



LVD TEST REPORT

EN 61800-5-1:2023

Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy

For

Shenzhen Rtelligent Technology Co.,Ltd

2F-6F, A Building, Ruitech Industrial Park, Xingyu Road No.23, Xixiang Street, Bao an District, Shenzhen, Guang Dong Province, China, 518102

Model:

DM456-V-24,R60C,R60S,R28S,R42S,R60S,R86S,ECT86S

2024-07-15

This Report Concerns:

☒ Original Report

Equipment Type:

Stepper Servo Drives/Microstep Drives

Test Engineer:

Eric Tao/

Eric Tao

Report Number:

TH2407145-C04-R01

Test Date:

2024-07-08 to 2024-07-15

Reviewed By:

Prince Huang/

Prince Huang

Approved By:

Prince Huang/

Prince Huang

Prepared By:

Shenzhen Tian Hai Test Technology Co., Ltd.

4F, A3 BLDG, The Silicon Valley Power intelligent terminal industrial park, Guanlan street, Longhua district, Shenzhen

Tel : 86-755-86615100

Fax: 86-755-86615105

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior written consent of Shenzhen Tian Hai Test Technology Co.,Ltd.



TEST REPORT
EN IEC 61800-5-1:2023

Adjustable speed electrical power drive systems - Part 5-1: Safety requirements - Electrical, thermal and energy

Report	
Report reference No.	: TH2407145-C04-R01
Tested by (signature)	: Eric Tao
Reviewed By (signature)	: Prince Huang
Approved By (signature)	: Prince Huang
Date of issue	: 2024-07-15
Testing laboratory	
Name	: Shenzhen Tian Hai Test Technology Co.,Ltd.
Address	: 4F, A3 BLDG, The Silicon Valley Power intelligent terminal industrial park, Guanlan street, Longhua district, Shenzhen
Client	
Applicant's Name	: Shenzhen Rtelligent Technology Co.,Ltd
Address	: 2F-6F, A Building, Ruitech Industrial Park, Xingyu Road No.23, Xixiang Street, Bao an District, Shenzhen,Guang Dong Province, China, 518102
Manufacturer	: Shenzhen Rtelligent Technology Co.,Ltd
Address	: 2F-6F, A Building, Ruitech Industrial Park, Xingyu Road No.23, Xixiang Street, Bao an District, Shenzhen,Guang Dong Province, China, 518102
Test specification	
Standard	: EN IEC 61800-5-1:2023
Non-standard test method	: N.A.
Test item	
Description	: Stepper Servo Drives/Microstep Drives
Trade mark	: /
Series model No.	: DM456-V-24,R60C,R60S,R28S,R42S,R60S,R86S,ECT86S
Rating(s)	: 48V DC,3A,150W
Note	: All tests on model DM456-V-24.



EN 61800-5-1			
Clause	Requirement – Test	Result - Remark	Verdict
4	Protection against hazards		P
4.1	General		P
	Clause 4 defines the minimum requirements for the design and construction of a BDM/CDM/PDS and accessories for the intended use, to ensure its safety during installation, normal operating conditions and maintenance for the expected lifetime of the BDM/CDM/PDS. Consideration is also given to minimize hazards resulting from reasonably foreseeable misuse.	Comply with the requirements	P
4.2	Single-fault conditions and abnormal operating conditions	See below	P
4.3	Short-circuit and overload protection	Comply with the requirements	P
4.3.1	General		P
	To comply with the requirements defined in 4.2, the BDM/CDM/PDS shall not present a hazard under short-circuit or overload conditions (further referred as fault) at any power port, including phase to phase, phase to earth and phase to neutral. Adequate information shall be provided in the documentation to allow proper selection of installation wiring and protective devices external of the BDM/CDM/PDS.	Comply with the requirements	P
4.3.2	Input short-circuit rating and available output short-circuit current		P
4.3.2.1	General		P
	The interrupting capability of the overcurrent protective device shall be equal to or greater than the prospective short-circuit current of the mains supply or non-mains supply.	Comply with the requirements	P
4.3.2.2	Rated conditional short-circuit current (I _{cc}) on input power ports		P
4.3.2.3	Available output short-circuit current		N/A
4.3.2.4	Combined input and output ports		N/A
4.3.3	Short-circuit coordination (upstream protection)		N/A
4.3.4	Protection by several devices		N/A
4.3.5	Motor overload and overtemperature protection		N/A
4.3.5.1	Means of protection		N/A
4.3.5.2	BDM/CDM with electronic motor overload protection		N/A
4.3.5.3	BDM/CDM with electronic motor overload protection with thermal memory retention		N/A



