

AC Master series (TDS/TDX)

3.3kW AC/AC Voltage & Frequency Changer

GENERAL FEATURES:

- Designed according to EN50155
- Fire and smoke: EN45545-2
- High input-output isolation
- Remote start signal
- Output failure alarm
- Output short circuit protection
- Over temperature shutdown
- Low inrush current
- 94% efficiency
- HV DC input allowed



Models	Input	Output
TDS-3300-7801	400V three phase	230V single phase
TDX-3300-7802	400V three phase	400V three phase



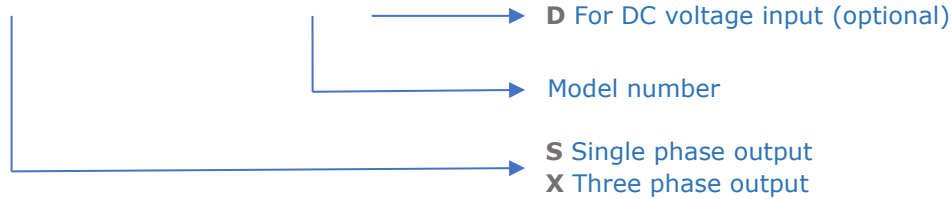
INPUT		
Nominal voltages	400 - 480 VAC three phase or 600 VDC	
AC voltage range	360 ... 528 VAC	
DC voltage range	400 ... 740 VDC	
Frequency range	47 ... 63 Hz	
Maximum input current	6.8 AAC 3ph or 8.8 ADC	
Inrush current	< 12 Apk	
Efficiency	94% at nominal conditions	
OUTPUT		
	TDS-3300	TDX-3300
Type	AC single phase	AC three phase
Nominal AC voltage	230 V	400V
Maximum continuous current	14.4 A	4,77A
Waveform	Sinusoidal	
Voltage adjust range	20 ... 100 %	
Frequency	5 ... 75 Hz	
Load regulation	< 4.5 %	
Line regulation	< 1 %	
Maximum active power	3.3 kW	
Maximum apparent power	3.3 kVA	
RELIABILITY		
MTBF (SN29500)	150 kh	
Service life	20 years	
ENVIRONMENTAL		
Derating output power / temperature	-2.5 %/°C	
Operating temperature:		
Full load	-40 – 55 °C (OT2 & OT1 acc. to EN50155:2021)	
62.5 % load	-40 – 70 °C (OT4 & OT3 acc. to EN50155:2021)	
Cooling	Internal forced air with fan speed control	
Relative humidity	5-95 % with no condensation	
Shock and vibration	EN61373:2010 Category 1 class B body mounted	
Environmental regulations	RoHS according to directive 2015/863/EU and REACH	
Altitude	2000 m	
MECHANICAL		
Mechanical shape	Slotted case	
Height	84.8 mm	
Width	248.4 mm	
Depth	421.59 mm	
Weight	5.80 kg	
SAFETY		
Safety according to	EN50124-1:2017 Railway app. (Insulation coordination)	
Pollution degree	PD2	
Overvoltage category	OV2	
Dielectric strength Input-Output	3000 Vac	
Dielectric strength Input-Earth	1500 Vac	
Dielectric strength Output-Earth	1500 Vac	
Fire and smoke	EN45545-2:2020	
Protection degree	IP20	
Dielectric strength Input/Output	3 kVac	
Dielectric strength Input/Earth	1.5 kVac	
Dielectric strength Output/Earth	1.5 kVac	
Time for discharging all voltages under 60V	< 1 minute	

