preeflow® by ViscoTec

Dosing system

Operation and maintenance instructions

eco-CONTROL EC200-B

Contents

1 Introduction

Dear customer,

we congratulate you on buying your Dosing system. We are certain that it will fully meet your requirements. We wish you trouble-free and successful operation.

The dosing system eco-CONTROL EC200-B is made up of the dosing control and one or more dispensers.

The Dosing system has been designed and tested for the most precise work with our dispensers. 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. Operation is done via an intuitive operator guidance system using a graphic user interface. It is possible to operate two dispensers at the same time. It is possible to set it up for other dispensers at any time without noteworthy setting-up times.

The dispensers have been developed and tested for high-precision work with products ranging from low to high viscosity with extremely high repeat precision.

They are rotating displacement systems consisting of a rotor and stator and can be dismantled in no time. A number of voids are produced as a result of the various geometries of the conveying elements. Turning the rotor in the stator creates conveyance which is either proportional to the angle of rotation or rpm-dependent.

Since the direction of flow is reversible, the medium can be sucked back to allow a clean break of the thread. Self-sealing depends on the viscosity.

We would be glad of your help as part of our efforts to maintain our standard of quality at the highest possible level. Please tell us about any possible ways we can improve our product.

2 Features

Functions in brief with your transactions in the document:

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3 dosing programs: Quantity Start/stop Time program	5.8.1	15
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Level monitoring for supply tank / cartridge / tank	5.10.10	26
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3 Scope of supply

Dosing system **eco-CONTROL EC200-B**, SD memory card and operating and maintenance manual, as well as at least one dispenser.

4 Safety

4.1 Informal safety measures

» The operating and maintenance manual must be kept, together with the operating and maintenance manual of the dispenser(s), at the site where the dosing system is used at all times.

» This is to be supplemented by the generally and locally applicable rules and regulations to prevent accidents and for protection of the environment that are to be provided and complied with.

4.2 Symbols used

The following symbols are used in these instructions:

Italicised text	Designation of keys, plugs, sections, screenshots, proprietary names and input dialogs
•	Listing of the work flow sequence
1.	Numbered listing of a work flow sequence
1	Legend numbers in an illustration
⚠	Warning: If these instructions are not followed, there is a risk of damage or injury or bothDosing system.
➡	Notes on special technical points concerning operation and/or the prevention of damage.

4.3 Appropriate use, warranty

The Dosing system is intended to be used to control dispensers in non-ex-proof environments.

Any of the following that are done without the explicit and written approval of the manufacturer:

» conversions or additions,

» the use of non-original spare parts,

» repairs carried out by companies or persons that had not been authorized by the manufacturer

can lead to the warranty being rendered null and void.

The manufacturer shall have no liability whatsoever for damage resulting from failure to follow the Operation and maintenance instructions.

The chemical resistance of the parts which come into contact with the product (see the commissioning and maintenance manual of the dispenser) must be ensured prior to commissioning.

4.4 Qualifications of the operating and maintenance personnel

The owner bears the responsibility for ensuring that the operating and maintenance personnel have the required qualifications. The Operation and maintenance instructions must have been read and understood. The relevant applicable technical and safety regulations are to be complied with.

4.5 Organizational measures

The owner is to provide any personal protective equipment that is required. All the safety devices are to be checked regularly. Wear protective glasses and a protective suit for operation and cleaning to protect against any chemicals that are sprayed out.

All the safety information in the relevant Operation and maintenance instructions of the dispenser(s) connected to the Dosing system must be complied with.

4.6 Preparation before starting up - visual check

Make a visual check of the Dosing system daily, before starting work, and before each shift change. If there is any doubt at at that the unit is not perfectly ready for operation, it must be shut down at once and inspected by a suitably qualified person before it used again.

4.7 Preventing damage to the motor of the dispenser

Only remove and insert the mains plug of a dispenser (plug 16, section 5.2, Connections on page 11) **when the power has been switched off**. Otherwise the electronics of the drive motor could be damaged.

4.8 Sources of danger due to Dosing system

Failure to follow the instructions given below can result in damage to the unit and possible severe injury to persons in the vicinity.

» Very high dosing pressures can be produced, depending on the viscosity and the speed of rotation, and this could result in unintended spurting out of the medium. **Check the flow quantity in relation to the dosing needle used (needle cross-section).**

» When it is started up for the first time and after being refilled, air bubbles that are included in the medium could cause an uncontrollable spurting out of the outlet nozzle. **Only start production operation once the Dosing system has been completely bled.**

» Wear suitable protective clothing if chemical, corrosive or dangerous products are being used. **Note and comply with the safety stipulations and the information from the manufacturer.** Ensure sufficient bleeding or extraction of air. Take special safety precautions if working with dangerous media, for example, provide eye flushing facilities if working with corrosive chemicals.

5 Operation

⚠️ Before starting up the Dosing systems the safety information in section *4, Safety,* starting on page *7,* must have been read and understood.

5.1 Displays and controls

	Designation	Function, description
1	*Graphic display*	
2	Keys	For service, software update
4	*NAVI wheel*	Select and set variable values and input dialog confirmations.
5	Key *START*	Starts the dosing / function
6	Key *STOP*	Stops the dosing / function; emergency stop
7	Key *PRG / Esc*	Selection of programming, quitting an input dialog.
8	Key *INFO*	Brings further information onto the display, used to quit page 2 in the dosing programs.
9	*Return*	Confirmation of a selection / value input.