4.3.5.4	BDM/CDM with electronic motor overload protection which is speed sensitive		N/A
4.3.5.5	BDM/CDM providing monitoring and trip by means of thermal sensors		N/A
4.3.6	BDM/CDM providing current limiting control		N/A
4.4	Protection against electric shock		P
4.4.1	General		P
	Protection against electric shock depends on the decisive voltage class (DVC) from 4.4.2 and protection requirements from Table 3 and shall be provided by at least one of the following measures a) or b):		P
	a) basic protection from 4.4.3 and fault protection from 4.4.4; or		N/A
	b) enhanced protection from 4.4.5.		N/A
4.4.2	Decisive voltage class (DVC)		P
4.4.2.1	General		N/A
4.4.2.2	DVC As		P
4.4.2.3	DVC B		N/A
4.4.2.4	DVC C		N/A
4.4.2.5	DVC D		N/A
4.4.2.6	Determination of decisive voltage class (DVC)	See table 4.4.2.6	P
4.4.2.6.1	General		P
	Protective measures against electric shock depend on the DVC of circuits according to 4.4.2.2 to 4.4.2.5. The DVC in turn determines the minimum required level of protection for the circuit.		P
4.4.2.6.2	Limits of the working voltage for the DVC		P
4.4.2.7	Requirements for protection against electric shock		P
4.4.3	Provision for basic protection	Comply with the requirements	P
4.4.3.1	General		P
4.4.3.2	Protection by means of basic insulation of hazardous live parts		P
4.4.3.3	Protection by means of enclosures or barriers		P
4.4.3.3.1	General		P
	Hazardous live parts shall be arranged in enclosures or located behind barriers which comply at least with the requirements of IP2X according to IEC 60529.	Protection by metal enclosures, at least IP2X used The top surface at least IP3X used.	P
4.4.3.3.2	Service-access areas		N/A
4.4.3.3.3	Restricted-access areas		N/A



4.4.3.3.4	Open type BDM/CDM and sub-assemblies		N/A
4.4.3.3.5	Top surfaces of enclosures or barriers	Comply with the requirements	P
4.4.3.3.5.1	General		P
4.4.3.3.5.2	Protection against vertical falling objects		P
4.4.4	Provision for fault protection	See below	P
4.4.4.1	General		P
4.4.4.2	Protective equipotential bonding		N/A
4.4.4.2.1	General		N/A
4.4.4.2.2	Rating of protective equipotential bonding		N/A
4.4.4.3	PE conductor	Comply with the requirements	P
4.4.4.3.1	General		P
4.4.4.3.2	Means of connection for the PE conductor		P
4.4.4.3.3	Touch current in case of failure of PE conductor		P
4.4.4.3.4	PE conductor current		P
4.4.4.4	Automatic disconnection of supply		N/A
4.4.4.4.1	General		N/A
4.4.4.4.2	Interruption of the fault current within the required time		N/A
4.4.4.4.3	Automatic disconnection of supply is not feasible		N/A
4.4.4.5	Supplementary insulation	Comply with the requirements	P
4.4.4.6	Basic protection between circuits	Comply with the requirements	P
4.4.4.7	Electrically protective screening	Comply with the requirements	P
4.4.5	Provisions for enhanced protection	Comply with the requirements	P
4.4.5.1	General		P
4.4.5.2	Double insulation		P
4.4.5.3	Reinforced insulation		P
4.4.5.4	Protection by means of protective impedance		P
4.4.6	Protective measures		N/A
4.4.6.1	General		N/A
4.4.6.2	Protective measures for protective class I BDM/CDM/PDS		N/A
4.4.6.3	Protective measures for protective class II BDM/CDM/PDS		N/A
4.4.6.4	Protective measures for protective class III BDM/CDM/PDS		N/A
4.4.6.5	Protective measures for DVC As circuits in protective class I or protective class II BDM/CDM/PDS		N/A



