

Firma / Company **FRIWO Gerätebau GmbH**

Gerätetyp / Type: FB14S12P18650-CP
 Artikelnr. / Part-No.: 5500347
 Zeichnungsnr. / Drawing-No.: 50.0046.700-02
 Datum / Date: 05.07.2021

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 Freigabe App. / Approved App. PRFFR
 Freigabe / Approved KSTMM

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We may ask you to return one signed copy of the specification for our records as having your approval. Unless you do not enter your objection to the latest specification issue without delay, your acceptance and release for production on the basis of this specification is deemed to be given.

Kundenfreigabe / Customer Release:

Datum / Date:

Unterschrift / Signature:

Index / Rev.	Datum / Date	Name	Einzelheit / Detail
ⓑ	2022/1/24	Michael	PCR P003836451; MR2022-4-12210: Add protection class IP65, temp ...
ⓒ	2022/3/4	Jessica	PCR P003850004; MR2022-4-12345: Add label 30x12 into housing an ...
ⓓ	2022/5/26	Roy	PCR P003890215; MR2022-4-12677: Remove "Communication: SMB" on ...
ⓔ	2022/9/22	Jessica	PCR P003934721; MR2022-4-13080: Update technical data of electr ...
ⓕ	2023/2/28	Frenkie	PCR P004017255; MR2023-4-13521: Add CAN communication, see point 5.5.

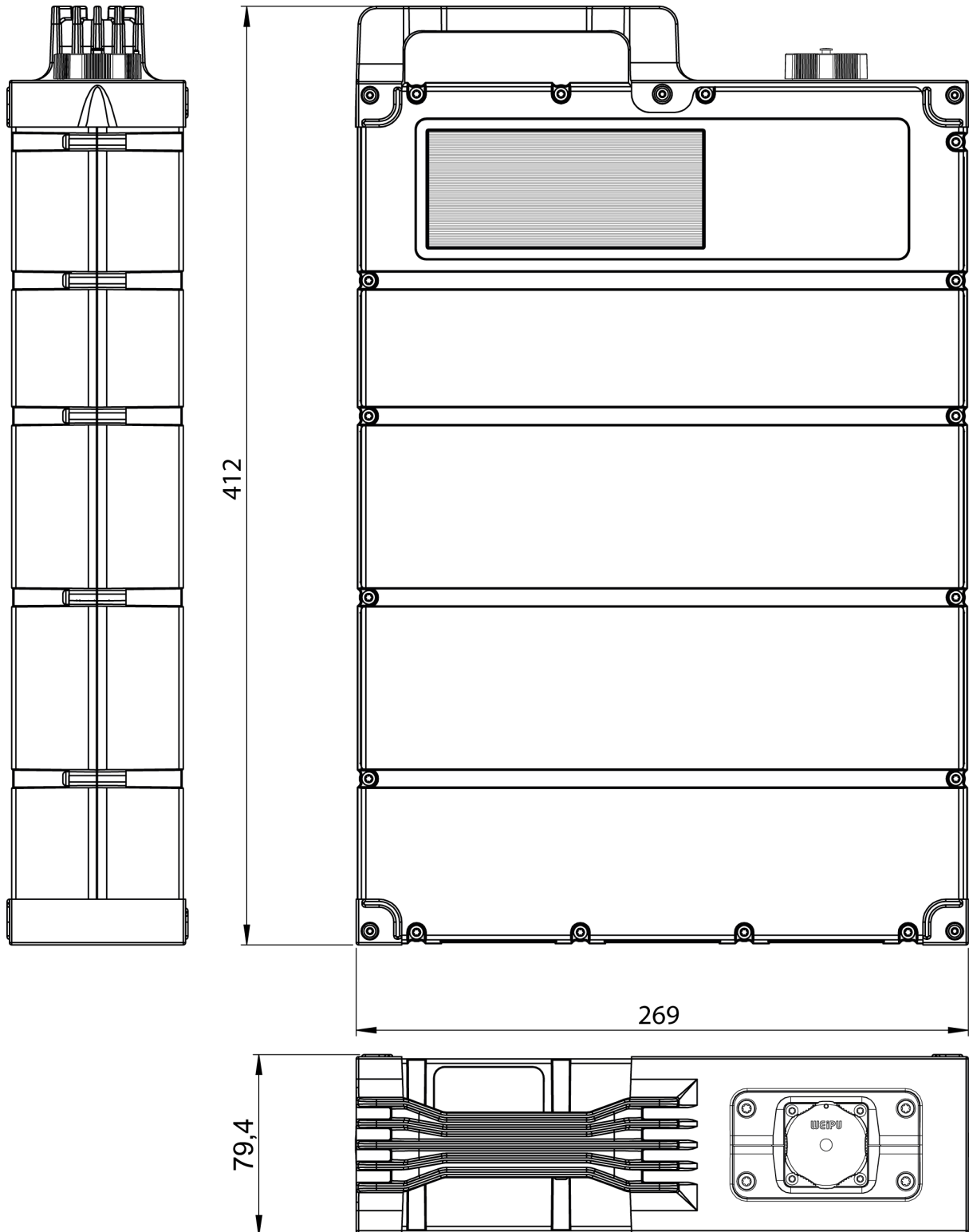
1 Gehäuse / Housing:

Gehäusertyp / housing type: Kunststoff Gehäuse / Plastic housing

Material:

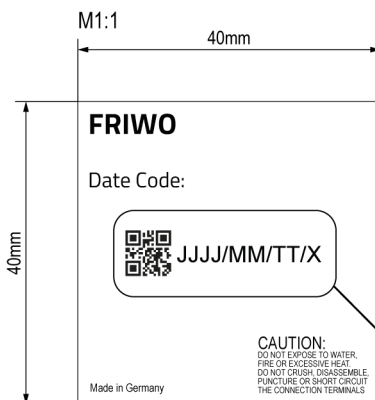
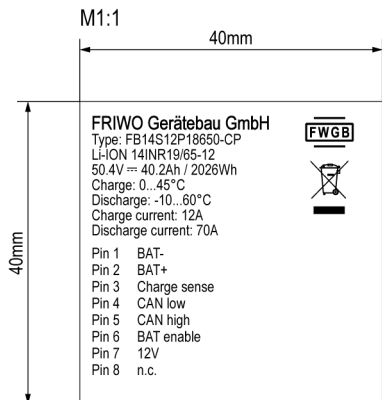
Farbe / Colour: Schwarz / Black

Protection class: IP65

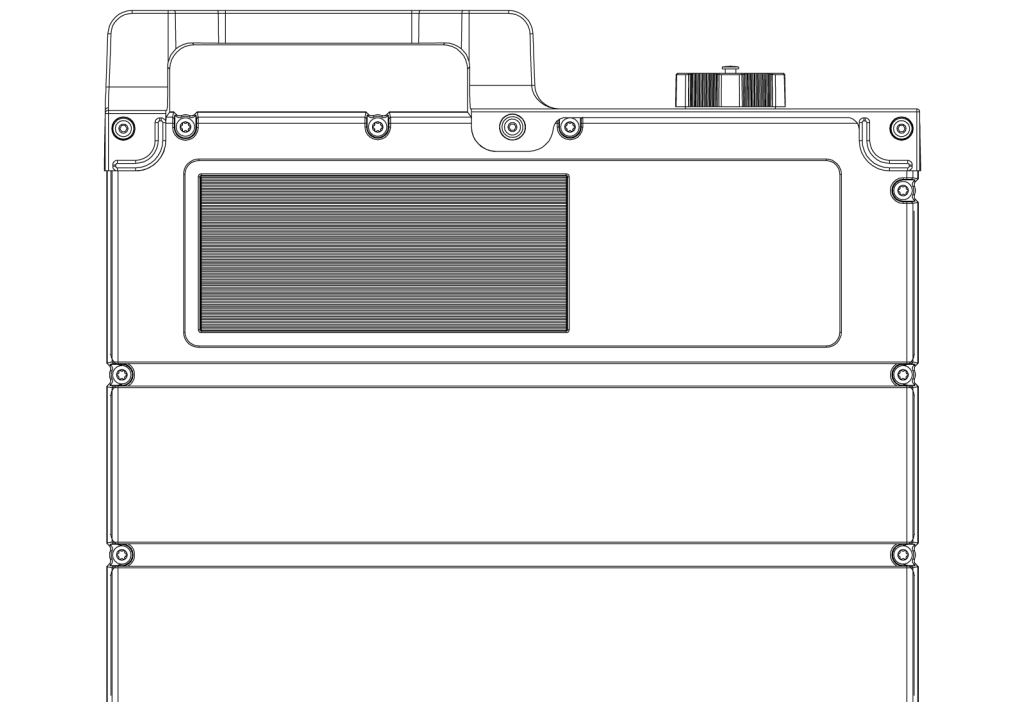
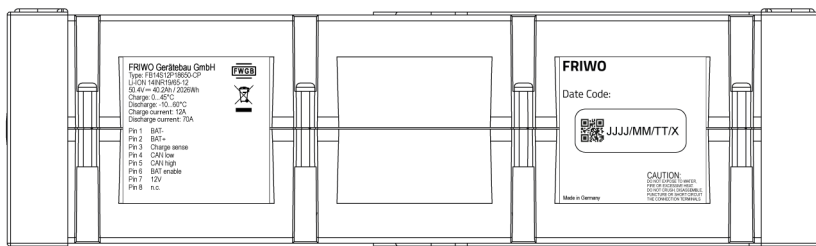


2 Gehäuseaufschriften / Housing labelling:

2.1 Bodenbeschriftung / Bottom labelling

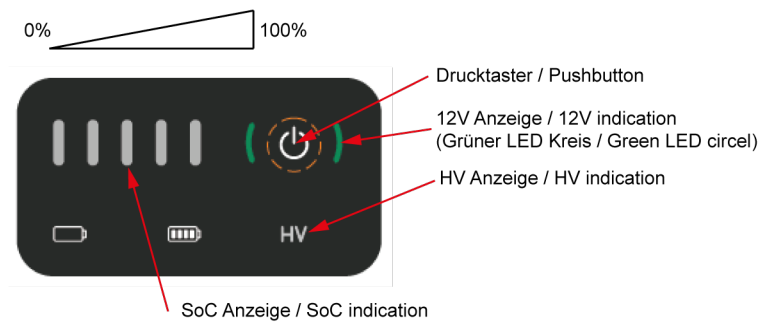


Printing directly on label
 30x12mm. For content, see
 specification 15.2528.056-06



2.2 Die Batterie ist mit einem Foliendisplay ausgestattet. Je nach FW und Parametrierung werden unterschiedliche Informationen dargestellt. (Bedienungsanleitung beachten) / The battery is equipped with foil keyboard. According to firmware and parameterization several information could be indicated (see Manual).

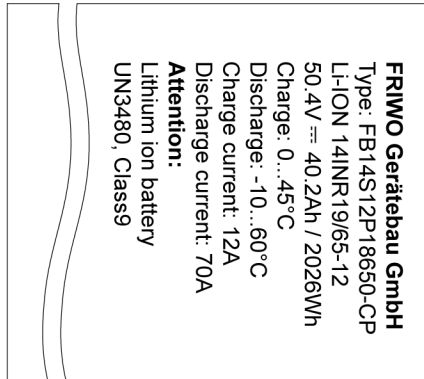
Zudem befindet sich auf dem Foliendisplay eine Taste. Je nach FW und Parametrierung werden unterschiedliche Funktionen realisiert. (Bedienungsanleitung beachten) / Additionally there is a push button on foil keyboard. According to firmware and parameterization several functions could be realized (see Manual).