Shortcut keys for dosing programs

10	*Time program*	There is a status LED
11	*Start / stop program*	on the right
12	*Quantity program*	next to the key
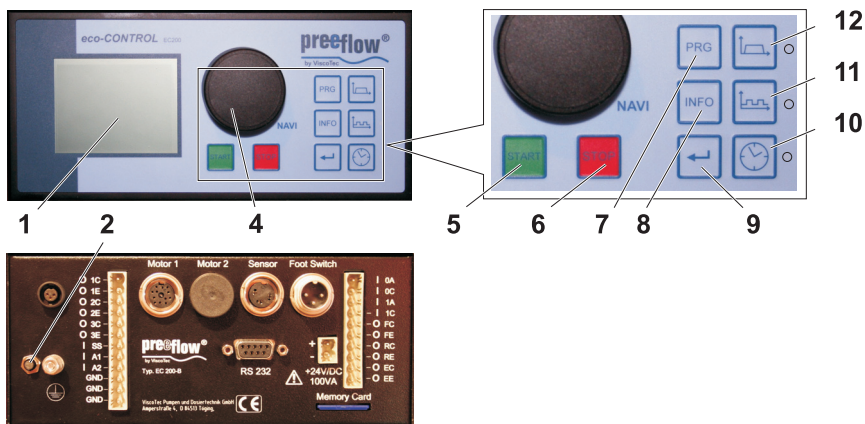
5.2 Connections

	Designation	Function, description
13	Air pressure sensor	Input compressed air monitoring (external sensor)
14	Connection to earth	Potential equalization line
15	System plugs	See section 8.3, page 34 for the pin-outs
16	Motor 1 / 2	For dispensers 1 and 2
17	Sensor	Input level monitoring medium
18	Foot switch	Foot switch for hands-free operation
19	System plugs	See section 8.3, page 34 for the pin-outs
20	RS 232	Data transfer with PC, interface. preparation
21	+24 V/DC 100 VA	Mains plug, connection for power supply
22	Chipcard (SD memory card)	Chipcard reader (SD memory card)
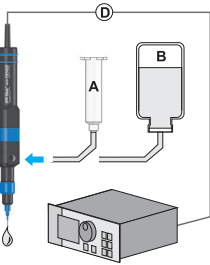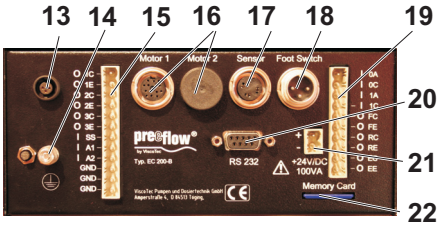
Self-levelling
liquid, low viscosity
medium
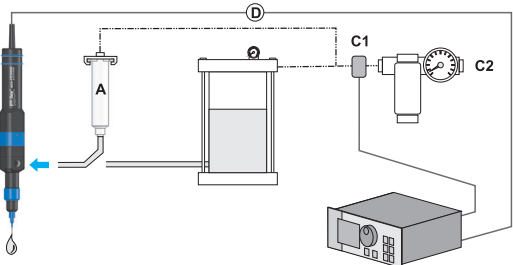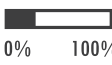
Not a self-levelling liquid,
medium/high viscosity medium

A	Cartridge	C2	Compressed air, external
B	Bottle	D	Power supply dispenser
C1	Compressed air sensor (primary pressure medium)		

5.3   Symbols on the screen

	Designation / function	Description
	Dosing program quantity	See 5.8.1, Dosing programs, page *15* of the quantity program
	Dosing program start / stop	See 5.8.1, Dosing programs, page *15* Start / stop program
	Dosing program time	See 5.8.1, Dosing programs, page *15* time program
	Flow rate	Dosing quantity per minute[a]
	Sucking back	Preventing dripping of the medium The amount of medium that is "sucked back" into the dispenser in connection with the dosing process.
	Calibrating	Matching the dispenser by determining the effective flow rate.
	Teach in	Empirical determination of the dosing quantity
	Saving	Used to save the last values that had been amended. Only applies if a chipcard has been inserted.
	Start / stop	Shows the current controlling of the dispenser (high/low). The switch is set to I during dosing.
	Relative quantity, capacity	Dynamic display of the flow rate, for example
	Error	Plain text messages in the status line give information on the relevant error message. Details can be called up with the Info key.

a) depending on connected Dispenser in **ml** or **µl** respectively **g** or **mg**

5.4 Functional and operational schematic

The interaction of the screen displays, the input dialog and the function keys:

The control system has an intuitive input dialog. The selection or the change of a value is offered on the screen to suit the relevant program section. The corresponding area (A)[1] on the screen is then shown as inverse.

The status bar (B) provides plain text messages in accordance with the input dialogs.

```
B                          A

  Calibration auto      ⟂⟂⟂
                          g
  Desired qty   00.500 ml
  Actual qty    00.000 ml
  Flow rate     middle

  Insert value        Esc  OK
```
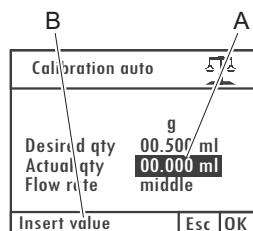
NAVI wheel (see 5.1, Displays and controls, page 10)
It is used for the quick selection, input and confirmation of various functions.

The *rotation* of the *NAVI wheel switches* to the next or previous selection, depending on the direction of rotation, or changes a value.

A *press* of the *NAVI wheel confirms* a selection or a change in value that had just been made. (Alternatively, the *Return* key can also be used for confirmation)

Changing a setting value

1. Select the value to be changed by *rotating the NAVI wheel*, the value is shown in inverse.
2. *Press the NAVI wheel*, numbered items[1] can be selected individually.
3. Select a numbered item by *rotating the NAVI wheel*, the numbered item flashes.
4. *Press the NAVI wheel*, the numbered item is shown in inverse.
5. Change the value by *rotating* the *NAVI wheel* and press the *NAVI wheel* for confirmation, the numbered item flashes again. Another numbered item can be selected.
6. If further numbered items are to be changed, start again from 3., and if not, continue.
7. Press the *PRG* key to confirm the change, the value that has just been set is shown in inverse, if other values can be changed in the input dialog, these can now be reached by *rotating* the *NAVI wheel*.

Esc
Used to quit an input dialog. In some cases it also assumes other functions. If that is the case, this is shown in plain text in the status line.

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[1] depending on connected Dispenser in **ml** or **µl** respectively **g** or **mg**

5.5 Starting up

➡ **Caution:** Only remove and insert the mains plug of a dispenser (plug 17, section 5.2, Connections on page 11) once the power has been switched off. Otherwise the electronics of the drive motor could be damaged.

➡
- Ensure that the mains switch has been turned off.
- Make the earth connection to the potential equalization line.
- Funktionsbereitschaft des / der Dispenser(s) gemäß der mitgelieferten Inbetriebnahme- und Wartungsanleitung herstellen.
- Connect the plug of the dispenser(s).
- Connect the power supply to the control system.
- Switch on the power supply, and the Dosing system is ready for operation.