ADDITIONAL FEATURES

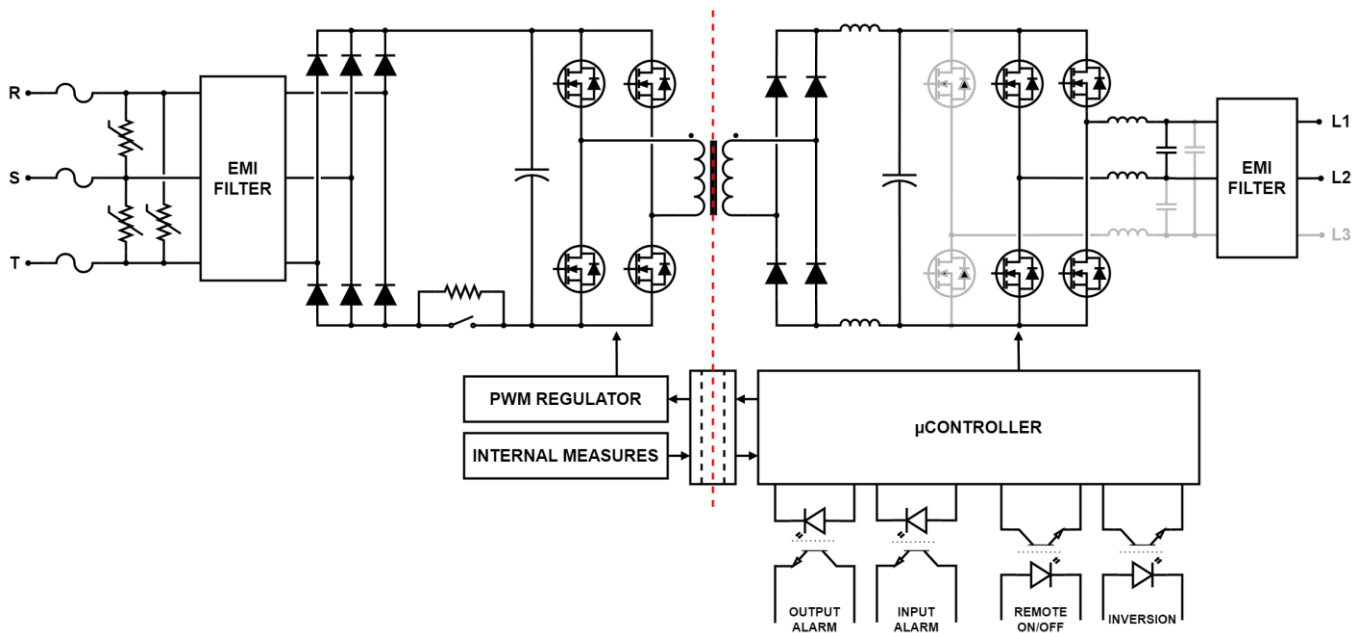
Output protected against overloads and short circuits	By shutdown when I^2t is exceeded
Over-temperature shutdown	Self-recoverable
Input under-voltage lockout	
Input under-voltage lockout	

ORDERING CODES

TD_-3300-780_-_-



BLOCKS DIAGRAM



DESCRIPTION

The TDS and TDX series are AC/AC or DC/AC isolated voltage and frequency changers.

The unit maintains the output voltage stable within the whole input voltage range.

In addition, they can withstand load peaks according to a I^2T characteristic curve and limiting short circuits at the output, disabling it and restarting itself after a certain time. If short circuit is persistent after a determined number of restarts, the output switches off and an input voltage reset is needed. The output can be activated or deactivated with an opto-isolated remote ON/OFF signal and has an output and input failure opto-isolated alarm, which is activated if an error is detected (output short circuit, output overload, internal DC bus out of margins or input voltage out of specs).



INSTALLATION

- 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 an air flow reduction (minimum recommended distance to other objects 50 mm).
- Make connections according to the connections picture and table.
- The ground connection can be done through the stud on the front side.

