



# Commeo Energy storage blocks

## Safety information

# Safety information

This document provides voluntary safety information in line with the safety data sheet pursuant to Regulation (EG) No 1907/2006 (REACH).

## 1 Identification of the product and of the company/undertaking

### 1.1 Product

Energy storage blocks consisting of lithium-ion cells monitored by a battery management system in an aluminium/plastic housing:

Name	Model
Parallel Block 1.5 kWh with relay for 48 V systems	esbC15PR
End Block 1.5 kWh with relay for 48 V systems	esbC15ER
End Block 1.5 kWh for HV systems	esbC15E
Parallel Block 1.5 kWh for HV systems	esbC15P
Serial Block 1.5 kWh for HV systems	esbC15S
Parallel Block 1.5 kWh with relay for 48 V systems	esbC152PR
End Block 1.5 kWh with relay for 48 V systems	esbC152ER
End Block 1.5 kWh for HV systems	esbC152E
Parallel Block 1.5 kWh for HV systems	esbC152P
Serial Block 1.5 kWh for HV systems	esbC152S
Parallel Block 1.45 kWh with relay for 48 V systems	esbC141PR
End Block 1.45 kWh with relay for 48 V systems	esbC141ER
End Block 1.45 kWh for HV systems	esbC141E
Parallel Block 1.45 kWh for HV systems	esbC141P
Serial Block 1.45 kWh for HV systems	esbC141S
Parallel Block 1.1 kWh with relay for 48 V systems	esbC11PR
End Block 1.1 kWh with relay for 48 V systems	esbC11ER
End Block 1.1 kWh for HV systems	esbC11E
Parallel Block 1.1 kWh for HV systems	esbC11P
Serial Block 1.1 kWh for HV systems	esbC11S
Parallel Block 1.1 kWh with relay for 48 V systems	esbC112PR

Name	Model
End Block 1.1 kWh with relay for 48 V systems	esbC112ER
End Block 1.1 kWh for HV systems	esbC112E
Parallel Block 1.1 kWh for HV systems	esbC112P
Serial Block 1.1 kWh for HV systems	esbC112S
End Block 4.45 kWh with relay for 48 V systems	esbL44ER
End Block 4.45 kWh for HV systems	esbL44E
End Block 5.4 kWh with relay for 48 V systems	esbL54ER
End Block 5.4 kWh for HV systems	esbL54E
End Block 6.2 kWh with relay for 48 V systems	esbL62ER
End Block 6.2 kWh for HV systems	esbL62E

## 1.2 Intended use

Battery system to be used purely for industrial purposes.

Several energy storage blocks can be interconnected to serve as an battery system in connection with a Commeo control unit (ccu48V or ccuHV).

The operating window provided for the energy storage block, consisting of mandatory technical (voltage, current, power, energy, etc.), temporal and spatial limits must be complied with.



### **NOTE**

The current version of the technical data sheet, including information on the operating window for the energy storage block, can be found on the Commeo website: [www.commeo.com](http://www.commeo.com).

## 1.3 Improper use

Safe usage of the energy storage blocks can only be guaranteed if the following examples of improper use are ruled out, as a minimum:

- Operation outside of the energy storage block operating window
- Operation in a defective condition
- Operation without protective coverings
- Operation without properly functioning and operational safety devices
- Operation outside of the spatial, temporal and technical limits
- Operation in end products that have not been developed and constructed in accordance with applicable guidelines
- Operation in enclosures that have no protection against excessive pressure
- Structural changes to energy storage blocks or the control unit
- Operation of the energy storage blocks without the intended control unit
- Unauthorised changes to limit values (e.g. temperature values, voltage values, currents)
- Unauthorised changes of any type to the software in the battery control unit or the firmware in the battery management system of the energy storage blocks

## 1.4 Company/undertaking

Address of the manufacturer/supplier:

**commeo**  
energy storage solutions®

**p** +49 5407 81381-0

Commeo GmbH

Otto-Lilienthal-Strasse 8  49134 Wallenhorst  Germany

[www.commeo.com](http://www.commeo.com)

Emergency telephone number: +49 5407 81381-0

## 2 Hazards identification

Lithium-ion batteries are sealed gas-tight and harmless when used and handled in accordance with the manufacturer's instructions.



