



Kraftfahrt-Bundesamt

DE-24932 Flensburg

Allgemeine Betriebserlaubnis (ABE) National Type Approval

ausgestellt von:

Kraftfahrt-Bundesamt (KBA)

nach § 20 der Straßenverkehrs-Zulassungsordnung (StVZO) in der Fassung vom 26.04.2012 (BGBl I S. 679) für einen Typ des folgenden Genehmigungsobjektes

Elektrokleinstfahrzeug

issued by:

Kraftfahrt-Bundesamt (KBA)

according to § 20 Straßenverkehrs-Zulassungs-Ordnung (StVZO) in the version of April 26, 2012 (BGBl I S. 679) for a type of the following approval object

Small electric vehicle

Genehmigungsnummer: **P410*00**

Approval number:

1. Genehmigungsinhaber:
Holder of the approval:
WeRoll Tech GmbH
DE-47877 Willich
2. Name und Anschrift des Bevollmächtigten (gegebenenfalls):
Name and address of representative (if any):
Entfällt
Not applicable
3. Name und Anschrift des Herstellers:
Manufacturer's name and address:
WeRoll Tech GmbH
DE-47877 Willich
4. Typbezeichnung:
Type:
ESX105AE
5. Zuständiger Technischer Dienst:
Responsible Technical Service:
Technischer Dienst der TÜV Rheinland Kraftfahrt GmbH
DE-51105 Köln



Kraftfahrt-Bundesamt

DE-24932 Flensburg

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Genehmigungsnummer: **P410*00**

Approval number:

6. Datum des Gutachtens des Technischen Dienstes:
Date of test report issued by the Technical Service:
12.04.2023
7. Nummer des Gutachtens des Technischen Dienstes:
Number of test report issued by that Technical Service:
87-eKFV-0426/23-00
8. Ausnahmegenehmigungen nach §70 StVZO:
Exceptions according to §70 StVZO:
Entfällt
Not applicable
9. Auflagen:
Conditions:
Siehe Typbeschreibung zum Gutachten, Punkt 13.2.
See type description of the test report, point 13.2.

Für jedes Fahrzeug, das dem genehmigten Typ entspricht, ist eine Datenbestätigung gemäß Muster 2d der StVZO auszustellen und dem Fahrzeug mitzugeben.

A data confirmation in accordance with model 2d of the StVZO has to be issued for each vehicle that corresponds to the approved type and has to be given with the vehicle.

10. Die Genehmigung wird **erteilt**
Approval is **granted**
11. Grund (Gründe) für die Erweiterung der Genehmigung (gegebenenfalls):
Reason(s) for the extension (if any):
Entfällt
Not applicable
12. Bemerkungen:
Remarks:
Das Fahrzeug ist ein Elektrokleinstfahrzeug gemäß §1 der Elektrokleinstfahrzeuge-Verordnung (eKFV).
The vehicle is a small electric vehicle according to §1 of Elektrokleinstfahrzeuge-Verordnung (eKFV).



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Genehmigungsnummer: **P410*00**

Approval number:

13. Ort: **DE-24932 Flensburg**
Place:

14. Datum: **24.04.2023**
Date:

15. Unterschrift: **Im Auftrag**
Signature:

Kleist



Kleist

Anlagen:

Enclosures:

Gemäß Inhaltsverzeichnis

According to index



Kraftfahrt-Bundesamt

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Inhaltsverzeichnis zu den Beschreibungsunterlagen Index to the information package

Nummer der Genehmigung: **P410*00**
Approval No.

Ausgabedatum: **24.04.2023**
Date of issue:

letztes Änderungsdatum: --
last date of amendment:

Nebenbestimmungen und Rechtsbehelfsbelehrung
Collateral clauses and instruction on right to appeal

Prüfbericht(e) Nr.:
Test report(s) No.:
87-eKFV-0426/23-00

Datum:
Date
12.04.2023

Beschreibungsbogen Nr.:
Information document No.:
Entfällt
Not applicable

Datum:
Date

Liste der Änderungen:
List of modifications:
Entfällt
Not applicable

Datum:
Date



Kraftfahrt-Bundesamt

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Nummer der Genehmigung: **P410*00**

- Anlage -

Nebenbestimmungen und Rechtsbehelfsbelehrung

Nebenbestimmungen

Jede Einrichtung, die dem genehmigten Typ entspricht, ist gemäß der angewendeten Vorschrift zu kennzeichnen.

Die Einzelerzeugnisse der reihenweisen Fertigung müssen mit den Genehmigungsunterlagen genau übereinstimmen. Änderungen an den Einzelerzeugnissen sind nur mit ausdrücklicher Zustimmung des Kraftfahrt-Bundesamtes gestattet.

Änderungen der Firmenbezeichnung, der Anschrift und der Fertigungsstätten sowie eines bei der Erteilung der Genehmigung benannten Zustellungsbevollmächtigten oder bevollmächtigten Vertreters sind dem Kraftfahrt-Bundesamt unverzüglich mitzuteilen.

Verstöße gegen diese Bestimmungen können zum Widerruf der Genehmigung führen und können überdies strafrechtlich verfolgt werden.

Die Genehmigung erlischt, wenn sie zurückgegeben oder entzogen wird, oder der genehmigte Typ den Rechtsvorschriften nicht mehr entspricht. Der Widerruf kann ausgesprochen werden, wenn die für die Erteilung und den Bestand der Genehmigung geforderten Voraussetzungen nicht mehr bestehen, wenn der Genehmigungsinhaber gegen die mit der Genehmigung verbundenen Pflichten - auch soweit sie sich aus den zu dieser Genehmigung zugeordneten besonderen Auflagen ergeben - verstößt oder wenn sich herausstellt, dass der genehmigte Typ den Erfordernissen der Verkehrssicherheit oder des Umweltschutzes nicht entspricht.

Das Kraftfahrt-Bundesamt kann jederzeit die ordnungsgemäße Ausübung der durch diese Genehmigung verliehenen Befugnisse, insbesondere die genehmigungsgerechte Fertigung sowie die Maßnahmen zur Übereinstimmung der Produktion, nachprüfen. Es kann zu diesem Zweck Proben entnehmen oder entnehmen lassen. Dem Kraftfahrt-Bundesamt und/oder seinen Beauftragten ist ungehinderter Zutritt zu Produktions- und Lagerstätten zu gewähren.

Die mit der Erteilung der Genehmigung verliehenen Befugnisse sind nicht übertragbar. Schutzrechte Dritter werden durch diese Genehmigung nicht berührt.

Rechtsbehelfsbelehrung

Gegen diese Genehmigung kann innerhalb eines Monats nach Bekanntgabe Widerspruch erhoben werden. Der Widerspruch ist beim **Kraftfahrt-Bundesamt, Fördestraße 16, DE-24944 Flensburg**, schriftlich oder zur Niederschrift einzulegen.



Kraftfahrt-Bundesamt

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Approval No.: **P410*00**

- Attachment -

Collateral clauses and instruction on right to appeal

Collateral clauses

All equipment which corresponds to the approved type is to be identified according to the applied regulation.

The individual production of serial fabrication must be in exact accordance with the approval documents. Changes in the individual production are only allowed with express consent of the Kraftfahrt-Bundesamt.

Changes in the name of the company, the address and the manufacturing plant as well as one of the parties given the authority to delivery or authorised representative named when the approval was granted is to be immediately disclosed to the Kraftfahrt-Bundesamt.

Breach of this regulation can lead to recall of the approval and moreover can be legally prosecuted.

The approval expires if it is returned or withdrawn or if the type approved no longer complies with the legal requirements. The revocation can be made if the demanded requirements for issuance and the continuance of the approval no longer exist, if the holder of the approval violates the duties involved in the approval, also to the extent that they result from the assigned conditions to this approval, or if it is determined that the approved type does not comply with the requirements of traffic safety or environmental protection.

The Kraftfahrt-Bundesamt may check the proper exercise of the conferred authority taken from this approval at any time. In particular this means the compliant production as well as the measures for conformity of production. For this purpose samples can be taken or have taken. The employees or the representatives of the Kraftfahrt-Bundesamt may get unhindered access to the production and storage facilities.

The conferred authority contained with issuance of this approval is not transferable. Trade mark rights of third parties are not affected with this approval.

Instruction on right to appeal

This approval can be appealed within one month after notification. The appeal is to be filed in writing or as a transcript at the **Kraftfahrt-Bundesamt, Fördestraße 16, DE-24944 Flensburg.**

zur Erteilung einer Allgemeinen Betriebserlaubnis (ABE)
 eines Nachtrags zur ABE Nr.
 nach § 20 Straßenverkehrs-Zulassungs-Ordnung (StVZO)

Fahrzeugart / category : Elektrokleinstfahrzeug bis max. 500 Watt
Typ / type : ESX105AE
Antragsteller / applicant : WeRoll Tech GmbH
 Hausbroicher Str. 62, D-47877 Willich

1. Der genannte Fahrzeugtyp wird von der Fa. *HL CORP (SHEN ZHEN)* mit Sitz in *The 3rd Industrial Park, Bitou Village, Songgang Town, 518105, Shenzhen, China* gefertigt.
2. Der Antragsteller ermöglicht aufgrund
 - von technischen Fachkräften, Fertigungsanlagen und Kontrolleinrichtungen eine gleichmäßige, reihenweise Fertigung von
 - eigener Fachkunde, von technischen Fachkräften und Kontrolleinrichtungen eine erlaubnisgerechte Auslieferung von gleichmäßig und reihenweise gefertigten Fahrzeugen des in der Typbeschreibung festgelegten Fahrzeugtyps.
 - Die Eignung des Antragstellers konnte noch nicht beurteilt werden.

Tatsachen, die die Zuverlässigkeit des Antragstellers im Sinne des § 20 StVZO in Frage stellen, sind hier nicht bekannt.
 dem beigefügten Schreiben vom zu entnehmen.
3. Die beigefügte Typbeschreibung besteht aus Blatt 1 bis 14 und ist mit den darin unter Nr. 13.3. angegebenen Anlagen Bestandteil des Gutachtens.
4. Der Fahrzeugtyp entspricht der vollständigen Typbeschreibung und genügt den heute gültigen Bestimmungen
 - der StVZO in Verbindung mit eKFV.
 - der Verordnung über den Betrieb von Kraftfahrunternehmen im Personenverkehr (BOKraft).
 - den hierzu vom Bundesminister für Verkehr erlassenen heute gültigen Anweisungen und Richtlinien.
 - den in den herangezogenen ABG und ABE für Fahrzeugteile ggf. enthaltenen Auflagen.
 - bis auf die unter Nr. 13.1. der Typbeschreibung beschriebene(n) Abweichung(en).
5. Der Erteilung einer ABE
 eines Nachtrags zur o.a. ABE
 - und der Genehmigung der aufgrund der unter Nr. 13.1. der beigefügten Typbeschreibung beschriebenen Abweichung(en) ggf. erforderlichen Ausnahme(n)
 - bei Einhaltung der unter Nr. 13.2. der beigefügten Typbeschreibung vorgeschlagenen Auflage(n) stehen technische Bedenken nicht entgegen.

Der technische Dienst ist für die angewendeten Prüfverfahren vom Kraftfahrt-Bundesamt für das nationale Typgenehmigungsverfahren anerkannt.

Shanghai, 2023-04-12



B.Eng. Liangjun Zhang
 Sachverständiger Technischer Dienst
 Expert Technical Service

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

0. Allgemeines / general

- 0.1. Fahrzeughersteller / *vehicle manufacturer* : WeRoll Tech GmbH
Hausbroicher Str. 62, D-47877 Willich
- 0.2. Fahrzeug- und Aufbauart / *kind of vehicle and structure* : Elektrokleinstfahrzeug bis max. 500 Watt / *Small electric vehicle up to max. 500 Watt*

Fahrzeugklasse / *vehicle category*: 27
Art des Aufbaus / *kind of structure*: 0003
- 0.3. Typ / *type* : ESX105AE
- 0.4. Handelsbezeichnung / *commercial description* : entfällt / *not applicable*
- 0.5. Ort und Art der Anbringung des Fabrik Schildes und der Fahrzeug-Identifizierungsnummer / *location and method of affixing the identification plate and vehicle identification no.*
- 0.5.0. Genehmigung oder Prüfung / *approval or test* : Prüfung gem. / *test acc. to* § 2 (1) Nr. 3 eKFV i.V.m. § 59 StVZO

Anforderungen erfüllt / *requirements fulfilled*
- 0.5.1. Fabrik Schild / *identification plate* : vordere rechte Seite des Rahmens, gelasert / *front right on the frame, lasered*
- 0.5.2. Fahrzeug-Identifizierungsnummer / *vehicle identification number* : vordere rechte Seite des Rahmens, gelasert / *front right on frame, lasered*
- 0.6. Fahrzeug-Identifizierungsnummer und deren Aufbau / *vehicle identification number and its structure* : W G1 C B 0 P 1 00001

Stelle / <i>digit</i>	Beschreibung / <i>description</i>	Wert / <i>value</i>
1	Batterie / <i>battery</i>	W= Lithium battery
2-3	Bremse / <i>brake</i>	G1= drum brake
4	Motor / <i>Motor</i>	C=300W
5	Steuerung / <i>control</i>	B
6	Prüfziffer / <i>check bit</i>	0,1,2,..., 9, X
7	Jahr / <i>year</i>	P = 2023, R = 2024, ...
8	Werk / <i>plant</i>	1= HL
9-14	Rahmennr. / <i>frame number</i>	000001

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Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

0.7. Ort der Anbringung der Kennzeichnung der Antriebsmaschine / *location of affixing of the engine code* : auf Motorgehäuse, rechts / *on motor housing, right side*

0.8. Ort der Anbringung der ECE-Genehmigungszeichen / *location of affixing the ECE approval mark* : entfällt / *not applicable*

1. Änderungen, Ausführungen, wahlweise Ausrüstungen, Rüstzustände / *changes, versions, options, equipments*

1.1. Änderungen / *changes*

Es wird berichtigt / *correction of* : entfällt / *not applicable*

Es wird geändert / *modification of* : entfällt / *not applicable*

Es wird hinzugefügt / *addition of* : entfällt / *not applicable*

Es entfällt / *deletion of* : entfällt / *not applicable*

1.2. Ausführungen (Varianten) / *models (variants)* : entfällt / *not applicable*

1.3. wahlweise Ausrüstungen (Versionen) / *optional equipment (versions)* : entfällt / *not applicable*

2. Hauptabmessungen und Gewichte / *main dimensions and weights*

2.1. Hauptabmessung in mm / *main dimensions in mm*

2.1.0. Genehmigung oder Prüfung / *approval or test* : Prüfung gem. / *test acc. to* § 1 (1) Nr. 4 eKFV
 Anforderungen erfüllt / *requirements fulfilled*

2.1.1. Länge / *length* : 1120 mm

2.1.2. Breite / *width* : 479 mm

2.1.3. Höhe / *height* : 1200 mm

2.1.4. Radstand / *wheelbase* : 825 mm

2.1.5. Höhe der Lenkstange / *height of steering rod* : 997 mm

2.1.9. Weitere Angaben / *further informations* : keine / *none*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

- 2.2. Gewichte in kg / weights in kg**
- 2.2.0. Genehmigung oder Prüfung / *approval or test* : Prüfung gem. / *test acc. to* § 1 (1) Nr. 5 eKFV
 Anforderungen erfüllt / *requirements fulfilled*
- 2.2.3. Leergewicht / *unladen weight* : 17,0 kg
- 2.2.4. Achslasten bzw. Radlasten bei
 Leergewicht / *axle load or wheel
 load at unladen weight*
 Achse / *axle 1* : 8,7 kg
 Achse / *axle 2* : 8,3 kg
- 2.2.5. Nutzlast / *load capacity* : 100 kg
- 2.2.7. Zul. Gesamtgewicht / *technically
 permissible maximum weight as
 stated by manufacturer* : 117,0 kg
- 2.2.8. Zul. Achslast bzw. zul. Radlast /
*permissible axle load or permissible
 wheel load*
 Achse / *axle 1* : 70 kg
 Achse / *axle 2* : 70 kg
- 2.2.9. Zul. Anhängelast / *permissible tow-
 ing mass* : entfällt / *not applicable*
- 2.2.11. Zul. Stützlast / *permissible bear
 load* : entfällt / *not applicable*
- 2.2.12. Weitere Angaben / *further
 informations* : keine / *none*
- 3. Antriebsmaschine / propulsion engine**
- 3.1. Identifizierungsmerkmal / *identification code* : SHLE105X *****
- 3.2. Hersteller / *manufacturer* : Anhui Weite Motor Technology Co., Ltd.
- 3.6. Elektromotor / electric motor**
- 3.6.0. Genehmigung oder Prüfung / *approval or test* : Prüfung der Nenndauerleistung gem. / *test of
 continuous rated power acc. to*
 UN-Regelung Nr. 85 / *UN-Regulation no. 85*
 Prüfbericht Nr. / *test report no.:*
 87-R85-0428/23-00
 Anforderungen erfüllt / *requirements fulfilled*
- 3.6.1. Bauart / *type of construction* : Radnabenmotor / *wheel hub motor*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

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- 3.6.2. Nennspannung / *nominal voltage* : 36 V
- 3.6.3. Leistung / *power* : 0,30 kW
- 3.6.4. Energiequelle bzw. Batterie / *energy source or battery*
- 3.6.4.1. Nennspannung / *nominal voltage* : 36 V
- 3.6.4.2. Nennkapazität / *nominal capacity* : 10 Ah
- 3.6.4.3. Anzahl / *quantity* : 1
- 3.6.4.4. Maximaler Strom / *maximum electric current* : 14A
- 3.6.4.5. Hersteller / *manufacturer* : Shenzhen Elite Electronic Co., Ltd.
- 3.6.4.6. Identifizierungsmerkmal / *identification code* : HY-ELITOP-S1004A-ZN
- 3.6.5. Steuerung / *control*
- 3.6.5.1. Identifizierungsmerkmal / *identification code* : FL-C-ES-S7050-AE
- 3.6.5.2. Hersteller / *manufacturer* : SHENZHEN FLSMART TECHNOLOGY CO., LTD.
- 3.6.6. Weitere Angaben / *further informations* : Prüfung der EMV gem. / *test of EMC acc. to*
 UN-Regelung Nr. 10 / *UN-Regulation no. 10*
 Prüfbericht Nr. / *test report no.:*
 87-R10-0427/23-00
- Prüfung der Batteriesicherheit gem. / *test of battery safety acc. to*
 DIN EN 15194:2018-11 Kap. 4.2.3 i.V.m EN 62133
 Prüfbericht Nr. / *test report no.:*
 SZES210600431201
- Anforderungen erfüllt / *requirements fulfilled*
- 3.8. Geräusch in dB(A) / noise in dB(A)**
- 3.8.2. Standgeräusch / *static noise* : entfällt / *not applicable*
- 3.8.2.1. Drehzahl / *Engine speed* : entfällt / *not applicable*
- 3.8.3. Fahrgeräusch / *drive by noise* : entfällt / *not applicable*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

3.9. Maßnahmen gegen Verunreinigung der Luft / *measures against air pollution*

3.9.0. Genehmigung oder Prüfung / *approval or test* : entfällt / *not applicable*

4. Kraftübertragung / *power transmission*

4.1. Art / *kind* : mechanisch / ~~hydraulisch~~ / ~~elektrisch~~
mechanical / ~~hydraulic~~ / ~~electrical~~

4.3. Getriebe / *gearbox*

4.3.1. Bauart / *construction* : entfällt / *not applicable*
 (Radnabenmotor / *wheel hub motor*)

4.3.4. Übersetzungen / *ratio* : 1 : 1

4.5. Höchstgeschwindigkeit / *maximum design speed* : 20 km/h

4.5.0. Genehmigung oder Prüfung / *approval or test* : Prüfung gem. / *test acc. to*
 § 1 (1) eKFV i.V.m. Anlage (zu § 7 Nummer 1)
 Nr. 2.1 eKFV

Anforderungen erfüllt / *requirements fulfilled*

4.5.1. Geschwindigkeitsbegrenzer / *speed limiter* : siehe Abschnitt / *see section* 3.6.5.

4.5.1.0. Genehmigung oder Prüfung / *approval or test* : Herstellerbescheinigung zur Manipulationssicherheit
 gem. / *manufacturers declaration for manipulation*
security acc. to
 DIN EN 15194:2018-11 Kap. 4.2.17
 liegt vor / *is available*.

