Prüfbericht-Nr.: *Test report no.*:	**NN240F5E 001**	**Auftrags-Nr.:** *Order no.*:	326029627	Seite 1 von 25 *Page 1 of 25*
Kunden-Referenz-Nr.: *Client reference no.*:	5138	**Auftragsdatum:** *Order date:*	2024-06-06	
Auftraggeber: *Client*:	Ninebot (Changzhou) Tech Co., Ltd. 16F-17F, Block A, Building 3, No. 18, Changwu Mid Rd, Wujin Dist., Changzhou, Jiangsu, P.R.China			
Prüfgegenstand: *Test item*:	Segway eKickScooter ZT3 Pro			
Bezeichnung / Typ-Nr.: *Identification / Type no.*:	051801E, 051801D, 051801A			
Auftrags-Inhalt: *Order content*:	AM			
Prüfgrundlage: *Test specification*:	EN ISO 12100:2010 Safety of machinery-General principles for design-Risk assessment and risk reduction			

Wareneingangsdatum: *Date of sample receipt*:	2024-07-08
Prüfmuster-Nr.: *Test sample no:*	A003764024 001
Prüfzeitraum: *Testing period*:	2024-07-09 - 2024-07-23
Ort der Prüfung: *Place of testing*:	Kunshan
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shanghai) Co., Ltd. Kunshan Branch
Prüfergebnis*: *Test result**:	Pass

geprüft von:
tested by:

Datum:
Date: 2024-07-26

2024.07.26 15:59:20 +08'00'

genehmigt von:
authorized by:

Ausstellungsdatum:
Issue date: 2024-07-26

2024.07.26 16:05:32 +08'00'

Stellung / Position: John He / PE

Stellung / Position: Nan Jiang / Reviewer

Sonstiges / *Other*:
1. The product, which conforms to the standard EN ISO 12100:2010, follows the essential health and safety requirements of the Machinery Directive 2006/42/EC-Annex I.
2. This test report is only valid together with: attachment 1-EN 60335 test report_CN24PQM4.
3. This test report is only valid together with: attachment 2-EN 17128 test report_NN2408XH.

Zustand des Prüfgegenstandes bei Anlieferung:
Condition of the test item at delivery: Prüfmuster vollständig und unbeschädigt
Test item complete and undamaged

* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
* *Legend:*	*P(ass) = passed a.m. test specification(s)*	*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Anmerkungen
Remarks

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4	Die Entscheidungsregel für Konformitätserklärungen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. *The decision rule for statements of conformity in this test report is based on the “Zero Guard Band Rule” and “Simple Acceptance” in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report.*

Prüfbericht-Nr.: NN240F5E 001
Test report no.:

Produktbeschreibung
Product description

1	**Produktdetails** *Product details*	Class 2 vehicle. Two aligned wheels in a single track.
2	**Maße / Gewicht** *Dimensions / Weight*	Weight: 29.15kg.
3	**Bedienelemente** *Operating elements*	Throttle on handlebar.
4	**Ausstattung / Zubehör** *Equipment / Accessories*	Battery charger.
5	**Verwendete Materialien** *Used materials*	Not provided.
6	**Sonstiges** *Other*	Test sample(s), as well sample information, description, product details and intended usage was provided by customer.
7	**Prüfmusterbereitstellung:** **Test sample obtaining:**	☒ Sending by customer ☐ Sampling by TÜV Rheinland Group ☐ others:

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Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
4	Strategy for risk assessment and risk reduction		P
	To implement risk assessment and risk reduction the designer shall take the following actions, in the order given (see Figure 1)	Considered.	P
	Risk assessment is a series of logical steps to enable, in a systematic way, the analysis and evaluation of the risks associated with machinery.	Considered.	P
	Risk assessment is followed, whenever necessary, by risk reduction. Iteration of this process can be necessary to eliminate hazards as far as practicable and to adequately reduce risks by the implementation of protective measures.	The construction of the product is safe concerning of its operation and maintenance.	P
	It is assumed that, when present on machinery, a hazard will sooner or later lead to harm if no protective measure or measures have been implemented.		P
	Protective measures are the combination of the measures implemented by the designer and the user in accordance with Figure 2. Measures which can be incorporated at the design stage are preferable to those implemented by the user and usually prove more effective.		P
	The objective to be met is the greatest practicable risk reduction, taking into account the four below factors. The strategy defined in this clause is represented by the flowchart in Figure 1. The process itself is iterative and several successive applications can be necessary to reduce the risk, making the best use of available technology.		P
5	Risk assessment		P
5.1	General		P
	Risk assessment comprises (see Figure 1) - risk analysis - risk evaluation (see 5.6).	Considered.	P
5.2	Information for risk assessment		P
	The information for risk assessment should include the following. a) Related to machinery description b) Related to regulations, standards and other applicable documents c) Related to experience of use d) Relevant ergonomic principles.	Intended use, description, etc., provided in instructions, EN 17128:2020.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
5.3	Determination of limits of machinery		P
5.3.1	General		P
	Risk assessment begins with the determination of the limits of the machinery, taking into account all the phases of the machinery life. This means that the characteristics and performances of the machine or a series of machines in an integrated process, and the related people, environment and products, should be identified in terms of the limits of machinery as given in 5.3.2 to 5.3.5.	Intended use provided in instructions.	P
5.3.2	Use limits	Relevant information provided in instructions: This product is designed for one adult use only, personal transportation.	P
5.3.3	Space limits	The user's minimum height and maximum age are specified in instructions, The user shall check the limits of use in accordance with the local regulations as required in instructions.	P
5.3.4	Time limits	Considered.	P
5.3.5	Other limits	Considered, e.g., avoid using on the ground with oil or ice.	P
5.4	Hazard identification		P
	After determination of the limits of the machinery, the essential step in any risk assessment of the machinery is the systematic identification of reasonably foreseeable hazards (permanent hazards and those which can appear unexpectedly), hazardous situations and/or hazardous events during all phases of the machine life cycle	Considered.	P
	Only when hazards have been identified can steps be taken to eliminate them or to reduce risks. To accomplish this hazard identification, it is necessary to identify the operations to be performed by the machinery and the tasks to be performed by persons who interact with it	Considered.	P
	The designer shall identify hazards taking into account the following.		P
	a) Human interaction during the whole life cycle of the machine b) Possible states of the machine. c) Unintended behaviour of the operator or reasonably foreseeable misuse of the machine	Considered.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
5.5	Risk estimation		P
5.5.1	General		P
	After hazard identification, risk estimation shall be carried out for each hazardous situation by determining the elements of risk given in 5.5.2. When determining these elements, it is necessary to take into account the aspects given in 5.5.3.	Considered.	P
	If standardized (or other suitable) measurement methods exist for an emission, they should be used, in conjunction with existing machinery or prototypes, to determine emission values and comparative emission data.	Considered.	P
	Hazards other than emissions that are described by measurable parameters can be dealt with in a similar manner.	Considered.	P
5.5.2	Elements of risk		P
5.5.2.1	General		P
	The risk associated with a particular hazardous situation depends on the following elements: a) the severity of harm; b) the probability of occurrence of that harm	Considered.	P
5.5.2.2	Severity of harm		P
	The severity can be estimated by taking into account the following: a) the severity of injuries or damage to health b) the extent of harm When carrying out a risk assessment, the risk from the most likely severity of the harm that is likely to occur from each identified hazard shall be considered, but the highest foreseeable severity shall also be taken into account, even if the probability of such an occurrence is not high.	Considered.	P
5.5.2.3	Probability of occurrence of harm		P
5.5.2.3.1	Exposure of persons to the hazard		P
	The exposure of a person to the hazard influences the probability of the occurrence of harm.	Considered.	P
5.5.2.3.2	Occurrence of a hazardous event		P
	The occurrence of a hazardous event influences the probability of occurrence of harm.	Considered.	P
5.5.2.3.3	Possibility of avoiding or limiting harm		P
	The possibility of avoiding or limiting harm influences the probability of occurrence of harm. Factors to be taken into account when estimating the possibility of avoiding or limiting harm	Considered.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
5.5.3	Aspects to be considered during risk estimation		P
5.5.3.1	Persons exposed		P
	Risk estimation shall take into account all persons (operators and others) for whom exposure to the hazard is reasonably foreseeable.	Considered.	P
5.5.3.2	Type, frequency and duration of exposure		P
	The estimation of the exposure to the hazard under consideration (including long-term damage to health) requires analysis of, and shall account for, all modes of operation of the machinery and methods of working. In particular, the analysis shall account for the needs for access during loading/unloading, setting, teaching, process changeover or correction, cleaning, fault-finding and maintenance. The risk estimation shall also take into account tasks, for which it is necessary to suspend protective measures.	Considered.	P
5.5.3.3	Relationship between exposure and effects		P
	The relationship between an exposure to a hazard and its effects shall be taken into account for each hazardous situation considered. The effects of accumulated exposure and combinations of hazards shall also be considered. When considering these effects, risk estimation shall, as far as practicable, be based on appropriate recognized data	Considered.	P
5.5.3.4	Human factors		P
	Human factors can affect risk and shall be taken into account in the risk estimation Training, experience and ability can affect risk; nevertheless, none of these factors shall be used as a substitute for hazard elimination, risk reduction by inherently safe design measure or safeguarding, wherever these protective measures can be practicably implemented.	Considered.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
5.5.3.5	Suitability of protective measures		P
	Risk estimation shall take into account the suitability of protective measures and shall a) identify the circumstances which can result in harm, b) whenever appropriate, be carried out using quantitative methods to compare alternative protective measures and c) provide information that can assist with the selection of appropriate protective measures. When estimating risk, those components and systems identified as immediately increasing the risk in case of failure need special attention. When protective measures include work organization, correct behavior, attention, application of personal protective equipment (PPE), skill or training, the relatively low reliability of such measures compared with proven technical protective measures shall be taken into account in the risk estimation.	Considered.	P
5.5.3.6	Possibility of defeating or circumventing protective measures		P
	For the continued safe operation of a machine, it is important that the protective measures allow its easy use and do not hinder its intended use. Otherwise, there is a possibility that protective measures might be bypassed in order for maximum utility of the machine to be achieved.	Protective measure taken for this vehicle does not hinder the intended use.	P
	Risk estimation shall take account of the possibility of defeating or circumventing protective measures. It shall also take account of the incentive to defeat or circumvent protective measures	Considered	P
	Whether or not a protective measure can be defeated depends on both the type of protective measure, such as an adjustable guard or programmable trip device, and its design details.	Cannot be adjusted.	P
	Protective measures that use programmable electronic systems introduce additional possibilities of defeat or circumvention if access to safety-related software is not appropriately restricted by design and monitoring methods. Risk estimation shall identify where safety-related functions are not separated from other machine functions and shall determine the extent to which access is possible. This is particularly important when remote access for diagnostic or process correction purposes is required.	Programmable electronic system used for protective measure.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
5.5.3.7	Ability to maintain protective measures		P
	Risk estimation shall consider whether the protective measures can be maintained in the condition necessary to provide the required level of protection.	Considered.	P
5.5.3.8	Information for use		P
	Risk estimation shall take into account the information for use, as available. See also 6.4.	Considered.	P
5.6	Risk evaluation		P
5.6.1	General		P
	After risk estimation has been completed, risk evaluation shall be carried out to determine if risk reduction is required. If risk reduction is required, then appropriate protective measures shall be selected and applied.	Considered.	P
	Achieving the objectives of risk reduction and a favorable outcome of risk comparison applied when practicable gives confidence that risk has been adequately reduced.	Considered.	P
5.6.2	Adequate risk reduction		P
	Application of the three-step method described in 6.1 is essential in achieving adequate risk reduction.	Considered.	P
5.6.3	Comparison of risks		P
	As part of the process of risk evaluation, the risks associated with the machinery or parts of machinery can be compared with those of similar machinery or parts of machinery	Considered.	P
	The use of this comparison method does not eliminate the need to follow the risk assessment process as described in this International Standard for the specific conditions of use. For example, when a band saw used for cutting meat is compared with a band saw used for cutting wood, the risks associated with the different material shall be assessed.	Considered.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
6	Risk reduction		P
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: - severity of harm from the hazard under consideration; - probability of occurrence of that harm. 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). Step 1: Inherently safe design measures Step 2: Safeguarding and/or complementary protective measures Step 3: Information for use	Considered.	P
6.2	Inherently safe design measures		P
6.2.1	General		P
	Inherently safe design measures are the first and most important step in the risk reduction process.	Considered.	P
	Inherently safe design measures are achieved by avoiding hazards or reducing risks by a suitable choice of design features for the machine itself and/or interaction between the exposed persons and the machine.	Considered.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
6.2.2	Consideration of geometrical factors and physical aspects		P
6.2.2.1	Geometrical factors		P
	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. so as to take into account the characteristics of human vision, particularly when safe operation requires permanent direct control by the operator. 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.	Considered.	P
	b) The form and the relative location of the mechanical components parts	Considered.	P
	c) Avoiding sharp edges and corners, protruding parts	Considered.	P
	d) The form of the machine is designed so as to achieve a suitable working position and provide accessible manual controls (actuators).	Considered.	P
6.2.2.2	Physical aspects		P
	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; b) limiting the mass and/or velocity of the movable elements, and hence their kinetic energy; c) limiting the emissions by acting on the characteristics of the source using measures for reducing 1) noise emission at source 2) the emission of vibration at source, 3) the emission of hazardous substances, and 4) radiation emissions, including	Considered.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
6.2.3	Taking into account general technical knowledge of machine design		P
	This general technical knowledge can be derived from technical specifications for design (standards, design codes, calculation rules, etc.), which should be used to cover a) mechanical stresses b) materials and their properties c) emission values When the reliability of particular components or assemblies is critical for safety (for example, ropes, chains, lifting accessories for lifting loads or persons), stress limits shall be multiplied by appropriate working coefficients.	Considered.	P
6.2.4	Choice of appropriate technology		P
	One or more hazards can be eliminated or risks reduced by the choice of the technology to be used in certain applications such as the following:		P
	a) on machines intended for use in explosive atmospheres	Not used in explosive atmosphere.	N/A
	b) for particular products to be processed	Considered.	P
	c) the use of alternative equipment to avoid high noise levels	The vehicle's noise emission level is less than 70dB during operation. See clause 19.4.2.2 of EN 17128.	N/A
6.2.5	Applying principle of positive mechanical action		P
	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.	The front and rear wheels have the mudguards to protect, The rear part of the front mudguard is not present a pinching or crushing hazard. See clauses 14.1 and 14.2 of EN 17128.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
6.2.6	Provisions for stability		P
	Machines shall be designed so that they have sufficient stability to allow them to be used safely in their specified conditions of use.	The adhesion between the wheel and ground is sufficient to avoid slippery, see clause 15.3.1 of EN 17128, The width and diameter of the wheels are sufficient to pass through obstacles, see clause 15.3.2 of EN 17128.	P
	Stability shall be considered in all phases of the life cycle of the machine, including handling, travelling, installation, use, dismantling, disabling and scrapping.		P
6.2.7	Provisions for maintainability		P
	When designing a machine, the following maintainability factors shall be taken into account to enable maintenance of the machine:	Considered.	P
	- accessibility - ease of handling, taking into account human capabilities; - limitation of the number of special tools and equipment.	Considered.	P
6.2.8	Observing ergonomic principles		P
	Ergonomic principles shall be taken into account in designing machinery so as to reduce the mental or physical stress of, and strain on, the operator. These principles shall be considered when allocating functions to operator and machine (degree of automation) in the basic design.	The vehicle is started by three independent steps, at an initial speed of 3km/h, The audible signal for third parties is provided, See clauses 7.1.1 and 16 of EN 17128.	P
	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).	Considered.	P
	All elements of the operator–machine interface, such as controls, signalling 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, EN 13861 and IEC 61310-1.	Considered. The power on/off, lighting symbols are according to ISO 2575. All the symbols (for user) in the display are described in the instructions, See clause Annex F of EN 17128 and instructions.	P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
6.2.9	Electrical hazards		P
	For the design of the electrical equipment of machines, IEC 60204-1 gives general provisions about disconnection and switching of electrical circuits and for protection against electric shock. For requirements related to specific machines, see corresponding IEC standards (for example, IEC 61029, IEC 60745 or IEC 60335).	The rated voltage of the vehicle is 48VDC, the vehicle complied with clause 6 of EN 17128. The battery charger complied with EN 60335-2-29, See clause 10 of EN 17128.	P
6.2.10	Pneumatic and hydraulic hazards	The tyre is pneumatic (maximum 50 PSI), no other pneumatic construction. No hydraulic construction.	P
6.2.11	Applying inherently safe design measures to control systems		P
6.2.11.1	General		P
	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).	The vehicle has a throttle, to drive or cut off the driving power voluntarily, The driving power is cut off when there is hazard condition, The vehicle gives a smooth acceleration, See clauses 7.1.1, 6.2 and 7.2 of EN 17128.	P
	The correct design of machine control systems can avoid unforeseen and potentially hazardous machine behaviour.		P

