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BENK MACHINERY CO.,LIMITED.

MD & LVD TEST REPORT

Prepared For :	BENK MACHINERY CO.,LIMITED. Chenghang Industrial Zone, Zhangjiagang,Jiangsu,China
Product Name:	Double Exit PP Formwork Sheet Production Line
Trade Name:	/
Model :	BKE-2600 1250MM
Serial model No. :	/
Prepared By :	BST Testing (Shenzhen) Co.,Ltd. No.7,New Era Industrial Zone, Guantian, Bao'an District,Shenzhen, Guangdong, China
Test Date:	Apr. 14, 2023 To Apr. 30, 2023
Date of Report :	Apr. 30, 2023
Report No.:	XD23043006795701SR



TEST REPORT	
EN 60204-1	
Safety of machinery —Electrical equipment of machines —	
Part 1: General requirements	
EN ISO 12100	
Safety of machinery —Basic concepts, general principles for design —	
Part 1: Basic terminology, methodology and Part 2: Technical principles	
Testing Laboratory :	BST Testing (Shenzhen) Co.,Ltd.
Address	No.7,New Era Industrial Zone, Guantian, Bao'an District, Shenzhen,Guangdong, China
Testing location/address	Same as above
Applicant's name	BENK MACHINERY CO.,LIMITED
Address	Chenghang Industrial Zone, Zhangjiagang,Jiangsu,China
Test specification:	
Standard :	EN 60204-1: 2018 EN ISO 12100:2010
Non-standard test method :	N/A
Test Report Form No.	EN60204_A
Test item description	Ozone Test Chamber
Trade Mark	N/A
Model and/or type reference :	BKE-2600 1250MM
Manufacturer	BENK MACHINERY CO.,LIMITED
Address	Chenghang Industrial Zone, Zhangjiagang,Jiangsu,China
Rating(s)	/
Summary of testing:	
The products were evaluated under EN 60204-1, EN ISO 12100, 2006/42/EC Annex 1 was as considered. All tests were conducted and test result was pass.	



“(see remark #)” refers to a remark appended to the report.

“(see appended table)” refers to a table appended to the report.

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

The test results presented in this report relate only to the object tested.

This report shall not be reproduced except in full without the written approval of the testing laboratory.

Until otherwise specified, all tests are done

under normal ambient condition $25^{\circ}\text{C} \pm 10^{\circ}\text{C}$, Max RH: 75% and air pressure of 860 mbar to 1060 mbar.

Double Exit PP Formwork Sheet Production Line

Model : BKE-2600 1250MM

Input: 380V,300kW,50Hz,630mA.



BENK MACHINERY CO.,LIMITED

Chenghang Industrial Zone, Zhangjiagang, Jiangsu, China



Test item particulars :	
Classification of installation and use..... :	Fix appliance
Supply Connection..... :	Lead wires
..... :	
..... :	
Possible test case verdicts:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement..... :	P(Pass)
- test object does not meet the requirement..... :	F(Fail)
General remarks:	
The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report. "(see appended table)" refers to a table appended to the report. Throughout this report a comma is used as the decimal separator.	

Prepared by :

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Tested by :

Toby Zhong

Test Engineer

Reviewer :



Supervisor

Approved & Authorized Signer :

