Operating Instructions

Control unit

Type GRANUDOS S5

without dosing unit

GRANUDOS 45/100-S5

Suitable for the operating instructions for the dosing unit:
GRANUDOS 45/100
No.: BA SW 003

GRANUDOS Flex-S5

Suitable for the operating instructions for the dosing unit:
GRANUDOS Flex
No.: BA SW 022

GRANUDOS 15-S5

Suitable for the operating instructions for the dosing unit:
GRANUDOS 15
No.: BA SW 002

Table of contents

Imprint:

Edition: see footer

These operating instructions are an English translation of the original German version by the company WDT.

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1 About these instructions / general

1.1 Scope of applicability

This instruction describes the function, installation, commissioning and operation of the device. The Operating Instructions must be read carefully before use and kept on the device for direct use!
These Operating Instructions are valid in conjunction with the Operating Instructions:

- **"GRANUDOS Flex Dosing Unit", No.: BA SW 022**
- **"GRANUDOS 45/100 Dosing unit", No.: BA SW 003**
- **"GRANUDOS 10 / 15 Dosing Unit", No.: BA SW 002**

1.2 Target group

Only our authorised partners and people who have been trained in the device functions are permitted to work on the system, provided that they have read and understood these Operating Instructions.
Electrical connection work may only be carried out by appropriately trained specialists!

1.3 Symbols used

This document uses the following types of safety notices as well as general notices:

DANGER!
"DANGER" denotes a safety notice which, if disregarded, may lead to **serious** or **life-threatening injuries, serious material damage** or **death**!

CAUTION!
"CAUTION" denotes a safety notice which, if disregarded, may lead to **injuries, damage to health** or **material damage**!

ATTENTION!
"ATTENTION" denotes a safety notice which, if disregarded, may lead to **material damage** or may impair the **function of the system**

CORROSIVE!
"Corrosive" denotes a safety notice which, if disregarded when handling chemicals, may lead to **injuries** or **material damage**.

ESD SENSITIVE!
"ESD SENSITIVE" denotes electronic components that may be damaged by electrostatic discharges. The generally accepted safety precautions for electronic components must be observed when handling the devices!

NOTICE!
A "NOTICE" denotes information that is of particular importance for the smooth running of operations and that can disrupt the operating process if not observed.

TIP!
A "Tip" denotes information that may result in **improvements in the operating process**.

Use face protection!
Wear approved face protection to prevent facial injuries due to contact with hot or chemical materials.

Use hand protection!
Wear approved hand protection to prevent hand injuries due to contact with hot or chemical materials (according to DIN EN 374: Protective gloves against dangerous chemicals and micro-organisms).

Use protective apron!
Wear an approved protective apron to prevent injuries to the front of your body due to contact with hot or chemical materials.

Use foot protection!
Wear approved foot protection to prevent foot injuries due to contact with hot or chemical materials or falling objects.

1.4 Warranty

All WDT devices and systems are manufactured using modern production methods and are subject to comprehensive quality control. However, should there be a reason for complaint, any compensation claims shall be directed to the company WDT in accordance with the general terms and conditions of warranty (see below).

General terms and conditions of warranty
The company WDT assumes a 2-year warranty, starting with the commissioning, up to 27 months after delivery; subject to correct installation and commissioning with a completed and signed commissioning protocol.
Exempt from this are wear parts such as seals, hoses, diaphragms, dosing screws, electrodes, roller carriers and other parts that are subject to mechanical or chemical wear and tear. For these we assume a warranty of 1/2 year.
Our enterprise resource planning system requires an invoice for each delivery (including warranty services). When returning a defective component, upon review you will receive a corresponding credit, if applicable. We request a return within 14 days.
The costs for subsequent damage and for the processing of warranty claims are excluded.
There are no warranty claims for damage caused by frost, water and electrical overvoltage or by improper handling.

TIP!
In order to protect the warranty claims, please mail the completed commissioning protocol, along with the defective component, to the company WDT. Without the commissioning protocol, we reserve the right to assert a warranty regulation.

NOTICE!
It is not permitted to make any modifications to the device, as this may lead to malfunctions. If this specification is not observed, the warranty obligation and product liability will expire!

1.5 Additional information

Further information about special topics, e.g., design of the dosing performance or description of the operating parameters, is available from your specialist dealer.

1.6 Information regarding support queries

The control unit is subject to continued further development of both its software and hardware. We always strive to preserve the compatibility of the components used, but we are unable to guarantee this over a period of several years!

For spare part orders, we therefore always require the following data. You can find these on the identification plate.

- device designation
- device serial number
- year of manufacture

For technical support requests, we require the software data. You can find these under **Main menu → Service → Info.**

2 Safety

2.1 Intended use

The GRANUDOS S5 control unit must only be used for the purposes described in the product description in *Chapter 3.2, Product description*! Also pay attention to the locally applicable regulations concerning accident prevention, occupational safety and drinking water protection!

2.2 Safety notices

Carefully read and comply with the operating instructions prior to installation, maintenance and use of the device!
Work on the device and changes in the settings **may only be carried out by properly instructed persons**!

2.2.1 Handling of chemicals, risks to humans and the environment

Danger due to corrosive substances!
Formation of substances hazardous to health when handling and mixing chemicals!
In emergencies, contact the respective poison control centre.

Emergency number:

Munich Emergency Poison Centre (or any other Poison Centre)

Phone: +49 89 19240

2.2.2 Protective measures and rules of conduct

CORROSIVE!
The GRANUDOS Touch control unit controls devices that dose corrosive chemicals. For this reason, it is essential that you pay attention to the safety information.

ESD SENSITIVE!
The electronic components in the device control units are sensitive to electrostatic discharge. For this reason, the generally accepted safety precautions for electronic components must be observed when handling the devices, including:

- **Discharge of personal static charge**
- **Dissipative clothing**
- **Disconnect the device from the voltage supply**

3 Product description – scope of delivery

3.1 Scope of delivery / accessories

The GRANUDOS S5 control unit is delivered as standard.

Customer-specific or order-related modifications are possible.

3.2 Product description

The **GRANUDOS S5** control unit is intended solely for control tasks associated with the treatment of swimming pool water. It is used for the following dosing devices:

- **GRANUDOS 45/100-S5**
- **GRANUDOS Flex-S5**
- **GRANUDOS 15-S5**

The control unit has the following main functions:

- Chlorine dosing via dosing screw from the drum (GRANUDOS 45/100) or the dosing hopper (GRANUDOS Flex, GRANUDOS 15)
- Acid dosing with peristaltic pump directly from the supply canister
- Backwash disinfection / shock chlorination
- Fault indications, e.g., chlorine empty, acid empty, collective fault message potential free

Device overview

The GRANUDOS S5 control unit is mounted on the respective dosing device.

Figure 1, GRANUDOS 45/100-S5, GRANUDOS Flex-S5 GRANUDOS 15-S5

GRANUDOS S5 control unit

The control unit is contained in a dust-proof housing. The start display, called “automatic” operation in the display, shows the operation mode, the dosing performance and any pending actions or fault indications, if applicable.

3.3 Identification of the device/ Identification plate

For spare part orders and troubleshooting, the device serial number and the software version must be indicated. The device serial number is located on the identification plate on the right side of the control housing. The software version can be found using the menu item **Main menu → Service → Info**.

Identification plate see OI Dosing unit

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

3.4 Technical data

	GRANUDOS **45/100-S5** control unit	GRANUDOS **Flex-S5** control unit
Connection data		
Electrical connection data	240 VAC/50-60 Hz ± 10%, 35 W, I max. 0.2 A, standby 22 VA, safety (Schuko) plug 240 VAC	
Protection class	Control housing IP54	
Interface connection	—	
Operating data:		
Measuring range	pH-value: 2.00 to 12.00 pH-value: 2.00 to 12.00	
Medium temperature Ambient temperature Humidity technical room	0 to 40°C 5 to 35°C max. 70% (non-condensing)	
Hypochlorous acid concentration	max. 0.35%	max. 0.2%
Room ventilation (in and out)	According to DIN 19643	
Material of control housing	Housing: PS	
Firmware version	–	
Hardware version	—	

Additional data, see the dosing unit of the respective dosing device.

4 Installation

See operating instructions for the dosing unit of the respective dosing device.

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

5 Commissioning

For commissioning, see the operating instructions for the dosing unit of the respective dosing device.

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

The device is delivered with defined factory settings. You can find the setting values in the operation data sheet in *Chapter 9.4*. Adjust the parameters to your pool's requirements.

6 Operation / service of the control unit

Hinweis

NOTICE!

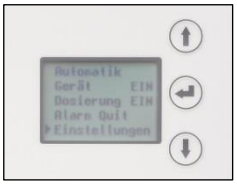
The nationally applicable accident prevention provisions must be complied with. In Germany: Operation of swimming pools DGUV 107-001.

