

LVD TEST REPORT

For

Intelligent Digital Variable Frequency Vibration Feeder Controller

Model Number: STVC31-M,STVC31-S,STVC31-L,

STVC31-XL,STVC31-XXL,STVC31-XXXL



Prepared for : WENZHOU SMART ELECTRIC & Technology
CO.,Ltd
NO.506, XINGFENG RD. ,HONGQIAO, YUEQING,
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Report Number : **TB-LVD111401**

Date of Test : Jul. 06-08, 2011

Date of Report : Jul. 11-13, 2011

EN 60204-1:2006+A1:2009

Safety Electrical equipment of machines

Testing laboratory-----:	Shenzhen Toby Technology Co., Ltd.
Address-----:	10/F., A Block, Jiada R & D Bldg., No.5 Songpingshan Road, Science & Technology Park, Nanshan District, Shenzhen, China
Testing location-----:	Shenzhen Toby Technology Co., Ltd.
Applicant-----:	WENZHOUSMART ELECTRIC & Technology CO.,Ltd
Address-----:	NO.506, XINGFENG RD. ,HONGQIAO, YUEQING, WENZHOUSMART ELECTRIC & Technology CO.,Ltd
Standard-----:	EN 60204-1:2006+A1:2009
Test result-----:	Compliance with the requirements.
Procedure deviation-----:	N.A.
Non-standard test method---	N.A.
Trademark-----:	N.A.
Type of test object-----:	Intelligent Digital Variable Frequency Vibration Feeder Controller
Models/Type reference-----:	STVC31-M,STVC31-S,STVC31-L, STVC31-XL,STVC31-XXL,STVC31-XXXL
Rating-----:	See the marking
Factory-----:	WENZHOUSMART ELECTRIC & Technology CO., Ltd
Address-----:	NO.506, XINGFENG RD., HONGQIAO, YUEQING, WENZHOUSMART ELECTRIC & Technology CO., Ltd

Test item particulars:	
Operating condition-----:	Continue Operating
Equipment mobility -----:	Fixed Equipment
Class of equipment -----:	Class I
Mass of equipment -----:	0.86Kg
Protection against ingress of water-----:	IPX0
Possible test case verdicts:	
Test case does not apply to the object-----: N (.A.)	
Test object does meet the requirement -----: P(ass)	
Test object does not meet the requirement-----: F(ail)	
Ambient temperature and humidity : (25±5) °C, (50-60)%RH.	
General remarks:	
1. "(see remark #)" refers to a remark appended to the report.	
2. Throughout this report a point is used as the decimal separator.	
3. The test results presented in this report relate only to the object tested.	
4. This report shall not be reproduced except in full without the written approval of the Shenzhen TOBY.	
5. If client has any objection to the testing results, please advise us within 15 working days after publish, otherwise claims will not be accepted.	

Artwork of Marking Label

Intelligent Digital Variable Frequency Vibration Feeder Controller
Model: STVC31-M
Input: AC85-250V, 50/60Hz
Output: Max 3A, 600VA, +5V, +24V, +24



WENZHOU SMART ELECTRIC & Technology CO.,Ltd

Made In China

EN 60204-1:2006+A1:2009			
Clause	Requirement Test	Result - Remark	Verdict
4	General considerations		P
4.1	This part of IEC 60204 is intended to apply to electrical equipment used with a wide variety of machines and with a group of machines working together in a co-ordinated manner. The risks associated with the hazards relevant to the electrical equipment shall be assessed as part of the overall requirements for risk assessment of the machine. This will determine the acceptable level of risk, and the necessary protective measures for persons who		P
	The use of the inquiry form as shown in annex B of this part of IEC 60204 is recommended in order to facilitate an appropriate agreement between the user and the supplier(s) on basic conditions and additional user		P
4.2	Selection of equipment electrical components and devices shall be suitable for their intended use and shall conform to relevant IEC standards where such exist.		P
4.3	Electrical supply		P
4.3.1	General		P
4.3.2	a .c. supplies voltage :steady state voltage 0,9...1,1of nominal voltage. Frequency:0,99---1,01of nominal frequency continuously, 0,98---1,02 of nominal frequency short-time. Harmonics: Harmonic distort between the live conductors for the sum of the 2nd through 5th harmonic. An additional 2% max .of the total r . m . s. Voltage between the live conductors for the sum of the 6th through 30th harmonic is permissible ion not to exceed 10% of the total r .m .s. voltage		P
	Voltage unbalance in 3-phase supplies: Neither the voltage of the negative sequence component nor the voltage of the zero sequence component shall exceed 2% of the positive Sequence component Voltage impulses Not to exceed 1,5 ms in duration with a rise/fall time between 500 us and 500 us and a peak value not more than 200% of the rated r. m. s . supply voltage		P
	Voltage interruption:Less than 5ms		P
4.3.3	d .c supplies		N
4.3.4	On-board power supply		N