4.4.6.5.1	General		N/A
4.4.6.5.2	Protection by means of limited voltages		N/A
4.4.6.5.3	Provisions for connection to external PELV circuits or SELV circuits		N/A
4.4.7	Insulation		P
4.4.7.1	Influencing factors		P
4.4.7.1.1	General	Comply with the requirements	P
4.4.7.1.2	Working voltage	48V dc	P
4.4.7.1.3	Pollution degree	Pollution degree 2	P
4.4.7.1.4	Overvoltage category (OVC)		N/A
4.4.7.1.5	Supply earthing system		N/A
4.4.7.1.6	Determination of impulse withstand voltage and temporary overvoltage		P
4.4.7.1.7	Determination of the system voltage		N/A
4.4.7.1.7.1	For mains supply		N/A
4.4.7.1.7.2	For non-mains supply		N/A
4.4.7.1.8	Components bridging insulation		N/A
4.4.7.2	Insulation to the surroundings	Comply with the requirements	P
4.4.7.2.1	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. system voltage is 300V The impulse voltage is 2500V	P
4.4.7.2.2	SPD monitoring		N/A
4.4.7.2.3	Circuits connected directly to mains supply		N/A
4.4.7.2.4	Circuits connected to non-mains supply	Insulation designed according to the impulse voltage, or the working voltage Overvoltage Category II	P
4.4.7.2.5	Insulation between circuits	Designed according to more severe requirements	P
4.4.7.3	Functional insulation		N/A
4.4.7.4	Clearance		P
4.4.7.4.1	General		P
4.4.7.4.2	Reinforced insulation		N/A
4.4.7.4.3	Clearance for use above 2 000 m and/or above 30 kHz		N/A
4.4.7.4.4	Electric field homogeneity		N/A
4.4.7.4.5	Clearance to conductive enclosures	Comply with the requirements	P



4.4.7.5	Creepage distances	Comply with the requirements	P
4.4.7.5.1	General		P
	Creepage distances shall be large enough to prevent long-term degradation of the surface of solid insulators.		P
4.4.7.5.2	Insulating material groups		P
4.4.7.5.3	Determination		P
4.4.7.6	Coating or potting		N/A
4.4.7.7	Clearance and creepage distances for functional insulation on PWB and components assembled on PWB	Comply with the requirements	P
4.4.7.8	Solid insulation		N/A
4.4.7.8.1	General		N/A
4.4.7.8.2	Material requirements		N/A
4.4.7.8.3	Thin sheet or tape material		N/A
4.4.7.8.3.1	General		N/A
4.4.7.8.3.2	Thin sheet or tape material thickness and number of layers		N/A
4.4.7.8.4	Printed wiring boards (PWBs)		N/A
4.4.7.8.4.1	General		N/A
4.4.7.8.4.2	Inner layers of multi-layer printed wiring boards		N/A
4.4.7.8.4.3	Use of coating materials		N/A
4.4.7.8.5	Potting materials		N/A
4.4.7.9	Connection of parts of solid insulation (cemented joints)		N/A
4.4.7.10	Requirements for electrical withstand capability	Comply with the requirements	P
4.4.7.10.1	General		P
4.4.7.10.2	Basic insulation or supplementary insulation		P
4.4.7.10.3	Double insulation or reinforced insulation		P
4.4.8	Compatibility with residual current-operated protective devices (RCD)		N/A
4.4.9	Capacitor discharge	60V within 5s after the removal of power See clause 5.2.3.7	P
4.4.10	Access conditions for high-voltage sections of BDM/CDM/PDS (interlock)		N/A
4.4.10.1	General		N/A
4.4.10.2	Isolating means for high-voltage BDM/CDM/PDS		N/A
4.4.10.2.1	BDM/CDM/PDS with isolating means		N/A
4.4.10.2.1.1	General		N/A