6.1 General

Once all the preparations for commissioning have been completed, the settings can be adjusted on the GRANUDOS Touch dosing system.

6.2 Operation of the **GRANUDOS S5** control unit

The operation modes and faults are displayed directly on the start display (operation display): see 6.2, *Figure 3*.
In automatic operation, the current operation mode, the control, the set dosing performance, output for chlorine or pH dosing and any potential delays or faults are displayed.



The device is operated by means of 3 operating keys next to the display.

Use the **arrow keys** to navigate up or down or to set numerical values.
Use the **Enter key** to navigate to the selected sub-menu and back.

For an overview of the menu structure and abbreviations, see *Chapter 10.1, page 31.*

Figure 2, Display with operating panel

Tipp

TIP! - Shortcut!

Back to main menu: Simultaneously press the two arrow keys for 3 seconds.

Password

There are predefined menu areas that require a password to be entered. The password is automatically queried in these areas. The password consists of four digits and has a factory default setting of 0123. It protects defined menu areas against unauthorised access. We recommend that you change this password and enter the new password in the operation data sheet.

6.3 Start display (operation display)

After activating the device, you will see the start display (also called operation display).

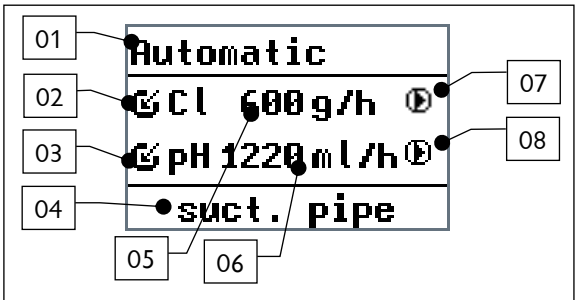
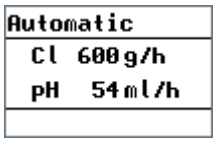


Figure 3, Start display - Explanation

01. Operation modes line
02. Input signal external chlorine control active
03. Input signal external pH control active
04. Status line / fault indication
05. Set chlorine dosing performance
06. Set acid dosing performance
07. Chlorine dosing active
08. pH dosing active – Example, chlorine and acid cannot be active at the same time

The operation modes line (01) can show the following displays:
Automatic, Manual dosing, GRD OFF, Auto Dos OFF, Start delay b-pump, filter disinfection (shock chlorination), CCT OFF
The status line (04) displays general notices and faults:
e.g., start-routine, dos delay XX sec., alarm fuse F2 - F14 as well as additional alarms and faults.
Depending on the operating state, the display shows different views. The following illustrates and describes the main display views.

6.3.1 start display – Automatic

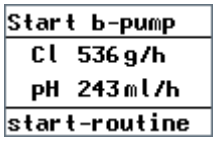


The device is in the Automatic operation mode. The device doses upon request via an external controller. The set dosing performance is displayed.
There is no fault.

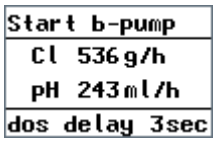
NOTICE!

The dosing stops once you switch to the main menu by pressing "Enter" and only starts again once you switch back to the start display. After 10 minutes without entry, the system automatically switches back to the start display.

6.3.2 Start display - Startup routine – Delay booster pump - Dosing delay



The startup routine:
If the device is started via the **CCT**, the startup delay runs for the booster pump **"Start delay b-pump".** The startup delay is used to ensure that no air enters the booster pump during the subsequent operation.
Setting the delay time under "Settings"→**"Start delay b-pump"**



If the specified pump pressure is reached within 6 seconds after the start of the booster pump, the dosing delay then runs (for a fixed 3 sec) and the dosing device switches to the set operation mode. The remaining times are displayed at the bottom in each case.

Startup mode:
If the specified pump pressure or the minimum water level is not reached/undercut within 6 seconds after the start of the booster pump or also during operation (fault "Pressure min", "Level min"), a startup mode of 120 sec. starts again up to 5x. In this case, the Boosterpump runs for 6 seconds, then pauses until 120 sec. The remaining times are displayed at the bottom in each case. If the specified values for pressure/level are not reached, the device enters the fault mode.

Software alarms are suppressed during this time.

6.4 The Main Menu

The main menu is reached by pressing "Enter".

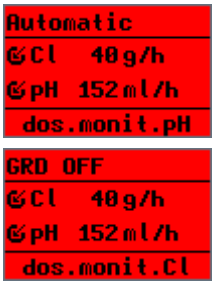
Automatic (PWM/Frequency) / Manual
Shows the set **operation mode**. Press "Enter" to switch to the start display that starts the GRANUDOS. Setting the operation mode time under the "Settings → Control" menu item.

GRANUDOS ON/OFF
Press "Enter" to switch the display to "GRANUDOS OFF" (see 6.2); the device switches to "Standby" operation.
The start display (operation display) displays "GRD OFF" in the status line (04).

Dosing ON/OFF
Press "Enter" to switch the display to "Dosing OFF", e.g., for service tasks or to flush the dissolving unit. The b-pump continues to run, the chlorine and acid dosing is switched off.
The start display displays "Auto Dos OFF" in the status line (04).

Reset alarm
For acknowledging a pending fault indication (alarm relay).

Start display – Fault indication – Acknowledge alarm



If a fault occurs, this will be indicated by a **red display** and the fault indication in the bottom line.
For a description of the fault indications, ***see Chapter 7.2,*** *Fault* removal**.**

Faults must be pending for 6 seconds before a notification or an alarm is triggered.
A distinction is made between **alarms** (software alarms, e.g., dosing time monitoring, monitoring switch) and **notifications** (e.g., "Chlorine empty").

Examples for fault indications / alarm

- Dos-limit Cl → = Dosing time limit for chlorine exceeded
- pH empty → = pH (= acid canister) empty
- Cl empt → = Chlorine tank empty
- Fuse F2 → = Fuse F2, for details, see *Chapter 7.2,. Fault* removal

NOTICE!

An alarm will automatically be deleted when its cause has been remedied. For example, the empty chemical container has been exchanged with a full one.

Acknowledge alarm

- Use the Enter key to switch to the main menu
- Use the arrow keys to navigate to the "Reset alarm" menu item
- Press the Enter key
  The alarm relay is temporarily deactivated; this does not rectify the fault! If the fault subsequently recurs, or if the fault is not rectified, the alarm relay will be reactivated.
- Navigate back to the operation mode; this will restart the device.

Special cases

- The two alarms for the dosing time monitoring **"Dos-limit" cannot automatically be deleted and must always be acknowledged manually!**
- In case of the faults **"Pressure min"** or **"Level min"** the **startup mode** starts 5 times for 120 seconds each to check if the fault is still pending. (See *Chapter 6.3.2*)
  - If the fault is rectified during the 5 startup attempts, the device returns to the previous state, e.g., automatic operation.
  - If the fault still continues after this, the GRANUDOS switches off.
  - If the GRANUDOS has switched off, the fault must be acknowledged manually. To do so, the "Reset alarm" command must be carried out twice: Once to reset the alarm, and once to reset the startup delay. Now, the GRANUDOS will start up again and the cause of the fault can be investigated.

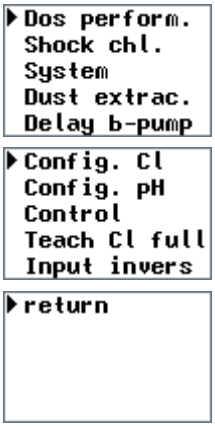
Settings – see *Chapter 6.4.1*
For adapting parameters and system settings:
Dos perform., Shock chlorination, System, Dust extraction, Delay b-pump, Config. Cl (= rated dosing performance), Config. pH, Control, Teach Cl, Input inverse, return

Service – see *Chapter 6.4.2*
For input and output test and device information.

Event Log – see *Chapter 6.4.3*
Displays the past 25 fault indications

6.4.1 Main menu → Settings (overview)

The Settings menu is used to implement the desired settings for the dosing device. Use the arrow keys to navigate to the next menu item.



Dos perform.
Adjust dosing performances for chlorine and acid to the pool size. The dosing performance is monitored.

Shock chlorination
Set dosing performance for the shock chlorination function for shock chlorination or filter disinfection.

System
Set or implement language, contrast, password, reset

Dust extraction (option)
Set parameters for dust extraction

Delay b-pump
Set delay time for the start of the booster pump after an external switch-off

Config. Cl (with password entry)
Set device-specific dosing parameters for chlorine (set ex works)

Config. pH (with password entry)
Set device-specific dosing parameters for acid (set ex works)

Control (with password entry)
Control type PWM (= pulse width modulation, also impulse length control), set Frequency or Manual

Teach Cl full (optional)
Calibrate the Chlorine empty switch

Input inverse (with password entry)
Invert the input signals

return
back to main menu

6.4.1.1 Main menu → Settings → Dosing performance/Dosing time monitoring/dosing process

The Dosing performance menu is used to adjust the dosing performance to the expected consumption of chemicals in the pool.

