EWELLIX

EWELLIX Control Unit

MCU

User Manual

We pioneer motion

SCHAEFFLER

Contents

1 About the manual

1.1 Information in this user manual

This manual provides important information on how to work with the device safely and efficiently.

The manual is part of the device, must always be kept in the device's direct proximity and should be available for personnel to read at any time. All personnel working with the device must read and understand this manual before starting any work. Strict compliance with all specified safety notes and instructions is a basic requirement for safety at work.

Moreover, the accident prevention guidelines and general safety regulations applicable at the place of use of the device must also be complied with.

1.2 Symbols

Safety precautions are identified by symbols and signal words as shown. The signal words indicate the severity of the hazard and the chance it could occur. Follow these safety precautions and act cautiously in order to avoid accidents, personal injury and damage to property.

The warning and hazard symbols are defined in accordance with ANSI Z535.6-2011.

1 Warning and hazard symbols

Signs and descriptions	
⚠ DANGER	In case of non-compliance, death or serious injury will occur.
⚠ WARNING	In case of non-compliance, death or serious injury may occur.
⚠ CAUTION	In case of non-compliance, minor or slight injury may occur.
NOTICE	In case of non-compliance, damage or malfunctions in the product or the adjacent construction may occur.

1.3 Signs

The warning, prohibition, and mandatory signs are defined in accordance with DIN EN ISO 7010 or DIN 4844-2.

2 Warning, prohibition, and mandatory signs

Signs and descriptions	
	General warning
	Electrical voltage warning
	Explosive substances warning
	General mandatory sign

1.4 Legal notices

The information in this manual reflects the status at the time of publication.

Unauthorized modifications to or improper use of the product are not permitted. Schaeffler accepts no liability in these cases.

1.5 Liability

In any case, the owner or the operator of the device is liable for its proper functioning if the device is improperly installed, maintained or repaired by persons who are not part of the Schaeffler Service department, or if the device is used in a manner that does not correspond to its intended use.

Schaeffler shall not be liable for any damage resulting from failure to observe these instructions. These instructions are not to be considered as an extension of the warranty conditions and liability conditions set out in Schaeffler's Terms and Conditions of Sale and Delivery.

The product is not subject to labeling requirements according to CE Directives or EMC Directives. The required EMC measures must be implemented on the end product by the manufacturer of the end product, taking into account the installation conditions, wiring and control, and must be checked in accordance with the intended use.

Compliance with these regulations is the responsibility of the manufacturer of the machine or system.

1.6 Availability

A current version of these instructions is available at:
https://www.schaeffler.de/std/2242

Ensure that this manual is always complete and legible and is available to all persons engaged in transporting, fitting, dismantling, commissioning, operating, or maintaining the product.

Keep the manual in a safe place for immediate reference.

1.7 Images

The images in this manual may be schematic representations and may differ from the delivered device.

2 General safety regulations

The general safety instructions are intended for users who operate and maintain the product.

The safety program from Schaeffler details authorized users and the responsibility of individual users. The product was designed and built in accordance with the latest technical standards and accepted safety regulations. EU conformity is documented within the technical documentation.

2.1 Intended use

The device has been developed and designed for its intended use. If the device is used for any purpose other than that described, the manufacturer cannot be held liable for any resulting damage.

The device has been designed for mobile applications in the medical field, particularly for patient lifts.

The device is approved for controlling the following components:

- Matrix MAX10, MAX30
- Telemag THG, TLG, TLT

2.2 Unintended use

Any use other than the intended use, or any modification to the device without the manufacturer's written consent, is not permitted. Operation beyond the technical limits is also not permitted.

The technical operating limits can be found in the Technical data.

Any unauthorized use of the device can cause personal injury and property damage. The instructions in this user manual must be observed at all times.

The device is suitable for indoor use only and must not be exposed to weather conditions, strong UV radiation, or corrosive or explosive atmospheres.

2.3 Safety regulations

The following safety regulations must be observed when working with the product. You can find further information on dangers and specific instructions in other chapters, including those entitled Installation, Commissioning, Operation, and Maintenance.