4.4.10.2.1.2	Operating location		N/A
4.4.10.2.1.3	Visibility of isolating gap		N/A
4.4.10.2.1.4	Interlocking and locking		N/A
4.4.10.2.1.5	De-energisation of switch blades		N/A
4.4.10.2.2	BDM/CDM/PDS without isolating means		N/A
4.5	Protection against electrical energy hazards	See below	P
4.5.1	General		P
4.5.2	Determination of hazardous electrical energy level		P
4.5.2.1	General		P
4.5.2.2	Stored electrical energy		P
4.5.2.3	Limited power sources		P
4.6	Protection against fire and thermal hazards		P
4.6.1	General		P
4.6.2	Circuits and components representing a fire hazard		P
4.6.3	Selection of components to mitigate the risk of a fire hazard	Comply with the requirements	P
4.6.4	Fire protection provided by enclosures	Metal enclosure used	P
4.6.4.1	General		P
4.6.4.2	General enclosure requirement		P
4.6.4.3	Open type BDM/CDM intended to be installed in additional enclosure or restricted-access area		N/A
4.6.4.4	BDM/CDM designed to mitigate fire hazard by means of the enclosure		N/A
4.6.5	Temperature limits		P
4.6.5.1	General		P
4.6.5.2	Internal parts		P
4.6.5.3	Accessible parts of BDM/CDM/PDS		N/A
4.7	Protection against mechanical hazards	See below	P
4.7.1	General		N/A
4.7.2	Critical torsional speed		N/A
4.7.3	Transient torque analysis		N/A



4.7.4	Specific requirements for liquid cooled BDM/CDM/PDS		N/A
4.7.4.1	General		N/A
4.7.4.2	Coolant		N/A
4.7.4.3	Design requirement		N/A
4.7.4.3.1	General		N/A
4.7.4.3.2	Corrosion resistance		N/A
4.7.4.3.3	Tubing, joints and seals		N/A
4.7.4.3.4	Provision for condensation		N/A
4.7.4.3.5	Conductivity of coolant		N/A
4.7.4.3.6	Leakage of coolant		N/A
4.7.4.3.7	Loss of coolant		N/A
4.7.4.3.8	Insulation requirements for coolant hoses		N/A
4.7.5	Mechanical hazards from rotating parts		P
4.7.5.1	General		P
	Rotating parts shall not cause hazards.	No danger	P
4.7.5.2	Mechanical hazards caused by fan		P
4.7.5.3	Expelled parts		N/A
4.7.6	Sharp edges		P
	Edges, projections, corners, openings, guards, handles and the like that are accessible to the operator shall be smooth and rounded so as not to cause injury during installation, normal operating conditions and maintenance of the equipment.		P
4.8	BDM/CDM/PDS with multiple sources of supply		N/A
4.8.1	General		N/A
4.8.2	Low-voltage DC link sharing		N/A
4.9	Protection against environmental stresses	Comply with the requirements	P
4.9.1	General		P
4.9.2	Protection against corrosion		P
4.10	Protection against excessive acoustic noise hazards		N/A
4.10.1	General		N/A



4.10.2	Acoustic noise level		N/A
4.11	Wiring and connections		P
4.11.1	General		P
4.11.2	Insulation of conductors		P
4.11.2.1	General		P
4.11.2.2	Accessible wiring system		P
4.11.2.3	Conductors of different circuits		N/A
4.11.3	Stranded wire		N/A
4.11.4	Routing and clamping		N/A
4.11.5	Identification of conductors and terminals of mains supply and non-mains supply		N/A
4.11.6	Splices and connections		N/A
4.11.7	Accessible connections		N/A
4.11.8	Interconnections between parts of the PDS		N/A
4.11.9	Supply connections for permanently connected BDM/CDM/PDS		N/A
4.11.10	Supply connections for pluggable BDM/CDM/PDS	Comply with the requirements	P
4.11.10.1	Requirements for cords (for example mains supply cords)		P
4.11.10.2	Fitting of non-detachable mains supply cords		P
4.11.10.2.1	Cord entry		N/A
4.11.10.2.2	Cord anchorage		N/A
4.11.10.2.3	Plugs and connectors		N/A
4.11.11	Terminals		N/A
4.11.11.1	Construction requirements		N/A
4.11.11.2	Connecting capacity of terminals		N/A
4.11.11.3	Connection to external conductors by field wiring terminals		N/A
4.11.11.4	Wire bending space for wires 10 mm ² and greater		N/A
4.11.12	Provisions for connecting the shield of shielded wire or cable		N/A
4.12	Mechanical requirements for enclosures	Comply with the requirements	P
4.12.1	General		P



