ControlBox LIN-DC

EN **Operating instructions**
Please take care of the operating instructions!

12/2015, TN: 2011712

EN

Translation from the original German version.

All other documents in different languages are translations of the original version.

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1 General

1.1 Information on the Assembly Manual

The contents structure is based on the life stages of the ControlBox LIN-DC (hereinafter referred to as „device“).
The manufacturer reserves the right to make changes to the technical data stated in this Assembly Manual. In individual cases they may deviate from the respective device version without the information being categorically changed or losing validity. The current state of the technical data can be obtained from the manufacturer at any time. Any claims arising herefrom may not be asserted.
Deviations from the text and image statements are possible and are dependent on the technical development, equipment and accessories of the device. The manufacturer shall provide information on any deviant details on special versions via the sales documentation. Other details shall remain unaffected thereby.

1.2 Standards and guidelines

During the design of the device the fundamental requirements for health and safety were applied and provision was made for the appropriate legislation, industrial standards and regulations.
The safety element is confirmed by the Declaration of Incorporation (see chapter „Declaration of Incorporation“).
All information on safety in this refers to legislation and regulations currently valid in Germany.
All information in this Assembly Manual must be complied with at all times and to the full extent.
In addition to the safety notices in this Assembly Manual, the regulations applicable at the place of installation with regard to accident prevention, environment protection and occupational safety must be observed and adhered to. The guidelines and standards for safety evaluation can be found in the Declaration of Incorporation.

1.3 Intended use

The device is intended to control linear drives from the Elero Junior and Picolo 0 series with a rated voltage of 24 V DC and a rated current of 1 A. Only one drive can be connected to the device at a time.

The device includes a power supply unit, which converts the 230 V 1 AC input voltage to 24 V DC voltage. A radio receiver is also integrated, which converts the radio signals to operating commands.
An output stage is responsible for the motor control and monitoring. The limit stop or overload cut-off device is based on the current measurement and can be adjusted in the device using a rotary switch.

- Please note that radio equipment cannot be operated in areas with an increased fault risk (for e.g. hospitals, airports).
- The remote control is only permitted for devices and systems, in which a malfunction in the handheld transmitter or receiver does not pose a risk to people, animals or objects or this risk is covered by other safety devices.
- The operator is in no way protected from interference from other telecommunications systems and facilities (for e.g. by radio equipment which is operated properly in the same frequency range).
- Only connect radio receivers to devices and systems approved by the manufacturer.

Other fields of application must be agreed in advance with the manufacturer.

The device must not be used in areas where there is a risk of injury to personnel or in rooms in potentially explosive environments.

If a direct or indirect hazard to personnel cannot be ruled out, additional measures (e.g. covers, barriers, etc.) must be taken in order to minimise the potential risk accordingly.

The operator alone is liable for all damage arising from the non-intended use of the device. The manufacturer assumes no liability for personal injury and material damage caused through misuse or procedural errors, improper use and commissioning.
The device must only be operated by trained and authorised specialist staff who comply with all safety instructions.

The safe and error-free use and operating safety of the device can only be guaranteed on the basis of the intended use according to the information in this Assembly Manual.

Intended use includes observation of and adherence to all safety instructions specified in this Assembly Manual, as well as all applicable regulations of professional associations and the valid legislation regards environment protection. Adherence to the operating rules prescribed in this Assembly Manual also form part of the intended use.

1.4 Foreseeable misuse

Installation deviating from the intended purpose approved by the manufacturer is considered foreseeable misuse. The control cannot be used for safety-related functions.

1.5 Warranty and liability

In principle, the General Terms & Conditions of Sale and Delivery of the manufacturer apply. The Terms & Conditions of Sale and Delivery form part of the sales documentation and are transferred to the operator upon delivery. Liability claims for personal injury and material damage shall be excluded if they are the result of one or more of the following causes:

- Non-intended use of the device
- Improper assembly, commissioning or operation of the device
- Changes to the design and construction of the device without written permission from the manufacturer
- Operating the device with improperly installed connections and defective or improperly installed safety and protective equipment
- Non-compliance with safety regulations and notices in this Assembly Manual
- Exceeding the limits of the specified technical specifications

1.6 Customer Service - manufacturer

The device must only be repaired by the manufacturer in the event of a fault. The address to send the device to customer service can be found on the inside of the back page.
If you have not purchased the device directly from elero, please contact the manufacturer of the machine or the supplier of the device.

