TEST REPORT

This report is to supersede test report RCO15CE040024.

Report No.:	RCO15CE040024A
Applicant:	ELETTRONICA SANTERNO SPA
Address of Applicant:	Via della Concia 7 - 40023 Castel Guelfo Di Bologna - Italy
EUT Name:	FREQUENCY INVERTER
Brand Name:	SANTERNO CARRARO GROUP
Model No.:	Please refer to page 4.
Standards:	EN 61800-5-1:2007
Date of Test:	April 29, 2015 To May 08, 2015
Date of Issue:	August 10, 2015
Test Result :	**PASS**

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives.

CE

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TEST REPORT
per
EN 61800-5-1
Adjustable speed electrical power drive systems
Part 5-1: Safety requirements for
Electrical, thermal and energy

Administrative Data

Report Reference No. .....:	RCO15CE040024A
Testing laboratory.....:	Rader Certification UK Co., Ltd.
Address.....:	710, Jiangong Building, Zizhu 7th Road, Futian District, Shenzhen, China
Tested by (name and signature) .....:	Michael Yu
Approved by (name and signature)..:	Jason Jing
Date of issue .....:	August 10, 2015
Contents .....:	21 Pages.

Test specification:

Standard(s).....:	EN 61800-5-1:2007
Test procedure ..... :	CE-LVD
Non-standard test method.....:	N/A

Applicant's name .....:	ELETTRONICA SANTERNO SPA
Address .....:	Via della Concia 7 - 40023 Castel Guelfo Di Bologna - Italy
Manufacturer……..:	ELETTRONICA SANTERNO SPA
Address……..:	Via della Concia 7 - 40023 Castel Guelfo Di Bologna - Italy

Test item description .....:	FREQUENCY INVERTER
Brand Name .....:	SANTERNO CARRARO GROUP
Model/Type reference .....:	Please refer to page 4.
Model tested……..:	SINUS VEGA 0007 4T
Rating(s).....:	AC 3PH 380V~, 50/60Hz

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Test item particulars:	
Type of item tested……..:	Safety Evaluation
Description of equipment function……:	
Overall size of the equipment (L x W x H)…..:	See instruction
Mass of the equipment (kg)……..:	/
Accessories and detachable parts included in the evaluation……..:	—
Option…… …:	—
Test case verdicts:	
Test case does not apply to the test object…..:	N(N/A)
Test object does meet the requirement…….:	P(Pass)
Test object does not meet the requirement….:	F(Fail)
Testing:	
Date of receipt of test item……..:	April 29, 2015
Date (s) of performance of tests……:	April 29, 2015 To May 08, 2015

General Remarks:

This report shall not be reproduced except in full without the written approval of the testing laboratory.
The test results presented in this report relate only to the item(s) tested.
”(see remark #)" refers to a remark appended to the report.
"(see Annex #)" refers to an annex appended to the report.
Throughout this report a comma is used as the decimal separator.

Copy of Marking Plate:

FREQUENCY INVERTER

Model: SINUS VEGA 0007 4T 

AC 3PH 380V~, 50/60Hz

ELETTRONICA SANTERNO SPA

Summary of Testing:

The product has been tested and found in compliance with the standard requirements.
We select the models of maximum power model SINUS VEGA 0007 4T for all testings.

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Model No.:

SINUS VEGA 0001 2S	SINUS VEGA 0002 2S	SINUS VEGA 0003 2S	SINUS VEGA 0004 2S
SINUS VEGA 0002 4T	SINUS VEGA 0003 4T	SINUS VEGA 0004 4T	SINUS VEGA 0005 4T
SINUS VEGA 0007 4T	SINUS VEGA 0011 4T	SINUS VEGA 0015 4T	SINUS VEGA 0018 4T
SINUS VEGA 0022 4T	SINUS VEGA 0030 4T	SINUS VEGA 0037 4T	SINUS VEGA 0045 4T
SINUS VEGA 0055 4T	SINUS VEGA 0075 4T	SINUS VEGA 0090 4T	SINUS VEGA 0110 4T
SINUS VEGA 0132 4T	SINUS VEGA 0160 4T	SINUS VEGA 0185 4T	SINUS VEGA 0200 4T
SINUS VEGA 0220 4T	SINUS VEGA 0250 4T	SINUS VEGA 0280 4T	SINUS VEGA 0315 4T
SINUS VEGA 0355 4T	SINUS VEGA 0400 4T	SINUS VEGA 0450 4T	SINUS VEGA 0500 4T
SINUS VEGA 0560 4T	SINUS VEGA 0630 4T	SINUS VEGA 0800 4T	SINUS VEGA 1000 4T