Anforderungen erfüllt / *requirements fulfilled*

4.6. Geschwindigkeitsmesser bzw. Tachometer / *speedometer* : ja / *yes*

4.6.0. Genehmigung oder Prüfung / *approval or test* : Prüfung gem. / *test acc. to*
 Anlage (zu § 7 Nummer 1) Nr. 2.1.4 eKFV

Anforderungen erfüllt / *requirements fulfilled*

4.6.1. Weitere Angaben / *further informations* : Die Abweichung der angezeigten Geschwindigkeit zur
 tatsächlichen beträgt max. + 10 %. / *The deviation of*
the displayed speed from the actual speed is max. + 10
%.

4.9. Antrieb auf / *traction on* : Achse / *axle* 2

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

5. Achsen, Radführungen / *axles, wheel control*

- 5.1. **Bauart / *construction*** : Achse / *axle* 1: Kraffradgabel, gefedert / *motorcycle fork, suspended*
 Achse / *axle* 2: starre Radführung, ungefedert / *fixed wheel guidance, non-suspended*
- 5.2. **Anzahl / *number*** : 2
- 5.3. **Anzahl angetriebener Achsen / *number of driven axles*** : 1

6. Federn, Dämpfer, Räder, Bereifung / *suspension, shock absorber, wheels, tyres*

- 6.1. **Federung / *suspension*** : Achse / *axle* 1: Schraubenfeder / *coil spring*
 Achse / *axle* 2: entfällt / *not applicable*
- 6.2. **Dämpfung / *shock absorber*** : Achse / *axle* 1: Reibungsdämpfer / *friction shock absorber*
 Achse / *axle* 2: entfällt / *not applicable*
- 6.3. **Räder und Bereifung / *wheels and tyres***
- 6.3.1. **Bauart / *construction*** : Achse / *axle* 1: einteiliges Scheibenrad / *one-piece disc wheel*
 Achse / *axle* 2: Radnabenmotor / *wheel hub motor*
- 6.3.2. **Hersteller / *manufacturer*** : Achse / *axle* 1: Shenzhen Te Nai Technology Co., Ltd.
 Achse / *axle* 2: siehe / *see* 3.2.
- 6.3.4. **Kennzeichnung / *marking*** : Achse / *axle* 1: no marking
 Achse / *axle* 2: siehe / *see* 3.1.
- 6.3.5. **Ort der Kennzeichnung / *location of marking*** : Achse / *axle* 1: entfällt / *not applicable*
 Achse / *axle* 2: siehe / *see* 0.7.
- 6.3.6. **Werkstoff / *material*** : Leichtmetall / *light metal*
- 6.3.7. **Anzahl / *quantity*** : 2
- 6.3.8. **Einpresstiefe / *offset*** : entfällt / *not applicable*
- 6.3.9. **Felgengröße / *rim size*** : Achse / *axle* 1: 165 X 49
 Achse / *axle* 2: 165 X 49
- 6.3.10. **Größenbezeichnung der Bereifung / *tyre size*** : Achse / *axle* 1: 10*2.125
 Achse / *axle* 2: 10*2.125
- 6.3.11. **Art der Bereifung / *kind of tyres*** : einfach, Vollgummireifen / *single formation, solid rubber*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

7. Lenkanlage / *steering system*

7.1. **Bauart / *construction*** : Kraftrad-/Steuerkopflenkung, mechanisch /
motorcycle or head tube steering, mechanic

7.4. Lenkrad bzw. Lenker / *steering wheel or handlebar*

7.4.0. Genehmigung oder Prüfung / *approval or test* : entfällt / *not applicable*

7.4.2. Identifizierungsmerkmal und Ort / *identifier and location* : entfällt / *not applicable*

7.4.4. ~~Durchmesser des Lenkrades bzw.~~ : 479 mm
 Lenkerbreite in mm / *diameter of*
~~the steering wheel or width of~~
handlebar

7.7. **möglicher Lenkeinschlag /**
maximum steering angle
 links / *left* : 60 °
 rechts / *right* : 60 °

7.9. **Weitere Angaben / *further*** : Lenkstange, klappbar / *steering rod, foldable*
informations

8. Bremsanlagen / *brake system*

8.0. **Genehmigung oder Prüfung /** : Prüfung gem. / *test acc. to*
approval or test § 4 (1) eKFV i.V.m. Anlage (zu § 7 Nummer 1)
 Nr. 2.2 eKFV

Anforderungen erfüllt / *requirements fulfilled*

8.1. Betriebsbremsanlage / *service brake*

8.1.1. Art / *kind*
 Achse / *axle* 1 : Muskelkraftbremsanlage, handbetätigt, mit
 mechanischer Übertragungseinrichtung / *muscle power*
brake system, operated by hand, with mechanic
transmission device

Achse / *axle* 2 : Muskelkraftbremsanlage, handbetätigt, mit
 mechanischer Übertragungseinrichtung / *muscle power*
brake system, operated by hand, with mechanic
transmission device

8.1.4. Bremse / *brake*

8.1.4.1. Art / *kind*
 Achse / *axle* 1 : Trommelbremse/ *drum brake*
 Achse / *axle* 2 : Trommelbremse/ *drum brake*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

- 8.1.4.2. Typ / *type*
 - Achse / *axle 1* : YM 9BF
 - Achse / *axle 2* : WLGZ-Φ13

- 8.1.4.3. Hersteller / *manufacturer*
 - Achse / *axle 1* : Taizhou Youmin Transportation equipment Co., Ltd.
 - Achse / *axle 2* : Taizhou Wanli Machinery Co., Ltd.

- 8.1.4.5. Trommel- bzw. Scheibendurchmesser / *drum or disc diameter*
 - Effektiver Brems Scheiben- / Trommeldurchmesser / *effective diameter of brake disc or drum*
 - Achse / *axle 1* : 79 mm
 - Achse / *axle 2* : 79 mm

 - Außendurchmesser / *outer diameter*
 - Achse / *axle 1* : entfällt / *not applicable*
 - Achse / *axle 2* : entfällt / *not applicable*

 - Anzahl der Scheiben je Bremse / *number of discs for each brake*
 - Achse / *axle 1* : entfällt / *not applicable*
 - Achse / *axle 2* : entfällt / *not applicable*

- 8.1.5. Bremsbelag / *brake lining*
 - 8.1.5.3. Hersteller / *manufacturer*
 - Achse / *axle 1* : Taizhou Youmin Transportation equipment Co., Ltd.
 - Achse / *axle 2* : Taizhou Wan Li Machinery Co., Ltd.

 - Kennzeichnung / *marking*
 - Achse / *axle 1* : keine / *none*
 - Achse / *axle 2* : keine / *none*

- 8.1.5.5. wirksame Bremsbelagfläche / *total friction area*
 - Achse / *axle 1* : 25,5 cm²
 - Achse / *axle 2* : 25,5 cm²

- 8.1.6. Übersetzung bis Zuspaltung / *transformation ratio until disc or drum*
 - Achse / *axle 1* : Handhebel / *hand lever*: 33 / 103
 - Achse / *axle 2* : Handhebel / *hand lever*: 33 / 103

- 8.1.20. Bremshebellänge an der Bremse / *brake lever length at brake*
 - Achse / *axle 1* : 44 mm
 - Achse / *axle 2* : 44 mm

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Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

- 8.1.21. Hauptzylinder-Durchmesser / *brake master cylinder diameter*
 Achse / *axle* 1 : entfällt / *not applicable*
 Achse / *axle* 2 : entfällt / *not applicable*
- 8.1.22. Radzylinder- bzw. Bremszylinder-Durchmesser / *diameter of wheel-brake cylinder or brake cylinder*
 Achse / *axle* 1 : entfällt / *not applicable*
 Achse / *axle* 2 : entfällt / *not applicable*
- 8.1.23. Weitere Angaben / *further informations* : entfällt / *not applicable*
- 8.2. Hilfsbremsanlage / *secondary brake system*** : Bei Ausfall einer von zwei unabhängigen Betriebsbremsen gem. Nr. 8.1 werden nach Vorgabe § 4 Absatz 1, Nr. 4 noch mindestens 44 % der Bremswirkung erreicht. / *In the event of failure of one of two independent service brakes in accordance with No. 8.1, at least 44 % of the braking effect is still achieved in accordance with § 4 para. 1, No. 4.*
- 8.10. Weitere Angaben / *further information* : keine / *none*
- 9. Aufbau / *body***
- 9.0. Genehmigung oder Prüfung für vorstehende Außenkanten / *approval or test for preceding outer edges* : Prüfung gem. / *test acc. to* § 7 Nr. 6 eKFV
 Anforderungen erfüllt / *requirements fulfilled*
- 9.1. Art / *kind* : siehe / *see* 0.2.
- 9.2. Werkstoff / *material* : Leichtmetall, Stahl / *light metal, steel*
- 9.3. Hersteller / *manufacturer* : siehe / *see* 0.1.
- 9.4. Sitze / *seats*
- 9.4.1. Art und Anordnung / *kind and placement* : entfällt / *not applicable*
- 9.4.2. Anzahl der Plätze / *number of places*
- 9.4.2.1. Sitzplätze / *seats available* : entfällt / *not applicable*
- 9.4.2.2. Stehplätze / *standing place available* : 1

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

9.9. Rückspiegel / *rearview mirror*

9.9.2.1. Art / *kind* : entfällt / *not applicable*

9.9.2.2. Anzahl / *quantity* : entfällt / *not applicable*

9.9.2.3. Ort und Art der Anbringung / *location and method of mounting* : entfällt / *not applicable*

9.9.2.4. Weitere Angaben / *further informations* : keine / *none*

9.11. Kennzeichen, Abmessungen / *licence plate, dimensions*

9.11.0. Genehmigung oder Prüfung / *approval or test* : Prüfung gem. / *test acc. to*
 § 2 (1) Nr. 2 eKFV i.V.m. § 29a (3) FZV
 Anforderungen erfüllt / *requirements fulfilled*

9.11.3. Abmessungen hinten / *rear plate dimensions* : 60 x 65 mm

9.11.4. Höhe des ~~oberen bzw.~~ unteren Randes hinten / *height of the ~~upper~~ or lower edge in the rear* : 106 mm

9.11.5. Anbringungswinkel / *mounting angle* : 30°
 vertikal in Fahrtrichtung / *vertical in direction of travel*

9.13. **Kraftradverkleidung / *motor cycle cover*** : entfällt / *not applicable*

9.14. **Zentralständer, Seitenständer / *central stand, side stand*** : Zentralständer / *central stand*: nein / *no*
 Seitenständer / *side stand*: ja / *yes*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

10. Lichttechnische Einrichtungen, Abmessungen / *lighting devices, dimensions*

10.0. Genehmigung oder Prüfung hinsichtlich. Anbau / *approval or test regarding mounting* : Prüfung gem. / *test acc. to* § 5 eKFV i.V.m. § 67 StVZO u. UNECE-R 74
 Anforderungen erfüllt / *requirements fulfilled*

10.1. Scheinwerfer für Abblendlicht und Fernlicht / *headlamps for dipped beam and main beam*

10.1.1. Anzahl / *quantity* : 1

10.1.2. Scheinwerfer für Abblend- und Fernlicht / *headlamps for dipped and main beam*

10.1.2.0 Prüfzeichen / *approval mark* : K1795

10.1.2.4. Leistungsaufnahme der Glühlampe / *power consumption of light bulb* : < 1 W

10.2. Begrenzungsleuchten / *clearance lamps*

10.2.0. Prüfzeichen / *approval mark* : entfällt / *not applicable*

10.2.1. Anzahl / *quantity* : entfällt / *not applicable*

10.3. Schlussleuchten / *rear lamps*

10.3.0. Prüfzeichen / *approval mark* : K 1634

10.3.1. Anzahl / *quantity* : 1

10.4. Bremsleuchten / *stop lights*

10.4.0. Prüfzeichen / *approval mark* : entfällt / *not applicable*

10.4.1. Anzahl / *quantity* : entfällt / *not applicable*

10.5. Rote Rückstrahler / *red retro reflectors*

10.5.0. Prüfzeichen / *approval mark* : K 1634/ IA E8 02 9960

10.5.1. Anzahl / *quantity* : 1

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Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

- 10.7. Kennzeichenbeleuchtung /
licence plate illumination**
- 10.7.0. Prüfzeichen / *approval mark* : entfällt / *not applicable*
- 10.11. Lichttechnische Einrichtungen
zur seitlichen Kenntlichmachung
/ *light-technical devices for side
marking***
- 10.11.1. Seitliche rückstrahlende Mittel / *side
reflector devices*
- 10.11.1.0. Prüfzeichen / *approval mark* : IA E24 02 0099
- 10.11.1.1. Anzahl / *quantity* : 2 (einer je Seite) / *(one on each side)*
- 10.22. Weiße Rückstrahler / *white retro
reflectors***
- 10.22.1. Prüfzeichen / *approval mark* : IA 02 E4 3898
- 10.22.2. Anzahl / *quantity* : 1
- 12. Verschiedenes / *miscellaneous***
- 12.1. Schallzeichen / *audible warning
device***
- 12.1.0. Genehmigung oder Prüfung und
Prüfzeichen / *approval or test and
approval mark* : Prüfung gem. / *test acc. to § 6 eKFV*
Anforderungen erfüllt / *requirements fulfilled*
- 12.1.1. Bauart / *construction* : helltönende Glocke gem. / *bright sounding bell acc. to
§ 64a StVZO*
- 12.4. Sicherungseinrichtung gegen
unbefugte Benutzung /
*protection against unauthorized
use*** : entfällt / *not applicable*
- 12.8. Akustische Kontrolle der
Fahrtrichtungsanzeiger /
*acoustic check of direction
indicators*** : keine / *none*

Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

12.9 Weitere Angaben / further information

12.9.1. Prüfung der Fahrdynamik / *testing of driving dynamics* : Prüfung gem. / *test acc. to* § 7 Nr. 1 eKFV i.V.m. Anlage (zu § 7 Nummer 1) Nr. 2.3 eKFV

Anforderungen erfüllt / *requirements fulfilled*

12.9.2. Schutz gegen Berühren spannungsführender Teile / *protection against contact to electrical parts* : Prüfung gem. / *test acc. to* § 7 Nr. 4 eKFV

Anforderungen erfüllt / *requirements fulfilled*

13. Abweichungen, Auflagen, Anlagen / deviations, additional requirements, enclosures

13.1. Abweichungen / *deviations* : entfällt / *not applicable*

13.2. Auflagen / *additional requirements* : *Der Fahrzeugführer hat sich vor Fahrtantritt mithilfe der Betriebsanleitung mit dem Fahrzeug vertraut zu machen. Dies gilt insbesondere für erschwerte Fahrsituationen (beispielsweise Bordsteine, steile Rampen, Quer- und Längsrillen etc.). / *Before driving, the driver must familiarise himself with the vehicle using the operating instructions. This applies in particular to difficult driving situations (e.g. curbs, steep ramps, transverse and longitudinal grooves, etc.).

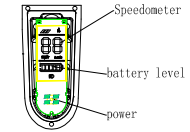
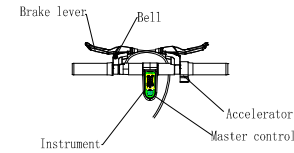
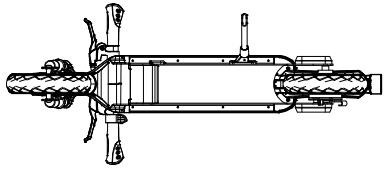
Anlage Nr. / Encls. no.	Zeichnungs-/ Berichtsnr. / Drawing or report no.	Bezeichnung / Description	Seiten / pages
13.3./2.1.	13.3./2.1.	Zeichnung des gesamten Fahrzeugs / <i>drawing of the whole vehicle</i>	2
13.3./3.	13.3./3.	Zeichnung der Antriebsmaschine / <i>drawing of propulsion engine</i>	1
13.3./8.	13.3./8.	Schematische Darstellung der Bremsanlage / <i>schematic diagram of the brake system</i>	2
13.3./9.1.	13.3./9.1.	Fotos einer repräsentativen Fahrzeugausführung / <i>photos of a representative vehicle</i>	1
13.3./10.	13.3./10.	Schematische Darstellung des gesamten Fahrzeugs mit Angaben zur Beleuchtung / <i>drawing of the whole vehicle with details of lighting devices</i>	1

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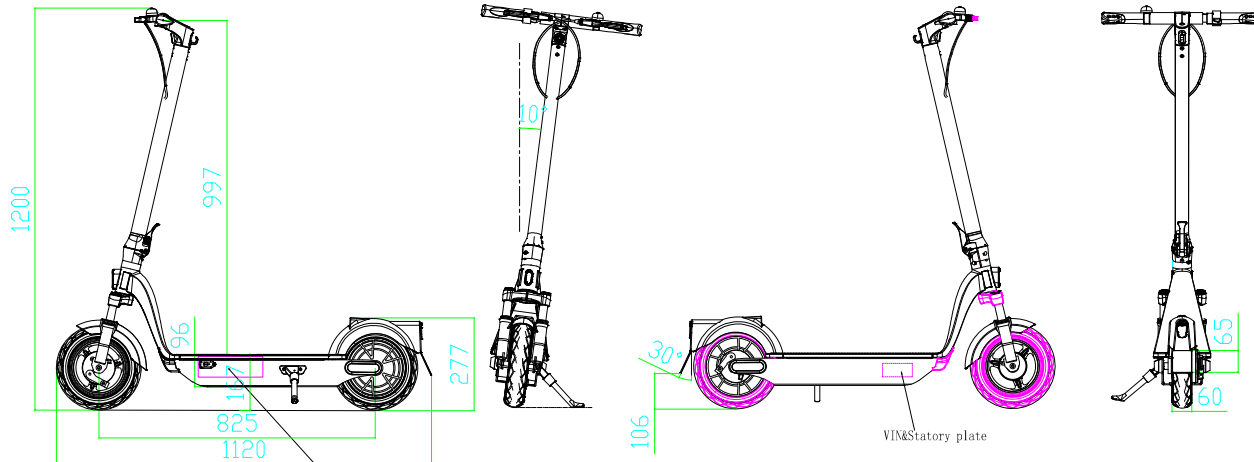
Fahrzeugtyp / *vehicle type* : ESX105AE
 Hersteller / *manufacturer* : WeRoll Tech GmbH

13.3./12.1.	SZES210600431201	Nachweis der Batteriesicherheit / <i>confirmation of battery safety</i>	32
13.3./12.2.	87-R85-0428/23-00	Nachweis der Nenndauerleistung / <i>confirmation of continuous rated power</i>	9
13.3./12.3.	87-R10-0427/23-00	Nachweis der elektromagnetischen Verträglichkeit / <i>confirmation of electromagnetic compatibility</i>	12
13.3./4.5.		Erklärung des Genehmigungsinhabers über Maßnahmen zur Verhinderung unbefugter Eingriffe in den Antriebsstrang und andere genehmigungsrelevante Bauteile oder Systeme/ <i>Approval holder's declaration on measures to prevent tampering on powertrain and other approval relevant components or systems</i>	2
13.3./12.		Datenbestätigung gem. Muster 2d § 20 StVZO / <i>data conformity sheet acc. to sample 2d § 20 StVZO</i>	1

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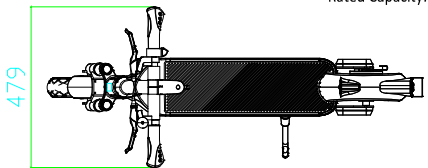


Instrument make: SHENZHEN FL SMART
TECHNOLOGY CO., LTD
Type: FL-43-67080

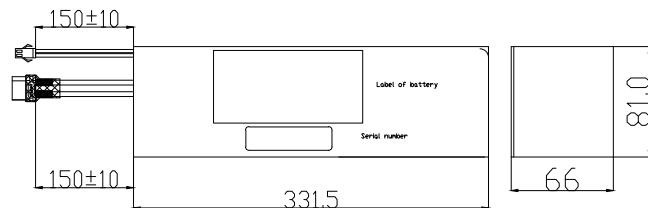


VIN&Statory plate

Battery position
Manufacture: Shen zhen Elite Electronic Co.,Ltd
Type:HY-ELITOP-S1004A-ZN
Rated Capacity: 10Ah



Battery L*W*H:331.5mm*81mm*66mm



Elektrokleinstfahrzeug
WeRoll Tech GmbH
ESX105AE
2023
WG1CB0P1000001
20km/h
P XXX

Radium engraving

WG1CB0 P1 000001

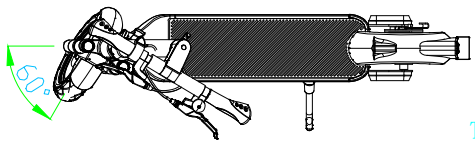
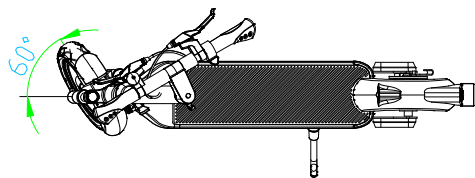