The required dosing performance depends on several factors, e.g., the pool volume, location, type of use and, of course, the pool's frequency of use.

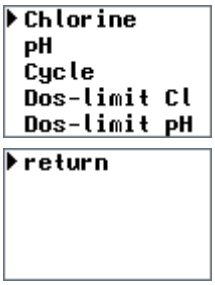
Explanation regarding the dosing process

Chlorine and acid are dosed at intervals with pauses between the dosing cycles.
The dosing performance is determined by the set cycle time, the set dosing times (running time of the dosing motors for chlorine and acid) with the intermittent pauses.

A dosing cycle proceeds as follows:
1. Chlorine dosing: 1-15 sec.
2. Pause: 3.5 sec. fixed
3. Acid dosing: 1-8 sec.
4. Pause until end of cycle – etc.

With **"Manual dosing"**, this cycle runs continuously.
In **"Automatic"** operation, this cycle also runs; however, the dosing is only activated if the control command for the dosing (chlorine or acid) is pending. It the control command encounters a pause, the respective dosing is activated in the following cycle.
Chlorine and acid dosing are independent; dosing occurs when the external controller requests chlorine or acid – but always in the cycle, so that chlorine and acid can never be mixed in the open flushing tub.

Explanation of the setting parameters



- **Chlorine:** → Dosing time for chlorine granulate in seconds per cycle, can be set from 1-15 sec. The dosing performance set in this way can be seen on the start display. It is best to use the "shortcut", see *Chapter 6.2.*
- **pH (acid):** → Dosing time for acid in seconds / cycle, can be set from 1-8 sec.
- **Cycle:** → Length of entire dosing cycle in seconds, can be set from 30-360 sec. The cycle time **must be set first**. If the cycle time is changed, the dosing performance for chlorine and acid changes **at an equal ratio**.
- **Dos-limit Cl:** → Dosing time monitoring for the chlorine dosing with external control, can be set in minutes from 0-100 min. This prevents overdosing in case of a fault in the control: *For an explanation, see 6.4.1.8.*
- **Dos-limit pH:** → Dosing time monitoring for the acid dosing with external control in minutes from 0-100 min. – see dosing time limit for chlorine.

Explanation of dosing time monitoring "Dos-limit Cl/pH"

If the GRANUDOS is controlled by a measuring and control device, the dosing performance must be set sufficiently high so that even large loads can be regulated without significant deviations from the target value. In case of a pulse width modulation (PWM), this means that the pause times must always be greater than the dosing times, since the actual values should approach the target values. However, if the dosing times are longer than the pause times, then either the dosing performance is too low (set too weakly, or motor or screw are defective), or there is a malfunction in the measuring and control device (control relay stuck, contact defective) or a fault in the GRANUDOS control board.
The dosing time monitoring totals the dosing times against the pause times, and if the set dosing time limit is exceeded, dosing is deactivated and indicated as a fault.

Both the chlorine and pH control respectively dosing are monitored.

Example for calculating the realisable dosing performance required according to DIN 19643

In accordance with DIN 19643, in indoor pools 2 g of chlorine must be added per each 1 m³/h circulation capacity. In outdoor pools, a dosing capacity of 10 g/m³h is required as a possible dosing performance.

Calculation: Thus, for an indoor pool with 600 m³ and a circulation capacity of 200 m³/h, a dosing performance of 200 m³/h x 2g chlorine = **400g/hour** must be possible.
In the delivery state, the maximum dosing performance of the GRANUDOS is displayed in the start display according to the installed dosing technology. (see also *Chapter 6.4.1.6/6.4.1.7* Config. Cl / pH)

Example for setting the dosing performance

1.Chlorine dosing

In an indoor pool, the usual chlorine requirement is around 200-300 g/100 m3 water content per day. For a 600 m³ pool, this equals 250 x 6 = 1500 g/day or **150 g/hour** with 10 hours of circulation time. If the GRANUDOS is designed with a dosing technology of **1600 g/h** – see "Config. Cl", about **150 g/h** should be set with continuous dosing without measuring and control technology. To do so, the cycle could be reduced to 60 seconds and the dosing time could be reduced so that the start display (see above) displays approx. **150 g/h**
If a measuring and control technology is present, the dosing performance must be set about 2-3x as high to be able to control demand peaks. In this case, a dosing performance of **300-400 g/h** would be required. Set the cycle to 30 seconds here and reduce the dosing time until about **350 g/h** is displayed.

In an outdoor pool, with fair weather the chlorine consumption is about **5x as high**, i.e., in the above pool, a dosing performance of approx. **700-800 g/h** should be provided. With the assumed incorporated dosing performance of **1600 g/h**, the cycle should therefore be set to 30 seconds, and the dosing performance should be set to the desired value.
After a few days, a readjustment may be necessary, according to the obtained measuring results – measuring value deviations from the target value!

2. Acid dosing

No exact prediction can be made for acid consumption. The actual demand for chemicals depends on the concentration of the acid, frequency of use by pool visitors and the specific local conditions (fresh water pH, hardness, temperature) and must be readjusted according to the measuring values:
At the start, the acid dosing is adjusted to approximately half of the chlorine dosing; e.g., if chlorine is 600g/h, then set acid to approx. 300ml/h. (With 37% sulphuric acid).

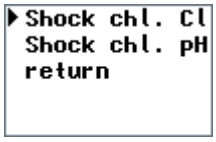
ATTENTION!

The use of sulphuric acid is generally possible up to a concentration of 50%. With higher concentrations or when using other acids (e.g., hydrochloric acid, dissolved sodium hydrogen sulphate, etc.), pay attention to a change in dosing performance and/or increased corrosiveness! We recommend consultation with the manufacturer!

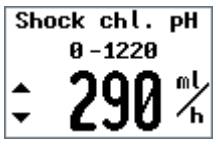
NOTICE!

When refilling the pool, the pH value must be manually brought to the desired value, since a relatively large amount of acid is required to reach the desired value with a high pH-value and extreme hardness. This would take too long if only using the GRANUDOS's acid pump. The result would be a poor disinfection performance at a high pH-value, or possibly a fault indication because the target value has not been reached.

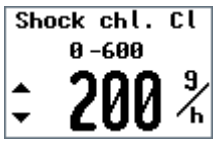
6.4.1.2 Main menu → Settings → Shock chlorination



With this menu, you can adjust the dosing performance for chlorine and pH for a shock chlorination. Please select a dosing performance that ensures the availability of the desired concentration during the shock chlorination.
This dosing performance is used when a filter disinfection is requested by the CCT.



For monitoring purposes, the chlorine concentration **should be checked several times** during shock chlorination.

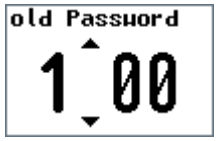


6.4.1.3 Main menu → Settings → System

Here, you can adjust the system settings for language, contrast, password and reset.

Language
Select the desired user language

Contrast
Adjust the display's contrast



Password
Change the password:
The password consists of four digits and has a factory default setting of 0123. It protects defined menu areas against unauthorised changes. We recommend that you change this password and enter the new password in the operation data sheet.

In order to change the password, you must first enter the old password.

- Use the arrow keys to select the appropriate number.
- Use the Enter key to jump to the next number and select it.
- Finally, confirm with the Enter key.
- The display jumps to the entry field for the new password. Enter the new password, confirm with Enter, and make a note of the new password in the operation data sheet.

If a wrong password is entered, the display colour changes to red, and the password must be re-entered. Only certain predefined menu areas require a password to be entered. The password is automatically queried in these areas. The respective areas are:

- Reset
- Dust extraction
- Delay booster pump
- Config. Cl
- Config. pH
- Control
- Input inverse

Once the password has been entered, all other password-protected menu areas are also activated. The activation ends once the user switches back to the start menu.

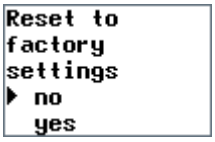
Hinweis

NOTICE!

Please store the individually chosen passwords safely in the operation data sheet. Lost passwords can only be reset by the factory customer service!

Reset
This process can only be performed by entering the password.
All of the set parameters are reset here to the factory settings.
The factory settings are listed in the operation data sheet *in Chapter 9.4*

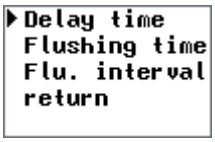
Tipp



TIP!

Note down the operating settings in the operation data sheet before resetting! This makes it easier to set new values.

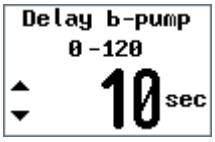
6.4.1.4 Main menu → Settings → Dust extraction (option), (password entry)



This process can only be performed by entering the password.
The dust extraction parameters are set here. The extraction begins with the start of the chlorine dosing and runs until the end of the run-on time.

