ODX-3000

2400...3000 VA DC/AC INVERTER

GENERAL FEATURES:

Sine wave output voltage
Suitable for motors control
Selectable output frequency: 50/60 Hz
Adjustable output voltage
High input-output isolation 3000 Vrms
Remote inhibit
Configurable input: Reverse or Mid power
Remote control via RS232
Alarms by isolated relay contacts
Remote off opto-coupled
Optional railway version EN50155
Fire and smoke: EN45545-2 approved

	24 Vdc 16.8 ... 30 V	36 Vdc 25.2 ... 45 V	48 Vdc 33.6 ... 60 V	72 Vdc 50.4 ... 90 V	110 Vdc 77 ... 138 V
230 Vac	**ODX-3000-7413** 2400 W	Available under request	Available under request	Available under request	**ODX-3000-7417** 3000 W
400 Vac	**ODX-3000-7403** 2400 W	**ODX-3000-7404** 3000 W	**ODX-3000-7405** 3000 W	**ODX-3000-7406** 3000 W	**ODX-3000-7407** 3000 W

Several references are subjected to special MOQs and lead times. Please consult Premium's Sales Dept. and web site.

INPUT		
Input voltage range	-30, +25 % Vin nom	
Maximum input ripple	5% Vin nom (Vrms, 100 Hz)	
OUTPUT		
Nominal output voltage (Von)	See table	
Output voltage range	50 … 230 Vac (models of 230 Vac output) via RS232 50 … 400 Vac (models of 400 Vac output) via RS232	
Output frequency	50 / 60 Hz via DIP-switch, 5…75 Hz via RS-232	
Load regulation	< 4 %	
Line regulation	< 2 % Vin -25 % … +25 % < 10 % Vin -30 % … +25 % < 20 % Vin -40 % … +40 % (100ms)	
Output waveform 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)
Relative humidity	5 … 95 %	
Maximum altitude	2000m at full load, 2500m at 95% of load	
Cooling	Controlled internal fan	
Shock and vibration	According to EN61373:2010 + Corr 1:2011 Category 1 class B body mounted	
MTBF (MIL-HDBK-217-E; G_b, 25 °C)	100.000 h	
EMC		
Immunity according	EN61000-6-2, EN50121-3-2	
Emissions according	EN61000-6-4, EN50121-3-2	
SAFETY	**Options B and T**	**Option L**
Dielectric strength: Input / Output	3000 Vrms / 50 Hz / 1 min	3000 Vrms / 50 Hz / 1 min
Dielectric strength: Output / PE	1500 Vrms / 50 Hz / 1 min	2500 Vrms / 50 Hz / 1 min
Dielectric strength: Input / PE	1000 Vrms / 50 Hz / 1 min	2500 Vrms / 50 Hz / 1 min
Dielectric strength: Signals (Note-2) / PE, Input	1500 Vrms / 50 Hz / 1 min	1500 Vrms / 50 Hz / 1 min
Dielectric strength: Signals (Note-2) / Output	1500 Vrms / 50 Hz / 1 min	2500 Vrms / 50 Hz / 1 min
Safety according to	EN62368-1	
Fire and smoke according to	EN45545-2 (only for options **T** and **L**, railway versions)	
MECHANICAL		
Weight	< 7150 g	
PROTECTIONS		
Against overloads	Current and I^2T limited (see overload protection)	
Against over-temperature	Shutdown with auto-recovery	
CONTROL		
Output OK LED	Green	
Input OK LED	Green	
Input alarm	Open when alarm. Maximum rating: 0.16 A at 160 Vdc	
Output alarm	Open when alarm. Maximum rating: 0.16 A at 160 Vdc	
Remote OFF input	OFF: applying 15…154 Vdc (acc. to EN50155), Impedance >35kΩ	
Configurable input (reverse rotation or mid-power)	ON: applying 15…154 Vdc (acc. to EN50155), Impedance >35kΩ	

