

OPERATING INSTRUCTIONS

ESC200

electronic control comfort



Read before installation and commissioning!



ATTENTION

*The figure- and graphic expositions in this operating instruction might deviate partially from your system, by virtue of technical modification! All the features, components or parts marked with a * are options or accessories and because of that not available on each system! You can find information and descriptions for extensions, additional components and -functions enclosed. Please read this operating instruction carefully before commissioning. Keep this operating instruction with care for further assignment!*

General information

Operating Instructions for ESC200
© 2013 (2018)
Software version (≥): 1.0

Original instructions

The German version of this document is the original instruction manual.

Contact:

Before contacting our service, make a note in advance ...

- The exact device type (rating plate)
- The serial number of the component (nameplate)
- Possibly. displayed error messages on the display

In case of faults and technical problems:

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* Option



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1. Quick Start - Quick-commissioning of the control

INFO - Read before commissioning !!!

The quick-commissioning is for experienced or technical versed users. Carry out the quick-commissioning step-by-step and without interruption. After an interruption start again with step 1! All settings for the quick-commissioning will be done in the quick menu! Always save all settings with ENTER before leaving a menu item !

= Go on to the next menu item

= Chose value / Change value

= Save (ENTER)

| Step | press ¹ |
|--|--------------------|
| 1 Inform yourself about the buttons on the control >>> see chapter 6.2 | |
| 2 Open quick menu | 1 x |
| 3 Set „language“ | + |
| 4 Chose „Switch on/off path“ (only if more than one path is connected!) | 2 x + |
| 5 Switch on the connected path (each umber is one path - 0 = off , 1 = on) | + |
| 6 Open submenu „settings“ (path1) | |
| 7 Motor type forward (set only when there are variations!) | / + |
| 8 Motor type backward (set only when there are variations!) | / + |
| 9 Motor test (rotating direction of the motor) test with the button ² or | |
| 10 Do learning (learn program breaking current forward/backward) | |
| 11 Wait for the message „learning finished“ - then save the breaking currents | |
| 12 Switch off forward (current breaking current motor 1 - will be displayed) | |
| 13 Switch off forward (current breaking current motor 1 - will be displayed) | |
| 14 Automatic on/off (accept factory setting „OFF“) | |
| 15 Frost mode (off/type 1/type 2 - accept factory setting „OFF“) | |
| 16 Drive3 (accept factory setting „OFF“) | |
| 17 Main menu | |
| 1 The displayed number during the navigation (e.g. 3 x ESC) refers always to the info-display as starting position. During sequenced settings it switches automatically to the next menu item after ESC or saving. | |
| 2 During the motor test you have to keep pressed the respective button (deadman-operation) | |
| 3 Option - Only for controls with driving function | |



INFO

After completion of these settings the operating mode display will be displayed and the control is operable with the standard functions. All standard- and extended functions can be set in the main menu. Read therefor the description in the chapter „7. Settings“.

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2. Common Advises

Please read this operating instruction carefully before assembling and commissioning the control. So you are able to avoid faults during the assembling/operation and you can learn to use all the characteristics and functions of the control.

2.1. Used signs, symbols and abbreviations

- BA** = Operating instruction
- (1)** = The numbers in the brackets refer to the details of the pictures aside
- >>>** = Consequence of an action
- AE** = Drive unit, consisting of 2 single drive winches (forward/backward)
- Path** = Cow alley, Driving surface of the scraper. That driving surface exists of one or two cow alleys (when having a double scraper). For each path you need always one driving unit (AE).

2.2. Copyright

The copyright for this installation and operating instruction belongs to the PRINZING Company. It is not allowed, neither entire, nor partially duplicate it, publish it or for unauthorized using in function of competition, and not to inform others. Deliberate infringements against this will be prosecuted.

2.3. Intended using

1. The electronic control is only allowed to control drive winches or/and dung removal scrapers of the Peter PRINZING GmbH.
2. Only materials, components and special equipment which are on our order confirmation are allowed to be used
3. Unauthorized rebuildings and changes on the control are not allowed because of safety related reasons. Changes on the electronic control are not allowed without the permission of the, PRINZING company.
4. A deviant using of the control has to be put down on paper!
5. Use only original spare parts, or from the manufacturer authorised standard parts, to change damaged parts.
6. Keep the operational-, maintenance- and servicing terms which are prescribed here exactly.



ATTENTION!

A secure operation can not be ensured, if the control is not used in this vein. Not the manufacturer, but the operator is responsible for personal injury and property damage, which results of misapplication. Without permission of the PRINZING Company, technical modifications on the system or of its components are not allowed and can lead to a deficit of warranty claim!

* Option

3. Security

The following safety instructions are intended to avoid persons- or property damages. The operator of the dung removal system must ensure that the basic safety precautions and regulations are observed and respected. Operational managers as well as persons who are working on or with the dung removal system have to read and understand the operation instruction completely.

Inform yourself, before commissioning the control, about the place of the safety- and protective devices.

Safety- and protective devices are

- Lockable main switch
- Emergency shut off button
- Protective coverings
- Protective grids

3.1. Common safety advices

1. Before commissioning the system, after assembling, repair- and maintenance works check the entire assembling and proper function of all safety- and protective devices.
2. Before starting repair or maintenance works on the dung removal system you have to switch off the control and protect it against accidental switching on (e.g. lock main switch).

Not allowed are:

- Repair-and maintenance works on the system during the operation.
- Arbitrary changes on the control or on the components of the dung removal system.
- Working methods which influence the safety of the dung removal system.
- Uncontrolled operation on the system, if not all the required safety- and protective devices for unattended operation on the system (see chapter 2.3) are met.

To avoid danger points between scraper and solid parts of buildings (e.g. wall openings, gates, pillars and parts of the housing), it must be respected a safety distance of at least 500 mm over the scraper path. An undercut of this safety distance must be clarified with the relevant Employer's Liability Insurance Association on site. The statutory provisions are valid unconfined (e.g. VSG 2.1 § 16) Technical safeguards for danger spots are, for example, switching strips on danger points, emergency trip wires or step circuit of the scraper.

3.2. Unattended operation (auto mode) of the dung removal system

The following conditions must be guaranteed for an unattended operation of the dung removal system:

1. It is not allowed, for unauthorized persons (especially children) or animals, to access the workspace of the dung removal system.
2. A risk of injury for the animals must be excluded by structural conditions in the work area of the plant (consider minimum heights).
3. All safety arrangements, especially main switch and emergency shut off have to be accessible and functional.
4. It is not allowed to do service-, maintenance- or cleaning works round the working area of the dung removal system.

Unattended operation on the system is possible during:

- Auto mode ON, that means the scraper move will be started automatically corresponding a timetable
- Manual start of the scraper move by a radio control or an external operating key
- Manual start of the scraper move with operating keys from the control, if the working area of the scraper is not visible (e.g. during assembling the control in an engineering room)

* Option



3.2.1 Danger of self starting scraper

When „auto mode on“ and „frost mode on“ the scraper starts according to the programmed settings automatically,

In the following situations the scraper starts automatically:

- according timetable when „auto mode on“ () beginning at the starting position
- according timetable, after manual stop in the walkway (starts from the next starting time)
- according starting temperature, when „frost mode on“ () according the set interval
- after „STOP“ during the frost mode according the set interval
- after 600 sec. when „PAUSE“ during the frost mode



INFO

When doing repair-, service- or maintenance works round the operation area of the scraper, always switch “OFF” the main switch. Thereby you can avoid risks emerging by the automatically starting scraper.

3.3. How to behave in case of danger

When there are dangerous situations you have to:

1. stop the system immediately by using the emergency shut off, the STOP-button or the main switch
2. switch off the main switch and lock it by using a padlock to avoid an accidental switch on
3. delete the cause of risk or the cause of defect immediately

Do not switch on the machine till the cause of risk is deleted!

3.4. Danger of electric energy



ATTENTION!

- Assembling-, connection- and repair works on the electric components of the dung removal system are only allowed to be done by an electrician.

- After assembling-, connection- and repair works on the electric system you have to test all safety measures and note down according to the statutory provision.



ATTENTION - Danger of electric shock!

During the main switch is switched on there might be mains voltage on the terminal clamps of the control and on the motor. Before you open the control you always have to switch off the main switch!

Consider the following information:

- Do not work on energised parts.
- Pass the cables and lines that there are no thermal, mechanical or electromagnetic loads. Consider the information in the chapter “Assembling”.
- Mount all buttons and coverings, close all box holes.
- Damaged or leaking electrical appliances (controls, pushbuttons, motors, etc.) must be de-energized immediately and replaced by new ones
- Is is only allowed to do repair works on electric parts with specified tools.

* Option

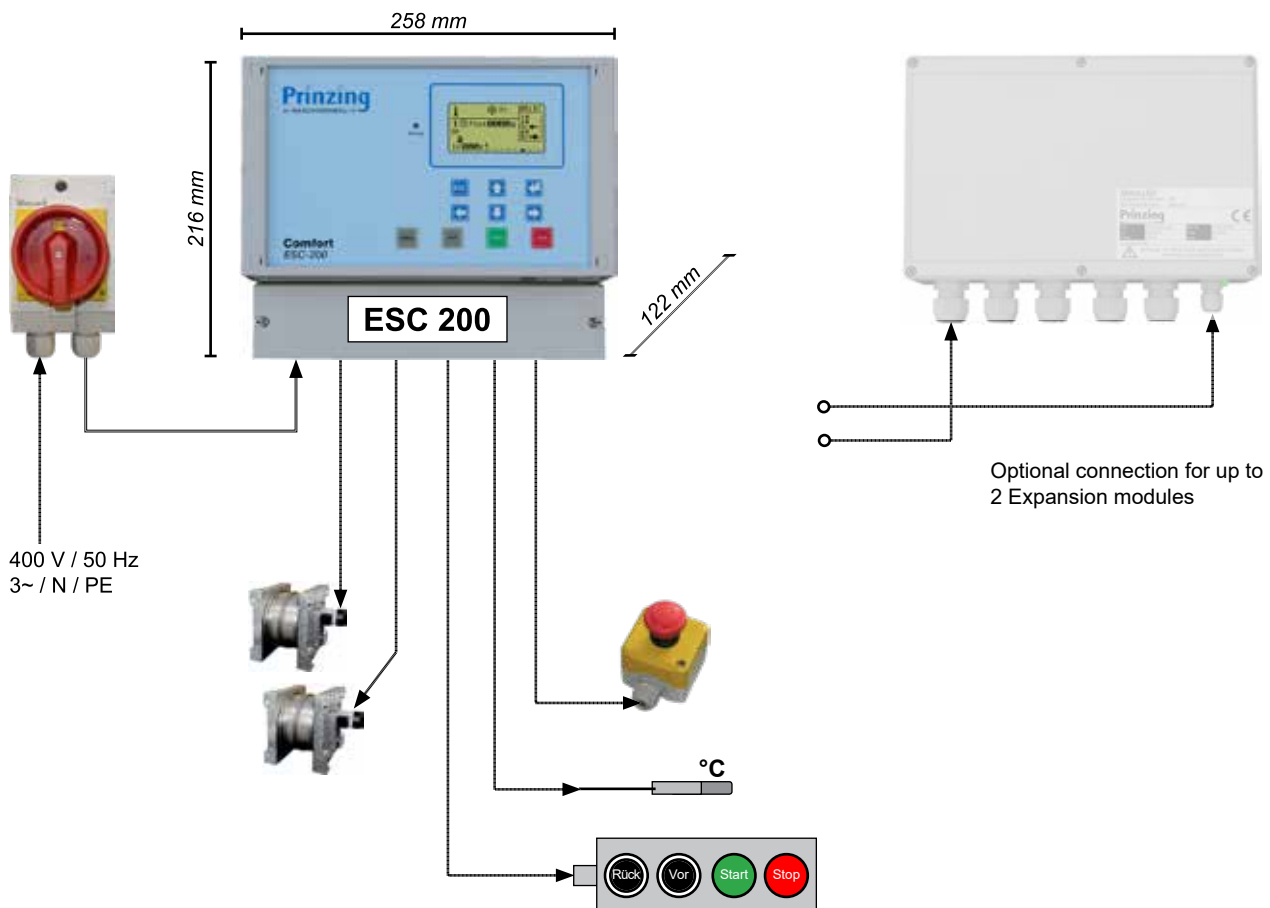
4. Assembling

4.1. Common advises for the assembling works

Consider the following points when assembling the control:

1. Mount the control on a central, accessible place with solid floor.
2. Do not expose the control to extreme heat, cold or temperature variation.
3. Protect the control against splash water and direct insolation.
4. Into the feed line of the control you have to mount a lockable main switch (next to the control)
5. Mount all necessary screwing (enclosed) and close after assembling all coverings and holes on the control.
6. Mount the emergency shut off preferably impenetrable for the animals (malfunctions).
7. Mount the emergency shut off viewable and accessible on the stall- or box entrance. Accordant to the local conditions you have to mount several emergency shut off buttons.
8. Use only allowed cables and lines, do not cross the maximum line length.

Overview electrical connection



* Option

4.2. Assembling of the Expansion Modules (EXP 200)

Up to 2 expansion modules (EXP 200) can be connected to the COMFORT control. Up to 2 drive units can be connected to each expansion module.

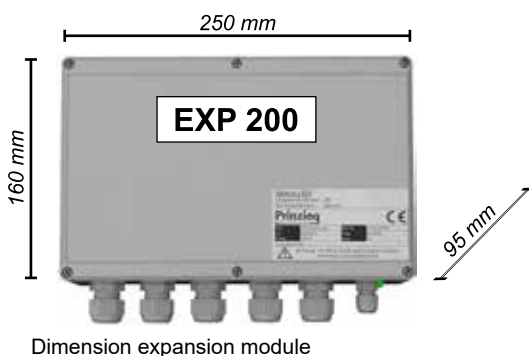
Observe the following notes:

- Mount expansion modules (EXP200) next to the controller (ESC200)
- Only connect expansion modules (EXP200) to the enclosed data cable (do not extend the data cable!)
- The mains connection of the control system (ESC200 + EXP200) with only one main switch
- Observe the setting of the coding switches in the expansion module (EXP200) - see picture below and connection diagram

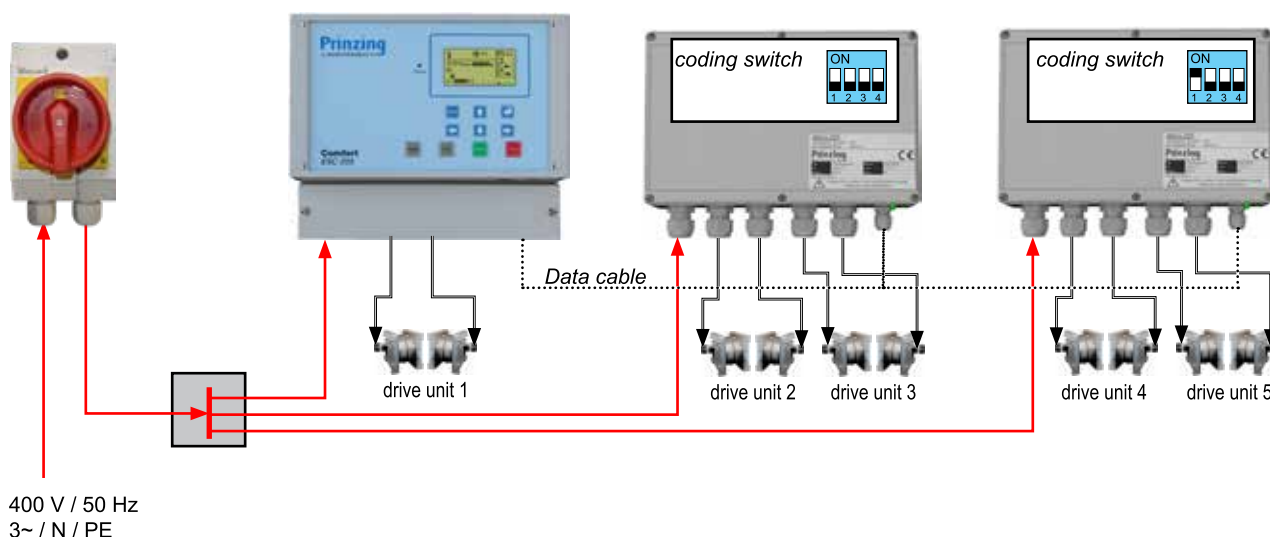
At the bottom of the expansion module (EXP200) there is an LED (see picture below).

This LED signals after switching on the system ...

- Slow flashing >>> Connection of the controller is OK
- Fast flashing >>> incorrect connection of the data line
- LED is off >>> faulty connection of the expansion module (EXP200)



Electrical connection controller unit ESC200 + EXP200



INFO

If the coding switches are set incorrectly, the LED does not flash and the display shows the error message "Error phase L1". Set the coding switches correctly and restart the controller!