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
	Typical causes of hazardous machine behaviour are – an unsuitable design or modification (accidental or deliberate) of the control system logic, – a temporary or permanent defect or failure of one or several components of the control system, – a variation or a failure in the power supply of the control system, and – in appropriate selection, design and location of the control devices. examples of hazardous machine behaviour are – unexpected start-up (see ISO 14118), – uncontrolled speed change, – failure to stop moving parts, – dropping or ejection of part of the machine or of a workpiece clamped by the machine, and – machine action resulting from inhibition (defeating or failure) of protective devices. 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. These principles and methods shall be applied singly or in combination as appropriate to the circumstances (see ISO 13849-1, IEC 60204-1 and IEC 62061).	The vehicle can only be started by three steps: Power on→pushing to a speed of 3km/h→operate the throttle. The vehicle has four brakes, two mechanical hand brakes and two electric brakes. During the electric brake failure or speed change, the vehicle can be stopped normally. The motor is in the rear wheel, and has mudguard to protect from contact with feet. The brake levers also have cut-off switches. Strength of the vehicle is tested with positive result.	P
	requires one or several of the following solutions: – systematic analysis of start and stop conditions; – provision for specific operating modes (for example, 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); – clear display of the faults; – measures to prevent accidental generation of unexpected start commands (for example, shrouded start device) likely to cause dangerous machine behaviour (see ISO 14118:2000, Figure 1); – maintained stop commands (for example, interlock) to prevent restarting that could result in dangerous machine behaviour (see ISO 14118:2000, Figure 1).		
	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. The different zones shall be clearly defined and it shall be obvious which parts of the machine belong to which zone. Likewise, it shall be obvious which control devices (for example, emergency stop devices, supply disconnecting devices) and/or protective devices belong to which zone. 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.		N/A