### **DANGER!**

#### **Serious injury due to explosion/burns**

If the temperature exceeds 90°C or severe mechanical damage is caused, there is a risk that the energy storage block may burst and burn ("thermal runaway").

- Prevent any mechanical damage (piercing, deformation, dismantling, etc.).
- Do not heat above the permitted temperature or burn.



### **WARNING!**

- Never use charging devices that are not suitable for the type.
- Do not short circuit.
- The energy storage block must only be used by personnel who can demonstrate that they have undergone suitable technical training and who understand the mechanisms and basic principles of energy storage blocks.
- Only use the energy storage blocks for the specified intended use.
- Always store energy storage blocks in a dry and cool location.



### **CAUTION!**

As with other cells, lithium-ion cells may still be a source of danger even if they are apparently empty.

Lithium-ion cells are safe to use when handled correctly within the operating window specified by the manufacturer. Mishandling or circumstances leading to improper operation may cause leakages of the battery contents and decomposing substances, and therefore violent reactions that are hazardous to health and the environment.

In principle, contact with any escaping components may pose a risk to health and the environment. Therefore, sufficient bodily and respiratory protection is necessary when in contact with any suspicious energy storage blocks (escape of contents, deformation, discolouration, dents, excessive temperatures, or similar). Lithium-ion cells can react violently when in contact with fire, for example. This may cause components of the battery system to be emitted with considerable force.

## Handling and operational safety:



### **WARNING!**

Lithium-ion cells must be handled in accordance with the manufacturer's instructions under all circumstances. This applies in particular to the maximum current load, end-of-charge and end-of-discharge voltages and the mechanical and thermal loads specified in the operating window.



### **WARNING!**

The user must comply with the power limits communicated by the battery management system (for more information, please see the operating instructions for the energy storage blocks).

Energy storage blocks may not be modified or manipulated under any circumstances, as this may result in significant safety risks.

In most products, excessive discharging leads to permanent damage. Energy storage blocks that have been excessively discharged cannot be charged or used until a Commeo-approved inspection has taken place.

Excessive charging voltage and overloading must be avoided under all circumstances. This can lead directly to critical situations and has a negative impact on the service life of the energy storage block. Commeo explicitly states that compliance with the charging voltage specified in the operating window for the energy storage block is mandatory.

### 3 Composition, informational ingredients

Energy storage blocks are products that do not release any substances when used as intended.

Lithium-ion cells with lithium metal oxide cathode and graphite anode.



#### **WARNING!**

The energy storage block must not be opened. The built-in cells must not be heated to temperatures above 90°C or burnt, as exposure to the component substances can be dangerous under certain conditions.

Typical component substances of a sealed cell:






Component	%	CAS Number
Lithium nickel manganese cobalt oxide	30 – 45 w/w	182442-95-1
Silicon oxide/ graphite powder	12 – 25 w/w	10097-28-6, 7782-42-5
Organic linear and cyclic carbonates	5 – 16 w/w	No information
Copper foil	5 – 15 w/w	7440-50-8
Aluminium foil	2 – 8 w/w	7429-90-5
Steel, nickel and inert polymer	0.2 – 5 w/w	No information
Lithium hexafluorophosphate (LiPF <sub>6</sub> )	1 – 3 w/w	21324-40-3
Carbon black and other	0.5 – 2 w/w	1333-86-4
Polyvinylidene fluoride (PVDF)	0.1 – 2 w/w	24937-79-9

## 4 First aid measures

Lithium-ion cells and energy storage blocks pose no risk when handled and stored correctly. The following first aid information refers exclusively to action to be taken in the event that the ingredients are released.

