



Test Report issued under the responsibility of:



TEST REPORT IEC 60950-1 Information technology equipment – Safety – Part 1: General requirements	
Report Number	31781623.016
Date of issue	Oct. 17, 2019
Total number of pages	229 + Attachments
Applicant's name	TDK-Lambda Ltd.
Address	56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel
Test specification:	
Standard	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure	CB Scheme
Non-standard test method	N/A
Test Report Form No.	IEC60950_1F
Test Report Form(s) Originator	SGS Fimko Ltd
Master TRF	Dated 2014-02
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Test item description	Programmable Power Supplies
Trade Mark	TDK-Lambda, <i>TDK-Lambda</i>
Manufacturer	Same as applicant
Model/Type reference	<p>1. GENESYS+5000W series</p> <p>1a) Gxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=8.5-500; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Ordinary unit</p> <p>1b) GBxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=8.5-500; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Blank unit</p> <p>1c) GSSxxx-yyy-z-v-uuuuuu-w(xxx=010-600; yyy=8.5-500; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Booster unit</p> <p>2. GSP/GBSP 10kW series</p> <p>2a) Consist of: Ordinary unit + Booster unit GSPxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=17-1000; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank;</p> <p>2b) Consist of: Blank unit + Booster unit GBSPxxx-yyy-z-v-uuuuuu-w(xxx=010-600; yyy=17-1000; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank;</p> <p>3. GSP/GBSP 15KW series</p> <p>3a) Consist of: Ordinary unit + Two Booster units GSPxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=25.5-1500; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank;</p> <p>3b) Consist of: Blank unit + Two Booster units GBSPxxx-yyy-z-v-uuuuuu-w(xxx=010-600; yyy=25.5-1500; z="GPIB (IEEE)", "AnyBus", Blank; v="3P200", "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank;</p> <p>4. GENESYS+ 1700W series</p> <p>4a) Gxxx-yyy-z-uuuuuu-w (xxx=010-600; yyy=2.8-170; z="GPIB (IEEE)", "AnyBus", Blank; u=A-Z, 0-9, Blank; w="CO", Blank; Ordinary unit.</p> <p>4b) GBxxx-yyy-z-uuuuuu-w (xxx=010-600; yyy=2.8-170; z="GPIB (IEEE)", "AnyBus", Blank; u=A-Z, 0-9, Blank; w="CO", Blank; Blank unit.</p>

5. GENESYS+ GH1500W series

5a) GHxxx-yyy-z-uuuuuu-w (xxx=010-600; yyy=2.6-150; z="GPIB (IEEE)", "AnyBus", Blank; u=A-Z, 0-9, Blank; w="CO", Blank; Ordinary unit.

5b) GHBxxx-yyy-z-uuuuuu-w (xxx=010-600; yyy=2.6-150; z="GPIB (IEEE)", "AnyBus", Blank; u=A-Z, 0-9, Blank; w="CO", Blank; Blank unit.

6. GENESYS+ 2700W series

6a) Gxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=4.5-265; z="GPIB (IEEE)", "AnyBus", Blank; v="1P200" or "1P208" or "1P230", "3P200" or "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Ordinary unit

6b) GBxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=4.5-265; z="GPIB (IEEE)", "AnyBus", Blank; v="1P200" or "1P208" or "1P230", "3P200" or "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Blank unit

7. GENESYS+ 3400W series

7a) Gxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=5.6-340; z="GPIB (IEEE)", "AnyBus", Blank; v="1P200" or "1P208" or "1P230", "3P200" or "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Ordinary unit

7b) GBxxx-yyy-z-v-uuuuuu-w (xxx=010-600; yyy=5.6-340; z="GPIB (IEEE)", "AnyBus", Blank; v="1P200" or "1P208" or "1P230", "3P200" or "3P208", "3P400", "3P480"; u=A-Z, 0-9, Blank; w="CO", Blank; Blank unit

Note: see "General product information" and "Definition of variables" for details

Ratings

Input:
 Option 1: AC 190-240V; 3W+PE, 50/60Hz.
 1a), 1b), 1c): 18.5A max.
 2a), 2b): 37A max.
 3a), 3b): 55.5A max.
 6a), 6b): 10A max.
 7a), 7b): 12.5A max.

 Option 2: AC 380-415V; 3W+PE, 50/60Hz.
 1a), 1b), 1c): 9.2A max.
 2a), 2b): 18.4A max.
 3a), 3b): 27.6A max.
 6a), 6b): 5.5A max.
 7a), 7b): 6.5A max.

Option 3: AC 380-480V; 3W+PE, 50/60Hz.

1a), 1b), 1c): 9.2A max.

2a), 2b): 18.4A max.

3a), 3b): 27.6A max.

6a), 6b): 5.5A max.

7a), 7b): 6.5A max.

Option 4: AC 100-240V; single phase, 50/60Hz.

4a), 4b): 20A max.

5a), 5b): 18.5A max.

Option 5: AC 190-240V; single phase, 50/60Hz.

6a), 6b): 16.5A max.

7a), 7b): 21A max.

Output:

1a), 1b), 1c): DC 0-10V/500A to DC 0-600V/8.5A, 5200 Watt max.

2a), 2b): DC 0-10V/1000A to DC 0-600V/17A, 10400 Watt max.




3a), 3b): DC 0-10V/1500A to DC 0-600V/25.5A, 15600 Watt max.

4a), 4b): DC 0-10V/170A to DC 0-600V/2.8A, 1700 Watt max.

5a), 5b): DC 0-10V/150A to DC 0-600V/2.6A, 1560 Watt max.

6a), 6b): DC 0-10V/265A to DC 0-600V/4.5A, 2720 Watt max.

7a), 7b): DC 0-10V/340A to DC 0-600V/5.6A, 3450 Watt max.