Before disassembling the device, the system must be secured mechanically and the device must be disconnected from the mains voltage. The device must not be separated from the system by force.

2 Safety

2.1 General safety notices

This Assembly Manual contains all safety notices that must be observed to avoid and prevent risks when working with the device in the individual life cycles.
Safe use of the device is guaranteed when all the specified safety notices are adhered to.

2.1.1 Structure of the safety notices

The safety notices in this document are identified with safety symbols and designed in accordance with the SAFE principle. They contain information on the type and source of risk, the possible consequences, as well as the prevention of the risk.
The following table provides a description of the degrees of risk with possible physical injury, as they are used in this Assembly Manual.

Symbol	Key word	Meaning
	DANGER	Warns of an accident that will occur if the instructions are not followed, which may lead to life-threatening, irreversible injuries or death.
	WARNING	Warns of an accident that may occur if the instructions are not followed, which may lead to serious, perhaps life-threatening, irreversible injuries or death.
	CAUTION	Warns of an accident that may occur if the instructions are not followed, which may lead to minor, reversible injuries.

The following table describes the symbols used in the present Assembly Manual, which are used for the graphic display of danger situations in connection with the symbol for the degree of risk.

Symbol	Meaning
	Risk of electrical voltage or electric shock: This symbol refers to risks associated with electrical currents.
	Risk of crushing and killing persons: This symbol refers to dangers associated where the entire body or individual limbs may become crushed or suffer injury.

The following table describes the situations used in this Assembly Manual where damage may occur to the product or refers to important facts, states, tips and information

Symbol	Key word	Meaning
	*CAUTION*	This symbol warns of possible material damage.
		This symbol refers to important facts and states, as well as to further information in this Assembly Manual. Furthermore, it refers to specific instructions which give additional information on or provide assistance in performing a process in a simpler manner.

The following is an example of the structure of a safety notice:

DANGER

Type and source of hazard

Explanation of the type and source of hazard

- Measures to avoid danger.

2.2 Safety principles

The device is built according to state-of-the-art technology and the generally accepted safety standards. The device is safe to operate. During the design of the device, the fundamental requirements for health and safety were applied and provision was made for the appropriate legislation, industrial standards and regulations. The safety of the device is confirmed in the Declaration of Incorporation.

All details pertaining to safety relate to the regulations from the European Union, which are valid at this time. In other countries the operator must ensure that the relevant laws and national regulations are adhered to.

In addition to the safety notices in this Assembly Manual, the generally applicable regulations regarding accident prevention and environmental protection must be observed and complied with.

The device must only be used when in perfect working order, for its intended use, and in compliance with the safety notices in this Assembly Manual. The device is designed for the application stated in the chapter „Intended use“. In the event of non-intended use, injury to the life and limbs of the user or a third party may result or the device may be impacted or other material damage caused. Accidents or near misses during use of the device which led or could have led to personal injuries and/or damage in the work environment must be reported directly to the manufacturer with immediate effect.

All safety notices specified in the Assembly Manual and on the device must be adhered to. In addition to these safety notices, the operator must ensure that all national and international regulations applicable in the respective country of use, as well as other binding regulations on operational safety, accident prevention and environment protections, are complied with. All work on the device must only be performed by trained and authorised personnel who have received the appropriate safety instructions.

2.3 General duties of the operator

- ❑ The operator is obliged to only operate the device in a fault-free and operationally safe working condition. He must ensure that, in addition to the safety notices in the Assembly Manual, the generally accepted safety and accident prevention regulations, the specifications of DIN VDE 0100 and the provisions on environment protection in the respective country of application, are observed and complied with.
- ❑ The operator is responsible that all work with the device is performed by trained and authorised personnel who have received the appropriate safety instructions.
- ❑ Ultimately responsible for accident-free operation is the operator of the device or the personnel authorised by the operator.
- ❑ The operator is responsible for adhering to the technical specifications.