Hersteller/Manufacturer: WeRoll Tech GmbH	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr./drawing no: 13.3./2.1	
	Titel/title: 13.3./2.1.Zeichnung des gesamten Fahrzeugs/drawing of the whole vehicle	Material/material:	
		Masstab/scale: 1:20	1/2

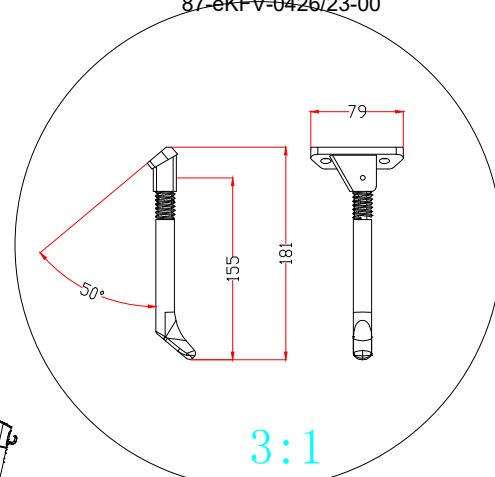
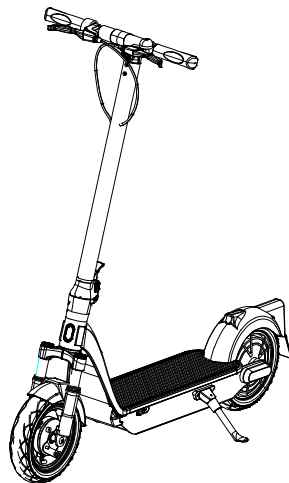
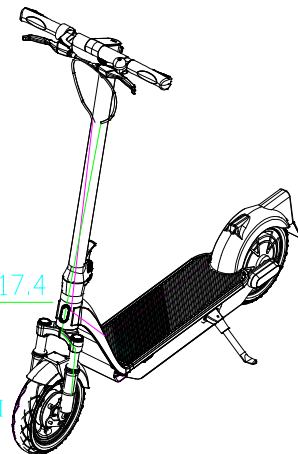
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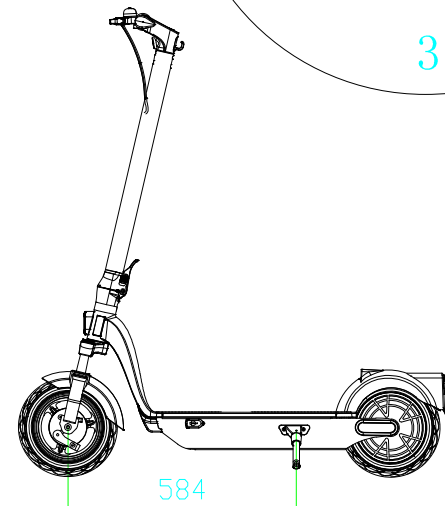
Anlage zu / Attachment to
87-eKFV-0426/23-00



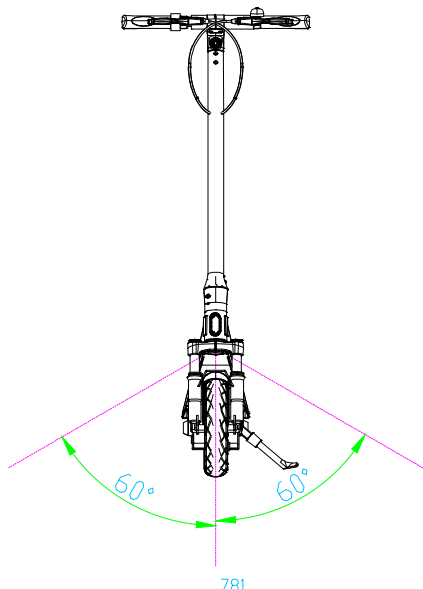
45
Travel:25MM
4:1
ø33.2
ø17.4



3:1



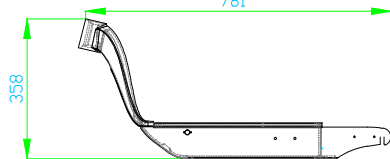
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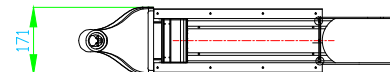
60°

60°

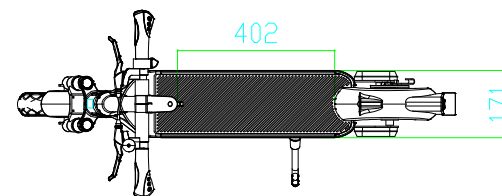
781



358



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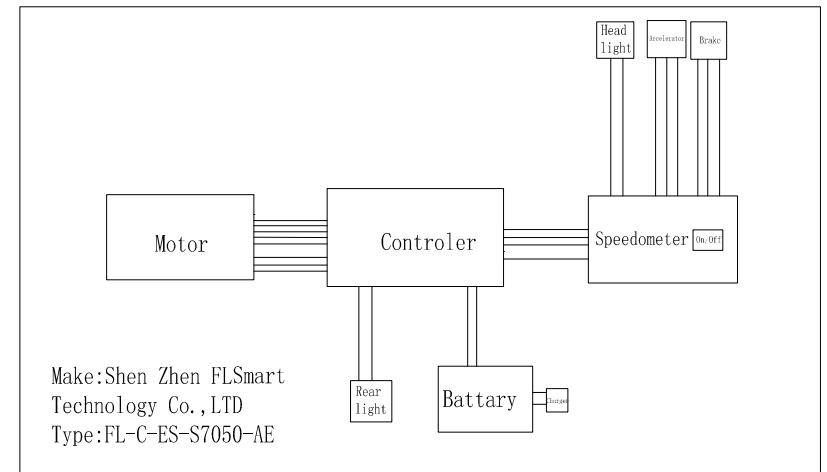
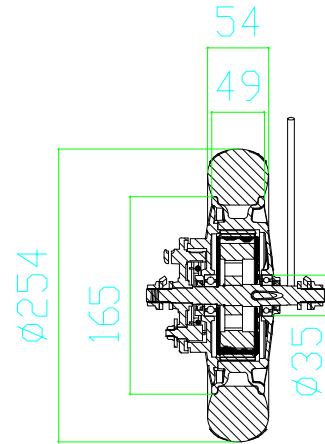
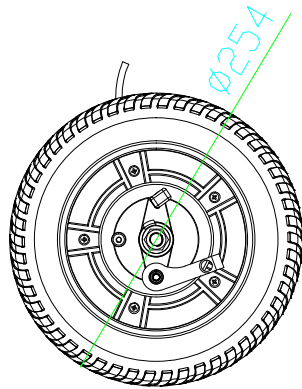
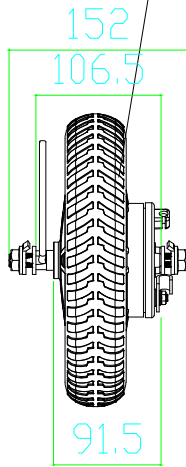
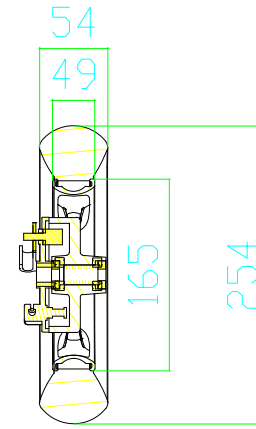
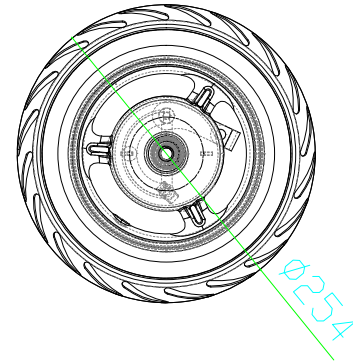
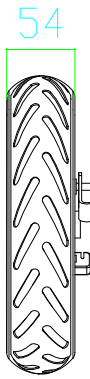
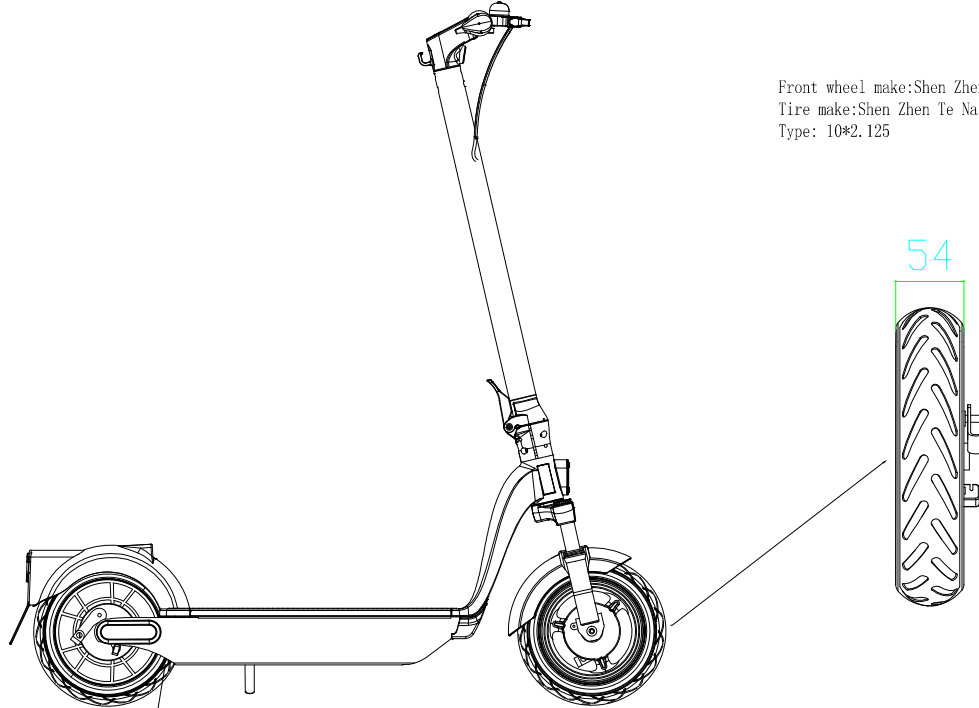


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Hersteller/Manufacturer: WeRoll Tech GmbH	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr./drawing no: 13.3./2.1	
	Titel/title: 13.3./2.1.Zeichnung des gesamten Fahrzeugs/drawing of the whole vehicle		Material/material:
		Masstab/scale: 1:20	Blatt/page: 2/2

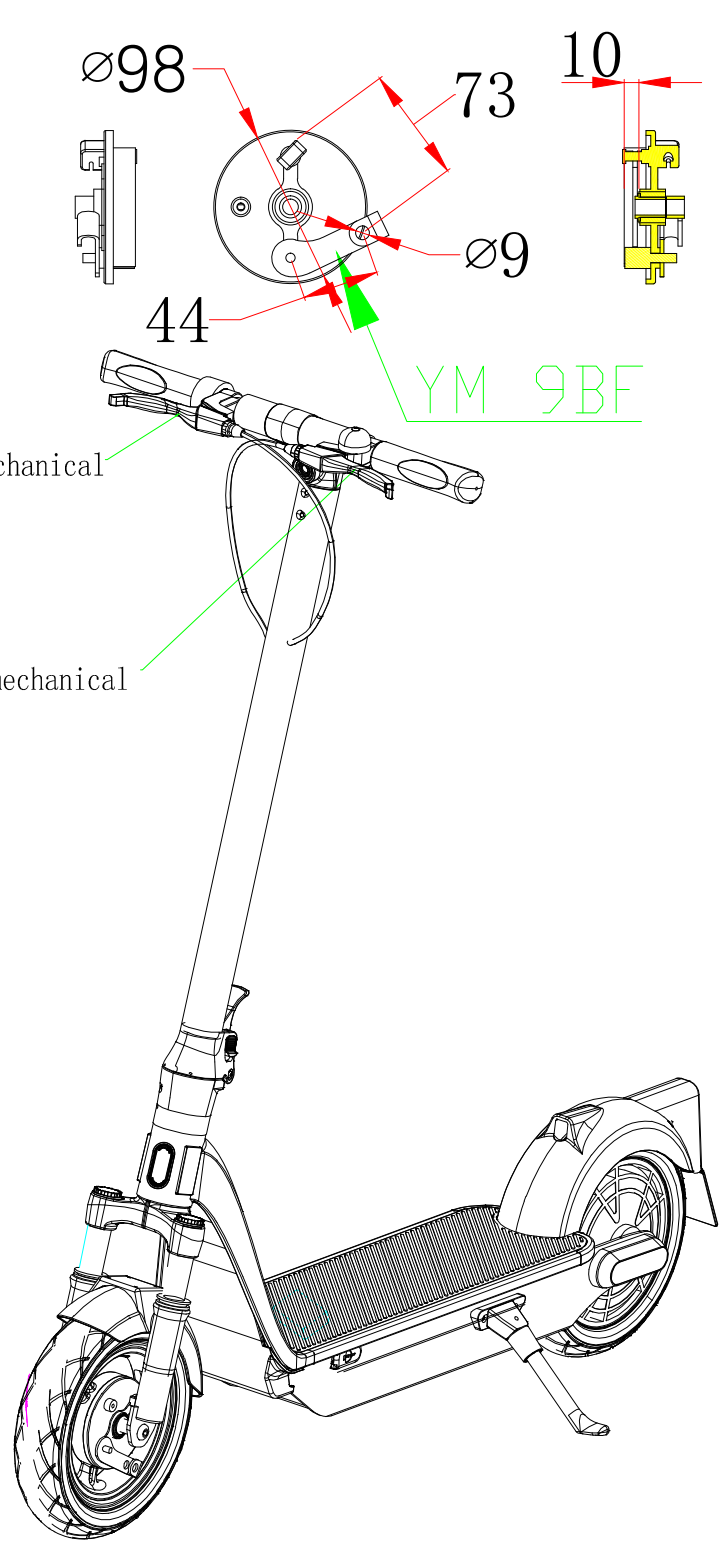
Front wheel make: Shen Zhen Te Nai Technology Co., Ltd
Tire make: Shen Zhen Te Nai Technology Co., Ltd
Type: 10*2.125



Motor make: Anhui Weite Motor Technology Co., Ltd
Motor Type: WT-36V-30H
Tyre make: Shen Zhen Te Nai Technology Co., LTD
Tyre Type: 10*2.125

Hersteller/Manufacturer: WeRoll Tech GmbH	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr./drawing no: 13.3./3.	
	Titel/title: 13.3./3.3. Zeichnung der Antriebsmaschine/drawing of propulsion engine (longitudinal/cross section)		Material/material: Aluminium, copper
		Masstab/scale: 1:6	Blatt/page: 1/1

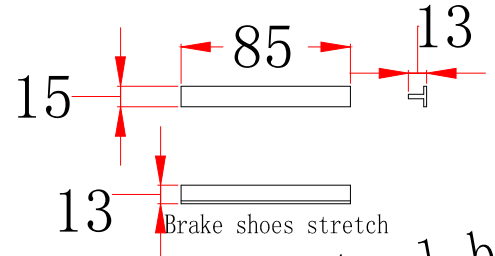
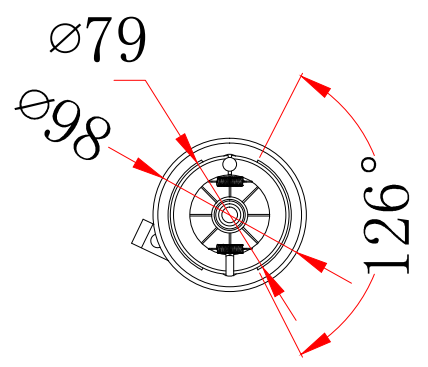
S20 P410*00



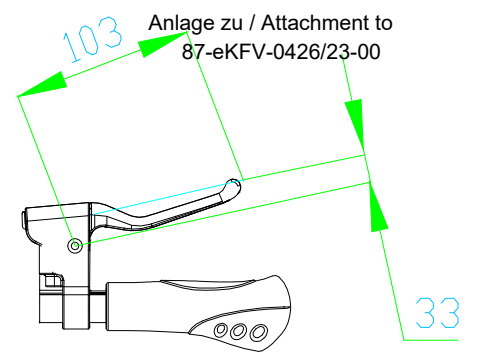
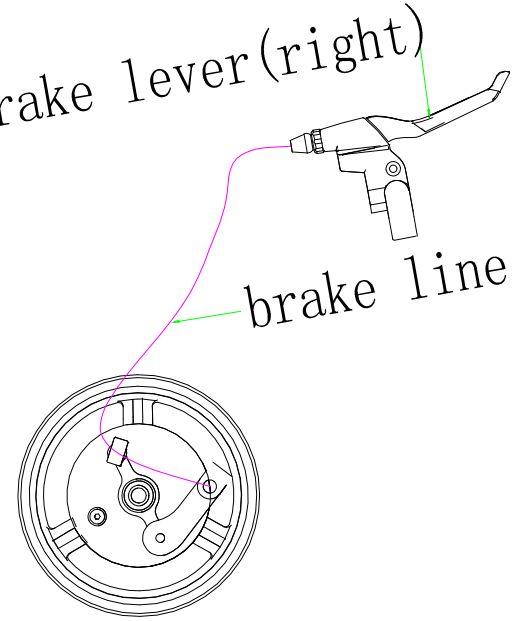
Rear mechanical brake

Front mechanical brake

YM 9BF

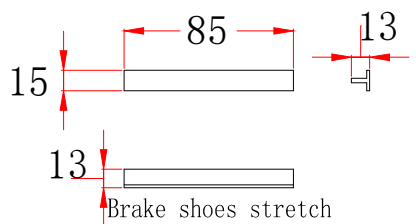
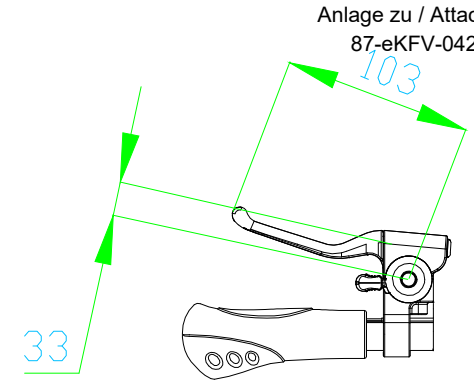
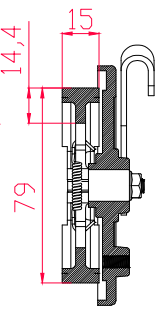
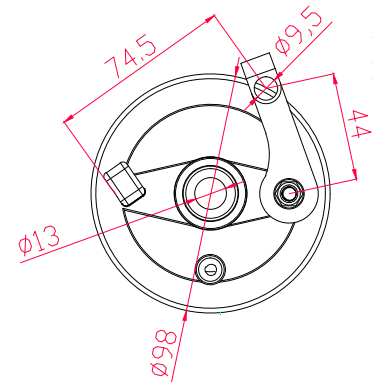
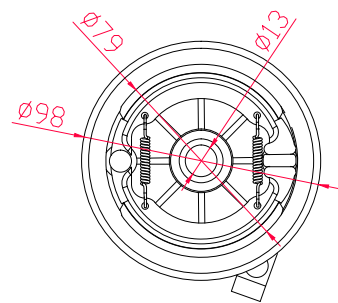
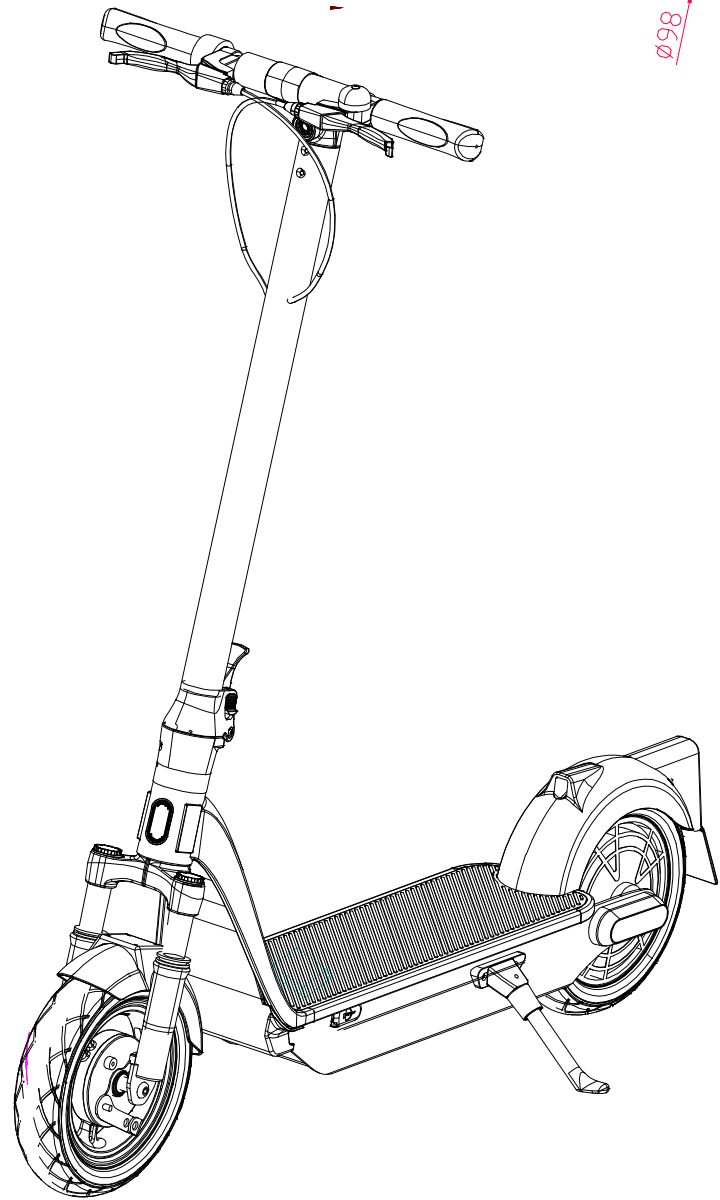


