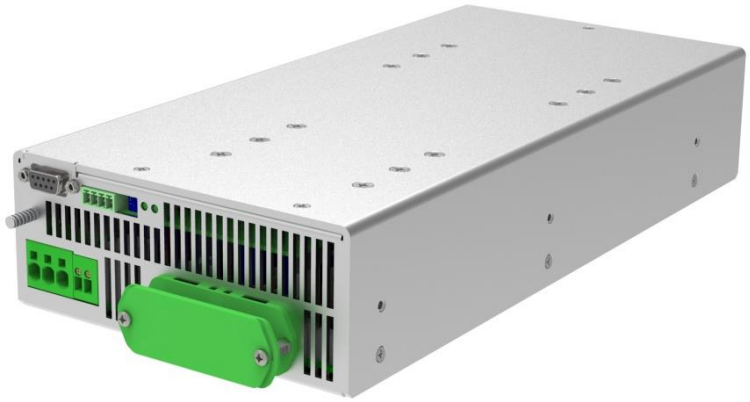
ODS-1500

1200...1500 VA DC/AC INVERTER

GENERAL FEATURES:

Sine wave output voltage
Selectable output frequency: 50/60Hz
Adjustable output voltage
High input-output isolation 3000Vrms
Remote inhibit
Remote control via RS232
Alarm by isolated relay contacts
Remote off opto-coupled
Optional railway version EN50155
Fire and smoke: EN45545-2 approved
Efficiency up to 91%



MODEL SELECTION TABLE

	12Vdc 10 ... 15V	24Vdc 16.8 ... 30V	36Vdc 25.2 ... 45V	48Vdc 33.6 ... 60V	72Vdc 50.4 ... 90V	110Vdc 77 ... 138V
120Vac	**ODS-1500-7121** 1200 W	**ODS-1500-7123** 1500 W	**ODS-1500-7124** 1500 W	**ODS-1500-7125** 1500 W	**ODS-1500-7126** 1500 W	**ODS-1500-7127** 1500 W
230Vac	**ODS-1500-7111** 1200 W	**ODS-1500-7113** 1500 W	**ODS-1500-7114** 1500 W	**ODS-1500-7115** 1500 W	**ODS-1500-7116** 1500 W	**ODS-1500-7117** 1500 W

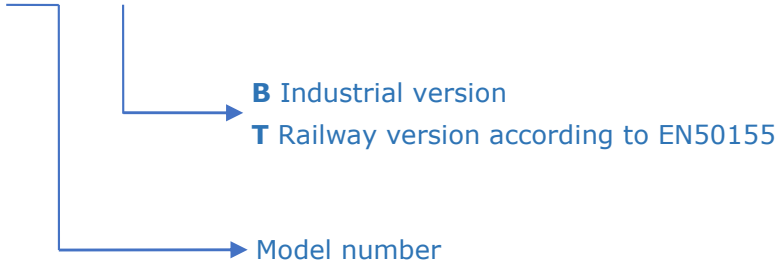
PRODUCT SPECIFICATIONS

INPUT	
Input voltage range	-30, +25% Vin nom, (10 … 15Vdc)*
Maximum input ripple	5% Vin nom (Vrms, 100Hz)
OUTPUT	
Output voltage	120 / 230Vac sinusoidal
Output frequency	50 / 60Hz ± 0.25Hz
Load regulation	< 4%
Line regulation	< 2 % Vin -25% … +25%, < 10% Vin -30% … +30%
Output wave distortion THD	< 2% (average of 16 samples)
Output HF ripple	< 2.5%
ENVIRONMENTAL	
Storage temperature	-25 … 80°C
Operatingtemperature full load	-25 … 55°C(EN50155 OT1)
Operatingtemperature 50% load	-25 … 70°C(EN50155 OT3)
Relative humidity without condensation	5 … 95%
Cooling	Controlledinternal fan
MTBF (MIL-HDBK-217-E; G_b, 25°C)	130.000 h
EMC	
Immunity according	EN61000-6-2 (EN50121-3-2)
Emissions according	EN61000-6-4 (EN50121-3-2)
SAFETY	
Dielectric strength: Input /output	3000 Vrms / 50Hz / 1min
Dielectric strength: Output / ground	1500 Vrms / 50Hz / 1min
Dielectric strength: Input / ground	500 Vrms / 50Hz / 1min
Safety according to	EN60950-1, EN62368-1
Fire and smoke	EN45545-2 approved
MECHANICAL	
Weight	3800 g
PROTECTIONS	
Against overloads	Current andI^2T limited (see overload protection)
Against over-temperature	Shutdown with auto-recovery
CONTROL	
Output OK LED	Green
Alarm LED	Red
Output failure alarm	Isolated contact relay open when alarm (<0.3A at 150Vcc)
Remote OFF	Off applying 4…24 Vdc, Impedance > 3k3Ω
Status and programming	RS232 port