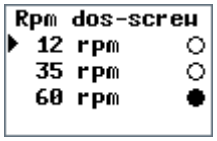
- Set **Delay time**, 0-60 sec, 0 = dust extraction deactivated; after completion of the chlorine dosing, the dust extraction continues to run for the set amount of time.
- Set **Flushing time** 1-5 sec. for the suction injector and the dissolving pipe (option); the flushing valve opens for the set amount of time and both items are cleaned.
- Set **Flushing interval** 0 - 48 hrs (option); the flushing interval is the time between two flushing cycles.

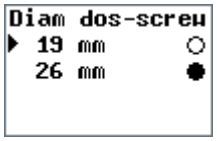
6.4.1.5 Main menu → Settings → Delay Booster pump (password entry)



This value can only be set by entering the password.
This function is only active when the GRANUDOS is switched off externally for filter flushing via the CCT. Once the GRANUDOS has been switched on again, the booster pump is started with the set delay time. This ensures that no air remains in the supply line to the GRANUDOS, which could lead to faults in the b-pump.

6.4.1.6 Main menu → Settings → Config. Cl (chlorine dosing performance) (password entry)





This setting can only be executed by entering the password.
"dos-screw" denotes the dosing screw
Here, the dosing components: dosing motors, dosing screws that can be used are displayed. The values are preset ex works and are used as the basis for determining the defined maximum dosing performance that is shown when the display is switched on.

The maximum dosing performance defined from the Config. Cl is displayed here. To change the desired dosing performance, the cycle time and the chlorine dosing time (Settings → Dosing performance menu) can be changed.

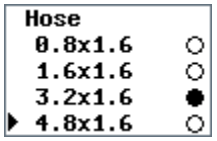
CAUTION!
These values may only be changed if the appropriate components have been installed in the dosing device. Otherwise, the dosing performance will be displayed incorrectly!

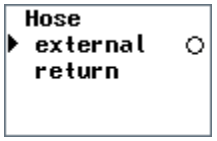
Maximum achievable dosing performance depending on the dosing motor's rotation speed and the diameter of the dosing screw.

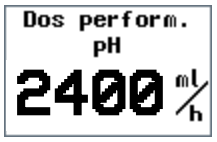
Rotation speed of the dosing motor	Diameter of the dosing screw	maximum dosing performance* - default
12 rpm	19 mm	600 g/h
35 rpm	19 mm	1600 g/h
60 rpm	19 mm	2200 g/h
12 rpm	26 mm	1000 g/h
35 rpm	26 mm	3300 g/h
60 rpm	26 mm	4800 g/h

* The specified values are the maximum dosing performance of the GRANUDOS. This represents 50% of the permanent dosing performance. These are approximate values +/- 20% - depending on the condition of the granulate and dosing screw.

6.4.1.7 Main menu → Settings → Config. pH (acid dosing performance) (password entry)







This Input can only be performed by entering the password.
The hose length of the **installed** peristaltic pump for acid is set here. The values are preset ex works and are used as the basis for the dosing performance display.

If an **external acid pump** is used, the menu item "External" must be selected and the external pump's dosing performance must be entered.

The maximum possible dosing performance is displayed here – see below. To change the dosing performance, the cycle time and the pH dosing time can be changed (Menu Settings → Dosing performance).
If the cycle time is changed, the chlorine dosing performance and the pH dosing performance change **at an equal ratio**.

CAUTION!
These configuration values may only be changed if the appropriate components have been installed in the dosing device. Otherwise, the dosing performance will be displayed incorrectly!

Maximum achievable dosing performance, depending on the dosing pump's hose diameter.

Hose kit - hose diameter	maximum dosing performance*
0.8 mm	100 ml/h
1.6 mm	400 ml/h
3.2 mm	1200 ml/h
4.8 mm	2400 ml/h

* The specified values are the maximum dosing performance of the GRANUDOS; this represents 25% of the pump's permanent dosing performance. These are approximate values +/- 10% - depending on the condition of the peristaltic pump.

6.4.1.8 Main menu → Settings → Control (password entry)

Control via external measuring and control technology

CORROSIVE!

The measuring and control technology must not switch the GRANUDOS device on or off under any circumstances, but only the dosing unit – see wiring diagram. Any necessary shutdown of the GRANUDOS must not take place during cycle. The dosing cycle must always be able to run unimpeded. Otherwise, a chemical back-up could occur when flushing the chlorine granulate, resulting in chlorine gas formation!

This setting determines the control mode of the chlorine and acid dosing and can only be executed by entering the password.

a) Control PWM = Pulse width modulation (standard)

The controller output is organised in cycles. The control signals come with 230 VAC or potential-free. After capturing the input signal, the GRANUDOS doses for chlorine or acid using the set performance. If the input signal is pending for a longer time than the set cycle duration, another dosing is carried out in the following cycle.

NOTICE!

The shortest signal duration should be at least 2 seconds long to ensure accurate dosing.

Explanation about the operation with an external acid dosing pump for regulating the pH-value; only possible with PWM control

If an (existing) external dosing pump is to be operated for regulating the pH-value, it must be considered that the acid dosing in the GRANUDOS must also always be active in order to avoid deposits in the dissolving system.
For this purpose, the acid control can be clamped parallel on the chlorine control (electric wire bridge).

- With 230 V control: on SL3 terminal 1+3, plus bypass 2+4.
- With potential-free control: on SL8 terminal 1+3, plus bypass 2+4.

Thus, during each chlorine dosing the acid dosing is activated as well. For the required cleaning function, the dosing performance for acid dosing must be set to a low value. However, it must be checked if the set dosing performance is sufficient for the cleaning; the mixing cyclone must not get cloudy. See also *Chapter 6.4.1.1, page 12, Example for setting the dosing performance.*

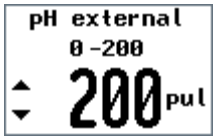
CAUTION!

It is urgently recommended in this case to also connect the pH-control at the GRANUDOS in parallel to avoid acid overdosing in the event of a fault in the chlorine dosing.

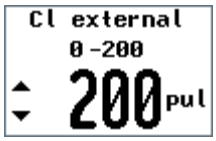
TIP!

As a rule, the pH-value in the pool is set with the acid dosing at the GRANUDOS.

b) Frequency control → pH external, Cl external



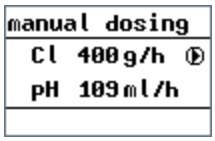
The maximum number of impulses (frequency) of the external control technology is set on the GRANUDOS up to max. 200 impulses/minute. The GRANUDOS now always counts the incoming impulses per minute, calculates the requested dosing performance on this basis and doses the respective amount in the following cycle.



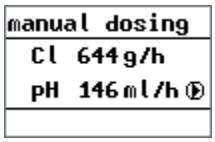
- In this case, an input signal of 200 impulses/minute results in 100% dosing performance.
- An input signal of 100 impulses/minute results in 50% of the set dosing performance.

The setting must be made separately for the pH and chlorine control.

c) Manual control = Manual dosing



It is possible to change over to continuous dosing. This may be required in the event of a fault in the external measuring technology, e.g., electrode failure, that cannot be rectified at short notice.
"Manual dosing" can only be selected for both chlorine and acid dosing together.



Upon activation of Manual dosing, the status line on the start display changes from Automatic to Manual dosing.

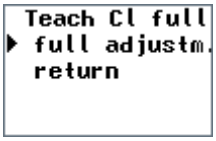
CAUTION!

In the "Manual dosing" operation mode, the water quality must be checked continuously and the dosing performance must be adjusted to the current consumption. Non-compliance with this may result in considerable incorrect dosing!

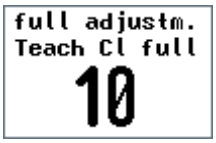
6.4.1.9 Main menu → Settings → Teach Cl full (optional)

TIP!

This function is not available in the standard design; it only works in combination with a special sensor.



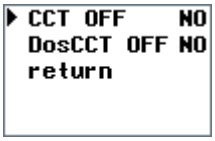
The switch for the **Chlorine empty notification** in the device is a capacitive proximity switch. This switch must be recalibrated, if necessary. The justage is carried out as follows.

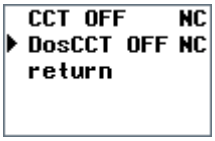


Full adjustment (justage):
Full adjustment can only be carried out if the dosing hopper contains granulate!

- Fill chlorine granulate into the dosing hopper **(for GRANUDOS Flex + GRANUDOS 15)**, or attach the chlorine drum **(for GRANUDOS 45/100)** and pivot into the dosing position.
- Carry out the full adjustment in the menu via "Teach Cl full" → Full adjustment. The process is started by pressing the Enter key; it runs for 12 seconds. The full adjustment has now been carried out.
- **For the standard design, the justage is described in the Operating Instructions for the respective dosing device.**

6.4.1.10 Main menu → Settings → Input inverse (password entry)

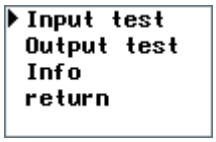




With an activation via an external control (e.g., central control technology CCT) it may be necessary to invert the input signals **"CCT OFF"** and **"Dosing CCT OFF".** Here, you can switch between NC and NO.

