Pioneering for You

Wilo-Control CT-Mix

en Installation and operating instructions

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Table of contents

1 General

1.1 About these instructions

These instructions are a part of the product. Obey the instructions for correct handling and use:

- Read the instructions carefully before all works.
- Keep the instructions easily get access to.
- Follow the product specifications.
- Follow the markings on the product.

1.2 Copyright

1.3 Subject to change

Wilo reserves the right to change the listed data without prior notice and is not liable for technical inaccuracies and/or omissions. The illustrations vary from the original and are intended as a sample representation of the product.

1.4 Exclusion from warranty and liability

Wilo accepts no warranty or liability in these cases:

- Wrong configuration because the operator or the customer did not give enough or correct instructions
- Non-compliance with these instructions
- Incorrect use of the product
- Incorrect storage or transport
- Incorrect installation or dismantling
- Not sufficient maintenance
- Non-approved repairs
- Not applicable installation location
- Chemical, electrical or electrochemical causes
- Wear of product components

2 Safety

This chapter contains basic information for the individual phases of the life cycle. Failure to observe this information carries the following risks:

- Risk of personal injury from electrical, electromagnetic or mechanical influences
- Environmental damage from discharge of hazardous substances
- Damage to property
- Failure of important functions

Failure to observe the information contained herein will result in the loss of claims for damages.

The instructions and safety instructions in the other chapters must also be observed!

2.1 Identification of safety instructions

These installation and operating instructions set out safety instructions for preventing personal injury and damage to property, which are displayed in different ways:

- Safety instructions relating to personal injury start with a signal word and are **preceded by a corresponding symbol**.

DANGER

Type and source of the danger!

Consequences of the danger and instructions for avoidance.

- Safety instructions relating to property damage start with a signal word and are displayed **without** a symbol.

CAUTION

Type and source of the danger!

Consequences or information.

Signal words

- **Danger!**
  Failure to observe safety instructions will result in serious injury or death!
- **Warning!**
  Failure to follow instructions can lead to (serious) injury!
- **Caution!**
  Failure to follow instructions can lead to property damage and possible total loss.

- **Notice!**
  Useful information on handling the product

Markups

✓ Prerequisite

1. Work step/list
   ⇒ Notice/instructions
   ► Result

Symbols

These instructions use the following symbols:

Danger of electric voltage

Danger – explosive atmosphere

Useful information

2.2 Staff qualifications

- The staff knows the local accident prevention regulations.
- The staff reads and understands these instructions.
- Electrical work: Only a qualified electrician must do the work.
  Necessary knowledge: identification and prevention of electrical hazards
- Installation and dismantling: Only a qualified electrician must do the work.
  Necessary knowledge: assembly tools and fastening to different construction parts
- Operation/control: The staff knows how the system works.

This product is not for use by:

- Persons (including children) below the age of 16.
- Persons below the age of 21 without supervision from an expert.
- Persons with reduced physical, sensory, or mental abilities.

2.3 Electrical work

- Electrical work must be carried out by a qualified electrician.
- Before commencing work, disconnect the product from the mains and safeguard it from being switched on again.
- Observe applicable local regulations when connecting to the mains power supply.
- Adhere to the requirements of the local energy supply company.
- Earth the product.
- Observe technical information.
- Replace a defective connection cable immediately.

2.4 Monitoring devices

Circuit breaker

The size and switching characteristics of the circuit breakers must conform to the rated current of the connected consumer. Observe local regulations.

2.5 Installing/dismantling

- Locally applicable laws and regulations on work safety and accident prevention must be complied with.
- Disconnect the product from the mains and secure it against being switched on again.
- Suitable fixation material must be used for the existing bearing surface.
- The product is not watertight. Select an appropriate installation site!
- Do not deform the housing during installation. Seals could leak and affect the stated IP protection class.
- The product may **not** be installed in potentially explosive areas.

2.6 During operation

- Do not open the switchgear.
- The user must notify the person in charge of all fault or irregularity immediately.
- In case of damage to the product or connection cable, switch off the product immediately.

