



Technical Construction File

File No : BATT20160953

According to

2006/42/EC Machinery Directive

2014/30/EU Electromagnetic Compatibility Directive

related to the

NOVA VOYAGER DVR DRILL PRESS

Model:

18|| Voyager DVR Drill Press

15|| Voyager DVR Drill Press

16|| Voyager DVR Drill Press

20|| Voyager DVR Drill Press 22||

Voyager DVR Drill Press

presented by

TEKNATOOL INTERNATIONAL LIMITED

7D Dallen Place, Rosedale, Auckland, 0632, NZ

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Part I : General

1.1 General description

This NOVA VOYAGER DVR DRILL PRESS is used to drill on the steel board and similar borad.The DVR Motor drive is a unique type of motor and controller where the motor and controller interact. The motor provides data to the controller on its position and load conditions. The controller uses this data to handle all the timing and power management to ensure an energy efficient and powerful motor.. They don't belong to the machinery listed in Annex IV of 2006/42/EC, the machinery safety directive.

Basically, this kind of machine doesn't belong to hazard machine and with low risk when using it. All possible risk have been analysis in the risk assessment report and been prevent by suitable ways.

The main risk of this kind of machine could be:

- The risk of access to the power transmission elements.
- The risk of access to the electrictrial parts

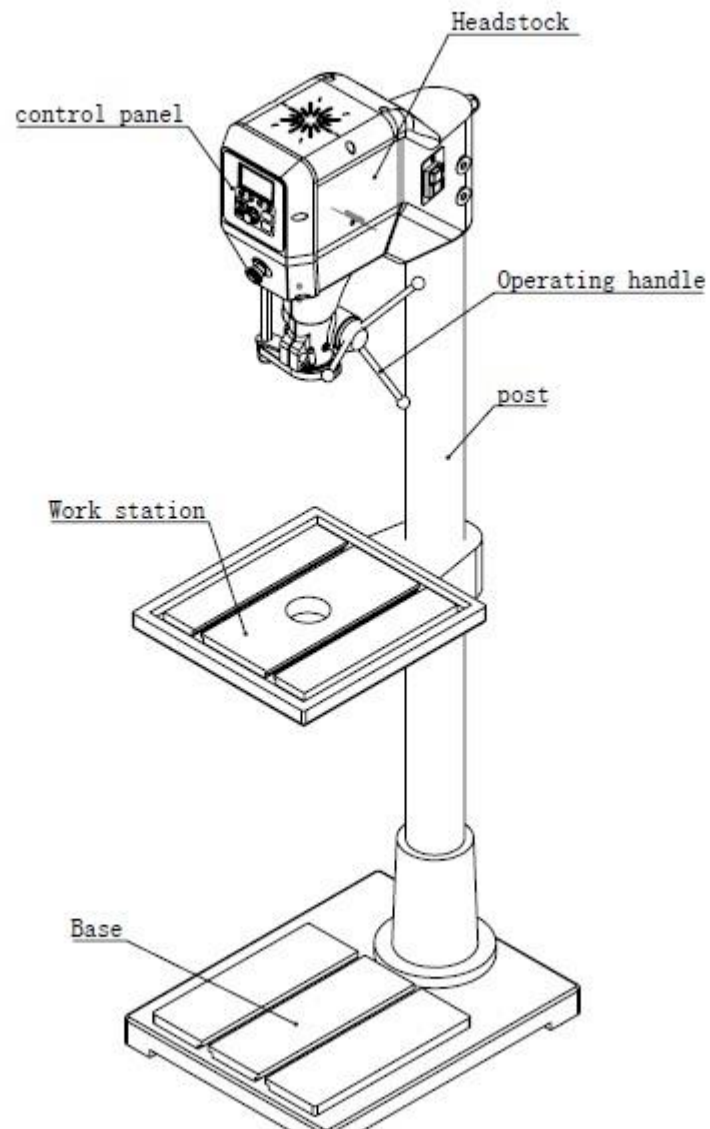
In order to prevent the main risks mentioned above, the protection guarding systems are provided, and all the detail safety provision are constructed in accordance with the requirement of EN13857. In addition to the safety of the machinery mentioned above, the compliance of LVD directive is also an important part of putting CE mark on the machine. As for the compliance of LVD the inspection and test report carried out according to the European standard of EN 60204-1 was provided too.

In order to ensure the conformity for CE marking for these hydraulic shearing machines, some main European and/or International standards have been used to made assessment of conformity, they are :

- The EN12717 for checking drill safety
- EN 60204-1 for checking of electrical equipment ;
- EN ISO 12100 : 2010 for checking the machinery safety

The test reports for these applicable standards in detail have been included in the relevant sub-clauses of this technical construction file.

These machines main legend may be:



1.2 Quality control system

In order to ensure the conformity of the series production, the **TEKNATOOL INTERNATIONAL LIMITED** has taken the related procedures mentioned below :

- (1) Apply for the consultant form the qualified body in China

The **TEKNATOOL INTERNATIONAL LIMITED** has applied for the consultant form GRS, who is a competent institute for the CE marking consultant and certification in China. The complete technical construction file (TCF) have been established before applying for the CE marking certificate under the consultant of GRS .

- (2) Carry out the inspection for parts and components according to the TCF

Before the assemblies of the series production, the QC engineers of **TEKNATOOL INTERNATIONAL LIMITED** has to check and inspect the technical specifications and intended functions of parts and components to ensure the correct use of them according to the contents of TCF and principle described in the related technical information.

- (3) Carry out the inspection & testing for the products before packing

Before packing the products, the QC engineers of **TEKNATOOL INTERNATIONAL LIMITED** have to do the necessary inspection and testing to ensure the conformity of related requirements. In particular, the testing and inspection of electrical characteristics and outer feature.

- (4) Carry out the inspection for the packing

After finishing the necessary inspection and testing for the products, an inspection for the packing has to be done to ensure the necessary elements being included in this packing before shipment.

- (5) Provision for the change of design

Any change of the products described in this TCF must be checked in detail and written down again in the TCF by the designer of **TEKNATOOL INTERNATIONAL LIMITED** the change may effects the related electrical or mechanical characteristics.

- (6) Provision for the Quality Assurance

For the provisions of internal control measures to ensure the conformity of series production of the machines, **TEKNATOOL INTERNATIONAL LIMITED** has built an internal quality control system in accordance with the international standard of ISO-9001.

1.3 Declaration of conformity

EC Declaration of Conformity	CE
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The undersigned, representing the following:

Manufacturer and	the authorised representative established within the European Economic Area:
Company name: TEKNATOOL INTERNATIONAL LIMITED ADD: LAIZHOU SINDY ELECTRONIC & TECHNOLOGY CO.,LTD	

Here with declare that the following machinery:

Description of machinery
Generic denomination: NOVA VOYAGER DVR DRILL PRESS
Function: This NOVA VOYAGER DVR DRILL PRESS is used to drill on the steel board and similar borad.
Model/s: 18" Voyager DVR Drill Press 15" Voyager DVR Drill Press 16" Voyager DVR Drill Press 20" Voyager DVR Drill Press 22" Voyager DVR Drill Press

Fulfill the relevant provisions of European Directive 2006/42/EC (MD) and 2014/35/EU (LVD). The harmonized standards used in order to obtain compliance to 2006/42/EC (MD) and 2014/35/EU (LVD) are the following:

Standards

EN ISO 12100: 2010

Safety of machinery . General principles for design . Risk assessment and risk reduction.

EN 60204-1: 2006/AC:2010

EN 12717:2001+A1:2009 Safety of machine tools — Drilling machines

Safety of machinery - Electrical equipment of machines Part 1: General requirements. EN ISO

13857 : 2008 /Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs

EN ISO 13849-1:2008 / AC:2009 / Safety of machinery - Safety-related parts of control systems

. Part 1: General principles for design

EN 61000-6-2 : 2005 / Electromagnetic compatibility (EMC)

Part 6-2 : Generic standards – Immunity for industrial environments

EN 61000-6-4:2007/A1:2011 / Safety of machinery - Electrical equipment of machines -

Part 6-4 : Generic standards – Emission standard for industrial environments

Prepared for TEKNATOOL INTERNATIONAL LIMITED

Prepared by Shenzhen BATT Testing Technology Co., Ltd.

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Place: CEO

Date: _

Signature:

1.4 List of applicable regulations and standards

Regulations

- Machinery Directive: 2006/42/EC
- Electromagnetic Compatibility: 2004/108/EC

Standards

- EN ISO 12100: 2010
- Safety of machinery . General principles for design . Risk assessment and risk reduction.
- EN 60204-1: 2006/AC:2010
- EN 12717:2001+A1:2009 Safety of machine tools — Drilling machines
- Safety of machinery - Electrical equipment of machines Part 1: General requirements.
- EN ISO 13857 : 2008 /Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs
- EN ISO 13849-1:2008 / AC:2009 / Safety of machinery - Safety-related parts of control systems . Part 1: General principles for design
- EN 61000-6-2 : 2005 / Electromagnetic compatibility (EMC)
- Part 6-2 : Generic standards – Immunity for industrial environments
- EN 61000-6-4:2007/A1:2011 / Safety of machinery - Electrical equipment of machines -
- Part 6-4 : Generic standards – Emission standard for industrial environments





Part II : Assessment of conformity

2.1 Essential health and safety requirements

1	Essential health and safety requirements	-
1.1	General remarks	-
1.1.1	Definitions	-
1.1.2	Principles of safety integration	-
a)	Machinery must be constructed that it is fitted for its function, and can be adjusted and maintained without putting person at risk when these operations are carried out under the conditions foreseen by the manufacturer	<i>Pass. All the machines are fitted for their function:</i>
	The aim of measures taken must be to eliminate any risk of accident throughout the foreseeable lifetime of the machinery, including the phases of assembly and dismantling, even where risks of accident arise from foreseeable abnormal situations	<i>Pass. These requirements have been complied with.</i>
b)	In selecting the most appropriate methods, the manufacturer must apply the following principles, in the order given ;	-
	- eliminate or reduce risks as far as possible	<i>Pass Manufacturer has provided enough safety devices to eliminate or reduce risks.</i>
	- take the necessary protection measure in relation to risks that can't be eliminated	<i>Pass. Safety guards and other devices are used.</i>
	- inform users of the residual risks due to any shortcomings of the protection measures adopted, indicate whether any particular training is required and specify any need to provide personal protection equipment	<i>Pass. Enough warnings are provided in the appropriate spot</i>
c)	When designing and constructing machinery, and when drafting the instruction, the manufacturer must envisage not the normal use of the machinery but also uses which could reasonably be expected	<i>Pass. All the conditions are considered by the manufacturer, and the related information also has been provided within the instruction manual</i>
	The machinery must be designed to prevent abnormal use if such use would engender a risk In other cases the instructions must draw the user's attention to ways which experience has shown might occur-in which the machinery should not be used	<i>Pass. These requirements have been complied with, and the related information also has been provided within the instruction manual.</i>
d)	Under the intended conditions of use, the discomfort,	<i>Pass.</i>



	fatigue and psychological stress faced by the operator must be reduced to the minimum possible taking ergonomic principles into account	<i>These requirements have been taken into account during the design of this machine.</i>
e)	When designing and constructing machinery, the manufacturer must taken account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protection equipment	<i>Pass. These requirements have been taken into account during the design of this machine.</i>
f)	Machinery must be supplied with all the essential special equipment and accessories to enable it to be adjusted, maintained and used without risk	<i>Pass. All the essential special equipment and related accessories have been supplied.</i>
1.1.3	Materials and products	-
	The materials used to construct machinery or products used and created during its use must not endanger exposed persons' safety or health	<i>Pass. They cannot endanger exposed person's safety or health.</i>
	In particular, where fluids are used, machinery must be designed and constructed for use without risks due to filling, use, recovery or draining	<i>Not applicable.</i>
1.1.4	Lighting	-
	The manufacturer must supply integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity	<i>There is no risk when there is no integral lighting.</i>
	The manufacturer must ensure that, there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects due to the lighting provided by the manufacturer	<i>This kind of risk hasn't been found.</i>
	Internal parts requiring frequent inspection, and adjustment and maintenance areas, must be provided with appropriate lighting	<i>There is enough lighting for the inspection, adjustment and maintenance areas and required provided at workroom</i>
1.1.5	Design of machinery to facilitate its handling	-
	Machinery or each component part thereof must:	-
	- be capable of being handle safely	<i>Pass. Enough measures have been taken to ensure the safe of the handling.</i>



	- be packaged or designed so that it can be stored safely and without damage	<i>Pass. The machine can be stored in wood box safely and without damage.</i>
	Where the weight, size or shape of machinery or its various component parts prevents them from being moved by hand, the machinery or each components	-

	part must:	
	- either be fitted with attachments for lifting gear, or	<i>Pass. Provided</i>
	- be designed so that it can be fitted with such attachments, or	<i>Pass. Provided</i>
	- be shaped in such a way that standard lifting gear can easily be attached	<i>Not applicable.</i>
	Where machinery or one of its component parts is to be moved by hand, it must:	-
	- either be easily movable, or	<i>Not applicable.</i>
	- be equipped for picking up and moving in complete safety	<i>Not applicable.</i>
	Special arrangement must be made for the handling of tools and/or machinery parts, even if lightweight, which could be dangerous	<i>Not applicable.</i>
1.2	Controls	-
1.2.1	Safety and reliability of control systems	-
	Control systems must be designed and constructed so that they are safe and reliable, in a way that will prevent a dangerous situation arising	<i>Pass. The control system for this machine is safe and reliable by appropriate designing</i>
	Above all they must be designed and constructed:	-
	- they can withstand the rigors of normal use and external factors	<i>Pass. The control system can withstand related effects during normal operation.</i>
	- errors in logic don't lead to dangerous situations	<i>Pass. Any error in logic doesn't lead to dangerous situations.</i>
1.2.2	Control devices	-
	Control devices must be:	-
	- clearly visible and identifiable and appropriately marked where necessary	<i>Pass. Appropriate labels and markings are provided This requirement has been complied with.</i>
	- positioned for safe operation without hesitation or loss of time, and without ambiguity	<i>Pass. Appropriate positions have been taken into account during design.</i>



	- designed so that the movement of the control is consistent with its effect	<i>Not applicable</i>
	- located outside the danger zones, except for certain controls where necessary, such as emergency stop, console for training of robots	<i>Pass. All control devices have been located outside the danger zones.</i>

	positioned or that their operation can't cause additional risk	Pass. <i>All operation of control devices won't cause additional risk.</i>
	- designed or protected so that the desired effect, where a risk is involved, can't occur without an intentional operation	Pass. <i>Appropriate safety devices have been used to comply with this requirement.</i>
	- made so as to withstand foreseeable strain, particular attention must be paid to emergency stop devices liable to be subjected to considerable strain	Pass. <i>The emergency stop and other control devices have enough strength to withstand foreseeable strain.</i>
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence, the action to be performed must be clearly displayed and subject to confirmation where necessary	Not applicable
	Controls must be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles	Pass. <i>These requirements have been taken into account during design.</i>
	Constraints due to the necessary foreseeable use of personal protection equipment must be taken into account	Not applicable.
	Machinery must be fitted with indicators as required for safe operation	Pass. <i>The indicators have been provided.</i>
	The operator must be able to read them from the control position	Pass. <i>The indicators are clearly visible in the control position.</i>
	From the main control position the operator must be able to ensure that there are no exposed persons in the danger zones	Pass. <i>The danger zones are visible for the operator in the main control position.</i>
	If this is impossible, the control system must be designed and constructed so that an acoustic and/or visual warning signal is given whenever the machinery is about to start	Not applicable.
	The exposed person must have the time and the means to take rapid action to prevent the machinery starting up	Pass. <i>Emergency stop , main switch and other related devices have been provided for the exposed person.</i>
1.2.3	Starting	-



	It must be possible to start machinery only by voluntary actuation of a control provided for the	<i>Pass.</i> <i>Devices preventing unintended</i>
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	purpose	Shenzhen BATT Testing Technology Co., Ltd.	starting have been provided.
	The same requirement applies:		-
	When restarting the machinery after stoppage, whatever the cause		Pass. <i>Reset is necessary before restaring.</i>
	- when effecting a significant change in the operating conditions		Pass. <i>These requirements have been complied with.</i>
	Unless such restarting or change in operating conditions is without risk to exposed persons		Pass <i>For equipment is fully enclosed, and the equipment installation for computer connection indirect operation, when the equipment heavy start, just equipment offline and online process, operators to direct contact with equipment, does not exist without exposure to risk</i>
	This essential requirement doesn't apply to the restarting of the machinery or to the change in operating conditions resulting from the normal sequence of an automatic cycle		Pass. <i>These requirements have been complied with by appropriate design.</i>
	Where machinery has several starting controls and the operators can therefore put each other in danger, additional devices must be fitted to rule out such risks		<i>Not applicable</i>
	It must be possible for automated plant functioning in automatic mode to be restarted easily after a stoppage once the safety conditions have been fulfilled		Pass. <i>These requirements have been complied with by appropriate design.</i>
1.2.4	Stopping device		-
	Normal stopping		-
	Each machine must be fitted with a control whereby the machine can be brought safety to a complete stop		Pass. <i>A normal stop control has been provided.</i>
	Each workstation must be fitted with a control to stop some or all of the moving parts of the machinery, depending on the type of hazard, so that the machinery is rendered safe		Pass. <i>A normal stop control has been provided.</i>
	The machinery's stop control must have priority over the start controls		Pass. <i>It has priority over the start control.</i>
	Once the machinery or its dangerous parts have stopped, the energy supply to the actuators concerned must be cut off		Pass. <i>The stops belong to the category 0, or category 1 stops.</i>
	Emergency stop		-



	Each machinery must be fitted with one or more emergency stop devices to enable actual or impending danger to be averted	<i>Pass. emergency stop is provided.</i>
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	The following exceptions apply:	-
	- machines in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would not enable the special measures required to deal with the risk to be taken	<i>Not applicable</i>
	The emergency stop device must:	-
	- have clearly identifiable, clearly visible and quickly accessible controls	<i>Pass.</i> <i>The emergency stop has red button, yellow background and marked with "emergency stop"</i>
	- stop the dangerous process as quickly as possible, without creating additional hazards	<i>Pass.</i> <i>The emergency stop will stop the machine as soon as it is pressed and it will not create any additional hazards.</i>
	- where necessary, trigger or permit the triggering of certain safeguard movements	<i>Not applicable</i>
	Once active operation of the emergency stop control has ceased following a stop command, that command must be sustained by engagement of the emergency stop device until that engagement is specifically overridden	<i>Pass.</i> <i>After the action of the emergency stop, machine can not be restarted until reset the emergency stop.</i>
	It must be possible to disengage the device only by an appropriate operation, and disengaging the device must not restart the machinery but only permit restarting	<i>Pass.</i> <i>Operator should turn the emergency stop to disengage the device.</i>
	Complex installations	-
	In the case of machinery or parts of machinery designed to work together, must so design and construct the machinery that the stop controls, including the emergency stop, can stop not only the machinery itself but also all equipment upstream and/or downstream if its continued operation can be dangerous	<i>Not applicable.</i>
1.2.5	Mode selection	-
	The control mode selected must override all other control systems with the exception of the emergency stop	<i>Pass</i> <i>The emergency stop is effective regardless of operating modes.</i>

	If machinery has been designed and built to allow for its use in several control or operating modes presenting different safety levels, it must be fitted with a mode selector which can be locked in each position	<i>Pass</i> <i>A lockable selector switch used.</i>
	Each position of the selector must correspond to a single operating or control mode	<i>Pass</i> <i>Complied with</i>

	The selector may be replaced by a mode selector method which restricts the use of certain functions of the machinery or certain categories of operator	Not applicable.: BATT20160953 No this situation
	If, for certain operations, the machinery must be able to operate with its protection devices neutralized, the mode selector must simultaneously:	Pass <i>This requirement has been taken into account during design.</i>
	- disable the automatic control mode	Pass <i>This requirement has been taken into account during design.</i>
	- permit movements only by controls requiring sustained action	Pass <i>Hold-to-run control used</i>
	- permit the operation of dangerous moving parts only in enhanced safety conditions while preventing hazards from linked sequences	Pass <i>This requirement has been taken into account during design.</i>
	- prevent any movement liable to pose a danger by acting voluntarily or involuntarily on the machine's internal sensors	Pass <i>This requirement has been taken into account during design.</i>
	In addition, the operator must be able to control operation of the parts he is working on at the adjustment point	Pass <i>This requirement has been taken into account during design.</i>
1.2.6	Failure of the power supply	-
	The interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply to the machinery must not lead to a dangerous situation	Pass. <i>No any dangerous situation has been found.</i>
	In particular:	-
	- the machinery must not start unexpectedly	Pass. <i>Reset is necessary before restarting the machine.</i>
	- the machinery must not be prevented from stopping if the command has already been given	Pass. <i>The stop command has the priority over all other devices</i>
	- no moving part of the machinery or piece held by the machinery must fall or be ejected	Pass. <i>No such part is found.</i>
	- automatic or manual stopping of the moving parts whatever they may be must be unimpeded	Pass. <i>Stopping of the moving parts is always effective.</i>
	- the protection devices must remain fully effective	Pass. <i>The protection devices remain effective after the failure of the power supply.</i>
1.2.7	Failure of the control circuit	-

	A fault in the control circuit, or failure of or damage to the control circuit must not lead to dangerous situations	<i>Pass.</i> <i>No dangerous situation is found.</i>
	In particular:	-
	- the machinery must not start unexpectedly	<i>Pass.</i> <i>Reset is necessary before restarting the machine.</i>
	- the machinery must not be prevented from stopping if the command has already been given	<i>Pass.</i> <i>The stop command has the priority over all other devices</i>
	- no moving part of the machinery or piece held by the machinery must fall or be ejected	<i>Pass.</i> <i>No such part is found.</i>
	- automatic or manual stopping of the moving parts whatever they may be must be unimpeded	<i>Pass.</i> <i>Stopping of the moving parts is always available.</i>
	- the protection device must remain fully effective	<i>Pass.</i> <i>The protection devices remain effective after the failure of the control circuit</i>
1.2.8	Software	-
	Interactive software between the operator and the command or control system of a machine must be user-friendly	<i>Pass</i> <i>This requirement has been taken into account during design.</i>
1.3	Protection against mechanical hazards	-
1.3.1	Stability	-
	Machinery, components and fittings there of must be so designed and constructed that they are stable enough, under the foreseen operating conditions for use without risk of overturning, falling or unexpected movement	<i>Pass.</i> <i>These requirements have been taken into account design</i>
	If the shape of the machinery itself or its intended installation doesn't offer sufficient stability, appropriate means of anchorage must be incorporated and indicated in the instructions	<i>Not applicable.</i> <i>The sufficient stability has been offered for this machine.</i>
1.3.2	Risk of break-up during operation	-
	The various parts of machinery and their linkages must be able to withstand the stress to which they are subject when used when as foreseen by the manufacturer	<i>Pass.</i> <i>All parts of the machine can withstand related stress when they are used.</i>


	The durability of the materials used must be adequate for the nature of the workplace foreseen by the manufacturer, in particular as regards the phenomena of fatigue, aging, corrosion and abrasion	<i>Pass. All materials used for this machine are appropriate for their intended use and have adequate life.</i>
	The manufacturer must indicate in the instructions the type and frequency of inspection and maintenance required for safety reasons, where appropriate, indicate the parts subject to wear and the criteria for replacement	<i>Pass. The related information have been provided within the instruction manual.</i>

	<p>Where a risk of rupture exists, despite the measures taken the moving parts must be mounted and positioned in such a way that in case of rupture their fragments will be contained</p>	<p><i>Not applicable.</i> <i>No such risk is possible.</i></p>
	<p>Both rigid and flexible pipes carrying fluids, particularly those under high pressure, must be able to withstand the foreseen internal and external stresses and must be firmly attached and/or protected against all manner of external stresses and strains, precaution must be taken to ensure that no risk is posed by a rupture</p>	<p><i>Pass.</i> <i>This requirement has been taken into account during design.</i></p>
	<p>Where the material to be processed is fed to the tool automatically, the following conditions must be fulfilled to avoid risks to the persons exposed :</p>	<p>-</p>
	<p>- when the work piece comes into contact with the tool the later must have attained its normal working conditions</p>	<p><i>Not applicable.</i></p>
	<p>- when the tool starts and/or stops the feed movement and the tool movement must be coordinated</p>	<p><i>Not applicable.</i></p>
<p>1.3.3</p>	<p>Risked due to falling or ejected objects</p>	<p>-</p>
	<p>Precautions must be taken to prevent risks from falling or ejected object</p>	<p><i>NA</i></p>
<p>1.3.4</p>	<p>Risks due to surfaces, edges or angles</p>	<p>-</p>
	<p>In so far as their purpose allows, accessible parts of the machinery must have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury</p>	<p><i>Pass.</i> <i>All the surfaces,edges and similar parts has been treated appropriately.</i></p>
<p>1.3.5</p>	<p>Risks related to combined machinery</p>	<p>-</p>
	<p>Where the machinery is intended to carry out several different operations with the manual removal of the piece between each operation, it must be designed and constructed in such a way as to enable each element to be used separately without the other element constituting a danger or risk for the exposed person</p>	<p><i>Not applicable.</i> <i>No this kind of combined machinery.</i></p>
	<p>For this purpose, it must be possible to start and stop separately and elements that are not protected</p>	<p><i>Not applicable.</i> <i>No this kind of combined machinery.</i></p>
<p>1.3.6</p>	<p>Risks relating to variations in the rotation speeds of tools</p>	<p>-</p>
	<p>When the machine is designed to perform operations under different conditions of use, it must be designed and constructed in such a way that selection and adjustment of these conditions can be carried out safely and reliably</p>	<p><i>Not applicable.</i> <i>This machine have scanned continuously output and leaflet scanning output two kinds of state, two states of differentiation only continuous and sheet of equipment,</i></p>

		<i>the difference between safety performance does not exist any changes</i>
1.3.7	Prevention of risks related to moving parts	-
	The moving parts of machinery must be designed, built and laid out to avoid hazards or, where hazards persist, fixed with guards or protective devices in such a way as to prevent all risk of contact which could lead to accidents	<i>Pass. This kind of hazards has been prevented by appropriate guards.</i>
	All necessary steps must be taken to prevent accidental blockage of moving parts involved in the work	<i>Pass. All necessary steps have been taken.</i>
	In cases where, despite the precaution taken, a blockage is likely to occur, specific protection devices or tools, the instruction handbook and possibly a sign on the machinery should be provided by the manufacturer to enable the equipment to be safely unblocked	<i>Not applicable. No this kind of need.</i>
1.3.8	Choice of protection against risk related to moving parts	<i>Pass</i>
	Guards or protection devices used to protect against the risks related to moving parts must be selected on the basis of the type of risk	<i>Pass. It is in accordance with the risk assessment.</i>
	The following guidelines must be used to help make the choice	-
	A. Moving transmission parts Guards designed to protect exposed persons against the risks associated with moving transmission parts must be :	<i>Fixed guard is used against the moving transmission</i>
	- either fixed, complying with requirements 1.4.1 and 1.4.2.1 or	<i>See the related clauses.</i>
	- movable, complying with requirements 1.4.1 and 1.4.2.2.A	<i>See the related clauses.</i>
	B. Moving parts directly involved in the process Guards or protection devices designed to protect exposed persons against the risks associated with moving parts contributing to the work must be :	<i>Not</i>



	- wherever possible fixed guards complying with requirements 1.4.1 and 1.4.2.1	<i>See the related clauses.</i>
	- otherwise, movable guards complying with requirements 1.4.1 and 1.4.2.2.B or protection devices such as sensing devices, remote-hold protection	<i>See the related clauses.</i>

	devices, or protection devices installed automatically to prevent all part of the operator's body from encroaching to the danger zone in accordance with requirements 1.4.1 and 1.4.3	Report No.: BATT20160953
	However, when certain moving parts directly involved in the process can't be completely or partially inaccessible during operation owing to operations requiring near-by operator intervention, where technically possible such parts must be fitted with :	-
	- fixed guards, complying with requirements 1.4.1 and 1.4.2.1 preventing access to those sections of the parts that are not used in the work	<i>See the related clauses.</i>
	- adjustable guards, complying with requirements 1.4.1 and 1.4.2.3 restricting access to those sections of the moving parts that are strictly for the work	<i>See the related clauses.</i>
1.4	Required characteristics of guards and protection devices	-
1.4.1	General requirement	-
	Guards and protection devices must:	-
	- be of robust construction	<i>Pass. All the guards have enough strength.</i>
	- not give rise to any additional risk	<i>Pass. No additional risk is found.</i>
	- not be easy to bypass or render non-operational	<i>Pass. All the guards can't be bypassed or rendered non-operational by design.</i>
	- be located at an adequate distance from the danger zone	<i>Pass. All the guards comply with the safety distances.</i>
	- cause minimum obstruction to the view id the production process	<i>Pass. Appropriate materials are used to make guards.</i>
	- enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by restricting access only to the area where the work has to be done, if possible without the guard or protection device having to be dismantled	<i>Pass. These requirements have been taken into account during design.</i>
1.4.2	Special requirements for guards	-
1.4.2.1	Fixed guards	-
	Fixed guard must be securely held in place	<i>Pass. They all be securely held in place by appropriate fixation.</i>



	They must be fixed by system that can be opened only	Pass.
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	With tools	Shenzhen BATT Testing Technology Co., Ltd.	They all can be opened only with tools.
	Where possible, guards must be unable to remain in place without their fixings		Pass Guard be remained by the hinges
1.4.4.2	Movable guards		-
	A. Type A movable guards must:		-
	- as far as possible remain fixed to the machinery when open		Pass Complied with
	- be associated with a locking device to prevent moving parts starting up as these parts can be accessed and to give a stop command whenever they are no longer closed		Pass An interlock switch provided
	B. Type B movable guards must be designed and incorporated into the control system so that		Not applicable. No this kind of guard has been used.
	- moving parts can't start up while they are within the operator's reach		Not applicable.
	- the exposed person can't reach moving parts once they have started up		Not applicable.
	- they can be adjusted only by means of an intentional action, such as the use of a tool, etc.		Not applicable.
	- the absence or failure of one of their components prevents starting or stops the moving parts		Not applicable.
	- protection against any risk of ejection is provided by means of an appropriate barrier		Not applicable.
1.4.2.3	Adjustable guards restricting access		-
	Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work must:		Not applicable. No this kind of guard has been used.
	- be adjustable manually or automatically according to the type of work involved		Not applicable.
	- be readily adjustable without the use of tools		Not applicable.
	- reduce as far as possible the risk of ejection		Not applicable.
1.4.3	Special requirements for protection devices		-
	Protection devices must be designed and incorporated into the control system so that:		-
	- moving parts can't start up while they are within the operator's reach		Pass. These requirements have been taken into account during design.
	- the exposed person can't reach moving parts once they have started up		Pass. Appropriate guards have been provided.