Note-1: Is not recommended to handle connectors below -25°C
Note-2: Signals include RS-232 port, control inputs and alarms outputs

ORDERING CODES

Model	Input				Output						
	Voltage		Current		Voltage	Power		Current			Effic
	Nom	range	No load	Max	Nom	Active	Appar	Cont. rms	5s rms	10ms Iopk	
	[V]	[V]	[A]	[A]	[V]	[W]	[VA]	[A]	[A]	[A]	[%]
ODX-3000-7403	24	16.8 - 30	<1.58	160,5	400	2400	2400	3.46	5.25	11	89
ODX-3000-7404	36	25.2 - 45	<1.05	132,3	400	3000	3000	4.33	6.6	11	90
ODX-3000-7405	48	33.6 - 60	< 0.79	98,1	400	3000	3000	4.33	6.6	11	91
ODX-3000-7406	72	50.4 - 90	< 0.52	65,4	400	3000	3000	4.33	6.6	11	91
ODX-3000-7407	110	77 - 138	< 0.34	42,3	400	3000	3000	4.33	6.6	11	92
ODX-3000-7413	24	16.8 - 30	<1.58	160,5	230	2400	2400	6.00	9.0	19	89
ODX-3000-7417	110	77 - 138	< 0.34	42,8	230	3000	3000	7.55	11.3	19	91

Several references are subjected to special MOQs and lead times. Please consult Premium's Sales Dept. and web site.

ODX–3000–74_ _–_ _

I Remote OFF reversed (Optional. ON applying 15…154V)

B Industrial version

T Railway version according to EN50155

L Extended railway version. Includes the following:

- Lower temperature operation (-40ºC)
- Higher isolation input & output to earth (2500Vac)
- Output terminals type Cage clamp
- Signal connectors with locking lever
- New enclosure style