Substance	Chemical abbreviation	Melting point	Boiling point	Load limit	Hazard
Lithium nickel manganese cobalt oxide	NCM	> 800 °C	–	–	–
Organic linear and cyclic carbonates	EC	38 °C	243 °C	Not specified by OSHA	flam- mable
	DMC	4 °C	90 °C		
	EMC	-14 °C	107 °C		

### 4.1 General information

Substance	CLP hazard class and hazard category
Lithium nickel manganese cobalt oxide	 <p>H315: Causes skin irritation (Category 2) H319: Causes serious eye irritation (Category 2) H335: May cause respiratory irritation (Category 3)</p>
Organic linear and cyclic carbonates	 <p>H312: Harmful in contact with skin (Category 4)</p>
	 <p>H318: Causes serious eye damage (Category 1)</p>
	 <p>H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled (Category 1)</p>
	 <p>H317: May cause an allergic skin reaction (Category 1)</p>

## **4.2 Skin or eye contact**

In case of contact with skin or eyes, the affected areas must be rinsed thoroughly with water for at least 15 minutes. In case of eye contact, Medical attention must be sought in all cases, in addition to the thorough rinsing with water.

## **4.3 Burns**

Burns should be treated accordingly. Sufferers are also urgently advised to seek medical attention.

## **4.4 Airways**

If significant amounts of smoke develop or if gas is released, leave the room immediately. In the case of large quantities and irritation to the airways, seek medical attention. Provide sufficient ventilation, where possible.

## **4.5 If swallowed**

Rinse mouth and surrounding area with water. Seek immediate medical attention.

# **5 Firefighting measures**

Fires involving lithium-ion cells can, in principle, be extinguished with water. It is generally not possible and not necessary to differentiate between the different lithium-ion cell systems when a fire breaks out. The cooling effect of water can fully prevent a fire from spreading to lithium-ion cells that have not yet reached the critical temperature to ignite ("thermal runaway").

As in the case of all fires, the resulting combustion gases can cause health damage if inhaled. Sufficient ventilation must therefore be provided.

## 6 Accidental release measures

Electrolytes may escape if the housing becomes damaged. Wherever possible, energy storage blocks must be enclosed in an airtight plastic bag, to which dry sand, chalk powder ( $\text{CaCO}_3$ ) or vermiculite must be added. Traces of electrolytes can be soaked up using dry paper towel. When doing this, wear protective gloves to prevent direct contact with the skin. The area should be rinsed thoroughly with water.

Specific PPE that is suitable for the situation must be used (protective gloves, protective clothing, face protection, respiratory protection).

## 7 Handling and storage

Warnings on battery systems and instructions for devices, systems and other applications must be carefully followed in all cases. Comply with the intended use and the operating window for the energy storage blocks.

Energy storage blocks should preferably be stored at room temperature (max. 30°C), in a dry location; large fluctuations in temperature should be avoided (e.g. do not store in the vicinity of heaters, do not expose to sunlight long-term). Protect against humidity and water.

When storing large quantities of energy storage blocks, consult the local authorities. It is recommended that the storage information given in guideline VdS 3103 be followed.

## 8 Exposure controls/personal protection

Energy storage blocks are products that do not release any substances when used under normal and reasonably foreseeable conditions.

Respiratory protection	Not necessary under normal usage. A respiratory mask with ABEK filter must be worn if the cell coating is ruptured.
Hand protection	Protective rubber gloves (alkali resistant) must be worn when handling a defective battery.
Eye protection	Not necessary under normal usage. Safety goggles must be worn when handling a defective battery.
Skin protection	Not necessary under normal usage. A rubber apron and suitable work clothing must be worn when handling a defective battery.

## 9 Physical and chemical properties

The esbC-series energy storage block from Commeo consists of lithium-ion cells in an aluminium/plastic housing and an integrated battery management system.