* Option

4.3. Cable types, power length and cable cross-section

| System | Type ¹ | Minimum number of wires | Voltage | Maximum recommended length ² |
|---|-----------------------------------|-------------------------|---|---|
| Supply to control ESC200 | NYM 5 x 1,5 mm ² | 5 | 400 V / 3~ / 50 Hz | |
| Supply to Expansion EXP200 | NYM 5 x 1,5 mm ² | 5 | 400 V / 3~ / 50 Hz | |
| Drive motor forwards (path 1...5) Drive motor backwards (path 1...5) | NYM 5 x 1,5 mm ² | 4 | 400 V / 3~ / 50 Hz | 100 m |
| Emergency stop button ³ | NYM 3 x 1,5 mm ² | 2 | 24 V DC | 100 m |
| External operating keys | NYM Cat 5 / Cat7 | 6 | 24 V DC | 100 m |
| Data cable Expansion EXP200 | LiYCY 2 x 0,25 mm ² | 2 + shielding | Only use the enclosed data cable! The maximum length of the data cable is 1 m! | |
| Temperature sensor | NYM 3 x 1,5 mm ² | 2 | 5 V DC | 10 m |

Clamping type on the control: WAGO with control lever, marked in color, cable cross section max. 1,5 mm²

- ¹ - Define cable cross-section according to the power of the motors and the pipeline length
- ² - The pipeline length depends on the cable cross-section and the connected load. Consider for the low-voltage line (e.g. external operating key) that there may be failures on the control by launching of electromagnetic fields. Because of that, do not pass these lines together with the electric power line and keep the cable length as short as possible.
- ³ - Emergency stop button - We suggest to mount min. one emergency stop button on each drive unit (path)!

4.4. Mount the following warning and information signs

In order to increase the safety of your dung removal system and avoid accidents, please assemble the following warning labels after mounting the modules and before starting the system into operation:

- "Machine starts automatically" >>> Mounting the warning labels to the driving winds. These warning labels are provided with the delivery of your system.
- "ATTENTION - automatically starting dung removal system" >>> Installation at all entrances to the work area of the dung removal system. These warning labels are available in stores.

* Option



5. Electrical connection

The electrical components may only be connected by authorized electricians! Before connecting the electrical components, find out about your local supply voltage and network performance. For the connection of the electrical components, the currently valid legal regulations apply.

Required mains voltage: 400 V / 3 ~ / PE-N / 50Hz.

The terminals of the ESC200 controller and the EXP200 extension are located on the underside of the boards. (see picture below)

You can find a connection diagram for the controller in the appendix of this operating instruction and in the packaging of the controller.

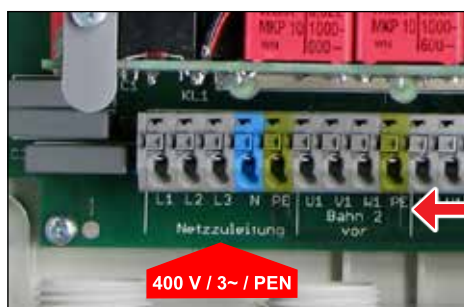
| Cable cross-section and color codes of the terminals | |
|--|---|
| Cable cross-section of the terminals | Max. 1,5 mm ² |
| Color codes of the terminals | Gray >>> mains voltage (230 - 400 VAC) Blue >>> neutral Green >>> protective conductor Orange >>> control voltage (5 - 24 VDC) |

INFO

We accept no liability and warranty for damages due to faulty, unprofessional or improper connection of the electrical components! To prove a professional installation, a test protocol must be prepared by the electrical installation company. Connecting several COMFORT-controllers is not allowed.



connecting terminal ESC200



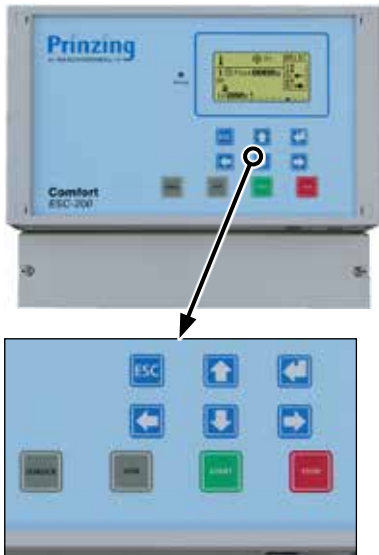
connecting terminal EXP200



* Option

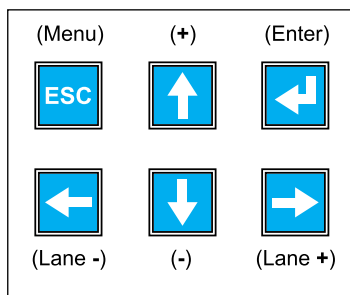
6. Control buttons and display elements

6.1. Control and input buttons on the controller

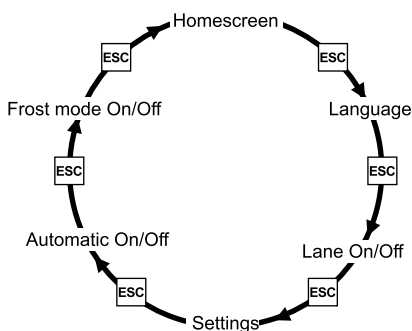


control buttons ESC200

| Function of the control buttons | |
|---------------------------------|---|
| | START-button - Starts the automatic mode according to the settings - Starts the automatic mode after a break (1x STOP) |
| | STOP-button - Stops the scraper during manual operation - Stops the scraper in frost mode until the next interval - In automatic mode 1 x STOP = break - In automatic mode 2 x STOP = cancel program |
| | Button Forwards (VOR) Starts motor 1 (fwd) in manual mode. The scraper stops at the next stop, obstacle or with STOP-button |
| | Button Backwards (ZURÜCK) Starts motor 2 (bwd) in manual mode. The scraper stops at the next stop, obstacle or with STOP-button |



| Function of the control buttons | |
|---------------------------------|--|
| | ESC-button - Opens quick menu from the homescreen - Changes to the next menu item in the quick menu (see ring navigation) - Backwards navigation (stepwise) in the main- and submenu - Cancel a setting in the main menu without saving |
| | ENTER-button - Acknowledge an error message. - Open a menu point (e.g. settings forwards) - Save an setting or function - Confirm a Query (e.g. save really?) |
| | - Changing cow alleys in the display (backwards - 5...4...3...2...1) - Positioning the cursor in the left direction |
| | - Changing cow alleys in the display (forwards - 5...4...3...2...1) - Positioning the cursor in the right direction |
| | - Navigation in the main menu upwards - Move selection upwards - Change a marked number (+1) |
| | - Navigation in the main menu downwards - Move selection downwards - Change a marked number (-1) |

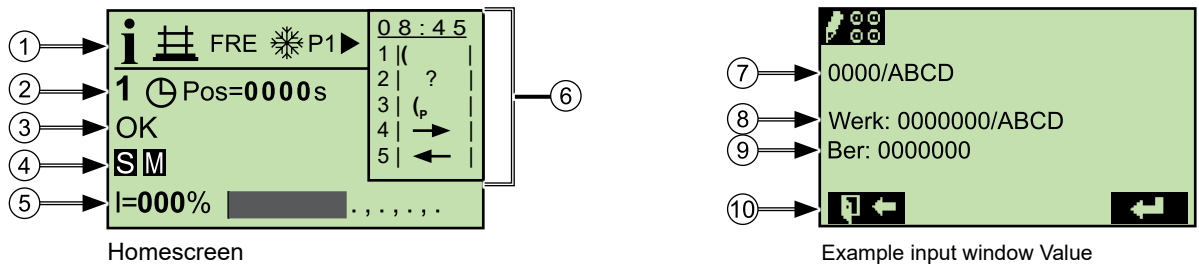


Ring navigation quickmenu

* Option



6.2. Display - icons and description



| | Symbol | Description | See |
|---|------------------|--|--|
| ① | i | INFO line - shows activated functions for the system (e.g. FRE) or single cow alley (e.g. *) | |
| | ☰ | Cow drover function is activated for the displayed cow alley | page 34 |
| | FRE | "Free" operating mode for automatic mode is activated. (alternatively: Parallel - Sequential - Off) | page 24 |
| | ☼ P1▶ | - Frost program for the displayed cow alley is switched on (P1 = Type1 - P2 = Type2) - ▶ = Frost program is activ | page 30 |
| ② | 1 (2...5) | Selected cow alley with display of the activated functions | |
| | ⏻ | Automatic mode is switched on for the selected cow alley | page 25 |
| | POS = | Display of the scraper position in seconds after starting or switching the direction | |
| ③ | OK | Display of the operating state (OK) or of error messages (eg emergency stop-in) | |
| ④ | SM | - Display of activated additional functions of the selected cow alley S = Slatted floor operation - M = Drop shaft centered is On - Display error code in case of fault (e.g. 01110000000) | page 28 page 32 |
| ⑤ | I=100% | - Numeric display Motor current from active motor (digit) - Graphic display Motor current from the active motor (graphic) | |
| ⑥ | | Time and switched ON cow alleys (with symbol) | |
| | (| Symbol for the scraper. - Bracket is on the left side of the display = scraper is in basic position - Bracket is on the right side of the display = scraper is opposite the basic position | |
| | → | Scraper is in movement from basic position to opposite stop (forward) | |
| | ← | Scraper is moving from the opposite stop to the basic position (backwards) | |
| | (P | Scraper is in parking position> the scraper has moved to the programmed parking position | page 29 |
| | ? | Current scraper position is unknown. e.g. after switching Off, power failure or reset of the control | |
| ⑦ | 000/XXX | Adjustable value - can be a function (e.g. On/Off) or a numeric value > editable | |
| ⑧ | std: | Standard - Factory setting (delivery state/or after RESET) > not editable | |
| ⑨ | rng: | Range - Setting range for the value (e.g. 0 ... 2000s) > not editable | |
| ⑩ | ESC | Close setting without saving >>> Press key below (ESC) | |
| | ENTER | Save setting and close window >>> Press key below (ENTER) | |

* Option

7. Commissioning



INFORMATION

To understand the functions and operation of the controller, read the operating instructions completely before commissioning. Make sure before start the system:

- that the system was installed in compliance with legal requirements
- that all safety covers have been properly installed
- that the electrical components are properly connected (specialist)
- that no persons may be endangered by the operation of the system.

7.1. Function of the controller

With the electronic control COMFORT you regulate the process and function of your dung removal system. The control regulates and monitors the drive winches. Up to 5 drive units (cow alleys) can be controlled independently of each other. The control of the scraper movement takes place by means of current and time monitoring of the individual motors. The parameters are set via the blue input buttons on the front side of the control. The display is via a graphic display. All functions can be assigned individually for each cow alley (drive unit). Unused drive units can be switched Off/On without loss of settings.

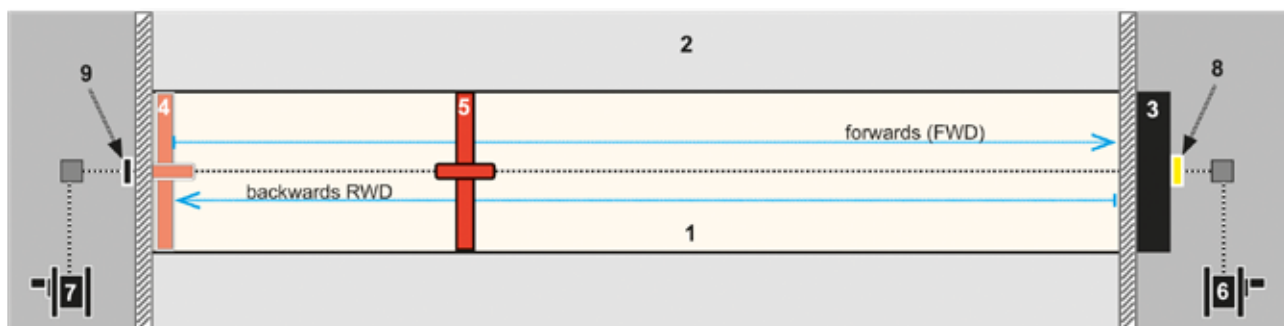
7.1.1 Basic functions of the COMFORT control

- Switching on / off of cow alleys (factory setting: cow alley 1 = on, cow alley 2-5 = off)
- "Learn" function to automatically determine the shutdown current of the drive motors
- Manual operation of the control with buttons for START - STOP - FORWARD - BACK
- BASIC operation mode default (Start > FWD > Turn > RWD > Stop)
- Display of system information (software, temperature, etc.)
- System diagnostics in case of malfunctions

Slider drive with the basic functions (Figure below):

After the start command, motor 1 [6] starts to move the slider [5] forward. If the slider moves against the front stop [8] or an obstacle, motor 2 [7] is started and the slider moves back. If the slider moves backwards against the rear stop [9] or an obstacle, the movement is stopped.

- | | | |
|------------------------------|-------------------------------|-----------------------------|
| 1 Cow alley | 4 Scraper in basic position | 7 Drive winch RWD (motor 2) |
| 2 Resting box, Feeding table | 5 Scraper in driving position | 8 Stop forwards |
| 3 Dropping channel | 6 Drive winch FWD (motor 1) | 9 Stop backwards |



* Option



7.1.2 Extended functions of the COMFORT control

The advanced functions of the controller are individually available for each cow alley after programming and/or switching on the respective function. Advanced features are:

- Automatic start with integrated system clock (automatic mode)
- Automatic start with temperature sensor (frost operation)
- Selection between standard operation and operation on slatted floor
- Scraper operation for dropping channel in the middle of cow alley (center dropping)
- Obstacle detection with repeat function when obstacles are detected
- Stepwise movement of the scraper before manure discharge and end position (cycle operation)
- Exact slide positioning via runtime programming and switching without stop
- Automatic activation of a cross conveyor (only after programming the cow alley)
- Various automatic sequences can be selected: Parallel (all scrapers together), Sequential (all scrapers consecutive) or Free (all scrapers independent)
- Cow drover function

7.1.3 Overview of all functions (factory setting)

| Function | Factory setting | Option | see |
|--------------------------------------|---------------------------------|--|-------------------------|
| Language | deutsch | EN, FR, more see menu | page 19 |
| Paths (Cow alleys) ON/OFF | Alley 1 = On Alley 2-4 = Off | Cow alley 1...5 OFF or ON | page 18 |
| Rated power motor FWD | 0,55 kW | 0,55 kW - 0,75 kW - 0,9 kW - 1,1 kW - 1,5 kW | page 21 |
| Rated power motor RWD | 0,55 kW | 0,55 kW - 0,75 kW - 0,9 kW - 1,1 kW - 1,5 kW | |
| Cut-off current motor FWD | 80 % | 50 % 115 % | page 22 |
| Cut-off current motor RWD | 80 % | 50 % 115 % | |
| Automatic mode | Off | Off - On | page 25 |
| Frost mode | Off | Off - Type 1 - Type 2 | page 30 |
| Cow drover | Off | Off - On | page 34 |
| Center dropping | Off | Off - On | page 32 |
| Slatted floor (one-way operation) | Off | Off - On | page 28 |
| Driving time, cycle time, break time | 0 sec | individual settings | page 27 |
| Time reverse | 10 sec | individual settings for obstacle detection | |
| Number of trials | 3 | individual settings for obstacle detection | |
| Cross-channel function | Off | Off - On | page 33 |
| Switch-on temperature frost mode | 0 °C | individual settings -25...90 °C | page 30 |
| Interval frost mode | 120 sec | individual settings 0...6000 sec | |
| Delay time frost mode | 600 sec | 300.....3000 sec | |
| Timetables | 00:00 | 00:00 23:59 | page 25 |
| Beep | On | OFF or ON | |
| Service | Password | 1111 | page 39 |

* Cow drover >>> text in menu is "Treiben"

* Option

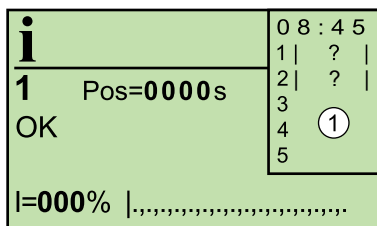
7.2. Control switch on



INFO

Before switching on the controller, inform yourself about the function of the individual keys on the device and about the meaning of the symbols in the display!

1. Switch the main switch "On" >>> the control is started (software boots).
2. The display shows the PRINZING logo
3. Wait until booting is complete >>> The display shows the homescreen



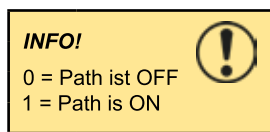
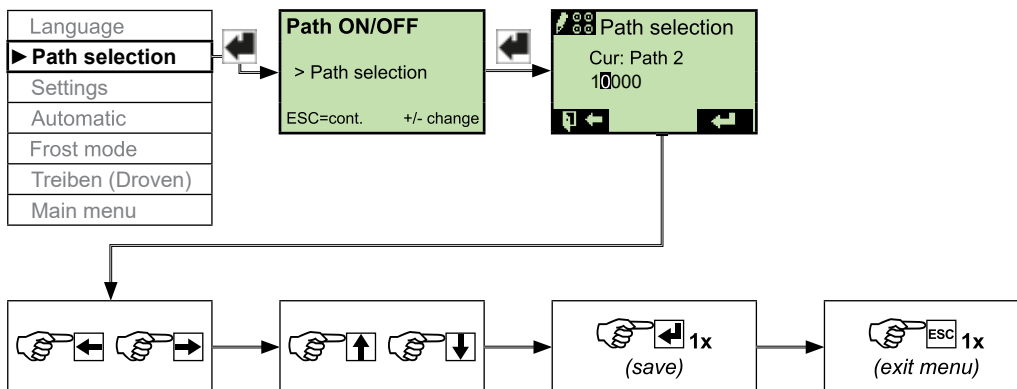
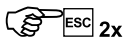
Info screen after switching ON.
The control is ready for operation.