2.7 Maintenance tasks

- Do not use any aggressive cleaners or scouring agents or fluids.
- The product is not watertight. Do not submerse the product in fluids.
- Only carry out maintenance tasks mentioned in these installation and operating instructions.
- Only original parts from the manufacturer may be used for maintenance and repairs. Use of parts other than the original parts releases the manufacturer from any liability.

2.8 Operator responsibilities

- Provide installation and operating instructions in a language which the personnel can understand.
- Make sure that the personnel has had the corresponding training for the specified work.
- Safety and information signs mounted on the device must always be legible.

- Train the personnel on how the system operates.
- Eliminate risk from electrical current.
- To ensure safe working practice, define personnel responsibilities.

Children and persons younger than 16 years or with reduced physical, sensory or mental capacities or limited experience are prohibited from handling the product! A technician must supervise persons younger than 18 years!

3 Application/use

3.1 Intended use

Control of mixers in treatment plants.

Intended use also includes compliance with this manual. Any other use is regarded as non-compliant with the intended use.

3.2 Improper use

- Installation in potentially explosive atmospheres
- Overflow of the switchgear

4 Product description

4.1 Structure

The front of the switchgear comprises the following main components:

- Main switch for switching the switchgear On/Off
- Emergency stop button to cut the power in case of an emergency
- LEDs for displaying the current condition
- Touchscreen controlling and displaying the current operating data and each menu items

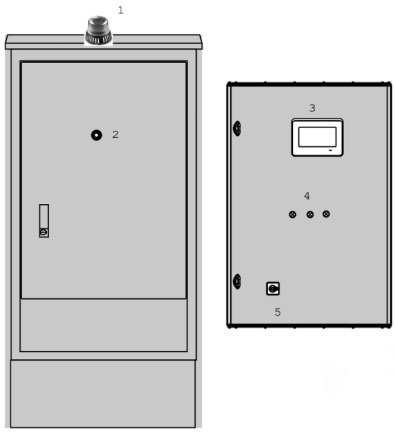


Fig. 1: Switchgear front

1	Alarm
2	Emergency Shutdown Button
3	Touchscreen
4	Run-Fault Signals
5	Main Switch

4.2 Function

Mixers work according to the manually set speed reference coming from the panel or automation and circulate the basin water in the treatment plants.

4.3 Technical data

Date of manufacture*	2024
Mains connection	3~400 V, 50/60 Hz
Mains frequency	50/60 Hz
Max. current consumption for each mixer	11 A
Max. rated power for each mixer	5.5 kW
Pump activation type	FC (Frequency Controller)
Ambient/operating temperature	-10 … +50 °C
Storage temperature	-30 … +60 °C
Max. relative humidity	90 %, non-condensing
Protection class	IP65
Electrical safety	Pollution degree II
Control voltage	24 V =/~
Housing material	Metal

Details about the Hardware version (HW) and Software version (SW) can be found on the rating plate!

4.4 Type key

Example: W-CTRL-CT-M-2X5.5 KW-T4-DOL-FC	
W-CTRL-CT-M	Mixer control panel
2X	Number of mixers
5.5	Nominal power of each mixer (kW)
T4	3x400 V / 50 Hz
DOL	Direct starter
FC	With frequency converter

4.5 Operation on electronic start-up controllers

Connect the switchgear directly to the mixer and the mains. Intermediate switching of additional electronic start-up controllers, e.g. a frequency converter, is not permitted!

4.6 Installation in potentially explosive atmospheres

The switchgear does not have its own explosion protection class. **Do not** install the switchgear in potentially explosive areas!

4.7 Scope of delivery

- Control panel – Wilo-Control CT-MIX
- Electrical Circuit Diagram
- Installation and operating instructions

4.8 Accessories

The connection of the mixers must be carried out on the contact site in accordance with the circuit diagram,

- ProfiNet communication

5 Transportation and storage

5.1 Delivery

- Immediately examine the shipment for defects (damage, completeness ...).
- Write all defects on the freight documentation.
- Tell the manufacturer about the defects on the day of receiving the shipment.
- Subsequent told claims can no longer be asserted.

5.2 Transport

- Clean control device.
- Close housing apertures, ensuring they are sealed watertight.
- Impact-resistant and watertight packaging.