2.4 Requirements of the personnel

- ❑ Each person who is commissioned to work with the device must read and understand the Assembly Manual in its entirety before he/she carries out the respective work. This also applies if the assigned person has previously worked on such a device or was trained to do so.
- ❑ All work on the device must only be performed by trained and authorised personnel who have received the appropriate safety instructions. Before starting any operations, personnel must be made aware of the hazards involved in handling the device.
- ❑ All persons must only perform work according to their qualifications. The areas of responsibility of the respective personnel must be clearly specified.
- ❑ Any personnel who have been commissioned to work with the device must have no physical limitations, limitations on attention or judgement, whether temporary or permanent (e.g. due to overtiredness).
- ❑ Minors or persons who are under the influence of alcohol, drugs or medication, are prohibited from working with the device, as well as performing all assembly, disassembly and cleaning work.
- ❑ Personnel must wear the suitable personal protective gear appropriate to the work and present work environments.

2.5 Safety notices on technical condition

- ❏ The device must be checked before installation for damage and proper condition.
- ❏ The operator is obliged to only operate the device in a fault-free and operationally safe working condition. The technical condition must always comply with legal requirements.
- ❏ If risks to persons or changes in the operational behaviour are detected, the device must be shut down immediately and the incident reported to superiors or operator.
- ❏ The device may only be connected to the energy supply lines intended and designed for this purpose. The permissible type of voltage and operating voltage are stated on the type plate.
- ❏ No changes, extensions or retrofitting may be performed to the device without the approval of the manufacturer.

2.6 Safety notices on transport, assembly, installation

Responsibility for the transport of the device principally rests with the respective transport company. The following safety requirements must be complied with during transport, assembly and installation of the device.

- ❏ When transporting the device, it should be secured according to the instructions accompanying the means of transportation employed.
- ❏ Only the point defined on the device may be used as a securing point.
- ❏ In principle, assembly and installation may only be conducted by trained and qualified personnel.

2.7 Safety instructions for operation

- ❏ The operator of the device is obligated to ensure the safe and proper state of the device before the initial commissioning.
- ❏ This is also necessary during the operation of the device at regular intervals determined by the operator.

2.8 Safety notices on electrical installation

- ❏ All work on electrical connections must only be performed by authorised electricians in accordance with the applicable regulations and provisions of the trade association, in particular the specifications in accordance with DIN VDE 0100. Furthermore, the national statutory regulations of the respective country of application must be observed.
- ❏ In the event of defects such as loose connections or defective or damaged cables, the device must not be operated.
- ❏ In the event of faults with the electrical equipment, the device must be shut down immediately.
- ❏ The device must be switched off before inspection, assembly and disassembly work.
- ❏ The device must not be hosed down with a high-pressure cleaner or a steam blaster.

The following must be checked before connecting the device to the power supply:

- ❏ Are all electrical connections, safety devices, safeguards, etc. properly installed, connected and earthed?
- ❏ Is the intended power connection designed according to the specifications in the electrical circuit diagram (voltage type, voltage level)?
- ❏ Has the supply line been isolated?

3 Product description

3.1 General

The device is intended for the operation of linear drives from the Junior and Picolo 0 series with a rated voltage of 24 V DC and a rated current of 1 A.

Only one drive can be connected to each ControlBox LIN-DC.

Use the given part numbers when ordering the ControlBox LIN-DC and its components.

Control	Part number
ControlBox LIN-DC	758558801

Tab. 1 Control part number

Handheld transmitter	Part number
LumeroTel2 pure white	282250001
VarioTel2 pure white	282450001
SoloTel2 pure white	286000006
MultiTel2 pure white	282550001

Tab. 2 Handheld transmitter part number

Various devices are also available as sensors for light, wind, rain and vibration.

Sensors	Part number
Sensero-868 AC Plus	289000006
Aero-868	284400006
Ventero-868	281900006
Lumero-868	286800006
Protero-868 traffic white	289600006

Tab. 3 Sensor part number

Other Elero radio components, which can be programmed on the Revio-868 SW or Revio-915 SW, are possible. The respective assembly instructions for the programming and operation of these devices are binding.

The assembly instructions of the handheld transmitter and sensors can be found online at:
www.elero.de/de/produkte/steuerungen/

3.2 Technical specifications

All information in this chapter refers to an ambient temperature of 20 °C.