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EN 61800-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
4	**protection against electric shock, thermal, and energy hazards**		P
4.1	General	See below	P
	Hazard and risk assessment	See below	P
4.2	Fauit conditions	See below	P
4.3	Protection against electric shock	See 5.2.3.6.4	P
4.3.1	Decisive voltage class	See table 4.3.1	P
4.3.1.1	Use of decisive voltage class	See below	P
4.3.1.2	Limits of DVC		N
4.3.1.3	Requirments for protection		P
4.3.1.4	Circuit evaluation	Circuit evaluated by three cases of waveforms	P
4.3.1.4.1	General		P
4.3.1.4.2	AC working voltage	AC working voltage Class A : work voltage _____V<25Vrms Class B: work voltage _____V<50Vrms Class C: work voltage 250Vrms /329Vpeak<1000Vrms for input circuit	P
4.3.1.4.3	DC working voltage	DC working voltage Class A : work voltage 29.8Vdc<60Vdc for control circuit Class B: work voltage _____V< 120Vdc Class C: work voltage 348Vdc<1500Vdc for generatrix circuit	P
4.3.1.4.4	Pulsating working voltage	Pulsating working voltage Class A : work voltage _____V<42.4Vpeak Class B: work voltage _____V<71Vpeak Class C: work voltage 369Vpeak/256Vrms <4500Vpeak for output circuit	P
4.3.2	Protective Separation	Protective separation used for between ELV and other circuits	P
4.3.3	Protection against direct contact	Comply with the requirements	P

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EN 61800-5-1			
Clause	Requirement + Test	Result - Remark	Verdict
4.3.3.1	General	See below	P
4.3.3.2	Protection by means of insulation of live parts	Basic insulation used between accessible parts conductive and live parts, and then connected to protective bonding	P
4.3.3.3	Protection by means of enclosures and barriers	Protection by metal enclosures, at least IP2X used The top surface at least IP3X used.	P
4.3.4	Protection in case of direct contact	Comply with the requirements	P
4.3.4.1	General	See below	P
4.3.4.2	Protection using DVC A		N
4.3.4.3	Protection by means of protective impedance	Protective impedance used for between L,N and PE. See Table 5.2.3.1 and Table 5.2.3.2 and Table 5.2.3.5	P
4.3.4.4	Protection by means of using limited voltage		N
4.3.5	Protection against indirect contact	Comply with the requirements	P
4.3.5.1	General	Class I	P
4.3.5.2	Insulation between live parts and exposed conductive parts	No exposed conductive parts used Reinforced insulation used for between live parts and exposed nonconductive parts and then clearances>3.0mm	N
4.3.5.3	Protective bonding circuit	The equipment provided protective earthing bonding point, but not provided PBC and not provided exposed conductive parts. So the protective bonding resistance cann't been measured	N
4.3.5.4	Protective earting conductor		P
4.3.5.5	Means of connection for the protective conductor	Comply with the requirements	P
4.3.5.5.1	General	The means of connection is corrosion-resistance and not use as a part of mechanical assembly, cross-sectional area of protective conductor is not less than 2.5mm^2	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.5.5.2	Connection under high leakage current	Leakage current is 0.86mA <3.5mA Provision of two terminals for a protective conductor of the same cross-sectional area as the original protective conductor.	N
4.3.5.6	Special features in equipment for protection class II	Class I equipment	P
4.3.6	Insulation	See below	P
4.3.6.1	General	Comply with the requirements	P
4.3.6.1.1	Influencing factors		P
4.3.6.1.2	Pollution degree	Pollution degree 2	P
4.3.6.1.3	Overvoltage category		N
4.3.6.1.4	Supply earthing systems	TN systems	P
4.3.6.1.5	Insulation voltage		P
4.3.6.2	Insulation to the surroundings	Comply with the requirements	P
4.3.6.2.1	General	For creepage distance, the r.m.s.value of the working voltage is used; for clearance distances and solid insulation, the recurring peak value is used. The impulse voltage is 4000V	P
4.3.6.2.2	Circuits energized directly from the supply mains	No circuits energized directly from the supply mains	N
4.3.6.2.3	Circuits not energized directly from the mains	Insulation designed according to the impulse voltage, or the working voltage Overvoltage Category III	P
4.3.6.2.4	Insulation between circuits	Designed according to more severe requirements	P
4.3.6.3	Functional insulation		P
4.3.6.4	Clearance distances	See table 4.3.6.6	P
4.3.6.4.1	Determination	See table 4.3.6.6	P
4.3.6.4.2	Electric Field homogeneity		N
4.3.6.4.3	Clearance to conductive enclosures		N
4.3.6.5	Creepage distance	See table 4.3.6.6	P
4.3.6.5.1	General		P
4.3.6.5.2	Materials	Insulating material group IIIa 400>CTI≧175 Insulating material group IIIb 175>CTI≧100	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.6.6	Coating	Coating used to provide insulation Comply with IEC60664-3 approved component	P
4.3.6.7	PWB spacing for functional insulation		P
4.3.6.8	Solid insulation	See below	P
4.3.6.8.1	General	Comply with the requirements	P
4.3.6.8.2	Requirements for electrical withstand capability	See table 5.2.3.1,5.2.3.2,5.2.3.3	P
4.3.6.8.2.1	Basic- and Supplementary Insulation	See table 5.2.3.1,5.2.3.2,5.2.3.3 Test with a.c. or d.c. voltage 1500Vac/2120Vdc	P
4.3.6.8.2.2	Double- and Reinforced Insulation	See table 5.2.3.1,5.2.3.2,5.2.3.3 Impulse withstand voltage 4000V Test with a.c. or d.c. voltage 3000Vac/4240Vdc	P
4.3.6.8.2.3	Functional insulation		P
4.3.6.8.3	Thin sheet or tape material	Tape insulation used ,See table: list of critical components for transformer	N
4.3.6.8.3.1	General		N
4.3.6.8.3.2	Material thickness not less than 0,2mm		N
4.3.6.8.3.3	Material thickness less than 0,2mm		N
4.3.6.8.3.4	Compliance		N
4.3.6.8.4	Printed wiring boards	See table: list of critical components	P
4.3.6.8.4.1	General		P
4.3.6.8.4.2	Use of coating materials		P
4.3.6.8.5	Wound components	Varnish material used, See table: list of critical components for transformer	P
4.3.6.8.6	Potting materials etc.	No potting materials	P
4.3.6.9	Insulation requirments above 30kHz		N
4.3.7	Enclosures		P
4.3.7.1	General	Plastic enclosure	P
4.3.7.2	Cast metal	Not cast metal	N
4.3.7.3	Sheet metal		N
4.3.8	Wiring and Connections	See below	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.3.8.1	General	No mechanical damage and comply with relevant standard, See table: list of critical components	P
4.3.8.2	Routing	Comply with the requirements	P
4.3.8.3	Color coding	Comply with the requirements Protective bonding used for EMC Green and yellow bicolour	P
4.3.8.4	Splices and connections	All splices connection is mechanically secure No wire-binding screw used	P
4.3.8.5	Accessible connections		P
4.3.8.6	Interconnections between parts of the PDS	Comply with the requirements Rubber bushing used for protective cable damaged	P
4.3.8.7	Supply connections	No loosen hazard	P
4.3.8.8	Terminals		P
4.3.8.8.1	Construction requirements	Comply with the requirements	P
4.3.8.8.2	Connecting capacity	Comply with the requirements	P
4.3.8.8.3	Connection	Terminals for connection to external conductors is accessible during installation, no clamping screws and nuts serve to fix any other component	P
4.3.8.8.4	Wire bending space for wires 10 mm² and greater	Comply with the requirements	P
4.3.9	Short Circuit Requirements	See clause 5.2.3.6	P
4.3.10	RCD Compartibility		N
4.3.11	Capacitor Discharge	No such capacitor	N
4.3.12	Access conditions for high voltage product	No high voltage product	N
4.4	Protection against thermal hazards	See below	P
4.4.1	Minimising the risk of ignition	Comply with the requirements	P

