No. XMT0201901428S/LVD

TEST REPORT

Report Reference No.	XMT0201901428S/LVD
Applicant:	NIETZ ELECTRIC CO., LTD.
Address:	Room 1208, No. 9 Building, No. 99 TianZhou Road, Xuhui district, Shanghai, China
Sample Name:	Frequency Inverter
Model:	See Annex
Test Type:	NL1000
Standard:	EN 61800-5-1:2007+A1:2017
Test Period:	Dec.02,2019 to Dec.09,2019
Test Result:	Please refer to next pages
Conclusion:	Based on the performed tests on submitted samples, the results comply with the Low Voltage Directive 2014/35/EU and its subsequent amendments

Tested By: **Reviewed By:**

John Chen - Engineer **Amy Zhang - Lab Manager**

Applicant	NIETZ ELECTRIC CO., LTD.
Address	Room 1208, No. 9 Building, No. 99 TianZhou Road, Xuhui district, Shanghai, China

Test Item Description	
Product Name :	Frequency Inverter
Standard :	EN 61800-5-1:2007+A1:2017
Model/Type Reference :	See Annex
Rating:	400V,3.7KW

Test Case Verdicts	
Test case does not apply to the test object :	N(.A .)
Test item does meet the requirement :	P(ass)
Test item does not meet the requirement :	F(ail)

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 tested.
- Clause numbers between brackets refer to clauses in EN 61800-5-1:2007+A1:2017.
- “(see remark #)”refers to a remark appended to the report.
- “(see Annex #)”refers to an annex appended to the report.
- Throughout this report a point is used as the decimal separator.

Claus	Requirement-Test	Result-Remark	Verdict

EN 61800-5-1:2007+A1:2017
Adjustable speed electrical power drivesystems —Part 5-1: Safety requirements —Electrical, thermal and energy

4	**Protection against electric shock, thermal, and energy hazards**		
4.1	General		
	This Clause 4 defines the minimum requirements for the design and construction of a PDS, to ensure its safety during installation, normal operating conditions and maintenance for the expected lifetime of the PDS. Consideration is also given to minimising hazards resulting from reasonably foreseeable misuse.		P
4.2	Fault conditions		
	PDS shall be designed to avoid operating modes or sequences that can cause a fault condition or component failure leading to a hazard, unless other measures to prevent the hazard are provided by the installation.		P
4.3	Protection against electric shock		P
4.3.1	Decisive voltage classification		P
4.3.1.1	Use of decisive voltage class (DVC)		
	Protective measures against electric shock depend on the decisive voltage classification of the circuit according to Table 3, which correlates the limits of the working voltage within the circuit with the DVC. The DVC in turn determines the minimum required level of protection for the circuit.	See in the table 3	P
4.3.1.2	Limits of DVC		
	Table 3 – Summary of the limits of the decisive voltage classes		P
4.3.1.3	Requirements for protection		
	Table 4 shows the requirements for the application of basic insulation or protective separation,dependent on the DVC of the circuit under consideration and of adjacent circuits.		P
4.3.1.4	Circuit evaluation		
4.3.1.4.1	General		
	The DVC of a given circuit is evaluated by the method set out below, three cases of waveforms being considered.		P
4.3.1.4.2	A.C. working voltage (see Figure 2)		
	The working voltage has an r.m.s. value UAC and a recurring peak value UACP.The DVC is that of the lowest		
4.3.1.4.3	D.C. working voltage (see Figure 3)		
	The working voltage has a mean value UDC and a recurring peak value UDCP, caused by a ripple voltage of r.m.s. value not greater than 10 % of UDC. The DVC is that of the lowest voltage row of Table 3 for which both of the following conditions are satisfied. • UDC ⩽ UDCL • UDCP ⩽ 1,17 × UDCL	Pass Muster	P
4.3.1.4.4	Pulsating working voltage (see Figure 4)		
	The working voltage has a mean value UDC and a recurring peak value UACP, caused by a ripple voltage of		P

	r.m.s. value UAC greater than 10 % of UDC. The DVC is that of the lowest voltage row of Table 3 for which both of the following conditions are satisfied. • UAC/UACL + UDC/UDCL ⩽ 1 • UACP/UACPL + UDC/(1,17 × UDCL) ⩽ 1		
4.3.2	Protective separation		
	Protective separation shall be achieved by application of materials resistant to degradation, as well as by special constructive measures; and • by double or reinforced insulation,or • by protective screening, i.e. by a conductive screen connected to earth by protective bonding of the PDS, or connected to the protective earth conductor itself, whereby the screen is separated from live parts by at least basic insulation,or • by protective impedance according to 4.3.4.3 comprising limitation of discharge energy and of current, or by limitation of voltage according to 4.3.4.4.		P
4.3.3	Protection against direct contact		
4.3.3.1	General		
	Protection against direct contact is employed to prevent persons from touching live parts which do not meet the requirements of 4.3.4. It shall be provided by one or more of the measures given in 4.3.3.2 and 4.3.3.3. For integrated PDS the motor shall meet the requirements of IEC 60034-5. For the BDM the protection shall be provided by one or more of the measures given in 4.3.3.2 and 4.3.3.3.		P
4.3.3.2	Protection by means of insulation of live parts		
	Live parts shall be completely surrounded with insulation if their working voltage is greater than the maximum limit of DVC A or if they do not have protective separation from adjacent circuits of DVC C or D. The insulation shall be rated according to the impulse voltage, temporary overvoltage or working voltage (see 4.3.6.2.1), whichever gives the most severe requirement.	Meet the requirements	P
4.3.3.3	Protection by means of enclosures and barriers		
	Live parts of DVC B, C or D shall be arranged in enclosures or located behind enclosures or barriers, which meet at least the requirements of the Protective Type IPXXB according to 15.1 of IEC 60529. The top surfaces of enclosures or barriers which are accessible when the equipment is energized shall meet at least the requirements of the Protective Type IP3X with regard to vertical access only. See 5.2.2.3 for test. It shall only be possible to open enclosures or remove barriers with the use of a tool or after de-energization of these live parts.Where the enclosure is required to be opened and the PDS energised during installation or maintenance: a) accessible live parts of DVC B, C or D shall be protected to at least IPXXA; b) live parts of DVC B, C or D that are likely to be touched when making adjustments shall be protected to at least IPXXB; c) it shall be ensured that persons are aware that live parts of DVC B, C or D are accessible.		P
4.3.4	Protection in case of direct contact		