Absatz *Clause*	**Anforderungen - Prüfungen /** *Requirements - Tests*	**Messergebnisse – Bemerkungen /** *Measuring results - Remarks*	**Ergebnis** *Result*
	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 (for example, range, speed, acceleration, deceleration, load capacity). Allowance shall be made for dynamic effects (swinging of loads, etc.). For example: – the travelling speed of mobile pedestrian controlled machinery other than remote-controlled shall be compatible with walking speed; – the range, speed, acceleration and deceleration of movements of the person-carrier and carrying vehicle for lifting persons shall be limited to non-hazardous 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. When the machinery contains various elements that can be operated independently, the control system shall be designed to prevent risks arising out of a lack of coordination (for example, collision prevention system).	Pedestrian mode fitted. Under pedestrian mode, the maximum speed<6km/h.	P
6.2.11.2	Starting of an internal power source/switching on an external power supply		P
	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 remarks in clause 6.2.11.1.	P
6.2.11.3	Starting/stopping of a mechanism	See remarks in clause 6.2.11.1.	P
6.2.11.4	Restart after power interruption	See remarks in clause 6.2.11.1.	P
6.2.11.5	Interruption of power supply		P
	Machinery shall be designed to prevent hazardous situations resulting from interruption or excessive fluctuation of the power supply.	See remarks in clause 6.2.11.1.	P
6.2.11.6	Use of automatic monitoring	See remarks in clause 6.2.11.1.	P
	Automatic monitoring is intended to ensure that a safety function or functions implemented by a protective measure do not fail to be performed	See remarks in clause 6.2.11.1.	P
	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.	See remarks in clause 6.2.11.1.	P