1 = display of switched-on cow alleys (1+2)

7.3. Switch cow alleys (Path) On/Off

After switching on, the controller is ready for operation with the factory settings. For trouble-free operation, the controller must be adapted to local requirements. Information on setting the individual parameters can be found in the chapter Settings. On delivery, only cow alley 1 is switched on. Two additional cow alleys can be switched On for each connected expansion module.

To turn cow alleys ON/OFF:



INFO

Backward navigation in the quick menu is not possible. Press ESC until you are back at the desired menu item.

* Option



8. Standard settings

The following chapter describes how to set the functions on the COMFORT controller. All settings can be made in the main menu or in the quick menu.



INFO

Before setting the controller, inform yourself about the function of the buttons on the control and about the meaning of the symbols in the display! Inform yourself in the menu overview (page 6) about the position of the respective menu items.

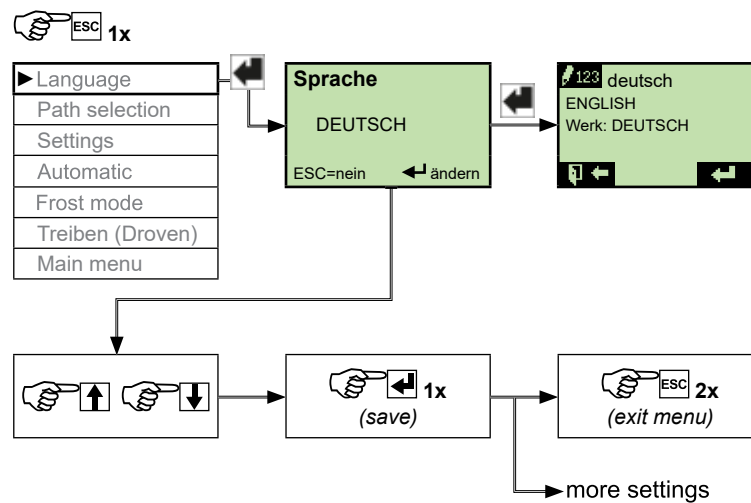
The starting point for the description of the setting is the info screen. In the quick menu, after pressing the ESC key or saving an entry, you are automatically guided to the next menu item.

In the main menu you can select the menu points with the up/down arrow keys.

Always select first the cow alley (1 ... 5) for which you want to make the setting!

8.1. Setting language

Setting the operating language:



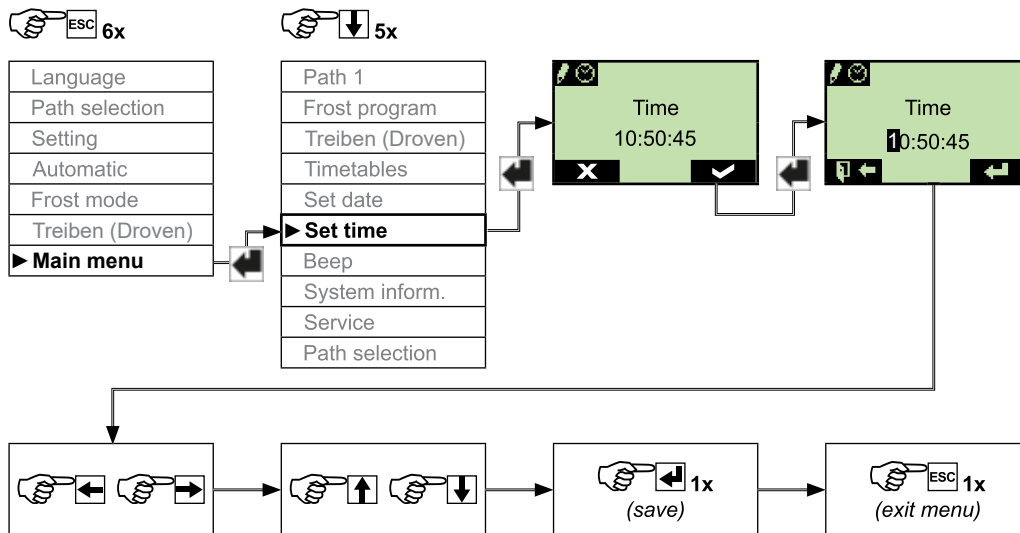
* Option

8.2. Setting date and time

The date and time are set in the main menu. You must change the time / date if:

- The displayed date / time values deviate from the current values
- When changing from summer / winter time
- After battery change on the control

Set time:



Setting Date is the same, via the menu item „Set date“

* Option

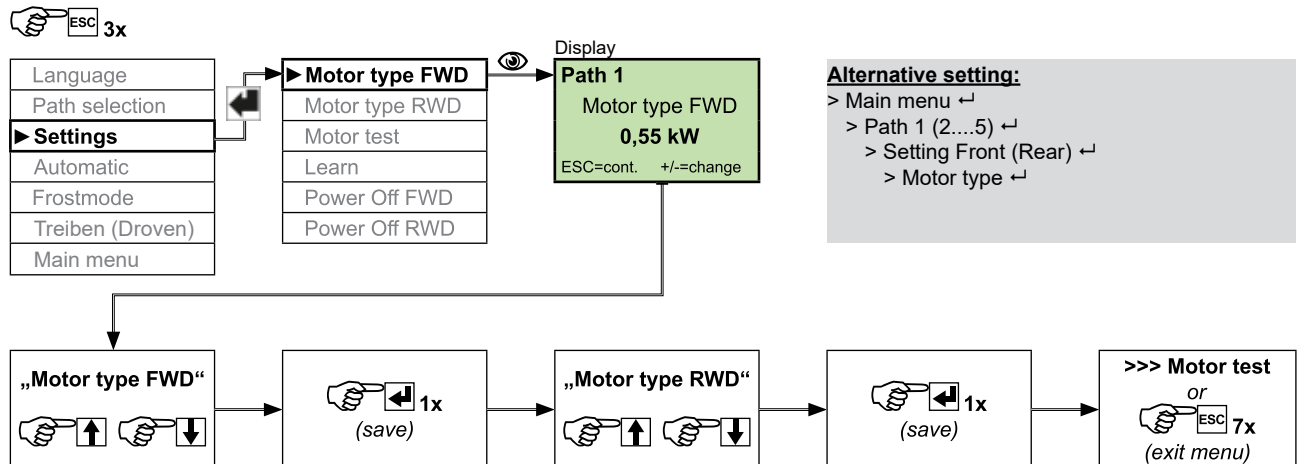
8.3. Set the rated power of the motor



INFO

The rated motor power (kW) may only be set to the value of the connected motors (rating plate). A faulty setting can lead to the destruction of the motor, or to malfunction of the controller!

Setting the rated motor power (quick menu):



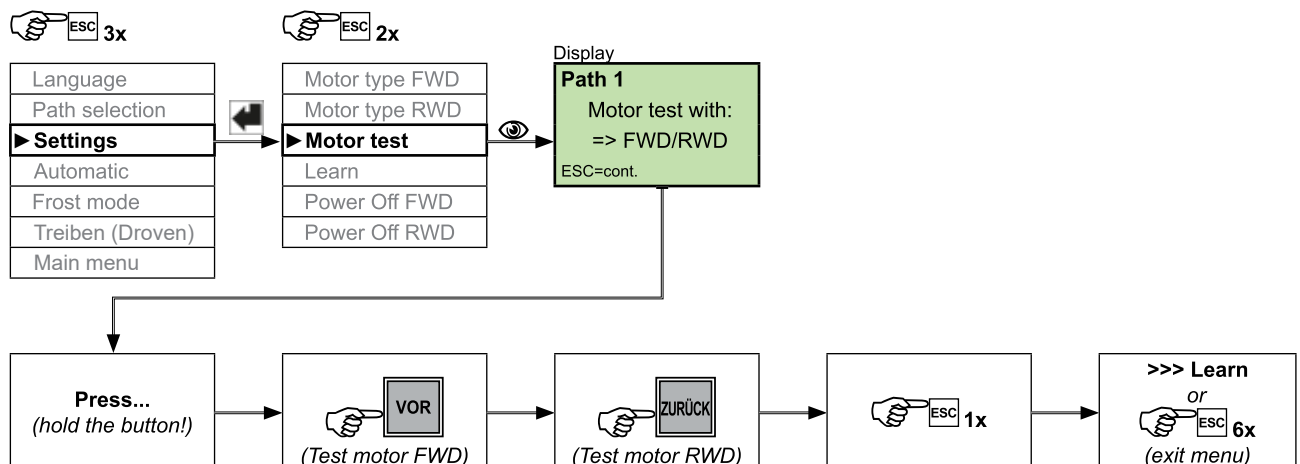
8.4. Motor test - Test the direction of rotation of the motors

The test is used to determine the direction of rotation of the cable drum. He should always be executed:

- After a re-installation of the drive winches
- After a repair or replacement of a drive motor
- After installation or repair work on the motor supply line or its terminals

Please also note the instructions for installing the pull rope and cable guide in the installation instructions!

Testing the direction of rotation of the motors:



* Option

8.5. Setting switch-off current

With the switch-off current you determine the performance of the scraper during the movement. If this value is exceeded, the motor switches off. This value can be automatically learned through the “Learn”-program (recommended) or manually adjusted as needed.

In order to prevent thermal destruction of the motor, the switch-off current should not permanently exceed 95 %. The pulling power of the scraper depends on the connected motor (kW) and the set breaking current (%), but is at least 200 kg.

8.5.1 Automatic detection of switch-off current (program “Learn”)

- Check the correct motor type setting (kW) before “learning”
- With the “learning”, the switch-off current of the motors (forward/backward) is automatically determined
- During the “learning” the cow alley has to be run completely (forwards and backwards)
- If the “learning” is interrupted/aborted, it must be repeated
- During the “learning” drive the motors with the maximum rated power! ATTENTION: high pulling power !!!
- For optimal learning, there should be an average amount of manure in the cow alley

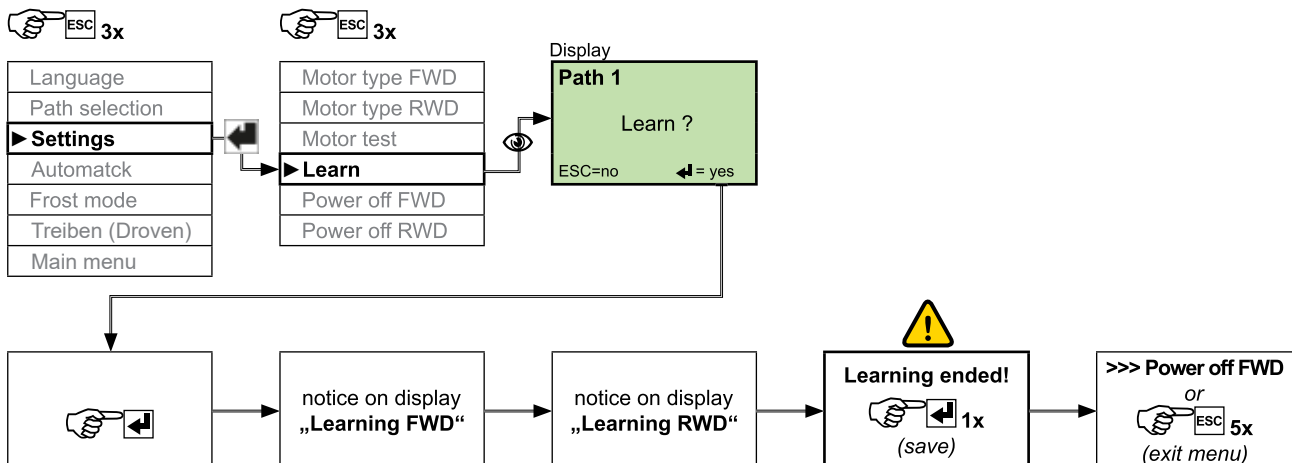


INFO

For an optimal work of the dung-removal system, the “learning” should be carried out:

- *at the first commissioning of the dung-removal system*
- *after structural changes to the dung-removal system*
- *after changing the properties / characteristics of the scraper or the cow alley*
- *in case of frequent faulty operation of the dung-removal system*

Start the “Learn” program:



* Option



8.5.2 Set cut-off current manually

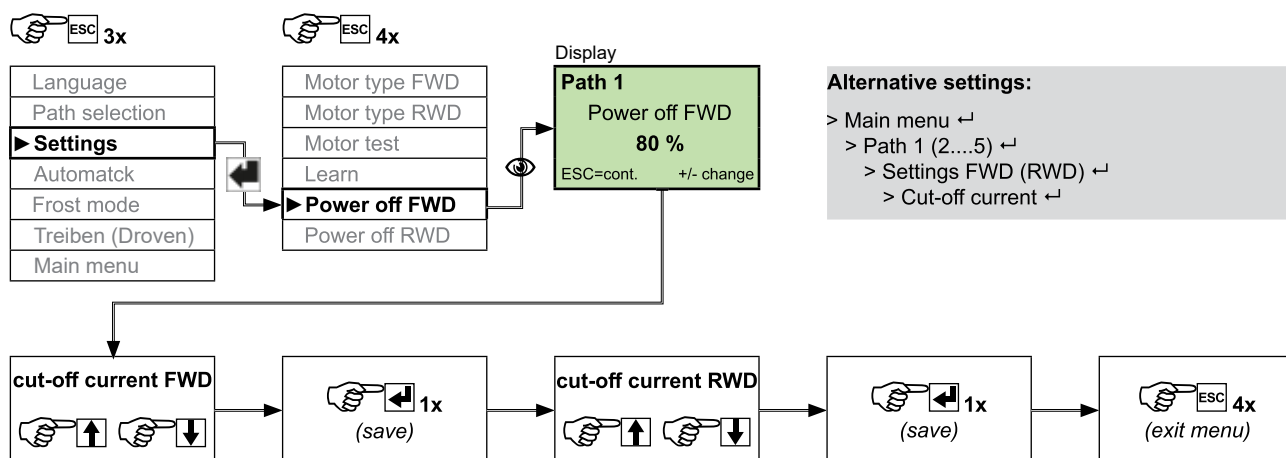
The cut-off current can be set manually if:

- The manure removal system reacts too sensitively after “learning” >>> the slider does not move until it is dropped off, or it makes frequent repetitions while driving
- The dung removal system reacts too insensitive after “learning” >>> the slide moves very hard against the stop

The cut-off current can be set:

1. Main menu >>> Menu of the selected cow alley
2. Quick menu of the selected cow alley >>> Settings

Set cut-off current:



DANGER

The maximum setting value of the cut-off current is 115%. When setting the cut-off current over 100% there is a risk of thermal overload of the motor. If a setting below 100% is not possible, stop operating the system. (In case of emergency only for a short time!)



INFO

If the cut-off current is set too low, interference may occur during operation (for example error message “Error obstacle”). If the cut-off current is set too high, the material wear of the equipment (e.g., towing rope) may increase. An optimal result for the cut-off current can be achieved with the “Learn” function.

* Option

8.6. Automatic mode - Overview settings

The following requirements must be met for automatic operation:

- There must be a program type (Free, Sequential, Parallel) switched on (*Main menu > Timetables > Program type*)
- At least one start time must be programmed in the timetable of the program type (path, sequential, parallel)
- The function "Automatic mode" must be set to "On" (quick menu/path menu)

8.6.1 Set a program type for automatic mode

The setting for the program type is made in the *main menu > Timetable > program type*
 The following 3 types of programs are available for automatic mode.

