

OPERATION & MAINTENANCE MANUAL

eco-CONTROL EC200 2.0





Power supply A

Inlet pressure monitoring A

Material feeding A



A

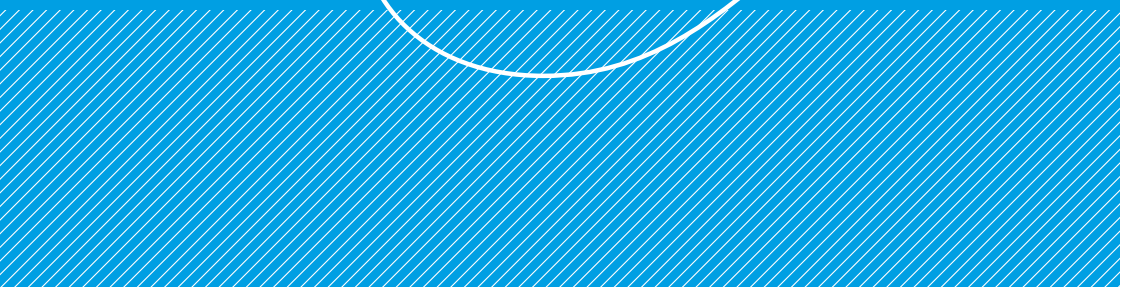
B

Material feeding B



2-component dispenser
eco-DUO

Dosing pressure monitoring A



1	Introduction	7
1.1	Scope of delivery	7
1.2	Incoming inspection	7
2	Safety	8
2.1	Explanation of symbols used	8
2.2	Intended Use	9
2.3	Personnel	10
2.3.1	Operators	10
2.3.2	Maintenance staff	10
2.4	Informal safety precautions	11
2.5	Preventing damage to equipment	11
2.6	Compressed air supply	12
2.7	Organisational safety measures	12
2.8	Residual risks	13
2.9	IT safety	14
3	Product description	15
4	Operation	16
4.1	Connections	16
4.1.1	1-component dispenser connection	17
4.1.2	Connection of two 1-component dispensers (synchronous operation)18	
4.1.3	2-component dispenser connection	19
4.1.4	2-component dispenser connection with dynamic mixer	20
4.2	Initial commissioning	21
4.3	Switching on / off	21
4.4	Navigation structure	22
4.5	Icons	24
4.6	Start-up process	25
4.7	First-time start-up	26
4.8	Quick start	27

4.9	Editing a program.....	28
4.9.1	Volume.....	29
4.9.2	Flow rate.....	30
4.9.3	Suck-back.....	30
4.9.4	Pot life (with 2-component dispenser).....	31
4.9.5	Blankshot quantity (with 2-component dispenser).....	32
4.9.6	Mixing ratio (with 2-component dispenser).....	34
4.9.7	Material density.....	34
4.9.8	Calibration.....	35
4.9.9	Save location.....	35
4.9.10	Dosing pressure max. (with dosing pressure sensor).....	36
4.9.11	Pressure monitoring (with dosing pressure sensor).....	36
4.9.12	Dynamic mixer (for 2-component dispensers).....	37
4.9.13	Changing field values.....	38
4.10	Calibration.....	39
4.11	Duplicating a program/creating a new program.....	42
4.12	Dispense screen.....	44
4.12.1	Dispense screen – Selecting parameters.....	45
4.12.2	Dispense screen - Changing the view.....	46
4.12.3	Dispensing screen - Selecting the view.....	46
4.13	Choosing favourites.....	47
4.14	Deleting a program.....	48
4.15	Settings.....	48
4.15.1	User management.....	49
4.15.2	System Information.....	52
4.15.3	Program Management.....	55
4.15.4	Error messages.....	56
4.15.5	Display & Sounds.....	58
4.15.6	Start-Up Window.....	59
4.15.7	Date & Time.....	59
4.15.8	Language.....	60
4.15.9	Units.....	60
4.15.10	System Calibration.....	61

4.15.11	Manual purging	62
4.15.12	Sensors	63
4.15.13	External Control unit	65
4.15.14	Interfaces	67
4.15.15	IO Test (hardware test)	68
4.16	Manual purging (start screen)	70
4.17	Help (start screen)	71
5	Dosing pressure monitoring	72
5.1	Teach-In dosing	74
5.2	Monitoring units	75
5.2.1	Envelope curve	76
5.2.2	Integral	77
5.2.3	Control box	78
5.3	Teach-In settings	80
5.4	List of Teach-In dosing operations and monitoring units	81
5.5	Validity of a dosing operation	81
5.6	Component signal	82
5.7	Dosing window – view with monitoring units	83
6	Dynamic mixer	86
7	Explanations of the operating modes	88
7.1	Dosing manually	88
7.2	Dosing with the foot switch (optional)	89
7.3	Dosing using external control unit	90
7.3.1	Signal value for external program selection	90
7.3.2	Signal forms and levels	92
7.3.3	Troubleshooting with external control unit	93
8	Maintenance	94
8.1	Maintenance intervals	94
8.2	Troubleshooting / Warning message / Error message	94

9	Cleaning	99
10	Spare parts	99
11	Technical specifications	100
11.1	Interface description.....	100
11.1.1	Interface X1: System I/O.....	100
11.1.2	Interface X2: Inlet pressure.....	101
11.1.3	Interface X3: External program selection.....	101
11.1.4	Wiring diagrams for external inputs/outputs	102
11.1.5	Logical links of the outputs	105
11.2	EU Declaration of Conformity	106
11.3	Technical data.....	107
12	Disposal	108
12.1	General principles	108
12.2	Return and recycling programme for waste equipment in the European Union108	
13	Accessories	110
13.1	Mounting of the holder	111
13.2	Cabinet installation.....	112
13.3	Installation of the pneumatic unit	114
14	Keyword index	115

1 Introduction

Dear customer,

We are delighted that you have decided to purchase a ViscoTec product. We have no doubt that this product will meet all your requirements. We wish you trouble-free and successful operation.

The dosing system consists of the eco-CONTROL EC200 2.0 dosing control unit and a 1- or 2-component dispenser. Simultaneous operation of two identical 1-component dispensers is possible.

This operation manual describes the dosing control unit. A separate operation and maintenance manual is supplied for the different dispensers.

1.1 Scope of delivery

eco-CONTROL EC200 2.0 dosing control unit, support, power cable, USB stick and operation and maintenance manual. The 2-component dispenser also includes a set of adhesive stickers to label the two motors, the plugs, sensors and the supply line.

1.2 Incoming inspection

Damage in transit can lead to malfunctions, and consequently to personal injury and damage to property. Damaged components must not be put into operation.


Check the delivery immediately on receipt for damage in transit and damage to the packaging. Check that the delivery is complete according to the enclosed delivery note. Make sure you have not left any part of the delivery in the packaging.

Compensation for damage during transport may be claimed only if the carrier is notified immediately.

2 Safety

2.1 Explanation of symbols used

The following symbols are used in this manual:

	Work step
•	List
Fig. 1	Legend number, reference to a figure
*	Reference to a comment
COMMAND	Designations of buttons/switches, menu items and input dialogs

The following notices indicate safety instructions and must be followed:



indicates a hazardous situation which, if not avoided, will result in death or serious injury.



indicates a hazardous situation which, if not avoided, may result in death or serious injury.



indicates a hazardous situation which, if not avoided, may result in minor injury.

NOTE

indicates a technical tip to avoid damage to property or equipment.

This manual is structured so that text and the related figure are on the same page as far as possible. In this way the information can be understood quickly. If reference is made to a component in a figure, the part has a key number.

2.2 Intended Use

The dosing control unit controls the dispensers in order to convey and precise dispense viscose material.

Check the chemical resistance of the materials that are in contact with the material before commissioning. For information on the equipment materials refer to the dispenser operation and maintenance manual.

No liability can be accepted for damage caused by failure to observe this operation manual or due to a lack of maintenance or checks.

Misuse

Any use other than the stipulated intended use shall be considered as misuse.

This includes

- Use outside the permissible operating limits
- Use in explosive environments
- Use underground
- Use outdoors

Misuse also includes the following actions carried out without the explicit written approval of the manufacturer:

- Conversions and/or extensions
- Use of non-genuine spare parts
- Repairs carried out by unauthorised companies or persons
- Use of non-approved materials

Misuse is not permissible, and will result in voiding of guarantee, warranty and liability claims.

2.3 Personnel

The operating organisation shall ensure that only appropriately qualified and authorised personnel work on this machine. It is responsible for ensuring that operators and maintenance staff possess the necessary qualifications. Personnel must be at least 15 years old.

All personnel working with or on the machine must have read and understood this operation manual.

The operating company shall document the operators' and maintenance staff's acknowledgement of this manual, and shall ensure their compliance with it by means of regular training.

2.3.1 Operators

Before starting work, the personnel assigned as operators must be adequately instructed regarding the nature and scope of their duties and the potential risks. Training is to be conducted on a regular basis (at least once a year). Training is to be conducted after any technical modifications.

2.3.2 Maintenance staff

The maintenance and repair staff must be authorised and

- adequately trained for the relevant activities
- familiar with and comply with the applicable technical rules and safety regulations

Competent personnel are persons who, by virtue of their training, experience and knowledge of the relevant requirements, standards and safety regulations, can carry out the necessary activities while recognising and avoiding potential hazards.

2.4 Informal safety precautions

The following documents must be read, understood and followed. They must always be available at the machine's operating location, and must be kept in legible condition:

- The operation manual for this product
- Generally applicable and local accident prevention and environmental protection regulations
- Safety data sheets for the conveyed materials, as well as for any cleaning products or lubricants being used

2.5 Preventing damage to equipment

In order to prevent damage to equipment and to ensure precision dosing, ensure that

- the connecting cable for a dispenser may only be connected or disconnected when the power supply is switched off. Otherwise, the electronics in the drive motor could be damaged
- only original dosing pressure sensors adapted for the dosing control unit are to be used
- the dispenser must never be operated without material (the stator will be destroyed)
- the material inlet (feed) and the material outlet must never be closed during operation
- the material outlet (e.g. dosing needle or mixer) must not be damaged or blocked
- the dispenser is regularly checked and cleaned
- the specifications in the product data sheet for the material are observed and adhered to

2.6 Compressed air supply

If the pneumatic unit is used, there must be a maintenance unit (pressure regulator and cut-off valve) immediately before the dosing system. Compressed air supply max. 6 bar.

2.7 Organisational safety measures

The necessary personal protective equipment must be provided by the operating organisation. Personal protective equipment must be worn when carrying out all work and procedures.

To ensure the provision of suitable personal protective equipment, the safety data sheet for the conveyed material must be observed. Specifications for e.g. cleaning products and lubricants must also be checked and observed.

All personal protective equipment must be checked to ensure it is working properly before starting work.



Eye protection



Hand protection



Body protection



Foot protection

2.8 Residual risks

Thorough training, observance of the operation manual and compliance with safety regulations are key to permanently accident-free operation.

The following residual risks may occur when operating this machine:

DANGER

Danger to life from electrical voltage

There is a risk of fatal electric shock if equipment covers are removed or cables are defective.

- Work and repairs on live parts may only be carried out by competent maintenance staff. All applicable standards and safety, directives and regulations (e.g. EN 50110-1) must be complied with.

WARNING

Material hazardous to health

The conveyed material may contain constituents which are hazardous to health. Such constituents may cause serious acute or chronic harm to health if they come into contact with skin, are inhaled or swallowed.

- Always wear appropriate protective equipment
- Observe the specifications in the safety data sheet for the material

WARNING

Pressurised material

Depending on the setting of the dosing system, the material is conveyed under very high pressure. If the feeding rate is not adapted to the dosing needle being used, unwanted spraying of the material might occur. This may result in serious injury.

- Shut down the machine immediately
- The machine may only be restarted once the correct dosing needle has been installed or after eliminating the leak

 **CAUTION**

Splashing material

During initial commissioning and after being refilled, air bubbles in the material could cause an uncontrollable spraying from the conveying area. This may result in injury.

- Always wear appropriate protective equipment
- Fully bleed the system before start of production

2.9 IT safety

To protect the eco-CONTROL EC200 2.0 dosing control unit and existing IT systems, it is essential to adhere to the following:

- ▶ All USB sticks must be checked for viruses and malware by up-to-date security software before use.

ViscoTec accepts no liability if a USB stick containing malware or an incorrect update file is used.

3 Product description

The dosing control unit has been developed and tested for high-precision work with 1-component and 2-component dispensers. Simultaneous operation of two identical 1-component dispensers is possible. For 2-component dispensers, a dynamic mixer can also be connected.

The dosing system has a wide variety of setting options for the dosing quantity and time. All the values that are related to production can be saved and changed at any time. Up to 100 different programs can be stored in the dosing control unit.

Operation is done via an intuitive operator guidance system using a graphic user interface. Depending on the customer order, the required software licence will come pre-installed on the dosing control unit. The corresponding software licence is also saved as a "backup" on the supplied USB stick.

Converting to a different software licence can be done at any time without significant setup times. Simply install the new chargeable software licence on the dosing control unit using a USB stick (activation). Different software licences are available (see page 110). You can get the new USB stick from your contract partner or by contacting the manufacturer, citing the serial number.

New software licences are encrypted and can therefore only be installed on one dosing control unit. The serial number (SN) of the associated dosing control unit is therefore printed on the USB stick. The serial number (SN) of the dosing control unit can be found on the type plate (see page 99).

The dispensers have been developed and tested for precision dosing of materials ranging from low to high viscosity with extremely high repeat precision.

Preeflow dispensers are positive displacement pumps. The conveying elements comprise a rotating part, the rotor, and a stationary part, the stator. The rotor, which is in the form of a type of knuckle thread, rotates inside the stator, which has one more thread turn and twice the pitch length of the rotor. As a result, conveying areas are produced between the stator and the rotor rotating inside the stator. The rotor also moves radially within the stator. The conveying areas move forwards continuously due to the movement. The flexible shaft used to drive the rotor compensates for the eccentric movement of the rotor and is completely maintenance-free.

Since the direction of flow is reversible, the material can be sucked back to allow a clean thread breakage.

The dispenser can be dismantled very quickly.

4 Operation

4.1 Connections

The following connections can be found on the rear. All texts are in English.

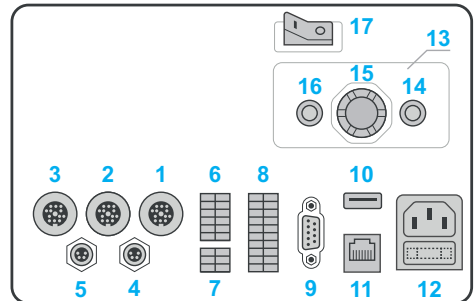


Fig. 1

1	Motor 1	Connection for dispenser 1 (component A (resin))
2	Motor 2	Connection for dispenser 2 (component B (hardener))
3	Motor 3	Connection for dynamic mixer
4	Dispensing Pressure A	Dosing pressure sensor connection for dispenser 1 (component A (resin))
5	Dispensing Pressure B	Dosing pressure sensor connection for dispenser 2 (component B (hardener))
6	X1	Interface for system I/O (see page 100)
7	X2	Interface for inlet pressure (see page 101)
8	X3	Interface for external program selection (see page 101)
9	RS232	Interface for external control (see page 67)
10	USB	USB connection
11	LAN	Connection not used
12	110–230 V AC	Mains connection 110–230 V AC 100 VA, (inc. 2 fuses T2,5L250V (glass fuse 5x20))
13	Pressure Control	Pneumatic unit (optional)
14	Pressure IN	Compressed air inlet (connection hose Ø 6 mm)
15	Control	Regulator for manual adjustment of the compressed air
16	Pressure OUT	Compressed air outlet (connection hose Ø 4 mm), connection to material reservoir / cartridge / tank
17	Power on/off	On/off switch

4.1.1 1-component dispenser connection

Illustrated with non-self-levelling liquid (material/high viscosity material)

1. Motor 1, 4. Dispensing Pressure A (optional), 16. Pressure OUT

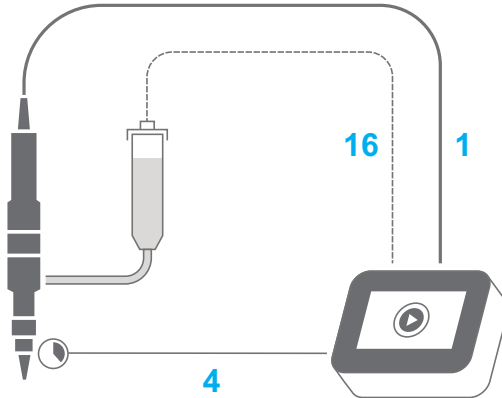


Fig. 2

Illustrated with self-levelling liquid (low viscosity material)

1. Motor 1, 4. Dispensing Pressure A (optional)

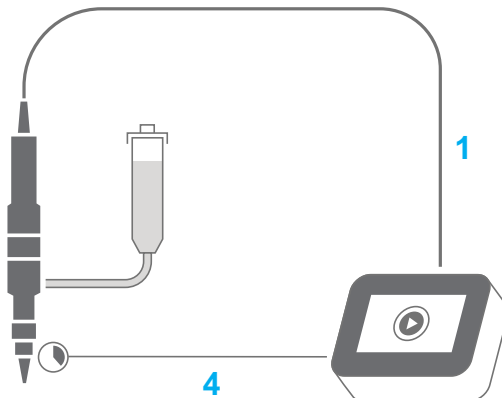
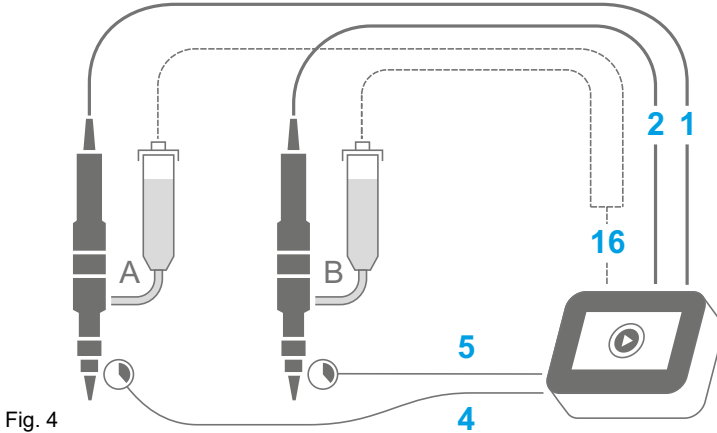


Fig. 3

4.1.2 Connection of two 1-component dispensers (synchronous operation)

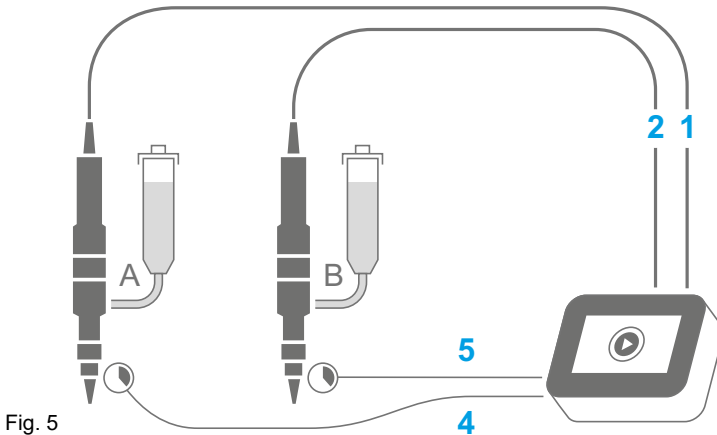
Illustrated with non-self-levelling liquid (material/high viscosity material)

- 1. Motor 1, 2. Motor 2, 4. Dispensing Pressure A, 5. Dispensing Pressure B, 16. Pressure OUT



Illustrated with self-levelling liquid (low viscosity material)

- 1. Motor 1, 2. Motor 2, 4. Dispensing Pressure A, 5. Dispensing Pressure B



4.1.3 2-component dispenser connection

Illustrated with non-self-levelling liquid (material/high viscosity material)

1. Motor 1, 2. Motor 2, 4. Dispensing Pressure A, 5. Dispensing Pressure B, 16. Pressure OUT

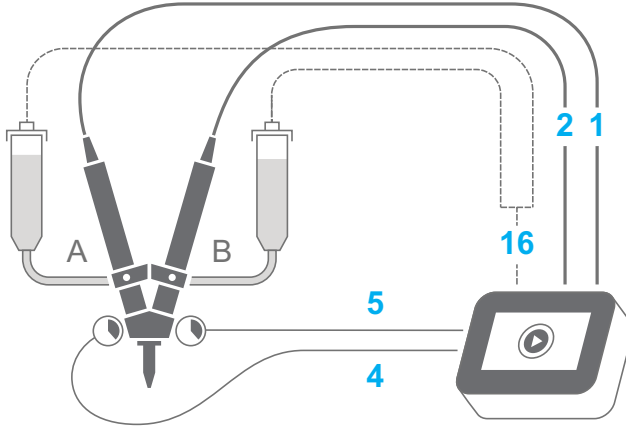


Fig. 6

Illustrated with self-levelling liquid (low viscosity material)

1. Motor 1, 2. Motor 2, 4. Dispensing Pressure A, 5. Dispensing Pressure B

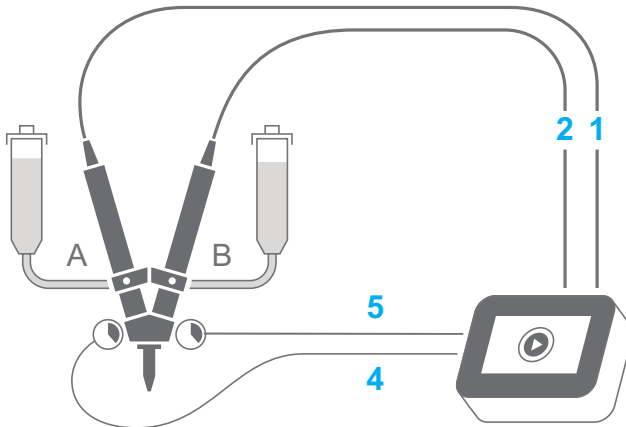


Fig. 7

4.1.4 2-component dispenser connection with dynamic mixer

Illustrated with non-self-levelling liquid (material/high viscosity material)

1. Motor 1, 2. Motor 2, 3. Motor 3, 4. Dispensing Pressure A, 5. Dispensing Pressure B, 16. Pressure OUT

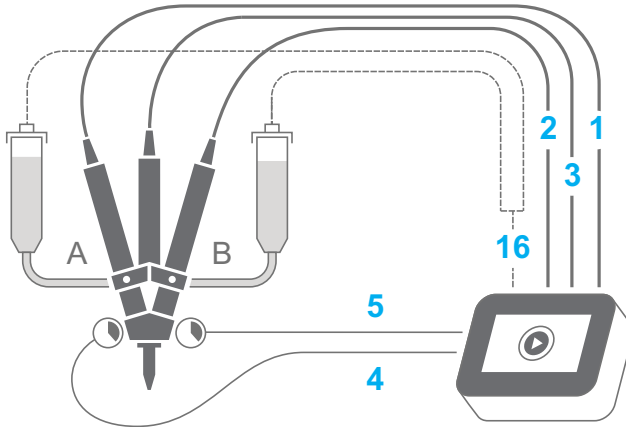


Fig. 8

Illustrated with self-levelling liquid (low viscosity material)

1. Motor 1, 2. Motor 2, 3. Motor 3, 4. Dispensing Pressure A, 5. Dispensing Pressure B

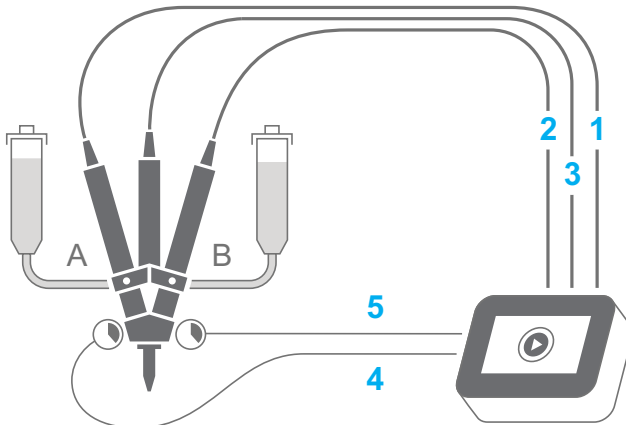


Fig. 9

4.2 Initial commissioning

NOTE

Isolate the power supply before connecting or disconnecting a dispenser's connection cable. The electronics in the drive motor could be damaged if this precaution is not taken.