Mike Mo

Mike Mo/Manager



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
4	General requirements		P
4.1	General considerations.		P
4.2	Selection of equipment		P
4.2.1	General		P
	Electrical components and devices shall:		P
	– be suitable for their intended use; and		P
	– conform to relevant IEC standards where such exist; and		P
	– be applied in accordance with the supplier's instructions.		P
4.2.2	Electrical equipment in compliance with the EN 60439 series		P
4.3	Electrical supply		P
4.3.1	The electrical equipment shall be designed to operate correctly with the conditions of the supply:		P
	– as specified in 4.3.2 or 4.3.3, or		P
	– as otherwise specified by the user (see Annex B), or		N/A
	– as specified by the supplier in the case of a special source of supply such as an on-board generator.		N/A
4.3.2	AC supplies		P
4.3.3	DC supplies		N/A
4.3.4	Special supply systems		N/A
4.4	Physical environment and operating conditions		P
4.4.1	General		P
4.4.2	Electromagnetic compatibility (EMC)		P
	The equipment shall not generate electromagnetic disturbances above levels that are appropriate for its intended operating environment.		P
	In addition, the equipment shall have a level of immunity to electromagnetic disturbances so that it can function in its intended environment.		P
4.4.3	Ambient air temperature	+5 °C and +40 °C	P
4.4.4	Humidity		P
4.4.5	Altitude		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
4.4.6	Contaminants	for indoor use	P
4.4.7	Ionizing and non-ionizing radiation		N/A
4.4.8	Vibration, shock, and bump		P
4.5	Transportation and storage.		P
4.6	Provisions for handling		P
4.7	Installation		P
5	Incoming supply conductor terminations and devices for disconnecting and switching off		P
5.1	Incoming supply conductor terminations		P
	It is recommended that, where practicable, the electrical equipment of a machine is connected to a single incoming supply.		P
	Where another supply is necessary for certain parts of the equipment		N/A
	Unless a plug is provided with the machine for the connection to the supply (see 5.3.2 e), it is recommended that the supply conductors are terminated at the supply disconnecting device.		P
	Where a neutral conductor is used it shall be clearly indicated in the technical documentation of the machine		N/A
	There shall be no connection between the neutral conductor and the protective bonding circuit inside the electrical equipment nor shall a combined PEN terminal be provided.		P
	Exception: a connection may be made between the neutral terminal and the PE terminal at the point of the connection of the power supply to the machine for TN-C systems.		N/A
	All terminals for the incoming supply connection shall be clearly identified in accordance with IEC 60445 and 16.1.		P
	For the identification of the external protective conductor terminal, see 5.2.		P
5.2	Terminal for connection to the external protective earthing system		P
	For each incoming supply, a terminal shall be provided in the vicinity of the associated phase conductor terminals for connection of the machine to the external protective earthing system or to the external protective conductor, depending upon the supply distribution system.		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	The terminal shall be of such a size as to enable the connection of an external protective copper conductor with a cross-sectional area in accordance with Table 1.		N/A
	Where an external protective conductor of a material other than copper is used, the terminal size shall be selected accordingly		N/A
	At each incoming supply point, the terminal for connection of the external protective earthing system or the external protective conductor shall be marked or labelled with the letters PE		N/A
5.3	Supply disconnecting (isolating) device.		P
5.3.1	General		P
	A supply disconnecting device shall be provided:		P
	– for each incoming source of supply to a machine(s);		N/A
	– for each on-board power supply.		N/A
	The supply disconnecting device shall disconnect (isolate) the electrical equipment of the machine from the supply when required		N/A
	When two or more supply disconnecting devices are provided, protective interlocks for their correct operation shall also be provided in order to prevent a hazardous situation, including damage to the machine or to the work in progress.		N/A
5.3.2	Type		P
	The supply disconnecting device shall be one of the following types:		--
	a) switch-disconnector, with or without fuses, in accordance with IEC 60947-3, utilization category AC-23B or DC-23B;		N/A
	b) disconnector, with or without fuses, in accordance with IEC 60947-3, that has an auxiliary contact that in all cases causes switching devices to break the load circuit before the opening of the main contacts of the disconnector		N/A
	c) a circuit-breaker suitable for isolation in accordance with IEC 60947-2;		N/A
	d) any other switching device in accordance with an IEC product standard for that device and which meets the isolation requirements of IEC 60947-1 as well as a utilization category defined in the product standard as appropriate for on-load switching of motors or other inductive loads;		N/A
	e) a plug/socket combination for a flexible cable supply.		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
5.3.3	Requirements		P
	When the supply disconnecting device is one of the types specified in 5.3.2 a) to d) it shall fulfil all of the following requirements		--
	– isolate the electrical equipment from the supply and have one OFF (isolated) and one ON position marked with "O" and "I" (symbols IEC 60417-5008 (DB:2002-10) and IEC 60417-5007 (DB:2002-10), see 10.2.2);		N/A
	– have a visible contact gap or a position indicator which cannot indicate OFF (isolated) until all contacts are actually open and the requirements for the isolating function have been satisfied;		N/A
	– have an external operating means (for example handle), (exception: power-operated switchgear need not be operable from outside the enclosure where there are other means to open it). Where the external operating means is not intended for emergency operations, it is recommended that it be coloured BLACK or GREY (see 10.7.4 and 10.8.4);		N/A
	– be provided with a means permitting it to be locked in the OFF (isolated) position (for example by padlocks). When so locked, remote as well as local closing shall be prevented;		N/A
	– disconnect all live conductors of its power supply circuit. However, for TN supply systems, the neutral conductor may or may not be disconnected except in countries where disconnection of the neutral conductor (when used) is compulsory;		N/A
	– have a breaking capacity sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and/or loads. The calculated breaking capacity may be reduced by the use of a proven diversity factor.		P
	When the supply disconnecting device is a plug/socket combination, it shall fulfil the following requirements:		P
	– have the switching capability, or be interlocked with a switching device that has a breaking capacity, sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and/or loads. The calculated breaking capacity may be reduced by the use of a proven diversity factor. When the interlocked switching device is electrically operated (for example a contactor) it shall have an appropriate utilisation category.		N/A
	– a) to f) of 13.4.5.		N/A