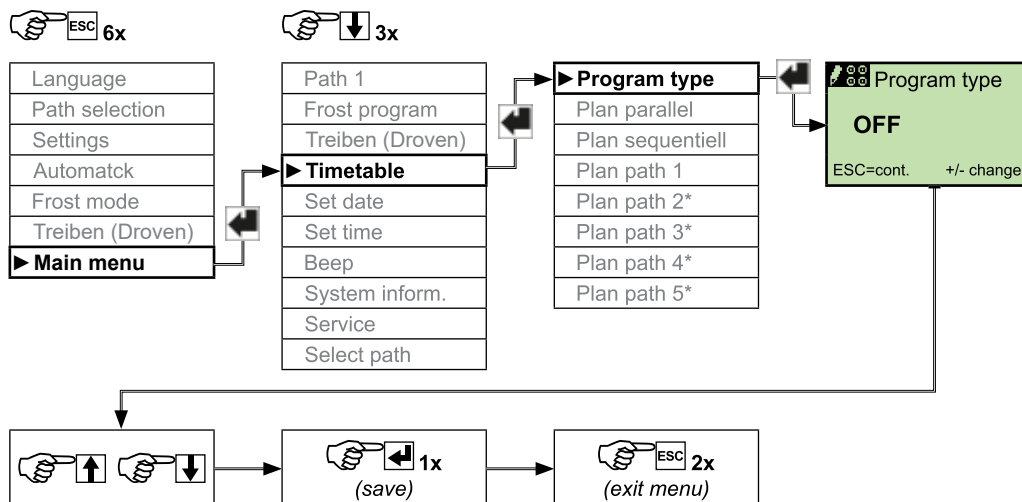
| Program type | Description | Timetable |
|--------------|---|-----------------|
| Parallel | The scrapers of the switched-on cow alleys (paths) start at the same time | Plan parallel |
| Sequential | The scrapers start one after the other (path 1 > path 2 > path 3 - etc.) | Plan sequential |
| Free | The scrapers of the cow alleys (paths) start independently, according to the programmed start time in the timetable of the cow alley (path) | Plan Path 1...5 |



INFO

If the automatic mode is "ON" (symbol ☺ in the display), but the program type is "OFF", the system will not start automatically! Please select a program type in the menu! The set program type is displayed in the home screen (first line above)

Set program type:



* Path 2 ... 5 >>> only visible, when the path (cow alley) is switched on (see path selection)

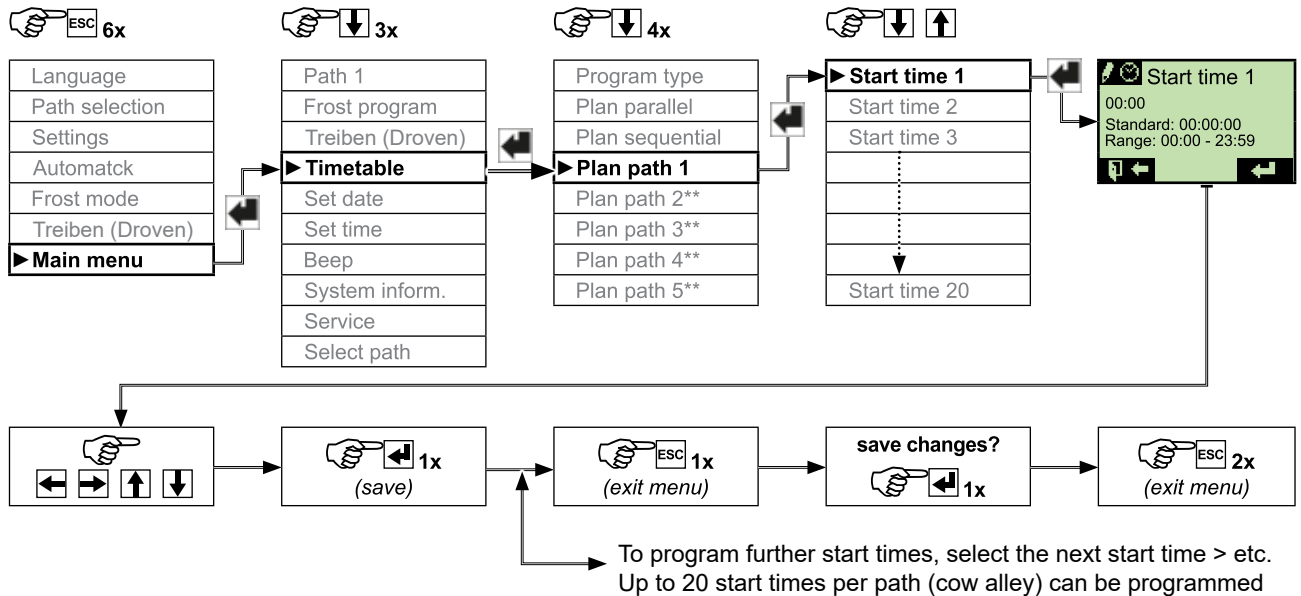
* Option



8.6.2 Set start times for automatic mode

If you have selected a program type (sequential, parallel, free), you can set the start times in the corresponding timetable. Start times in the timetable can be changed or deleted. More start times can be added to the existing start times. Start times do not have to be programmed in order. The start times are automatically sorted in automatic mode. Empty entries in the timetable (e.g. 00:00 hours) are ignored.

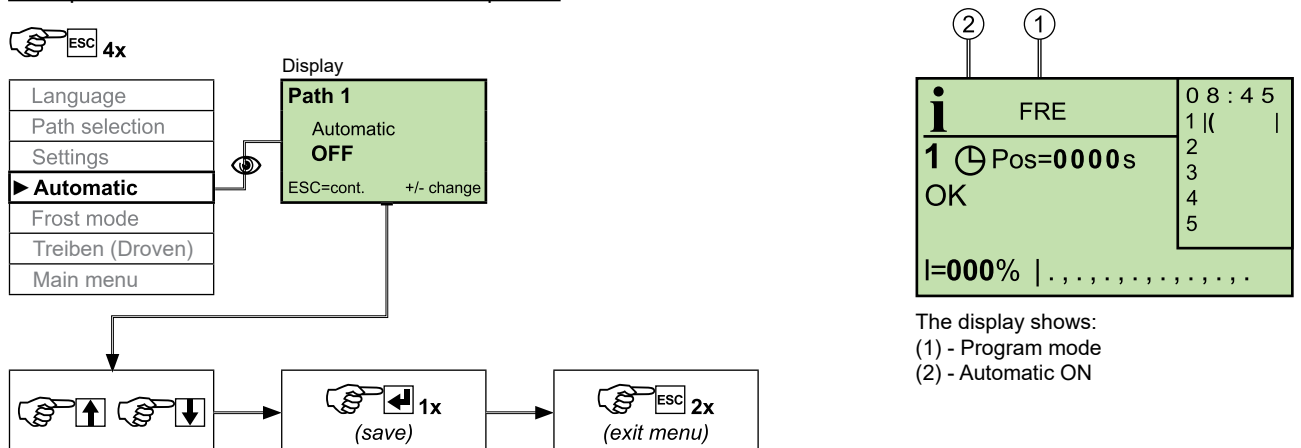
Example: Program timetable for program type "Free" for path 1:



8.6.3 Switch on the automatic mode

If a program type is set and start times programmed, you can use automatic mode. The automatic mode must be switched ON for the respective path (quick menu or main menu). If the automatic mode is switched ON, the symbol (⌚) "Automatic" is shown in the display of the selected path. The automatic mode can be switched On/Off separately for each path.

Example: Switch ON the automatic mode for path 1:



* Option

8.7. Parameters for COMFORT features - Description and Settings



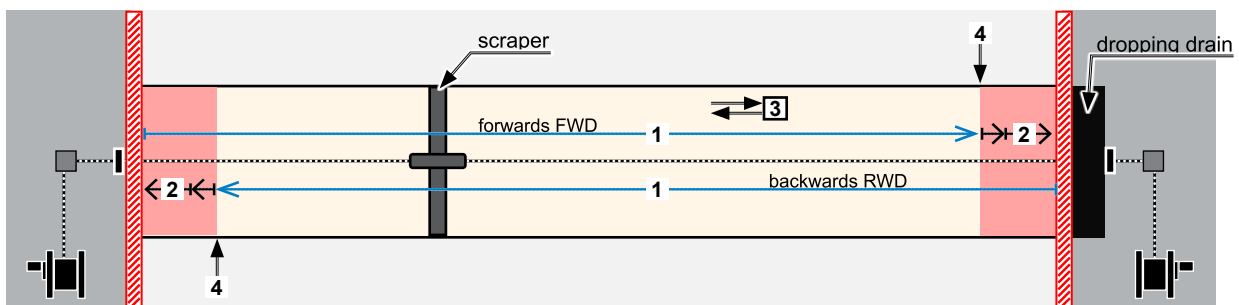
INFO

If the following COMFORT parameters are not set on the ESC200, the ESC200 controller only operates in standard mode (BASIC).

Notes on setting:

- Before adjusting the parameters, measure the travel time of the scraper from **stop to stop in each direction** (forward / backward). Write down these values.
- The cyclic operation (stepping) is for safety. The cyclic operation should take place approx. 2-3 m before a wall breakthrough, dropping drain or personnel bridge.
- Set the cycle time so, that the distance scraper <> end stop at the last break is not less than **40 cm**.
- In the "Number cycles" always enter +1 cycle. This ensures that the scraper safely moves to the end stop.
- If a time has been set for the "park position", take this time into account when setting "time to sync" (subtract!)
- The parameters must always be set for forward **and** backward. Each cow alley (path) can be individually adjusted.

| No. | Function | Description | Note |
|-----|-------------------------|--|---|
| 1 | Time to sync. | Driving time scraper from START until the Start cyclic operation | Only during this time, the animal / obstacle detection is active! |
| 2 | Cycle mode | Scraper drives cyclically (cycles) forwards (FWD) | Start cyclic operation about 2-3 m before the drop drain |
| | Cycle time | Driving time scraper per cycle | Input at least 5 seconds |
| | Break time | Break between cycles | If the value is "0" > no break |
| | Number cycles | Cycles until the stop or end of the cow alley (path) The necessary number of cycles is calculated from the cycle time. If you do not want any cycles at the end, you have to set one long cycle and set the break time to "0". The scraper then moves without interruption, but with animal/ obstacle detection. At least one cycle must be programmed. Otherwise the program will not operate. | After expiration of the "number of cycles" the scraper travel is switched RWD or OFF. If the programmed "Number cycles" has not yet been reached when the scraper approaches the stop, the scraper travel is switched RWD or OFF. |
| 3 | Time reverse | Parameter for animal / obstacle detection during "time to sync". If there is an obstacle: scraper stops >>> moves back ("time reverse") >>> moves again. If the obstacle is gone, the scraper continues. If the obstacle is still there, the scraper repeats the process ("Number of tries"). If the tries are unsuccessful, the controller goes into failure mode. (Error obstacle) | Factory setting: 10 s |
| | Number of tries | | Factory setting: 3 tries |
| 4 | Cross conveyor On/Off | With function "Cross conveyor on": With the beginning of the cycle mode (after "time to sync,") the contact for the cross conveyor is switched. (Changeover contact) | "Cross conveyor ON / OFF" |
| | Duration Cross conveyor | The changeover contact of cross conveyor is switched for the programmed time | Only operated, if the parameter No. 1 and No. 2 is programmed! |



* Option



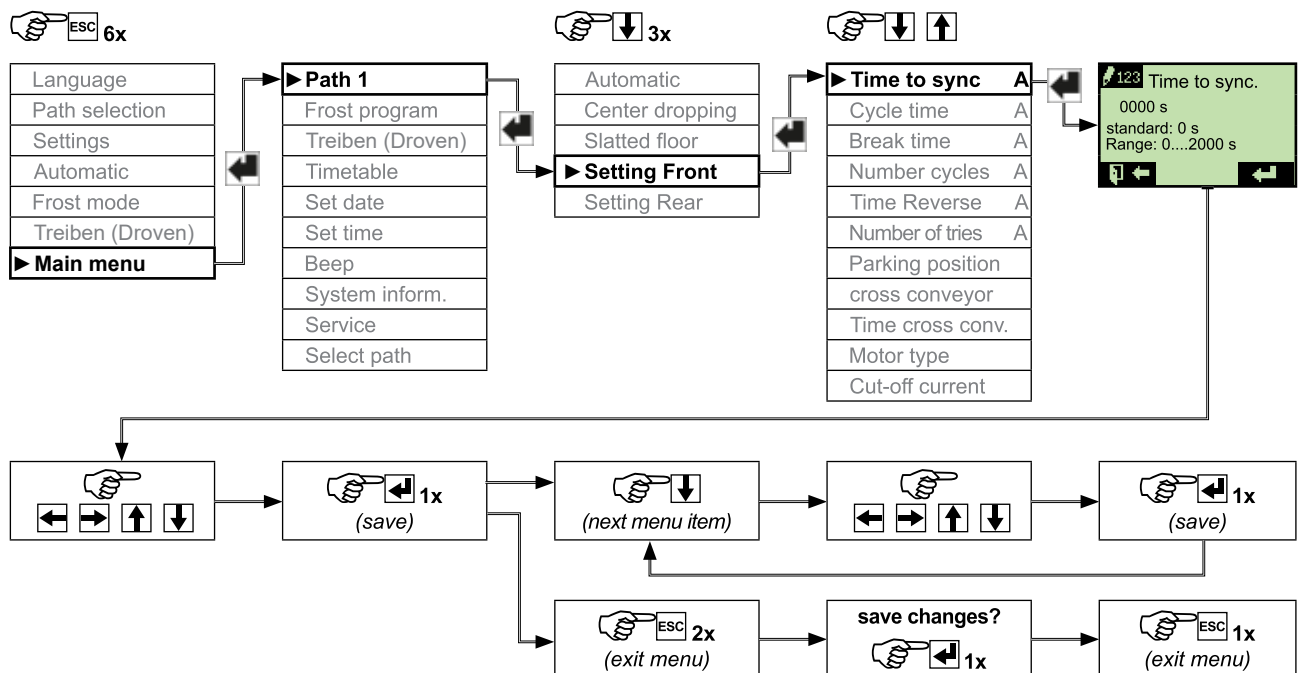
8.7.1 Setting COMFORT parameters



INFO

You can set all parameters one after the other without leaving the menu. Save each setting with the ENTER button - abort with ESC-button! When exiting the menu, you are prompted to save. Confirm this message with ENTER-button, if you want to save your settings. All programmed parameters are saved after switching OFF a path or after a blackout.

Set parameters - example path 1:



Example:

Dung removal system: PKSF-scraper, 2 drive winches, Dropping drain at the end of the cow alley
 Driving time stop <-> stop: Scraper stop RWD to stop FWD (forwards) = 580 s
 Scraper stop FWD to stop RWD (backwards) = 560 s

| Requirements |
|---|
| The scraper should move forwards and backwards with animal and obstacle detection |
| If there is an obstacle, the scraper should move back 10 seconds and try to remove the obstacle up to 5 times |
| From approx. 4 m before dropping drain, the scraper should move in 5 steps until dropping drain. Between cycles, the scraper breaks for 10 seconds. |
| When the scraper driving backwards, no cyclic operation should occur before the end of the cow alley (path). |
| The basic position at the end of the program is at the stop RWD. |

| Parameter | FWD | RWD |
|------------------|---------|---------|
| Time to sync. | 530 sec | 540 sec |
| Cycle time | 15 sec | 30 sec |
| Break time | 10 sec | 0 sec |
| Number cycles | 5 | 1 |
| Time reverse | 10 sec | 10 sec |
| Number of tries | 5 | 5 |
| Parking position | 0 | 0 |

* Option

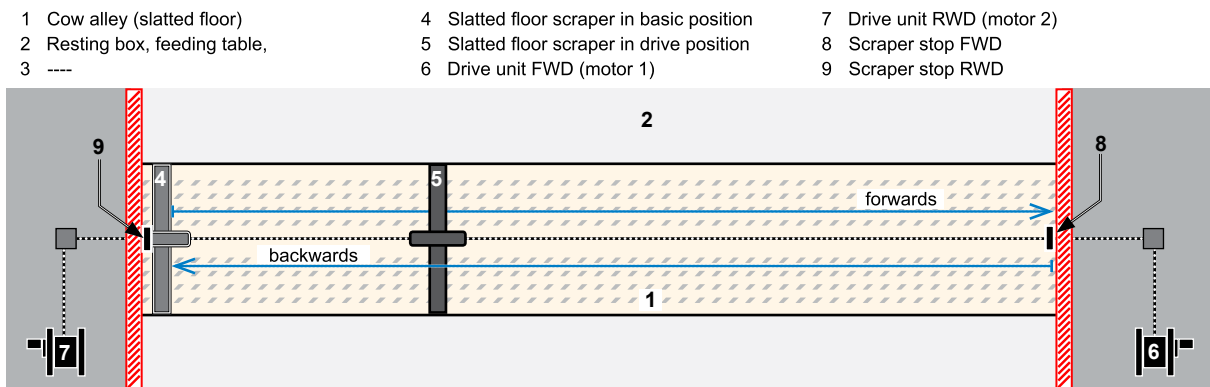


9. Advanced features

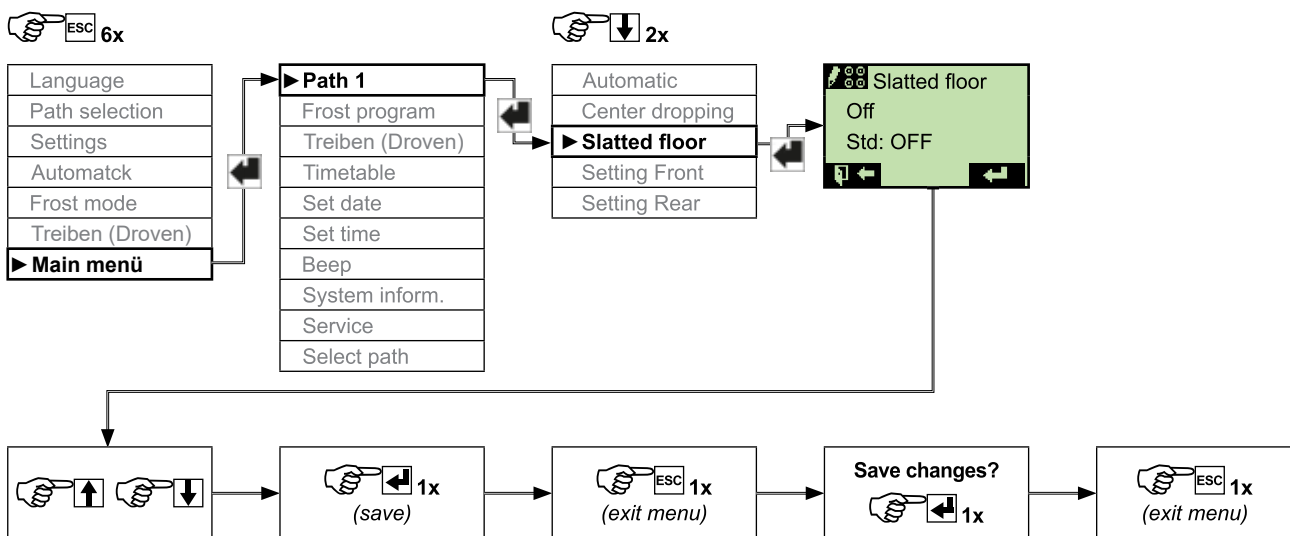
9.1. Operation for slatted floor scraper (one way operation)