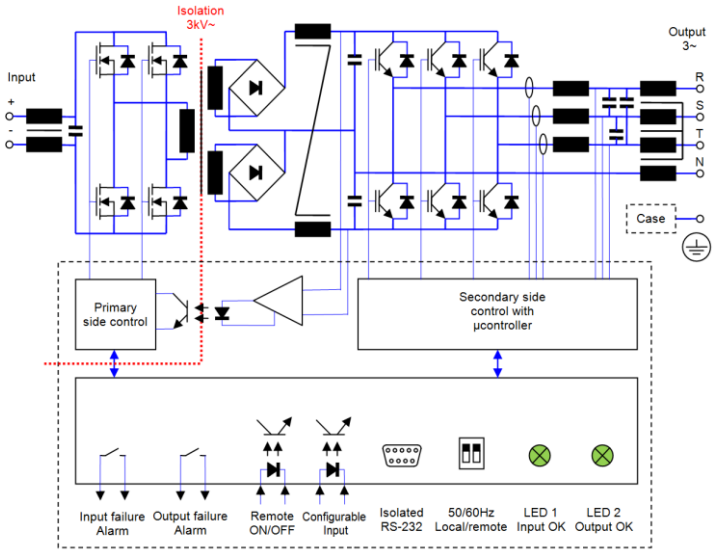
Model number

Options B and T

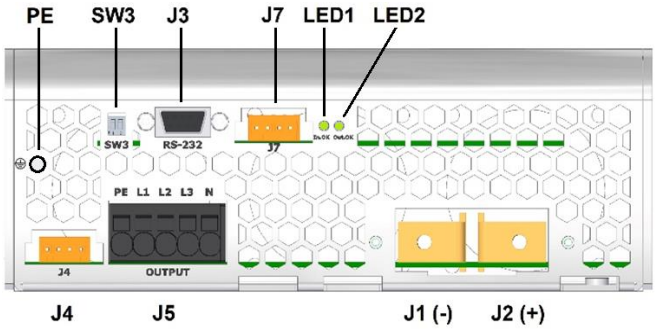
Option L

Accessories must be ordered in a separate order line

BLOCKS DIAGRAM



CONNECTIONS



J1	-Vin	Terminals M6 (Rec. torque 6 Nm)
J2	+Vin	
PE	Protective Earth	Stud M5 (Rec. torque 3.8 Nm)
J5 - 1	Protective Earth	Cables 1.5 … 2.5 mm^2
J5 - 2	Output R	
J5 - 3	Output S	
J5 - 4	Output T	
J5 - 5	Output Neutral	
J4 - 1	+ Configurable input	Cables 0.25 … 1.5 mm^2 **Option B and T** Phoenix Contact MC1.5/4-G-3.81 Includes female: FK-MCP 1.5/4-ST-3.81 **Option L** Wago 734-264 Includes female: 734-204/037-000
J4 - 2	- Configurable input	
J4 - 3	+ Remote ON/OFF	
J4 - 4	- Remote ON/OFF	
J7 - 1	Output alarm	
J7 - 2	Output alarm	
J7 - 3	Input alarm	
J7 - 4	Input alarm	
J3 - 2	RS-232 Rx	Sub-DB9 female
J3 - 3	RS-232 Tx	
J3 - 5	RS-232 GND	
J3 rest	Not connected	
SW3	Options switch	ON is position down

DESCRIPTION

The ODX-3000 consists of three phase sine-wave DC-AC inverters with galvanic isolation between input and output.

The unit allows:

- Three working modes configurable via switch SW3:

SW3-1	SW3-2	Working mode
OFF (UP)	OFF (UP)	Output frequency: 50Hz or the one programmed by default via RS232, if different from 50Hz. Output enabled by default.
OFF (UP)	ON (DOWN)	Output frequency: 50Hz or the one programmed by default via RS232, if different from 50Hz. Output disabled by default. It is enabled by the PRG3999.9 command (RS232).
ON (DOWN)	OFF/ON (UP/DOWN)	Output frequency: 60Hz.

When SW3-2 is ON (down position), the AC output must be enabled by means of the command PRG3999.9. You will find more information about this and other commands in the table "RS232 communication port" in the section below (see page 6/10).

- Shutdown applying voltage output 15 to 154 V 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 0 V 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 154 V
  - Mid power mode: Changing the output frequency in V/F mode from nominal to a mid-power frequency by applying voltage between 15 and 154 V.
- 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.

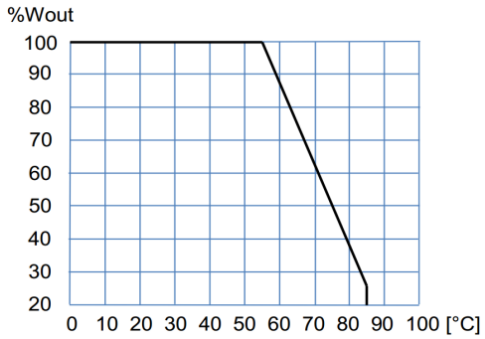
The ODX-3000 is equipped with a maximum average power protection as well as maximum output peak current protection. This protects the semiconductors even when an output short-circuit occurs. It also features a disable function for input under-voltage, which allows protecting the batteries from harmful discharges.

INSTALLATION

- The unit has 4 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 an air flow reduction (minimum recommended distance to other objects 50 mm).
- Make connections as shown in the figure.
- The ground connection can be made through the terminal strip (J5-1) or the ground stud on the front side indistinctly.
- The default output frequency is 50 Hz. For 60 Hz simply actuate the DIP-switch as indicated in the figure.

For safety reasons, the following requirements must be met:

POWER DERATING vs AMBIENT TEMP.