	- they can be adjusted only by means of an intentional action, such as the use of a tool, etc.	<i>Pass.</i> <i>These requirements have been taken into account during design.</i>
	-the absence or failure of one of their components	<i>Pass.</i>

	prevents starting or stops the moving parts	<i>These requirements have been taken into account during design.</i>
1.5	Protection against other hazards	-
	Electricity supply	-
	Where machinery has an electricity supply it must be designed, constructed and equipped so that all hazards of an electrical nature are or can be prevented	<i>Pass. See the EN 60204-1 test report in detail.</i>
	The specific rules in force relating to electrical equipment designed for use within certain voltage limits must apply to machinery which is subject to those limits	<i>Pass. See the EN 60204-1 test report in detail.</i>
1.5.2	Static electricity	-
	Machinery must be so designed and constructed as to prevent or limit the build-up of potentially dangerous electrostatic charges and/or be fitted with a discharging system	<i>Pass. See the EN 60204-1 test report in detail.</i>
1.5.3	Energy supply other than electricity	-
	Where machinery is powered by an energy other than electricity, it must be so designed, constructed and equipped as to avoid all potential hazards associated with these types of energy	<i>Pass. No any additional hazard has been found for energy supply.</i>
1.5.4	Error of fitting	-
	Errors likely to be made when fitting or refitting certain parts which could be a source of risk must be made impossible by the design of such parts or, failing this, by information on moving parts and/or their housing where the direction of movement must be known to avoid a risk	<i>Pass. These requirements have been taken into account during design.</i>
	Any further information that may be necessary must be given in the instructions	<i>Pass. The related information has been provided within the instruction manual.</i>
	Where a faulty connection can be the source of risk, incorrect fluid connections, including electrical conductors, must be made impossible by the design or, failing this, by information given on the pipes, cables, etc. and/or connectors blocks	<i>Pass. All related information have been provided within the instruction manual. Necessary lables and markings have been provided.</i>
1.5.5	Extreme temperatures	-



	Step must be taken to eliminate any risk of injury caused by contact with or proximity to machinery parts or materials at high or very low temperatures	NA
	The risk of hot or very cold materials being ejected should be assessed	NA

	Where this risk exists, the necessary steps must be taken to prevent it or, if this is not technically possible, to render it non-dangerous	
1.5.6	Fire	-
	Machinery must be designed and constructed to avoid all risk of fire or overheating posed by the machinery itself or by gases, liquids, dusts, vapors or the other substances produced or used by the machinery	<i>Not applicable. No this kind of risk exists.</i>
1.5.7	Explosion	-
	Machinery must be designed and constructed to avoid any risk of explosion posed by the machinery itself or by gases, liquids, dusts, vapors or other substances produced or used by the machinery	<i>Not applicable. No such risk is exist</i>
	To that end the manufacturer must take steps to:	-
	-avoid a dangerous concentration of products	<i>Not applicable.</i>
	- prevent combustion of the potentially explosive atmosphere	<i>Not applicable.</i>
	-minimize any explosion which may occur so that it doesn't endanger the surroundings	<i>Not applicable.</i>
	The same precautions must be taken if the manufacturer foresees the use of the machinery in potentially explosive atmosphere	<i>Not applicable. This machine is not intended to be used in potentially explosive atmosphere.</i>
	Electrical equipment forming part of the machinery must conform, as far as the risk from explosion is concerned, to the provision of the specific Directive in force	<i>Pass. See the 60204-4 test report in detail.</i>
1.5.8	Noise	-
	Machinery must be so designed and constructed that risks resulting from the emission of airborne noise are reduced to the lowest level taking accounting of technical progress and the availability of means of reducing noise, in particular at source	<i>Pass. The design and construction of this machine are in conformity with this requirements. Noise of this machine is not beyond 70dB</i>
1.5.9	Vibration	-
	Machinery must be so designed and constructed that risks resulting from the vibrations produced by the machinery are reduced to the lowest level, taking account of technical progress and the availability of means of reducing vibration, in particular at source	<i>Pass. The design and construction of this machine are in conformity with this requirements. Vibrations of this machine will not creat any risk.</i>
1.5.10	Radiation	-

	Machinery must be so designed and constructed that any emission of radiation is limited to the extent	<i>Not applicable.</i>
	necessary for its operation and that the effects on exposed persons non-existent or reduced to non-dangerous proportions	
1.5.11	External radiation	-
	Machinery must be so designed and constructed that external radiation doesn't interfere with its operation	<i>Pass.</i> <i>The machine can withstand the external radiation by appropriate design and construction.</i>
1.5.12	Laser equipment	-
	Where laser equipment is used, the following provisions should be taken into account;	<i>Pass</i>
	- laser equipment on machinery must be designed and constructed so as to prevent any accidental radiation	<i>Laser Equipment is very low power and guard very well to prevent any accidental radiation .</i>
	- laser equipment on machinery must be protected so that effective radiation, radiation produced by reflection or diffusion and secondary radiation don't damage health	<i>Pass</i>
	- optical equipment for the observation or adjustment of laser equipment on machinery must be such that no health risk is created by the laser rays	<i>Pass</i>
1.5.13	Emission of dust, gases, etc	-
	Machinery must be so designed, constructed and/or equipped that risk due to gases, liquids, dust, vapors and other waste materials which it produces can be avoided	<i>Not applicable</i> <i>No this hazard</i>
	Where a hazard exists, the machinery must be so equipped that the said substances can be contained and/or evacuated	<i>Not applicable</i> <i>No this hazard</i>
	Where machinery is not enclosed during normal operation, the devices for containment and/or evacuation must be situated as close as possible to the source emission	<i>Not applicable</i> <i>No this hazard</i>
1.5.14	Risk of being trapped in a machine	-




	Machinery must be so designed, constructed or fitted with a means of preventing a exposed person from being enclosed within it or, if that is impossible, with a means of summoning held	<i>Pass.</i> <i>No this kind of hazard</i>
1.5.15	Risk of slipping, tripping or falling	-
	Parts of the machinery where persons are liable to move about or stand must be designed and constructed to prevent persons slipping, tripping or falling on or off these parts	<i>Not applicable</i>
1.6	Maintenance	-

1.6.1	Machinery maintenance	-
	Adjustment, lubrication And maintenance points must be located outside danger zones	<i>Pass.</i> <i>The design and construction of this machine are in conformity with this requirements.</i>
	It must be possible to carry out adjustment, Maintenance, repair, cleaning and servicing Operations while machinery is at a standstill	<i>Pass.</i> <i>Maintenance, repair, cleaning and servicing, operations can only be implemented while machinery is at a standstill</i>
	If one or more of the above conditions can't be satisfied for technical reasons, operations must be possible without risk	<i>Not applicable.</i> <i>No this kind of situation.</i>
	In the case of automated machinery and, where necessary, other machinery, the manufacturer must take provision for a connecting device for mounting diagnostic fault-finding equipment	<i>Pass.</i> <i>Some adequate provisions have been taken.</i>
	Automated machine components which have to be changed frequently, in particular for a change in manufacture or where they are liable to wear or likely to deteriorate following an accident, must be capable of being removed and replaced easily and in safety	<i>Pass.</i> <i>The related parts can be removed and replaced easily and in safety.</i>
	Access to the components must enable these tasks to be carried out with the necessary technical means in accordance with an operating method specified by the manufacturer	<i>Pass.</i> <i>All operation methods have been specified by the manufacturer.</i>
1.6.2	Access to operating position and servicing points	-
	The manufacturer must provide means of access to allow access in safety to all areas used for production, adjustment and maintenance operations	<i>Pass.</i> <i>Appropriate guards and safety control devices have been used.</i>
1.6.3	Isolation of energy sources	-
	All machinery must be fitted with means to isolate it from all energy sources	<i>Pass.</i> <i>The power switch has been used.</i>
	Such isolators must be clearly identified	<i>Pass.</i> <i>It has passed CE</i>
	They must be capable of being locked if reconnection could endanger exposed persons	<i>Not applicable.</i>
	In the case of machinery supplied with electricity through a plug capable of being plugged into a circuit, separation of the plug is sufficient	<i>Not applicable.</i>



	The isolator must be capable of being locked also where an operator is unable, from any of the points to which he has access, to check that the energy is still cut off	<i>Pass.</i> <i>The isolator can be locked in the off position.</i>
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	<p>After the energy is cut off, it is possible to dissipate normally any energy remaining or stored in the circuits of the machinery without risk to exposed persons</p>	<p>Pass. Report No.: BATT20160953 <i>All the parts will not be live after After the energy is cut off.</i></p>
	<p>As an exception to the above requirement, certain circuits may remain connected to their energy source in order, for example, to hold parts, protect information, light interiors, etc. In this case, special steps must be taken to ensure operator safety</p>	<p><i>Not applicable. No this kind of situation.</i></p>
1.6.4	Operator intervention	-
	Machinery must be so designed, constructed and equipped that the need for operator intervention is limited	<p>Pass. <i>The design and construction of this machine are in conformity with these requirements.</i></p>
	If operator intervention can't be avoided, it must be possible to carry it out easily and in safety	<p><i>Not applicable. No this kind of situation.</i></p>
1.6.5	Cleaning of internal parts	-
	The machinery must be designed and constructed in such a way that it is possible to clean internal parts which have contained dangerous substances or preparations without entering them; any necessary unblocking must also be possible from the outside	<p>Pass. <i>The design of this machine is allowed to carried out this work.</i></p>
	If it is absolutely impossible to avoid entering the machinery, the manufacturer must take steps during its construction to allow cleaning to take place with the minimum of danger	<p><i>Not applicable. No this kind of situation.</i></p>
1.7	Indicators	-
1.7.1	Information devices	-
	The information needed to control machinery must be unambiguous and easily understood	<p>Pass. <i>The information is identified clearly and can be easily under understood.</i></p>
	It must not be excessive to the extent of overloading the operator	Pass.
	Where the health and safety of exposed persons may be endangered by a fault in the operation of unsupervised machinery, the machinery must be equipped to give an appropriate acoustic or light signal as a warning	<p>Not application No this exposed situation exist.The machine is fully enclosed, and the equipment installation for computer connections, operators and equipment indirect operation without direct contact with exposure to risk, does not exist</p>
1.7.2	Warning devices	-
	Where machinery is equipped with warning devices, these must be unambiguous and easily perceived	No warning devices ,Not applicable

	The operator must have facilities to check the operation of such warning devices at all times	<i>Not applicable</i>
	The requirements of the specific directives concerning colors and safety signals must be complied with	<i>Not applicable</i>
1.7.3	Warning of residual risks	-
	Where risks remain despite all the measures adopted or in the case of potential risks which are not evident, the manufacturer must provide warnings	<i>Pass</i> <i>Appropriate warning labels provided</i>
	Such warnings should preferably use readily understandable pictograms and/or be drawn up in one of the languages of the country in which the machinery is to be used, accompanied, on request, by the languages understood by the operators	<i>Pass</i> <i>Appropriate warning labels provided</i>
1.7.4	Marking	-
	All machinery must be marked legibly and indelibly with the following minimum particular :	-
	- name and address of the manufacturer	<i>Pass.</i> <i>Name and address of the manufacturer has been marked in the nameplate.</i>
	- CE mark, which includes the year of construction	<i>Pass.</i>
	- designation of series or type	<i>Pass.</i> <i>Designation of series or type has been marked in the nameplate.</i>
	- serial number, if any	<i>Pass.</i> <i>Serial number has been marked in the nameplate.</i>
	Furthermore, where the manufacturer constructs machinery intended for use in a potentially explosive atmosphere, this must be indicated on the machinery	<i>Not applicable.</i> <i>This machine is not intended to be used in a potentially explosive atmosphere.</i>
	Machinery must also bear full information relevant to its type and essential to its safe use	<i>Pass.</i> <i>Such information is provide in manual and nameplate.</i>
	Where a machine part must be handled during use with lifting equipment, its mass must be indicated legible, indelibly and unambiguously	<i>Not applicable.</i>



	The interchangeable equipment referred to in Article 1 (2) , third subparagraph, must bear the same information	<i>Pass. All the related information is provided legible, indelibly and unambiguously.</i>
1.7.5	Instruction	-
	a) All machinery must be accompanied by instructions	-

	including at least the following :	
	- a repeat of the information with which the machinery is marked, except the serial number, together with any appropriate additional information to facilitate maintenance	Pass. Information provided within the instruction manual.
	- foreseen use of the machinery within the meaning of 1.1.2(c)	Pass. Information provided within the instruction manual.
	- workstation(s) likely to be occupied by operators	Pass. Information provided within the instruction manual.
	- instructions for safe	Pass. Information provided within the instruction manual.
	- putting into service	Pass. Information provided within the instruction manual.
	- use	-
	- handling, giving the mass of the machinery and its various parts where they are regularly to be transported separately	Pass. All related information has been provided within the instruction manual.
	- installation	Pass. All related information has been provided within the instruction manual.
	- assembling, dismantling	Pass.
	- adjustment	Pass.
	- maintenance (servicing and repair)	Pass.
	- where necessary, training instructions	Pass.
	- where necessary, the essential characteristics of tools which may be fitted to the machinery	Pass.

	Where necessary, the instructions should draw attention to ways in which the machinery should not be used	<i>Pass. All related information has been provided within the instruction manual.</i>
	b) The instructions , must be drawn up in one of the Community languages by the manufacturer or his	<i>Pass. Chinese and English versions of the</i>

	authorized representative established in the Community	<i>instruction manual are provided.</i>
	On being put into service, all machinery must be accompanied by a translation of the instructions in the language or languages of the country in which the machinery is to be used and by the instructions in the original language	<i>Pass. An English version of the instruction manual is provided.</i>
	This translation must be done either by the manufacturer or his authorized representative established in the Community or by the person introducing the machinery into the language area in question	<i>Pass. The translation is done by the manufacture.</i>
	By way of derogation from this requirement, the maintenance instructions for use by the specialized personnel employed by the manufacturer or his authorized representative established in the Community may be drawn up in only one of the Community languages understood by that personnel	<i>Pass.</i>
	c) The instructions must contain the drawing and diagrams necessary for putting into service, maintenance, inspection, checking of correct operation and, where appropriate, repair of the machinery and all useful instructions in particular with regard to safety	<i>Pass. All related information has been provided within the instruction manual.</i>
	d) Any literature describing the machinery must not contradict the instructions as regards safety aspects	<i>Pass. No such situation exist.</i>
	The technical documentation describing the machinery must give information regarding the airborne noise emission referred to in(f) and, in the case of hand-help and/or hand-guided machinery, information regarding vibration as referred to in 2.2	<i>Pass. All related information has been provided within the technical documentation.</i>
	e) Where necessary, the instructions must give the requirement relating to installation and assembly for reducing noise or vibration	<i>Not applicable.</i>
	f) The instructions must give the following information concerning airborne noise emission by the machinery, either the actual value or a value established on the basis of measurements made on identical machinery:	-



	- equivalent continuous A-weighted pressure level at workstations, where this exceeds 70 dB(A); where this level doesn't exceed 70dB(A), this fact must be indicated	<i>Pass.</i> <i>The noise pressure level is 77dB.</i>
	- peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa(130 dB in	<i>Not applicable.</i>

	relation to 20 mPa)	
	- sound power level emitted by the machinery where the equivalent continuous A-weight sound pressure level at workstations exceeds 85 dB(A)	<i>Pass</i> <i>Appropriate warnings provided.</i>
	In the case of very large machinery, instead of the sound power level, the equivalent continuous sound pressure levels at specified positions around the machinery may be indicated	<i>Not applicable.</i> <i>This machine is not a very large machinery.</i>
	Where the harmonized standards are not applied sound levels must be measured using the most appropriate method for the machinery	<i>Pass.</i> <i>Appropriate standards are applied to determine the sound level.</i>
	The manufacturer must indicate the operating conditions of the machinery during measurement and what methods have been used for the measurement	<i>Pass.</i> <i>All related information has been provided within the technical documentation.</i>
	Where the workstation(s) are undefined or can't be defined, sound pressure levels must be measured at a distance of 1 meter from the surface of the machinery and at a height of 1.60 meters from the floor or access platform	<i>Not applicable.</i> <i>The workstation has been defined.</i>
	The position and value of the maximum sound pressure must be indicated	<i>Pass.</i> <i>It has been indicated in the appropriate position of the machine.</i>
	g) If the manufacturer foresees that the machinery will be used in a potentially explosive atmosphere, the instructions must give all the necessary information	<i>Not applicable.</i> <i>This machine is not intended to be used in a potentially explosive atmosphere.</i>
	h) In the case of machinery which may also be intended for use by non-professional operators, the wording and layout of the instructions for use, whilst respecting the other essential requirement mentioned above, must take into account the level of general education and acumen that can reasonably be expected from such operators	<i>Pass.</i> <i>All these requirements have been taken into account.</i>
2	Essential health and safety requirements for certain categories of machinery	-
2.1	Agri-foodstuffs machinery	-
	Where machinery is intended to prepare and process foodstuffs, it must be so designed and constructed as to avoid any risk of infection, sickness or contagion and the following hygiene rules must be observed:	<i>Not applicable.</i>



	a) materials in contact, or intended to come into contact, with the foodstuffs must satisfy the conditions set down in the relevant Directives	<i>Not applicable.</i>
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	The machinery must be so designed and constructed that these materials can be clean before each use	<i>Not applicable.</i>
	b) all surfaces including their joinings must be so smooth, and must have neither ridges nor crevices which could harbor organic materials	<i>Not applicable.</i>
	c) assemblies must be designed in such a way as to reduce projections, edges and recesses to a minimum	<i>Not applicable.</i>
	They should preferably be made by welding or continuous bonding	<i>Not applicable.</i>
	Screws, screw heads and rivets may not be used except where technically unavoidable	<i>Not applicable.</i>
	d) all surfaces in contact with the foodstuffs must be easily cleaned and disinfected, where possible after removing easily dismantled parts	<i>Not applicable.</i>
	The inside surfaces must have curves of a radius sufficient to allow through cleaning	<i>Not applicable.</i>
	e) liquid deriving from foodstuffs as well as cleaning disinfecting and rinsing fluids should be able to be discharged from the machine without impediment	<i>Not applicable.</i>
	f) machinery must be so designed and constructed as to prevent any liquids or living creatures, in particular insects, entering, or any organic matter accumulating in area that can't be cleaned	<i>Not applicable.</i>
	g) machinery must be so designed and constructed that no ancillary substances can come into contact with foodstuffs	<i>Not applicable.</i>
	Where necessary, machinery must be designed and constructed so that continuing compliance with this requirement can be checked	<i>Not applicable.</i>
	Instructions	<i>Not applicable.</i>
	In addition to the information required in Section1, the instructions must indicate recommended products and methods for cleaning, disinfecting and rinsing(not only for easily accessible areas but also where areas to which access is impossible or inadvisable, such as piping, have to be cleaned in it situ)	<i>Not applicable.</i>
2.2	Portable hand-help and/or hand-guided machinery	-
	Portable hand-help and/or hand-guided machinery must conform to the following essential health and safety requirements:	-



	- according to the type of machinery, it must have a supporting surface of sufficient size and have a sufficient number of handles and supports of an appropriate size and arranged to ensure the stability	<i>Not applicable.</i>
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	of the machinery under the operating conditions foreseen by the manufacturer	
	- except where technically impossible or where there is an independent control, in the case of handles which can't be released in complete safety, it must be fitted with start and stop controls arranged in such a way that the operator can operate them without releasing the handles	<i>Not applicable.</i>
	- it must be designed, constructed or equipped to eliminate the risks of accidental starting and/or continued operation after the operator has released the handles	<i>Not applicable.</i>
	Equivalent steps must be taken if the requirement is not technically feasible	<i>Not applicable.</i>
	- portable hand-help machinery must be designed and constructed to allow, where necessary, a visual check of the contact of the tool with the material being processed	<i>Not applicable.</i>
	Instructions	-
	The instructions must give the following information concerning vibrations transmitted by hand-help and hand-guided machinery	-
	- the weight root mean square value to which the arms are subjected, if it exceeds 2.5 m/s^2 as determined by the appropriate test code	<i>Not applicable.</i>
	Where the acceleration doesn't exceed 2.5 m/s^2 , this must be mentioned	<i>Not applicable.</i>
	If there is no applicable test code, the manufacturer must indicate the measurement methods and conditions under which measurement were made	<i>Not applicable.</i>
2.3	Machinery for working wood and analogous materials	-
	Machinery for working wood and machinery for working materials with physical and technology characteristics similar to those of wood, such as cork, bone, hardened rubber, hardened plastic material and other similar stiff material must conform the following essential health and safety requirements	-



	a) the machinery must be designed, constructed or equipped so that the piece being machined can be placed and guided in safety; where the piece is hand-help on a work-bench the later must be sufficiently stable during the work and must not impede the movement of the piece	<i>Not applicable.</i>
	b) where the machinery is likely to be used in	<i>Not applicable.</i>

	conditions involving the risk of ejection of pieces of wood, it must be designed, constructed or equipped to eliminate this ejection, or, if this is not the case, so that the ejection doesn't engender risks for the operator and/or exposed persons	
	c) the machinery must be equipped with an automatic brake that stops the tool in a sufficiently short time if there is a risk of contact with the tool whilst it runs down	<i>Not applicable.</i>
	d) where the tool is incorporated into a non-fully automated machine, the latter must be so designed and constructed as eliminate or reduce the risk of serious accidental injury	<i>Not applicable.</i>
3	Essential health and safety requirement to offset the particular hazards due to the mobility machinery	-
4	Essential health and safety requirement to offset the particular hazards due to a lifting operation	-
5	Essential health and safety requirement for machinery intended for underground work	-
6	Essential health and safety requirement to offset the particular hazards due to the lifting or moving of persons	-

2.1 Risk assessment

Product: NOVA VOYAGER DVR DRILL PRESS

All models:

18" Voyager DVR Drill Press

15" Voyager DVR Drill Press

16" Voyager DVR Drill Press

20" Voyager DVR Drill Press

22" Voyager DVR Drill Press

This risk assessment report is based on the methods in the EN ISO 12100:2010 standards, and the 4 factors S-A-G-W have been used for evaluating the level of risks.

S : Severity of possible harm

- S1 : Slight (normally reversible)
- S2 : Serious (normally irreversible)
- S3 : Cause a few men die
- S4 : Calamity or cause many men die

A : Frequency any duration of exposure

- A1 : Seldom to very often
- A2 : Frequent to continuous

G : Possibilities of avoidance

- G1 : Possible
- G2 : Impossible

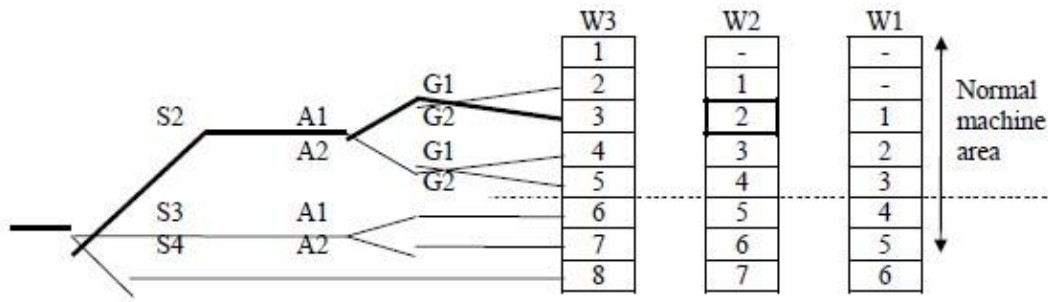
W : Probability of occurrence of harm

- W1 : Low
- W2 : Medium
- W3 : High

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Solutions for the level of hazards

- 1 : Protected by warning sign
- 2 : Protected by guard and warning sign
- 3 : Consider the other design, choose the best one, add both guard and warning sign
- 4 : Consider another two design, choose the best one, add both guard and warning sign
- 5 : Consider another three design, choose the best one, add both guard and warning sign

No.	Hazards source	S	A	G	W	Level
Mechanical hazards						
1.0-1	Mechanical hazards due to machine parts or work pieces					
1.0-2	Mechanical hazards due to accumulation of energy inside the machinery					
1.1	Crushing					
1.2	Shearing					
1.3	Cutting or severing					
1.4	Entanglement					
1.5	Drawing-in or trapping	2	1	1	2	1
1.6	Impact					
1.7	Stabbing or puncture					
1.8	Friction or abrasion					
1.9	High pressure fluid injection or ejection					
Electrical hazards						
2.1	Contact with live parts	1	1	1	1	-
2.2	Contact with parts which have become live under faulty conditions	1	1	1	1	-
2.3	Approach to live part under high voltage					
2.4	Electrostatic phenomena					

2.5	Thermal radiation or other phenomena such as projection of molten particles and chemical effects from short circuits, overloads etc.					
Thermal hazards						
3.1	Burns, scalds and other injuries by a possible contact of persons with objects or materials with an extreme high					
	or low temperature, by flames or explosions and also by the radiation of heat sources					
3.2	Damage to health by hot or cold working environment					
Hazards generated by noise						
4.1	Hearing loss					
4.2	Interference with speech communication, acoustic signals, etc.					
Hazards generated by noise						
5.1	Use of hand held machines resulting in a variety of neurological and vascular disorder					
5.2	Whole body vibration, particular when combined with poor postures					
Hazards generated by radiation						
6.1	Low frequency, radio frequency radiation, microwaves					
6.2	Infrared, visible and ultraviolet light					
6.3	Lasers					
6.4	X and gamma rays					
6.5	Alpha, beta rays, electron or ion beams, neutrons					
Hazards generated by materials and substances processed or used by the machinery						
7.1	Hazards from contact with or inhalation of harmful fluids, gases, mists, fumes and dusts					
7.2	Fire and explosion hazard					
7.3	Biological and microbiological (viral or bacterial) Hazards					
Hazards generated by neglecting ergonomic principles in machine design						
8.1	Unhealthy postures or excessive effort					
8.2	Inadequate consideration of hand-arm or foot-leg anatomy					

8.3	Neglected use of personal protection equipment					
8.4	Inadequate local lighting					
8.5	Mental overload or underload, stress					
8.6	Human error, human behavior	1	1	1	1	-
8.7	Inadequate design, location or identification of manual controls					
8.8	Inadequate design, location or identification of manual controls					
Combination of hazards						
9	Combination of hazards					
Unexpected start-up, unexpected overrun/over-speed						
10.1	Failure/disorder of the control system					
10.2	Restoration of energy on supply after an interruption					
10.3	External influences on electrical equipment					
10.4	Other external influences (gravity, wind, etc.)					

10.5	Errors in the software					
10.6	Error made by the operator (due to mismatch of machinery with human characteristics and abilities, see 8.6)					
Impossibility of stopping the machine in the best possible conditions						
11	Impossibility of stopping the machine in the best possible conditions					
Variations in the rotational speed of tools						
12	Variations in the rotational speed of tools					
Failure of the power supply						
13	Failure of the power supply					
Failure of the control circuit						
14	Failure of the control circuit					
Errors of fitting						
15	Errors of fitting					
Break-up during operation						
16	Break-up during operation					
Falling or ejected objects or fluids						
17	Falling or ejected objects or fluids					
Loss of stability / overturning of machinery						
18	Loss of stability / overturning of machinery					
Slip, trip and fall of persons(related to machinery)						
19	Slip, trip and fall of persons(related to machinery)					
Additional hazards, hazardous situations and hazardous events due to mobility						
20	Relating to the traveling function					
20.1	Movement when starting the engine					
20.2	Movement without a driver at the driving position					
20.3	Movement without all parts in a safe position					
20.4	Excessive speed of pedestrian controlled machinery					
20.5	Excessive oscillations when moving					
20.6	Insufficient ability of machinery to be slowed down, stopped and immobilised					
Linked to the work position (including driving station) on the machine						

21.1	Fall of persons during access to (or at/from) the work position					
21.2	Exhaust gases/lack of oxygen at the work position					
21.3	Fire (flammability of the cab, lack of extinguishing means)					
21.4	Mechanical hazards at the work position : contact with the wheels ; rollover ; fall of objects, penetration by objects ; break-up of parts rotation at high speed ; contact of persons with machine parts or tools (pedestrian controlled machines)					

21.5	Insufficient visibility form the work positions					
21.6	Inadequate lighting					
21.7	Inadequate seating					
21.8	Noise at the work position					
21.9	Vibration at the work position					
21.10	Insufficient means for evacuation/emergency exit					
Due to the control system						
22.1	Inadequate location of manual controls					
22.2	Inadequate design of manual controls and their mode of operation					
Form handling the machine (lack of stability)						
23	Form handling the machine (lack of stability)					
Due to the power source and to the transmission of power						
24.1	Hazards form the engine and the batteries					
24.2	Hazards form the transmission of power between machines					
24.3	Hazards form coupling and towing					
Form/to third persons						
25.1	Unauthorized start-up/use	1	1	1	1	-
25.2	Drift of a part away from its stopping position					
25.3	Lack or inadequacy of visual or acoustic warning means					
Insufficient instructions for the driver/operator						
26	Insufficient instructions for the driver/operator	1	1	1	1	-
Additional hazards, hazardous situations and hazardous events due to lifting						
27	Mechanical hazards and hazardous events					
27.1	Form load falls, collisions, machine tipping caused by :					
27.1.1	Lack of stability					
27.1.2	Uncontrolled loading-overloading-overturning moments exceeded					
27.1.3	Uncontrolled amplitude of movements					
27.1.4	Unexpected/unintended movement of loads					

27.1.5	Inadequate holding devices/accessories					
27.1.6	Collision of more than one machine					
27.2	Form access of persons to load support					
27.3	Form derailment					
27.4	Form insufficient mechanical strength of parts					
27.5	Form inadequate selection of chains, ropes, lifting and accessories and their inadequate integration into the machine					

27.6	Form inadequate selection of chains, ropes, lifting and accessories and their inadequate integration into the machine					
27.7	Form lowering of the load under the control of friction brake					
27.8	Form abnormal conditions of assembly/testing/use/maintenance					
27.9	Form the effect of load on persons (impact by load or counterweight)					
Electrical hazards						
28.1	Form lightning					
Hazards generated by neglecting ergonomic principles						
29.1	Insufficient visibility from the driving position					
Additional hazards, hazardous and situations and hazardous events due to underground work						
30	Mechanical hazards and hazardous events due to:					
30.1	Lack of stability of powered roof supports					
30.2	Failing accelerator or brake control of machinery running on rails					
30.3	Failing or lack of dead man's control of machinery running on rails					
31	Restricted movement of persons					
32	Fire and explosion					
33	Emission of dust, gases etc.					
Additional hazards, hazardous situations and hazardous events due to the lifting or moving of persons						
34	Mechanical hazards and hazardous events due to:					
34.1	Inadequate mechanical strength-inadequate working coefficients					
34.2	Failing of loading control					
34.3	Failing of controls in person carrier (function, priority)					
34.4	Over speed of person carrier					
35	Falling of person from person carrier					
36	Falling or overturning of person carrier					

37	Human error, human behavior					
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NO.	Hazards source	S	A	G	W	Level
1.5	Drawing-in or trapping	2	1	1	1	1
Where	fan parts					
When	Worker access to the fan during operation					
Improvement result						
Improvement result		S	A	G	W	Level
1. Affixing suitable warning signs. 2. Only operation by training/authorized persons. 3. Operation of the machine shall conform to the instructions of the instruction manual. 4. Check and inspection according to the specified durations of the instruction manual.		1	1	1	1	-
NO.	Hazards source	S	A	G	W	Level
2.1	Contact with live parts	1	1	1	1	-
Where	Whole power and control systems					
When	The machine is power on					
Improvement result						
Improvement result		S	A	G	W	Level
1.Only operation by training/authorized persons. 2.Operation of the machine shall conform to the instructions of the instruction manual. 3.Check and inspection according to the specified durations of the instruction manual. 4.Using safety components in accordance with those relevant international standards. 5.Use of warning label.		1	1	1	1	-

NO.	Hazards source	S	A	G	W	Level
2.2	Contact with parts which have become live under faulty conditions	<i>1</i>	<i>1</i>	<i>1</i>	<i>1</i>	-
Where	<i>Whole power and control systems</i>					
When	<i>The machine is power on</i>					
Improvement result						

Improvement result	S	A	G	W	Level
1. Only operation by training/authorized persons. 2. Operation of the machine shall conform to the instructions of the instruction manual. 3. Check and inspection according to the specified durations of the instruction manual. 4. Using safety components in accordance with those relevant international standards. 5. Use of warning label.	1	1	1	1	-

NO.	Hazards source	S	A	G	W	Level
8.6	Human error, human behavior	2	1	1	1	1
Where	Whole machine					
When	Operation, adjustment or maintenance of the machine					
Improvement result						
Improvement result		S	A	G	W	Level
1 Only authorized person can use the machine.		1	1	1	1	-
2 Training before using this machine.						
3 Make reference to the instruction manual before using this machine.						

NO.	Hazards source	S	A	G	W	Level
10.1	Failure/disorder of the control system	1	1	1	1	-
Where	Control circuit/control components					
When	During operation of the machine					
Improvement result						
Method		S	A	G	W	Level
1. Only authorized person can use the machine.		1	1	1	1	-
2. Make reference to the instruction manual before using this machine.						
3. Check before operation.						
4. Periodic maintenance.						

NO.	Hazards source	S	A	G	W	Level
10.3	External influences on electrical equipment	1	1	1	1	-
Where	All electrical equipments equipped on the machine					
When	Working of the electrical equipments					
Improvement result						
Method		S	A	G	W	Level
1. All electrical equipments have been submitted to carry out the EMC testing according to relevant EN standards and get the CE E-mark.		1	1	1	1	-
2. Connection of protective earthing indeed.						
3. Excellent electrical shielded housing.						

NO.	Hazards source	S	A	G	W	Level
14	Failure of the control circuit	1	1	1	1	-
Where	Control circuit/control components					
When	During operation of the machine					
Improvement result						
Method		S	A	G	W	Level
<ul style="list-style-type: none">Checking before operation.Make reference to the instruction manual before operate this machine.Daily/periodic inspection and maintenance.		1	1	1	1	-

NO.	Hazards source	S	A	G	W	Level
25.1	Unauthorized start-up/use	1	1	1	1	-
Where	Control system					
When	Operation, adjustment or maintenance of the machine					
Improvement result						
Method		S	A	G	W	Level
<ul style="list-style-type: none">Always starting the machine by training/authorized persons.During adjustment or maintenance, put a warning nameplate near the working area.Lock the power switch of the machine.		1	1	1	1	-

NO.	Hazards source	S	A	G	W	Level
26	Insufficient instructions for the driver/operator	1	1	1	1	-
Where	Whole machine					
When	Installation, assembly/disassembly, operation, adjustment or maintenance of the machine					
Improvement result						
Method		S	A	G	W	Level
1. Edit the instruction manual in conformity with those requirement of Machinery Directive and EN ISO 12100: 2010 standard.		1	1	1	1	-
2. Each machine accompanied with a complete instruction manual.						

Part III : Test report

Prepared for TEKNATOOL INTERNATIONAL LIMITED

Prepared by Shenzhen BATT Testing Technology Co., Ltd.

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Part III : Test report

3.1 EN 12100:2010 test report

Clause	Requirement-Test	Verdict and Result-Remark
EN ISO 12100:2010 General principles for design — Risk assessment and risk reduction		Pass
6	Risk reduction	
6.1	General	
	<p>The objective of risk reduction can be achieved by the elimination of hazards, or by separately or simultaneously reducing each of the two elements that determine the associated risk:</p> <ul style="list-style-type: none"> _ severity of harm from the hazard under consideration; _ probability of occurrence of that harm. <p>All protective measures intended for reaching this objective shall be applied in the following sequence, referred to as the three-step method (see also Figures 1 and 2).</p>	<p>- Pass.</p> <p>This requirement is complied with.</p> <p>See related clauses.</p>
6.2	Inherently safe design measures	-
6.2.1	General	-
	<p>Inherently safe design measures are the first and most important step in the risk reduction process because protective measures inherent to the characteristics of the machine are likely to remain effective, whereas experience has shown that even well-designed safeguarding may fail or be violated and information for use may not be followed.</p>	<p>Pass.</p> <p>Appropriate machine design has been performed by the manufacturer.</p>
	<p>Inherently safe design measures are achieved by avoiding hazards or reducing risks by a suitable choice of design features of the machine itself and/or interaction between the exposed persons and themachine.</p>	<p>Pass.</p> <p>Appropriate machine design has been performed by the manufacturer.</p>
	<p>NOTE See 6.3 for safeguarding and complementary measures that can be used to achieve the risk reduction objectives in the case where inherently safe design measures are not sufficient (see 6.1 for the three-step method).</p>	
6.2.2	Consideration of geometrical factors and physical aspects	-

6.2.2.1	Geometrical factors Such factors include the following.	-
	<p>a) The form of machinery is designed to maximize direct visibility of the working areas and hazard zones from the control position — reducing blind spots, for example — and choosing and locating means of indirect vision where necessary (mirrors, etc.) so as to take into account the characteristics of human vision, particularly when safe operation requires permanent direct control by the operator, for example:</p> <ul style="list-style-type: none"> _ the travelling and working area of mobile machines; _ the zone of movement of lifted loads or of the carrier of machinery for lifting persons; _ the area of contact of the tool of a hand-held or hand-guided machine with the material being worked. The design of the machine shall be such that, from the main control position, the operator is able to ensure that there are no exposed persons in the danger zones. 	<p>Pass.</p> <p>Appropriate machine design has been performed by the manufacturer.</p>
	<p>b) The form and the relative location of the mechanical components parts: for instance, crushing and shearing hazards are avoided by increasing the minimum gap between the moving parts, such that the part of the body under consideration can enter the gap safely, or by reducing the gap so that no part of the body can enter it (see ISO 13854 and ISO 13857).</p>	<p>Pass.</p> <p>Appropriate machine design has been performed by the manufacturer.</p>
	<p>c) Avoiding sharp edges and corners, protruding parts: in so far as their purpose allows, accessible parts of the machinery shall have no sharp edges, no sharp angles, no rough surfaces, no protruding parts likely to cause injury, and no openings which can —trap‖ parts of the body or clothing. In particular, sheet metal edges shall be deburred, flanged or trimmed, and open ends of tubes which can cause a —trap‖ shall be capped.</p>	<p>Pass.</p> <p>Appropriate machine design has been performed by the manufacturer.</p>
	<p>d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).</p>	<p>Pass.</p> <p>Appropriate machine design has been performed by the manufacturer.</p>
6.2.2.2	Physical aspects -	-

	Such aspects include the following:	-
	a) limiting the actuating force to a sufficiently low value so that the actuated part does not generate a mechanical hazard;	Pass. The actuating force has been limited to be a sufficiently low value so that the actuated part does not generate a mechanical hazard.
	b) limiting the mass and/or velocity of the movable elements, and hence their kinetic energy;	Pass. This have been limited.
	<p>- c) limiting the emissions by acting on the characteristics of the source using measures for reducing</p> <p>1) noise emission at source (see ISO/TR 11688-1), 2) the emission of vibration at source, such as redistribution or addition of mass and changes of process parameters [for example, frequency and/or amplitude of movements (for hand-held and hand-guided machinery, see CR 1030-1)],</p> <p>3) the emission of hazardous substances, including the use of less hazardous substances or dust-reducing processes (granules instead of powders, milling instead of grinding), and</p> <p>4) radiation emissions, including, for example, avoiding the use of hazardous radiation sources, limiting the power of radiation to the lowest level sufficient for the proper functioning of the machine, designing the source so that the beam is concentrated on the target, increasing the distance between the source and the operator or providing for remote operation of the machinery [measures for reducing emission of non-ionizing radiation are given in 6.3.4.5 (see also EN 12198-1 and EN 12198-3)].</p>	Pass. The emissions by acting on the characteristics of the source have been limited.
4.3	Taking into account the general technical knowledge regarding machine design This general technical knowledge can be derived from technical specifications for design (e.g. standards, design codes, calculation rules). These should be used to cover :	-
	a) mechanical stresses such as	-

	- stress limitation by implementation of correct calculation, construction and fastening methods as regards, e.g. bolted assemblies, welded assemblies	Pass. Has been taken into account.
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	- stress limitation by overload prevention, (e.g. —fusible plugs, pressure-limiting valve, breakage points, torque-limiting devices);	Pass. Has been taken into account.
	- avoiding fatigue in elements under variable stresses (notably cyclic stresses);	Pass. Has been taken into account.
	- static and dynamic balancing of rotating elements;	Pass. Has been taken into account
	b) materials and their properties such as	-
	- resistance to corrosion, ageing, abrasion and wear;	Pass. It has appropriate coating.
	- hardness, ductility, brittleness;	Pass. The materials have been treated by appropriate methods.
	- homogeneity;	Pass. The materials have been treated by appropriate methods
	- toxicity;	Pass. The materials is non-toxicity.
	- flammability.	Pass. The materials no flammability.
	c) emission values for :	-
	- noise;	Pass. No noise will result in hazard in this machine.
	- vibration;	Pass. No vibration will result in hazard in this machine.
	- hazardous substances;	Pass. No hazardous substances will result in hazard in this machine.
	- radiation.	Pass. No radiation will result in hazard in this machine.