Note: The Dosing system is only ready for operation if the dispenser has been connected.

5.6 Switching on and off

The Dosing system has no mains switch of its own. It is switched on by applying mains power.

5.7 Shutting down

Shutting down is done in the reverse order of starting up.

5.8 The dosing programs and their areas of application

General
In order to achieve *eco-CONTROL EC200-B* the most accurate results, all the main factors for a reproducible dosing operation can be set.

The dosing system must be recalibrated when the medium is changed.
See, 5.9, Calibrating page 16.

All the parameters of a dosing program can be saved. When using a memory card, there are 24 program slots available for permanent storage.
If you do not have a data card, the data is stored temporarily in program slot 00. It is kept until the dosing system is switched off.

The following values can be defined, depending on the dosing program used: Dosing program	Flow quantity	Flow rate	Dosing time	Sucked back quantity	Suck back speed	Pause before Sucking back	Material density
Quantity program	x	x		x	x	x	x
Start / stop program		x		x	x	x	
Time program		x	x	x	x	x	

5.8.1   Dosing programs

Quantity program
The *quantity program* is used to give out a fixed and defined quantity of medium. Depending on the dispenser and the medium used, it is possible to set very small amounts per dosing. The dosing time is determined by the volume flow. The dosing operation can be broken off at any time until the set time has expired (*STOP* key).

Note: The controller automatically sets the theoretical dosing amount at the connected dispenser.

Maximum flow quantity that can be set:

eco-PEN300 0,1 ml	eco-PEN450 11 ml	eco-PEN600 34 ml	eco-PEN700 100 ml

start / stop program
The *start / stop program* is used when the dispenser is set to convey the medium for the relevant individual period by the operator (or an external controller). The amount that is dispensed can be defined. The dosing quantity is determined by the volume flow.

Time program
The *time program* is used if the dosing is to be done for a set period. This is triggered by the operator (or an external controller). The amount that is dispensed can be defined. The dosing operation can be broken off at any time until the set time has expired (*STOP* key). The maximum dosing time that can be set is 99.99 seconds.

5.8.2   Operating modes

Dosing manually
In the three dosing programs the dosing is initiated by pressing the *START* key. The *quantity programs* and the *time program* end the dosing by itself once the set values have been reached or at the end of the set dosing time.
In the *start / stop program* the dosing is ended by pressing the STOP key.

Dosing with the foot switch
The dosing system reacts to the pressing of the foot switch as follows:

Dosing program	Press the foot switch	... and release it again
Quantity program	Quantity program ends	
Start / stop program	Dosing on	Dosing off
Time program	Time program ends	

In the quantity and time programs the dosing can be stopped by pressing the *STOP* key before the specified values have been reached (EMERGENCY STOP). A set pause and a return flow are carried out as well.

Dosing by means of an external controller

As in the case of *dosing with the foot switch*, but the triggering and termination of the dosing are done by supplying an electrical signal. See 8.3, Interfaces, page 34.

Note: If a memory card is being used, press the foot switch briefly to load the saved and most recently run program and to display it on the screen. Press the foot switch once again to start the dosing. It behaves in exactly the same way with an external signal.

5.9 Calibrating

Preparation

• Connect to the controller the dispenser that has been made ready for operation and bled.

Caution: Only remove and insert the mains plug of a dispenser (plug 16, section 5.2, Connections on page 11) once the power has been switched off. Otherwise the electronics of the drive motor could be damaged.

• Keep at hand a suitable vessel (calibration vessel) to catch and measure the quantity required for calibration.

5.9.1 Calibration auto

Note: During the calibration operation the Dosing system cannot be operated by either the foot switch or an external control signal.

• Press the *PRG* key, *system selection menu*, display 2 appears.

• Select and confirm *Calibration auto*, the menu *Calibration auto*, display 14 appears.

• Select * and confirm the desired flow rate
• Select the OK button and confirm, the next input dialog appears (display 15).

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11   Esc  OK
```
Display 2
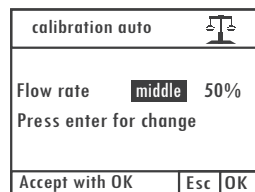
```
calibration auto       ⚖

Flow rate    middle  50%
Press enter for change

Accept with OK      Esc  OK
```
Display 14

* The flow rate (output of the dispenser) should correspond approximately to the flow speed at which the dosing is to be done. The values 25%, 50% and 75% are offered for selection. This setting compensates for a reduction in the level of efficiency (depending on the medium) as the speed increases.

Selection whether the calibration is to be done with quantity unit **ml**(µl) or **g(mg)*** and confirm this, the set quantity can be set as desired.

* If the saved density value corresponds to the value 1.000 g/cm³ (default value), the input dialog for the material density appears when you select **g(mg)**. See 5.10.5, Material density, page21.

```
┌─────────────────────────────┐
│ Calibration auto      ⚖      │
│                             │
│   ml          g             │
│ Desired qty   00.500 ml     │
│ Actual qty    00.000 ml     │
│ Flow rate     middle        │
│ Press Start        Esc  OK  │
└─────────────────────────────┘
```
Display 15

- Set and confirm the set quantity.
  The value preset in the Dosing system is to be regarded as the ideal value.

- Position the calibration vessel underneath the outlet nozzle (dosing needle) of the dispenser.
- Press the *START* key, the calibration starts, the dispenser is switched on and conveys the quantity specified by the system. This process can be repeated as often as desired. e.g., for comparative measurements.
- The ACTUAL amount that goes into the calibration vessel is determined in the previously set measuring unit. See also 5.10.1, Dosing amount.
- Input and confirm the ACTUAL quantity that has been determined.
- Select the OK button and confirm, the next dialog to save the calibration value appears (display 17.1).

- Accept or discard the suggested program slot, confirm this, and the system has been calibrated.