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	Where the supply disconnecting device is a plug/socket combination, a switching device with an appropriate utilisation category shall be provided for switching the machine on and off. This can be achieved by the use of the interlocked switching device described above.		P
5.3.4	Operating means		P
	The operating means (for example, a handle) of the supply disconnecting device shall be easily accessible and located between 0,6 m and 1,9 m above the servicing level.		P
5.3.5	Excepted circuits		N/A
	The following circuits need not be disconnected by the supply disconnecting device:		--
	– lighting circuits for lighting needed during maintenance or repair;		N/A
	– plug and socket outlets for the exclusive connection of repair or maintenance tools and equipment (for example hand drills, test equipment);		N/A
	– undervoltage protection circuits that are only provided for automatic tripping in the event of supply failure;		N/A
	circuits supplying equipment that should normally remain energized for correct operation (for example temperature controlled measuring devices, product (work in progress) heaters, program storage devices);		N/A
	– control circuits for interlocking.		N/A
	It is recommended, however, that such circuits be provided with their own disconnecting device.		N/A
	Where such a circuit is not disconnected by the supply disconnecting device:		--
	– permanent warning label(s) in accordance with 16.1 shall be appropriately placed in proximity to the supply disconnecting device;		N/A
	– a corresponding statement shall be included in the maintenance manual, and one or more of the following shall apply;		N/A
	a permanent warning label in accordance with 16.1 is affixed in proximity to each excepted circuit, or		N/A
	- the excepted circuit is separated from other circuits, or		N/A
	- the conductors are identified by colour taking into account the recommendation of 13.2.4.		N/A
5.4	Devices for switching off for prevention of unexpected start-up		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	Devices for switching off for the prevention of unexpected start-up shall be provided		N/A
	Such devices shall be appropriate and convenient for the intended use, shall be suitably placed, and readily identifiable as to their function and purpose		P
	Means shall be provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations		P
	The following devices that fulfil the isolation function may be provided for this purpose		N/A
	– devices described in 5.3.2;		N/A
	– disconnectors, withdrawable fuse links and withdrawable links only if located in an enclosed electrical operating area		N/A
	Devices that do not fulfil the isolation function		N/A
5.5	Devices for disconnecting electrical equipment		P
	Devices shall be provided for disconnecting (isolating) electrical equipment to enable work to be carried out when it is de-energised and isolated.		N/A
	– appropriate and convenient for the intended use;		N/A
	– suitably placed;		N/A
	– readily identifiable as to which part(s) or circuit(s) of the equipment is served		N/A
	Means shall be provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations		N/A
	In addition to the supply disconnecting device, the following devices that fulfil the isolation function may be provided for this purpose:		N/A
	– devices described in 5.3.2;		N/A
	– disconnectors, withdrawable fuse links and withdrawable links only if located in an electrical operating area (see 3.15) and relevant information is provided with the electrical equipment (see 17.2 b)9) and b)12))		N/A
5.6	Protection against unauthorized, inadvertent and/or mistaken connection.....		P
6	Protection against electric shock		P
6.1	General		P
	The electrical equipment shall provide protection of persons against electric shock from:		P
	– direct contact (see 6.2 and 6.4);		P
	– indirect contact (see 6.3 and 6.4).		N/A
6.2	Protection against direct contact		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
6.2.1	General		P
	For each circuit or part of the electrical equipment, the measures of either 6.2.2 or 6.2.3 and, where applicable, 6.2.4 shall be applied		P
	When the equipment is located in places open to all persons, which can include children, measures of either 6.2.2 with a minimum degree of protection against direct contact corresponding to IP4X or IPXXD (see IEC 60529), or 6.2.3 shall be applied		P
6.2.2	Protection by enclosures		P
	Live parts shall be located inside enclosures that conform to the relevant requirements of Clauses 4, 11, and 14 and that provide protection against direct contact of at least IP2X or IPXXB		P
	Where the top surfaces of the enclosure are readily accessible, the minimum degree of protection against direct contact provided by the top surfaces shall be IP4X or IPXXD		P
	Opening an enclosure (i.e. opening doors, lids, covers, and the like) shall be possible only under one of the following conditions:		P
	a) The use of a key or tool is necessary for access. For enclosed electrical operating areas, see IEC 60364-4-41, or IEC 60439-1 as appropriate.		P
	b) The disconnection of live parts inside the enclosure before the enclosure can be opened.		P
6.2.3	Protection by insulation of live parts		P
	Live parts protected by insulation shall be completely covered with insulation that can only be removed by destruction.		P
	Such insulation shall be capable of withstanding the mechanical, chemical, electrical, and thermal stresses to which it can be subjected under normal operating conditions.		P
6.2.4	Protection against residual voltages		P
6.2.5	Protection by barriers		P
6.2.6	Protection by placing out of reach or protection by obstacles		P
6.3	Protection against indirect contact		N/A
6.3.1	General		N/A
6.3.2	Prevention of the occurrence of a touch voltage		N/A
6.4	Protection by the use of PELV		N/A
6.4.1	General requirements		N/A
6.4.2	Sources for PELV		N/A
7	Protection of equipment		P
7.1	General		