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6.2.11.7	Safety functions implemented by programmable electronic control systems		P
6.2.11.7.1	General		P
	A control system that includes programmable electronic equipment (for example, programmable controllers) can, where appropriate, be used to implement safety functions at machinery. Where a programmable electronic control system is used, it is necessary to consider its performance requirements in relation to the requirements for the safety functions. The design of the programmable electronic control system shall be such that the probability of random hardware failures and the likelihood of systematic failures that can adversely affect the performance of the safety-related control function(s) is 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 the IEC 61508 series for further guidance). NOTE Both ISO 13849-1 and IEC 62061, specific to machinery safety, provide guidance applicable to programmable electronic control systems.	The safety function can be achieved by hardwares. See clause 6.2.11.7.2.	P
	The programmable electronic control system should be installed and validated to ensure that the specified performance [for example, safety integrity level (SIL) in IEC 61508] for each safety function has been achieved. Validation comprises testing and analysis (for example, static, dynamic or failure analysis) to show that all parts interact correctly to perform the safety function and that unintended functions do not occur.		
6.2.11.7.2	Hardware aspects		P
	The hardware (including, for example, sensors, actuators and 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 – architectural constraints (the configuration of the system, its ability to tolerate faults, its behaviour on detection of a fault, etc.), – selection, and/or design, of equipment and devices with an appropriate probability of dangerous random hardware failure, and – the incorporation of measures and techniques within the hardware so as to avoid systematic failures and control systematic faults.	Hardware protection including below: Thermostat in the motor, Fuse in the battery, Mechanical brakes in addition to the electric brakes.	P