```
┌─────────────────────────────┐
│ Calibration auto      ⚖      │
│                             │
│                             │
│ Save calibration value      │
│ at prog. no.:  00           │
│                             │
│ Save with OK       Esc  OK  │
└─────────────────────────────┘
```
Display 17.1

5.9.2 Calibration manual

The *Calibration manual* function provides a simplified option to recalibrate the system without having to run through the entire process in the *Calibration auto* menu.
This can be helpful, for example, after changing the stator, in the event of batch-related product variations, etc., whereby the set dosing value is not to be changed (QA documents, etc.).
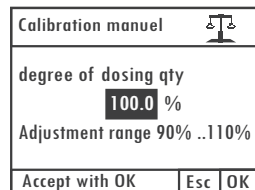
➡ **Caution:** Setting the flow rate in the *Calibration manual* menu also changes the dosing results of all the dosing programs by a linear factor.

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select and confirm *Calibration manual*, the *Calibration manual* menu, display 40 appears.

```
┌─────────────────────────────┐
│ Quantity program            │
│ Start/stop                  │
│ Time program                │
│ Calibration auto            │
│ Calibration manuel          │
│ Teach in function           │
│ Administration              │
│ Service                     │
│ 10 47h Fr 18.03.11  Esc  OK │
└─────────────────────────────┘
```
Display 2

- Confirm the flow rate and set the desired value with the *NAVI wheel*
- Press the *OK* button, *system selection menu*, display 2 appears.

```
Calibration manuel        ⚖
────────────────────────────
degree of dosing qty
         100.0  %
Adjustment range 90% ..110%
────────────────────────────
Accept with OK      Esc  OK
```
Display 40

5.10 Settings

5.10.1 Dosing amount

General on determining the dosing amount.

➡ **Note:** If a value that differs from 100% is set in the *Calibration manual* menu (section *5.9.2*), this affects the results of the dosing.

There are two options to choose from:

A) Determination via calculation
It is easiest to determine the smallest dosing quantities by weight. We recommend that you first set the material density.
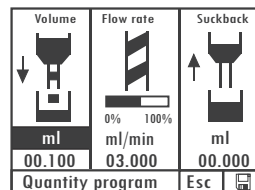Dose the required amount with the *start / stop program* and weigh it out. Now input in the *quantity program* the quantity in **g**.

B) Teach in, empirical determination
Use the *Teach in* function if you wish to determine the required amount by means of doing (for example, filling a void). The Dosing system saves the required amount.

Setting the dosing amount as a value

1. Press the *Quantity program* shortcut key, display 3 appears.
2. Ensure that the required quantity unit* has been selected in the *Quantity* display area.
3. Set and confirm the dosing amount.

```
Volume   Flow rate   Suckback
          0%   100%
  ml      ml/min       ml
00.100   03.000     00.000
Quantity program    Esc  💾
```
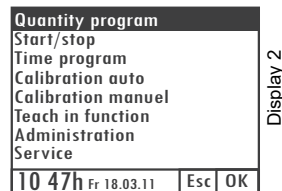Display 3

* If the saved density value corresponds to the value 1.000 g/cm³ (default value), the input dialog for the material density appears when you select **g**. See 5.10.5, Material density, page21.

**Setting the dosing quantity with the Teach in function**

Note: The Dosing system cannot be operated by either the foot switch or an external control signal can be used during the *Teach In* function.

4. Press the *PRG* key, *system selection menu*,
   display 2 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11    Esc  OK
```
Display 2

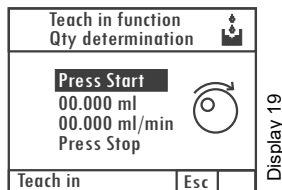5. *Select and confirm the Teach in function*,
   display 18 appears.

6. Confirm the *NAVI wheel* selection, the first input dialog
   to determine the quantity appears (display 19).

   (The procedure with the selection*External* is described
   from 9. onwards.)

```
Teach in function
        
     NAVI-wheel
      External

select signal      Esc
```
Display 18
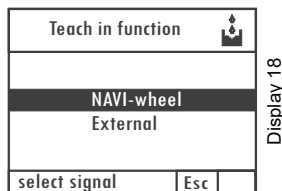
7. Press the *START* key, the second input dialog to
   determine the quantity appears (display 20).
   In addition, the conveying capacity is shown.

   The NAVI wheel controls the dispenser in a linear
   fashion, 1/4 tourn = 1/4 conveying capacity.

```
Teach in function
Qty determination
   Press Start
   00.000 ml
   00.000 ml/min
   Press Stop
Teach in          Esc
```
Display 19

8. Rotate the *NAVI wheel* until the desired dosing quantity
   is reached. The amount given out is shown directly.

```
Teach in function
Qty determination
   Press Start
   00.780 ml
   01.053 ml/min
   Press Stop
Teach in          Esc
```
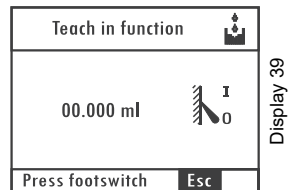Display 20

Continue with 12. (9. to 11. only apply when controlling by means of an external signal)

9. *Select External* and confirm, the input dialog to determine the quantity appears, display 39.

Display 18

Teach in function

NAVI-wheel
External

select signal   Esc
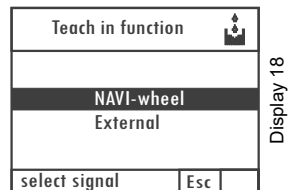
10. *Create an external signal* (e.g., press the foot switch), the dispenser is started up.
11. Once the dosing quantity has been reached, switch off the *external signal*. The dosing quantity is displayed, accept it with *OK*.

Display 39

Teach in function

00.000 ml

Press footswitch   Esc

12. Press the *STOP* key, *OK* is offered to save the dosing quantity.
13. Confirm with *OK*, the dosing quantity is saved and display 3, *Quantity program*, appears with the saved quantity.
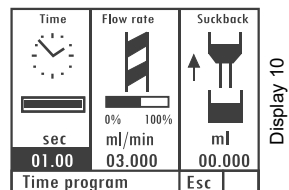
Display 3

Volume	Flow rate	Suckback
	0% 100%	
ml	ml/min	ml
00.100	03.000	00.000
Quantity program	Esc	
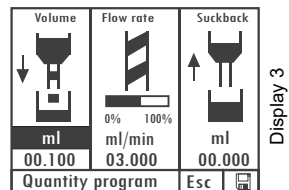
Note: Since the flow rate in the Teach in function can differ from the flow rate in the program that is used subsequently, we recommend that you next check this and make any necessary corrections if there are especially tight requirements concerning the dosing quantity.

