

# Electronics Module

## Rivo™ I Controller

## NOTICE

Electronics Module Rivo™ I Controller as of version  
1.02

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<b>1</b>	<b>General notes .....4</b>	2.9	Safety instructions for specific operating phases ..... 16
1.1	General precept of non-discrimination ..... 4	2.10	Warranty conditions ..... 17
1.2	Target groups ..... 4	2.11	Liability for defects ..... 17
1.3	Information in the instruction manual ..... 4		
1.4	Associated documents ..... 5	<b>3</b>	<b>Delivery, Transport and Storage ..... 18</b>
1.5	Retention of the documentation ..... 5	3.1	Checking incoming goods ..... 18
1.6	Original version of the instruction manual ..... 5	3.2	Packaging ..... 18
1.7	New functions and firmware updates ..... 5	3.3	Scope of delivery ..... 18
1.8	Digital instruction manual ..... 5	3.4	Optional accessories ..... 19
1.9	Warnings on the device ..... 6	3.4.1	Modules for installation in the electronics module (module slot)..... 19
1.10	Device Id/type plate ..... 6	3.4.2	Expansion board for installation on the HMI .. 19
1.11	Important System Information - Recovery Key - ..... 7	3.5	Transport..... 19
1.12	Warnings and safety instructions ..... 8	3.6	Storage ..... 20
1.13	Notes and information ..... 9		
1.14	Design features ..... 9	<b>4</b>	<b>Technical data ..... 21</b>
<b>2</b>	<b>Safety .....10</b>	4.1	Electronics Module..... 21
2.1	Intended use ..... 11	4.2	Rivo™ Flex Mod Output Modules (optional) .. 24
2.2	Improper use ..... 12	4.3	Rivo™ Com-Board 485 (optional) ..... 25
2.3	General safety instructions ..... 12	<b>5</b>	<b>Design ..... 26</b>
2.4	Personnel qualification ..... 13	5.1	Rivo™ Backboard 4 (basic housing)..... 26
2.5	Spare parts/components ..... 15	5.2	HMI (housing cover)..... 27
2.6	Extensions and modifications ..... 15		
2.7	Electrical power ..... 15		
2.8	IT security ..... 15		

<b>6</b>	<b>Description and function .....</b>	<b>28</b>		
6.1	General description .....	28	6.16	Interfaces .....
6.2	Device configuration.....	29	6.16.1	USB interface.....
6.3	Ratio control.....	30	6.16.2	Firmware update via USB interface .....
6.4	Control parameters .....	32	6.16.3	RS485 interface (optional) .....
6.5	Display of dosing quantity .....	34	6.16.4	Ethernet interface (HMI).....
6.6	Digital inputs DI 1 and DI 2 .....	35	<b>7</b>	<b>Installation .....</b>
6.7	mA inputs, Rivo™ Backboard 4 .....	36	7.1	Requirements with regard to the
6.8	Connections to visualization systems .....	36	7.2	environment and installation location .....
6.9	Controller outputs .....	37	7.2.1	Installing the electronics module.....
6.9.1	Positioner (with feedback).....	37	7.2.2	Installation with top-hat rail.....
6.9.2	2-point pulse-duration controller for			Installation without top-hat rail
	dosing pumps .....	37		(wall installation).....
6.9.3	2-point pulse-frequency controller for		7.2.3	Installation drawing, Electronics Module .....
	solenoid pumps .....	38	7.3	Removing and fitting the housing cover .....
6.9.4	Analog 2-point output .....	38	7.4	Installation of Rivo™ Flex Mod Modules.....
6.10	mA outputs .....	38	7.5	Remove the battery insulator .....
6.11	Positioner feedback.....	39	7.6	Connecting the Ethernet cable.....
6.12	Digital outputs .....	39	7.7	Electrical installation.....
6.13	Relay outputs .....	40	7.8	Firmware update via USB interface .....
6.14	Messages and alarms .....	41	7.9	RS485 interface (optional) .....
6.14.1	Configuration .....	41	<b>8</b>	<b>Start-up .....</b>
6.14.2	Without Acknowledge.....	42	8.1	Initial commissioning and putting back into
6.14.3	ACK with reset .....	42		operation .....
6.14.4	Simple ACK.....	42	<b>9</b>	<b>Shut-down .....</b>
6.14.5	Safety functions.....	43		
6.15	Status LED states .....	43		

<b>10</b>	<b>Operation .....</b>	<b>63</b>	13.4	Cleaning .....	99
10.1	Display and control elements .....	63	13.4.1	Cleaning the housing .....	99
10.1.1	Icons .....	64	13.4.2	Cleaning the display .....	99
10.2	Password protection and user administration .....	65	<b>14</b>	<b>Dismantling and disposal .....</b>	<b>100</b>
10.2.1	Login - user administration (user level) .....	65	14.1	Dismantling .....	100
10.3	Resetting a password .....	67	14.2	Disposal .....	100
10.4	Application settings .....	68	14.2.1	General information .....	100
10.5	Setting operation mode .....	69	14.2.2	Used electrical/electronic equipment .....	100
10.6	Menu bar .....	69	14.2.3	Used batteries and used storage batteries ..	101
10.7	System menu .....	70	<b>15</b>	<b>Spare parts, accessories, retrofit kits</b>	<b>102</b>
10.7.1	Alarms/Messages .....	79	15.1	Spare parts .....	102
10.7.2	User Log in/Log out .....	79	15.2	Optional accessories .....	102
10.8	Service-Center .....	80	<b>16</b>	<b>Wiring Diagram .....</b>	<b>103</b>
10.9	Resetting a password in the Service Center ..	82	<b>17</b>	<b>Marking and approval .....</b>	<b>111</b>
10.10	Menu field measurement channel .....	83	17.1	CE mark .....	111
10.10.1	Measuring channel measurement - Flow .....	84	17.2	UKCA mark .....	111
<b>11</b>	<b>System messages .....</b>	<b>92</b>	<b>18</b>	<b>LICENSE AGREEMENTS .....</b>	<b>112</b>
<b>12</b>	<b>Troubleshooting .....</b>	<b>97</b>			
<b>13</b>	<b>Maintenance .....</b>	<b>98</b>			
13.1	Maintenance intervals .....	98			
13.2	Replace battery .....	98			
13.3	Replacing the fuses on the CPU board .....	99			

## 1 GENERAL NOTES

### WARNING

#### **Danger in the case of failure to observe the instruction manuals**

Possible consequence: fatal or serious injury and significant material damage.

- All persons working with the Rivo™ I Controller (Mod. E10) Electronics Module must have read and understood these instruction manual and the associated manuals.
- The warnings and safety instructions must be observed.
- The owner/operator is responsible for ensuring compliance with the relevant accident prevention regulations, other statutory provisions and the accepted rules of safety engineering.

### 1.1 General precept of non-discrimination

In the interest of better legibility, the linguistic forms male, female and diverse (m/f/d) are not used in parallel in this instruction manual. Nevertheless, all personal nouns and pronouns are understood to apply equally to all genders. We apologize for any inconvenience this may cause.

### 1.2 Target groups

Only trained and authorized specialist personnel are permitted to work on the Rivo™ I Controller (Mod. E10) Electronics Module. All electrical work (e.g. electrical installation, installation of Rivo™ Flex Modules) must be performed by a qualified electrician. The sections on assembly, installation, start-up, system messages, faults, maintenance, shut-down and dismantling are intended exclusively for trained specialist personnel. Operation, storage, transport and disposal can be carried out by instructed personnel.

### 1.3 Information in the instruction manual

For clarity, the Rivo™ I Controller (Mod. E10) Electronics Module is referred to in this instruction manual as the electronic module or the device. Details of the actual equipment may differ from those shown in the illustrations.

## 1.4 Associated documents

All operating, assembly and installation instructions for assemblies and components as well as Quick Guides must be observed. These manuals are included with the respective assemblies and supplementary components.

## 1.5 Retention of the documentation

The installation manual form part of the device and must be kept in the immediate vicinity of the device and accessible at all times. The instruction manual must be passed on to third parties with the device.

## 1.6 Original version of the instruction manual

These instruction manual is created in several languages. The German-language version is the original version. All other language versions are translations of the original version.

## 1.7 New functions and firmware updates

A new firmware version may contain new, enhanced or improved functions that are not yet or not fully described in these instruction manual. The latest version of the instruction manual can be downloaded online at [www.evoqua.com](http://www.evoqua.com).

See the Chapter “Digital Instruction Manual”.

## 1.8 Digital instruction manual

You can download the digital version of the instruction manual from the official website of Evoqua Water Technologies GmbH.

- Scan the QR code.
- OR enter the following link in your browser:  
<https://www.evoqua.com>  
Select the corresponding instruction manual and log in.



### 1.9 Warnings on the device

There is a warning label attached to the device. Read the warnings through carefully. Do not remove this label. If the label is missing or illegible, please contact your contractual partner.

### 1.10 Device Id/type plate

The type plate is affixed to the device. The type plate identifies the specific device. Please use or state this information if you need service support.

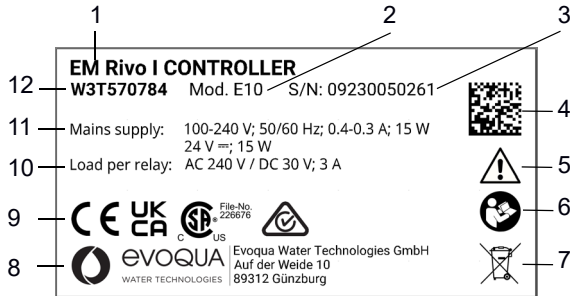


Fig. 1 For example, type plate

- 1 Device name
- 2 Series code/model code (e.g. Mod. E10)
- 3 Sales Order/position/serial number

- 4 DataMatrix code (contains part/serial number)
- 5 Safety information and warnings
- 6 “Read the operating instructions” symbol
- 7 “Disposal” symbol  
Disposal instruction: Device must not be disposed of with household waste!  
See Chapter “Dismantling and disposal”.
- 8 Manufacturer’s address
- 9 CE mark (conformity of the device)  
UKCA mark (UK Conformity Assessed)  
CSA mark (Canadian Standards Association)  
Australian approval (RCM - Regulatory Compliance Mark)
- 10 Electrical connection data: Supply voltage and supply output
- 11 Available inputs and outputs: Supply voltage
- 12 Article number



### 1.11 Important System Information - Recovery Key -

An “Important System Information“ label is included in the scope of delivery of the electronic module. This is located inside the housing.

The “Important System Information“ label contains device-specific data and the access data, such as the App Default for Login User and the Service Default for Login Service-Center, as well as the recovery key for resetting the access data.

The label must be kept in a safe place that is not accessible and protected against unauthorised access.

The access data for the software must be stored securely in accordance with your IT guidelines and must not be handed over to unauthorised persons.

If you lose the recovery key and the user administration access data, please contact your contractual partner.

#### **Recovery Key:**

The recovery key is only valid for a specific electronic module and cannot be transferred to other electronics modules. The recovery key is used to reset the user administration if the access data is lost.

The Service-Center menu can be used to reset the device to the factory settings and delete the customer-specific passwords.

See chapter Operation Service-Center.

#### **App Default:**

Access data (user/password) for the initial login of the user.

#### **Service Default:**

Access data (user/password) for the initial login in the Service-Center menu.

See chapter Operation Service-Center.

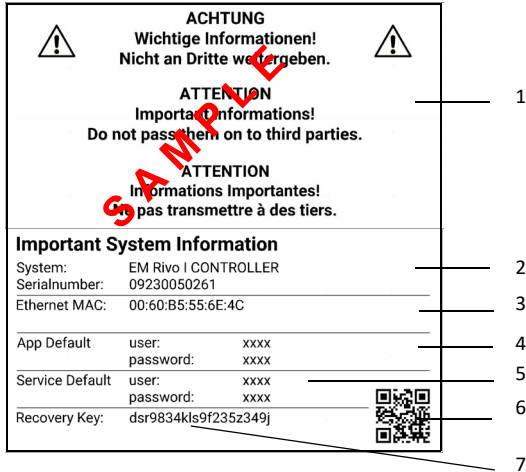


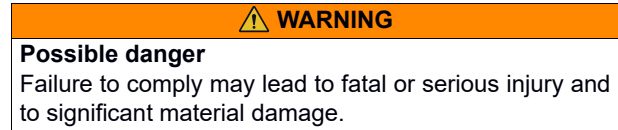
Abb. 2 Example Recovery Key

- 1 Multilingual notice
- 2 System and serial number
- 3 Ethernet MAC
- 4 App Default
- 5 Service Default
- 6 Code for the Important System Information
- 7 Recovery Key (example)

### 1.12 Warnings and safety instructions

The warnings and safety instructions are classified by means of a signal word and a pictogram. They comprise three parts:

- Nature and source of the danger
- Explanatory notes on nature and source of consequence if the instructions are not complied with
- Where applicable, measure to avoid the danger



**⚠ WARNING****Danger caused by toxic substances**

Failure to comply may lead to fatal or serious injury.

**⚠ WARNING****Danger caused by fire or explosive material**

Failure to comply may lead to fatal or serious injury.

**⚠ ATTENTION****Danger with low risk**

Failure to comply may lead to minor injury.

**CAUTION****Danger with the risk of material damage**

Failure to comply may lead to serious material damage and impair functionality.

**1.13 Notes and information****NOTICE****Notes and information**

Supplementary information and notes relevant to a specific topic or goal.



Notes and information



Read the instruction manual.

**1.14 Design features**

The following representations are used in these operating instructions:

**Instructions for action**



- 1 Carry out action
- 2 Consequence of action
- 3 Further consequence of action



=> result/goal of the action



**List**

- List/list item
  - List/list sub-item

2 SAFETY

 <b>DANGER</b>	
	<p><b>Danger fatal injury caused by electric shock</b> External voltages may still be connected even if the operating voltage is switched off. Possible consequence: fatal or serious injury.</p> <ul style="list-style-type: none"> <li>• All electrical work must be performed by a qualified electrician.</li> <li>• The Electronics module is not equipped with a mains switch and is in operation as soon as the supply voltage is applied. An external switch or circuit breaker with a clearly identifiable “Off” switch position is necessary.</li> <li>• The Electronics module may only be operated with the prescribed supply and control voltage (technical data).</li> <li>• In the event of a fault in the electrical power supply, switch the device off immediately.</li> <li>• Do not carry out work on active parts and equipment to which voltage is applied.</li> <li>• The device operates with liquids. For this reason, DIN EN IEC 62368/60950 must be observed when connecting the devices.</li> </ul>

 <b>WARNING</b>	
	<p><b>Danger caused by uncontrolled dosing and incorrect circulation output</b> If there is a shortage of sample water or the flow rate is too low, if the circulation is switched off or the circulation output is too low, there is a risk of uncontrolled dosing of chemicals. Possible consequence: fatal or serious injury.</p> <ul style="list-style-type: none"> <li>• Never disable the sample water monitoring - even temporarily, e.g. by bridging the signal input.</li> <li>• Chemical dosing must switch off if the circulation is switched off or if the circulation output or flow rate is too low. To ensure this, circulation output or flow rate monitoring must be installed in the system and connected to the electronic module.</li> </ul>

 <b>WARNING</b>	
	<p><b>Risk of injury due to chemicals</b> Dosing liquids are caustic and oxidizing. Possible consequence: fatal or serious injury.</p> <ul style="list-style-type: none"> <li>• Observe safety regulations and the prescribed protective clothing for handling chemicals.</li> <li>• All instructions in the product data sheet for the dosing medium must be complied with.</li> </ul>

## 2.1 Intended use

- The Rivo™ I Controller (Mod. E10) Electronics Module must be used exclusively for the quantity-proportional dosing of chemicals used, for example, in municipal water treatment and similar industrial process applications. The electronic module can control actuators (e.g. V10K gas dosing system), dosing pumps (Chem-Ad VPP) or analog actuators.
  - The Rivo™ I Controller Electronics module may only be operated in combination with actuators, dosing pumps and analog actuators approved by Evoqua Water Technologies GmbH.
  - Operational safety can only be guaranteed if the device is used in accordance with its intended purpose.
  - The device may only be used for the purpose defined in the contract and under the installation, operating, and environmental conditions specified in this instruction manual.
  - No substances may be used other than those described in this instruction manual (chemicals and prescribed calibration chemicals).
  - All inspection and maintenance work must be carried out at the specified intervals.
- The system must be protected against access by insufficiently qualified personnel by means of access restriction and the assignment of passwords. Corresponding security concepts must be provided to prevent unauthorized remote access.
  - All inspection and maintenance work must be carried out at the specified intervals. Inspections and control measures must be carried out at the prescribed intervals and documented!
  - Compliance with the intended use also includes reading this instruction manual and observing all the safety information, instructions and notes therein. The owner/operator of the installation bears sole responsibility for consequences of any use that does not conform with the installation's intended use.