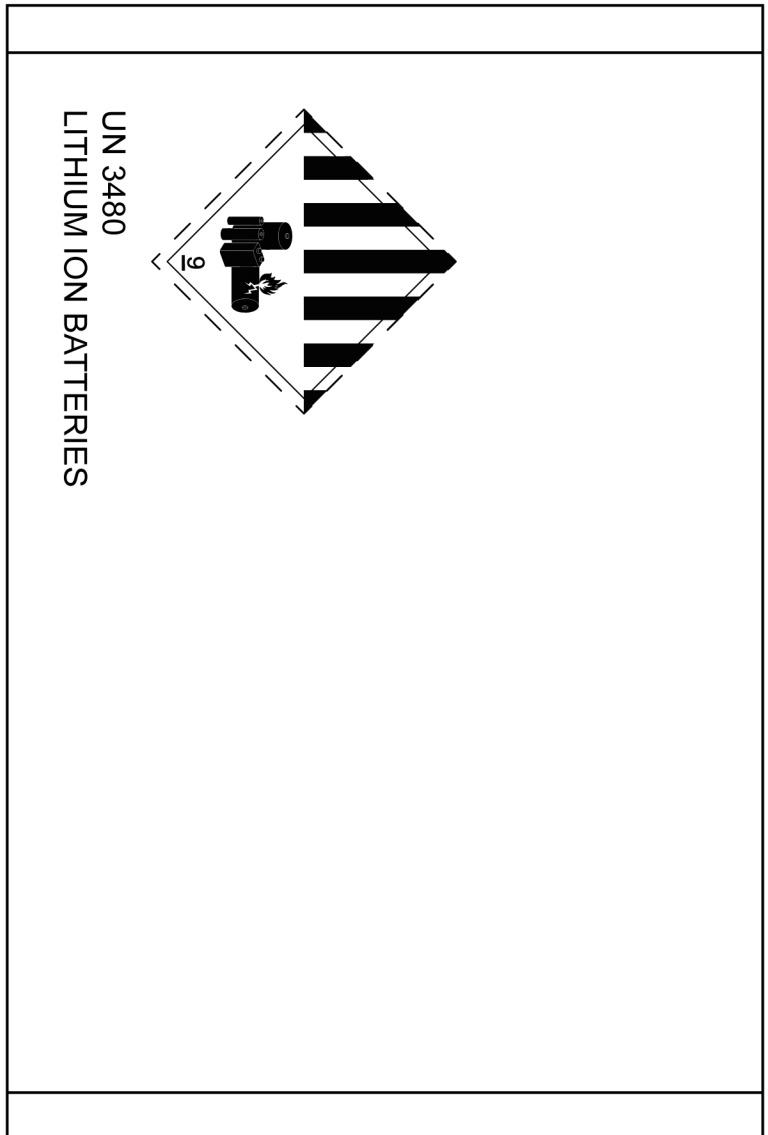
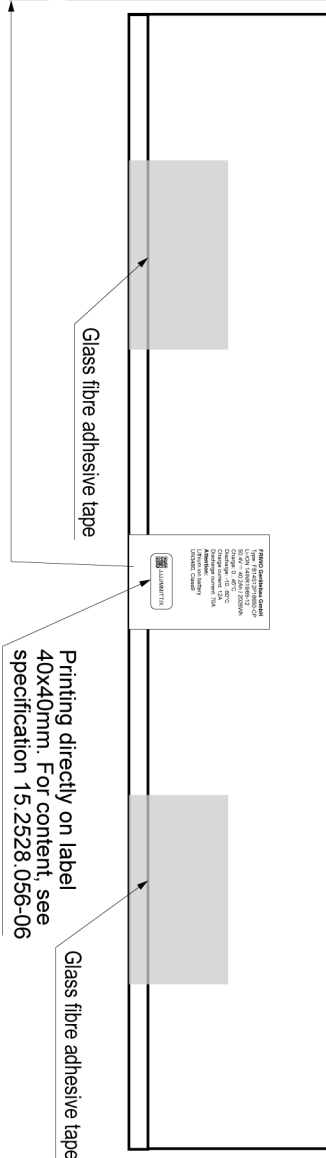
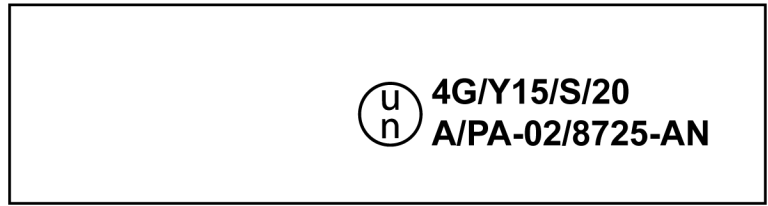
3 Verpackung / Packaging