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Clause	Requirement + Test	Result - Remark	Verdict
4.4.2	Insulation Materials	Insulation materials comply with relevant standard See table: list of critical components The insulating material comply with the glow-wire test described in 5.2.5.3 at a test temperature of 850 °C. The alternative hot wire ignition test of 5.2.5.4 may be used. HWI=3 The insulating material have a CTI of 100 or greater.	P
4.4.2.1	General		P
4.4..2.2	Material requirments		P
4.4.3	Flammability of enclosure materials	Metal enclosure used	N
4.4.4	Temperature limits	Comply with the requirements	P
4.4.4.1	Internal parts	See table: 5.2.3.9	P
4.4.4.2	External parts of CDM	See table: 5.2.3.9	P
4.4.5	Specific requirment for liquid cooled PDS		N
4.4.5.1	Coolant		N
4.4.5.2	Design requirments		P
4.4.5.2.1	Corrosion resitance		P
4.4.5.2.2	Tubing,joints and seals		N
4.4.5.2.3	Provision for condensation		N
4.4.5.2.4	Leakage of coolant		N
4.4.5.2.5	Loss of coolant		N
4.4.5.2.6	Conductivity of coolant		N
4.4.5.2.7	Insulation requirments for coolant hoses		N
4.5	Protection against energy hazards	See below	P
4.5.1	Electrical energy hazards	No such hazards	P
4.5.2	Mechanical energy hazards	No such hazards	P
4.5.2.1	General	See below	P
4.5.2.2	Critical torsional speed	See instruction	P
4.5.2.3	Transient torque analysis	See instruction	P
4.5.3	Acoustic noise emission		N
4.6	Protection against environmental stresses		N