- 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 24 V	Input 36 V	Input 48 V	Input 72 V	Input 110 V	Output 230 V	Output 400 V
Maximum current	161 A	132 A	98 A	66 A	43 A	7.55 A	4.4 A
Cable cross-section	**50 mm²**	**50 mm²**	**25 mm²**	**16 mm²**	**10 mm²**	**1.5 mm²**	**1.5 mm²**

RS232 communication port

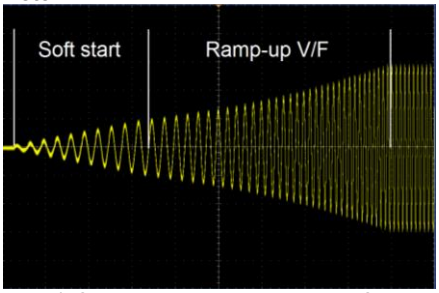
It is possible to control and monitor de unit via RS232 by means a terminal emulator like "Tera Term" or "Putty".
It is also possible to control and monitor the unit directly using the protocol showed in table:

Protocol configuration: ASCII code, 9600 bauds, parity none, 8 bits, 1bit stop

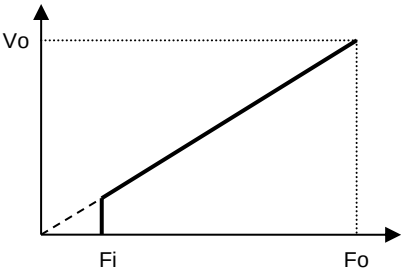
Header		Function	Parameter		Returns	Explanation
P	R	L	V		PTV■■■.■	Input voltage in Volts
			v		PTv■■■.■	Input voltage ripple in Volts
			U		PTURS=■■■■*[13]*UST=■■■■*[13]* UTR=■■■■	Output voltage in Volts RMS (*[13]* = char 13 of ASCII code)
			I		PTIR=■■.■■*[13]*IS=■■.■■*[13]* IT=■■.■■	Output current in Amps RMS (*[13]* = char 13 of ASCII code)
			T		PTT■■■.■	Internal temperature in K
			F		PTF■■■.■	Nominal output frequency in Hz
			f		PTf■■■.■	Actual output frequency in Hz
			u		PTu■■■.■	Actual output voltage set-point in V
			S		PTS■■■.■	Inverter state **999.9** → Enabled **000.0** → Disabled **222.2** → Blocked by overload **111.1** → Blocked by overload or short-circuit
			M		PTM■■■■	Model number
			R		PTR■■■■	Firmware version
			Other		PTE	Command not supported
		G	1	■■■.■	OK / ERR	Set the low input voltage timed shutdown in V
			2	■■■.■	OK / ERR	Set the minimum alarm input voltage in V
			3	■■■.■	OK / ERR	Change the status bit (after start-up enabled with SW3 =LOCAL and disabled with SW3 =REMOTE) **999.9** → Inverter enabled **000.0** → Inverter disabled
			4	■■■.■	OK / ERR	Set the output voltage in Vrms (Vo). (output must be stopped) 050.0 ≤ ■■■.■ ≤ 232.0 (models of 230V output) 050.0 ≤ ■■■.■ ≤ 405.0 (models of 400V output)
			5	■■■.■	OK / ERR	Set the maximum output current in Arms 20% I_{nom} ≤ ■■■.■ ≤ 100% I_{nom}
			6	■■■.■	OK / ERR	Set the nominal output frequency in Hz (Fo) (output must be stopped) 005.0 ≤ ■■■.■ ≤ 075.0
			7	■■■.■	OK / ERR	Set the alarm maximum output current in Arms 0 < ■■■.■ ≤ 100% $I_{max\_warning}$
			8	■■■.■	OK / ERR	**111.1** → Reset the inverter
			L	■■■.■	OK / ERR	Set the minimum input starting voltage in Volts
			O	■■■.■	OK / ERR	Set the initial frequency in the start-up (Fi) 005.0 ≤ ■■■.■ ≤ 075.0
			P	■■■.■	OK / ERR	Set the ramp-up in increment of "N" cycles per Hz in mode V/F, frequency changes or start-up (Note-1) 001.0 ≤ ■■■.■ ≤ 100.0
			Q	■■■.■	OK / ERR	Set the ramp-down in decrement of "N" cycles per Hz in mode V/F(Note-1) 002.0 ≤ ■■■.■ ≤ 100.0
			Y	■■■.■	OK / ERR	* Change the working mode of the input J4-1,J4-2 **111.1** → Input as reverse phase control (default) **222.2** → Input as mid-power control
			X	■■■.■	OK / ERR	* Set the mid-power frequency for V/F mode by the use of input J4-1,J4-2 005.0 ≤ ■■■.■ ≤ 75.0
		M	1	■■■.■	OK / ERR	Set a new output frequency in Hz (output must be run and not stored in memory) 005.0 ≤ ■■■.■ ≤ 075.0
			2	■■■.■	OK / ERR	Set a new output voltage in Volts (output must be run and not stored in memory) 050.0 ≤ ■■■.■ ≤ 232.0 (models of 230V output) 050.0 ≤ ■■■.■ ≤ 405.0 (models of 400V output)
			3	■■■.■	OK / ERR	Set a new output frequency in Hz in mode V/F (output must be run and not stored in memory) 005.0 ≤ ■■■.■ ≤ 075.0
			4	■■■.■	OK / ERR	Changes the output phase order (output must be run and not stored in memory) **111.1** → Phase RST (direct phase) **222.2** → Phase SRT (reverse phase)