4.3.4.1	General		
	Protection in case of direct contact is required to ensure that contact with live parts does not produce a shock hazard. The protection against direct contact according to 4.3.3 is not required if the circuit contacted is separated from all other circuits according to 4.3.1.3, and: • is of DVC A and complies with 4.3.4.2,or • is current limited via a protective impedance according to 4.3.4.3,or • is limited in voltage according to 4.3.4.4. See Annex A for examples of these measures.	Comply with the requirement	P
4.3.4.2	Protection using DVC A		
	Unearthed circuits of DVC A, and earthed circuits of DVC A used within a zone of equipotential bonding (see 3.44), do not require protection in case of direct contact. Earthed circuits of DVC A that are not within a zone of equipotential bonding require additional protection in case of direct contact, by one of the measures given in 4.3.4.3 or 4.3.4.4, in order to provide protection in cases where the earth reference potentials of the DVC A circuits are not the same. The instruction manual shall provide information concerning the use of these circuits (see 6.3.6.5).	See the instruction manual in detail	N/A
4.3.4.3	Protection by means of protective impedance		
	The connection of accessible live parts to circuits of DVC B, C or D, or to earthed circuits of DVC A not used within a zone of equipotential bonding, shall only be made through protective impedances (unless 4.3.4.4 applies). The same constructional provisions as those for protective separation shall be applied for the construction and arrangement of a protective impedance. The current value stated below shall not be exceeded in the event of failure of a single component. The stored charge available between simultaneously accessible parts protected by the protective impedance shall not exceed 50 μC. The protective impedances shall be designed so that the current available through them to earth at the accessible live part does not exceed a value of 3,5 mA a.c. or 10 mA d.c. See 5.2.3.4 for test.	Pass muster	P
4.3.4.4	Protection by means of limited voltages		
	This type of protection implies a voltage divisiontechnique from a circuit protected against direct contact, resulting in a voltage to earth not greater than that of DVC A. This circuit shall be designed so that, even in the event of failure of a single component in the voltage division circuit, the voltage across output terminals as well as the voltage to earth will not become greater than that of DVC A. The same constructional measures as in protective separation shall be employed in this case. This type of protection shall not be used in case of protective class II, because it relies on protective earth being connected.	Pass muster	P
4.3.5	Protection against indirect contact		
4.3.5.1	General		
	Protection against indirect contact is required to prevent shock currents which can result from accessible conductive parts during an insulation failure. This		

	protection shall comply with the requirements for protective class I, class II or class III.That part of a PDS which meets the requirements of 4.3.5.2, 4.3.5.3 and 4.3.5.3.2 is defined as protective class I. That part of a PDS which meets the requirements of 4.3.5.6 is defined as protective class II. That part of a PDS which meets the requirements of SELV is defined as protective class III. Protective class 0 is only acceptable for parts of the PDS when instructions are provided		P
4.3.5.2	Insulation between live parts and accessible conductive parts		
	Accessible conductive parts of equipment shall be separated from live parts at least by basic insulation or by clearances as in 4.3.6.4.	Comply with the requirement	P
4.3.5.3	Protective bonding circuit		
4.3.5.3.1	General		
	Other than in a) or b) below, protective bonding shall be provided between accessible conductive parts of equipment and the means of connection for the protective earthing conductor: a) when accessible conductive parts are protected by one of the measures in 4.3.4.2 to4.3.4.4; b) when accessible conductive parts are separated from live parts using double or reinforced insulation.NOTE Some examples of such parts are magnetic cores, screws, rivets, nameplates and cable clamps.Figure 6 shows an example CDM/BDM assembly and its associated protective bonding.		P
4.3.5.3.2	Rating of protective bonding		
	Protective bonding shall withstand the highest thermal and dynamic stresses that can occur to the PDS/CDM/BDM item(s) concerned when they are subjected to a fault connecting to accessible conductive parts.The protective bonding shall remain effective for as long as a fault to the accessible conductive parts persists or until an upstream protective device removes power from the part.	Supplied	P
4.3.5.3.3	Protective bonding impedance		
	The impedance of the protective bonding shall be sufficiently low that: • during normal operation, no voltage exceeding continuously 5 V a.c. or 12 V d.c. Can persist between the accessible conductive parts and the means of connection for the protective earthing conductor, and • under fault conditions, no voltage exceeding AC-2 or DC-2 in Figure 7 can persist between accessible conductive parts and the means of connection for the protective earthing conductor until an upstream protective device removes power from the part. The upstream protective device considered for this requirement shall have the characteristics required by the installation manual according to 6.3.7.	Supplied	P
4.3.5.4	Protective earthing conductor		
	A protective earthing conductor shall be connected at all times when power is supplied to the PDS/CDM/BDM, unless the PDS/CDM/BDM complies with the requirements of protective class II (see 4.3.5.6). Unless		

	local wiring regulations state otherwise, the protective earthing conductor cross-sectional area shall be determined from Table 5 or by calculation according to 543.1 of IEC 60364-5-54.		P
4.3.5.5	Means of connection for the protective earthing conductor		
4.3.5.5.1	General		
	Every PDS or PDS element (motor, converter, transformer) requiring connection to earth by protective bonding shall have a means of connection for the protective earthing conductor,located near the terminals for the respective live conductors. The means of connection shall be corrosion-resistant and shall be suitable for the connection of cables according to Table 5 and of cables in accordance with the wiring rules applicable at the installation. The means of connection for the protective earthing conductor shall not be used as a part of the mechanical assembly of the equipment or for other connections. A separate means of connection shall be provided for each protective earthing conductor.	Comply with the requirement	P
4.3.5.5.2	Touch current in case of failure of protective earthing conductor		
	The requirements of this subclause shall be satisfied to maintain safety in case of damage to or disconnection of the protective earthing conductor.For plug-connected single phase PDS/CDM/BDM, not using an industrial connector according to IEC 60309, the touch current (measured in accordance with 5.2.3.5) shall not exceed 3,5 mA a.c. or 10 mA d.c. For all other PDS/CDM/BDM, one or more of the following measures shall be applied, unless the touch current (measured in accordance with 5.2.3.5) can be shown to be less than 3,5 mA a.c. or 10 mA d.c.	Comply with the requirement	P
4.3.5.6	Special features in equipment for protective class II		
	If equipment is designed to use double or reinforced insulation between live parts and accessible surfaces in accordance with 4.3.3.2, then the design is considered to meet protective class II, if the following also apply. • Equipment designed to protective class II shall not have means of connection for the protective earthing conductor. conductor is passed through the equipment to equipment series-connected beyond it. In the latter event, the protective earthing conductor and its means for connection shall be insulated with basic insulation from the accessible surface of the equipment and from circuits which employ protective separation, extra-low voltage, protective impedance and limited discharging energy, according to 4.3.4. This basic insulation shall correspond to the rated voltage of the series-connected equipment.		P
4.3.6	Insulation		
4.3.6.1	General		
4.3.6.1.1	Influencing factors		
	This subclause gives minimum requirements for insulation, based on the principles of IEC 60664 and IEC 60071.Manufacturing tolerances shall be taken into account during design and installation of the PDS. For integrated PDS the motor insulation system shall meet the requirements of the relevant part of IEC 60034.	Comply with the requirement	P