If the dosing control unit is placed on its glass side, always place a clean, soft cloth underneath to prevent the display from being scratched.

- ▶ Set the dosing control unit down on its glass side.
- ▶ Make sure that the dosing control unit has been switched off by the **POWER ON/OFF** switch.
- ▶ Ready the dispenser(s) for operation in accordance with the supplied operation and maintenance manual.
- ▶ Connect the compressed air supply (optional).
- ▶ Connect the cable of the dispenser(s).
- ▶ Connect the dosing pressure sensors (optional) (for 2-component dispenser).
- ▶ Plug the power cable into the dosing control unit.
- ▶ Connect the power cable to the mains power.
- ▶ Insert the support in the locating slot and tighten the screws (see Fig. 171 (Page 112)). Do not route the cable through the cut-out in the support.
- ▶ Turn the dosing control unit over and set it upright.
- ▶ Switch on the dosing control unit by the **POWER ON/OFF** switch.

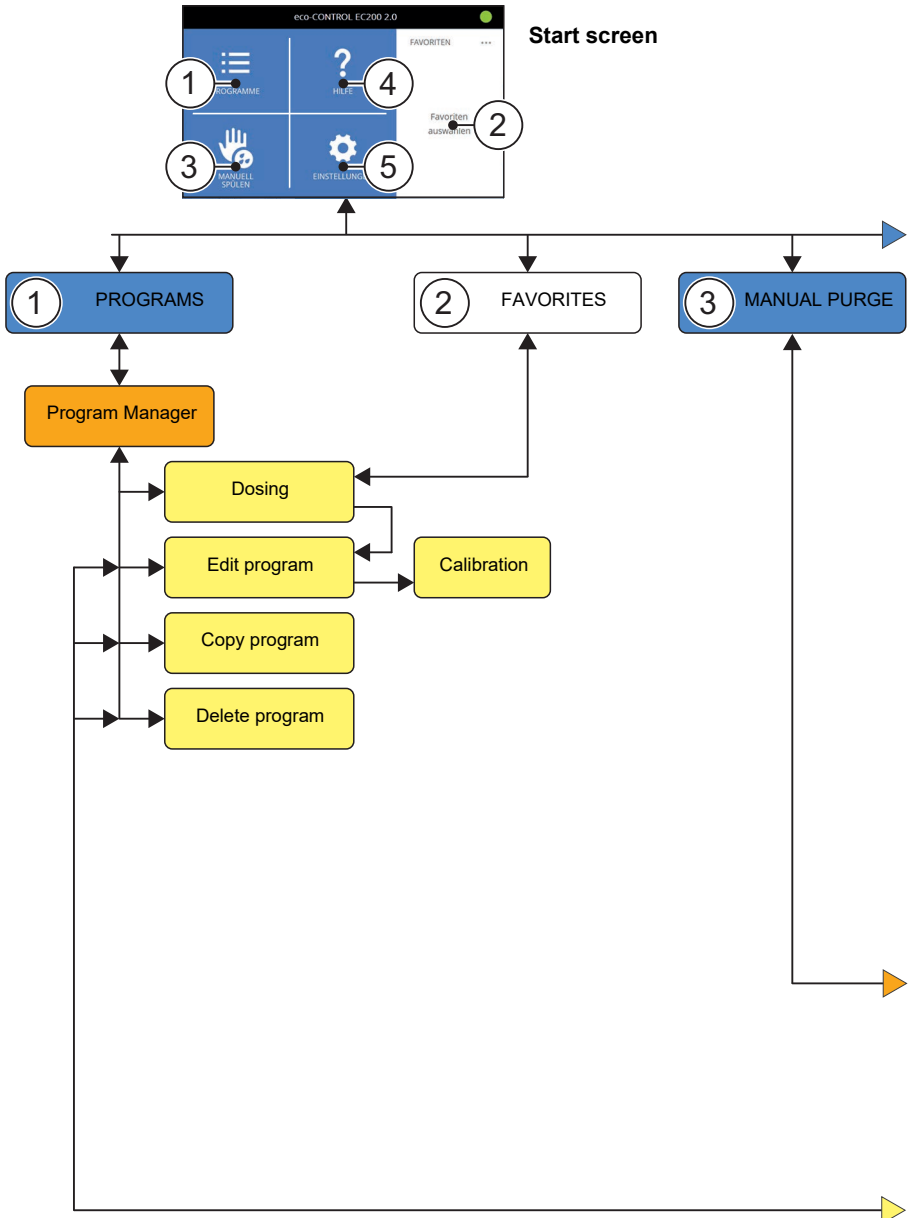
The dosing system is only ready for operation when the dispenser is connected.

4.3 Switching on / off

The dosing control unit is switched on and off using the **POWER ON/OFF** switch.

When switching off, make sure that dosing is finished.

4.4 Navigation structure



The following two buttons appear in the header in the top left of every screen (except the start screen):



The **PAGE BACK** button is used to move one hierarchy level up.



The **START SCREEN** button takes you directly back to the start screen.

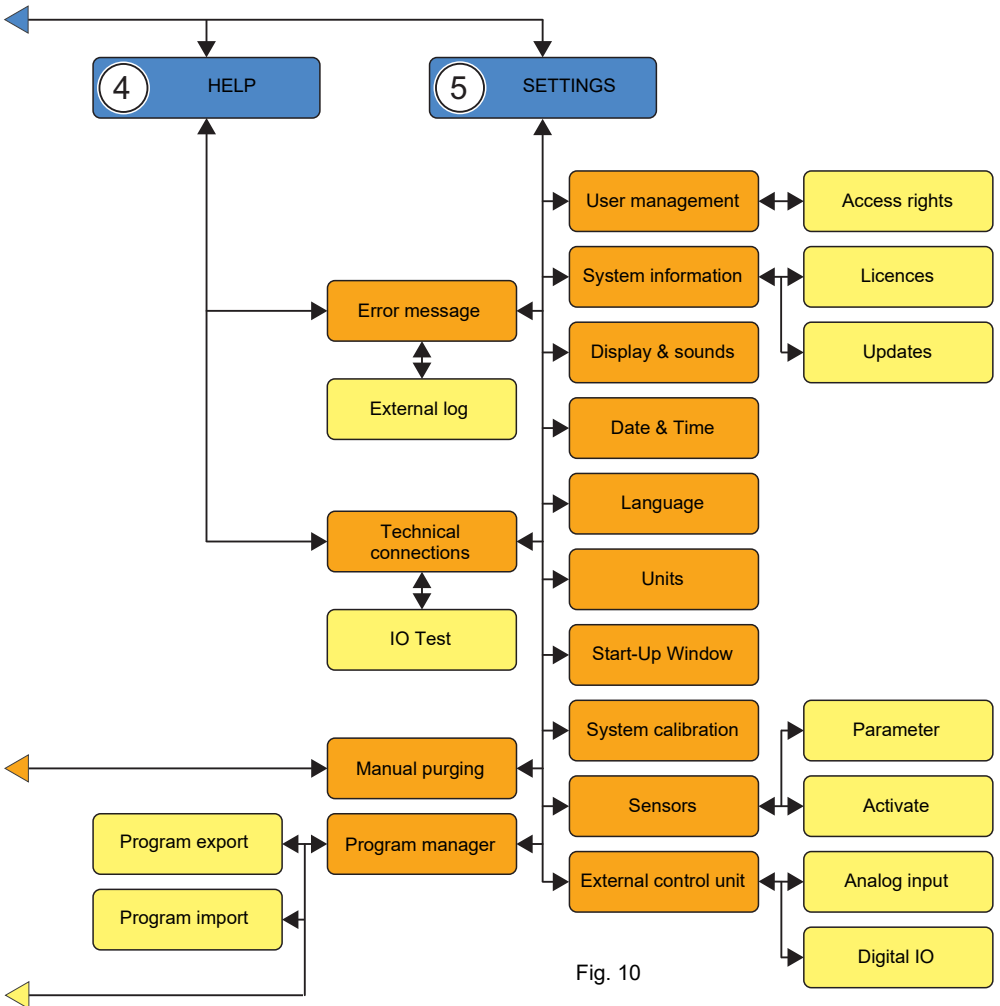



























Fig. 10

4.5 Icons

The following explains the various icons that appear on the individual screens.

Icon	Function
	List of stored dispenser programs
	Manual purging
	Delete
	Copy program
	Page back / forward
	Input confirmation
	Start/stop dosing
	Start dispenser
	Dispense screen - Changing the view (two- or three-column)
	User
	Signal: Note (dosing possible, check values and settings)
	Signal: System is running error-free
	External control unit active (page 90)

Icon	Function
	Help
	Settings
	Edit program
	Loading a program
	Back to start screen
	Quantity dosing
	Stop dispenser
	Select parameters
	Administrator
	Signal: Error (no dosing possible, remedy the error)
	Analog voltage input active (page 66)
	Analog current input active (page 66)

4.6 Start-up process

Operating the **POWER ON/OFF** switch on the rear switches on the dosing control unit and starts (boots) it up.



Fig. 11

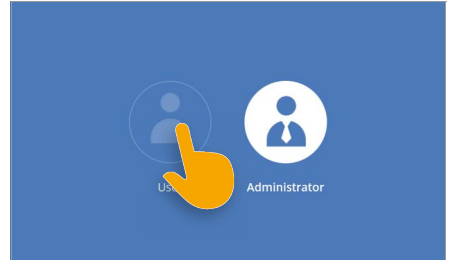


Fig. 12

If a user or administrator has been set up, the login screen appears.

The user or administrator must be selected (Fig. 12) and the release code entered (Fig. 13).

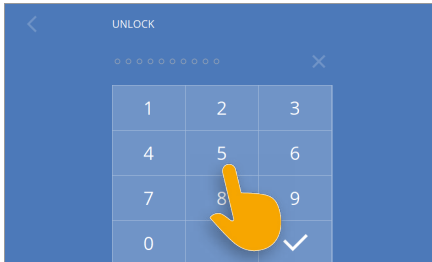


Fig. 13



Fig. 14

Then the start screen is displayed (Fig. 14). If no user or administrator has been set up, the start screen is displayed immediately. On initial booting there are no programs in the Favourites listing.

4.7 First-time start-up

Based on the order placed, the software is pre-installed in the dosing control unit at the factory for a 1-component or 2-component dispenser. The software automatically detects which dispenser is connected, and makes an initial program available. This program is not adapted to the desired dosing and the conveyed material.



Fig. 15

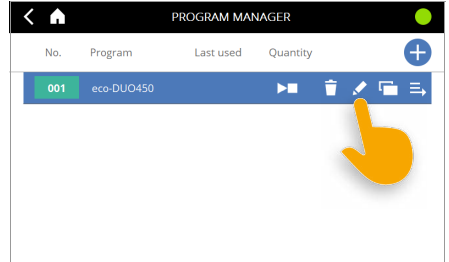


Fig. 16

The initial program can be edited to adapt to the desired dosing (Fig. 16). The procedure is described in Section 4.9.13 (page 38). Or you can create a new program based on the initial default program (Fig. 17).

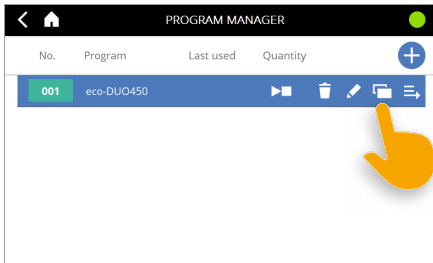


Fig. 17

4.8 Quick start

There are two ways to start a dosage quickly:

1. Programs –  Button – **START/STOP-button**
2. Favorites – **START/STOP-button**



Fig. 18

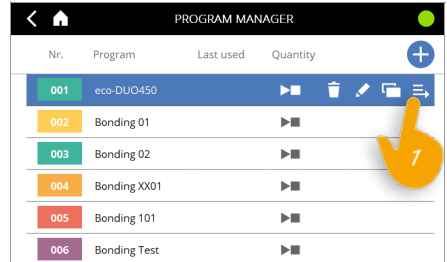


Fig. 19

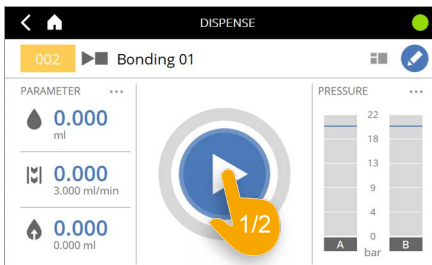


Fig. 20

NOTE

The prerequisite for this is that the selected program has been edited to match the conveyed material, the connected dispenser and the desired dosing.

Depending on the settings, either the set quantity is dosed (quantity dosing) or dosing continues until it is terminated by pressing the **START/STOP-button** again (start/stop dosing).

4.9 Editing a program

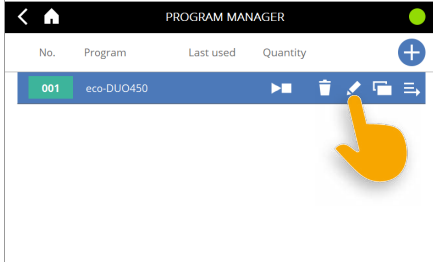


Fig. 21

Each program must be edited to adapt it to the desired dosing (Fig. 21). The following fields must be edited and set to your desired dosing.

The number of fields displayed varies depending on the connected dispenser and whether a dosing pressure sensor is connected.

1-component dispenser	2-component dispenser	For description, see...
Quantity	Quantity	Page 29
Flow rate	Flow rate	Page 30
Suck-back	Suck-back	Page 30
	Pot life	Page 31
	Blank shot quantity	Page 32
	Mixing ratio	Page 34
Material density	Material density	Page 34
Calibration	Calibration	Page 35
Save location	Save location	Page 35
Dosing pressure max.	Dosing pressure max.	Page 36
Dosing pressure monitoring	Dosing pressure monitoring	Page 36
	Mixer (dynamic)	Page 37

By clicking on the < or > arrow key on the screen, you can go to the individual pages on which the respective fields can be seen. The dots at the bottom are for orientation and indicate in which field you are.

4.9.1 Volume

Quantity dosing

If a precisely defined quantity is to be dosed, select “Quantity” (Fig. 22) and enter the desired dosing quantity in millilitres* (ml) or in grams (g). Switch from (ml) to (g) using the field **UNITS**. Depending on the dispenser and the material being used, it is possible to set very small amounts per dose. The dosing time is determined by the flow rate. This quantity is dosed when a Start signal is given. The dosing process can be cancelled at any time by pressing the **START/STOP-button** again.

* Microlitres (µl) for the eco-PEN300 dispenser

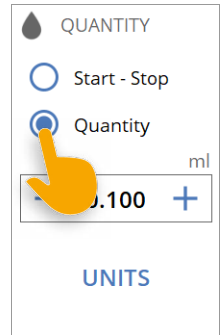


Fig. 22

Start/stop dosing

If the option “Start - Stop” is selected (Fig. 23), the start/stop dosing is carried out. This dosing mode is used if the dispenser is set by the operator (or external control) to convey the material for a specific period. If the control unit receives a Start signal, it carries out dosing until the signal is reset again. This type of control is suitable for bead application or filling that is controlled by an external foot switch or a robot, for example.

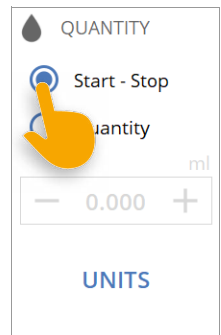


Fig. 23

4.9.2 Flow rate

The dispenser flow rate (Fig. 24) is the quantity that can be conveyed per time unit. For the dispensers it is indicated in millilitres (ml) per minute (min). The maximum flow rate is stored in the dosing control unit for each dispenser.

The values for the minimum and maximum flow rate can be found in the operation and maintenance manual for the dispenser, in the “Technical Data” section under volume flow.

If the minimum flow rate of the dispenser is undercut, no warranty is given for the behaviour of the dosing control unit and the dosing result. When saving the program, a message appears on the display.



Fig. 24

4.9.3 Suck-back

In order to effectively prevent any dripping of the material, various values for the suck-back can be set (Fig. 25).

Delay: “Delay” indicates the time when the suck-back is to be carried out after dosing. The value in seconds (sec) can be entered at will.

Quantity: “Quantity” indicates the suck-back quantity. The maximum value that can be set is stored in the dosing control unit for each dispenser.

Speed: “Speed” indicates the suck-back speed. The maximum value that can be set is stored in the dosing control unit for each dispenser.

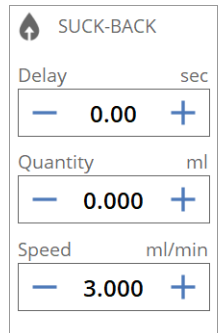


Fig. 25

If the minimum suck-back speed of the dispenser is not reached, no warranty is provided for the behaviour of the dosing control unit and the dosing result. When saving the program, a message appears on the display.

Suck-back is carried out after each dosing process. The suck-back quantity must be lower than the dosing quantity at all times. The maximum suck-back quantity is limited for each dispenser.

When using a 2-component dispenser, make sure that no mixed material is sucked back into the mixing head. Hardened material can destroy the mixing head!

4.9.4 Pot life (with 2-component dispenser)

It is essential to enter the pot life when using a 2-component dispenser.

The pot life defines the time that may elapse from the first contact of the two components A (resin) and B (hardener) to the final processing of the components (Fig. 26). When the two components come into contact, they start to chemically react with one another.

Specifications relating to the pot life can be found in the safety data sheet / technical data sheet for the material. These specifications must be observed and complied with. The pot life is defined by the material manufacturer, and is different for all 2-component systems. Depending on the specification, a pot life between 1 second and 100 hours must be entered.

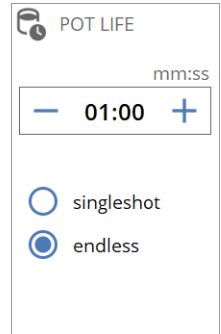


Fig. 26

Once the pot life has expired, a blank shot is made according to the quantity of blank shot entered (Fig. 28) and the mixing ratio (Fig. 31).

single shot

If “singleshot” is activated, the blank shot quantity entered (Fig. 28) is dispensed only once after the pot life has expired. If the pot life has expired a second time, the control unit is set to “error” and the pot life icon turns red. Immediately change the mixer, manually purge the dosing system, and, if necessary, disassemble and clean the dispenser to prevent the material in it from hardening.

endless (default setting)

If “endless” is activated, the blank shot quantity entered (Fig. 28) is always dispensed after the pot life has expired.

On 2-component dispensers, the pot life is always displayed in the header (Fig. 27). It starts counting down following a dosing. Once the countdown reaches a specific time (lead time), the screen changes to the blank shot display (Fig. 30) and the pot life icon turns yellow. The lead time is specified in the blank shot quantity settings.

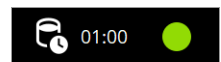


Fig. 27

If the program changes, the pot life of the old program will display until dispensing has been controlled by the new program.

The changed pot life is only displayed after the first dosing. The pot life is not restarted after a manual purge or calibration.

4.9.5 Blankshot quantity (with 2-component dispenser)

By an blank shot, the mixed material, which is in the mixer, is renewed immediately after the pot life has expired. This prevents hardening in the mixer. The quantity for the blank shot should be 1.1 to 1.5 times the mixer size used.

After the blank shot, the pot life begins again.

The **SETTINGS** field allows you to adjust additional values for the blank shot.

Deactivate blank shot

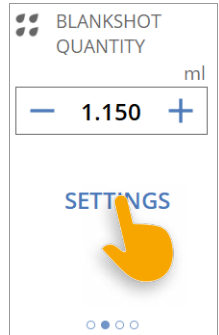


Fig. 28

After the pot life has expired, no blank shot is made. When the pot life has expired, the control unit goes to error. Immediately change the mixer, manually purge the dosing system, and, if necessary, disassemble and clean the dispenser to prevent the material in it from hardening.