ORDERING CODES

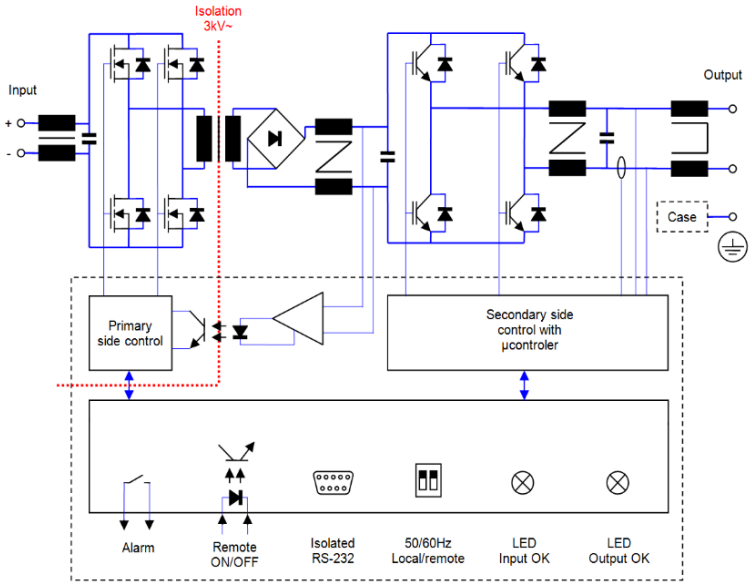
Model	Input voltage DC [V]	Input voltage range [V]	Output voltage AC [V]	Output current [V]	Active output power [W]	Appar. output power [VA]	Output peak current		Efficien. [%]	No load input current [A]
							5s [Arms]	(Iopk) 10ms [Apk]		
ODS-1500-7111	12	10.0 - 15	230	5.2	1200	1200	6.8	16	87	< 0.8
ODS-1500-7113	24	16.8 - 30	230	6.5	1500	1500	10	16	88	< 0.4
ODS-1500-7114	36	25.2 - 45	230	6.5	1500	1500	10	16	89	< 0.3
ODS-1500-7115	48	33.6 - 60	230	6.5	1500	1500	10	16	90	< 0.2
ODS-1500-7116	72	50.4 - 90	230	6.5	1500	1500	10	16	90	< 0.15
ODS-1500-7117	110	77 - 138	230	6.5	1500	1500	10	16	91	< 0.1
ODS-1500-7121	12	10.0 - 15	120	10.0	1200	1200	13	30	86	< 0.8
ODS-1500-7123	24	16.8 - 30	120	12.5	1500	1500	20	30	88	< 0.4
ODS-1500-7124	36	25.2 - 45	120	12.5	1500	1500	20	30	88	< 0.3
ODS-1500-7125	48	33.6 - 60	120	12.5	1500	1500	20	30	89	< 0.2
ODS-1500-7126	72	50.4 - 90	120	12.5	1500	1500	20	30	89	< 0.15
ODS-1500-7127	110	77 - 138	120	12.5	1500	1500	20	30	90	< 0.1