	The CDM/BDM shall comply with the requirements of 4.3.6.		
4.3.6.1.2	Pollution degree		
	Insulation, especially when provided by clearances and creepage distances, is affected by pollution which occurs during the expected lifetime of the PDS. The micro-environmental conditions for insulation shall be applied according to Table 6.		P
4.3.6.1.3	Overvoltage category		
	The concept of overvoltage categories (based on IEC 60364-4-44 and IEC 60664-1) is used for equipment energized from the supply mains. Four categories are considered:		P
4.3.6.1.4	Supply earthing systems		
	IEC 60364-1describes the three following basic types of earthing system. • TN system: has one point directly earthed, the accessible conductive parts of the installation being connected to that point by protective conductors. Three types of TN system, TN-C, TN-S and TN-C-S, are defined according to the arrangement of the neutral and protective conductors. • TT system: has one point directly earthed, the accessible conductive parts of the installation being connected to earth electrodes electrically independent of the earth electrodes of the power system. • IT system: has all live parts isolated from earth or one point connected to earth through an impedance, the accessible conductive parts of the installation being earthed independently or collectively to the earthing system.		P
4.3.6.1.5	Insulation voltages		
	Table 7 and Table 8 use the system voltage of the circuit under consideration and overvoltage category to define the impulse voltage. The system voltage is also used to define the temporary overvoltage.		P
4.3.6.2	Insulation to the surroundings		
4.3.6.2.1	General		
	Insulation for basic, supplementary, and reinforced insulation between a circuit and its surroundings shall be designed according to: • the impulse voltage,or • the temporary overvoltage,		P
4.3.6.2.2	Circuits connected directly to the supply mains		
	Insulation between the surroundings and circuits which are connected directly to the supply mains shall be designed according to the impulse voltage, temporary overvoltage, or working voltage, whichever gives the most severe requirement. This insulation is normally evaluated to withstand impulses of overvoltage category III, except that overvoltage category IV shall be used when the PDS is connected at the origin of the installation. Overvoltage category II may be used for plug-in equipment connected to a supply for non-industrial purposes without special requirements with regard to reliability.		P
4.3.6.2.3	Circuits not connected directly to the supply mains		

	Insulation between the surroundings and circuits supplied by a transformer providing galvanic isolation from the supply mains shall be designed according to: a) the impulse voltage determined using the transformer secondary voltage as the system voltage; or b) the working voltage, whichever gives the more severe requirement. This insulation is normally evaluated to withstand impulses of overvoltage category II, except that overvoltage category III shall be used when the PDS is connected at the origin of the installation.		P
4.3.6.2.4	Insulation between circuits		
	Insulation between two circuits shall be designed according to the circuit having the more severe requirement.	Comply with the requirement	P
4.3.6.3	Functional insulation		
	For parts or circuits that are not significantly affected by external transients, functional insulation shall be designed according to the working voltage across the insulation.For parts or circuits that are significantly affected by external transients, functional insulation shall be designed according to the impulse voltage of overvoltage category II		P
4.3.6.4	Clearance distances		
4.3.6.4.1	Determination		
	Table 9 defines the minimum clearance distances required to provide functional, basic, or supplementary insulation (see Annex C for examples of clearance distances). Clearances for use in altitudes between 2 000 m and 20 000 m shall be calculated with a correction factor according to Table A.2 of IEC 60664-1, which is reproduced as Clearances in air are a function of the atmospheric pressure according to Paschen's Law. Clearance distances provided in Table 9 are valid up to 2000 m above sea level. Clearances above 2000 m must be multiplied by the factor provided in Table D.1.		P
4.3.6.4.2	Electric field homogeneity		
	The dimensions in Table 9 correspond to the requirements of an inhomogeneous electric field distribution across the clearance, which are the conditions normally experienced in practice. If a homogeneous electric field distribution is known to exist, and the impulse voltage is equal to or greater than 6000 V for a circuit connected directly to the supply mains or 4 000 V within a circuit, the clearance for basic or supplementary insulation may be reduced to not less than that required by Table 2 Case B of IEC 60664-1. In this case, however, the impulse voltage test of 5.2.3.1 shall be performed on the clearance.		P
4.3.6.4.3	Clearance to conductive enclosures		-
	The clearance between any non-insulated live part and the walls of a metal enclosure shall be in accordance with 4.3.6.4.1 following the deformation tests of 5.2.2.5. If the design clearance is at least 12,7 mm and the clearance required by 4.3.6.4.1 does not exceed 8 mm, the deformation tests may be omitted.	Pass muster	P
4.3.6.5	Creepage distances		
	Creepage distances shall be large enough to prevent long-term degradation of the surface of solid insulators,	Pass muster	

	according to Table 10.For functional, basic and supplementary insulation, the values in Table 10 apply directly. For reinforced insulation, the distances in Table 10 shall be doubled. When the creepage distance determined from Table 10 is less than the clearance required by 4.3.6.4.1 or the clearance determined by impulse testing (see 5.2.3.1), then it shall be increased to that clearance. Creepage distances shall be verified by measurement or inspection (see 5.2.2.1) (see Annex C for examples of creepage distances). Figure E.2 and Table E.2 provide informative guidance for determination of creepage distances for frequencies above 30 kHz.		P
4.3.6.6	Coating		
	A coating may be used to provide insulation, to protect a surface against pollution, and to allow a reduction in creepage and clearance distances (see 4.3.6.8.4.2 and 4.3.6.8.6).		
4.3.6.7	PWB spacings for functional insulation		
	Spacings for functional insulation on a PWB which do not comply with 4.3.6.4 and 4.3.6.5 are permitted when all the following are satisfied: • the PWB has a flammability rating of V-0 (see IEC 60695-11-10); • the PWB base material has a minimum CTI of 100; • the equipment complies with the PWB short-circuit test (see 5.2.2.2). On PWB creepage and clearance distances for functional insulation at working voltages less than 80 V (r.m.s.) or 110 V (recurring peak) are permitted to be evaluated according to pollution degree 1 if the tracks are covered with a suitable coating.		P
4.3.6.8	Solid insulation		
4.3.6.8.1	General		
	Materials selected for solid insulation shall be able to withstand the stresses occurring. These include mechanical, electrical, thermal and climatic stresses which are to be expected in normal use. Insulation materials shall also be resistant to ageing during the expected lifetime of the PDS. Tests shall be performed on components and subassemblies using solid insulation, in order to ensure that the insulation performance has not been compromised by the design or manufacturing process. Components that comply with a relevant product standard which provides equivalent requirements to those of this standard do not require separate evaluation. Assemblies containing such components shall be tested according to the requirements of this standard.		P
4.3.6.8.2	Requirements for electrical withstand capability		
4.3.6.8.2.1	Basic or supplementary insulation:		
	Test with impulse withstand voltage according to 5.2.3.1, column 2 or column 4 of Table 19,or Table 20, column 2 or 4, as appropriate;and Test with a.c. or d.c. voltage according to 5.2.3.2, column 2 ofTable 21, Table 22, orTable 23, as appropriate.		P