Testing procedure and testing location:		
<input type="checkbox"/>	CB Testing Laboratory:	TUV Rheinland of North America, Inc.
Testing location/ address..... :		1279 Quarry Lane, Ste. A, Pleasanton, CA 94566
<input type="checkbox"/>	Associated CB Testing Laboratory:	
Testing location/ address..... :		
Tested by (name + signature)		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:	
Testing location/ address..... :		
Tested by (name + signature)		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:	
Testing location/ address..... :		
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature)		
<input checked="" type="checkbox"/>	Testing procedure: SMT/CTF Stage 3 or 4:	
Testing location/ address..... :		56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel
Tested by (name + signature)		Boris Gorinshtein 
Witnessed by (name + signature)		
Approved by (name + signature)		Jimmy Howell 
Supervised by (name + signature)..... :		Dan Aquino 

List of Attachments (including a total number of pages in each attachment):

- Attachment 1: National Differences (41 pages)
- **Attachment 2: Photos (56 pages)**
- **Attachment 3: Electrical Schematics (24 pages)**
- **Attachment 4: PCB layouts (91 pages)**
- **Attachment 5: Magnetics (45 pages)**
- **Attachment 6: Wire harness (56 pages)**

Summary of testing:

Tests performed (name of test and test clause):	Testing location:
<u>31781623.001</u> Clause 1.6.2. Power Input Measurements Clause 2.1.1.1. Accessibility to Energized parts Clause 2.1.1.7. Capacitor discharge test Clause 2.2. SELV circuits – voltage measurements (normal and fault conditions) Clause 2.5. Limited Power Test Clause 2.6.3.4. Protective bonding trace earth fault current Clause 2.6.3.4. Earthing test. Clause 2.10.2. Determination of working voltage Clause 2.10.2. Hazardous voltage (circuit) measurement test Clause 2.10.3.9 Measurement of transient levels Clause 4.2. Mechanical strength test Clause 4.3.2. Knob Pull Test Clause 4.4. Hazardous moving parts Clause 4.5.1. Temperature rise measurements Clause 4.5.2, 4.5.5. Ball Pressure Test Clause 5.1. Touch current measurements Clause 5.2. Dielectric strength test Clause 5.3. Abnormal operating and fault Conditions	TDK-Lambda Ltd.56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel
<u>31781623.003</u> Clause 1.6.2. Power Input Measurements Clause 2.1.1. Accessibility to Energized parts Clause 2.6.3.4. Earthing test Clause 2.9.2 Humidity Conditioning Clause 2.10 Clearances, Creepage distances Clause 4.2. Mechanical strength test Clause 4.5. Temperature rise measurements Clause 5.1. Touch current measurements Clause 5.2. Dielectric strength test Clause 5.3. Abnormal operating and fault Conditions	TDK-Lambda Ltd.56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel
<u>31781623.004</u> No Testing Performed	
<u>31781623.006</u> Clause 1.6.2. Power Input Measurements Clause 1.7.11 Durability of marking Clause 2.2 SELV circuits – voltage measurements	TDK-Lambda Ltd.56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel

<p>(normal and fault conditions) Clause 2.10 Clearances, Creepage distances Clause 2.10.2. Hazardous voltage (circuit) measurement test Clause 4.5. Temperature rise measurements Clause 5.2. Dielectric strength test Clause 5.3. Abnormal operating and fault Conditions</p>	
<p><u>31781623.008</u></p> <p>Clause 1.6.2 Power Input Measurements Clause 2.1.1.7 Capacitor discharge test Clause 2.5 Limited Power Test Clause 2.6.3.4 Earthing Test Clause 2.9.2 Humidity Conditioning Clause 2.10.2 Determination of working voltage Clause 2.10.2 Hazardous voltage (circuit) measurement test Clause 2.10.3.9 Measurement of transient levels Clause 4.2 Mechanical strength test Clause 4.5 Temperature rise measurements Clause 5.1 Touch current measurements Clause 5.2 Dielectric strength test Clause 5.3 Abnormal operating and fault Conditions</p>	<p>TDK-Lambda Ltd.56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel</p>
<p>31781623.009 No Testing Performed</p>	
<p>31781623.011 No Testing Performed</p>	
<p><u>31781623.013</u></p> <p>For GENESYS+ GH1500W: Clause 1.6.2. Power Input Measurements Clause 2.1.1.1. Accessibility to Energized parts Clause 2.6.3.4. Earthing test. Clause 2.10.2. Determination of working voltage Clause 4.2. Mechanical strength test Clause 4.5.1. Temperature rise measurements Clause 5.2. Dielectric strength test Clause 5.3. Abnormal operating and fault Conditions</p> <p>For GENESYS+ 2700/3400W: Clause 1.6.2. Power Input Measurements Clause 2.6.3.4 Earthing Test Clause 4.5.1. Temperature rise measurements Clause 5.2. Dielectric strength test Clause 5.3. Abnormal operating and fault Conditions</p>	<p>TDK-Lambda Ltd.56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel</p>
<p><u>31781623.015</u> No Testing Performed</p>	
<p><u>31781623.016</u> No Testing Performed</p>	

Summary of compliance with National Differences

The following national differences were considered to IEC 60950-1:2005 (2nd Edition) + Am 2:2013:

List of countries addressed: EU Group Differences, EU Special National Conditions, US

Explanation of used codes: US = United States of America

The following national differences were considered to IEC 60950-1:2005 (2nd Edition) + Am 1:2009:

List of countries addressed: IL, KR, JP, CA.

Explanation of used codes: IL = Israel, KR = Republic of Korea, JP=Japan, CA = Canada.