2.3.1 Transport and storage

The product may only be transported and stored in its original packaging and under the permissible ambient conditions, see *Technical data*.

2.3.2 Disposal

Locally applicable regulations must be observed.

3 Scope of delivery

The scope of delivery comprises:

- 1 control unit mounted on the system bracket
- battery pack ZBA
- User manual

3.1 Check for damage during transit

1. Check the product immediately upon delivery for any damage during transit.
2. Do not accept delivery, or only accept it with reservation, if transport damage is found.
3. Record the extent of damage on the transport documents or the carrier's delivery note.
4. Report any damage during transit promptly as a complaint to the carrier.

Report any damage as soon as it is discovered. Claims for damages can only be made within the applicable claim period stipulated by the transport company.

3.2 Check for defects

1. Check the product immediately upon delivery for any visible defects.
2. Check the product for completeness immediately upon delivery.
3. Report any defects promptly to the distributor of the product.
4. Do not put damaged products into operation.

4 Product description

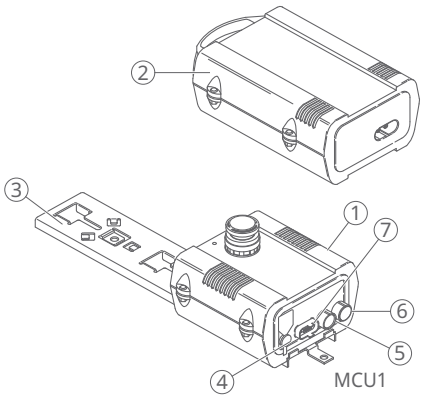
The control unit is used for mains-independent control of DC 24 V actuators and consists of 2 components:

- The MCU1 control unit is connected to the mains voltage using a mains adapter. Protection type IPX4 applies to the MCU1 control unit.
- The ZBA battery pack consists of 2 batteries connected in series, each with 12 V and 4.5 Ah, which together provide 24 V. The charged battery pack supplies power to the control unit and therefore to the actuator.

Operation is performed via a connected operating device, e.g., a hand switch.

An integrated overcurrent cut-off protects the actuator from overload. The integrated emergency stop function allows the power supply to the actuator to be interrupted so that it stops immediately.

1 Control unit MCU with battery pack



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1	Control unit	2	Battery pack
3	System bracket	4	Mains adapter with closure flap (MCU1 only)
5	Actuator 1	6	Optional: actuator 2
7	Operating device		

Operating devices

The following operating devices are suitable for the control unit:

- hand switch EHA
- foot switch STF
- desk switch STA

4.1 Options

- connection for second actuator
- electrical emergency lowering (for channel 1 only)
- individual current cut-off for both channels

4.2 Accessories

- mains adapter ZDV for MCU1
- wall charging station ZLA
- hand switch EHA
- distribution box
- battery pack ZBA

5 Transport and storage

NOTICE

Damage due to improper transport

Improper transport may result in significant property damage.

- Proceed with caution when unloading the packaged goods, during delivery, and during transport to the destination.
- Observe the symbols and instructions on the packaging.
- Do not remove the product from the packaging until immediately before installation.
- Observe the storage conditions for return transport to the manufacturer; see the *Safety regulations, transport, and storage* section.

5.1 Transport

Observe the safety regulations for transport.

Requirements for packaging

Each individual packaged part must be packed appropriately for the anticipated transport conditions. Only environmentally friendly materials may be used for the packaging.

The packaging is intended to protect the individual components from transport damage, corrosion, and other types of damage until assembly.

1. Do not destroy the packaging and only remove it shortly before assembly.
2. Keep the packaging in case the product needs to be returned to the manufacturer ➤11|5.3.

Packaging material consists of valuable raw materials, most of which can be effectively recycled and reused.

If the packaging is to be disposed of following intact delivery, the following instructions must be observed and complied with:

3. Dispose of packaging material in an environmentally responsible manner.
4. Observe the locally applicable disposal regulations.

5.2 Storage

Observe the safety regulations for the storage.

1. Store the product in its original packaging and avoid mechanical shocks.
2. If the storage period is ≥ 3 months, regularly check the general condition of all packaging components.
3. Follow any additional storage instructions detailed on the packaging.