CAUTION

Damage to property due to wet packaging!

Wet packaging may tear. If unprotected, the product may fall on the ground and be irreparably damaged.

- Carefully lift wet packaging and replace it immediately!

5.3 Storage

- Pack the switchgear in dustproof and watertight packaging.
- Keep storage temperature: -30 °C to +60 °C, max. relative humidity max 90 %.
- Frost-proof storage at a temperature of -30 °C to +60 °C with relative humidity of max 90 %. is recommended.
- Prevent the formation of condensation always.
- All open threaded cable glands must be sealed to prevent water ingress into the housing.
- Attached cables must be protected against kinking, damage, and ingress of moisture.
- To prevent damage to the components, protect the switchgear from direct sunlight and heat.
- Clean the switchgear after storage.
- If there has been water ingress or condensation has formed, have all the electronic components tested for correct function. Contact customer service.

6 Installation and electrical connection

6.1 Installation types

- Floor-mounted

6.2 Staff qualifications

- Electrical work: qualified electrician.
  Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.
- Installation/dismantling work: qualified electrician.
  Person with knowledge regarding tools and fixation material for various structures

6.3 Operator responsibilities

- The installation location is clean, dry and free of vibration.
- The installation location is overflow-proof.
- The switchgear is not exposed to direct sunlight.
- Installation location outside of potentially explosive atmospheres.

6.4 Installation

- Level sensor and connection cable provided by the customer.
- While laying the cables, make sure that there is no tension, no kinking and no pinching that could damage the cable.
- Make sure the cable cross-section and length for the routing type correct.
- Seal not used threaded cable glands.
- Make sure that the ambient conditions defined at the “Technical Data” are followed

DANGER

Risk of explosion if the switchgear is installed in potentially explosive areas!

The switchgear does not have its own explosion protection class!

- Always install the switchgear outside hazardous areas.

6.4.1 Basic advice on fixing the switchgear in place

The fixation material for the relevant construction must be provided by the customer and the following information must be observed:

- To prevent cracks in the masonry and chipping of the construction material, ensure sufficient clearance to the edge of the structure.
- The depth of the borehole depends on the length of the screws. Drill the borehole approx. 5 mm deeper than the screw length.
- Drilling dust impairs retention force. Always blow the borehole clean or vacuum it out.
- Do not damage the housing during installation.

6.4.2 Installation of switchgear

Attach the switchgear to the floor with the four screws.

✓ Switchgear is disconnected from the mains and voltage-free.

1. Align the drill template at the installation location and attach.
2. Drill and clean the mounting holes in accordance with the specifications of the fixation material.
3. Remove the drill template.
4. Fasten the screws.
   ► The switchgear is installed. Now connect the mains, and mixers.

6.5 Overview of components

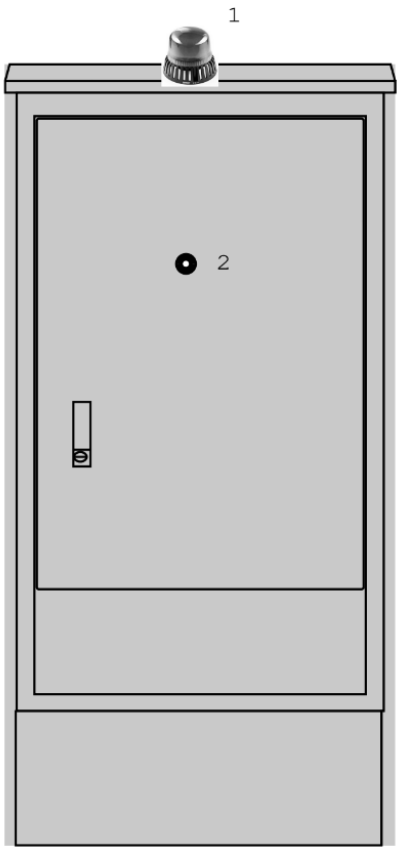
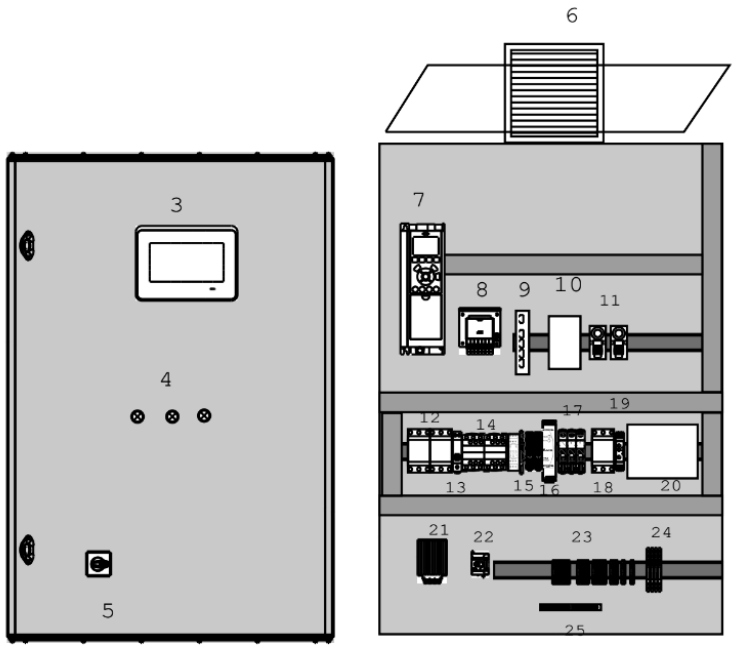