The product fulfils the requirements of IEC 60950-1:2005 + Am 1:2009 + Am 2:2013 and EN60950-1:2006+A11+A1+A12+A2

Copy of marking plate







The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBS that own these marks

GENESYS+5000W series







Input option 1

GENESYS 5000W			
INPUT RATING: 190-240V 3W+ ⊕ 18.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Input option 2

GENESYS 5000W			
INPUT RATING: 380-415V 3W+ ⊕ 9.2A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Input option 3

GENESYS 5000W			
INPUT RATING: 380-480V 3W+ ⊕ 9.2A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Model identification marking (sample)

1. Ordinary (full panel) unit










2. Blank unit



GSP/GBSP 10kW series:

Input option 1

GENESYS				
INPUT RATING: 190-240V 3W+  37A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 www.tuv.com ID 1234501131	 geprüfte Sicherheit	  
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern				

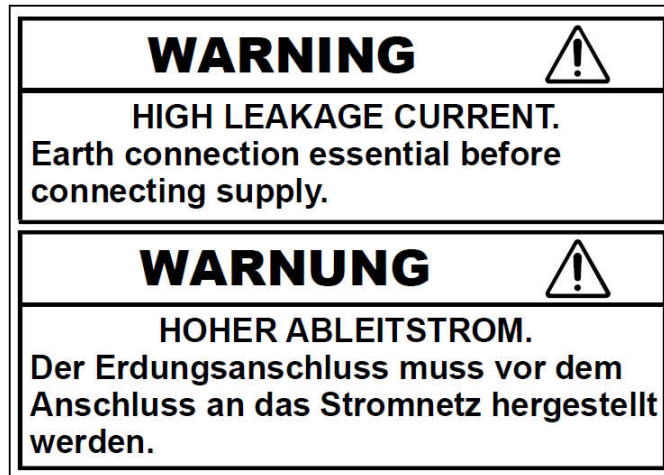
Input option 2

GENESYS				
INPUT RATING: 380-415V 3W+  18.4A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 www.tuv.com ID 1234501131	 geprüfte Sicherheit	  
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern				

Input option 3

GENESYS				
INPUT RATING: 380-480V 3W+  18.4A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 www.tuv.com ID 1234501131	 geprüfte Sicherheit	  
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern				

Warning labels



Model identification marking









Model identification marking




GSP/GBSP 15KW series:







Input option 1

GENESYS	
INPUT RATING: 190-240V 3W+⊕ 55.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY
    	
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achem	

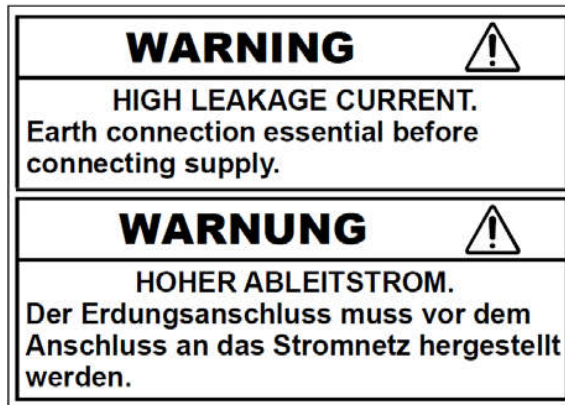
Input option 2

GENESYS	
INPUT RATING: 380-415V 3W+⊕ 27.6A 50/60Hz	 E155698 I.T.E. POWER SUPPLY
    	
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achem	

Input option 3

GENESYS	
INPUT RATING: 380-480V 3W+⊕ 27.6A 50/60Hz	 E155698 I.T.E. POWER SUPPLY
    	
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achem	

Warning labels




Model identification marking



Model identification marking



GENESYS+ 1700W series

GENESYS 1700W				
INPUT RATING: 100-240V 20A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	 <small>geprüfte Sicherheit</small>	  
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern				

Model identification marking

1. Ordinary (full panel) unit









2. Blank unit








GENESYS+ 2700W series







Input Option 1:

GENESYS 2700W			
INPUT RATING: 190-240V 16.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			







Input Option 2:

GENESYS 2700W			
INPUT RATING: 190-240V 3W+⊕ 10A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Input Option 3:

GENESYS 2700W			
INPUT RATING: 380-415V 3W+⊕ 5.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Input Option 4:

GENESYS 2700W			
INPUT RATING: 380-480V 3W+⊕ 5.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Model identification marking

1. Ordinary (full panel) unit



2. Blank unit




GENESYS+ 3400W series





Input Option 1:

GENESYS 3400W			
INPUT RATING: 190-240V 21A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			






Input Option 2:

GENESYS 3400W			
INPUT RATING: 190-240V 3W+⊕ 12.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Input Option 3:

GENESYS 3400W			
INPUT RATING: 380-415V 3W+⊕ 6.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Input Option 4:

GENESYS 3400W			
INPUT RATING: 380-480V 3W+⊕ 6.5A 50/60Hz	 E155698 I.T.E. POWER SUPPLY	 <small>www.tuv.com ID 1234501131</small>	   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Model identification marking





1. Ordinary (full panel) unit



2. Blank unit



GENESYS+ GH1500W series

<h1>GENESYS GH1500W</h1>			
INPUT RATING: 100-240V 18.5A 50/60Hz	 US LISTED E155698 I.T.E. POWER SUPPLY	 CERTIFIED <small>www.tuv.com ID 1234501131</small>	 gesicherte Sicherheit   
EU representative: TDK-Lambda Germany GmbH, Karl-Bold-Str. 40, D-77855 Achern			

Model identification marking



Test item particulars	
Equipment mobility	<input checked="" type="checkbox"/> movable (for GENESYS+ GH1500W/1700W/2700W/3400W/5000W series) <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input checked="" type="checkbox"/> stationary (for GSP/GBSP 10kW series, GSP/GBSP 15KW series) <input type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains	<input type="checkbox"/> pluggable equipment <input checked="" type="checkbox"/> type A (for GENESYS+ GH1500W/1700W/2700W/3400W) <input checked="" type="checkbox"/> type B <input type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input checked="" type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains <i>(NOTE: Means of connection to the mains is depends to the final installation)</i>
Operating condition	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input checked="" type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	+10%/-10%
Tested for IT power systems	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	30 (for GENESYS+5000W series) 60 (for GSP/GBSP 10kW series) 90 (for GSP/GBSP 15KW series)
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IP20
Altitude during operation (m)	Less than 3000
Altitude of test laboratory (m)	Less than 2000
Mass of equipment (kg)	3.5 max (GENESYS+ GH1500W series) 5 max (GENESYS+1700W series) 7 max (GENESYS+ 2700W/3400W series) 7.5 max (GENESYS+5000W series) 16 max (GSP/GBSP 10kW series) 24 max (GSP/GBSP 15KW series)
Possible test case verdicts:	
- test case does not apply to the test object.....	N/A (or N)
- test object does meet the requirement	P (Pass)
- test object does not meet the requirement.....	F (Fail)
Testing	
Date of receipt of test item	May 1, 2017 (31781623.001) Aug 27,2017 (31781623.003)