### 2.2 Improper use

- The Rivo™ I Controller (Mod. E10) Electronics Module must not be used with actuators, dosing pumps and analog actuators other than those recommended and approved by Evoqua Water Technologies GmbH.
- Any use above and beyond the intended use.
- Use that deviates from the information in the technical data.
- Modifications to the device or parts of the device.
- Assembly and installation of or work on electrical components must be carried out by a qualified electrician.
- The unit must not be operated with flammable liquids.

### 2.3 General safety instructions

The manufacturer places great emphasis on safety when working on or with the device. This is already taken into account in the design of the installation and by the integration of safety features.

### Safety instructions

This instruction manual describes the safe and proper handling of the device. The specified safety notes and instructions, as well as the local accident prevention regulations and general safety regulations applicable to the area of use, must be observed. Additional industry-wide or in-house safety regulations also continue to apply. The operating company is under obligation to provide operating instructions in accordance with local, national and international specifications, regulations and legislation. Modifications to the device other than those described in this instruction manual are not permissible.

### State-of-the-art technology

The unit has been constructed in accordance with state-of-the-art technology and the accepted rules of safety engineering. However, if the unit is used by persons who have not been adequately instructed, danger to the life and limb of such persons or third parties and damage to the unit itself or to other property cannot be ruled out. Work not described in this instruction manual must be performed only by authorized personnel.

## 2.4 Personnel qualification

### WARNING

#### **Danger from unqualified personnel**

Possible consequence: fatal or serious injury and significant material damage.

- The company operating the overall system must ensure that only authorized and qualified personnel are permitted to work with and on the device and within their defined scope of authority.
- Unqualified personnel must be kept away from the device.
- The system must be protected against access by insufficiently qualified personnel by means of the assignment of passwords and access restriction.
- Work on electrical components must be carried out by qualified electricians.

It is a prerequisite that all persons assigned to work on or at the device are familiar with and comply with the work safety and accident prevention regulations.

The operating company must train all persons handling the system, device, components, substances etc. and inform them of possible hazards.

It is the responsibility of the operating company to monitor personnel qualification.

If the personnel do not have the necessary knowledge, they must be trained. The responsibilities for work on and with the device (assembly, installation, installation or de-installation of interfaces, operation, troubleshooting, start-up, shut-down, maintenance, dismantling as well as storage, transport and disposal) must be clearly defined and adhered to so that there is no unclear distribution of competencies from the point of view of safety.

Only persons who can be expected to perform their work reliably may work on and with the device. Refrain from any working method that affects the safety of persons, the environment or the device.

Persons who are under the influence of drugs, alcohol or medication affecting their ability to react must not work on or with the device. When selecting personnel, the age- and occupation-specific regulations applicable at the device's place of use must be observed.

The operator must ensure that unauthorized persons are kept at a safe distance from the device.

Personnel are under obligation to immediately report to the operating company any changes that occur in the device that affect safety.

#### **Instructed personnel**

Instructed personnel are persons who have received instruction and, where necessary, training on the tasks assigned to them and the associated hazards and have been informed of the necessary protective devices and protective measures.

#### **Trained user**

A trained user meets the requirements that apply to an instructed person and in addition, has received system-specific training.

#### **Qualified specialist**

Qualified specialist personnel are persons who meet the requirements that apply to a trained user and who, in addition, on the basis of their technical training, knowledge, experience and knowledge of the relevant standards and regulations, are able to assess the work assigned to them and recognize possible hazards. When assessing specialist training, a period of several years' employment in the respective field may also be taken into consideration.

#### **Qualified electrician**

Qualified electricians are persons who, on the basis of their technical training, knowledge and experience, as well as knowledge of the relevant standards and regulations, are able to assess the work assigned to them and recognize possible hazards. Qualified electricians must comply with the provisions of the applicable accident prevention regulations.

#### **IT specialist**

IT specialists (IT = Information Technology) are persons who, on the basis of their technical training, knowledge and experience, as well as knowledge of the relevant standards and regulations, are able to carry out work on computer systems, networks and network components as well as to independently recognize and avoid possible hazards.



## 2.5 Spare parts/components

Trouble-free operation of the unit is only guaranteed if original spare parts and components are used in precisely the combination described in this instruction manual. Failure to observe this instruction may lead to malfunctions or damage to the device.

## 2.6 Extensions and modifications

Never attempt to perform any modifications, extensions or conversions on the device that could impair safety without the written approval of the manufacturer.

## 2.7 Electrical power

Only qualified electricians or trained personnel supervised by a qualified electrician are permitted to perform any work on electrical components and must do so in accordance with valid electro-technical regulations. During normal operation, the electronic module and the flow-through assembly must remain closed. The electronic module may only be put into operation when the housing is closed, and must be connected to protective earth. Power cables must be connected in accordance with the wiring diagram.

## 2.8 IT security

The manufacturer offers IT security mechanisms for its products to support secure system operation. We recommend checking on a regular basis to see what information is available regarding IT security developments for your products. Information on this can be found on the Internet. Moreover, for the safe operation of an installation, it is also necessary to integrate the automation components into a holistic IT security concept which comprises the entire system and is in accordance with the state of the art in IT technology. Integrated products from other manufacturers should also be taken into account.

Unsecure connections via the Internet or WLAN are not permitted.

During commissioning of the device, the factory-configured passwords and user names should be replaced with individual ones and the user administration enabled.

#### 2.9 Safety instructions for specific operating phases

- Never employ any working methods which could affect safety!
- All system components must be correctly installed and meet the requirements.
- Only operate the electronic module when the housing is closed.
- The device poses hazards to persons and property. These hazards may arise due to parts carrying voltage or the incorrect dosing of chemicals.
- Only qualified electricians or trained personnel supervised by a qualified electrician are permitted to perform any work on electrical components and must do so in accordance with valid electro-technical regulations.
- Avoid setting up and operating the equipment where there are strong electromagnetic fields. Take appropriate measures to ensure electromagnetic compatibility (EMC) with other devices.
- Inspect the device at least once daily for externally visible damage and faults! Inform the responsible person/authority immediately of any detected changes (including any changes in the operating performance)!
- In the event of malfunctions, switch the device off immediately! Have malfunctions remedied immediately!
- Connect disconnected cables in accordance with the wiring diagram.
- During installation and maintenance work, secure the device against being switched back on!
- If stipulated, disconnect all parts of the device from the power supply before performing any inspection, maintenance or repair work. Then first test the disconnected components to ensure they do not carry any voltage.
- Use only original fuses with the prescribed rating!
- Observe the safety regulations applicable to the device when handling auxiliary materials and chemical substances. Remove leaked auxiliary materials with a suitable binding agent or wipe them up with a cloth. Danger of slipping! Collect auxiliary materials separately and dispose of them appropriately in accordance with the relevant national regulations.
- Never use corrosive cleaning agents (e.g. isopropyl alcohol, spirit, scouring agents) and do not clean using high-pressure steam!

## 2.10 Warranty conditions

The following must be observed for compliance with warranty conditions. If any of the conditions listed are not met, the warranty is void.

- Assembly, installation, start-up, troubleshooting, maintenance, shut-down and dismantling must be carried out by the manufacturer or qualified specialist personnel, e.g. from contracted companies
- Intended use
- Observation of the operational parameters and settings
- Operation, storage, transport and disposal of the unit must be carried out by qualified specialist personnel or instructed personnel
- Only approved calibration chemicals may be used
- The device must not be exposed to frost or explosive environments.
- The prescribed maintenance work must be carried out
- Use of original spare parts

## 2.11 Liability for defects

Liability for defects is regulated by the general terms and conditions of supply or by special contractual agreements. To preserve the liability for defects, the operating and environmental conditions, and the operating and maintenance regulations described in this instruction manual must be observed. If they are not observed, the right to claim under liability for defects is rendered invalid.

## 3 DELIVERY, TRANSPORT AND STORAGE

### 3.1 Checking incoming goods

- 1 Check transport packaging. Please notify the transport company immediately in the event of damage, as your rights to compensation will otherwise be lost.
- 2 Check that the consignment is complete and undamaged. Pay attention to small parts. If a component is damaged, please contact your contractual partner immediately.

### 3.2 Packaging

Packaging is reusable waste which must not be disposed of with household waste, but must be collected and disposed of separately, e.g. at public collection points. If necessary, contact your regional or local authorities for details of collection points and options for separating and collecting waste.

### 3.3 Scope of delivery

Article number	Designation
W3T570784	Rivo™ I Controller Electronics Module (Mod. E10)
W3T570786	Accessory set EM E10 (incl. PDA pen for touch panels)
W3T173182	Assembly accessories
W3T597263	Instruction Manual, English
--	Label "Important Safety Information" (Recovery Key)

### 3.4 Optional accessories

#### NOTICE

Please contact our customer service or visit our online store if you need any spare parts.

#### 3.4.1 Modules for installation in the electronics module (module slot)

Article number	Designation
W3T557914	Rivo™ Flex Mod 2Rel-2DO Relay module for activation of dosing outputs and alarms
W3T557869	Rivo™ Flex Mod 2AO-mA mA signal output module, 2-channel

#### 3.4.2 Expansion board for installation on the HMI

Article number	Designation
W3T583003	Rivo™ Com-Board 485

### 3.5 Transport

#### ATTENTION

##### **Danger due to impact or breakage**

Possible consequence: Injury or material damage.

- Follow the instructions and warnings on the packaging.
- Protect the device against impact during transport and transport it in the original packaging. Keep the packaging until the system has been commissioned and put into operation.
- Observe instructions on the packaging for the correct positioning of the device.
- Do not expose the device to shocks, moisture, rain, frost, heat or direct sunlight.
- Observe the specified temperatures for transport and storage (see Technical Data).

#### 3.6 Storage

##### **ATTENTION**

##### **Danger caused by incorrect storage**

Incorrect storage can impair the functionality of the device.  
Possible consequence: Injury or material damage.

- Store the device in dry condition in a dust-free environment and protected against moisture.
- Do not store the device outdoors or expose it to aggressive media, and protect it against direct sunlight and mechanical damage.
- Observe the specified temperatures for storage (see Technical Data).
- Regularly check the general condition of the device and the packaging.

## 4 TECHNICAL DATA

### 4.1 Electronics Module

Rivo™ I Controller electronics module (Mod. E10)		
Article number	W3T570784	
Area of application	Treatment of drinking water and waste water, the treatment of industrial and process water, cooling water circuits	
Housing	Dimensions (WxHxD)	220 x 305 x 153 mm
	Weight	approx. 3.7 kg
	Protection rating	IP66
	Mains connection	<ul style="list-style-type: none"> <li>• 100 ... 240 V AC <math>\pm</math> 10% 50 ... 60 Hz or 24 V DC</li> <li>• -15 ... +20 %, 15 W</li> </ul>
Display	4.3" graphic color display with backlit LED and resistive touchscreen	
Insulation	Overvoltage category	2
	Contamination level	2
	Protection category	1
Approvals	CE, CSA	
Operating conditions	Ambient temperature	0 ... 50 °C (32 ... 122 °F)
	Relative humidity	< 80 %, non-condensing, moist environment
	Environment	No direct sunlight, use indoors
	Atmospheric pressure	75 ... 106 kPa
	Max. working height (altitude)	2000 m
	Ambient noise	<45 dB

Transport and storage temperature	-20 ... +70 °C (-4 ... 158 °F) Store the device in dry condition in a dust-free environment and protected against moisture. Do not store the device outdoors or expose it to aggressive media, and protect it against direct sunlight and mechanical damage.
Digital inputs (Backboard 4)	<ul style="list-style-type: none"> <li>• 2x for voltage-free contact (internal 24 V DC power supply)</li> <li>• Freely selectable function in menu</li> <li>• When input open: DI active</li> <li>• When input closed: DI inactive</li> </ul>
Measurement inputs (Backboard 4)	<ul style="list-style-type: none"> <li>• 1x positioner position feedback Potentiometer 1kOhm or 5kOhm, 0 ... 1 V, 0 ... 10 V, 0 ... 20 mA (adjustable via the menu)</li> </ul>
	<ul style="list-style-type: none"> <li>• 1x mA input for flow rate 0 ... 20 mA/4 ... 20 mA (electrically isolated)</li> </ul>
	<ul style="list-style-type: none"> <li>• 1x mA input for external setpoint or dosing factor (electrically isolated)</li> <li>• 0 ... 20 mA/4 ... 20 mA</li> </ul>



Relay outputs (Backboard 4)	Version	<ul style="list-style-type: none"> <li>• 2x changeover contact with integrated fuse, replaceable</li> <li>• Type TR5 3,15 A T</li> </ul>
	Nominal breaking capacity	<ul style="list-style-type: none"> <li>• 3A 250V AC, 1250VA max. (resistive load)</li> <li>• 1A 250V AC, 250VA max. (<math>\cos \phi = 0.4</math>)</li> <li>• 3A 30V DC, 150W max. (resistive load)</li> </ul>
	Max. switching voltage	<ul style="list-style-type: none"> <li>• 250V AC / 30V DC</li> </ul>
	UL/CSA rating	<ul style="list-style-type: none"> <li>• 3A, 125/250V AC (general use)</li> <li>• 3A 30V DC (resistive)</li> </ul>

**NOTE**

When connecting inductive or capacitive loads (e.g. pump with integrated switching power supply), an additional power relay with suitable specification must be provided. Each relay output has an integrated 3.15 A fuse as overcurrent protection.

Typical use of the relay: Enabling contact for external alarm or activation of the dosing devices or dosing pumps. If the relay is used to switch inductive loads with direct voltage, the load must be equipped with a suppressor circuit against overvoltage (free-wheeling diode etc.).

