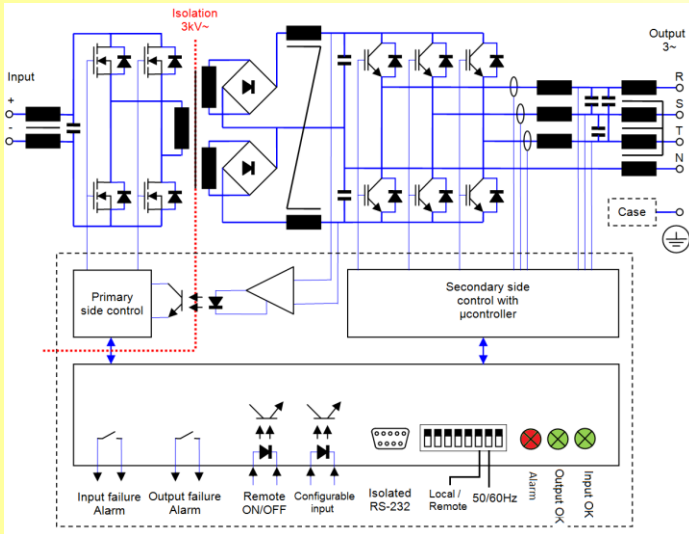
Output OK LED	Green
Input OK LED	Green
Alarm LED	Red
Input alarm	Open when alarm. Maximum rating: 0.16A at 160Vdc
Output alarm	Open when alarm. Maximum rating: 0.16A at 160Vdc
Remote OFF input	Off applying 15...143 Vdc (acc. to EN50155), Impedance >35kΩ
Configurable input (reverse or mid-power)	ON: applying 15...143 Vdc (acc. to EN50155), Impedance >35kΩ

Note-1: Is not recommended to handle connectors below -25°C

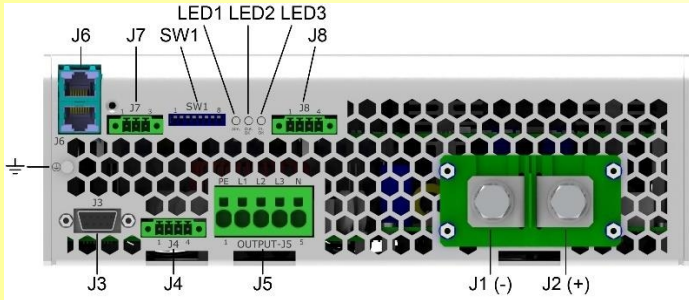
WRHD-DC-AC-6000W-3PH



BLOCKS DIAGRAM



CONNECTIONS



J1	-Vin	Terminal M8
J2	+Vin	
J5 - 1	Protective Earth	Cables 2.5 ... 4mm ²
J5 - 2	Output R	
J5 - 3	Output S	
J5 - 4	Output T	
J5 - 5	Output Neutral	
J4 - 1	+ Configurable input	Phoenix Contact MC1.5/4-GF-3.81 Recommended female:
J4 - 2	- Configurable input	
J4 - 3	+ Remote	Phoenix Contact MC1.5/4-STF-3.81
J4 - 4	- Remote	
J8 - 1	Status output	Phoenix Contact MC1.5/4-GF-3.81 Recommended female:
J8 - 2	Status output	
J8 - 3	Status input	Phoenix Contact MC1.5/4-STF-3.81
J8 - 4	Status input	
J7 - 1	CAN L (optional Can bus)	Phoenix Contact MC1.5/3-GF-3.81 Recommended female:
J7 - 2	CAN H (optional Can bus)	
J7 - 3	GND CAN	Phoenix Contact MC1.5/3-STF-3.81
J3	RS-232	Female D-Sub DB9
J6A - J6B	Optional Parallel operation	RJ45

POWER DERATING vs AMBIENT TEMP.



DESCRIPTION

The WRHD consists of three phase sine-wave DC-AC inverters with galvanic isolation between input and output.

The unit allows:

- Changing the output frequency by means of DIP-switch-7 of SW1. OFF: 50Hz (default programmed), ON: 60Hz
- Change local/remote (waiting RS-232 commands) by means of DIP-switch-6 of SW1. OFF: local, ON: remote
- Shutdown applying voltage output 15 to 143V on pins 3 and 4 of J4
- Start-up motors by means of a soft start. In the start-up, the output voltage rises linearly from 0V to set voltage and the frequency from the initial to the set one. The start-up ramp slope may be changed via RS-232
- Set the rotation speed of a motor according to the appropriate Voltage/Frequency ratio.
- Configurable input (pin 1 and 2 of J4):
 - Reverse mode: Changing the rotation direction for the next start-up of a motor by applying voltage between 15 and 143V.
 - Mid power mode: Changing the output frequency in V/F mode from nominal to a mid-power frequency by applying voltage between 15 and 143V.
- Monitoring the status of the input and output voltage through the contacts of two separate solid state relays.
- Set and monitor parameters via RS-232.