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
7.2	Overcurrent protection		P
7.3	Protection of motors against overheating		P
7.4	Abnormal temperature protection		P
7.5	Protection against supply interruption or voltage reduction and subsequent restoration		N/A
7.6	Motor overspeed protection		N/A
7.7	Earth fault/residual current protection		N/A
7.8	Phase sequence protection.		N/A
7.9	Protection against overvoltages due to lightning and to switching surges..		N/A
8	Equipotential bonding		N/A
8.1	General		N/A
8.2	Protective bonding circuit		N/A
8.3	Functional bonding		N/A
8.4	Measures to limit the effects of high leakage current		N/A
9	Control circuits and control functions		N/A
9.1	Control circuits		N/A
9.2	Control functions		N/A
9.3	Protective interlocks		N/A
9.4	Control functions in the event of failure		N/A
10	Operator interface and machine-mounted control devices		P
10.1	General		P
10.2	Push-buttons		N/A
10.3	Indicator lights and displays		P
10.4	Illuminated push-buttons		N/A
10.5	Rotary control devices		N/A
10.6	Start devices		N/A
10.7	Emergency stop devices		P
10.8	Emergency switching off devices		N/A
10.9	Enabling control device		N/A
11	Controlgear: location, mounting, and enclosures		P
11.1	General requirements		P
	All controlgear shall be located and mounted so as to facilitate:		N/A
	– its accessibility and maintenance;		P
	– its protection against the external influences or conditions under which it is intended to operate;		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	– operation and maintenance of the machine and its associated equipment		P
11.2	Location and mounting		P
11.2.1	Accessibility and maintenance		P
11.2.2	Physical separation or grouping		P
11.2.3	Heating effects		N/A
11.3	Degrees of protection		P
11.4	Enclosures, doors and openings		P
11.5	Access to controlgear		N/A
12	Conductors and cables		P
12.1	General requirements		P
12.2	Conductors		P
12.3	Insulation		P
12.4	Current-carrying capacity in normal service		P
	The current-carrying capacity depends on several factors, for example insulation material,number of conductors in a cable, design (sheath),methods of installation, grouping and ambient temperature.		P
	One typical example of the current-carrying capacities for PVC insulated wiring between enclosures and individual items of equipment under steady-state conditions is given in Table 6.		N/A
12.5	Conductor and cable voltage drop		N/A
12.6	Flexible cables		N/A
12.7	Conductor wires, conductor bars and slip-ring assemblies		N/A
12.7.1	Protection against direct contact		P
	Conductor wires, conductor bars and slip-ring assemblies shall be installed or enclosed in such a way that, during normal access to the machine, protection against direct contact is achieved by the application of one of the following protective measures		N/A
	– protection by partial insulation of live parts, or where this is not practicable;		N/A
	– protection by enclosures or barriers of at least IP2X		P
	Conductor wires and conductor bars shall be so placed and/or protected as to:		--
	– prevent contact, especially for unprotected conductor wires and conductor bars, with conductive items such as the cords of pull-cord switches, strain-relief devices and drive chains;		P