## 4.2 Rivo™ Flex Mod Output Modules (optional)

Rivo™ Flex Mod 2 Rel-2DO		
Article number	W3T557914	
Description	Relay module for activation of dosing outputs and alarms	
Relay outputs (only if Rivo™ Flex Mod 2 Rel-2DO is used)	Version	<ul style="list-style-type: none"> <li>• 2x changeover contact with integrated fuse (5 A, not replaceable)</li> </ul>
	Nominal breaking capacity	<ul style="list-style-type: none"> <li>• 3A 250V AC, 1250VA max. (resistive load)</li> <li>• 1A 250V AC, 250VA max. (<math>\cos \phi = 0.4</math>)</li> <li>• 3A 30V DC, 150W max. (resistive load)</li> </ul>
	Max. switching voltage	<ul style="list-style-type: none"> <li>• 250V AC / 30V DC</li> </ul>
	Max. switching current	<ul style="list-style-type: none"> <li>•</li> </ul>
	UL/CSA rating	<ul style="list-style-type: none"> <li>• 3A, 125/250V AC (general use)</li> <li>• 3A 30V DC (resistive)</li> </ul>
<b>NOTE</b>		
<p>When connecting inductive or capacitive loads (e.g. pump with integrated switching power supply), an additional power relay with suitable specification must be provided. Each relay output has an integrated 5 A fuse as overcurrent protection.</p> <p>Typical use of the relay: Enabling contact for external alarm or activation of the dosing devices or dosing pumps.</p>		
Digital outputs (only if Rivo™ Flex Mod 2Rel-2DO is used)	<ul style="list-style-type: none"> <li>• Optocoupler output for connection of enabling inputs to dosing systems, dosing pumps, electrolysis systems</li> <li>• Max. ext. power supply 24 V DC</li> <li>• max. current 20 mA</li> </ul>	

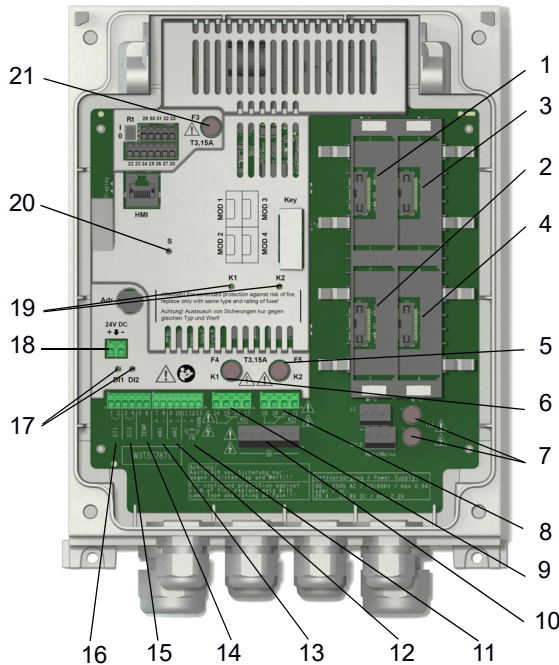
<b>Rivo™ Flex Mod 2AO-mA</b>	
Article number	W3T557912
Description	mA signal output module, 2-channel
Analog outputs (only if Rivo™ Flex Mod 2AO-mA is used)	<ul style="list-style-type: none"><li>• 2-way mA output module 0/4 to 20 mA</li><li>• Freely configurable signal assignment via menu</li><li>• Load max. 500 ohm, accuracy &lt; 0.5 % FS</li><li>• Integrated load monitoring</li><li>• Galv. isolated up to 50 V relative to earth</li></ul>

#### 4.3 Rivo™ Com-Board 485 (optional)

<b>Rivo™ Com-Board 485</b>	
Article number	W3T583003
Interface	RS485 interface with Wallace & Tiernan protocol for connection to OPC server or control system for data visualization

5 DESIGN

5.1 Rivo™ Backboard 4 (basic housing)



**NOTICE**

For module configuration, see chapter Installation of Rivo™ Flex Mod Modules.

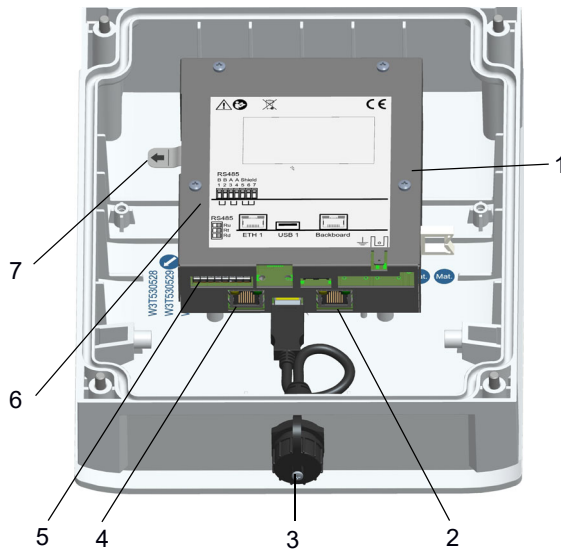
Observe assignment of the module slots (sequence). Status LED states of the Rivo™ Flex Mod Module, see chapter Description/Function Status LED states.

- 1 Slot for Rivo™ Flex Mod - not used
- 2 Slot for Rivo™ Flex Mod - not used
- 3 Slot for Rivo™ Flex Mod - MOD 3 (relay module)
- 4 Slot for Rivo™ Flex Mod - MOD 4 (mA output module)
- 5 Fuse for relay 2
- 6 Fuse for relay 1
- 7 Mains fuses
- 8 Terminals for relay 2
- 9 Terminals for relay 1
- 10 PE connection terminals
- 11 Feedback input for actuator
- 12 mA input 2
- 13 mA input 1
- 14 Temperature input
- 15 Digital input 2
- 16 Digital input 1
- 17 Status LEDs of the digital inputs
- 18 24V DC connector
- 19 Status LED of relays K1/K2
- 20 Status LED
- 21 24V DC internal fuse

## 5.2 HMI (housing cover)

### NOTICE

Figure shows the HMI including optional expansion board



- 1 HMI cover
- 2 Connection to the Backboard 4
- 3 USB 1
- 4 Ethernet 1
- 5 RS485 terminal strip
- 6 RS485 switch bus termination/Symmetry
- 7 Battery Insulator

## 6 DESCRIPTION AND FUNCTION

### 6.1 General description

The electronics module Rivo™ I Controller (Mod. E10) is a special control device for quantity-proportional dosing of chemicals in the treatment of drinking water and the industrial treatment of process water and water.

Based on a flow signal and an adjustable dosing factor, the electronics module determines the control signal for dosing. Via position feedback, it regulates the exact position of the positioner and allows correction of the dosing rate in the case of non-linearity of the gas dosing device. The control of further dosing devices, for example dosing pumps and solenoid pumps, is possible.

Typical applications are:

- quantity-proportional dosing of disinfectants (ratio control)
- quantity-proportional dosing of disinfectants with linearization of the actuator (with positioner)

The electronics module is used in:

- the treatment of drinking water
- the treatment of waste water
- cooling water circuits
- the treatment of industrial and process water

Possible signal inputs are:

- external mA signal for flow measurement
- actuator feedback
- 2 digital inputs
- mA signal for optional external dosing factor specification

The dosing quantity is determined depending on the flow signal and an adjustable dosing factor and is output via mA output (optional) or relay.

Controller outputs for positioners, dosing pumps, solenoid pumps, analog mA output are available.

The functions safety functions are integrated in the controller with the corresponding configuration:

- Safety deactivation if dosing tank signals that it is empty
- Dosing time delay
- External stop with digital input
- "Positioner closed" function in the event of a power failure (only if actuator has external power supply)
- Password protection or access restriction

## 6.2 Device configuration

Up to two additional Rivo™ Flex Modules can be installed at slots 3 to 4.

- 1x Rivo™ Flex Mod 2Rel-2DO (relay module for activation of alarms)
- 1x Rivo™ Flex Mod 2AO-mA (mA signal output module, 2-channel)

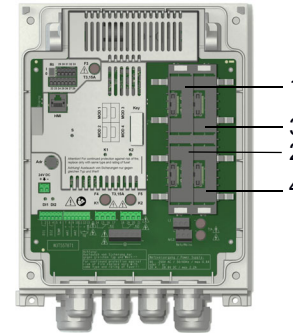


Fig. 3 Section, Rivo™ Backboard 4

- 1 Slot for Rivo™ Flex Mod - Mod 1 (not used)
- 2 Slot for Rivo™ Flex Mod - Mod 2 (not used)
- 3 Slot for Rivo™ Flex Mod 2Rel-2DO
- 4 Slot for Rivo™ Flex Mod 2AO-mA

#### 6.3 Ratio control

The ratio control of the Rivo™ Controller I is used exclusively for quantity-proportional activation of dosing devices.

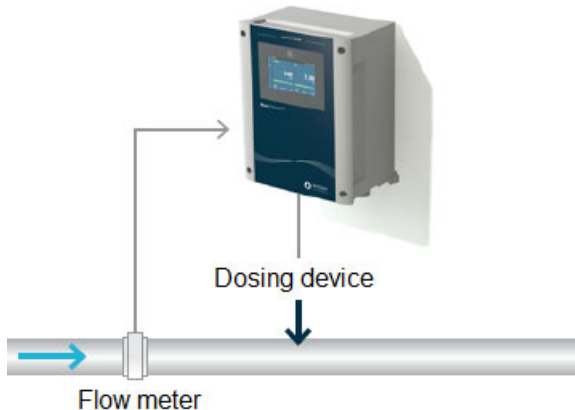


Fig. 4 Ratio control

The dosing rate of the connected device is controlled proportional to the flow in dependency on a measuring signal (external flow control signal) and an adjustable dosing factor. It is possible to compensate for the non-linearity of the dosing device via a maximum of 11 calibration points. The display of the dosing quantity is freely configurable for the specific system, with adjustable display format and unit.

#### Module equipment:

The electronics module required no additional modules. Optionally, a relay module or mA output module can be used to provide additional outputs.

#### Input signals:

- Flow measurement (0/4 to 20mA), scalable measurement range with unit

#### The following dosing outputs are possible:

- Dosing pump
- Pulse pump
- Positioner with feedback 1kOhm / 5kOhm / 0 bis 10 V / mA signal
- Analog mA output (only with optional use of the Rivo™ Flex Mod 2AO-mA)



Operating principle of the ratio control:

Using the flow sensor with linear mA output signal, the flow rate in a pipe is measured and the dosing rate adjusted proportional to the flow. Settings for the flow signal are made via the "Application Bar".

#### NOTICE

If the measuring range end value of the flow meter is not equal to the actual, maximum flow, the flow signal must be adjusted. To do this, an upper calibration point input is entered as an mA value corresponding to the mA signal at maximum flow. A further value, to be displayed as max. display value for the flow rate, must be entered as upper calibration point output.

For example:

Measurement range flow meter = 5000 l/h

Actual maximum flow rate = 2500 l/h of the controlled system (corresponds to 50 % of the measuring range of the flow meter)

Input signal = 4 ... 20 mA (output, flow measurement)

Upper calibration point input signal = 12 mA (corresponds mathematically to 50% of the mA signal range)

Upper calibration point output signal = 2500 l/h

The ratio between control variable flow  $W_q$  and dosing output is defined via the internal dosing factor.

The setting range allows values from 0 to 400 %.

If a positioner with feedback signal is used as a dosing output, it can be linearized with several data points. At least two points are necessary (0/100%). They can be calibrated manually or via the automatic positioner calibration function (see Chapter 10.8 Positioner calibration).

If a positioner with position feedback  $Y_m$  is used, it is essential to calibrate the position during startup. 2, 3, 6 or 11 data points with firmly defined data points are possible.

The number can be defined under:

Menu - Dosing >  $Y_m$  calib. points

The data points must then be set:

Menu - Dosing -  $Y_m$  calib. manual

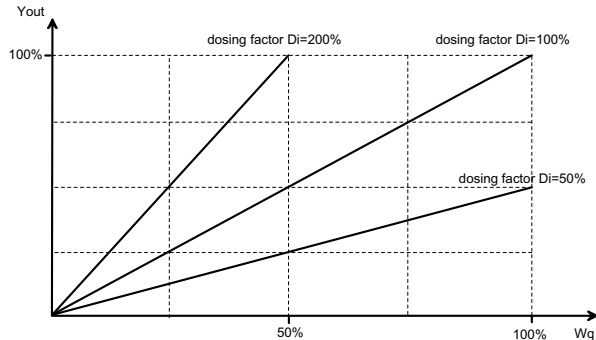
In this operation mode, the controller output is calculated as follows:

<b><math>Y_{out} = W_q \times DF</math></b>	
$W_q$	Control variable 1 flow rate in %
DF	Set dosing factor in %

#### NOTICE

If a dosing factor >100% is selected, the maximum dosing quantity is already reached at flow rates of less than 100%, i.e. it may not be possible to reach the desired dosing quantity with higher flow rates.

The graph below shows the output dosing quantity based on the flow rate  $Wq$  and the set dosing factor.



#### 6.4 Control parameters

Control parameters are input variables that determine the control functions of a controller. Different parameters apply to each type of controller.

##### Dosing factor

This parameter determines the dosing rate in relation to the flow rate.

##### Switch-off threshold

This parameter can be used to define a minimum flow rate of the controlled system at which the dosing switches off if the flow rate falls below this value.

##### Bumpless-Transfer

This parameter enables the current dosing capacity to be transferred to the following operating mode or controller mode when the operating mode and controller mode are changed. This keeps the dosing and therefore the current measurement stable. The function can be activated or deactivated once or permanently.

**Dosing delay time**

The dosing delay time delays the start of dosing after switching on the appliance and after changing the operating mode.

**Safety MAN. Mode**

If this parameter is set to ON, dosing also stops in manual mode if the sample water flow is too low or if an external stop occurs.

**Source dosing factor**

This parameter defines the source of the dosing factor active for the control. This can either be the internally set dosing factor of the menu setting or the dosing factor as an external mA signal input or interface interface.

**Ym calibration**

This parameter is only possible for dosing output positioner with feedback.

Adjust the positioner feedback signal to 0 % and 100 % dosing capacity. When automatic Ym calibration is started, the positioner moves to positions 0 % and 100 % and calibrates both positions with the Electronics Module.

With manual calibration of the up-to-11 positions, all positions must be shifted to manually and saved in the menu using the Enter key.

**Feedback Threshold**

This parameter defines the accuracy of the positioning of the servomotor with feedback.

#### **Tp**

Meaning: Cycle period

Display: Seconds (s)

Explanation: The parameter Tp only applies to dosing pumps.

The cycle period Tp defines a switching period, which must be coordinated with the respective pump type.

Setting range: The parameter Tp can be set from 10 to 180 s.

Example:

Fast dosing pumps correspond to a low Tp;  
slow dosing pumps correspond to a high Tp.

The control parameter Tp must always be adjusted to suit the pump employed:

Dosing pump strokes/ min	Tp value
up to 20	120
20 to 40	100
40 to 80	60
80 to 125	30
125 to 200	15

#### **6.5 Display of dosing quantity**

The electronics module allows a freely configurable dosing quantity display (Yout). In the menu, the dosing quantity can be left as a value 0 to 100% or freely configured as a dosing quantity, e.g. 0 to 10.0 l/h, 0 to 4.0 g/h, etc. Format and unit are freely selectable - see menu on the device.

## 6.6 Digital inputs DI 1 and DI 2

### CAUTION

#### **Danger caused by external voltages at the digital inputs**

Possible consequence: Serious material damage.

- Do not apply external voltages at the digital inputs.

There are two integrated digital inputs on the Rivo™ Backboard 4. They are provided for connection of voltage-free contacts (< 100 Ohm) and are supplied internally with 24 V.

The functions of the digital inputs can be configured for the specific customer application in the menu.

It is possible to influence the controller or trigger alarms. Various functions can be assigned to the digital inputs. With the help of a voltage-free enabling contact, e.g. external stop, it is possible to realize the various functions:

- Alarm (freely configurable)
- Ext. stop: Dosing is switched off.  
The positioner moves to 0 %.

- Empty signal contact of the chemical tank(s).  
The dosing pump is switched off.  
The positioner moves to 0 %.
- Change-over between internal and external dosing factor.

### NOTICE

When the contact closes, restart of the controller may be delayed due to the dosing delay time. In as-delivered status, the digital inputs are disabled. To activate the function, configure the digital input in the menu. The digital inputs can also be assigned as alarms.

The digital inputs can be configured directly or inversely to switch as normally closed or normally open contacts in the active state.

#### 6.7 mA inputs, Rivo™ Backboard 4

There are two integrated mA inputs on the Rivo™ Backboard 4. mA input 1 is used to record the flow signal as a 0 to 20 mA or 4 to 20 mA signal. The input signal can be freely configured in the menu (see menu Input/Output). Format, range and unit are freely selectable. mA input 2 is used to record an external dosing factor specification via a 0 to 20 mA or 4 to 20 mA signal. The mA signal corresponds to a dosing factor of 0 to 400%.

#### 6.8 Connections to visualization systems

The following options are available for connecting the electronics module to a higher-level visualization or control system:

- Ethernet interface with Modbus TCP and HTTP protocol (standard)
- Optional 2-way mA signal output module “Rivo™ Flex Mod 2AO-mA”
- Optional “Rivo™ Com-Board 485” expansion board with RS485 interface (Wallace & Tiernan protocol). See Chapter Interfaces .

#### NOTICE

For detailed information on the interfaces, see the separate installation manual “Rivo™ communication interfaces”. You can request this installation manual from us or download it from our homepage.

## 6.9 Controller outputs

The electronics module supports the activation of various dosing systems via relay or mA-signal outputs. Slots are provided for optional expansion with further relays.