	N/A (31781623.004) Feb 4, 2018 (31781623.006) June 1, 2018 (31781623.008) N/A (31781623.009) N/A (31781623.011) Nov 22, 2018; Dec 6, 2018 (31781623.013) N/A (31781623.015) N/A (31781623.016)
Date(s) of performance of tests	May 1, 2017 to May 9, 2017 (31781623.001) Aug 27, 2017 to Sep 28, 2017 (31781623.003) N/A (31781623.004) Feb 4 to Feb 19, 2018; Mar 4 to Mar 8, 2018 (31781623.006) June 12, 2018 to June 18, 2018 (31781623.008) N/A (31781623.009) N/A (31781623.011) Nov 22, 2018; Dec 6, 2018; Feb 06 and 12, 2019; Mar 18, 2019; April 10-23, 2019 (31781623.013) N/A (31781623.015) N/A (31781623.016)

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.
 "(See appended table)" refers to a table appended to the report.

Throughout this report a comma / point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IEC60950:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....: **Yes**
 Not applicable

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies): TDK-Lambda Ltd.
 56 Haharoshet St., P.O.B. 500 Karmiel Industrial Zone Karmiel 2161401, Israel

 Wuxi TDK-Lambda Electronics Co., Ltd
 No. 6, Xing Chuang Er Lu
 Wuxi, Jiangsu Province, CHINA

General product information:

The GENESYS+5000W series is a family of power supplies having rated output from 0-10VDC/0-500A up to 0-600VDC/0-8.5A with total output power 5200 Watt maximum.

The GENESYS+5000W series is separated into three types of front panels and operation modes:

- a) Ordinary (full panel) units: is comes with display, on/off switch and may be operated independently or in parallel with another Ordinary, Blank or Booster unit by manual or remote control mode.
- b) Blank units: is comes without display, with on/off switch, and may be operated independently or in parallel with another Blank or Booster unit by remote control mode only.

c) Booster units: is comes without on/off switch, display and operated by master unit only (Ordinary or Blank)

The GSP/GBSP 10kW units consists of two single GENESYS+5000W units, in combination as described above in section " Model/Type reference", connected by the input and output in parallel.
The GSP/GBSP 10kW units is factory assembled only.

The GSP/GBSP 15KW units consists of three single GENESYS+5000W units, in combination as described above in section " Model/Type reference", connected by the input and output in parallel.
The GSP/GBSP 15KW units is factory assembled only.

The GENESYS+ 1700W series based on GENESYS+ 5000W. Since the output power of the GENESYS+ 1700W units is lower than the GENESYS+ 5000W, two DC/DC boards and interconnects board removed because they are no longer needed. The GENESYS+ 1700W series has the same mechanical and electronic construction as the GENESYS+ 5000W, with the exception of input and PFC boards. Power supplies having rated output from 0-10VDC/0-170A up to 0-600VDC/0-2.8A with total output power 1700 Watt maximum.

The GENESYS+ GH1500W series is based on GENESYS+ 1700W. The GENESYS+ GH1500W uses the same modules used in GENESYS+1700W except for the output filter boards. The GENESYS+ GH1500W has a different mechanical construction. The power supplies having rated output from 0-10VDC/0-150A up to 0-600VDC/0-2.6A with total output power 1560 Watt maximum.

The GENESYS+ 2700W and 3400W series are based on GENESYS+ 5000W. Since the output power of the GENESYS+ 2700W or 3400W units are lower than the GENESYS+ 5000W, one DC/DC board removed because it is no longer needed. The GENESYS+ 2700W and 3400W series have the same mechanical and electronic construction as the GENESYS+ 5000W, with the exception of additional one phase input and PFC boards but they are same as GENESYS+ 1700W series. The GENESYS+ 2700W and 3400W series having rated output from 0-10VDC/0-265A up to 0-600VDC/0-4.5A and 0-10VDC/0-340A up to 0-600VDC/0-5.5A respectively with total output power 2720 and 3450 Watt maximum respectively.

Engineering Considerations

- The units are Class I, evaluated for use in Installation Category II and Pollution Degree 2 environments.
- The units are evaluated for use in TN and TT power systems.
- All units may be adjusted by operator to 105% of the rated output voltage or current.
- Units with output rated up to (but not including) 60VDC considered as SELV output units.
- Units with output rated 60VDC and higher considered as Secondary Hazardous voltage output units.
- The units consist of an aluminum box-type frame enclosure with an aluminum cover.

The following parts factory installed (or may be installed - optional parts) inside of enclosure:

Common parts:

Input board IA764 for input 190-240V or IA765 for inputs 380-415V and 380-480V include:

- Input SELV module IA814 for input 190-240V or IA850 for inputs 380-415V and 380-480V;
- Input control module IA815 for input 190-240V or IA849 for inputs 380-415V and 380-480V;
- Input STBY module IA818 for inputs 380-415V and 380-480V.

For GENESYS+ GH1500W/1700W only:

- Input board IA763 for input 100-240V

For GENESYS+ 2700W/3400W only:

- Input board IA763 for input 190-240V

Power factor control board (PFC) IA766 for input 190-240V - 3Ph, IA767 for inputs 380-415V - 3Ph and 380-480V - 3Ph.

For GENESYS+ GH1500W/1700W only: Power factor control board (PFC) IA833 for input 100-240V - 1Ph.

For GENESYS+ 2700W/3400W only: Power factor control board (PFC) IA833 for input 190-240V - 1Ph.

GENESYS+ 5000W have three DC/DC converter boards connected in parallel,

GENESYS+GH1500W/1700W have one DC/DC converter board:

GENESYS+2700W/3400W have two DC/DC converter board connected in parallel.

IA768 for output 10V-30V, IA785 for output 40V-100V, IA769 for output 150-300V or IA851 for output 600V, each board includes:

- DC/DC slave module IA771.

Control board IA806.

