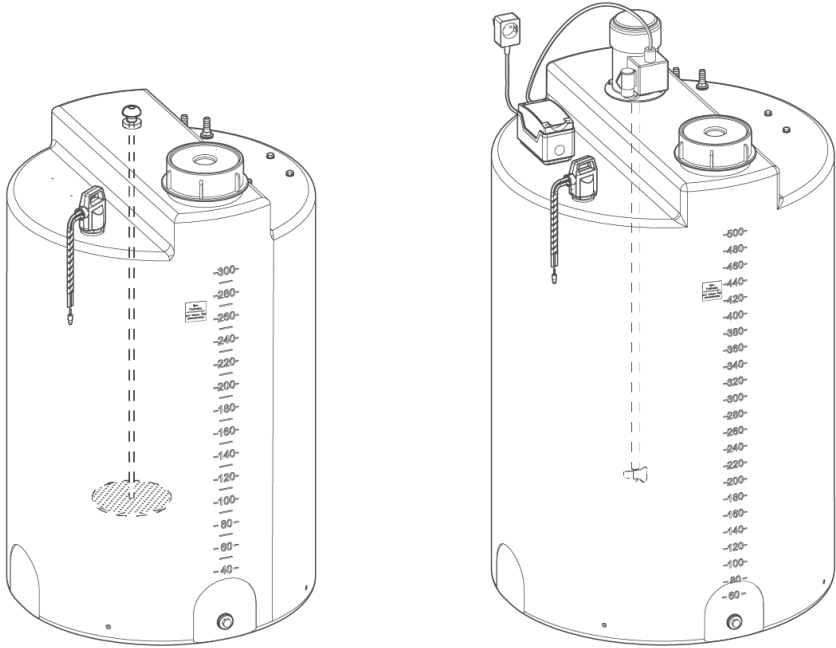


We understand water.



Dosing tank | 60 – 500 HMI/ARW

Operation manual

grünbeck

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Service

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Availability

Monday to Thursday

7:00 am - 6:00 pm

Friday

7:00 am - 4:00 pm

We reserve the right to technical modifications.
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Original operation manual

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1 Introduction

This manual is intended for owners/operators/operating companies, users as well as qualified specialists and ensures the safe and efficient handling of the product. The manual is an integral part of the product.

- ▶ Carefully read this manual and the included manuals on the components before you operate your product.
- ▶ Obey all safety and handling instructions.
- ▶ Keep this manual and all other applicable documents, so that they are available when needed.

1.1 Validity of the manual

This manual applies to the products below:

Dosing tank with hand mixer (HMI)

- Dosing tank 60 D420-HMI
- Dosing tank 100 D460-HMI
- Dosing tank 200 D600-HMI
- Dosing tank 300 D670-HMI
- Dosing tank 500 D790-HMI

Dosing tank with automatic agitator (ARW)

- Dosing tank 60 D420-ARW
- Dosing tank 100 D460-ARW
- Dosing tank 200 D600-ARW
- Dosing tank 300 D670-ARW
- Dosing tank 500 D670-ARW

1.2 Other applicable documents

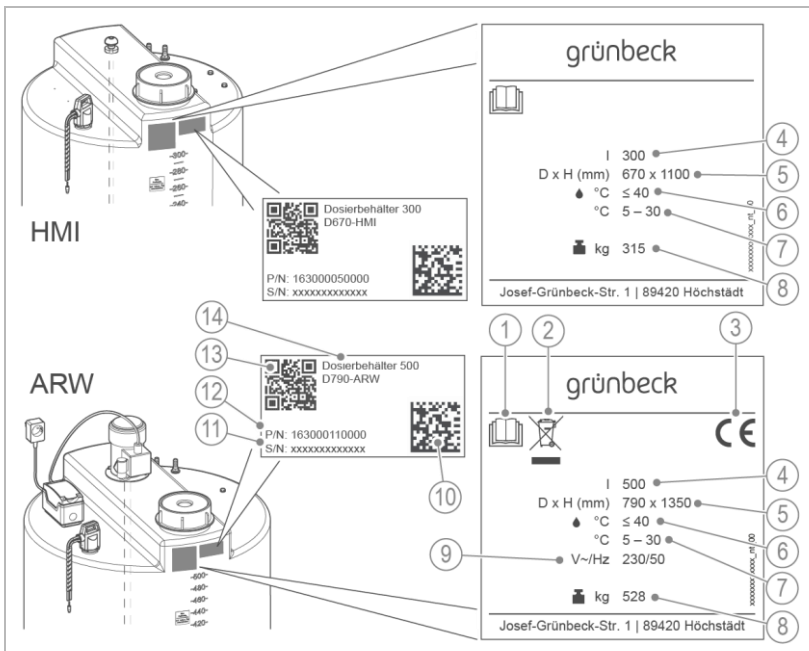
- Technical Information on GENODOS pump GP
- Operation manual of GENODOS pump GP
- Safety data sheets for chemicals

1.3 Product identification

You can identify your product based on the product designation and the order no. indicated on the type plate.