Flow rate

A different flow rate can be set here for the blank shot.

Leadtime DO-warning

The lead time (0 to 60 sec.) in which the pot life icon turns yellow and the screen changes to the blank shot display can be configured here.

A lead time can also be set here for the digital output X1.4 (warning blank shot). The output then goes to H level correspondingly earlier.

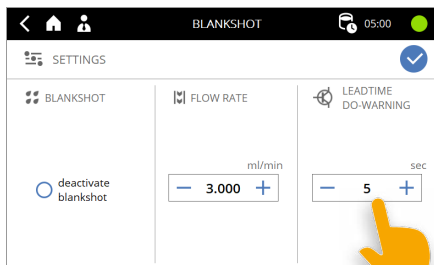



Fig. 29

Blank shot display

With the beginning of the lead time (Page 32), the blank shot display is displayed on the screen (Fig. 30) with the most important parameters for the blank shot.

The blank shot display can be opened or closed at any time by clicking the pot life icon or countdown. The display can also be closed with the  icon.

The blank shot display can always be seen during the blank shot. If the blank shot is deactivated, the blank shot display is not displayed.

The blank shot can be aborted by clicking the  icon.

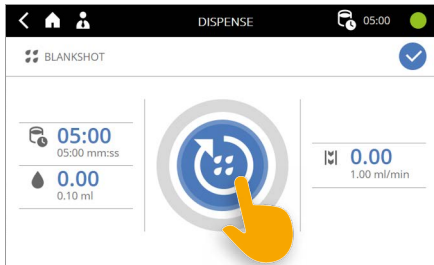


Fig. 30

The blank shot is only carried out if the unit is in the Dispense screen or the start screen. Otherwise, the “Pot life elapsed” error message appears.

4.9.6 Mixing ratio (with 2-component dispenser)

For the mixing ratio (Fig. 31) of components A (resin) and B (hardener), the specifications according to the product data sheet or recommendation of the manufacturer of the material must be observed.

The mixing ratio is displayed here volumetrically (according to volume) or gravimetrically (according to weight).

According to the given specifications, either “**volumetric**” or “**gravimetric**” must be marked.

The input of the correct material densityl (Fig. 32) particularly important for the mixing ratio by weight.

The factor for the mixing ratio is max. 10. Thus, the maximum value is (10:1 or 1:10) and the minimum value is (0.1:1 or 1:0.1).

MIXING RATIO

A

— 1.00 +

B

— 1.00 +

volumetric

gravimetric

Fig. 31

4.9.7 Material density

The material density must be entered for component A (resin) and component B (hardener). Information on the material density can be found in the data sheet of the particular material. Information on the material density is required if the quantity was entered in grams (g).

MATERIAL DENSITY

Density A g/cm³

— 1.000 +

Density B g/cm³

— 1.000 +

Fig. 32

4.9.8 Calibration

This field can be used to calibrate each dispenser (Fig. 33). This is described in detail in Section 4.10 (page 39).

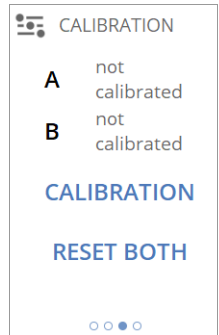


Fig. 33

4.9.9 Save location

The save location is automatically issued by the control unit. For external program selection (see chapter 7.3.1 (page 90)) a different program number (Fig. 34) can be assigned here.



Fig. 34

4.9.10 Dosing pressure max. (with dosing pressure sensor)

If a dosing pressure sensor is connected to the dosing control unit and activated (see Section 4.15.12 (page 63)), the maximum dosing pressure for overpressure switch-off can be set here (Fig. 35).

If one of the set pressures is exceeded, both dispensers are stopped immediately. The system goes into the fault state. This protects the dispensers against damage.

Further dosing is only possible after the error has been reset.

The pressure can be set differently for each dispenser.

The maximum value that can be set is stored in the dosing control unit for each dispenser.

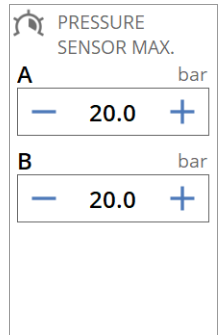


Fig. 35

4.9.11 Pressure monitoring (with dosing pressure sensor)

If a dosing pressure sensor is connected to the dispenser and activated (see Section 4.15.12 (page 63)), the dosing pressure monitoring can be set here via the **TEACH-IN** field.

During the execution of a program, the pressure trend is then checked using the defined monitoring units. If the pressure trend is not within the specified tolerance, an error message is displayed. The dosing is completed and not interrupted. Further dosing is only possible after the error has been reset.

The extensive variety of settings for dosing pressure monitoring is described in Section 5 (page 72).



Fig. 36

4.9.12 Dynamic mixer (for 2-component dispensers)

The **SETTINGS** field can be used to adjust the dynamic mixer, which is connected to the “Motor 3” connection.

The extensive variety of settings for the dynamic mixer is described in Section 6 (page 86).

“Mixer active” can be used to activate or deactivate the dynamic mixer in the program without disconnecting it from the dosing control unit.

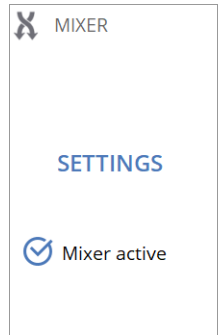


Fig. 37

4.9.13 Changing field values

When you click on a field (Fig. 38) an input field pops up. Alternatively, you can change the value using the +/- buttons. Touch and hold the +/- button to make the value change more rapidly.

The input field can be closed by the red field (Fig. 39). Changed values are not saved.

Carry out one of the following steps in the number input dialog:

- ▶ You can clear the set value using the arrow button. Touch and hold the arrow key to clear the value more rapidly (Fig. 40, Touch and hold).
- ▶ Enter the desired value in the input field. If the limit values are exceeded or undershot, the permitted values are displayed immediately.
- ▶ Confirm the new value (Fig. 41).
- ▶ Finally, save your changes (Fig. 42).

You can use this method to edit all the values in the fields in question to adapt them to your dosing operation.

NOTE

You can click the pencil icon  at any time to access the "EDIT PROGRAM" screen.

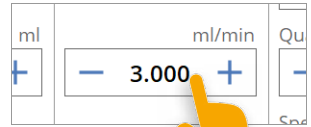


Fig. 38

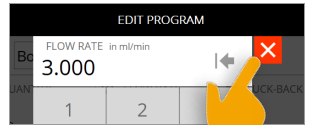


Fig. 39

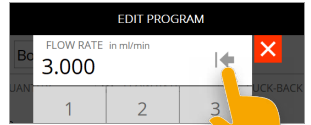


Fig. 40

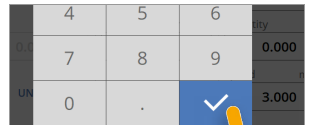


Fig. 41

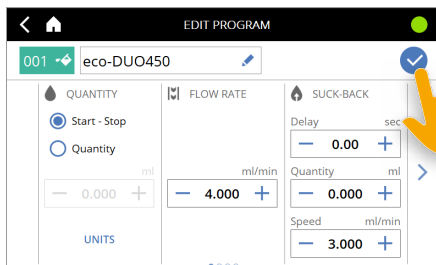


Fig. 42

4.10 Calibration

NOTE

The time interval for the calibration must be defined by the system's operating organisation, depending on necessary process security. The operating organisation stipulates whether calibration is to be carried out before a shift starts, after cleaning, or on changing the batch or program, for example.

Provide the following aids for the calibration:

- Measuring beaker with adequate volume
- Digital precision scales (display in g with at least 3 decimal places)

1-component and 2-component dispensers are calibrated using the same procedure. For a 2-component dispenser, the calibration adapter must first be connected to the dispensers.

The explanation is based on a 2-component dispenser.

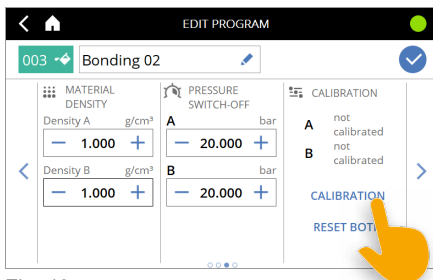


Fig. 43

- ▶ Select motor. The value for the density is transferred from the material density field for the particular component. If millilitres are selected as the unit of measurement, no density is displayed.
- ▶ Enter the target quantity, then place the empty measuring beaker on the scale and tare it.
- ▶ Position the measuring beaker under the end piece (dosing needle) or the calibration adapter as appropriate and press the **START/STOP-button** (Fig. 44). The calibration starts, and the set quantity is conveyed.

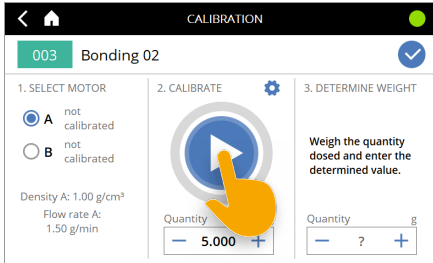


Fig. 44

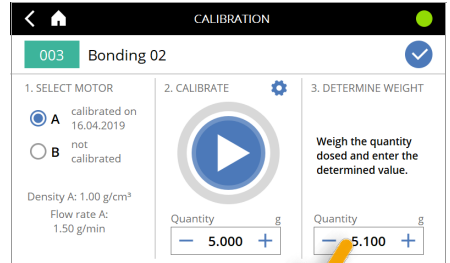


Fig. 45

- ▶ Strip off the beaker from the end piece (dosing needle) or calibration adapter and then weigh it.
- ▶ Enter the measured **actual quantity** (Fig. 45).
The procedure can be repeated at will, e.g. for comparative measurements (the measuring cup must be tared for each measurement).
- ▶ Finally, save the values (Fig. 46).

With a 2-component dispenser, you are asked whether you also want to calibrate motor B (dispenser B) (Fig. 47). If so, follow the same procedure as for motor A (dispenser A).

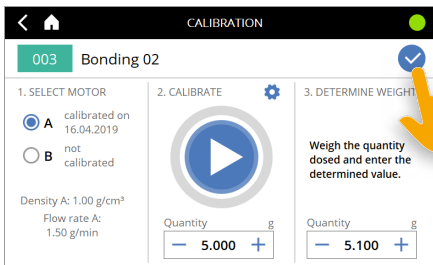


Fig. 46

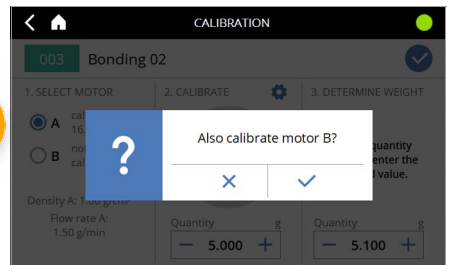


Fig. 47

Change values for the calibration

For the calibration, the values “Flow rate”, “Density” and “Units” can be adjusted. Press the button “Advanced Settings” (Fig. 48) and enter the desired values (Fig. 49). The changes to the flow rate and the units remain active only during calibration. The change of the material density is applied to the program.

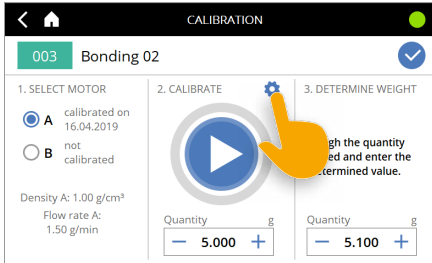


Fig. 48

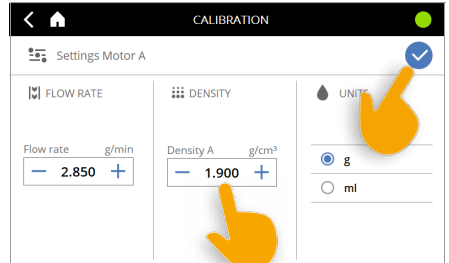


Fig. 49

4.11 Duplicating a program/creating a new program

You can duplicate an existing program, make changes to it and save it under a new name. Or you can create a completely new program. Proceed as follows:

- ▶ Select the program you want to duplicate and press the **Copy Icon**. The first time the dosing software runs, only program 01 is available. Alternatively, click the **PLUS ICON** in the top right of the screen (Fig. 51).



Fig. 50

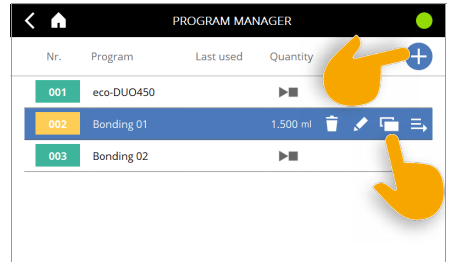


Fig. 51

- ▶ In the first step, a program number must be selected and confirmed (Fig. 52). Numbers from 0 to 99 can be assigned. The selected program number is used as a short code for the program.

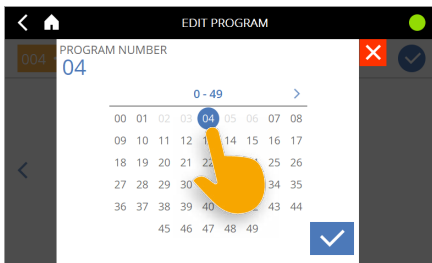


Fig. 52

- ▶ Click on the name (Fig. 53).
- ▶ You can clear the preset name using the arrow button. Touch and hold the arrow key to clear the name more rapidly.

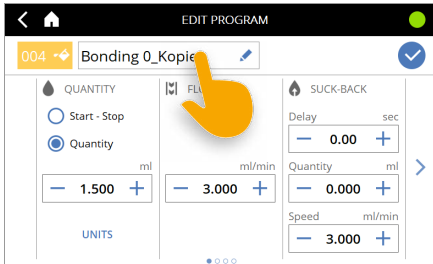


Fig. 53

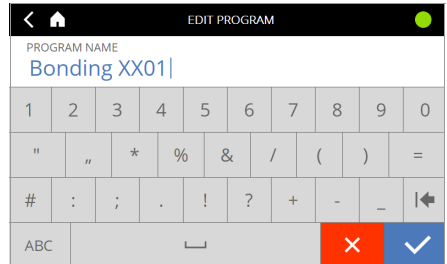


Fig. 54

- ▶ Assign and confirm a new name (Fig. 54).
- ▶ You can change the colour of the assign with the colour bucket icon (Fig. 55). There is a choice of 5 colours (Fig. 56).

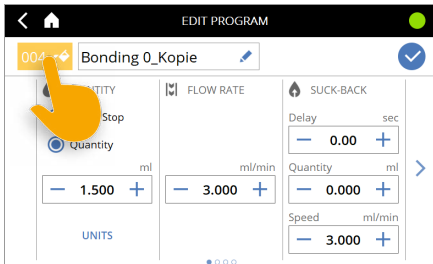


Fig. 55

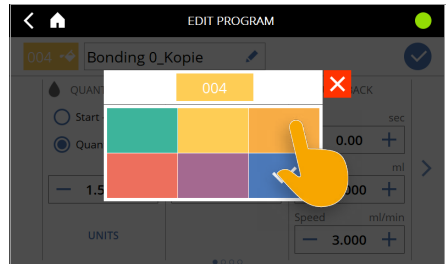


Fig. 56

- ▶ If you have created a new program, you must re-enter all the settings for the desired dosing. When copying an existing program, you can accept or edit the existing values.

By clicking on the left/right arrow key on the screen, you can access the individual fields (Fig. 57).

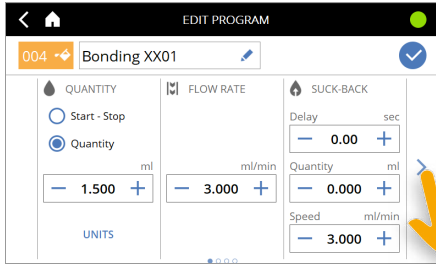


Fig. 57

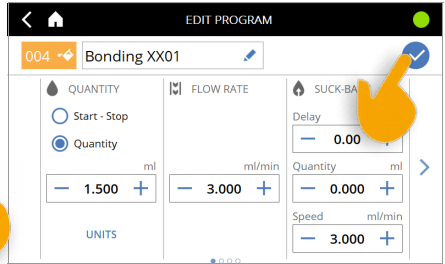


Fig. 58

- ▶ Save the program (Fig. 58). If you forget this step, all your previous settings will be lost.

4.12 Dispense screen

The Dispense screen (Fig. 59) can be customised. This is done by enabling additional options, depending on the licence and the available sensors. The following chapters describe the general process for adapting the Dispense screen.

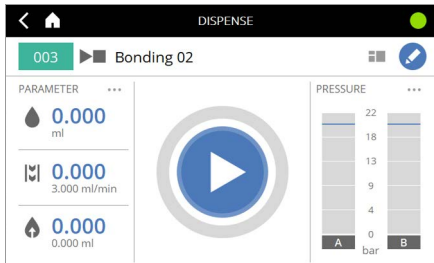


Fig. 59

4.12.1 Dispense screen – Selecting parameters

A number of parameters are displayed on the left and right side of the **DISPENSE** screen (Fig. 60). You can set other parameters here too. Max. three parameters can be selected on each side. On the right side the pressure display (Fig. 61) can additionally be selected. Due to the pressure display, no further parameters are possible. Carry out one of the following steps in the number input dialog.

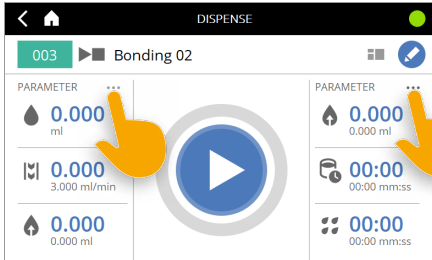


Fig. 60

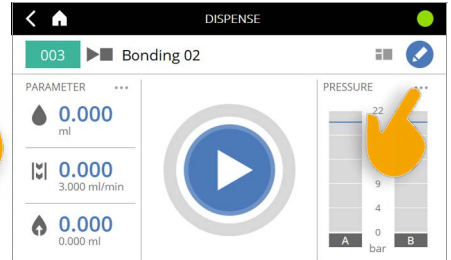


Fig. 61

- ▶ First click on a parameter to deselect it and then reselect it (Fig. 62).
- ▶ Save the settings (Fig. 63).

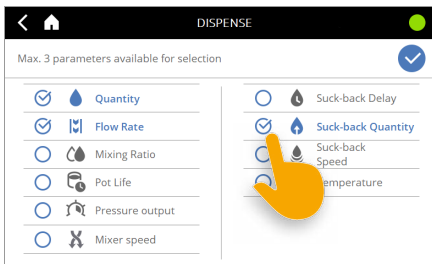


Fig. 62

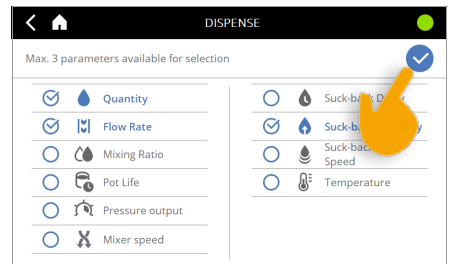


Fig. 63

4.12.2 Dispense screen - Changing the view

You can change the view in the **DISPENSE** screen (Fig. 64). Choose either a three-column or two-column layout (e.g. for 2-component control).

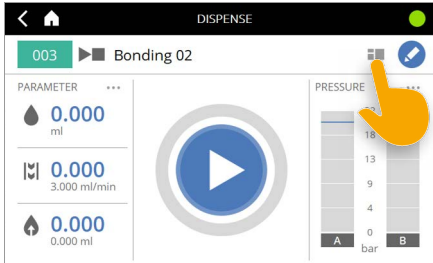


Fig. 64

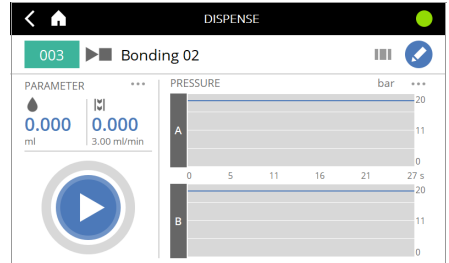


Fig. 65

If an active dosing pressure sensor is connected to the dispenser and monitoring units have been defined for the program, a special two-column dosing window will appear (see Section 5.7 (page 83)).

4.12.3 Dispensing screen - Selecting the view

With the two-column layout, it is possible to customise the screen view further (Fig. 66). You can choose between the **PRESSURE** and **SCHEMA** views.

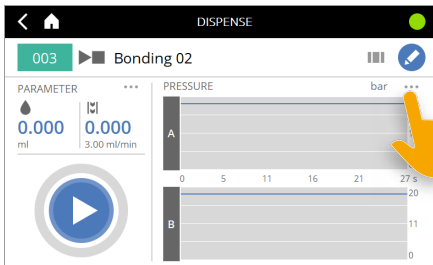


Fig. 66

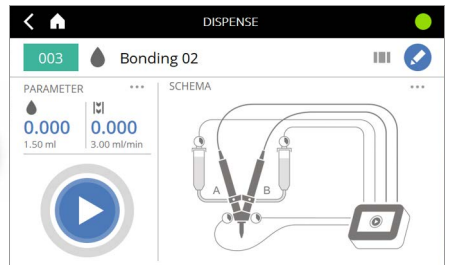


Fig. 67

4.13 Choosing favourites

You can set up to three favourites on the start screen. The sequencing of the favourites is determined by the order in which you click on them.