At the operation mode for the slatted floor scraper the scraper is driving after the starting command only one time above the cow alley to the stop. At the next start the slatted floor scraper is driving in the opposite direction again, and so on. The driving direction of the slatted floor scraper after a starting command is always opposite to the previous driving direction. The operation mode for the slatted floor scraper can be adjusted independently for each path. All further options are also available for this operation mode. (Obstacle identification, driving stepwise, and so on)

Figure: Scraper operation on slatted floor:



Set operating mode "slatted floor"



* Option



9.2. Parking position

In standard mode, the scraper is parking after the program at the rear stop (basic position). With the option "Parking position", the scraper can be parked at any position in the cow alley after the program has run. (e.g. scraper does not park directly at the stop, but at a distance from the stop)

Mode of operation:

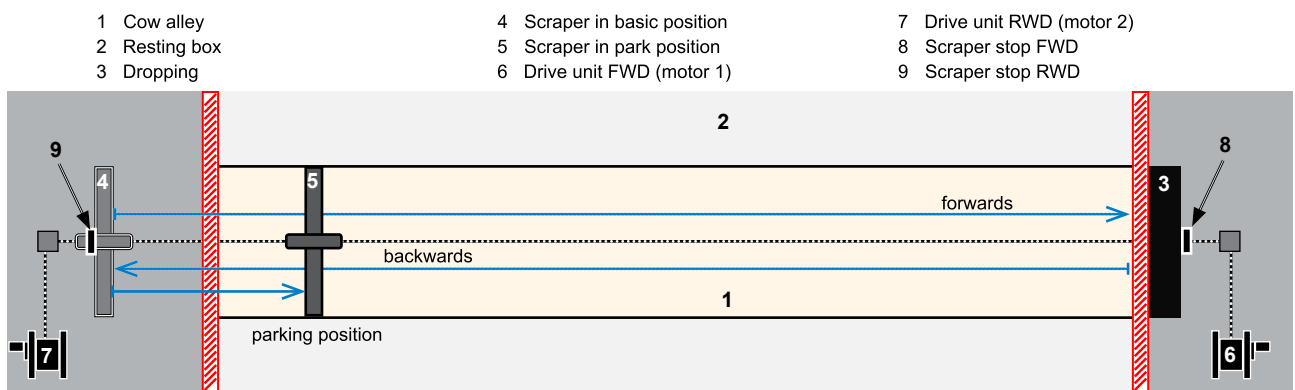
After the end of the program at the stop, the slide moves in the opposite direction until the set time "parking position" has expired.



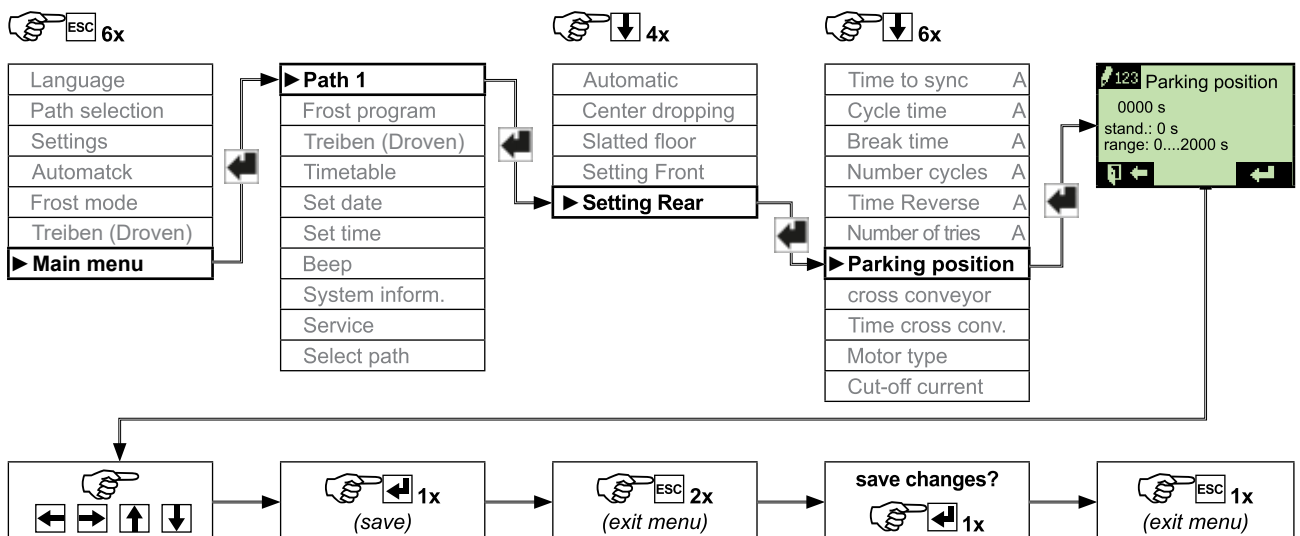
NOTE

Do not use this function for a calving area!

Figure: Scraper operation parking position:



Setting the parking position:



* Option

9.3. ESC200 - Frost operation

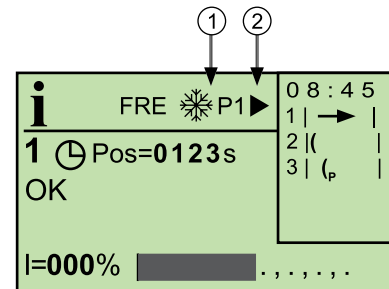
To prevent freezing of the scraper and the cow alley, the controller is equipped with two programs for frost operation. (Type1 and Type2) The frost operation can be switched ON for each cow alley (path) in the quick menu or path menu. The following requirements are required for frost operation:

- The temperature sensor must be connected to the controller
- For frost operation mode, it must be set to "Type1" or "Type2"

Adjust the settings for frost operation and the respective frost program type before operation.

After switch ON the frost operation, there are two operating states:

- (1) Frost mode is switched on (☼). The frost program (Type1 or Type2) is on **standby**. The scraper can be started manually, with automatic start button or timetable.
- (2) Frost mode is active (P1 ▶). The frost program (Type1 or Type2) is **active**. The scraper moves to the settings for the frost program. The timetable is deactivated for the duration of the active frost operation.



Is a frost program (Typ1 or Type2) switched on:

- The scraper starts automatically if the set temperature is undercut by at least 1° C for the duration of the set delay time.
- The scraper stops automatically when the set temperature is exceeded by at least 3° C for the duration of the set delay time. With Type1, the current program is terminated (slider is at the stop), with Type2, the slider movement is stopped after the last interval (slider can be in the cow alley)



ATTENTION! Function of the STOP button during "Frost program active"

1x STOP = scraper movement stops until the next start pulse (interval or manual)

2x STOP = scraper movement stops for a pause of 600 sec - THEN STARTS AUTOMATICALLY

If the frost program is to be stopped permanently, it must be switched OFF in the menu. Always switch off the main switch during repair/maintenance work on the system!

9.3.1 Functionality of the frost programs Type1 and Type2

Frost program - Type1:

The scraper runs through the entire cow alley (forwards and backwards). The start takes place in the set "Interval time" in the menu item "Parameter Type1".

Frost program - type 2:

The scraper moves step by step through the cow alley. The start takes place after the "Interval time" set in the menu item "Parameter Type2". The scraper moves for the duration of the set "travel time".

Example for type1:

Interval time = 120 sec

The scraper always starts 120 seconds after the end of the previous scraper movement

Example for type 2:

Interval time = 120 sec. - Travel time = 60 sec

The scraper always starts after 120 seconds and then runs for 60 seconds.

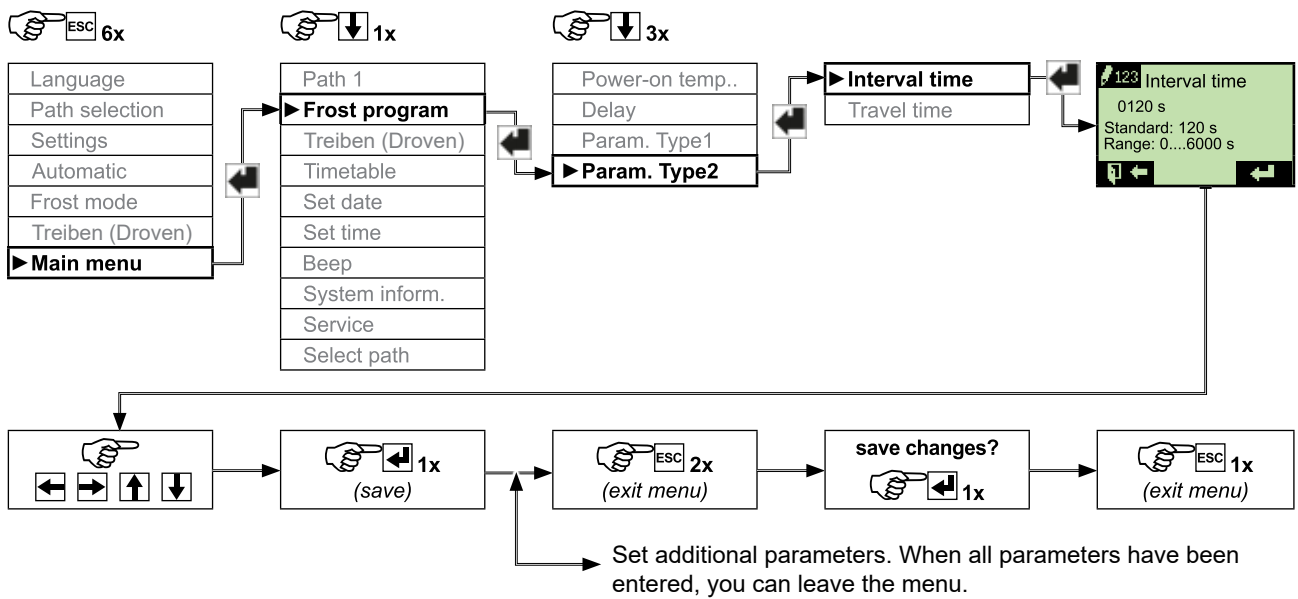
* Option



9.4. Frost operation - Settings

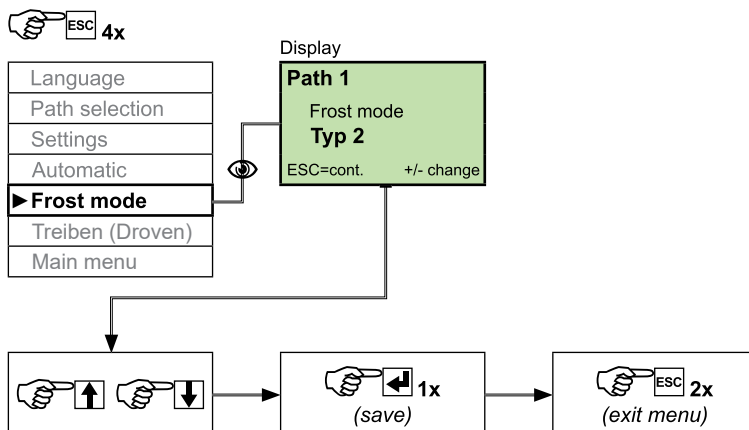
Factory settings frost mode:

| Menu items | Parameter | Value | Adjustment range |
|----------------|---|---------------|----------------------------|
| power-on temp. | switch-on temperature for start scraper | 0 °C | -25....90 °C |
| Delay | Delay time until the start of the scraper | 600 s | 300....3000 s |
| Param. Type1 | Interval time for the start pulse | 120 s | 0....6000 s |
| Param. Type2 | Interval time for the start pulse Driving time for the scraper | 120 s 60 s | 0....6000 s 0....2000 s |



9.4.1 Frost operation - switch ON

When all parameters for frost operation are set, you can use the frost operation. The frost operation can be switched ON separately for each cow alley (path).



* Option

9.5. Center dropping - Function and settings

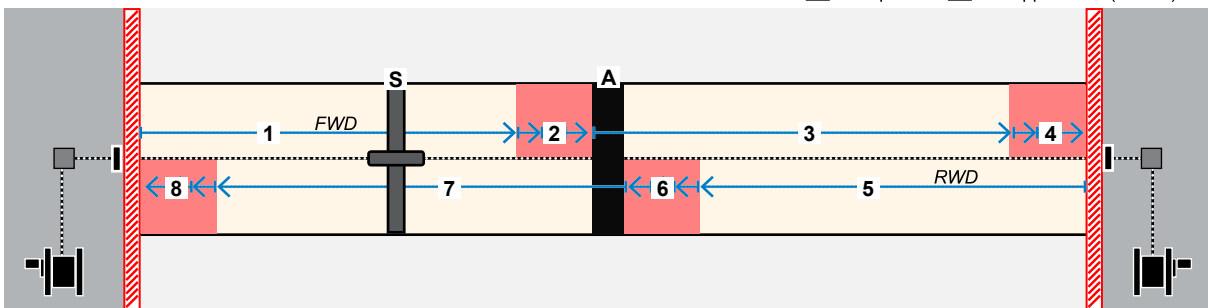
For dung removal systems with a center dropping channel in the cow alley, in combination with a special scraper (PKWS), the function "center dropping" is available. With this function, the scraper travel can be adjusted so, that the cyclic operation (stepping) can be performed before the center dropping and before the end of the cow alley (stop). The function can be activated for each path! By activating the function "center dropping" additional parameters are displayed in the menu "Setting Front" and "Setting Rear". (e.g., time to sync. B, cycle time B). The letter after the parameter means: **A** = parameter **before** center dropping channel (seen in direction of travel) **B** = parameter **after** center dropping channel (seen in direction of travel)

Figure:

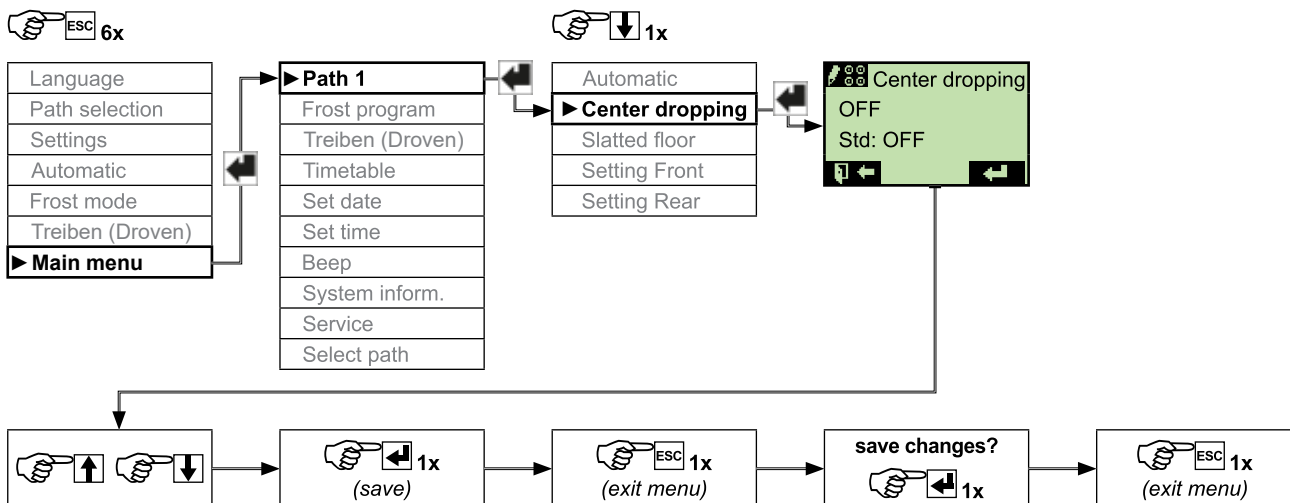
Cow alley with center dropping and scraper-type PKWS.