- ▶ Check whether the products indicated in chapter 1.1 correspond to your product.

The type plate is located on the front of the dosing tank.



Designation		Designation	
1	Obey the operation manual	8	Operating weight
2	Disposal information	9	Power supply (for ARW version)
3	CE mark	10	Data matrix code
4	Volume	11	Serial no.
5	Tank size (diameter x height)	12	Order no.
6	Temperature of dosing medium	13	QR code
7	Ambient temperature	14	Product designation

1.4 Symbols used

Symbol	Meaning
	Danger and risk
	Important information or requirement
	Useful information or tip
	Written documentation required
	Reference to further documents
	Work that must be carried out by qualified specialists only
	Work that must be carried out by qualified electricians only
	Work that must be carried out by technical service personnel only

1.5 Depiction of warnings




This manual contains information and instructions that you must obey for your personal safety. The information and instructions are highlighted by a warning symbol and are structured as shown below:



SIGNAL WORD Type and source of hazard

- Possible consequences
- ▶ Preventive measures

The signal words below are defined subject to the degree of danger and might be used in the present document:

Warning symbol and signal word		Consequences if the information/ instructions are ignored	
	DANGER		Death or serious injuries
	WARNING	Personal injury	Possible death or serious injuries
	CAUTION		Possible moderate or minor injuries
	NOTE	Damage to property	Possible damage to components, the product and/or its functions or an object in its vicinity

1.6 Demands on personnel

During the individual life cycle phases of the product, different people carry out work on the product. This work requires different qualifications.

1.6.1 Qualification of personnel

Personnel	Requirements
User	<ul style="list-style-type: none"> • No special expertise required • Knowledge of the tasks assigned • Knowledge of possible dangers in case of incorrect behaviour • Knowledge of the required protective equipment and protective measures • Knowledge of residual risks
Owner/operator/ operating company	<ul style="list-style-type: none"> • Product-specific expertise • Knowledge of statutory regulations on work safety and accident prevention
Qualified specialist <ul style="list-style-type: none"> • Electrical engineering • Sanitary engineering (HVAC and plumbing) • Transport 	<ul style="list-style-type: none"> • Professional training • Knowledge of relevant standards and regulations • Knowledge of detection and prevention of potential hazards • Knowledge of statutory regulations on accident prevention
Technical service (Grünbeck's technical service/authorised service company)	<ul style="list-style-type: none"> • Extended product-specific expertise • Trained by Grünbeck

1.6.2 Authorisations of personnel

The table below describes which tasks may be carried out by whom.

	User	Owner/ operator/ operating company	Qualified specialist	Technical service
Transport and storage		X	X	X
Installation and mounting			X	X
Start-up/commissioning				X
Operation and handling	X	X	X	X
Cleaning	X	X	X	X
Inspection	X	X	X	X
Maintenance			X	X
semi-annually			X	X
annually			X	X
Troubleshooting	X	X	X	X
Repair			X	X
Decommissioning and restart/recommissioning		X	X	X
Dismantling and disposal			X	X

1.6.3 Personal protective equipment

- ▶ As an owner/operator/operating company, make sure that the required personal protective equipment is available.

The components below fall under the heading of personal protective equipment (PPE):



Protective gloves



Protective footwear



Protective overall or



Safety goggles
(tightly fitting)



Protective apron



Mask

2 Safety



This mark confirms that the product complies with the requirements stipulated in the EC/EU directives.

2.1 Safety measures

- Only operate your product if all components are installed properly.
- Obey the local regulations on drinking water protection, accident prevention and occupational safety.
- Do not make any changes, alterations, extensions or program changes on your product.
- Only use genuine spare parts for maintenance or repair.
- Keep the premises locked against unauthorised access to protect imperilled or untrained persons from residual risks.
- Comply with the maintenance intervals (refer to chapter 8.2).

2.1.1 Mechanical hazards

- For all work on the system that cannot be carried out from the ground, use stable, safe and self-standing access aids (e.g. stepladders).
- Make sure that the system is set up in a way that it cannot tip over and that the stability of the system is guaranteed at all times.