* Parameters are only useful from version 6.0 of firmware

Note 1:

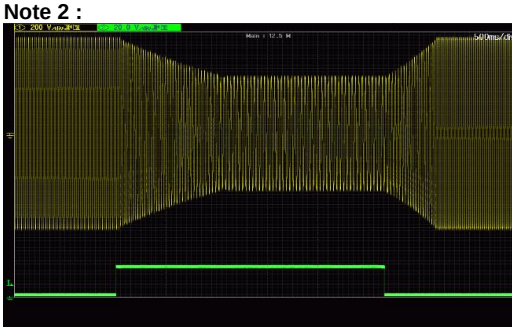


Example for N=1: start-up time = N x 1.7 s for changes from 16 Hz to 50 Hz



Mode V/F curve

Note 2 :



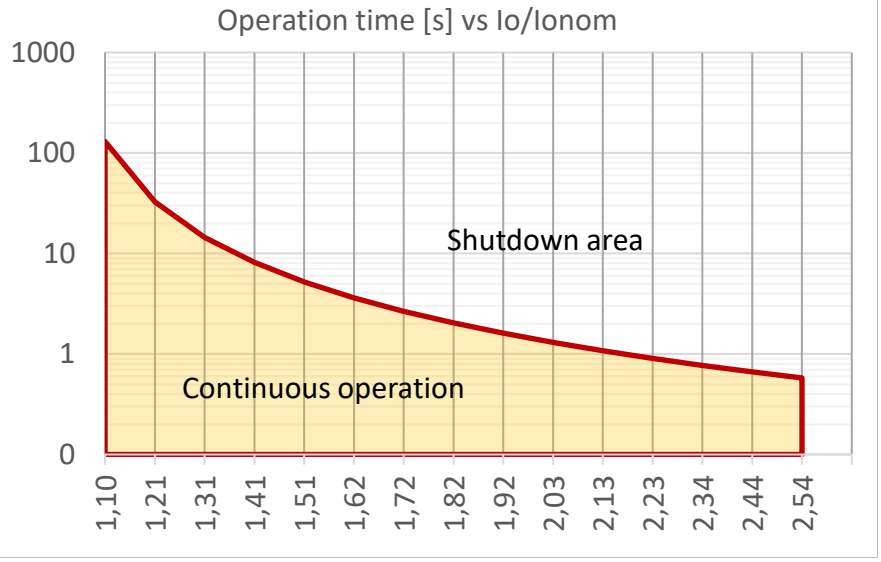
Example for change from 50Hz / 400 V to 30 Hz and 240 V with ramp-down of 2 cycles / Hz and ramp-up de 1 Cycle/Hz. Yellow: output voltage and Green: Mid-Power input signal