3.2.1 Configuration of technical parameters

Technical specifications	ControlBox LIN-DC		
	Minimum	Nominal	Maximum
Voltage connection	205 V	230 V / 240 V 1AC	264 V
Recommended back-up fuse	6 A		
Mains supply line	3 x 1.5 mm²		
Power consumption	0.07 A	0.2 A	0.3 A
Power	69 VA		
Weight	approx. 550 g		
Housing	Plastic		
Housing colour	light grey	more RAL colours available on request	
Housing dimensions (L x W x H)	approx. 121 x 171 x 55 mm		
Installation position	Preferably downward screw connections		
Radio frequency	868 MHz / 915 MHz		
Radio system	elero bidirectional		
Max. number of transmitters	16		
Protection class	IP 65		
Operating temperature range	-20 °C	+20 °C	+50 °C

Tab. 4 Technical parameters of ControlBox LIN-DC

Technical data	Example of drive: Linear drive Picolo 0	
Nominal voltage of drive	24 V DC	
Force Speed	900 N 4.5 mm/s	1800 N 2 mm/s
Stroke length	70 - 400 mm	
Protection class of drive	IP 67	

Tab. 5 Technical parameters using the example of the Picolo 0 linear drive

CAUTION

Damage to the device through incorrect operation.

- When activating the device, a pause time of at least 0.5 seconds must be observed between shutdown and reactivation.
- A pause of at least 1 s must be observed if the direction is changed.

4 Assembly

WARNING

Risk of injury by electrical current.

Electric shock possible.

- Electrical work must only be performed by an authorised electrician.
- Before opening the housing the device must be switched off from the power supply.

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CAUTION

Damage to the device through incorrect assembly

- Observe the protection class.

4.1 Fitting

The device is intended for wall mounting. Use the dowels appropriate for your walls and the respective screws for securing the device.

The diameter of the screw heads for the housing mounting cannot exceed 8.5 mm.

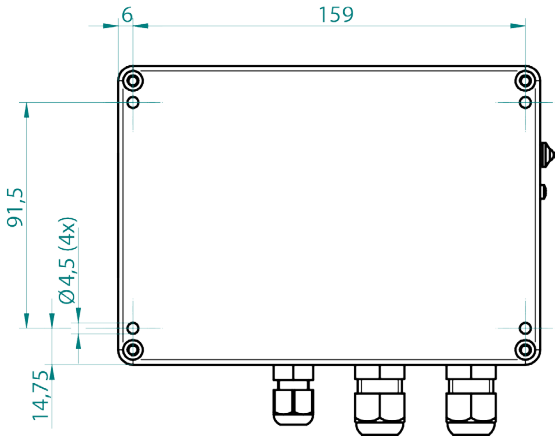

Fig. 1 Fixing dimensions of dowels

4.2 Electrical connection

The device must be connected according to the wiring diagram.

Only Elero drives with 24 V DC supply voltage and without an integrated overload cut-off device can be connected.

4.2.1 Pin assignment

The mains supply line (3 x 1.5 mm²) is connected at terminal X1. Ferrules must be used if using flexible lines. The ferrules can be inserted without a tool.

WARNING
Risk of injury from electrical current.
Electric shock possible.
- The mains voltage of 230 V AC is applied at the connections C V R.

A shutter switch can be optionally connected to terminal X2. The switch must be approved for nominal voltage of 230 V and have 2 normally open contacts. The connection cable used must also be suitable for 230 V AC.

Description of contacts of shutter switch:
- C: Common contact
- V: Signal for extending 
- R: Signal for retracting 

The drive is connected at the two outer connections of terminal X3 (brown + and blue -).

Please check the assignment of the direction for the desired movement direction of your system during the initial start-up. In the case of an incorrect assignment, the connections of the drive (+;-) at terminal X3 may be exchanged.

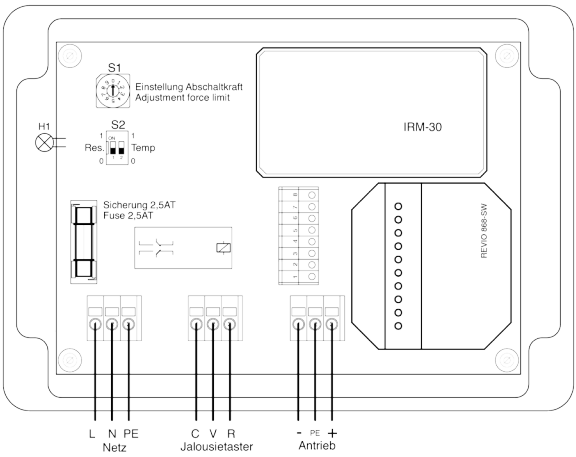

Fig. 2 Wiring diagram

4.3 Force limit

The shutdown force of the drive can be set in 10 stages using the S1 rotary switch. Using the example of the Picolo 0 the force values are shown in the table. These are guidelines which may vary depending on the temperature and installation situation.