5.10.2 Dosing time

1. Press the *Quantity program* shortcut key, display 10 appears.
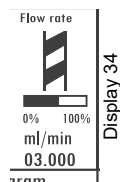2. Set, confirm and save the dosing time.

The set value remains active until the next change or until the Dosing systems is switched off. Alternatively, a value of its own for the flow rate can be assigned to each dosing program (See 5.14, Changing a dosing program, page 29).

Display 10

Time	Flow rate	Suckback
	0% 100%	
sec	ml/min	ml
01.00	03.000	00.000
Time program		Esc

5.10.3 Flow rate

The flow rate can be set in each dosing program. The maximum flow rate that can be set is:
eco-PEN300 1,48 ml/min; eco-PEN450 6 ml/min; eco-PEN600 16 ml/min

• Selecting, changing and saving the displayed value.

The bar chart shows in what range (%) the flow rate is.

Display 34

Flow rate
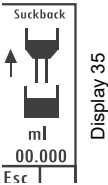
0%   100%
ml/min
03.000
gram

The set value remains active until the next change or until the Dosing systems is switched off. Alternatively, a value of its own for the flow rate can be assigned to each dosing program (See 5.14, Changing a dosing program, page 29).

5.10.4 Sucking back

In order to effectively prevent any dripping of the medium, a value for the sucking back can be set. The maximum amount for sucking back that can be set is 0.5 ml (eco-PEN300 50 µl).

• Selecting, changing and saving the displayed value.

The sucking back is done after each dosing operation.

The set value remains active until the next change or until the Dosing systems is switched off. Alternatively, a value of its own for the sucking back can be assigned to each dosing program (See 5.14, Changing a dosing program, page 29).

Display 35

```
Suckback

ml
00.000
Esc
```

5.10.5 Material density
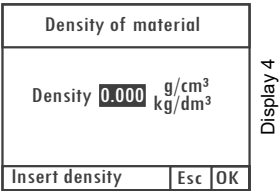
Inputting the material density for the first time

• Press the Quantity program shortcut key, menu Quantity program, display 3 appears.
• Confirm selection, display 4, input dialog for material density appears.

Note: If the quantity can be switched from *ml*(µl) to *g(mg)*, a material density has already been set and saved. See the following description *Changing the set material density.*
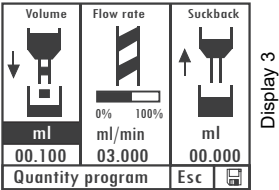
• Set, confirm and save the material density.

After leaving the input dialog, the *Quantity program* menu, display 3, appears again.

Display 3

```
Volume   Flow rate   Suckback

         0%    100%
ml        ml/min      ml
00.100   03.000      00.000
Quantity program    Esc
```

Display 4

```
Density of material

Density  0.000  g/cm³
                kg/dm³

Insert density    Esc  OK
```

Changing the set material density

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select and confirm *Administration*, the *Administration* menu, display 25 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11    Esc  OK
```
Display 2

- Select *Change program*, the input dialog for Change a program appears, display 26.

```
Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time
```
Display 25

- *Rotate* the *NAVI wheel* on page 2 to navigate to the program* to be changed, display 27 appears.

```
Program no.   00  /  1
Type      Quantity program
Volume    00.100 ml
Speed     03.000 ml/min
Suckback  0.000  ml
Speed     03.000 ml/min
Pause     0.00   s
Calibr.   no
10 47h Fr 18.03.11    Esc
```
Display 26

- Change and confirm the material density value (*Density*).

After leaving the input dialog, the *Administration* menu, display 25, appears again.

```
Program no.   00  /  2
Type      Quantity program
Desired pr. 1.0  Bar
Actual pr.  0.0  Bar
Density     0.000  g/cm³
Info        . . . . . . . . . .
User no.
. . . . . . . . . . . . . . . . . .
10 47h Fr 18.03.11    Esc  🖫
```
Display 27

* If you are using a memory card and the material density value is to be changed in a particular program. If there is no memory card in the control system, the change is made in program 00 (volatile memory).
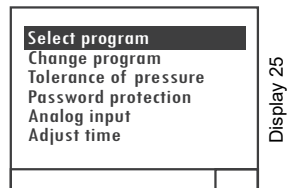
5.10.6   Tolerance value primary pressure monitoring

If the air pressure at the pressure regulating valve is changed (primary pressure for the medium), an alarm is given and no further dosing is possible. A tolerance value can be set. The alarm can be switched on or off. See 5.10.10, System and error messages, page 26.

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select *Administration*, display 25 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11    Esc  OK
```
Display 2
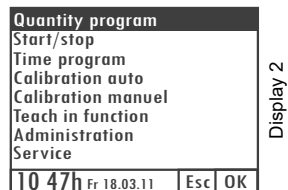
- Select *Pressure tolerance*, display 29 appears.

```
Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time
```
Display 25

- Input the *Pressure tolerance* tolerance in the input dialog and confirm with *OK*, display 25 appears.

```
Tolerance of pressure


Tolerance  ± 0.2  Bar


Insert value          Esc  OK
```
Display 29
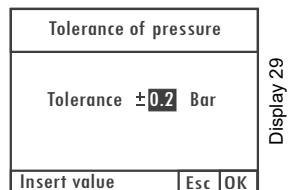
5.10.7 Password protection

The password protection blocks access to the settings of the controller and all function keys. Dosing is possible via a foot switch (optional) and an external signal (system plug). The most recently selected dosing program is always run and shown on the display.

Setting range for the password: 0000 to 9999
Time of the automatic blocking after the last input: 30 seconds.

Turning on password protection

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select and confirm *Administration*, the *Administration* menu, display 25 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11    Esc  OK
```
Display 2

- Select *Password protection*, display 41 appears.