Fig. 2: Control W-CTRL-MIX

Overview Wilo-Control CT-MIX



1	Alarm
2	Emergency Shutdown Button
3	Touchscreen
4	Fault-Run Signals
5	Main Switch
6	Fan
7	Frequency Converter
8	Isolation transformer
9	Ethernet Switch
10	Power Distribution Bar
11	Thermostat
12	Thermal Magnetic Switches
13	Automatic-Manual Mode Switch
14	Contactors
15	Relays
16	Power Supply 24 VDC
17	Fuses
18	Control Thermal Magnetic Switch
19	Phase Protection Relay
20	PLC
21	Heater
22	Main breaker switch
23	Terminals
24	Fault-Run Signal Relays
25	Grounding Strip

7 Operation

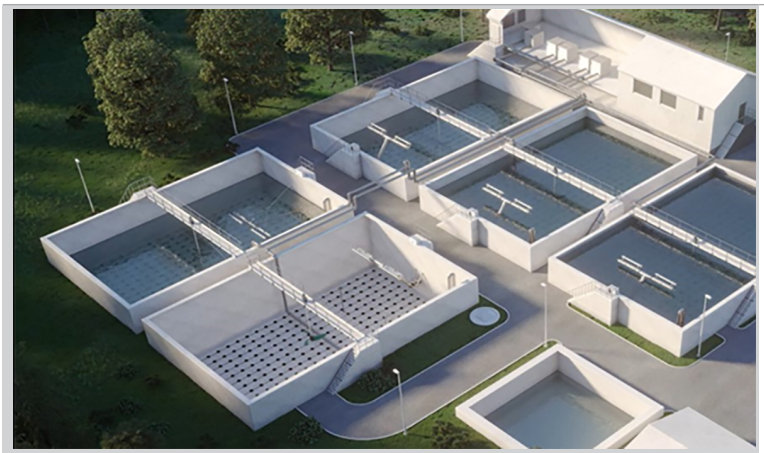
DANGER

Danger of death due to electrical current!

There is danger of death from open switchgear.

- Only operate the switchgear when closed.
- Electrical work on the internal components must be carried out by a qualified electrician.