Output filter board-IA787 for output 10-100V, IA809 for output 150-300V or IA788 for output 400-600V.
For GENESYS+ GH1500W: IA791 for output 10-100V, IA873 for output 150-200V, IA792 for output 300-600V.

Interface board-IA770.

Connect board-IA789.

Display-IA772 (GENESYS+ series)

Display-IA871 (GENESYS+ GH1500W only)

Blank Display-IA854 or IA884 or IA860 or IA910 (GENESYS+ series)

Booster-IA853 (GENESYS+ series)

Air filter kit-IA857:

For all models except 10V 3.4kW~15kW: 0~40°C, 100% load.

For 10V 3.4kW~15kW models: 0~30°C, 100% load, For 30°C ≤ Ta ≤ 40°C, derate 5A/1°C.

Operating: Maximum 10000ft (3000m).

For all models except 10V 3.4kW~15kW: Derate 1°C/100m, or 2% Load/100m above 2000m.

For 10V 3.4kW~15kW models: Derate 2°C/100m, or 2% Load/100m above 2000m.

Optional parts

GPIB (IEEE) board IA834.

Anybus board IA790.

The power I/O connectors are suitable for factory and field wiring.

The units are suitable for maximum ambient operating temperature 50°C at maximum load with the following derating: All units which include GPIB (IEEE) module are limited up to Tma=40°C. Output current derating 2%/100m or Tma derating 1°C /100m above 2000m. Non-operating: 40000ft (12000m).

For GENESYS+ 5000W only:

Units with output 0-10VDC/0-500A: up to Tma=40°C, or 0-10VDC/0- 450A up to Tma=50 °C; For 10V model derate 5A/1°C above 40°C. For 10V model Tma derating 2°C /100m,

For 10V model only: Max. output current for using GPIB (IEEE) is 400A up to 40 °C and 450A up to 30 °C.

For GSP/GBSP+ 10KW only:

Units with output 0-10VDC/0-1000A: up to Tma=40°C, or 0-10VDC/0-900A up to Tma=50 °C; For 10V model derate 10A/1°C above 40°C. For 10V model Tma derating 2°C /100m, For 10V model only: Max. output current for using GPIB (IEEE) is 800A up to 40 °C and 900A up to 30 °C.

For GSP/GBSP+ 15KW only:

Units with output 0-10VDC/0-1500A: up to Tma=40°C, or 0-10VDC/0-1350A up to Tma=50 °C; For 10V model derate 15A/1°C above 40°C. For 10V model Tma derating 2°C /100m,

For 10V model only: Max. output current for using GPIB (IEEE) is 1200A up to 40 °C and 1350A up to 30 °C.

For GENESYS+ GH1500W only:

When applying input voltage under 100Vac, maximum operating temperature is 45°C.

Definition of variable(s): Model configuration code

GENESYS+5000W series

Gxxx-yyy-z-v-uuuuuu-w – ordinary unit

GBxxx-yyy-z-v-uuuuuu-w – blank unit

GSSxxx-yyy-z-v-uuuuuu-w – booster unit

GSP/GBSP 10kW series:

GSPxxx-yyy-z-v-uuuuuu-w Consist of: Ordinary unit + Booster unit

GBSPxxx-yyy-z-v-uuuuuu-w Consist of: Blank unit + Booster unit

GSP/GBSP 15KW series:

GSPxxx-yyy-z-v-uuuuuu-w Consist of: Ordinary unit + Two Booster units

GBSPxxx-yyy-z-v-uuuuuu-w Consist of: Blank unit + Two Booster units

GENESYS+1700W series

Gxxx-yyy-z-uuuuuu-w – ordinary unit

GBxxx-yyy-z-uuuuuu-w – blank unit

GENESYS+2700W/3400W series

Gxxx-yyy-z-v-uuuuuu-w – ordinary unit

GBxxx-yyy-z-v-uuuuuu-w – blank unit

GENESYS+ GH1500W series

GHxxx-yyy-z-uuuuuu-w – ordinary unit

GHBxxx-yyy-z-uuuuuu-w – blank unit

Variable:	Range of variable:	Content:
xxx	010-600	min/max output voltage in VDC
y	yy = 8.5-500 (for GENESYS+5000W) yyyy = 17-1000 (for GSP/GBSP 10kW) yyyy = 25.5-1500 (for GSP/GBSP 15kW) yyy = 2.8-170 (for GENESYS+1700W) yyy = 2.6-150 (for GENESYS+ GH1500W) yyy = 4.5-265 (for GENESYS+ 2700W) yyy = 5.5-340 (for GENESYS+ 3400W)	min/max output current in A
z	1. GPIB (IEEE) 2. AnyBus 3. Blank	1. IEEE card installed; 2. AnyBus module installed 3. Base model.
v	1. 3P200/3P208 2. 3P400 3. 3P480 4. 1P100-240 5. 1P190-240	1. Three phase units (option 1): 190-240V, 3 W+PE, 50/60 Hz 2. Three phase units (option 2): 380-415V, 3W+PE, 50/60 Hz 3. Three phase units (option 3): 380-480V, 3W+PE, 50/60 Hz 4. Single phase units: 100-240V, 50/60 Hz. 5. Single phase units: 190-240V, 50/60Hz.
u	1. Various letters or/and numbers 2. Blank	1. Indicate other options (not safety related) 2. Base model
w	1.CO 2.Blank	1. Conformal coating used on all boards or partially (for environmental protection only). 2. Without conformal coating.