5.3 Return to the manufacturer

Proceed as follows for return transport:

1. Dismantle the device if necessary.
2. Pack the device in its original packaging.
3. Observe the safety instructions for transport and storage ➤7|2.3.1.
4. Send to the manufacturer. The address is provided on the back of this operating manual.

6 Installation

DANGER

Damaged plugs or damaged mains adapters

Danger to life from electric current

- Never touch a damaged mains adapter while the device is in operation, as it is supplied with AC 120 V or AC 230 V.
- Ensure that the circuit breaker is switched off before removing a defective plug from the socket. Check the mains adapter regularly for damage.

This section contains all information required for the installation, connection, and commissioning of the control unit.

When installing and aligning the control unit, the following points must be observed:

- Keep the mains adapter of the power cable accessible at all times.
- Do not bend or crush the power cable.
- Do not bend or crush the connection cables to the actuators.
- Install the control unit on a flat surface. Do not deform the housing during installation, otherwise the IP protection rating can no longer be guaranteed.
- Position the control unit properly. Shocks and vibrations must not loosen the control unit.

6.1 Mounting the control unit

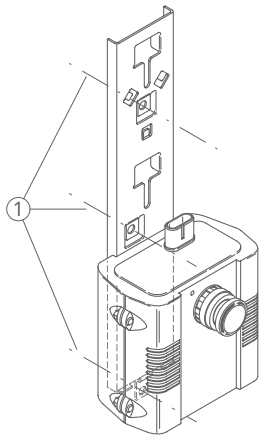
✓ Install the device free of mechanical stress.

✓ Do not expose the device to vibrations.

✓ Observe the installation positions for MCU1.

- Mount the control unit using the 3 designated holes in the system bracket.

2 Mounting holes in the system bracket



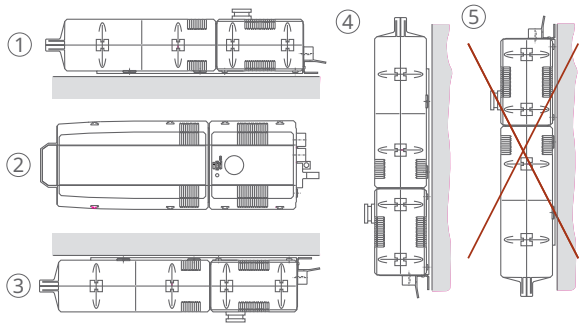
1	Mounting hole

Permissible installation positions for MCU1

The MCU1 control unit can be installed in the following positions.

The MCU1 control unit (protection rating IPX4) may only be installed vertically with the battery located above the control unit. This prevents the ingress of liquids. A vertically suspended installation position with the battery located below the control unit is not permitted, as the battery could fall out.

3 Permissible installation positions for MCU1



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1	Horizontal, lying	2	Horizontal, upright
3	Horizontal, suspended	4	Vertical (battery above the control unit)
5	Not permitted: battery vertically below the control unit		

6.2 Connecting the battery

NOTICE

Blocked ventilation opening

Risk of property damage to the device. Ingress of liquid and blockage of the ventilation may lead to malfunctions.

Gases generated in the battery pack may no longer be able to escape.

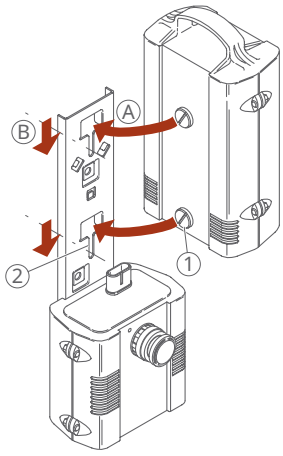
- Ensure that the ventilation opening is not damaged, removed, or painted over.

✓ Only batteries and chargers approved by Schaeffler may be used.

1. Insert the battery pack into the system bracket
2. Slide the cams into the guide until they reach the stop

» A retaining spring on the rear of the system bracket secures the battery pack.