- Risk of tripping due to hoses and electrical cables on the floor. Route hoses and electrical cables away from traffic and escape routes.

2.1.2 Pressure-related hazards

- Components can be under pressure. There is a risk of injuries and damage to property due to escaping dosing solution and unexpected movement of components. Check the system's pressure lines at regular intervals.
- Before starting any repair and maintenance work, make sure that all affected components are depressurised.
- Use personal protective equipment.

2.1.3 Electrical hazards

- There is an immediate danger of fatal injury from electric shock when touching live parts. Damage to the insulation or individual components can be lethal.
- Only have a qualified electrician carry out electrical work on the system.
- In case of damage to live components, switch off the voltage supply immediately and arrange for repair.
- Switch off the power supply before working on electrical system parts. Discharge residual voltage.
- Never bridge electrical fuses. Do not disable fuses. Use the correct current ratings when replacing fuses.
- Keep moisture away from live parts. Moisture can cause short-circuits.

2.1.4 Danger due to chemicals

- Chemicals can be hazardous to health and environment. They can cause chemical eye and skin burns as well as irritation of the respiratory tract, or allergic reactions.
- Avoid any skin/eye contact with chemicals.
- Use personal protective equipment.
- Read the safety data sheet before handling chemicals. Obey the instructions for different activities/situations.
- Current safety data sheets for chemicals are available for download at www.gruenbeck.de/en/info-centre/safety-data-sheets.
- Obey in-house instructions when handling chemicals. Make sure that protective and emergency equipment such as emergency shower and eye wash are available, if necessary, and that they are in working order.

Mixing and residual amounts of chemicals

- Do not mix different chemicals. Unforeseeable chemical reactions posing a lethal danger can occur.
- Dispose of residual amounts of chemicals in accordance with local regulations and/or in-house instructions.
- Residual amounts from used containers should not be transferred into containers with fresh chemicals in order not to impair the effectiveness of the chemicals.

Labelling/Minimum shelf life/Storage of chemicals

- Check the labelling of the chemicals. Chemical labels must not be removed or made illegible.
- Do not use any unknown chemicals.

- Obey the use-by date (minimum shelf life) stated on the label to ensure the functionality of the system and the quality of the water produced.
- If stored incorrectly, chemicals could change their state of matter, crystallise, outgas, or lose their effectiveness. Store and use the chemicals at the specified temperatures only.

Cleaning/Disposal

- Immediately absorb leaked chemicals with suitable binding agents.
- Collect and dispose of chemicals in such a way that they cannot pose any risk to people, animals, or the environment.

2.1.5 Persons in need of protection

- This product must not be used by persons (including children) with limited abilities, lack of experience or knowledge.
- Children should be supervised to make sure that they do not play with the product.
- Cleaning and maintenance must not be carried out by children.

2.2 Product-specific safety instructions

- ▶ Always route lines such as suction and return hose, mains cables, electrical connecting cables away from traffic routes in order to prevent tripping and tear-off.
- ▶ Secure the lines of the dosing system at the installation site where public traffic can be expected.
- ▶ Mark possible tripping hazards, if necessary.

- ▶ Be aware of a possible risk of slipping due to leaking water or dosing solution on the floor.
- ▶ Always use personal protective equipment (PPE) when working on the dosing tank (refer to chapter 1.6.3).

The safety package for caustic substances is available under order no. 180 810 (refer to chapter 3.4).

The safety package contains the personal protective equipment below:



1x Gloves, 1x Safety goggles, 1x Eye wash bottle

The safety package contains the symbol signs below:

1x Warning against caustic substances, 1x Use hand protection, 2x Use eye protection

When using chemicals that are subject the Ordinance on Hazardous Substances (German Gef-StoffV), you must comply with the legal requirements (e.g. § 20 of the Ordinance on Hazardous Substances – operating instruction).



Labels on the product



Risk of electric shock



Risk of chemical burns



The affixed information and pictograms must be clearly legible. They must not be removed, soiled or painted over.

- ▶ Obey all warnings and safety instructions.
- ▶ Immediately replace illegible or damaged symbols and pictograms.

2.2.1 Dosing chemical/dosing solution



- ▶ Brief/train the owner/operator/operating company in handling the dosing system and inform the owner/operator/operating company about possible risks/sources of danger when handling chemicals.
- ▶ Always use personal protective equipment when handling chemicals.

- ▶ Only use the approved dosing chemical which is permissible for the GENODOS pump GP used.
- ▶ Absorb leaked or spilled dosing chemical or dosing solution with appropriate means.