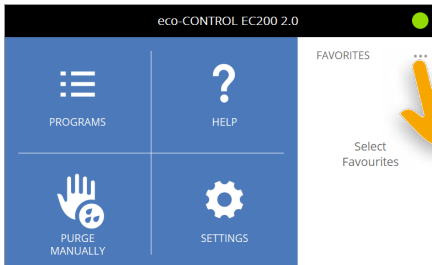


Fig. 68

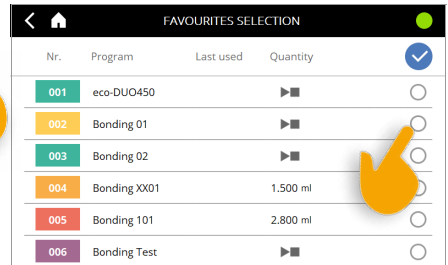


Fig. 69

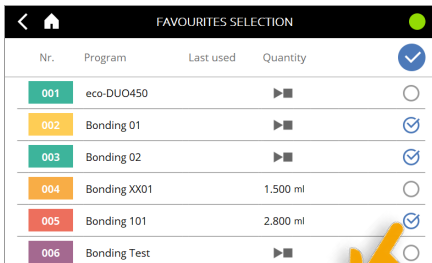


Fig. 70

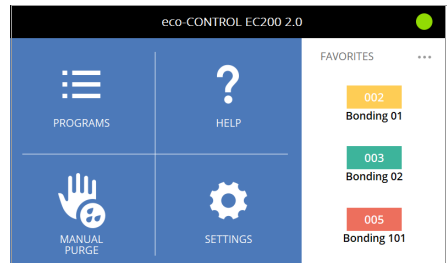


Fig. 71

4.14 Deleting a program

Do the following to delete a program.

- ▶ Select program (Fig. 73)
- ▶ Press the delete icon (Fig. 74)
- ▶ Confirm or cancel the delete operation (Fig. 75)

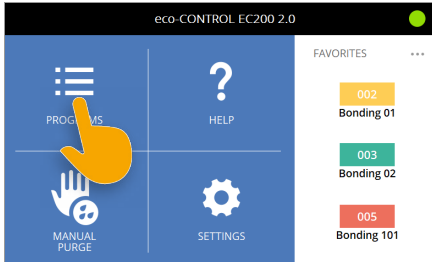


Fig. 72

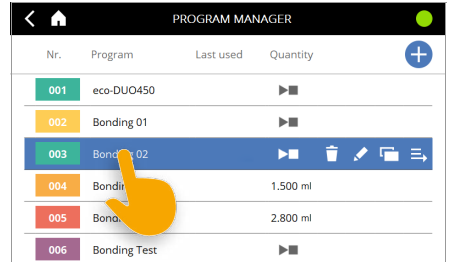


Fig. 73

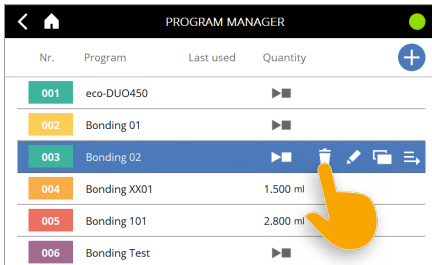


Fig. 74

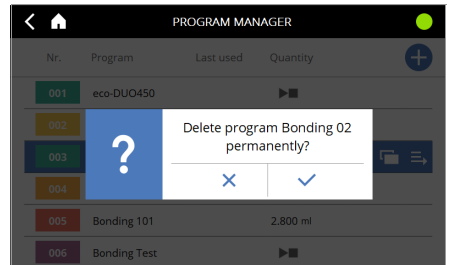


Fig. 75

4.15 Settings

In the **SETTINGS** area you can edit the dosing control program in even more detail.

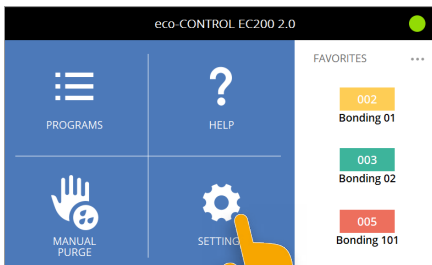


Fig. 76

4.15.1 User management

(password assignment, access rights, changing user and screen lock)

Assign password

We recommend setting passwords for administrators and users in the user management system (Fig. 78). This will protect access to the dosing control unit and its settings. It will rule out the possibility of unintentionally changing settings.

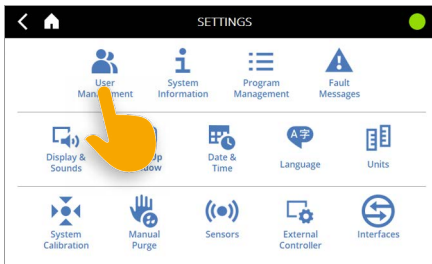


Fig. 77

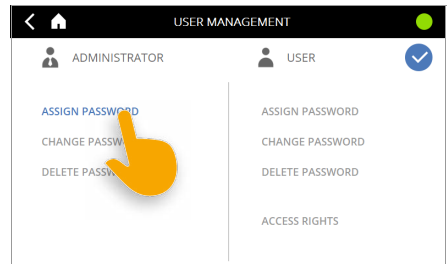


Fig. 78

The first time User management is called up, no passwords are stored.

First, the administrator has to assign themselves a password.

The administrator also assigns the password for the user.

Only the administrator is allowed to edit or delete passwords.

A password may be a maximum of 10 digits long (from 0 to 9999999999).

Assign different passwords for administrators and users. Avoid simple passwords such as 123 or 123456.

Advise users of their passwords. Keep the administrator password secret from users. Do not write down passwords. Set passwords that you will remember.

To edit or delete passwords, the current password must always be entered. The user password can always be changed or deleted with the administrator password.

Access rights for users

The administrator can assign users the following access rights. This enables the specific rights that a user has to be determined.

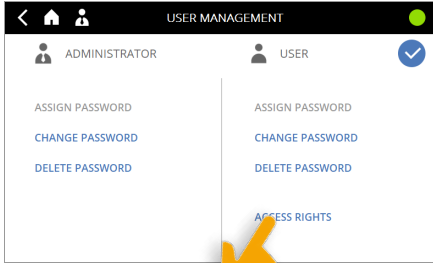


Fig. 79

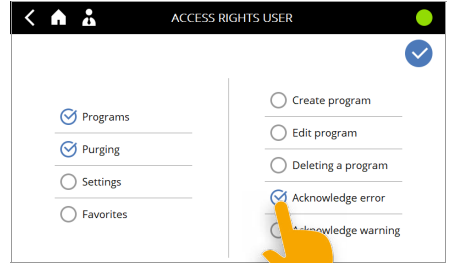


Fig. 80

Access rights	Description
Programs	The user is allowed to use programs.
Purging	The user is allowed to perform a manual purge.
Settings	The user is allowed to make additional settings.
Favorites	The user is allowed to create/edit favorites.
Create program	The user can create programs.
Edit program	The user can edit programs.
Deleting a program	The user can delete programs.
Acknowledge error	The user can acknowledge error messages.
Acknowledge warning	The user can acknowledge warning messages.

Change of user

When users are set up, an icon representing the person currently logged in is always displayed in the header. Click the icon to quickly change between administrator and user.

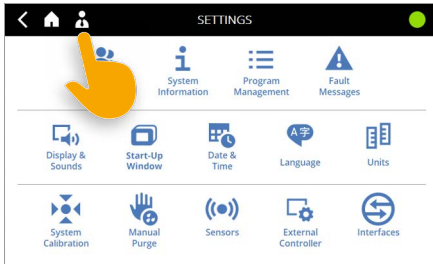


Fig. 81

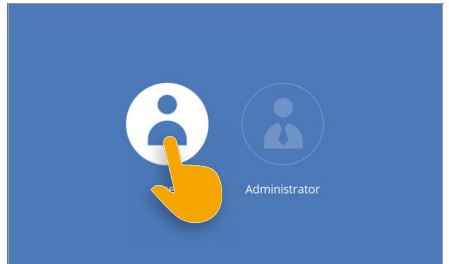


Fig. 82

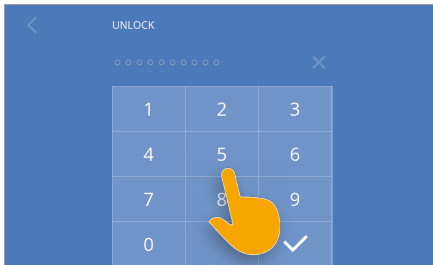


Fig. 83

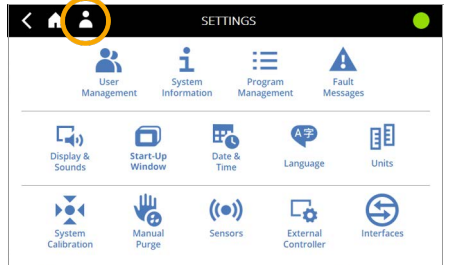


Fig. 84

Screen lock

The screen lock can be activated by clicking the administrator or user icon in the header (Fig. 85).

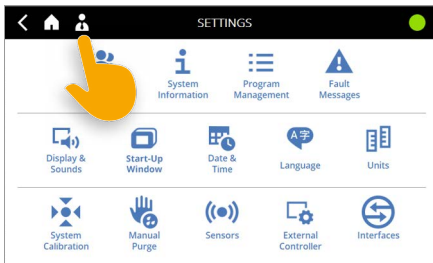


Fig. 85

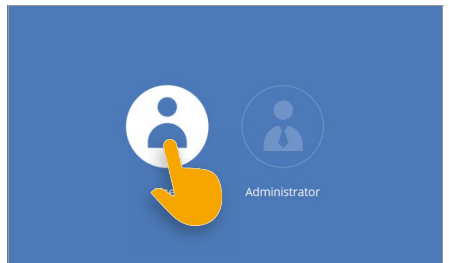


Fig. 86

4.15.2 System Information

Software Update / installing new licences / licences (information)

This area contains system information such as software updates, installing new licences, information about the licenses and the operating hours counter (Fig. 87).

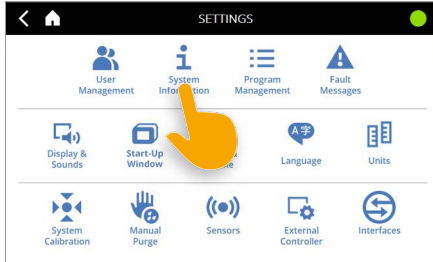


Fig. 87

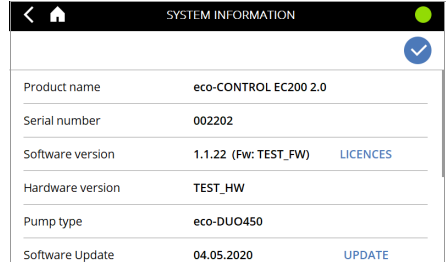


Fig. 88

Software Update / installing new licences

You can obtain a software update or a new licence from your contract partner or, on request, from the manufacturer.

Due to the file size, you will usually receive a download link for a zip file for the software update. Unzip this file and save the contents to a USB stick. Updates can be installed on any dosing control unit with the appropriate existing licence.

In the case of a new licence, you will receive a USB stick. The installation can only be performed on the corresponding dosing control unit (with the same serial number).

- ▶ Connect the USB stick to the USB port on the rear.



Fig. 89

- ▶ The new software and, if applicable, the licence key are listed on the left. It may be that an update (new licence) comprises multiple software packages (e.g. dosing control unit and pressure monitor).
- ▶ The individual software packages have to be installed one after another.
- ▶ Select the top program in the list first, and confirm your selection (Fig. 90).
- ▶ Confirm your input.
- ▶ Another box appears prompting you to update (Fig. 91).

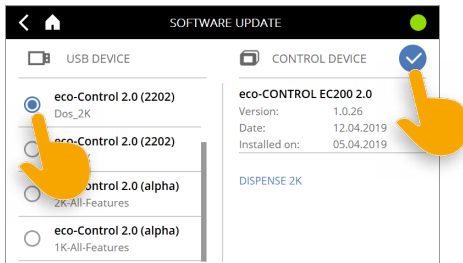


Fig. 90

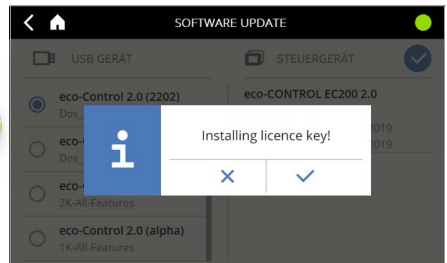


Fig. 91

- ▶ The new software is installed (Fig. 92).
- ▶ The dosing control is then restarted automatically (Fig. 93).

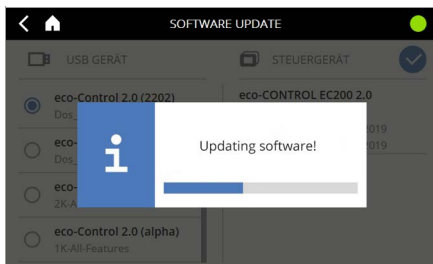


Fig. 92



Fig. 93

Successful installation is indicated on the start screen.

If you need to install more software packages, do so in the same way as described above.

Licences (information)

Here you will find information on the software being used. The licence text of the dosing control program is displayed.

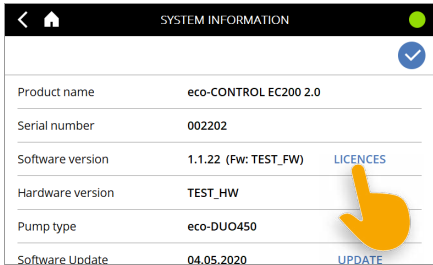


Fig. 94

Operating hours counters

The operating hours are recorded at the bottom of the system information screen.

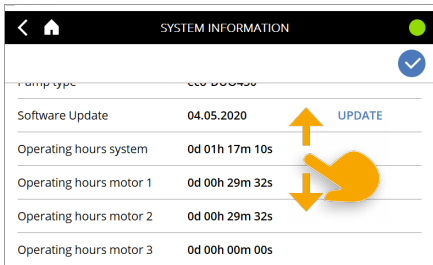


Fig. 95

4.15.3 Program Management

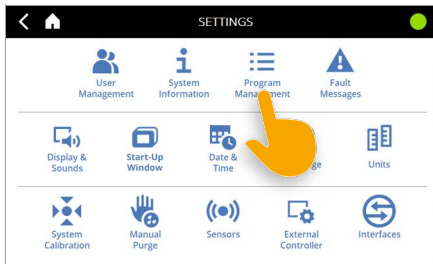


Fig. 96

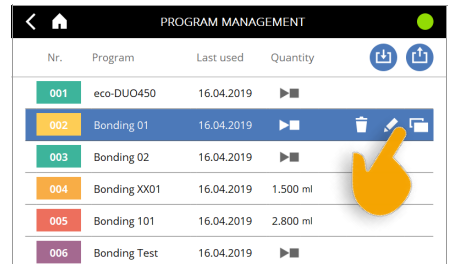


Fig. 97

In the program manager you can edit, duplicate and delete the individual programs. You can also save all installed programs simultaneously to a USB stick (Fig. 97). This makes it possible to create a backup copy.

Use the **DOWNLOAD** button (Fig. 98) to load all the programs from the USB stick to the dosing control unit. This will enable you to install existing programs quickly on a new dosing control unit, or to keep multiple controls at the same version status.

If there are programs with the same name on the dosing control unit, a prompt is displayed asking whether you want to overwrite them.

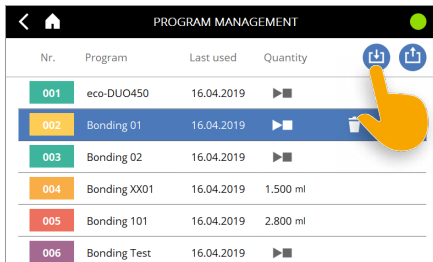


Fig. 98

4.15.4 Error messages

Error messages can be accessed in three ways:

1. Directly from the header (Fig. 99).
2. If the “Schema” view is set in the “Dispense” screen, some errors are indicated graphically. If you click on the image, you will be taken to the error message (Fig. 99).
3. By selecting Start screen – Settings – Error messages (Fig. 100).

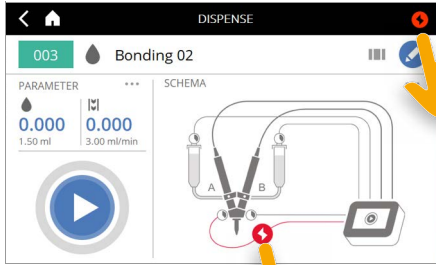


Fig. 99

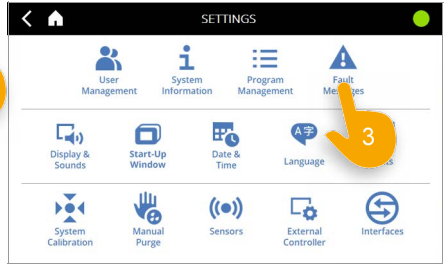


Fig. 100

Displaying details

Click on the error text to view all the available details of the error (Fig. 101). Click again to close the details view.

Accessing help on the error

A link to the Help screen is provided for some errors (Fig. 102). Click on the link to open the Help screen.

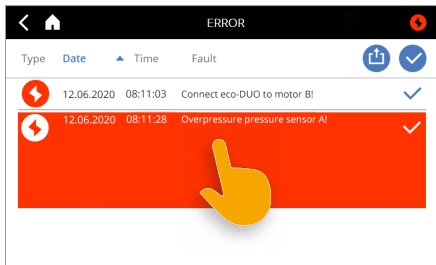


Fig. 101

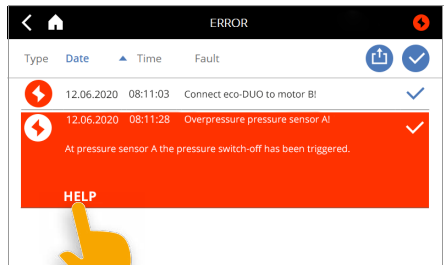


Fig. 102

Click the **PAGE BACK** button (Fig. 103) to return to the error message.

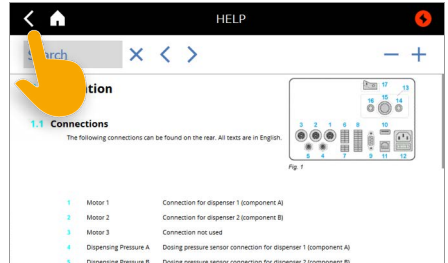


Fig. 103

Acknowledge error

Click on the **CHECK MARK** to confirm that the error has been remedied (Fig. 104). The icon on the left changes colour from red to grey. If the error still persists, a new error message appears.

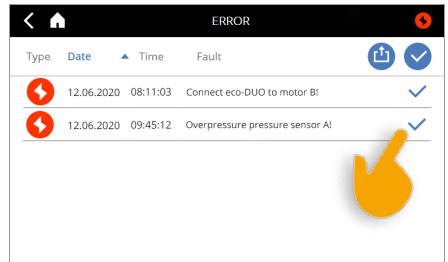


Fig. 104

Saving the error list

The complete error list can be saved to a USB stick as a log file (Fig. 105).

This function is required if an error log file is requested by ViscoTec for service purposes.

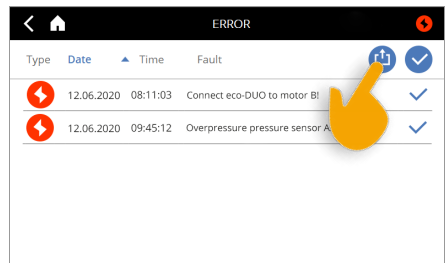


Fig. 105

Clearing individual errors

Confirmed errors can be cleared individually (Fig. 106).

Even when the error has been deleted, the error remain stored on the device for subsequent checks.

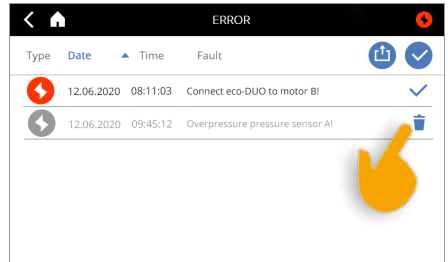


Fig. 106

4.15.5 Display & Sounds

The dosing control can be individually adapted. The brightness and volume can be adjusted.

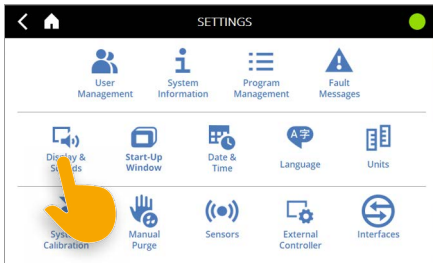


Fig. 107

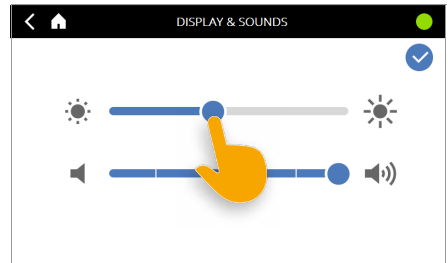


Fig. 108

4.15.6 Start-Up Window

This selection can be used to specify whether the dosing control unit starts after the start process with the start screen (see page 25) or selects the program last used and switches directly to the Dispense screen (see page 45).

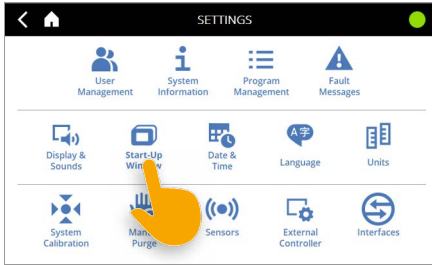


Fig. 109



Fig. 110

4.15.7 Date & Time

The date and time can be set as follows.

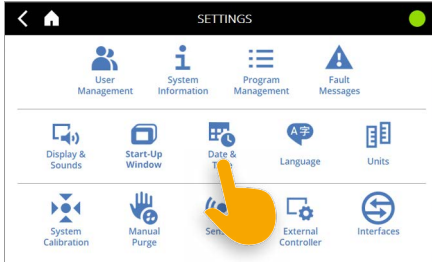


Fig. 111

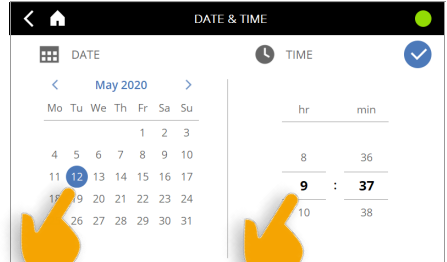


Fig. 112

4.15.8 Language

A range of different languages are stored in the dosing control unit. In the basic configuration, German and English are available. Other languages are possible on request.