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Clause	Requirement Test	Result - Remark	Verdict
4.4	Physical environment and operating conditions		P
4.4.1	The electrical equipment shall be suitable for use in the physical environment and operating conditions specified in 4.4.2 to 4.4.8. When the physical environment or the operating conditions are outside those specified, an agreement may be needed between the supplier and the user (see annex B).		
4.4.2	Electromagnetic compatibility (EMC)		P
4.4.3	Ambient air temperature: Electrical equipment shall be capable of operating correctly in the intended ambient air temperature. The minimum requirement for all electrical equipment is correct operation between air temperatures of +5 °C and +40 °C. For very hot environments (e.g. hot climates, steel mills, paper mills) and for cold environments, extra requirements may be necessary (see annex B).		P
4.4.4	Humidity: The electrical equipment shall be capable of operating correctly when the relative humidity does not exceed 50 % at a maximum temperature of +40 °C.		P
4.4.5	Altitude: Electrical equipment shall be capable of operating correctly at altitudes up to 1000 m above mean sea level		P
4.4.6	Contaminants: Electrical equipment shall be adequately protected against the ingress of solid bodies and liquids (see 13.3).		P
4.4.7	Ionizing and non-ionizing radiation: When equipment is subject to radiation (e.g. microwave, ultraviolet, lasers, X-rays), additional measures shall be taken to avoid malfunctioning and accelerated deterioration of the insulation .		N
4.4.8	Vibration ,shock and bump		P
4.5	Transportation and storage		P
4.6	Provisions for handling		P
4.7	Installation and operation		P
5	Incoming supply conductor terminations and devices for disconnecting and switching off		P
5.1	Incoming supply conductor terminations		P
	The electrical equipment connected to a single power supply	single power supply	P
	Supply for certain parts of the equipment		N

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Clause	Requirement Test	Result - Remark	Verdict
	Supply conductors directly connected to the supply terminals		P
	Neutral conductor used		P
	No connection between the neutral conductor and protective bonding circuit nor combined PEN terminal.		N
	The mark of incoming supply connection terminals		P
5.2	External protective conductor terminal		P
	The size of the external protective conductor terminal		P
	"PE" mark for the external protective conductor		P
	The use of the "PE" mark		P
	The mark for the other terminals used for the connection of machine components to the protective bonding circuit.		P
5.3	Supply disconnecting(isolating)device		N
5.3.1	General		N
	Hand-operated supply disconnecting device provided for incoming supply		N
	Two or more supply disconnecting		N
	Supply disconnecting device provided for sewing systems		N
5.3.2	Type		N
	The supply disconnecting device shall be one of the following types: a) a switch-disconnector in accordance with EN 60947-3;utilization category AC-23B or DC-23B;		N
	b) a disconnector which has an auxiliary contact which in all cases causes switching devices to break the load circuit before the opening of the main contacts of the disconnector;		N
	c) a circuit-breaker in accordance with EN 60947-2 suitable for isolation in accordance with EN60947-3;		N

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Clause	Requirement Test	Result - Remark	Verdict
	d) a plug/socket combination for a machine with a rated current not exceeding 16 A and a total power rating not exceeding 3kw. Where a plug/socket combination is used as the supply disconnecting device , it shall have a breaking capacity of at least the rated current of the machine at rated voltage (see also 14.4.5).where the plug/socket combination is to be used for disconnection under overload (e.g. locked rotor),then the rating should be at least locked rotor current .In addition , the electrical equipment shall have a device for switching the machine on and off.		N
5.3.3	Requirements		N
5.3.3.1	General Requirements for type a)--c) disconnecting device		N
5.3.3.2	Power operated circuit-breakers		N
5.3.4	Operating handle The handle of the supply disconnecting device shall be easily accessible and located between 0,6 m and 1,9 m above the servicing level; a maximum height of 1,7 m is preferred.		N
	For seated positions the operating handle of the ON/OFF switch shall be mounted between 0.5m and 1.5m above the servicing level.		N
5.3.5	Excepted circuits The following circuits need not be disconnected by the supply Disconnecting device: -- lighting circuits		N
	-- plug/socket circuits		N
	-- undervoltage protection circuits		N
	-- circuits supplying equipment which should normally remain energized for satisfactory operation(e.g. temperature controlled measuring devices, product heaters, program storage devices);		N
	--control circuits for interlocking in accordance with 14.1.3. It is recommended that such circuits be provided with their own disconnecting device.		N
5.4	Devices for switching off for prevention of unexpected start-up		N