	When the reliability of particular components or assemblies is critical for safety (e.g. ropes, chains, lifting accessories for lifting loads or persons), stress values shall be multiplied by appropriate working coefficients.	Pass. Appropriate working coefficients have been taken into account during design and calculation.
6.2.4	Choice of an appropriate technology	-
	One or more hazards can be eliminated or risks reduced by the choice of the technology to be used in certain	-

	applications, e.g. :	
	a) on machines intended for use in explosive atmospheres: <ul style="list-style-type: none"> - fully pneumatic or hydraulic control system and machine actuators; - —intrinsically safe electrical equipment (see IEC60079-11) 	Not applicable.
	b) for particular products to be processed such as a solvent: equipment assuring that the temperature will remain far below the flash point.	Not applicable.
	c) alternative equipment to avoid high noise level, e.g.: <ul style="list-style-type: none"> - electrical instead of pneumatic equipment - in certain conditions, water cutting instead of mechanical equipment. 	Not applicable.
6.2.5	Applying the principle of the positive mechanical action	-
	Positive mechanical action is achieved when a moving mechanical component inevitably moves another component along with it, either by direct contact or via rigid elements. An example of this is positive opening operation of switching devices in an electrical circuit (see IEC 60947-5-1 and ISO 14119).	Pass. The principle of the positive mechanical action of a component on another component has been applied.
6.2.6	Provisions for stability	-
	Machines shall be designed to have sufficient stability to allow them to be used safely in their specified conditions of use.	Pass. Satisfied it.
	Factors to be taken into account include	-
	<ul style="list-style-type: none"> - geometry of the base; - weight distribution, including loading; - dynamic forces due to movements of parts of the machine, of the machine itself, or of elements held by the machine which may result in an overturning moment; - vibration 	Pass. Taken into account during design.
	- oscillations of the centre of gravity;	Not applicable
	- characteristics of the supporting surface in case of traveling or installation on different sites (e.g. ground conditions, slope);	Pass. Taken into account during design.
	- external forces (e.g. wind pressure, manual forces)	Pass. Taken into account during design.



	Stability shall be considered in all phases of the life of the machine, including handling, traveling, installation, use, de-commissioning and dismantling.	Pass. Taken into account during design.
	Other protective measures for stability relevant to	Pass. Please see the related

	safeguarding are given in 6.3.2.6	clause.
6.2.7	Provision for maintainability	-
	When designing a machine, the following maintainability factors shall be taken into account:	-
	- accessibility, taking into account the environment and the human body measurements, including the dimensions of the working clothes and tools used;	Pass. These factors have been taken into account during design.
	- ease of handling, taking into account human capabilities;	Pass. The factor has been taken into account during design.
	- limitation of the number of special tools and equipment;	Pass. The factor has been taken into account during design.
6.2.8	Observing ergonomic principles	-
	Ergonomic principles shall be taken into account in designing machinery to reduce mental or physical stress and strain of the operator.	Pass. Appropriate ergonomic principles have been taken into account in designing machinery
	These principles shall be considered when allocating functions to operator and machine (degree of automation) in the basic design.	Pass. These principles have been taken into account during allocating functions to operator and machine.
	Account shall be taken of body sizes likely to be found in the intended user population, strengths and postures, movement amplitudes, frequency of cyclic actions (see ISO 10075 and ISO 10075-2)	Pass. All these factors have been taken into account during design.
	All elements of the —operator-machine interface such as controls, signaling or data display elements, shall be designed to be easily understood so that clear and unambiguous interaction between the operator and the machine is possible. (see EN 614-1, ISO 6385, EN 13861 and IEC 61310-1)	Pass. All arrangement and design of manual controls have been checked in compliance with.
	Designer's attention is especially drawn to following ergonomic aspects of machine design	-
	a) Avoiding stressful postures and movements during use of the machine (e.g. by providing facilities to adjust the machine to suit the various operators).	Pass. Stressful postures and movements during use of the machine have been avoided.

	b) Designing machines, and more especially hand-held and mobile machines to enable them to be operated easily taking into account human effort, actuation of controls and hand, arm and leg anatomy.	Pass. This machine has been adjusted to the human strength and convenient movement.
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	c) Limit as far as possible noise, vibration and thermal effects such as extreme temperature	Pass. This machine with low noise, low vibration.
	d) Avoid linking the operator's working rhythm to an automatic succession of cycles.	Pass. This situation has been avoided.
	e) Providing local lighting on or in the machine for the illumination of the working area and of adjusting, setting-up, and frequent maintenance zones when the design features of the machine and /or its guards render the ambient lighting inadequate. Flicker, dazzling, shadows and stroboscopic effects shall be avoided if they can cause a risk. If the position of the lighting source has to be adjusted, its location shall be such that it does not cause any risk to persons making the adjustment.	Not applicable.
	f) Select, locate and identify manual controls (actuators) so that	-
	- they are clearly visible and identifiable and appropriately marked where necessary (see 6.4.4)	Pass. All design and arrangement are compliance with this requirement.
	- they can be safely operated without hesitation or loss of time and without ambiguity (e.g. a standard layout of controls reduces the possibility of error when an operator changes from a machine to another one of similar type having the same pattern of operation)	Pass. All design and arrangement of the control logic have been checked in compliance with this requirement.
	- their location (for push-buttons) and their movement (for levers and handwheels) are consistent with their effect (see IEC 61310-3)	Pass. All the function has been checked in compliance with this requirement.
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence (e.g. keyboards), the action to be performed shall be clearly displayed and subject to confirmation where necessary.	Not applicable.
	Controls shall be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles.	Pass. All the arrangement of the control logic have been checked in compliance with this requirement.



	Constraints due to the necessary or foreseeable use of personal protective equipment(such as footwear,	Pas. taken into account
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	gloves)shall be taken into account.	
	g) Select, design and locate indicators, dials and visual display units so that	-
	- they fit within the parameters and characteristics of human perception	Pass.
	- information displayed can be detected, identified and interpreted conveniently, i.e. long lasting, distinct, unambiguous and understandable with respect to the operator's requirements and the intended use;	Pass. All the information displayed comply with this requirement.
	- the operator is able to perceive them from the control position	Pass.
6.2.9	Preventing electrical hazard	-
	For the design of the electrical equipment of machines IEC 60204-1 gives general provisions, especially in clause 6 for protection against electric shock.	Pass. Please also make reference to EN 60204-1 test report.
	For requirements related to specific machines, see corresponding IEC standards (e.g. series of IEC 61029, IEC 60745, IEC 60335).	Not applicable.
6.2.10	Preventing and hydraulic hazards	-
	Pneumatic and hydraulic equipment of machinery shall be designed so that :	-
	- the maximum rated pressure cannot be exceeded in the circuits (e.g. by means of pressure limiting devices)	Pass. Appropriate limiting devices have been provided.
	- no hazard results from pressure surges or rises, pressure losses or drops or losses of vacuum;	Pass. No such hazards exist.
	- no hazardous fluid jet or sudden hazardous movement of the hose (whiplash)results from leakage or component failures;	Not applicable.
	- air receivers, air reservoirs or similar vessels (e.g. in gas loaded accumulators) comply with the design rules for these elements;	Pass. The devices are designed appropriately.
	- air elements of the equipment, and especially pipes and hoses, be protected against harmful external effects;	Pass. The pipes have been protected by appropriated devices.

	- as far as possible, reservoirs and similar vessels (e.g. in gas loaded accumulators) are automatically depressurized when isolating the machine from its power supply (see 6.3.5.4) and, if it is not possible, means are provided for their isolation, local depressurizing and pressure indication (see also ISO 14118:2000, clause 5)	This requirement is complied with
	- all elements which remain under pressure after isolation of the machine from its power supply be	Pass. This requirement is

	provided with clearly identified exhaust devices, and a warning label drawing attention to the necessity of depressurizing those elements before any setting or maintenance activity on the machine. See also ISO 4413 and ISO4414	complied with by appropriate design.
6.2.11	Applying inherently safe design measures to control system	-
6.2.11.1	General	-
	The design measures of the control system shall be chosen so that their safety-related performance provides a sufficient amount of risk reduction (see ISO 13849-1 or IEC 62061)	Pass. Inherently safe design measures to control system have applied.
	The correct design of machine control systems can avoid unforeseen and potentially hazardous machine behaviour.	Pass. Inherently safe design measures to control system have applied.
	- an unsuitable design or modification (accidental or deliberate) of the control system logic;	Pass. No this kind of hazard in this machine
	- a temporary or permanent defect or a failure of one or several components of the control system;	Pass
	- a variation or a failure in the power supply of the control system;	Pass.No this kind of hazard in this machine
	- inappropriate selection, design and location of the control devices;	Not applicable. No this kind of hazard in this machine
	Typical examples of hazardous machine behaviour are :	-
	- unintended/unexpected start-up(see ISO 14118)	Pass.No this kind of hazard
	- uncontrolled speed change;	Pass.No this kind of hazard
	- failure to stop moving parts;	Pass.No this kind of hazard
	- dropping or ejection of a mobile part of the machine or of a workpiece clamped by the machine;	Pass.No this kind of hazard
	- machine action resulting from inhibition (defeating or failure) of protective devices	Pass.No this kind of hazard
	In order to prevent hazardous machine behaviour and to achieve safety functions, the design of control systems shall comply with the principles and methods presented in this subclause 6.2.11 and in 6.2.12.	Pass. the design of control systems comply with the related principles and methods

	These principles and methods shall be applied singly or in combination as appropriate to the circumstances (see ISO 13849-1 and IEC 60204-1 and IEC 62061).	Pass. Please see the related clause.
	Control systems shall be designed to enable the operator to interact with the machine safely and easily; this	-

	requires one or several of the following solutions;	
	- systematic analysis of start and stop conditions;	Pass. Systematic analysis have been applied.
	- provision for specific operating modes (e.g. start-up after normal stop, restart after cycle interruption or after emergency stop, removal of the workpieces contained in the machine, operation of a part of the machine in case of a failure of a machine element)	Pass. Enough provisions have been provided.
	- clear display of the faults;	Pass.
	- measures to prevent accidental generation of unexpected start commands (e.g. shrouded start device) likely to cause dangerous machine behaviour (see ISO 14118:2000, figure 1)	Pass. Main switch with lock and related devices are provided.
	- maintained stop commands(e.g. interlock) to prevent restarting that could result in dangerous machine behaviour (see ISO 14118:2000, figure 1)	Pass. This requirement is complied with.
	An assembly of machines may be divided into several zones for emergency stopping, for stopping as a result of protective devices and/or for isolation and energy dissipation.	Not applicable.
	The different zones shall be clearly defined and it shall be obvious which parts of the machine belong to which zone.	Not applicable.
	Likewise it shall be obvious which control devices (e.g. emergency stop devices, supply disconnecting devices)and/or protective devices belong to which zone.	Not applicable.
	The interfaces between zones shall be designed such that no function in one zone creates hazards in another zone which has been stopped for an intervention.	Not applicable.
	Control systems shall be designed to limit the movements of parts of the machinery, the machine itself, or workpieces and/or loads held by the machinery, to the safe design parameters(e.g. range, speed, acceleration, deceleration, load capacity). Allowance shall be made for dynamic effects (e.g. the swinging of loads).	Not applicable.
	For example:	-
	- the traveling speed of mobile pedestrian controlled machinery other than remote-controlled shall be compatible with walking speed.	Not applicable



	- the range, speed, acceleration and deceleration of movements of the person-carrier and carrying vehicle for lifting persons shall be limited to non-hazardous	Not applicable
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	values, taking into account the total reaction time of the operator and the machine.	
	- the range of movements of parts of machinery for lifting loads shall be kept within specified limits.	Not applicable
	When machinery is designed to use synchronously different elements which can also be used independently the control system shall be designed to prevent risks due to lack of synchronization.	Not applicable
6.2.11.2	Starting of internal power source/switching on an external power supply	-
	The starting of an internal power source or switching-on of an external power supply shall not result in a hazardous situation. For example: _ starting the internal combustion engine shall not lead to movement of a mobile machine; _ connection to mains electricity supply shall not result in the starting of working parts of a machine. See IEC 60204-1:2005, 7.5 (see also Annexes A and B).	Pass. Please also make reference to EN 60204-1 test report.
6.2.11.3	Starting/stopping of a mechanism	-
	The primary action for starting or accelerating the movement of a mechanism should be performed by application or increase of voltage or fluid pressure, or, if binary logic elements are considered, by passage from state 0 to state 1 (if state 1 represents the highest energy state)	Pass. This requirement has been taken into account during design.
	The primary action for stopping or slowing down should be performed by removal or reduction of voltage or fluid pressure, or, if binary logic elements are considered, by passage from state 1 to state 0 (if state 1 represents the highest energy state).	Pass. The type of stopping of this machine belongs to state 1 and state 0.
	When, in order for the operator to maintain permanent control of deceleration, this principle is not observed (e.g. a hydraulic braking device of a self-propelled mobile machine), the machine shall be equipped with a means of slowing and stopping in case of failure of the main braking system	Pass. No such situation exist.
6.2.11.4	Restart after power interruption	-

	If it may generate a hazard, the spontaneous restart of a machine when it is re-energized after power interruption shall be prevented (e.g. by use of a self-maintained relay, contactor or valve).	Pass. The spontaneous restart of amachine when it is re-energized after power interruption has been prevented by contactor.
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6.2.11.5	Interruption of power supply situations resulting from interruption or excessive fluctuation of the power supply. At least the following requirements shall be met:	Machinery shall be designed to prevent hazardous
	- the stopping function of the machinery shall remain;	Pass.
	- all devices whose permanent operation is required for safety shall operation an effective way to maintain safety (e.g. locking, clamping devices, cooling or heating devices, power-assisted steering of self-propelled mobile machinery);	Pass.
	- parts of machinery or workpieces and/or loads held by machinery which are liable to move as a result of potential energy shall be retained for the time necessary to allow them to be safely lowered.	Pass. No such situation exists.
6.2.11.6	Use of automatic monitoring	-
	Automatic monitoring is intended to ensure that a safety function(s) implemented by a protective measure do(es) not fail to be performed if the ability of a component or an element to perform its function is diminished, or if the process conditions are	Pass. Appropriate automatic monitoring has been used.
	Automatic monitoring either detects a fault immediately or carries out periodic checks so that a fault is detected before the next demand upon the safety function.	Pass. Appropriate automatic monitoring has been used.
	In either case, the protective measure can be initiated immediately or delayed until a specific event occurs (e.g. the beginning of the machine cycle.) The protective measures may be , e.g.:	Pass. Appropriate automatic monitoring has been used.
	- the stopping of the hazardous process;	Pass. Emergency stop is provided.
	- preventing the re-start of this process after the first stop following the failure;	Pass. Reset before restart is necessary.
	- the triggering of an alarm	Not applicable
6.2.11.7	Safety functions implemented by programmable electronic control systems	-
6.2.11.7.1	General	-
	A control system including programmable electronic equipment (e.g. programmable controllers) can be used to implement safety functions t machinery.	Pass

	equipment (e.g. programmable controllers) can be used to implement safety functions t machinery.	Pass safety functions are considered during design.
	The design of the programmable electronic control system shall be such that the probability of random hardware failures and the likelihood of systematic	Pass safety functions are considered during design.

	failures that can adversely affect the performance of the safety-related control function(s) are sufficiently low.	
	Where a programmable electronic control system performs a monitoring function, the system behaviour on detection of a fault shall be considered (see also IEC 61508 series for further guidance)	Pass satisfied this
	The programmable electronic control system should be installed and validated to ensure that the specified performance (e.g. safety integrity level (SIL) in IEC 61508 series) for each safety function has been achieved.	Pass ,it be installed and validated to ensure that the specified performance
	Validation comprises testing an analysis (e.g. static, dynamic or failure analysis) to show that all parts interact correctly to perform the safety function and that unintended functions do not occur.	Pass. All parts interact correctly to perform the safety function and that unintended functions do not occur.
6.2.11.7.2	Hardware aspects	
	The hardware (including e.g. sensors, actuators, logic solvers) shall be selected (and/or designed) and installed to meet both the functional and performance requirements of the safety function(s) to be performed, in particular, by means of :	Pass. The hardware has been selected and installed to meet both the functional and performance requirements of the safety functions to be performed.
	- architectural constraints (e.g. the configuration of the system, its ability to tolerate faults, its behaviour on detection of a fault);	Pass. Appropriate devices are provided.
	- selecting (and/or designing) equipment and devices with an appropriate probability of dangerous random hardware failure;	Pass. Appropriate devices are provided
	Incorporating measures and techniques within the hardware to avoid systematic failures and control systematic faults.	Pass. Appropriate devices are provided.
6.2.11.7.3	Software aspects	-
	The software (including internal operating software (or system software) and application software) shall be designed so as to satisfy the performance specification for the safety functions (see also IEC 61508-3)	Pass. It has PLC.
	Application software	-

	Application software should not be re-programmable by the user.	Not applicable.
	This may be achieved by use of embedded software in a non re-programmable memory (e.g. micro-controller,	Not applicable.

	application specific integrated circuit (ASIC)	
	When the application requires reprogramming by the user, the access o the software dealing with safety functions should be restricted e.g. by : - locks; - passwords for the authorized persons	Not applicable.
6.2.11.8	Principles relating to manual control	
	a) Manual control devices shall be designed and located according to the relevant ergonomic principles given in 6.2.8	Pass. Manual control devices have been designed and located according to the relevant ergonomic principles given in 4.8.7.
	b) A stop control device shall be placed near each start control device. Where the start/stop function is performed by means of a hold-to-run control, a separate stop control device shall be provided when a risk can result from the hold-to-run control device failing to deliver a stop command when released.	Pass. A stop control device has been placed near each start control device.
	c) Manual controls shall be located out of reach of the danger zones (see IEC 61310-3), except for certain controls where, of necessity, they are located within a danger zone, such as emergency stop or teach pendant.	Pass. Manual controls have been located out of reach of the danger zones.
	d) Whenever possible, control devices and control positions shall be located so that the operator is able to observe the working area or hazard zone.	Pass. The control devices and control positions have been located so that the operator is able to observe the working area or hazard zone.
	The driver of a ride-on mobile machine shall be able to actuate all control devices required to operate the machine from the driving position, except for functions which can be controlled more safely from other positions.	Not applicable.
	On machinery intended for lifting persons, controls for lifting and lowering and, if appropriate, for moving the carrier, shall generally be located in the carrier. If safe operation requires controls to be situated outside the carrier, the operator in the carrier shall be provided with the means of preventing hazardous movements.	Not applicable.

	e) if it is possible to start the same hazardous element by means of several controls, the control circuit shall be so arranged that only one control is effective at a given	Not applicable.
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	time. This applies especially to machines which can be manually controlled by means among others of a portable control unit (teach pendant, for instance), with which the operator may enter danger zones.	
	f) Control actuators shall be designed or guarded so that their effect, where a risk is involved, cannot occur without intentional operation (see ISO 9355-1 and ISO 447)	Pass. This requirement is complied with.
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be taken to ensure the presence of the operator at the control position , e.g. by the design and location of control devices.	Pass. This requirement is complied with.
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be taken to ensure the presence of the operator at the control position , e.g. by the design and location of control devices.	Pass. This requirement is complied with.
	h) For cableless control an automatic stop shall be performed when correct control signals are not received, including loss of communication (see IEC 60204-1)	Not applicable.
	Control mode for setting, teaching, process changeover fault-finding, cleaning or maintenance	- Not applicable.
	Where, for setting, teaching, process changeover, fault-finding, cleaning or maintenance of machinery, a guard has to be displaced or removed and/or a protective device has to be disabled, and where it is necessary for the purpose of these operations for the machinery or part of the machinery to be put in operation, safety of the operator shall be achieved using a specific control mode which simultaneously:	Not applicable.
	- disables all other control modes;	Not applicable.
	- permits operation of the hazardous elements only by continuous actuation of an enabling device, a hold-to-run control device or a two-hand control device;	Not applicable.
	- permits operation of the hazardous elements only in reduced risk conditions (e.g. reduced speed, reduced power/force, step-by-step operation, e.g. with a limited movement control device)	Not applicable.

	prevents any operation of hazardous functions by voluntary or involuntary action on the machine's sensors.	Not applicable.
	This control mode shall be associated with one or more of following measures:	Not applicable.

	- restriction of access to the danger zone as far as possible.	Not applicable.
	- emergency stop control within immediate reach of the operator;	Not applicable.
	- portable control unit (teach pendant) and/or local controls allowing sight of the controlled elements.(see IEC 60204-1:1997, 9.2.4)	Not applicable.
6.2.11.10	Selection of control and operating modes	-
	If machinery has been designed and built to allow for its use in several control or operating modes requiring different protective measures and/or work procedures (e.g. to allow for adjustment , setting, maintenance, inspection), it shall be fitted with a mode selector which can be locked in each position.	Not applicable.
	Each position of the selector shall be clearly identifiable and shall exclusively allow one control or operating mode.	Not applicable.
	The selector may be replaced by another selection means which restricts the use of certain functions of the machinery to certain categories of operators (e.g. access codes for certain numerically controlled functions).	Not applicable.
6.2.11.11	Applying measures achieve electromagnetic compatibility (EMC)	-
	For guidance on electromagnetic compatibility, see IEC 60204-1, and IEC 61000-6 series.	Not applicable
6.2.11.12	Provision of diagnostic systems to aid fault-finding	-
	Diagnostic systems to aid fault finding should be included in the control system so that there is no need to disable any protective measures.	Not applicable.
6.2.12	Minimizing the probability of failure of safety functions	-
6.2.12.1	General	-
	Safety of machinery is not only dependent on the reliability of the control systems but also on the reliability of all parts of the machine.The continued operation of the safety functions is essential for the safe use of the machine. This can be achieved by :	Pass
6.2.12.2	Use of reliable components	-

	<p>—Reliable components means components which are capable of withstanding all disturbances and stresses associated with the usage of the equipment in the conditions of intended use (including the environmental conditions), for the period of time or the number of operations fixed for the use, with a low probability of failures generating a hazardous</p>	<p>Pass. Reliable components have been used.</p>
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	malfunctioning of the machine. Components shall be selected taking into account all factors mentioned above(see also 6.213)	
6.2.12.3	Use of —oriented failure model components	-
	—Oriented failure model components or systems are those in which the predominant failure mode is known in advance and which can be used so that such a failure leads to a non-hazardous alteration of the machine function.	Not applicable.
	The use of such components should always be considered, particularly in cases where redundancy is (see 6.2.12.4) not employed.	Not applicable.
6.2.12.4	Duplication (or redundancy) of components or subsystems	-
	In the design of safety-related parts of the machine, duplication (or redundancy) of components may be used so that, if one component fails, another component (or other components) continue(s) to perform its (their) function, thereby ensuring that the safety function remains available.	Not applicable.
	In order to allow the proper action to be initiated, component failure shall be preferably detected by automatic monitoring (see 6.2.11.6) or in some circumstances by regular inspection,	Not applicable.
	provided that the inspection interval is shorter than the expected lifetime of the components.	Not applicable.
	Diversity of design and/or technology can be used to avoid common cause failures (e.g. from electromagnetic disturbance) or common mode failures.	Not applicable.
6.2.13	Limiting exposure to hazards through reliability of equipment	-
	Increased reliability of all component parts of machinery reduces the frequency of incidents requiring rectification, thereby reducing exposure to hazards.	Pass. This requirement is complied with.
	This applies to power systems (operative part) as well as to control systems, to safety functions as well as to other functions of machinery.	Pass. This requirement is complied with.
	Safety-critical components (as e.g. certain sensors) with a known reliability shall be used.	Pass. Safety-critical components are used in this machine.

	The elements of guards and of protective services shall be particularly reliable, as their failure can expose persons to hazards, and also as poor reliability would encourage attempts to defeat them.	Pass. This requirement is complied
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6.2.14	Limiting exposure to hazards through mechanization or Automation of loading(feeding) /unloading (removal) operations	-
	Mechanization and automation of machine loading/unloading operations and more generally of handling operations (of workpieces, materials, substances) limit the risk generated by these operations by reducing the exposure of persons to hazards at the operating points.	Pass. This requirement is complied with.
	Automation can be achieved e.g. by robots, handling devices, transfer mechanisms, air blast equipment.	Pass. This requirement has been complied with by design.
	Mechanization can be achieved, e.g. by feeding slides, push rods, hand-operated indexing tables.	Pass. This requirement has been complied with by design.
	While automatic feeding and removal devices have much to offer in preventing accidents to machine operators, they can create danger when any faults are being rectified.	Pass. Appropriate provisions have been provided.
	Care shall be taken to ensure that the use of these devices does not introduce further hazards (e.g. trapping, crushing) between the devices and parts of the machine or workpieces/materials being processed.	Pass. These devices will not introduce further hazards
	Suitable safeguards (see 6.3) shall be provided if this cannot be ensured.	Pass. Please see the related clause.
	Automatic feeding and removal devices with their own control systems and the control systems of the associated machine shall be interconnected after thoroughly studying how all safety functions are performed in all control and operation modes of the whole equipment.	Pass. This requirement has been complied with by design.
6.2.15	Limiting exposure to hazards through location of the setting and maintenance points outside of danger zones.	Pass.
	The need for access to danger zones shall be minimized by locating maintenance, lubrication and setting points outside these zones.	Pass. This requirement has been complied with by design.
6.3	Safeguarding and complementary protective measures	-
6.3.1	General	-

	Guards and protective devices shall be used to protect persons whenever inherently safe design does not reasonably make it possible either to remove hazards or to sufficiently reduce risks. Complementary protective measures involving additional equipment (e.g. emergency stop equipment)may have to be implemented.	Pass. Appropriate guards and protective devices have been used to protect persons whenever inherently safe design does not reasonably make it possible either to remove
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		hazards or to sufficiently reduce risks.
	The different kinds of guards and protective devices are defined in 3.27 and 3.28.	Pass. Please see the related clause.
	Certain safeguards may be used to avoid exposure to more than one hazard (e.g. a fixed guard preventing access to a zone where a mechanical hazard is present being used to reduce noise level and collect toxic emissions)	Pass. Such safeguards exist.
6.3.2	Selection and implementation of guards and protective devices	-
6.3.2.1	General	-
	This subclause gives guidelines for the selection and the implementation of guards and protective devices the primary purpose of which is to protect persons against hazard generated by moving parts, according to the nature of those parts (see figure 4) and to the need for access to the danger zone(s).	Pass. Please see the related clause.
	The exact choice of a safeguard for a particular machine shall be made on the basis of the risk assessment for that machine.	Pass. Please see the related clause.
	In selecting an appropriate safeguard for a particular type of machinery or hazard zone, it shall be borne in mind that a fixed guard is simple and shall be used where access of an operator to the danger zone is not required during normal operation (operation without any malfunction) of the machinery.	Pass.
	As the need for frequency of access increase this inevitably leads to the fixed guard not being replaced	Pass. This requirement is complied with.
	This requires the use of an alternative protective measure (movable interlocking guard, sensitive protective equipment.)	Pass. Movable interlocking guard is used.

	A combination of safeguards may sometimes be required. For example , where, in conjunction with a fixed guard, a mechanical loading (feeding) device is used to feed a workpiece into a machine, thereby removing the need for access to the primary hazard zone, a trip device may be required to protect against the secondary drawing-in or shearing hazard between the mechanical loading (feeding) device, when reachable, and the fixed guard.	Not applicable.
	Consideration shall be given to the enclosure of control positions or intervention zones to provide combined	Pass. This requirement has been

	protection against several hazards which may include:	taken in to consideration.
	- hazards from falling or ejected objects (e.g. falling object protection structure)	Pass.No such hazards exist in this machine.
	- emission hazards (e.g. protection against noise, vibration, radiation , harmful substances)	Pass. No such hazards exist in this machine.
	- hazards due to the environment (e.g. protection against heat, cold, foul weather)	Pass. No such hazards exist in this machine.
	- hazards due to tipping over or rolling over of machinery (e.g. roll-over or tip-over protection structure)	Pass. No such hazards exist in this machine.
	The design of such enclosed work stations (e.g. cabs and cabins) shall take into account ergonomic principles concerning visibility, lighting, atmospheric conditions, access, posture.	Pass. No such hazards exist in this machine
6.3.2.2	Where access to the hazard zone is not required during normal operation	-
	Where access to the hazard zone is not required during normal operation of the machinery, safeguard should be selected from the following:	-
	a) fixed guard (see also ISO 14120)	Pass. Fixed guards are provided.
	b) interlocking guard with or without guard locking (see also 6.3.3.2.3, ISO 14119, ISO 14120);	Pass. are provided.
	c) self-closing guard (see ISO 14120:2002, 3.3.2)	Not applicable.
	d) sensitive protective equipment, e.g. electro-sensitive protective equipment (see IEC 61496) or pressure sensitive mat (see ISO 13856)	Not applicable.
6.3.2.3	Where access to the hazard zone is required during normal operation	-
	Where access to the hazard zone is required during normal operation of the machinery , safeguards should be selected from the following:	-
	a) interlocking guard with or without guard locking (see also ISO 14119, ISO 14120 and 6.3.3.2.3 of this standard);	Not applicable.
	b) sensitive protective equipment, e.g electro-sensitive protective equipment (see IEC 61496)	Not applicable.
	e) two-hand control device (see ISO 13851)	Not applicable.

	e) two-hand control device (see ISO 13851)	Not applicable.
6.3.2.4	Where access to the hazard zone is required for machine setting, teaching, process changeover, fault finding, cleaning or maintenance.	-

	As far as possible, machines shall be designed so that the safeguards provided for the protection of the production operator may ensure also the protection of personnel in charge of setting, teaching, process changeover, fault finding, cleaning or maintenance without hindering them in performing their task.	Not applicable.
	Such tasks shall be identified and considered in the risk assessment as parts of the use of the machine (see 5.2)	Not applicable.
6.3.2.5	Selection and implementation of sensitive protective equipment	-
6.3.2.5.1	Selection	-
	Due to the great diversity of the technologies on which their detection function is based, all types of sensitive protective equipment are far from being equally suitable for safety applications.	Not applicable.
	The following provisions are intended to provide the designer with criteria for selecting , for each application , the most suitable device(s).	Not applicable.
	Types of sensitive protective equipment include, e.g.:	-
	- light curtains;	Not applicable.
	- scanning devices as, e.g. laser scanners;	Not applicable.
	- pressure sensitive mats;	Not applicable.
	- trip bars, trip wires.	Not applicable.
	Sensitive protective equipment can be used:	-
	- for tripping purposes;	Not applicable.
	- for presence sensing;	Not applicable.
	- for both tripping and presence sensing	Not applicable.
	- to re-initiate machine operation, a practice which is subject to stringent conditions.	Not applicable.
	The following characteristics of the machinery, among others, can preclude the sole use of sensitive protective equipment:	Not applicable.-
	- tendency for the machinery to eject materials or component parts;	Not applicable.
	- necessity to guard against emissions (noise, radiation, dust, etc.)	Not applicable.
	- erratic or excessive machine stopping time;	Not applicable.