- ▶ Clean the areas until they are completely dry.

2.2.2 Safety components



Safety components must be replaced by original spare parts only.

- Spare parts for GENODOS pump GP
 - Pump head
 - Dosing line
 - Dosing valves
- All pressurised components and components that come into contact with the media

2.3 Conduct in emergencies



WARNING

Pressurised media lines

- After the mains plug is unplugged, media lines on the pressure side are still under pressure
- Dosing solution spraying out
 - ▶ Use personal protective equipment.
 - ▶ Relieve the pressure on the pressure side of the dosing pump before working on the pump head, its equipment parts or the dosing line.

2.3.1 In case of escaping dosing solution

1. De-energise the system.
2. Locate the leak.
3. Eliminate the cause of the dosing solution escaping.

2.3.2 In case of incorrect dosing

1. De-energise the system.
2. Check the state of the dosing solution in the dosing tank.
 - a Stir the dosing solution, if necessary.
3. Check the settings on the dosing pump.
4. Check the suction lance for damage and impurities.
5. Check all dosing lines for damage and impurities.

3 Product description

3.1 Intended use

- The dosing tanks are used for chemical dosing in the commercial and industrial sector.
- The dosing tanks with hand mixer or automatic agitator are used to prepare and mix liquids as well as for intensive mixing of the dosing solution.

3.1.1 Application limits

- The dosing tanks with mixing unit must not be used with out-gassing chemicals such as chlorine, Baktox, acid and hydrazine.
- Additional application limits due to the materials of the components used (refer to chapter 3.2.13.2).

3.1.2 Foreseeable misuse

- Use of incorrect GENODOS pump GP and unsuitable materials.
- Use of incorrect accessories for the dosing system.
- Incorrect connection of suction, dosing and return lines.
- Connection of the return line to the dosing tank is missing.
- Changing the dosing chemical without taking into consideration the materials used.

3.2 Product components

The dosing tanks differ in size and in the design of the mixing unit.

The dosing tanks are prepared for the installation of a dosing pump GENODOS pump GP at the factory.

The GENODOS pump GP must be selected separately in accordance with the intended use (refer to chapter 3.4).



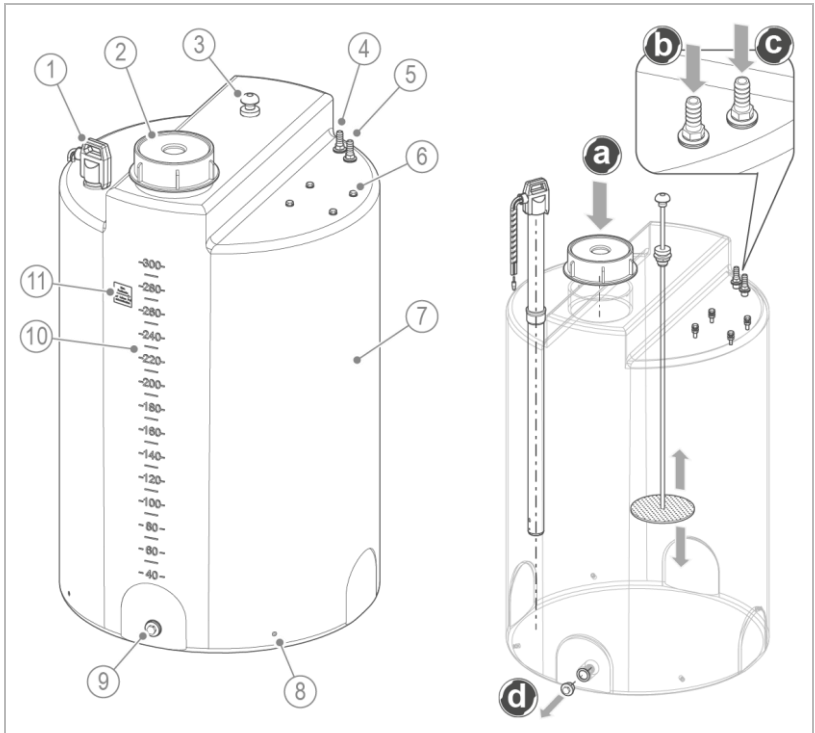
The design of the pump head and the materials for lines and connections must be determined according to the application of the pump and the dosing medium (refer to design calculation and chemical resistance list of GENODOS pump GP, order no. 118 949).

- Depending on the intended use, additional components must be ordered as options (refer to chapter 3.4).