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Clause	Requirement Test	Result - Remark	Verdict
6	Protection against electric shock		P
6.1	General The electrical equipment shall provide protection of persons against Electric shock from:-direct contact; and -indirect contact		P
6.2	Protection against direct contact		P
6.2.1	Protection by enclosures		P
6.2.2	Protection by insulation of live parts		P
6.2.3	Protection against residual voltages		P
6.3	Protection against indirect contact		P
6.3.1	- Protection by automatic disconnection of supply Automatic disconnection of the supply after occurrence of an insulation failure is intended to prevent a touch voltage persisting for the time that a hazardous condition can arise .		P
6.3.2	- Protection by use of class II equipment or by equivalent insulation This measure is intended to prevent the appearance of hazardous voltages on the accessible parts through a failure in the basic insulation .		N
6.3.3	- Protection by electrical separation Electrical separation of an individual circuit is intended to prevent shock current through contact with exposed conductive parts which can be energized by a failure in the basic insulation of the live parts of that circuit .		P
6.4	Protection by the use of PELV (Protective Extra Low Voltage)		P
7	Protection of equipment		P
7.1	General This clause details the measures to be taken to protect equipment against the effects of:		P
	- over current arising from short circuit;		P
	- overload currents		P
	- abnormal temperatures ;		P
	- loss of or reduction in the supply voltage; and over - speed of machines/machine elements		P
7.2	Over current protection		P
7.2.2	Supply conductors		P
7.2.3	Power circuits All conductors except earthed neutral conductors shall be protected		P
7.2.4	Control circuits		P

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Clause	Requirement Test	Result - Remark	Verdict
7.2.5	Socket outlets and their associated conductors Over current protection shall be required for the circuits feeding general purpose socket outlets intended primarily for supplying power to maintenance equipment over current protective devices shall be provided in the unearthed live conductors of each circuit feeding such socket outlets.		P
7.2.6	Local lighting circuits		N
7.2.7	Transformers Transformers shall be protected against over current in accordance with IEC 76-5 and EN 60742 as appropriate. Such protection shall (see Also 7.2.9): -avoid nuisance tripping due to transformer magnetizing inrush currents; and - avoid a winding temperature rise in excess of the permitted value for the insulation class of transformer when it is subjected to the effects of a short circuit at its secondary terminals.		N
7.2.8	Location of over current protective devices		P
7.2.9	Over current protective devices		P
7.2.9	Rating and setting of over current protective devices		P
7.3	Overload protection of motors Overload protection of motors shall be provided for each motor rated at more than 0,5kw which is normally in continuous operation. Such overload protection is recommended for all other motors ,especially for coolant pump motors ,Overload protection of motors can be achieved by the use of devices such as overload protective devices, temperature sensing devices, current limiting devices.		N
7.4	Abnormal temperature protection		P
7.5	Protection against supply interruption or voltage reduction and subsequent restoration		P
	The provision of a device for avoiding an unintentional restart after a supply interruption or voltage reduction and subsequent restoration on sewing units and systems which are started by actuating a hold-to-run control device		P
7.6	Motor over speed protection		N
8	Potential bonding		P
8.1	General This clause provides requirements for both protective bonding and operational bonding .		P
8.2	Protective bonding circuit		P

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Clause	Requirement Test	Result - Remark	Verdict
8.2.1	Component of protective bonding circuit		P
8.2.2	Protective conductors		P
	Protective conductors mark		P
	Copper conductor or other used		P
	The cross-sectional area of protective conductors		P
8.2.3	Continuity of the protective bonding circuit		P
	Hazardous touch voltage in the event of an insulation failure		P
	Current-carrying capacity of connection and bonding points		P
	Metal conduits of flexible or rigid construction and metallic cable sheaths		P
	Requirements for electrical equipment mounted on lids, doors, or cover plates		P
8.2.4	Exclusion of switching devices from the protective bonding circuit		P
8.2.5	Parts which need not be connected to the protective bonding circuit		P
	Necessity to connected to the protective bonding circuit		P
8.2.6	Interruption of the protective bonding circuit by connectors		P
8.2.7	Protective conductor connecting points		P
8.3	Bonding to the protective bonding circuit for operational purposes		P
8.4	Insulation failures		P
8.5	Bonding to a common reference potential		P
8.6	Electrical interference		P
9	Operator interface and machine mounted control devices		P
9.1	General This clause contains requirements for devices mounted outside or partially outside control enclosures.		P
9.1.1	Location and mounting		P
9.1.2	Protection Where mounted as intended, operator interface and machine mounted control devices shall withstand the stresses of the expected use and shall have a minimum degree of protection of IP 40. The degree of protection considered to be sufficient since sewing units and sewing systems are operated in an environment in which the effects of aggressive fluids, vapours and contamination by coarse dust and chips are not to be expected.		P
9.1.3	Position sensors		N