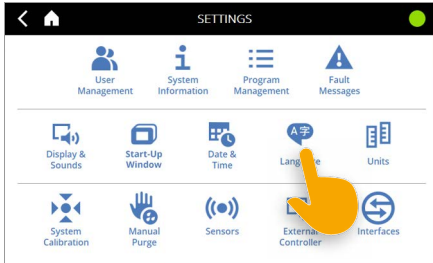


Fig. 113



Fig. 114

4.15.9 Units

The available units for pressure are bar and psi.
The available units for temperature are °C and °F.

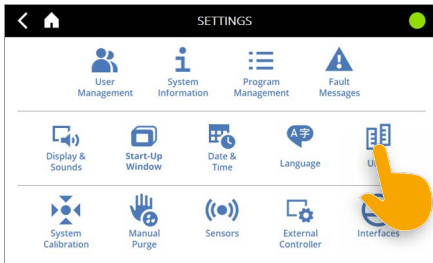


Fig. 115

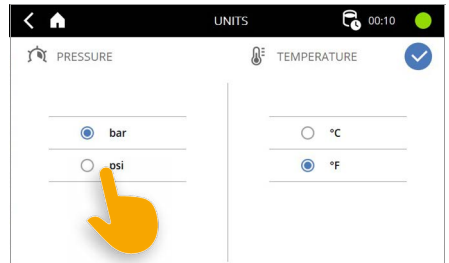


Fig. 116

4.15.10 System Calibration

NOTE

Administrator rights are needed to make changes here. Any changes made here, affect all saved programs. When changing program, this can lead to a negative dosing result.

System calibration is a simple way of recalibrating the dosing control unit without having to edit or change the programs. This can be helpful, for example, when changing the stator, in the event of batch-related product variations, etc., whereby the preset program must not be changed (QA documents, etc.).

The prerequisite for this is that the selected program has been edited to match the conveyed material, the connected dispenser and the desired dosing.

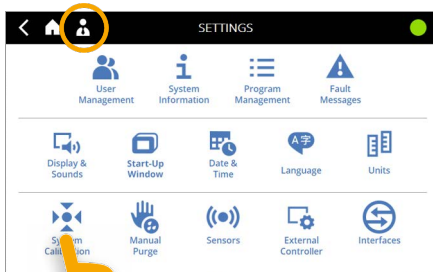


Fig. 117

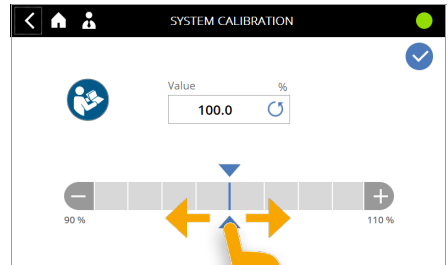


Fig. 118

4.15.11 Manual purging

The mixer can be purged via [SETTINGS – Manual Purge](#).

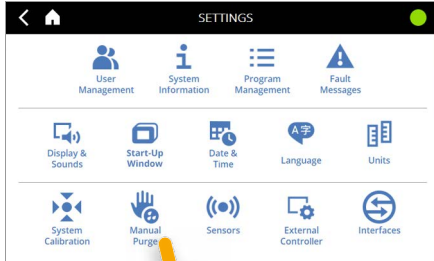


Fig. 119

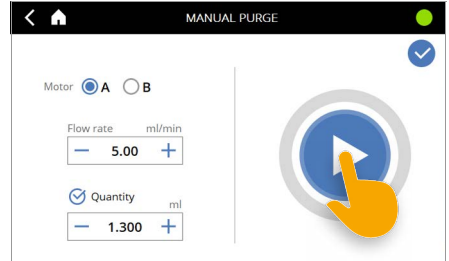


Fig. 120

The purge quantity and the flow rate can be individually set for each component. Manual purging is started by pressing the [START/STOP-button](#).

The mixer is purged with the quantity of the selected component (Fig. 120).

If the Quantity option is deactivated, purging continues until the [START/STOP-button](#) is pressed again.

This function can also be accessed directly from the start screen.

With 2-component dispensers, this function is provided separately for components A (resin) and B (hardener).

4.15.12 Sensors

All connected pressure and level sensors can be set here. The settings apply to all programs. Only those sensors are displayed which are connected to the device.

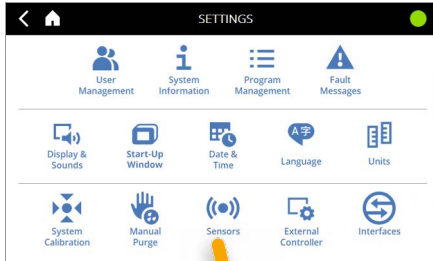
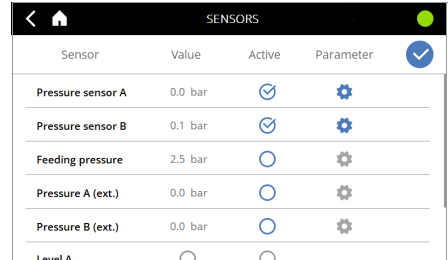


Fig. 121




Sensor	Value	Active	Parameter
Pressure sensor A	0.0 bar	<input checked="" type="checkbox"/>	
Pressure sensor B	0.1 bar	<input checked="" type="checkbox"/>	
Feeding pressure	2.5 bar	<input type="checkbox"/>	
Pressure A (ext.)	0.0 bar	<input type="checkbox"/>	
Pressure B (ext.)	0.0 bar	<input type="checkbox"/>	
Level A		<input type="checkbox"/>	

Fig. 122

The current measurement value is displayed in the “**Value**” column.

Evaluation of the sensor data is activated using the icon in the “**Active**” column. Unless activated, the connected sensor is ignored.

In the “**Parameter**” column, the  icon can be used to open the **PARAMETER** window for the relevant pressure sensor, where you can set the values for monitoring. The icon can only be used if the sensor is activated.

PARAMETER for dosing pressure A / B

In each window, the active sensor type is displayed at the top. If the displayed sensor type does not match the connected sensor, another one can be selected by clicking on the sensor type.

The lower section shows the current values for voltage, pressure and the status of the sensor connection.

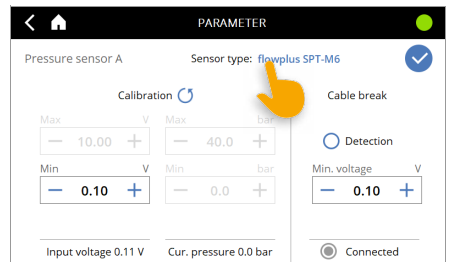



Fig. 123

Zero point calibration for the sensor can be carried out in the left-hand section. The minimum voltage value can be set between 0.05 V and 0.15 V. The  icon can be used to restore the default settings.

Cable break detection can be activated in the right-hand section. The minimum voltage at the sensor input can be defined for this purpose. If the input voltage during a dosing process falls below this limit continuously (for at least 2 seconds), the dosing process is aborted and an error message is generated. The value for the "Min. Voltage" of the cable break detection

cannot exceed the value for the minimum voltage value of the calibration.

The settings for monitoring the "Max. dosing pressure" are made in the **EDIT PROGRAM** window (see page 36). If the set maximum value is exceeded, the dosing process is stopped and an error message is generated (see section 4.15.4 (page 56)).

The settings for dosing pressure monitoring are made using the **TEACH-IN** button in the **EDIT PROGRAM** menu (see page 36).

PARAMETER for pressure output and inlet pressure A / B (ext.)

In the left-hand section, the sensor can be adjusted by entering the minimum and maximum voltage values and the associated minimum and maximum pressure values.

The corresponding values from the sensor data sheet need to be entered here.

To monitor the sensors, a pressure set point has to be specified in the right-hand section (Fig. 124).

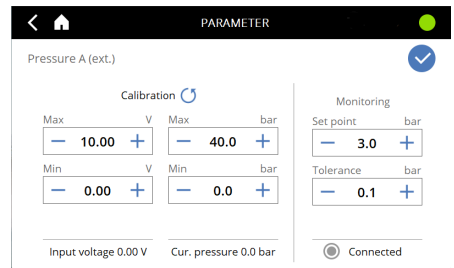


Fig. 124

If the measured pressure is outside the tolerance range, the dosing control unit goes into fault mode and an error message is generated (see Section 4.15.4 (page 56)). The dosing process is not interrupted and is carried out to the end. A further dosing process can only be started after the error has been successfully acknowledged.

In the first two seconds after the system has started, monitoring is deactivated (pressure build-up time).

Sensors with no PARAMETER window

The **level sensors** are connected to digital inputs. When monitoring is activated, the input signal must be on **1** (high) when the level is correct. If the input signal drops to **0** (low), the dosing control unit goes into fault mode and an error message is generated (see Section 4.15.4 (page 56)). The dosing process is not interrupted and is carried out to the end. A further dosing process can only be started after the error has been successfully acknowledged.

For the integrated **temperature sensors** in the "flowplus-SPT M6" dosing pressure sensor, only the current temperature values are displayed.

4.15.13 External Control unit

NOTE

Administrator rights are needed to make changes here. Any changes made here directly affect the entire dosing control unit.

The external control unit is activated and controlled via these settings.

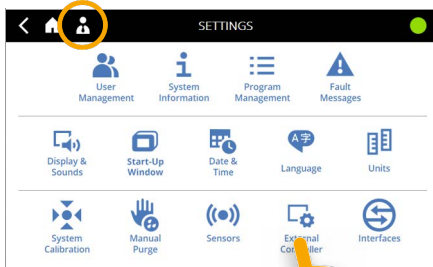


Fig. 125

Analog Input

The flow rate of the connected dispensers is regulated proportionally to the analog signal applied. Voltage regulation from 0V to 10V or current regulation from 4mA - 20mA can be used. The required connections for the external speed control can be found in the Interface X1 table (see page 100). Whatever the setting of the flow rate, the maximum flow rate of the dispenser must always be assumed.

The values for the maximum flow rate can be found in the operation and maintenance manual for the dispenser, in the "Technical Data" section under volume flow. The suck-back remains unaffected by this setting.

If the voltage 0–10V input is activated (Fig. 126), a **V** is displayed in the header. When the Current 4–20mA input is activated (Fig. 127), an **A** is displayed in the header.

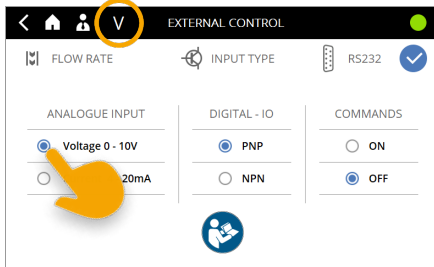


Fig. 126

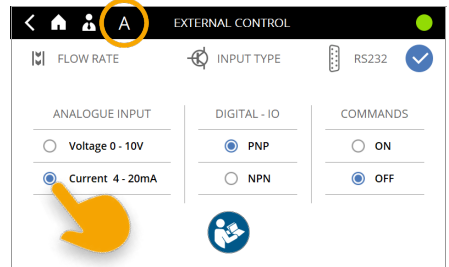


Fig. 127

Digital - IO

The digital inputs are factory set to PNP.

If the digital inputs have to be reset to NPN, all connectors at inputs X3, X2 and X1 must first be disconnected and the external wiring adapted. The actuation must match the selected digital IO type. If this requirement is not met, the dosing control unit may be damaged. Refer to the wiring diagrams on page 102–104.

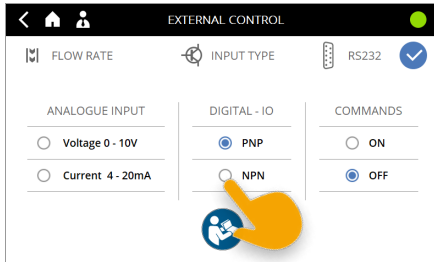


Fig. 128

RS232 - Commands

Communication and data exchange with a higher-level control unit, such as a PLC, can be carried out via the external RS232 interface. If the interface is activated (Fig. 129), a **RS232 icon** is displayed in the header.

A separate manual describes the interface and commands in detail.

Please contact us if required: info@preeflow.com

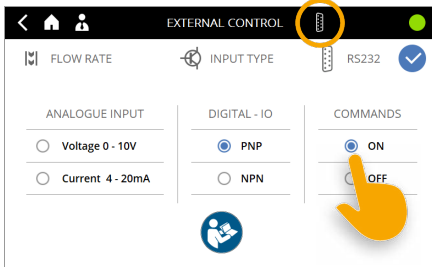


Fig. 129

4.15.14 Interfaces

The interfaces and connections are described within the dosing control unit. Clicking on the interface or the description (Fig. 131) opens the Help screen. Here, you can search for information (see page 71).

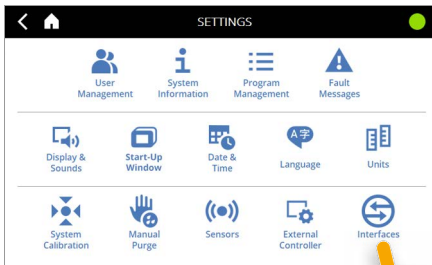


Fig. 130

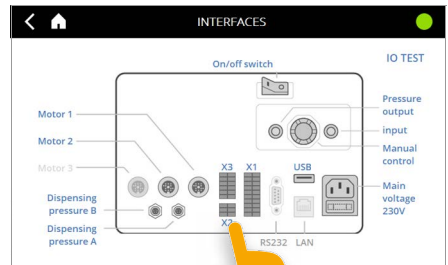


Fig. 131

4.15.15 IO Test (hardware test)

By clicking the "IO TEST" button (Fig. 133), you can access further pages on which you can test the interfaces X1 or X2/X3, the motor connections and the connections of the dosing pressure sensors.

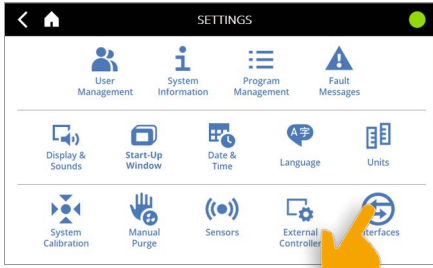


Fig. 132

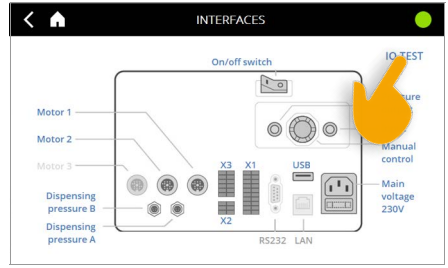


Fig. 133

By clicking on the left/right arrow key on the screen, you can access the individual pages.

IO Test interface X1 or X2/X3

Some outputs can be activated and the signal level set to "high" by clicking on them (Fig. 134).

Each digital output or input is provided with a colour code.

Light grey = signal level set to "low"

Green = signal level set to "high"

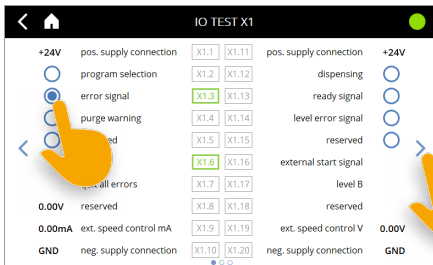


Fig. 134

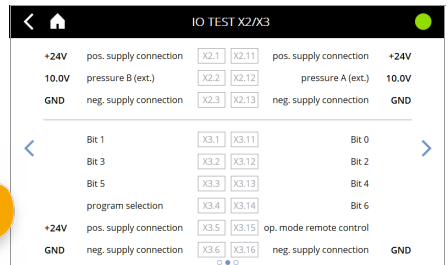


Fig. 135

! WARNING

All set values for the digital Inputs must be reset before leaving the page. The values for the digital Outputs are reset automatically.

IO Test Motors

The connected motor is displayed (Fig. 136). For the dosing pressure sensor, the applied voltage is displayed (Fig. 136).

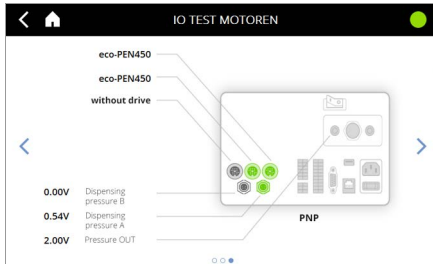


Fig. 136

The polarity of the digital IO connections X1, X2 and X3 (PNP or NPN) is displayed below the dosing controller.

4.16 Manual purging (start screen)

You can select **MANUAL PURGE** directly from the start screen (Fig. 137). A quantity can be defined in the dosing control unit which is to be conveyed during manual purging.

Manual purging is started and stopped by pressing the **START/STOP-button**. If the Quantity option is deactivated, purging continues until the **START/STOP-button** is pressed again.

With 2-component dispensers, this function is provided separately for components A (resin) and B (hardener) (Fig. 138).

This function can also be called up by selecting **SETTINGS – MANUAL PURGE**.

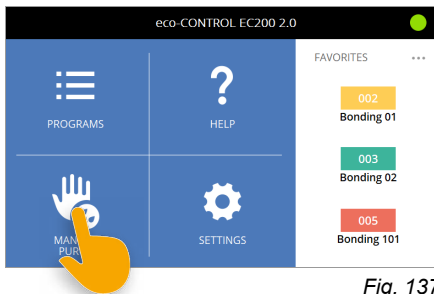


Fig. 137

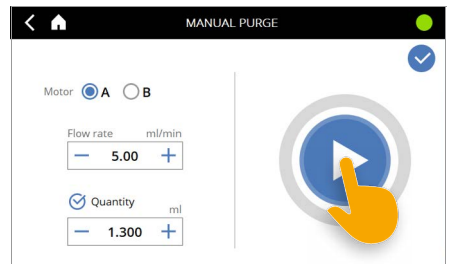


Fig. 138

4.17 Help (start screen)

You can select **HELP** directly from the start screen (Fig. 139).

The information from the user manual starting from the “Operation” chapter is displayed on the dosing control unit.

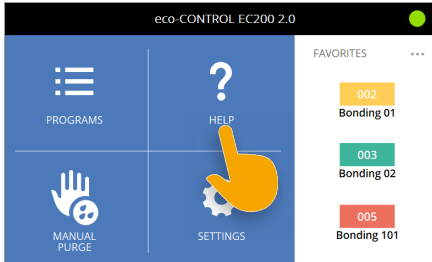


Fig. 139

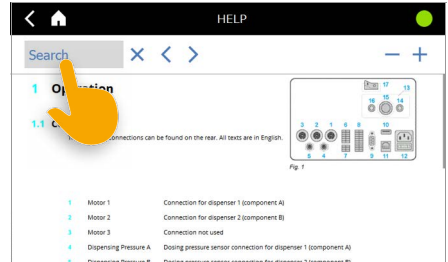







Fig. 140

Clicking on **Search** (Fig. 140) enables you to enter the search term of your choice.

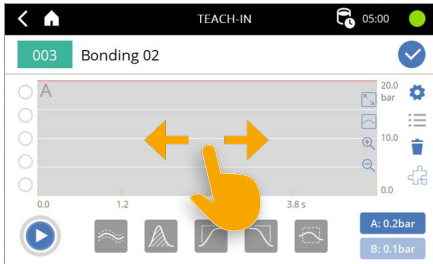
The search term is then displayed in the search box and the results found are marked in blue in the text.

There are four icons to navigate through the **HELP**.

Icon	Function	Icon	Function
	Delete the search term		Expand content
	Go to next match of the search		Reduce content
	Go to previous match of the search		

5 Dosing pressure monitoring

If a dosing pressure sensor is connected to the dispenser and activated (see Section 4.15.12 (page 63)), the dosing pressure monitoring can be set via the **TEACH-IN** field (see Section 4.9.11 (page 36)).















The image section of the diagram can be shifted to the left or right by touching and holding the grey background.

Fig. 141

Icon	Function
	Saves the monitoring units that have been set in the program.
 	Switches between sensors A / B when both are activated. The current pressure value is always displayed. The pressure monitoring of the two sensors A / B is independent of each other. As a result, different monitoring units can be defined. The active sensor is displayed at the top left.
	Start a Teach-In dosing operation.
	Open the settings menu.
	Full screen display of the diagram.
	Centre zoom on measurement.
	Zoom in / Zoom out
	The red horizontal line indicates the set maximum dosing pressure for the overpressure switch-off (see Section 4.9.10 (page 36)).

The following icons are available when a TEACH-IN dosing operation has been carried out.

Icon	Function
Five monitoring units (see Section 5.2 (page 75)):	
	Envelope (see Section 5.2.1 (page 76))
	Integral (see Section 5.2.2 (page 77))
	Control box for rising edge (see Section 5.2.3 (page 78))
	Control box for falling edge (see Section 5.2.3 (page 78))
	Control box in general (see Section 5.2.3 (page 78))
	Status display of the Teach-In dosing operation. Clicking on a dosing operation deletes it.
	Grey = No Teach-In dosing operation
	Blue = Correct Teach-In dosing operation
	Red = Teach-In dosing operation with pressure trend outside of the set tolerance
	Deletes all Teach-In dosing operations and monitoring units.
	Shows the list of all Teach-In dosing operations and monitoring units. Option to delete and edit.
	Only visible during Start-Stop dosing operations. If only the border is visible, the component signal is inactive; if the symbol is filled in, the component signal is active (see Section 5.6 (page 82)).

5.1 Teach-In dosing

Fig. 142 shows the Teach-In screen after three Teach-In dosing operations have been carried out in a row. In this example, a bead dosing operation, a dot dosing operation, and a dot and bead dosing operation were carried out via an external control unit.

The pressure trend of the last dosing operation is shown with a thick blue line, while previous pressure trends are shown with a thin light blue line (see detailed view).

Up to five Teach-In dosing operations can be saved. If more than five dosing operations are carried out, the oldest Teach-In dosing operation is automatically overwritten.

The maximum number of Teach-In dosing operations can be specified in the settings (see Section 5.3 (page 80)).