The following dosing outputs can be activated:

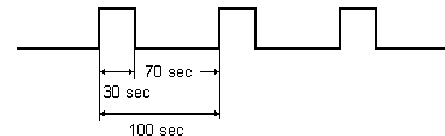
Controller for	Type	Parameter designation	Action
Positioner with feedback signal	3-point	Positioner with Ym	Dosing ↑ or ↓
Motor dosing pump (pulse-duration controller)	2-point	Dosing pump 2p	
Solenoid pump (pulse-frequency controller)	2-point	Solenoid pump 2p	
Dosing pump with mA input	2-point	Analog output 2p	

### 6.9.1 Positioner (with feedback)

With the selection of the positioner, for example, it is possible to use chlorine gas dosing in combination with a positioner as an actuator of a chlorine gas dosing system. If actuator feedback is present, it must be calibrated during startup. Potentiometers 1 kOhm/5 kOhm or 0 to 1 V or 0/4 up to 20 mA signals can be connected as actuator feedback (see Chapter 6.11 Positioner feedback). Linearization of the actuator via several calibration points is possible here.

### 6.9.2 2-point pulse-duration controller for dosing pumps

The dosing pump is switched on for the calculated time within an adjustable cycle period TP (relay contact). The cycle period is mainly determined by the reaction time of the connected system and entered as the cycle period TP.



Example:

Cycle period TP = 100 s

Duty cycle 30 s

Output value  $Y_{out} = 30\%$

Off time 70 s

### 6.9.3 2-point pulse-frequency controller for solenoid pumps

Solenoid pumps are controlled with 0 to a maximum of 180 pulses per minute, depending on the specification of the connected pump. The electronics module supports pumps with 100, 120, 140, 160 and 180 pulses per minute.

The minimum duty cycle is 0.15 s. The pause time is calculated depending on the dosing rate.

Example of a solenoid pump at 120 pulses/min:

Yout in %	Pulses/min
100...	120...
84...	96...
72...	85...
56	75
50...	60...
33...	40...
25...	30...
10...	12...
5...	6...
10	10

### 6.9.4 Analog 2-point output

As an option, the electronics module can be retrofitted with a 2-way mA output module (Rivo™ Flex Mod 2AO mA). These mA outputs can be configured as registration or control outputs.

In the selection “Analog output 2p,” the mA output is firmly assigned as a control output.

With a control output of 0%, the output current is 0 or 4 mA, while with a greater Yout, the output current reaches up to 20 mA. Dosing pumps with mA control input, control valves with mA signal input, for example, can be used as actuators.

### 6.10 mA outputs

As an option, the electronics module can be equipped with a Rivo™ Flex Mod 2AO-mA 2-channel output module. Both mA outputs are electrically isolated and can be freely assigned. The output signals can be configured as 0 to 20 mA and 4 to 20 mA.

If an mA value of 3.4 mA is not reached in the setting 4 to 20 mA, this is detected as a line break and an error is generated.



### 6.11 Positioner feedback

When a positioner with feedback (positioner with Ym) is used as dosing output, the actual position of the positioner/dosing rate is transferred to the control device via selectable input signals in order to achieve the best possible control result. Various feedback options are available:

- Potentiometer 1 kOhm
- Potentiometer 5 kOhm
- 0...10V
- 0/4...20mA

The feedback signal used can be set in the menu, see device. For an optimum control result, the position feedback must be aligned (calibrated) with the controller. The positioner feedback end points 0% and 100% must always be calibrated. This can be done by running the automatic positioner calibration function. It can be started by pressing the "Start" button in the menu, see device. The controller automatically approaches the 100% and the 0% position and saves the corresponding values measured for the feedback signal internally. The positioner runtime  $T_y$  is automatically determined during the calibration process. During calibration, the positioner must not be unlocked for manual operation.

If the dosing rates between 0% and 100% are not linear to the position feedback, these non-linearities can be compensated for or linearized via correction values between 0 and 100%. Up to 11 further positions can be corrected to compensate for non-linearities in the dosing.

#### Procedure:

In order to calibrate further data points, select desired calibration points between 0 and 100% and set the required dosing output to correct the linearity.

### 6.12 Digital outputs

As an option, the electronics module can be equipped with a Rivo™ Flex Mod 2Rel-2DO. It makes two further relay outputs and two digital outputs available, which can be configured as alarm outputs. The digital outputs are optocoupler switching outputs for the power-free activation of dosing devices. The maximum control voltage (external) of 24 V and a maximum switching current of 20 mA must be observed here (these digital outputs are not supported in the Rivo™ I Controller).

### 6.13 Relay outputs

The electronics module has two on-board relays and can be expanded with relay modules. Further relays can be added as modules. To do this, the Rivo™ Flex Mod 2Rel-2DO must be installed. The modules are configured via the menu setting. These switches are assigned various switching tasks depending on the respective application. See the Chapter “Device configuration”.

The connection and switching of non-approved devices/ loads destroys the relay contacts. The device then functions in an uncontrolled manner! In order to switch inductive loads or capacitive loads that exceed the technical properties of the relay contact, an additional switching element such as a contactor or load relay with suitable specifications must be installed. To suppress radio interference, the relay contacts are protected internally by suppressor diodes.

All on-board relays are protected by fuses. They act as overcurrent limiters protecting the terminal and relay connections. The fuses of the backboard are replaceable (Type TR5, T3,15A). To fuses of the Rivo™ Flex Mod 2Rel-2DO are not replaceable.

**NOTICE**  
If the internal power supply L1 and N/L2 is used for dosing pumps or other devices, the current consumption must not exceed the value of the selected back-up fuse.

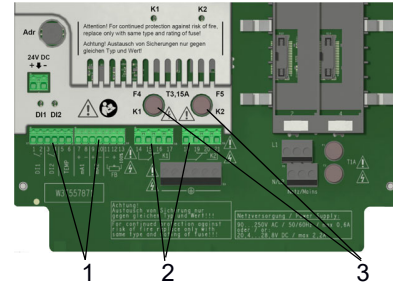


Fig. 5 Detail of PCB - relay outputs

- 1 Terminal strips for control inputs
- 2 Terminal strips for relays
- 3 Fuses of the Rivo™ Backboard 4 relay

**NOTICE**  
If the internal power supply L1 and N/L2 is used for dosing pumps or other devices, the current consumption must not exceed the value of the selected back-up fuse.

## 6.14 Messages and alarms

Alarms, warnings, messages are displayed by means of a colored message symbol (🔔 alarm bell) and a RGB LED above the display.

Red symbol:	error active
Yellow symbol:	warning active
Neutral symbol:	general notes

Tap the alarm bell to open the message window. All active messages are displayed with text. Acknowledgeable messages are confirmed or acknowledged with the ACK button.

### 6.14.1 Configuration

The electronics module supports the creation of freely configurable alarms. The alarms are output optionally via relay contacts and a color message display. At the same time, a message is displayed in the message system. The number of available relays depends on the configuration. The alarm relays can be used, for example, for safety deactivation of dosing when specific values are exceeded or not reached. The assignment of a relay as a switching function is optional.

Each alarm can be configured as described below. Multiple assignment is possible:

Message	freely configurable text
Description	freely configurable text
Delay time	hh:mm:22 00:00:00 to 10:49:59
Notification level	Error/warning
Acknowledge	Without/simple ACK/ACK with reset
Assignment	Single/multiple assignment
Relay assignment	Assignment to relay

#### 6.14.2 Without Acknowledge

- The alarm symbol and the message symbol light up in the event of an alarm and go out automatically when the condition is eliminated.
- Unlatched alarms are displayed in yellow as messages.
- The relay is active when the alarm symbol is displayed and the alarm is active.

#### 6.14.3 ACK with reset

- In the event of an alarm, the alarm symbol and the message symbol flash and the relay is active until acknowledged.
- The alarm symbol and the message go out even if the conditions still apply when the alarm is acknowledged.
- Latched alarms are displayed in red as messages.
- The relay becomes inactive after acknowledgment if the condition is still pending.

#### 6.14.4 Simple ACK

- The relay becomes active as soon as the alarm is active.
- In the event of an alarm, the alarm symbol and the message symbol flash until the alarm is acknowledged.
- If the condition is no longer present when the alarm is acknowledged, the alarm symbol goes out and the message disappears.
- If the condition is still present when the alarm is acknowledged, the alarm symbol and the message are reset from flashing to a permanent state. The alarm symbol and the message light up until the condition is eliminated (auto-reset).
- Latched alarms are displayed in red as messages.
- The relay is only deactivated when the condition has been eliminated and acknowledged.

### 6.14.5 Safety functions

Various safety functions are integrated to ensure system safety and minimize the risk of accidents:

- alarms freely configurable
- external STOP for dosing (depending on the configuration of the digital inputs)
- password protection
- safe manual mode stops dosing if the flow rate is too low or external stop in manual mode

### 6.15 Status LED states

The Rivo™ Flex modules use LEDs to provide information about the operating status of the module.

LED	Status	Modus	Description
white	illuminated	BOOT	Only displayed briefly during booting. Module restarts.
red	illuminated	STOP	Module is in stop mode. No outputs active, or output based on Stop-Behavior.
green	illuminated	RUN	The module is in run mode. All outputs are active and are activated. This is the normal state during operation.

LED	Status	Modus	Description
red	flashing	STOP, TIMEOUT	<p>Module has switched to stop mode due to a communication interruption after a timeout has expired.</p> <p>If this state occurs, communication with the control unit has been unexpectedly interrupted.</p>
blue	flashing	UPDATE	Module is in update mode. Firmware update is being carried out.

### 6.16 Interfaces

 **WARNING**

**Danger due to inadequately qualified personnel**

Possible consequence: fatal or serious injury and significant material damage.

- To ensure safe operation and prevent serious injury, the device must be installed by trained and authorized specialist personnel.

**NOTICE**

- See Chapter Design of the HMI and the Backboard.
- For more detailed information, please refer to the installation manual "Rivo™ communication interfaces." You can request this installation manual from us or download it from our homepage.
- The firmware update can be downloaded free of charge from our homepage.


### 6.16.1 USB interface

The Electronics Module is equipped with a USB interface. It can be used for the following:

- Transfer of firmware updates. Download via our homepage.
- Transfer of configuration data for reproduction and back-up of a configuration.
- Download of the internally saved archiving data.

### 6.16.2 Firmware update via USB interface

The firmware can be updated using a USB stick. The firmware file can be downloaded free of charge from our homepage.

You can read off the currently installed firmware version of the CPU in the system menu  under system information - Software information.

#### NOTICE

For information on installing a firmware update, see Chapter Firmware update via USB interface.

### 6.16.3 RS485 interface (optional)

As an option, the Electronics Module can be equipped with a Rivo™ Com-Board 485 expansion board. This expansion board has an integrated RS485 interface.

The RS485 interface is used for data transfer to higher-level control systems or other systems that support the Wallace & Tiernan RS485 protocol.

The RS485 interface is electrically isolated. It has four integrated terminals and a terminating resistor  $R_t$  for incorporation into a Wallace & Tiernan bus system.

#### NOTICE

For information on installing the Rivo™ Com-Board 485 expansion board, see Chapter RS485 interface (optional).

#### 6.16.4 Ethernet interface (HMI)

##### HINWEIS

This instruction manual does not cover installation and commissioning in combination with routers or wireless routers. Responsibility for this lies with the operator.

- For security reasons, access to the device should only be granted to authorized personnel.
- Permanent, unsafe connections via the Internet or WLAN are not permitted. Safe connections can, for example, be set up via a VPN-secured communication channel or an encoded WLAN connection.
- The Electronics Module only supports the unencrypted communication protocol “http” and is designed for operation within an Intranet (closed network) (Chapter Safety - IT security).

The Electronics Module has an integrated Ethernet interface.

The installed LAN interface allows data visualization via an Internet-capable device and HTTP protocol or standard browser. The LAN interface also supports data communication with higher level control systems via Modbus TCP protocol.

Visualization and operation are effected via the web pages integrated in the Electronics Module. Wireless access via mobile devices such as tablet computers or smartphones is possible by installing a wireless router on-site and connecting it to the Electronics Module.

The Ethernet interface supports a transmission rate of 100 Mbit/s.

The Ethernet interface is electrically isolated.

Connection is via a standard Ethernet connection cable. To allow the use of pre-terminated Ethernet cables with connectors, one special M25 cable gland with slit rubber seals and larger grommets is installed. The Ethernet connectors can be inserted through these fittings.

The Ethernet connection is designed in accordance with IEEE 802.3. There is a RJ45 socket installed at the HMI. Connection to a network is possible using a patch cable (1:1) or a crossover cable (crossover network cable). The LEDs are fitted in the RJ45 socket. They display the interface statuses.



LED	Status	Meaning
green	illuminated	Ethernet connection established
green	flashing	Data being transferred
yellow	off	10 Base-T
yellow	illuminated	100 Base-T

LED (yellow)    LED (green)

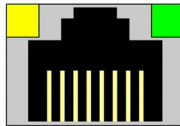


Fig. 6 Ethernet connection

The connection runs in Auto negotiation mode. The data transfer rate and full or half duplex are defined automatically with the connected switch/HUB.

## 7 INSTALLATION

### **DANGER**



#### **Danger of fatal injury caused by electric shock**

External voltages may still be connected even if the operating voltage is switched off.

Possible consequence: fatal or serious injury.

- All electrical installation work must be performed by a qualified electrician.
- Work on the device must be carried out when it is in de-energized state.
- Do not carry out work on active parts and equipment to which voltage is applied.
- In the event of a fault in the electrical power supply, switch the device off immediately.
- The device operates with liquids. For this reason, DIN EN IEC 62368/60950 must be observed when connecting the devices.

### **WARNING**

#### **Danger from unqualified personnel**



Possible consequence: fatal or serious injury and significant material damage.

- To ensure safe operation and prevent serious injury, the device must be installed by trained and authorized specialist personnel.
- Local installation regulations, general guidelines, technical data and construction regulations of the respective water or building authority as well as applicable national and local regulations must be observed.

### **NOTICE**

The assembly accessories included in the scope of delivery must be used for installation.

## 7.1 Requirements with regard to the environment and installation location

 <b>WARNING</b>	
	<p><b>Danger caused by fire or explosive material</b> Possible consequence: fatal or serious injury.</p> <ul style="list-style-type: none"><li>• Do not use the device in environments where there are flammable gases, fumes or dust or conductive dust.</li><li>• Smoking, fire, naked flames, welding, and work that may generate sparks are forbidden in the vicinity of the device.</li></ul>

The installation location must meet the following requirements:

- The installation location must not be accessible to the public.
- The installation location must be such that operation by unauthorized personnel is ruled out.
- The installation location must not be used as a permanent workplace.
- Protect the device against moisture, rain, frost, heat and direct sunlight.
- Do not install the device outdoors.
- Do not expose the device to strong vibration or impact, magnetic fields or electromagnetic radiation.
- Provide sufficient aeration and ventilation.

- Note the minimum ceiling height.
- The installation wall must be vertical, flat and stable.
- The device must be accessible and visible from the front and side for installation, operation and maintenance.
- Operating and ambient temperature must lie between 0 and +50 °C (32 ... 122 °F) (technical data).
- The air in the room must be non-condensing.
- The Electronics Module is not suitable for electrical connection with permanently installed cable conduits. If the cable glands do not meet local installation rules and regulations, these glands must be replaced with suitable ones.

### 7.2 Installing the electronics module

The electronics module can be installed using a top-hat rail or tallow-drop screws (wall installation).

Required material and tools:

- top-hat rail (optional)
- screws and dowels (assembly accessories)
- drill
- screwdriver

#### **ATTENTION**

##### **Danger caused by incorrect mounting fixtures**

Possible consequence: injury or significant material damage.

- Use the corresponding screws and dowels.
- Dowels and screws/tallow-drop screws for fixing to a solid wall are included in the scope of delivery.
- If the device is to be installed on a suitable light-weight wall, the corresponding mounting fixtures must be used. These mounting fixtures are not included in the scope of delivery!