NO (normally open) indicates that the is switch open in the operating state and closed when deactivated (for switching off).
NC (normally closed) indicates that the switch is closed in the operating state and open when deactivated (for switching off).

6.4.2 Main Menu → Service



Input test
A test programme for the switch inputs (electrical signals).

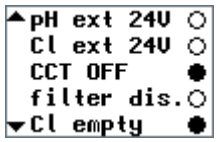
Output test
A test programme for the actuators and relay outputs.

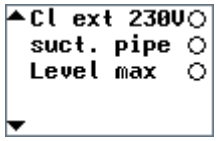
Info
Information about the software version.

6.4.2.1 Main menu → Service → Input test

The input test is used to check (via manual actuation) the connected monitoring switches and external inputs.
The position of the switch inputs is indicated by symbols.
The symbol " ○ " indicates Switch open
The symbol " ● " indicates Switch closed
Use the arrow keys to scroll through the pages.

List of input tests:

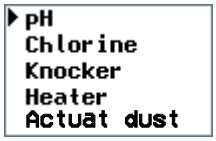


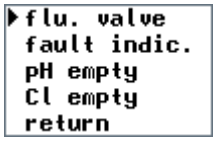


1. **pH ext 24 V**, → potential-free signal for pH dosing via external control
2. **Cl ext 24 V**, → potential-free signal for chlorine dosing via external control
3. **CCT OFF**, → The GRANUDOS is deactivated via the central control technology (CCT). No dosing, no alarm message issued (b-pump OFF).
4. **Filter dis.**, → A filter disinfection is running (the dosing performance is set in the "Shock chlorination" menu)
5. **Cl empty**, → no chlorine in the dosing hopper → chlorine empty switch active
6. **Level min,** → The level in the GRANUDOS flushing tub is too low. The booster pump is stopped
7. **DosCCT OFF**, → The dosing is deactivated externally.
8. **pH empty**, no chlorine in the dosing canister → Acid empty switch active
9. **Pres. min,** → The pressure at the GRANUDOS booster pump is too low. The booster pump and the dosing are stopped
10. **pH ext 230 V**, → 230 V signal for pH dosing via external control
11. **Cl ext 230 V**, → 230 V-free signal for chlorine dosing via external control
12. **Suct. pipe,** → The flow in the GRANUDOS's suction pipe is too low. The dosing of chlorine and acid is stopped.
13. **Level max,** → The level in the GRANUDOS flushing tub is too high. The dosing of chlorine and acid is stopped.

6.4.2.2 Main menu → Service → Output test

The output test is used to check the connected outputs (actuators and relays). The selected output is activated for 20 seconds. The activation can be cancelled at any time using "Enter".
For safety reasons (chlorine gas formation), the output test for the chemical-dosing outputs is only released if no fault exists that could prevent the dosing, e.g., flow in the suction pipe too low.





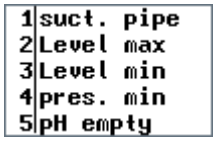
An output test can be performed for the following actuators:

1. pH (=acid) dosing
2. Chlorine dosing
3. Knocker - 4x active
4. Heater / Heating
5. Actutator Dust extraction (option)
6. Dust extraction flushing valve (option)
7. Fault indication with relay output
8. pH (=acid) empty = output test for indication with relay output
9. Chlorine empty = output test = indication with relay output

6.4.2.3 Main Menu → Service → Info

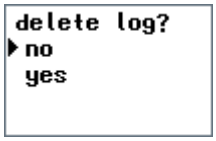
The software version used can be viewed using the Info button.
This is required for support queries.

6.4.3 Main menu → Event log (event and data logging)



The Event log displays the past 25 fault indications. Use the arrow keys to scroll up and down. The last fault indication received is in the no. 1 position.

At the end of the list, the "Delete log?" command is shown under no. 26. Use "Yes" to delete the entire list.



Back to the main menu using the "Shortcut" *(Chapter 6.2)*

7 Maintenance, care, fault removal

7.1 Device maintenance

In accordance with the DIN and the DGVU, chlorination systems must be serviced annually. We recommend that you assign a specialist firm to carry out regular maintenance. Required spare parts are available from your specialist dealer.

ATTENTION!

Pay attention to the safety notices when handling chemicals and wear appropriate protective clothing to prevent damage to health.

TIP!

In order to carry out any maintenance work, use the maintenance protocol found in *Chapter 9.5.* of the respective dosing device:

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

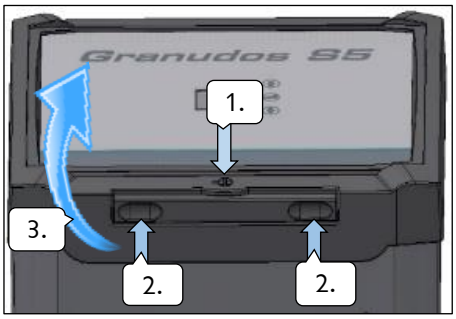
Document all work in the maintenance protocol.

Open and close the housing

DANGER!

Risk of death due to high voltage. Any electrical work on the device must only be carried out by trained electricians in accordance with the applicable safety regulations! Fuses inside the control housing may only replaced by maintenance or repair personnel.

Open housing:



1. Unlock the screw cap, e.g., with a screw driver
2. Press down on both recessed grips until the housing snaps open.
3. Fold the lid upwards

Close the housing in reverse sequence
The housing lid will close with a soft, audible click.
Ensure that the housing lid is securely locked.

Figure 4, Control housing 45/100 + 15

7.2 Fault removal

TIP!

All faults and messages are displayed in the status line on the display. In addition, they may be queried in the Event log.

An error will only be displayed once it has occurred uninterrupted for at least 6 seconds.

NOTICE!

In the event of a fault indication, it is also possible that switches or sensors are defective!

No collective fault occurs for chlorine / acid empty!

Back to main menu: Simultaneously press the two arrow keys for 3 seconds.

For additional information, also see the operating instructions for the respective dosing device, *in Chapter 7.1,* Device maintenance.

Fault display	Cause / effect	Actions
1. Chlorine empty notification: The "Chlorine empty switch" was triggered **Notification only; further switching only via relay**	This notification is for information purposes only, no action ensues. The dosing and the booster pump keep running.	1. Refill chlorine or change container 2. If the dosing hopper is not empty, recalibrate the empty switch (see OI Dosing unit) 3. Renew and calibrate the empty switch!
2. pH empty notification The "Acid empty sensor" was triggered **Notification only; further switching only via relay**	The acid dosing stops, chlorine dosing and the booster pump keep running.	1. Replace the empty acid container with a full one 2. If the acid container is not empty, the empty switch is faulty. 3. If the suction lance is new, check the float's functional direction, float at the bottom → empty
3. Minimum pressure ALARM: The pressure switch on the booster pump reports insufficient flow pressure	Dosing is stopped. The booster pump has been deactivated. The device automatically switches into Startup mode with 5 starting attempts – *see 6.3.2*	1. Supply pressure too low → Check pressure 2. Booster pump faulty → Check pump 3. Pressure switch faulty → Check pressure switch 4. Set a lower response pressure at the pressure switch (see OI Dosing unit) To start, manually acknowledge alarm *(6.4)*
4. Level min ALARM (flushing tub): The water level in the flushing tub is low; more water is suctioned off than runs into the flushing tub through the floating valve.	Dosing is stopped. The booster pump has been deactivated. The device automatically switches into Startup mode with 5 starting attempts – *see 6.3.2*	1. Floating valve function: The water inlet should gently follow the float's movement. If OK, calibrate the water level. See OI Dosing unit, Chapter Commissioning If this is not the case, insert a new diaphragm in the floating valve. 2. Insert a hole washer with a smaller drill hole 3. Dirt filter contaminated → clean filter To start, manually acknowledge alarm *(6.4)*
5. Level max ALARM (flushing tub): The water level in the flushing tub is too high, less water is siphoned off than is flowing into the flushing tub through the floating valve.	Dosing is stopped. The booster pump continues to run for a maximum of 10 minutes. Acknowledge the alarm, use the shortcut to return to the operation mode.	1. If the injector's suction capacity is OK: a) Floating valve function: The water inlet should gently follow the float's movement. If OK, calibrate the water level. See OI Dosing unit, Chapter Commissioning b) If this is not the case, insert a new diaphragm in the floating valve. 2. If the suction capacity is not sufficient, see under fault display **"Suction pipe ALARM"**
6. Suction pipe ALARM (flow): The water flow in the suction pipe is too low. The switch body of the flow switch does not rise, the switch LED lights up.	Dosing is stopped. The booster pump continues to run for a maximum of 10 minutes. Acknowledge the alarm, use the shortcut to return to the operation mode.	1. Check booster pump functioning. 2. Dirt filter contaminated → clean filter 3. Blocked suction opening in the flushing tub 4. There may be particles in the injector's nozzle or in the suction pipe, due to particles entering during installation or from the chlorine container. 5. Insert a hole washer with a larger drill hole or remove it entirely 6. Blocked non-return valve in the dosing line 7. Diffuser nozzle worn out, if D > 6.5mm, replace nozzle