Step mode before the center dropping (2 + 6) and step mode before the end of the cow alley (4 + 8)

- 1 FWD - Time to sync. A
 - 2 FWD - Cycle A
 - 3 FWD - Time to sync. B
 - 4 FWD - Cycle B
 - 5 RWD - Time to sync. A
 - 6 RWD - Cycle A
 - 7 RWD - Time to sync. B
 - 8 RWD - Cycle B
- S** = Scraper **A** = Droppin drain (middle)



9.5.1 Center dropping - switch ON



INFO

The parameters are set in the same way as for systems with dropping drain at the end. It differs only in the distribution of travel time for the areas before and after the dropping drain of the cow alley.

A = before the dropping drain

B = after the dropping drain.

* Option



9.6. Function cross conveyor

The ESC200 control has a switching output for controlling an external control (e.g., cross conveyor, manure pump, hydraulic unit). This switching output is a potential-free changeover contact (NO / NC contact). The switching contact is always automatically switched, when the first cycle begins in the program sequence (after „time to sync.“). The switching contact serves only as a pulse or self-holding contact. The cross conveyor (pump or hydraulics) must have its own control! The switch contact can not be started manually or via timetable.

Requirements for function:

- On the ESC200 controller, the parameters „Time to sync“ - „cycle time“ - „break time“ - „number of cycles“ must be programmed
- The function „Transverse conveyor“ must be switched ON in the menu of the cow alley (path)

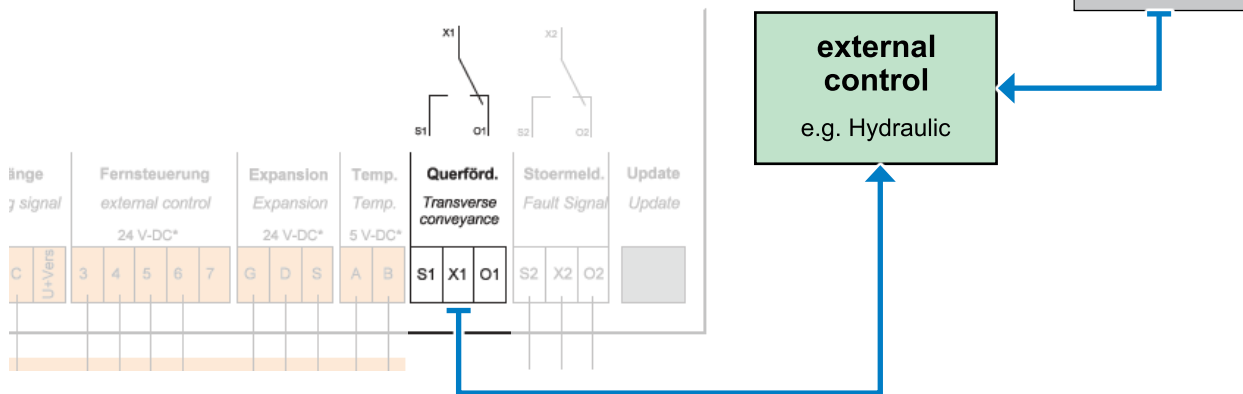
Connection and features:

The switching contact is potential-free

S1 <> X1 = N/C contact (normally closed contact)

X1 <> O1 = N/O contacts (normally open contact)

Switching capacity: 250 VAC = 4 A / 24 VDC = 1 A

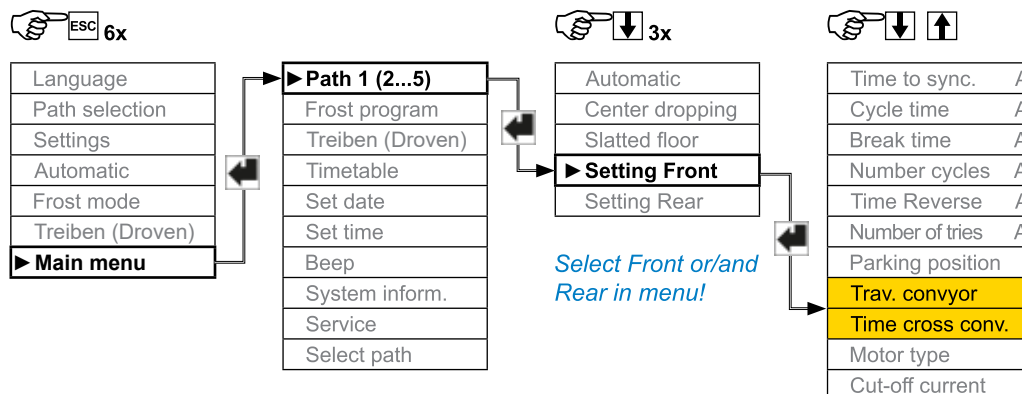


Please note:

The translation for „Cross conveyor“ is partly different in ESC200 menu and manual!

Cross conveyor = Cross conveyor - Transverse conveyor - Trav. convyor

9.6.1 Cross conveyor - Settings



* Option

9.7. Function cow drover


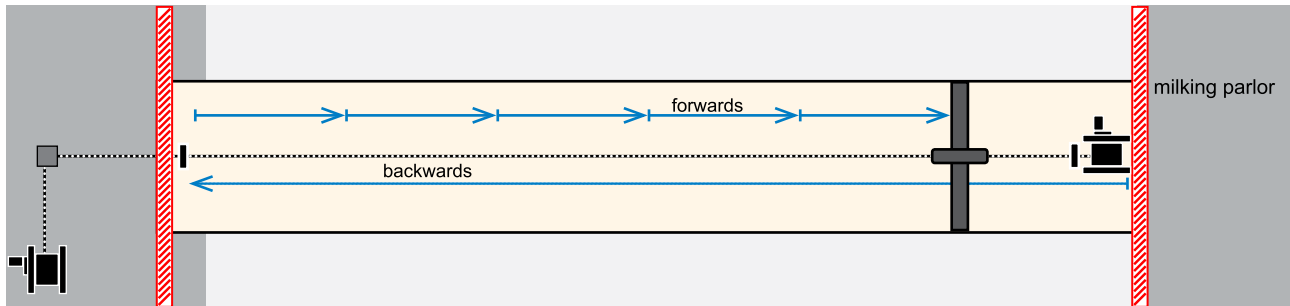
With the function “Drove” you have the possibility to use a scraper with mounted drover grid* use as cow drover. In the “Drove” mode, the scraper moves forward after each start command (START button only) for the duration of the set driving time. The duration of the movement can be set individually. The activated function is shown in the display with the symbol Drive (). When cow drover is switched ON, the automatic mode and the frost mode is deactivated.

Figure: Scraper operation cow drover:



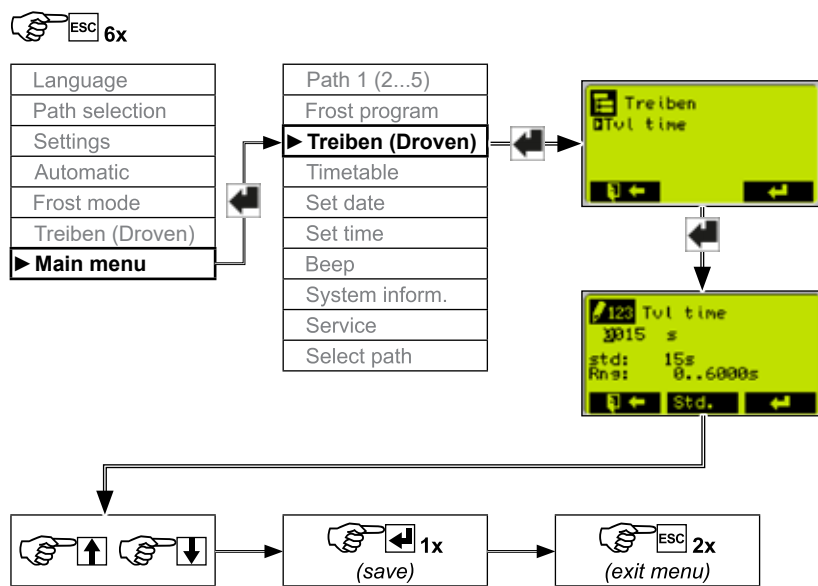
9.7.1 Cow drover - Settings

Notes:

Factory setting = 15 sec.

Setting range: 0 - 6000 sec.


After sequence of event (programmed time) the scraper movement stops automatically.

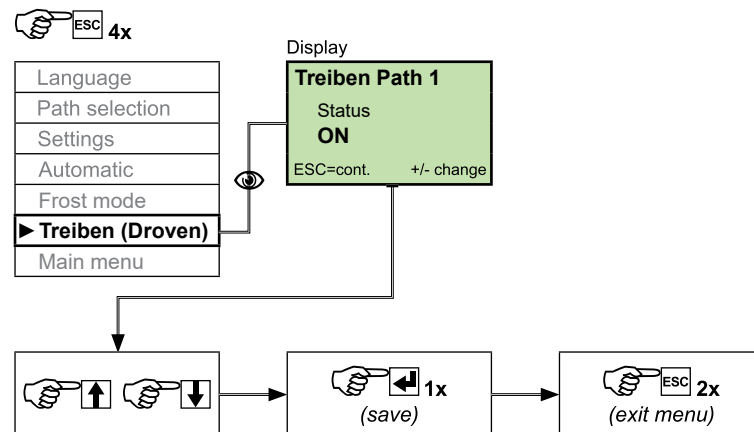


* Option



9.7.2 Cow drover - switched ON / OFF

1. Select the path (cow alley) where you want to use the droven function > Arrow keys right/left.
2. The cow drover can switched ON in the quickmenu of the set path (Cow alley) > Arrow keys up/down
3. When the cow drover function is switched ON, the display shows the symbol 



* Option

10. Operation






Before commissioning the controller, please check the following points.

- Is the system fully assembled (motors, slides, rope, covers)
- Is a hazard to humans and animals by the operation of the system excluded
- Are all necessary safety covers and safety devices mounted to the system
- Are the device parameters correctly set on the controller (motor data, currents, direction of rotation)

10.1. Manual operation


In manual operation, the manure scrapers are controlled by the buttons on the ESC200. The sequence of the scraper travel depends on the set operating mode (standard or slatted floor) and the set parameters. Cow alley (path) 1-3 can also be controlled via external control buttons.

Function of the buttons on the controller:

| | |
|---|--|
|  | Select cow alley (Path) 1....5 |
|  | Motor 1 (FWD) starts. The scraper moves to the end stop. It also stops, when the cut-off current FWD is exceeded (e.g. obstacle) or the STOP button is pressed |
|  | Motor 2 (RWD) starts. The scraper moves to the end stop. It also stops, when the cut-off current RWD is exceeded (e.g. obstacle) or the STOP button is pressed |
|  | Automatic mode starts. The scraper moves according to the set parameters for FWD and RWD. |
|  | STOP-function (NOT emergency stop) If the scraper was started with VOR (FWD) ZURÜCK (RWD) > the scraper movement stops If the scraper was started with START > 1x press STOP = Program break - 2x press STOP = Program end |

INFO: During the movement of the scraper, the display shows the direction of the movement (arrow), the current consumption (in %) and the scraper position (in sec).

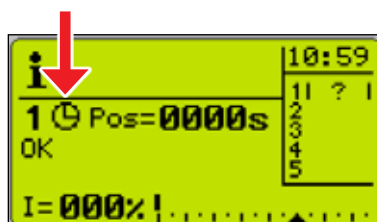
10.2. Automatic operation via timetable

In automatic mode via timetable, the scraper movement is started via the programmed start times in the timetable. The scraper movement takes place according to the set operating mode (standard or slatted floor) and the set parameters. The switched-on automatic mode is shown in the display with the symbol  next to the path number.

The automatic mode can:

- Switched ON / OFF for each cow alley (path)
- Stopped with the STOP button (1x = break) or aborted (2x = cancel).
- start scraper movement with the START button - in addition to the programmed times in the timetable

Fig: Automatic mode is switched ON



* Option



NOTE for the automatic operation!

- Only use the automatic mode, if it is ensured that the danger to humans and animals due to unattended scraper operation is excluded.
- After a power failure, the scraper automatically starts again at the next start time. If the scraper is not in the initial position or parking position at the start, an error ("Error Obstacle") may occur at the end of the cow alley (end stop)
- For automatic operation via timetable, at least one start time and one program type (e.g. "free") must be programmed in the timetable!
- In programmed automatic mode, the scraper must always be started from the initial position or parking position!
- If the frost program is active, the automatic start via the timetable is deactivated.

10.3. Frost operation



INFO

Before use the frost mode function, please inform them in chapter "Frost mode" about function and settings! When frost operation is switched ON, the "Learn program" function is deactivated!

Notes:

The frost operation can be switched ON / OFF for each path.

If the frost mode is switched ON, the symbol "❄️ P" is shown on the display of the path.

If the frost mode is active, the symbol "❄️ P ▶" appears in the display of the path.

In frost mode ON, the scraper movement is started automatically:

- If the programmed switch-on temperature has fallen **below** by at least 1° C
- The programmed delay time has expired

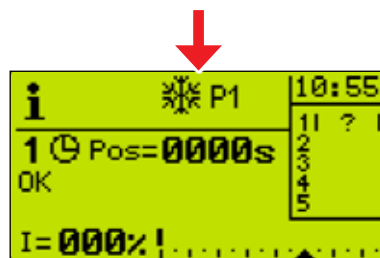
Thereafter, the scraper moves according to the set frost program (type1/type2).

The scraper movement stops, when the programmed switch-on temperature has been **exceeded** by at least 3° C

When the frost operation is switched ON, the scraper can be controlled with the buttons VOR-ZURÜCK-START-STOP.


When the frost program is activ, the scraper can only be paused with the STOP button.

Fig: Frost mode is ON



* Option

10.4. Cow drover operation

With the function “Drove” you have the possibility to use a scraper with mounted drover grid* use as cow drover. In the “Drove” mode, the scraper moves forward after each start command (START button only) for the duration of the set driving time. The duration of the movement can be set individually. The activated function is shown in the display with the symbol Drive (). When cow drover is switched ON, the automatic mode and the frost mode is deactivated.

Function of the buttons when cow drover is switched ON:





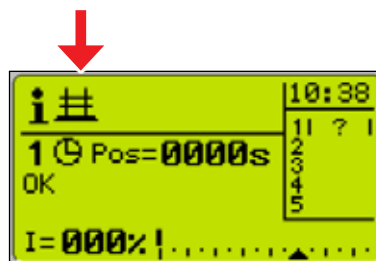
| | |
|---|--|
|  | Motor 1 (FWD) starts. The scraper moves the set movement time and stops automatically |
|  | STOP-function (NOT emergency stop) Stops the scraper movement, before the set movement time has expired |
|  | Motor 2 (RWD) starts. The scraper moves fully backwards to the stop |
|  | NO function |

Fig: Cow drover operation is switched ON



* Option

11. Service

Observe the following notes!