### 7.2.1 Installation with top-hat rail

- 1 Secure the top-hat rail to a vertical, stable and flat solid wall using the dowels and screws supplied.
- 2 Hook the electronics module onto the top-hat rail so that it is flush at the right.
- 3 Fasten the electronics module to the solid wall at the bottom by the brackets using dowels and screws.

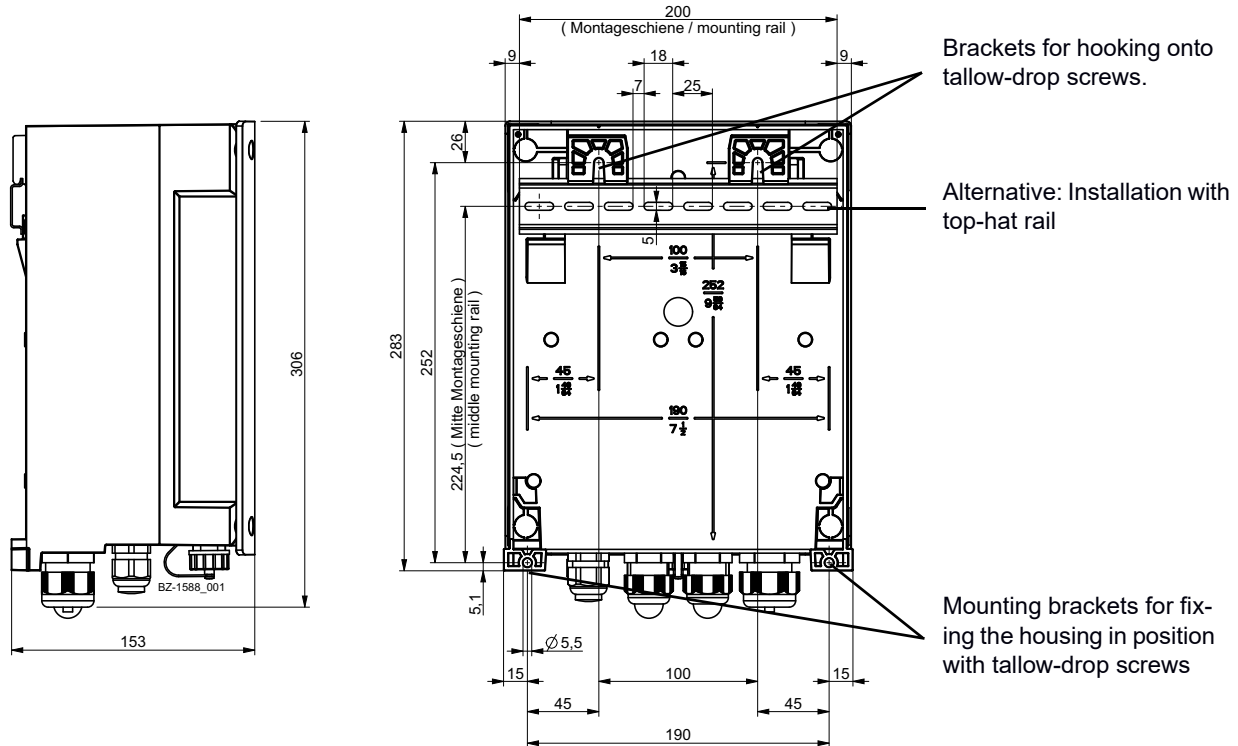
### 7.2.2 Installation without top-hat rail (wall installation)

#### **NOTICE**

The dimensions for the drilling pattern can be found on the back of the plastic housing. Use the rear housing panel as a drilling template.

- 1 Secure the tallow-drop screws rail to a vertical, stable and flat solid wall using dowels.
- 2 Hook the electronics module onto the tallow-drop screws.
- 3 Fasten the electronics module to the solid wall at the bottom by the brackets using dowels and screws.

### 7.2.3 Installation drawing, Electronics Module



### 7.3 Removing and fitting the housing cover

#### Removing

- 1 Release the four screws on the housing cover.
- 2 Carefully remove the housing cover.
- 3 Hook the housing cover into the brackets on the basic housing.

#### Fitting

- 1 Carefully unhook the housing cover from the brackets on the basic housing and fit it onto the basic housing.
- 2 Tighten the four housing screws by hand (to a maximum torque of  $0.7 \text{ Nm} \pm 0.15 \text{ Nm}$ ).

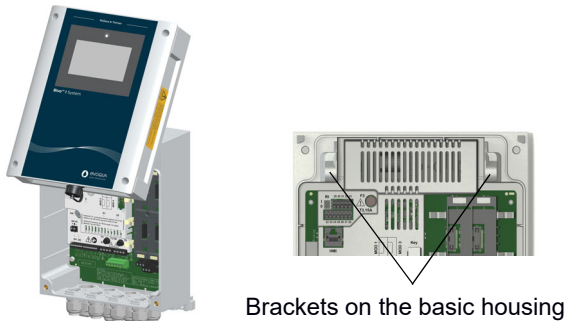


Fig. 7 Housing cover hooked on - brackets

### 7.4 Installation of Rivo™ Flex Mod Modules

#### CAUTION

#### Danger of damage to the Rivo™ Flex Mod Modules and the HMI

Possible consequence: Significant material damage.

- The Rivo™ Flex Mod Modules and the HMI must not be plugged in or unplugged with the power supply switched on.

- 1 Disconnect the Electronics Module from the power supply and check that it is de-energized.
- 2 Remove the housing cover of the Electronics module.
- 3 Insert the Rivo™ Flex Mod Modules into the module slots provided and ensure that the module locking mechanism (blue) is engaged and pressed downward.

To dismantle the Rivo™ Flex Mod Module, first pull the module locking mechanism (blue) upwards and then remove the module.

Module 1, 2, 3 and 4 allow the installation of the following modules:

- Module slot 1: -
- Module slot 2: -
- Module slot 3: Rivo™ Flex Mod 2Rel 2DO
- Module slot 4: Rivo™ Flex Mod 2AO

**NOTICE**

Module slots 1 and 2 are not used in this Electronics Module.

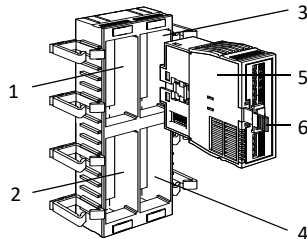


Fig. 8 Section, module slots

- 1 Module slot 1
- 2 Module slot 2
- 3 Module slot 3
- 4 Module slot 4
- 5 Rivo™ Flex Mod Module
- 6 Module locking mechanism (blue) - unlocking/locking

- 4 Route connection cables into the cable holder and into the housing through the cable glands.



Fig. 9 Section, cable connection

- 5 Tighten cable gland. Make sure that all cable glands are installed correctly.
- 6 Switch power supply back on.
- 7 When the device has booted, a scan must be carried out in order to transfer the new module configuration. To do this, open Setup - System settings - General and press the "Scan" (hardware) button.  
=> The device scans the changed module configuration and configures itself accordingly.

#### 7.5 Remove the battery insulator

##### CAUTION

##### Danger due to battery insulator

Possible consequence: Material damage

- When commissioning the HMI for the first time, the battery insulator of the lithium button cell must first be removed.

Procedure:

- 1 Fix the battery in the battery holder with a non-conductive pin and pull the battery insulator out to the left. Ensure that the battery is not pulled out at the same time.
- 2 The date and time must be set or checked during commissioning.

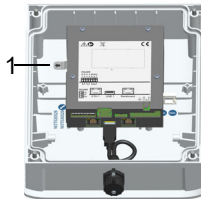


Fig. 10 HMI (housing cover)

- 1 Battery insulator

#### 7.6 Connecting the Ethernet cable

##### NOTICE

- The cable glands on the Electronics Module are already fitted at the factory.
- Blind plugs are fitted in the cable glands at the factory. These must be removed during installation in order to install the corresponding cables.
- For more detailed information, please refer to the separate installation manual “Rivo™ communication interfaces”. You can request this installation manual from us or download it from our homepage.

- 1 Route the Ethernet cable into the housing through the M25 cable gland. Only one Ethernet cable can be connected. Only one cable gland is provided and suitable for the insertion of Ethernet connectors (M25 left side).
- 2 The other cable glands can be used as required. Multiple sealing inserts (4x5 mm, 2x6 mm) are included with the accessories.
- 3 Plug the Ethernet cable into the HMI as shown in the wiring diagram.



## 7.7 Electrical installation

### **DANGER**



#### **Immediate danger caused by electric current**

Possible consequence: fatal or serious injury and significant material damage.

- External voltages may still be connected even if the operating voltage is switched off.
- The electronic module must be de-energized before opening it.
- When connecting the electronic module to the power supply, a back-up fuse must be used in the mains supply line. The connection values must match the data on the type plate.

### **WARNING**

#### **Risk of injury and damage to the device!**

Possible consequence: injury and significant material damage.

- Only trained and authorized electricians are permitted to install the electronic module and open the housing.
- The electronic module may only be put into operation when the housing is closed.
- Connect the electronic module in accordance with the wiring diagram and applicable local and national regulations.
- The electronic module is not equipped with a mains switch and is in operation as soon as the supply voltage is applied. For this reason, an external switch or circuit breaker with a clearly identifiable “Off” switch position is necessary.
- Line cross-section for the mains input side at least 0.75 mm<sup>2</sup> (AWG 18), on-site mains fuse 6 A with 100 to 240 V AC supply.
- When connecting system components (e.g. devices, motors, pumps) as well as when entering operating data, the system components must be switched off in order to prevent uncontrolled activation or incorrect operation.

#### WARNING

- If devices are connected to the internal power supply (e.g. dosing devices) or via fixed connection cables (e.g. connectors), the current consumption must not exceed the installed back-up fuse (max. 20A).
- Rivo™ Flex Modules and the HMI must not be plugged in or unplugged with the power supply switched on.
- The device operates with liquids. For this reason, DIN EN IEC 62368/60950 must be observed when connecting the devices.
- Avoid high temperatures at the terminals of the relays and the mains supply. Due to the high ambient temperatures at the terminals, connected cables must be designed as follows:
  - Ambient temperature <30°C:**  
Cables heat-resistant up to at least 60°C
  - Ambient temperature <40°C:**  
Cables heat-resistant up to at least 70°C
  - Ambient temperature >40°C:**  
Cables heat-resistant up to at least 80°C

#### NOTICE

- The electronic module is not suitable for electrical connection with permanently installed cable conduits.
- If the cable glands do not meet local installation rules and regulations, these glands must be replaced with suitable ones.
- The electronic module is equipped with a flexible voltage supply input and accepts AC voltages from 100 to 240 volts. Take the power consumption into account when dimensioning.
- Note the correct polarity of the voltage connections and the correct dimensioning of the wire cross-sections.

Carry out electrical installation as follows:

- 1 Remove the housing cover of the Electronics Module.
- 2 Connect voltage supply in accordance with the wiring diagram.
- 3 Install optional Rivo™ Flex Mod Modules.  
See chapter Installation "Installation of Rivo™ Flex Modules".
- 4 Connect HMI/Rivo™ Backboard 4 in accordance with the wiring diagram. Make sure that all cable glands are installed correctly.
- 5 Connect optional Rivo™ Flex Modules in accordance with the wiring diagram in chapter "wiring diagram".
- 6 Remove the protective discharge foil from the lithium button cell on the HMI. See chapter „Remove the discharge protection film“.
- 7 Fit housing cover.
- 8 Then put the Electronics Module into operation.

#### NOTICE

If the module configuration is changed, a scan must be carried out. To do this, open Setup - System settings - General and press the 'Scan' (hardware) button.

### 7.8 Firmware update via USB interface

The firmware can be updated using a USB stick. The memory size must be at least as large as the firmware file.

#### NOTICE

The firmware file can be downloaded free of charge from our homepage.

You can read off the currently installed firmware version of the CPU in the menu under System Information.

Carry out the firmware update as follows:

- 1 Copy firmware file to the USB stick.  
Do not use subdirectories!
- 2 Plug the USB stick into the USB socket (on the bottom of the device).
- 3 Open the Service-Center menu and click on the Update button. Follow the instructions on the display. The device executes a restart.
- 4 Firmware update starts. The LED (above the display) flashes during the firmware update.

- 5 When the firmware update is complete, the LED remains static.
- 6 Remove the USB stick.
- 7 Following a successful firmware update, check whether the new firmware version is displayed in the menu.
- 8 Check the settings, adjust if necessary.

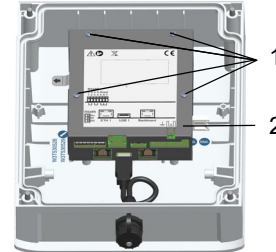
### 7.9 RS485 interface (optional)

#### NOTICE

For more detailed information, please refer to the separate installation manual "Rivo™ communication interfaces". You can request this installation manual from us or download it from our homepage.

Install the Rivo™ Com-Board as follows:

- 1 Disconnect the Electronics Module from the power supply and check that it is de-energized.
- 2 Remove the housing cover of the Electronics Module.
- 3 Release the four screws on the metal cover of the HMI (Pos. 1).



- 4 Carefully remove the metal cover of the HMI (Pos. 2).
- 5 Unscrew the four spacer bolts.
- 6 Grip the Rivo™ Com-Board carefully at the sides and insert the connector strip precisely into the terminal strips. Make sure that the connector strip is fitted correctly!
- 7 Tighten the four spacer bolts again by hand (to a maximum torque of  $0.7 \text{ Nm} \pm 0.15 \text{ Nm}$ ).
- 8 Refit the metal cover and screw tight again using the four screws of the metal HMI cover.
- 9 Connect interface in accordance with the wiring diagram.
- 10 Activate terminating resistor when installing at the end of the bus.
- 11 Fit the housing cover again and tighten by hand (to a maximum torque of  $0.7 \text{ Nm} \pm 0.15 \text{ Nm}$ ).
- 12 Reconnect the power supply.
- 13 Switch the Electronics Module on or reconnect the power supply.
- 14 Configure the interface.

## 8 START-UP

 **WARNING****Danger from unqualified personnel and incorrectly connected devices**

Possible consequence: fatal or serious injury and significant material damage.

- To ensure safe and correct commissioning, knowledge of the operation, connected electrical load, measurement signals, cable assignment and fuse protection of the connected devices and machines and the relevant safety regulations is required.
- Startup of the electronic module must be performed by trained and authorized electricians.
- Incorrectly connected devices can be damaged, possibly irreparably, or cause faults in other equipment when they are switched on or in operation.
- Ensure that the measuring and control cables are not confused or make contact with one another.
- Never connect or disconnect any cables to which voltage is applied.

 **DANGER****Risk of injury or death!**

Possible consequence: fatal or serious injury.

- The electronic module must not be operated with flammable liquids.

## 8.1 Initial commissioning and putting back into operation



Observe the instructions in the corresponding instruction manuals.

**NOTICE**

On delivery, the language setting of the Electronics Module is set to English.

Item	Work steps
1	Install the electronics module.
2	Remove the housing cover.
3	Connect optional devices to the electronics module as shown in the wiring diagram. For example: actuators (e.g. V10K gas dosing system), dosing pumps (Chem-Ad VPP) or analog actuators (e.g. frequency converter)
4	Integrate or activate safety deactivation (see Chapter 6.14.5 Safety functions).
5	Remove the discharge protection film from the lithium battery button cell on the HMI.
6	Refit the housing cover.

Item	Work steps
7	<p>Put the electronics module into operation:</p> <ol style="list-style-type: none"> <li>1 Turn the power supply on.</li> <li>2 Select the language (System menu - possible without a password).</li> <li>3 Log in and enter password protection (user administration).</li> <li>4 Set the date and time.</li> <li>5 Enter system name.</li> <li>6 Check whether all Rivo™ I/O modules installed were detected.</li> <li>7 Configure mA outputs (optional).</li> <li>8 Configure signal input for flow (measuring range, factor, format).</li> <li>9 Where applicable, configure signal input for external dosing factor.</li> <li>10 Where applicable, perform initial positioner calibration.</li> <li>11 Configure digital inputs as required.</li> <li>12 Configure alarms as required.</li> <li>13 Parametrize interfaces.</li> </ol>

Item	Work steps
	<ol style="list-style-type: none"> <li>14 In Manual mode, check all dosing devices for correct functioning.</li> <li>15 Test safety deactivations.</li> <li>16 If required, carry out extended calibration or linearization of the dosing device.</li> <li>17 Set desired dosing factor.</li> <li>18 Switch to Automatic mode and monitor system for correct functioning.</li> </ol>

## 9 SHUT-DOWN

 **WARNING**

**Danger from unqualified personnel**

Possible consequence: fatal or serious injury and significant material damage.