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Clause	Requirement Test	Result - Remark	Verdict
9.2	Push-buttons		P
9.2.1	Colours Push-button actuators shall be colour-coded in accordance with table 2.		N
9.2.2	Markings In addition to the functional identification as described in 18.3, it is recommended that push-buttons be marked with symbols, near or preferably directly on the actuators		P
9.3	Indicator lights and displays		P
9.3.1	Modes of use		P
9.3.2	Colours		P
9.3.3	Flashing lights		N
9.4	Illuminated push-buttons		P
9.5	Rotary control devices		N
9.6	Start devices		P
9.7	Emergency stop devices		P
9.7.1	General		P
9.7.2	Types The types of emergency stop device include: -a push-button operated switch;		P
	-a pull-cord operated switch; and		P
	-a pedal-operated switch without a mechanical guard.		P
	The devices shall be of the self-latching type and shall be positioned so as to be readily accessible.		P
9.7.3	Characteristics		P
9.7.4	Actuators of emergency stop devices shall be coloured RED. Where background exists behind the device actuator, it shall be of the palm or mushroom head type.		N
9.7.5	Use of means of disconnection		N
9.8	Displays		N
10	Control interfaces		P
10.1	General		P
10.2	Digital input/output interfaces		P
10.2.1	Inputs		P
10.2.2	Outputs		P
10.3	Drive interfaces with analogue inputs		P
10.3.1	Separation between control and electric drives		P
10.3.2	Hydraulic servo-valves		N

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Clause	Requirement Test	Result - Remark	Verdict
10.3.3	Electric servo and velocity drives		P
10.4	Peripherals		N
10.5	Communications		N
11	Electronic equipment		P
11.1	General		P
11.2	Basic requirements		P
11.2.1	Inputs and outputs Status indication of digital inputs and outputs should be provided.		P
11.2.2	Electronic control equipment		P
11.2.3	Equipotential bonding		N
11.3	Programmable equipment		N
11.3.1	Programmable controllers Programmable controllers shall comply with relevant IEC standards (see IEC 1131).		N
11.3.2	Memory retention and protection		P
11.3.3	Programming equipment		N
11.3.4	Software verification		N
11.3.5	Use in safety-related functions		P
12	Controlgear: location, mounting and enclosures		P
12.1	General requirements		P
12.2	Location and mounting		P
12.2.1	Accessibility and maintenance		P
12.2.2	Segregation		P
	Controlgear shall be mounted so that it does not interfere with operation and maintenance of the machine and its associated equipment.		P
	Not-electrical parts and devices, not directly associated with the electrical equipment, shall not be located within enclosures containing controlgear. Devices such as solenoid valves should be separated from other electrical equipment (e.g. in a separate compartment).		N
	Control devices, mounted in the same location and connected to the supply voltages or to both supply and control voltages, shall be grouped separately from those connected only to the control voltages. Terminal blocks for power circuits shall be grouped separately from those for control circuits. However grouped power terminals may be mounted adjacent to control terminals provided that each group can be readily identified (e. g. by use of different sizes, by use of barriers, by colour).		P

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Clause	Requirement Test	Result - Remark	Verdict
12.2.3	Heating effects Heat generating components (e. g. heat sinks, power resistors) shall be located so that the temperature of each component in the vicinity remains within the permitted limit.		P
12.3	Degrees of protection The minimum degree of protection is IP40 for enclosures of sewing units and systems. However , if all the circuits used in and with the devices meet the requirements of 6.1 of this part of IEC204,IP20 is permitted as the minimum degree of protection.		N
12.4	Enclosures, doors and openings		N
13	Conductors and cables		P
13.1	General requirements Conductors and cables shall be selected so as to be suitable for the operating conditions (e.g. voltage, current, protection against electric shock, grouping of cables) and external influences (e.g. ambient temperature, presence of water or corrosive substances, mechanical) which can exist.		P
13.2	Conductors In general, conductors shall be of copper. Conductors of any other material shall have a nominal cross-sectional area such that, carrying the same current, the maximum conductor temperature shall not exceed the values given in table 4. where aluminium is used, the cross-sectional area shall be at least 16 mm ²		P
13.3	Insulation The types of insulation include (but are not limited to):		P
	-polyvinyl chloride (PVC);		P
	-rubber, natural and synthetic;		P
	-silicone rubber (SiR);		P
	-mineral;		P
	-cross-linked polyethylene (XLPE); and		P
	-ethylene propylene compound (EPR)		P
	Dielectric strength of the insulation		P
	Mechanical strength and thickness of the insulation		P
13.4	Current carrying capacity in normal service		P
13.5	Voltage drop The voltage drop shall not exceed 5% of the nominal voltage.		P
13.6	Minimum cross-sectional area		P
14	Wiring practices		P
14.1	Connections and routing		P