Abbreviations used in the report:

- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI

Indicate used abbreviations (if any)

- primary	PRI
- ground (protective earth)	GND
- safety extra low voltage	SELV
- terminal block	TB
- triple insulated wire	TIW
- restricted access location	RAL
- Internal protection operated (list component)	IP
- Constant temperatures were obtained	CT
-Transformer winding opened	TW
- Components damaged (list damaged components)	CD
- No indication of dielectric breakdown	NB
- Dielectric breakdown (indicate time and location)	YB
- Cheesecloth remained intact	NC
- Cheesecloth charred or flamed	YC
- Tissue paper remained intact	NT
- Tissue paper charred or flamed	YT

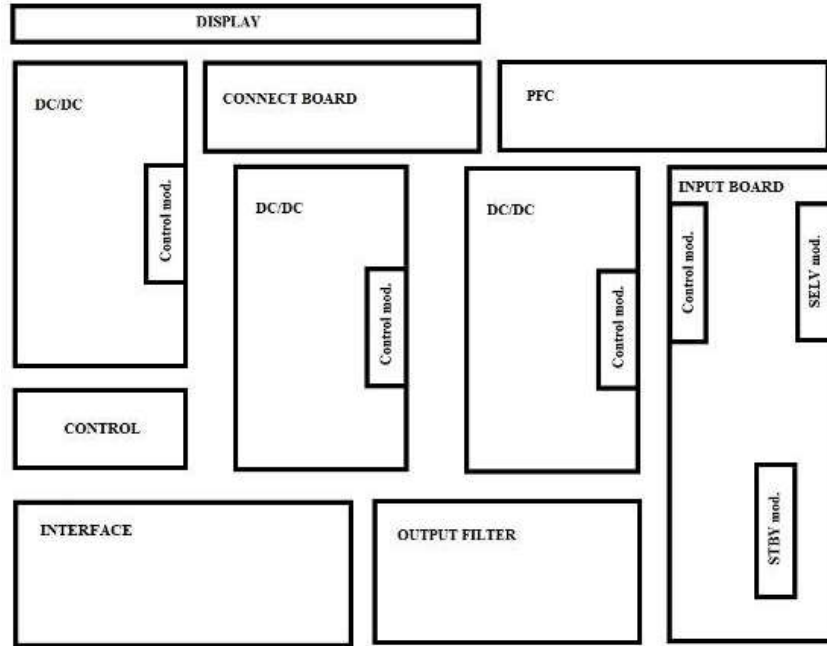
Test Report History:

31781623.016	<p>This report covers the following:</p> <ul style="list-style-type: none"> - Addition of 200VDC output option for the GENESYS + series (under model G200-25). This model is included in the already approved GENESYS+ family as part of already approved output voltage range. All necessary safety testing was carried out during previous evaluations and testing. The only changes are the additional transformer T3 and inductive choke part number L3. - Update of attachments. - Administrative updates: Correction of typos and additional information added to the list of critical components.
31781623.015	<p>This report covers the following:</p> <ul style="list-style-type: none"> - Update of Attachments 1 with the missing clauses - Added missing photographs in Attachments 2 - Added missing electrical schematics in Attachment 3
31781623.013	<p>This report covers the following:</p> <ul style="list-style-type: none"> - Addition of the new GENESYS+ GH1500W series. - Addition of the new GENESYS+ 2700W and 3400W series. - Addition of the new Strain relief for GSP/GBSP 3Ph400/480 - New DCDC transformer drawing for G200-25 model. - New Front Panel design with Light Pipe for Booster and Blank models. - Update of warning-label artwork. - Update of Chokes names from IA867-01 to IA788-01 and from IA868-01 to IA809-01. - Update of Attachments 2 (Photos) to CBTR. - Update of Attachments 3 (Schematics) to CBTR. - Update of Attachments 4 (PCB layout) to CBTR. - Update of Attachments 5 (Magnetics) to CBTR. - Update of Attachments 6 (Wire harness) to CBTR. - Added two inner layers to the INPUT STBY module PCB. - Added alternative INTERFACE board ICB367 with two inner layers, by GUANGZHOU FAST-PRINT CIRCUIT TECHNOLOGY CO LTD

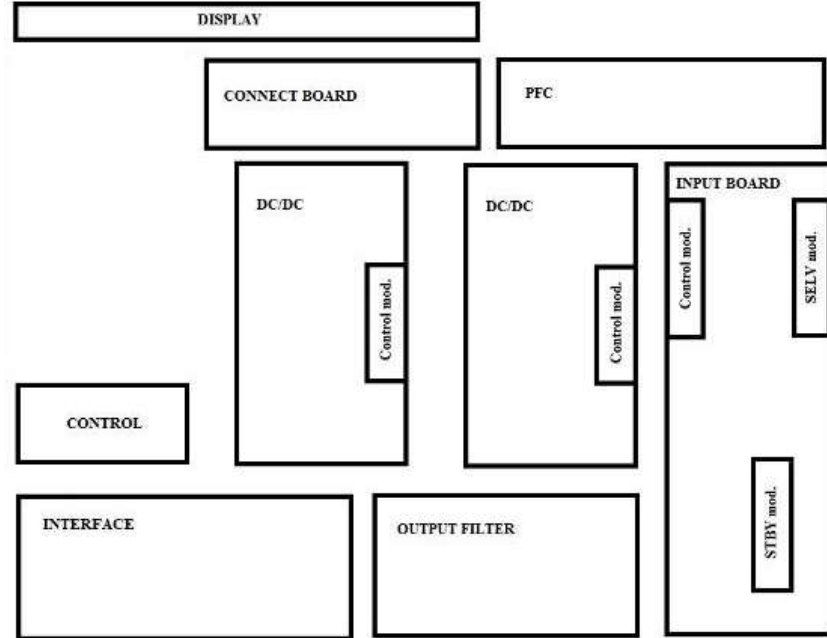
	<ul style="list-style-type: none"> - Added LINKO as alternative manufacturer for internal wire harness - Added MFS TECHNOLOGY as alternative manufacturer for PCB. - Added winding wire (xUEW/155 QA-x/155, Ningbo Jintian) to transformer IA851-35-01 and transformer IA769-35-01.
31781623.011	<p>Addition of factory: Wuxi TDK-Lambda Electronics Co., Ltd No. 6, Xing Chuang Er Lu Wuxi, Jiangsu Province, China No testing deemed necessary.</p>
31781623.009	<p>Amendment 1 to 31781623.008. This report covers the following:</p> <ul style="list-style-type: none"> - Correction to Clause 2.6.3.4 Protective bonding trace earth fault current. The test was waived due to similarity with previous circuit. - Correction of DC-DC Choke L3 model number from 60Vdc: IA785-02 to 60Vdc: IA785-04 - Updated the Canada National Differences from Amendment 1 to Amendment 2
31781623.008	<p>This report covers the following:</p> <ul style="list-style-type: none"> - Addition of the new GENESYS+ 1700W series. - Update of attachments to include GENESYS+ 1700W series. - Update of critical component list and attachments to include necessary information. - Correction of critical component list and Table: Clearance and creepage distance measurements.
31781623.006	<p>Amendment 3 to 31781623.001. This report covers the following:</p> <ul style="list-style-type: none"> -The model designation for 10000W and 15000W has been changed from GENESYS+10kW series and GENESYS+15KW series to GSP/GBSP 10kW series and GSP/GBSP 15kW series correspondingly. - Adding 3P200 to configuration code. - Update of safety label -The listing of Input/Output rating has been updated to clarify information. - Adding test result tables in body of report, information in critical component list and attachments regarding new models with output voltage 40, 60, 80, 100, 150. -Corrected the max. allowed temperature for chokes. -Update of attachment 2, 3, 4, 5. -Critical Component List revisions
31781623.004	<p>Amendment 2 to 31781623.001. This report covers the following:</p> <ul style="list-style-type: none"> -The model nomenclature has been updated to provide more information about the model series. -Administrative update to the critical components list to include missed components from 31781623.003.
31781623.003	<p>Amendment 1 to 31781623.001. This report covers the following:</p> <ul style="list-style-type: none"> -Addition of the new GENESYS+10kW series and GENESYS+15KW series (based on previously certified GENESYS+5000W, factory assembled) -Removal of the applicability for IT power distribution system -Critical Component List revisions -Addition of Attachment 6: Wire Harness.
31781623.001	Original CB report