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6.2.11.7.3	Software aspects		N/A
	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). Application software should not be reprogrammable by the user. This may be achieved by use of embedded software in a non-reprogrammable memory [for example, micro-controller, application-specific integrated circuit (ASIC)]. When the application requires reprogramming by the user, the access to the software dealing with safety functions should be restricted (for example, by locks or passwords for the authorized persons).	The safety function can be achieved by hardwares. See remarks in clause 6.2.11.7.2.	N/A
6.2.11.8	Principles relating to manual control		P
	These are as follows.		P
	a) Manual control devices shall be designed and located according to the relevant ergonomic principles.	The throttle is at the handlebar which is easy to reach. See clause 6.2 of EN 17128.	P
	b) A stop control device shall be placed near each start control device.	The vehicle has a throttle, to drive or cut off the driving power voluntarily.	P
	c) Manual controls shall be located out of reach of the danger zones	Fulfilled.	P
	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	Fulfilled.	P
	e) The control circuit shall be so arranged that only one control is effective at a given times.	Fulfilled.	P
	f) Control actuators shall be designed or guarded so that their effect, where a risk is involved, cannot occur without intentional operation	The driving power of the vehicle is given by three independent steps, it is not foreseeable to drive without intentional operation. See clause 7.1.1 of EN 17128.	P
	g) For machine functions whose safe operation depends on permanent, direct control by the operator, measures shall be implemented to ensure the presence of the operator at the control position	The driver needs to stand on the step and gives an initial speed by foot of 3km/h.	P
	h) For cableless control, an automatic stop shall be performed	By throttle.	N/A
6.2.11.9	Control mode for setting, teaching, process changeover, fault-finding, cleaning or maintenance		P

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6.2.11.10	Selection of control and operating modes		P
	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 (for example, to allow for adjustment, setting, maintenance, inspection), it shall be fitted with a mode selector which can be locked in each position. Each position of the selector shall be clearly identifiable and shall exclusively allow one control or operating mode.	The vehicle has different speed levels with maximum of 20km/h or 25km/h. In all speed modes, the control is the same. The vehicle has an additional pedestrian mode, under this mode, the maximum speed<6km/h. See clause 8.1 of EN 17128.	P
	The selector may be replaced by another selection means which restricts the use of certain functions of the machinery to certain categories of operators (for example, access codes for certain numerically controlled functions).	No other selection mode.	N/A
6.2.11.11	Applying measures to achieve electromagnetic compatibility (EMC)		P
	For guidance on electromagnetic compatibility, see IEC 60204-1 and IEC 61000-6.	EMC protective measure is taken. The vehicle complies with Annex B of EN 17128 regarding EMC.	P
6.2.11.12	Provision of diagnostic systems to aid fault-finding		P
	Diagnostic systems to aid fault-finding should be included in the control system so that there is no need to disable any protective measure.	The driving power is cut off when there is hazard condition in the control system, e.g., short circuit, motor stucked etc.	P
6.2.12	Minimizing probability of failure of safety functions		P
6.2.12.1	General		P
	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.	Fulfilled.	P
6.2.12.2	Use of reliable components	Considered.	P
6.2.12.3	Use of “oriented failure mode” components	No this kind of components used.	N/A
	“Oriented failure mode” components or systems are those in which the predominant failure mode is known in advance and which can be used so that the effect of such a failure on the machine function can be predicted.	No this kind of components used.	N/A
	NOTE In some cases, it will be necessary to take additional measures to limit the negative effects of such a failure.	No this kind of components used.	N/A
	The use of such components should always be considered, particularly in cases where redundancy (see 6.2.12.4) is not employed.	No this kind of components used.	N/A