WORKING PARAMETERS (Configurable parameters underlined)

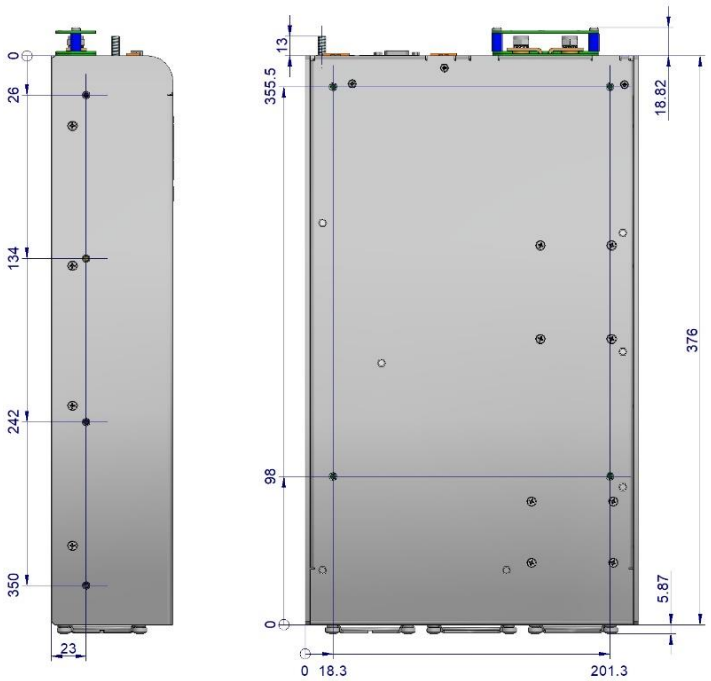
Thermal protection	**7403…7417**					
Internal warning temperature(output alarm)	82					ºC
Internal shutdown temperature	98					ºC
Internal restart temperature	87					ºC
Internal temperature of fan start-up	45					ºC
Input voltage parameters	**7403 7413**	**7404**	**7405**	**7406**	**7407 7417**	
High input voltage shutdown instantaneous	33.6	50.4	67.2	100.8	154.0	Vdc
High input voltage timed shutdown (t) (Input alarm)	31.2	46.8	62.4	93.6	143.0	Vdc
Low start-up input voltage	16.8	25.2	33.6	50.4	77.0	Vdc
Low input voltage timed shutdown (t) (Input alarm)	<16.8	<25.2	<33.6	<50.4	<77.0	Vdc
Low input voltage instantaneous shutdown	<14.4	<21.6	<28.8	<43.2	<66.0	Vdc
Time to shutdown (t)	500					ms
Output voltage parameters	**7403…7407**			**7413…7417**		
Output voltage	400			230		Vac
Output under-voltage shutdown	< 85% of setting 1000 ms					
Warning voltage (output alarm)	< 90% of setting 200 ms					
Initial start-up frequency	16					Hz
Soft start duration	10 cycles					
Ramp-up V/F	1 Hz/cycle					
Output current parameters	**7403**	**7404 … 7407**		**7413**	**7414 … 7417**	
Maximum continuous output current	3.46	4.33		6.30	7.55	A
Warning current (output alarm)	3.46	4.33		6.30	7.55	A
Maximum overload I^2t	See figure below					
Time between restart attempts	4000					ms
Number of attempts of consecutive overload	5					
Working failures and reset	**7403…7417**					
Lock for continuous overload or internal failure	Unlimited time					
Reset time by input disconnection	> 2					min

OVERLOAD PROTECTION

Protection against overloads and short-circuits	By **current** limiting at Iopk By **I^2t**. 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**.