ODS–1500–71_ _–_

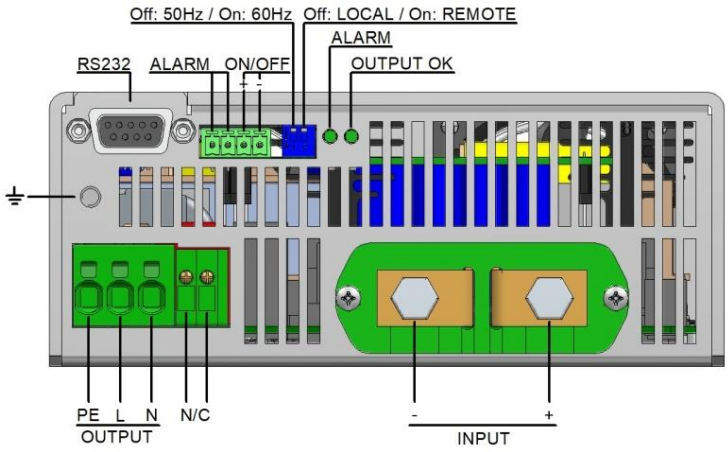


Accessories must be ordered in a separated order line

BLOCKS DIAGRAM

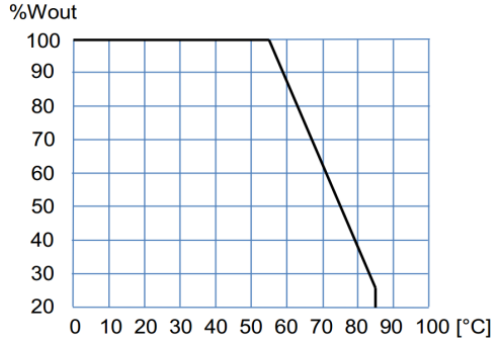


CONNECTIONS



RS232 functions	
Monitoring	Input voltage
	Output voltage
	Output current
	Internal temperature
	Output frequency
	Output power
Settings	Input under-voltage lockout
	Input under-voltagealarm
	On / Off
	Output frequency
	Maximumoutputcurrent
	Output voltage

POWER DERATING vs AMBIENT TEMPERATURE



DESCRIPTION

The ODS-1500 consists of single phase sine-wave DC/AC inverters with galvanic isolation between input and output

The unit allows:

- Select 50 / 60Hz by means of DIP-switch.
- Select local / remote (RS-232) by means of DIP-switch
- Shutdown applying voltage on pins 3 and 4 of signal connector
- Local signalization of Output OK by means of green LED
- Local alarm. Red LED ON when:
  - Output voltage is not OK
  - Output current >OUTPUT CURRENT ALARM
  - Input voltage out of margins
  - Unit shutdowns by over-current or remote OFF
- Remote alarm. Open contacts when output voltage is not OK
- Set and monitor parameters via RS-232.

The ODS-1500 are equipped with a maximum average power protection as well as maximum output peak current protection. This protects the unit 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 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 50mm).
- 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 12V	Input 24V	Input 36V	Input 48V	Input 72V	Input 110V	Output 120V	Output 230V
Max. current	140 A	100 A	75A	50 A	33 A	22 A	13 A	6.7 A
Cable cross-section	**35 mm²**	**16 mm²**	**16 mm²**	**10 mm²**	**6 mm²**	**2.5 mm²**	**1.5 mm²**	**1.0 mm²**

RS232 communication port

It is possible to control and monitor de unit via RS232 by means of an application tool named PAM. This application is free and can be downloaded from the Premium web side

Also it is possible to control and monitor de unit directly using the protocol showed in table:

Protocol configuration:ASCII code, 19200 bauds, parity none, 8 bits, 1bit stop

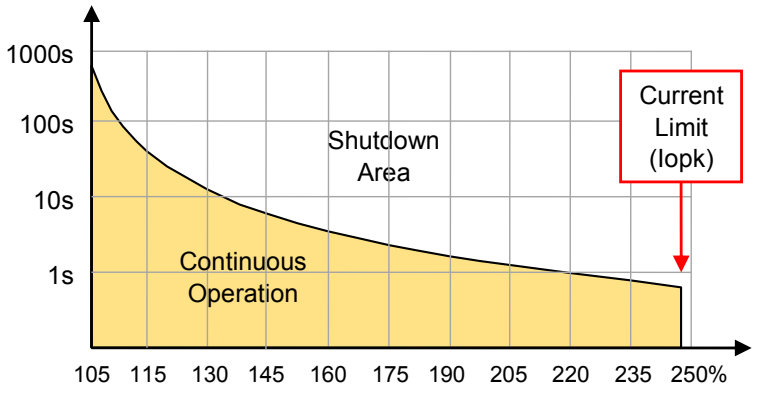
Header		Function	Parameter		Returns	Explanation
P	R	L	V		PTV■■■.■	Input voltage in Volts
			U		PTU■■■.■	Output voltage in Volts RMS
			I		PTI■■■.■	Output current in Amps RMS
			T		PTT■■■.■	Internal temperature in ºC
			F		PTF■■■.■	Output frequency in Hz
			W		PTW■■■■	Output power in W
			S		PTS■■■.■	Inverter state **999.9**→ Inverter enabled **000.0**→ Inverter disabled **222.2**→ Inverter blocked by overload **111.1**→ Inverter blocked by overload or short-circuit
			M		PTM■■■■	Model number
			R		PTR■■■■	Firmware version
			Othercharacter		PTE	Command not supported
		G	1	■■■.■	OK	Set the minimum input working voltage in Volts
					ERR	Value NO VALID for this parameter
			2	■■■.■	OK	Set the minimum alarm input voltage in Volts
					ERR	Value NO VALID for this parameter
			3	■■■.■	OK	Changes the status bit (after start up enabled with SW3 =LOCAL and disabled with SW3 =REMOTE) **999.9**→ Inverter enabled **000.0**→ Inverter disabled
					ERR	Value NO VALID for this parameter
			4	■■■.■	OK	Set the output voltage in Volts RMS 80% V_{nom} ≤ ■■■.■≤ 105% V_{nom}
					ERR	Value NO VALID for this parameter
			5	■■■.■	OK	Set the maximum output current in Amps 20% I_{nom} ≤ ■■■.■≤ 100% I_{nom}
					ERR	Value NO VALID for this parameter
			6	■■■.■	OK	Changes the output frequency (it's not stored for the next start-up) **050.0**→ 50Hz **060.0**→ 60Hz
					ERR	Value NO VALID for this parameter
			7	■■■.■	OK	Set the OUTPUT CURRENT ALARM 0 ≤ ■■■.■≤ 100% $I_{max\_warning}$
					ERR	Value NO VALID for this parameter
			8	■■■.■	OK	**111.1**→ Reset the inverter
					ERR	Value NO VALID for this parameter