The cells contain:

- Lithium nickel manganese cobalt oxide in the form of a black powder
- Silicon oxide/graphite in the form of a black, odourless powder
- Organic solvent in the form of a colourless liquid

## 10 Stability and reactivity



### **CAUTION!**

When charging an energy storage block, comply with the operating window at all times.



### **NOTICE!**

If the storage temperature exceeds 45°C, this can lead to accelerated ageing and premature loss of function.

## 11 Toxicological information

No danger when used as intended. If damaged or used improperly, irritating or sensitising ingredients may escape.

## 12 Ecological information

No negative ecological effects are expected if used and disposed of properly.

## 13 Disposal considerations



As a manufacturer of energy storage blocks, Commeo is obliged under §18 of the Battery Act (BattG) to provide information on the handling of the energy storage blocks or batteries/rechargeable batteries.

- The end user is legally obliged to return used batteries.
- Energy storage blocks are marked with the symbol of the crossed-out wheeled bin. The symbol reminds end users that energy storage blocks must not be disposed of as unsorted waste with household waste, but must be returned to appropriate collection points for reuse and recycling.
- As the manufacturer, Commeo is obliged to take back used energy storage blocks free of charge.
- If not stored or disposed of properly, harmful substances contained in the used battery may cause damage to the environment and health.
- Raw materials contained in the battery, some of which are rare, such as iron, zinc, manganese or nickel, can be recycled through proper disposal measures.

To prevent short circuits and associated heating, energy storage blocks must never be stored or transported unprotected in bulk. Suitable measures against short circuits include:

- placing batteries in original packaging or in a plastic bag
- embedding in dry sand
- insulation of the outer battery terminals and contacts

## 14 Transport information

For transport and storage temperatures, see operating window



### **WARNING!**

The commercial transport of lithium-ion cells is subject to laws on hazardous goods. The transport preparations and the transport itself must only be carried out by appropriately trained individuals and the process must be supervised by suitable experts or qualified companies.

### 14.1 UN Number

3480

## 14.2 UN proper shipping name

- ADR: Lithium-ion batteries
- IMDG: Lithium ion batteries
- IATA: Lithium ion batteries
- RID: Lithium-ion batteries

## 14.3 Transport hazard classes

Lithium-ion cells are subject to the current valid version of the Dangerous Goods Regulations and any exceptions therefrom:

>100Wh



Class 9 – Hazard label 9a

## 14.4 Packing group

not relevant

## 14.5 Environmental hazards

not relevant

## 14.6 Specific precautions for user

Individuals tasked with transporting dangerous goods must be trained accordingly. Provisions for securing dangerous goods must be observed by all individuals involved in their transportation. Precautions must be taken to prevent damage.

## 14.7 Transport in bulk according to Annex II of MAR-POL 73/78 and the IBC Code

Not relevant as the goods are not transported in bulk but as general cargo. Minimum quantity regulations are not observed here. Observe special provisions.



### **NOTICE!**

Do not expose goods to high temperatures during transport and prevent formation of condensation. Protect cargo from crashing, falling or breaking. Protect cargo stacks from toppling and from moisture penetration as a result of rain. The cargo must be handled carefully (see Section "Handling and storage" on page 10).

Energy storage blocks must be declared to be defective if they suffer any kind of excessive mechanical stress (crash, tipping, etc.).

## 15 Regulatory information

In German, the Act governing the Sale, Return and Environmental Disposal of Batteries and Accumulators (Battery Act – BattG) of 25 June 2009 applies.

This act serves to implement Directive 2006/66/EC (Battery Directive). In EU Member States, the national laws implementing Directive 2006/66/EC (Battery Directive) apply.

## 16 Other information

This information gives advice on complying with legal requirements; however, it does not replace them. The information described here has been compiled to the best of our knowledge.

It does not constitute a guarantee of product qualities. The distributors and users of the product bear sole responsibility for complying with any applicable laws and provisions.



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