4 Inserting the battery pack



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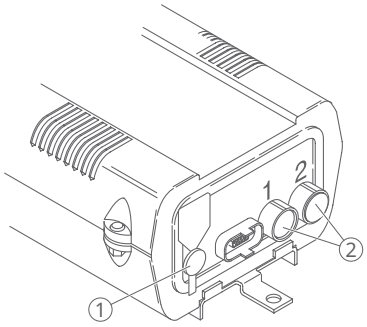
1	Cams	2	Guide and retaining spring
A	Insert	B	Slide in

6.3 Connecting the operating device and actuator

Secure the cables so that no forces act on the control unit plugs. Misaligned plugs may leak and damage the control unit.

5 Operation device and actuator sockets



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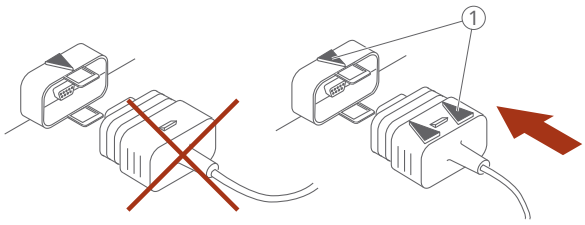
1	Operation device socket	2	Actuator 1 (optional: actuator 2)

✓ Ensure that the arrows on the plug and on the socket are aligned.

1. Insert the D-Sub plug of the operating device into the designated socket.

» When inserted, the cables are strain-relieved and sealed at the socket by the molded locking tabs. The locking tabs engage in the retaining brackets.

6 Inserting the plug correctly



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1	Alignment arrows		

Connecting the actuator

Unused connection sockets are sealed watertight at the factory with sealing stoppers. The sealing stopper must not be removed.

NOTICE

Incorrect lubricant

The use of incorrect additives may cause significant material damage.

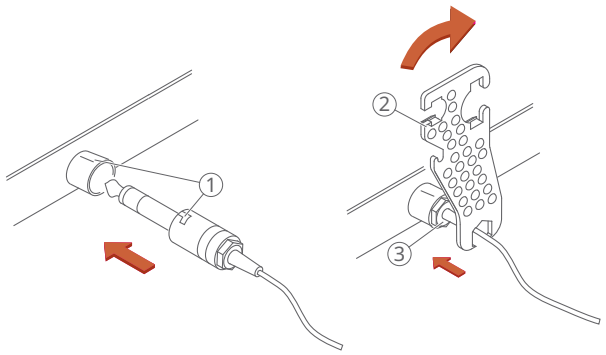
- Use only the auxiliary products listed by the manufacturer.

✓ Lightly grease the sealing rings of the plugs with Klübersynth VR-252 (order no. R50014).

✓ The slot in the plug is aligned with the marking on the control unit.

2. Insert the actuator plug into the connection socket and ensure that the sealing rings are no longer visible.
3. Lock the plug by turning it 30° to the right using the special wrench until it reaches the stop.
4. Optionally: repeat to connect an additional actuator.

7 Using the special tool



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1	Slot in the connector housing	2	Special tool (ZBG-140375)
3	Nut of the connector housing		

7 Commissioning

Authorized personnel

- Assembly and commissioning may only be carried out by qualified technical personnel.
- Work on the electrical system may only be carried out by trained, electrically skilled persons.

7.1 Charging the battery

⚠ CAUTION

Gases released during charging

Risk of health hazards or explosion due to gas accumulation.

- ▸ Only charge batteries in well-ventilated rooms and avoid moisture.

✓ Do not use connected devices during the charging process.

✓ The battery is connected to the control unit.

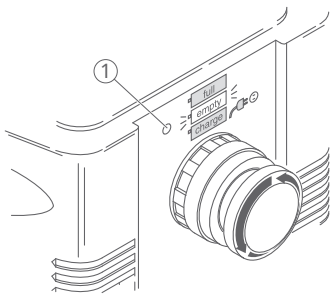
▸ Start the charging process by plugging in the mains adapter.

» The LED indicates the charging status.