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	– prevent damage from a swinging load.		N/A
12.7.2	Protective conductor circuit		N/A
12.7.3	Protective conductor current collectors		N/A
12.7.4	Removable current collectors with a disconnect function		N/A
12.7.5	Clearances in air		P
12.7.6	Creepage distances		N/A
12.7.7	Conductor system sectioning		N/A
12.7.8	Construction and installation of conductor wire, conductor bar systems and slip-ring assemblies		N/A
13	Wiring practices		P
13.1	Connections and routing		P
13.1.1	General requirements		N/A
	All connections, especially those of the protective bonding circuit, shall be secured against accidental loosening.		N/A
	The means of connections shall be suitable for the cross-sectional areas and nature of the conductors being terminated.		N/A
	Soldered connections shall only be permitted where terminals are provided that are suitable for soldering.		N/A
	Terminals on terminal blocks shall be plainly marked or labelled to correspond with markings on the diagrams.		N/A
	Where an incorrect electrical connection (for example, arising from replacement of devices) can be a source of risk and it is not practicable to reduce the possibility of incorrect connection by design measures, the conductors and/or terminations shall be identified in accordance with 13.2.1.		N/A
	The installation of flexible conduits and cables shall be such that liquids shall drain away from the fittings.	No water	N/A
	Means of retaining conductor strands shall be provided when terminating conductors at devices or terminals that are not equipped with this facility. Solder shall not be used for that purpose.		N/A
	Shielded conductors shall be so terminated as to prevent fraying of strands and to permit easy disconnection		N/A
	Identification tags shall be legible, permanent, and appropriate for the physical environment.		N/A
	Terminal blocks shall be mounted and wired so that the internal and external wiring does not cross over the terminals		N/A
13.1.2	Conductor and cable runs		N/A



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	Conductors and cables shall be run from terminal to terminal without splices or joints.		N/A
	Connections using plug/socket combinations with suitable protection against accidental disconnection are not considered to be joints for the purpose of this Subclause.		N/A
13.1.3	Conductors of different circuits		N/A
	Conductors of different circuits may be laid side by side, may occupy the same duct		N/A
13.1.4	Connection between pick-up and pick-up converter of an inductive power supply system		N/A
13.2	Identification of conductors		N/A
13.2.1	General requirements		P
	Each conductor shall be identifiable at each termination in accordance with the technical documentation		P
13.2.2	Identification of the protective conductor		N/A
13.2.3	Identification of the neutral conductor		N/A
13.2.4	Identification by colour		P
13.3	Wiring inside enclosures		N/A
	Conductors inside enclosures shall be supported where necessary to keep them in place.		N/A
	Non-metallic ducts shall be permitted only when they are made with a flame-retardant insulating material		N/A
	Connections to devices mounted on doors or to other movable parts shall be made using flexible conductors in accordance with 12.2 and 12.6 to allow for the frequent movement of the part		N/A
	The conductors shall be anchored to the fixed part and to the movable part independently of the electrical connection		N/A
	Conductors and cables that do not run in ducts shall be adequately supported.		N/A
	Terminal blocks or plug/socket combinations shall be used for control wiring that extends beyond the enclosure. For plug/socket combinations, see also 13.4.5 and 13.4.6.		N/A
	Power cables and cables of measuring circuits may be directly connected to the terminals of the devices for which the connections were intended.		N/A
13.4	Wiring outside enclosures		N/A
13.4.1	General requirements		N/A



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	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/A
13.4.2	External ducts		N/A
13.4.3	Connection to moving elements of the machine		N/A
13.4.4	Interconnection of devices on the machine		N/A
13.4.5	Plug/socket combinations		N/A
13.4.6	Dismantling for shipment		N/A
13.4.7	Additional conductors		N/A
13.5	Ducts, connection boxes and other boxes		N/A
13.5.1	General requirements		P
	Ducts shall provide a degree of protection suitable for the application		N/A
	All sharp edges, flash, burrs, rough surfaces, or threads with which the insulation of the conductors can come in contact shall be removed from ducts and fittings.		N/A
	Where necessary, additional protection consisting of a flame-retardant, oil-resistant insulating material shall be provided to protect conductor insulation		N/A
	Drain holes of 6 mm diameter are permitted in cable trunking systems, connection boxes, and other boxes used for wiring purposes that can be subject to accumulations of oil or moisture		N/A
	In order to prevent confusion of conduits with oil, air, or water piping, it is recommended that the conduits be either physically separated or suitably identified.		N/A
	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.		N/A
	Ducts shall be provided only for mechanical protection		N/A
	Cable trays that are partially covered should not be considered to be ducts or cable trunking systems		N/A
13.5.2	Percentage fill of ducts		N/A
	Consideration of the percentage fill of ducts should be based on the straightness and length of the duct and the flexibility of the conductors.		N/A
	It is recommended that the dimensions and arrangement of the ducts be such as to facilitate the insertion of the conductors and cables.		N/A
13.5.3	Rigid metal conduit and fittings		N/A
	Rigid metal conduit and fittings shall be of galvanized steel or of a corrosion-resistant		N/A