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6.2.12.4	Duplication (or redundancy) of components or subsystems	No this kind of components used.	N/A
6.2.13	Limiting exposure to hazards through reliability of equipment	Considered.	P
6.2.14	Limiting exposure to hazards through mechanization or automation of loading (feeding)/ unloading (removal) operations	Considered.	P
6.2.15	Limiting exposure to hazards through location of setting and maintenance points outside danger zones	Considered.	P
6.3	Safeguarding and complementary protective measures		P
6.3.1	General		P
	Guards and protective devices shall be used to protect persons whenever an inherently safe design measure does not reasonably make it possible either to remove hazards or to sufficiently reduce risks.	The front and rear wheels have the mudguards to protect, The clearance between the front mudguard and the deck is checked ok, See clauses 14.1 and 14.2 of EN 17128.	P
6.3.2	Selection and implementation of guards and protective devices		P
6.3.2.1	General		P
	The exact choice of a safeguard for a particular machine shall be made on the basis of the risk assessment for that machine. A combination of safeguards can sometimes be required. Consideration shall be given to the enclosure of control positions or intervention zones to provide combined protection against several hazards	See remark in clause 6.3.1.	P
6.3.2.2	Where access to the hazard zone is not required during normal operation		N/A
6.3.2.3	Where access to the hazard zone is required during normal operation of the machinery, safeguards should be selected from the following:		N/A
	a) interlocking guards with or without guard locking b) sensitive protective equipment c) adjustable guards; d) self-closing guards e) two-hand control devices f) interlocking guards with a start function		N/A

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6.3.2.4	Where access to the hazard zone is required for machine setting, teaching, process changeover, fault-finding, cleaning or maintenance		N/A
	As far as possible, machines shall be designed so that the safeguards provided for the protection of the production operator also ensure the protection of personnel carrying out setting, teaching, process change over, fault-finding, cleaning or maintenance, without hindering them in the performance of their task. Such tasks shall be identified and considered in the risk assessment as parts of the use of the machine (see 5.2). NOTE Isolation and energy dissipation for machine shut-down (see 6.3.5.4, and also ISO 14118:2000, 4.1 and Clause 5) ensure the highest level of safety when carrying out tasks (especially maintenance and repair tasks) that do not require the machine to remain connected to its power supply.		N/A
6.3.2.5	Selection and implementation of sensitive protective equipment	No sensitive protective equipment needed.	N/A
6.3.2.5.1	Selection		N/A
	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. The following provisions are intended to provide the designer with criteria for selecting, for each application, the most suitable device(s).		N/A
6.3.2.5.2	Implementation		N/A
	Consideration should be given to		N/A
	a) the size, characteristics and positioning of the detection zone b) the reaction of the device to fault conditions c) the possibility of circumvention, and d) detection capability and its variation over the course of time Sensitive protective equipment shall be integrated in the operative part and associated with the control system of the machine		N/A
6.3.2.5.3	Additional requirements for sensitive protective equipment when used for cycle initiation		N/A
	In this exceptional application, the 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.		N/A

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6.3.2.6	Protective measures for stability		P
	If stability cannot be achieved by inherently safe design measures such as weight distribution (see 6.2.6), it shall be maintained by the use of protective measures.	Stability is ensured. The adhesion between the wheel and ground is sufficient to avoid slippery, see clause 15 of EN 17128, The width and diameter of the wheels are sufficient to pass through obstacles, see clause 15 of EN 17128.	P
6.3.2.7	Other protective devices		P
	When a machine requires continuous control by the operator (for example, 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	Considered.	P
6.3.3	Requirements for design of guards and protective devices		P
6.3.3.1	General requirements		P
	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.	The guards of the wheels are compatible with the vehicle and using conditions.	P
	NOTE For additional information, see ISO 14120, ISO 13849-1, ISO 13851, ISO 14119, ISO 13856, IEC 61496 and IEC 62061.	Informative.	P
	Guards and protective devices shall		P
	a) be of robust construction, b) not give rise to any additional hazard, c) not be easy to bypass or render non-operational, d) be located at an adequate distance from the danger zone (see ISO 13855 and ISO 13857), e) cause minimum obstruction to the view of the production process, and f) enable essential work to be carried out for the installation and/or replacement of tools and for maintenance by allowing access only to the area where the work has to be carried out — if possible, without the guard having to be removed or protective device having to be disabled. For openings in the guards, see ISO 13857.	Considered.	P
6.3.3.2	Requirements for guards		P