	- inability of a machine to stop part-way through a cycle.	Not applicable.
6.3.2.5.2	Implementation	-
	consideration should be given to :	-
	a) - size, characteristics and positioning of the detection zone (see ISO 13855, which deals with the positioning of some types of sensitive protective	Not applicable.

	equipment)	
	b) - reaction of the device to fault conditions (see IEC 61496 for electro-sensitive protective equipment)	Not applicable.
	c)- possibility of circumvention	Not applicable.
	d)- detection capability and its variation over the course of time (e.g. as a result of its susceptibility to different environmental conditions such as the presence of reflecting surfaces, other artificial light sources, sunlight or impurities in the air.	Not applicable.
	sensitive protective equipment shall be integrated in the operative part and associated with the control system of the machine so that:	-
	- a command is given as soon as a person or part of a person is detected;	Not applicable.
	- the withdrawal of the person or part of a person detected does not, by itself, restart the hazardous machine function (s); therefore, the command given by the sensitive protective equipment shall be maintained by the control system until a new command is given;	Not applicable.
	- restarting the hazardous machine function(s) results from the voluntary actuation , by the operator, of a control device placed outside the hazard zone, where this zone can be observed by the operator;	Not applicable.
	- the machine cannot operate during interruption of the detection function of the sensitive protective equipment, except during muting phases,;	Not applicable.
	- the position and the shape of detection field prevents, possibly together with fixed guards, a person or part of a person from entering the hazard zone, or being present in it, without being detected.	Not applicable.
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation.	-

	In this exceptional application, starting of the machine cycle is initiated by the withdrawal of a person or of the detected part of a person from the sensing field of the sensitive protective equipment, without any additional start command, hence deviating from the general requirement given in the second point of the dashed list in 6.3.2.5.2, above. After switching on the power supply, or when the machine has been stopped by the tripping function of the sensitive protective equipment, the machine cycle shall be initiated only by voluntary actuation of a start control.	Not applicable.
	Cycle initiation by sensitive protective equipment shall	-

	be subject to the following conditions:	
	a) only active optoelectronic protective devices (AOPDs) complying with IEC 61496 series shall be used;	Not applicable.
	b) the requirements for an AOPD used as a tripping and presence-sensing device (see IEC 61496) are satisfied — in particular, location, minimum distance (see ISO 13855), detection capability, reliability and monitoring of control and braking systems;	Not applicable.
	c) the cycle time of the machine is short and the facility to re-initiate the machine upon clearing of the sensing field is limited to a period commensurate with a single normal cycle;	Not applicable.
	d) entering the sensing field of the AOPD(s) or opening interlocking guards is the only way to enter the hazard zone;	Not applicable.
	e) if there is more than one AOPD safeguarding the machine, only one of the AOPD (s) is capable of cycle re-initiation;	Not applicable.
	f) with regard to the higher risk resulting from automatic cycle initiation, the AOPD and the associated control system comply with a higher safety-related performance than under normal conditions.	Not applicable.
6.3.2.6	Protective measures for stability	-
	If stability cannot be achieved by inherently safe design measures such as weight distribution (see 4.6), it will be necessary to maintain it by protective measures such as the use of :	-
	- anchorage bolts;	Pass Anchorage bolts have been used.
	- locking devices	Not applicable.
	- movement limiters or mechanical stops;	Not applicable.
	- acceleration or deceleration limiters;	Not applicable.
	- load limiters;	Not applicable.
	- alarms warning of the approach to stability or tipping limits;	Not applicable.
6.3.2.7	6.3.2.7 Other protective devices	-

	When a machine requires continuous control by the operator(e.g. mobile machines, cranes) and an error of the operator can generate a hazardous situation, this machine shall be equipped with the necessary devices to enable the operation to remain within specified limits , in particular:	Not applicable.
	- when the operator has insufficient visibility of the	Not applicable.

	hazard zone;	
	- when the operator lacks knowledge of the actual value of a safety –related parameter (e.g. .a distance, a speed, the mass of a load, the angle of a slope)	Not applicable.
	- when hazards may result from operations other than those controlled by the operator;	Not applicable.
	The necessary devices include:	-
	- devices for limiting parameters of movement (distance, angle, velocity , acceleration)	Not applicable.
	- overloading and moment limiting devices:	Not applicable.
	- devices to prevent collisions or interference with other machines;	Not applicable.
	-device for preventing hazards to pedestrian operators of mobile machinery or other pedestrians;	Not applicable.
	- torque limiting devices, breakage points to prevent excessive stress of components and assemblies;	Not applicable.
	- devices for limiting pressure, temperature;	Not applicable.
	- devices for monitoring emissions;	Not applicable.
	- devices prevent operation in the absence of the operator at the control position;	Not applicable.
	- device to prevent lifting operations unless stabilizers are in place;	Not applicable.
	- devices to ensure that components are in a safe position before traveling;	Not applicable.
	Automatic protective measures triggered by such devices which take operation of the machinery out of the control of the operator (e.g. automatic stop of hazardous movement) should be preceded or accompanied by a warning signal to enable the operator to take appropriate action (see 6.4.3)	Not applicable.
6.3.3	Requirements for the design of guards and protective devices	-
6.3.3.1	General requirements	-

	Guards and protective devices shall be designed to be suitable for the intended use, taking into account mechanical and other hazards involved. Guards and protective devices shall be compatible with the working environment of the machine and designed so that they cannot be easily defeated. They shall provide the minimum possible interference with activities during operation and other phases of machine life, in order to reduce any incentive to defeat them.	Pass. Guards and protective devices have been appropriately designed.
	Guards and protective devices shall :	-
	- be of robust construction.	Pass.This requirement has

		been taken into account during design.
	- not give rise to any additional hazard;	Pass. This requirement has been taken into account during design.
	- not be easy to by-pass or render non-operational;	Pass. This requirement has been taken into account during design.
	- be located at an adequate distance from the danger zone (see ISO 13857 and ISO 13855).	Pass. This requirement has been taken into account during design.
	- cause minimum obstruction to the view of the production process;	Pass. This requirement has been taken into account during design.
	- enable essential work to be carried out on installation and/or replacement of tools and also for maintenance by allowing access only to the area where the work has to be done, if possible without the guard or protective device having to be moved;	Pass. This requirement has been taken into account during design.
	For openings in the guards see ISO 13857	Pass. This requirement has been taken into account during design.
6.3.3.2	Requirements for fixed guards	
6.3.3.2.1	Functions of guards	-
	The functions that guards can achieve are:	Pass These functions are achieved by fixed guards.
	- prevention of access to the space enclosed by guard and/or - containment/capture of materials, workpieces, chips, liquids which may be ejected or dropped by the machine and reduction of emissions(noise, radiation, hazardous substances such as dust, fumes, gases) which may be generated by the machine.	Pass These functions are achieved by fixed guards.

	Additionally, they may need to have particular properties relating to electricity, temperature, fire, explosion, vibration, visibility(see ISO 14120) and operator position ergonomics(e.g. usability, operator's movements, posture, repetitive movements).	These functions are achieved by fixed guards.
6.3.3.2.2	Requirements for fixed guards	-

	Fixed guards shall be securely held in place:	-
	<ul style="list-style-type: none"> - either permanently (e.g. by welding) - or by means of fasteners (screws, nuts) making removal/opening impossible without using tools; they should not remain closed without their fasteners (see ISO 14120) 	<p>Pass</p> <p>All the fixed guards are securely held in place by appropriate fasteners.</p>
6.3.3.2.3	Requirements for movable guards	-
	a) movable guards which provide protection against hazards generated by moving transmission parts shall :	-
	- as far as possible remain fixed to the machinery or other structure (generally by means of hinges or guides) when open;	<p>Pass.</p> <p>Gemels are used for the movable guards.</p>
	- be interlocking guards (with guard locking when necessary) (see ISO 14119)	NO
	b) movable guards against hazards generated by non-transmission moving parts shall be designed and associated with the machine control system so that:	-
	- moving parts cannot start up while they are within the operator's reach and the operator cannot reach moving parts once they have started up ; this can be achieved by interlocking guards, with guard locking when necessary.	<p>Pass.</p> <p>Interlocking guards are provided to comply with these requirements.</p>
	- they can be adjusted only by an intentional action , such as the use of a tool or a key;	Pass. This requirement is complied with.
	- the absence or failure of one of their components prevents starting of the moving parts or stops them; this can be achieved by automatic monitoring (see 4.11.6)	Pass. This requirement is complied with.
6.3.3.2.4	Requirements for adjustable guards	-
	Adjustable guards may only be used where the hazard zone cannot for operational reasons be completely enclosed;	Not applicable.
	They shall :	-
	- be designed so that the adjustment remains fixed during a given operation;	Not applicable.
	- be readily adjustable without the use of tools;	Not applicable.
6.3.3.2.5	Requirements for interlocking guards with a start function (control guards)	-Not applicable.
	An interlocking guard with a start function may be used provided that	-Not applicable.

	- all requirements for interlocking guards are satisfied (see ISO 14119)	Not applicable.
	- the cycle time of the machine is short	Not applicable.
	- the maximum opening time of the guard is present to a low value (e.g. equal to the cycle time). When this time is exceeded, the hazardous function(s) cannot be	Not applicable.

	initiated by the closing of the interlocking guard with a start function and resetting is necessary before restarting the machine.	
	- the dimensions or shape of the machine do not allow a person, or part of a person, to stay in the hazard zone or between the hazard zone and the guard while the guard is closed (see ISO 14120)	Not applicable.
	- all other guards whether fixed (removable type) or movable are interlocking guards;	Not applicable.
	- the interlocking device associated with the interlocking guard with a start function is designed in such a way – e.g. by duplication of position detectors and use of automatic monitoring (see 4.11.6)- that its failure cannot lead to an unintended/unexpected start-up;	Not applicable.
	- the guard is securely held open (e.g. by a spring or counterweight)such that it cannot initiate a start while falling by its own weight;	Not applicable.
6.3.3.2.6	Hazards from guards	-
	Care shall be taken to prevent hazards which might be generated by :	-
	- the guard construction (e.g. sharp edges or corners, material);	Pass. This requirement has been taken into account during design.
	- the movements of the guards (shearing or crushing zones generated by power-operated guards and by heavy guards which are liable to fall)	Pass. This requirement has been taken into account during design.
6.3.3.3	Technical characteristics of protective devices	-
	Protective devices shall be selected or designed and connected to the control system so as to ensure correct implementation of their safety function (s) is ensured.	Pass. This requirement has been taken into account during design.
	Protective devices shall be selected on the basis of their having met the appropriate product standard (for example, IEC 61496 for active optoelectronic protective devices) or shall be designed according to one or several of the principles formulated in ISO 13849-1 or IEC62061.	Pass. This requirement has been taken into account during design.



	Protective devices shall be installed and connected to the control system so that they cannot be easily defeated.	Pass. his requirement has been Taken into account during design
6.3.3.4	Provisions for alternative types of safeguards.	-

	Provisions should be made to facilitate the fitting of alternative types of safeguards on machinery where it is known that this fitting will be necessary because the work to be done on it will vary.	Not applicable.
6.3.4	Safeguarding for reducing emissions	
6.3.4.1	General	-
	If the measures for the reduction of emissions at source mentioned in 6.2.2.2 are not adequate, the machine shall be provided with additional protective measures (see 6.3.4.2 to 6.3.4.5).	Pass. No such hazard exists.
6.3.4.2	Noise	-
	Additional protective measures include, for example: - enclosures (see ISO 15667) - screens fitted to the machine; - silencers (see ISO 14163)	Pass. No such hazard exists.
6.3.4.3	Vibration	-
	Additional protective measures include, for example, damping devices for vibration isolation between the source and the exposed person such as resilient mounting or suspended seats.	Pass. No such hazard exists.
	For measures for vibration isolation of stationary industrial machinery see EN 1299	Pass. No such hazard exists.
6.3.4.4	Hazardous substances	-
	Additional protective measures include, for example:	-
	- encapsulation of the machine (enclosure with negative pressure);	Not applicable.
	- local exhaust ventilation with filtration.	Not applicable.
	- wetting with liquids;	Not applicable.
	- special ventilation in the area of the machine (air curtains, cabins for operators)	Not applicable.
6.3.4.5	Radiation	-
	Additional protective measures include, for example:	-
	- use of filtering and absorption;	Not applicable.
	- use of attenuating screens or guards	Not applicable.
6.3.5	Complementary protective measures	-
6.3.5.1	General	-

	Protective measures which are neither inherently safe design measures, nor safeguarding (implementation of guards and/or protective devices), nor information for use may have to be implemented as required by the intended use and the reasonably foreseeable misuse of the machine. Such measures include, but are not limited to , the ones dealt with in 6.3.5.2 to 6.3.5.6	Pass. It meet the requirement.
6.3.5.2	Components and elements to achieve the emergency	-

	stop function	
	If following a risk assessment, a machine needs to be fitted with components and elements to achieve an emergency stop function to enable actual or impending emergency situations to be averted, the following requirements apply:	-
	- the actuators shall be clearly identifiable, clearly visible and readily accessible	Pass. The actuators can be clearly identifiable, clearly visible and readily accessible
	- the hazardous process shall be stopped as quickly as possible without creating additional hazards. If this is not possible or the risk cannot be reduced, it should be questioned whether implementation of an emergency stop function is the best solution;	Pass. The hazardous process can be stopped as quickly as possible without creating additional hazards
	- the emergency stop control shall trigger or permit the triggering of certain safeguard movements where necessary.	Pass No this situation exists.
	Once active operation of the emergency stop device has ceased following an emergency stop command, the effect of this command shall be sustained until it is reset.	Pass. Reset is necessary before re-start.
	This reset shall be possible only at that location where the emergency stop command has been initiated. The reset of the device shall not restart the machinery, but only permit restarting.	Pass This requirement is complied with by appropriate design of the emergency stop.
	More details for the design and selection of electrical components and elements to achieve the emergency stop function are provided in IEC 60204 series.	Pass. Please see the related clauses.
6.3.5.3	Measures for the escape and rescue of trapped persons -	-
	Measures for the escape and rescue of trapped persons may consist e.g. of :	-
	- escape routes and shelters in installations generating operator-trapping hazards'	Not applicable.
	- arrangements for moving some elements by hand, after an emergency stop	Not applicable.
	- arrangements for reversing the movement of some elements	Not applicable.
	- anchorage points for descender devices;	Not applicable.
	- means of communication to enable trapped operators to call for help	Not applicable.



6.3.5.4	Measures for isolation and energy dissipation	-
	Especially with regard to their maintenance and repair , machines shall be equipped with the technical means to achieve the isolation from power supply(ies) and	-

	dissipation of stored energy as a result of following actions:	
	a) isolating (disconnecting, separating) the machine (or defined parts of the machine) from all power supplies;	Pass. A main switch with lock is provided.
	b) locking (or otherwise securing) all the isolating units in the isolating position;	Pass. Please see the report for IEC 60204
	c) dissipating or , if this is not possible or practicable, restraining (containing) any stored energy which may give rise to a hazard;	Pass. Please see the report for IEC 60204
	d) verifying, by means of a safe working procedure, that the actions taken according to a), b) and c) above have produced the desired effect.	Pass. Please see the report for IEC 60204
	See ISO 14118:2000, clause 5 and IEC 60204-1:2005, 5.5 and 5.6	
6.3.5.5	Provisions for easy and safe handling of machines and their heavy component parts	-
	Machines and their component parts which cannot be moved or transported by hand shall be provided or capable of being provided with suitable attachment devices for transport by means of lifting gear.	Pass. Appropriate attachments are provided.
	These attachments may be, among others,	-
	- standardized lifting appliances with slings, hooks, eyebolts, or tapped holes for appliance fixing;	Not applicable.
	- appliances for automatic grabbing with a lifting hook when attachment is not possible from the ground.	Pass. Such devices are used.
	- guiding grooves for machines to be transported by a fork truck;	Not applicable.
	- lifting gear and appliances integrated into the machine.	
	Parts of machinery which can be removed manually in operation shall be provided with means for their safe removal and replacement; See also 6.4.4c) (item 3).	Pass
6.3.5.6	Measures for safe access to machinery	-
	Machinery shall be so designed as to enable operation and all routine tasks relating to setting and/or maintenance, to be carried out, as far as possible, by a person remaining at ground level.	These requirements have been taken into account during design.



	Where this is not possible, machines shall have built-in platforms, stairs or other facilities to provide safe access for those tasks, but care should be taken to ensure that such platforms or stairs do not give access to danger zones of machinery.	Not applicable.
	The walking areas shall be made from materials which remain as slip resistant as practicable under working	Not applicable.

	conditions and, depending on the height from the ground, suitable guard-rails (see ISO 14122-3) shall be provided.	
	In large automated installations, particular attention shall be given to safe means of access such as walkways, conveyor bridges or crossover points.	Not applicable.
	Means of access to parts of machinery located at a height shall be provided with collective means of protection against falls (e.g. guard-rails for stairways, stepladders and platforms and/or safety cages for ladders)	Not applicable.
	As necessary , anchorage points for personal protective equipment against falls from a height shall also be provided (e.g. in carriers of machinery for lifting persons or with elevating control sations)	Not applicable.
	Openings shall whenever possible open towards a safe position. They shall be designed to prevent hazards due to unintended opening.	Not applicable.
	The necessary aids for access shall be provided (e.g. steps, handholds). Control devices shall be designed and located to prevent their being used as aids for access.	Not applicable.
	When machinery for lifting goods and/or persons includes landings at fixed levels, these shall be equipped with interlocking guards preventing falls when the platform is not present at the level.	Not applicable.
	Movement of the lifting platform shall be prevented while the guards are open.	Not applicable.
	For detailed provisions see ISO 14122.	Not applicable.
6.4	Information for use	-
6.4.1	General requirements	-
	Drafting information for use is an integral part of the design of a machine (see figure 2).	Pass. Please see the related clause.
6.4.1.1	Information of use consists of communication links, such as texts, words, signs, signals, symbols or diagrams, used separately or in combination to convey information to the user. It is directed to professional and/or non-professional users.	Pass. All the information is stated in the appropriate place.
6.4.1.2	Information shall be provided to the user about the intended use of the machine, taking into account, notably, all its operating modes.	-



	The information shall contain all directions required to ensure safe and correct use of the machine. With this in view, it shall inform and warn the user about residual risk.	Pass. All the information is stated in the appropriate place.
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	The information shall indicate, as appropriate,	-
	- the need for training,	Pass. All the information is stated in the appropriate place.
	- the need for personal protective equipment,	Pass. All the information is stated in the appropriate place.
	- the possible need for additional guards or protective devices (see Figure 2, Footnote d).	Pass. All the information is stated in the appropriate place.
	It shall not exclude uses of the machine that can reasonably be expected from its designation and description and shall also warn about the risk which would result from using the machine in other ways than the ones described in the information, especially considering its reasonably foreseeable misuse.	Pass. All the information is stated in the appropriate place.
6.4.1.3	Information for use shall cover, separately or in combination, transport, assembly and installation, commissioning, use of the machine (setting, teaching/programming or process changeover, operation, cleaning, fault-finding and maintenance) and, if necessary, dismantling, disabling and scrapping.	Pass. All the information is stated in the appropriate place.
6.4.2	Location and nature of the information for use	-
	Depending on the risk, the time when the information is needed by the user and the machine design, it shall be decided whether the information – or parts thereof – are to be given:	Pass. All the information is stated in the appropriate place.
	- in /on the machine itself (see 6.3 and 6.4.4)	Pass. Adequate information is stated in the machine itself.
	- in accompanying documents (in particular instruction handbook, see 6.4.5)	Pass. Adequate information is stated in the accompanying documents



	- on the packaging	Pass. Adequate information is stated on the packaging
	- by other means such as signals and warnings outside the machine.	Pass. Adequate information is

		stated
	Standardized phrases shall be considered where important messages such as warnings need to be given (see also IEC 62079)	This requirement is considered.
6.4.3	Signals and warning devices	-
	Visual signals (e.g. flashing lights) and audible signals (e.g. sirens) may be used to warn of an impending hazardous event such as machine start-up or overspeed.	Pass. Signals and warning devices are provided.
	Such signals may also be used to warn the operator before the triggering of automatic protective measures (see last paragraph of 5.2.70	Pass. Please the related clause.
	It is essential that these signals:	-
	- be emitted before the occurrence of the hazardous event;	taken into account during design and selection of the warning devices.
	- be unambiguous;	Pass. This requirement is taken into account during design and selection of the warning devices.
	- be clearly perceived and differentiated from all other signals used; - be clearly recognized by the operator and other persons.	Pass. This requirement is taken into account during design and selection of the warning devices.
	The warning devices shall be designed and located such that checking is easy.	Pass. This requirement is taken into account during design and selection of the warning devices.
	The information for use shall prescribe regular checking of warning devices.	Pass. This requirement is taken into account during design and selection of the warning devices.
	The attention of designers is drawn to the risks from —sensorial saturation which results from too many visual and/or acoustic signals, which may also lead to defeating the warning devices.	Pass. This requirement is taken into account during design and selection of the warning devices.
6.4.4	Markings, signs (pictograms), written warnings	-
	Machinery shall bear all markings which are necessary:	-

	a) for its unambiguous identification, at least - name and address of the manufacturer; - designation of series or type; - serial number, if any.	Pass. Adequate information is provided.
	b) in order to indicate its compliance with mandatory requirements;	-
	- marking;	Pass.

	- written indications (e.g. for machines intended for use in potentially explosive atmosphere)	Adequate information is provided.
	c) for its safe use, e.g. :	
	<ul style="list-style-type: none"> - maximum speed of rotating parts; - maximum diameter of tools; - mass (expressed in kilograms) of the machine itself and/or of removable parts' - maximum working load; - necessity of wearing personal protective equipment; - guard adjustment data; - frequency of inspection. 	Pass. Adequate information is provided.
	Information printed directly on the machine should be permanent and remain legible throughout the expected life of the machine.	Pass. This requirement is complied with.
	Signs or written warnings only saying —danger! shall not be used.	Pass. This requirement is complied with.
	Readily understandable signs (pictograms) should be used in preference to written warnings.	Pass. This requirement is complied with.
	Signs and pictograms should only be used if they are understood in the culture in which the machinery is to be used.	Pass. This requirement is complied with.
	Markings shall comply with recognized standards (see ISO 2972, ISO 7000, particularly for pictograms, symbols, colours) See IEC 60204 series as regards marking of electrical equipment.	Pass. This requirement is complied with.
6.4.5	Accompanying documents (in particular, instruction handbook)	-
6.4.5.1	Contents	-
	The instruction handbook or other written instructions (e.g. on the packaging) shall contain among others:	-
	a) information relating to transport, handling and storage of the machine e.g. :	-Pass. All the related information is stated in the instruction handbook
	- storage conditions for the machine;	-Pass. All the related information is stated in the instruction handbook

	- dimensions , mass value(s), position of the centre (s) of gravity;	-Pass. All the related information is stated in the instruction handbook
	- indications for handling (e.g. drawings indicating	-Pass.

	application points for lifting equipment)	All the related information is stated in the instruction handbook
	b) information relating to installation and commissioning of the machine, e.g.	-
	- fixing/anchoring and vibration dampening requirements	Pass. All the related information is stated in the instruction handbook
	- assembly and mounting conditions;	Pass. All the related information is stated in the instruction handbook
	- space needed for use and maintenance;	Pass. All the related information is stated in the instruction handbook
	- permissible environmental conditions (e.g. temperature, moisture, vibration, electromagnetic radiation);	Pass. All the related information is stated in the instruction handbook
	- instructions for connecting the machine to power supply (particularly about protection against electrical overloading);	Pass. All the related information is stated in the instruction handbook
	- advice about waste removal /disposal;	Pass. All the related information is stated in the instruction handbook
	- if necessary, recommendations about protective measures which have to be taken by the user; e.g. additional safeguards (see ISO 12100-1:2003, figure 1, note 4), safety distances, safety signs and signals.	Pass. All the related information is stated in the instruction handbook
	c) information relating to the machine itself, e.g. :	-
	- detailed description of the machine, its fittings, its guards and/or protective devices;	Pass. All the related information is stated in the instruction handbook

	- comprehensive range of applications for which the machine is intended, including prohibited usages, if any , taking into account variations of the original machine if appropriate.	Pass. All the related information is stated in the instruction handbook
	- diagrams (especially schematic representation of safety functions);	Pass. All the related information

		is stated in the instruction handbook
	- data about noise and vibration generated by the machine, about radiation , gases, vapours, dust emitted by it, with reference to the measuring methods used.	Pass. All the related information is stated in the instruction handbook
	- technical documentation about electrical equipment (see IEC 60204 series)	Pass. All the related information is stated in the instruction handbook
	- documents attesting that the machine complies with mandatory requirements;	Pass. All the related information is stated in the instruction handbook
d)	information relating to the use of the machine, e.g. about:	-
	<ul style="list-style-type: none"> - intended use; - description of manual controls (actuators); - setting and adjustment; - modes and means for stopping (especially emergency stop) - risks which could not be eliminated by the protective measures taken by the designer; - particular risks which may be generated by certain applications, by the use of certain fittings, and about specific safeguards which are necessary for such applications. - reasonably foreseeable misuse and prohibited usages; - fault identification and location , repair, and re-starting after an intervention; - personal protective equipment which need to be used and training required. 	Pass. All the related information is stated in the instruction handbook
	e) information for maintenance e.g.	-

	<ul style="list-style-type: none">- nature and frequency of inspections for safety functions;- instructions relating to maintenance operations which require a definite technical knowledge or particular skills and hence should be carried out exclusively by skilled persons (e.g. maintenance staff, specialists) - instructions relating to maintenance actions (e.g. replacement of parts) which do not require specific skills and hence may be carried out by users (e.g. operators)- drawings and diagrams enabling maintenance	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>
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	<p>personnel to carry out their task rationally (especially fault-finding tasks)</p> <p>f) information relating to de-commissioning , dismantling and disposal;</p> <p>g) information for emergency situations , e.g. : - type of fire-fighting equipment to be used.</p> <p>- warning about possible emission or leakage of harmful substance(s), and if possible, indication of means to fight their effects.</p>	
	<p>h) maintenance instructions provided for skilled persons (second dash in e))and maintenance instructions provided for unskilled persons (third dash in e)), that should appear clearly separated from each other.</p>	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>
6.4.5.2	Production of the instruction handbook	-
	<p>a) type and size of print shall ensure the best possible legibility. Safety warnings and/or cautions should be emphasized b the use of colours, symbols and/or large print.</p>	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>
	<p>b) information for use shall be given in the language(s) of the country in which the machine will be used for the first time and in the original version.</p> <p>If more than one language are to be used, each language should be readily distinguished from the other(s), and efforts should be made to keep the translated text and the relevant illustration together.</p>	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>
	<p>c) whenever helpful to the understanding, text should be supplemented with written details enabling , for instance, manual controls (actuators) to be located and identified; they should not be separated from the accompanying text and should follow sequential operations.</p>	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>
	<p>d) consideration should be given to presenting information in tabular form where this will aid understanding. Tables should be adjacent to the relevant text.</p>	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>
	<p>e) the use of colours should be considered, particularly in relation to components requiring quick identification.</p>	<p>Pass.</p> <p>All the related information is stated in the instruction handbook</p>

	f) when information for use is lengthy, a table of contents and/or an index should be given.	Pass. All the related information is stated in the instruction handbook
	g) safety-relevant instructions which involve immediate	Pass.

	action should be provided in a form readily available to the operator.	All the related information is stated in the instruction handbook
6.4.5.3	Drafting and editing information for use	-
	a) relationship to model : the information shall clearly relate to the specific model of machine and, if necessary, other appropriate identification (for example, by serial number).	Pass. All the related information is stated in the instruction handbook
	b) communicate principles : when information for use is being prepared, the communication process —see-think-use should be followed in order to achieve the maximum effect and should follow sequential	Pass. All the related information is stated in the instruction handbook
	operations. The questions —how ? and —why ? should be anticipated and the answers provided.	Pass. All the related information is stated in the instruction handbook
	c) information for use shall be as simple and as brief as possible, and should be expressed in consistent terms and units with a clear explanation of unusual technical terms.	Pass. All the related information is stated in the instruction handbook
	d) when it is foreseen that a machine will b put to non-professional use, the instructions should be written in a form that is readily understood by the non-professional users. If personal protective equipment is required for the safe use of the machine, clear advice should be given, e.g. on the packaging as well as on the machine, so that this information is prominently displayed at the point of sale.	Pass. All the related information is stated in the instruction handbook
	e) durability and availability of the documents : documents giving instructions for use should be produced in durable form (i.e. they should be able to survive frequent handling by the user). It may be useful to mark them —keep for future referencell. Where information for use is kept in electronic form (e.g. CD, DVD, tape) information on safety-related issues that need immediate action shall always be backed up with a hand copy that is readily available.	Pass. All the related information is stated in the instruction handbook
7	Documentation of risk assessment and risk reduction	-

	The documentation shall demonstrate the procedure that has been followed and the results that have been achieved. This includes, when relevant, documentation of	-
	a) the machinery for which the risk assessment has been made (for example, specifications, limits, intended use);	See the risk assessment report in detail.

	b) any relevant assumptions that have been made (loads, strengths, safety factors, etc.);	See the risk assessment report in detail.
	c) the hazards and hazardous situations identified and the hazardous events considered in the risk assessment	See the risk assessment report in detail.
	d) the information on which risk assessment was based (see 5.2):	See the risk assessment report in detail.
	1) the data used and the sources (accident histories, experience gained from risk reduction applied to similar machinery, etc.);	See the risk assessment report in detail.
	2) the uncertainty associated with the data used and its impact on the risk assessment;	See the risk assessment report in detail.
	e) the risk reduction objectives to be achieved by protective measures;	See the risk assessment report in detail.
	f) the protective measures implemented to eliminate identified hazards or to reduce risk;	See the risk assessment report in detail.
	g) residual risks associated with the machinery;	See the risk assessment report in detail.
	h) the result of the risk assessment (see Figure 1);	See the risk assessment report in detail.
	i) any forms completed during the risk assessment.	See the risk assessment report in detail.

3.3 EN 60204-1:2006 + A1:2010 TEST REPORT

1	Scope		-
	This part of IEC 60204 applies to the application of electrical, electronic and programmable electronic equipment and systems to machines not portable by hand while working, including a group of machines working together in a co-ordinated manner.	These machine are within this scope.	Pass.
	This part of IEC 60204 is applicable to the electrical equipment or parts of the electrical equipment that operate with nominal supply voltages not exceeding 1 000 V for alternating current (AC) and not exceeding 1 500 V for direct current (DC), and with nominal supply frequencies not exceeding 200 Hz.	The nominal supply voltage for these machines is AC 230/380V, and the nominal frequency is 50/60Hz.	Pass.
2	Normative references		-
3	Terms and definitions		-
4	General requirements		-
4.1	General		
	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.	See the risk assessment report in detail.	Pass.
	The risks associated with the hazards relevant to the electrical equipment shall be assessed as part of the overall requirements for risk 120 assessment of the machine. This will determine the adequate risk reduction, and the necessary protective measures for persons who can be exposed to those hazards, while still maintaining an acceptable level of performance of the machine and its equipment.	Please the risk assessment report in detail.	Pass.
4.2	Selection of equipment		-
4.2.1	General		-
	Electrical components and devices shall:		-
	– be suitable for their intended use; and	This requirement has been considered during design.	Pass.
	– conform to relevant IEC standards where such exist; and	This requirement has been considered during design.	Pass.
	– be applied in accordance with the supplier's instructions.	This requirement has been considered during design.	Pass.

4.2.2	Electrical equipment in compliance with the IEC 60439 series		-
	The electrical equipment of the machine shall satisfy the safety requirements identified by the risk		Pass.
	assessment of the machine. Depending upon the machine, its intended use and its electrical equipment, the designer may select parts of the electrical equipment of the machine that are in compliance with EN 60439-1 and, as necessary, other relevant parts of the EN 60439 series (see also Annex F).		
4.3	Electrical supply		-
4.3	Electrical supply		-
	The electrical equipment shall be designed to operate correctly with the relevant conditions of supply	They can be operated correctly with the relevant conditions of supply.	Pass.
4.4	Physical environment and operating conditions		
	Shall be suitable for use as specified: - Electromagnetic compatibility - Ambient air temperature - Humidity - Altitude - Contaminants - Ionizing and non-ionizing radiation - Vibration, shock and bump	This machine is suitable for use as specified in this clause.	Pass.
4.5	Transportation and storage		-
	Electrical equipment shall be designed to withstand, or suitable precautions shall be taken to protect against, the effects of transportation and storage temperatures within a range of – 25 °C to +55 °C and for short periods not exceeding 24 h at up to +70 °C. Suitable means shall be provided to prevent damage from humidity, vibration, and shock. A special agreement can be necessary between the supplier and the user (see Annex B).	These requirements have been meet.	Pass.
4.6	Provisions for handling		-



	Heavy and bulky electrical equipment that has to be removed from the machine for transport, or that is independent of the machine, shall be provided with suitable means for handling by cranes or similar equipment.		Not applicable
4.7	Installation		-
	Electrical equipment shall be installed in accordance with the electrical equipment supplier's instructions.		Pass.
5	Incoming supply conductor terminations and devices for disconnecting and switching off		-
5.1	Incoming supply conductor terminations		-

	It is recommended that, where practicable, the electrical equipment of a machine is connected to a single incoming supply. Where another supply is necessary for certain parts of the equipment (for example, electronic equipment that operates at a different voltage), that supply should be derived, as far as is practicable, from devices (for example, transformers, converters) forming part of the electrical equipment of the machine. For large complex machinery comprising a number of widely-spaced machines working together in a coordinated manner, there can be a need for more than one incoming supply depending upon the site supply arrangements (see 5.3.1).	Single power supply.	Pass.
	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.	The supply conductors are terminated at the supply disconnecting device.	Pass.
	Where a neutral conductor is used it shall be clearly indicated in the technical documentation of the machine, such as in the installation diagram and in the circuit diagram, and a separate insulated terminal, labelled N in accordance with 16.1, shall be provided for the neutral conductor (see also Annex B).	neutral conductor has been used and satisfied this requirement.	Pass
	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.	These requirements have been met.	Pass
	All terminals for the incoming supply connection shall be clearly identified in accordance with IEC 60445 and 16.1. For the identification of the external protective conductor terminal, see 5.2.	All of them have been identified clearly.	Pass.
5.2	Terminal for connection to the external protective earthing system		-
	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.	A terminal has been provided for each incoming supply.	Pass.



	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	This requirement has been met.	Pass.
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	with Table 1.		
	Where an external protective conductor of a material other than copper is used, the terminal size shall be selected accordingly (see also 8.2.2).	This requirement has been met.	Pass.
	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 (see IEC 60445).	This requirement has been met.	Pass.
5.3	Supply disconnecting (isolating) device		-
5.3.1	General		
	A supply disconnecting device shall be provided: <ul style="list-style-type: none"> – for each incoming source of supply to a machine(s); – for each on-board power supply. 	A supply disconnecting device is provided.	Pass.
	The supply disconnecting device shall disconnect (isolate) the electrical equipment of the machine from the supply when required (for example for work on the machine, including the electrical equipment).	This device can disconnect the electrical equipment of the machine from supply.	Pass.
	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.		Not applicable
5.3.2	Type		-
	The supply disconnecting device shall be one of the following types:		-

	<p>a) switch-disconnector, with or without fuses, in accordance with IEC 60947-3, utilization category AC-23B or DC-23B;</p> <p>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 ;</p> <p>c) a circuit-breaker suitable for isolation in accordance with IEC 60947-2;</p> <p>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</p>		Pass.
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	standard as appropriate for on-load switching of motors or other inductive loads; e) a plug/socket combination for a flexible cable supply.		
5.3.3	Requirements		-
	When the supply disconnecting device is one of the types specified in 5.3.2 a) to d) it shall fulfill 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);		Pass.
	– 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;		Pass.
	– 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);		Pass.
	– 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;	Padlock has been provided.	Pass.
	– 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;		Pass.
	– 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.	It has sufficient breaking sufficient to interrupt the current.	Pass.