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Clause	Requirement Test	Result - Remark	Verdict
14.1.1	General requirements		P
	All connections, especially those of the protective bonding circuit, shall be secured against accidental loosening.		P
	The means of connection shall be suitable for the cross-sectional areas and nature of the conductors being terminated. In the case of aluminium or aluminium alloy conductors, particular consideration shall be given to the problems of electrolytic corrosion (see 14.2)		P
	The connection of two or more conductors to one terminal is permitted only in those cases where the terminal is designed for that purpose. However, only one protective bonding circuit conductor shall be connected to one terminal connecting point.		P
	Soldered connections shall only be permitted where terminals are provided which are suitable for soldering.		P
	Terminals on terminal blocks shall be plainly identified to correspond with markings of the diagrams.		N
	The installation of flexible conduits and cables shall be such that liquids shall drain away from the fittings.		P
	Means of retaining conductor strands shall be provided when terminating conductors at devices or terminals which are not equipped with this facility. Solder shall not be used for this purpose.		P
	Shielded conductors shall be so terminated as to prevent fraying of strands and to permit easy disconnection.		P
	Identification tags shall be legible, permanent, and appropriate for the physical environment.		P
	Terminal blocks shall be so mounted and wired, that the internal and external wiring does not cross over the terminals (see EN 60947-7-7-1).		P
14.1.2	Conductor and cable runs		P
	Conductors and cables shall be run from terminal to terminal without splices or intervening joints.		N
	Where it is necessary to connect and disconnect cables and cable assemblies, sufficient extra length shall be provided for this purpose. The terminations of multicore cables shall be adequately supported where undue strain can be exerted on the terminations of the conductors.		P
14.1.3	Conductors of different circuits		P
14.2	Identification of conductors		N
14.2.1	General requirements		P

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Clause	Requirement Test	Result - Remark	Verdict
	Conductors shall be identifiable at each termination in accordance with the technical documentation Colour-coding used for identification of conductors It is recommended that, where colour is used for identification, the colour be used throughout the length of the conductor either by the colour of the insulation or by colour markers. An acceptable alternative may consist of additional identification at selected locations. For safety reasons, the colour GREEN or the colour YELLOW shall not be used where there is a possibility of confusion with the bicolour combination GREEN-AND-YELLOW (see 14.2.2)		P
14.2.2	Identification of the protective conductor		P
14.2.3	Identification of the neutral conductor		P
14.2.4	Identification of other conductors		N
14.3	Wiring inside enclosures		P
14.4	Wiring outside enclosures		N
14.4.1	General requirements The means of introduction of cables or ducts with their individual glands, bushings, etc., into an enclosure shall ensure that the degree of protection is not reduced		N
14.4.2	External ducts		N
14.4.3	Connection to moving elements of the machine		N
14.4.4	Interconnection of devices on the machine		N
14.4.5	Plug and socket connections		N
14.4.6	Dismantling for shipment		N
14.4.7	Additional conductors		N
14.5	Ducts,connection and junction boxes		N
14.5.1	General requirements		N
	All sharp edges, flash, burrs, rough surfaces, or threads, with which the insulation of the conductors may come in contact, shall be removed from ducts and fittings. Where necessary, additional protection consisting of a flame-retardant, oil-resistant insulating material shall be provided to protect conductor insulation.		N
	Ducts shall provide a minimum degree of protection of IP 33 (see EN 60529)		N
	Drain holes of 6 mm diameter shall be permitted in cable trunking systems, junction boxes and pull boxes which are subject to accumulations of oil or moisture.		N

EN 60204-1:2006+A1:2009			
Clause	Requirement Test	Result - Remark	Verdict
	In order to prevent confusion of electrical conduits with piping for oil, air, or water, it is recommended that the electrical conduits be either physically separated or suitably identified.		N
	Ducts and cable trays shall be rigidly supported and positioned at a sufficient distance from moving parts and in such a manner so as to minimize the possibility of damage or wear. In areas where human passage is required, the ducts and open cable trays shall be mounted to give at least 2 m clearance for such passage.		N
	Ducts and connection boxes are provided for mechanical protection only (see 8.2.1 for suitable means of equipotential bonding).		N
14.5.2	Percentage fill of ducts		N
14.5.3	Rigid metal conduit and fittings		N
14.5.4	Flexible metal conduit and fittings		N
14.5.5	Flexible non-metallic conduit and fittings		N
14.5.6	Cable trunking systems		N
	Cable trunking systems external to enclosures shall be rigidly supported and clear of all moving or contaminating portions of the machine.		N
	Covers shall be shaped to overlap the sides; gaskets shall be permitted. covers shall be attached to cable trunking systems by hinges or chains, and held closed by means of captive screws or other suitable fasteners. On horizontal cable trunking systems, the cover shall not be on the bottom.		N
	Where the cable trunking system is furnished in sections, the joints between sections shall fit tightly but need not be gasketed.		N
	There shall be no openings other than those required for wiring or for drainage. Cable trunking systems shall not have opened unused knockouts.		N
14.5.7	Machine compartments and cable trunking systems		N
	The use of compartments or cable trunking systems within the column or base of a machine to enclose conductors shall be permitted provided the compartment or cable trunking system is isolated from coolant or oil reservoirs and is entirely enclosed. Conductors run in enclosed compartments and cable trunking systems shall be secured and so arranged that they will not be subject to physical damage.		N
14.5.8	Terminals, connection and junction boxes		N