4.12.2	Handles and manual controls		N/A
4.12.3	Cast metal enclosure		P
4.12.4	Sheet metal enclosure		P
4.12.5	Stability for floor-standing BDM/CDM/PDS		N/A
4.12.6	Wiring strain relief		P
4.12.7	Polymeric enclosure stress relief		N/A
4.12.8	Internal condensation or accumulation of water		N/A
4.12.9	Polymeric outdoor enclosure ultra-violet (UV) resistance		P
4.13	Components	Comply with the requirements	P
4.13.1	Components general		P
4.13.2	Components representing a fire hazard		P
4.13.3	Components being part of an enclosure		P
4.13.4	Components representing a mechanical hazard		P
4.13.5	Wound components		N/A
4.13.6	Protective devices		N/A
4.14	Protection against electromagnetic fields		N/A
5	Test requirements		P
5.1	General		P
5.1.1	Test objectives and classification		P
5.1.2	Selection of test samples		P
5.1.3	Sequence of tests		P
5.1.4	Earthing conditions		N/A
5.1.5	General conditions for tests	See below	P
5.1.5.1	Application of tests		P
5.1.5.2	Selecting of test samples		P
5.1.5.3	Operating parameters for tests		P
5.1.5.4	Mounting		P
5.1.6	Compliance	Comply with the requirements	P



5.1.7	Test overview	EUT tested according to type test	P
5.2	Test specifications		P
5.2.1	Visual inspections		P
5.2.2	Mechanical tests	See below	P
5.2.2.1	Clearances and creepage distances test		N/A
5.2.2.2	Non-accessibility test		P
5.2.2.3	Ingress protection test (IP rating)		P
5.2.2.4	Enclosure integrity test	See below	P
5.2.2.4.1	General		P
5.2.2.4.2	Deflection test		P
5.2.2.4.2.1	General		P
5.2.2.4.2.2	Steady force test, 30 N		N/A
5.2.2.4.2.3	Steady force test, 250 N	250N for 5s, no damage	P
5.2.2.4.3	Impact test	A solid smooth steel sphere of 500g, 50mm in diameter applied, no damage	P
5.2.2.4.4	Drop test	1000mm, hard wooden board, no danger	P
5.2.2.4.5	Mould stress relief distortion test		N/A
5.2.2.5	Wall or ceiling mounted test		N/A
5.2.2.6	Handles and manual control securement test		N/A
5.2.2.7	Strain relief test		N/A
5.2.2.7.1	Performing the test		N/A
5.2.2.7.2	Acceptance criteria		N/A
5.2.2.8	Isolating means and interlock integrity test		N/A
5.2.2.8.1	Performing the isolating means test		N/A
5.2.2.8.2	Performing drawout contactor test		N/A
5.2.2.8.3	Performing mechanical interlock test		N/A
5.2.2.9	Acoustic noise test		N/A
5.2.3	Electrical tests	Comply with the requirements See table 5.2.3	P