3 Battery charge status

LED indicator	Charge status
Yellow	Battery is charging, mains voltage present
Yellow, flashing	Charge the battery, remaining capacity ≈ 20 %
Yellow, flashing with audible signal	Charge the battery, remaining capacity ≤ 20 % for at least 1 double stroke; afterwards the integrated deep-discharge protection blocks the actuator
Green	Batteries are charged, mains voltage present
–	Mains voltage not present, battery ready for operation

8 LED for battery charge status



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1	LED indicator

7.2 Current consumption under full load

The current consumption must not exceed the value specified on the actuator product label. If the current consumption is too high, the actuator is overloaded and may be damaged. An integrated overcurrent cut-off automatically switches off the actuator if the current consumption is too high.

- ▸ During initial commissioning, measure the maximum current consumption of the actuator under full load.

8 Operation

DANGER

Damaged plugs or damaged mains adapters

Danger to life from electric current

- Never touch a damaged mains adapter while the device is in operation, as it is supplied with AC 120 V or AC 230 V.
- Ensure that the circuit breaker is switched off before removing a defective plug from the socket. Check the mains adapter regularly for damage.

CAUTION

Incorrect operation

Risk of property damage and personal injury due to incorrect operation

- Ensure that the operating unit cannot be actuated unintentionally.

Preconditions for operation

The device controls 1 to 2 actuators. The power supply via the battery must be ensured.

Operation is only possible using the battery.

The battery must be sufficiently charged for operation. Operation with empty batteries is not possible.

Operation

Operation is performed using an operating device.

✓ The preconditions for operation must be met.

1. Press the corresponding button on the operating unit to retract or extend the associated actuator.

› The LED on the operating device illuminates green.

2. If the movement does not stop as soon as the button is released, immediately press the button for the opposite direction to stop the movement.

During actuator movement, the battery status is indicated on the control unit by the LED.

Emergency stop function

Activating the emergency stop switch interrupts the power supply to the actuators and stops the actuator immediately.

3. Press the emergency stop switch in case of immediate danger.

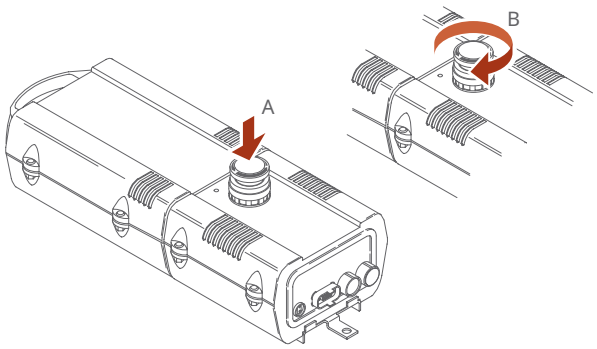
» The switch locks into position. The actuator can no longer be operated using the operating device.

✓ The hazard has been eliminated.

4. To release the emergency stop function, turn the switch clockwise.

» The actuator can then be operated again.

9 Pressing and releasing the emergency stop switch



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A	Press emergency stop switch	B	Release emergency stop switch

8

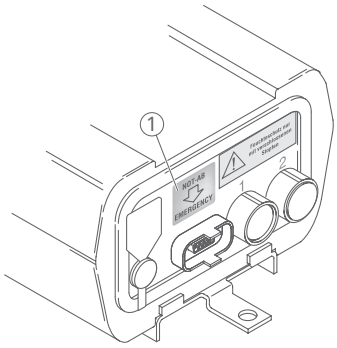
Emergency lowering (optional)

Unlike the emergency stop switch, the optional emergency lowering function is intended for use in the event of a malfunction. A defective control unit can be bypassed by activating the emergency lowering function. This causes the actuator to move to the lower end position. The emergency lowering function only applies to the actuator on channel 1.

✓ A defective control unit must be bypassed.

5. Press the yellow button on the control unit
6. Send the defective control unit to Schaeffler for repair.

10 Emergency lowering button



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1	Emergency lowering button		

9 Troubleshooting

The following section describes possible causes of malfunctions and the necessary measures for restoring functionality.

In the event of frequent malfunctions, shorten the maintenance intervals.

If a malfunction cannot be rectified with the measures described, contact Schaeffler Service.

Authorized personnel

- The measures described here may be carried out by the operator unless otherwise specified.
- Some tasks may only be performed by qualified personnel; this will be explicitly stated in the relevant fault description.
- Work on the electrical system may only be carried out by trained, electrically skilled persons.