Front wheel brake lever (right)



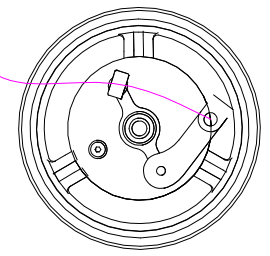
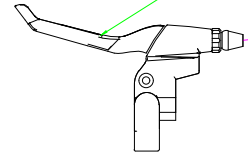
Make: Taizhou Youmin Transportation equipment Co., Ltd.
 Type: YM 9BF
 Material: Mixture of resin, aluminium silicate, calcium carbonate, barium sulfate
 Mass: 0.22KG
 Brake shoe area: 1275*2mm²

Hersteller/Manufacturer: WeRoll Tech GmbH	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr./drawing no: 13.3./8.	
	Titel/title: 13.3./8.Schematische Darstellung der Bremsanlage/schematic diagram of the brake system		Material/material:
		Masstab/scale: 1:4	Blatt/page: 1/2



Rear brake lever (left)

brake line



Anlage zu / Attachment to
87-eKFV-0426/23-00

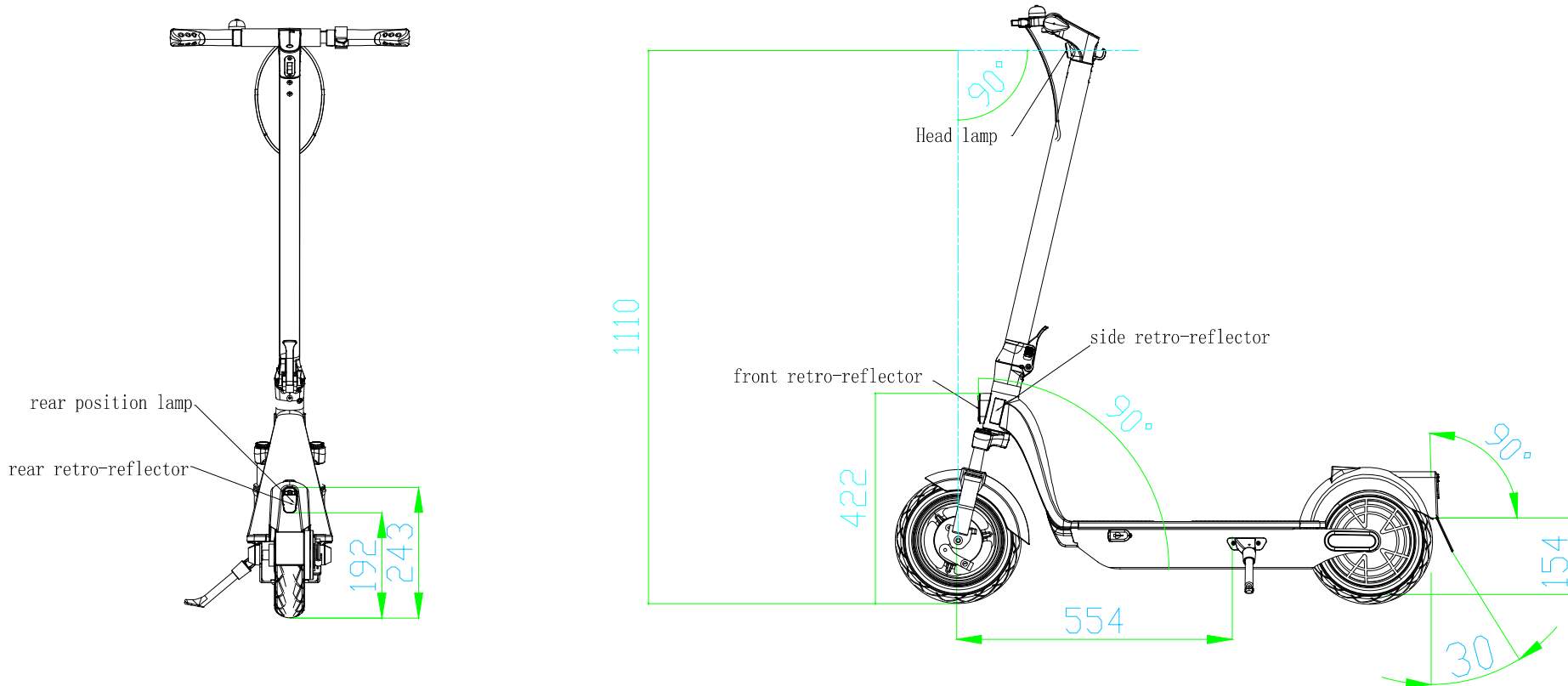
Make: Taizhou Wan Li Machinery Co., Ltd.
 Type: WLGZ- $\phi 13$
 Material: Mixture of resin, aluminium silicate, calcium carbonate, barium sulfate
 Mass: 0.20KG
 Brake shoe area: $1275 * 2 \text{mm}^2$

Hersteller/Manufacturer: WeRoll Tech GmbH	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr. /drawing no: 13.3./8.	
	Titel/title: 13.3./8.Schematische Darstellung der Bremsanlage/schematic diagram of the brake system		Material/material:
		Masstab/scale: 1:4	Blatt/page: 2/2



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Hersteller/Manufacturer:	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr./drawing no: 13. 3. /9. 1.	
WeRoll Tech GmbH	Titel/title: 13. 3. /9. 1. Fotos einer repräsentativen Fahrzeugausführung / photos of a representative vehicle	Material/material:	
		Masstab/scale: 1:20	Blatt/page: 1/1



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rear position lamp
rear retro-reflector

192
243

1110

front retro-reflector

422

Head lamp

side retro-reflector

554

154

30

90°

90°

90°

Headlamp
Make: Laité Cultural Products Co., Ltd.; Type: C6, Approval No.: K 1795
Rear position lamp
make Sate-Lite(Foshan)Plastics Co.,Ltd;Type:M4, Approval No:K1634

Front retro-reflector
make K-LITE(Yuyao) Plastics Co.,Ltd;Type:KM221, Approval No:E4*3R02/16*3898*00

Side reflector
make Sate-Lite(Foshan)Plastics Co., Ltd;Type:SL-198, Approval
No:E24*3R02/17*0099*00

Rear retro-reflector
make Sate-Lite(Foshan)Plastics Co., Ltd;Type:M4, Approval No:K 1634/E8-3R-029960

Hersteller/Manufacturer: WeRoll Tech GmbH	Verantwortlicher/Responsible: Guohua Zeng	Zeichnungsnr./drawing no: 13.3./10	
	Titel/title: 13.3./10.Schematische Darstellung des gesamten Fahrzeugs mit Angaben der Abmessungen und Maßangaben zur Beleuchtung /Drawing of the whole vehicle with dimension of the vehicle and the lighting devices		Material/material:
		Masstab/scale: 1:20	Blatt/page: 1/1

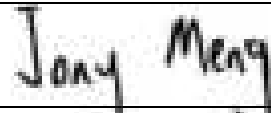
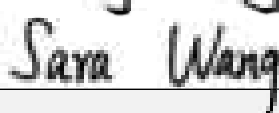


Test Report issued under the responsibility of:



TEST REPORT IEC 62133-2 Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for portable sealed secondary cells, and for batteries made from them, for use in portable applications – Part 2: Lithium systems	
Report Number	SZES210600431201
Date of issue	2021-07-24
Total number of pages	23 Pages
Name of Testing Laboratory preparing the Report	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
Applicant's name	HL CORP (Shen Zhen)
Address	The Third Industrial Park, Bitou Village, Songgang Town, Baoan District, Shenzhen, Guangdong, China
Test specification:	
Standard	IEC 62133-2:2017
Test procedure	CB Scheme
Non-standard test method	N/A
Test Report Form No.	IEC62133_2A
Test Report Form(s) Originator	DEKRA
Master TRF	Dated 2017-08-10
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General disclaimer: The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.	

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Test item description :	Li-ion Battery Pack	
Trade Mark :	ELITOP	
Manufacturer :	Shenzhen Elite Electronic Co., Ltd 2F, A&B&C, 2 Building, Huiye Technology park, Guanguang Road, Tangjia Community, Gongming Street, Guangming New District, Shenzhen, 518132, Guangdong, China	
Model/Type reference :	HY-ELITOP-S1004A-ZN	
Ratings :	Rated Voltage: 36 V Rated Capacity: 10000 mAh	
Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
	Testing location/ address:	No.2, Jianghao Industrial Factory Area, No.430, Jihua Road, Bantian Street, Longgang District, Shenzhen, Guangdong, China
	Tested by (name, function, signature):	Jony Meng / Project Engineer 
	Approved by (name, function, signature) ...:	Sara Wang Report Reviewer 
<input type="checkbox"/>	Testing procedure: CTF Stage 1:	N/A
	Testing location/ address:	
	Tested by (name, function, signature):	
	Approved by (name, function, signature) ...:	
<input type="checkbox"/>	Testing procedure: CTF Stage 2:	N/A
	Testing location/ address:	
	Tested by (name + signature)	
	Witnessed by (name, function, signature) ...:	
	Approved by (name, function, signature) ...:	
<input type="checkbox"/>	Testing procedure: CTF Stage 3:	N/A
<input type="checkbox"/>	Testing procedure: CTF Stage 4:	N/A
	Testing location/ address:	
	Tested by (name, function, signature):	
	Witnessed by (name, function, signature) ...:	
	Approved by (name, function, signature) ...:	
	Supervised by (name, function, signature) :	

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List of Attachments (including a total number of pages in each attachment):

Attachment 1: 3 pages of Photos;
Attachment 2: 2 pages of Information for safety;
Attachment 3: 1 page of Packaging;
Attachment 4: 2 pages of Product specification;
Attachment 5: 1 page of ISO9001 certificate.

Summary of testing:

The sample(s) tested complies with the requirements of IEC 62133-2: 2017.

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Remark: Only battery was considered and tested according to standard in this report as the cell (model: INR18650S-2500mAh) was certified according to IEC 62133-2: 2017 by SGS Fimko (CB Report No.: SZES190801518201, Certif. No.: FI-42377).

Tests performed (name of test and test clause):

- 5.2 Insulation resistance
- 7.2.1 Continuous charging at constant voltage (cells)
- 7.2.2 Case stress at high ambient temperature (battery)
- 7.3.1 External short circuit (cell)
- 7.3.2 External short circuit (battery)
- 7.3.3 Free fall
- 7.3.4 Thermal abuse (cells)
- 7.3.5 Crush (cells)
- 7.3.6 Over-charging of battery
- 7.3.7 Forced discharge (cells)
- 7.3.8 Mechanical tests (batteries)
- 7.3.9 Design evaluation – Forced internal short circuit (cells)
- Annex D Measurement of the internal AC resistance for coin cells

Testing location:

SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch
No.2, Jianghao Industrial Factory Area, No.430,
Jihua Road, Bantian Street, Longgang District,
Shenzhen, Guangdong, China

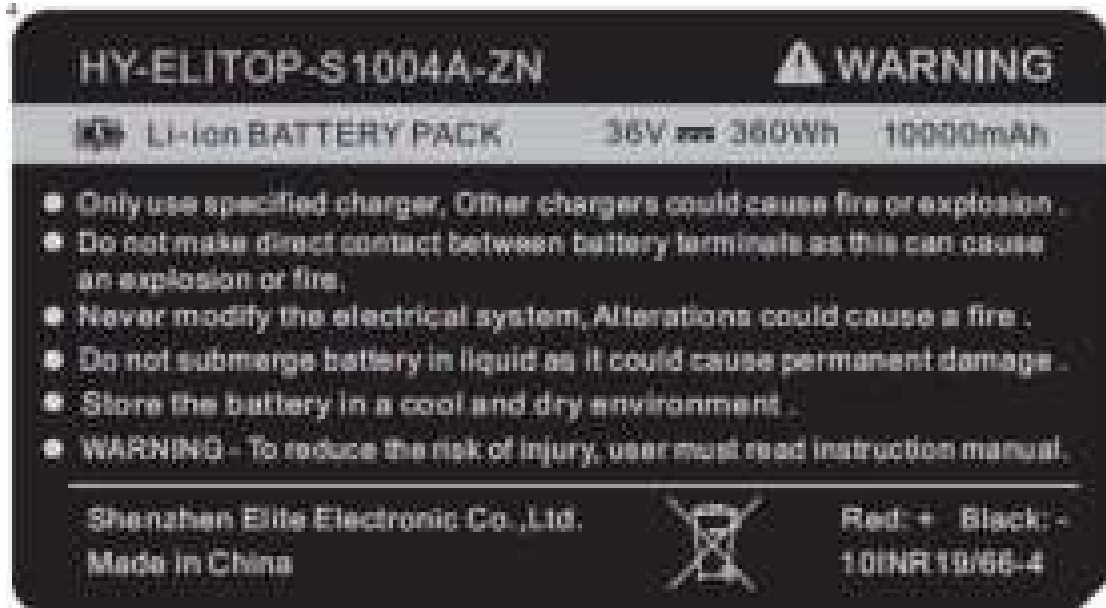
Summary of compliance with National Differences (List of countries addressed): none.

- The product fulfils the requirements of EN 62133-2:2017 and BS EN 62133-2:2017

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Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.



SHL X102 P YY DDD XXXX

Remark: 1. Battery pack with keyed external connector which prevents reverse polarity connections.
2. YY in serial number is the year of manufacture, DDD is the manufacture day in this year.

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Test item particulars	
Classification of installation and use.....	--
Supply Connection	--
Recommend charging method declared by the manufacturer.....	CC/CV
Discharge current (0,2 It A)	2 A
Specified final voltage.....	28 V
Upper limit charging voltage per cell.....	4,2 V
Maximum charging current.....	3 A
Charging temperature upper limit.....	45°C
Charging temperature lower limit	0°C
Polymer cell electrolyte type.....	<input type="checkbox"/> gel polymer <input type="checkbox"/> solid polymer <input checked="" type="checkbox"/> N/A
Possible test case verdicts:	
- test case does not apply to the test object.....	: N/A
- test object does meet the requirement.....	: P (Pass)
- test object does not meet the requirement.....	: F (Fail)
Testing	
Date of receipt of test item.....	: 2021-07-01
Date (s) of performance of tests	: 2021-07-02 to 2021-07-08
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p>This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.</p>	

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Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided.....:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable
When differences exist; they shall be identified in the General product information section.	
Name and address of factory (ies)..... : Same as manufacture	
General product information and other remarks:	
Product description:	Li-ion Battery Pack
Model of pack:	HY-ELITOP-S1004A-ZN
Designation of pack:	10INR19/66-4
Rated voltage:	36 V
Rated capacity:	10000 mAh
Maximum charging current:	3 A
Number of cells in battery pack:	10S4P
Model of cell:	INR18650S-2500mAh
Designation of cell:	INR19/66
Rated voltage of cell:	3,6 V
Rated capacity of cell:	2500 mAh
Maximum charge current of cell:	1250 mA
Remark: See Attachment 4 for more detailed product specification.	

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
4	PARAMETER MEASUREMENT TOLERANCES		P
	Parameter measurement tolerances		P
5	GENERAL SAFETY CONSIDERATIONS		P
5.1	General		P
	Cells and batteries so designed and constructed that they are safe under conditions of both intended use and reasonably foreseeable misuse		P
5.2	Insulation and wiring		P
	The insulation resistance between the positive terminal and externally exposed metal surfaces of the battery (excluding electrical contact surfaces) is not less than 5 MΩ		N/A
	Insulation resistance (MΩ)		—
	Internal wiring and insulation are sufficient to withstand maximum anticipated current, voltage and temperature requirements		P
	Orientation of wiring maintains adequate clearance and creepage distances between conductors		P
	Mechanical integrity of internal connections accommodates reasonably foreseeable misuse		P
5.3	Venting		P
	Battery cases and cells incorporate a pressure relief mechanism or are constructed so that they relieve excessive internal pressure at a value and rate that will preclude rupture, explosion and self-ignition	Cell: A pressure relief mechanism was used to relieve excessive internal pressure. Pack: Plastic enclosure wrapping 40 cells and secured by screws, aperture as the venting mechanism of battery	P
	Encapsulation used to support cells within an outer casing does not cause the battery to overheat during normal operation nor inhibit pressure relief	Plastic enclosure was used as encapsulation to wrap cells, will not cause the battery to overheat during normal operation nor inhibit pressure relief.	P
5.4	Temperature, voltage and current management		P
	Batteries are designed such that abnormal temperature rise conditions are prevented	Protection circuit was used	P
	Batteries are designed to be within temperature, voltage and current limits specified by the cell manufacturer	Protection circuit was used	P