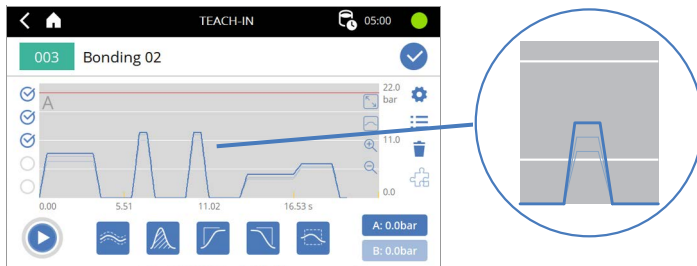


Fig. 142

The desired monitoring units can now be placed on the diagram by clicking on them. All Teach-In dosing operations must then comply with the specifications of the placed monitoring units.

In Fig. 143, a control box with a green margin has been added as an example, which must be intersected by the pressure trend. If this is not the case, the status display and the line of the pressure trend will be shown in red. The Teach-In can only be saved if all Teach-In dosing operations are valid.

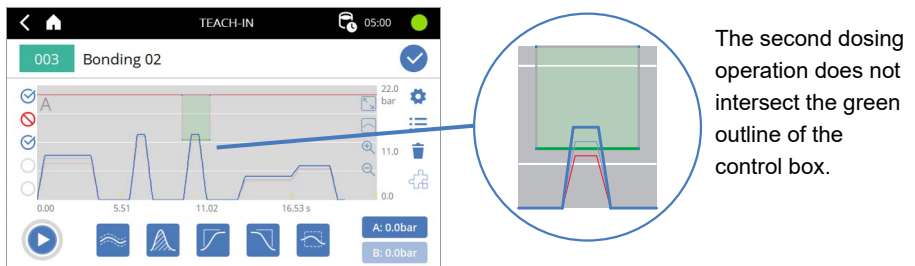







Fig. 143

The second dosing operation does not intersect the green outline of the control box.

5.2 Monitoring units

The following specifications apply to all five types of monitoring units:

- At least one Teach-In dosing operation must have been carried out.
- By clicking on one of the five icons, the desired monitoring unit is placed in the middle of the diagram. The newly added monitoring unit is automatically selected (recognisable by the black dotted border).
- Existing monitoring units can be adjusted and moved by clicking on them.
- The monitoring unit can be edited using the input fields that appear in the lower half of the screen. The start and end time of the envelope can be set. More values can be changed by scrolling using the  arrow key.
- By selecting the pencil icon , a pop-up window can be opened for adjusting all values centrally.
- The monitoring units can also be dragged and dropped on the time axis.
- A selected monitoring unit can be deleted using the bin icon  (bottom left).
- Selecting the  icon exits the editing of the current monitoring unit. The changed values are automatically saved and the display in the diagram is updated live.
- The newly created or changed monitoring units are saved in the program by selecting the  icon.

5.2.1 Envelope curve

The envelope monitors the pressure trend within a specified time interval to determine the relative deviation from the mean value of all Teach-In dosing operations. The arithmetic mean is formed from all Teach-In dosing operations. Then a relative tolerance is added symmetrically up and down from the mean pressure trend. This results in a defined area within which the pressure trend must be located. This is graphically represented by two red lines that must not be crossed.

The envelope is well suited for monitoring longer dosing sections during which the dosing pressure changes only slowly, e.g. in bead dosing operations. A control box should be used for steep pressure increases.

The envelope has a transparent green background if the last dosing trend was within the envelope. If this is not the case, the background is transparent red.

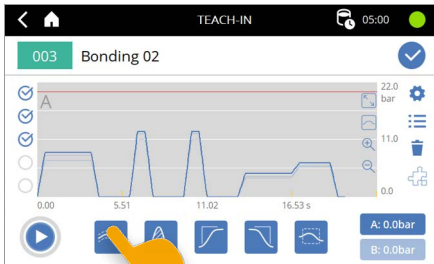


Fig. 144

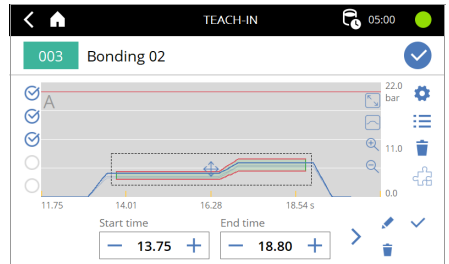


Fig. 145

5.2.2 Integral

The integral monitors the dosed quantity within a specified time range. The quantity is calculated based on the time and the measured pressure. In contrast to the envelope, the check is not carried out throughout the entire time interval, but only when the end point is reached. Monitoring using the integral makes sense for short dosing operations during which the dosing needle does not move (e.g. dot dosing), because in such cases it is not the exact pressure trend during dosing that is decisive for a correct result, but the total dosed quantity.

The two grey lines show the mean value of the pressure trend of the Teach-In dosing (M) on the one hand and the dosed quantity (Q) on the other. At the end of the integral trend there is a vertical bar that shows the tolerance range of the dosed quantity. The green curve represents the integral of the current Teach-In dosing operation. If this is within the tolerance, the area below the mean value will have a transparent green background. Otherwise it will be red.

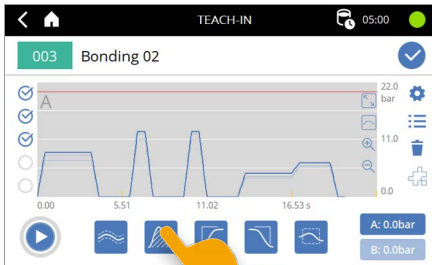


Fig. 146

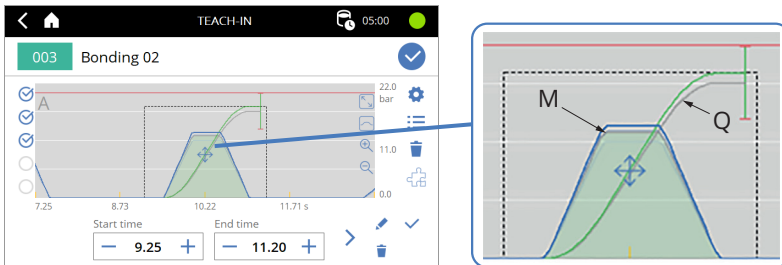


Fig. 147

5.2.3 Control box

The control box can be used to check whether a pressure trend runs through or avoids the region covered by the control box.

There are three different control boxes (for a rising edge, for a falling edge and for the general control box) to choose from. These differ only in terms of the default settings for the margins.

The control boxes represent a very flexible way of monitoring pressure and expand the functionality in situations to which the envelope and integral are not optimally suited.

As shown in the figure below, control boxes can be used to monitor steep edges of the pressure trend.

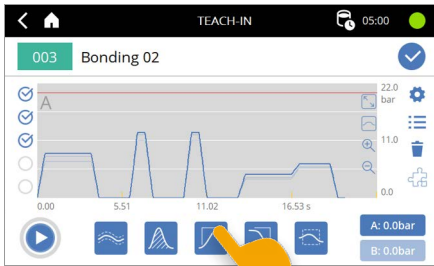


Fig. 148

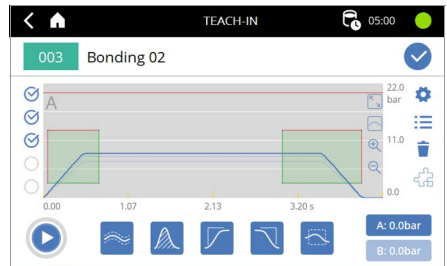



Fig. 149

The four margins of a control box can place different conditions on the pressure trend:

- Green = The pressure trend must pass through this margin at least once.
- Red = The pressure trend must not pass through this margin.
- Grey = No condition; the pressure trend may, but does not have to, pass through this margin.

For example, a rising edge can be monitored by green margins at the bottom and right, and red margins at the top and left. The pressure trend must therefore rise above the lower threshold value within the time specified by the control box (green lower margin) and be at least at this level at the end time (green right margin). However, the pressure trend must not increase too early (red left margin) and must never exceed a maximum value (red upper margin).

The margin conditions can only be changed in the pop-up window. The pop-up window can be opened via the pencil icon .

Here you can use the corresponding icons to select the margins and define how they are used (Fig. 150).

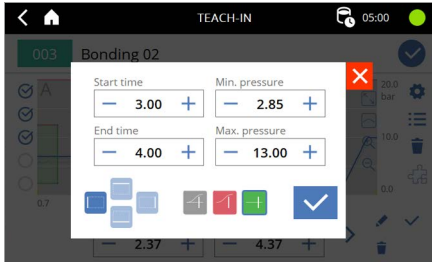


Fig. 150

5.3 Teach-In settings

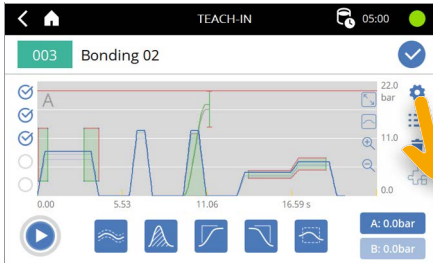


Fig. 151

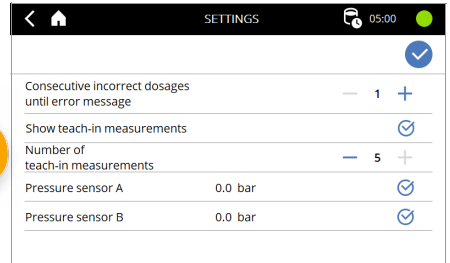


Fig. 152

Consecutive incorrect dosages until error message

Required number of consecutive dosing operations outside of tolerance before an error is triggered. "Outside of tolerance" means that the conditions of at least one monitoring unit have not been met.

Show teach-in measurements

Shows past Teach-In measurements on the diagram (thin blue line).

Number of teach-in measurements

Limits the maximum number of Teach-In measurements. If this number is exceeded, the oldest measurement will be overwritten. Value between 3 and 5, inclusive.

Pressure sensor A / B

Activation of dosing pressure sensors A and B. At least one sensor must be selected. If a new sensor is added, all previous Teach-In measurements will be deleted.

5.4 List of Teach-In dosing operations and monitoring units

The list with all Teach-In dosing operations and monitoring units can be displayed here. Pressure measurements and monitoring units can be deleted here; monitoring units can also be edited via “Edit”.

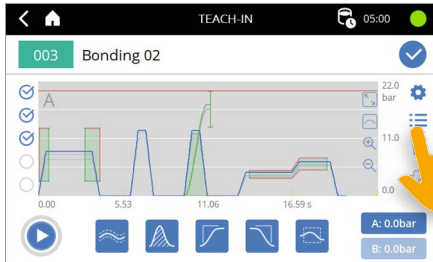


Fig. 153

Pressure measurement	08.04.2022, 15:37:52		Delete
Pressure measurement	08.04.2022, 15:38:13		Delete
Pressure measurement	08.04.2022, 15:38:35		Delete
Control box A	[0.05s, 0.70s]	Edit	Delete
Control box A	[3.00s, 4.00s]	Edit	Delete
Integral A	[9.25s, 11.20s]	Edit	Delete

Fig. 154

5.5 Validity of a dosing operation

In both Teach-In and in normal dosing mode, a dosing operation is marked as “OK” if it passes through all monitoring units within the specified tolerance. In this context, to “pass through” means that the end time of the last monitoring unit in the time sequence must be reached or surpassed.

If a Teach-In dosing operation is “not OK”, this is indicated by a crossed-out red circle to the left of the diagram. However, the dosing mode is not stopped.

During normal dosing mode (execute program), the counter for consecutive incorrect dosages is incremented after a “not OK” dosing operation. If, as a result, the counter reaches the maximum permissible number of consecutive incorrect dosages, an error is set at the end of the dosing operation. It is not possible to start a new dosing operation until the error has been reset.

5.6 Component signal

The component signal allows the pressure trend of several Start-Stop dosing operations to be saved in one measurement. The component signal is a digital signal, which is switched via interface X1, digital input 18. If the signal is “high”, pressure recording is not stopped when dosing is stopped. Only when the signal is “low” and dosing is stopped, or the component signal is set to “low” outside of a dosing operation, does the pressure recording stop. This can be used to link multiple short dosing operations, such as a few bead and dot dosing operations on the same component. In this way, pressure monitoring can be programmed directly for an entire component, and it is possible to assess whether the dosing pressure corresponds to the specifications for each component as a whole (and not for each individual dosing operation within the component).



An active component signal (“high”) is represented by the filled puzzle icon.



An inactive component signal is indicated by an empty icon.

The icon is only visible for Start-Stop dosing operations, both in Teach-In and in the two-column dosing window with pressure diagram display.

While the component signal is “high”, it is not possible to exit the Teach-In or dosing window. It is also not possible to switch the program externally.

5.7 Dosing window – view with monitoring units

If monitoring units have been saved in a program, the two-column dosing window with the print view is opened by default when the program is run (Fig. 155).

Dosing pressure monitoring using the envelope, integral and control boxes is only active in this window! The overpressure switch-off, on the other hand, is always active.

If you switch to another view, e.g. the “Schema” view or the three-column dosing window, a dialogue box will inform you that doing so will deactivate the dosing pressure monitoring (Fig. 156).

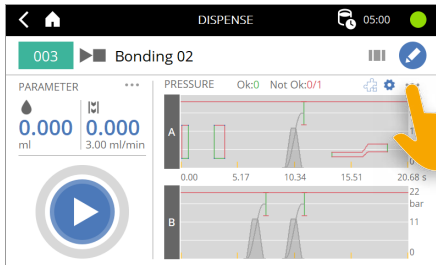


Fig. 155

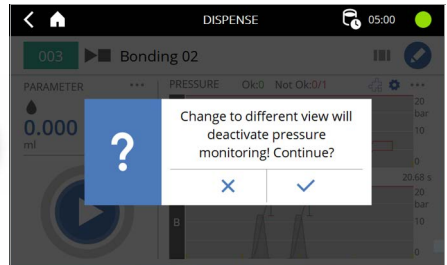


Fig. 156

A diagram is displayed for each active pressure sensor. The scaling of the diagram axes is set automatically, but this can be changed in the settings. The number of consecutive successful dosing operations (“Ok”) and consecutive dosing operations outside of tolerance (“Not Ok”) are displayed above the top diagram. Depending on the setting, an error is triggered after a user-specified number of consecutive dosing operations which are outside the tolerance. A successful dosing operation resets this counter. Next to this display is the symbol that shows the status of the component signal (Start-Stop dosing operations only).

The “gear button” takes you to settings relating to the display of the diagrams.
The following settings can be configured:

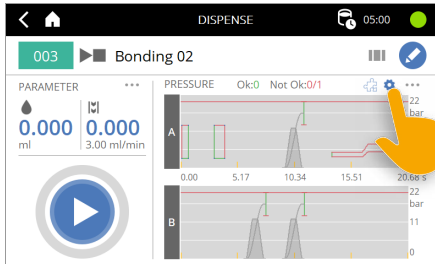


Fig. 157

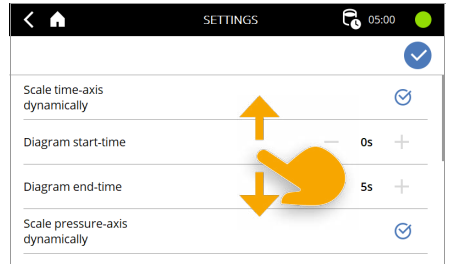


Fig. 158

Scale time-axis dynamically / Diagram start-time / Diagram end-time

If dynamic scaling of the time axis is active, the axis is stretched up to a time of 30 seconds. For dosing operations over 30 seconds, the frame moves to show the last 30 seconds of the dosing operation.

If dynamic scaling of the time axis is inactive, the time axis can be defined via the “Diagram start-time” and “Diagram end-time”.

Scale pressure-axis dynamically / Diagram maximum pressure A (B)

If dynamic scaling of the pressure axis is active, the axis is scaled in such a way that the maximum pressure for the overpressure switch-off is clearly visible.

If dynamic scaling of the pressure axis is inactive, a value for the limits can be specified manually via “Diagram maximum pressure A (B)”.

Show number of good/bad dosing operations

Switch the display above the diagram on or off.

Reset number of good/bad dosing operations

Reset display above the diagram.

Pressure data via RS232

Live feed of dosing pressure data via RS232 interface. This is only possible if control via RS232 commands is inactive. At intervals of 0.5 s, the pressure data from both sensors is saved in the format STX,244,<Time>,<PressureA>,<PressureB>,ETX. If one of the two sensors is not connected, nothing is sent in place of the pressure value. For example, if sensor A were connected without sensor B, this would result in the following: STX,244,<Time>,<PressureA>,ETX.

Exporting the dosing history

Exports past dosing processes to the connected USB stick. A new folder is created with the name DosingHistory_<date>_<time>, using the date and time of the export. An export on 4 September 2022 at 11:38:27 would therefore create the following folder: DosingHistory_20220904_113827.

- Export without pressure trend

The file CompactDosingHistory.csv, containing one dosing operation per line, is created in the folder that was created. The first entry per line is the date and time the dosing operation started. The second entry contains “ok” for a dosing operation within the tolerance or “error” for a dosing operation outside of tolerance. The last 50,000 measurements are saved. When this memory is full, the oldest dosing operations are overwritten.

- Export with pressure trend

A <date>_<time>.csv file is created for each dosing operation in the folder that was created. The first entry per line is the date and time the dosing operation started. The second line is the header for the following data, e.g. t,pA[bar],pB[bar], for time, dosing pressure A, dosing pressure B, if both sensors are connected and the control unit is set to bar as the pressure unit. The pressure trend of the last 40 measurements is saved. When this memory is full, the oldest dosing operations are overwritten. The compact format of the dosing operation (date and time of dosing operation, as well as dosing operation within tolerance) can still be output via “Export without pressure trend”.

6 Dynamic mixer

If a dynamic mixer has been connected and activated, it can be adjusted using the **SETTINGS** field (see Section 4.9.12 (page 37)).

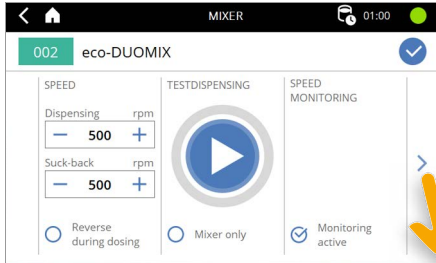


Fig. 159

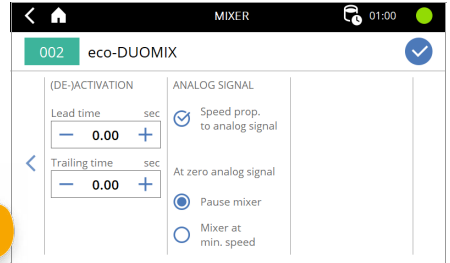


Fig. 160

Speed

The speed (10 to 1000 rpm) for dispensing and suck-back can be set here.

If the “Reverse during dosing” option is activated, the rotating direction of the dynamic mixer can be reversed during the dosing process. The dynamic mixer will then run in the same direction as for suck-back. This can improve the dosing result for materials that tend to expand after being mixed. The change in rotating direction causes a slight suck-back effect.

Testdispensing

Dosing can be started directly here in order to check and optimise the settings for the dynamic mixer. This negates the need to constantly switch over to the Dispense screen to start dosing.

NOTE

All the values required for the program (page 29 to 35) must have been entered beforehand.

Speed monitoring

Speed monitoring can be activated and deactivated here. If the dynamic mixer is outside a certain tolerance, an error message is displayed.

(De-)activation

The lead time and trailing time for the dynamic mixer can be saved here.

In the case of the lead time, the dosing does not start until the set time has elapsed (max. 5 seconds).

In the case of the trailing time, the dynamic mixer continues to run in the suck-back movement for the set time (max. 5 seconds).

Analog signal

If the dosing control unit is controlled by an analogue signal (see Section 4.15.13 (page 65)), this signal can also be used for the dynamic mixer by activating the “Speed prop. to analog signal” option. The speed of the dynamic mixer (100 to 1000 rpm) will then be controlled in proportion to the analogue signal (0V to 10V).

At zero analog signal

This area is for specifying how the dynamic mixer should behave if the analogue signal is 0V.

If “Pause mixer” is activated, the dynamic mixer will not move.

If “Mixer at min. speed” is activated, the dynamic mixer will run at 100 rpm.

7 Explanations of the operating modes

Dosing can be carried out in three different operating modes, as described below.

7.1 Dosing manually

Manual dosing is carried out using the touch display on the dosing control unit.

Dosing is initiated by pressing the **START/STOP-button** (Fig. 161).

Quantity dosing stops dosing automatically when the preset values are reached.

Start/stop dosing is ended by pressing the **START/STOP-button** again.

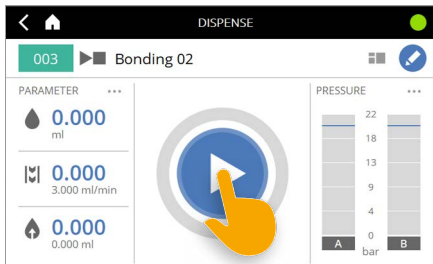


Fig. 161

7.2 Dosing with the foot switch (optional)

A foot switch can be connected to the dosing control unit. A suitable foot switch is available (see Section 13 “Accessories” (Page 110)).

The dosing system reacts to the foot switch being activated as follows:

	Press the foot switch	... and release
Quantity dosing	Preset quantity is dispensed	–
Start/stop dosing	Dosing starts	Dosing stops

In quantity dosing mode, dosing can be stopped by pressing the **START/STOP-button** before the specified values have been reached (EMERGENCY STOP). A set pause or a suck-back will be carried out, however.

Wiring diagram for foot switch

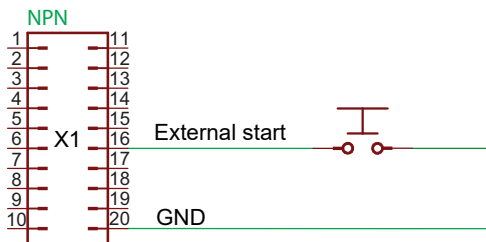
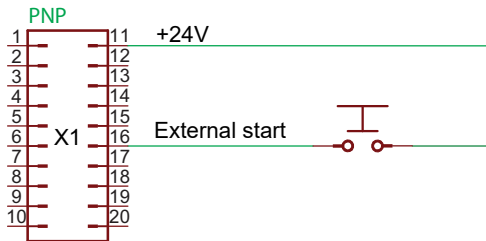




Fig. 162

7.3 Dosing using external control unit

External operation is activated using the digital input X3.11. The user interface switches to the last program used and is locked.