	When the supply disconnecting device is a plug/socket combination, it shall fulfill the following requirements:		Not applicable
	– have the switching capability, or be interlocked		Not

	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.		applicable .
	– a) to f) of 13.4.5.		Not applicable .
	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.		Not applicable .
	This can be achieved by the use of the interlocked switching device described above.		Not applicable .
5.3.4	Operating means		-
	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. An upper limit of 1,7 m is recommended.	Above 0.6m	Pass.
5.3.5	Excepted circuits		-
	The following circuits need not be disconnected by the supply disconnecting device:		-
	– lighting circuits for lighting needed during maintenance or repair;	Lighting circuit has been used.	Pass.
	– plug and socket outlets for the exclusive connection of repair or maintenance tools and equipment (for example hand drills, test equipment);		Not applicable
	– undervoltage protection circuits that are only provided for automatic tripping in the event of supply failure;		Not applicable

	– 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);		Not applicable
	– control circuits for interlocking.		-
	It is recommended, however, that such circuits be		Not

	provided with their own disconnecting device.		applicable .
	Where such a circuit is not disconnected by the supply disconnecting device:		Not applicable .
	– permanent warning label(s) in accordance with 16.1 shall be appropriately placed in proximity to the supply disconnecting device;		-
	– a corresponding statement shall be included in the maintenance manual, and one or more of the following shall apply;		-
	– a permanent warning label in accordance with 16.1 is affixed in proximity to each excepted circuit, or		-
	– the excepted circuit is separated from other circuits, or		-
	– the conductors are identified by colour taking into account the recommendation of 13.2.4.		-
5.4	Devices for switching off for prevention of unexpected start-up		-
	Devices for switching off for the prevention of unexpected start-up shall be provided (for example where, during maintenance, a start-up of the machine or part of the machine can create a hazard).	There is such function to prevent unexpected start-up.	Pass.
	Such devices shall be appropriate and convenient for the intended use, shall be suitably placed, and readily identifiable as to their function and purpose (for example by a durable marking in accordance with 16.1 where necessary).	These requirements have been met.	Pass.
	Means shall be provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations (see also 5.6).	A switch with key has been used.	Pass.
	The following devices that fulfill the isolation function may be provided for this purpose:		-
	– devices described in 5.3.2, – disconnectors, withdrawable fuse links and withdrawable links only if located in an enclosed electrical operating area (see 3.19).		Pass.
5.5	Devices for disconnecting electrical equipment		-



	Devices shall be provided for disconnecting (isolating) electrical equipment to enable work to be carried out when it is de-energised and isolated. Such devices shall be:	Devices have been provided for disconnecting electrical equipment.	Pass.
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	– appropriate and convenient for the intended use;		Pass.
	– suitably placed;		Pass.
	– readily identifiable as to which part(s) or circuit(s) of the equipment is served (for example by durable marking in accordance with 16.1 where necessary).		Pass.
	Means shall be provided to prevent inadvertent and/or mistaken closure of these devices either at the controller or from other locations (see also 5.6).		Pass.
	The supply disconnecting device (see 5.3) may, in some cases, fulfill that function. However, where it is necessary to work on individual parts of the electrical equipment of a machine, or on one of a number of machines fed by a common conductor bar, conductor wire or inductive power supply system, a disconnecting device shall be provided for each part, or for each machine, requiring separate isolation.		Pass.
	In addition to the supply disconnecting device, the following devices that fulfill the isolation function may be provided for this purpose:		Pass.
	– devices described in 5.3.2;		Pass.
	– 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)).		Pass.
5.6	Protection against unauthorized, inadvertent and/or mistaken connection		-
	The devices described in 5.4 and 5.5 that are located outside an enclosed electrical operating area shall be equipped with means to secure them in the OFF position (disconnected state), (for example by provisions for padlocking, trapped key interlocking). When so secured, remote as well as local reconnection shall be prevented.	No need.	Not applicable
	Where a non-lockable disconnecting device (for example withdrawable fuse-links, withdrawable links) other means of protection against reconnection (for example warning labels in accordance with 16.1) may be provided.		Not applicable



	However, when a plug/socket combination according to 5.3.2 e) is so positioned that it can be kept under the immediate supervision of the person		Not applicable .
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	carrying out the work, means for securing in the disconnected state need not be provided.		
6	Protection against electric shock		-
6.1	General		-
	The electrical equipment shall provide protection of persons against electric shock from:		-
	– direct contact (see 6.2 and 6.4);	Please see the relative report.	Pass.
	– indirect contact (see 6.3 and 6.4).	Please see the relative report.	Pass.
	The measures for this protection given in 6.2, 6.3, and, for PELV, in 6.4, are a recommended selection from IEC 60364-4-41. Where those recommended measures are not practicable, for example due to the physical or operational conditions, other measures from IEC 60364-4-41 may be used.	Please see the relative report.	Pass.
6.2	Protection against direct contact		-
6.2.1	General		-
	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.	Please see the relative report.	Pass.
6.2.2	Protection by enclosures		-
	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 (see IEC 60529).	Above IP2X	Pass.
	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.	IP4X	Pass.
	Opening an enclosure (i.e. opening doors, lids, covers, and the like) shall be possible only under one of the following conditions:		-
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.	Tool is necessary for access to enclosed electrical operating areas.	Pass,



	All live parts, that are likely to be touched when resetting or adjusting devices intended for such operations while the equipment is still connected, shall be protected against direct contact to at least IP2X or IPXXB. Other live parts on the inside of doors shall be protected against direct contact to at	IP2X	Pass.
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	least IP1X or IPXXA.		
b)	The disconnection of live parts inside the enclosure before the enclosure can be opened. This may be accomplished by interlocking the door with a disconnecting device (for example, the supply disconnecting device) so that the door can only be opened when the disconnecting device is open and so that the disconnecting device can only be closed when the door is closed.	An interlock has been used.	Pass..
c)	Opening without the use of a key or a tool and without disconnection of live parts shall be possible only when all live parts are protected against direct contact to at least IP2X or IPXXB (see IEC 60529). Where barriers provide this protection, either they shall require a tool for their removal or all live parts protected by them shall be automatically disconnected when the barrier is removed.		Not applicable .
6.2.3	Protection by insulation of live parts		-
	Live parts protected by insulation shall be completely covered with insulation that can only be removed by destruction.	This requirement has been met.	Pass.
	Such insulation shall be capable of withstanding the mechanical, chemical, electrical, and thermal stresses to which it can be subjected under normal operating conditions.	Such insulation can withstand these situations.	Pass.
6.2.4	Protection against residual voltages		-
	Live parts having a residual voltage greater than 60 V after the supply has been disconnected shall be discharged to 60 V or less within a time period of 5 s after disconnection of the supply voltage provided that this rate of discharge does not interfere with the proper functioning of the equipment. Exempted from this requirement are components having a stored charge of 60 μ C or less.		Not applicable .
	Where this specified rate of discharge would interfere with the proper functioning of the equipment, a durable warning notice drawing attention to the hazard and stating the delay required before the enclosure may be opened shall be displayed at an easily visible location on or immediately adjacent to the enclosure containing the capacitances.		Not applicable .



	If the withdrawal of plugs or similar devices would make the exposure of the conductors (e.g. pins), the	No need.	Not applicable
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	discharge time shall not exceed 1 second such conductor shall have the protection degree at least IP2X or IPXXB		.
6.2.5	Protection by barriers		-
	For protection by barriers, 412.2 of IEC 60364-4-41 shall apply.		Not applicable .
6.2.6	Protection by placing out of reach or protection by obstacles		-
	For protection by placing out of reach, 412.4 of IEC 60364-4-41 shall apply.		Not applicable .
	For protection by obstacles, 412.3 of IEC 60364-4-41 shall apply.		Not applicable .
	For conductor wire systems or conductor bar systems with a degree of protection less than IP2X, see 12.7.1.		Not applicable .
6.3	Protection against indirect contact		-
6.3.1	General		-
	Protection against indirect contact (3.29) is intended to prevent hazardous situations due to an insulation fault between live parts and exposed conductive parts.		-
	For each circuit or part of the electrical equipment, at least one of the measures in accordance with 6.3.2 to 6.3.3 shall be applied:		-
	– measures to prevent the occurrence of a touch voltage (6.3.2); or	See the relative clause.	Pass.
	– automatic disconnection of the supply before the time of contact with a touch voltage can become hazardous (6.3.3).	See the relative clause.	Pass.
6.3.2	Prevention of the occurrence of a touch voltage		-
6.3.2.1	General		-
	Measures to prevent the occurrence of a touch voltage include the following:		-



	– provision of class II equipment or by equivalent insulation; –electrical separation.	Please see the relative clause.	Pass.
6.3.2. 2	Protection by provision of class II equipment or by equivalent insulation		-
	This measure is intended to prevent the occurrence of touch voltages on the accessible parts through a		-

	fault in the basic insulation.		
	This protection is provided by one or more of the following:		-
	<ul style="list-style-type: none"> – class II electrical devices or apparatus (double insulation, reinforced insulation or by equivalent insulation in accordance with IEC 61140); – switchgear and control gear assemblies having total insulation in accordance with IEC 60439-1; – supplementary or reinforced insulation in accordance with 413.2 of IEC 60364-4-41 	Appropriate insulations have been provided.	Pass.
6.3.2.3	Protection by electrical separation		-
	Electrical separation of an individual circuit is intended to prevent a touch voltage through contact with exposed conductive parts that can be energized by a fault in the basic insulation of the live parts of that circuit.		-
	For this type of protection, the requirements of 413.5 of IEC 60364-4-41 apply.	Appropriate measures have been taken.	Pass.
6.3.3	Protection by automatic disconnection of supply		-
	This measure necessitates co-ordination between:		-
	– the type of supply and earthing system;		-
	– the impedance values of the different elements of the protective bonding system;		-
	–the characteristics of the protective devices that detect insulation fault(s).		-
	Automatic disconnection of the supply of any circuit affected by an insulation fault is intended to prevent a hazardous situation resulting from a touch voltage.		-
	This protective measure comprises both:		-
	– protective bonding of exposed conductive parts (see 8.2.3),	This measure has been taken.	Pass.
	– and either:		-
	a)overcurrent protective devices for the automatic disconnection of the supply on detection of an insulation fault in TN systems, or	This measure has been taken.	Pass.

	b) residual current protective devices to initiate the automatic disconnection of the supply on detection of an insulation fault from a live part to exposed conductive parts or to earth in TT systems, or		Not applicable .
	c) insulation monitoring or residual current protective devices to initiate automatic		Not applicable

	disconnection of IT systems. Except where a protective device is provided to interrupt the supply in the case of the first earth fault, an insulation monitoring device shall be provided to indicate the occurrence of a first fault from a live part to exposed conductive parts or to earth. This insulation monitoring device shall initiate an audible and/or visual signal which shall continue as long as the fault persists.		.
	Where automatic disconnection is provided in accordance with a), and disconnection within the time specified in Clause A.1 cannot be assured, supplementary bonding shall be provided as necessary to meet the requirements of Clause A.3.		Not applicable .
6.4	Protection by the use of PELV		-
6.4.1	General requirements		-
	PELV (protective extra-low voltage) circuits shall satisfy all of the conditions specified in this clause	No PELV circuit has been used.	Not applicable .
6.4.2	Sources for PELV		-
	The sources for PELV shall be one of the conditions specified in this clause	No PELV circuit has been used.	Not applicable .
7	Protection of equipment		-
7.1	General		-
7.2	Over current protection		-
7.2.1	General		-
7.2.2	Supply conductors		-
	The supplier is not responsible for providing the over current device for the supply conductors.		Pass.
	Installation diagram with data necessary for selection of the over current protective device	Relative information has been provided.	Pass.
7.2.3	Power circuits		-
	All conductors shall be protected against over current (except earthed neutral conductor)	All conductors have been protected against overcurrent.	Pass.
	Cross-section area of neutral conductor	Cross-section area of neutral conductor is equal to the phase conductors'.	Pass.



	For neutral conductors smaller than phase conductors then IEC 364-4-473 shall apply	.	Not applicable
	In IT-systems, it is recommended that the neutral conductor is not used		Not applicable

			.
7.2.4	Control circuits		-
	Conductors of control circuits connected to the supply voltage and of circuits feeding control circuit transformers shall be protected against over current in accordance with 7.2.3	This requirement has been met.	Pass.
	Conductors of control circuits supplied by a control circuit transformer or DC supply shall be protected against overcurrent (see also 9.4.3.1)		Not applicable .
7.2.5	Socket outlets and their associated conductors		-
	Over current protection devices shall be provided in the unearthed live conductors		Not applicable .
7.2.6	Lighting circuits		-
	All unearthed conductors of circuits supplying lighting shall be protected against the effects of short circuits by the provision of over current devices separate from those protecting other circuits		Not applicable .
7.2.7	Transformers		-
	Transformers shall be protected against Over current in accordance with IEC 60076-5 and IEC 60743 as appropriate	All transformers have been protected against over current.	Pass.
	The type and setting of the overcurrent protective device should be in accordance with the recommendations of the transformer supplier	This requirement has been considered during design.	Pass.
7.2.8	Location of over current protective device		-
	Over current protective device shall be located at the point where the conductors to be protected are connected to their supply	This requirement has been considered during design.	Pass.
7.2.9	Over current protective devices		-
	Sufficient breaking capacity	The over current protective devices have sufficient breaking capacity.	Pass.
	Where fuses are used, a type readily available in the country of use shall be selected, or arrangement shall be made with the use for the supply of spare parts	This requirement has been considered during design.	Pass.



7.2.10	Rating and setting of over current protective devices		-
	The rated current of fuses or the setting current of other over current protective devices shall be selected as low as possible but adequate for the anticipated over currents	This requirement has been met.	Pass.

	The rated current or setting of an over current protective device is determined by the current carrying capacity of the conductors to be protected by that device in accordance with 13.4	This requirement has been considered during design.	Pass.
7.3	Protection of motors against overheating		-
7.3.1	General		
	Overload protection of motors shall be provided for each motor rated at more than 0.5kW	The overload protection is provided.	Pass.
	Protection of motors against overheating can be achieved by: - overload protection - over-temperature protection - current-limiting protection.	Appropriate protection has been taken.	Pass.
7.3.2	Overload protection		-
	Detection of overload shall be provided in each live conductor excepted for the neutral conductor		Not applicable.
	For motors having single-phase or d.c power supplies. Detection in only one unearthed live conductor is permitted		Not applicable.
	Where overload protection is achieved by switching off, the switching device shall switch off all live conductors. The switching of the neutral conductor is not necessary for overload protection.		Not applicable.
	Where motors with special duty ratings are required to start or to brake frequently it can be difficult to provide overload protection with a time constant comparable with that of the winding to be protected. Appropriate protective devices designed to accommodate special duty motors or over-temperature protection (see 7.3.3) can be necessary.		Not applicable.
	For motors that cannot be overloaded (for example torque motors, motion drives that either are protected by mechanical overload protection devices or are adequately dimensioned), overload protection is not required		Not applicable.
7.3.3	Over-temperature protection		-

	The provision of motors with over-temperature protection (see IEC 60034-11) is recommended in situations where the cooling can be impaired (for example dusty environments).	Over-temperature protection devices have been provided.	Pass.
	Depending upon the type of motor, protection under stalled rotor or loss of phase conditions is not		Not applicable

	always ensured by over-temperature protection, and additional protection should then be provided.		
	Over-temperature protection is also recommended for motors that cannot be overloaded (for example torque motors, motion drives that are either protected by mechanical overload protection devices or are adequately dimensioned), where the possibility of over-temperature exists (for example due to reduced cooling).		-
7.3.4	Current limiting protection		-
	Where protection against the effects of overheating in three phase motors is achieved by current limitation, the number of current limitation devices may be reduced from 3 to 2 (see 7.3.2). For motors having single phase AC or DC power supplies, current limitation in only one unearthed live conductor is permitted.		Not applicable .
7.4	Abnormal temperature protection		-
	Use of abnormal temperature protection	No need.	Not applicable .
7.5	Protection against supply interruption or voltage reduction and subsequent restoration		-
	Where a voltage drop or a supply interruption can cause a hazardous condition, damage to the machine, or to the work in progress, under voltage protection shall be provided	No this kind of hazard has been found.	Not applicable .
	The operation of the under voltage device shall not impair the operation of any stopping control of the machine	No under voltage device is used.	Not applicable .
	Upon restoration of the voltage or upon switching on the incoming supply, automatic or unexpected restarting of the machine shall be prevented	Automatic of unexpected restarting of the machine can be prevented.	Pass.
	Where only a part of the machine or of the group of machines working together in a coordinated manner is affected by the voltage reduction or supply interruption, the under voltage protection shall initiate appropriate control responses to ensure co-ordination		Not applicable .
7.6	Motor over speed protection		-



	Use of the motor over speed protection		Not applicable .
7.7	Earth fault/residual current protection		-

	Use of earth fault/residual current protection for automatic disconnection		Not applicable .
7.8	Phase sequence protection		
	Where an incorrect sequence of the supply voltage can cause a hazardous condition or damage to the machine, protection shall be provided		Not applicable .
7.9	Protection against over voltage due to lighting and to switching surges		-
	Protection devices can be provided to protect against the effects of over voltages due to lighting or to switching surges		Not applicable .
8	Equipotential bonding		
8.1	General		-
8.2	Protective bonding circuit		-
8.2.1	General		-
	All parts of the protective bonding circuit shall be so designed that they are capable of withstanding the highest thermal and mechanical stresses that can be caused by earth-fault currents that could flow in that part of the protective bonding circuit.	All these circuits have been designed that are capable of withstanding the highest thermal and mechanical stresses.	Pass.
	Where the conductance of structural parts of the electrical equipment or of the machine is less than that of the smallest protective conductor connected to the exposed conductive parts, a supplementary bonding conductor shall be provided. This supplementary bonding conductor shall have a cross-sectional area not less than half that of the corresponding protective conductor.		Not applicable .
	If an IT distribution system is used, the machine structure shall be part of the protective bonding circuit and insulation monitoring shall be provided. See 6.3.3 c).		Not applicable .
	Conductive structural parts of equipment in accordance with 6.3.2.2 need not be connected to the protective bonding circuit. Extraneous conductive parts which form the structure of the machine need not be connected to the protective bonding circuit where all the equipment provided is in accordance with 6.3.2.2.		Pass.



	Exposed conductive parts of equipment in accordance with 6.3.2.3 shall not be connected to the protective bonding circuit.		Pass.
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8.2.2	Protective conductors		-
	Protective conductors shall be identified in accordance with 13.2.2.	Please see clause 13.2.2 in detail.	Pass.
	Copper conductors are preferred.		Pass.
	Where a conductor material other than copper is used, its electrical resistance per unit length shall not exceed that of the allowable copper conductor and such conductors shall be not less than 16 mm ² in cross-sectional area.	Only copper conductors are used.	Not applicable.
	The cross-sectional area of protective conductors shall be determined in accordance with the requirements of: – 543 of IEC 60364-5-54; or – 7.4.3.1.7 of IEC 60439-1, as appropriate.	They have been used according to these requirements.	Pass.
	This requirement is met in most cases where the relationship between the cross-sectional area of the phase conductors associated with that part of the equipment and the cross-sectional area of the associated protective conductor is in accordance with Table 1 (see 5.2).		-
	See also 8.2.8.		-
8.2.3	Continuity of the protective bonding circuit		-
	All exposed conductive parts shall be connected to the protective bonding circuit in accordance with 8.2.1.	All these parts have been connected.	Pass.
	Where a part is removed for any reason (for example routine maintenance), the protective bonding circuit for the remaining parts shall not be interrupted.	This requirement has been met.	Pass.
	Connection and bonding points shall be so designed that their current-carrying capacity is not impaired by mechanical, chemical, or electrochemical influences.	Their current-carrying capacity is stable enough	Pass.
	Metal ducts of flexible or rigid construction and metallic cable sheaths shall not be used as protective conductors.	No this kind of construction has been used as protective bonding conductor.	Pass.
	Nevertheless, such metal ducts and the metal sheathing of all connecting cables (for example cable armouring, lead sheath) shall be connected to the protective bonding circuit.	No metal duct or metal sheathing has been used.	Not applicable.



	Where the electrical equipment is mounted on lids, doors, or cover plates, continuity of the protective bonding circuit shall be ensured and a protective conductor (see 8.2.2) is recommended. Otherwise	No electrical equipment is mounted on lids, doors, or cover plates.	Not applicable .
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	fastenings, hinges or sliding contacts designed to have a low resistance shall be used (see 18.2.2, Test 1).		
	The continuity of the protective conductor in cables that are exposed to damage (for example flexible trailing cables) shall be ensured by appropriate measures (for example monitoring).	Appropriate protection has been provided.	Pass.
	For requirements for the continuity of the protective conductor using conductor wires, conductor bars and slip-ring assemblies, see 12.7.2.	No this kind of device is used.	Not applicable.
8.2.4	Exclusion of switching devices from the protective bonding circuit		-
	Shall not incorporate a switching device, an over current protective device nor a means for current detection for such devices		Pass.
	The only means permitted for interruption shall be carried out by instructed or skilled persons by using a tool		Pass.
	Where the continuity of the protective bonding circuit can be interrupted by means of removable current collectors or plug/socket combinations, the protective bonding circuit shall be interrupted by a first make last break contact. This also applies to removable or withdrawable plug-in units (see also 13.4.5).		Not applicable.
8.2.5	Parts that need not be connected to the protective bonding circuit		-
	Screws, rivets, and nameplates and to parts inside an enclosure, are not necessary to connect to the protective bonding circuit		Pass.
8.2.6	Protective conductor connecting points		-
	All protective conductors shall be terminated in accordance with 13.1.1. The protective conductor connecting points shall have no other function and are not intended, for example, to attach or connect appliances or parts.	These connecting points have complied with the requirements.	Pass.



	Each protective conductor connecting point shall be marked or labelled as such using the symbol IEC 60417-5019 (DB:2002-10): or with the letters PE, the graphical symbol being preferred, or by use of the bicolour combination GREEN-AND-YELLOW, or by any combination of these.	All these points have been marked appropriately.	Pass.
8.2.7	Mobile machines		-

	On mobile machines with on-board power supplies, the protective conductors, the conductive structural parts of the electrical equipment, and those extraneous conductive parts which form the structure of the machine shall all be connected to a protective bonding terminal to provide protection against electric shock.	Not a mobile machine with on-board power supply.	Not applicable .
	.Where a mobile machine is also capable of being connected to an external incoming power supply, this protective bonding terminal shall be the connection point for the external protective conductor.		Not applicable .
8.2.8	Additional protective bonding requirements for electrical equipment having earth leakage currents higher than 10 mA AC or DC		-
	Where electrical equipment has an earth leakage current (for example adjustable speed electrical power drive systems and information technology equipment) that is greater than 10 mA AC or DC in any incoming supply, one or more of the following conditions for the associated protective bonding circuit shall be satisfied:		Not applicable .
a)	the protective conductor shall have a cross-sectional area of at least 10 mm ² Cu or 16 mm ² Al, through its total run;		Not applicable .
b)	where the protective conductor has a cross-sectional area of less than 10 mm ² Cu or 16 mm ² Al, a second protective conductor of at least the same cross-sectional area shall be provided up to a point where the protective conductor has a cross-sectional area not less than 10 mm ² Cu or 16 mm ² Al;		Not applicable .
c)	automatic disconnection of the supply in case of loss of continuity of the protective conductor.		-
	To prevent difficulties associated with electromagnetic disturbances, the requirements of 4.4.2 also apply to the installation of duplicate protective conductors.		Not applicable .



	<p>In addition, a warning label shall be provided adjacent to the PE terminal, and where necessary on the nameplate of the electrical equipment. The information provided under 17.2</p> <p>b)1) shall include information about the leakage current and the minimum cross-sectional area of</p>		<p>Not applicable</p> <p>.</p>
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	the external protective conductor.		
8.3	Functional bonding		-
	Protection against maloperation as a result of insulation failures can be achieved by connecting to a common conductor in accordance with 9.4.3.1.	The measure described in this clause has been used.	Pass.
	For recommendations regarding functional bonding to avoid maloperation due to electromagnetic disturbances, see 4.4.2.	See the relative clause.	Pass.
8.4	Measures to limit the effects of high leakage current		-
	The effects of high leakage current can be restricted to the equipment having high leakage current by connection of that equipment to a dedicated supply transformer having separate windings. The protective bonding circuit shall be connected to exposed conductive parts of the equipment and, in addition, to the secondary winding of the transformer. The protective conductor(s) between the equipment and the secondary winding of the transformer shall comply with one or more of the arrangements described in 8.2.8.	The measure described in this clause has been used.	Pass.
9	Control circuits and control functions		-
9.1	Control circuits		-
9.1.1	Control circuit supply,		-
	Where control circuits are supplied from an source, control transformers shall be used for supplying the control circuits. Such transformers shall have separate windings.	An AC transformer has been used.	Pass.
	Where several transformers are used, it is recommended that the windings of those transformers be connected in such a manner that the secondary voltages are in phase.	Only one transformer has been used.	Not applicable
	Where DC control circuits derived from an AC supply are connected to the protective bonding circuit (see 8.2.1), they shall be supplied from a separate winding of the AC control circuit transformer or by another control circuit transformer.		Not applicable



9.1.2	Control circuit voltages		-
	The nominal value of the control voltage shall be consistent with the correct operation of the control circuit. The nominal voltage shall not exceed 277 V	The nominal voltage for control circuit is 220V.	Pass.

	when supplied from a transformer.		
9.1.3	Protection		
	Control circuits shall be provided with overcurrent protection in accordance with 7.2.4 and 7.2.10.		Not applicable
9.2	Control functions		-
9.2.1	Start functions		-
	Start functions shall operate by energizing the relevant circuit (see 9.2.5.2).	See the relative report.	Pass.
9.2.2	Stop functions		-
	Each machine shall be equipped with appropriate stop functions.	Appropriate stop functions have been taken.	Pass.
9.2.3	Operating modes		-
	Each machine can have one or more operating modes determined by the type of machine and its application. When a hazardous situation can result from a mode selection, unauthorized and/or inadvertent selection shall be prevented by suitable means (for example key operated switch, access code).	Only one operation mode	Not applicable
	Mode selection by itself shall not initiate machine operation. A separate actuation of the start control shall be required.		Not applicable
	For each specific operating mode, the relevant safety functions and/or protective measures shall be implemented.		Not applicable
	Indication of the selected operating mode shall be provided (for example the position of a mode selector, the provision of an indicating light, a visual display indication).		Not applicable
9.2.4	Suspension of safety functions and/or protective measures		-
	Where it is necessary to suspend safeguarding, a secure provision shall be provided to prevent automatic operation		Not applicable
9.2.5	Operation		-
9.2.5.1	General		-



	The necessary safety functions and/or protective measures (for example interlocks (see 9.3)) shall be provided for safe operation.		Pass.
	Measures shall be taken to prevent movement of the machine in an unintended or unexpected manner after any stopping of the machine (for	Measures have been taken.	Pass.

	example due to locked-off condition, power supply fault, battery replacement, lost signal condition with cableless control).		
	Where a machine has more than one control station, measures shall be provided to ensure that initiation of commands from different control stations do not lead to a hazardous situation.	There is only one control station.	Not applicable .
9.2.5.2	Start		-
	The start of an operation shall be possible only when all the safeguards are in place and functional (except described in 9.2.4)		Pass.
	Hold-to-run control shall be used for the others machines, as appropriate		Not applicable .
	Suitable interlocks shall be provided to secure correct sequential starting		Pass.
	The use of more than one control station to initiate a start		Not applicable .
9.2.5.3	Stop		-
	Stop category 0 and/or stop category 1 and/or stop category 2 stop functions shall be provided as indicated by the risk assessment and the functional requirements of the machine	Appropriate stop function has been taken.	Pass.
	Stop functions shall override related start functions (see 9.2.5.2).	Stop function will override all the related start functions.	Pass.
	Where required, facilities to connect protective devices and interlocks shall be provided. If such a protective device or interlock causes a stop of the machine, it may be necessary for that condition to be signalled to the logic of the control system. The reset of the stop function shall not initiate any hazardous situation.	All these requirements have been met.	Pass.
	Where more than one control station is provided, stop commands from any control station shall be effective when required by the risk assessment of the machine.		Not applicable .



9.2.5.4	Emergency operations (emergency stop, emergency switching off)		-
9.2.5.4.1	General		-



9.2.5.4.2	Emergency stop		
	Shall function either as a category 0 stop or as a category 1 stop	Category 1 stop.	Pass.
	The choice of the emergency stop shall be determined by the risk assessment of the machine	According to the result of risk assessment of the machine.	Pass.
	Where a category 0 stop is used for emergency stop function, it shall have only hard-wired electromechanical components	No category 0 stop is used for emergency stop function.	Not applicable.
	The operation of emergency stop shall not depend on electronic logic or on the transmission of commands over a communications network or link	No this kind of situation.	Pass.
	Where a category 1 stop is used for the emergency stop function, final removal of power to the machine actuators shall be ensured and carried out by means of electromechanical components	The final removal of power to the machine actuators is ensured by the controller and carried out by means of electromechanical components.	Pass.
9.2.5.4.3	Emergency switching off		-
	Use of emergency switching off		Not applicable.
9.2.5.5	Monitoring of command actions		-
	Movement or action of a machine or part of a machine that can result in a hazardous situation shall be monitored by providing, for example, overtravel limiters, motor overspeed detection, mechanical overload detection or anti-collision devices.	Not this kind of hazardous situation.	Not applicable.
9.2.6	Other control functions		-
9.2.6.1	Hold-to-run controls		-
	Hold-to-run controls shall require continuous actuation of the control device(s) to achieve operation.	No hold-to-run control has been used.	Not applicable.



9.2.6. 2	Two-hand control		-
	Three types of two-hand control are available, the selection of which is determined by the assessment	No two-hand control has been used.	Not applicable .
9.2.6.	Enabling control		-

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	It shall be designed to allow motion when actuated in one position only (In any other position motion shall be stopped)	These machines have been designed to allow motion when actuated in position only.	Pass.
9.2.6.4	Combined start and stop controls		-
	Push-buttons and similar control devices that, when operated, alternately initiate and stop motion shall only be provided for functions which cannot result in a hazardous situation.	No this kind of device has been used.	Not applicable .
9.2.7	Cableless control		-
9.2.7.1	General		-
	Means shall be provided to readily remove or disconnect the power supply of the operator control station (see also 9.2.7.3).	No this kind of device has been used.	Not applicable .
	Means (for example key operated switch, access code) shall be provided, as necessary, to prevent unauthorized use of the operator control station.		Not applicable .
	Each operator control station shall carry an unambiguous indication of which machine(s) is (are) intended to be controlled by that operator control station		Not applicable .
9.2.7.2	Control limitation		-
	Measures shall be taken to prevent the machine from responding to signals other than those from the intended operator control station(s).		Not applicable .
	Where necessary, means shall be provided so that the machine can only be controlled from operator control stations in one or more predetermined zones or locations.		Not applicable .
9.2.7.3	Stop		-
	Operator control stations shall include a separate and clearly identifiable means to initiate the stop function of the machine or of all the motions that can cause a hazardous condition		Not applicable .



	The actuating means to initiate this stop function shall not be marked or labeled as an emergency stop device		Not applicable .
	A machine which is equipped wit cableless control shall have a means of automatically initiating the		Not applicable

	stopping of the machine and of preventing a potentially hazardous operation		.
9.2.7.4	Use of more than one operator control station		-
	Where a machine has more than one operator control station, including one or more cableless control stations, measures shall be provided to ensure that only one of the control stations can be enabled at a given time. An indication of which operator control station is in control of the machine shall be provided at suitable locations as determined by the risk assessment of the machine.		Not applicable .
	Exception: a stop command from any one of the control stations shall be effective when required by the risk assessment of the machine.		Not applicable .
9.2.7.5	Battery-powered operator control stations		-
	A variation in the battery voltage shall not cause a hazardous situation. If one or more potentially hazardous motions are controlled using a battery-powered cableless operator control station, a clear warning shall be given to the operator when a variation in battery voltage exceeds specified limits. Under those circumstances, the cableless operator control station shall remain functional long enough for the operator to put the machine into a nonhazardous situation.		Not applicable .
9.3	Protective interlocks		-
9.3.1	Reclosing or resetting of an interlocking safeguard		-
	The reclosing or resetting of an interlocking safeguard shall not initiate hazardous machine operation.	No safeguard can initiate machine motion or operation.	Pass.
9.3.2	Exceeding operating limits		-
	Where an operating limit (for example speed, pressure, position) can be exceeded leading to a hazardous situation, means shall be provided to detect when a predetermined limit(s) is exceeded and initiate an appropriate control action.		Not applicable .



9.3.3	Operation of auxiliary functions		-
	The correct operation of auxiliary functions shall be checked by appropriate devices (for example pressure sensors).		Not applicable .

9.3.4	Interlocks between different operations and for contrary motions		-
	Interlocking shall be provided against incorrect operation		Not applicable
9.3.5	Reverse current braking		
	Use of reverse current braking		Not applicable
9.4	Control functions in the event of failure		-
9.4.1	General requirements		-
	Provision of control functions in case of failure according to the level of risk assessment.	According to the risk assessment.	Pass.
9.4.2	Measures to minimize risk in the event of failure		-
9.4.2.1	Use of proven circuit techniques and components		-
	Use of proven circuit techniques and components	Appropriate components have been taken.	Pass.
9.4.2.2	Provisions for redundancy		-
	Provisions for redundancy		Not applicable
9.4.2.3	Use of diversity		-
	Use of diversity		Not applicable
9.4.2.4	Functional tests		-
	Carried out automatically by the control system or manually by inspection	By inspection manually.	Pass.
9.4.3	Protection against maloperation due to earth faults, voltage interruptions and loss of circuit continuity		-
9.4.3.1	Earth faults		-
	Bonding to the protective bonding circuit may be provided according to 8.2 and the devices may be connected as described in 9.1.4	Make reference to the relevant clause.	Pass.



9.4.3.2	Voltage interruptions		-
	Where a memory device is used, proper functioning in the event of power failure shall be ensured to prevent any loss of memory that can result in a hazardous condition	No memory device has been used.	Not applicable
9.4.3.	Loss of circuit continuity		-

3			
	Where the loss of continuity of safety-related control circuits depending upon sliding contacts can result in hazardous condition, appropriate measures shall be taken	No such function has been found.	Not applicable
10	Operator interface and machine-mounted control devices		-
10.1	General		-
10.1.1	General device requirements		-
	As far as is practicable, those devices shall be selected, mounted, and identified or coded according to IEC 60073 and IEC 60447	These requirements appropriate for this machine have been complied with.	Pass.
10.1.2	Location and mounting		-
	Appropriate location mounting for machine-mounted and hand-operated control devices	This requirement has been complied with.	Pass.
10.1.3	Protection		-
	Operator and machine mounted control devices shall withstand the stress of expected use.	They can withstand the stress of expected use.	Pass.
	The operator interface control devices shall have a min degree of protection: IPXXD	IPXXD	Pass.
10.1.4	Position sensors		-
	Position sensors shall not be damaged in the event of over travel	No position sensor has been used.	Not applicable
	Position sensors used in circuits with safety-related functions either shall have positive opening operation or shall provide similar reliability		Not applicable
10.1.5	Portable and pendant control stations		-
	Portable and pendant control stations and their control devices shall be so selected and arranged as to minimize the possibility of inadvertent machine operations caused by shocks and vibrations		Not applicable
10.2	Push-buttons		-
10.2.1	Colors		-
	Push-button actuators shall be color-coded according to table 2	Their colors are according to table 2.	Pass.



10.2.2	Markings		-
	Use of adequate markings for push-buttons	Adequate markings are used.	Pass.
10.3	Indicator lights and displays		-
10.3.1	Modes of use		-
	Indication and /or confirmation		Pass.