7. Fuse F2 ALARM Secondary fuse 24 V-500 mA	The fuse F2 has blown. The dosing and booster pump stops	Renew the fuse and check whether all other fuses show the correct fuse value. If F2 fails again, exchange the circuit board
8. Fuse F9 ALARM Dosing pipe (heating)	The fuse F9 has blown. The dosing and the booster pump keep running.	Check the chlorine dosing pipe (heating); exchange, if necessary, and renew the fuse.
9. Fuse F10 ALARM (chlorine dosing motor)	The fuse F10 has blown. The chlorine dosing stops despite control. The booster pump continues to run.	Check chlorine motor for blockages, remove blockage, if necessary, and renew the fuse. Check the chlorine dosing motor; exchange, if necessary, and renew the fuse.
10. Fuse F11 ALARM (acid dosing pump)	The fuse F11 has blown. The acid dosing stops despite control. The booster pump continues to run.	Check the acid dosing pump; exchange, if necessary, and renew the fuse.
11. Fuse F14 ALARM Collective fuse for sensors: Cl empty, flow	The fuse F14 has blown. The dosing and booster pump stops.	Check the "Chlorine empty" and "Flow min" sensors in the suction pipe, renew the defective sensor and the fuse (input test).
12. CCT OFF, MESSAGE:	The control unit is deactivated by the central control technology. No dosing occurs, no alarm message given. The dosing device stops.	No action, since it has been deactivated externally.
13. "Dos-limit Cl" (chlorine) Chlorine dosing time-out ALARM:	The dynamic dosing time for chlorine has been exceeded. → Chlorine dosing has stopped, *see 6.4.1.1*	Check the function of the dosing: Dosing screw blocked or worn? Eliminate fault or blockage. (see also Chapter 7 for the dosing unit). Check the dosing performance setting; increase, if necessary. Check the M&C activation
14. "Dos-limit pH" (acid) pH dosing time-out ALARM:	The dynamic dosing time for pH (**acid dosing**) has been exceeded. → Acid dosing has stopped, *see 6.4.1.1.*	Check the function of the dosing. Eliminate fault or blockage. (see also Chapter 7 for the respective dosing unit). Check the dosing performance setting, → increase, if necessary. Check the M&C activation
15. Filter dis. MESSAGE:	Filter disinfection is active.	No action

Malfunction without indication on the display:

Malfunction	**Cause → Actions**
16. The display is dark and the device is turned off	a) No supply voltage → Restore the supply voltage b) The main fuse on the housing or the front panel has blown → Renew the fuse c) The fuse F1 or F2 has blown → Renew the fuse d) The transformer is defective → Renew the circuit board
17. The flushing tub overflows when shutting down the GRANUDOS	a) Leaking floating valve: → Renew diaphragm b) Switch body in the suction pipe is blocked: → Foreign objects in suction pipe → Clean suction pipe
18. Dust extraction drive/pump not running	a) The fuse F5 has blown → Renew the fuse b) Check the pump motor, including the condenser.
19. The dust extraction flushing valve does not switch	a) The fuse F4 has blown → Renew the fuse b) Check the solenoid valve.
20. The solenoid knocker at the dosing hopper does not work	a) The fuse F7 has blown → Renew the fuse b) Check the solenoid knocker.
21. The booster pump does not start up	a) The fuse F8 has blown → Renew the fuse b) Check the pump, including the condenser.

8 Decommissioning – Storage – Disposal

See operating instructions for the dosing unit of the respective dosing device:

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5 No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

9 Documents

9.1 Declaration of conformity

The declaration of conformity can be found in the operating instructions for the dosing unit of the respective dosing device:

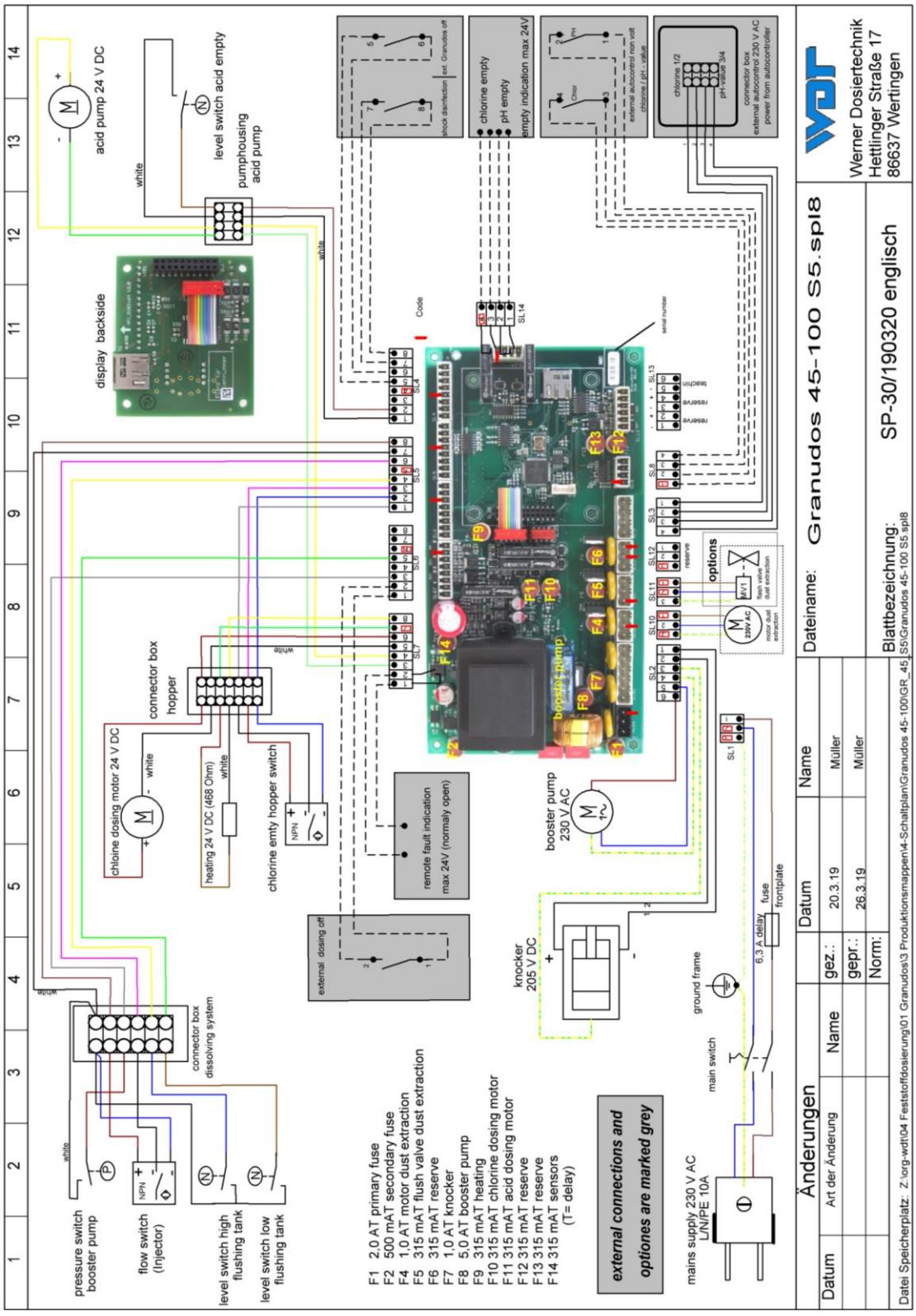
- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