In this mode, the user can no longer perform any manual operations and the operating elements (e. g. , ) are greyed out (Fig. 163). Starting dosing (X1.16) and changing program (X3.4) can thus only be carried out from an external control unit. An **R** is displayed in the header.

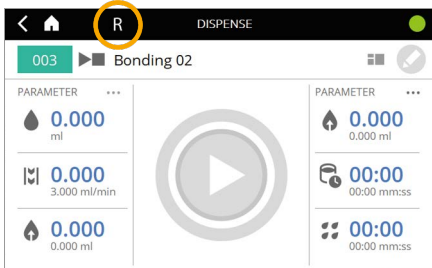


Fig. 163

7.3.1 Signal value for external program selection

The program can be determined using 7 digital inputs (see table below).

Prog. No.	Pin X3	10	3	9	2	8	1	7
	Bit	6	5	4	3	2	1	0
0		0	0	0	0	0	0	0
2		0	0	0	0	0	1	0
4		0	0	0	0	1	0	0
6		0	0	0	0	1	1	0
8		0	0	0	1	0	0	0
10		0	0	0	1	0	1	0
12		0	0	0	1	1	0	0
14		0	0	0	1	1	1	0
16		0	0	1	0	0	0	0
18		0	0	1	0	0	1	0
20		0	0	1	0	1	0	0
22		0	0	1	0	1	1	0
24		0	0	1	1	0	0	0
26		0	0	1	1	0	1	0
28		0	0	1	1	1	0	0
30		0	0	1	1	1	1	0

Prog. No.	Pin X3	10	3	9	2	8	1	7
	Bit	6	5	4	3	2	1	0
1		0	0	0	0	0	0	1
3		0	0	0	0	0	1	1
5		0	0	0	0	1	0	1
7		0	0	0	0	1	1	1
9		0	0	0	1	0	0	1
11		0	0	0	1	0	1	1
13		0	0	0	1	1	0	1
15		0	0	0	1	1	1	1
17		0	0	1	0	0	0	1
19		0	0	1	0	0	1	1
21		0	0	1	0	1	0	1
23		0	0	1	0	1	1	1
25		0	0	1	1	0	0	1
27		0	0	1	1	0	1	1
29		0	0	1	1	1	0	1
31		0	0	1	1	1	1	1

Prog. No.	Pin X3 Bit	10	3	9	2	8	1	7
		6	5	4	3	2	1	0
32		0	1	0	0	0	0	0
34		0	1	0	0	0	1	0
36		0	1	0	0	1	0	0
38		0	1	0	0	1	1	0
40		0	1	0	1	0	0	0
42		0	1	0	1	0	1	0
44		0	1	0	1	1	0	0
46		0	1	0	1	1	1	0
48		0	1	1	0	0	0	0
50		0	1	1	0	0	1	0
52		0	1	1	0	1	0	0
54		0	1	1	0	1	1	0
56		0	1	1	1	0	0	0
58		0	1	1	1	0	1	0
60		0	1	1	1	1	0	0
62		0	1	1	1	1	1	0
64		1	0	0	0	0	0	0
66		1	0	0	0	0	1	0
68		1	0	0	0	1	0	0
70		1	0	0	0	1	1	0
72		1	0	0	1	0	0	0
74		1	0	0	1	0	1	0
76		1	0	0	1	1	0	0
78		1	0	0	1	1	1	0
80		1	0	1	0	0	0	0
82		1	0	0	0	0	1	0
84		1	0	0	0	1	0	0
86		1	0	0	0	1	1	0
88		1	0	0	1	0	0	0
90		1	0	1	1	0	1	0
92		1	0	1	1	1	0	0
94		1	0	1	1	1	1	0
96		1	1	0	0	0	0	0
98		1	1	0	0	0	1	0

Prog. No.	Pin X3 Bit	10	3	9	2	8	1	7
		6	5	4	3	2	1	0
33		0	1	0	0	0	0	1
35		0	1	0	0	0	1	1
37		0	1	0	0	1	0	1
39		0	1	0	0	1	1	1
41		0	1	0	1	0	0	1
43		0	1	0	1	0	1	1
45		0	1	0	1	1	0	1
47		0	1	0	1	1	1	1
49		0	1	1	0	0	0	1
51		0	1	1	0	0	1	1
53		0	1	1	0	1	0	1
55		0	1	1	0	1	1	1
57		0	1	1	1	0	0	1
59		0	1	1	1	0	1	1
61		0	1	1	1	1	0	1
63		0	1	1	1	1	1	1
65		1	0	0	0	0	0	1
67		1	0	0	0	0	1	1
69		1	0	0	0	1	0	1
71		1	0	0	0	1	1	1
73		1	0	0	1	0	0	1
75		1	0	0	1	0	1	1
77		1	0	0	1	1	0	1
79		1	0	0	1	1	1	1
81		1	0	1	0	0	0	1
83		1	0	0	0	0	1	1
85		1	0	0	0	1	0	1
87		1	0	0	0	1	1	1
89		1	0	0	1	1	0	1
91		1	0	1	1	0	1	1
93		1	0	1	1	1	0	1
95		1	0	1	1	1	1	1
97		1	1	0	0	0	0	1
99		1	1	0	0	0	1	1

7.3.2 Signal forms and levels

The digital outputs X1.2 and X1.12 can be used to ensure a reliable program change and start of dosing. Make sure that the digital input X3.11 is set for at least 1 second before changing the programme. The following figure shows the required signal flow.

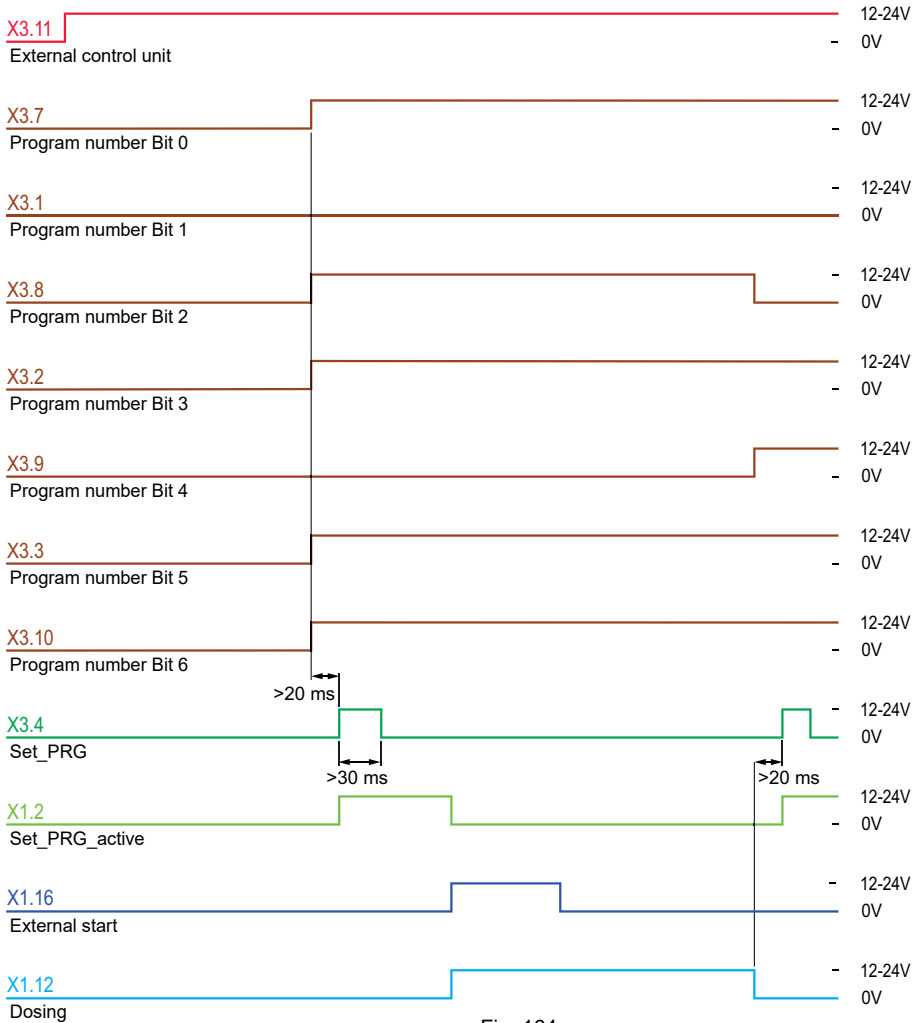


Fig. 164

If the “Set program number active” (X1.2) and “Dosing” (X1.12) digital outputs cannot be evaluated by the master control unit, the following delay times can be used.

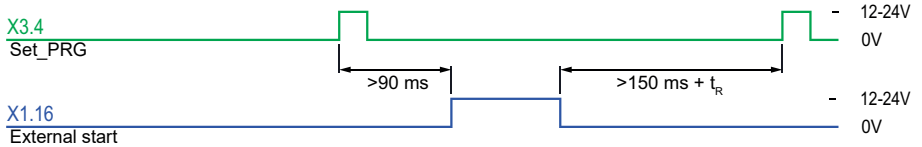


Fig. 165

A minimum waiting time is required after the end of the dosing. This is calculated by 150 ms + suck-back time t_R .

The suck-back time t_R can be calculated using the following formula:

$$t_R \text{ [ms]} = \frac{\text{Suck-back quantity}}{\text{Suck-back speed}} \times 60000$$

7.3.3 Troubleshooting with external control unit

Fault	Cause
User interface not greyed out or the “R” for remote input not displayed in the header	No current at input X3.4 (mode: external control unit)
Activated program does not start	Signal timing not adhered to or signal at input X3.4 (acceptance of program number) is missing.
Dosing control unit cannot be operated	Dosing control unit is in remote mode (“R” at the top left of the display)

8 Maintenance

In the event of a fault, or if there is any doubt that the machine/system is not completely ready for operation, it must be shut down immediately and inspected by competent maintenance staff before operation continues.

 **WARNING**

Maintenance and cleaning work may only be carried out when the machine has been shut down safely and secured against unauthorised restarting. Otherwise, serious injuries may result.

- Switch off the dosing control unit.
- Disconnect the dosing control unit's power cable from the power supply

8.1 Maintenance intervals

In order to ensure problem-free operation, we recommend a visual check for leakage, contamination and damage at the beginning of the shift (but at least once a day). This is the responsibility of the operating staff.

8.2 Troubleshooting / Warning message / Error message

Fault	Possible cause	Action
Dosing system cannot be operated, no display.	No dispenser connected.	Connect dispenser (ensure that the mains plug has been removed beforehand).
	Mains switch turned off.	Turn on the mains switch.
	Power cable defective.	Check power cable.
	Fuse for mains connection faulty.	Check fuse.

ID	Error message	Possible cause	Action
1	No dispenser connected.	No dispenser is connected to the device.	Connect a dispenser to the device and check the cable connection.
		A system error has occurred.	Switch the unit off and back on again.
		The dispenser type could not be identified.	Change the dispenser.
2	Prohibited dispenser combination.	More dispensers are connected than the current licence permits.	Install licence upgrade or unplug dispenser.
		Different dispenser types are connected.	Connect uniform dispenser types.
3 (4) (5)	Connect dispenser to motor plug 1 (2) (3).	No dispenser is connected to the motor 1 (2) (3) connection.	Connect a dispenser at motor connection 1 (2) (3) and check the cable connection.
7 (8) (9)	Drive torque at the Motor 1 (2) (3) too high! Safety switch-off for component protection activated.	Dispenser parts do not move smoothly due to hardened material or as a result of dry running at the motor 1 (2) (3) connection.	Dismantle the dispenser and clean, if necessary with a stator change (see dispenser instructions).
13 (14)	Overpressure dosing pressure sensor A (B)	The dosing needle is too small or clogged.	1-component dispenser: Change dosing needle; 2-component dispenser: Check the pot life, change the mixer.
15 (16)	Level sensor A (B) min	The material reservoir is empty (component A (B)).	Change the reservoir for component A (B) or refill with material.
17 (18)	Inlet pressure A (B) (ext.) max.	The inlet pressure on dispenser A (B) has been exceeded.	Check the compressed air supply for the material (component A (B)).
19 (20)	Inlet pressure A (B) (ext.) min.	The inlet pressure on dispenser A (B) has not been reached.	Check the compressed air supply for the material (component A (B)).
21	Pressure outlet max.	limit values defined too narrowly.	Check the limit values in the sensor settings and check the pneumatic unit.
22	Pressure outlet min.	limit values defined too narrowly or compressed air supply is interrupted.	Check the limit values in the sensor settings, check the pneumatic unit, check the compressed air supply.
23 (24)	Dosing pressure sensor A (B) - cable break!	Sensor cable damaged or sensor faulty.	Check the cable connection to dosing pressure sensor A (B) and if necessary replace the sensor.
25 (26)	Inlet pressure A (B) - cable break	Sensor cable damaged or sensor faulty.	Check the cable connection to inlet pressure sensor A (B) and if necessary replace the sensor.

ID	Error message	Possible cause	Action
27	Pressure outlet - cable break	Sensor cable damaged or sensor faulty.	Check the cable connection to the pneumatic unit and if necessary replace the pneumatic unit.
28	Load program	An error occurred when loading the program parameters.	Switch the device off and back on again, and if necessary load a saved programs.
30	Pot life elapsed.	The pot life has been exceeded.	Change mixer immediately and manually purge the dosing system, and if necessary dismantle and clean the dispenser.
33	Software update cancelled.	An error occurred during a software or licence update.	Check the USB stick connection and load the update or licence again.
34	No valid serial number.	The device was unable to detect the serial number.	Switch the device off and back on again.
35	External program selection not possible.	The set program signal has been detected but not the remote control unit signal.	Check the signal sequence or the signal cable to the external program selection.
36	Program number not available.	The selected program is not available.	Select another program or if necessary load saved programs.
37	Suck-back quantity is larger than dosing quantity.	The dosing program has been stopped or cancelled too early.	Reduce the suck-back volume, switch off suck-back, or run the dosing program for longer.
38	Error writing the log file.	The log file could not be opened.	Check the USB stick connection and export the log file again.
39	Ext. program selection not enabled.	A different program was selected during dosing (ext.).	Only select a program (ext.) when dosing is complete. Check external program selection signal sequence.
40	Start (ext.) not possible.	Dosing start was activated during the boot process.	Wait for the boot process to complete before starting the first dosing.
41	Program loading failed!	The selected program is not available.	Select another program or if necessary load saved programs.
42	Current program cannot be used with this pump!	The dispenser has been changed.	Select another program or if necessary load saved programs.
43	Installed firmware cannot be used.	The firmware used does not match the hardware.	Load the latest software update. If necessary, send in the device for maintenance.
44	No quantity programs can be used.	The selected program is a quantity program and ext. control unit via the analog input is activated.	Select a start/stop program or deselect the analog input.

ID	Error message	Possible cause	Action
46	The flow rate is too high.	The flow rate is too high due to calibration.	Adjust the flow rate in the program.
47	The suck-back speed is too high.	The suck-back speed is too high due to calibration.	Adjust the suck-back flow rate in the program.
48	The dosing quantity is too low.	The dosing quantity is too low due to calibration.	Adjust the dosing quantity in the program.
49	System was not able to start firmware.	An error occurred during booting.	Reload the firmware, perform a software update or switch the device off and back on again.
50	Please select a different program!	A different dispenser has been connected.	Select a different program from the list of available programs.
51	Maximum current at motor!	Dispenser parts do not move smoothly due to hardened material or as a result of dry running of the dispenser	Dismantle the dispenser and clean, if necessary with a stator change (see dispenser instructions).
52	Automatic program selection not possible.	The programme that was used before switching off does not exist. The device has been switched off with an active error message.	Select the program again. Acknowledgement only possible after selecting a new program.
53	Cable break of the external speed specification	The cable connection of interface X1 (pin 9) is interrupted.	Check the cable connection.
54	No feedback from motor No. 1 (2) (3).	Dispenser blocked, cable connection interrupted or motor 1 (2) (3) defective.	Check dispenser, cable connection and motor.
55 (56)	Temperature A (B) max.	The temperature on dispenser A (B) has been exceeded.	Check the temperature for the material (component A (B)).
57 (58)	Temperature A (B) min.	The temperature on dispenser A (B) has been undershot.	Check the temperature for the material (component A (B)).
59 (60)	Temperature A (B) – cable break	Sensor cable damaged or sensor faulty.	Check the cable connection to temperature sensor A (B) and if necessary replace the sensor.

ID	Error message	Possible cause	Action
61	The dosing pressure runs outside the tolerance range defined by the monitoring units.	At least one of the monitoring units violated the pressure limits.	Bleed pump, check material.
		Air in the material.	
		Dosing needle blocked.	Change dosing needle.
		Dosing too short.	Check the dosing process, possibly extend the rundown time.
		Dosing needle contacts surface.	Check the setting of the axis system/robot.
		Stator worn.	Replace stator.
		Tolerance of the monitoring unit too low.	Adjust tolerances.
62	The flow rate at motor A differs from the specification by 30%.	Dispenser parts do not move smoothly due to hardened material or as a result of dry running of the dispenser.	Dismantle the dispenser and clean, if necessary with a stator change (see dispenser instructions). With a 2-component system, also change the mixer.
65	Mixer speed out of tolerance.	Dynamic mixer does not move smoothly due to hardened material in the mixing capsule.	Replace the mixing capsule and/or disassemble and clean the mix housing of the dispenser.

9 Cleaning

WARNING

Cleaning work may only be carried out when the machine has been shut down safely and secured against unauthorised restarting. Otherwise, serious injuries may result.

- Switch off the dosing control unit.
- Disconnect the dosing control unit's power cable from the power supply

If the dosing control unit is dirty, clean it using a soft, damp cotton cloth with a few drops of pH-neutral cleaning agent (e.g. washing up liquid). The ventilation louvres in the mains adapter and housing must be kept clear at all times.

Note the following points regarding the use of cleaning agents and the performance of cleaning work:

- Do not use cleaning agents containing abrasive constituents.
- Do not use bleaching agents or heavily acidic or alkaline cleaning agents.
- Check the compatibility of the cleaning agents in an unobtrusive spot.
- Cleaning agents and water must not be allowed to penetrate into electrical or mechanical system components.
- Completely remove all cleaning agent used.
- Do not use steel wool, sponges with a roughened side, or sharp-pointed implements.
- Do not use pressure or steam cleaners.

10 Spare parts

When ordering spare parts, always quote the article number (Art.), the year of manufacture (e. g. 2022) and the serial number (SN) as specified on the type plate (Fig. 166). You will find the type plate on the rear of the control unit.



Fig. 166

11 Technical specifications

11.1 Interface description

NOTE

Digital inputs respond to 24V with PNP polarity or to GND with NPN polarity.