Materials of the components

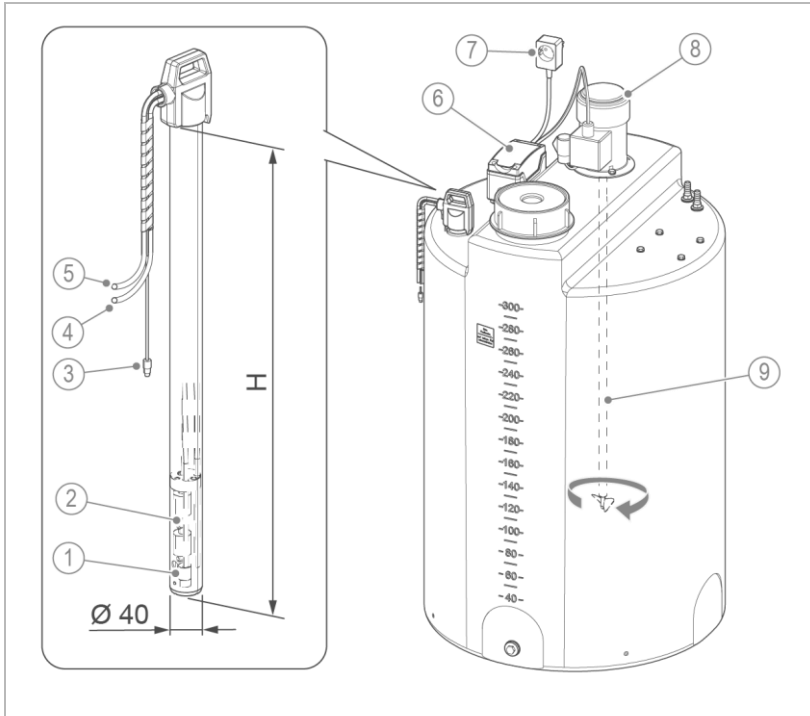
Component	Material
Dosing tank	HDPE
Screw cap	PP
Flat seal	EPDM
Hose connections	PP
Suction lance	PVC
Mixing units	
Hand mixer	PVC
Stirrer: automatic agitator	Stainless steel V4A / PP

3.2.1 HMI version







Designation	Function/Description
1 Suction lance	To draw in the dosing solution
2 Screw cap	To close the tank
3 Hand mixer	Designed as tamper with handle
4 Hose connections	To connect an optional overflow valve
5	To connect a water supply line
6 Fastening material	To fasten the base plate of GENODOS pump GP
7 Dosing tank	To receive the water and the dosing chemical
8 Rivet nuts	To fix the dosing tank on the floor
9 Closing plug	To drain the tank
10 Litre scale	As marking for the filling volume
11 Label	Marking for the max. filling height

3.2.2 ARW version



Designation	Function/Description
1 Foot valve	To filter the dosing solution with integrated retaining function
2 Level sensor	Signals the filling level in the dosing tank
3 Connector plug	For pre-alarm and empty signal for GENODOS pump GP (3-pole)
4 Suction line	To draw in the dosing solution
5 Return line	To return the dosing solution to the dosing tank
6 Timer control	For analogue agitator control of the electric motor for intermittent operation (5 minutes per 0.5 hours)
7 Mains plug	As shock-proof connector plug with mains cable of 1.5 m in length
8 Electric motor	In 230 V/AC with push-button for manual release
9 Agitator	Stirrer as agitator shaft with agitator blade

3.2.3 Connections

	Designation	Function
	Tank opening	To fill in the dosing chemical
	Return line*	From the overflow valve to the dosing tank
	Supply line*	To fill the dosing tank with water
	Draining	To drain the dosing tank for cleaning purposes

* The lines on connections b and c are interchangeable

3.3 Functional description

The dosing tanks feature a mixing unit. The mixing unit in the form of a hand mixer or an automatic agitator is required if the dosing solution is prepared with solid substances and in case of solutions that tend to settle.

The dosing tanks are pre-filled with water. The dosing chemical is prepared and mixed with the mixing unit.

In case of the hand mixer, the dosing solution is mixed manually.

In case of the automatic agitator, the electric motor stirs the dosing chemical automatically. The electric motor is controlled by the analogue timer control. The timer control can be set via the three-position switch:

Permanently ON (1), AUTO (time) and permanently OFF (0).

The suction lance draws the dosing solution and outputs a pre-alarm or an empty signal in good time when the dosing tank becomes empty and dosing solution must be refilled.

3.4 Accessories

You can retrofit your product with accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstaedt/Germany for details.