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Clause	Requirement + Test	Result - Remark	Verdict
5	**Test Requirements**		P
5.1	General		P
5.1.1	Test objectives and classification	EUT tested according type tests	P
5.1.2	Selection of test samples		P
5.1.3	Sequence of tests		P
5.1.4	Earthing Conditions	This EUT include : L phase to earth.N phase to earth. Between L,N, and earth have voltage resistance.	P
5.1.5	Compliance	Comply with the requirements	P
5.1.6	Test Overview	EUT tested according to type test	P
5.2	Test specifications		P
5.2.1	Visual Inspections (type test)	Visual inspections has been made before starting testing	P
5.2.2	Mechanical tests	See below	P
5.2.2.1	Clearance and creepage distance (type test)	See table: 4.3.6.6 and 4.3.6.7	P
5.2.2.2	PWB abnormal operation test (type test)	PWB comply with relevant standard	P
5.2.2.3	Non -accesssibility test (type test)	IP3X	P
5.2.2.4	Enclosure integrity test (type test)	IP20	P
5.2.2.5	Deformation tests	Comply with the requirements	P
5.2.2.5.1	General		P
5.2.2.5.2	Deflection test (type test)	250N for 5s, no damage	P
5.2.2.5.3	Impact test (type test)	A solid smooth steel sphere of 500g, 50mm in diameter applied, no damage	P
5.2.3	Electrical tests	Comply with the requirements See table 5.2.3	P
5.2.3.1	Impulse voltage test (type test)	Clearances comply with table 6 requirements	N
5.2.3.2	AC or DC voltage test (type and routine test)	See table 5.2.3.2	P
5.2.3.2.2	Value and type of test voltage	Test circuits connected directly to the mains 1500V for basic insulation, 3000V for supplementary damage and reinforced insulation	P
5.2.3.2.3	Performing the voltage test	See table 5.2.3.2	P
5.2.3.2.4	Duration of the AC or DC voltage test	60s	P

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Clause	Requirement + Test	Result - Remark	Verdict
5.2.3.2.5	Verification of the AC or DC voltage test	No breakdown occurs	P
5.2.3.3	Partial Discharge Test (type, sample or special test)		N
5.2.3.4	Protective impedance (type test and routine test)		P
5.2.3.5	Leakage current measurement (type test)	See table 5.2.3.5	P
5.2.3.6	Short circuit test and Breakdown of components test	See below	P
5.2.3.6.1	General		P
5.2.3.6.2	Test configuration		P
5.2.3.6.2.1	Supply voltage and current		P
5.2.3.6.3	Short-circuit test		P
5.2.3.6.3.1	Loading conditions		P
5.2.3.6.3.2	Location of short-circuit		P
5.2.3.6.4	Breakdown of Components test (type test)		P
5.2.3.6.4.1	Load conditions		P
5.2.3.6.4.2	Application of short-circuit or open-circuit		P
5.2.3.6.5	Sequence test		P
5.2.3.6.6	Pass criteria		P
5.2.3.7	Capacitor discharge(type test)	No such capacitor	N
5.2.3.8	Temperature rise test (type test)	See table 5.2.3.8	P
5.2.3.9	Protective bounding (type test and routine test)		P
5.2.4	Abnormal operation tests	See below	P
5.2.4.1	General		P
5.2.4.2	Test duration		P
5.2.4.3	Pass criteria		P
5.2.4.4	Clogged filter (type test)	No clogged filter	N
5.2.4.5	Cooling failure tests		N
5.2.4.5.1	General		N
5.2.4.5.2	Inoperative blower motor		N
5.2.4.5.3	Clogged filter		N
5.2.3.5.4	Loss of coolant		N
5.2.5	Material tests	Materials comply with relevant standard	P
5.2.5.1	High current arcing ignition test (type test)		N
5.2.5.2	Glow-wire test (type test)	850 °C.	P
5.2.5.3	Hot wire ignition test (type test - alternative to glow-wire test	HWI=3	P
5.2.5.4	Flammability test (type test)	UL94-5VA/VB	P
5.2.6	Environmental tests (type test)		P
5.2.6.1	General		P