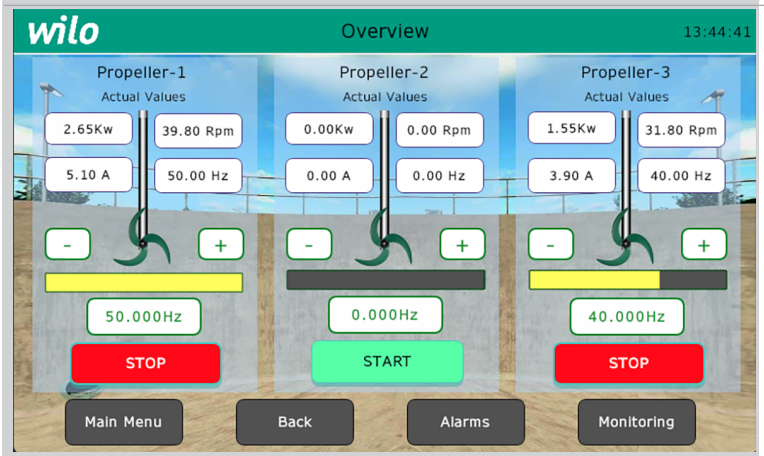
7.1 Controlling and menu structure



Startup Screen

When the main switch turned on, this image will show up on the screen. Click this image to access the Overview Page.

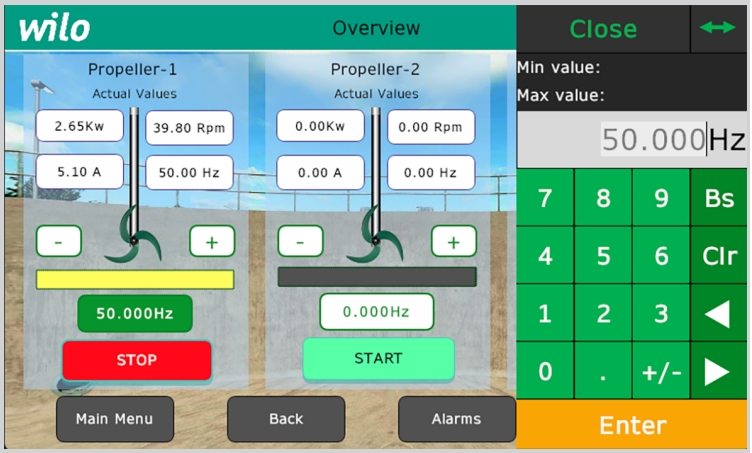
Screen turns off after 5 minutes of inactivity and turn on again when clicked somewhere on the screen.