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Batteries are provided with specifications and charging instructions for equipment manufacturers so that specified chargers are designed to maintain charging within the temperature, voltage and current limits specified	See Attachment 4 for detail	P
5.5	Terminal contacts		P
	The size and shape of the terminal contacts ensure that they can carry the maximum anticipated current		P
	External terminal contact surfaces are formed from conductive materials with good mechanical strength and corrosion resistance		P
	Terminal contacts are arranged to minimize the risk of short-circuit		P
5.6	Assembly of cells into batteries		P
5.6.1	General		P
	Each battery have an independent control and protection for current, voltage, temperature and any other parameter required for safety and to maintain the cells within their operating region		P
	This protection may be provided external to the battery such as within the charger or the end devices	The protection is within the battery	N/A
	If protection is external to the battery, the manufacturer of the battery provide this safety relevant information to the external device manufacturer for implementation		N/A
	If there is more than one battery housed in a single battery case, each battery have protective circuitry that can maintain the cells within their operating regions	Single battery pack without separate case	N/A
	Manufacturers of cells specify current, voltage and temperature limits so that the battery manufacturer/designer may ensure proper design and assembly		P
	Batteries that are designed for the selective discharge of a portion of their series connected cells incorporate circuitry to prevent operation of cells outside the limits specified by the cell manufacturer		P
	Protective circuit components added as appropriate and consideration given to the end-device application		P
	The manufacturer of the battery provide a safety analysis of the battery safety circuitry with a test report including a fault analysis of the protection circuit under both charging and discharging conditions confirming the compliance		N/A
5.6.2	Design recommendation		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	For the battery consisting of a single cell or a single cellblock, it is recommended that the charging voltage of the cell does not exceed the upper limit of the charging voltage specified in Table 2		N/A
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that the voltages of any one of the single cells or single cellblocks does not exceed the upper limit of the charging voltage, specified in Table 2, by monitoring the voltage of every single cell or the single cellblocks	10S4P The voltages of any one of the single cells does not exceed the upper limit of the charging voltage 4,2 V.	P
	For the battery consisting of series-connected plural single cells or series-connected plural cellblocks, it is recommended that charging is stopped when the upper limit of the charging voltage is exceeded for any one of the single cells or single cellblocks by measuring the voltage of every single cell or the single cellblocks	10S4P Charging is stopped when the upper limit of the charging voltage 4,2 V is exceeded for any one of the single cells	P
	For batteries consisting of series-connected cells or cell blocks, nominal charge voltage not be counted as an overcharge protection		P
	For batteries consisting of series-connected cells or cell blocks, cells have closely matched capacities, be of the same design, be of the same chemistry and be from the same manufacturer		P
	It is recommended that the cells and cell blocks not discharged beyond the cell manufacturer's specified final voltage		P
	For batteries consisting of series-connected cells or cell blocks, cell balancing circuitry incorporated into the battery management system		P
5.6.3	Mechanical protection for cells and components of batteries		P
	Mechanical protection for cells, cell connections and control circuits within the battery provided to prevent damage as a result of intended use and reasonably foreseeable misuse		P
	The mechanical protection can be provided by the battery case or it can be provided by the end product enclosure for those batteries intended for building into an end product	The mechanical protection can be provided by the battery enclosure	P
	The battery case and compartments housing cells designed to accommodate cell dimensional tolerances during charging and discharging as recommended by the cell manufacturer		P
	For batteries intended for building into a portable end product, testing with the battery installed within the end product considered when conducting mechanical tests	Should be considered in the end product	N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
5.7	Quality plan		P
	The manufacturer prepares and implements a quality plan that defines procedures for the inspection of materials, components, cells and batteries and which covers the whole process of producing each type of cell or battery	ISO9001 certificate was submitted See Attachment 5 for details	P
5.8	Battery safety components		P
	According annex F		P
6	TYPE TEST AND SAMPLE SIZE		P
	Tests are made with the number of cells or batteries specified in Table 1 using cells or batteries that are not more than six months old	The production date is 2021-04	P
	Coin cells with resistance $\leq 3 \Omega$ (measured according annex D) are tested according table 1	Not coin cell	N/A
	Unless otherwise specified, tests are carried out in an ambient temperature of $20 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$		P
	The safety analysis of 5.6.1 identify those components of the protection circuit that are critical for short-circuit, overcharge and overdischarge protection		P
	When conducting the short-circuit test, consideration given to the simulation of any single fault condition that is likely to occur in the protecting circuit that would affect the short-circuit test		P
7	SPECIFIC REQUIREMENTS AND TESTS		P
7.1	Charging procedure for test purposes		P
7.1.1	First procedure		P
	This charging procedure applies to subclauses other than those specified in 7.1.2		P
	Unless otherwise stated in this document, the charging procedure for test purposes is carried out in an ambient temperature of $20 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$, using the method declared by the manufacturer		P
	Prior to charging, the battery have been discharged at $20 \text{ }^\circ\text{C} \pm 5 \text{ }^\circ\text{C}$ at a constant current of 0,2 It A down to a specified final voltage		P
7.1.2	Second procedure		N/A
	This charging procedure applies only to 7.3.1, 7.3.4, 7.3.5, and 7.3.9		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	After stabilization for 1 h and 4 h, respectively, at ambient temperature of highest test temperature and lowest test temperature, as specified in Table 2, cells are charged by using the upper limit charging voltage and maximum charging current, until the charging current is reduced to 0,05 It A, using a constant voltage charging method		N/A
7.2	Intended use		P
7.2.1	Continuous charging at constant voltage (cells)	Cells were certified according to IEC 62133-2: 2017	N/A
	Fully charged cells are subjected for 7 days to a charge using the charging method for current and standard voltage specified by the cell manufacturer		N/A
	Results: No fire. No explosion. No leakage :		N/A
7.2.2	Case stress at high ambient temperature (battery)		P
	Oven temperature (°C) : 70°C		—
	Results: No physical distortion of the battery case resulting in exposure of internal protective components and cells		P
7.3	Reasonably foreseeable misuse		P
7.3.1	External short-circuit (cell)	Cells were certified according to IEC 62133-2: 2017	N/A
	The cells were tested until one of the following occurred:		N/A
	- 24 hours elapsed; or		N/A
	- The case temperature declined by 20 % of the maximum temperature rise		N/A
	Results: No fire. No explosion :		N/A
7.3.2	External short-circuit (battery)		P
	The batteries were tested until one of the following occurred:		P
	- 24 hours elapsed; or	Rapid decline in short circuit current, protective electronic circuit operated	P
	- The case temperature declined by 20 % of the maximum temperature rise		N/A
	In case of rapid decline in short circuit current, the battery pack remained on test for an additional one hour after the current reached a low end steady state condition		N/A
	A single fault in the discharge protection circuit conducted on one to four (depending upon the protection circuit) of the five samples before conducting the short-circuit test		P

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	A single fault applies to protective component parts such as MOSFET, fuse, thermostat or positive temperature coefficient (PTC) thermistor	Single fault applies to MOSFET (M1)	P
	Results: No fire. No explosion	(See appended table 7.3.2)	P
7.3.3	Free fall		P
	Results: No fire. No explosion		P
7.3.4	Thermal abuse (cells)	Cells were certified according to IEC 62133-2: 2017	N/A
	Oven temperature (°C)		—
	Results: No fire. No explosion		N/A
7.3.5	Crush (cells)	Cells were certified according to IEC 62133-2: 2017	N/A
	The crushing force was released upon:		N/A
	- The maximum force of 13 kN ± 0,78 kN has been applied; or		N/A
	- An abrupt voltage drop of one-third of the original voltage has been obtained		N/A
	Results: No fire. No explosion		N/A
7.3.6	Over-charging of battery		P
	The supply voltage which is:		P
	- 1,4 times the upper limit charging voltage presented in Table A.1 (but not to exceed 6,0 V) for single cell/cell block batteries or		N/A
	- 1,2 times the upper limit charging voltage resented in Table A.1 per cell for series connected multi-cell batteries, and		P
	- Sufficient to maintain a current of 2,0 It A throughout the duration of the test or until the supply voltage is reached		P
	Test was continued until the temperature of the outer casing:		P
	- Reached steady state conditions (less than 10 °C change in 30-minute period); or		N/A
	- Returned to ambient		P
	Results: No fire. No explosion	(See appended table 7.3.6)	P
7.3.7	Forced discharge (cells)	Cells were certified according to IEC 62133-2: 2017	N/A
	If the discharge voltage reaches the negative value of upper limit charging voltage within the testing duration, the voltage is maintained at the negative value of the upper limit charging voltage by reducing the current for the remainder of the testing duration		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	If the discharge voltage does not reach the negative value of upper limit charging voltage within the testing duration, the test is terminated at the end of the testing duration		N/A
	Results: No fire. No explosion		N/A
7.3.8	Mechanical tests (batteries)		P
7.3.8.1	Vibration		P
	Results: No fire, no explosion, no rupture, no leakage or venting.	(See appended table 7.3.8.1)	P
7.3.8.2	Mechanical shock		P
	Results: No leakage, no venting, no rupture, no explosion and no fire.....	(See appended table 7.3.8.2)	P
7.3.9	Design evaluation – Forced internal short-circuit (cells)		N/A
	The cells complied with national requirement for		—
	The pressing was stopped upon:		N/A
	- A voltage drop of 50 mV has been detected; or		N/A
	- The pressing force of 800 N (cylindrical cells) or 400 N (prismatic cells) has been reached		N/A
	Results: No fire.....		N/A
8	INFORMATION FOR SAFETY		P
8.1	General		P
	Manufacturers of secondary cells ensure that information is provided about current, voltage and temperature limits of their products	See Attachment 4 for detail.	P
	Manufacturers of batteries ensure that equipment manufacturers and, in the case of direct sales, end-users are provided with information to minimize and mitigate hazards	See Attachment 2 for detail.	P
	Systems analyses performed by device manufacturers to ensure that a particular battery design prevents hazards from occurring during use of a product		N/A
	As appropriate, any information relating to hazard avoidance resulting from a system analysis provided to the end user		N/A
	Do not allow children to replace batteries without adult supervision		N/A
8.2	Small cell and battery safety information	Not small battery	N/A
	The following warning language is to be provided with the information packaged with the small cells and batteries or equipment using them:		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	- Keep small cells and batteries which are considered swallowable out of the reach of children		N/A
	- Swallowing may lead to burns, perforation of soft tissue, and death. Severe burns can occur within 2 h of ingestion		N/A
	- In case of ingestion of a cell or battery, seek medical assistance promptly		N/A
9	MARKING		P
9.1	Cell marking	Only battery will be marked	N/A
	Cells marked as specified in IEC 61960, except coin cells		N/A
	Coin cells whose external surface area is too small to accommodate the markings on the cells show the designation and polarity		N/A
	By agreement between the cell manufacturer and the battery and/or end product manufacturer, component cells used in the manufacture of a battery need not be marked		N/A
9.2	Battery marking		P
	Batteries marked as specified in IEC 61960, except for coin batteries	Batteries also marked with caution statement	P
	Coin batteries whose external surface area is too small to accommodate the markings on the batteries show the designation and polarity. Batteries also marked with an appropriate caution statement	Not coin batteries	N/A
	Terminals have clear polarity marking on the external surface of the battery		P
	Batteries with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections		P
9.3	Caution for ingestion of small cells and batteries	Not small battery	N/A
	Coin cells and batteries identified as small batteries according to 8.2 include a caution statement regarding the hazards of ingestion in accordance with 8.2		N/A
	When small cells and batteries are intended for direct sale in consumer-replaceable applications, caution for ingestion given on the immediate package		N/A
9.4	Other information		P

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
	Storage and disposal instructions	Storage and disposal instructions were supplied with the battery. See Attachment 2 for detail.	P
	Recommended charging instructions	Recommended charging instructions were supplied with the battery. See Attachment 4 for detail.	P

10	PACKAGING AND TRANSPORT		P
	Packaging for coin cells not small enough to fit within the limits of the ingestion gauge of Figure 3	Not coin cells	N/A
	The materials and packaging design are chosen so as to prevent the development of unintentional electrical conduction, corrosion of the terminals and ingress of environmental contaminants	See Attachment 3 for detail.	P

ANNEX A	CHARGING AND DISCHARGING RANGE OF SECONDARY LITHIUM ION CELLS FOR SAFE USE		N/A
A.1	General	Cells were certified according to IEC 62133-2: 2017	N/A
A.2	Safety of lithium ion secondary battery		N/A
A.3	Consideration on charging voltage		N/A
A.3.1	General		N/A
A.3.2	Upper limit charging voltage		N/A
A.3.2.1	General		N/A
A.3.2.2	Explanation of safety viewpoint		N/A
A.3.2.3	Safety requirements, when different upper limit charging voltage is applied		N/A
A.4	Consideration of temperature and charging current		N/A
A.4.1	General		N/A
A.4.2	Recommended temperature range		N/A
A.4.2.1	General		N/A
A.4.2.2	Safety consideration when a different recommended temperature range is applied		N/A
A.4.3	High temperature range		N/A
A.4.3.1	General		N/A
A.4.3.2	Explanation of safety viewpoint		N/A
A.4.3.3	Safety considerations when specifying charging conditions in the high temperature range		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
A.4.3.4	Safety considerations when specifying a new upper limit in the high temperature range		N/A
A.4.4	Low temperature range		N/A
A.4.4.1	General		N/A
A.4.4.2	Explanation of safety viewpoint		N/A
A.4.4.3	Safety considerations, when specifying charging conditions in the low temperature range		N/A
A.4.4.4	Safety considerations when specifying a new lower limit in the low temperature range		N/A
A.4.5	Scope of the application of charging current		N/A
A.4.6	Consideration of discharge		N/A
A.4.6.1	General		N/A
A.4.6.2	Final discharge voltage and explanation of safety viewpoint		N/A
A.4.6.3	Discharge current and temperature range		N/A
A.4.6.4	Scope of application of the discharging current		N/A
A.5	Sample preparation		N/A
A.5.1	General		N/A
A.5.2	Insertion procedure for nickel particle to generate internal short		N/A
A.5.3	Disassembly of charged cell		N/A
A.5.4	Shape of nickel particle		N/A
A.5.5	Insertion of nickel particle in cylindrical cell		N/A
A.5.5.1	Insertion of nickel particle in winding core		N/A
A.5.5.2	Marking the position of the nickel particle on both ends of the winding core of the separator		N/A
A.5.6	Insertion of nickel particle in prismatic cell		N/A
A.6	Experimental procedure of the forced internal short-circuit test		N/A
A.6.1	Material and tools for preparation of nickel particle		N/A
A.6.2	Example of a nickel particle preparation procedure		N/A
A.6.3	Positioning (or placement) of a nickel particle		N/A
A.6.4	Damaged separator precaution		N/A
A.6.5	Caution for rewinding separator and electrode		N/A
A.6.6	Insulation film for preventing short-circuit		N/A
A.6.7	Caution when disassembling a cell		N/A
A.6.8	Protective equipment for safety		N/A
A.6.9	Caution in the case of fire during disassembling		N/A

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict
A.6.10	Caution for the disassembling process and pressing the electrode core		N/A
A.6.11	Recommended specifications for the pressing device		N/A
ANNEX B	RECOMMENDATIONS TO EQUIPMENT MANUFACTURERS AND BATTERY ASSEMBLERS		P
ANNEX C	RECOMMENDATIONS TO THE END-USERS		N/A
ANNEX D	MEASUREMENT OF THE INTERNAL AC RESISTANCE FOR COIN CELLS		N/A
D.1	General	Not coin cell	N/A
D.2	Method		N/A
	A sample size of three coin cells is required for this measurement		N/A
	Coin cells with an internal resistance of less than or equal to 3 Ω are subjected to the testing according to Clause 6 and Table 1		N/A
	Coin cells with an internal resistance greater than 3 Ω require no further testing		N/A
ANNEX E	PACKAGING AND TRANSPORT		P
ANNEX F	COMPONENT STANDARDS REFERENCES		P

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: Critical components information					P
Object/part no.	Manufacturer/ trademark	Type/model	Technical data	Standard	Mark(s) of conformity ¹⁾
Cell	Guangxi Zhuoneng New Energy Technology Co., Ltd	INR18650S-2500mAh	3,6 V 2500 mAh	IEC 62133-2: 2017 EN 62133-2: 2017	SGS Fimko (CB Report No.: SZES1908015182 01, Certif. No.: FI-42377).
Protect IC (U1)	Joulwatt Technology Inc.	JW3311	Overcharge Detection Voltage: 4,25 ± 0,025 V Over-discharge Detection Voltage: 2,5 ± 0,1 V	--	--
MOSFET (M1, M2, M3)	Hangzhou Silan Integrated Circuit Co., Ltd	SVT078R0NT/S	Vds: 68 V Id: 88 A	--	--
MOSFET (M5)	Hangzhou Silan Integrated Circuit Co., Ltd	SVT078R0ND	Vds: 68 V Id: 88 A	--	--
PCB	HUIZHOU TAISHENG ELECTRONICS CO LTD	TS-M8	V-0 Max temperature: 130°C	UL 796	UL (E361828)
Enclosure (Plastic)	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC310(+)	PC/ABS V-0 Max temperature: 85°C Thickness: 1,5 mm	UL 94 UL 746C	UL (E162823)
Cell bracket (plastic)	FORMOSA CHEMICALS & FIBRE CORP PLASTICS DIV	AC310(+)	PC/ABS V-0 Max temperature: 85°C Thickness: 1,5 mm	UL 94 UL 746C	UL (E162823)
NTC (RT2)	DONGGUAN SENSICOM ELECTRINOCS TECHNOLOGY CO LTD	SNS103	Resistance at 25°C: 10 kΩ Tmoa: 125°C	UL1434	UL (318986)
Fuse (F1)	DONGGUAN ANDU ELECTRONICS CO LTD	MIN/ATM	30 A, 48 Vdc	UL248-1 UL248-14	UL (E317400)

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IEC 62133-2					
Clause	Requirement + Test	Result - Remark			Verdict
Fuse (F2)	AEM COMPONENTS (SUZHOU) CO LTD	F1206VH	5 A, 65 Vdc	UL248-1 UL248-14	UL (E232989)
Lead wires (charge & discharge)	Dongguan Yue Zhen Wire & Cable Co Ltd	3239	20 AWG, Fire rating:VW-1 Max temperature: 150 °C Vmax: 3000 V	UL 758	UL (E354338)
Supplementary information: ¹⁾ Provided evidence ensures the agreed level of compliance. See OD-CB2039.					

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.2.1	TABLE: Continuous charging at constant voltage (cells)				N/A
Sample no.	Recommended charging voltage V _c (Vdc)	Recommended charging current I _{rec} (A)	OCV before test (Vdc)	Results	
--	--	--	--	--	
Supplementary information:					
--					

7.3.1	TABLE: External short-circuit (cell)					N/A
Sample no.	Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature rise ΔT (K)	Results	
Samples charged at charging temperature upper limit						
--	--	--	--	--	--	
Samples charged at charging temperature lower limit						
--	--	--	--	--	--	
Supplementary information:						
--						

7.3.2	TABLE: External short-circuit (battery)						P
Sample no.	Ambient T (°C)	OCV before test (Vdc)	Resistance of circuit (mΩ)	Maximum case temperature rise ΔT (K)	Component single fault condition	Results	
Pack: HY-ELITOP-S1004A-ZN(#4)	21,8	41,331	84,9	--*	Normal	Pass	
Pack: HY-ELITOP-S1004A-ZN(#5)	21,8	41,326	81,5	--**	SC M1 PIN (S-D)	Pass	
Pack: HY-ELITOP-S1004A-ZN(#6)	21,8	41,329	82,8	--**	SC M1 PIN (S-D)	Pass	
Pack: HY-ELITOP-S1004A-ZN(#7)	21,8	41,335	88,3	--**	SC M1 PIN (S-D)	Pass	
Pack: HY-ELITOP-S1004A-ZN(#8)	21,8	41,326	84,6	--**	SC M1 PIN (S-D)	Pass	
Supplementary information:							
- No fire or explosion							
- SC means short circuit							
--* Shut down immediately and test for 24 hours, no max. temperature was noted.							
--** Fuse (F1) opened and test for 24 hours, no max. temperature was noted.							

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.5	TABLE: Crush (cells)				N/A
Sample no.	OCV before test (Vdc)	OCV at removal of crushing force (Vdc)	Maximum force applied to the cell during crush (kN)	Results	
Samples charged at charging temperature upper limit					
--	--	--	--	--	
Samples charged at charging temperature lower limit					
--	--	--	--	--	
Supplementary information:					
--					

7.3.6	TABLE: Over-charging of battery				P
Constant charging current (A)		20,0		—	
Supply voltage (Vdc)		50,4		—	
Sample no.	OCV before charging (Vdc)	Total charging time (minute)	Maximum outer case temperature (°C)	Results	
Pack: HY-ELITOP-S1004A-ZN(#12)	31,320	184	58,9	Pass	
Pack: HY-ELITOP-S1004A-ZN(#13)	31,164	184	55,3	Pass	
Pack: HY-ELITOP-S1004A-ZN(#14)	31,319	184	49,3	Pass	
Pack: HY-ELITOP-S1004A-ZN(#15)	31,308	184	53,6	Pass	
Pack: HY-ELITOP-S1004A-ZN(#16)	31,325	184	49,6	Pass	
Supplementary information:					
- No fire or explosion - Ambient temperature was 23,5°C. - The maximum charging current was 10,0 A during the testing due to the electronic circuit cut off higher current.					