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6.3.3.3	Technical characteristics of protective devices		P
	Protective devices shall be selected or designed and connected to the control system such that correct implementation of their safety function(s) is ensured.	Considered.	P
6.3.3.4	Provisions for alternative types of safeguards		P
	Provisions should be made to facilitate the fitting of alternative types of safeguards on machinery where it is known that it will be necessary to change the safeguards because of the range of work to be carried out.	Considered.	P
6.3.4	Safeguarding to reduce emissions	No such risk.	N/A
6.3.4.1	General		N/A
	If the measures for the reduction of emissions at source specified 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).		N/A
6.3.4.2	Noise	No such risk.	N/A
	Additional protective measures against noise	No noise hazard during the use, as the sound level during riding is less than 70dB.	N/A
6.3.4.3	Vibration	No such risk.	N/A
	Additional protective measures against vibration		N/A
6.3.4.4	Hazardous substances	No such risk.	N/A
	Additional protective measures against hazardous substances See ISO 14123-1.		N/A
6.3.4.5	Radiation	No such risk.	N/A
	Additional protective measures against radiation		N/A
6.3.5	Complementary protective measures		P
6.3.5.1	General		P
	Protective measures which are neither inherently safe design measures, nor safeguarding (implementation of guards and/or protective devices), nor information for use, could have to be implemented as required by the intended use and the reasonably foreseeable misuse of the machine.	Considered.	P
6.3.5.2	Components and elements to achieve emergency stop function	The electric brake.	P

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6.3.5.3	Measures for the escape and rescue of trapped persons		N/A
	Measures for the escape and rescue of trapped persons may consist, among others, of - escape routes and shelters in installations generating operator-trapping hazards, - arrangements for moving some elements by hand, after an emergency stop, - arrangements for reversing the movement of some elements, - anchorage points for descender devices, - means of communication to enable trapped operators to call for help.	No trapped hazards.	N/A
6.3.5.4	Measures for isolation and energy dissipation		P
	Machines shall be equipped with the technical means to achieve isolation from power supply(ies) and dissipation of stored energy	The battery charger or vehicle has protective means to avoid electric shock.	P
6.3.5.5	Provisions for easy and safe handling of machines and their heavy component parts		N/A
	Machines and their component parts which cannot be moved or transported by hand shall be provided or be capable of being provided with suitable attachment devices for transport by means of lifting gear.	This product is for transportation of persons. It is also can be pushed to move by the users. The product is foldable for handling.	N/A
6.3.5.6	Measures for safe access to machinery		N/A
	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.	Not applicable for this product.	N/A
6.4	Information for use		P
6.4.1	General requirements		P
6.4.1.1	Drafting information for use is an integral part of the design of a machine	Related information is mentioned in the instructions.	P
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.	Related information is mentioned in the instructions.	P
	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.	Related information is mentioned in the instructions.	P
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.	Related information is mentioned in the instructions.	P

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6.4.2	Location and nature of information for use		P
6.4.3	Signals and warning devices		P
	Visual signals, such as flashing lights and audible signals such as sirens may be used to warn of an impending hazardous event such as machine start-up or over speed. Such signals may also be used to warn the operator before the triggering of automatic protective measures	Considered.	P
	The warning devices shall be designed and located such that checking is easy. The information for use shall prescribe regular checking of warning devices.	Considered.	P
	The attention of designers is drawn to the possibility of “sensorial saturation”, which can result from too many visual and/or acoustic signals and which can also lead to defeating the warning devices. NOTE Consultation of the user on this subject is often necessary.	Considered.	P
6.4.4	Markings, signs (pictograms) and written warnings		P
	Machinery shall bear all markings which are necessary	Fulfilled.	P
6.4.5	Accompanying documents (in particular - instruction handbook)	Fulfilled.	P
7	Documentation of risk assessment and risk reduction		P
	The documentation shall demonstrate the procedure that has been followed and the results that have been achieved. This includes, when relevant, documentation of	Fulfilled.	P
	Standards or other specifications used to select protective measures referred to in f) above should be referenced. NOTE No requirement is given in this International Standard to deliver the risk assessment documentation together with the machine. See ISO/TR 14121-2 for information on documentation.	Fulfilled.	P

*** End of test report ***