4.3.6.8.2.2	Double and reinforced insulation		
	Test with impulse withstand voltage according to 5.2.3.1 Table 19, column 3 or column 5,or Table 20, column 3 or 5 as appropriate;andtest with a.c. or d.c. voltage according to 5.2.3.2, column 3 of Table 21, Table 22, orTable 23, as appropriate;and partial discharge test according to 5.2.3.3, if the recurring peak working voltage across the insulation is greater than 750 V and the voltage stress on the insulation is greater than 1 kV/mm.		P
4.3.6.8.2.3	Functional insulation		
	Functional insulation shall comply with the requirements of 4.3.6.3. Testing is not required,except where the circuit analysis required by 4.2 shows that failure of the insulation could result in a hazard. In these cases, the insulation shall meet the requirements and tests for basic insulation.	Pass muster	P
4.3.6.8.2.3.1	General		
	Subclause 4.3.6.8.3 applies to the use of thin sheet or tape materials in assemblies such as wound components and bus-bars. Insulation consisting of thin (less than 0,75 mm) sheet or tape materials is permitted, provided that it is protected from damage and is not subject to mechanical stress under normal use.Where more than one layer of insulation is used, there is no requirement for all layers to be of the same material.		P
4.3.6.8.2.3.2	Material thickness not less than 0,2 mm		
	Basic or supplementary insulation shall consist of at least one layer of material, which will meet the requirements of 4.3.6.8.1 and 4.3.6.8.2.1.Double insulation shall consist of at least two layers of material, each of which will meet the requirements of 4.3.6.8.1, 4.3.6.8.2.1, and the partial discharge requirements of 4.3.6.8.2.2, and both layers together will meet the impulse and a.c. or d.c. voltage requirements of 4.3.6.8.2.2. Reinforced insulation shall consist of a single layer of material, which will meet the requirements of 4.3.6.8.1 and 4.3.6.8.2.2.	Comply with the requirement	P
4.3.6.8.2.3.3	Material thickness less than 0,2 mm		
	Basic or supplementary insulation shall consist of at least one layer of material, which will meet the requirements of 4.3.6.8.1 and 4.3.6.8.2.1.Double insulation shall consist of at least three layers of material. Each layer shall meet the requirements of 4.3.6.8.1 and 4.3.6.8.2.1, and any two layers together shall meet the requirements of 4.3.6.8.2.2.	Comply with the requirement	P
4.3.6.8.2.3.4	Compliance		
	Compliance is checked by the tests described in 5.2.3.1 to 5.2.3.3.When a component or sub-assembly makes use of thin sheet insulating materials, it is permitted to perform the tests on the component rather than on the material.	Pass muster	P
4.3.6.8.4	Printed wiring boards (PWBs)		
4.3.6.8.4.	General		

1			
	Insulation between conductor layers in double-sided single-layer PWBs, multi-layer PWBs and metal core PWBs, shall meet the requirements of 4.3.6.8.1. Basic, supplementary, double and reinforced insulation shall meet the appropriate requirements of 4.3.6.8.2.1 or 4.3.6.8.2.2.Functional insulation in PWBs shall meet the requirements of 4.3.6.8.2.3.		P
4.3.6.8.4.2	Use of coating materials		
	A coating material used to provide functional, basic, supplementary and reinforced insulation shall meet the requirement as specified below.Type 1 protection (as defined in IEC 60664-3) improves the microenvironment of the parts under protection. The clearance and creepage distance of Table 9 and Table 10 for pollution degree 1 apply under the protection. Between two conductive parts, it is a requirement that one or both conductive parts, together with all the spacing between them, are covered by the protection.	Comply with the requirement	P
4.3.6.8.5	Wound components		
	Varnish or enamel insulation of wires shall not be used for basic, supplementary, double or reinforced insulation. Wound components shall meet the requirements of 4.3.6.8.1 and 4.3.6.8.2.	Comply with the requirement	P
4.3.6.8.5	Potting materials		
	A potting material may be used to provide solid insulation or to act as a coating to protect against pollution. If used as solid insulation, it shall comply with the requirements of 4.3.6.8.1 and 4.3.6.8.2. If used to protect against pollution, the requirements for Type 1 protection in 4.3.6.8.4.2 apply.	Comply with the requirement	P
4.3.6.9	Insulation requirements above 30 kHz		
	Where voltages across insulation have fundamental frequencies greater than 30 kHz, further considerations apply. For low-voltage circuits, guidance is provided in IEC 60664-4.Annex E contains flow-charts for the determination of clearance and creepage distances under these circumstances. For information, Tables 1 and 2 of IEC 60664-4 are also included in Annex E.		P
4.3.7	Enclosures		
4.3.7.1	General		
	Metal enclosures shall comply with the deflection test of 5.2.2.5.2 or have a thickness as specified in 4.3.7.2 or 4.3.7.3.Polymeric enclosures or polymeric parts, relied on to complete and maintain the integrity of an electrical enclosure, shall comply with the flammability requirements of 4.4.3 and the impact test in 5.2.2.5.3. For integrated PDS the CDM/BDM enclosure shall comply with the above requirements. The motor enclosure shall meet the requirements of the relevant parts of IEC 60034.Enclosures shall be suitable for use in their intended environments. The manufacturer shall specify the intended environment (see 6.3.3) and the IP rating of the enclosure (see 5.2.2.4 for test).		P
4.3.7.2	Cast metal		
	Die-cast metal, except at threaded holes for conduit, where a minimum of 6,4 mm is required,shall be:		