3.1 Einzelverpackung / individual packaging:

Faltschachtel / Folding box: 50.0046.556-00
 Aufkleber / Label: (50mm x 100mm)
 Aufkleber / Label: (30mm x 12mm)



Scale 1:1
 Printing on label 50x100mm



3.2 Anzahl der Geräte pro Umkarton / amount of units per master carton: 1

3.3 Gewicht pro Stück / weight per unit: 12400g

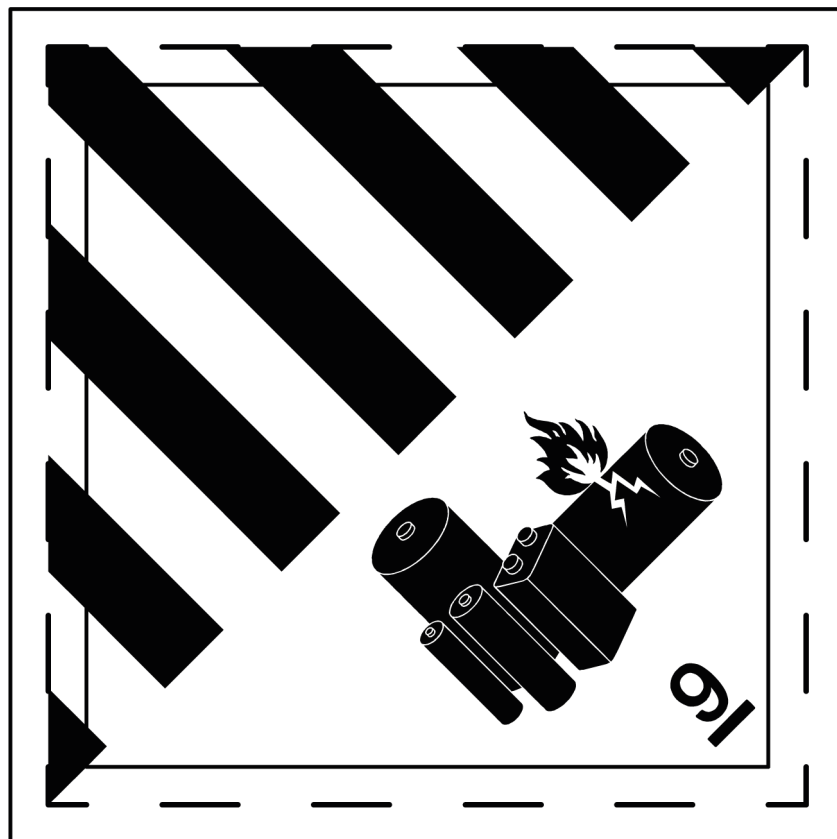
3.4 Lagertemperatur / storage temperature:

1Jahr / 1 Year: -20°C - +25°C
 3 Monate / 3 Month: -20°C - +45°C
 1 Monat / 1 Month: -10°C - +60°C