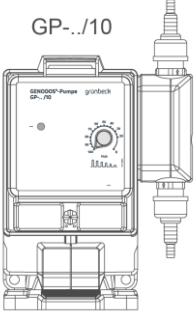
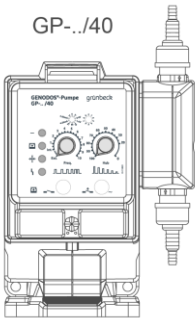
Illustration	Product	Order no.
<p data-bbox="252 470 336 494">GP-../10</p> 	<p data-bbox="479 432 739 456">GENODOS pump GP-6/10</p> <ul data-bbox="481 475 778 619" style="list-style-type: none"> • GP-6/.. (6.8 l/h at max. 8 bar) • Control variant 10 with the features below: <ul data-bbox="504 566 756 619" style="list-style-type: none"> • Adjustable dosing stroke • Operation indicator 	<p data-bbox="901 432 980 456">118 260</p>
<p data-bbox="252 850 336 874">GP-../40</p> 	<p data-bbox="479 818 739 842">GENODOS pump GP-6/40</p> <ul data-bbox="481 869 935 1310" style="list-style-type: none"> • GP-6/.. (6.8 l/h at max. 8 bar) • Control variant 40 with the features below: <ul data-bbox="504 962 935 1310" style="list-style-type: none"> • Adjustable dosing stroke • Operation indicator • Empty indicator • Level pre-alarm • Indication of membrane break • Dosing monitoring • Selector switch for internal/external control • Voltage-free activation • Voltage-free collective fault signal output • Analogue controller (0 – 5 V / 1 – 6 V / 0 – 20 mA or 4 – 20 mA) • Pulse division and pulse multiplication 	<p data-bbox="901 818 980 842">118 300</p>

Illustration	Product	Order no.
	GENODOS pump GP	118 xxx
<p>Please inquire for additional sizes and versions (resistance) of the dosing pump</p>		
	Safety package for caustic substances	180 810
<p>Consisting of the required PPE equipment and symbol signs necessary for the safe operation of the dosing system with caustic dosing chemicals</p>		
	Pneumatic eye wash bottle, 600 ml	210 512
<p>1 Bottle with plastic valve and 1 eye wash with 2 transparent hoses</p>		
	Wall bracket for pneumatic eye wash bottle	210 513
<p>For wall mounting and housing the eye wash bottle</p>		
	Chemical spill tray	163 805
<p>For 60/100 l dosing tanks</p> <ul style="list-style-type: none"> For larger spill trays, please inquire 		

You will need additional accessories to install the dosing system.

- Connection kit for dosing pump
- Dosing group (injection point)
- Dosing line
- Pressure maintaining valve/overflow valve
- Digital timer
- Contact water meter (with pulse divider)



Refer to Technical Information “Accessories for GENODOS pumps GP”.

4 Transport, set-up and storage

4.1 Shipping/Delivery/Packaging

The system is fixed on a pallet at the factory and secured against tipping.

- ▶ Upon receipt, immediately check for completeness and transport damage.

NOTE Improper transport

- Damage to the system due to falling
- The system does not feature any lifting points for lifting by a crane and lifting strap.
- ▶ Do not lift the system with a crane or lifting device.
- ▶ Load/unload the system secured on a pallet with a forklift/lift truck and suitable pallet forks.



4.2 Transport/Set-up to/at the installation site

- ▶ Transport the product in its original packaging only.



CAUTION

Unhandy size of the system during transport

- Crushing due to slipping and falling system
- ▶ Transport or lift the system with two people.
- ▶ Keep unauthorised persons away when transporting and setting up system.



CAUTION

Transport over stairs and inclines

- Crushing due to slipping and falling system
- ▶ Use suitable transport equipment (e.g. a forklift) when transporting the system to the installation site via inclines.
- ▶ Do not use any self-rolling transport equipment (e.g. lift trucks, trolleys).