	• not less than 2,0 mm thick for an area larger than 155 cm2 or having any dimension larger than 150 mm; • not less than 1,2 mm thick for an area of 155 cm2 or less and having no dimension larger than 150 mm.The area under evaluation may be bounded by reinforcing ribs subdividing a larger area. Malleable iron or permanent-mould cast aluminium, brass, bronze, or zinc, except at threaded holes for conduit, where a minimum of 6,4 mm is required, shall be: at least 2,4 mm thick for an area greater than 155 cm2 or having any dimension more than 150 mm;		P

4.3.7.3	Sheet metal		
	The thickness of a sheet-metal enclosure at points to which a wiring system is to be connected shall be not less than 0,8 mm thick for uncoated steel, 0,9 mm thick for zinc-coated steel, and1,2 mm thick for non-ferrous metal. Enclosure thickness at points other than where a wiring system is to be connected shall be not less than that specified in Table 11 or Table 12.With reference to Table 11 and Table 12, a supporting frame is a structure of angle or channel or folded section of sheet metal, which is attached to and has the same outside dimensions as the enclosure surface, and which has torsional rigidity to resist the bending moments that are applied by the enclosure surface when it is deflected.		P
4.3.8	Wiring and connections		
4.3.8.1	General		
	The wiring and connections between parts of the equipment and within each part shall be protected from mechanical damage during installation. The insulation, conductors and routing of all wires of the equipment shall be suitable for the electrical, mechanical, thermal and environmental conditions of use. Conductors which are able to contact each other shall be provided with insulation rated for the DVC requirements of the relevant circuits. The compliance with 4.3.8.2 to 4.3.8.8 shall be checked by visual inspection (see 5.2.1) of the overall construction and datasheets if applicable.	Pass muster	P
4.3.8.2	Routing		
	A hole through which insulated wires pass in a sheet metal wall within the enclosure of the equipment shall be provided with a smooth, well-rounded bushing or grommet or shall have smooth, well-rounded surfaces upon which the wires bear to reduce the risk of abrasion of the insulation. Wires shall be routed away from sharp edges, screw threads, burrs, fins, moving parts,drawers, and similar parts, which abrade the wire insulation. The minimum bend radius specified by the wire manufacturer shall not be violated.Clamps and guides, either metallic or non-metallic, used for routing stationary internal wiring shall be provided with smooth, well-rounded edges. The clamping action and bearing surface shall be such that abrasion or cold flow of the mechanical protection shall be provided.		P

4.3.8.3	Leakage current and electric strength		
	Insulated conductors, other than those which are integral to ribbon cable or multi-cord signal cable, identified by the colour green with or without one or more yellow stripes shall not be used other than for protective bonding.		P
4.3.8.4	Splices and connections		
	All splices and connections shall be mechanically secure and shall provide electrical continuity. Electrical connections shall be soldered, welded, crimped, or otherwise securely connected. Asoldered joint, other than a component on a PWB, shall additionally be mechanically secured.When stranded internal wiring is connected to a wire-binding screw, the construction shall besuch that loose strands of wire do not contact: • other uninsulated live parts not always of the same potential as the wire; •de-energized metal parts. When screw terminal connections are used, the resulting connections may require routine maintenance (tightening). Appropriate reference shall be made in the maintenance manual (see 6.5.1).	see 6.5.1	P
4.3.8.5	Accessible connections		
	In addition to measures given in 4.3.4.1 to 4.3.4.3 it shall be ensured that neither insertion error nor polarity reversal of connectors can lead to a voltage on an accessible connectionhigher than the maximum of DVC A. This applies for example to plug-in sub-assemblies or other plug-in devices which can be plugged in without the use of a tool (key) or which areaccessible without the use of a tool. This does not apply to equipment intended to be installed In closed electrical operating areas. If relevant, non-interchangeability and protection against polarity reversal of connectors, plugs and socket outlets shall be confirmed by inspection and trial insertion.		P
4.3.8.6	Interconnections between parts of the PDS		
	In addition to complying with the requirements given in 4.3.8.1 to 4.3.8.5, the means provided for the interconnection between parts of the PDS shall comply with the following requirements or those of 4.3.8.7. Cable assemblies and flexible cords provided for interconnection between sections ofequipment or between units of a system shall be suitable for the service or use involved. Cables shall be protected from physical damage as they leave the enclosure and shall be a multipin male connector in a female connector other than the one intended to receive it, and other manipulations of parts which are accessible to the operator shall not result in mechanical damage or a risk of thermal hazards, electric shock, or injury to persons.	Comply with the requirement	P
4.3.8.7	Supply connections		
	A PDS intended for permanent connection to the power supply shall have provision for connection to the applicable wiring system in accordance with the requirements where it is being installed. The connection points provided shall be of appropriate construction to preclude the possibility of loose strands reducing the		P

	spacing between conductors when careful attention is paid to installation.		
4.3.8.8	Terminals		
4.3.8.8.1	Construction requirements		
	All parts of terminals which maintain contact and carry current shall be of metal having adequate mechanical strength.Terminal connections shall be such that the conductors can be connected by means of screws, springs or other equivalent means so as to ensure that the necessary contact pressure is maintained. Terminals shall be so constructed that the conductors can be clamped between suitable surfaces without any significant damage either to conductors or terminals. Terminals shall not allow the conductors to be displaced or be displaced themselves in amanner detrimental to the operation of equipment and the insulation shall not be reduced below the rated values.		P
4.3.8.8.2	Connecting capacity		
	Terminals shall be provided which accommodate the conductors specified in the installation and maintenance manuals (see 6.3.6.4) and cables in accordance with the wiring rules applicable at the installation. The terminals shall meet the temperature rise test of 5.2.3.8. The terminals shall also be suitable for conductors of the same type at least two sizes smaller, as given in the appropriate column of Table F.1.		P
4.3.8.8.3	Connection		
	Terminals for connection to external conductors shall be readily accessible during installation.Clamping screws and nuts shall not serve to fix any other component although they may hold the terminals in place or prevent them from turning.		P
4.3.9	Output short-circuit requirements		
	The PDS shall not present a thermal hazard, electric shock or energy hazard under shortcircuit conditions at any output that is capable of providing power. In some cases, short-circuit protection may be provided by external measures, the characteristics of which shall be specified by the manufacturer. For co-ordination with upstream protection devices, the manufacturer shall specify a maximum prospective short-circuit current rating corresponding to each power output of the CDM/BDM. If protection devices with particular characteristics are necessary, these shall also be specified.		P
4.3.10	Residual current-operated protective (RCD) or monitoring (RCM) device compatibility		
	RCD and RCM are used to provide protection against insulation faults in some domestic and Industrial installations, additional to that provided by the installed equipment.An insulation fault or direct contact with certain types of PDS circuits can cause current with a d.c. component to flow in the protective earthing conductor and thus reduce the ability of an RCD or RCM of type A or AC (see IEC 60755 and IEC 62020) to provide this protection for other equipment in the installation.		P
4.3.11	Capacitor discharge		-
	Capacitors within a PDS shall be discharged to a voltage less than 60 V, or to a residual charge less than 50 μC,		