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Clause	Requirement + Test	Result - Remark	Verdict
5.2.6.2	Acceptance criteria		N
5.2.6.3	Climatic tests		P
5.2.6.3.1	Dry heat tests		N
5.2.6.3.2	Damp heat test	40℃, 93%,120h	P
5.2.6.4	Vibration test(type test)		N
5.2.7	Hydrostatic pressure(type test and routine test)		N
6	**Information and marking requirements**	See below	P
6.1	General	See below	P
6.2	Information for selection	See intruction	P
	Name of manufacturer, supplier or importer	on product and manual and packaging	P
	Model:	on product and instruction and packaging	P
	Voltage, current and power rating for input	on product and instruction	P
	Voltage, current and power rating for output	on product and instruction	P
	Protective class	Class I	P
	Short circuit designation	150% of rated output current /1min 180% of rated output current /10s 200% of rated output current /0.5s	P
	Operating and storage environment	-10℃-40℃,humidity 5%-95%	P
	Reverence to relevant standards	EN61800-5-1:2007 See instruction	P
	Serial No. or year of fabrication	Marked on product	P
	Reverence to instructions for installation, use and maintenance	See instruction	P
6.3	Information for installing and commissioning	See below	P
6.3.1	General	See instruction	P
6.3.2	Mechanical considerations	See instruction	P
6.3.3	Environment	-10℃-40℃,humidity 5%-95%	P
6.3.4	Handling and mounting	See instruction and packaging	P
6.3.5	Motor and driven equipment	See instruction	P
6.3.5.1	General	See instruction	P
6.3.5.2	Motor selection	See instruction about motor	P
6.3.5.3	Motor integrated sensors	See instruction about motor	P
6.3.5.4	Critical torsional speeds	See instruction about motor	P

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6.3.5.5	Transient torque analysis	See instruction about motor	P
6.3.6	Connections	See instruction	P
6.3.6.1	General	See instruction	P
6.3.6.2	Interconnection and wiring diagrams	See instruction	P
6.3.6.3	Conductor (cable) selection	See instruction	P
6.3.6.4	Terminal capacity and identification	See instruction	P
6.3.6.5	Protection requirements	See instruction	P
6.3.6.6	Earthing		N
6.3.6.7	Protective earthing conductor current		N
6.3.6.8	Special requirments		N
6.3.7	Overcurrent or short-circuit protection		N
6.3.8	Motor overload protection		N
6.3.9	Commissioning		N
6.4	Information for use	See instruction	P
6.4.1	General	See instruction	P
6.4.2	Adjustment	See instruction	P
6.4.3	Labels, signs and signals	Comply with the requirements ISO 3864-B.3.1 and ISO 3864-B.3.6 signals provided	P
6.4.3.1	Generel	See instruction	P
6.4.3.2	Power isolators		N
6.4.3.3	Visual and audible signals	ISO 3864-B.3.1 and ISO 3864-B.3.6 signals provided	P
6.4.3.4	Hot surface	No exceed temperature limits	N
6.4.3.5	Equipment marking	See instruction and marking	P
6.5	Information for maintenance	See instruction	P
6.5.1	General	See instruction	P
6.5.2	Capacitor discharge	60V after 1s ISO 3864-B.3.6 signals provided	P
6.5.3	Auto restart/bypass connection	See instruction	P
6.5.4	PT/CT connections	See instruction	N
6.5.5	Other hazards	See instruction	P
Annex A	Examples of protection in case of direct contact	Considered	P
Annex B	Examples of overvoltage category reduction		N
Annex C	Measurement of clearance and creepage distances	Considered	P
Annex D	Altitude correction for clearance	Considered	P
Annex E	Clearance and creepage distance determination for frequencies greater than 30kHz		N

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Clause	Requirement + Test	Result - Remark	Verdict

Annex F	Cross-sections of round conductors		N
Annex G	Guidelines for RCD compatibility		N
Annex H	Symbols referred to in this part of IEC 61800		P

4.3.1	Table: Decisive voltage class (in normal conditions)					P
Location of between	Circuit type	Decisive voltage class	Work voltage(measured)	Work voltage(limited)	Condition/status	Verdict
	AC working voltage	Class A	---	<25Vrms	380V/50Hz normal load	P
		Class B	---	<50Vrms	---	---
Input circuit		Class C	253Vrms/389 Vpeak	<1000Vrms	380V/50Hz normal load	P
Control circuit	DC working voltage	Class A	29.3Vdc	<60Vdc	380V/50Hz normal load	P
		Class B	---	< 120Vdc	---	---
Generatrix circuit		Class C	448Vdc	<1500Vdc	380V/50Hz normal load	P
	Pulsating working voltage	Class A	---	<42.4Vpeak	---	---
		Class B	---	<71Vpeak	---	---
Output circuit		Class C	439Vpeak/246Vrms	<4500Vpeak	380V/50Hz normal load	P

4.3.6.6 and 4.3.6.7	TABLE: clearance and creepage distance measurements				P
clearance cl and creepage distance dcr at/of:	Work voltage U Vr.m.s./Vpeak	required cl (mm)	cl (mm) measured	Required dcr (mm)	Dcr(mm) measured
Between primary and second of transformer	250	5.5	8.2	5.5(R)	8.2
Between primary L and N of Transformer	250	3.0	6.0	3.0(B)	6.0
Between primary and second of PWB's	250	5.5	8.2	5.5(R)	8.2
Between primary L and N of PWB's	250	3.0	6.0	3.0(B)	6.0
*), B=Basic, S=Supplementary and R=Reinforced					