WORKING PARAMETERS

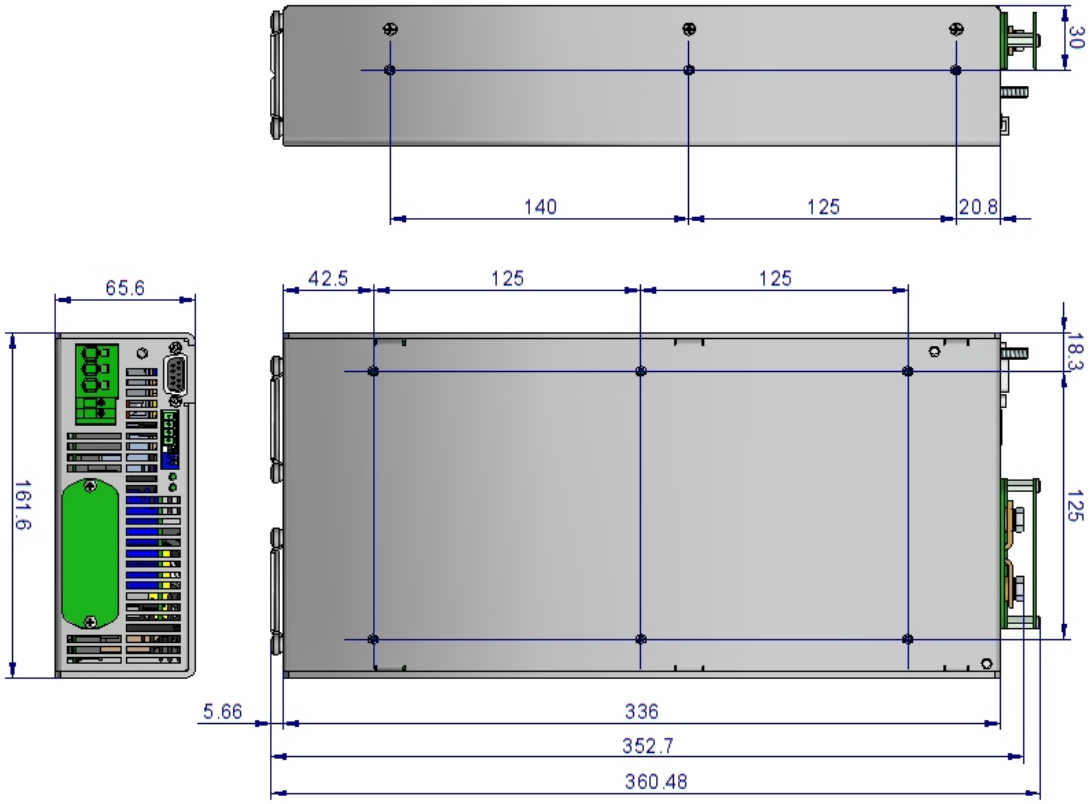
Thermal protection	**71**XX						
Internal warning temperature	88						ºC
Internal shutdown temperature	92						ºC
Internal restart temperature after over-temperature shutdown	75						ºC
Input voltage parameters	**71X1**	**71X3**	**71X4**	**71X5**	**71X6**	**71X7**	
Max. input voltage shutdown instantaneous	16.8	33.7	50.6	67.3	100.9	154.1	Vdc
Max. input voltage shutdown timed 0.1s	15.1	30.1	45.2	60.1	90.1	138.6	Vdc
Maximum star-up voltage	14.9	29.9	44.9	59.8	89.7	137.4	Vdc
Minimum star-up voltage	10.6	17.9	26.9	35.9	53.9	82.4	Vdc
Min. input voltage shutdown timed 0.1s	10.0	16.7	25.1	33.5	50.3	76.9	Vdc
Min. input voltage shutdown instantaneous	9.6	14.4	21.6	28.7	43.1	65.9	Vdc
Output voltage parameters	**711**X			**712**X			
Output voltage of short circuit or deep overload	< 164			< 86			Vac
Time of short-circuit	1000						ms
Time of start-up after shutdown by short-circuit	2000						ms
Number of start-up attempts afterashort circuit	3						
Output current parameters	**7111**	**7113/4/5/6/7**		**7121**	**7123/4/5/6/7**		
Maximum continuous output current	5.3	6.6		10.1	12.7		A
Warning current	5.2	6.5		10	12.5		A
Start-up time after shutdown by overload	1000	1500		1000	2000		ms
Maximum overload I^2t	See figure below						
Number of attempts of consecutive overload	3						
Start-up and working errors	**71**XX						
Maximum time for overload or internal failure	unlimited						
Minimum time required between disconnection and next connection	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 2 seconds after shutdown, the unit tries to restart up to 3 times. If the overload persists, the unit reminds shutdown until an **input reconnection**.