4.3 Storage

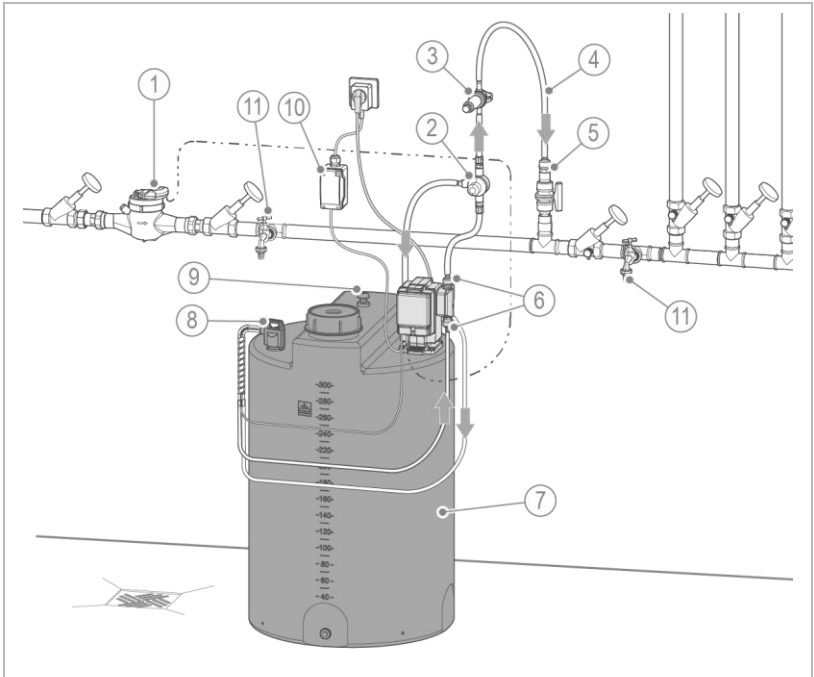
- ▶ Protect the product from the impacts below when storing it:
 - Dampness, moisture
 - Environmental impacts such as wind, rain, snow, etc.
 - Frost, direct sunlight, severe heat exposure
 - Other chemicals than the dosing chemical used
 - Dyes, solvents and their vapours

5 Installation



The installation of the system is a major intervention into the water system and must be carried out by a qualified specialist only.

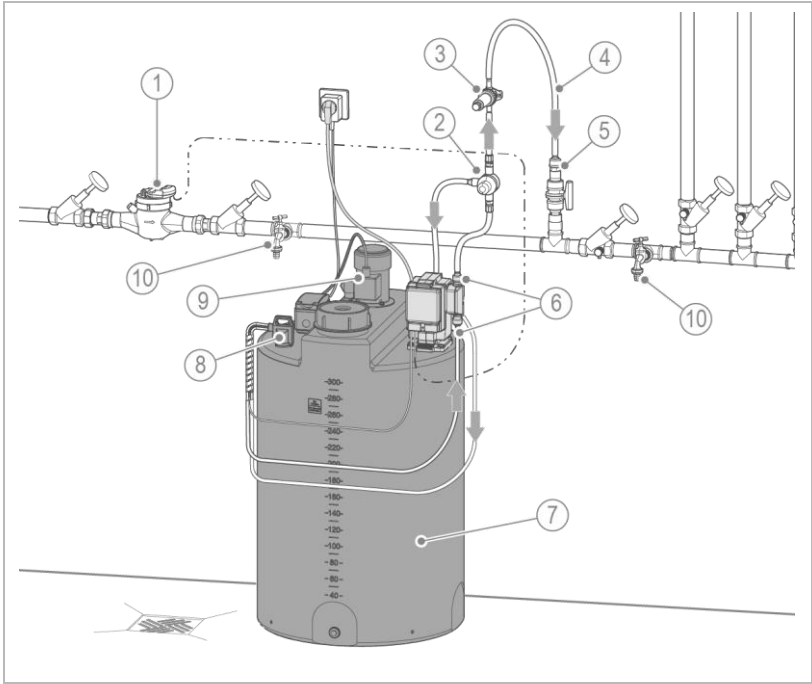
Installation example: Dosing tank with hand mixer (HMI)



Designation	
1	Contact water meter
2	Overflow valve
3	Pressure maintaining valve
4	Dosing line
5	Dosing group
6	Connection kit

Designation	
7	Dosing tank
8	Suction lance with suction and return line
9	Hand mixer
10	Digital timer control
11	Water withdrawal point upstream and downstream of the system

Installation example: Dosing tank with automatic agitator (ARW)



Designation	
1	Contact water meter
2	Overflow valve
3	Pressure maintaining valve
4	Dosing line
5	Dosing group
6	Connection kit

Designation	
7	Dosing tank
8	Suction lance with suction and return line
9	Automatic agitator with timer control
10	Water withdrawal point upstream and downstream of the system

5.1 Requirements for the installation site

Obey the local installation directives, general guidelines and technical specifications.