10.3.2	Colors		-
	Color-coded according to table 3 (Unless otherwise agree between the supplier and the user)	Their colors are according to table 3.	Pass.
10.3.3	Flashing lights		-
	Use of flashing lights		Not applicable ..
10.4	Illuminated push-buttons		-
	Color-coded according to table 2 and 3		Not applicable .
10.5	Rotary control devices		-
	Devices having a rotational member shall be mounted to prevent rotation of the stationary member (Friction alone shall not be sufficient)		Not applicable .
10.6	Start devices		-
	Shall be constructed and mounted to minimize inadvertent operation	Inadvertent operation can be prevented.	Pass.
10.7	Devices for emergency stop		-
10.7.1	Location		-
	Devices for emergency stop shall be readily accessible	It is readily accessible.	Pass.
	Emergency stop devices shall be located at each operator control station and at other locations where the initiation of an emergency stop can be required	All of them are located at each operator control station.	Pass.
10.7.2	Types		-
	Use of type - a push-button operated switch - a pull-cord operated switch - a pedal-operated switch without a mechanical guard	A push-button operated switch.	Pass.
	Shall be of the self-latching type and shall have positive opening operation	Self-latching type and positive opening operation.	Pass.
10.7.3	Restoration of normal function after emergency stop		-



	It shall not be possible to restore an emergency stop circuit until all emergency stop devices have been manually reset.	This requirement has been complied with.	Pass.
10.7.4	Local operation of the supply disconnecting device to effect emergency switching off		-
	Where the supply disconnecting device is to be locally operated for emergency switching off, it		Not applicable

	shall be readily accessible and should meet the colour requirements of 10.7.3		.
10.8	Emergency switching off devices		-
10.8.1	Location of emergency switching off devices		-
	Emergency switching off devices shall be located as necessary for the given application. Normally, those devices will be located separate from operator control stations. Where it is necessary to provide a control station with an emergency stop device and an emergency switching off device, means shall be provided to avoid confusion between these devices.		Not applicable ..
10.8.2	Types of emergency switching off device		-
	The types of device for emergency switching off include: – a push-button operated switch with a palm or mushroom head type of actuator; – a pull-cord operated switch.		Not applicable ..
	The devices shall have direct opening action (see IEC 60947-5-1, Annex K).		Not applicable ..
	The push-button operated switch may be in a break-glass enclosure.		Not applicable ..
10.8.3	Colour of actuators		-
	Actuators of emergency switching off devices shall be coloured RED. If a background exists immediately around the actuator, then this background shall be coloured YELLOW.		Not applicable ..
	Where confusion can occur between emergency stop and emergency switching off devices, means shall be provided to minimise confusion.		Not applicable ..
10.8.4	Local operation of the supply disconnecting device to effect emergency switching off		-
	Where the supply disconnecting device is to be locally operated for emergency switching off, it shall be readily accessible and should meet the colour requirements of 10.8.3.		Not applicable ..
10.9	Enabling control device		-



	When an enabling control device is provided as a part of a system, it shall signal the enabling control to allow operation when actuated in one position only. In any other position, operation shall be stopped or prevented.	The enabling control device will activate only in one position.	Pass.
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	Enabling control devices shall be selected and arranged so as to minimize the possibility of defeating.	This requirement has been complied with.	Pass.
	Enabling control devices shall be selected that have the following features in this clause.	Appropriate enabling control devices have been selected.	Pass.
11	Controlgear: location, mounting, and enclosures		-
11.1	General requirements		-
11.2	Location and mounting		-
11.2.1	Accessibility and maintenance		-
	All control gears can be identified without moving or the wiring	All of them can be identified without moving or the wiring.	Pass.
	Replacement without dismantling other equipment or parts of the machine	They can be replaced without dismantling other equipment or parts of the machine.	Pass.
	Terminals not associated with control gear shall also comply with the requirements mentioned above	Those relative requirements have been complied with.	Pass.
	Facilitate operation and maintenance from the front.	It can easily operation and maintenance from the front.	Pass.
	Use of special tools (if necessary)		Pass.
	If access is required for regular maintenance or adjustment, the devices shall be located between 0.4 m and 2.0 m above the severing level	Those relative requirements have been complied with.	Pass.
	It is recommended that terminals be at least 0.2m above the servicing level and so placed that connectors and cables can be easily connected to them	Above 0.2m and can be connected easily.	Pass.
	Except those for operating, indicating, measuring and cooling, no devices shall be mounted on doors, and normally removable access covers, of enclosures	No electrical devices mounted on doors.	Pass.
	If control devices are connected through plug-in arrangements, their association shall be made clear by type (shape), marking or designation, singly or in combination.	No control device is connected through plug-in arrangement.	Not applicable.



	Plug in devices shall be provided with non-interchangeable features		Not applicable .
	Use of plug/socket combinations shall be unobstructed access		Not applicable .

11.2.2	Physical separation or grouping		-
	Non-electrical parts and devices not directly associated with the electrical equipment shall not be located within enclosures containing control gear	No this kind of parts or devices are located within enclosures containing control gear.	Pass.
	Devices such as solenoid valves should be separated from the other electrical equipment.	All solenoid valves have been separated from the other electrical equipment.	Pass.
	Control devices mounted in the same location and connected to the supply voltage, or to both supply and control voltages, shall be grouped separately from those connected only to the control voltages	Appropriate separation has been taken.	Pass.
	Terminals shall be separated into groups for : - power circuits; - associated control circuits - other control circuits, fed from external sources	They have been separated appropriately.	Pass.
	The clearances and creep distances specified for the devices shall be maintained	Appropriately clearances and creep distances have been provided.	Pass.
11.2.3	Heating effects		-
	Heat generating components shall be located so that the temperature of each component in the vicinity remains within the permitted limit	Wind cooling equipment has been provided.	Pass..
11.3	Degrees of protection		-
	Enclosures of control gear: at least IP 22	IP23	Pass.
11.4	Enclosures, doors and openings		-
	Enclosure shall be constructed using materials capable of withstanding the mechanical, electrical and thermal stresses	The material (metal plate with painting used for enclosure can withstand the mechanical, electrical and thermal stresses	Pass.
	Fasteners used to secure doors and covers should be of the captive type	Captive type.	Pass.
	Windows provided for viewing internally mounted indicating devices shall be of a material suitable to withstand mechanical stress and chemical attack.		Not applicable



	It is recommended that enclosures doors shall have: - Not wider than 0.9 m - Vertical hinges - Lift-off type - Angle of opening at least 95°.	These requirements have been taken.	Pass.
	If enclosures which readily allow a person fully to	No this kind of situation.	Not



	enter, the relevant requirements specified in this clause shall be comply		applicable .
	The joints or gaskets of doors, lids, covers and enclosures shall withstand the chemical effects of the aggressive liquids, vapours, or gases used on the machine	They can withstand the chemical effects of the aggressive liquids, vapours, or gases used on the machine.	Pass.
	The means used to maintain the degree of protection of an enclosure on doors, lids and covers that require opening or removal for operation or maintenance shall be secured	They can be secured firmly.	Pass.
	The degree of protection for all openings in the enclosures shall be secured	The degree of protection can be secured.	Pass.
	Openings for cable shall be easily re-opened on site	They can be re-opened easily.	Pass.
	There shall be no opening between enclosures containing electrical equipment and compartments containing coolant, lubricating or hydraulic fluids, or those into which oil, other liquids, or dust can penetrate	No this kind of opening has been found.	Pass.
	The requirement mentioned above does not apply to electrical devices specially designed to operate in oil nor to electrical equipment in which coolants are used		Not applicable .
	Where there are holes in an enclosure for mounting purpose, the degree of protection for the enclosure shall be secured	Appropriate protection degree can be secured.	Pass.
	Equipment that, can attain a surface temperature sufficient to cause a risk of fire or harmful effect to an enclosure material, the relevant requirements shall be complied	No this kind of equipment.	Not applicable .
11.5	Access to control gear		-
	The min dimensions of gangways in front of and between control gear shall be according to 481.2.4 of IEC 60364-4-481	No this kind of gangway has been found.	Not applicable .



	Doors in gangways and for access to electrical operating areas shall: - be at least 0.7 m wide and 2.0 m high; - open outward; ■ have a device to allow opening from the inside without the use of a key or tool	No this kind of gangway has been found.	Not applicable .
12	Conductors and cables		-
12.1	General requirements		-

	Conductors and cables shall be selected so as to be suitable for the operating conditions (for example voltage, current, protection against electric shock, grouping of cables) and external influences (for example ambient temperature, presence of water or corrosive substances, mechanical stresses (including stresses during installation), fire hazards) that can exist.	All of conductors and cables used on these machines are suitable for the operating conditions and external influences.	Pass.
12.2	Conductors		-
	In general, conductors shall be of copper.		pass
	Where aluminium conductors are used, the crosssectional area shall be at least 16 mm ²	This requirement has been met.	Pass.
	To ensure adequate mechanical strength, the cross-sectional area of conductors should not be less than as shown in Table 5. However, conductors with smaller cross-sectional areas or other constructions than shown in Table 5 may be used in equipment provided adequate mechanical strength is achieved by other means and proper functioning is not impaired.	All these requirements have been complied with.	Pass.
	All conductors that are subject to frequent movement (for example one movement per hour of machine operation) shall have flexible stranding of class 5 or class 6.	This requirement has been met.	Pass.
12.3	Insulation		-
	The insulation of cables and conductors used, shall be suitable for a test voltage: – not less than 2 000 V AC for a duration of 5 min for operation at voltages higher than 50 V AC or 120 V DC, or – not less than 500 V AC for a duration of 5 min for PELV circuits (see IEC 60364-4-41, class III equipment).	This test has been carried out for the cables, and there is no breakdown is occurred.	Pass.
	The mechanical strength and thickness of the insulation shall be such that the insulation cannot be damaged in operation or during laying, especially for cables pulled into ducts.	Appropriate insulation with sufficient mechanical strength and thickness is provided.	Pass.
12.4	Current-carrying capacity in normal service		-
	Max allowable temperature of conductors shall not exceed the values given in table 6.	See table6.	Pass.



12.5	Conductor and cable voltage drop		-
	The voltage drop for conductors and cables shall not exceed 5% of the nominal voltage	Not exceed 5%.	Pass.
12.6	Flexible cables		-

12.6.1	General		-
	Flexible cables shall have Class 5 or Class 6 conductors.	This requirement has been met.	Pass.
	Cables that are subjected to severe duties shall be of adequate construction	Cables that are subjected to severe duties have adequate construction	Pass.
12.6.2	Mechanical rating		-
	The tensile stress for copper conductors shall not exceed 15 N/mm ² of the copper cross-sectional area	Not exceed 15 N/mm	Pass.
	If the demands of the application exceed the tensile stress, it of 15 N/mm ² , cables with special construction feature should be used and the allowed max. tensile stress strength should be agree with the cable manufacturer	No this kind of situation ² .	Not applicable
12.6.3	Current-carrying capacity of cables wound on drums		-
	Cables to be wound on drums shall be selected with conductors having a cross-sectional area such that, when fully wound on the drum and carrying the normal service load, the maximum allowable conductor temperature is not exceeded.	No cable is wound on drums.	Not applicable
	For cables of circular cross-sectional area installed on drums, the maximum current-carrying capacity in free air should be derated in accordance with Table 7 (see also Clause 44 of IEC 60621-3).	No cable is wound on drums.	Not applicable
12.7	Conductor wires, conductor bars and slip-ring assemblies		-
12.7.1	Protection against direct contact		-
	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: <ul style="list-style-type: none"> – protection by partial insulation of live parts, or where this is not practicable; – protection by enclosures or barriers of at least IP2X (see 412.2 of IEC 60364-4-41) 		Not applicable



	Horizontal top surfaces of barriers or enclosures that are readily accessible shall provide a degree of protection of at least IP4X (see 412.2.2 of IEC 60364-4-41).		Not applicable .
	Where the required degree of protection is not achieved, protection by placing live parts out of		Not applicable

	reach in combination with emergency switching off in accordance with 9.2.5.4.3 shall be applied.		.
	Conductor wires and conductor bars shall be so placed and/or protected as to:		Not applicable .
	<ul style="list-style-type: none"> – 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; – prevent damage from a swinging load. 		Not applicable .
12.7.2	Protective conductor circuit		-
	Where conductor wires, conductor bars and slip-ring assemblies are installed as part of the protective bonding circuit, they shall not carry current in normal operation. Therefore, the protective conductor (PE) and the neutral conductor (N) shall each use a separate conductor wire, conductor bar or slip-ring. The continuity of the protective conductor circuit using sliding contacts shall be ensured by taking appropriate measures (for example, duplication of the current collector, continuity monitoring).		Not applicable .
12.7.3	Protective conductor current collectors		-
	Protective conductor current collectors shall have a shape or construction so that they are not interchangeable with the other current collectors. Such current collectors shall be of the sliding contact type.		Not applicable .
12.7.4	Removable current collectors with a disconnecter		-
	Removable current collectors having a disconnecter function shall be so designed that the protective conductor circuit is interrupted only after the live conductors have been disconnected, and the continuity of the protective conductor circuit is re-established before any live conductor is reconnected (see also 8.2.4).		Not applicable .
12.7.5	Clearances in air		-



	Clearances between the respective conductors, and between adjacent systems, of conductor wires, conductor bars, slip-ring assemblies and their current collectors shall be suitable for at least a rated impulse voltage of an overvoltage category III in accordance with IEC 60664-1.		Not applicable .
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12.7.6	Creepage distances		-
	Creepage distances between the respective conductors, between adjacent systems of conductor wires, conductor bars and slip-ring assemblies, and their current collectors shall be suitable for operation in the intended environment, for example open air (IEC 60664-1), inside buildings, protected by enclosures.		Not applicable .
	In abnormally dusty, moist or corrosive environments, the following creepage distance requirements apply: – unprotected conductor wires, conductor bars, and slip-ring assemblies shall be equipped with insulators with a minimum creepage distance of 60 mm; – enclosed conductor wires, insulated multipole conductor bars and insulated individual conductor bars shall have a minimum creepage distance of 30 mm.	No such condition exist.	Not applicable .
	The manufacturer's recommendations shall be followed regarding special measures to prevent a gradual reduction in the insulation values due to unfavourable ambient conditions (for example deposits of conductive dust, chemical attack).		Not applicable .
12.7.7	Conductor system sectioning		-
	Where conductor wires or conductor bars are arranged so that they can be divided into isolated sections, suitable design measures shall be employed to prevent the energization of adjacent sections by the current collectors themselves.		Not applicable .
12.7.8	Construction and installation of conductor wire, conductor bar systems and slip-ring assemblies		
	Conductor wires, conductor bars and slip-ring assemblies in power circuits shall be grouped separately from those in control circuits.		Not applicable .
	Conductor wires, conductor bars and slip-ring assemblies shall be capable of withstanding, without damage, the mechanical forces and thermal effects of short-circuit currents.		Not applicable .



	Removable covers for conductor wire and conductor bar systems laid underground or underfloor shall be so designed that they cannot be opened by one person without the aid of a tool.	No such condition exists.	Not applicable .
	Where conductor bars are installed in a common	No such condition exists.	Not

	metal enclosure, the individual sections of the enclosure shall be bonded together and connected to a protective bonding conductor at several points depending upon their length. Metal covers of conductor bars laid underground or underfloor shall also be bonded together and connected to a protective bonding conductor.		applicable .
	The protective bonding circuit shall include the covers or cover plates of metal enclosures or underfloor ducts. Where metal hinges form a part of the bonding circuit, their continuity shall be verified (see Clause 18).		Not applicable .
	Underground and underfloor conductor bar ducts shall have drainage facilities.	No such condition exists.	Not applicable .
13	Wiring practices		-
13.1	Connections and routing		-
13.1.1	General requirements		-
	All connections, especially those of the protective bonding circuit, shall be secured against accidental loosening.	All connections can be secured against accidental loosening.	Pass.
	The means of connection shall be suitable for the cross-sectional areas and nature of the conductors being terminated.	The means of connection is suitable.	Pass.
	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 conductor shall be connected to one terminal connecting point.	No terminal has been connected with three or more conductors.	Pass.
	Soldered connections shall only be permitted where terminals are provided that are suitable for soldering.	No soldered connection has been taken.	Not applicable .
	Terminals on terminal blocks shall be plainly marked or labelled to correspond with markings on the diagrams.	All of them have been marked corresponding to markings on the diagrams.	Pass.




	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.		Pass.
	The installation of flexible conduits and cables	Liquids can drain away	Pass.

	shall be such that liquids shall drain away from the fittings.	from the fittings.	
	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.	By appropriate terminals.	Pass.
	Shielded conductors shall be so terminated as to prevent fraying of strands and to permit easy disconnection.	Appropriate termination is taken.	Pass,
	Identification tags shall be legible, permanent, and appropriate for the physical environment.	They are legible, permanent, and appropriate for the physical environment.	Pass.
	Terminal blocks shall be mounted and wired so that the internal and external wiring does not cross over the terminals (see IEC 60947-7-1).	No conductor crosses over the terminals.	Pass.
13.1.2	Conductor and cable runs		-
	Conductors and cables shall be run from terminal to terminal without splices or joints. Connections using plug/socket combinations with suitable protection against accidental disconnection are not considered to be joints for the purpose of this Sub clause.	All of them are run from terminal to terminal without splices or joints.	Pass.
	Where it is necessary to connect and disconnect cables and cable assemblies, a sufficient extra length shall be provided for that purpose.		Pass.
	The terminations of cables shall be adequately supported to prevent mechanical stresses at the terminations of the conductors.	Adequate support measure has been taken.	Pass.
	Wherever practicable, the protective conductor shall be placed close to the associated live conductors in order to decrease the impedance of the loop.		Pass.
13.1.3	Conductors of different circuits		
	Suitable arrangement for conductors of different circuits	Suitable arrangement is provided.	Pass.
13.1.4	Connection between pick-up and pick-up converter of an inductive power supply system		-



	<p>The cable between the pick-up and the pick-up converter as specified by the manufacturer of the inductive power supply shall be:</p> <ul style="list-style-type: none">– as short as practicable;– adequately protected against mechanical damage.	<p>These requirements have been complied with.</p>	<p>Pass.</p>
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13.2	Identification of conductors		-
13.2.1	General requirements		
	Conductors shall be identifiable at each termination according to the technical documentation (see clause 17)	Make reference to clause 18.	pass
	Use of color-coding for identification of conductors		
	It is recommended (for example to facilitate maintenance) that conductors be identified by number, alphanumeric, colour (either solid or with one or more stripes), or a combination of colour and numbers or alphanumeric. When numbers are used, they shall be Arabic; letters shall be Roman (either upper or lower case).	Appropriate measures have been taken to identify conductors.	Pass.
13.2.2	Identification of the protective conductor		-
	Shall be really distinguishable by shape, location, marking or color	By marking and color.	Pass.
	When identification is by color alone, the bicolor combination GREEN-AND YELLOW shall be used	By GREEN-AND-YELLOW.	Pass.
	For the bicolor combination GREEN-AND YELLOW : one of the color covers at least 30% and not more than 70% of the surface of the conductor, the other color covering the remainder of the surface		Pass.
	Use of graphical symbol 	The earthing symbol has been used.	Pass.
13.2.3	Identification of the neutral conductor		-
	The color shall be Light Blue	No neutral conductor has been used.	Not applicable
	Requirements for bare conductors used as neutral conductors		Not applicable
13.2.4	Identification by colour		-
	Where colour-coding is used for identification of conductors (other than the protective conductor (see 13.2.2) and the neutral conductor (see 13.2.3)), the following colours may be used:		-
	BLACK, BROWN, RED, ORANGE, YELLOW, GREEN, BLUE (including LIGHT BLUE), VIOLET, GREY, WHITE, PINK, TURQUOISE.	Some colors have been used.	Pass.



	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 at regular intervals and at the ends or accessible location.	This requirement has been complied with.	Pass.
	For safety reasons, the colour GREEN or the colour	Neither color GREEN nor	Pass.

	YELLOW should not be used where there is a possibility of confusion with the bicolour combination GREEN-AND-YELLOW (see 13.2.2).	the color YELLOW has been used.	
	Where colour-coding is used for identification of conductors, it is recommended that they be colour-coded as follows: – BLACK: AC and DC power circuits; – RED: AC control circuits; – BLUE: DC control circuits; – ORANGE: excepted circuits in accordance with 5.3.5.	These requirements have complied with.	Pass.
13.3	Wiring inside enclosures		-
	Panel conductors shall be supported where necessary to keep them in place	Appropriate support is provided.	Pass.
	Non-Metallic ducts shall be permitted only when they are made with a flame-retardant insulating material	Some non-metallic ducts are used with a flame-retardant insulating material.	Pass.
	Connections to devices mounted on doors or to other movable parts shall be made using flexible conductors according to 12.2 and 12.6.	Connections according to 12.2 and 12.6..	Pass.
	The conductors shall be anchored to the fixed part and to the movable part independently of the electrical connection	Adequate anchored measures have been taken.	Pass.
	Conductors and cables that do not run in ducts shall be adequately supported	All of them have been supported adequately.	Pass.
	Terminal blocks or plug-socket combinations shall be used for control wiring that extends beyond the enclosure	This application has been taken.	Pass.
	Power cables and cables of measuring circuits may be directly connected to the terminals of the devices for which the connections were intended.	This application has been taken.	Pass.
13.4	Wiring outside enclosures		-
13.4.1	General requirements-		-
	The protection degree shall be ensured when cables or ducts are introduced into the enclosure	The protection degree can be secured.	Pass.



13.4.2	External ducts		-
	Shall be enclosed in suitable ducts as described in 13.5 except for suitably protected cables		Not applicable
	Fittings used with ducts or multi-conductor cable		Not

	shall be suitable for the physical environment		applicable .
	Flexible conduit or flexible multi-conductor cable shall be used where it is necessary to employ flexible connections to pendant push-button stations		Not applicable .
	The weight of the pendant stations shall be supported by means other than the flexible conduit or the flexible multi-conductor cable		Not applicable .
	Flexible conduit or flexible multi-conductor cable shall be used for connections involving small or infrequent movements		Not applicable .
13.4.3	Connection to moving elements of the machine		-
	Connection to frequently moving parts shall be made using conductors according to 13.2	No device is connected to moving elements of the machine.	Not applicable
	Flexible cable and flexible conduit shall be so installed as to avoid excess flexing and straining, particularly the fittings		Not applicable
	Cables subject to movement shall be supported in such a way that there is no mechanical strain on the connection points nor any sharp flexing		Not applicable
	If the requirement mentioned above is achieved by using of a loop, it shall have sufficient length to provide for a bending radius of the cable of at least 10 times the diameter of the cable		Not applicable .
	Flexible cables of machines shall be protected to minimize the possibility of external damage		Not applicable .
	The cable sheath shall be resistant to the normal wear that can be expected from movement and to the effects of atmospheric contaminants		Not applicable .
	If cables subject to movement are close to moving parts, it shall have a space of at least 25 mm between the moving parts and the cables		Not applicable .
	Where the distance mentioned above is not practicable, fixed barriers shall be provided between the cables and the moving parts		Not applicable .



	The cable handing system shall be so designed that the lateral cable angles do no exceed 5。 , avoiding torsion in the cable		Not applicable .
	Measures shall be taken to ensure that at least two turns of flexible cables always remain on a drum		Not applicable

			.
	Min. permitted bending radii for the forced guiding of flexible cables shall not less than the values given in table 8		Not applicable .
	The strength section between section between two bends in an S-shaped length or a bend into another plane shall be at least 20 times the diameter of the cable		Not applicable .
	Where flexible conduit is adjacent to moving parts, the construction and supporting means shall prevent damage to the flexile conduit under all conditions of operation		Not applicable .
	Flexible metallic conduit shall not be used for rapid of frequent movements		Not applicable .
13.4.4	Interconnection of devices on the machine		-
	The connections shall be conveniently placed, adequately protected, and shown on the relevant diagrams		Not applicable .
	Such terminals shall be conveniently placed, adequately protected, and shown on the relevant diagrams		Not applicable .
13.4.5	Plug/socket combinations		-
	Shall be of adequate size and shall have sufficient contact pressure and a wiping action to ensure electrical continuity		Not applicable .
	Clearances between contacts shall be adequate for the voltages used and shall be maintained during insertion and removal of the connectors		Not applicable .
	Prevent unintentional contact with live parts at any time		Not applicable .
	Protective bonding circuit connection shall be made before any live connections are made, and shall not disconnected until all live connections in the plug are disconnected		Not applicable .
	Rated at more than 16 A or that remain connected during normal service shall be of a remaining type to prevent unintended disconnection		Not applicable .



	Rated at 63 A or above shall be of an interlocked type with a switch, so that connection and disconnection is possible only when the switch is in the OFF position		Not applicable .
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	If more than one plug-socket combination is used in the same electrical equipment, they shall be clearly identifiable		Not applicable .
	It is recommended that mechanical coding be used to prevent incorrect insertion		Not applicable .
	According to IEC 60309-1 or of a type used for domestic application shall not be used for control circuits		Not applicable .
13.4.6	Dismantling for shipment		-
	Terminals shall be suitably enclosed and plug/socket combinations shall be protected from the physical environment during transportation and storage	All of them are enclosed suitably.	Pass.
13.4.7	Additional conductors		-
	Spare conductors shall be connected to spare terminals or isolated to prevent contact with live parts	All spare conductors are connected to spare terminals or isolated to prevent contact with live parts.	Pass.
13.5	Ducts, connection boxes and other boxes		-
13.5.1	General requirements		-
	Min. protection degree for ducts: IP 33	IP33.	Pass.
	Appropriate protection for conductors insulation	Suitable protection is taken.	Pass.
	Drain holes of 6 mm diameter are permitted		Pass.
	Ducts and cables trays shall be rigidly supported and positioned at a sufficient distance from moving parts	Suitable support and sufficient distance has been taken.	Pass.
	In areas where human passage is required, the ducts and cable trays shall be mounted at least 2 m above the working surface		Not applicable .
	Ducts shall be provided only for mechanical protection	Adequate mechanical protection is provided.	Pass.
	Cable trays that are partially covered should not be considered to be ducts or cable trunking system, and the cables used shall be suitable for installation on cable trays	No cable tray is used.	Not applicable .
13.5.2	Percentage fill of ducts		-



	The dimensions and arrangement of the ducts be such as to facilitate the insertion of the conductors and cables	This requirement has been complied with.	Pass.
13.5.3	Rigid metal conduit and fittings		-
	Shall be of galvanized steel or of a corrosion-resistant material	No rigid metal conduit is used.	Not applicable



	Conduits shall be securely held in place and supported at each end		Not applicable .
	Fitting shall be threaded		Not applicable .
	Where threadless fittings are used, the conduit shall be securely fastened to the equipment		Not applicable .
	The conduit shall not be damage and the internal diameter of the conduit shall not e effectively reduced when it is bent		Not applicable .
13.5.4	Flexible metal conduit and fittings		-
	Flexible metal tubing and suitable for the expected physical environment	No flexible conduit used.	Not applicable .
13.5.5	Flexible non-metal conduit and fittings		-
	Shall be resistant to kinking and suitable for the expected physical environment	No flexible non-metal conduit and fittings.	Not applicable .
13.5.6	Cable trunking systems		-
	Shall be rigidly supported and clear of all moving or contaminating portions of the machine	No cable trunking system is used.	Not applicable .
	Covers shall be shaped to overlap the sides; gasket shall be permitted		Not applicable .
	Covers shall be attached to cable trunking systems by hinges or chain and held closed by means of captive screws or other suitable fasteners		Not applicable .
	On horizontal cable trunking systems, the cover shall not be on the bottom		Not applicable .
	Where the cable trunking system is furnished in sections, the joints between sections shall fit tightly but need not be gasketed		Not applicable .
	The only openings permitted shall be those required for wiring or for drainage		Not applicable .



	Cable trunking systems shall not have opened but unused knockouts		Not applicable .
13.5.7	Machines compartments and cable trunking systems		-
	Are isolated from coolant or oil reservoirs and are		Not

	entirely enclosed		applicable .
	Conductors run in enclosed compartment and cable trunking systems shall be so secured and arranged that they are not subject to damage		Not applicable .
13.5.8	Connection boxes and other boxes		-
	Shall be readily accessible for maintenance	They are readily accessible for maintenance.	Pass.
	Shall provide protection against the ingress of solid bodies and liquids	Adequate protection is provided.	Pass.
	Shall not have opened but unused knockouts nor any other opening and shall be so constructed as to exclude materials such as dust, flying, oil, and coolant	These requirements have been complied with.	Pass.
13.5.9	Motor connection boxes		-
	Shall enclose only connections to the motor and motor-mounted devices	They enclose only connections to the motor and motor-mounted devices.	Pass.
14	Electric motors and associated equipment		
14.1	General requirements		-
	Electric motor should conform to the requirements of IEC 60034-1	The electric motor is in conformity with the requirements of IEC 60034 series.	Pass.
14.2	Motor enclosures		-
	Protection degree shall be at least IP 23	At least IP23.	Pass.
14.3	Motor dimensions		-
	As far as is practicable, the dimensions of the motors shall comply with IEC 60072 series.	It is in compliance with IEC 60072 series.	Pass.
14.4	Motor mounting and compartments		-
	Each motor and its associated couplings, belts and pulleys, or chains, shall be so mounted that they are adequately protected and are easily for inspection	They have adequate protection and are easily for inspection.	Pass.
	Shall be such that all motor hold-down means can be removed and all terminal boxes are accessible.	This requirement has been complied with.	Pass.



	The proper cooling shall be ensured and the temperature rise remains within the limits of the insulation class.	This requirement has been complied with.	Pass.
	Motor compartment should be clean and dry, and shall be ventilated directly to the exterior of the machine	No motor compartment is found.	Not applicable .
	The vents shall be such that ingress of swarf, dust,	Adequate vents are	Pass.

	or water spray is at an acceptable level	provided.	
	There shall be no opening between the motor compartment and any other compartment that does not meet the motor compartment requirements	No this kind of opening.	Pass.
	If a conduit or pipe is run into the motor compartment from another compartment not meet the motor compartment requirements, any clearance around the conduit or pipe shall be sealed	No this kind of situation.	Not applicable
14.5	Criteria for motor selection		-
	Shall be selected according to the anticipated service and physical environment conditions	They are selected according to the anticipated service and physical environment conditions.	Pass.
14.6	Protective devices for mechanical brakes		-
	Operation of the overload and over current protective devices for mechanical brake actuators shall initiate the simultaneous de-energization (release) of the associated machine actuators	No this kind of device.	Not applicable
15	Accessories and lighting		-
15.1	Accessories		-
	Where the machine or its associated equipment is provided with socket-outlets that are intended to be used for accessory equipment (for example hand-held power tools, test equipment), the following apply:		-
	– the socket-outlets should conform to IEC 60309-1. Where that is not practicable, they should be clearly marked with the voltage and current ratings;		Not applicable
	– the continuity of the protective bonding circuit to the socket-outlet shall be ensured except where protection is provided by PELV;		Not applicable
	– all unearthed conductors connected to the socket-outlet shall be protected against overcurrent and, when required, against overload in accordance with 7.2 and 7.3 separately from the protection of other circuits;		Not applicable



	–where the power supply to the socket-outlet is not disconnected by the supply disconnecting device for the machine or the section of the machine, the requirements of 5.3.5 apply.		Not applicable .
15.2	Local lighting of the machine and equipment		-
15.2.1	General		

	Connections to the protective bonding circuit shall be in accordance with 8.2.2.	It is in accordance with 8.2.2.	Pass.
	The ON/OFF switch shall not be incorporated in the lampholder or in the flexible connecting cords.	A switch has provided in the front of the machine.	Pass.
	Stroboscopic effects from lights shall be avoided by the selection of appropriate luminaires.		Pass.
	Where fixed lighting is provided in an enclosure, electromagnetic compatibility should be taken into account using the principles outlined in 4.4.2.	This requirement has been considered.	Pass.
15.2.2	Supply		-
	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.	The voltage of the lighting circuit is 220V.	Pass.
	Lighting circuits shall be supplied from one of the following sources (see also 7.2.6) in this clause.		Pass.
15.2.3	Protection		-
	Local lighting circuits shall be protected in accordance with 7.2.6.	Please see the relative clause.	Pass.
15.2.4	Fittings		-
	Adjustable lighting fittings shall be suitable for the physical environment.		Pass.
	The lampholders shall be: – in accordance with the relevant IEC standard; – constructed with an insulating material protecting the lamp cap so as to prevent unintentional contact	These requirements have been met.	Pass,
	Reflectors shall be supported by a bracket and not by the lampholder.		Pass.
16	Marking, warning signs and reference designations		-
16.1	General		-
	Warning signs, nameplates, markings, and identification plates shall be of sufficient durability to withstand the physical environment involved.	They can withstand the physical environment involved.	Pass.
16.2	Warning signs		-
16.2.1	Electric shock hazard		-



	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 (DB:2002-10).	This warning sign has been used.	Pass.
16.2.2	Hot surfaces hazard		-
	Where the risk assessment shows the need to warn against the possibility of hazardous surface	See the risk assessment report.	Pass.

	temperatures of the electrical equipment, the graphical symbol IEC 60417-5041 (DB:2002-10) shall be used.		
16.3	Functional identification		-
	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. Such markings may be as agreed between the user and the supplier of the equipment (see Annex B).	Appropriate markings have been provided for these devices.	Pass.
	Preference should be given to the use of standard symbols given in IEC 60417- DB:2002 and ISO 7000.	Preference should be given to the use of standard symbols given in IEC 60417- DB:2002 and ISO 7000.	Pass.
16.4	Marking of equipment		
	Equipment (for example controlgear assemblies) shall be legibly and durably marked in a way that is plainly visible after the equipment is installed. adjacent to each incoming supply:	They have been marked legibly and durably.	Pass.
	The full-load current shown on the nameplate shall be not less than the running currents for all motors and other equipment that can be in operation at the same time under normal conditions.	This requirement has been met.	Pass.
	Where only a single motor controller is used, that information may instead be provided on the machine nameplate where it is plainly visible.		Pass..
16.5	Reference designations		-
	All enclosures, assemblies, control devices, and components shall be plainly identified with the same reference designation as shown in the technical documentation.	These information has been provided within the instruction manual.	Pass.
17	Technical documentation		-
17.1	General		-
	The information necessary for installation, operation, and maintenance of the electrical equipment of a machine shall be supplied in the appropriate forms, for example, drawings, diagrams, charts, tables, instructions.	All the information has been provided by many forms.	Pass.



	The information shall be in an agreed language (see also Annex B).	In English.	Pass.
	The information provided may vary with the 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.		
17.2	Information to be provided		-
	The information provided with the electrical equipment shall include the requirements specified in this clause.	All of these information has been provided.	Pass.
17.3	Requirements applicable to all documentation		-
	Unless otherwise agreed between manufacturer and user:		-
	– the documentation shall be in accordance with relevant parts of IEC 61082;	This requirement has been met.	Pass.
	– reference designations shall be in accordance with relevant parts of IEC 61346;	This requirement has been met	Pass.
	– instructions/manuals shall be in accordance with IEC 62079.	This requirement has been met	Pass.
	– parts lists where provided shall be in accordance with IEC 62027, class B.	This requirement has been met	Pass.
	For referencing of the different documents, the supplier shall select one of the following methods:		-
	– where the documentation consists of a small number of documents (for example less than 5) each of the documents shall carry as a cross-reference the document numbers of all other documents belonging to the electrical equipment; or	No this condition exist.	Not applicable .
	– for single level main documents only (see IEC 62023), all documents shall be listed with document numbers and titles in a drawing or document list; or		Not applicable .
	– all documents of a certain level (see IEC 62023) of the document structure shall be listed, with document numbers and titles, in a parts list belonging to the same level.		Not applicable .
17.4	Installation documents		
	Use and requirements for installation diagram	Installation diagrams are provided.	Pass.
17.5	Overview diagrams and function diagrams		-



	Use and requirements for Overview diagrams and function (block) diagram	Overview diagrams are provided.	Pass.
17.6	Circuit diagrams		-
	Use and requirements for circuit diagrams	Circuit diagrams are provided.	Pass.