The WRHD is equipped with a maximum average power protection as well as maximum output peak current protection. This protects the semiconductors even when an output short-circuit occurs. It also features a disable function for input under-voltage, which allows protecting the batteries from harmful discharges.

START-UP

- The unit has 6 threaded holes for the fixation on a mounting surface.
- The unit has internal fans. For an appropriate cooling, the air input and output should be free of elements that cause and an air flow reduction (minimum recommended distance to other objects 90mm).
- Make connections as shown in the figure.
- The default output frequency is 50Hz. For 60Hz simply actuate the dip-switch as indicated in the figure.

For safety reasons, the following requirements must be met:

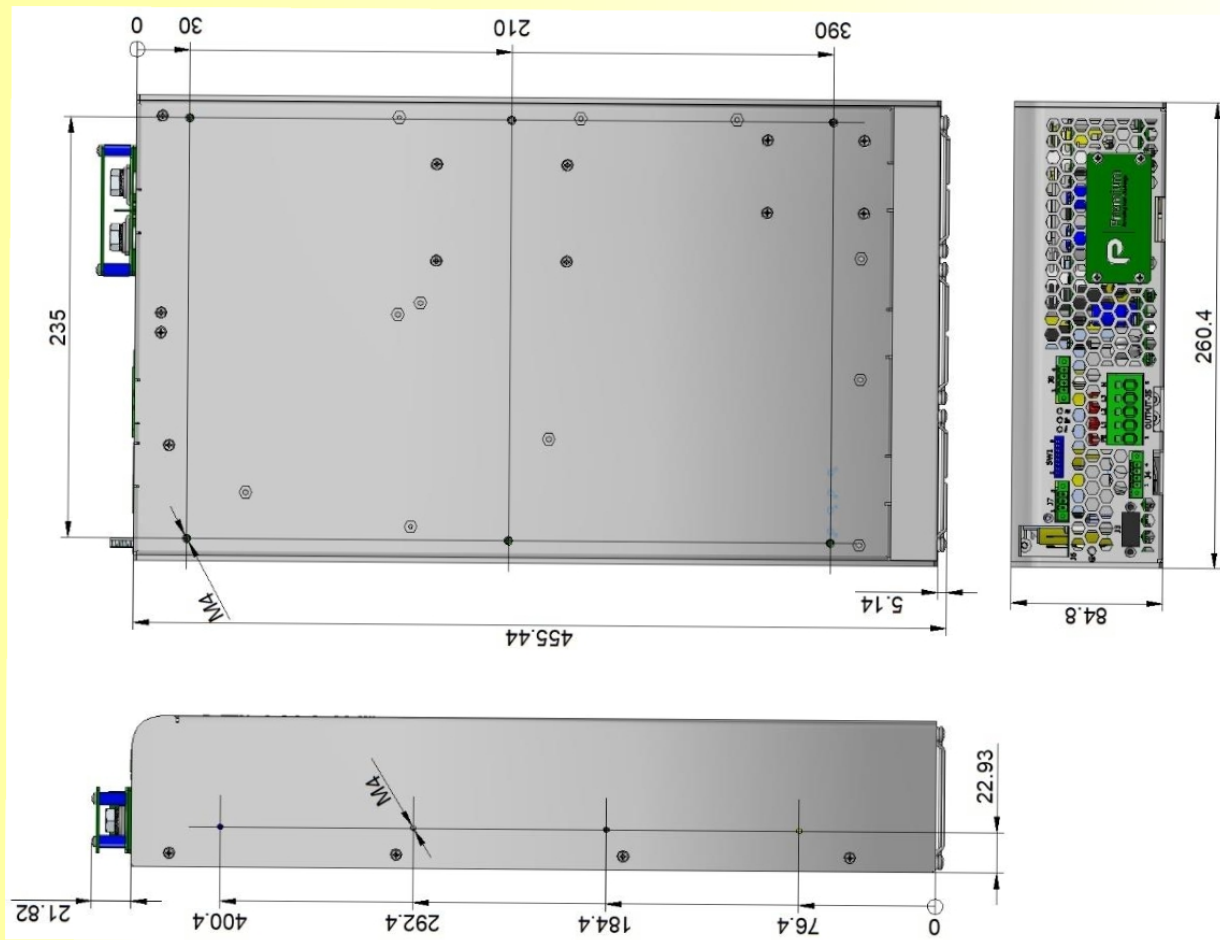
- Provide the equipment with some kind of protective enclosure that complies with the electrical safety directives in effect within the country where the equipment is installed.
- Include an input fuse with a rating immediately higher than the maximum input current.
- Use cables of adequate cross-section to connect inputs and outputs. The following table lists the maximum currents and the minimum cross-sections for the cables used for each power connection.