9.2 Wiring diagrams

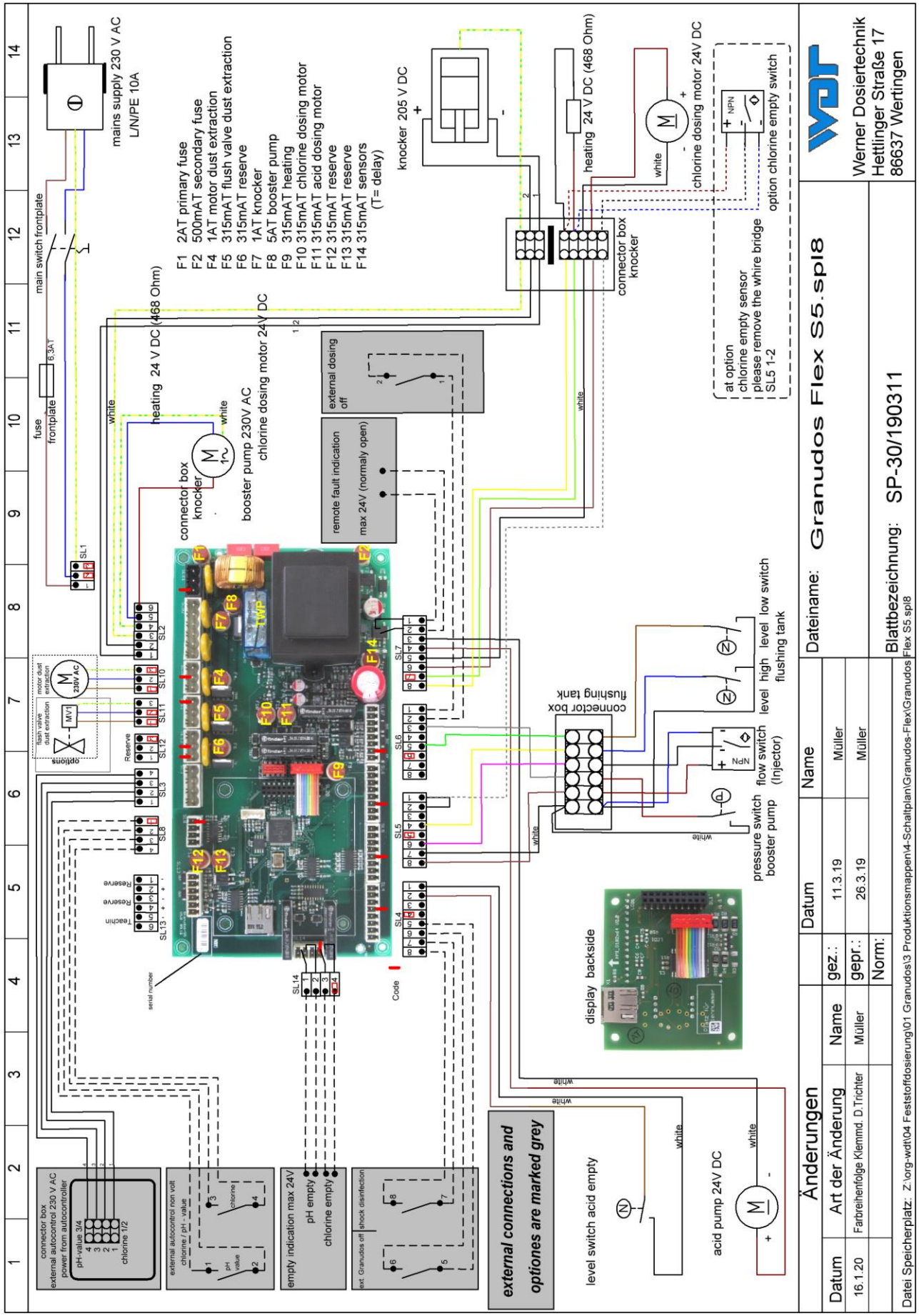
DANGER!

Risk of death due to high voltage! Any work on the device may only be carried out by trained specialists in accordance with the applicable safety regulations! Fuses in the control housing may only be renewed once the power has been disconnected and secured against being reactivated!

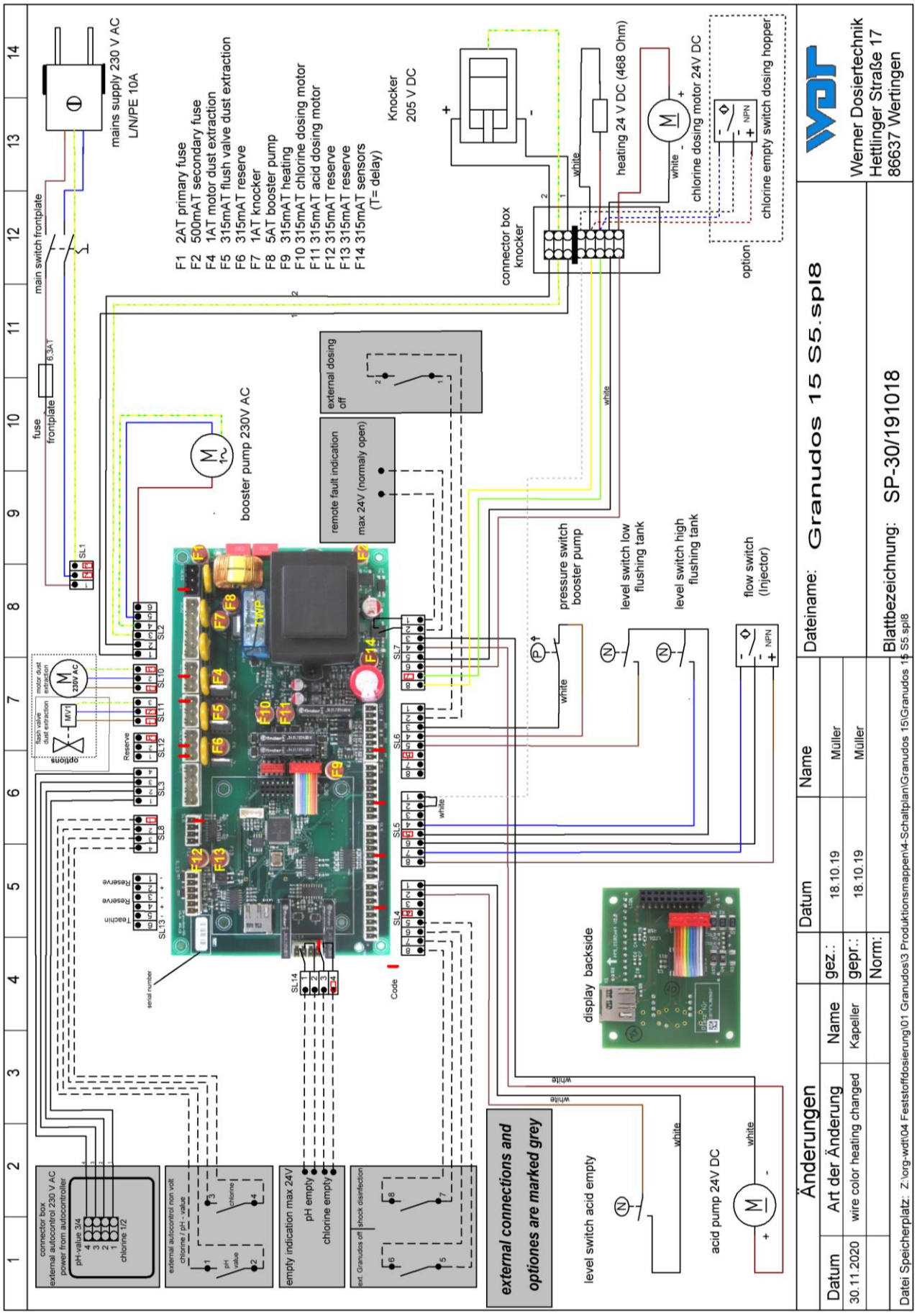
9.2.1 Wiring diagram network board **GRANUDOS 45/ 100-S5**



9.2.2 Wiring diagram network board **GRANUDOS Flex-S5**



9.2.3 Wiring diagram network board **GRANUDOS 15-S5**



9.3 Commissioning protocol

The commissioning protocol can be found in the operating instructions for the dosing unit of the respective dosing device in *chapter: 9.3.*

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

9.4 Operation data sheet

During a *"software update"*, all parameters are reset to the factory setting. After an "update", all parameters must therefore be checked and readjusted to the pool. We therefore recommend that, prior to the update, you enter the optimised, pool-specific parameters in this list.

Settings menu	Factory setting	Setting ranges	Step	during commissioning	Optimised during operation
1. Chlorine/pH dosing performance				Date:	Date:
Chlorine	15 seconds	1-15 seconds	1		
pH (acid)	8 seconds	1-8 seconds	1		
Cycle	30 seconds	30-360 seconds	30		
Dosing time limit acid	0	0-100 minutes	5		
Dosing time limit chlorine	0	0-100 minutes	5		
2. Shock chlorination					
Chlorine dosing performance	50%	depending on the technical configuration	1		
Dosing performance acid	50%	depending on the technical configuration	1		
3. System → Password					
Technician	0123	0000 – 9999	1		
4. Dust extraction					
Run-on time	0	0 – 60			
Flushing time	5 seconds	1 - 5 seconds	1		
Flushing interval	0 h	0 – 48 h	1		
5. Delay booster pump					
Delay time	120 seconds	0 - 120 seconds	5		
6. Configuration chlorine					
Rotation speed dosing screw	depending on design	12 – 60 rpm	1		
Diameter dosing screw	depending on design	19 / 26 mm	1		
7. Configuration pH					
Hose diameter	depending on design	0.8/1.6/3.2/4.8/ext			
8. Control					
Control	PWM	PWM, freq., manual			
9. Invert the inputs					
CCT OFF	NO	NO/NC			
Dos CCT OFF	NO	NO/NC			

Operation data sheet, –master copy–
Please copy the blank operation data sheet before filling it out!