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.
- Protect the input line using time lag fuses or circuit breaker curve D with a rating 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 400 V 3ph	Input 600 V DC (D option)	Output TDS-3300 230 V 1ph	Output TDX-3300 400 V 3ph
Maximum current	6.8 A	8.8 A	14.4 A	4.77 A
Internal fuse	T 10A 600Vac	none	none	none
Cable cross-section	2.5 mm²	2.5 mm²	2.5 mm²	2.5 mm²



AC INPUT or DC INPUT	J5-1	Phase R	AC 3 phase voltage or DC voltage using two phases in any polarity	Cables 2.5 ... 4mm ²	
	J5-2	Phase S			
	J5-3	Phase T			
AC OUTPUT	J4-1	L1	Only for TDX-3300		
	J4-2	L2			
	J4-3	L3			
Earth	-	PE	Protective Earth		Stud M5
Reverse rotation	J2A-1	+	Only for TDX-3300		Recommended aerial female: Phoenix Contact FK-MCP 1.5/4-STF-3.81
	J2B-1	-			
Remote ON-OFF	J2A-2	+	Remote ON		
	J2B-2	-			
Input status	J2A-3	no polarity	Input status signal, free potential solid-state relay		
	J2B-3				
Output status	J2A-4	no polarity	Output status signal, free potential solid-state relay		
	J2B-4				
RS-232	J1-2	RX	RS-232 communications	DB9	
	J1-3	TX			
	J1-5	GND			
CAN BUS	J3-1	L	CAN BUS communications	Recommended aerial female: Phoenix Contac MC1.5/3-STF-3.81	
	J3-2	H			
	J3-3	GND			

SIGNAL	TYPE	SPECIFICATIONS	DESCRIPTION
Input Status	Output	Potential-free solid-state relay without polarity. Maximum current 160mA, maximum blocking voltage 140V	CLOSED if input voltage is within range, OPEN if input voltage is out of specs
Output status			CLOSED if the AC output is running, OPEN when it's idle.
Remote ON/OFF	Input	Potential free with polarity optocoupled. Maximum applying voltage 140V.	17V > applied voltage < 140V, output disabled.
Reverse rotation			0V > applied voltage < 12V (or open circuit), output enabled.

OVERLOAD PROTECTION

Protection against overloads and short-circuits	By current limiting at Iopk 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 3 times. If the overload persists, the unit reminds shutdown until an input reconnection .	



RS232 COMMUNICATION PORT

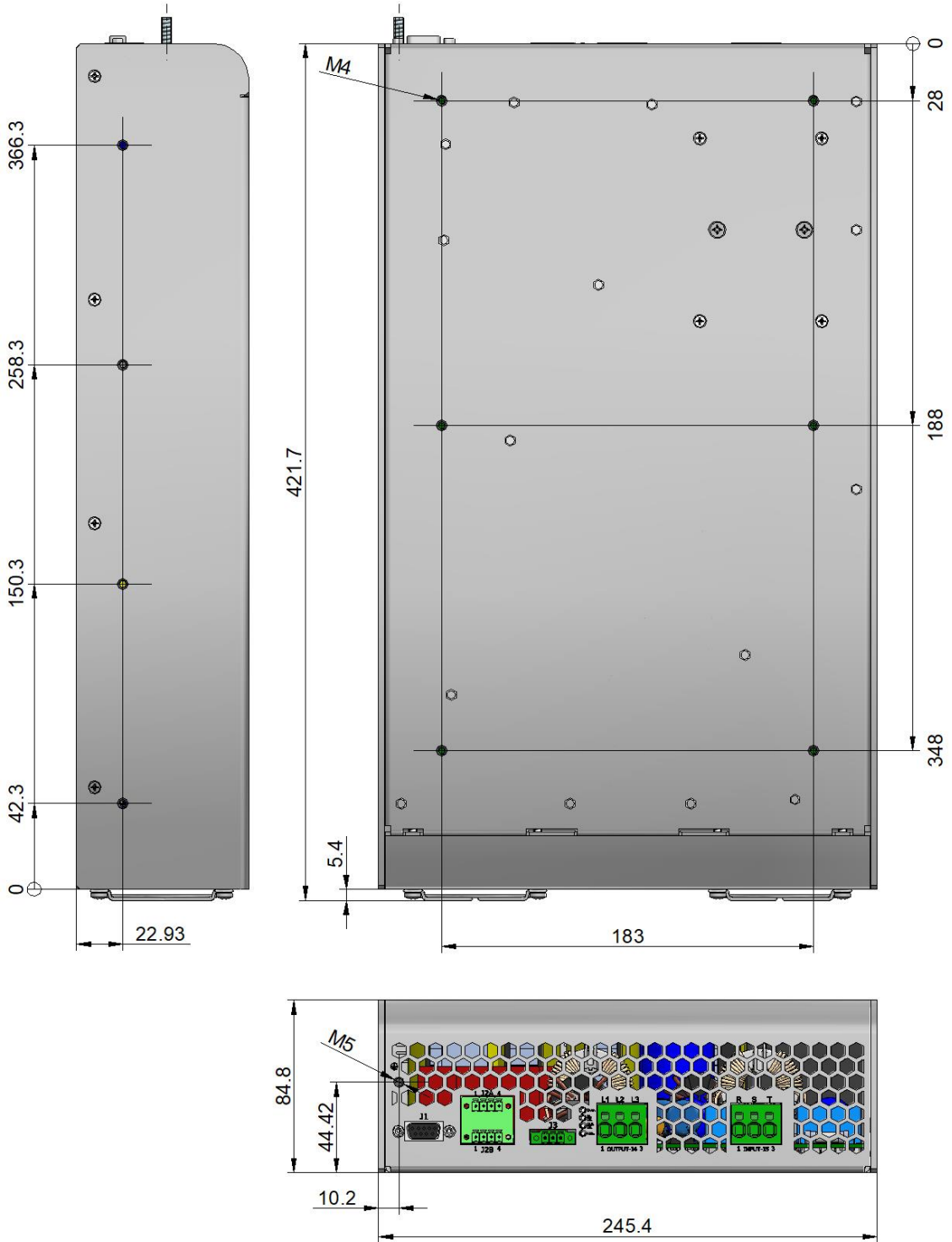
It is possible to control and monitor the unit via RS232 by means of a terminal emulator like "Tera Term" or "Putty". Also it is possible to control and monitor the unit directly using the protocol showed in table:

Protocol configuration: ASCII code, 57600 bauds, parity none, 8 bits, 1bit stop

Header	Function	Parameter	Returns	Command description	
P	L	V	PTV####	Input voltage in Volts	
		U	PTURS=#### [13]JUST=#### [13]UTR=####	Output voltage in Volts RMS Phase-Neutral ([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 temperature1 in K	
		F	PTF####	Nominal output frequency in Hz	
		f	PTf####	Actual output frequency in Hz	
		y	PTy####	Actual output voltage set-point in V	
		S	PTS####	AC output state 999.9 → Enabled 000.0 → Disabled 222.2 → Blocked by overload 111.1 → Blocked by overload or shortcircuit	
		M	PTM####	Model number	
		R	PTR####	Firmware version	
		Other	PTE	Command not supported	
		G	1	####	OK / ERR
	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 → AC output enabled 000.0 → AC output disabled
	4		####	OK / ERR	Set the output voltage Phase-neutral in Vrms (Vo)(output must be stopped) 040.0 ≤ #### ≤ 230.0
	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 0 < #### ≤ 100% I _{max_warning}
	8		####	OK / ERR	111.1 → Reset the AC output
	L		####	OK / ERR	Set the minimum input starting voltage in Volts
	O		####	OK / ERR	Set the initial frequency in the startup (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
	M	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 (Note-2)
		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
		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) 040.0 ≤ #### ≤ 230.0
		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)