	within 5 s after the removal of power from the PDS. If this requirement is not achievable for functional or other reasons, the information and marking requirements of 6.5.2 apply. See 5.2.3.7 for test.		P
4.3.12	Access conditions for high-voltage PDS		
	The high voltage sections (transformer, converter, motor, etc.) shall be protected by an appropriate housing enclosure according to IEC 60204-11 with respect to personnel safety. a) Operating conditions Interlocking doors shall prevent any access inside the enclosure of the high voltage converter section when main circuit breaker(s) providing the high voltage to the circuit are on, and if live parts have not been earthed (see 0). b) Access for maintenance – earthing instructions The earthing operation is performed after the normal discharge time stated by the converter manufacturer. Care shall be taken to ensure that this operation is safe even in case of failure of the discharge circuit. Care shall also be taken that on the input and output side the stray capacitance of cables, motor and/or transformer shall be discharged before possible access to live parts. The requirements of 4.3.11 apply. Earthing devices (earthing switches and/or earthing cables) shall be provided in sufficient quantity to facilitate work being carried out in safety on the live parts of the HV equipment of the PDS. The earthing devices shall comply with the relevant requirements of IEC 62271-102 or IEC 61230. The earthing contacts, or an indication that the contacts of the switches are closed, shall be visible by the maintenance personnel before they access the equipment.		P

4.4	Protection against thermal hazards		-
4.4.1	Minimizing the risk of ignition		
	The risk of ignition due to high temperature shall be minimized by the appropriate selection and use of components and by suitable construction. Electrical components shall be used in such a way that their maximum working temperature under normal load conditions is less than that necessary to cause ignition of the surrounding materials with which they are likely to come into contact. The limits in Table 15 shall not be exceeded for the surrounding material. Where it is not practical to protect components against overheating under fault conditions, all materials in contact with such components shall be of flammability class V-1, according to IEC 60695-11-10, or better.Compliance with 4.4.2 to 4.4.5 shall be confirmed by inspection of component and material data sheets and, where necessary, by test.		P
4.4.2	Insulating materials		
4.4.2.1	General		
	A material which is used for the direct support of an uninsulated live part shall comply with the following requirements.NOTE A material is typically considered to be in direct support of an uninsulated live part when: a) it is in direct physical contact with the uninsulated live		

	part, and b) it physically supports or maintains the relative position of the uninsulated live part. The insulating material shall be suitable for the maximum temperature it attains as determined by the temperature rise test of 5.2.3.8. Consideration shall be given as to whether or not the insulating material additionally provides mechanical strength and whether or not the part can be subject to impact during use.		P
5	Test requirements		
5.1	General		
5.1.1	Test objectives and classification		
	Testing, as defined in this Clause 5, is required to demonstrate that PDS is fully in accordance with the requirements of this part of IEC 61800. Testing may be waived if permitted by the relevant requirements subclause of Clause 4.		P
5.1.2	Selection of test samples		
	When testing a range or series of similar products, it may not be necessary to test all models in the range. Each test should be performed on a model or models having mechanical and electrical characteristics that adequately represent the entire range for that particular test.		P
5.1.3	Sequence of tests		
	In general, there is no requirement for tests to be performed in a set sequence, nor is it required that they are all performed on the same sample of equipment. However, the pass criteria for some of the tests require that they are followed by one or more further tests.		P
5.1.4	Earthing conditions		
	The manufacturer shall state the acceptable earthing systems (see 4.3.6.1.4) for the PDS. Test requirements shall be determined using the worst-case (most stressful) earthing system allowed by the manufacturer. Earthing systems may include: • neutral to earth; • line to earth; • neutral to earth through high impedance; • isolated (not earthed). The unacceptable systems shall be indicated as • forbidden; • with modification of values and/or safety levels which shall be quantified through type test.		P
5.2	Mechanical tests		
	It shall be verified by measurement or visual inspection that the clearance and creepage distances comply with Table 9 and Table 10. See Annex C for measurement examples. Where this verification is impossible to perform, an impulse voltage test (see 5.2.3.1) shall be performed between the considered circuits.		P
5.3	Electrical tests		
	The impulse voltage test is performed with a voltage having a 1,2/50 μs waveform (see Figure 6 of IEC 60060-1) and is intended to simulate overvoltages of atmospheric origin. It also covers overvoltages due to switching of equipment. See Table 18 for conditions of the impulse voltage test. Tests on clearances smaller than required by Table 9 and on solid insulation are		P

	performed as type tests using appropriate voltages from Table 19 or Table 20.Tests on components and devices for protective separation are performed as a type test . a sample test before they are assembled into the PDS, using the impulse withstand voltages listed in column 3 or column 5 of Table 19 or Table 20, as appropriate. To ensure that limiting devices (see 4.3.6.2.2, 4.3.6.2.3, 4.3.6.3) are able to reduce the overvoltage, the values of column 2 or column 4 in Table 19 or Table 20, as appropriate, are applied to the PDS as a type test, and reduced values corresponding to the next lower voltage of the same column of that Table are verified.		