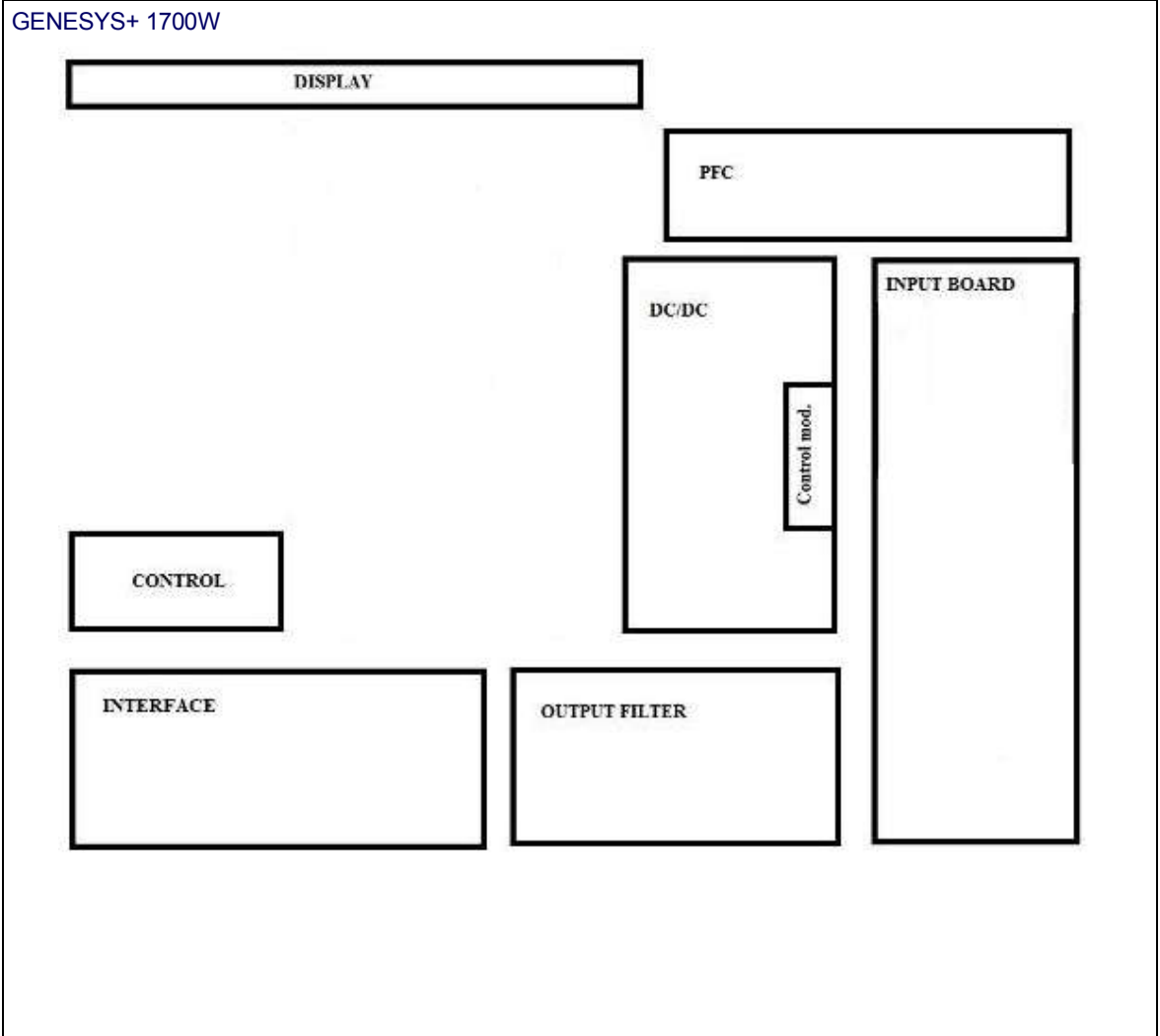
Block Diagram (as they are laid out within unit)