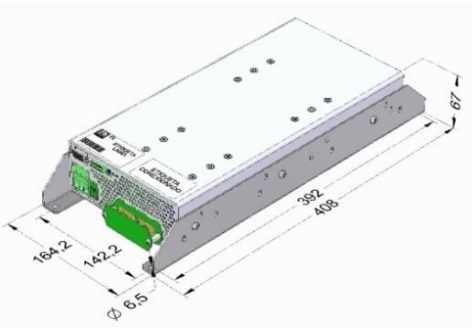
DIMENSIONS



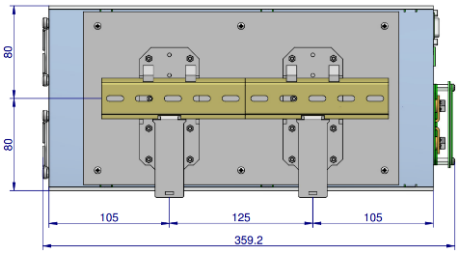
ACCESSORIES

DESCRIPTION	NOTES	CODE
Mounting brackets kit	Contains two brackets and screws	NP-9282
DIN rail assembly kit	Screws included	NP-9339
2U 19" rack mounting tray kit	It allows to install one or two units	NP-9353
Signals female connector		2601-409

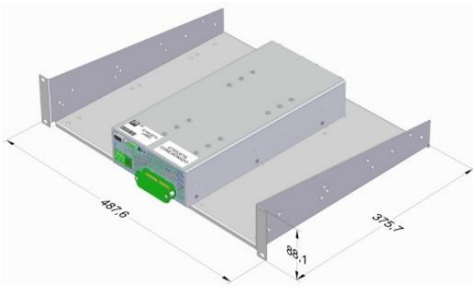
NP-9282



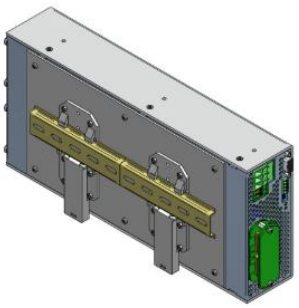
NP-9339

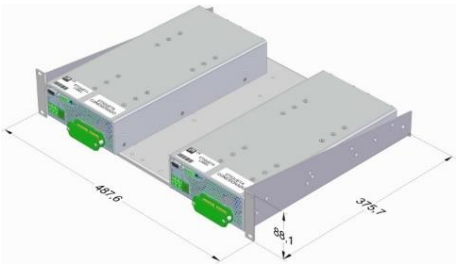


NP-9353



2601-409





CE 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/DC converter
Models: **ODS-1500-7111 … 7127**

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

2014/35/EU	Low voltage
2014/30/EU	Electromagnetic compatibility
2011/65/EU	Restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

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

EN 60950-1: 2005	Safety. Information technology equipment
EN 62368-1: 2014	Safety. Audio/video, information and communication technology equipment
EN 61000-6-3: 2007	Generic emission standard
EN 61000-6-2: 2005	Generic immunity standard
EN 50155: 2017*	Railway applications. Electronic equipment used on rolling stock material
EN 50121-3-2: 2016*	Railway applications. EMC Rolling stock equipment

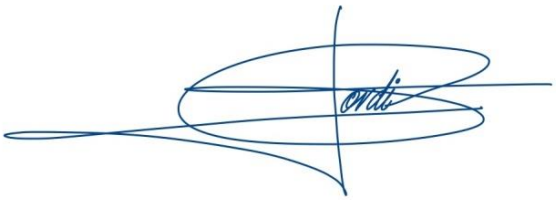
* Optional, See annexe

CE markingyear: **2010**

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, 04-10-2019



Jordi Gazo
Chief Executive Officer

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: 2017</th></tr>
<tr><td>4.3.1</td><td>Working altitude</td><td>Up to 2000m</td></tr>
<tr><td>4.3.2</td><td>Ambient temperature</td><td>Class OT1 (-25 to 55°C): load < 100%
Class OT2 (-40 to 55°C): load < 100% (Without connectors handling)
Class OT3 (-25 to 70°C): load <75%
Class OT4 (-40 to 70°C): load <75% (Without Connectors handling)
Class OT5 (-25 to 85°C): load <37.5%
Class OT6 (-40 to 85°C): load <37.5% (Without Connectors handling)</td></tr>
<tr><td>4.3.3</td><td>Switch-on extended operating temp.</td><td>ST1</td></tr>
<tr><td>4.3.4</td><td>Rapid temperature variations</td><td>H1</td></tr>
<tr><td>4.3.5</td><td>Shocks and vibrations</td><td>According EN61373:2010 Category 1 class B</td></tr>
<tr><td>4.3.6</td><td>EMC Electromagnetic Compatibility