11.1.1 Interface X1: System I/O

(Wago 713-1110)

Pin	Type	Designation
1	+24 V	Positive supply connection
2	Dig.Output	Program change active (Set_PRG_active)
3	Dig.Output	Error message active (Error active)
4	Dig.Output	Warning blank shot
5	Dig.Output	Reserved
6	Dig. Input	Level sensor A
7	Dig. Input	Error acknowledgement (Quit Error)
8	Dig. Input	Reserved
9	Analog Input	External speed control 4-20mA
10	GND	Negative supply connection
11	+24 V	Positive supply connection
12	Dig.Output	Dosing
13	Dig.Output	Status ready for operation
14	Dig.Output	Level alarm
15	Dig.Output	Reserved
16	Dig. Input	External start
17	Dig. Input	Level sensor B
18	Dig. Input	Component signal for dosing pressure monitoring
19	Analog Input	External speed control 0-10V
20	GND	Negative supply connection

Reserved = do not use – can cause damage to the control unit

11.1.2 Interface X2: Inlet pressure

(Wago 713-1103)

Pin	Type	Designation
1	+24 V	Positive supply connection
2	Analog Input	Inlet pressure sensor B (0-10V)
3	GND	Negative supply connection
4	+24 V	Positive supply connection
5	Analog Input	Inlet pressure sensor A (0-10V)
6	GND	Negative supply connection

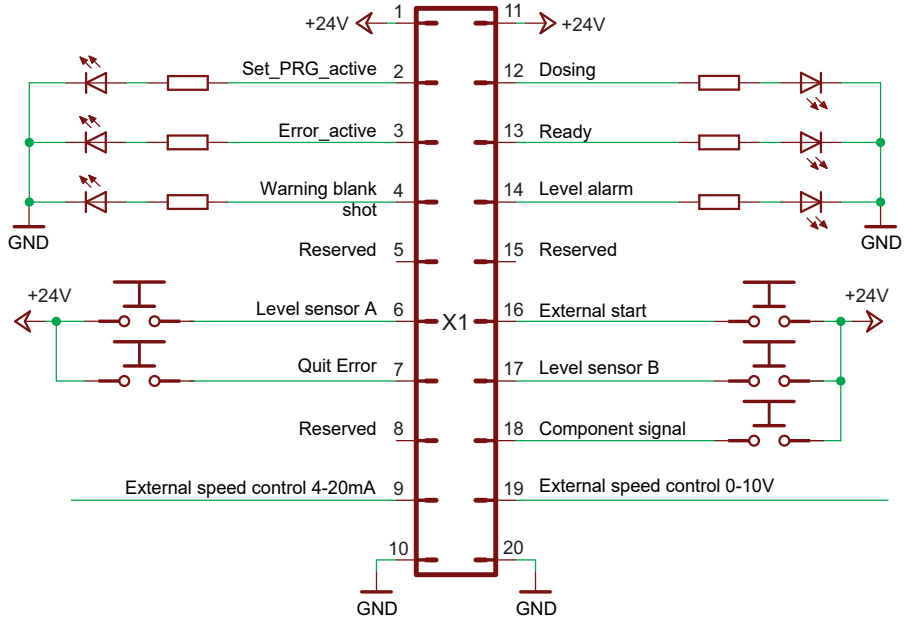
11.1.3 Interface X3: External program selection

(Wago 713-1106)

Pin	Type	Designation
1	Dig. Input	Program number Bit 1
2	Dig. Input	Program number Bit 3
3	Dig. Input	Program number Bit 5
4	Dig. Input	Set program number (Set_PRG)
5	+24 V	Positive supply connection
6	GND	Negative supply connection
7	Dig. Input	Program number Bit 0
8	Dig. Input	Program number Bit 2
9	Dig. Input	Program number Bit 4
10	Dig. Input	Program number Bit 6
11	Dig. Input	External control unit
12	GND	Negative supply connection

11.1.4 Wiring diagrams for external inputs/outputs

PNP



PNP

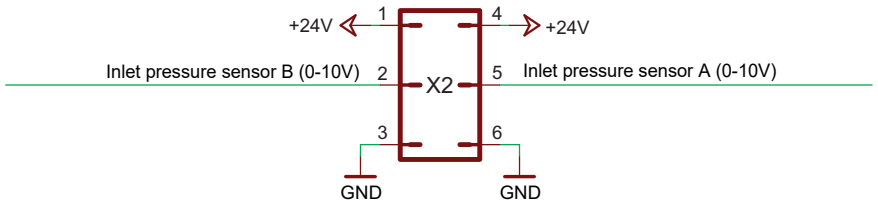
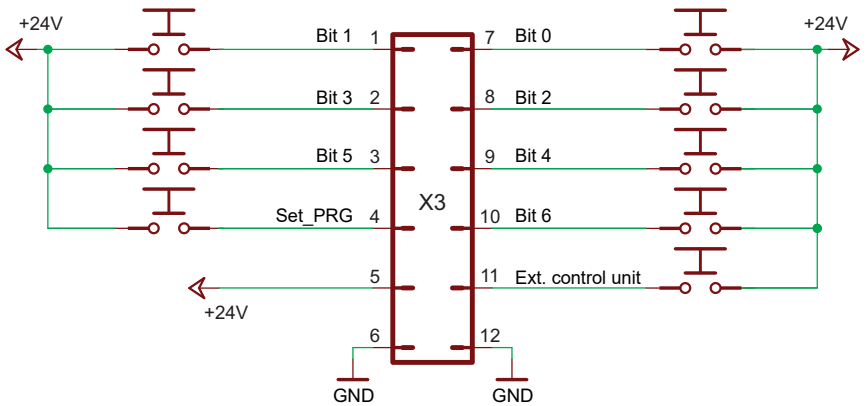


Fig. 167

PNP



NPN

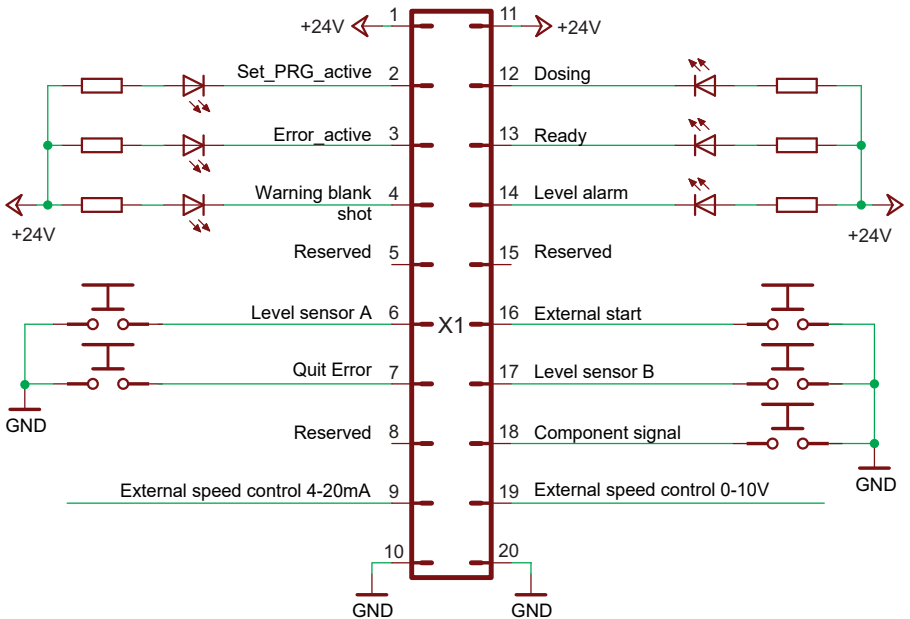
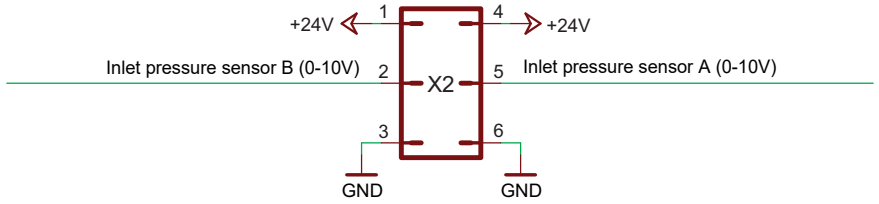


Fig. 168

NPN



NPN

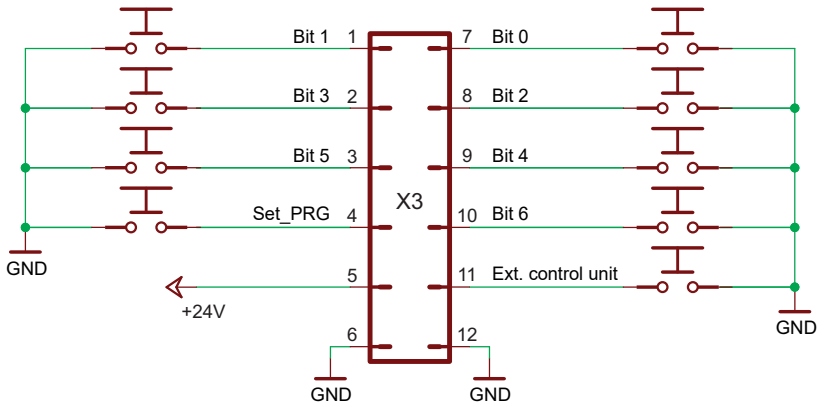


Fig. 169

11.1.5 Logical links of the outputs

Dosing (X1.12)

The output has H-level during the dosing process, otherwise it has L-level.

Program change active (X1.2)

When switching to a different program, the output has an H-level, otherwise an L-level.

Level alarm (X1.14)

The output is activated following successful initialisation (H-level). It switches to L-level if the connected level sensor switches to L-level. "Settings/Sensors" can be used to activate or deactivate level monitoring for "Level A" or "Level B".

Status ready (X1.13)

When the control system has been switched on, initialisation is run. The output is activated when the initialisation has been successfully completed (H-level).

Error message active (X1.3)

The output is activated following successful initialisation (H-level). If the control system detects an error (see page 95, Error message), the output switches to L-level.

Warning blank shot (X1.4)

Only for 2-component dispensers: During an blank shot this output has H-level, otherwise L-level. If a lead time (page 31) is specified for the blank shot, this output goes to H-level accordingly earlier

11.2 EU Declaration of Conformity

within the meaning of EC Directive 2006/42/EC on machinery Annex II A

ViscoTec Pumpen- u. Dosiertechnik GmbH
Amperstraße 13
D-84513 Töging am Inn,

hereby declares, that the machine designated below complies with the relevant underlying safety and health protection requirements of the EU Directive on the basis of its design and type of construction and in the form in which it is sold by us. This declaration loses its validity if any change is made to the machine that had not been agreed to by us.

Product designation:	Dosing system
Components:	eco-CONTROL EC200 2.0 dosing control unit with dispenser
Dispenser:	eco-PEN300, eco-PEN330, eco-PEN450, eco-PEN600, eco-PEN700, eco-DUO330, eco-DUO450, eco-DUO600, eco-DUOMIX450

The following EU Directives were applied:

2006/42/EC	Directive of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC
2014/30/EU	Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
2011/65/EU	Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

Applied harmonised standards:

DIN EN 809:2012-10	Pumps and pump units for liquids – Common safety requirements
DIN EN ISO 12100:2011-03	Safety of machinery - General principles for design - Risk assessment and risk reduction
DIN EN 60204-1:2019-06	Safety of machinery - Electrical equipment of machines - Part 1: General requirements

Töging am Inn, 30 May 2023



Martin Stadler
Managing Director and authorised representative

11.3 Technical data

eco-CONTROL EC200 2.0	
Dimensions (W× H× D)	235 × 177 × 85 mm
Weight	approx. 2.9 kg
Power supply	110 to 230 V AC / 50/60 Hz
Power consumption	maximum 100VA
Compressed air supply	0 to 6 bar (option)
Operating modes	Start/Stop dosing and quantity dosing
Display	7" TFT with capacitive touch
Motor control	for dosing programs to be created, external speed regulation via 0 to 10 V or 4 to 20 mA analog signal possible
Protection rating	IP20 (table-top device) IP64 (installed in a control cabinet)
Connection for level sensor	Yes
External start	24 V via terminal strip
Programs	Internal storage capacity for maximum 100 dosing programs
Interface	Digital I/O, analog inputs, RS232, USB, Ethernet
On / off switch	Yes
Dosing monitor	0 to 40 bar
Operating conditions	+10 ° to +40 °C, air pressure 1 bar, relative humidity less than 60% (non-condensing)
Material temperature	10°C to 40°C
Storage conditions	dry / dust free -10 °C to +40 °C

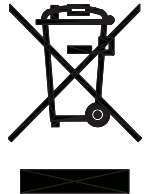
12 Disposal

12.1 General principles

The dispenser must be removed by competent maintenance staff.
Equipment must be disposed of in an environmentally appropriate way.

All materials and material residue must be handled in accordance with the applicable recycling stipulations.

Electrical parts must not be disposed of with household waste. They must be taken to the collection points provided for this purpose or disposed of in an environmentally appropriate way.



12.2 Return and recycling programme for waste equipment in the European Union

Note on compliance with the legal requirements of Art. 7a of the German Electrical and Electronic Equipment Act (ElektroG) for B2B customers

The German act governing the sale, return and environmentally sound disposal of electrical and electronic equipment (“Elektro- und Elektronikgerätegesetz” or “ElektroG” for short) implements the requirements of European Directive 2002/96/EC of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE) and the recast version of EU Directive 2012/19/EU in Germany.

According to the Electrical and Electronic Equipment Act (ElektroG) applicable in Germany, all manufacturers are obligated to provide reasonable means of returning waste equipment from users other than private households.

ViscoTec Pumpen- u. Dosiertechnik GmbH assumes responsibility for its products and recycles them once they have reached the end of their useful life. For equipment that was used for commercial purposes or in public institutions (known as B2B equipment), we provide a return and disposal scheme for you.

Returning and disposing of waste equipment

ViscoTec Pumpen- u. Dosiertechnik GmbH itself primarily takes back the actual electrical devices it manufactured as electronic waste at the end of their service life. We assume the costs of handling, recycling and recovering the electronic waste that was taken back, but do not assume shipping or transportation costs.

1. Please contact us via phone or e-mail in order to register your return.
2. Please use the note "Return for recycling according to WEEE Directive".
3. State the type and quantity of the products being returned for each item.
4. If the electrical device has come into contact with hazardous substances, please draw up a declaration of no objection and a declaration of decontamination and enclose them.
5. Clearly mark the transport unit with "Return for recycling".

Please note the following:

- As our customer, you are responsible for deleting any personal data on the products being disposed of. Please ensure this is done before returning the products to us.
- If the products contain batteries, remove the batteries before returning the products to us.
- Products in our range that fall under the German Electrical and Electronic Equipment Act (ElektroG) are marked with a symbol depicting a crossed-out waste container on wheels. Any products marked in this way must be collected separately at the end of their useful life and appropriately recycled.

13 Accessories

Art.no.	Designation
20313	"Extender" cable extension 5m cpl. (for one drive motor)
20314	"Extender" cable extension 10m cpl. (for one drive motor)
21878	Holder for eco-CONTROL EC200 2.0 dosing control unit
21882	Mounting set for installation in control cabinet
22257	Pneumatic unit
22373	Foot switch
22375	Capacitive empty level sensor for cartridges and containers (PNP polarity)
22478	Capacitive empty level sensor for cartridges and containers (NPN polarity)
22378	System plug for X1 (System I/O)
22379	System plug for X2 (inlet pressure)
22380	System plug for X3 (program selection)

Activation of new software licences – subject to charge:

Art.no.	Designation
22546	USB stick with activation for operation of a 1-component dispenser (without pressure monitoring)
22381	USB stick with activation for simultaneous operation of two identical 1-component dispensers (without pressure monitoring)
22527	USB stick with activation of pressure monitoring for a 1-component dispenser or for two identical 1-component dispensers.
22528	USB stick with activation for operation of a 2-component dispenser (pressure monitoring already integrated).
22601	USB stick with activation for operation of a 2-component dispenser with dynamic mixer (pressure monitoring already integrated).

Please contact us if required: info@preeflow.com

13.1 Mounting of the holder

The holder (Art.no. 21878) is attached to 4 sleeves on the rear (Fig. 170). The bracket can be mounted on a mounting profile. Wall mounting is possible. You will need to choose the appropriate fixings for this yourself. They are not supplied.

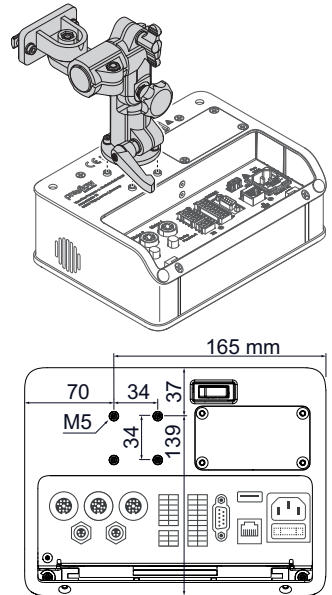


Fig. 170

13.2 Cabinet installation

The mounting set (Art.no. 21882) is required for installing the dosing control unit in a control cabinet. The mounting set consists of 6 clamps, which fix the dosing control unit.

DANGER

Danger to life from electrical voltage

Work and repairs on live parts may only be carried out by competent maintenance staff.

- Disconnect the dosing control unit's power cable from the power supply

NOTE

If the dosing control unit is placed on its glass side, always place a clean, soft cloth underneath to prevent the display from being scratched.

- ▶ Make sure that the dosing control unit has been switched off by the "Power on / off" switch.
- ▶ Disconnect all cables and lines.
- ▶ Set the dosing control unit down on its glass side.
- ▶ Slightly loosen the screws (1) (Fig. 171).
- ▶ Pull the support (2) out of the locating slot.
- ▶ Unscrew the four M4 × 10 (3) (Fig. 172).
- ▶ Remove the cover (4).

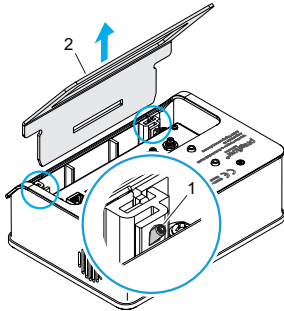


Fig. 171

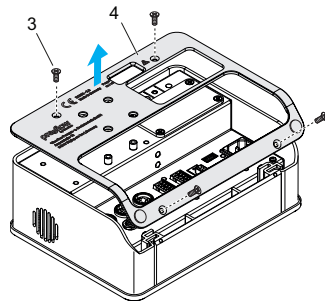


Fig. 172

- ▶ Remove the frame (5).
- ▶ Unscrew the two M5 screws (6) (Fig. 173).
- ▶ Remove the frame (7).
- ▶ Insert the dosing control unit in the cut-out in the cabinet.
- ▶ Insert the six clamps (8) in the slots on the side (A).
- ▶ Turn the set screw down (B) and secure the dosing control unit.

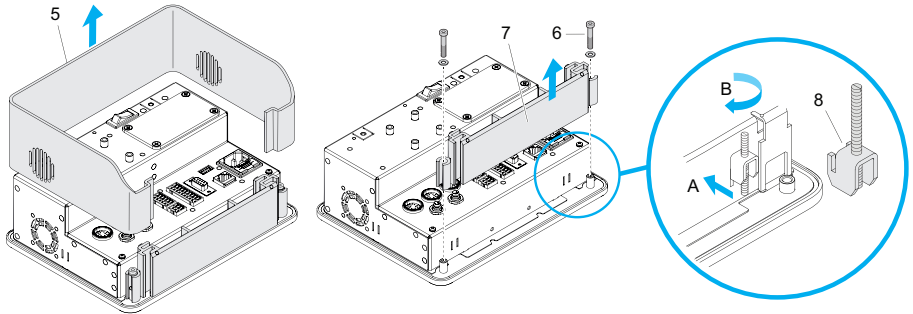


Fig. 173

Dimensions for cut-out in the control cabinet

Please refer to the technical drawing for the dimensions for the required cut-out in the control cabinet (Fig. 174).

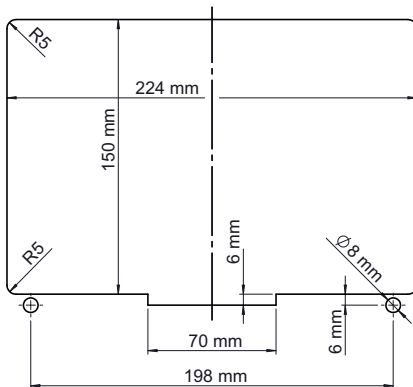


Fig. 174

13.3 Installation of the pneumatic unit

The dosing control unit can be retrofitted with a pneumatic unit (Art.no. 22257).

DANGER

Danger to life from electrical voltage

Work and repairs on live parts may only be carried out by competent maintenance staff.

- Disconnect the dosing control unit's power cable from the power supply

NOTE

If the dosing control unit is placed on its glass side, always place a clean, soft cloth underneath to prevent the display from being scratched.

- ▶ Make sure that the dosing control unit has been switched off by the **POWER ON/OFF** switch.
- ▶ Unscrew the four M4x10 screws (3) and remove the cover plate (8) (Fig. 175).
- ▶ Connect the cable beneath the cover plate to the pneumatic unit (8) (Fig. 176).
- ▶ Install the pneumatic unit (9) and secure it by the four M4x10 screws (2) (Fig. 175).

The pneumatic unit is detected by the dosing control unit. Compressed air monitoring additionally has to be enabled in the dosing control unit, and the desired parameters set. This is carried out by selecting **SETTINGS – SENSORS – PNEUMATIC**.

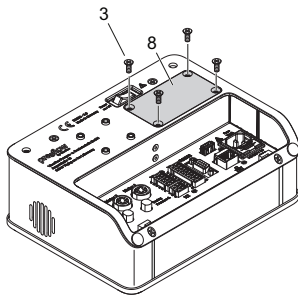


Fig. 175: without support

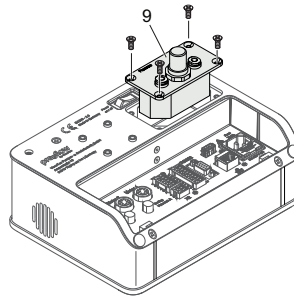


Fig. 176

14 Keyword index

A

Access rights for users	50
Accessories	110
Acknowledge error	57
Adjusting the brightness	58
Adjusting the display	58
Adjusting the sensors	63
Adjusting the sound	58
analog Input	65

B

Blank shot	32
Blank shot display	33
Blank shot quantity	32

C

Cabinet installation	112
Calibration	35, 39
Change of user	51
Choosing favourites	47
Cleaning	99
Clear errors	58
Component signal	82
Connections	16
Control box	78
Creating a new program	42
Cut-out dimension for control cabinet ...	113

D

Deactivate blank shot	32
Delete program	48
Digital IO	66

Dispense screen	44, 45, 46, 83
Disposal	108
Dosing manually	88
Dosing pressure max.	36
Dosing pressure monitoring	36
Dosing pressure sensor	36
Dosing using ext. control unit	90
Dosing with the foot switch	89
Duplicating a program	42
Dynamic mixer	37

E

Edit program	28
Envelope curve	76
Error message	56, 94
External control unit	65
External program selection	90

F

First-time start-up	26
Flow rate	30
Foot switch	89

H

Help	71
------------	----

I

Icons	24, 71
Incoming inspection	7
Initial commissioning	21
Inlet pressure sensor	16, 64
Install new licence	52
Integral	77
Interface description	100

Interface RS232	67
Interface X1	100
Interface X2	101
Interface X3	101
IO Test (hardware test)	68

L

Lead time	32
Licences	54
Logical links	105

M

Maintenance	94
Maintenance intervals	94
Manual purging	62, 70
Material density	34
Mixing ratio	34

N

Navigation structure	22
----------------------------	----

O

Operating hours counters	54
Operating modes	88

P

Password assignment	49
Pneumatic unit	12, 16, 114
Pot life	31
Power supply	107
Program manager	55

Q

Quantity dosing	29
Quick start	27

S

Save location	35, 36, 37
Saving the error list	57
Scope of delivery	7
Screen lock	51
Setting the date	59
Setting the language	60
Setting the Start-Up window	59
Setting the time	59
Settings	48
Signal forms	92
Signal levels	92
Signal values	90
Software update	52
Spare parts	99
Start screen	22
Start/stop dosing	29
Start-up process	25
Suck-back	30
System calibration	61
System information	52

T

Teach-In dosing	74
Teach-In settings	80
Technical connections	67
Technical data	107
Troubleshooting	93, 94

U

Units	60
User management	49

W

Warning message 94
Wiring diagrams 102

NOTES



eco-CONTROL
EC200 2,0

Handed over by:



Gewerbepark 13 85402
Kranzberg
Germany

www.dosieren.de/en



© Copyright 2023

ViscoTec Pumpen- u. Dosiertechnik GmbH
Amperstraße 13
D-84513 Töging am Inn
Germany

This document is protected by copyright. It must not be modified, extended, reproduced or distributed to third parties without written consent.

Subject to technical and editorial change.

Translation of German original operation manual

Document no. / Version
INST-007080 / E

EN