- Servicing may only be carried out by authorized specialist personnel!
- When replacing defective parts, only use original spare parts from the manufacturer or standard parts approved / released by the manufacturer
- In the event of faults in the electrical system (eg cables, motors), troubleshooting and fault elimination must be carried out by an electrical specialist or a qualified person.
- Keep the ESC300 and other electrical components closed, when not working on the assemblies.
- For repair work only use approved electrical tools!
- In the event of unauthorized repair work on electrical components, the warranty expires! We accept no liability for damage caused by improperly performed connection and repair work on the control / dung removal system.
- Contact us, if you have any questions. This will help you avoid any major damage to your manure removal system



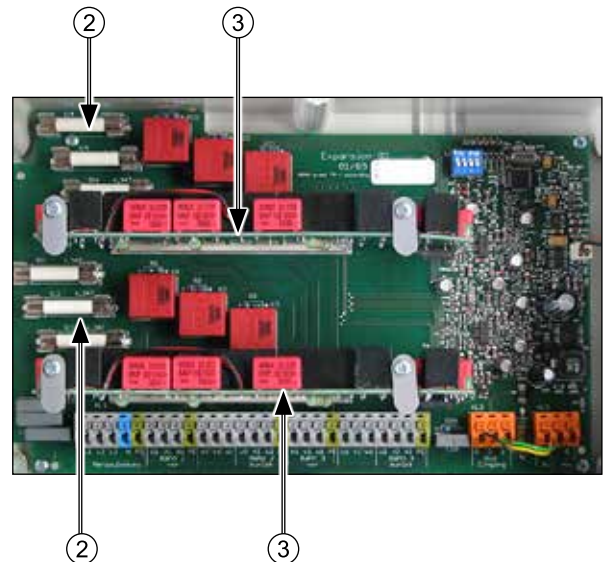
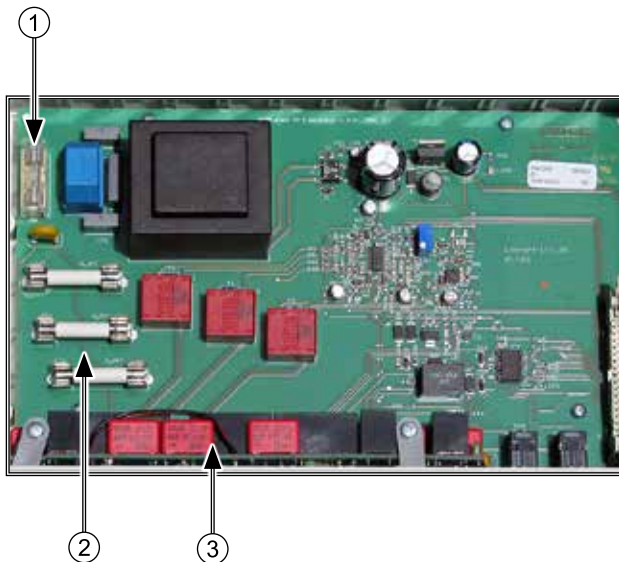
CAUTION

**Always switch OFF the main switch, before opening the electrical components!
Check the fuses on control board only when removed!**

11.1. Description of components

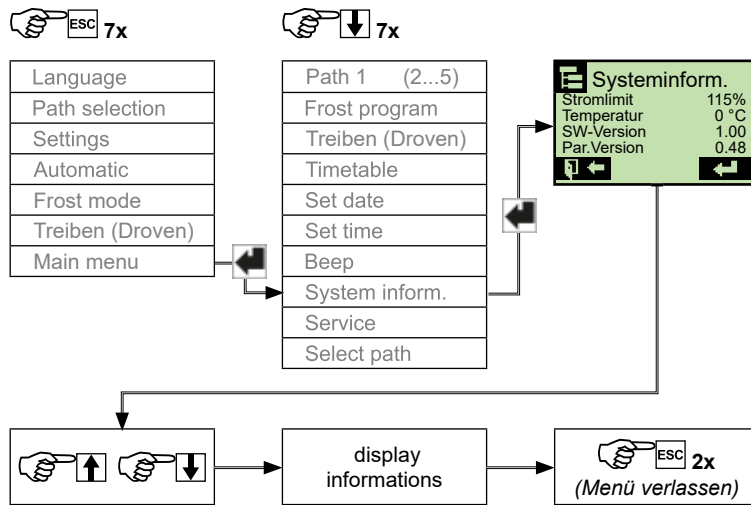
Figure circuit board ESC200 / EXP200

- (1) Primary fuse of the PLC I/O unit (0.250 AT)
- (2) Fuses for power board - phase L1 - L2 - L3 (6.3 AT)
- (3) Power board (relay module)



* Option

11.2. Display system information



The following system information are displayed:

| Information | Description | Display |
|------------------|---|-------------------------|
| Current limit | Maximum adjustable cut-off current (factory setting) | 115 % |
| Temperature | - Display of the current temperature at the sensor - Display if no temperature sensor is connected | 15°C (example) ↑↑↑°C |
| Software-Version | Display of the installed software version of the controller | 1.00 (example) |
| Par.-Version | special information about the software. (only for PRINZING service) | 0.48 (example) |
| Kom.-Version | | 0.38 (example) |
| Kali.-Version | | 0.36 (example) |

* Option



11.3. Service menu - Functions

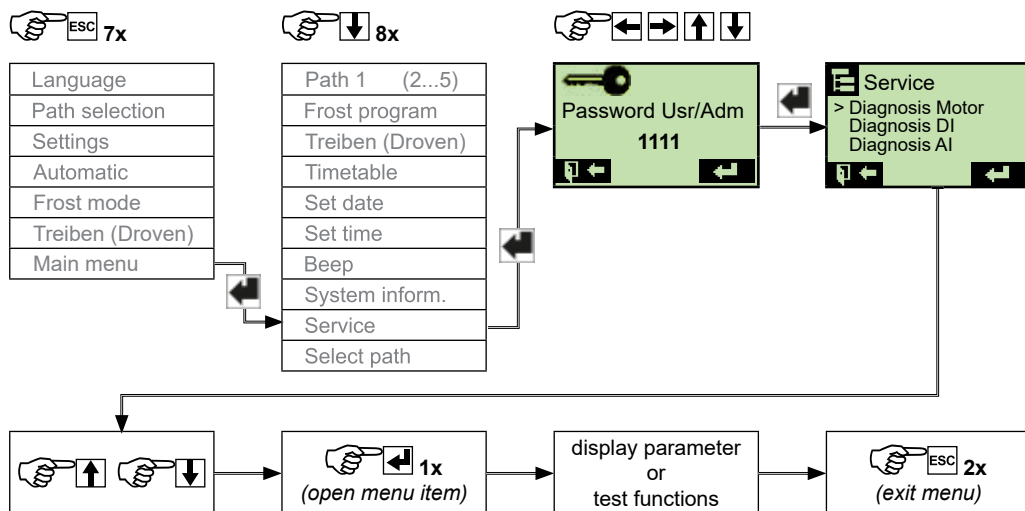
In the Service menu you find informations and test functions for checking the ESC200 controller.
The user-password for login is >1111<.



DANGER

For some tests, the scraper is in motion and the motors are rotating. Before performing the functional tests make sure, that there is no danger to persons or animals.

Service menu - Open



Displays and test functions

| Menu item | Description |
|---|---|
| Diagnosis motor ATTENTION Scrapers / motors in motion!! | Display motor current > Phase L1 - L2 - L3 (Path 1...5) press button VOR (forwards) to display the current of motor 1 (FWD) press button ZURÜCK (backwards) to display the current of motor 2 (Zurück) press buttons arrow keys left / right to select a path (1...5) For the test, you must press continuously the respective button (FWD/RWD) > deadman mode! In standby mode, the current must be "0,00" on each phase |
| Diagnosis DI | Check the digital inputs (buttons on ESC200 + external buttons) The first line on the display shows the selected button (e.g. T. FNT = button FWD). Use the arrow keys left / right to select a button. Press the selected button shown in the first line on display. If the respective button is functioning correctly, the marked value changes from 0 > 1. Repeat the test with all buttons. |
| Diagnosis AI ATTENTION Scrapers / motors in motion!!! | Display motor current in operation <p style="text-align: center;">USE ONLY BY PRINZING SERVICE EMPLOYEES !!!</p> |
| LED-/Signal test | Test the front-LED and the beeper press (ENTER) for LED and beeper test >>> LED lights + beeper beeps |
| Factory settings | Factory settings (delivery state) - reset the parameters All settings on the controller are reset to the factory settings. ATTENTION: All set parameters are deleted. |

* Option

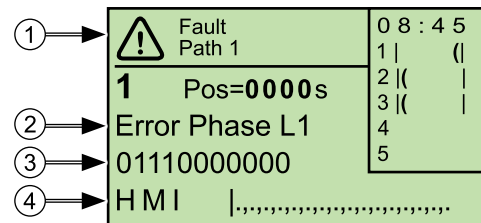
11.4. Debugging

Check the following points in case of an electrical fault:

- Connection of the supply to the power distributor and the controller (fixed connection of the contacts)
- Supply voltage at the power input terminals of the control (phase-phase 380-400 V, phase-zero 200-230 V)
- Function of all fuses in the control (primary fuse and power fuses)
- Correct connection of all components to the control and the individual components (motors, buttons, EXP 200)
- How does the LED on the EXP200 expansion module flash (slow = OK - fast = no communication - off = voltage missing)
- Check all cables and electrical lines for mechanical or thermal damage
- Are there external influences, such as voltage drop due to pumping or electrosmog
- Condition of the electrical assemblies (e.g., gear oil in the motor, moisture in switching devices, contact corrosion)

11.4.1 Error messages on the display - Overview

- (1) - Information on which lane is the fault.
- (2) - Error message as text
- (3) - error message in numeric form
- (4) - error code (see table next page)



INFO

Display and reset of error messages is only possible on the screen of the path (cow alley).

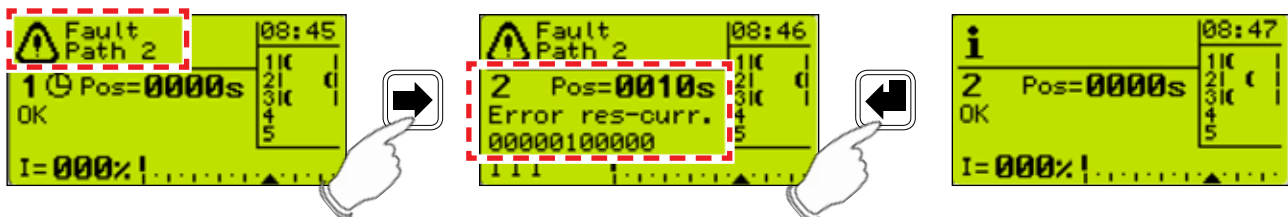
Before you quit/reset an error message:

- *Make a note of the error message and the error code*
- *Eliminate the cause of the error message*

Acknowledge error message

- Select the path with the error (arrow keys right / left)
- Error message and error code are displayed. Write down this information.
- Eliminate the cause of the fault, if possible (e.g. obstacle remove or unlock emergency stop button)
- Acknowledge the error message with ENTER button

If the error message can not be acknowledged, contact your electrician or our customer service.



* Option



11.4.2 Error messages - Cause and troubleshooting

| Error message | Cause | Troubleshoot |
|---|--|--|
| EmergOFF-In | <ul style="list-style-type: none"> - Emergency stop button not connected - Emergency stop button pressed - Emergency stop interrupted | <ul style="list-style-type: none"> > Connect the emergency stop button > Unlock emergency stop button > Check emergency stop cable |
| Error Phase L1 (L2 / L3) (Note error code!) | <ul style="list-style-type: none"> - Error in the power section of the controller - Faulty supply line - Fuse for motor (3x G fuse 32x6.3 mm) defective - Faulty motor supply - Faulty motor connection - Power module (relay module) defective - no communication with the EXP 200 expansion | <ul style="list-style-type: none"> > Check voltage in power section > Check voltage of supply line > Check engine fuses > Check motor cable > Check motor connection > Change / exchange power module > Check setting of coding switch EXP200 > Check data bus line ESC200 <> EXP200 |
| Error R-curr. | Quiescent current error | Hardware error > Exchange device |
| Error overload | Rated motor current has been exceeded <ul style="list-style-type: none"> - The scraper moves directly after the start (within the first 2 seconds) against an obstacle, stop or is blocking - Incorrect setting of engine power (engine type) | <ul style="list-style-type: none"> > Move scraper out of obstacle / stop, check free scraper movement > Check rated motor power (type plate motor) and adjust setting |
| Error-code --I-- | INFO - every letter I means a phase Power relays are switched off, but a current flows on phase L2. Relay contact is clamping | Change power module |
| Error code MMM | <ul style="list-style-type: none"> - Power module not properly plugged / missing - Electrical activation of the power module defective | <ul style="list-style-type: none"> > Check power module for tightness. > Power module must be replaced |
| Error-code --MM | INFO - every letter M means a phase <ul style="list-style-type: none"> - the controller is powered only on L1 - L2 and L3 are lacking - 2 phases to the motor are lacking - 2 phases have failed internally (e.g. defective fuse / relay) | <ul style="list-style-type: none"> > Check supply voltage > Check motor cable > Check fuses, replace power module |
| Error-code H---- | INFO - every letter H means a phase Phase L1 has a too high current > Motor defect, short-circuiting, motor overload | Check motor for short circuit, measure motor winding, check connection cable |



INFO

The letters of the error code may appear in different order or combination. Before you contact our customer service, make a note of the message on the display!

* Option

11.5. Other malfunctions - Cause and elimination

| Malfunction | Cause | Troubleshoot | see |
|--|--|---|-----|
| Cut-off current over 95 % or „Error overload“ | <ul style="list-style-type: none"> - Setting rated power motor wrong (motor type) - Mechanical problem with the system - Gear oil in the motor (see connecting board > oily) - Wrong dimensioned drive motor (not enough power) | <ul style="list-style-type: none"> > Check setting motor-type > set correct motor type > Maintenance of the hardware > Repair or replace geared motor - contact PRINZING service > Use more powerful drive unit - contact PRINZING service | |
| It can not be selected a another cow alley (path) | <ul style="list-style-type: none"> - other cow alleys (paths) are not switched ON - Arrow keys on the controller have no function | <ul style="list-style-type: none"> > Switch on the cow alley (path) in the “Path selection” > Check the function of the buttons in the service menu (diagnosis DI) | |
| Parameters are not saved | <ul style="list-style-type: none"> - ENTER key not pressed after programming - Program memory defective | <ul style="list-style-type: none"> > Any change must be saved with ENTER > Exchange of control ESC200 | |
| No indication in the display | <ul style="list-style-type: none"> - Check Voltage Phase L1 <> Neutral N (230 VAC) - Check primary fuse (control voltage) - Check cable connection IO-board <> control board | <ul style="list-style-type: none"> > Ensure power supply > Replace micro fuse (0,250 AT) > Fully insert the plug | |
| Display shows only dark or bright | <ul style="list-style-type: none"> - Temperature sensor defective - Short circuit cable temperature sensor | <ul style="list-style-type: none"> > Exchange temperature sensor > Check and renew the cable | |
| No parameters programmed - BASIC mode | | | |
| Scraper driving is changed direction / switch OFF before end of the path | <ul style="list-style-type: none"> - Obstacle in the walkway - Manure too much for the set shutdown current - Power failure or stop while driving - Frost program “Type 2” is finished | <ul style="list-style-type: none"> > Check the cow alley (path) / guide rail for obstacles > Execute the “Learn” program or increase the switch-off current manually > Manually move the slider to the home position | |
| Scraper driving does not start automatically | <ul style="list-style-type: none"> - Automatic mode not switched ON - Program type (FRE - PAR - SEQ) not set - No start times set in the timetable - Frost mode is active | <ul style="list-style-type: none"> > Switch ON automatic mode > Set program type (e.g. Free) > Set start times in the timetable > During active frost operation, the timetable is deactivated | |
| Parameters are programmed - COMFORT mode | | | |
| Scraper stands in the cow alley - “Error obstacle” is displayed | Animal or other obstacle in the cow alley (path) or guide rail. The scraper drove unsuccessfully the programmed attempts. | Observe behavior of the animals. Check the cow alley, guide rail and other components for mechanical obstacles. (e.g., edges, open expansion gaps, stones, etc.) | |
| Scraper is at the end stop > “Error obstacle” is displayed | the programmed “time to sync” is longer than the driving time of the scraper from start to stop. | Correct the “time to sync”. The time has to be shorter, then the driving time from end stop to end stop! | |
| | “Parking position” was programmed, the value “Time to sync” was not adjusted. | The time “parking position” must be subtracted from the “time to sync” forwards. | |
| Scraper is at the end stop > “Error overload” is displayed | At the last cycle (stepping mode), the scraper is tailgating to the end stop and moves after the start pulse directly to the end stop. | Program the “cycle time” so, that the distance scraper <> end stop at the last cycle is not less than 40 cm. | |

* Option



11.6. Change battery on the control ESC200

In the control board of the ESC200 (front cover) there is a 3V-lithium battery. The battery is used to power supply the volatile memory, when the main switch is switched OFF or during a power failure. The battery life is about 5 years. Signs of a empty battery > after switching OFF / ON the controller, the date and time are reset to 00:00.

Change the battery:

- Switch OFF the main switch
- Open the front cover and loosen the ribbon cable on the I/O board
- Change the battery carefully - consider the polarity!
- Reassemble the controller
- Set date and time

INFO - Battery type: VARTA CR 2430 Li-Mn 3V



11.7. Software update

A software update is only required if malfunctions in the program are detected. The current software version of your controller can be found in: *Main menu > System information* or when switching ON the controller for few seconds. The software update for the ESC200 is made via the RJ45 socket in the terminal box of the controller. The update requires a special module. This module is available from PRINZING company. For software update information, please contact the PRINZING customer service.



* Option

12. Disassembly and Disposal

The ESC200 must be dismantled by qualified personnel and disposed of properly in the industrial waste cycle. When disassembling / disposing of the ESC200, observe the applicable company and statutory regulations and regulations.



CAUTION - Risk of electric shock due to voltage not switched off!
Before disassembling the ESC300, make sure that the system is de-energized and protected against being switched on again.

12.1. Information about the disposal

NOTES FOR DISPOSAL

Electrical and electronic products must not be disposed of with household waste. A separate collection system is available for these products. Used electrical / electronic equipment must be handled separately and in accordance with the legal requirements which require the correct handling, disposal and recycling of such products.