5.2.3.1	General		P
5.2.3.2	Impulse withstand voltage test	See table 5.2.3.2	P
5.2.3.3	Alternative to impulse withstand voltage test		N/A
5.2.3.4	AC or DC voltage test	See table 5.2.3.2	P
5.2.3.4.1	Purpose of test		P
5.2.3.4.2	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
5.2.3.4.3	Additional test considerations		P
5.2.3.4.4	Performing the voltage test	See table 5.2.3.2	P
5.2.3.4.5	Duration of the AC or DC voltage test	60s	P
5.2.3.4.6	Verification of the AC or DC voltage test	No breakdown occurs	P
5.2.3.5	Partial discharge test		N/A
5.2.3.6	Protective impedance test		N/A
5.2.3.7	Touch current measurement test	See table 5.2.3.7	P
5.2.3.8	Capacitor discharge test	See table 5.2.3.8	N/A
5.2.3.9	Limited power source test		N/A
5.2.3.10	Temperature rise test	See table 5.2.3.10	P
5.2.3.11	Protective equipotential bonding test		N/A
5.2.3.11.1	General		N/A
5.2.3.11.2	Protective equipotential bonding continuity test		N/A
5.2.3.12	Input test	Comply with the requirements	P
5.2.3.13	Thin sheet material test		N/A
5.2.3.13.1	General		N/A
5.2.3.13.2	Test procedure for separable thin sheet material		N/A
5.2.3.13.3	Mandrel test		N/A
5.2.3.14	Test procedure for determination of working voltage	Comply with the requirements	P
5.2.3.15	Internal SPD monitoring test		N/A
5.2.3.16	Preconditioning of material		N/A



5.2.4	Abnormal operation and simulated faults tests	See below	P
5.2.4.1	General		P
5.2.4.2	Supply voltage, current and frequency	48V DC,3A	P
5.2.4.3	Acceptance criteria		P
5.2.4.4	Protective equipotential bonding short-circuit withstand test		N/A
5.2.4.4.1	General		N/A
5.2.4.4.2	Test conditions		N/A
5.2.4.4.3	Protective equipotential bonding short-circuit test method		N/A
5.2.4.4.4	Acceptance criteria		N/A
5.2.4.5	Output short-circuit test	Comply with the requirements	P
5.2.4.5.1	Load conditions		P
5.2.4.5.2	Short-circuit test between phase terminals of output power port		P
5.2.4.5.3	Short-circuit test between phase terminals of output power ports and earth		P
5.2.4.6	Electronic motor overload protection test		N/A
5.2.4.6.1	General requirements		N/A
5.2.4.6.2	Test set-up		N/A
5.2.4.6.3	Acceptance criteria		N/A
5.2.4.6.4	Electronic motor overload protection test		N/A
5.2.4.6.5	Electronic motor thermal memory retention trip test		N/A
5.2.4.6.6	Electronic motor thermal memory retention loss of power test		N/A
5.2.4.6.7	Electronic motor thermal speed sensitivity test		N/A
5.2.4.7	Circuit functionality evaluation test		N/A
5.2.4.8	Current limiting test		N/A
5.2.4.9	Output overload test		N/A
5.2.4.10	Breakdown of component test	Comply with the requirements	P
5.2.4.10.1	Load conditions		P
5.2.4.10.2	Application of short-circuit or open-circuit		P



5.2.4.10.3	Test sequence		P
5.2.4.11	PWB short-circuit test	Comply with the requirements	P
5.2.4.12	Loss of phase test		N/A
5.2.4.13	Cooling failure test		P
5.2.4.13.1	General and acceptance criteria		N/A
5.2.4.13.2	Inoperative blower motor test	Comply with the requirements	P
5.2.4.13.3	Clogged filter test		N/A
5.2.4.13.4	Loss of coolant test		N/A
5.2.4.13.5	Covering of openings for cooling air test		N/A
5.2.5	Material tests	Materials comply with relevant standard	P
5.2.5.1	General		P
5.2.5.2	High current arcing ignition test		P
5.2.5.3	Glow-wire test		N/A
5.2.5.4	Hot wire ignition test	HWI=3	P
5.2.5.5	Flammability test	UL94-5VA/VB	P
5.2.5.6	Cemented joints test		N/A
5.2.5.7	Ultra-violet (UV) resistance test		N/A
5.2.6	Environmental tests		N/A
5.2.6.1	General		N/A
5.2.6.2	Acceptance criteria		N/A
5.2.6.3	Climatic tests		N/A
5.2.6.3.1	Preconditioning or recovery procedure for climatic tests		N/A
5.2.6.3.2	Dry heat test (steady state)		N/A
5.2.6.3.3	Cold test		N/A
5.2.6.3.4	Damp heat test (steady state)		N/A
5.2.6.3.5	Damp heat test (cyclic)		N/A
5.2.6.4	Vibration test		N/A
5.2.6.5	Salt mist test		N/A