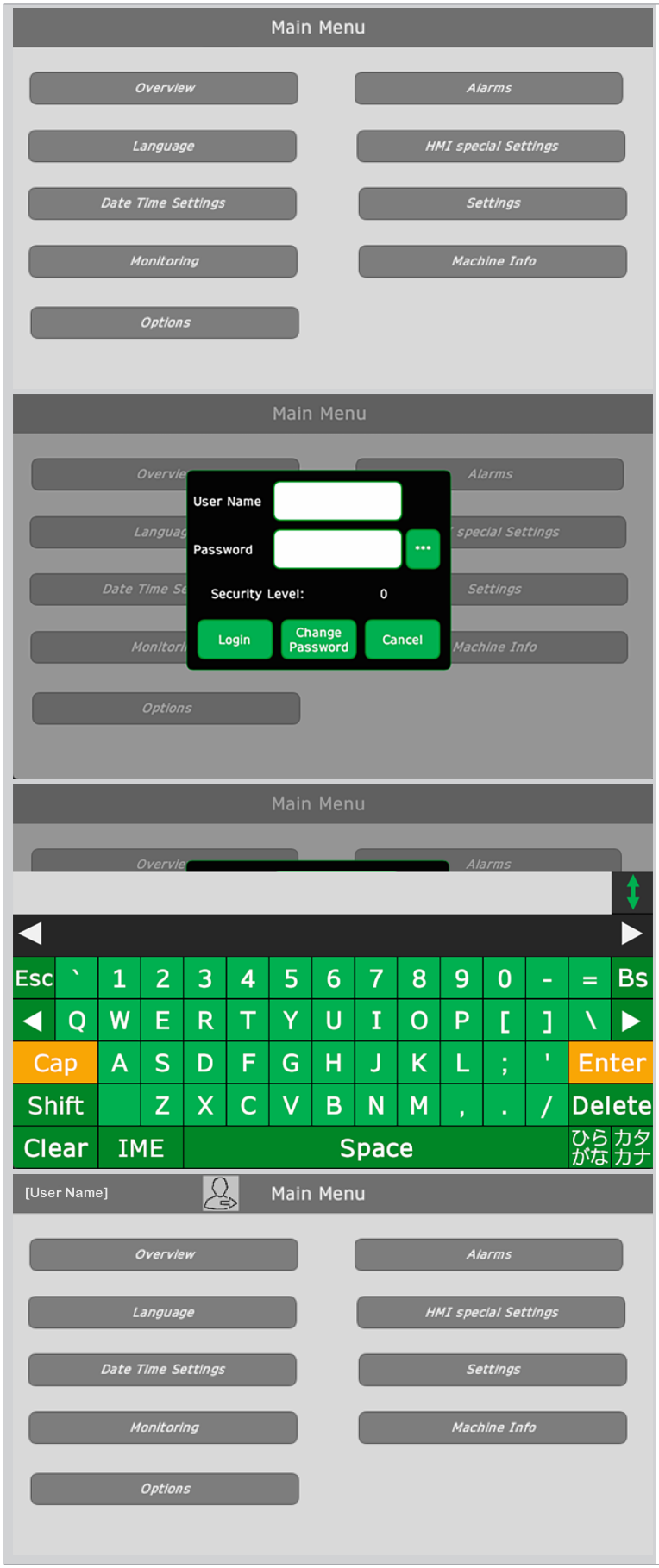


"Overview" Page

The propellers' speed is adjusted by changing frequency in this touchscreen. Use the buttons “+” and “–” to set the frequency with a sensitivity of 0.1 Hz.

The propeller animation speeds up and down according to the propeller speed.





"Main Menu"
The "Main Menu" screen is where different parts of the system can be accessed, such as "Overview, Language, Date and Time, and Settings." Related pages can be accessed by clicking their names.

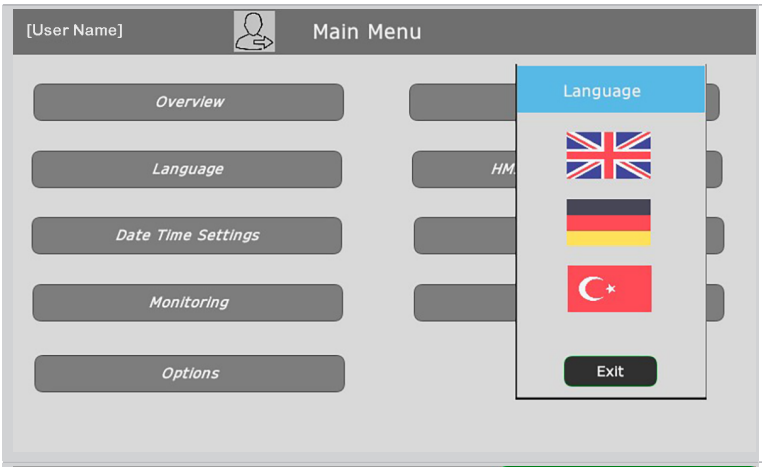
2 user levels exist in the system. No user is permitted to change anything without entering a username and a password.

Operator Level: Only approved to change the propeller frequency, date/time and language settings.
(User Name: OP1, Password: 1111)

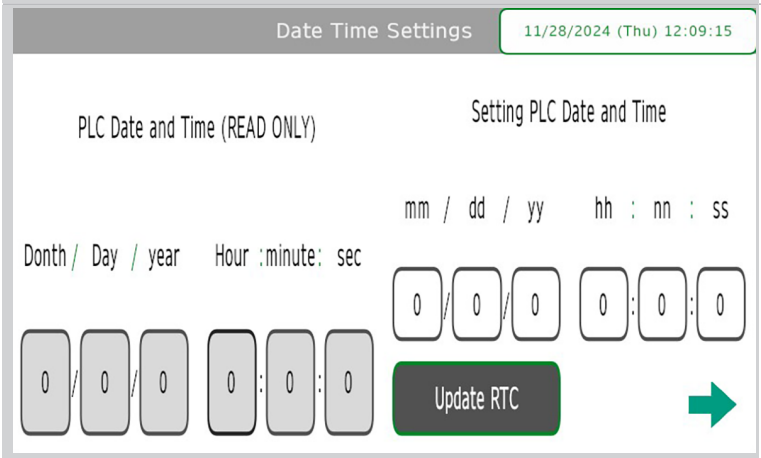
Service Level: Access to all settings.