LIST OF INSTRUMENTS				
NO	Equipment name	Type	Serial NO	period of validity
1	Digital AC Power Source	6200 series	Angui-004	2019.11.23
2	Radiation Tester	440RF/D	Angui-006	2019.11.23
3	Line Leakage Tester	7620	Angui-008	2019.11.23
4	Electrical Safety Compliance analyzer	7452	Angui-011	2019.11.23
5	Safely-testing instrument	ST-1001	Angui-012	2019.11.23
6	Digital display caliper	0.01 ㎜	Angui-014	2019.11.23
7	Dual display LCR instrument	ELC-131D	Angui-161	2019.11.23
8	Impact testing hammer	ST-1002	Angui-017	2019.11.23
9	Surge-insulation tester	NF2675	Angui-019	2019.11.23
10	Lecroy Storage Oscillocope	9304A	Angui-020	2019.11.23
11	Trillion-Ohm Instrument	ZC25B-3	Angui-022	2019.11.23
12	Digital temperature tester	DR030	Angui-024	2019.11.23
13	Program control combustion Instrument	CS-1	Angui-032	2019.11.23
14	Torque driver	RTD60CN	Angui-036	2019.11.23
15	Digital micrometer		Angui-013	2019.11.23
16	Pushing Tube-shaped ergometer	KL-10	Angui-038	2019.11.23
17	Noncontact thermometer	ST60	Angui-156	2019.11.23
18	Dynamometer	KL-2	Angui-040	2019.11.23

19	Dynamometer	TK-30	Angui-044	2019.11.23
20	Alternating Moisture testing instrument	SDJ020	Angui-050	2019.11.23
21	Measuring instrument for temperature raise of live windings	RC-3	Angui-150	2019.11.23
22	Audio analyzer	VP-7720A	YPL03-01	2019.11.23
23	FM/AM signal generator	VP-8179B10	YXH01-01	2019.11.23
24	FM/AM signal generator	VP-8179B10	YXH01-02	2019.11.23
25	Frequency counter	500A	YPL-05-01	2019.11.23
26	Muitiplex srereo modulator	VP-7633A	YQT23-01	2019.11.23
27	WOW flutter meter	MK-668E	YDBW03-01	2019.11.23

APPENDIX A— TEST PHOTOGRAPH

EC Declaration of conformity

Council Directive 2014/35/EU on Low Voltage Directive

NIETZ ELECTRIC CO., LTD.
Room 1208, No. 9 Building, No. 99 TianZhou Road, Xuhui district, Shanghai, China

Certify that the product described is in conformity with the Low Voltage Directive 2014/35/EU as amended

Product Name:

Frequency Inverter

Item No:

See Annex

The product has been assessed by the application of the following standards:

EN 61800-5-1:2007+A1:2017

Issue place and date

Company stamp and Signature of authorized personnel

Annex

Model:

NL1000, NL1000 PLUS, NL2000, NZ2000, NZE, NZS, NZ8000, NZ3000, AT10, AT20, AMD, ASW, NZC, NZ21;
NL1000 (models are : NL1000-00R4G2, NL1000-00R7G2, NL1000-01R5G2, NL1000-02R2G2, NL1000-03R7G2, NL1000-00R7G4, NL1000-01R5G4, NL1000-02R2G4, NL1000-03R7G4, NL1000-05R5G4, NL1000-07R5G4, NL1000-011G4, NL1000-015G4, NL1000-018.5G4, NL1000-022G4, NL1000-030G4, NL1000-037G4, NL1000-045G4, NL1000-055G4, NL1000-075G4, NL1000-090G4, NL1000-110G4, NL1000-132G4, NL1000-160G4, NL1000-185G4, NL1000-200G4, NL1000-220G4, NL1000-Keypad) ; NL1000 PLUS (models are : NL1000-00R4G2-PLUS, NL1000-00R7G2-PLUS, NL1000-01R5G2-PLUS, NL1000-02R2G2-PLUS, NL1000-03R7G2-PLUS, NL1000-00R7G4-PLUS, NL1000-01R5G4-PLUS, NL1000-02R2G4-PLUS, NL1000-03G4-PLUS, NL1000-03R7G4-PLUS, NL1000-05R5G4-PLUS, NL1000-07R5G4-PLUS, NL1000-011G4-PLUS, NL1000-015G4-PLUS, NL1000-018.5G4-PLUS, NL1000-022G4-PLUS, NL1000-030G4-PLUS, NL1000-037G4-PLUS, NL1000-045G4-PLUS, NL1000-055G4-PLUS, NL1000-075G4-PLUS, NL1000-090G4-PLUS, NL1000-110G4-PLUS, NL1000-132G4-PLUS, NL1000-160G4-PLUS, NL1000-185G4-PLUS, NL1000-200G4-PLUS, NL1000-220G4-PLUS, NL1000-PLUS-Keypad) ; NL2000 (models are :NL2000-00R4G2, NL2000-00R7G2, NL2000-01R5G2, NL2000-02R2G2, NL2000-00R7G4, NL2000-01R5G4, NL2000-02R2G4, NL2000-03R7G4, NL2000-05R5G4, NL2000-07R5G4, NL2000-011G4, NL2000-015G4, NL2000-018.5G4, NL2000-022G4, NL2000-030G4, NL2000-037G4, NL2000-045G4, NL2000-055G4, NL2000-075G4, NL2000-090G4, NL2000-110G4, NL2000-132G4, NL2000-160G4, NL2000-185G4, NL2000-200G4, NL2000-220G4, NL2000-Keypad) ; NZ2000 (models are : NZ2200-0R25G, NZ2200-00R4G , NZ2200-0R55G , NZ2200-0R75G , NZ2200-01R1G , NZ2200-01R5G , NZ2200-02R2G , NZ2200-03R7G , NZ2400-00R4G , NZ2400-0R75G , NZ2400-01R1G , NZ2400-01R5G , NZ2400-02R2G , NZ2400-03R7G/5R5P , NZ2400-05R5G , NZ2400-7R5P , NZ2400-07R5G/11P , NZ2400-11G/15P , NZ2400-15G/18.5P , NZ2400-18.5G/22P , NZ2400-22G/30P , NZ2400-30G/37P , NZ2400-37G/45P , NZ2400-45G/55P , NZ2400-55G , NZ2400-75P , NZ2400-75G/90P , NZ2400-90G/110P , NZ2400-110G/132P , NZ2400-132G/160P , NZ2400-160G/185P , NZ2400-185G/200P , NZ2400-200G/220P , NZ2400-220G/250P , NZ2400-250G/280P , NZ2400-280G/315P , NZ2400-315G/350P , NZ2400-350G/400P , NZ2400-400G/450P , NZ2400-450G/500P , NZ2000-Keypad) ; NZE (models are : NZE0002T2B , NZE0004T2B , NZE0005T2B , NZE0007T2B , NZE0011T2B , NZE0015T2B , NZE0022T2B , NZE0037T2B , NZE0004T4B , NZE0007T4B , NZE0011T4B , NZE0015T4B , NZE0022T4B , NZE0037T4B , NZE0055T4B , NZE0075T4B , NZE0110T4B , NZE0150T4B , NZE0185T4B , NZE0220T4B , NZE0300T4B , NZE0370T4B , NZE0450T4B , NZE0550T4B , NZE0750T4B , NZE0900T4B , NZE110T4B , NZE132T4B , NZE160T4B , NZE185T4B , NZE200T4B , NZE220T4B , NZE250T4B , NZE280T4B, NZE315T4B, NZE350T4B, NZE400T4B, NZE450T4B, NZE-Keypad) ; NZS (models are : NZS0007T2B , NZS0015T2B , NZS0022T2B , NZS0007T4B , NZS0015T4B , NZS0022T4B , NZS0037T4B , NZS0055T4B , NZS0075T4B , NZS0110T4B , NZS0150T4B , NZS0185T4B , NZS0220T4B , NZS0300T4B , NZS0370T4B, NZS0450T4B, NZS0007T2B-V , NZS0015T2B-V , NZS0022T2B-V , NZS0007T4B-V , NZS0015T4B-V , NZS0022T4B-V , NZS0037T4B-V , NZS0055T4B-V , NZS0075T4B-V , NZS0110T4B-V , NZS0150T4B-V , NZS0185T4B-V , NZS0220T4B-V ,