```
Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time
```
Display 25
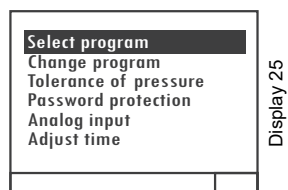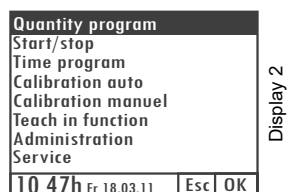
- Press the *Navi wheel*, display *On*, changes to *Off*, *Protection active* appears in the status bar.
- Select and confirm the password (code).
- Set the password by turning* the *Navi wheel*.
- Press the *OK* button and confirm, password protection has been activated.

Password protection	
on	Display 41
Code 5000	
protection inactive Esc OK	
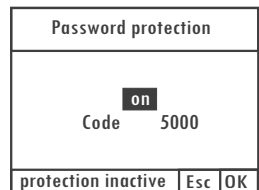
* Dynamic behaviour: The faster it is turned, the quicker the range of numbers changes.

Note: If no further buttons are pressed, the password protection blocks the controller after 30 seconds.

**Releasing the controller
(if password protection has been activated)**

The start screen is shown when it is in the blocked state. Display 42 appears if a button is pressed.
- Select the correct password by turning the *Navi wheel* and confirm it by pressing, then the start screen appears.
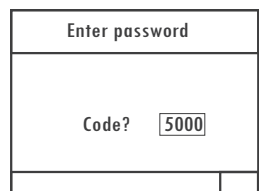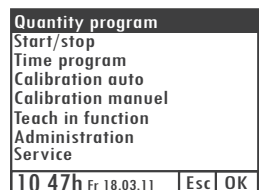
Enter password	
Code? 5000	Display 42

Note: If no further buttons are pressed, the password protection blocks the controller after 30 seconds.
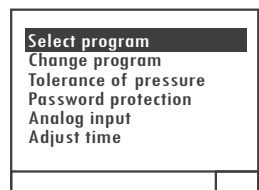
Turning off password protection

Release the controller as described above.

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select and confirm *Administration*, the *Administration* menu, display 25 appears.

Quantity program	
Start/stop	Display 2
Time program	
Calibration auto	
Calibration manuel	
Teach in function	
Administration	
Service	
10 47h Fr 18.03.11 Esc OK	

- Select *Password protection*, display 41 appears.

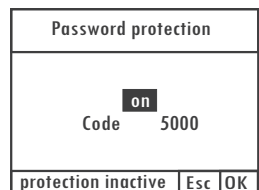| Select program	
Change program	Display 25
Tolerance of pressure	
Password protection	
Analog input	
Adjust time	

- Press the *Navi wheel*, display *Off*, changes to *On*, *Protection inactive* appears in the status bar.
- Press the *OK* button and confirm, password protection has been deactivated.

| Password protection	
on	Display 41
Code 5000	
protection inactive Esc OK	

5.10.8 Analogue Input

Description: The flow rate of the connected pump(s) is controlled proportional to the applied analogue signal (V or mA).
This function is only active in the *Start / Stop program*.

Technical connection data on the system connector (15)				
Pin	Analogue signal	Input resistance / resolution	Pump	ml/min
A1	0-10V	Ri = k 20 kΩ / 10 bit	ecoPEN300	0 - 0,1
A2	04-20mA	Ri = 100Ω / 10Bit Maximum input voltage +5V	echPEN450 ecoPEN600 echPEN700	0 - 11 0 -34 0 - 100
GND	GND Analog			

Note: Whatever the setting of the flow rate in the *Start / Stop program*, the maximum flow rate of the pump (see table above) must always be assumed. This setting does not affect the return.

Switching the analogue input on / off

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select and confirm *Administration*, the *Administration menu*, display 25 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11   Esc OK
```
Display 2

- Select *Analogue Input*, display 43 appears.
  The current setting is shown in the status bar.

```
Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time
```
Display 25

- Select the desired setting and press *Navi wheel*, the status bar displays *Press OK to accept.*
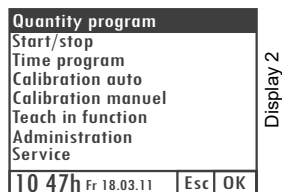- Select the *OK* button and confirm, the setting is activated.

```
Analog input


Off  A1  A2


Analog inactive   Esc OK
```
Display 43
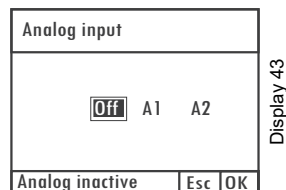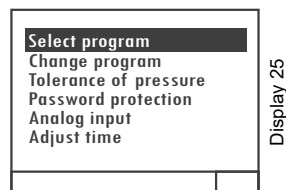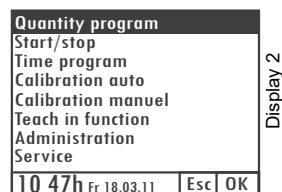
Note: If one of the two analogue inputs is active, this will be indicated in plain text in the display of the *Start / Stop Program* (display 44) instead of the dynamic flow rate display.
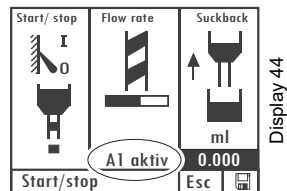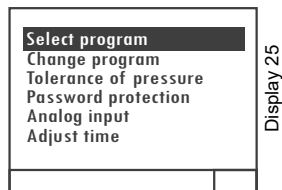
Display 44

5.10.9 Time and date

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select *Administration*, display 25 appears.

Display 2

Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11   Esc   OK

- Select *Set time*, the time and the date can be set in the status bar with the aid of the *NAVI wheel* field by field.

Display 25

Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time

5.10.10 System and error messages

Switching error messages on / off

- Press the *PRG* key, *the start screen*, display 1 appears.

Display 1

pre⊖flow®
by ViscoTec

Dosierstation
eco-Control Ec200

10 47h Fr 18.03.11
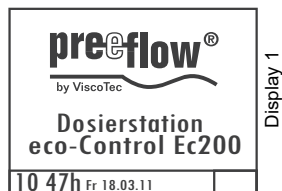
- Press and hold down the *START* key.
- Press the *Quantity program* key, *Config. Error messages* are displayed (display 33).

Select the desired error message and switch it on or off with the *Enter* key.

Press the *Esc* key to quit the menu.