EN 60204-1:2006+A1:2009			
Clause	Requirement Test	Result - Remark	Verdict
	Terminals shall be placed in easily accessible enclosures. IP40 is the minimum degree of protection for connection and through boxes of sewing units and systems. If all the circuits used in and with the devices meet the requirements of 6.1 of this part of IEC204, IP20 is permitted as the minimum degree of protection. The joints or gaskets of these boxes shall withstand the foreseen effects of the physical environment, including any contaminants.		N
	Connection and junction boxes shall not have opened unused knockouts nor any other openings and shall be so constructed as to exclude materials such as dust, oil and coolant.		N
14.5.9	Motor connection boxes motor terminal boxes shall enclose only connections to the motor and motor-mounted devices (e.g. brakes, temperature sensors, plugging switches, tachometer generators).		N
15	Electric motors and associated equipment		N
14.1	General requirements Motors should comply with the requirements of IEC 34-1. Motors and associated equipment shall be protected against:		N
	-overload in accordance with 7.3;		N
	-overspeed in accordance with 7.6		N
	-field failure of d.c. motors by the use of current detection or overspeed protection ;and		N
	-overcurrent in accordance with 7.2(see also IEC 146)		N
	Motor control equipment shall be located and mounted in accordance with clause 13.		N
14.2	Motor enclosures		N
	It is recommended that motor enclosures be chosen from those included in EN 60034-5.		N
	The minimum degree of protection of the sewing machine drive(including the control device possibly attached to it) shall be IP40.		N
14.3	Motor dimensions		N
	The dimensions of sewing machine drives need not correspond to IEC72-1 and IEC72-2		N
14.4	Motor mounting and compartments		N
14.5	Motor nameplates		N
14.6	Criteria for selection		N
16	Accessories and lighting		P
16.1	Accessories		P
16.2	Local lighting of the machine and equipment		P

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Clause	Requirement Test	Result - Remark	Verdict
16.2.1	General		P
	Connections to the protective bonding circuit shall be in accordance with 8.2.2.		P
	The ON-OFF switch shall not be incorporated in the lampholder nor in the flexible connecting cords.		P
	Stroboscopic effects from lights shall be avoided.		N
	For local lighting(sewing lamps) of sewing units and systems up to a rated voltage of 50Va.c., the ON/OFF switch may be incorporated in the flexible connecting cords		P
16.2.2	Supply		P
	Requirement for lighting circuits		P
	Low-voltage sewing lamps shall be supplied either by built-in transformers or by external extra-low voltage transformers according to IEC742.		P
	Circuits for local lighting(sewing lamps)intended for use for threading,,replacing sewing implements, maintenance work.		N
16.2.3	Protection Local lighting circuits shall be protected in accordance with 7.2.5.		P
16.2.4	Fitting		P
17	Warning signs and item designation		P
17.1	Nameplates, marking and identification plates		P
	The electrical equipment shall be marked with the supplier's name, trade mark, or other identifying symbol and, where required, with a certification mark. (Marking principles are under consideration by CENELEC/TC 44X).		P
	Motor nameplates shall be in accordance with 16.5		P
	Nameplates, markings and identification plates shall be of sufficient durability to withstand the physical environment involved.		P
17.2	Warning signs		P
	Enclosures which do not clearly show that they contain electrical devices shall be marked with a black lightning flash on a yellow background within a black triangle, shaped in accordance with the graphical symbol 417-IEC-5036, the whole in accordance with symbol 13 of ISO 3864.		P
	This warning sign shall be durably fixed to electrical control enclosures which: -do not have the supply disconnecting device integral with the enclosure;		P
	-enclose more than one electrical device; and		P

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Clause	Requirement Test	Result - Remark	Verdict
	-and not connection or junction boxes.		P
	Warning signs shall be: -attached to the enclosure door or cover; and		P
	-plainly visible to all operating persons.		P
17.3	Functional identification		P
	Control devices, visual indicators and displays (particularly those related to safety functions), used in the man-machine interface shall be clearly and durably marked with regard to their functions either on or adjacent to the unit. Such markings shall be as agreed between the user and the supplier of the equipment (see annex B). preference should be given to the use of the standard symbols given in IEC 417 and ISO 7000		P
17.4	Marking of control equipment Control equipment (e.g. controlgear assemblies) shall be legibly and durably marked in such a way that is readily to persons where the equipment is installed. Wherever possible, a nameplate giving the following information shall be fixed to the enclosure: -name or trade mark of supplier;		P
	-certification mark where required;		P
	-serial number where applicable;		P
	-rated voltage, number of phases and frequency (if a. c.), and full-load current (for each supply when more than one)(see IEC 1082); -current rating of the largest motor or load; -short-circuit interrupting capacity of the machine overcurrent protective device, where furnished as part of the equipment; and		P
	-the electrical diagram number(s) or the number of the index to the electrical drawings.		P
17.5	Item designations		P
18	Technical documentation		P
18.1	General The information necessary for installation, operation, and maintenance of the electrical equipment of a machine shall be supplied in the form of drawings, diagrams, charts, tables and instructions. This information shall be on the information carrier or medium (e.g. paper, film, magnetic disk) in the language agreed between the user and the supplier (s) prior to the acceptance of the order (see annex B.)		P
	For detailed requirements see 5.5.2b) of EN 292-2		P