Safety instructions

DANGER

Moving parts

Severe injury or death due to unexpected movement of the actuator.

- ▸ Before performing work on the system, disconnect the power supply, remove the battery, and secure the system against unintended reconnection.

DANGER

Risk of injury and property damage due to improper troubleshooting

The device is not designed for repair work. Improper troubleshooting may result in injury or property damage.

- ▸ Do not loosen screws on the device.
- ▸ Do not open the device.
- ▸ If malfunctions cannot be resolved by following the instructions below, disassemble the actuator and return it to Schaeffler for repair.

Procedure in the event of malfunctions

As a general rule:

1. In the event of malfunctions that could pose a direct danger to persons or property: Switch off the actuator or the control system immediately and secure it against being switched back on.
2. Determine cause of malfunction.
3. Depending on the type of malfunction: Have the malfunction rectified by qualified personnel.
4. Inform the persons responsible on site about the malfunction.

4 Malfunction

Malfunction	Possible cause	Remedy
Several actuators do not move	Emergency stop switch activated	▸ Release the emergency stop switch by turning it.
	Deep-discharge protection of the control unit activated: • indicator flashes yellow • operating device emits an audible signal when buttons are pressed	▸ Charge the batteries or replace the battery pack.
	No batteries inserted	▸ Insert batteries
	Battery not making contact	▸ Check that the batteries are correctly seated and positioned.
	Missing connector contact at the operating device plug	▸ Check the operating unit plug and reconnect it.

Malfunction	Possible cause	Remedy
Actuator does not move	Missing connector contact at the actuator	▸ Check the actuator plug and reconnect it.
	Actuator cable defective	▸ Check the cable and replace the actuator if necessary
Batteries are not charging.	Battery is fully charged, LED illuminates green	▸ Restart the charging process by briefly disconnecting the power supply or the battery.
	Batteries not inserted or incorrectly inserted, LED illuminates green	▸ Insert the batteries and check their position.
Actuator switches off during operation	Actuator overloaded in load direction	▸ Reduce the load on the actuator
	Batteries almost empty, LED flashes yellow when a button is pressed	▸ Charge the batteries or replace the battery pack
	Batteries empty, LED flashes yellow and an audible signal sounds when a button is pressed (battery deep-discharge protection)	▸ Do not continue using the device. ▸ Charge the battery immediately or replace the battery pack.

10 Maintenance

DANGER

Electric shock

Risk of serious injury or death due to improper maintenance

- Work on electrical systems may only be carried out by professional electricians.

DANGER

Unintentional restart

Risk of serious injury or death due to the power supply being switched on by unauthorized persons in the hazard area

- Before carrying out any work, disconnect the product from all power supplies.
- Secure the product against unintentional activation.

Maintenance work and repairs may only be carried out by qualified personnel.

Maintenance includes all activities required to keep the device in a functional condition. These activities include inspections, replacement of consumable materials, and cleaning.

The device is maintenance-free for the duration of its service life. The battery is excluded.

Carry out maintenance in accordance with standard IEC 62353.

1. Every 6 months, check the mains adapter, power cable, controller, housing, and operating unit for damage and proper functioning. A damaged housing does not provide IP protection. Damaged cables may lead to a short circuit.
2. During operation: if the battery is low, connect the device to the mains supply for 12 h. Complete discharge will destroy the batteries.
3. During storage: connect the device to the main supply for 12 h every 6 weeks.

Cleaning and disinfection

NOTICE

Risk of property damage due to water jets

Property damage

- Ensure that the device is not damaged by water jets. The device is protected against spray water in accordance with IPX4, but not against water jets. Do not expose the device to water jets.

Observe the following points during cleaning and disinfection:

- The actuator and operating device must be properly connected. Unused connections must be properly sealed.
- Max. cleaning temperature and drying temperature: +65 °C
- The wash water, including any added chemicals, must be pH-neutral.
- Acidic or alkaline wash water can destroy metallic and synthetic parts.
- Hand disinfection must be carried out using isopropyl alcohol only.