EN50121-3-2:2016</td><td>
<table>
<tr><th>Test</th><th>Norm</th><th>Port</th><th>Frequency</th><th>Limits</th></tr>
<tr><td rowspan="4">Radiated emissions</td><td rowspan="4">IEC55016</td><td rowspan="4">Case</td><td>30MHz…230MHz</td><td>40dB(µV/m) Qpk at 10m</td></tr>
<tr><td>230MHz…1GHz</td><td>47dB(µV/m) Qpk at 10m</td></tr>
<tr><td>1…3GHz</td><td rowspan="2">Do not apply
Internal freq. < 108MHz</td></tr>
<tr><td>3…6GHz</td></tr>
<tr><td rowspan="2">Conducted emissions</td><td rowspan="2">IEC55016</td><td rowspan="2">Input</td><td>150kHz…500kHz</td><td>99dB(µV) Qpk</td></tr>
<tr><td>500kHz…30MHz</td><td>93dB(µV) Qpk</td></tr>
</table>
<table>
<tr><th>Test</th><th>Norm</th><th>Port</th><th>Severity</th><th>Conditions</th><th>P</th></tr>
<tr><td rowspan="2">Electrostatic discharge</td><td rowspan="2">IEC61000-4-2</td><td rowspan="2">Case</td><td>±8kV</td><td>Air (isolated parts)</td><td rowspan="2">B</td></tr>
<tr><td>±8kV</td><td>Contact (conductive parts)</td></tr>
<tr><td rowspan="4">Radiated high-frequency</td><td rowspan="4">IEC61000-4-3</td><td rowspan="4">X/Y/Z Axis</td><td>20V/m</td><td>0.08…1.0GHz M. 80% 1kHz</td><td rowspan="4">A</td></tr>
<tr><td>10V/m</td><td>1.4…2.1GHz M. 80% 1kHz</td></tr>
<tr><td>5V/m</td><td>2.1…2.5GHz M. 80% 1kHz</td></tr>
<tr><td>3V/m</td><td>5.1…6Ghz M. 80% 1kHz</td></tr>
<tr><td rowspan="4">Fast transients</td><td rowspan="4">IEC61000-4-4</td><td>Input</td><td>±2kV</td><td rowspan="4">Tr/Th: 5/50 ns</td><td rowspan="4">A</td></tr>
<tr><td>Output</td><td>±2kV</td></tr>
<tr><td>Signal</td><td>±2kV</td></tr>
<tr><td>PE</td><td>±1kV</td></tr>
<tr><td rowspan="2">Surge</td><td rowspan="2">IEC61000-4-5</td><td>Input L to L</td><td>±1kV</td><td rowspan="2">Tr/Th: 1.2/50µs</td><td rowspan="2">B</td></tr>
<tr><td>Input L to PE</td><td>±2kV</td></tr>
<tr><td rowspan="4">Conducted RF</td><td rowspan="4">IEC61000-4-6</td><td>Input</td><td>10V</td><td rowspan="4">0.15...80MHz M. 80% 1kHz</td><td rowspan="4">A</td></tr>
<tr><td>Output</td><td>10V</td></tr>
<tr><td>Signal</td><td>10V</td></tr>
<tr><td>PE</td><td>10V</td></tr>
<tr><td>Magnetic field</td><td>IEC61000-4-8</td><td>X/Y/Z Axis</td><td>300A/m</td><td>0Hz, 16.7Hz, 50/60Hz</td><td>A</td></tr>
</table>
P= Performance criteria, L= Line, PE= Protective Earth
</td></tr>
<tr><td>4.3.7</td><td>Relative humidity</td><td>Up to 95%</td></tr>
<tr><td>5.1.1.2</td><td>DC power supply range</td><td>From 0.70 to 1.25 Un continuous</td></tr>
<tr><td>5.1.1.3</td><td>Temporary DC power supply fluctuation</td><td>From 0.60 to 1.40 Un 0.1s
From 1.25 to 1.40 Un 1s without damage</td></tr>
<tr><td>5.1.1.4</td><td>Interruptions of voltage supply</td><td>Class S1 (without interruptions)</td></tr>
<tr><td>5.1.1.6</td><td>Input ripple factor</td><td>10% peak to peak with a DC Ripple Factor of 5 %</td></tr>
<tr><td>5.1.3</td><td>Supply change-over</td><td>0.6 Un duration 100 ms (without interruptions). Performance criterion A</td></tr>
<tr><td>7.2.7</td><td>Input reverse polarity protection</td><td>By external fuse</td></tr>
<tr><td>10.7</td><td>Protective coating for PCB assemblies</td><td>Class PC2</td></tr>
<tr><td>13.3</td><td>Tests list</td><td>
<table>
<tr><td>1 Visual Inspection</td><td>Routine</td></tr>
<tr><td>2 Performance test</td><td>Routine</td></tr>
<tr><td>3 Power supply test</td><td>Routine</td></tr>
<tr><td>4 Insulation test</td><td>Routine</td></tr>
<tr><td>5 Low temperature storage test</td><td>-</td></tr>
<tr><td>6 Low temperature start-up test</td><td>Type</td></tr>
<tr><td>7 Dry heat test</td><td>Type</td></tr>
<tr><td>8 Cyclic damp heat test</td><td>Type</td></tr>
<tr><td>9 Salt mist test</td><td>-</td></tr>
<tr><td>10 Enclosure protection test (IP code)</td><td>-</td></tr>
<tr><td>11 EMC test</td><td>Type</td></tr>
<tr><td>12 Shocks and vibrations test</td><td>Type</td></tr>
<tr><td>13 Equipment stress screening test</td><td>Routine: 24h at 40°C and load 100%</td></tr>
<tr><td>14 Rapid Temperature variation test</td><td>Type</td></tr>
</table>
</td></tr>
</table>