7.3.7	TABLE: Forced discharge (cells)				N/A
Sample no.	OCV before application of reverse charge (Vdc)	Measured reverse charge I _t (A)	Lower limit discharge voltage (Vdc)	Results	
--	--	--	--	--	
Supplementary information:					
--					

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IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

7.3.8.1	TABLE: Vibration					P
Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results	
Pack: HY-ELITOP-S1004A-ZN(#17)	41,329	41,329	2335,64	2335,64	Pass	
Pack: HY-ELITOP-S1004A-ZN(#18)	41,331	41,331	2337,88	2337,88	Pass	
Pack: HY-ELITOP-S1004A-ZN(#19)	41,335	41,335	2336,91	2336,91	Pass	
Supplementary information:						
<ul style="list-style-type: none"> - No fire or explosion - No rupture - No leakage - No venting 						

7.3.8.2	TABLE: Mechanical shock					P
Sample no.	OCV before test (Vdc)	OCV after test (Vdc)	Mass before test (g)	Mass after test (g)	Results	
Pack: HY-ELITOP-S1004A-ZN(#20)	41,331	41,331	2334,67	2334,67	Pass	
Pack: HY-ELITOP-S1004A-ZN(#21)	41,329	41,329	2338,21	2338,21	Pass	
Pack: HY-ELITOP-S1004A-ZN(#22)	41,325	41,325	2335,41	2335,41	Pass	
Supplementary information:						
<ul style="list-style-type: none"> - No fire or explosion - No rupture - No leakage - No venting 						

7.3.9	TABLE: Forced internal short circuit (cells)					N/A
Sample no.	Chamber ambient T (°C)	OCV before test (Vdc)	Particle location ¹⁾	Maximum applied pressure (N)	Results	
Samples charged at charging temperature upper limit						
--	--	--	--	--	--	
Samples charged at charging temperature lower limit						
--	--	--	--	--	--	
Supplementary information:						
--						

IEC 62133-2			
Clause	Requirement + Test	Result - Remark	Verdict

D.2	TABLE: Internal AC resistance for coin cells				N/A
Sample no.	Ambient T (°C)	Store time (h)	Resistance Rac (Ω)	Results ¹⁾	
--	--	--	--	--	
Supplementary information:					
--					

---End report---

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Attachment 1 Photo documentation

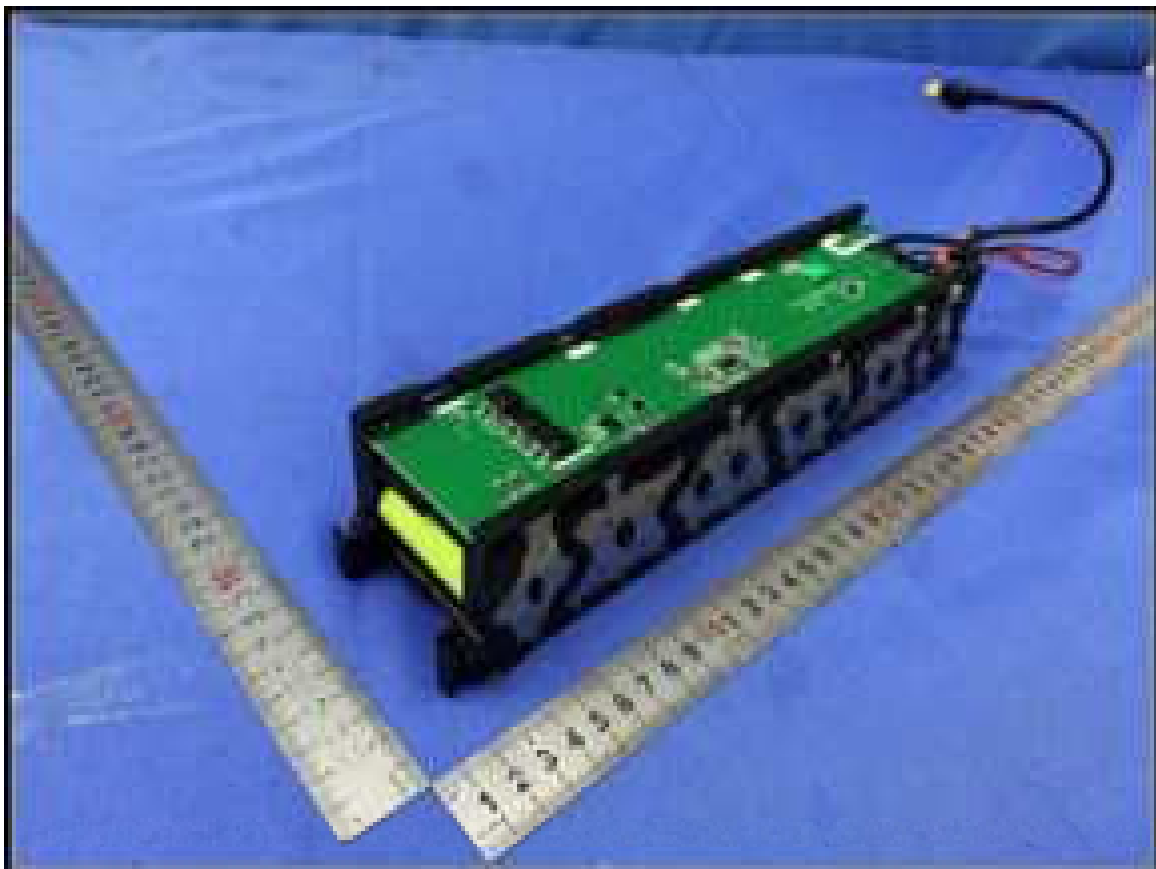
Whole unit



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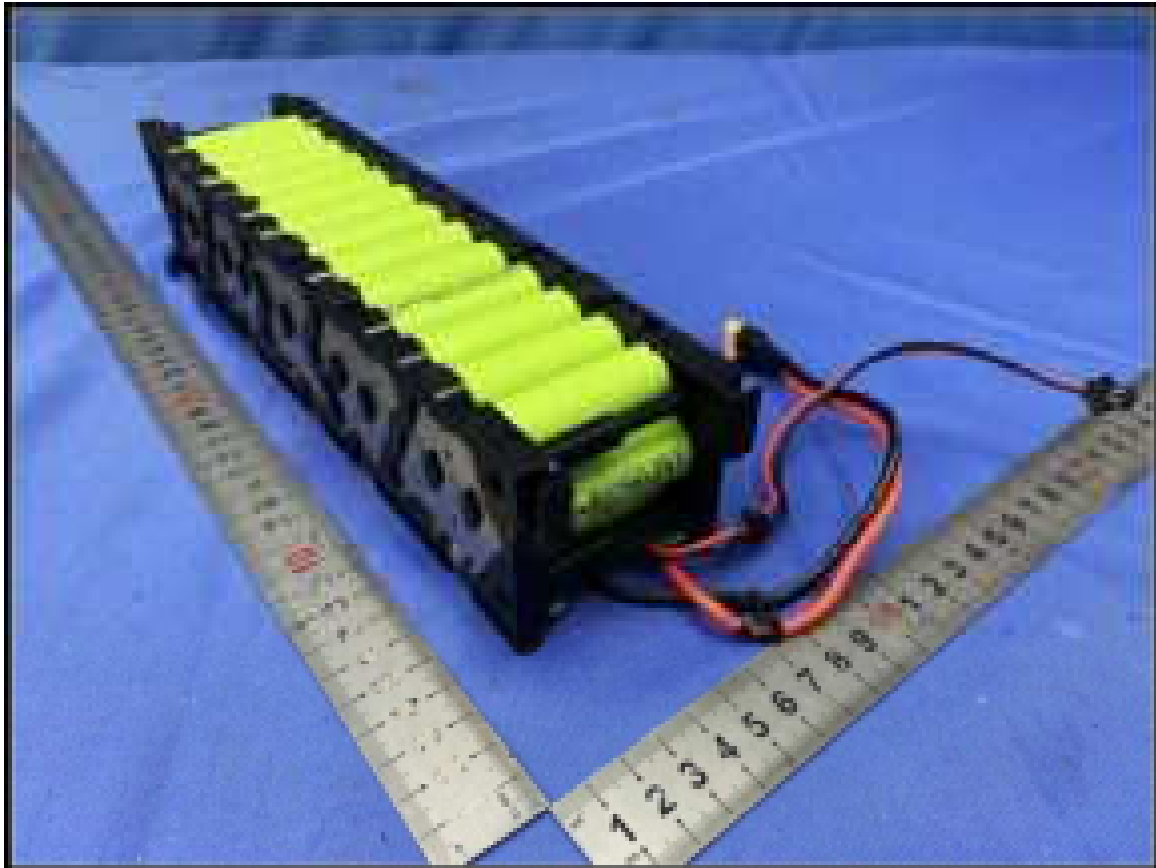
Attachment 1 Photo documentation

Internal view

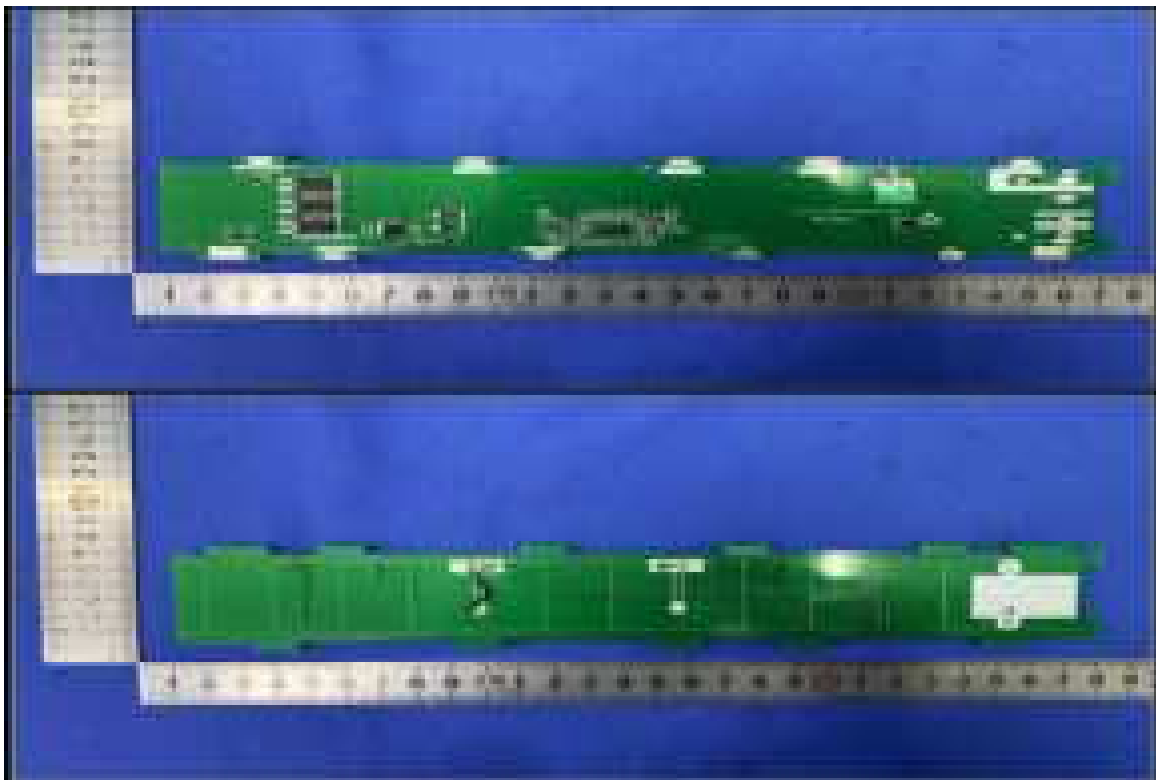


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Attachment 1 Photo documentation



PCB



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Attachment 2 Information for safety

14. POINTS FOR ATTENTION IN BATTERY PACK 电池使用注意事项

请务必阅读本产品说明书及以下事项以避免损坏锂电池。防止错误使用而引起安全事故。

Be sure to use batteries in accordance with this specification and the following precautions to prevent accidents caused by incorrect use.

- 使用锂电池前，请仔细阅读使用说明书和电池表面标识。

Before using batteries, please read the instructions and battery surface markings carefully.

- 请在正常的、室内、无环境中使用电池。

Please use batteries in normal, indoor and outdoor environments.

- 在使用过程中，应远离热源、高温、明火或玩弄电池。

In the process of using, we should keep away from heat source and high voltage to avoid children playing with batteries.

- 切勿敲打电池。

Do not smash the battery.

- 本电池只能使用有安全认证的、带有配对的充电器充电，建议充电不要超过 12 小时。

The battery can only be charged with a safety certified, and the whole vehicle is charged with a charger.

It is recommended that the charge should not exceed 12 hours.

- 切勿将电池正负极短路，以免发生危险。

Never short-circuit the positive and negative poles of the battery to avoid danger.

- 长期不用时，请给电池充电或储存，防止电池受损。

When not in use for a long time, please charge the battery half/full to prevent damage.

Danger

- 充电时请使用有安全认证的整车配置充电器，并按照说明书的要求进行充电。

When charging, please use a complete vehicle charger with safety certification and charge according to the instructions.



Attachment 2 Information for safety

Use batteries only on designated devices.

- 不要把电池拆开或投入火中。

Do not heat or throw batteries into the fire.

- 不要在温度超过 60°C 的环境中进行充电或存储。

Do not charge, discharge and store at temperatures exceeding 60°C.

- 不要把电池投入水中。

Don't put batteries in water.

- 不要使用金属导体短路电池的正负极。

Do not use positive and negative electrodes of metal conductor short circuit batteries.

- 在使用时不要让电池的电极直接接触。

When using, we should pay attention to the positive and negative poles of the battery.

- 不要使用锐利的物品刺穿电池。

Do not use sharp objects to pierce the battery.

- 不要对电池进行分解。

Do not disassemble batteries.

- 不要直接对电池进行焊接。

Do not weld batteries directly.

- 不要使用带有严重变形或变形的电池。

Do not use batteries with severe scars or deformation.

- 在使用之前请仔细阅读使用说明书。

Please read the instructions carefully before using them.

- 不要把电池放到微波炉、洗衣机或高压容器中。

Do not put batteries in heaters, washing machines or high-pressure containers.

- 不要使用非指定的和没有安规认证的充电器给电池充电。

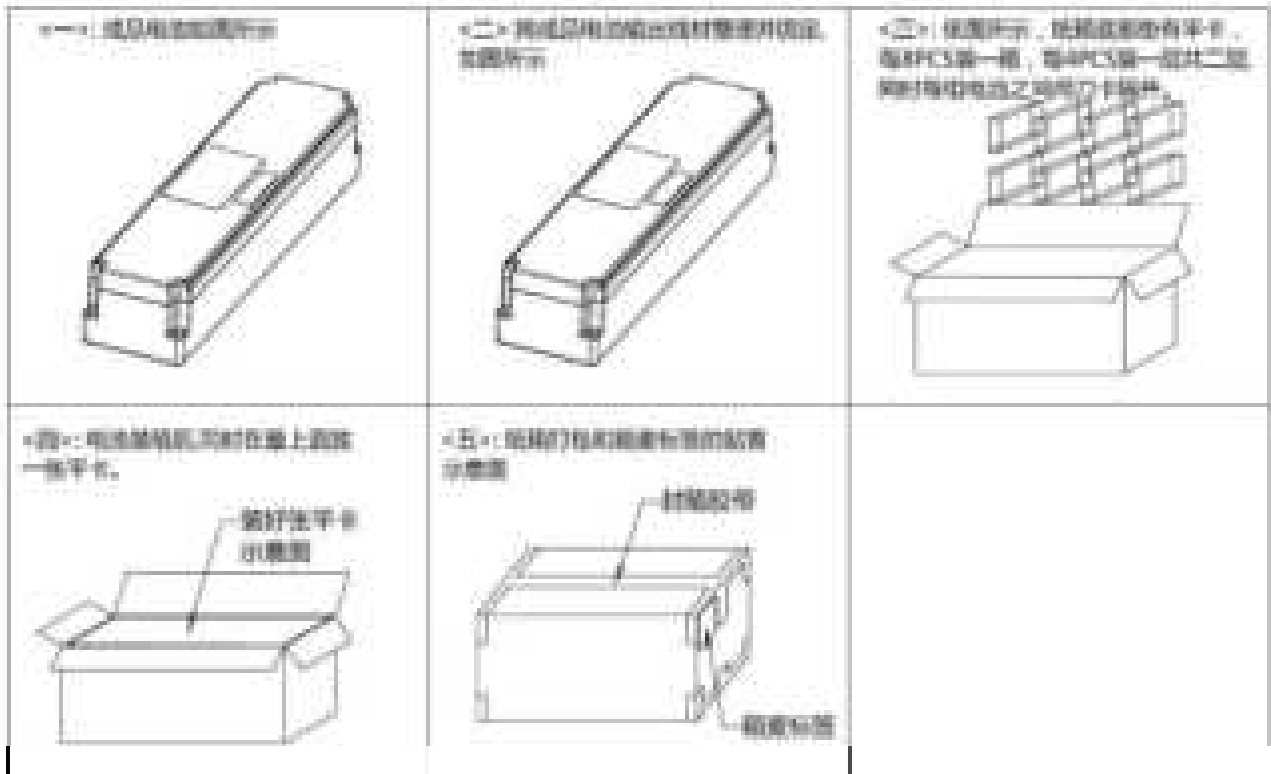
Do not charge batteries with unspecified and unauthorized chargers.

- 在使用、充电或储存期间如发现电池有变形、散发气味、变色、变形或其它异常之态停止使用。

Discontinue use of batteries during use, charging or storage if they are found to be hot, abnormal, discolored, deformed or otherwise abnormal.

- - - End of Attachment 2 - - -

Attachment 3 Packaging



--- End of Attachment 3 ---

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Attachment 4 Product specification

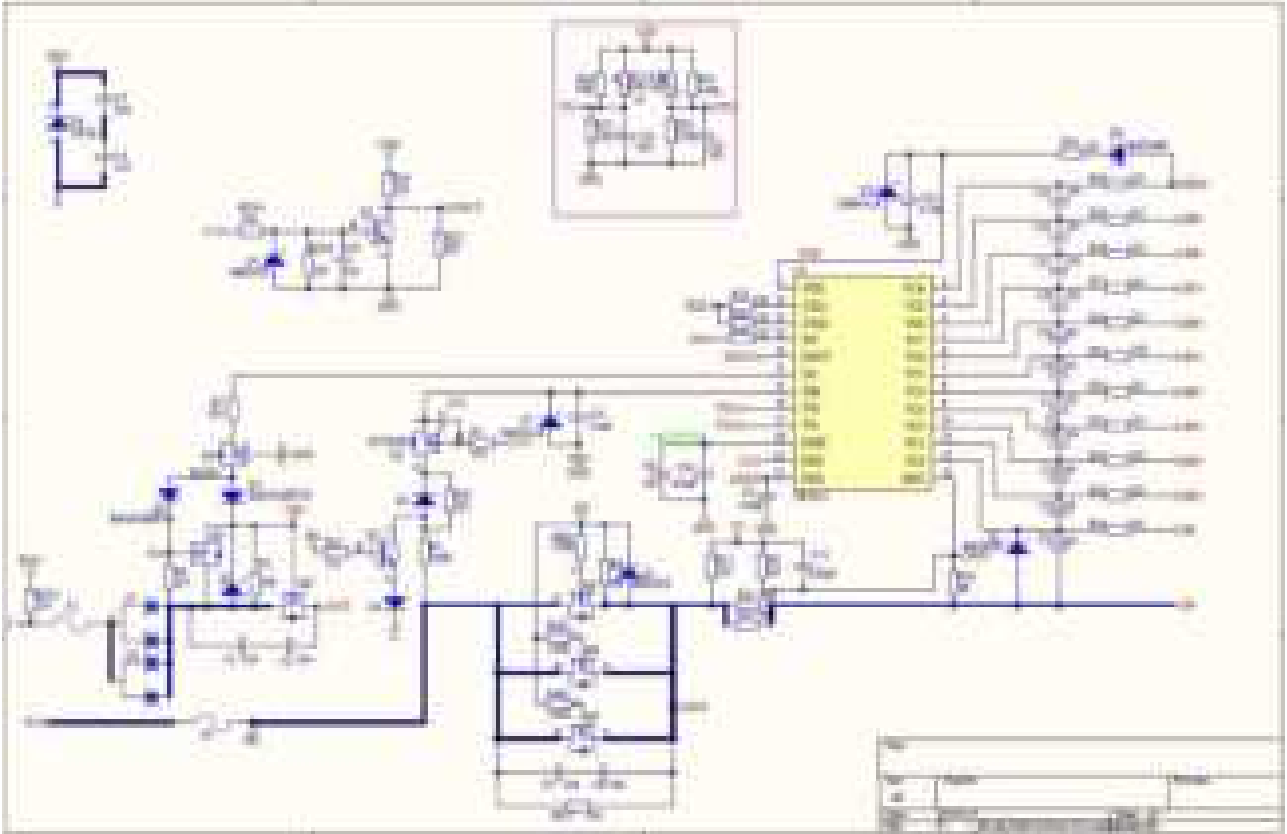
Specification of Pack

Item No.	Item Description	Rated performance / 评价指标	Remark / 备注	
1	Battery Cells 电芯	2000 mAh 2000mAh-2000mAh	Minimum capacity: 2000mAh 最小容量: 2000mAh	
2	PACK Typical capacity 电芯包的典型容量	1000mAh	Refer to the capacity test standard of the cell specification 参考电芯规格书容量测试标准	
3	PACK Minimum capacity 电芯包的最小容量	800mAh	Refer to the capacity test standard of the cell specification 参考电芯规格书容量测试标准	
4	Nominal voltage 标称电压	3.6 VDC	Open operation voltage during rate discharge after rate change 标称电压的放电电压	
5	Battery Internal Impedance 电芯内阻	<0.05Ω	Internal Impedance Testing Machine(GB/T 1983, IEC61967) 电芯内阻测试设备(GB/T 1983, IEC61967)	
6	Dimension 外形尺寸	Length: 长度	As external dimension drawing 详见成品外形尺寸图	
		Width: 宽度		
		Height: 高度		
7	Charge voltage 充电电压	Typ:	4.2 VDC	CV mode charging voltage 恒压电压模式下的充电电压
		Max:		
8	Voltage at end discharge 放电终止电压	2.75±0.05V	Discharge is terminated when the voltage of any of the cells is lower than the floor discharge 任何一电芯的电压低于放电截止电压时终止放电	
9	Standard charging current 额定充电电流	2A	Maximum charge current 2.0A 最大充电电流: 2.0A	
10	Standard discharge current 额定放电电流	100	Maximum discharge current 最大持续放电电流 10A (To 25°C) 非持续放电电流: 10A	
11	Operating Temperature 工作温度	Charge: 充电温度:	0°C~45°C	25°C ambient temperature best 25°C环境温度最佳
		Discharge: 放电温度:	-10°C~50°C	

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Attachment 4 Product specification

Circuit diagram



--- End of Attachment 4 ---

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Attachment 5 ISO 9001 certificate



S20 P410*00

Test Report No.: 87-R85-0428/23-00



Vehicle Type : ESX105AE
 Manufacturer : WeRoll Tech GmbH

TEST REPORT

according to UN-Regulation

**UNIFORM PROVISIONS CONCERNING THE APPROVAL OF INTERNAL
 COMBUSTION ENGINES OR ELECTRIC DRIVE TRAINS INTENDED FOR
 THE PROPULSION OF MOTOR VEHICLES OF CATEGORIES M AND N
 WITH REGARD TO THE MEASUREMENT OF THE NET POWER AND THE
 MAXIMUM 30 MINUTES POWER OF ELECTRIC DRIVE TRAINS**

UN R85

including all amendments until

Series of Amendments: 00

Supplement: 07

Structure of the Test Report	Item No.
	0. General information
	1. Tested vehicle(s) object(s)
	2. Test record
	3. List of appendices
	4. Statement

The Test Report shall be reproduced and published only in its entirety by the client. It may however be reproduced and published partially, but only with the written permission of the Technical Service.