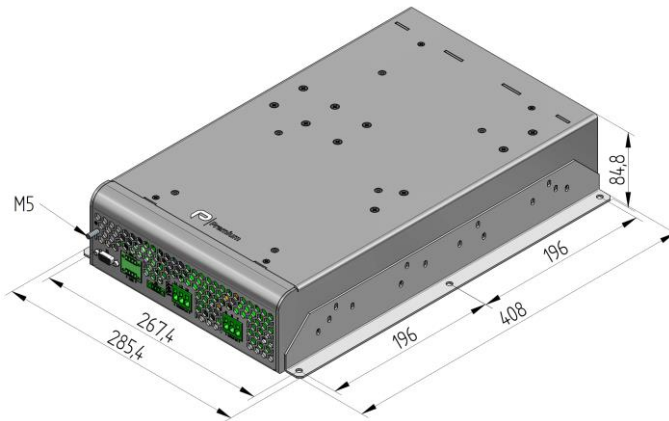
MECHANICAL DIMENSIONS



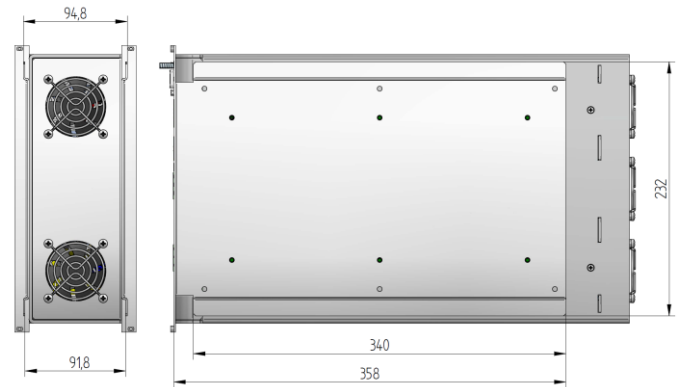
ACCESSORIES

Description	Notes	CODE
Standard Mounting brackets kit	Contains two brackets and screws	NP-9282
Special mounting brackets kit	Contains two brackets and screws	NP-9643
Guiding and fixing kit for 19" 6U subrack	Contains two pieces and all necessary screws	NP-9644

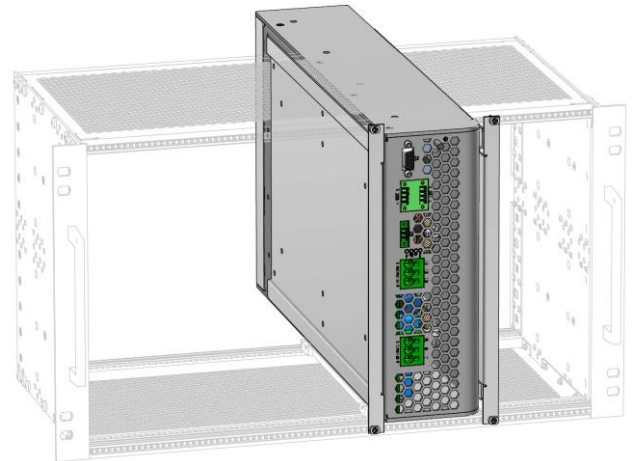
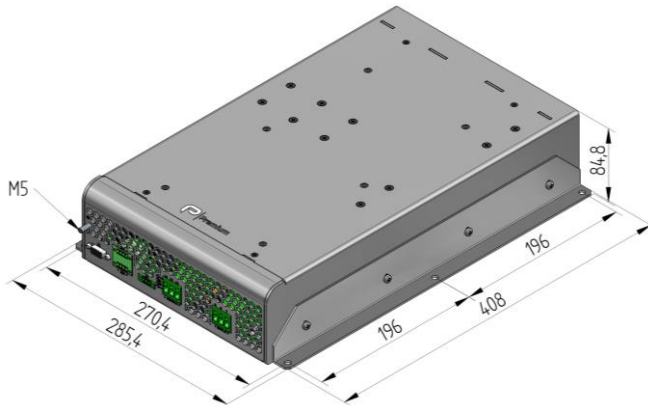
NP-9282



NP-9644



NP-9643





CE|UK CA EU, UKCA 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: AC/AC converter
Models: **TDS-3300-7801**

is in conformity with the provisions of the following EU directives or UK regulations:

2014/35/EU SI 2016 No 1101	Low voltage / The electrical equipment (safety) regulations
2014/30/EU SI 2016 No 1091	EMC / Electromagnetic compatibility regulations
2011/65/EU Annex II and its amendment 2015/863/EU SI 2012 No. 3032	RoHS / Restriction of the use of certain hazardous substances in electrical and electronic equipment

and that standards and/or technical specifications referenced below have been applied:

EN 62368-1: 2020	Safety. Audio/video information and communication technology equipment
EN 61000-6-4: 2019	Generic emission standard
EN 61000-6-2: 2019	Generic immunity standard
EN 50155: 2021*	Railway applications. Electronic equipment used on rolling stock material
EN 50121-3-2: 2016* IEC 62236-3-2: 2018*	Railway applications. EMC Rolling stock equipment
EN 50121-4: 2016* IEC 62236-4: 2018*	Railway applications. EMC of the signalling and telecommunications apparatus

* See annexe

CE marking year: 2023; UKCA marking year: 2023

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, 14-06-2023

Albert Sole
Technical Director

PREMIUM S.A. is an ISO9001 and ISO14001
certified company by **Bureau Veritas**

ANNEX A

Applicable values for the different sections of the norm EN50155:2021																																																						
4.4.1	Working altitude	AX, up to 2000m																																																				
4.4.2	Operating temperature	Class OT1 (-25 to 55°C): load < 100% Class OT2 (-40 to 55°C): load < 100% Class OT3 (-25 to 70°C): load < 62.5% Class OT4 (-40 to 70°C): load < 62.5%																																																				
4.4.3	Switch-on extended operating temp.	ST1: OTx + 15 °C, test cycle B																																																				
4.4.4	Rapid temperature variations	H1																																																				
4.4.5	Shocks and vibrations	According EN61373:2011 Category 1 class B																																																				
4.4.6	EMC Electromagnetic Compatibility EN50121-3-2:2016 IEC 62236-3-2: 2018	<table border="1"> <thead> <tr> <th>Test</th> <th>Norm</th> <th>Port</th> <th>Frequency</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Radiated emissions</td> <td rowspan="4">EN61000-6-4</td> <td rowspan="4">Case</td> <td>30-230 MHz</td> <td>40 dB(µV/m) Qpk at 10 m</td> </tr> <tr> <td>230-1 GHz</td> <td>47 dB(µV/m) Qpk at 10 m</td> </tr> <tr> <td>1-3 GHz</td> <td rowspan="2">Do not apply Internal freq. < 108 MHz</td> </tr> <tr> <td>3-6 GHz</td> </tr> <tr> <td rowspan="2">Conducted emissions</td> <td rowspan="2">EN55016-2-1</td> <td rowspan="2">Input & Output</td> <td>150-500 kHz</td> <td>99 dB(µV) Qpk</td> </tr> <tr> <td>0.5-30 MHz</td> <td>93 dB(µV) Qpk</td> </tr> <tr> <td>THD (Total Harmonic Distortion)</td> <td>EN61000-4-30</td> <td>Output</td> <td>50 Hz-2 KHz</td> <td>< 8%</td> </tr> </tbody> </table>	Test	Norm	Port	Frequency	Limits	Radiated emissions	EN61000-6-4	Case	30-230 MHz	40 dB(µV/m) Qpk at 10 m	230-1 GHz	47 dB(µV/m) Qpk at 10 m	1-3 GHz	Do not apply Internal freq. < 108 MHz	3-6 GHz	Conducted emissions	EN55016-2-1	Input & Output	150-500 kHz	99 dB(µV) Qpk	0.5-30 MHz	93 dB(µV) Qpk	THD (Total Harmonic Distortion)	EN61000-4-30	Output	50 Hz-2 KHz	< 8%																									
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P= Performance criteria, L= Line, PE= Protective Earth																																																						
4.4.7	Relative humidity	Up to 95%																																																				
5.3.2	Supply by AC auxiliary power converter	It shall operate satisfactorily for the voltage characteristics given in EN50533.																																																				
6.1.1	Predicted reliability SN29500	150kh																																																				
6.2	Useful life	L4, 20 years																																																				
7.2.1	Insulation coordination EN50124-1:2016	PD2, OV2																																																				
7.2.8	Inrush current	< 12A																																																				
10.7	Protective coating for PCB assemblies	PC2																																																				
11.4	Fire behaviour	EN45545-2:2020																																																				
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