17.7	Operating manual		-
	The technical documentation shall contain an operating manual detailing proper procedures for set-up and use of the electrical equipment. Particular attention should be given to the safety measures provided.	Operating manual is provided.	Pass.
	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.		Not applicable
17.8	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 intervals and records should be part of that manual. Where methods for the verification of proper operation are provided (for example software testing programs), the use of those methods shall be detailed.	Maintenance manual is provided.	Pass.
17.9	Parts list		-
	The parts list, where provided, shall comprise, as a minimum, information necessary for ordering spare or replacement parts (for example components, devices, software, test equipment, technical documentation) required for preventive or corrective maintenance including those that are recommended to be carried in stock by the user of the equipment.	Parts list is provided.	Pass.
18	Verification		-
18.1	General		-
	This part of IEC 60204 gives general requirements for the electrical equipment of machines.		-



	The extent of verification will be given in the dedicated product standard for a particular machine. Where there is no dedicated product standard for the machine, the verifications shall always include the items a), b) and f) and may include one or more of the items c) to e) in this clause.	Relative tests have been carried out according to this clause.	Pass.
	When the electrical equipment is modified, the requirements stated in 18.7 shall apply.		Pass.
	For tests in accordance with 18.2 and 18.3,	Measuring equipment in	Pass.

	measuring equipment in accordance with the EN 61557 series is applicable.	accordance with the EN 61557 series is applicable.	
	The results of the verification shall be documented.	The result has been documented.	Pass.
18.2	Verification of conditions for protection by automatic disconnection of supply		-
18.2.1	General		-
	The conditions for automatic disconnection of supply (see 6.3.3) shall be verified by tests.	Please see the follow clauses.	Pass.
	For TN-systems, those test methods are described in 18.2.2; their applications for different conditions of supply are specified in 18.2.3.	Please see the relative clauses.	Pass.
	For TT and IT systems, see IEC 60364-6-61.		Not applicable
18.2.2	Test methods in TN-systems		-
	Test 1 verifies the continuity of the protective bonding circuit. Test 2 verifies the conditions for protection by automatic disconnection of the supply.		-
	Test 1 – Verification of the continuity of the protective bonding circuit		
	The resistance of each protective bonding circuit between the PE terminal (see 5.2 and Figure 2) and relevant points that are part of each protective bonding circuit shall be measured with a current between at least 0,2 A and approximately 10 A derived from an electrically separated supply source (for example SELV, see 413.1 of IEC 60364-4-41) having a maximum no-load voltage of 24 V AC or DC.	Please see the test report.	Pass.
	Test 2 – Fault loop impedance verification and suitability of the associated overcurrent protective device		-
	The connections of the power supply and of the incoming external protective conductor to the PE terminal of the machine, shall be verified by inspection.	They have been verified by inspection.	Pass.



	The conditions for the protection by automatic disconnection of supply in accordance with 6.3.3 and Annex A shall be verified by both:		-
1)	verification of the fault loop impedance by: – calculation, or – measurement in accordance with A.4, and	Please see the test report.	Pass.

2)	confirmation that the setting and characteristics of the associated overcurrent protective device are in accordance with the requirements of Annex A.		Pass.
18.2.3	Application of the test methods for TN-systems		-
	Test 1 of 18.2.2 shall be carried out on each protective bonding circuit of a machine.	Each protective bonding circuit have been tested.	Pass.
	When Test 2 of 18.2.2 is carried out by measurement, it shall always be preceded by Test 1.		Pass.
18.3	Insulation resistance tests		-
	Test conditions : 500 V d.c.		Pass.
	The measured values shall not less than 1 MΩ	Please see the test report in detail.	Pass.
18.4	Voltage tests		-
	Test conditions : - at least 1 second - test voltage is twice the rated supply voltage of the equipment or 1000 V, whichever is greater - frequency of 50/60 Hz - supplied from a transformer with a min. rating of 500 VA		Pass.
	Shall not breakdown	Please see the test report in detail.	Pass.
18.5	Protection against residual voltages		-
	Where appropriate, tests shall be performed to ensure compliance with 6.2.4.		Not applicable
18.6	Functional tests		-
	The functions of electrical equipment shall be tested.	The functions of electrical equipment equipped with this machine have been tested.	Pass.
	The function of circuits for electrical safety (for example earth fault detection) shall be tested.	The functions of electrical safety equipped with this machine have been tested.	Pass.
18.7	Retesting		-

	Where a portion of the machine and its associated equipment is changed or modified, that portion shall be reverified and retested, as appropriate (see 18.1).		Not applicable.
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3.3 EN 12717:2001+A1:2009 test report

1	Scope	Informative paragraph.	P
2	Normative references	Informative paragraph.	P
3	Terms and definitions	Informative paragraph.	P
4	List of significant hazards	See below	P
4.1	The list of hazards contained in table 1 is the result of a hazard identification and risk assessment carried out as described by EN 1050, for the wide range of milling machines covered by the scope of this standard. The safety requirements and/or measures and information for use contained in clauses 5 and 7 are based on the risk assessment and deal with the identified hazards by either eliminating them or reducing the effects of the risks they generate.	Risk assessment carried out by EN ISO 12100. See detail in test report of EN ISO 12100.	P
4.2	The risk assessment assumes foreseeable access from all directions, as well as unexpected start-up. Risks to both the operators and other persons who can have access to the hazard zones are identified, taking into account hazards which can occur under various conditions (e.g. commissioning, set-up, production, maintenance, repair, decommissioning) during the life of the machine. The assessment includes an analysis of the effect of failure in the control system.	Applied.	P

4.3	<p>In addition, the user of this standard (i.e. the designer, manufacturer, supplier) shall validate that the risk assessment is complete for the machine under consideration with particular attention to:</p> <ul style="list-style-type: none"> - the intended use of the machine including maintenance, setting and cleaning, and its reasonably foreseeable misuse; - the identification of the significant hazards associated with the machine. 	<p>Considered. Such information listed in the user manual.</p>	P
5	Safety requirements and/or protective measures	See below.	P
5.1	<p>General requirements Machines covered by the scope of this standard shall comply with the safety requirements and/or protective measures of this clause. In addition, the machine shall be designed according to the principles of EN 292 for hazards relevant but not significant which are not dealt with by this standard.</p>	<p>Designed according to EN ISO 12100.</p>	P
5.2	Specific requirements	See below.	P
	<p>The specific safety requirements and/or protective measures for manual drilling machines are detailed in table 2. The specific safety requirements and/or protective measures for automatic drilling machines are detailed in table 3. The specific safety requirements and/or protective measures common to both manual and automatic drilling machines are detailed in table 4.</p>	<p>Manual drilling machine designed according to table 2.</p>	P
Table 2	List of safety requirement and/or protective measure and their verification procedures for manual drilling machines	See below.	P

	<p>1.1 Work zone</p> <p>Access to mechanical hazards arising from rotating spindle/tools of manual drilling machines shall be prevented by fixed or adjustable guards (Interlocking devices shall be in accordance with EN 1088:1995). Where guards are not practicable, these may be substituted by protective devices.</p>	Adjustable guards used.	P
	<p>1.1.1 Guards</p> <p>Guard(s) shall enclose the spindle nose, chuck/toolholder, and cutting tool to prevent access from at least the front and both sides when the spindle/quill is at its normal rest position (see figure A.6)</p>		P

	<p>1.1.2 Protective devices</p> <p>For machine types (e.g. radial arm drilling machine) where reasonably foreseeable applications can preclude the use of guards, protective devices shall be provided (e.g. telescopic trip device associated with a braking system).</p> <p>Such protective devices shall be located no more than 150 mm from the outside diameter of each spindle of the machine and in the first quadrant of spindle rotation from the operator's normal position (see figure A.7).</p>		P
	<p>1.1.3 Spindle braking</p> <p>Stopping performance of spindle braking systems associated with a trip device shall have minimum capability as follows:</p> <p>spindle RPM (n) max. revolutions to stop</p> <p style="text-align: center;">$n \leq 250$ 1</p> <p style="text-align: center;">$250 < n \leq 1000$ 2</p> <p style="text-align: center;">$1000 < n \leq 1500$ 3</p> <p style="text-align: center;">$n > 1500$ 4</p>		P
	<p>1.2 workpiece holding</p> <p>For all manual drilling machines, the manufacturer shall incorporate facilities to securely affix the workpiece to the work table (e.g. through holes, T slots, mounting holes – see figure A.8).</p>		
6	<p>Verification of safety requirements and/or protective measures</p> <p>Safety requirements and/or measures implemented per clause 5 shall be verified using the recommended procedures found in tables 2, 3, and 4, column 3.</p>	Verified by table 2.	P
7	Information for use	See below.	P



7.1	General Machine warning devices (e.g. audible and visual signals), markings (e.g. signs, symbols), and instructional material (e.g. manuals for operation, maintenance) shall be in accordance with 5.3 of EN 292-2:1991. Audible warning devices shall be in accordance with EN 457; visual warning devices shall be in accordance with EN 842.	Checked and ok.	P
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7.2	Instruction handbook	See below.	P
	In addition to the requirements of 7.1, each machine shall be accompanied by a handbook containing:	See below.	P
	<p>a) the name and address of the manufacturer/supplier;</p> <p>b) any necessary information for safe installation of the machine and its guarding system (e.g. floor conditions, services, anti-vibration mountings, guarding fitting); c) instructions for how the initial test and examination of the machine and its guarding system are to be carried out before first use and being placed into production;</p> <p>d) instructions for periodic maintenance, test and examination of the machine, guards, protective devices and other safety critical parts (e.g. spindle braking elements);</p> <p>e) instructions for any test or examination necessary after change of component parts or addition of optional equipment (both hardware and software) to the machine which can affect the safety functions;</p> <p>f) instructions for safe operation, setting and maintenance including safe working practices and the training necessary to achieve the required skill level of operators;</p> <p>g) the intended application of the machine when mode 3 (see table 4, 1.1.6.4) is provided;</p>	Information found in the user manual.	P

<p><i>Prepared for</i></p>	<p>h) instructions on control systems including circuit diagrams for electrical, hydraulic, and pneumatic systems; i) the noise levels determined by methods specified in 7.3; j) descriptions of possible failure modes and advice on detection and prevention by periodic maintenance and correction; k) the specification for any fluid to be used in lubrication, braking, or transmission system: l) guidance on correct selection, preparation, application, and maintenance of metal working fluids and/or lubricants; m) provide guidance on the means for the release of persons trapped in the machine; n) information describing residual risks (e.g. conditions where noise levels are likely to exceed 80 dB (A), hazards arising from sharp or hot tools/components); o) recommendations on additional protective measures (e.g. personal protective equipment); p) information defining the limits for the maximum mass, moment of inertia, tilting moment, and spatial envelope of tools; q) information defining the limits for the spatial envelope, maximum mass, position of the centre of gravity of the workpiece and work holding fixture; r) procedures to avoid errors of fitting during maintenance of the machine; s) warning of the hazards arising from sharp tools/components and of the need to wear appropriate personal protective equipment and the risk of entanglement with particular reference to correct adjustment of guards and provision of suitable work clothing. The risk of entanglement of long hair shall be stated and recommendations for the provision of suitable hair/head coverings shall be given. t) In particular for manually operated machines (i.e. manual feed and workpiece load/unload), instructions and guidance shall be provided concerning the</p>	<p>Information found in the user manual. www.batt-lab.com</p>	<p>P</p>
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Prepared by
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safe methods of workpiece holding. This information shall
~~make reference to correct use of~~
~~TEKNATOOL INTERNATIONAL LIMITED~~
~~Shenzhen BATT Testing Technology Co., Ltd.~~
suitable clamping devices and the use
of suitable drilling jigs.
A check list should be provided for the points
d), e), and f) and include drawings and



7.3	Noise declaration	See below.	P
	Noise measurement shall be made according to EN ISO 3746 or EN ISO 11202 as appropriate. Guidance for noise emission measurement is given in annex D.	Information found in the user manual.	P
	The declaration shall be made concerning the airborne noise emission (see annex A 1.7.4 (f) of EN 292:1991/A1:1995). The declaration and verification of noise emission values shall be according to EN ISO 4871, using the dual-number form of declaration. The declaration shall be accompanied by a statement of the measuring method used and the conditions applied during the test and values for the uncertainty K (see EN ISO 4871) as follows: - □ 4 dB when using EN ISO 3746:1995, - □ 2 dB when using EN ISO 3744:1995.	Information found in the user manual.	P
7.4	Marking	See below.	P
	Each machine shall be marked in a distinct and permanent manner with: a) name and address of the manufacturer and, where applicable, business name and full address of the authorised representative; b) mass of machine; c) supply data for electrical and where applicable, hydraulic, and pneumatic systems (e.g. minimum pneumatic pressure); d) lifting points for transportation and installation purposes where applicable; e) speed range where applicable;	Checked and OK.	P
	Guards, protective devices and other parts that are part of the machine but not fitted shall be marked with identification data. Any other information needed for fitting shall be provided (see 7.2 b) of clause 7).	None.	N/A

3.4 Grounding/Insulation resistance/ Withstand voltage Test report

Sample name	NOVA VOYAGER DVR DRILL PRESS		
Manufacturer	TEKNATOOL INTERNATIONAL LIMITED		
Type	22” Voyager DVR Drill Press		
Serial number	00300001		
Sample specifications			
Rated voltage	AC110~230	Rated frequency	50 /60Hz
Rated output	2.2kw	weight	140kg
Test date	August 23 , 2016		
Test specification	EN 60204-2006 + A1:2010		
Tested by	Johnny Dou		

Test item	Continuity of protective bonding circuit		
date	August 23 , 2016	Clause of standard	Clause 18.2
Test requirements	<p>The resistance of each protective bonding circuit between the PE terminal and relevant points that are part of each protective bonding circuit shall be measured with a current between at least 0.2A and approximately 10 A derived from an electrically separated supply source (for example SELV, see having a maximum no-load voltage of 24 V AC or DC. The resistance measured shall be in the expected range according to the length, the cross sectional area and the material of the related protective bonding conductor(s).</p>		
Points tested to:	Test requirement	Measured value	
1: Elec.cabinet-PE	≤1.0V	0.45V	

2:Machine.frame-PE	$\leq 1.0V$	0.53V
3: M1-PE	$\leq 1.0V$	0.64V
4: M2-PE	$\leq 1.0V$	0.39V
Conclusion	Pass	

Test item	Fault loop impedance verification and suitability of the associated overcurrent protective device.		
date	August 23 , 2016	Clause of standard	Clause18.2
Test requirements	The connections of the power supply and of the incoming external protective conductor to the PE terminal of the machine, shall be verified by inspection.		
conclusion	Pass.		

Test item	Insulation resistance test		
Date	August 23 , 2016	Clause of standard	Clause 18.3
Test requirements	The insulation resistance measured at 500V dc between the power circuit conductors and the protective bonding circuit is to be not less than the limits.		
Points tested	Limit value/ Resistance (Ω)	Measured value (Ω)	Test result
1:L/N-PE	$\geq 1M\Omega$	$4,34 \times 10^8$	Pass.



2: M1-PE	≥1MΩ	3.33×10 ⁶	Pass.
3: M2-PE	≥1MΩ	5.3510 ⁶	Pass.
Conclusion	Pass.		
Test Item	Electric strength test		
date	August 23 , 2016	Clause of standard	Clause 18.4
Test requirements	The electrical equipment shall withstand a test voltage applied		
	for a period of at least one second between the conductors of all circuits and the protective bonding circuit		
Points tested	Voltage	Test result	
1:L/N-PE	1000V	Pass.	
2: M1-PE	1000V	Pass.	
3: M2-PE	1000V	Pass.	
Conclusion	Pass.		

Test item	Functional text		
Date	August 23 , 2016	Clause of standard	Clause 18.6
Test requirements	The function of electrical equipment shall be tested, particularly those related to safety and safeguarding.		
Points tested	Requirements	Test result	
:Function of button	Function is verified in accordance with the requirements	Pass	



Conclusion	Pass
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Shenzhen BATT Testing Technology Co., Ltd.

Report No.: BATT20160953

Equipments used for the measurement

Equipments no	Equipment's name	mode	Specification		Last time calibrate	Next time calibrate	manufac ture
GRS-T1010	Programmable Auto Safety Tester	Zentech 9032A	Withstanding Voltage Test	AC:0.05~5KV/ DC:0.05~6KV, Constant Voltage	July 1.201	July.1 2017	TaiWan CHROM A ATE INC
			Insulation Resistance Test	DC:50~1 000V,Constant Voltage			
			Ground Resistance Test	AC1.5KV/ 5KV 100mA,60s AC:3.0~30A			

Photographs of the equipments

Zentech 9032A



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3.5 Noise test report

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1.2 Types of Noise Level.

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1.4 The machine features.

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III. Microphone Positions & Machinery Conditions

3.1 Microphone Positions.

3.2 Machinery Conditions.

IV. Test Results

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1. Introduction.

In general this test report for the Hydraulic Shearing Machine made by **TEKNATOOL INTERNATIONAL LIMITED** carried out in accordance with the clause 1.7.4 of Machinery Directive and some relative requirements described as following.

1.1 Normative references

Emission sound power levels are measured in accordance with BS EN ISO 11202:1995. Sound power levels are measured in accordance with the enveloping surface measuring method shown in EN ISO 3746: 1995.

1.2 Types of noise sources

The international standard mentioned above is applicable to the noise source of any type & size except for the machinery with very tall and/or very long size. It is found appropriate for this machinery to use this standard during the testing of noise level.

1.3 Test environment

The testing was carried out to the machine located inside factory with the appropriate control of background noise.

1.4 The machine features

The machines to be measured have the following features:

Sample name	NOVA VOYAGER DVR DRILL PRESS		
Manufacturer	TEKNATOOL INTERNATIONAL LIMITED		
Type	22" Voyager DVR Drill Press		
Serial number	00300001		
Sample specifications			
Rated voltage	AC110~230	Rated frequency	50 /60Hz
Rated output	2.2kw	weight	140kg
Test date	August 23 , 2016		
Test specification	EN 60204-2006 + A1:2010		
Tested by	Johnny Dou		

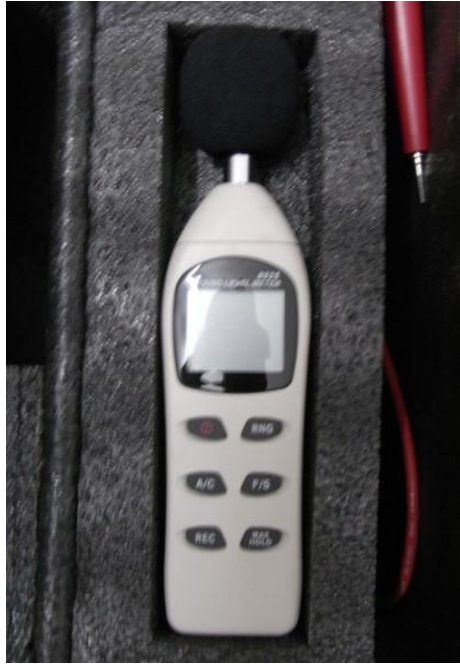
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II. Test Instruments

Equipments	Equipment's name	Model	Specification	Last time calibrate	Next time calibrate	manufactures
1024021	Sound level meter	AZ8925	40~130dB 300~8kHz A,C,Z weighing	July .1.2016	July .1.2017	Taiwan AZ Instrument Corp

2.1 Photographs of the test instruments

Sound Level Meter



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III. Microphone Positions & Machinery Conditions

3.1 Microphone positions.

When measuring the sound power level the microphone position is set up according to. EN ISO 3746: 1995, The position on the top of machine is omitted to keep the inspector from dangerous situation. Such a procedure is acceptable by the ISO/TC 43 technical committee.

When measuring the sound emission level the microphone position is set up according to BS EN ISO 11202-1996.

3.2 Machinery Conditions.

The new machine with features described above has been provided for the test.

IV. Test Result.

Noise Test Report

Sound Power Level Test Report

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Testing condition		Running free	
Position 1	70.8dB	Position 5	69.1dB
Position 2	73.7dB	Position 6	71.2dB
Position 3	71.0dB	Position 7	72.6dB
Position 4	70.2dB	Position 8	74.4dB
Average 1to 4	71.4dB	Average 1 to 8	71.8dB
Background noise		56.8 dB	
Corrections for background noise		0	
The environment correction		5.7 dB	
Sound pressure level		70.7dB	
Sound power level		72dB	

Testing condition	Normal loading
-------------------	----------------

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Position 1	69.2dB	Position 5	65.4 dB
Position 2	63.7dB	Position 6	71.3dB
Position 3	70.7 dB	Position 7	77.5dB
Position 4	78.4 dB	Position 8	69.7dB
Average 1to 4	70.5dB	Average 1 to 8	70.5dB
Background noise		56.8 dB	
Corrections for background noise		0	
The environment correction		5.7 dB	

Sound pressure level	68.8 dB
Sound power level	74dB

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IV EMC test report

1 Test Report Certification

Product: NOVA Voyager DVR Drill Press

18" Voyager DVR Drill Press

15" Voyager DVR Drill Press

Model No.: 16" Voyager DVR Drill Press

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20" Voyager DVR Drill Press

22" Voyager DVR Drill Press

Test Model No.: 22" Voyager DVR Drill Press

Applicant: Teknatool International Limited

Applicant Address: 7D Dallen Place, Rosedale, Auckland, 0632, NZ

Manufacturer: LAIZHOU SINDY ELECTRONIC & TECHNOLOGY CO., LTD

Manufacturer Address: Industry Zone, Zuocun Town, Laizhou, Shandong, China

Test Standards: EN 61000-6-4:2007+A1:2011

EN 61000-6-2:2005+AC:2005

Test Result: PASS

We, Shenzhen GRS Testing Technology Co., Ltd, hereby certify that the Equipment Under Test (EUT) described above has been tested in our facility. The test record, data evaluation and EUT configuration represented herein are true and accurate accounts of measurements of the sample's EMC characteristics under the conditions herein specified.

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2 General Information

2.1 Description of EUT

Product: NOVA Voyager DVR Drill Press

Model No.: 18" Voyager DVR Drill Press
15" Voyager DVR Drill Press
16" Voyager DVR Drill Press
20" Voyager DVR Drill Press
22" Voyager DVR Drill Press

Test Model No.: 22" Voyager DVR Drill Press
Serial No.: 00300001
Rating: AC110~230
Accessories: NA
NOTE:

1. For more detailed features description about the EUT, please refer to User's Manual.

2.2 Objective

Perform ElectroMagnetic Interference (EMI) and ElectroMagnetic Susceptibility (EMS) tests for CE Marking.

2.3 Test Standards and Results The

EUT has been tested according to the following specifications:

EMISSION		
Standard	Test Type	Result
EN 61000-6-4:2007+A1:2011	Mains terminal disturbance voltage	PASS
	Radiated disturbance	PASS
IMMUNITY (EN 61000-6-2:2005+AC:2005)		
Basic Standard	Test Type	Result
IEC 61000-4-2	Electrostatic discharge immunity	PASS
IEC 61000-4-3	Radiated, radio frequency electromagnetic field immunity	PASS

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IEC 61000-4-4	Electrical fast transient/burst immunity	PASS
IEC 61000-4-5	Surge immunity	PASS
IEC 61000-4-6	Immunity to conducted disturbances induced by RF fields	PASS
IEC 61000-4-8	Power Frequency Magnetic Field Immunity	PASS

NOTE: The latest versions of basic standards are applied.

2.4 List of Equipments Used

Description	Manufacturer	Model No.	Serial No.
Test Receiver	Schwarzbeck	FCKL1528	A0304230
Test Receiver	ROHDE&SCHWARZ	ESIB7	A0501375
LISN	Schwarzbeck	NSLK8127	A0304233
Broadband Ant.	CHASE	CBL6111A	A9704202
EMS Antenna	Amplifier Research	AR AT1080	A0304249
Power Frequency Test System	CI	15003iX-400-CTS	A0801521
Voltage Dips, Short Interruptions and Variation Test System	HAEFELY	PLine 1610	A0103106
ESD Test System	EM TEST	ESD30C	A0712513
EFT Test System	HAEFELY	PEFT JUNIOR	A0103110
Surge Test System	EM TEST	VCS500M10	A0712509
CDN	ROHDE&SCHWARZ	M2	---
Signal Generator	ROHDE&SCHWARZ	SML02	A0304261
Power Amplifier	Amplifier Research	AR 150W1000	A0304247
Power Amplifier	Amplifier Research	AR 75A250M	A0304255
Field Monitor	Amplifier Research	AR FM5004	305128
Magnetic Field Tester	HAEFELY	MAG 100.1	A0103109
Shield Room	Nanbo Tech	Site 3	A9901141
Shield Room	Nanbo Tech	Site 1	A0304210
Anechoic Chamber	Albatross	B83117-B1482-T161	A0412372
Anechoic Chamber	Albatross	H-249	A0304210

NOTE: Equipments above have been calibrated and are in the period of validation.

3 Emission Test

3.1 EUT Setup and Operating Conditions

The EUT was power by AC 380V Mains and operated in continuous test condition.

3.2 Mains Terminal Disturbance Voltage Measurement

3.2.1 Limits of Mains Terminal Disturbance Voltage

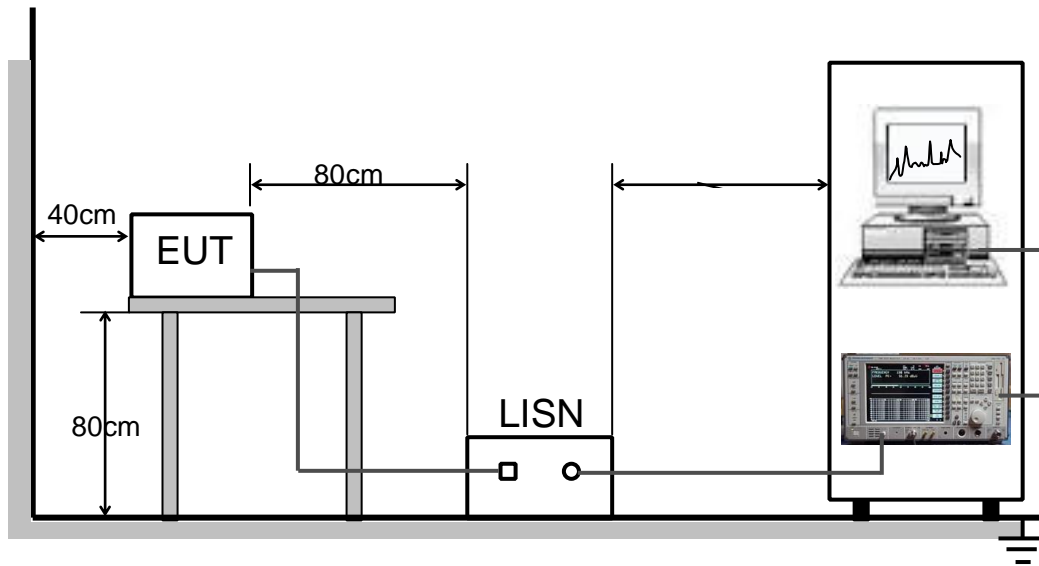
Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 - 0.50	79	66
0.50 - 5	73	60
0.50 - 30	73	60

NOTE:

- 1、 The lower limit shall apply at the transition frequencies.
- 2、 The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.2.2 Test Procedure

- a. The EUT was placed 0.4 meters from the conducting wall of shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). The LISN provide 50 Ω /50 μ H of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30MHz was searched. Emission levels over 10dB under the prescribed limits are not reported.



3.2.4 Test Result

No.	Freq. (MHz)	Limit Value (dBuV)		Emission Level (dBuV)	
		QP	AV	QP	AV
1	0.1590	79	66	50.8	48.4
2	0.1635	79	66	55.4	53.5
3	3.1785	73	60	39.0	32.0

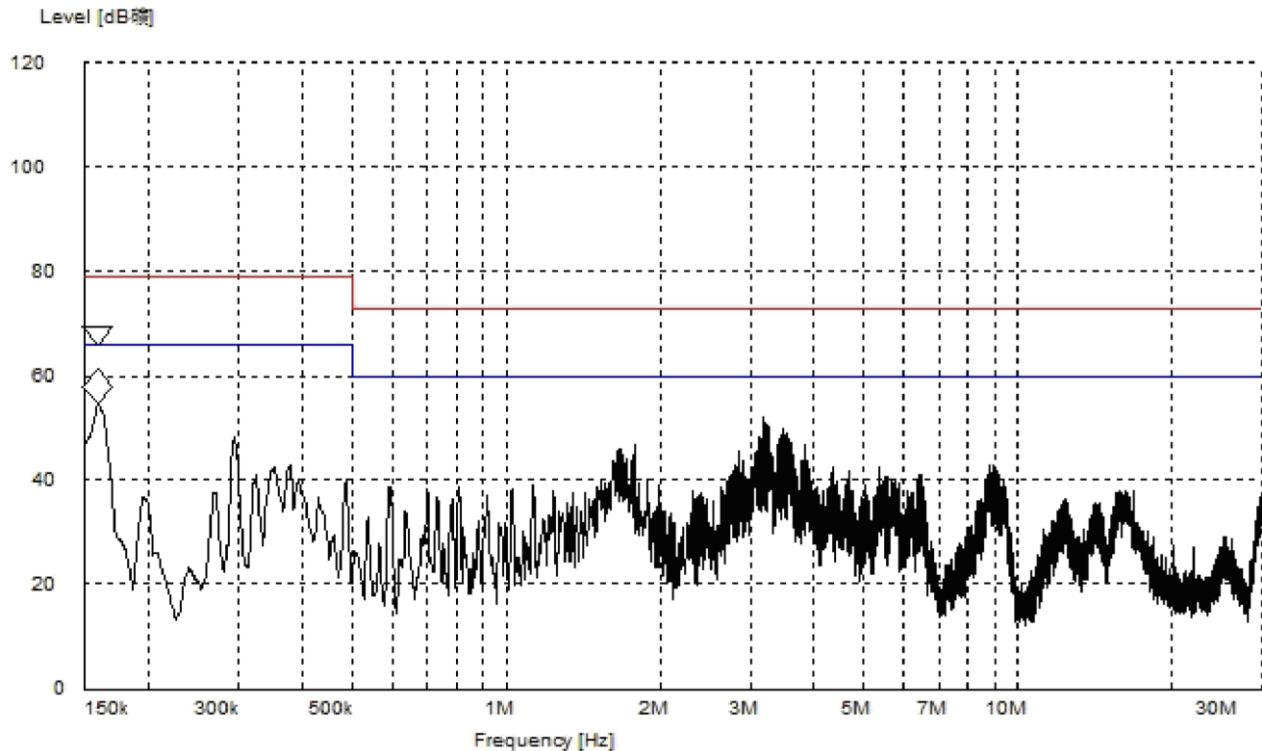
3.2.3 Test Setup

NOTE:

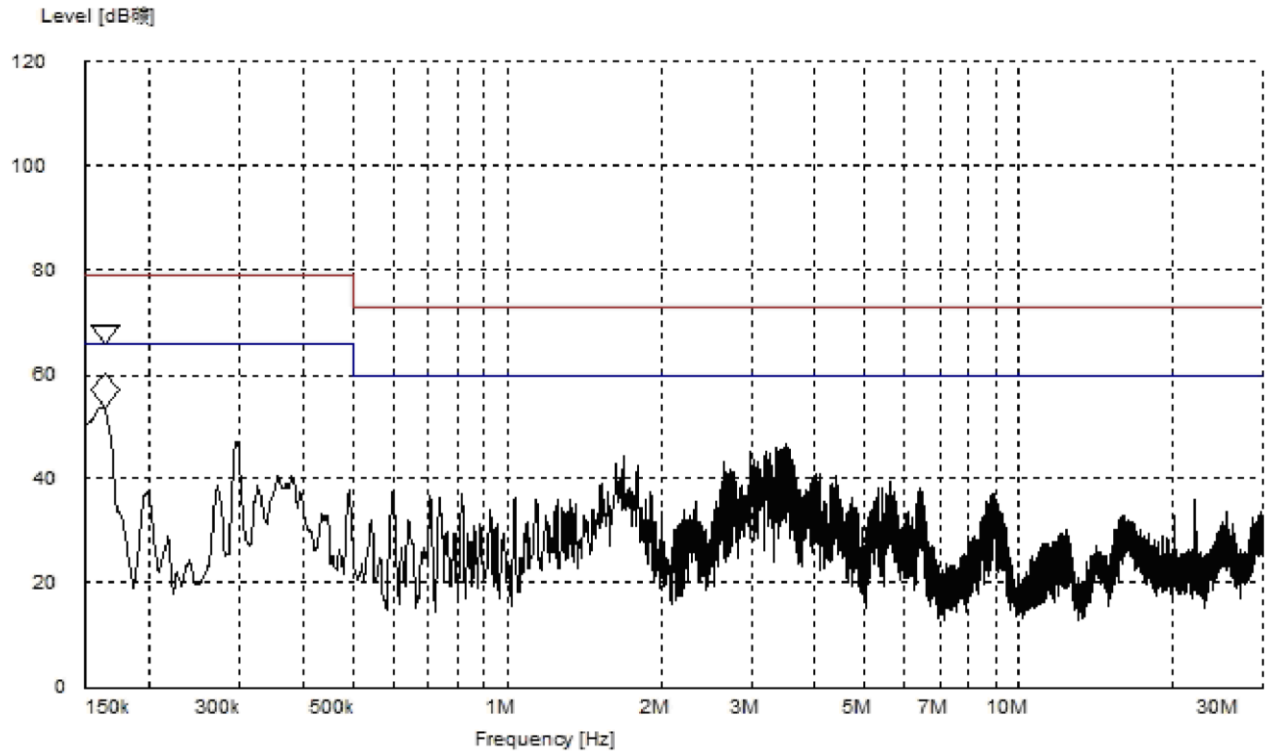
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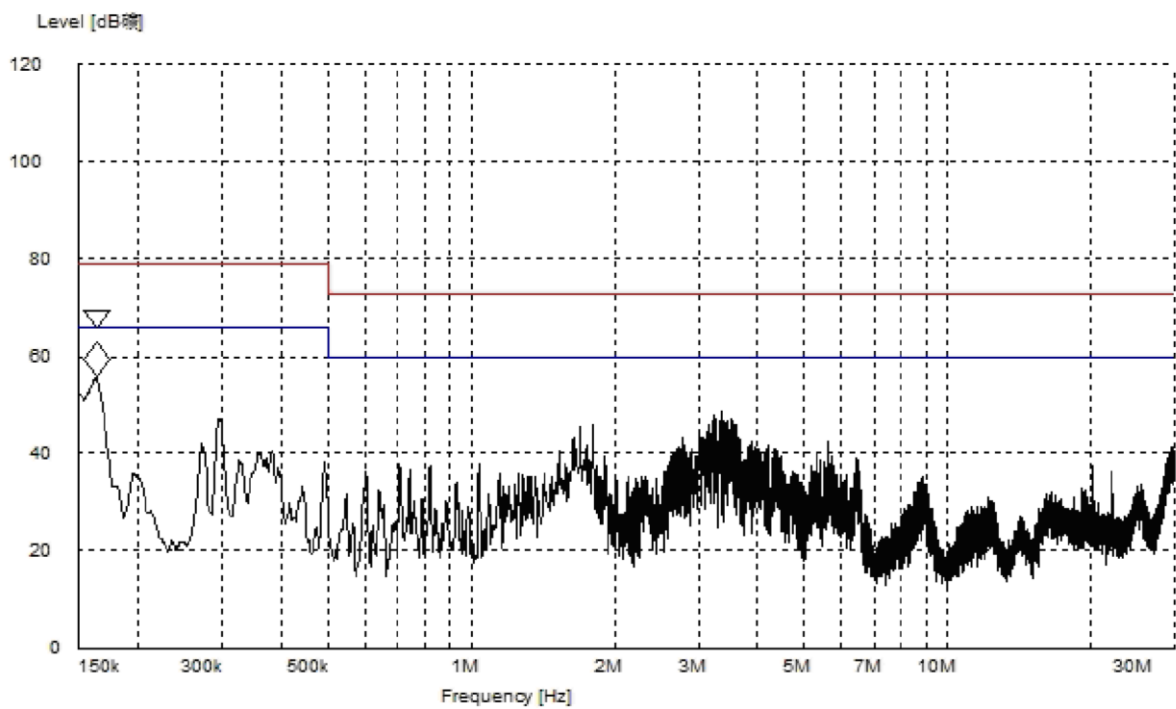
1. QP and AV are abbreviations of the quasi-peak and average individually.
 2. If the emission levels measured with QP detector are lower than AV limits, there is unnecessary to measure with AV detector.
 3. The emission levels recorded above are the larger ones of both L phase and N phase.
1. Mains terminal disturbance voltage, N phase