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Clause	Requirement Test	Result - Remark	Verdict
	The information supplied may vary with the complexity of the electrical equipment provided. For very simple equipment, the relevant information may be contained in one document, provided this document shows all the devices of the electrical equipment and enables the connections to the supply network to be made.		P
	The main supplier shall ensure that the technical documentation specified in this clause is provided with each machine.		P
18.2	Information to be provided The information provided with the electrical equipment shall include: a) a clear, comprehensive description of the equipment, installation and mounting, and the connection to the electrical supply(ies);		P
	b) electrical supply(ies) requirements;		P
	c) information on the physical environment (e. g. lighting, vibration, noise levels, atmospheric contaminants) where appropriate;		P
	d) system (block) diagram(s) where appropriate;		P
	e) circuit diagram(s);		P
	f) information (where appropriate) on : 1) programming 2) sequence of operation(s) 3) frequency of inspection 4) frequency and method of functional testing 5) guidance on the adjustment, maintenance and repair, particularly of the protective devices and circuits; and 6) parts list and in particular spare parts h) a description of the safeguarding means and methods where the primary safeguards are suspended (e.g. manual programming, program verification).		P
18.3	Requirements applicable to all documentation		P
18.4	Basic information		P
	The technical documentation shall contain, as a minimum, information on the following: -normal operating conditions of the electrical equipment, including the expected conditions of the electrical supply and, where appropriate, the physical environment; -handling, transportation, and storage; and -inappropriate use(s) of the equipment.		P
	This information may be presented as a separate document or as part of the installation or operation documentation.		P

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Clause	Requirement Test	Result - Remark	Verdict
	The documentation should also contain, where appropriate, information regarding load and peak starting currents and permitted voltage drops. This information should be contained in either the system or circuit diagram(s).		P
18.5	Installation diagram		P
	The installation diagram shall give all information necessary for the preliminary work for setting up the machine. In complex cases, it may be necessary to refer to the assembly drawings for details.		
18.6	System (block) diagram		P
18.7	Circuit diagrams		P
18.8	Operating manual The technical documentation shall contain an operating manual detailing proper procedures for set-up and use of the equipment. Particular attention should be given to the safety measures provided and to foreseen improper methods of operation. Where the operation of the equipment can be programmed, detailed information shall be provided on methods of programming, equipment required, program verification, and additional safety procedures where required.		P
18.9	Maintenance manual The technical documentation shall contain a maintenance manual detailing proper procedures for adjustment, servicing and preventive inspection, and repair. Recommendations on maintenance/service records should be part of this manual. Where methods for verification of proper operation are provided (e. g. software testing programs) their use shall be detailed.		P
18.10	Parts list		P
	The parts list shall include, as a minimum, information necessary for ordering spare or replacement parts (e. g. components, devices, software, test equipment, technical documentation) required for preventive or corrective maintenance including those which are recommended to be held in stock by the user of the equipment.		P
	This parts list shall show for each item: -the item designation used in the documentation;		P
	-its type designation;		P
	-the supplier and alternative sources where available;		P
	-its general characteristics where appropriate; and		P
	-the quantity of items with the same item designation.		P
19.	Testing		P

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Clause	Requirement Test	Result - Remark	Verdict
19.1	General		P
	When the electrical equipment is fully connected to the machine, the following tests shall be performed: -continuity of the protective bonding circuit (see 19.2);		P
	-insulation resistance tests (see 19.3);		P
	-voltage tests (see 19.4);		P
	-protection against residual voltages (see 19.5);		P
	-electromagnetic tests (see 19.6);		P
	-functional tests (see 19.7).		P
	When the electrical equipment is modified, the requirements stated in 19.8 shall apply.		P
19.2	Continuity of the protective bonding circuit		P
	The protective bonding circuit shall be visually inspected for compliance with clause 8 and a check for tightness of the connections of the protective conductors shall be made.		P
	In addition, the continuity of the protective bonding circuit shall be verified by injecting current of at least 10 A at 50 Hz derived from a PELV source for a period of at least 10 s. The tests shall be made between the PE terminal (see 5.2) and the various points that are part of the protective bonding circuit.		P
	The measured voltage between the PE terminal and the points of test shall not exceed the values given in table 7.		P
19.3	Insulation resistance tests		P
	The insulation resistance measured at 500 V d. c. between the power circuit conductors and the protective bonding circuit shall be not less than 1 MΩ.	>10 MΩ	P
19.4	Voltage tests		P
	The electrical equipment shall withstand a test voltage applied for a period of at least 1s between the conductors of all circuits, excluding those intended to operate at or below PELV voltages, and the protective bonding circuit.		P
	The test voltage shall: -have a value of twice the rated supply voltage of the equipment or 1000 V, whichever is the greater;		P
	-be at a frequency of 50Hz; and		P
	-be supplied from a transformer with a minimum rating of 500VA.		P
	Components which are not rated to withstand this test shall be disconnected during testing.		P