5.2.6.6	Dust test		N/A
5.2.6.7	Sand test		N/A
5.2.7	Hydrostatic pressure test		N/A
5.2.8	Electromagnetic fields (EMF) test		N/A
6	Information and marking requirements		P
6.1	General		P
6.1.1	Overview		P
6.1.2	Documentation in electronic form		P
6.1.3	Installation Instructions		P
6.2	Information for selection	See intruction	P
6.2.1	General		P
6.2.1.1	General		P
6.2.1.2	Identifying the product		P
6.2.1.3	Electrical ratings for each port		P
6.2.1.4	Supplementary information for each port		P
6.2.1.5	Liquid cooled BDM/CDM/PDS		P
6.2.1.6	General BDM/CDM/PDS marking		N/A
6.2.2	Instructions and markings pertaining to accessories		P
6.3	Information for installation and commissioning	Comply with the requirements	P
6.3.1	General		P
6.3.2	Mechanical considerations		P
6.3.3	Environment		P
6.3.4	Handling and mounting		P
6.3.5	Enclosure temperature		P
6.3.6	Open type BDM/CDM		P
6.3.6.1	Fire protection for open type BDM/CDM		P
6.3.6.2	Protection against electric shock not provided by enclosures or barriers		P
6.3.6.3	Operating temperature		P



6.3.6.3.1	Operating ambient temperature		P
6.3.6.3.2	Operating surrounding air temperature		P
6.3.7	Connections	See instruction	P
6.3.7.1	General		P
6.3.7.2	Interconnection and wiring diagrams		P
6.3.7.3	Conductor (cable) selection		P
6.3.7.4	Identification and other details of field wiring terminals		P
6.3.7.4.1	Identification of field wiring terminals		P
6.3.7.4.2	Other details of field wiring terminals		P
6.3.7.5	Mains plug and socket-outlets		P
6.3.8	Commissioning	Comply with the requirements	P
6.3.9	Protection requirements		
6.3.9.1	Accessible parts and accessible circuits		
6.3.9.1.1	General		
6.3.9.1.2	Requirements for alternate methods in service-access area		
6.3.9.2	Protective class		P
6.3.9.2.1	General		P
6.3.9.2.2	Protective class I BDM/CDM/PDS	Comply with the requirements	P
6.3.9.2.3	Protective class II BDM/CDM/PDS		N/A
6.3.9.2.4	Protective class III BDM/CDM/PDS		N/A
6.3.9.3	Protective equipotential bonding circuit		N/A
6.3.9.4	Touch current or high leakage current		P
6.3.9.4.1	General		P
6.3.9.4.2	Touch current	Comply with the requirements	P
6.3.9.4.3	High leakage current		N/A
6.3.9.5	Compatibility with RCD		N/A
6.3.9.6	External protection means		N/A
6.3.9.6.1	General		N/A



6.3.9.6.2	Protective devices		N/A
6.3.9.6.3	Protection according to IEC 60364-4-41:2005 and IEC 60364-4-41:2005/AMD1:2017, Clauses 411 or 415		N/A
6.3.9.6.4	Surge protective devices		N/A
6.3.9.7	Motor overload protection and overtemperature protection		P
6.3.9.7.1	BDM/CDM not incorporating internal electronic motor overload protection and overtemperature protection		N/A
6.3.9.7.2	BDM/CDM incorporating internal electronic motor overload protection and overtemperature protection		P
6.3.10	Motor and driven equipment		N/A
6.3.10.1	Motor selection		N/A
6.3.10.2	Motor integrated sensors		N/A
6.3.10.3	Critical torsional speeds		N/A
6.3.10.4	Transient torque analysis		N/A
6.3.11	Field installed components		P
6.4	Information for intended use		P
6.4.1	General	See instruction	P
6.4.2	Adjustment		P
6.4.3	Labels, signs, symbols and signals	Comply with the requirements	P
6.4.3.1	General		P
6.4.3.2	Isolating device and disconnects		P
6.4.4	Hot surface		P
6.4.5	Control and device marking		P
6.4.6	Stability for floor-standing BDM/CDM/PDS		P
6.5	Supplementary information		N/A