- To ensure safe operation and prevent serious injury, the device must be taken out of operation by trained and authorized specialist personnel.

 **WARNING**



**Risk of injury due to chemicals**

Dosing liquids are caustic and oxidizing.

Possible consequence: fatal or serious injury.

- Observe safety regulations and the prescribed protective clothing for handling chemicals.
- All instructions in the product data sheet for the dosing medium must be complied with.

Procedure:

- 1 Shut down dosing systems.  
Switch to manual mode and close positioner.
- 2 Switch the power supply off.



## 10 OPERATION

### 10.1 Display and control elements

The colored graphic display with resistive touchscreen is the display and control element.

#### CAUTION

##### Damage to the touchscreen!

Touching the touchscreen with pointed or sharp objects or striking the touchscreen with hard objects will damage the glass surface and have a negative impact on the functionality.

Possible consequence: Significant material damage.

- Only touch the touchscreen with your finger or a pen (PDA pen for touch panels). The PDA pen is included in accessory set EM E10.

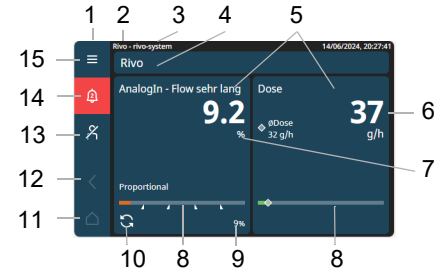

























Fig. 11 Main menu (example)
















- 1 Menu bar
- 2 Device name (factory setting - cannot be changed)
- 3 Device name affix (input individual)
- 4 Application settings (input individual)
- 5 Menu field Measurement (depending on the measuring module)
- 6 Display of dosing quantity (%/h)
- 7 Display of flow rate (liters/min, %/h)
- 8 Bar graph display with limit value indication
- 9 Control output/actuator feedback
- 10 Operation mode (example: Automatic mode)
- 11 Home key (main menu)
- 12 Back key
- 13 Login
- 14 Alarms - ACK
- 15 System menu

### 10.1.1 Icons

Some menus, icons, buttons or terms serve merely as displays, while others are assigned an underlying function (interactive menu navigation) or selection option. Values or terms can be entered, edited or saved in the input boxes.

Icon	Designation
	System menu
	Language (Icon under system menu)
	Alarms - ACK
	Log in
	Log out
	Log out
	Log in
	Apply
	Cancel
	Back button
	Home button
	Service-Center

Icon	Designation
	User administration selection
	Operating mode selection
	Operating mode "automatic mode" inactive/active Icon blue = "automatic mode" inactive Icon green = "automatic mode" active
	Operating mode "manual mode" inactive/active Icon blue = "manual mode" inactive Icon green = "manual mode" active
	Operating mode inaktiv/aktiv Icon blue = "Operating mode" inactive Icon green = "Operating mode" active
	Reset button
	Alarm unwiderruflich quittieren
	Alarm information
	Calibration
	Modul information
	Trend

Icon	Designation
	Hour display
	Pre button
	Button before
	Projection button
	Values: selection
	Diagram view, CH 1
	Diagram view, CH 2
	Diagram view, Temperature
	Diagram view, Flow
	Diagram view, set-point
	Diagram view, controller output
	Sample water stop
	Setting
	Button Reset
	Service-Center

## 10.2 Password protection and user administration

### NOTICE

#### Rules for password entry

Password must have at least eight characters. Upper case/lower case letters are allowed, as are figures and special characters.

### 10.2.1 Login - user administration (user level)

### NOTICE




For initial configuration, the user must always have administrator rights. Further users can only be created via the administrator.

For access data, see label "Important System Information" - App Default (user/password).






Users log in with the corresponding rights (user levels) in the "Login" menu. Three user levels (roles) with different rights are available.

Role	Meaning
Operator (User)	Read rights for all settings Write access to: <ul style="list-style-type: none"> <li>• Calibration</li> <li>• Simple setting</li> <li>• Operation modes</li> </ul>
Administrator  User: adminpassword: admin	Read rights and write access for all settings Write access to: <ul style="list-style-type: none"> <li>• User assignment (User)</li> <li>• Configuration applications</li> <li>• Service-Center</li> <li>• Factory setting</li> <li>• Configuration, system type</li> </ul>
Maintainer	Read rights for all settings Write access to: <ul style="list-style-type: none"> <li>• All settings</li> <li>• Setup</li> <li>• Operation modes</li> <li>• Calibration</li> </ul>



Procedure for setting up user levels:

- 1 Click the  symbol (system menu).
- 2 Click user administration.
- 3 Click the  symbol (create user).  
Enter or select the following:
  - Name:
  - Password
  - Description
  - Roles
 Click  to save.

Procedure for creating further users:

- 1 Click the  symbol (select user).
- 2 Enter user and password, and  
click  to log in.
- 3 Click the  symbol (system menu).
- 4 Click user administration.
- 5 Click the  symbol (create user) and create further user.  
Click  to save.

Procedure for selecting a user:

- 1 Click the  symbol (select user).
- 2 Click the corresponding user.
- 3 Enter user name (User) and password.
- 4 Click  to log in.

### 10.3 Resetting a password

Passwords can be reset via the Service-Center (see chapter Service-Center).

#### NOTICE

##### **Resetting access data**

If you forget your access data, you can reset the system at any time using the Recovery Key.  
See label "Important System Information".

#### 10.4 Application settings

Basic settings for the application are made in this menu.



Procedure:





- 1 Call up the Home menu (if applicable, click the Home key).
- 2 Click “Application setting” and make the corresponding settings.


	Input or selection options
<b>Application settings</b>	
<i>Application name</i>	<i>Input: individual</i>

### 10.5 Setting operation mode

Select the operation mode of the respective controllers as follows:

- 1 Call up the Home menu (if applicable, click the Home key).
- 2 Click measurement channel menu field.
- 3 Click  symbol or  symbol (operation mode). The corresponding operation mode is displayed.
- 4 Select operating mode.



 	<p><b>Automatic mode</b> Automatic activation of dosing (symbol is green).</p>
 	<p><b>Manual mode</b> Dosing is controlled manually (symbol is green).</p> <ul style="list-style-type: none"> <li>• Option of manual dosing in % for an adjustable time.</li> <li>• After expiry of this time =&gt; change to the operation mode set under “next operation mode”.             <ul style="list-style-type: none"> <li>• With man. dosing time = 0, the running time man. dosing is unlimited.</li> </ul> </li> </ul>



	<p><b>Manual mode</b> Dosing: display value in %</p> <ul style="list-style-type: none"> <li>• Option of manual dosing in % for an adjustable time.</li> <li>• Dosing = 0.0 % The running time for manual dosing is unlimited.</li> <li>• After expiry of this time =&gt; change to the operation mode set under “next operation mode”.</li> </ul> <p>Operation mode: Manual Dosing is controlled manually.</p>
---	--

### 10.6 Menu bar




The menu bar on the left of the display is visible on all menu levels. The system menu, alarm messages and the user login are opened via the menu bar. Return to the main menu for any menu level with the Home button. Press the arrow key to return to the previous level.

10.7 System menu



	Input or selection options
 <b>System menu</b>	
Menu 	<i>Language selection symbol - select the language: English GB – Deutsch – Français – English US</i>



	Input or selection options
<b>User administration</b>	
	<i>Create a new user.</i>
Name	<i>Input: User name</i>
Password	<i>Input: Password</i>
Description	<i>Input: z.B. Name, Position</i>
Roles	<i>Select: Operator - Administrator - Maintainer</i>
admin	 => <i>Edit the created users</i>





	Input or selection options
<b>Setup</b>	
<b>System settings</b>	
<b>General</b>	
Device name	Entry of a customised device name or measuring point identifier
Language	 Choose Your Language: English GB – Deutsch – Français – English US
Service-Center	 => Service-Center opens
Hardware	 => Perform a scan when changing the module configuration to accept the changed configuration.
<b>Time Config.</b>	
NTP	Activate/deactivate time synchronisation from the network. If OFF is selected, the time and date must be set manually. If ON is selected, the date and time are taken from the network.
Timezone	Select: Europe – Asia – America – Africa – Antarctica – Pacific – Australia – Atlantic – Indian
Date	Display: Year – Month – Day
Time	Display: Hours – Minutes

<b>Network Configuration</b>	
DHCP	<i>Activate/deactivate</i>
IP address	<i>Input IP address If ON is selected, the IP address is automatically assigned by the network.</i>
Subnet mask	<i>Input Subnet Mask</i>
Gateway	<i>Input Gateway</i>
MAC address	<i>Display (automatic) Display of the physical hardware address of the device in the Ethernet.</i>
<b>Global unit settings</b>	
Global Unit Setting	<i>Units of Measurement: Metric – Imperial</i>
Temperature Unit	<i>Select: °C – °F</i>



<b>Inputs / Outputs</b>	
<b>Relay outputs</b>	<i>Depending on the configuration of the Rivo™ Flex Mod measuring modules.</i>
e.g. Relay 1 <i>(depending on the configuration)</i>	 <i>Module information: Hardware address, Part number, Serial number, Software version, Product name, Error Code, State, Relay-Out</i>
Label	<i>Input: individual</i>
Inverse	<i>Select: ON – OFF</i>
Enabled	<i>Select: ON – OFF</i>
<b>Digital inputs</b>	
DI 1	 <i>Module information: Hardware address, Part number, Serial number, Software version, Product name, Error Code, State</i>
Label	<i>Input: individual</i>
Input signal direction	<i>Select: Direct – Inverse</i>
Debouncing	<i>Input: max 1000 ms</i>
Controller function	<i>Input: No function – Stop – Max. Dosing – Constant – 2xYouT – Ignore external setpoint / dosing factor</i>
Controller	<i>Input: Flow</i>


DI 2	 <b>Module information:</b> <i>Hardware address, Part number, Serial number, Software version, Product name, Error Code, State</i>
Label	<i>Input: individual</i>
Input signal direction	<i>Select: Direct – Inverse</i>
Debouncing	<i>Input: max 1000 ms</i>
Controller function	<i>Select: No function– Stop – Max. Dosing – Constant – 2xYout – Ignore external setpoint / dosing factor</i>
Controller	<i>Select: Flow</i>
<b>Analog outputs</b>	<i>Depending on the configuration of the Rivo™ Flex Mod measuring modules.</i>
e.g. mA output 1 <i>(depending on the configuration)</i>	 <b>Module information:</b> <i>Hardware address, Part number, Serial number, Software version, Product name, Error Code</i>
Label	<i>Input: individual</i>
Range	<i>Select: 0 - 20 – 4 - 20</i>
Stop behaviour	<i>Select: 0 mA – 4 mA – 10 mA – 12 mA – 20 mA – 22 mA – Hold last value</i>
Measurement	<i>Select: No select – Dosing factor – Flow sehr lang</i>

<b>Analog inputs</b>	<i>Depending on the configuration of the Rivo™ Flex Mod measuring modules.</i>
e.g. mA input 1 <i>(depending on the configuration)</i>	 <b>Module information:</b> <i>Hardware address, Part number, Serial number, Software version, Product name, Error code, mA-Value, Percentage</i>
Demo Mode	<i>Select: OFF – Demo Mode (Sine)</i>
Label	<i>Input: individuell</i>
Input signal	<i>Select: 0 - 20 mA – 4 - 20 mA</i>
Measurement filter	<i>Select: OFF – Minimal – Low – Medium – Strong</i>
Input signal direction	<i>Select: Direkt – Invers</i>
Unit	<i>Input: individual</i>
Lower range	<i>Input: individual</i>
Upper range	<i>Input: individual</i>
Format	<i>Select: #0 – #0.0 – #0.00 – 0.000</i>
Limits	
Dosing factor - Limit values	
Limit value I	
Min	<i>Input – delete</i>
Max	<i>Input – delete</i>
Hysteresis	<i>Input</i>
Limit value II	
Min	<i>Input – delete</i>
Max	<i>Input – delete</i>
Hysteresis	<i>Input</i>

<b>Communication</b>	
<b>Modbus TCP</b>	
Enabled	<i>Activate/deactivate</i>
Codepage	<i>Select: UTF-8 – Windows-1252</i>
Port	<i>Input: individual</i>
Write protection	<i>Select: OFF – On – On with Password</i>




	<b>Input or selection options</b>
<b>Alarm Configuration</b>	<i>Depending on the alarms</i>
<b>e.g. Alarm 1</b>	
Message	<i>Input: individual</i>
Description	<i>Input: individual</i>
Delay Time	<i>Input: Hours – Minutes – Seconds</i>
Alarm level	<i>Select: Warning – Error</i>
ACK Mode	<i>Select: None – Simple ACK – ACK with reset</i>
Assignment	<i>Select: Digital In 2 – Digital In 2</i>
Relay Assignment	<i>Select: Rel 3 BB00 S04 C01 – Rel 4 BB00 S04 C02</i>

	Input or selection options
<b>Factory settings</b>	
<b>Reset system settings</b>	
Reset	 <i>Reset the device.</i>
<b>Reset application settings</b>	
Reset	 <i>Reset the applications.</i>

	Input or selection options
<b>System information</b>	 => Service-Center
<b>Rivo OS</b>	
Version	Display of current version
<b>Software version</b>	
Helio	Display of current version
Helio Application	Display of current version
IO-Connector	Display of current version
SystemConfig	Display of current version
Rivo	Display of current version
ComGateway	Display of current version
Service-Center	Display of current version
<b>Yaml Informationen</b>	
Yaml name	Display of current version
Yaml version	Display of current version
Yaml hash	Display of current version
<b>Serial number HMI</b>	Display of current version
<b>Serial number Device</b>	Display of current version




### 10.7.1 Alarms/Messages


Error message display	
 <b>Acknowledge (ACK)</b>	
	<i>Acknowledge all alarms - All active alarm messages are irrevocably acknowledged.</i>
	<i>Type Code Runtime Timestamp Description e.g: Output load error (AO 1), backboard-addr. 00, slot 05, componente: 01</i>

### 10.7.2 User Log in/Log out

NOTICE	
The users currently logged in are displayed in this menu.	

Login	
 <b>Log out</b>	
User	<i>Input: User</i>
Password	<i>Input: Password</i>

#### 10.8 Service-Center

System information can be called up and service functions carried out via the Service Center .

Only certain persons can access the Service Center by entering their user name and password.

Login is requested when a menu in the Service Center is opened. This login is not identical to the standard device login.



The standard device login on first opening the Service Center is:

User: service


Initial password: service


Following initial login, the user is prompted to change the password. The password must be saved in a safe place. If it is lost, it can be reset in the Service Center with the Recovery Key (see Chapter Resetting a password)




There are two ways to open the Service Center:

- 1 Switch the electronic module on, the device boots.  symbol appears briefly on the bottom right of the screen.
- 2 Click the  symbol. Service Center opens.
- 3 Select menus.

OR:

- 1 Click the  symbol (system menu).
- 2 Select System information menu.
- 3 Click Service Center.
- 4 Select menus.

 Interactive menu navigation.