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5.2.3.1 **5.2.3.2** **5.2.3.3**	**TABLE: Impulse voltage test** **AC or DC voltage test** **Partial Discharge Test**	**P**

Test voltage applied between:	Voltage (V)		Breakdown (Yes/No)
test voltage applied between:	test voltage (V)	impulse withstand voltage (V)	partial discharge extinction voltage (V)	Result
Exposed conductive part (connected to earth)--> each circuit sequentially R/S/T and U/V/W and +/PB/+ pin	1500a.c.r.m.s/2120 d.c/5s (B)	--	---	No
Accessible surface (non conductive or conductive but not connected to earth)-→ each circuit sequentially R/S/T and U/V/W and +/PB/+ pin	3000a.c.r.m.s/4240 d.c/5s (R)	---	---	No
PELV or SELV decisive voltage class A circuit→each adjacent circuit sequentially R/S/T and U/V/W and +/PB/+ pin	3000a.c.r.m.s/4240 d.c/5s (R)	---	---	No
Between primary and secondary of transformer	3000a.c.r.m.s/4240 d.c/5s (R)	---	---	No
*), B=Basic, S=Supplementary and R=Reinforced				

5.2.3.5	**TABLE: Leakage current**		**P**
	Three phrase system shall be operated at rated voltage and connected motor with unloaded.....:	380Vac/50Hz	---
	Without any connection to the earth .....:	---	---
Leakage current between		I (mA)	Max. allowed I (mA)
R/S/T-→GND		0.6	3.5mA ac or 10mA dc
SELV Circuit --→GND		0.42	3.5mA ac or 10mA dc
R/S/T-→accessible enclosure		0.14	3.5mA ac or 10mA dc
For appliances intended to be connected in star connection only, the neutral is not connected			

5.2.3.6	**TABLE: Short-circuit tests**		**P**
	the outer enclosure and normally earthed or exposed dead metal parts are isolated from earth and connected through a 30 A fuse to the supply circuit pole least at risk of arcing to earth .....:	380V/50Hz	---

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	for earthed control circuits, the enclosure and normally earthed or exposed dead metal parts are isolated from earth and connected through the 30 A fuse to earth. .....:	---	---
150% of rated output current /1min 180% of rated output current /10s 200% of rated output current /0.5s		---	---
Requirements		Result	Verdict
the cotton indicator shall not have ignited		Not ignited	P
the earth fuse shall not have opened		Not opened	P
the door or cover shall not have blown open		Not blown open	P
the door or cover shall be able to be opened		Not opened	P
SELV and PELV circuits will not exhibit voltages greater than those of decisive voltage class A		29.9Vdc	P
Observation: one of the following:			
The operation of solid state short-circuit protection circuitry		IGBT disconnected	P
The opening of a suitable branch circuit short-circuit protection fuse		---	---
The opening of a suitable branch circuit short-circuit protection circuit breaker		---	---
U/V/W phase short circuit, during 1s disconnected power supply		---	---
(+)/PB/(-) pin short circuit, during 1s disconnected power supply		---	---

5.2.3.6.4	**Table:** **Breakdown of Components test and abnormal operation(type test)**		**P**
	Simulated after the BDM/CDM is fully energized and in operation	Input 380V/50Hz Output :normal load 5.8KW	---
	ambient temperature (°C) .....:	30°C	

No.	compo-nent No.	fault	test voltage (V)	test time	Observation	Result
1	Rectifier	Short-circuit	380Vdc	1s	Shutdown,fuse opened	Disconnected power supply
2	Transformer secondary	Short-circuit	380Vdc	1s	Shutdown,fuse opened	Disconnected power supply
See technical documentation.						

5.2.3.8	**TABLE: Temperature rise test**	**P**

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	Test voltage (V) .....:	230V~/50Hz 3Hour	---
	Ambient Temp (°C): Test before: 30.0	Test after:30.2	---

Thermocouple locations	T (℃)	Max. T (℃)
Terminal block	60.4	105
PCB near G1	87.6	130
PCB near T1&T2	91.5	130
T1 Coil	88.7	110
T1 core	82.4	110
PCB near U2	96.7	130
PCB near U20	99.8	130
PCB near U3	67.2	130
Internal wire to Fan	41.0	80
Fan winding	65.4	110
Plastic Panel	50.6	65

Note: the PDS is to be tested with at least 1,2 m of wire attached to each user terminal
Test until steady condition- temperature change not more than 1°C/hour

5.2.3.9	**TABLE: Protective bonding**		**P**
	A current of 25 A ,from a source having a maximum no-load voltage of 60 V d.c	25A/60Vdc	---
	The current should run until steady state conditions are reached	N/A	---