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
	material suitable for the conditions		N/A
	The use of dissimilar metals in contact that can cause galvanic action should be avoided.		N/A
	Conduits shall be securely held in place and supported at each end.		N/A
13.5.4	Flexible metal conduit and fittings		P
	A flexible metal conduit shall consist of a flexible metal tubing or woven wire armour. It shall be suitable for the expected physical environment.		P
	Fittings shall be compatible with the conduit and appropriate for the application.		P
13.5.5	Flexible non-metallic conduit and fittings		N/A
	Flexible non-metallic conduit shall be resistant to kinking and shall have physical characteristics similar to those of the sheath of multiconductor cables.		N/A
	The conduit shall be suitable for use in the expected physical environment.		P
	Fittings shall be compatible with the conduit and appropriate for the application.		P
13.5.6	Cable trunking systems		N/A
13.5.7	Machine compartments and cable trunking systems		N/A
13.5.8	Connection boxes and other boxes		N/A
	Connection boxes and other boxes used for wiring purposes shall be accessible for maintenance.		N/A
	Those boxes shall provide protection against the ingress of solid bodies and liquids, taking into account the external influences under which the machine is intended to operate		N/A
	Those boxes shall not have opened but unused knockouts nor any other openings and shall be so constructed as to exclude materials such as dust, flyings, oil, and coolant.		N/A
13.5.9	Motor connection boxes	Certified motor	N/A
14	Electric motors and associated equipment		P
14.1	General requirements		P
	Electric motors should conform to the relevant parts of IEC 60034 series.		P
	The protection requirements for motors and associated equipment are given in 7.2 for overcurrent protection, in 7.3 for overload protection, and in 7.6 for overspeed protection		P
	As many controllers do not switch off the supply to a motor when it is at rest, care shall be taken to ensure compliance with the requirements of 5.3, 5.4, 5.5, 7.5, 7.6 and 9.4.		N/A
	Motor control equipment shall be located and mounted in accordance with Clause 11.		N/A



EN 60204.1			
Clause	Requirement+ Test	Result - Remark	Verdict
14.2	Motor enclosures.		P
	It is recommended that motor enclosures be chosen from those included in IEC 60034-5.		P
14.3	Motor dimensions		P
	As far as is practicable, the dimensions of motors shall conform to those given in the IEC 60072 series		P
14.4	Motor mounting and compartments		P
14.5	Criteria for motor selection		N/A
14.6	Protective devices for mechanical brakes		N/A
15	Accessories and lighting		N/A
15.1	Accessories		N/A
	Where the machine or its associated equipment is provided with socket-outlets that are intended to be used for accessory equipment		N/A
15.2	Local lighting of the machine and equipment		N/A
15.2.1	General		N/A
	Connections to the protective bonding circuit shall be in accordance with 8.2.2.		N/A
	The ON/OFF switch shall not be incorporated in the lampholder or in the flexible connecting cords.		N/A
	Stroboscopic effects from lights shall be avoided by the selection of appropriate luminaires		N/A
	Where fixed lighting is provided in an enclosure, electromagnetic compatibility should be taken into account using the principles outlined in 4.4.2.		N/A
15.2.2	Supply		N/A
	The nominal voltage of the local lighting circuit shall not exceed 250 V between conductors. A voltage not exceeding 50 V between conductors is recommended.		N/A
	Lighting circuits shall be supplied from one of the following sources		N/A
15.2.3	Protection		N/A
	Local lighting circuits shall be protected in accordance with 7.2.6.		N/A
15.2.4	Fittings		N/A
	Adjustable lighting fittings shall be suitable for the physical environment		N/A
	The lampholders shall be		--
	– in accordance with the relevant IEC standard;	Certified lampholder	N/A