Display 33

Config. alarm messages	
Level control	Off
Primary pr. control	Off
Over-current control	On
External level sensor	Off
Volume OK	30
Volume alarm	30
10 47h Fr 18.03.11	
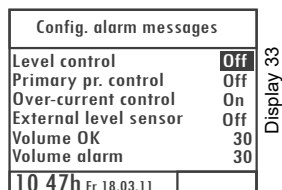
If the *Level monitoring* function has been activated with *ON*, the *Ext. level sensor* switch can be used to switch between the signal input at the
plug *sensor* (17) = *OFF*
*and* system plug (19) = *ON*.

The volume is set with the *NAVI wheel* and confirmed with the *Enter* key.

All the values that are set here are saved permanently in the Dosing system.
Note: The overcurrent monitoring is set permanently to ON.
The primary pressure and level monitoring functions protect the dispenser. This effectively prevents any damage due to running dry if there is too little medium.
(Connection for the level signal, see 5.2, Connections, page 11)

Error message SD chipcard

If the chipcard is defective or has not been inserted, when the Dosing systems is switched on a corresponding message (display 37) is shown for 3 seconds.

Can´t find memory card.
10 47h Fr 18.03.11
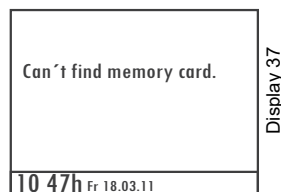
Display 37

5.11   Clearing error messages

If there is an error message, it is shown flashing in the status line (display 36) and an acoustic signal is given (if it has not been switched off, see 5.10.10, System and error messages, page 26)

Volume	Flow rate	Suckback
ml	ml/min	ml
00.100	03.000	00.000
Fault		Esc

Display 36

• Press the *Info* key, the acoustic signal is switched off, and the corresponding error message appears.

Alarm messages
Check pressure!
Desired pr.   Actual pr.
1.0Bar   0.2Bar
Quit   OK

Alarm messages
Over current shutdown!
Check dispenser!
Read manual!
Quit   OK

Alarm messages
Level minimum
Check level!
Quit   OK
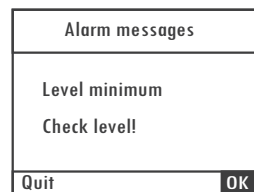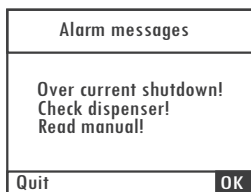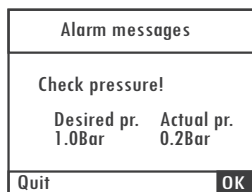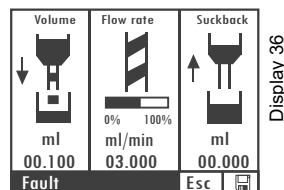
• Correct the error and clear the error message with *OK*.

➡ **Caution:** If the error message *Overcurrent switching* appears, the dispenser must be cleaned before any further use.

5.12   Creating dosing programs

Only possible when using a memory card, a diskette symbol appears in the display at the lower right. If there is no memory card, then only program 00 (volatile memory) is available.

The creation of a dosing program is done as part of the Save function by inputting a dosing program number.

- Select the dosing program (e.g. quantity program).
- Set the values (quantity, flow rate, sucking back).
- Save and input a dosing program number.

Use a memory slot that is still free so that no existing data is overwritten.

All the setting options for this dosing program are now available for editing. Do this as described below under 5.14.

5.13   Select the dosing program

Only possible if using a memory card. If there is no memory card, then only program 00 (volatile memory) is available.

- Press the *PRG* key, *system selection menu*,
  display 2 appears.
- Select *Administration*, display 25 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11   Esc  OK
```
Display 2

- Activate *Select program*, display 26 appears.

  Program 00 (volatile memory) or the last program that was used is shown.

```
Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time
```
Display 25

- Select and confirm the desired program number, the selected program is activated, dosing can be done at once. (See also 5.15)

```
Program no.    00  /  1
Type      Quantity program
Volume    00.100  ml
Speed     03.000  ml/min
Suckback  0.000   ml
Speed     03.000  ml/min
Pause     0.00    s
Calibr.   no
10 47h Fr 18.03.11   Esc
```
Display 26

5.14 Changing a dosing program

Only possible if using a memory card. If there is no memory card, then only program 00 (volatile memory) is available.

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select *Administration*, display 25 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11    Esc  OK
```
Display 2

- Activate *Select program*, display 26 appears.

  Program 00 (volatile memory) or the last program that was used is shown.

```
Select program
Change program
Tolerance of pressure
Password protection
Analog input
Adjust time
```
Display 25

- Select and confirm the desired program number, all program parameters (pages 1 and 2) can be changed.

```
Program no.    00  /  1
Type      Quantity program
Volume    00.100  ml
Speed     03.000  ml/min
Suckback  0.000  ml
Speed     03.000  ml/min
Pause      0.00   s
Calibr.    no
10 47h Fr 18.03.11    Esc
```
Display 26

Note: The value in the *Pause* function defines the amount of time between stopping the dosing and starting the sucking back.
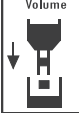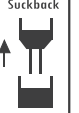
The pressure unit *Bar* can be changed over to *psi*.
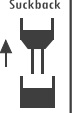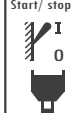
```
Program no.   00  /  2
Type      Quantity program
Desired pr.  1.0  Bar
Actual pr.   0.0  Bar
Density    0.000  g/cm³
Info       . . . . . . . . . .
User no.
. . . . . . . . . . . . . . . . . .
10 47h Fr 18.03.11    Esc   ▣
```
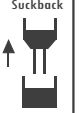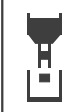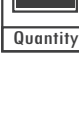Display 26.1

5.15   Dosing

- Select the dosing program, this can be done with the shortcut keys for the dosing programs
  - *» Quantity program*
  - *» Time program*
  - » Using the *start / stop program*.
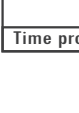- The associated main display appears for the relevant dosing program.

- After the first dosing operation the display changes to the associated detail display for the relevant dosing program.

Detail display

- Use the *Info* key to display all the dosing program parameters.