GENESYS+ 5000W

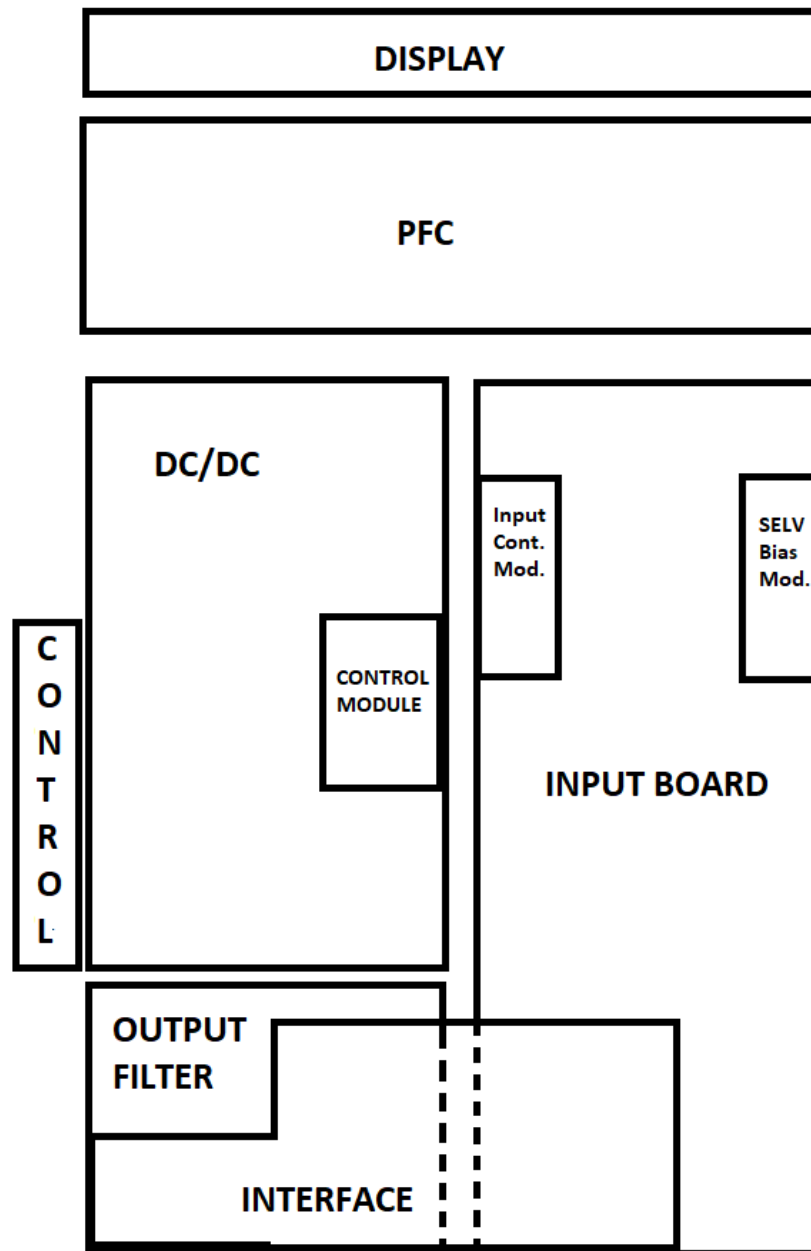


GENESYS+ 2700W/3400W





GENESYS+ GH1500W



<p>Component's description</p> <p>1. Input boards The input board is construct of UL Recognized input connector, EMI filter, inrush current protection, diode rectifier, SELV BIAS, FUN BIAS and Main BIAS. There are three types of input boards:</p> <ul style="list-style-type: none"> • 3 phase, for units rated 190-240VAC • 3 phase, for units rated 380-480VAC • 1 phase, for units rated 190-240VAC • 1 phase, for units rated 100-240VAC <p>The input board provides the DC voltage for the PFC (Power Factor Control) board</p>
<p>2. Power factor control (PFC) board The PFC board includes a Power Factor Correction circuit There are three types of PFC board:</p> <ul style="list-style-type: none"> • For 3 phase units rated 190-240VAC • For 3 phase units rated 380-480VAC • For 1 phase units rated 100-240VAC <p>The PFC board provides 380VDC voltage for the DC/DC boards and internal BIASs.</p>
<p>3. For GENESYS+ 5000W only: Connection board Distribute power from PFC to DC/DC boards</p>
<p>4. DC/DC boards The DC/DC board includes a DC/DC converter There are four types of DC/DC boards:</p> <ul style="list-style-type: none"> • For units having output voltage from 10Vdc up to (and including) 30Vdc • For units having output voltage from 40Vdc up to (and including) 100Vdc • For units having output voltage from 150Vdc up to (and including) 300Vdc • For units having output voltage from 400Vdc up to (and including) 600Vdc <p>Each GENESYS+ 5000W has three DC / DC boards that are assembled in parallel to provide a total output power of up to 5200 watts, for GENESYS+ GH1500W/1700W there is one DC / DC board with a maximum output of 1560/1700 watts respectively. GENESYS+ 2700W/3400W there are two DC / DC boards with a maximum output of 2720/3450 watts respectively.</p>
<p>5. Control board The control board is the same for all models. The control board includes the control and adjusts circuits for maintenance of functioning of power supply.</p>
<p>6. Output filter board There are six types of the output filter boards:</p> <ul style="list-style-type: none"> • For units having an output voltage from 10Vdc up to (and including) 100Vdc • For units having an output voltage from 150Vdc up to (and including) 300Vdc • For units having an output voltage from 400Vdc up to (and including) 600Vdc • For units having an output voltage from 10Vdc up to (and including) 100Vdc (GENESYS+ GH1500W only) • For units having an output voltage from 150Vdc up to (and including) 200Vdc (GENESYS+ GH1500W only) • For units having an output voltage from 300Vdc up to (and including) 600Vdc (GENESYS+ GH1500W only) <p>The output filter board 10-100Vdc has bus-bar type of output terminals. The output filter boards 150-300Vdc, 400-600Vdc, 150-200Vdc, 300-600Vdc has a UL Recognized connector intended for factory and field wiring.</p>

7. Display assembly

There are 5 types of display assemblies.

- Full panel assembly – includes LCD display, silicon buttons, knobs, encoders, on/off switch.
- Blank panel assembly – includes litepipes, on/off switch.
- Booster panel assembly – no additional parts assembly
- Full panel assembly (GENESYS+ GH1500W only) – includes LCD display, silicon buttons, knobs, encoders, on/off switch.
- Blank panel assembly (GENESYS+ GH1500W only) – includes litepipes, on/off switch.

8. Interface board

Intended to provide external communications (RS232, USB, LAN, remote programming, paralleling, etc.).