NZS0300T4B-V , NZS0370T4B-V, Adapter, NZS-Keypad) ; NZ8000 (models are NZ8200-0R75G , NZ8200-1R5G , NZ8200-2R2G , NZ8200-3R7G/5R5P , NZ8400-0R75G , NZ8400-1R5G , NZ8400-2R2G , NZ8400-3R7G/5R5P , NZ8400-5R5G/7R5P , NZ8400-7R5G/11P , NZ8400-11G/15P , NZ8400-15G/18.5P , NZ8400-18.5G/22P , NZ8400-22G/30P , NZ8400-30G/37P , NZ8400-37G/45P , NZ8400-45G/55P , NZ8400-55G , NZ8400-75G/90P , NZ8400-90G/110P , NZ8400-110G/132P , NZ8400-132G/160P , NZ8400-160G/185P , NZ8400-185G/200P , NZ8400-200G/220P ,NZ8400-220G/250P ,NZ8400-250G/280P ,NZ8400-280G/315P , NZ8400-315G/350P , NZ8400-350G/400P , NZ8400-400G/450P , NZ8400-450G/500P, NZ8400-500G/560P , NZ8400-560G/630P, NZ8400-630G/710P ,NZ8000-Keypad, PG card) ; NZ3000 (models are: NZ3000-075KY , NZ3000-11KY , NZ3000-15KY , NZ3000-18.5KY , NZ3000-22KY , NZ3000-30KY , NZ3000-37KY , NZ3000-45KY , NZ3000-55KY , NZ3000-75KY , NZ3000-90KY , NZ3000-110KY , NZ3000-132KY , NZ3000-160KY , NZ3000-11GY , NZ3000-15GY , NZ3000-18.5GY, NZ3000-22GY , NZ3000-30GY ,NZ3000-37GY , NZ3000-45GY , NZ3000-55GY , NZ3000-75GY , NZ3000-90GY , NZ3000-110GY , NZ3000-132GY , NZ3000-160GY, NZ3000-Keypad) ; AT10 (models are: AT10-07R5G4, AT10-011G4, AT10-015G4, AT10-018.5G4, AT10-022G4, AT10-030G4, AT10-037G4, AT10-045G4, AT10-055G4, AT10-075G4, AT10-090G4, AT10-110G4, AT10-132G4, AT10-160G4, AT10-185G4, AT10-200G4, AT10-220G4, AT10-250G4, AT10-280G4, AT10-315G4, AT10-Keypad); AT20 (models are: AT20-00R4G2 (V/F), AT20-00R7G2 (V/F), AT20-01R5G2 (V/F), AT20-02R2G2 (V/F), AT20-00R7G4 (V/F), AT20-01R5G4 (V/F), AT20-02R2G4 (V/F), AT20-00R4G2, AT20-00R7G2, AT20-01R5G2, AT20-02R2G2, AT20-03R7G2, AT20-00R7G4, AT20-01R5G4, AT20-02R2G4, AT20-03R7G4, AT20-05R5G4, AT20-07R5P4, AT20-07R5G4, AT20-011G4, AT20-015G4, AT20-018.5G4, AT20-022G4, AT20-030G4, AT20-037G4, AT20-045G4, AT20-055G4, AT20-075P4, AT20-075G4, AT20-090G4, AT20-110G4, AT20-132G4, AT20-160G4, AT20-185G4, AT20-200G4, AT20-220G4, AT20-250G4, PG card, AT20-Keypad) ; AMD (models are: AMD43D-00R4G, AMD43D-00R7G, AMD43D-01R5G, AMD43D-02R2G, AMD43D-03R7G, AMD43D-05R5G, AMD43D-07R5G, AMD43D-011G, AMD43D-015G, AMD43D-018.5G, AMD43D-022G, AMD43D-030G, AMD43D-037G, AMD43D-045G, AMD43D-055G, AMD43D-075G, AMD43D-090G, AMD43D-110G, PG card, AMD43D-Keypad);

ASW (models are: ASW-0R55G2, ASW-00R7G2, ASW-01R1G2, ASW-01R5G2, ASW-02R2G2, ASW-03R7G2, ASW-00R7G4, ASW-01R5G4, ASW-02R2G4, ASW-03R7G4, ASW-05R5G4, ASW-Keypad);

NZC (models are : NZC0055T4B , NZC0075T4B ,NZC0110T4B , NZC0150T4B , NZC0185T4B , NZC0220T4B , NZC0300T4B , NZC0370T4B , NZC0450T4B , NZC0550T4B ,NZC0750T4B , NZC0900T4B , NZC110T4B , NZC132T4B , NZC160T4B , NZC185T4B ,NZC200T4B , NZC220T4B , NZC250T4B , NZC280T4B , NZC315T4B , NZC350T4B, NZC--Keypad) ;

NZ21: (NZ21-0R75G2 , NZ21-01R5G2 , NZ21-02R2G2 , NZ21-0R75G4 , NZ21-01R5G4 , NZ21-02R2G4 , NZ21-03R7G4, NZ21-Keypad)

Notice

1. This test report shall be invalidation without the cachet of the testing laboratory.
2. This copied report shall be invalidation without sealed the cachet of the testing laboratory.
3. This report shall be invalidation without tester signature.
4. This altered report shall be invalidation.
5. Client shall put forward demurrer within 15 days after received report. The testing laboratory shall refuse disposal if exceeded the time limit.
6. The test results presented in this report relate only to the object tested.
7. This report is only applicable to CE certificate application.