	Input 24V	Input 48V	Input 72V	Input 110V	Output 400V
Maximum current	232 A	191 A	127A	83A	8.7A
Cable cross-section	150 mm ²	95 mm ²	50 mm ²	25 mm ²	2.5 mm ²

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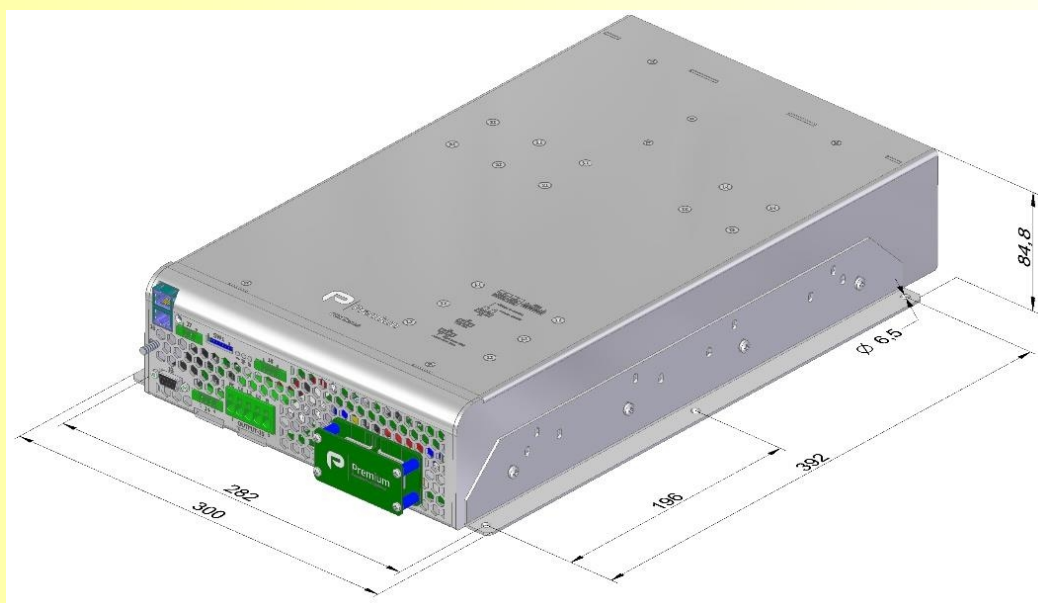
DIMENSIONS



ACCESSORIES

NOTE: All the fixing holes are M4. Maximum screw length inside de inverter 5mm.

Description	Notes	CODE
Mounting brackets kit	Contains two brackets and screws	NP-9282



WRHD-DC-AC-6000W-3PH



WORKING PARAMETERS

Thermal protection					
Internal warning temperature (output alarm)			88		°C
Internal shutdown temperature			92		°C
Internal restart temperature			75		°C
Internal temperature of fan start-up			45		°C
Input voltage parameters					
	24V	48V	72V	110V	
High input voltage shutdown instantaneous	33.6	62.4	93.6	143.0	Vdc
High input voltage timed shutdown (t) (Input alarm)	31.2	60.0	90.0	137.5	Vdc
<u>Start-up voltage</u>	19.2	38.4	57.6	88.0	Vdc
Low input voltage timed shutdown (t) (Input alarm)	16.8	33.6	50.4	77.0	Vdc
Low input voltage instantaneous shutdown	14.4	28.8	43.2	66.0	Vdc
Time to shutdown (t)	500				ms
Output voltage parameters					
<u>Output voltage phase-neutral</u>	230				Vac
Output under-voltage shutdown	< 85% of setting 1000ms				
Warning voltage (output alarm)	< 90% of setting 200ms				
<u>Initial start-up frequency</u>	5				Hz
Soft start duration	1 cycles				
<u>Ramp-up V/F</u>	1 Hz/cycle				
Output current parameters					
<u>Maximum continuous output current</u>	6.52	8.66	8.66	8.66	A
<u>Warning current (output alarm)</u>	6.20	8.22	8.22	8.22	A
Maximum overload I ² t	See figure below				
Time between restart attempts	4000				ms
Number of attempts of consecutive overload	5				
Working failures and reset					
Lock for continuous overload or internal failure	Unlimited time				
Reset time by input disconnection	> 2				min

Configurable parameters underlined

OVERLOAD PROTECTION

Protection against overloads and short-circuits	By current limiting at I _{opk} By I²t . The unit shutdowns when the current-time is over the continuous operation curve	
Overload protection recovery	Every 4 seconds after shutdown, the unit tries to restart up to 5 times. If the overload persists, the unit reminds shutdown until an input reconnection .	