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Clause	Requirement Test	Result - Remark	Verdict
19.5	Protection against residual voltages Tests shall be performed to ensure compliance with 6.2.3.		P
19.6	Electromagnetic compatibility tests		P
	The tests shall be carried out in accordance with IEC 801. the levels of interference used shall be selected in accordance with the environment in which the machine is intended to be used.		P
	It is recognized that with large or complex machines (e. g. several machines working together in a coordinated manner) the tests cannot be carried out on the complete system. In such cases, these tests may be made on the appropriate control subassemblies of the system, prior to integrating the system.		P
19.7	Functional tests The functions of electrical equipment, particularly those related to safety and safeguarding, shall be tested.		P
19.8	Retesting Where a portion of the machine and its associated equipment is changed or modified, that portion shall be retested in accordance with 19.2 to 19.7.		P

EUT PHOTOS

Photo 1 View of EUT



Photo 2 View of EUT



Photo 3 View of EUT



Photo 4 View of EUT



Photo 5 View of EUT

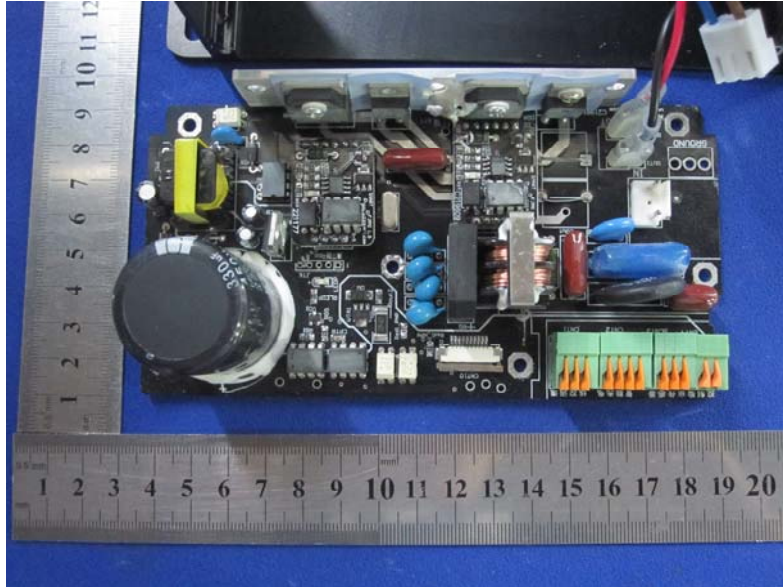
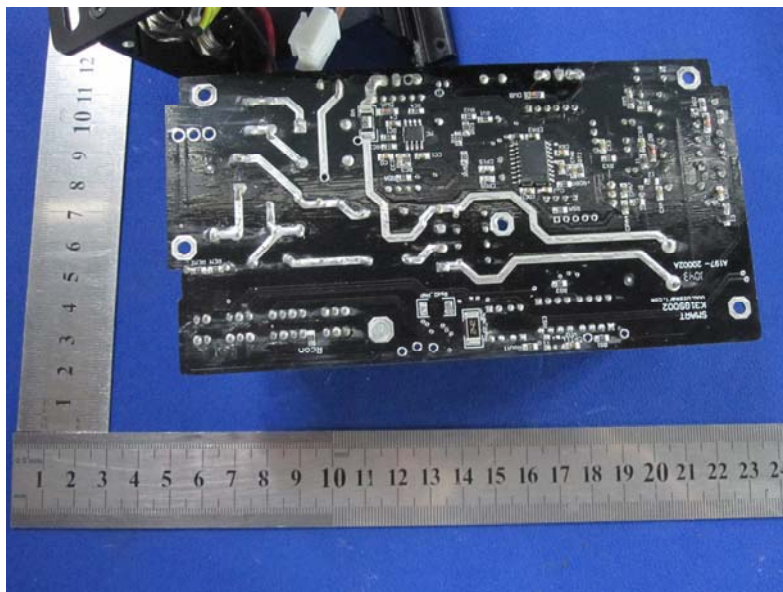


Photo 6 View of EUT



END OF REPORT