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

0. General information

- 0.1. Make (trade name of the manufacturer) : ORBO
- 0.2. Type : ESX105AE
- 0.3. Category of vehicle : Elektrokleinstfahrzeug
- 0.4. Name and address of the manufacturer : WeRoll Tech GmbH
Hausbroicher Str. 62, 47877 Willich,
Germany
- 0.5. No. of the information document : ---
-Date of issue : ---
-Date of last change : ---

1. Tested vehicle(s)

1.1. Description

- 1.1.1. ~~Vehicle~~/Object(s) : Motor
- Commercial description : ---
- Type / variant(s) / version(s) : WT-36V-30H/---/ ---
- Identification number : SHLE105X210980037
- 1.1.2. Condition of vehicle(s) : ---
- 1.2. Worst case selection : Only one variant/ version, no worst case to be selected.
- 1.3. Remark : n.a.

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

2. Test record

- 2.1. Equipment for measuring and testing : The test facilities / measurement equipment used were in compliance with the test requirements.
- 2.1.1. Specifications for the test site : Not applicable
- 2.1.2. Subcontracting : Not applicable
- 2.2. Test results : See Appendix 1
- 2.2.1. Test results referring to measurements : All measurement results are listed and referred to the respective limit(s) with judgment.
- 2.2.2. Attributive tests : Not applicable
- 2.2.3. Alternative test provisions : Not applicable
- 2.3. Additional information : The results of the test refer exclusively to the object(s) mentioned under point 1. Of this report.
- Test site : Wuxi, P.R. China
- Test date : July 29, 2021
- 2.4. Remarks : ---

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

3. List of Appendices

0	List of modifications	: Page 5
1	Test minutes	: Pages 6 - 9

4. Statement of conformity

The Information Document listed in section 0.5., and the type described therein, comply with the requirements stated on page 1. The test results in this report refer to the vehicle(s)/object(s) described under section 1.1. With regards to the required level of performance to be achieved, the tested samples were representative for the type to be approved (see section 1.2).

Engineering Center, Shanghai, March 14, 2023

LJZ/LS



Liangjun Zhang
Expert Technical Service

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

List of modifications

Appendix 0

Correction of : - --

Modification of : - --

Addition of : - --

Deletion of : - --

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Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

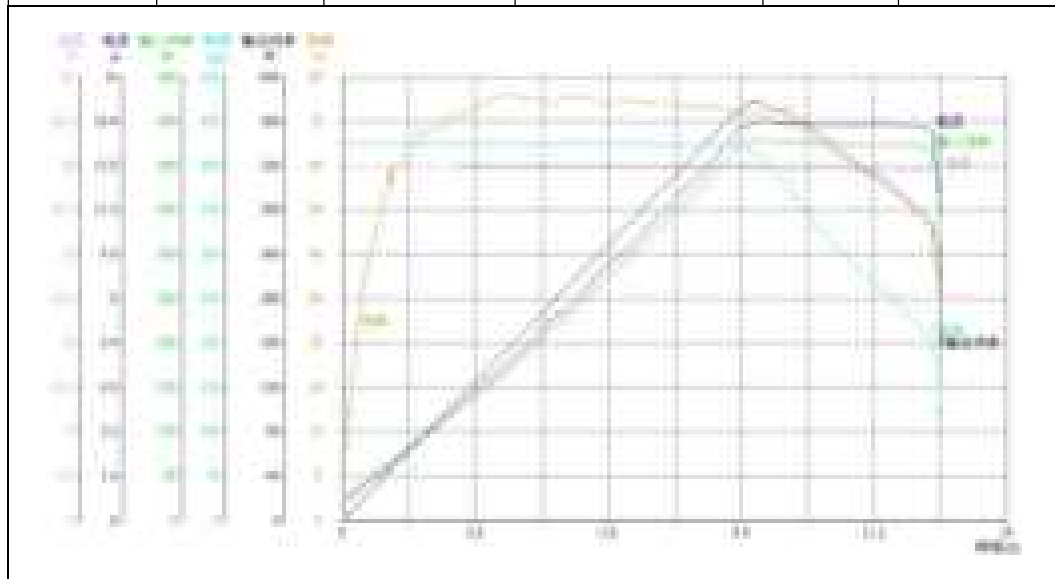
Test minutes of Motor measuring**Appendix 1**

0. Test condition
- 0.1. Test date : July 29, 2021
- 0.2. Test site : Wuxi, P.R.China
1. Test facilities : The test equipment used was in compliance with the requirements of the regulation.
2. Test vehicle(s)
- 2.1. Type : WT-36V-30H
- variant : ---
- version : ---
3. Motor
- 3.1. Motor make : Anhui Weite Motor Technology Co., Ltd.
- 3.2. Motor type : WT-36V-30H
- 3.3. Motor number : SHLE105X210980037
- 3.4. Test voltage : 36V
4. Power controller
- 4.1. Power controller make : SHENZHEN FLSMART TECHNOLOGY CO., LTD.
- 4.2. Power controller type : FL-C-ES-S7050-AE
5. Characteristics of the dynamometer
- 5.1. Make : KONZON
- 5.2. Type : ZC300KB

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

- 6. Detailed results of measurement
- 6.1. Net torque and power :

Measured				Corrected	
Motor Speed	Torque	Power	Power to be added for auxiliary equipment	Net Torque	Net Power
r/min	Nm	W	W	Nm	W
425.8	0.08	3.7	0	0.08	3.7
425.1	2.33	103.6	0	2.33	103.6
425.1	4.69	208.9	0	4.69	208.9
424.2	6.91	307.0	0	6.91	307.0
424.1	7.61	338.0	0	7.61	338.0
413.4	8.75	378.6	0	8.75	378.6
353.8	9.69	359.0	0	9.69	359.0
311.6	10.36	338.1	0	10.36	338.1
272.5	11.05	315.3	0	11.05	315.3
224.0	12.06	282.9	0	12.06	282.9
166.4	12.57	219.0	0	12.57	219.0
116.2	12.62	153.5	0	12.62	153.5



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Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

6.2. Maximum 30 minutes power :

Time [min]	P [W]	rpm	Difference [%]
0	300.1	424.3	0.00
5	303.3	424.0	1.07
10	303.9	423.4	1.27
15	300.4	423.2	0.10
20	300.2	422.9	0.03
25	300.2	423.4	0.03
30	300.4	423.2	0.10
Average	302.1	423.5	

6.2.1. Motor speed : 425 rpm
 (Declared by the manufacturer)

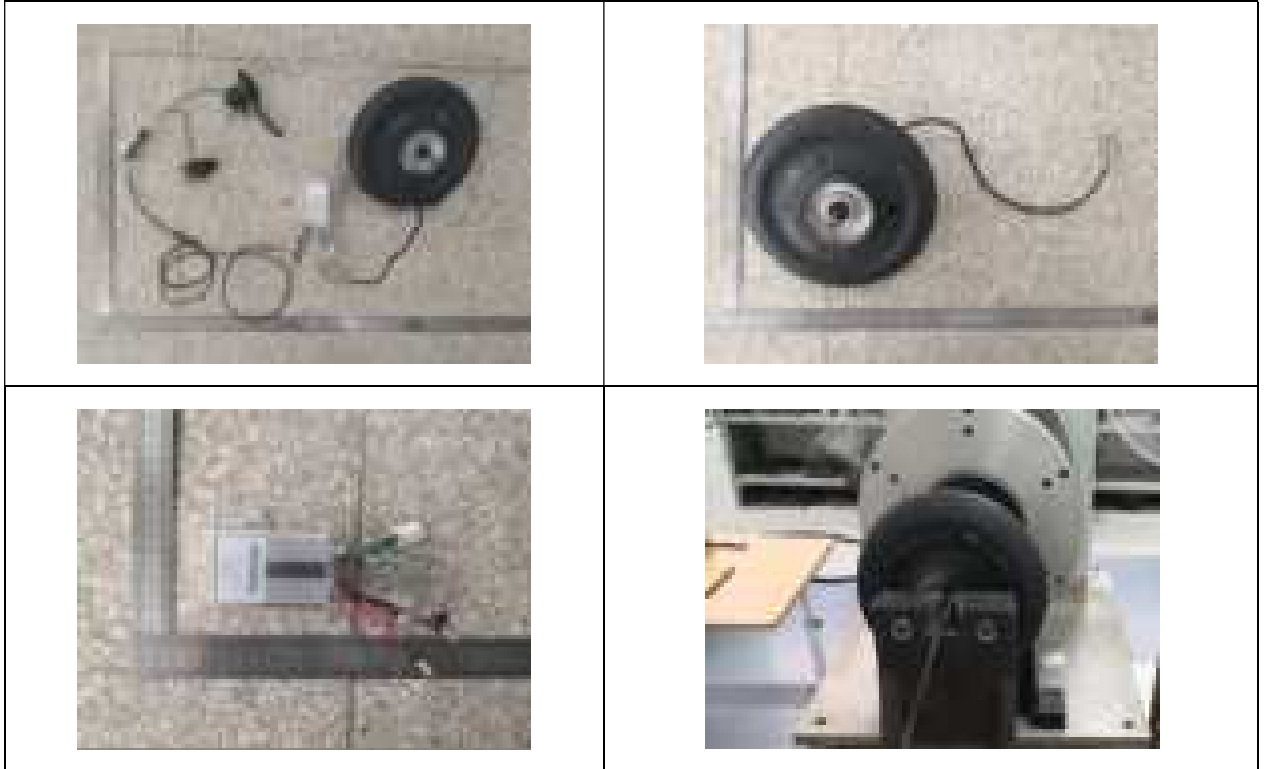
6.2.2. Maximum 30 minutes power : 300 W
 (Declared by the manufacturer)

6.2.3. Maximum 30 minutes power : 302.1 W (100.70% of the declared power)
 (Test result)

S20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

Test photos:



S20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

TEST REPORT

according to UN-Regulation
**UNIFORM PROVISIONS CONCERNING THE APPROVAL OF VEHICLES
WITH REGARD TO
ELECTROMAGNETIC COMPATIBILITY**

UN R10

including all amendments until

Series of Amendments: 06

Supplement: 01

applicable for vehicles according to
Elektrokleinstfahrzeuge-Verordnung (eKFV)
(§ 7 No. 2)

Structure of the Test Report	Item No.
	0. General information
	1. Tested vehicle(s) / object(s)
	2. Test record
	3. List of appendices
	4. Statement of conformity

The Test Report shall be reproduced and published only in its entirety by the client. It may however be reproduced and published partially, but only with the written permission of the Technical Service

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

0. General information

- 0.1. Make (trade name of the manufacturer) : ORBO
- 0.2. Type : ESX105AE
- 0.3. Category of vehicle : Elektrokleinstfahrzeug
- 0.4. Name and address of the manufacturer : WeRoll Tech GmbH
Hausbroicher Str. 62, 47877 Willich,
Germany
- 0.5. No. of the information document : ---
-Date of issue : ---
-Date of last change : ---

1. Tested vehicle(s)

1.1. Description

- 1.1.1. Vehicle : Elektrokleinstfahrzeug
- Commercial description : ---
- Type / variant(s) / version(s) : ESX105AE/ --- / ---
- Identification number : SHLX1051211160017(prototype)
- 1.1.2. Condition of vehicle(s) : new
- 1.2. Worst case selection : No variant/ version, no worst case to be selected.
- 1.3. Remark : ---

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

2. Test record

- 2.1. Equipment for measuring and testing : The test facilities / measurement equipment used were in compliance with the test requirements.
- 2.1.1. Specifications for the test site : Not applicable
- 2.1.2. Subcontracting : Not applicable
- 2.2. Test results : See Appendix 1
- 2.2.1. Test results referring to measurements : All measurement results are listed and referred to the respective limit(s) with judgment.
- 2.2.2. Attributive tests : Not applicable
- 2.2.3. Alternative test provisions : Not applicable
- 2.3. Additional information : The results of the test refer exclusively to the object(s) mentioned under point 1. of this report.
- Test site : Shanghai Inspection and Testing Institute of Instruments and Automatic Systems Co., Ltd.
Shanghai, P.R. China
- Test date : December 14, 2022
- 2.4. Remarks : ---

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Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

3. List of Appendices

- 0 List of modifications : Page 5
1 Test minutes : Pages 6 - 12

4. Statement of conformity

The Information Document listed in section 0.5., and the type described therein, comply with the requirements stated on page 1. The test results in this report refer to the vehicle(s)/object(s) described under section 1.1. With regards to the required level of performance to be achieved, the tested samples were representative for the type to be approved (see section 1.2).

Engineering Center, Shanghai, March 14, 2023
LJZ/LS



Liangjun Zhang
Expert Technical Service



Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

List of modifications

Appendix 0

Correction of : - ---

Modification of : - ---

Addition of : - ---

Deletion of : - ---

§20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

Test minutes of EMC measuring

Appendix 1

- 0. Test condition
 - 0.1. Test date : December 14, 2022
 - 0.2. Test site : Shanghai, P.R. China
- 1. Test facilities : The test equipment used was in compliance with the requirements of the regulation.
- 2. Test vehicle(s)
 - 2.1. Type : ESX105AE
 - variant : ---
 - version : ---
 - 2.2. Identification number : SHLX1051211160017(prototype)
 - 2.3. Motor
 - 2.3.1 Motor maker : Anhui Weite Motor Technology Co., Ltd.
 - 2.3.2. Motor type : WT-36V-30H
 - 2.3.3. Motor number : SHLE105X210980010
 - 2.4. Controller
 - 2.4.1. Controller maker : SHENZHEN FLSMART TECHNOLOGY CO., LTD.
 - 2.4.2. Controller type : FL-C-ES-S7050-AE
 - 2.5. Battery
 - 2.5.1. Battery maker : Shenzhen Elite Electronic Co., Ltd.
 - 2.5.2. Battery type : HY-ELITOP-S1004A-ZN
36VDC, 10Ah

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Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

2.6. Headlamp

2.6.1. Headlamp maker : Laite Cultural Products Co., Ltd.

2.6.2. Headlamp type : C6

2.6.3. Approval number : K 1795

2.7. Rear position lamp

2.7.1. Rear position lamp maker : Sate-Lite (Foshan) Plastics Co., Ltd.

2.7.2. Rear position lamp type : M4

2.7.3. Approval number : K 1634

2.8. Charger

2.8.1. Charger maker : POWSUN ELECTRONIC CO., LTD.

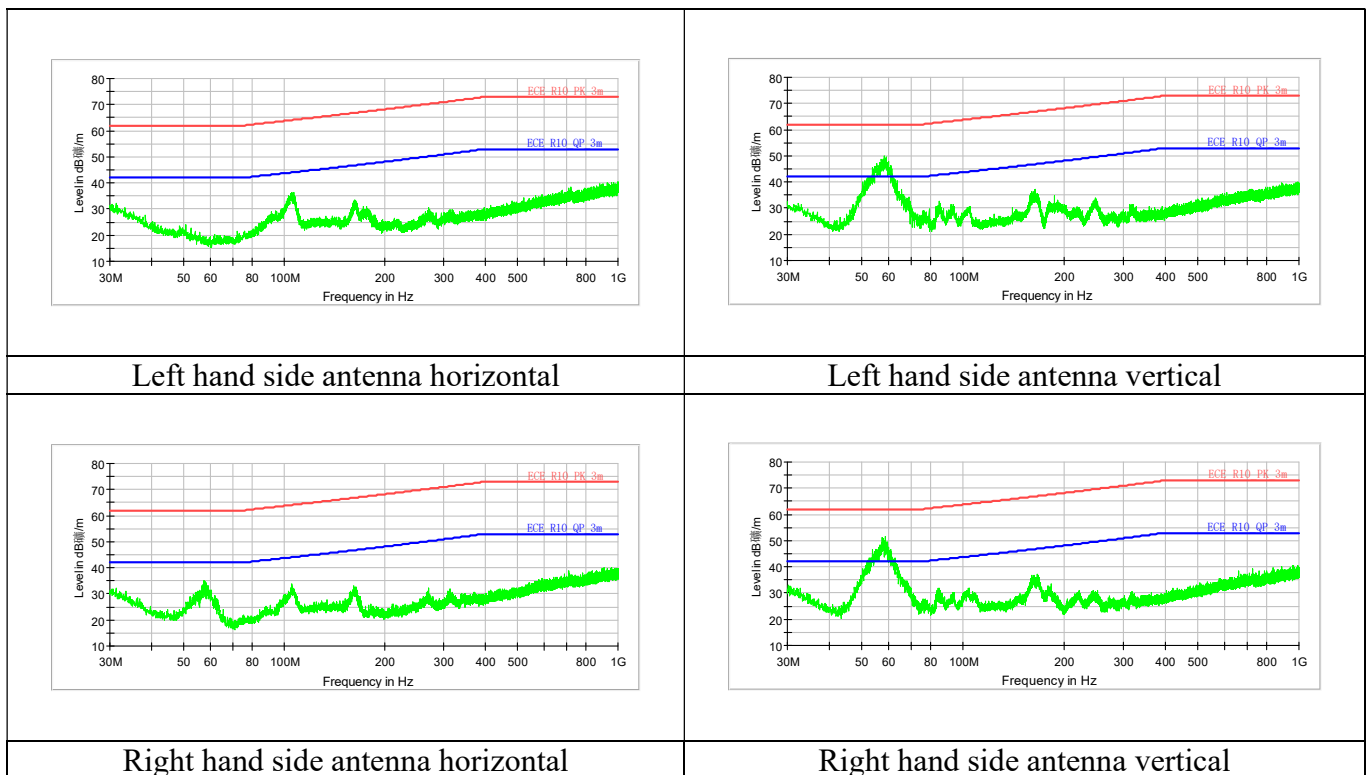
2.8.2. Charger type : CP4220
Input 100-240VAC, 50/60Hz 3.0A; Output
42.0VDC 2.0A

§20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

3. Test results of broadband electromagnetic emissions from vehicle(Annex 4)
(Other than REESS in charging mode coupled to the power grid)

- 3.1. Test condition : Closed installation (Peak detector)
- 3.2. Distance of the antenna (m) : 3
- 3.3. Height of the antenna (m) : 1.8
- 3.4. Engine / Motor revolution for radiated broadband emissions : 20 km/h (Maximum speed)