After entering the correct password and user name, the user name and logout icon ( ) will be displayed on top of the screen.

The system login access will be automatically terminated 5 minutes after logging in.
Any click by an operator on a button that requires higher access rights opens the Login-Screen again.



"Language" Page
The language of the system can be changed from this page.



"Date and Time Settings" Page
The date and time of the system can be changed from this page.

7.2 Factory settings

To reset the switchgear to the factory settings, contact customer service.

8 Commissioning

8.1 Operator responsibilities

- Supply installation and operating instructions at the switchgear or at a location specially reserved for it.
- Supply the installation and operating instructions available in a language that the staff can understand.
- Make sure that all staff read and understood the installation and operating instructions.
- The installation site of the switchgear is overflow-proof.
- The switchgear must be properly fused and earthed.
- The signal transmitter must be installed and set in accordance with the system documentation.
- See the minimum water submersion of the connected mixers.
- Safety devices (incl. emergency off) of the entire system are switched on and checked for trouble-free operation.
- The switchgear is suitable for use under the defined operating conditions.

8.2 Commissioning in explosive atmospheres

DANGER

Risk of explosion if the switchgear is installed in potentially explosive areas!

The switchgear does not have its own explosion protection class!

- Always install the switchgear outside hazardous areas.

8.3 Connection of signal transmitters and pumps within potentially explosive atmospheres

DANGER

Risk of explosion because of incorrect connection!

If the connected pump and signal transmitter is installed in an explosive atmosphere (Ex zone), there is a risk of explosion because of incorrect connection:

- **Do not** connect electrode in an explosive atmosphere (Ex zone)!
- Connect the float switch using an Ex cut-off relay!
- Connect level sensor through a Zener barrier!
- Connection must be carried out by a qualified electrician.

8.4 Activating the switchgear

8.4.1 Activating the device

NOTICE

Operating mode after power failure

Following a power failure, the switchgear will automatically start up in the last operating mode set.

✓ Switchgear is closed.
✓ Installation has been performed correctly.
✓ All signal transmitters and consumers are connected and installed in the operating space.
✓ If float switches are used, set the switching points correctly.
✓ Motor protection is preset according to the mixer data.

1. Open the outer cover.
2. Turn the main switch to the “ON” position.
3. Switchgear starts.
   All LEDs light up for 2 s.
   – The display illuminates and the start screen appears.

   ► The switchgear is ready for operation.

9 Shutdown

9.1 Personnel qualifications

- Installation/dismantling work: qualified electrician
  Knowledge regarding tools and fixation material for various structures
- Electrical work: qualified electrician
  Person with appropriate technical training, knowledge and experience who can identify and prevent electrical hazards.

9.2 Operator responsibilities

- Observe locally applicable accident prevention and safety regulations of trade associations.
- Make sure that the personnel has had the corresponding training for the specified work.
- Train the personnel on how the system operates.
- When working in enclosed spaces, a second person must be present for safety reasons.
- Ensure enclosed spaces have sufficient ventilation.
- Take immediate countermeasures if there is a build-up of toxic or suffocating gases!

9.3 Shutdown

To decommission the pumps, switch off the pumps and switchgear at the main switch. The settings are stored in non-volatile memory in the switchgear and are not deleted. This memory makes sure that the switchgear is always ready for operation. For the standstill period, follow to the values for ambient temperature and maximum humidity given in the Chapter “Technical data”.

1. Open the outer cover.
2. Turn main switch to the “OFF” position.
3. Secure the main switch against being activated by unauthorised persons (e.g. lock main switch)

   ► Switchgear switched off.

9.4 Removal

DANGER

Danger of death due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Before all electrical work, disconnect the product from the mains and secure it against being switched on again without authorisation.
- Electrical work must be carried out by a qualified electrician!
- Observe local regulations!

✓ Decommissioning performed.

✓ Mains connection is switched so that it is voltage-free and safeguarded against being activated by unauthorised persons.

✓ The power connection for fault and run signals is switched so that it is voltage-free and safeguarded against being activated by unauthorised persons.