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Clause	Requirement+ Test	Result - Remark	Verdict
	– constructed with an insulating material protecting the lamp cap so as to prevent unintentional contact		N/A
	Reflectors shall be supported by a bracket and not by the lampholder.		N/A
16	Marking, warning signs and reference designations		P
16.1	General		P
	Warning signs, nameplates, markings, and identification plates shall be of sufficient durability to withstand the physical environment involved.		P
16.2	Warning signs		P
16.2.1	Electric shock hazard		P
	Enclosures that do not otherwise clearly show that they contain electrical equipment that can give rise to a risk of electric shock shall be marked with the graphical symbol IEC 60417-5036		N/A
	The warning sign shall be plainly visible on the enclosure door or cover.		N/A
	The warning sign may be omitted (see also 6.2.2 b)) for:		N/A
16.2.2	Hot surfaces hazard		N/A
16.3	Functional identification		N/A
	Control devices, visual indicators, and displays (particularly those related to safety) shall be clearly and durably marked with regard to their functions either on or adjacent to the item.		N/A
	Such markings may be as agreed between the user and the supplier of the equipment		N/A
16.4	Marking of equipment		P
	Equipment (for example controlgear assemblies) shall be legibly and durably marked in a way that is plainly visible after the equipment is installed.		P
	A nameplate giving the following information shall be attached to the enclosure adjacent to each incoming supply		P
16.5	Reference designations		P
	All enclosures, assemblies, control devices, and components shall be plainly identified with the same reference designation as shown in the technical documentation.		P
17	Technical documentation		P
17.1	General		P
	The information necessary for installation, operation, and maintenance of the electrical equipment of a machine shall be supplied in the appropriate forms		P
	The information provided may vary with the		



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Clause	Requirement+ Test	Result - Remark	Verdict
	complexity of the electrical equipment. For very simple equipment, the relevant information may be contained in one document, provided that the document shows all the devices of the electrical equipment and enables the connections to the supply network to be made.		N/A
17.2	Information to be provided		P
	The information provided with the electrical equipment shall include:		--
	a) A main document (parts list or list of documents);		P
	b) Complementary documents including:		P
	1) a clear, comprehensive description of the equipment, installation and mounting, and the connection to the electrical supply(ies);		P
	2) electrical supply(ies) requirements;		N/A
	3) information on the physical environment (for example lighting, vibration, atmospheric contaminants) where appropriate;		P
	4) overview (block) diagram(s) where appropriate;		P
	5) circuit diagram(s);		N/A
	6) information (as applicable) on:		P
	programming, as necessary for use of the equipment;		N/A
	sequence of operation(s);		P
	frequency and method of functional testing;		N/A
	guidance on the adjustment, maintenance, and repair, particularly of the protective devices and circuits;		N/A
	recommended spare parts list; and		P
	list of tools supplied.		P
	7) a description (including interconnection diagrams) of the safeguards, interlocking functions, and interlocking of guards against hazards, particularly for machines operating in a co-ordinated manner;		N/A
	8) a description of the safeguarding and of the means provided where it is necessary to suspend the safeguarding (for example for setting or maintenance), (see 9.2.4)		N/A
	9) instructions on the procedures for securing the machine for safe maintenance; (see also 17.8);		N/A
	10) information on handling, transportation and storage;		P
	11) information regarding load currents, peak starting currents and permitted voltage drops, as applicable;		N/A



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Clause	Requirement+ Test	Result - Remark	Verdict
	12) information on the residual risks due to the protection measures adopted, indication of whether any particular training is required and specification of any necessary personal protective equipment.		N/A
17.3	Requirements applicable to all documentation		P
17.4	Installation documents		P
	In complex cases, it may be necessary to refer to the assembly drawings for details.		P
	The recommended position, type, and cross-sectional areas of the supply cables to be installed on site shall be clearly indicated.		N/A
	The data necessary for choosing the type, characteristics, rated currents, and setting of the overcurrent protective device(s) for the supply conductors to the electrical equipment of the machine shall be stated (see 7.2.2).		N/A
	Where necessary, the size, purpose, and location of any ducts in the foundation that are to be provided by the user shall be detailed		P
	The size, type, and purpose of ducts, cable trays, or cable supports between the machine and the associated equipment that are to be provided by the user shall be detailed		N/A
	Where necessary, the diagram shall indicate where space is required for the removal or servicing of the electrical equipment.		N/A
	In addition, where it is appropriate, an interconnection diagram or table shall be provided		N/A
17.5	Overview diagrams and function diagrams		P
	Function diagrams may be provided as either part of, or in addition to, the overview diagram.		P
17.6	Circuit diagrams		N/A
	A circuit diagram(s) shall be provided.		N/A
	Where appropriate, a diagram showing the terminals for interface connections shall be provided.		N/A
	Switch symbols shall be shown on the electromechanical diagrams with all supplies turned off		N/A
	Conductors shall be identified in accordance with 13.2.		N/A
	Circuits shall be shown in such a way as to facilitate the understanding of their function as well as maintenance and fault location.		N/A
17.7	Operating manual		P