Settings menu	Factory setting	Setting ranges	Step	during commissioning	Optimised during operation
1. Chlorine/pH dosing performance				Date:	Date:
Chlorine	15 seconds	1-15 seconds	1		
pH (acid)	8 seconds	1-8 seconds	1		
Cycle	30 seconds	30-360 seconds	30		
Dosing time limit acid	0	0-100 minutes	5		
Dosing time limit chlorine	0	0-100 minutes	5		
2. Shock chlorination					
Chlorine dosing performance	50%	depending on the technical configuration	1		
Dosing performance acid	50%	depending on the technical configuration	1		
3. System → Password					
Technician	0123	0000 – 9999	1		
4. Dust extraction					
Run-on time	0	0 - 60 seconds			
Flushing time	5 seconds	1 - 5 seconds	1		
Flushing interval	0 h	0 – 48 h	1		
5. Delay booster pump					
Delay time	120 seconds	0 - 120 seconds	5		
6. Configuration chlorine					
Rotation speed dosing screw	depending on design	12 – 60 rpm	1		
Diameter dosing screw	depending on design	19 / 26 mm	1		
7. Configuration pH					
Hose diameter	depending on design	0.8/1.6/3.2/4.8/ext			
8. Control					
Control	PWM	PWM, freq., manual			
9. Invert the inputs					
CCT OFF	NO	NO/NC			
Dos CCT OFF	NO	NO/NC			

9.5 Maintenance protocol

The maintenance protocol can be found in the operating instructions for the dosing unit of the respective dosing device in *Chapter 9.5*.

- **for GRANUDOS Flex-S5, No.: BA SW 022**
- **for Granudos 45/100-S5, No.: BA SW 003**
- **for Granudos 15-S5, No.: BA SW 002**

9.6 Spare parts list, wear parts list, consumables

The spare parts and wear parts listed in the following are available from your specialist dealer. Please always include the exact product designation and the device serial number with you orders. The device serial number can be found on the control unit's housing. Wear parts are excluded from the 2-year warranty. For these we assume a warranty of 1/2 year.

Spare parts

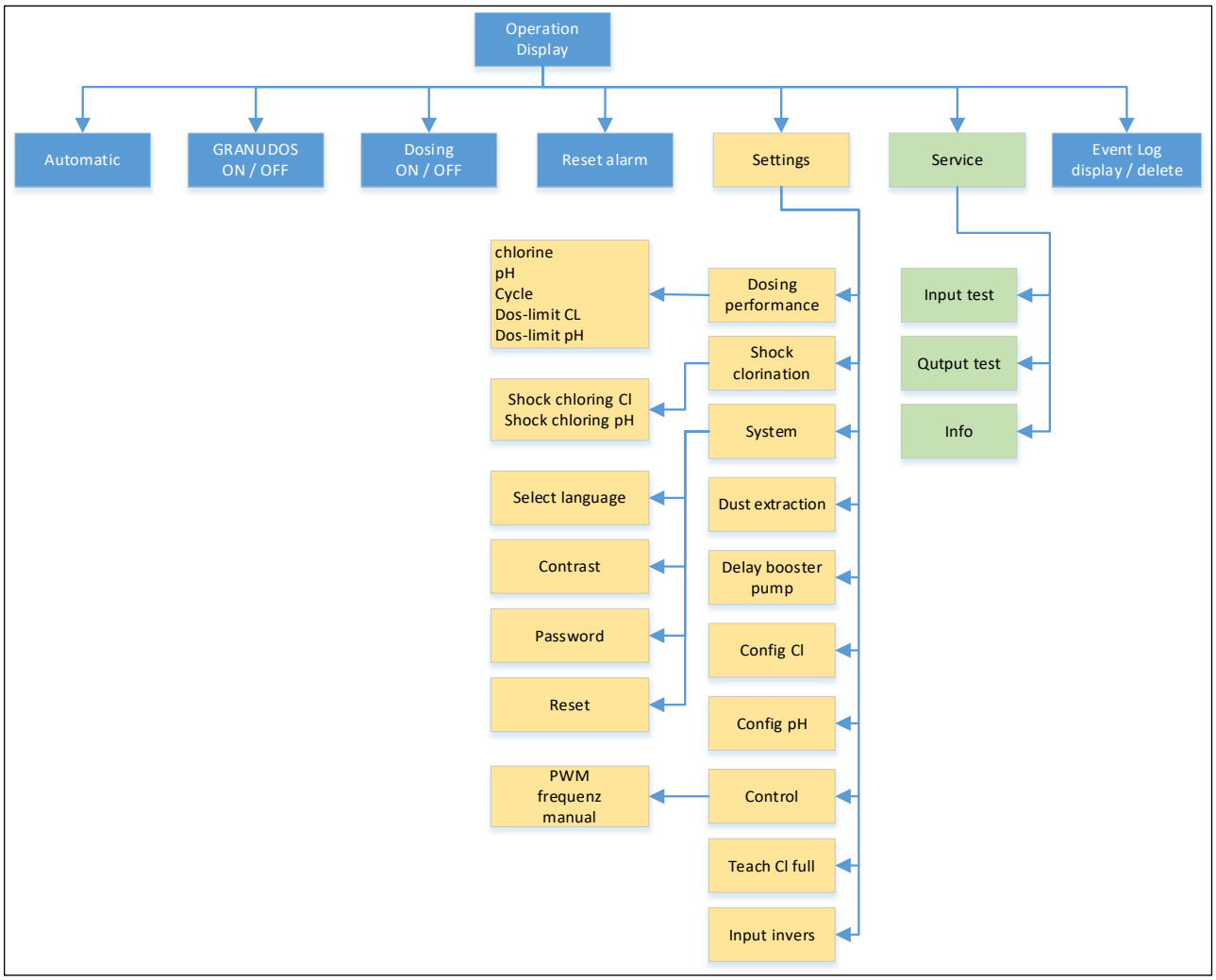
Device part		**Designation**	**Code no.**
Control unit		Control board-S5	26672-1
		Operating unit S5 (control board, HMI)	26926
		Ribbon cable	25320

Consumables
Please comply with the safety data sheets for chemical manufacturers!

10 Appendices

Personal notes
You can use the following lines for personal notes, e.g., regarding conducted service tasks or special versions, extensions or device modifications.

10.1 Menu overview with abbreviations



List of abbreviations

Reset alarm = Acknowledge alarm
Start = Startup GRANUDOS
Start routine = Startup routine
Start delay b-pump = Startup booster pump
Cl ext 230 V = external chlorine control with 230 V
Cl ext 24 V = external chlorine control with potential-free signal
Cl extern = external chlorine dosing
Cl empty = Chlorine tank empty
Dos perform. = Dosing performance
DOS OFF = Dosing OFF
Dos CCT Off = Dosing deactivated from central control technology
dos.monit.Cl = Dosing time monitoring chlorine
dos.monit.pH = Dosing time monitoring pH
Dos-limit Cl = Dosing time limit chlorine
Dos-limit pH = Dosing time limit pH
dos delay = Dosing delay
pres. min = Minimum pressure alarm
DS = Dosing screw
Input inverse = Invert the input signal
Filter dis. = Filter disinfection
Frequency = Frequency control
GRD OFF = GRANUDOS OFF
Manual = Manual dosing
Manual Dos Off = Operation mode Manual dosing, dosing OFF
Shock chl. Cl = Shock chlorination chlorine
Shock chl. pH = Shock chlorination pH (acid)
Config. Cl = configuration of chlorine dosing
Config. pH = Configuration pH (acid dosing)
delete log? = Delete log files?
Delay = Run-on time for dust extraction
Level max = Flushing tub maximum level alarm
Level min = Flushing tub minimum level alarm
pH ext 230 V = external pH acid control with 230 V
pH ext 24 V = external pH acid control with potential-free signal
pH extern = pH acid dosing - external control
pH empty = pH (acid) canister empty
PWM = Pulse width modulation (impulse length control)
Reset = Reset to factory settings
Suction pipe = Suction pipe flow too low - alarm
Fuse F2 to F13 = Fuses F2 to F13
flushing valve = Dust extraction flushing valve
Duct ext. = Dust extraction
Teach Cl full = Calibrate the chlorine empty switch (option)
b-pump = Booster pump
b-pump OFF = Booster pump OFF
Delay = Delay
Delay b-pump = Delay, start of booster pump
Full adjustm. = Calibrate the special chlorine empty switch
CCT OFF = GRANUDOS deactivated via central control technology