1. Open the switchgear.
2. Disconnect all connection cables and pull them out through the threaded cable connection.
3. Close off the ends of the connection cables watertight.
4. Seal threaded cable connections watertight.
5. Support the switchgear (e.g. get a second person to help).
6. Loosen the switchgear fastening screws and remove the switchgear from the structure.
   ► Switchgear removed. Observe the following for storage!

10 Maintenance

DANGER

Danger of death due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Before all electrical work, disconnect the product from the mains and secure it against being switched on again without authorisation.
- Electrical work must be carried out by a qualified electrician!
- Observe local regulations!

NOTICE

Unauthorised work or structural changes are prohibited!

Only maintenance and repair work described in this manual may be carried out. All other works and any alterations to the construction may only be carried out by the manufacturer.

10.1 Maintenance intervals

Regular

- Clean switchgear.

Annually

- Check electro-mechanical components for wear.

After 10 years

- General overhaul

10.2 Maintenance tasks

Check electro-mechanical components for wear

- Have electro-mechanical components checked for wear by an electrician.
- If wear is ascertained, have the affected components replaced by an electrician or by the Wilo Customer Service.

Cleaning switchgear

✓ Switch off switchgear.

1. Clean switchgear with a damp cotton cloth.
   Do not use any aggressive or scouring cleaners or fluids!

General overhaul

During a general overhaul, all of the components, wiring and the housing are checked for wear. Defective or worn components are replaced.

11 Faults, causes and remedies

DANGER

Danger of death due to electrical current!

Improper conduct when carrying out electrical work can lead to death due to electric shock!

- Before all electrical work, disconnect the product from the mains and secure it against being switched on again without authorisation.
- Electrical work must be carried out by a qualified electrician!
- Observe local regulations!

11.1 Operator responsibilities

- Observe locally applicable accident prevention and safety regulations of trade associations.
- Make sure that the personnel has had the corresponding training for the specified work.
- Train the personnel on how the system operates.
- When working in enclosed spaces, a second person must be present for safety reasons.
- Ensure enclosed spaces have sufficient ventilation.
- Take immediate countermeasures if there is a build-up of toxic or suffocating gases!

11.2 Fault indication

Possible faults are shown by the fault LEDs and alphanumeric codes on the display. Have system checked according to the displayed fault and have defective components replaced. Faults are displayed in various ways:

- Fault in the control/on the switchgear:
  - The red fault signal LED **lights up**.
  - Display of the error code alternates with the main screen. The error code is stored in the fault memory.
  - The collective fault signal is activated.
  - If the internal buzzer is activated, there is an audible alarm signal.
- Pump fault
  Status icon of the respective pump **flashes** on the display.

11.3 Further steps for troubleshooting

If the points listed here do not rectify the fault, please contact customer service. Costs may be incurred if other services are used. For more details, please contact customer service.

12 Disposal

12.1 Rechargeable battery

Do not dispose of rechargeable batteries in domestic waste and remove them before product disposal. End consumers are legally obliged to return all used rechargeable batteries. For this purpose, you can return used rechargeable batteries free of charge at municipal collection points or specialist retailers.

NOTICE

Disposal in domestic waste is prohibited!

Affected rechargeable batteries are marked with this symbol. The identifier for the heavy metal they contain is displayed beneath the graphic:

- **Hg** (mercury)
- **Pb** (lead)
- **Cd** (cadmium)

12.2 Information on the collection of used electrical and electronic products

Proper disposal and appropriate recycling of this product avoids environmental damage and risks to personal health.

NOTICE

Disposal in domestic waste is prohibited!

In the European Union this symbol may be included on the product, the packaging or the accompanying documentation. It means that the electrical and electronic products in question must not be disposed of along with domestic waste.

Please note the following points to ensure proper handling, recycling and disposal of the used products in question:

- Hand over these products at designated, certified collection points only.
- Observe the locally applicable regulations!

Please consult your local municipality, the nearest waste disposal site, or the dealer who sold the product to you for information on proper disposal. Further recycling information at http://www.wilo-recycling.com.

Subject to change without prior notice!

wilo

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