An overload cut-off is indicated by the flashing of the LED H1 on the housing side.

Shutdown force using the example of Picolo-0 24 V DC at 25 °C			
Switch position	**Cut-off current in A**	**Shutdown force in N Variant C 4 mm/s**	**Shutdown force in N Variant D 2 mm/s**
0	0.2	70	200
1	0.3	150	400
2	0.4	300	800
3	0.5	450	1100
4	0.6	550	1400
5	0.65	630	1500
6	0.7	700	1650
7	0.75	780	1720
8	0.8	850	1800
9	0.85	900	1900

Tab. 6 Shutdown forces using the example of the Picolo 0 drive

4.4 Temperature limit

At an ambient temperature below -5 °C the drive is prevented from moving. This function can be activated via the DIP switch S2-2 (Temp) on the printed circuit board by switching to position 1.

A temperature termination below -5 °C is indicated by the continuous lighting of LED H1 on the housing side.

4.5 Revio-868 (radio receiver in housing)

4.5.1 Operating mode

The Revio-868-SW is operated in the shutter drive mode.
Your system can be controlled in Jog mode upon actuation via the radio or a connected button for less than 3 seconds. If the button of a transmitter is pressed for longer than 3 seconds, the output is switched on for 300 seconds. This lock can be terminated by pressing the Stop button or briefly pressing a control button.

4.5.2 Start-up

A prerequisite for the start-up is that the mains supply line and the drive have been connected to the ControlBox LIN-DC.

Proceed as follows for starting up the radio components:

1. Each time the mains voltage is switched on the ControlBox LIN-DC is in programming mode for 5 minutes.
2. Programme the corresponding transmitter within this time (→ see transmitter instructions).
3. When connected to the mains, a manual activation can be effected at any time using the shutter switch.

4.5.3 Delete all programmed transmitters using the example of the Vario Tel2 handheld transmitter

On the handheld transmitter at the same time press the Stop button, the Programme button P (back of device), as well as the up and down buttons for approx. 6 s. The status display lights up briefly in orange-green twice and then in red.

For other transmitters the respective transmitter instructions must be applied.

4.6 Troubleshooting

The device has the LED H1 to display the reason for the shutdown.

- Quick flashing of LED: Overload cut-off
- Continuous lighting of LED: Temperature termination

4.6.1 Drive is moved suddenly or blocked

If the corresponding transmitter was programmed and the drive is moved suddenly or blocked, this may be a result of the following:

- ❏ No radio connection to the Sensero: If no signal was received from a programmed Sensero-868 AC Plus for 15 minutes, the drive moves into a protective position.
- ❏ Wind barrier: If it is too windy the drive moves into a protective position and is blocked for at least 15 minutes.

❑ Activation of vibration sensor: If a programmed vibration sensor (Protero) is triggered, the drive moves into a protective position for 15 minutes. It can be moved back using the handheld transmitter, but moves back again to its protective position following the stop.

4.6.2 Other errors

Fault	Cause	Remedy
Drive not running	Incorrect connection	Check connection
Drive runs in wrong direction	• Directions are programmed incorrectly • Connections + and - at terminal X3 are reversed	• Delete transmitter and programme correctly • Change connections + and - at terminal X3
No radio reception	• Transmitter is not programmed • No mains voltage	• Programme transmitter • Switch back on mains
Poor radio reception	Unfavourable position of aerial or receiver	Change position of receiver or aerial

5 Declaration of Conformity

The complete Declaration of Conformity can be downloaded from our website: www.elero-linear.de/downloads.

6 Waste disposal

6.1 Scrapping

When scrapping the device, adhere to the international, national and local rules and regulations valid at the time of scrapping.

Ensure that material reusability, removal and separation of materials and sub-assemblies are also taken into consideration as there are also risks to the environment and health during recycling and disposal.

Material groups, such as plastics and metals of different types, must be sorted before submitting to the recycling and disposal process.

6.2 Disposal of electrical and electronic components

Disposal and recycling of electrical and electronic components must be carried out in accordance with the relevant laws and national directives.

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