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Clause	Requirement+ Test	Result - Remark	Verdict
	The technical documentation shall contain an operating manual detailing proper procedures for set-up and use of the electrical equipment.		N/A
	Where the operation of the equipment can be programmed, detailed information on methods of programming, equipment required, program verification, and additional safety procedures (where required) shall be provided.		N/A
17.8	Maintenance manual		P
	The technical documentation shall contain a maintenance manual detailing proper procedures for adjustment, servicing and preventive inspection, and repair.		P
	Recommendations on maintenance/service intervals and records should be part of that manual.		P
	Where methods for the verification of proper operation are provided (for example software testing programs), the use of those methods shall be detailed.		N/A
17.9	Parts list		P
18	Verification		P
18.1	General		P
	This part of IEC 60204 gives general requirements for the electrical equipment of machines		P
	The extent of verification will be given in the dedicated product standard for a particular machine.		P
	Where there is no dedicated product standard for the machine, the verification shall always include the items a), b) and f)		P
	and may include one or more of the items c) to e):		N/A
	a) verification that the electrical equipment complies with its technical documentation;		N/A
	b) in case of protection against indirect contact by automatic disconnection, conditions for protection by automatic disconnection shall be verified according to 18.2;		N/A
	c) insulation resistance test (see 18.3);		N/A
	d) voltage test (see 18.4);		N/A
	e) protection against residual voltage (see 18.5);		N/A
	f) functional tests (see 18.6).		N/A
	When these tests are performed, it is recommended that they follow the sequence listed above.		P
	When the electrical equipment is modified, the requirements stated in 18.7 shall apply.		N/A



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Clause	Requirement+ Test	Result - Remark	Verdict
	The results of the verification shall be documented.		P
18.2	Verification of conditions for protection by automatic disconnection of supply		N/A
18.3	Insulation resistance tests		P
18.4	Voltage tests		P
18.5	Protection against residual voltages		N/A
18.6	Functional tests		P
18.7	Retesting		P





EN ISO 12100			
Clause	Requirement+ Test	Result - Remark	Verdict
4	Hazards to be taken into account when designing machinery		P
4.1	General		P
4.2	Mechanical hazard		P
4.3	Electrical hazard		N/A
4.4	Thermal hazard		N/A
4.5	Hazard generated by noise		N/A
4.6	Hazards generated by vibration		N/A
4.7	Hazards generated by radiation		N/A
4.8	Hazards generated by materials and substances		N/A
4.9	Hazards generated by neglecting ergonomic principles in machine design		N/A
4.10	Slipping, tripping and falling hazards		P
4.11	Hazard combinations		P
4.12	Hazards associated with the environment in which the machine is used		P
5	Strategy for risk reduction		P
5.1	General provisions		P
5.2	Specification of the limits of the machine		P
5.3	Hazard identification, risk estimation and risk evaluation		P
5.4	Elimination of hazards or reduction of risk by protective measures		P
5.5	Achievement of risk reduction objectives		P
6	Inherently safe design measures		P
6.1	General		P
6.2	Consideration of geometrical factors and physical aspects		P
6.3	Taking into account the general technical knowledge regarding machine design		P
6.4	Choice of an appropriate technology		P
6.5	Applying the principle of the positive mechanical action of a component on another component		P
6.6	Provisions for stability		P
6.7	Provisions for maintainability		P
6.8	Observing ergonomic principles		P
6.9	Preventing electrical hazard		N/A



EN ISO 12100			
Clause	Requirement+ Test	Result - Remark	Verdict
6.10	Preventing hazards from pneumatic and hydraulic equipment		N/A
6.11	Applying inherently safe design measures to control system		P
6.12	Minimizing the probability of failure of safety functions		P
6.13	Limiting exposure to hazards through reliability of equipment		P
6.14	Limiting exposure to hazards through mechanization or automation of loading (feeding) /unloading (removal) operations		N/A
6.15	Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones		P
7.	Safeguarding and complementary protective measures		P
7.1	General		P
7.2	Selection and implementation of guards and protective devices		P
7.3	Requirements for the design of guards and protective devices		P
7.4	Safeguarding for reducing emissions		P
7.5	Complementary protective measures		P
8	Information for use		P
8.1	General requirements		P
8.2	Location and nature of the information for use		P
8.3	Signals and warning devices		P
8.4	Markings, signs (pictograms),written warnings		P
8.5	Accompanying documents (in particular, instruction handbook)		P

--The end--

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Sample pictures