Protective bonding resistance between	R(Ω)	Max. allowed R(Ω)
From the main protective conductor (terminal) to the different exposed conductive parts in turn	0.02	0.1

6.0	**TABLE: Components of list**				**P**
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Standard	Mark(s) of conformity
PCB	/	/	V-0 130℃ min.	UL 796	UL E225438
Transformer	/	/	130℃	IEC/EN 61800-5-1	Tested within appliance
Magnet wire used in Transformer	/	/	130℃	UL 1446	UL E227475
alternate	/	/	130℃	UL 1446	UL E85640
Tape used in Transformer	/	/	130℃	UL510	UL E165111
Tube used in Transformer	/	/	200℃	UL 224	UL

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Photographs of the EUT

Fig1

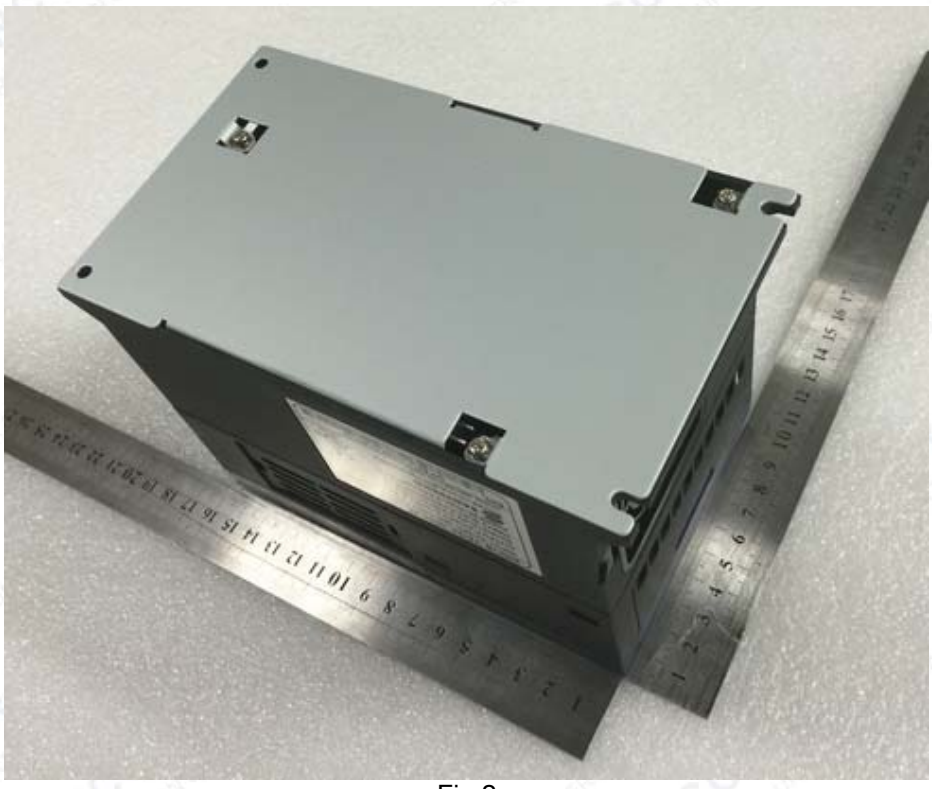

Fig.2

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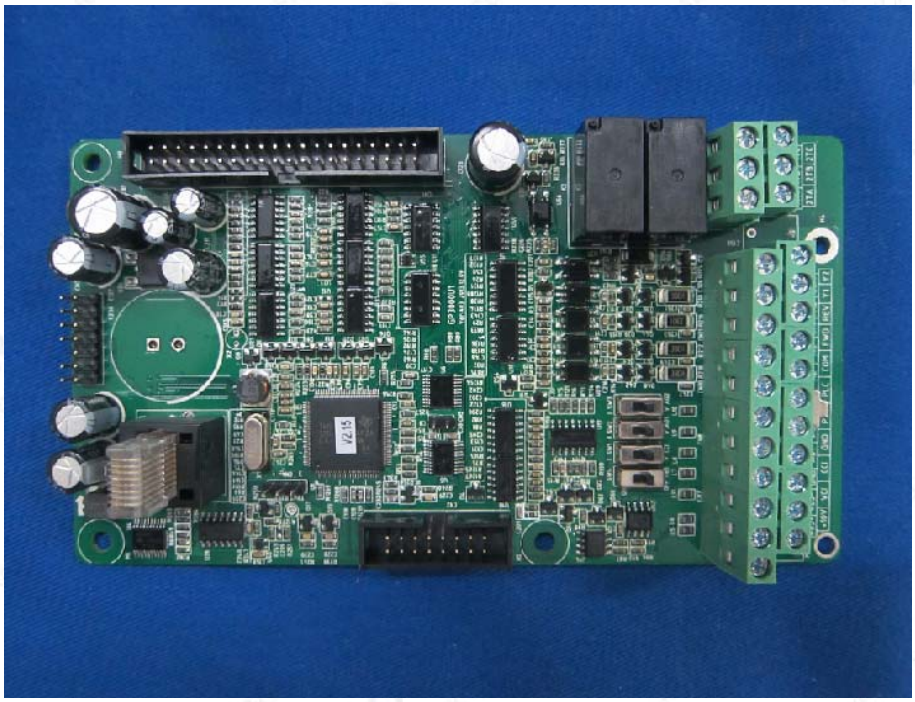