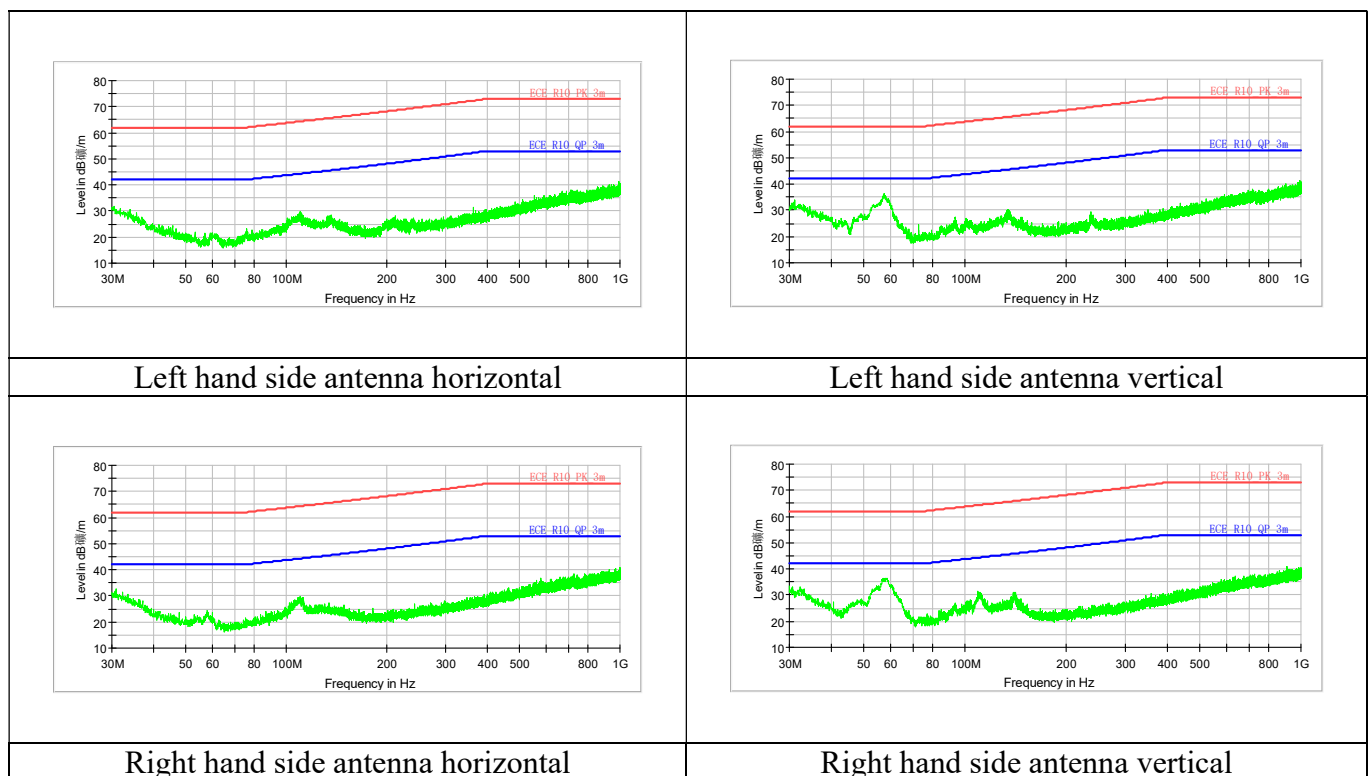
The measurement has been taken over the range of frequencies from 30 to 1000 MHz

S20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

4. Test results of broadband electromagnetic emissions from vehicle (Annex 4)
(REESS in charging mode coupled to the power grid)

- 4.1. Test condition : Closed installation (Peak detector)
- 4.2. Distance of the antenna (m) : 3
- 4.3. Height of the antenna (m) : 1.8



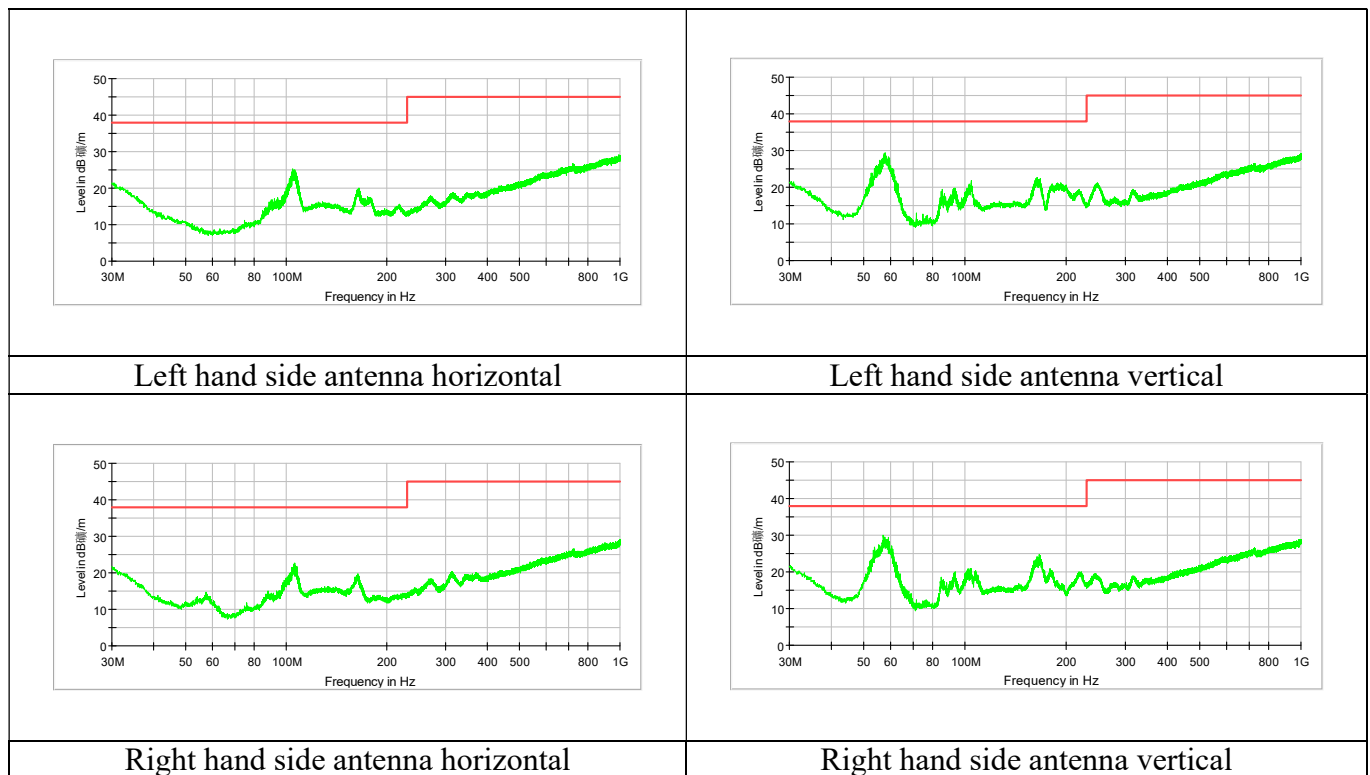
The measurement has been taken over the range of frequencies from 30 to 1000 MHz

S20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

5. Test results of narrowband electromagnetic emissions from vehicle (Annex 5)

- 5.1. Test condition : Closed installation (Average detector)
- 5.2. Distance of the antenna (m) : 3
- 5.3. Height of the antenna (m) : 1.8



The measurement has been taken over the range of frequencies from 30 to 1000 MHz

S20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

6. Test results of immunity to electromagnetic radiation (Annex 6)

(Other than REESS in charging mode coupled to the power grid)

- 6.1. Test method : Free field
- 6.2. Specified frequency range : 20 ~ 2000 MHz in vertical polarization
- 6.3. ~~Alternatively spot frequencies~~ : ~~27, 45, 65, 90, 120, 150, 190, 230, 280, 380, 450, 600, 750, 900, 1300 and 1800 MHz~~
- 6.4. Field strength : 30 V/m rms (over 90% of 20~2000 MHz)
- 6.5. Vehicle speed : 20 km/h (Maximum speed)

During the tests performed in accordance with Annex 6, there was no any degradation of performance of “immunity related functions” listed below.

<i>"50 km/h cycle" vehicle test conditions</i>	<i>Failure criteria</i>
Vehicle speed 50 km/h (respectively 25 km/h for L ₁ , L ₂ vehicles) ±20 per cent (vehicle driving the rollers). If the vehicle is equipped with a cruise control system, it shall be operational.	Speed variation greater than ±10 per cent of the nominal speed. In case of automatic gearbox: change of gear ratio inducing a speed variation greater than ±10 per cent of the nominal speed.
Dipped beams ON (manual mode)	Lighting OFF
Direction indicator on driver's side ON	Frequency change (lower than 0.75 Hz or greater than 2.25 Hz). Duty cycle change (lower than 25 per cent or greater than 75 per cent).
Horn OFF	Unexpected activation of horn

7. Test results of immunity to electromagnetic radiation (Annex 6)

(REESS in charging mode coupled to the power grid)

All other equipment which can be switched on permanently by the driver or passenger should be OFF. : Pass

Only non-perturbing equipment shall be used while monitoring the vehicle. The vehicle exterior and the passenger compartment shall be monitored to determine whether the requirements of this annex are met (e.g. by using (a) video camera(s), a microphone, etc.) : Pass

There was no any degradation of performance of “immunity related functions” listed below

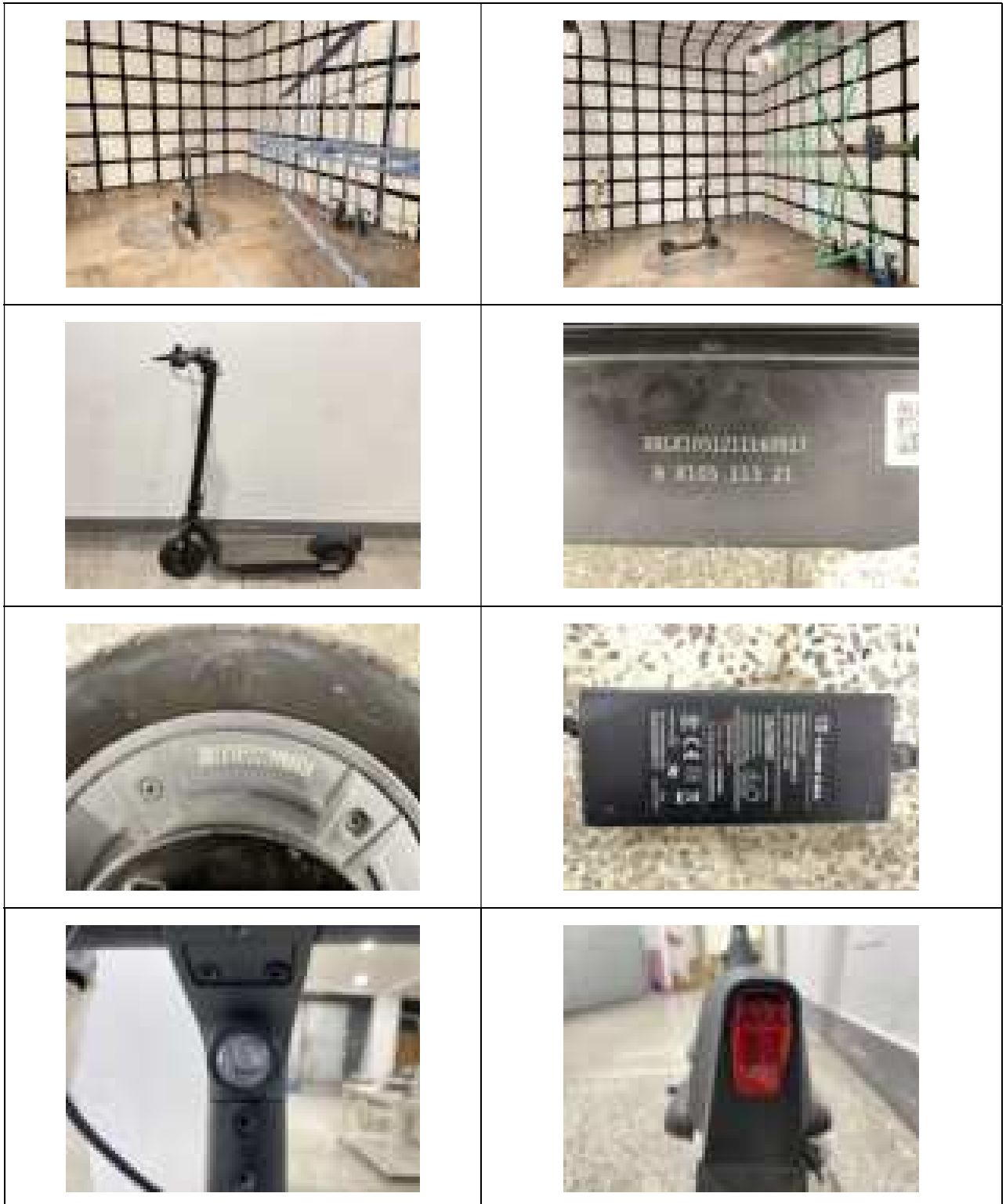
<i>“REESS in charging mode” vehicle test conditions</i>	<i>Failure criteria</i>
The REESS shall be in charging mode (engine OFF). The REESS state of charge shall be agreed in between the manufacturer and the Technical Service.	Vehicle sets in motion

8. Test result : All pass

S20 P410*00

Vehicle Type : ESX105AE
Manufacturer : WeRoll Tech GmbH

Test photos:



\$20 P410*00

Erklärung des Genehmigungsinhabers über Maßnahmen zur Verhinderung unbefugter Eingriffe in den Antriebsstrang und andere genehmigungsrelevante Bauteile oder Systeme
Approval holder's declaration on measures to prevent tampering on powertrain and other approval relevant components or systems

Der Unterzeichner : *Mengyu Wei / Manager*

The undersigned

(vollständiger Name und Position)

(full name and position)

Firmenname und Anschrift des Genehmigungsinhabers : *WeRoll Tech GmbH*
Hausbroicher Str. 62, D-47877
Willich

Company and address of the approval holder

Name und Anschrift des Bevollmächtigten des Genehmigungsinhabers (sofern vorhanden) :
Name and address of the approval holder's representative (if any)

erklärt hiermit, dass er
hereby certifies that

für das nachfolgend bezeichnete Fahrzeug:
for the below mentioned vehicle:

- §20 P410*00
- | | | |
|-------------|---|-----------------------------|
| 0.1. | Fabrikmarke
<i>make</i> | : ORBO |
| 0.2. | Typ ⁽¹⁷⁾
<i>Type</i> ⁽¹⁷⁾ | : ESX105AE |
| 0.2.1. | Variante(n) ⁽¹⁷⁾
<i>Variant(s)</i> ⁽¹⁷⁾ | : -- |
| 0.2.2. | Version(en) ⁽¹⁷⁾
<i>Version(s)</i> ⁽¹⁷⁾ | : -- |
| 0.2.3. | Handelsname(n) (sofern vorhanden)
<i>Commercial name(s) (if available)</i> | : entfällt / not applicable |
| 0.3. | Klasse des Fahrzeugs
<i>Class of the vehicle</i> | : Elektrokleinstfahrzeug |

keine austauschbaren Bauteile in Verkehr bringen wird, die eine Erhöhung der Antriebsleistung oder Höchstgeschwindigkeit, die für die jeweilige Klasse gilt, ermöglichen könnten,
he will not market interchangeable components, which could enable propulsion unit performance or maximum design speed to exceed levels applicable to the relevant category

keine Schnittstellen (z.B. USB oder Bluetooth) implementieren wird, über welche genehmigungsrelevante Bauteilfunktionen oder Systeme (z.B. Bremse oder Motorbedieneinrichtung) unzulässig durch den Anwender beeinflusst werden können

he will not implement any interfaces (e.g. USB or Bluetooth) which allow the consumer to influence approval relevant component functions or systems (e.g. brake or engine control unit) in an impermissible way

**und
and**

**dass die vom Hersteller erleichterten Änderungen der folgenden Merkmale:
that the manufacturer-facilitated modifications of the following characteristics:**

- ~~(a) gegebenenfalls der Funkenzeugung durch die Zündanlage;~~
(a) spark delivery of the ignition system if applicable;
- ~~(b) der Kraftstoffversorgungsanlage und -förderanlage;~~
(b) fuel feed and delivery system;
- ~~(c) des Luftansaugsystems einschließlich Luftfilter (Änderung oder Entfernung);~~
(c) air intake system including air filter(s) (modification or removal);
- (d) gegebenenfalls der Ausführung der Antriebsbatterie oder der Stromversorgung des/der Elektromotors/en;
(d) propulsion battery configuration or electric power to the electric motor(s) if applicable;
- (e) des Kraftübertragungsstrangs;
(e) drive-train;
- (f) der Steuereinheit(en) für die Antriebsleistung des Antriebsstrangs
(f) the control unit(s) that controls the propulsion unit performance of the powertrain.

**mit den Anforderungen aus Kapitel 4.2.17 der DIN EN 15194:2018-11 übereinstimmen.
comply with the requirements set out in Chapter 4.2.17 of DIN EN 15194:2018-11.**

Ort:
Place:

Datum:
Date:

Willich

21.03.2023

Unterschrift:
Signature:

Name und Stellung im Unternehmen:
Name and position in the company:

Mengyu Wei / Manager



**Datenbestätigung
für das nachfolgend beschriebene Fahrzeug zum Zwecke der Vorlage**

bei der Zulassungsbehörde für die Zulassung des Fahrzeugs, soweit ein Gutachten/Zusatzgutachten für die Zulassung nicht erforderlich ist

Feld	Teil II	Bezeichnung	Daten	
D.1	X	Marke	ORBO	
D.2	X	Typ	ESX105AE	
		Variante	-	
		Version	-	
D.3	X	Handelsbezeichnung(en)	-	
E	X	Fahrzeug-Identifizierungsnummer	WG1CB1P1000001	
F.1		Technisch zulässige Gesamtmasse in kg	117,0	
F.2		Im Zulassungsmitgliedstaat zulässige Gesamtmasse in kg	117,0	
G		Masse des in Betrieb befindlichen Fahrzeugs in kg (Leermasse)	17,0	
J	X	Fahrzeugklasse	27	
K	X	Nummer der EG-Typgenehmigung oder ABE		
L		Anzahl der Achsen	2	
O		Technisch zulässige Anhängelast in kg	O.1 gebremst in kg	-
			O.2 ungebremst in kg	-
P.1	X	Hubraum in cm ³	-	
P.2	X	Nennleistung in kW	0,30/ -	
P.4		Nenn Drehzahl bei min ⁻¹		
P.3	X	Kraftstoffart oder Energiequelle	Elektro	
Q		Leistungsgewicht in kW/kg (nur bei Krädern)	-	
R	X	Farbe des Fahrzeugs	-	
S.1		Sitzplätze einschließlich Fahrersitz	-	
S.2		Stehplätze	1	
T		Höchstgeschwindigkeit in km/h	20	
U.1		Standgeräusch in dB (A)	-	
U.2		Drehzahl in min ⁻¹ zu U.1	-	
U.3		Fahrgeräusch in dB (A)	-	
V.7		CO ₂ (in g/km)	-	
V.9		Für die EG-Typgenehmigung maßgebliche Schadstoffklasse	-	
(2)	X	Hersteller-Kurzbezeichnung		
(2.1)	X	Code zu (2)		
(2.2)	X	Code zu (D.2) mit Prüfziffer	Typ/Variante/Variation Prüfziffer	
(3)	X	Prüfziffer zur Fahrzeug-Identifizierungsnummer		
(4)	X	Art des Aufbaus	0003	
(5)	X	Bezeichnung der Fahrzeugklasse und des Aufbaus	Elektrokleinstfz. m. Lenk- o. Haltestange	
(6)	X	Datum zu K		
(7.1)		Technisch zulässige maximale Achslast/Masse je Achsgruppe in kg:	Achse 1	70
(7.2)			Achse 2	70
(7.3)			Achse 3	-
(8.1)		Zulässige maximale Achslast im Zulassungsmitgliedstaat in kg	Achse 1	70
(8.2)			Achse 2	70
(8.3)			Achse 3	-
(9)		Anzahl der Antriebsachsen	1	
(10)	X	Code zu P.3	0004	
(11)	X	Code zu R	-	
(12)		Rauminhalt des Tanks bei Tankfahrzeugen in m ³	-	
(13)		Stützlast in kg	-	
(14)		Bezeichnung der nationalen Emissionsklasse	-	
(14.1)		Code zu V.9 oder (14)	-	
(15.1)		Bereifung – Achse 1	10*2.125	
(15.2)		Bereifung – Achse 2	10*2.125	
(15.3)		Bereifung – Achse 3	-	
(18)		Länge in mm	1120	
(19)		Breite in mm	479	
(20)		Höhe in mm	1200	
(22)		Bemerkungen und Ausnahmen * Der Fahrzeugführer hat sich vor Fahrtantritt mithilfe der Betriebsanleitung mit dem Fahrzeug vertraut zu machen. Dies gilt insbesondere für erschwerte Fahrsituationen (beispielsweise Bordsteine, steile Rampen, Quer- und Längsrillen etc.).		
(22a)		-		
(23)	X	Raum für interne Vermerke des Herstellers	-	

Bescheinigung der Angaben durch den Ausstellungsberechtigten:

- Die Richtigkeit der vorstehenden Angaben wird heute bescheinigt.
- Die Übereinstimmung mit der unter Feld K und (6) angegebenen ABE und dem gleichnamigen Typ ggf. nebst Variante/Version bzw. Ausführung wird bestätigt.
- Für die Zulassung ist ein Gutachten/Teilgutachten erforderlich.

Datum
Firma
Unterschrift

14.03.2023
WeRoll Tech GmbH
Mengyu Wei / Manager



§20 P410*00