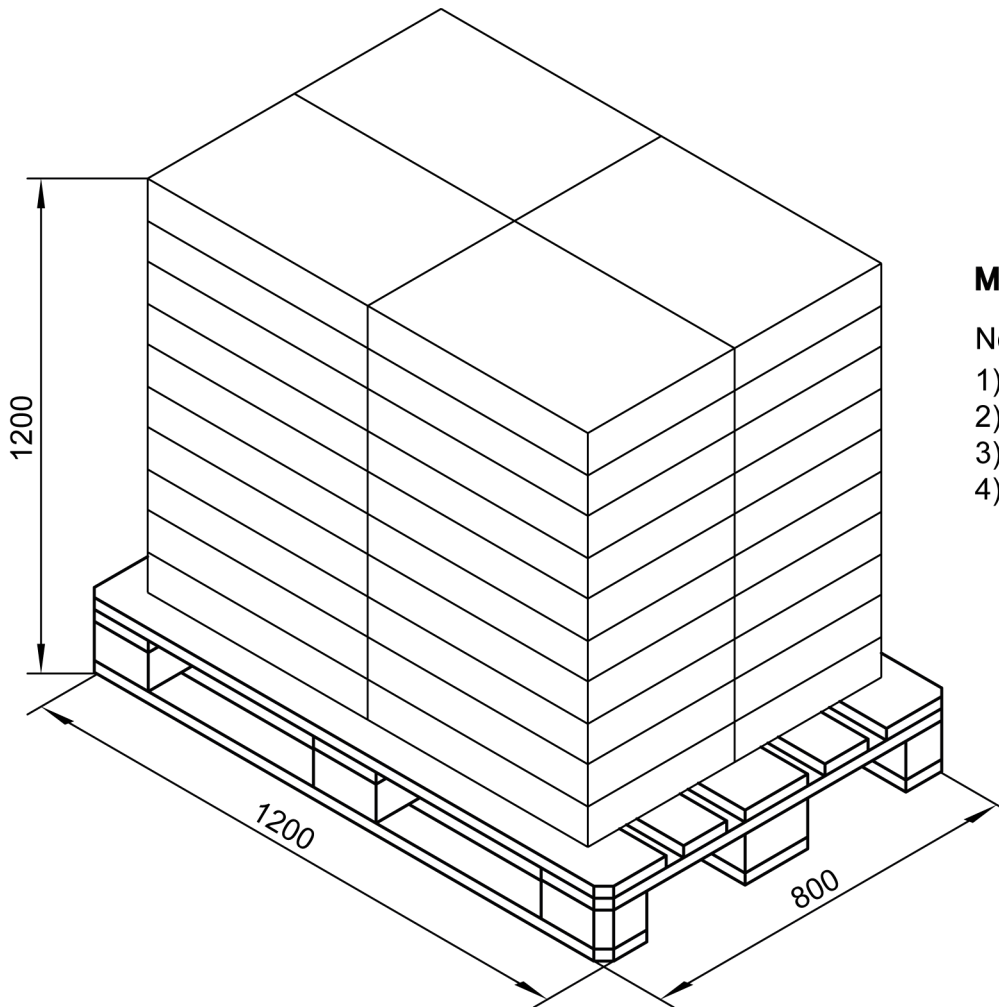
3.5 Transport Klassifizierung / Transport classification

UN class Class 9
 UN number UN3480, Lithium Ion Battery
 Energie des Batteriepacks / Energy of battery >100Wh

The following caution label should be placed on pallet.



3.6 Verpackungsanweisungen / packaging specification:



Master Packing

Notes:

- 1) 1 units per carton
- 2) 4 cartons per layer
- 3) 10 layers max. per pallet
- 4) total 40 pcs per pallet

4 Allgemeine Prüfbedingungen / General test conditions

Wenn keine anderen Umgebungsbedingungen angegeben sind, beziehen sich die elektrischen Daten auf eine Temperatur von $25 \pm 5^\circ\text{C}$ und eine Luftfeuchtigkeit von $65 \pm 20\%$.

Unless otherwise specified, all electrical data are tested at temperature of $25 \pm 5^\circ\text{C}$ and humidity of $65 \pm 20\%$.