According to the implementation by member states, households within EU countries can use their used electrical / electronic devices free of charge to appropriate collection points bring.

If you wish to dispose of this product, please contact your local authorities for proper disposal information.

USED BATTERIES

In the interests of environmental protection, according to the current battery regulation, end users are obliged to return old and used batteries and accumulators.

You can return used / defective batteries to any GRS collection point in your location, or wherever batteries of that type are sold.

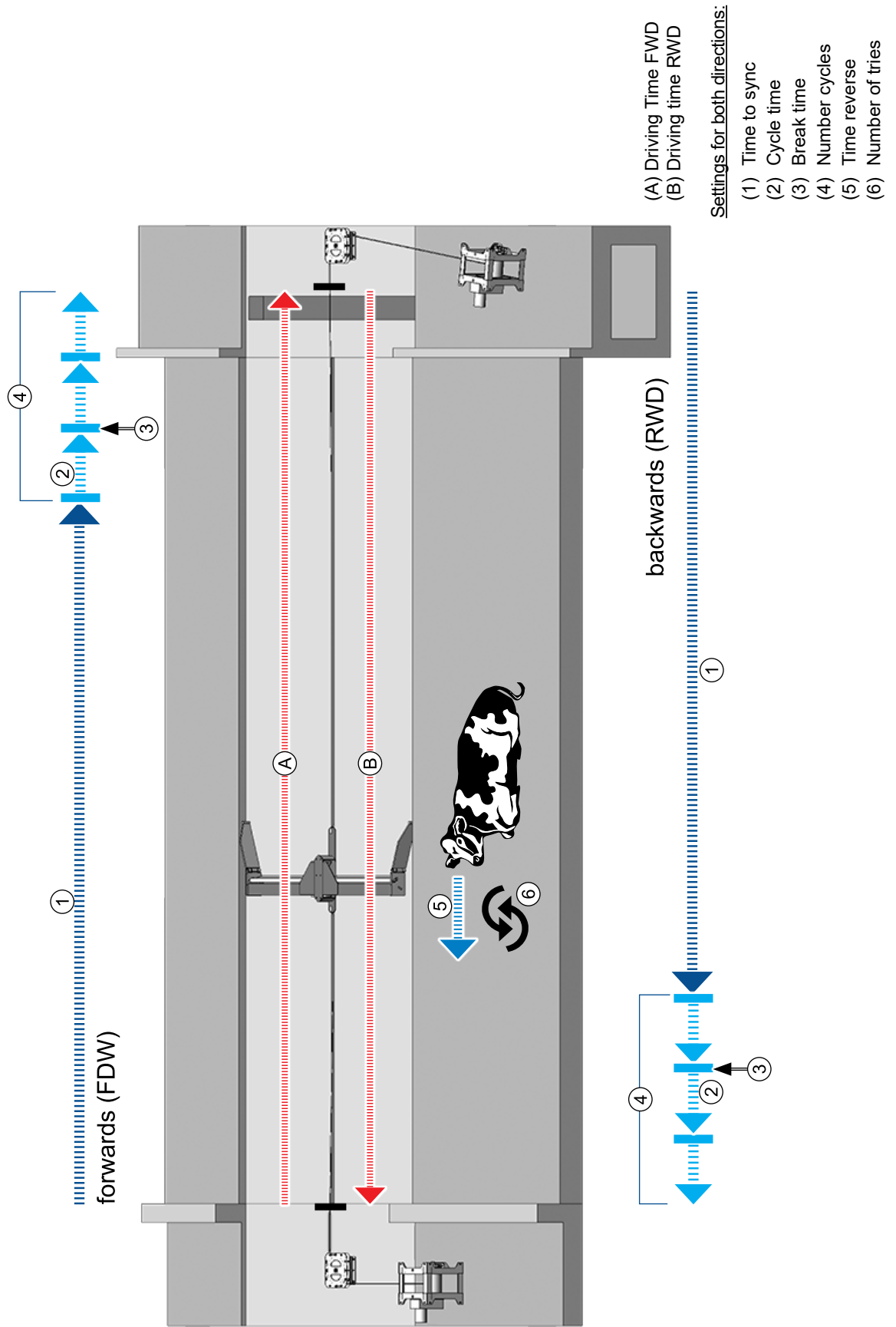
The batteries are returned free of charge to the consumer.

The disposal of ordinary household waste is prohibited and violates the battery law!

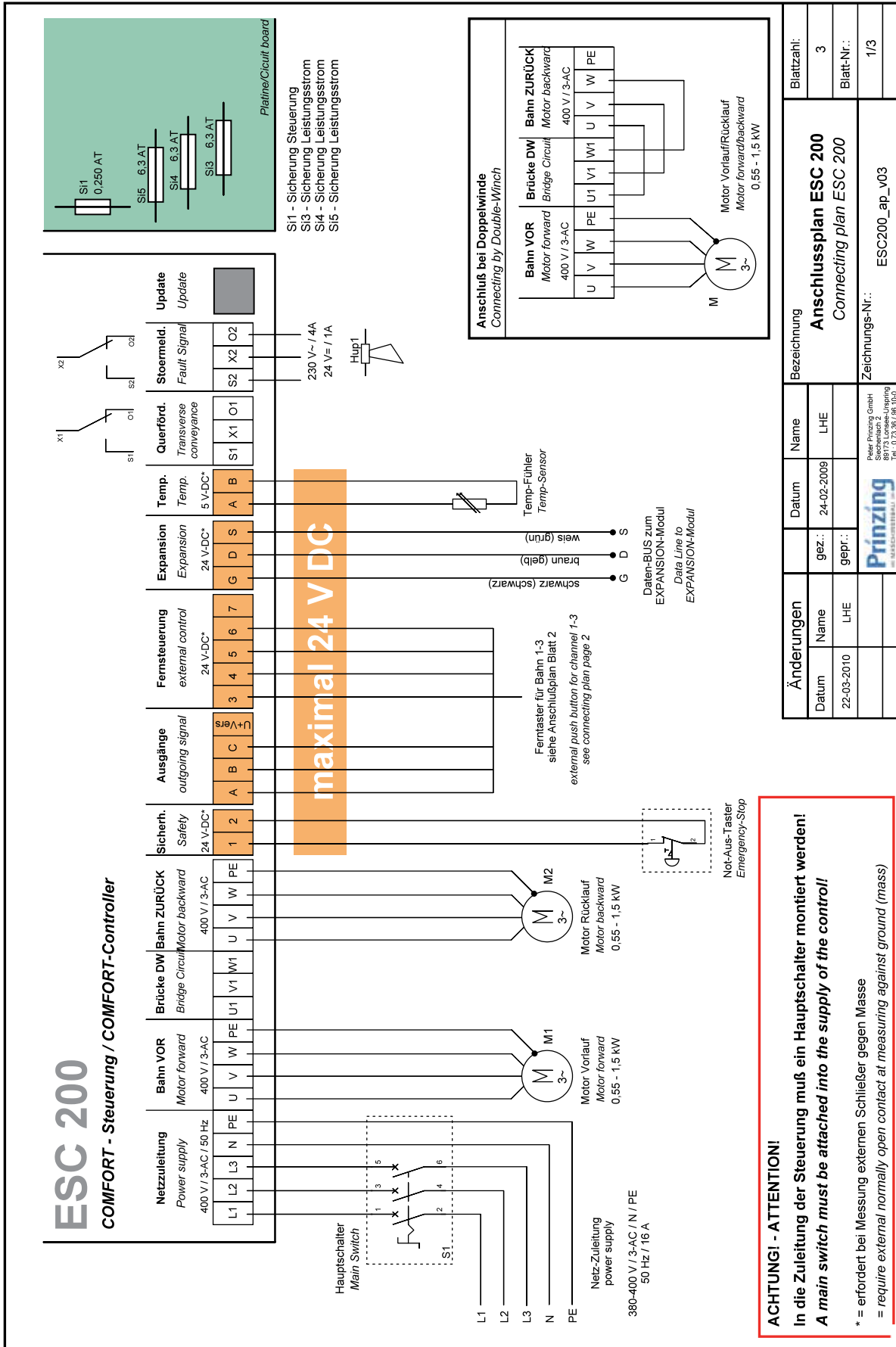
* Option

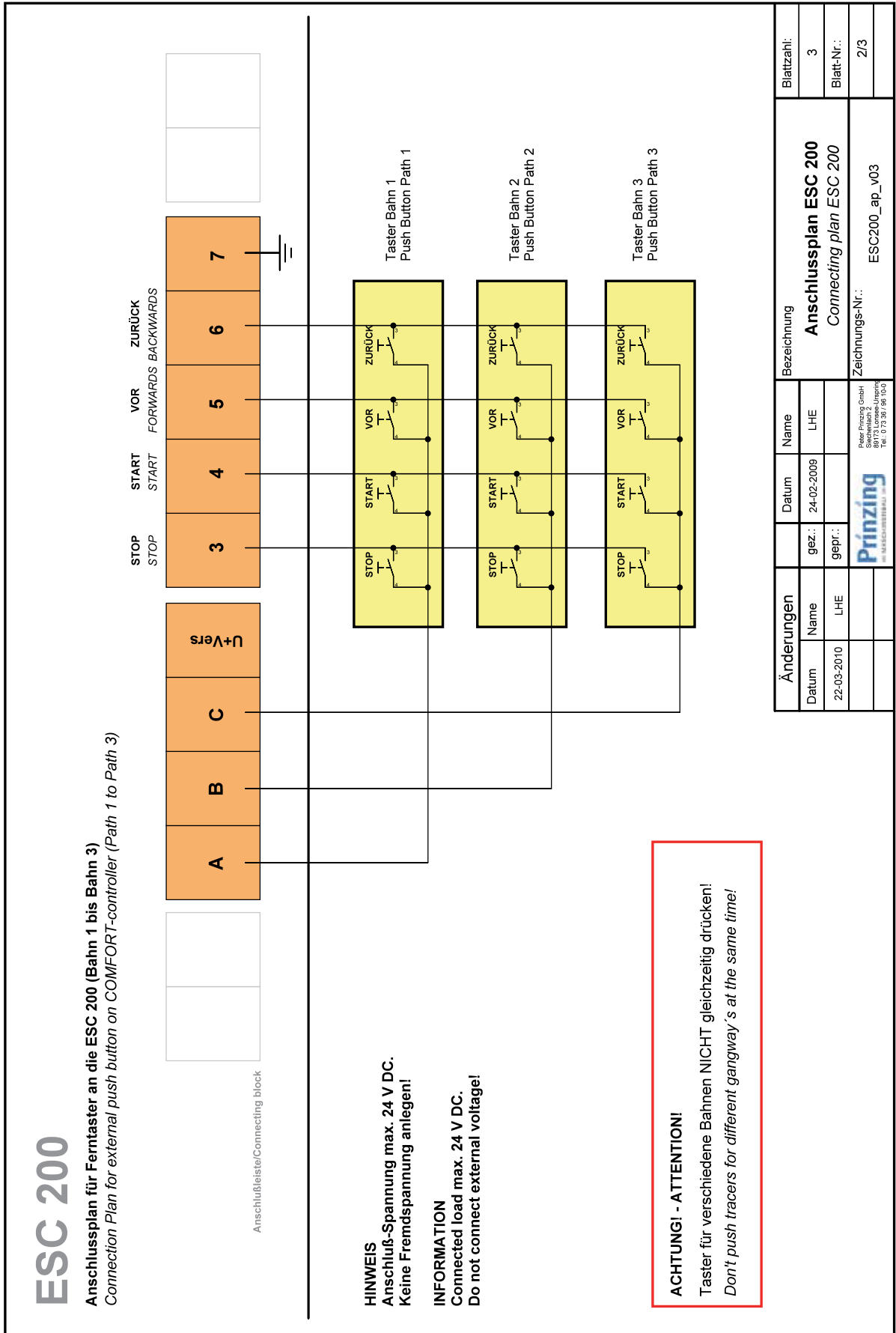


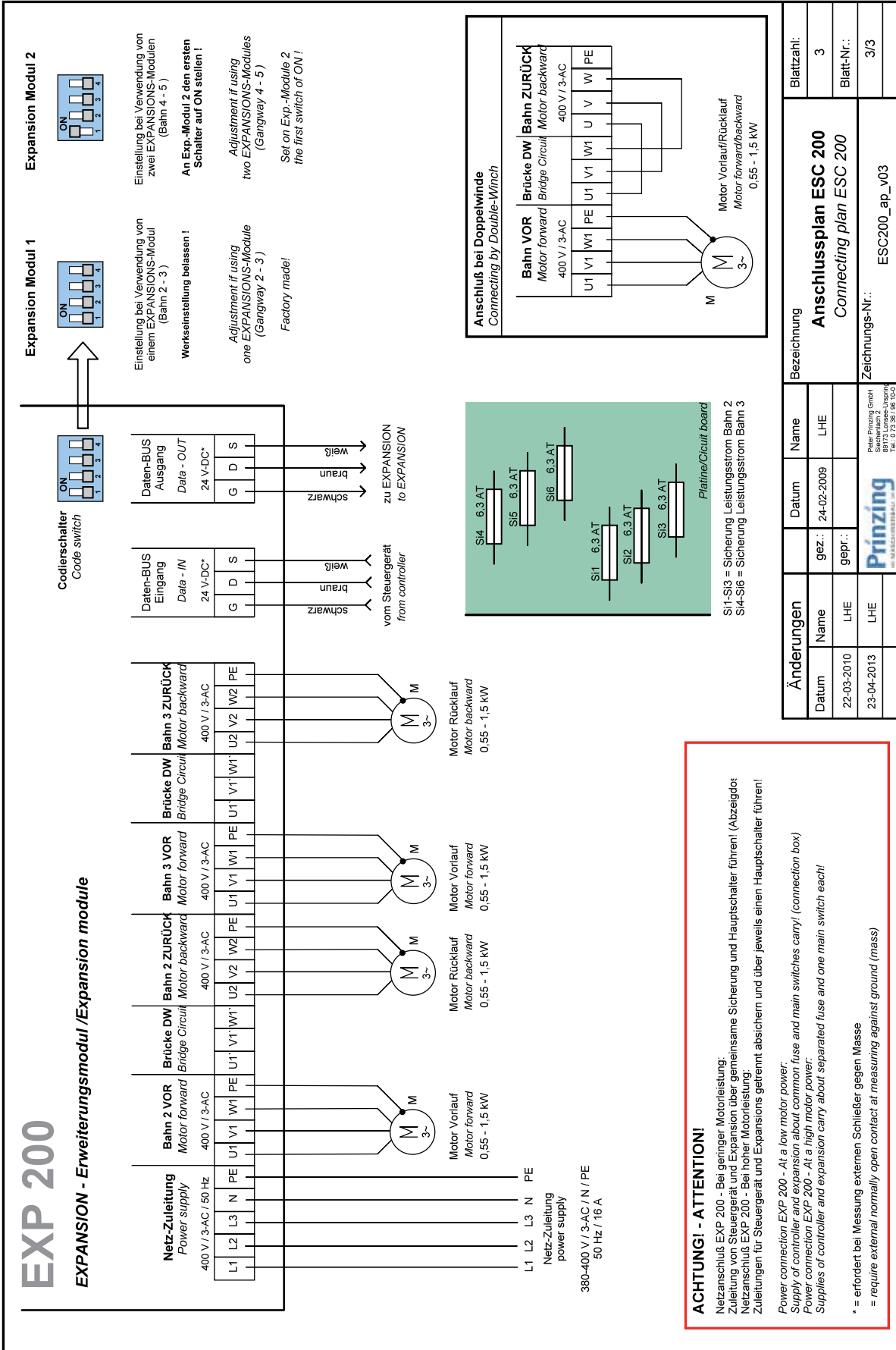
13. Graphic - Automatic mode with programmed parameters



14. Connection plan







| Änderungen | | Bezeichnung | | Blattzahl: | |
|------------|------|------------------------------|--|------------|--|
| Datum | Name | Anschlussplan ESC 200 | | 3 | |
| 22-03-2010 | LHE | Connecting plan ESC 200 | | Blatt-Nr.: | |
| 23-04-2013 | LHE | Zeichnungs-Nr.: | | 3/3 | |
| | | ESC200_ap_v03 | | | |

ACHTUNG! - ATTENTION!

Netzanschluss EXP 200 - Bei geringer Motorleistung:
Zuleitung von Steuergerät und Expansion über gemeinsame Sicherung und Hauptschalter führen! (Abzeigdos)
Netzanschluss EXP 200 - Bei hoher Motorleistung:
Zuleitungen für Steuergerät und Expansions getrennt absichern und über jeweils einen Hauptschalter führen!

Power connection EXP 200 - At a low motor power:
Supply of controller and expansion about common fuse and main switches carry! (connection box)
Power connection EXP 200 - At a high motor power:
Supplies of controller and expansion carry about separated fuse and one main switch each!

* = erfordert bei Messung externen Schließer gegen Masse
= require external normally open contact at measuring against ground (mass)

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Tel.: 073 38 108 100



15. User menu ESC200