4.4.2.6	Table: Decisive voltage class (in normal conditions)					P
Location of between	Circuit type	Decisive voltage class	Work voltage (measured)	Work Voltage (limited)	Condition/status	
Input circuit	--	Class C	48VAC	<1000VAC	--	P

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)	Part 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/2 120d.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/4 240d.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/4240d.c/5s(R)	--	--		No
Between primary and secondary of transformer	3000a.c.r.m.s/4 240d.c/5s(R)	--	--		No
*), B=Basic, S=Supplementary and R=Reinforced					

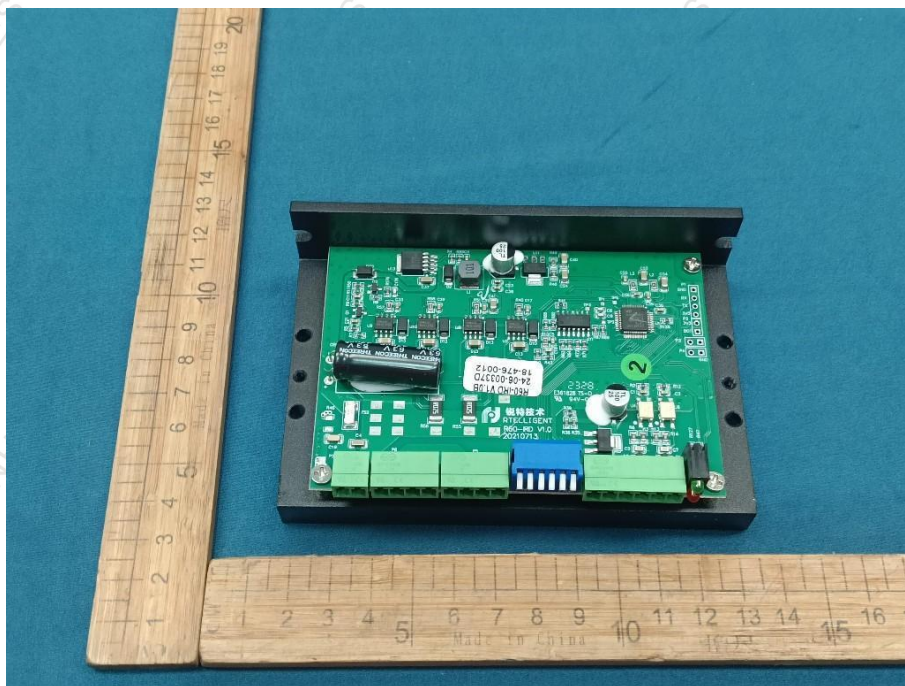
5.2.3.7	TABLE: Leakage current		P
	Three phase system shall be operated at rated voltage and connected motor with unloaded:	--	--
	Without any connection to the earth:	--	--
Leakage current between	I (mA)	Max. allowed I (mA)	
Input --accessible enclosure	0.58	3.5mA ac or 10mA dc	
SELV Circuit -- accessible enclosure	0.14	3.5mA ac or 10mA dc	
For appliances intended to be connected in star connection only, the neutral is not connected			



5.2.3.8	Table: Capacitor discharge			N/A
	1	2	3	Limited Value
Circuit type	input circuit	output circuit	Generatrix circuit	--
Measure voltage(Vrms	--	--	--	--

5.2.3.10	TABLE: Temperature rise test		P
	Test voltage (V)	48	--
	Ambient Temp (°C): Test before: 25.0	--	--
Thermocouple locations		T (°C)	Max. T (°C)
PWB' s for main board output		50.4	130°C
PWB' s for main board input		52.5	130°C
PWB' s for control board		41.8	130°C
PWB' s for main board		43.6	130°C
User terminals		38.1	<Cable rating T +15°C
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			

[illegible]



*****END OF THE REPORT*****