5 Elektrische Prüfbedingungen / electrical tests

5.1 Batteriepackinformationen / Battery pack information

Zellen / cells	BAK N18650-CP
Konfiguration / configuration	14S12P
IEC62133 Bezeichnung / designation	14INR19/65-12
Nennspannung / nominal voltage	50.4V
Nennkapazität / nominal capacity	40.2Ah (0.2C, 2.5V/cell discharge)
Nennenergie / nominal energy	2026Wh
Ausgangsstecker / Output connector	WEIPU WY28K8BZ

5.2 Anwendungshinweise / Recommended use

Lademodus / charge mode	CC-CV (constant voltage with current limit)
Ladespannung / Charging voltage	58.8V
Empfohlener Ladestrom / recommended charging current	12A
Minimaler Ladestrom / minimum charge current	1A
Empfohlener Entladestrom / recommended discharge current	<70A
Typische Entladezeiten / Typical discharge time	69A (~20min, starting at 20°C) 35A (~60min, starting at 20°C)
Entladezeiten / Discharge time	Depending on parametrization and cooling – see manual for more information!
Entladeschlussspannung / discharge cut off voltage	42V recommended / minimum 37.1 not for cycle life
Hilfsspannungsversorgung / auxiliary voltage supply	12V 2A
Arbeitstemperatur Zellen / operation temperature cells	Charge: 0 to 45°C Discharge: -10 to 60°C

Attention: Please ensure cell temperature not rising above specified limits!

Activation: Activation via pushbutton, BAT enable PIN and CAN communication depending on configuration and firmware version. See manual for more information.

5.3 Vordefinierte Grenzwerte / Preconfigured limits

Überspannungsabschaltung Zellen / Overvoltage cutoff cells	4.35V
Unterspannungsabschaltung Zellen / Undervoltage cutoff cells	2.50V
Überstromabschaltung Entladen / Overcurrent cutoff discharge	70A / 5sec
Überstromabschaltung Laden / Overcurrent cutoff charge	20A / 5sec
Kurzschlussstrom Erkennung / Short circuit detection level	153A (<10usec)

Übertemperaturabschaltung / Overtemperature cutoff	Charge: 45°C Discharge: 60°C Internal power components: 115°C
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5.4 Pinout/terminal assignment

Pin	Function
PIN 1	BAT-
PIN 2	BAT+
PIN 3	Charge sense
PIN 4	CAN low
PIN 5	CAN high
PIN 6	BAT enable
PIN 7	12V
PIN 8	n.c.

5.5 CAN Kommunikation / CAN communication

Die Batterie bietet CAN Kommunikation mit den folgenden voreingestellten Werten:
 The battery pack provides CAN communication with these standard preconfigured values:

CAN baud rate preset	500kBit/s
CAN baud rate selectable	125, 250, 500, 1000 kBit/s
CAN termination	120 Ohm included
Isolation	no CAN isolation

In einer Punkt-zu-Punkt Kommunikation ist keine weitere Terminierung notwendig. Eine Parallelschaltung von mehreren Teilnehmern mit CAN Terminierung sollte vermieden werden!
 In point to point communication no additional termination is needed. Please avoid combination of more than two devices with CAN termination in single BUS configuration!

Um zwei oder mehr Batteriepacks parallel zu schalten ist eine spezielle GRID Firmware und eine Hardware ohne CAN Terminierung auf Anfrage verfügbar.
 For connection two or more battery packs in parallel a special GRID firmware version and hardware without integrated CAN termination is available on request.

Eine CAN DBC Datenbank Datei ist auf Anfrage verfügbar.
 CAN DBC database file available on request.

6 Sicherheitsanleitung / Safety details:

6.1 Aufbau nach folgenden Normen / Construction according

Standard	Version	Description
ROHS directive (Protection circuit)	2011/65/EU	Remove of Hazardous Substances
WEEE directive	2012/19/EU	Waste Electrical and Electronic Equipment
Battery directive	2006/66/EC	Directive on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC
EN 62133-2:2017	2017-11	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

6.2 Zulassungen / Approvals

Standard	Description
UL 1642 (Cells)	Standard for Lithium Batteries
IEC62133-2:2017 (Cells)	Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for portable sealed secondary lithium cells, and for batteries made from them, for in portable applications. - Part 2: Lithium systems.
UN38.3/ IEC62281:2019 (Pack)	Safety of primary and secondary lithium cells and batteries during transport.