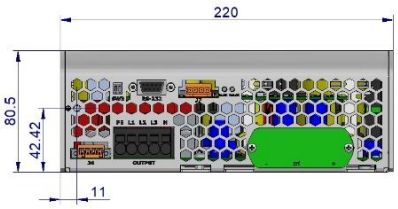


DIMENSIONS



Remarks:

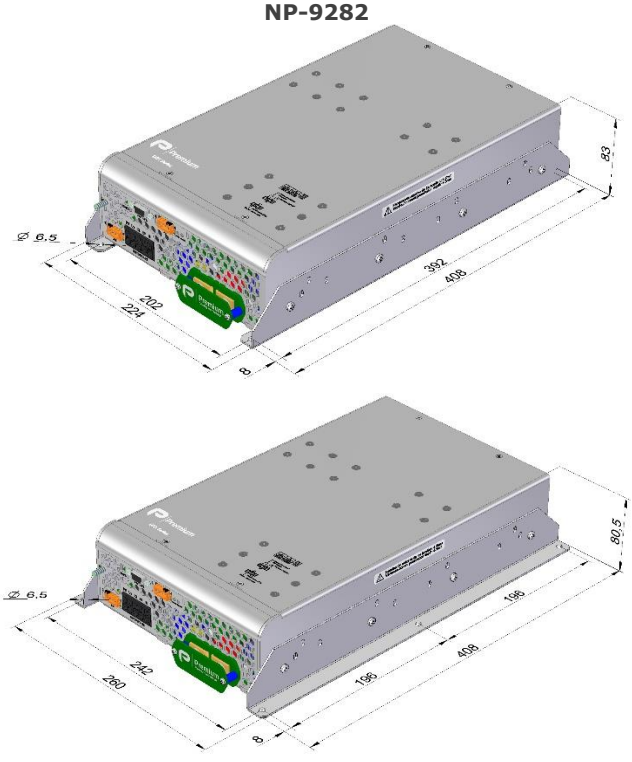
- The fixing holes are M4. **Its maximum allowable depth penetration is 4.5mm**
- Enclosures of models B, T and L have the same dimensions and fixing holes



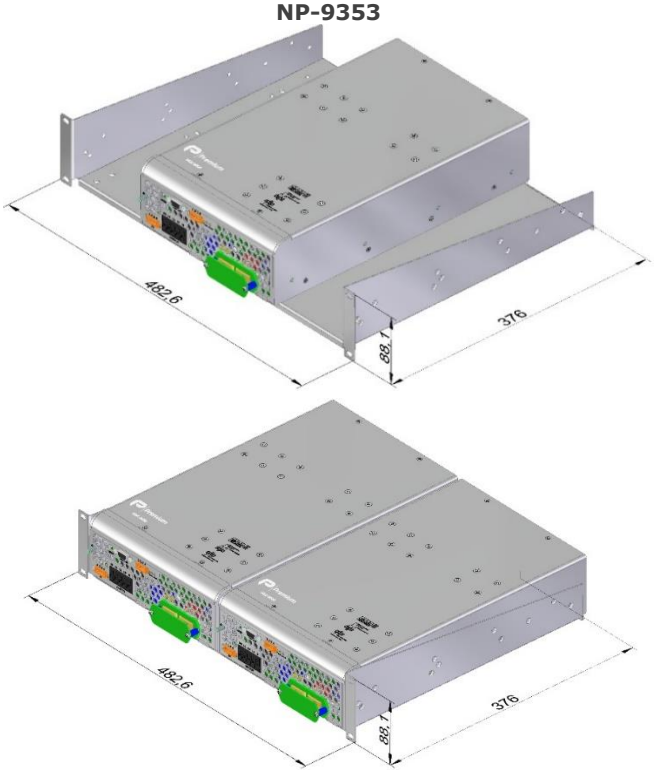
ACCESSORIES

Description	Notes	CODE
Mounting brackets kit	Contains two brackets and screws	NP-9282
2U 19" rackmount tray kit	It allows to install one or two ODX-3000	NP-9353

NP-9282



NP-9353



EU DECLARATION OF CONFORMITY

The undersigned, representing the following:

Manufacturer: PREMIUM, S. A.,
Address: C/ Dolors Aleu 19-21, 08908 L'Hospitalet de Llobregat, SPAIN

herewith declares that the product:

Type:	**DC/AC Inverter**
Brand:	**Premium**
Models:	**ODX-3000-7403, ODX-3000-7404, ODX-3000-7405, ODX-3000-7406, ODX-3000-7407, ODX-3000-7413, ODX-3000-7417** with any of the suffixes **B**, **T**, **L** or **I**

is in conformity with the provisions of the following EU directive(s):

2014/35/EU	Low voltage / The electrical equipment (safety) regulations
2014/30/EU	EMC / Electromagnetic compatibility regulations
2011/65/EU Annex II and its amendment 2015/863/EU	RoHS / Restriction of the use of certain hazardous substances in electrical and electronic equipment

This declaration applies to all specimens manufactured identical to the samples submitted for testing/evaluation.

Assessment of compliance of the product with the requirements relating to aforementioned directives, was performed by Premium S.A. and is based on the following standards:

EN IEC62368-1:2024 A11:2024	Safety. Audio/video information and communication technology equipment
EN IEC61000-6-4:2019	Generic emission standard
EN IEC61000-6-2:2019	Generic Immunity standard
EN IEC63000:2018	Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances
EN50155: 2021*	Railway applications. Electronic equipment used on rolling stock material
EN50121-3-2: 2016* A1:2019	Railway applications. EMC Rolling stock equipment

* Optional, see annexe

CE marking year: **2013**

Notes:
For the fulfilment of this declaration the product must be used only for the aim that has been conceived, considering the limitations established in the instructions manual or datasheet.

L'Hospitalet de Llobregat, 19-03-2025

Manuel Camacho
Technical Director

PREMIUM S.A. is an ISO9001and ISO14001 certified company by **Bureau Veritas**

UKCA DECLARATION OF CONFORMITY

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Complies with the essential protection requirements of the following regulations:

SI 2016 No 1101	Low voltage / The electrical equipment (safety) regulations
SI 2016 No 1091	EMC / Electromagnetic compatibility regulations
SI 2012 No. 3032	RoHS / Restriction of the use of certain hazardous substances in electrical and electronic equipment

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EN50155: 2017*	Railway applications. Electronic equipment used on rolling stock material
EN50121-3-2: 2016*	Railway applications. EMC Rolling stock equipment
EN50121-4: 2016* +A1:2019	Railway applications. EMC of the signalling and telecommunications apparatus

* Optional, see annexe

UKCA marking year: **2021**

Notes:
For the fulfilment of this declaration the product must be used only for the aim that has been conceived, considering the limitations established in the instructions manual or datasheet.

L'Hospitalet de Llobregat, 19-03-2025

Manuel Camacho
Technical Director

PREMIUM S.A. is an ISO9001and ISO14001 certified company by **Bureau Veritas**

ANNEXE

<table>
<tr><th colspan="3">Applicable values for the different sections of the norm EN50155: 2021</th></tr>
<tr><td>4.4.1</td><td>Working altitude</td><td>Up to 2000m at full load
Up to 2500m at 95% of load</td></tr>
<tr><td>4.2.2</td><td>Ambient temperature</td><td>For options B and T: Class OT1 (-25 to 55 °C): load < 100 %
For options B and T: Class OT3 (-25 to 70 °C): load <62.5 %
For option L: Class OT2 (-40 to 55 °C): load < 100 %
For option L: Class OT4 (-40 to 70 °C): load <62.5 %</td></tr>
<tr><td>4.4.3</td><td>Switch-on extended operating temp.</td><td>ST1: OTx + 15 ºC, test cycle B</td></tr>
<tr><td>4.4.4</td><td>Rapid temperature variations</td><td>H1</td></tr>
<tr><td>4.4.5</td><td>Shocks and vibrations</td><td>According EN61373:2010 + Corr 1:2011 Category 1 class B</td></tr>
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