	Input or selection options
	
Resource Monitor	<i>Display of the current utilisation of the CPU/memory</i>
View licenses	<i>Display of the open source licences used</i>
View journal logs	<i>Display journal</i>  Sort  Download log file
Device configuration	<i>Display and selection of the application or device configuration</i>  <i>Depending on the version of the device, it is possible to switch from the higher version to the lower version of the application.</i>  <i>Verfügbare Applikationen:</i> <i>2CH Analyser: 2 Channel measuring system without control function</i> <i>2CH Control PC: 2 Channel measuring system with control function</i> <i>Rivo I Control SC: Ratio control without measured value support</i>
Import/Export	<i>Menu for importing or exporting the device configuration of an identical device.</i>
Update	<i>Delete application data.</i>
System information	<i>Display:</i> <i>Rivo-OS version</i> <i>Service-Center version</i> <i>Serial number bb</i> <i>Serial number dev</i>

Reload UI	<i>Install new software/firmware.  In this menu, a firmware file (ZIP file) can be loaded from a drive and the device update can be started.</i>
Clearup	<i>Return to main display</i>

### 10.9 Resetting a password in the Service Center

It is possible to reset the device if the password is lost. To do this, you need the Recovery Key - Important Service Information (label included in the scope of delivery).

Procedure:

If an incorrect password is entered in the Service Center, a "Recovery" button appears in the login window.

- 1 Enter Recovery Key.
- 2 Click the "Reset device" button.  
=> Device is reset. All passwords and settings are now deleted, and the device is reset to the factory settings.

### 10.10 Menu field measurement channel

The menu field Measurement channel shows the current measured value and the sensor signal. All settings relating to measurements, such as range, limit values and controller settings, must be made via this menu.

#### HINWEIS

The measured values displayed depend on the various settings. Name can be entered individually. Depending on the user administration configuration and the currently registered users, the changes that can be made are limited. To change, it is necessary to log in at the appropriate user level.

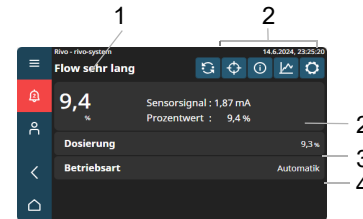
























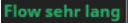






Fig. 12 Example menu field Measurement channel

- 1 Display of measurement (name individual)
- 2 Function buttons (selection option via symbols)
- 3 Display of measured values - measured value - sensor signal - percentage (display only)
- 4 Dosing (display only)
- 5 Operation mode (display only)


10.10.1 Measuring channel measurement - Flow

Trend	Input or selection options
	<i>Select: Diagram view CH 1</i>
	<i>Select: Diagram view CH 2</i>
	<i>Select: Diagram view Temperatur</i>
	<i>Select: Diagram view Flow</i>
	<i>Sample water stop</i>
	<i>Select: 2h – 6h – 12h – 24h – 7d</i>
	<i>Back/forward button for diagram display</i>
	<i>Advance button for diagram display</i>
	<i>Select: Flow - Yout - DI1</i>

	Input or selection options
<b>Flow (Measuring e.g. Flow sehr lang)</b>	
 <b>Flow - Controller modes</b>	
	<i>Blue symbol = automatic mode inactive</i>
	<i>Green symbol = automatic mode active</i>
	<i>Blue symbol = manual mode off</i>
	<i>Green symbol = manual mode inactive</i>
	<i>Blue symbol = operating mode inactive</i>
	<i>Green symbol = operating mode active</i>
Bumpless-Transfer	<i>Select: Off – Once – Permanent</i>
 <b>Flow - Calibration</b>	<i>Display: Lower Value, Cell signal, Upper value</i>
	 => Do you really want to solve the calibration? => Cancel/Confirm
	 => Flow - Calibration archive (Date, In1, Out1, In2, Out2)
Lower Value	<i>Automatic display</i>  <i>Switch off the sample water supply</i>
Upper value	<i>Automatic display</i>  <i>Switch off the sample water supply</i>

 <b>Flow - Module information</b>	
Hardware address	<i>Display</i>
Part number	<i>Display</i>
Serial number	<i>Display</i>
Software version	<i>Display</i>
Product Name	<i>Display</i>
Error Code	<i>Display</i>
<b>Trend</b>	
	<i>Select: Diagram view Flow sehr lang</i>
	<i>Select: Diagram view controller output</i>
	<i>Sample water stop</i>
	<i>Select: 2h – 6h – 12h – 24h – 7d</i>
	<i>Back/forward button for diagram display</i>
	<i>Advance button for diagram display</i>
	<i>Select: Flow - Yout - Digital In 1</i>











 <b>Flow - Settings</b>	
<b>Measurement</b>	
Demo Mode	Select: Off - Demo Mode (Sine)
Label	Input: individual
Input signal	Select: 0 - 20 mA – 4 - 20 mA
Measurement filter	Select: Off – Minimal – Low – Medium – Strong
Input signal direction	Select: Direct - Inverse
Unit	Input: %
Lower range	Input: %
Upper range	Input: %
Format	Select: #0 – #0.0 – #0.00 – #0.000
Upper calibration point input	Input: mA
Upper calibration point output	Input: %

## 10 Operation

### EN Rivo™ I Controller

Limits	Select: Limit value 1 - Limit value 2
Limit value 1	
Min	<i>Input - delete</i>
Max	<i>Input - delete</i>
Hysteresis	<i>Input: %</i>
Limit value 2	
Min	<i>Input - delete</i>
Max	<i>Input - delete</i>
Hysteresis	<i>Input: %</i>

<b>Dosing</b>	
Flow - Dosing	 => Display: Dosing quantity, Average dosage, Max. dosing, Min. dosing
Actuator	Select: Positioner w. Ym – Pump 2P – Analog output 2P
Settings actuator	
Flow - Positioner w. Ym	 => Display: Ty, Calibration start value, Calibration end value, Feedback, Dead time same direction, Dead time direction change, Feedback delay
Calibration positioner	Start – Cancel
Feedback Threshold	Input: %
Dosing agent settings	
Flow - Dosing agent settings	 => Display: Dosing quantity, Average dosage, Max. dosing, Min. dosing
Dosing Statistics	Reset
Label	Input: individual
Unit dosing performance	Input: g
Time base dosing performance	Select: Min. – h – Day
Max. rate	Input: g/h

Linearization	
Flow - Linearization	
Dosing	<i>Display: Current dosage</i>
Linearization point 0%	<i>Input</i>  => <i>Delete linearisation point</i>
Linearization point 10%	
Linearization point 20%	
Linearization point 30%	
Linearization point 40%	
Linearization point 50%	
Linearization point 60%	<i>Input</i>  => <i>Delete linearisation point</i>
Linearization point 70%	
Linearization point 80%	
Linearization point 90%	
Linearization point 100%	

<b>Controller</b>	
Flow - Controller settings	
Bumpless-Transfer	<i>Select: Off – Once – Permanent</i>
Feed delay time	<i>Select: Hours – Minutes – Seconds</i>
Safety MAN. Mpde	<i>Activate/deactivate</i>
Source dosing factor	<i>Select: Internal – Dosing factor</i>
Dosing factor	<i>Input: %</i>
Zero threshold	<i>Input: %</i>

### 11 SYSTEM MESSAGES



There are error messages, warnings, information and status messages.

If it is not possible to remedy the cause of the system messages yourself, please contact your service contractor.

Error Code	Level	ACK	Cause	Remedy
E-COM-100				
E-COM-101				
E-COM-102				
E-IOC-101	Error		Internal memory inconsistency.	Please contact service. Update software.
E-IOC-102	Warning		Hardware configuration has changed due to the removal or addition of modules.	Check the Hardware. Run hardware scan. Setup->System->General
E-IOC-103	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-IOC-104	Error		Unknown hardware. Hardware could not be identified.	Please contact service.
E-IOC-105	Error		Communication error in the indicated module.	Check the Hardware. Please contact service.
E-IOC-106	Error			

E-IOC-107	Info	YES	Firmware upgrade successfully performed on the indicated module.	Message can be deleted by ACK.
E-IOC-108	Error		Firmware upgrade successfully performed on the indicated module.	Please contact service.
E-RIV-101	Warning		The selected dosing unit is not compatible with the set controller type.	Adjust the dosing unit settings.
E-RIV-102			Configured alarm was triggered.	
E-RIV-103	Error		A required hardware module is not available.	Retrofit the appropriate hardware and perform a hardware scan, or select a suitable application.
E-RIV-105			Maintenance interval no further specified.	
E-RIV-106	Error		General runtime error.	Check the actuator feedback of the servomotor.
			Possible causes: Missing or incorrect actuator feedback. Setting wheel unlocked Electronics error	Check the connections. Lock the adjusting wheel.
E-RIV-107	Error		Servomotor calibration error	Check the actuator feedback of the servomotor.
E-RIV-109	Info		Self-calibration of the servomotor is performed.	Wait until the process is completed.
E-RIV-117	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-118	Info		Communication error in the indicated module.	Please contact service.
E-RIV-119	Error		Input signal outside of measurable range.	Check input signal and wiring.

## 11 System messages

### EN Rivo™ I Controller

E-RIV-120	Error		Input signal outside of measurable range.	Check input signal and wiring.
E-RIV-121	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-122	Error		Missing factory calibration in the Indicated module.	Please contact service.
E-RIV-123	Info		Communication error in the indicated module.	Please contact service.
E-RIV-124	Error		Input signal outside of valid range.	Eingangssignal und Verdrahtung überprüfen.
			Connecting cable is interrupted.	Falls der Eingang nicht benötigt wird, kann er deaktiviert werden.
E-RIV-125	Error		Input signal outside of valid range.	Eingangssignal und Verdrahtung überprüfen.
			Incorrect signal source.	Check the signal source.
E-RIV-126	Error		Input signal outside of measurable range.	Check the input signal and wiring.
E-RIV-127	Error		Input signal outside of measurable range.	Check the input signal and wiring.
E-RIV-128	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-129	Error		Missing factory calibration in the Indicated module.	Please contact service.
E-RIV-130	Error		Actuator was unlocked.	
E-RIV-131	Info		Communication error in the indicated module.	Please contact service.
E-RIV-132	Error		Input signal outside of measurable range.	Check the input signal and wiring.



E-RIV-133	Error		Input signal outside of measurable range.	Check the input signal and wiring.
E-RIV-134	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-135	Error		Missing factory calibration in the Indicated module.	Please contact service.
E-RIV-136	Info		Communication error in the indicated module.	Please contact service.
E-RIV-142				
E-RIV-144	Error		Load error The mA output cannot drive its mA output current through the connected current loop (max. 500 Ohm at 20 mA).	Check the signal cable for interruption. If the output is not required, it can be deactivated.
E-RIV-145	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-146	Error		Missing factory calibration in the Indicated module	Please contact service.
E-RIV-147	Info	YES	Indicates that a calibration is in progress	
E-RIV-149	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-150	Error		Hardware or electronic error in the Indicated module.	Please contact service.
E-RIV-151	Info	YES	Note for a successful upgrade. Data was successfully migrated.	Message can be deleted by ACK.
E-RIV-152	Info	YES		
E-RIV-158	Info	YES	Calibration data are outside the valid range.	

## 11 System messages

### EN Rivo™ I Controller

E-RIV-159	Info	YES	Calibration data are outside the valid range.	
E-SYS-101				
E-SYS-102				
E-SYS-103				
E-SYS-104				
E-SYS-105				


## 12 TROUBLESHOOTING



If it is not possible to remedy the fault or error yourself, please contact your service contractor.

Faults	Cause	Remedy
No indication on device.	No power supply.	External switch or fuse on.
	Device fuse defective.	Check the power supply and replace fuse. (Electrician)
	Housing cover is not fitted correctly.	Check and, if necessary, fit the housing cover correctly (cable possibly trapped).
Positioner/pump does not work.	Positioner in manual mode.	Engage manual knob.
	Dosing device selected incorrectly.	Select correct dosing device.
	Positioner/pump incorrectly connected.	Connect positioner/pump correctly. (Electrician)
	Relay defective.	Check. (Electrician)
Positioner runs in wrong direction.	Positioner incorrectly connected.	Correct connections. (Electrician)
Positioner closes.	Positioner feedback interrupted.	Correct connections. (Electrician)
Digital inputs without function.	Digital inputs not activated.	Activate digital inputs.

**13 MAINTENANCE**

 **WARNING**

**Danger from unqualified personnel**  
Possible consequence: fatal or serious injury and significant material damage.

- To ensure safe operation and prevent serious injury, the device must be serviced by trained and authorized specialist personnel.
- Observe the specified maintenance intervals.
- Adhere to the applicable standards and national and regional regulations.

**13.1 Maintenance intervals**

Replace battery of the electronics module after 5 years.


Article number	Designation
W2T555401	Battery, electronics module

**13.2 Replace battery**

The battery is required for the real time clock in the event of a power failure. If the time is not correct or if time-controlled functions show faulty behavior, the battery must be changed. Replace the battery after 5 years at the latest.

- 1 Disconnect the electronic module from the power supply and check that it is de-energized.
- 2 Remove the housing cover of the electronic module.
- 3 Unscrew the metal cover on the HMI.
- 4 Remove the battery from the HMI holder.
- 5 Insert the new battery, type CR1632. Observe the correct polarity!
- 6 Re-attach the metal cover to the HMI.
- 7 Fit housing cover.
- 8 Turn the power supply on.
- 9 Set the date and time. No further settings are required.

### 13.3 Replacing the fuses on the CPU board

 See Chapter Design.

The mains input and all relays are protected by fuses of type TR5. 3.15 A (slow-blow) fuses are used for the relays and 1.6 A (slow-blow) fuses for the mains input. Spare fuses are included with the accessories.

- 1 Disconnect the Electronics Module from the power supply and check that it is de-energized.
- 2 Remove the housing cover of the Electronics Module.
- 3 Pull the defective fuse out of the fuse holder and insert the new fuse. Make sure the rated data match!
- 4 Fit housing cover.
- 5 Turn the power supply on.

### 13.4 Cleaning

#### CAUTION

##### **Danger caused by incorrect cleaning agent**

The use of non-approved cleaning agents can damage housings, seals, cables and the touchscreen.

Possible consequence: Serious material damage.

- Never use corrosive cleaning agents (e.g. isopropyl alcohol, spirit, scouring agents)!

#### 13.4.1 Cleaning the housing

Clean housing, seals and cables with a moist cloth, if necessary with the addition of a commercially available neutral cleaning agent, and then dry them.

#### 13.4.2 Cleaning the display

Clean the touchscreen with a non-linting microfiber cloth. To remove heavy soiling, moisten a corner of the cloth and wipe the touchscreen. Then dry immediately using the dry side of the cloth.

## 14 DISMANTLING AND DISPOSAL

### **WARNING**

#### **Danger from unqualified personnel**

Possible consequence: fatal or serious injury and significant material damage.

- To ensure safe operation and to avoid serious personal injury, the appliance may only be dismantled and disposed of by trained and authorized specialist personnel.

### 14.1 Dismantling

- 1 Prior to disposal, delete any personal data stored on the old equipment.
- 2 De-energize the device.
- 3 Dismantle and dispose of the device properly and recycle raw materials.

### 14.2 Disposal

#### 14.2.1 General information

Ensure safe and environment-friendly disposal of old equipment, replacement parts, auxiliary materials, chemicals and their containers. Disposal must be effected in compliance with local, regional, national and international regulations.

### NOTICE



The symbol with the crossed-out garbage can indicates that the product - electrical and electronic equipment, batteries and storage batteries - must not be disposed of with household waste. At the end of its service life, the product must be disposed of appropriately or recycled. The statutory requirements of the country in which the product is put into use apply here.

#### 14.2.2 Used electrical/electronic equipment

Electrical or electronic equipment is labeled with the symbol showing a crossed-out garbage can and must not be disposed of with household waste, but must be collected and disposed of separately. The statutory requirements of the country in which the product is put into use apply.

Before handover to a collection point, old batteries, storage batteries and lamps must be removed from the old equipment and turned over to the corresponding collection points.

Where such central collection systems are not available, used equipment purchased from us can be returned to us.

Further details can be found on the official website of Evoqua Water Technologies GmbH.

- Scan the QR code.
- OR enter the following link in your browser:  
<http://qr.evoqua.com/bdYxgi>



#### 14.2.3 Used batteries and used storage batteries

Batteries and storage batteries are labeled with the symbol showing a crossed-out garbage can. Where, for technical reasons, it is not possible to label the batteries themselves, the symbol may be printed on the packaging. Used batteries and used storage batteries must not be disposed of with household waste, but must be collected and disposed of separately. The statutory requirements of the country in which the product is put into use apply. If necessary, contact your regional or local authorities for details of collection points and options for separating and collecting waste.