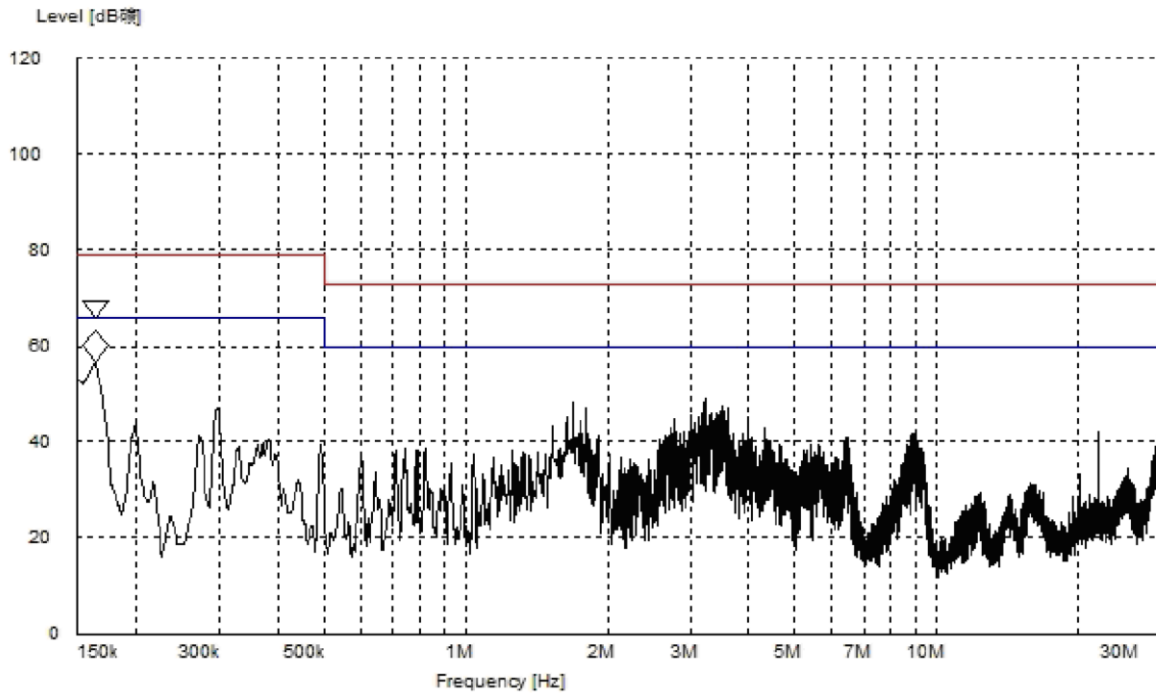
2. Mains terminal disturbance voltage, L1 phase



3、Mains terminal disturbance voltage, L1 phase



4、Mains terminal disturbance voltage, L1 phase



3.3 Radiated Disturbance Measurement

3.3.1 Limits of Radiated Disturbance

Frequency range (MHz)	Quasi peak limits(dBμV/m), at 10m measurement distance
30 – 230	40
230 - 1000	47

Notes:

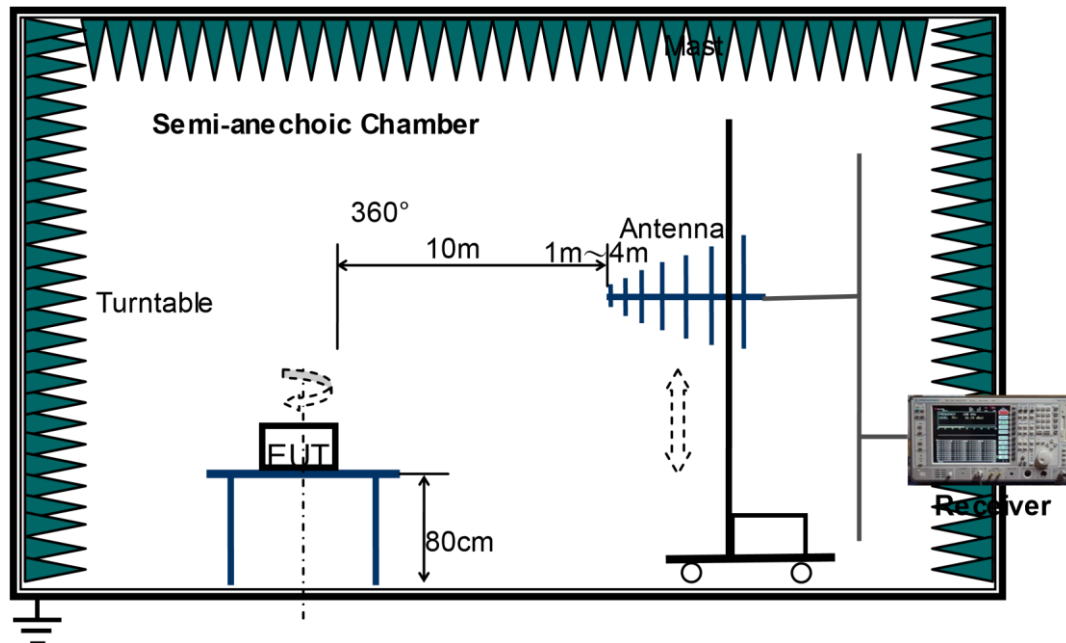
- (1) The lower limit shall apply at the transition frequency.
- (2) Additional provisions may be required for cases where interference occurs.

3.3.2 Test Procedure

- 1 The EUT was placed on the top of an insulating table 0.8 meters above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- 2 The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 3 The antenna is a broadband antenna, and its height is varied from 1 to 4 meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

- 4 For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to the heights from 1 to 4 meters and the ratable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- 5 The test-receiver system was set to Peak Detector Function and Specified Bandwidth with Maximum Hold Mode. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emission that did not have 10dB margin would be retested one by one using the quasi-peak method

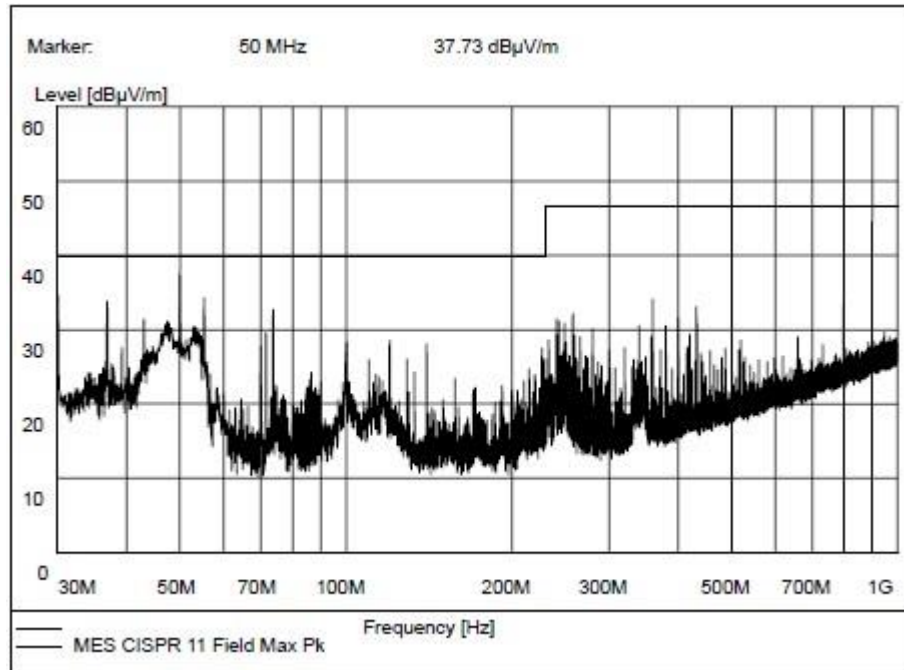
3.3.3 Test Setup



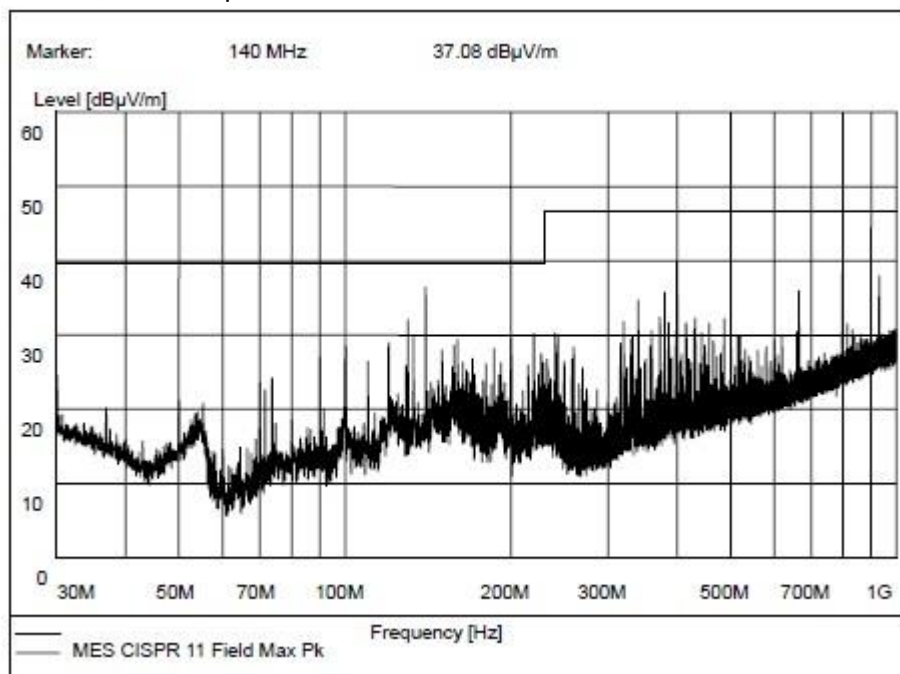
1.3.4 Test Result

No.	Frequency (MHz)	Antenna Polarization	Antenna Height (cm)	Table Angle (Degree)	QP Limits (dBuV/m)	Emission Level (dBuV/m)
1	360.00	Vertical	100	70	47	40.62
2	140.00	Horizontal	300	0	40	41.69

1. Radiation disturbances, antenna polarization: Vertical



2. Radiation disturbances, antenna polarization: Horizontal



4 Immunity Test

4.1 EUT Setup and Operating Conditions

Same as 3.1

4.2 Performance Criteria

Criterion A	The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion B	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended.
Criterion C	Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

4.3 Electrostatic Discharge Immunity Test

4.3.1 Test Specification

Basic Standard:	EN 61000-4-2
Discharge Impedance	330Ω / 150 pF
Discharge Voltage:	Air Discharge – 8 kV Contact Discharge – 4 kV
Polarity:	Positive / Negative
Number of Discharge:	Minimum 20 times at each test point
Discharge Mode:	Single discharge
Discharge Period:	1-second minimum

4.3.2 Test Procedure

The discharges shall be applied in two ways:

- a. Contact discharges to the conductive surfaces and coupling planes:

The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three contact test points shall

each receive at least 50 direct contact discharges. If no direct contact test points are available, at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

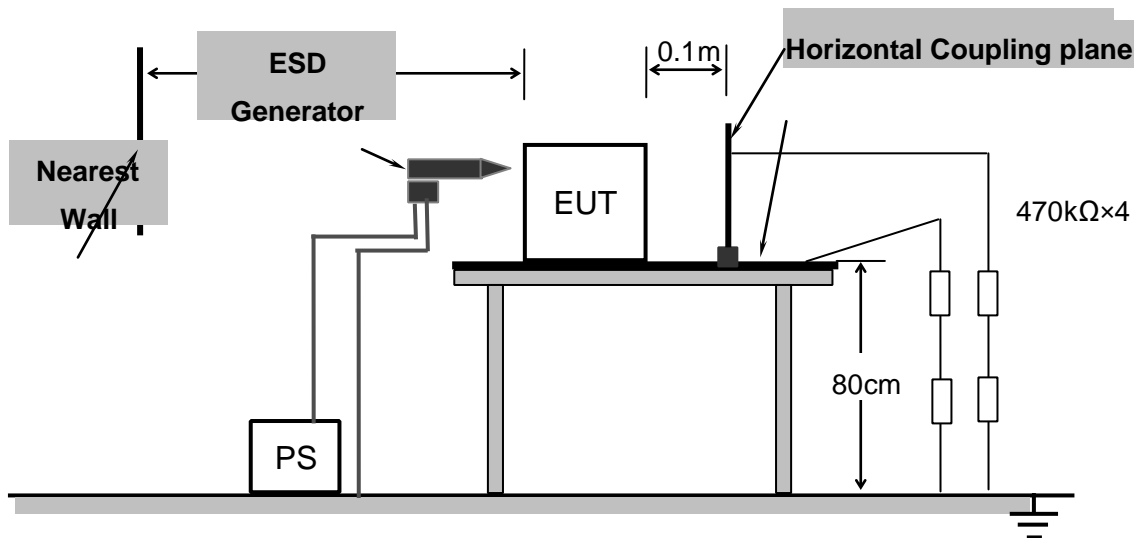
b. Air discharges at slots and apertures and insulating surfaces:

On those parts of the EUT where it is not possible to perform contact discharge testing, the equipment should be investigated to identify user accessible points where breakdown may occur. Such points are tested using the air discharge method. This investigation should be restricted to those area normally handled selected test point for each such area.

The basic test procedure was in accordance with EN 61000-4-2:

- a. Electrostatic discharges were applied only to those points and surfaces of the EUT that are accessible to users during normal operation.
- b. The test was performed with at least ten single discharges on the pre-selected points in the most sensitive polarity.
- c. The time interval between two successive single discharges was at least 1 second.
- d. The ESD generator was held perpendicularly to the surface to which the discharge was applied and the return cable was at least 0.2 meters from the EUT.
- e. Contact discharges were applied to the non-insulating coating, with the pointed tip of the generator penetrating the coating and contacting the conducting substrate.
- f. Air discharges were applied with the round discharge tip of the discharge electrode approaching the EUT as fast as possible (without causing mechanical damage) to touch the EUT. After each discharge, the ESD generator was removed from the EUT and re-triggered for a new single discharge. The test was repeated until all discharges were completed.
- g. At least ten single discharges (in the most sensitive polarity) were applied to the Horizontal Coupling Plane at points on each side of the EUT. The ESD generator was positioned vertically at a distance of 0.1 meters from the EUT with the discharge electrode touching the HCP.
- h. At least ten single discharges (in the most sensitive polarity) were applied to the center of one vertical edge of the Vertical Coupling Plane in sufficiently different positions that the four faces of the EUT were completely illuminated. The VCP (dimensions 0.5m×0.5m) was placed vertically to and 0.1 meters from the EUT.

4.3.3 Test Setup



4.3.4 Test Result

Test Points	Discharge Level (kV)	Discharge Mode	Observation	Comply with Criterion
Screw	±4	Contact	Note(1)	A
All touchable metal material of EUT	±4	Contact	Note(1)	A
HCP	±4	Contact	Note(1)	A
VCP	±4	Contact	Note(1)	A
Cover seams	±8	Air	Note(1)	A

NOTE:



The EUT continued to operate as intended. No degradation of performance was observed.

4.4 Radiated, Radio Frequency Electromagnetic Field Immunity Test

4.4.1 Test Specification

Basic Standard:	EN 61000-4-3
Frequency Range:	80 MHz – 1000MHz
Field Strength:	10V/m
Modulation:	1kHz sine wave, 80%, AM modulation
Frequency Step:	1% of fundamental
Polarity of Antenna	Horizontal and Vertical

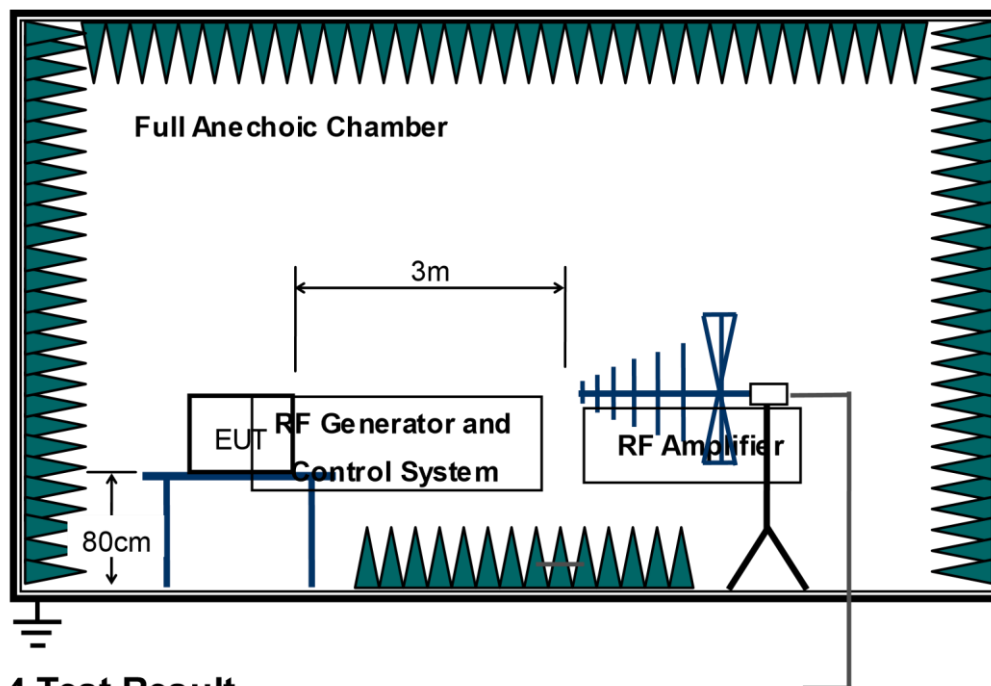
Test Distance:	3m
Antenna Height:	1.5m
Dwell Time:	3 seconds

4.4.2 Test Procedure

The test procedure was in accordance with EN 61000-4-3.

- The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- The frequency range is swept from 80 MHz to 1000MHz with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The field strength level was 3V/m.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.4.3 Test Setup



4.4.4 Test Result

Frequency	Polarity	Azimuth	Field Strength (V/m)	Observation	Comply with Criterion
80-1000 MHz	V&H	0, 90, 180, 270	10	Note(1)	A

NOTE:

(1). The EUT continued to operate as intended. No degradation of performance was observed.

4.5 Electrical Fast Transient/Burst Immunity Test

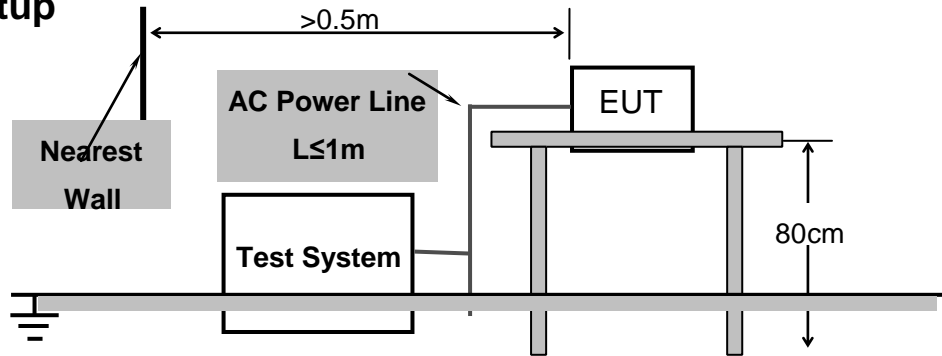
4.5.1 Test Specification

Basic Standard:	EN 61000-4-4
Test Voltage:	a.c. power port – 2 kV
Polarity:	Positive/Negative
Impulse Frequency:	5kHz
Impulse wave shape:	5/50ns
Burst Duration:	15ms
Burst Period:	300ms
Test Duration:	Not less than 1 min.

4.5.2 Test Procedure

- 16、The EUT was tested with 1000-volt discharges to the AC power input leads.
- 17、Both positive and negative polarity discharges were applied.
- 18、The length of the “hot wire” from the coaxial output of the EFT generator to the terminals on the EUT should not exceed 1 meter.
- 19、The duration time of each test sequential was 1 minute.
- 20、The transient/burst waveform was in accordance with EN 61000-4-4, 5/50ns.

4.5.3 Test Setup



4.5.4 Test Result

Test Point	Polarity	Test Level (kV)	Observation	Comply with Criterion
a.c. power, N	+/-	2	Note (1)	A
a.c. power, Line	+/-	2	Note (1)	A
a.c. power, Line+N	+/-	2	Note (1)	A

NOTE:

(1). The EUT continued to operate as intended. No degradation of performance was observed.

4.6 Surge Immunity Test

4.6.1 Test Specification

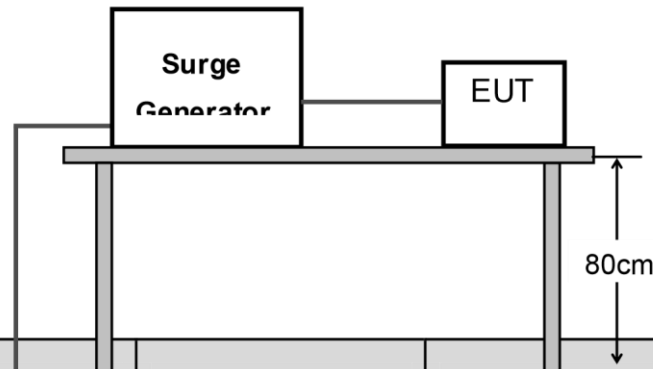
Basic Standard:	EN 61000-4-5
Waveform:	Voltage 1.2/50 μ s; Current 8/20 μ s
Test Voltage:	a.c. power port, line to line 1 kV, line to earth 2kV
Polarity:	Positive/Negative
Phase Angle:	0°, 90°, 180°, 270°
Repetition Rate:	60sec
Times:	5 times/each condition.

4.6.2 Test Procedure


- The EUT and the auxiliary equipment were placed on a table of 0.8m heights above a metal ground reference plane. The size of ground plane is greater than 1m×1m and project beyond the EUT by at least 0.1m on all sides. The ground plane is connected to the protective earth. The length of power cord between the coupling device and the EUT was less than 2 meters (provided by the manufacturer).

- b. The EUT was connected to the power mains through a coupling device that directly couples the surge interference signal. The surge noise was applied synchronized to the voltage phase at the zero crossing and the peak value of the AC voltage wave (positive and negative).
- c. The surges were applied line to line and line(s) to earth. When testing line to earth the test voltage was applied successively between each of the lines and earth. Steps up to the test level specified increased the test voltage. All lower levels including the selected test level were tested. The polarity of each surge level included positive and negative test pulses.

4.6.3 Test Setup



4.6.4 Test Result

Coupling Line 	Polarity	Voltage (kV)	Observation	Comply with Criterion
line-to-earth	+/-	2	Note (1)	A
line to line	+/-	1	Note (1)	A

NOTE:

- (1). The EUT continued to operate as intended. No degradation of performance was observed.

4.7 Immunity to Conducted Disturbances Induced by RF Fields **4.7.1**

Test Specification

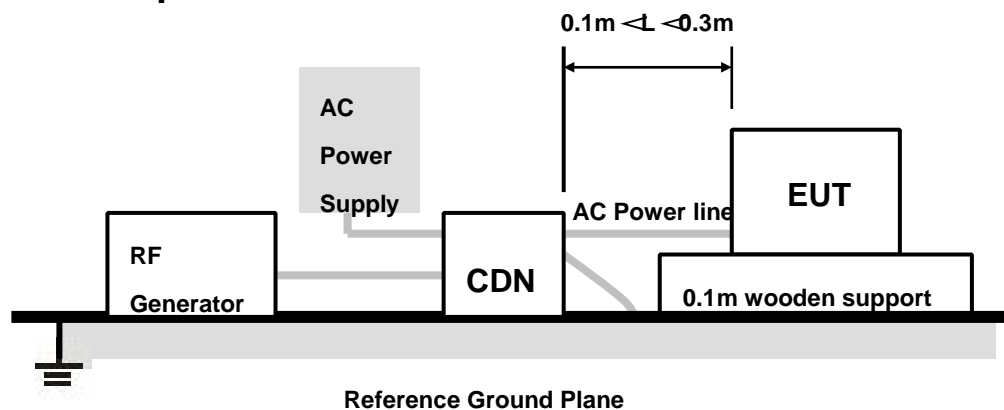
Basic Standard:	EN 61000-4-6
Frequency Range:	0.15 MHz – 80 MHz
Field Strength:	10V
Modulation:	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1% of fundamental
Coupled Cable:	a.c. power line, Ethernet line, Phone line
Coupling Device:	CDN-M2

4.7.2 Test Procedure

- a. The EUT shall be tested within its intended operating and climatic conditions.

- b. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn, while the other non-excited RF input ports of the coupling devices are terminated by a 50-ohm load resistor.
- c. The frequency range is swept from 150 kHz to 80 MHz, using the signal level established during the setting process and with a disturbance signal of 80% amplitude. The signal is modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or the switch coupling devices as necessary. The sweep rate shall not exceed 1.5×10^{-3} decades/s. The step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value where the frequency is swept incrementally.
- d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies such as clock frequencies and harmonics or frequencies of dominant interest, shall be analyzed separately.
- e. Attempts should be made to fully exercise the EUT during test, and to fully interrogate all exercise modes selected for susceptibility.

4.7.3 Test Setup



4.7.4 Test Result

Test Point	Frequency	Field Strength (Vrms)	Observation	Comply with criterion
a.c. power line	0.15 – 80 MHz	10	Note(1)	A

NOTE: (1) The EUT continued to operate as intended. No degradation of performance was observed.

4.8 Power Frequency Magnetic Field Immunity Test

4.8.1 Test Specification

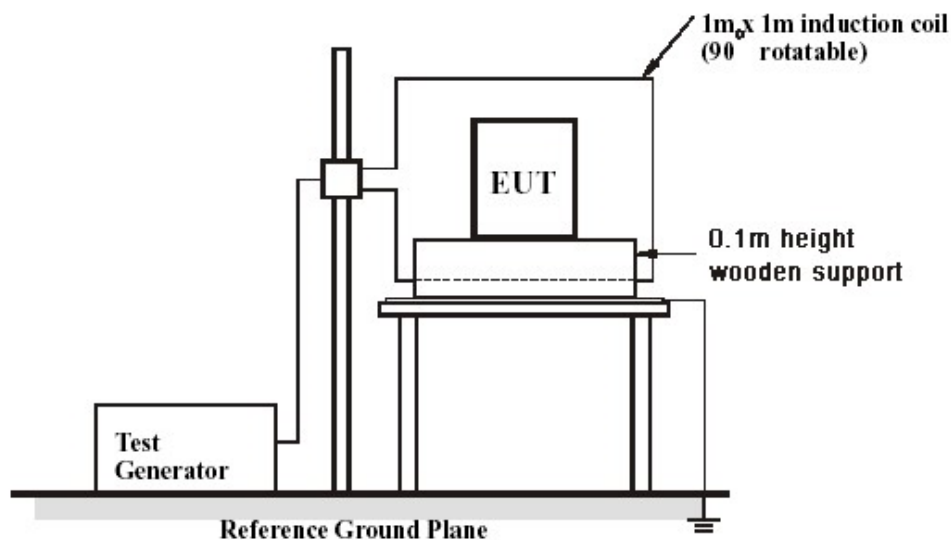
Basic Standard:	EN 61000-4-8
Frequency Range:	50Hz
Field Strength:	30 A/m

Observation Time:	2 minute
Inductance Coil:	Rectangular type, 1m×1m

4.8.2 Test Procedure

- The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m thick insulating support.
- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

4.8.3 Test Setup



4.8.4 Test Result

Direction	Field Strength(A/m)	Observation	Comply with Criterion
X	30	Note(1)	A
Y	30	Note(1)	A
Z	30	Note(1)	A

NOTE:

- (1). The EUT continued to operate as intended. No degradation of performance was observed.

Annex : Technical Information

A_1 EC Declaration of Conformity

EC Declaration of Conformity	CE
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The undersigned, representing the following:

Manufacturer and	the authorised representative established within the European Economic Area:
Company name: TEKNATOOL INTERNATIONAL LIMITED ADD: 7D Dallen Place, Rosedale, Auckland, 0632, NZ	

Here with declare that the following machinery:

Description of machinery
Generic denomination: NOVA VOYAGER DVR DRILL PRESS
Function: This NOVA VOYAGER DVR DRILL PRESS is used to drill on the steel board and similar board.
Model/s: 18" Voyager DVR Drill Press , 15" Voyager DVR Drill Press 16" Voyager DVR Drill Press , 20" Voyager DVR Drill Press , 22" Voyager DVR Drill Press

Fulfill the relevant provisions of European Directive 2006/42/EC (MD) and 2014/35/EU (LVD). The harmonized standards used in order to obtain compliance to 2006/42/EC (MD) and 2014/35/EU (LVD) are the following:

Standards

EN ISO 12100: 2010

Safety of machinery . General principles for design . Risk assessment and risk reduction.

EN 60204-1: 2006/AC:2010

EN 12717:2001+A1:2009 Safety of machine tools — Drilling machines

Safety of machinery - Electrical equipment of machines Part 1: General requirements. EN ISO

13857 : 2008 /Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs

EN ISO 13849-1:2008 / AC:2009 / Safety of machinery - Safety-related parts of control systems

. Part 1: General principles for design

EN 61000-6-2 : 2005 / Electromagnetic compatibility (EMC)

Part 6-2 : Generic standards – Immunity for industrial environments

EN 61000-6-4:2007/A1:2011 / Safety of machinery - Electrical equipment of machines -

Part 6-4 : Generic standards – Emission standard for industrial environments

Place: CEO Date:

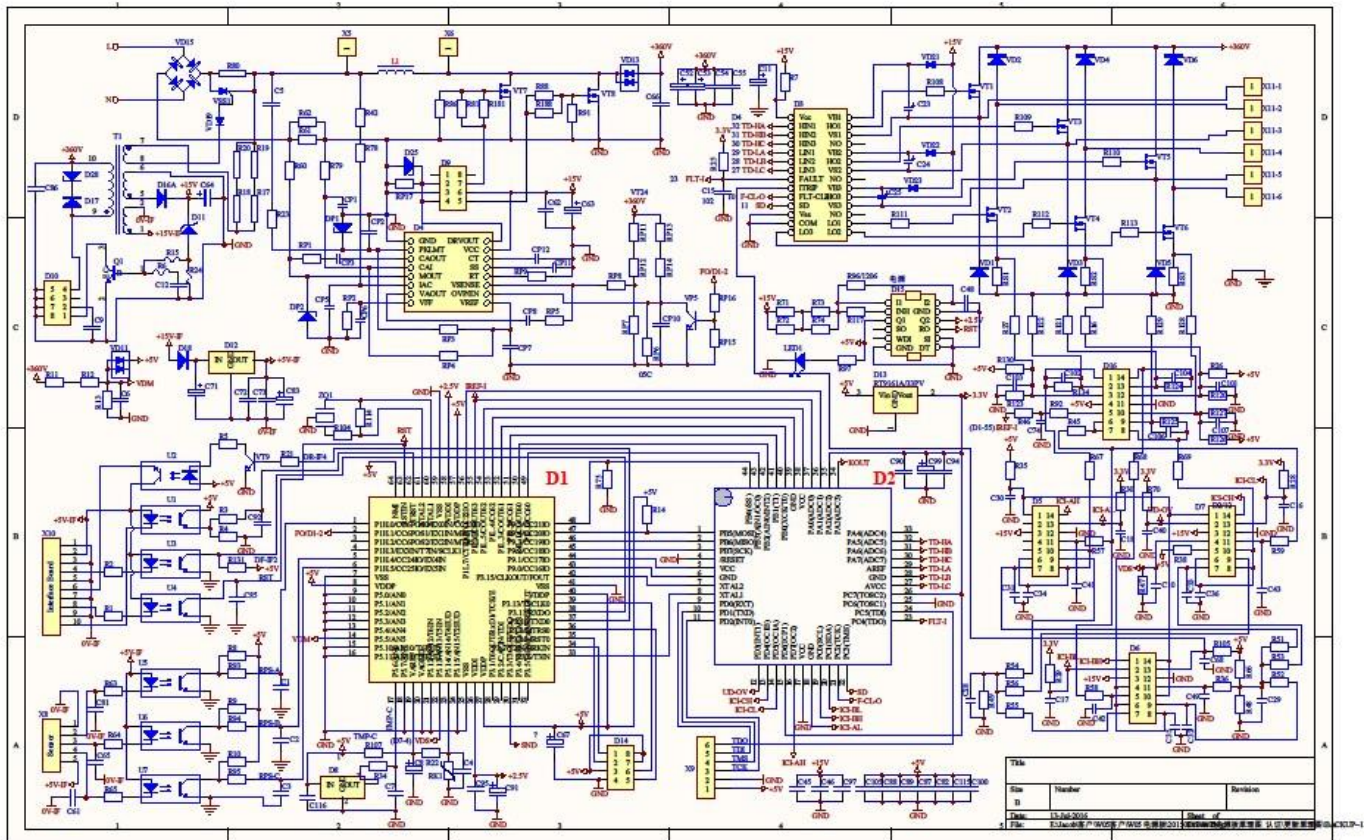
Signature:

A_2 Specification

Specification table (technical parameters)

Type	Dimension (mm)	Power (KW)	Weight (KG)	Voltage (V)	Speed Range (rpm/min)
18" Voyager DVR Drill Press	1780*450*580	1.5	120Kg	AC110~230	50~3000
15" Voyager DVR Drill Press	1600*400*500	1.3	100Kg	AC110~230	50~3000
16" Voyager DVR Drill Press	1780*400*500	1.3	110Kg	AC110~230	50~3000
20" Voyager DVR Drill Press	1780*450*580	1.7	130Kg	AC110~230	50~3000
22" Voyager DVR Drill Press	1780*450*580	2.2	140Kg	AC110~230	50~3000

A_3 Electrical circuit diagram



A_4 Electrical Parts list

BOM_Drill Press			
NO.	Product Code	Part Description	Specification
2	55018-F	Control board 6P Female	6P Female header
3	55213	PFC Coil PFC	Amorphous
16	55020	Sensor	Big Sensor
18	55400	STM32 Interface board STM32	20pin male L header
19		Drill press keypad Membrane	8 keys
24		Rotary Encoder	OpenJumper
26		16mm EMS 16mm	JHF16
28		Fuse&holder	10A Φ 6x20mm
29		Height sensor	WXD3-12/10K
34	55009	Motor stator	B50A400-J
35	55143	Rotor lamination	B50A400-J
3	KCD4-JK	Slide Switch	250V/10A
4	2.3MX3X1.5CM	The power cord	2.3MX3X1.5CM

A_5 Picture of machine





-----*The end of the Report*-----

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