10.1 Carrying out the function test

The following functions must be checked regularly, depending on the frequency of use.

Mechanical damage

Check the housing for mechanical damage and cracks at least every 6 months. Regularly check the sealing edges for damage. Before each connection, check the sealing rings of the plugs on the operating devices and actuators for damage and replace them if necessary.

Current cut-off

Regularly check the current cut-off while the actuator is traveling to an end position. The control unit must switch off the actuator when the end position is reached, without the button on the operating unit being released. If the power supply is interrupted, a clicking sound can be heard in the control unit and the actuator motor stops.

Battery indicator and deep-discharge protection

To check the function of the battery indicator, insert a discharged battery pack into the control unit and press a button on the operating device. If the battery is empty, the yellow LED flashes when a button is pressed. Press the button until an audible signal indicates activation of the battery deep-discharge protection. After the signal tone, the actuator must be able to retract again. If a completely empty battery is inserted, the audible signal for the deep-discharge protection is emitted.

Emergency stop function

Test the emergency stop function by pressing the emergency stop switch while an actuator is being operated. The actuator must stop immediately.

11 Disassembling

Observe all safety regulations.

Authorized personnel

- Disassembly may only be carried out qualified technical personnel.
- Work on the electrical system may only be carried out by trained, electrically skilled persons.

Safety instructions

DANGER

Moving parts

Severe injury or death due to unexpected movement of the actuator.

- ▸ Before performing work on the system, disconnect the power supply, remove the battery, and secure the system against unintended reconnection.

WARNING

Risk of severe injury from improper disassembly

Stored residual energy, sharp-edged components, pins, and corners on individual parts or on the required tools can cause severe injuries if disassembly is performed improperly.

- ▸ Ensure sufficient space for disassembly before starting work.
- ▸ Exercise caution when working with exposed, sharp-edged components.
- ▸ Ensure that the disassembly area is clean and tidy. Avoid loosely stacked components or parts and tools lying on the floor which may pose a hazard.
- ▸ Disassemble components properly in accordance with applicable local regulations.
- ▸ Secure components to prevent them from falling or tipping over.
- ▸ Contact Schaeffler with any questions or concerns.

Disassembling the device

✓ Before disassembly, remove the battery pack.

✓ Disconnect all plug connections.

▸ Loosen and remove the fastening screws.

» The device can then be prepared for transport, storage, or disposal.

11.1 Removing the battery

- ▸ Pull the handle of the battery pack to remove it. Apply sufficient force when pulling to overcome the retaining spring.

12 Disposal

Observe the local regulations for disposal.

Observe the disposal regulations for rechargeable batteries in particular.

Dismantling instructions and shipping requirements can be found in the corresponding sections.

13 Technical data

Detailed information:

LA 1 | EWELLIX Lifting and Actuating Systems |
https://www.schaeffler.de/std/222A

For further information, contact Schaeffler.

13.1 Ambient conditions

Transport and storage

The product may only be transported and stored in its original packaging under the following ambient conditions:

- dry and dust-free environment, not outdoors
- protected from sunlight and UV radiation
- chemically non-aggressive environment
- temperature: −20 °C to +60 °C
- humidity: 5 % to 95 %, non-condensing
- air pressure: 700 hPa to 1060 hPa

If additional storage instructions are printed on the packaging that go beyond the requirements listed here, those instructions must also be observed.

Operation

The product may only be operated under the following ambient conditions:

- indoor use only
- temperature: +10 °C to +40 °C
- humidity: 5 % to 85 %, non-condensing
- air pressure: 700 hPa to 1060 hPa
- max. altitude above normal height null (NHN): 3000 m (MOPP)

14 Replacement parts and accessories

14.1 Accessories

5 Accessories

Designation	Plug	Ordering designation	Order number
Battery 4.5 Ah	–	ZBA-142211	0126153
Mains adapter AC 100 V ... AC 240 V	Euro	ZDV-142378-2500	0132841
Mains adapter AC 100 V ... AC 240 V	UL	ZDV-142381-2500	0132843
Wall charging station	–	ZLA-142221	0126159
Tool for connector (socket/D-Sub/mains connection cable)	–	ZBG-140375	0125322

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