6.3 Warnungen / Precautions

(Source: IEC62133-2 2017)

Recommendations to equipment manufacturer

- a) Do not dismantle, open or shred cells. Batteries should be dismantled only by trained personnel. Multi-cell battery cases should be designed so that they can be opened only with the aid of a tool.
- b) Do not short-circuit a cell or battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by conductive materials.
- c) Do not remove a cell or battery from its original packaging until required for use.
- d) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
- e) Do not subject cells or batteries to mechanical shock.
- f) In the event of a cell leaking, do not allow the liquid to come into contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.
- g) Equipment should be designed to prohibit the incorrect insertion of cells or batteries and should have clear polarity marks. Always observe the polarity marks on the cell, battery and equipment and ensure correct use.
- h) Do not mix cells of different manufacture, capacity, size or type within a battery.
- i) Seek medical advice immediately if a cell or battery has been swallowed.
- j) Consult the cell/battery manufacturer on the maximum number of cells, which may be assembled in a battery and on the safest way in which cells may be connected.
- k) A dedicated charger should be provided for each equipment. Complete charging instructions should be provided for all secondary cells and batteries offered for sale.
- l) Keep cells and batteries clean and dry.
- m) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
- n) Secondary cells and batteries need to be charged before use. Always refer to the cell or battery manufacturer's instructions and use the correct charging procedure.
- o) Do not maintain secondary cells and batteries on charge when not in use.
- p) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
- q) Retain the original cell and battery literature for future reference.
- r) When disposing of secondary cells or batteries, keep cells or batteries of different electrochemical systems separate from each other.
- s) Drop a device containing the battery once from a height of one meter onto a concrete floor. Test three sets of fully charged batteries. For dropping, select the direction in which the free fall is likely to have the greatest impact on the safety of the battery. Instead of dropping a host device, a shock equivalent to dropping may be given to the battery for simulation.

Recommendations to the end-users

- a) Do not dismantle, open or shred secondary cells or batteries.
- b) Do not expose cells or batteries to heat or fire. Avoid storage in direct sunlight.
- c) Do not short-circuit a cell or a battery. Do not store cells or batteries haphazardly in a box or drawer where they may short-circuit each other or be short-circuited by other metal objects.
- d) Do not remove a cell or battery from its original packaging until required for use.
- e) Do not subject cells or batteries to mechanical shock.
- f) In the event of a cell leaking, do not allow the liquid to come in contact with the skin or eyes. If contact has been made, wash the affected area with copious amounts of water and seek medical advice.
- g) Do not use any charger other than that specifically provided for use with the equipment.
- h) Observe the plus (+) and minus (-) marks on the cell, battery and equipment and ensure correct use.
- i) Do not use any cell or battery which is not designed for use with the equipment.
- j) Do not mix cells of different manufacture, capacity, size or type within a device.
- k) Battery usage by children should be supervised.
- l) Seek medical advice immediately if a cell or a battery has been swallowed.
- m) Always purchase the battery recommended by the device manufacturer for the equipment.
- n) Keep cells and batteries clean and dry.
- o) Wipe the cell or battery terminals with a clean dry cloth if they become dirty.
- p) Secondary cells and batteries need to be charged before use. Always use the correct charger and refer to the manufacturer's instructions or equipment manual for proper charging instructions.
- q) Do not leave a battery on prolonged charge when not in use.
- r) After extended periods of storage, it may be necessary to charge and discharge the cells or batteries several times to obtain maximum performance.
- s) Retain the original product literature for future reference.
- t) Use only the cell or battery in the application for which it was intended.
- u) When possible, remove the battery from the equipment when not in use.
- v) Dispose of properly.

7 Entsorgung / Disposal

Entsorgung

Wir weisen darauf hin, dass diese Batterien (Akku-Packs) im entladenen Zustand bei den Rücknahmestellen abgegeben werden sollen bzw. das Vorsorge gegen Kurzschlüsse getroffen werden muss (z.B. durch das Isolieren der Pole mit Klebestreifen)

Disposal

We advise you that the battery packs have to be discharged before returning to the collection points or it must be taken care against short circuits (eg by isolating the poles with tape).