#### DANGER

##### **Risk of injury caused by damaged batteries and storage batteries!**

Possible consequence: fatal or serious injury and significant material damage

- Short-circuiting, for example caused by external contact with the battery poles (metal on metal), may cause fire or an explosion. Prior to disposal, cover the poles of batteries and storage batteries with masking tape to prevent an external short-circuit.
- There is an increased hazard if batteries are damaged or leak. Avoid touching 'greasy' or leaking batteries with your bare hands wherever possible. Wash your hands thoroughly if they have come into contact with leaking components.
- Observe the respective safety instructions, in particular in the case of batteries and storage batteries containing lithium.

#### 15 SPARE PARTS, ACCESSORIES, RETROFIT KITS

##### **WARNING**

##### **Danger from incorrect spare parts, accessories and retrofit kits**

There is a risk of malfunction or damage to the appliance if unauthorized spare parts, accessories and retrofit kits are used.

Possible consequence: fatal or serious injury and significant material damage.

- For reasons of safety, only use original spare parts, accessories and retrofit kits. If required, please contact our customer service or visit our e-commerce store.

#### 15.1 Spare parts

Article number	Designation
W3T601620	Backboard Rivo™ Board 4
W3T582385	Mains fuse 230V, TR5, T2A
W2T839300	Mains fuse 24V, relay, TR5, T3, 15A
W2T555401	HMI battery, CR1632
W3T604350	Operating front panel 4 RT Rivo™ I
W3T587694	Patch cable to the display
W3T587503	HMI protective grounding
W3T570786	Accessory set EM E10 (incl. PDA pen for touch panel W3T160886)

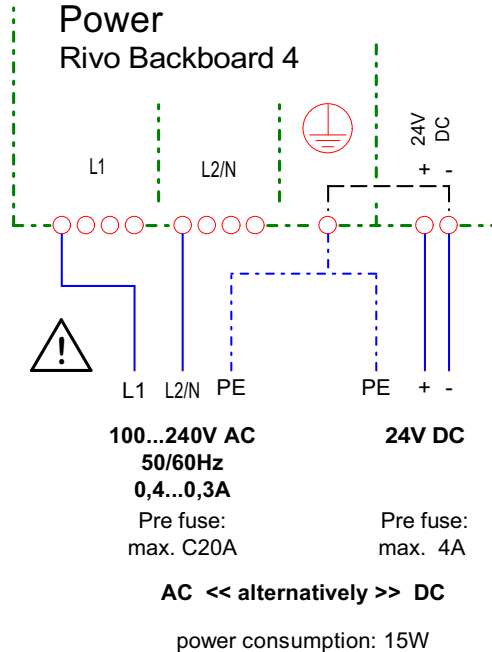
#### 15.2 Optional accessories

Article number	Designation
W3T557914	Rivo™ Flex Mod 2Rel-2DO Relay module for activation of dosing outputs and alarms
W3T557912	Rivo™ Flex Mod 2AO-mA (mA signal output module, 2-channel)
W3T583003	Rivo™ Com-Board 485



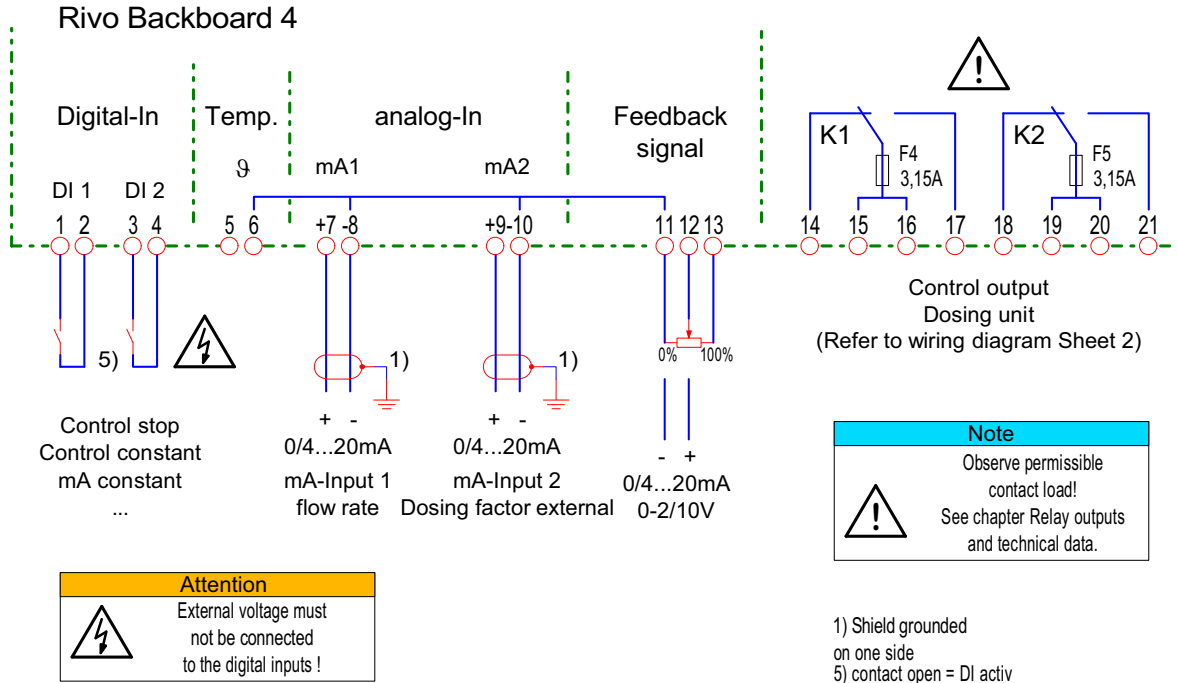
## 16 WIRING DIAGRAM

WBE2153 V: 01-0324

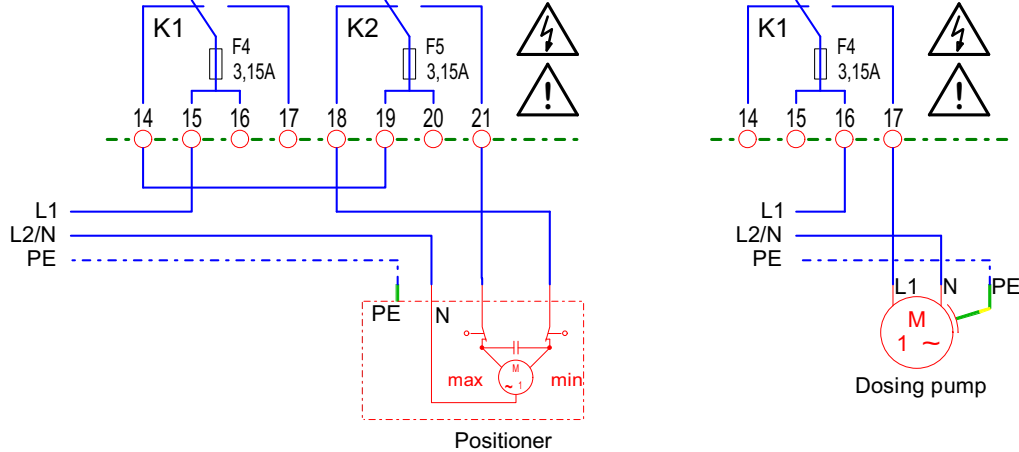


**Note**

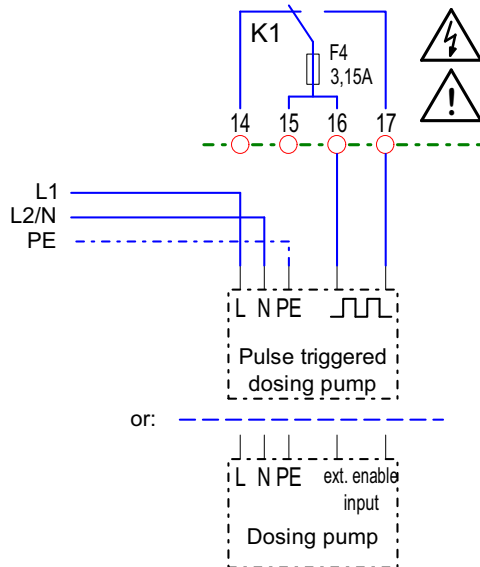
With mains supply 100...240V AC the additional terminals L1 and N/L2 are for connection of external loads. (Note prefuse!)



outputs Dosing Rivo Backboard 4  
page 1 of 2



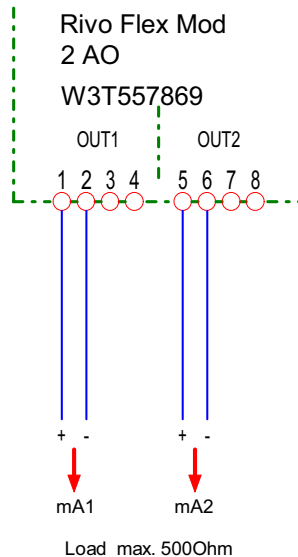
outputs Dosing Rivo Backboard 4  
page 2 of 2



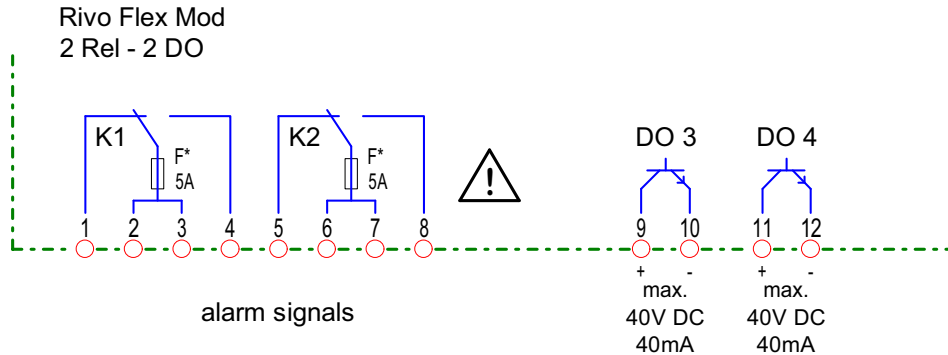
**Attention**  
External voltage may still be connected even when the main switch is set to OFF!

**Note**  
Observe permissible contact load!  
See chapter Relay outputs and technical data.

## Connection Rivo Flex Module (optionally) page 1 of 2




Connection Rivo Flex Module (optionally) page 2 of 2

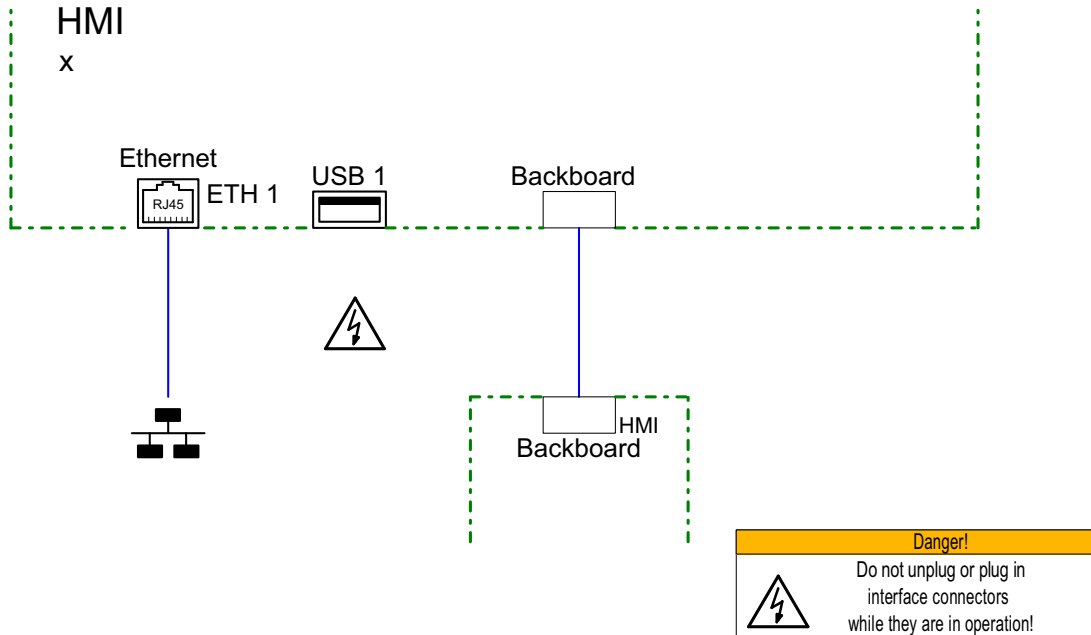


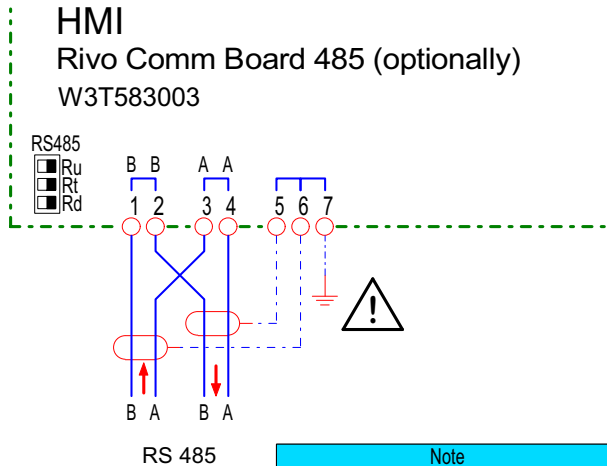
**Note**

Observe permissible contact load!  
See chapter Relay outputs and technical data.

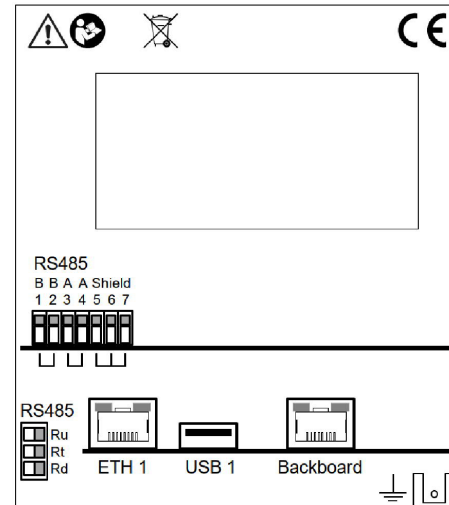


F\*) Fuse not replaceable





**Note**  
 Terminals 5 – 7 (no potential reference) for connecting the shielding establish.  
 An additional PE connection at the start or end of the bus.



**Danger!**  
 Do not unplug or plug in interface connectors while they are in operation!



## 17 MARKING AND APPROVAL

### 17.1 CE mark

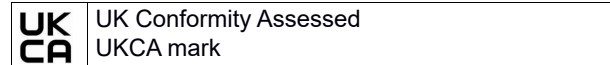


The electronic module Rivo™ I Controller (Mod. E10) meets the requirements of the harmonized European standards and thus complies with the statutory provisions of the EU directives. The manufacturer confirms successful testing of the device by affixing the CE mark.

The following harmonized European standards were applied:

- EMV/EMC: 2014/30/EU
- NRL/LVD: 2014/35/EU
- RoHS: 2011/65/EU and 2015/863/EU

### 17.2 UKCA mark



The electronic module Rivo™ I Controller (Mod. E10) meets the requirements of the harmonized European standards and thus complies with the statutory provisions of the EU directives. By affixing the UKCA mark, the manufacturer confirms that the device placed on the British market complies with the conformity requirements in Great Britain.

The following standards were applied:

- BS EN 61010-1:2010
- BS EN 61326-1:2021
- BS EN 63000:2018

### 18 LICENSE AGREEMENTS

The Electronics Module (Mod. E10) contains copy-right-protected software components covered by various Open Source licenses. Detailed information can be obtained from the Service-Center on the device.

**NOTES**



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Subject to modifications

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