Display 26 / 26.1

5.16 Bleed the dispenser (after filling, cleaning)

Caution: Dosing system Do **not** switch on before medium has been fed in. There is a danger of **damage.** Even a **brief** period of dry running can **lead to the stator being destroyed.**

The dispenser must be bled when it is used for the first time and each time after refilling or cleaning. Do this in accordance with the notes given in the operating instructions of the dispenser.
It is best to use the *start / stop program* with a medium flow rate to control the dispenser.

5.17 Service

5.17.1 Operating information

- Press the *PRG* key, *system selection menu*, display 2 appears.
- Select and confirm the *Service* function, display 38 appears.

```
Quantity program
Start/stop
Time program
Calibration auto
Calibration manuel
Teach in function
Administration
Service
10 47h Fr 18.03.11    Esc  OK
```
Display 2

All the main system and operating times are displayed.
The language for the displays can be set.

```
ViscoTec EC200
Serial number    1034
Software  EC200 V1.004
Motor totally    00002h13m
System totally   00152h26m
Error msg
Type of pump     eco-PEN450
Language         English
10 47h Fr 18.03.11
```
Display 38

5.17.2 Formatting the chipcard

- Using the chipcard
- Press the *PRG* key, *the start screen*, display 1 appears.
- Press and hold down the *START* key.
- Press the *PRG* key.
- Release both keys again, the chipcard is reformatted, and any data on it is deleted. A confirmation message appears on the display: *Chipcard initialized and ok.*

```
pre*flow®
by ViscoTec

Dosierstation
eco-Control Ec200
10 47h Fr 18.03.11
```
Display 1

6   Accessories / spare parts

Item	Part No.	Designation	Comment
1	20118	Chipcard for controller eco-CONTROL EC 200	
2	20159	Mains adapter 2.7 A for eco-Control EC 200K (1 motor)	For motor 1
3	20183	Protective cap socket motor 1+2	
4	20194	Protective cap for 9-pole Sub-D, RS 232	
5	20168	Sensor empty reporting cpl. for eco-CONTROL EC 200	
6	20165	Foot switch cpl. for eco-CONTROL EC 200	
7	20055	Plug for foot switch	
8	20056	Plug for sensor empty reporting	
9	20313	cable extension 5m cpl.	
10	20314	cable extension 10m cpl.	
11	20333	connection motor 2 for eco-PEN450 and eco-PEN300	
12	20335	connection motor 2 for eco-PEN600	
13	20326	eco-Remote 232 port for ext. channel selection	

7 Troubleshooting / maintenance

Troubleshooting

Error	Possible cause	Correction
Dosing system cannot be operated, no display.	no dispenser connected	connect dispenser (ensure that the mains plug has been removed beforehand)
	Power supply off	switch on
Dosing program cannot be saved, only program 00 is offered	No chipcard inserted, or not formatted	Insert / format the chipcard
Error messages		
Overcurrent monitoring	Dispenser components do not run smoothly due to hardened medium or as a result of dry running.	Dismantle and clean the dispenser, replace the stator if necessary. See the operating instructions for the dispenser.
Level of medium critical	Not enough medium in the supply tank	Fill up with the medium. If the error message remains, check the sensor and sensor input, if applicable, brief "emergency operation" without level monitoring.
Check the compressed air	Compressed air too little, or switched off	Check / switch on the compressed air
	Tolerance range set too small	Set the tolerance range to be larger, see (5.10.6)
	Primary pressure monitoring has been switched on and the dummy plug has not been inserted into the sensor input.	Insert the dummy plug or turn off the primary pressure monitoring, see (5.10.10)

Maintenance

The Dosing control can be regarded as maintenance-free. Do not use any aggressive solvents or cleaners for cleaning, only a damp cloth. Unplug the unit from the mains before doing any cleaning.

8 Technical data

8.1 Dosing control

Dimensions (HxWxD)	92.5 x 240 x 197 mm
Cutout dimensions control cabinet (HxW)	85 x 191 mm
Weight	approx. 980 g
Voltage / mains adapter	24 V DC / option
Performance	max. 50 W depending on the output set
Start	Key, foot switch
Start / stop externally	24 V pulse, 10 mA terminal strip; low 0 to 1.5 V, high 12 to 24 V
On / off switch	no
Interface	RS 232
Compressed air monitoring	0 to 7 bar (0 to 100 psi)
External memory	MM C/SD-Card min 64 MB max. 24 dosing programs can be read with a Microsoft operating system
Operating conditions	+10 °C to +40 °C (non-condensing), air pressure 1 bar
Medium temperature	+10°C to +40°C
Storage conditions	dry/dust-free -10 to +40°C

8.2 Dispenser

See the commissioning and maintenance manual supplied with the dispenser.

8.3 Interfaces

Please request manufacturer or your distributor.

9 Disposal

The final disposal of the Dosing system is to be done in an environmentally-appropriate way. All the materials and packaging must be handled in accordance with the recycling stipulations.

Do not dispose of electrical parts in the household garbage.

They are to be taken to the appropriate collecting points.

2002/96/EU(WEEE)* EU DIRECTIVE concerning used electrical and electronic equipment.

This equipment complies with the RoHS stipulations.

10 EC-Declaration of Conformity

in accordance with the EC-Machinery Directive 2006/42/EG, Appendix II A

We,

ViscoTec Pumpen- und Dosiertechnik GmbH
Amperstraße 13
D-84513 Töging

hereby declare that the machinery described below complies in its design and construction and in the version marketed by us with the basic safety and health requirements of the EC Directive 2006/42/EG.

Product description

Function	Dosing system with dispenser
Model	eco-CONTROL EC200-B with dispenser eco-PEN300 / 450 / 600 / 700

Harmonised standards applied

DIN EN ISO 12100:2011-03	Safety of machinery
DIN EN 809:2011-01	Pumps and Pump Units for Liquids (Common safety requirements)
DIN EN ISO 13857:2008-06	Safety of machinery - Safety distances
DIN EN 61000-6-3:2011-09	Electromagnetic compatibility
DIN EN 61000-6-2:2011-06	Electromagnetic compatibility, Immunity

Töging, 03.04.2019
Georg Senftl
Managing Director and Person authorised to collect the technical documents. (address see above)

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