Fig.3

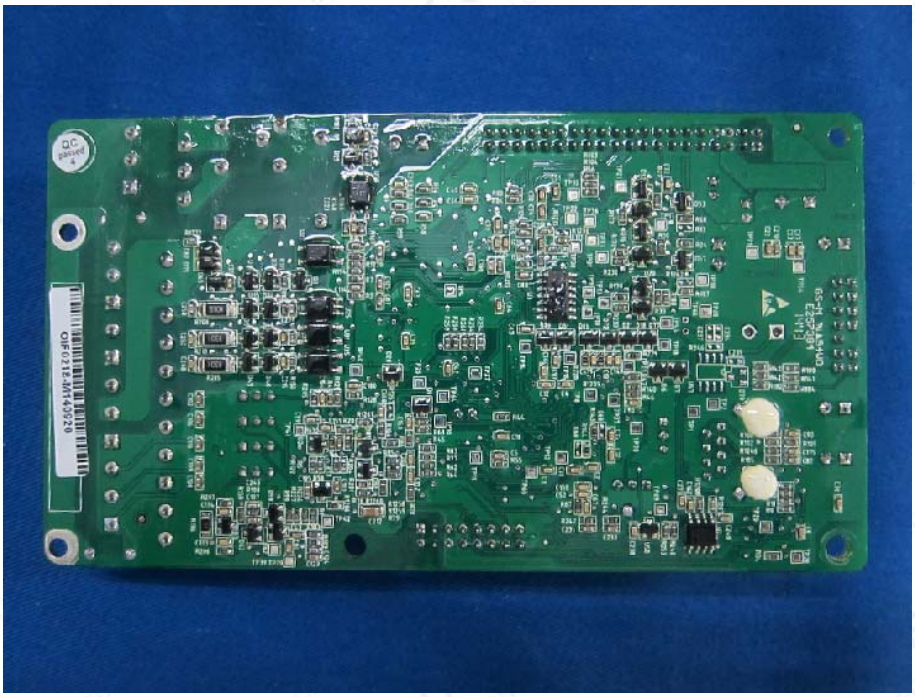

Fig.4

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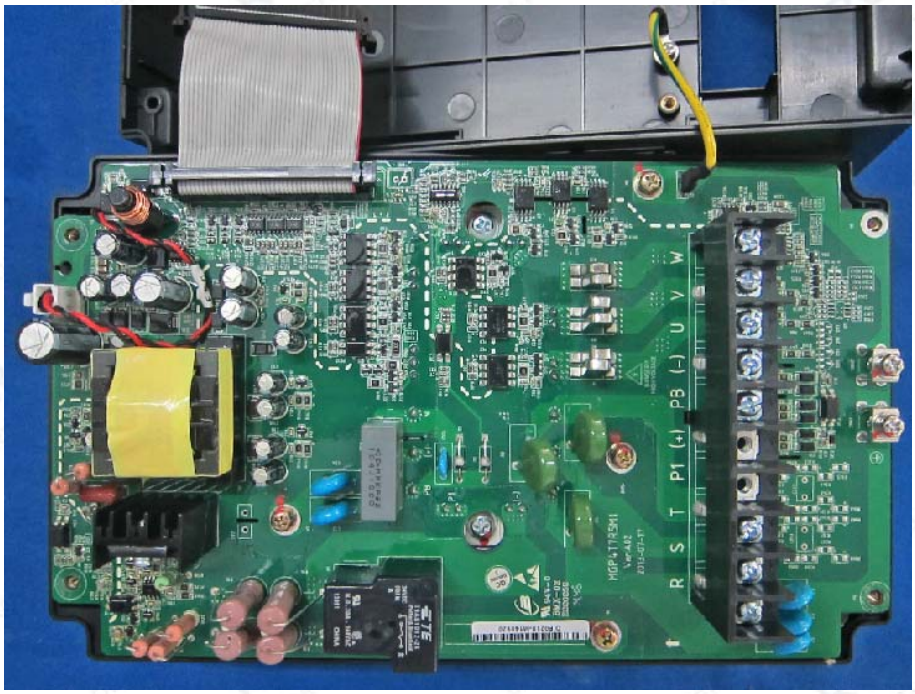

Fig.5

(RCO authenticate the photo on original report only)
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