- Protection from frost, severe heat exposure and direct sunlight
- Protection from other chemicals, dyes, solvents and their vapours
- Ambient and radiation temperature in the immediate vicinity $\leq 30\text{ }^{\circ}\text{C}$
- Access for maintenance work (take note of space required)
- Sufficiently illuminated as well as aerated and ventilated
- Depending on the dosing chemical used, sufficient ventilation must be provided in the event of outgassing.
- Horizontal installation surface with sufficient load-bearing capacity to support the operating weight the system
- Prior to using the dosing tank, you must know the composition of the water.



When using chemicals that are subject to the German Ordinance on Hazardous Substances (German Gef-StoffV), you must comply with the legal requirements (e.g. § 20 of the German Ordinance on Hazardous Substances – Operating instruction).

- Spill tray to collect the dosing solution in case of leaks (refer to chapter 3.4)

Space required

Space required for installation, operation and cleaning the system:

- On the right and on the left + 500 mm
- At the front + 800 mm
- Above the system
 - To operate the hand mixer in case of the HMI version (refer to chapter 12)
 - For the electric motor in case of the ARW version (refer to chapter 12)
 - To mount the dosing pump onto the dosing tank (refer to the operation manual of GENODOS pump GP)
 - To pull out the suction lance

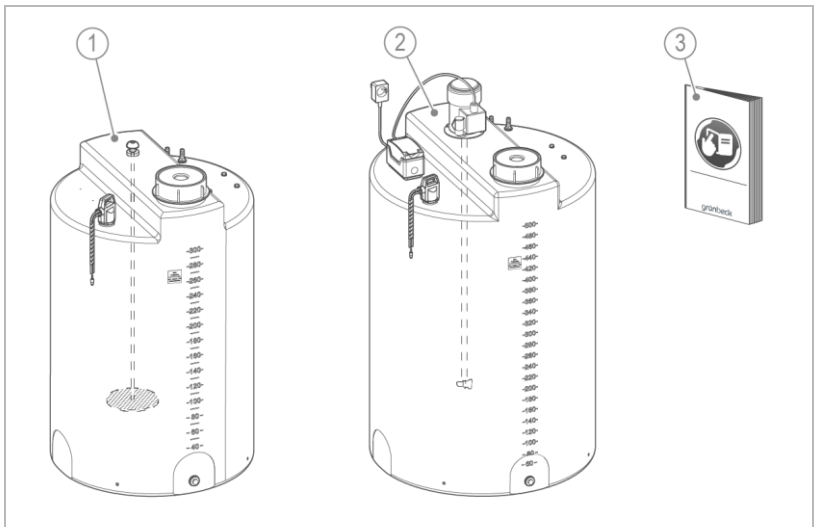
Water installation

- According to DIN EN 1717, dosing systems used in drinking water treatment must be secured by means of a Euro system separator if they are connected to the public drinking water network.
- Floor drain suitable for the system size or a safety device with water stop function
 - Alternatively, a collection vessel covering the maximum volume of the dosing solution
- Shut-off valves upstream and downstream of the system
- Water withdrawal points with possibility of sampling upstream and downstream of the system

Electrical installation

- Schuko socket with continuous power supply (approx. 1.2 m max. from the control unit of the automatic agitator)
- The socket outlet must be fitted in such a way that the system can be unplugged immediately and at any time in the event of malfunctions or maintenance work.

5.2 Checking the scope of supply



Designation

- 1 HMI version of dosing tank (completely pre-assembled)

Designation

- 2 ARW version of dosing tank (completely pre-assembled)
3 Operation manual

- Check the scope of supply for completeness and damage.

5.3 Water installation



The work below must be carried out by a qualified specialist only.



Obey the operation manuals below:

- Dosing pump GENODOS pump GP and Technical Information on accessories
- Contact water meter (with pulse divider)
- Pressure maintaining valve
- Dosing group



We always recommend using an overflow valve, in particular in case of aggressive media.

An overflow valve is a safety device to protect the dosing pump and the corresponding fittings and pipes.

It prevents an impermissibly high pressure increase in the system on the discharge side of the dosing pump.



- ▶ Install all components of the dosing system as compact as possible (rolled up with cable ties).
- ▶ Lay all lines without bends and free of mechanical stress.
- ▶ Leave a reserve length when shortening the dosing hose.
- ▶ Lay the dosing hose protected from hot and sharp-edged surfaces.

- ▶ Mount all required accessories of the dosing system (refer to accessories for GENODOS pumps GP).
- ▶ Comply with the space required for operation and maintenance of the dosing system (refer to chapter 5.1).
- ▶ Install the following when using hazardous chemicals:

- Eye wash unit

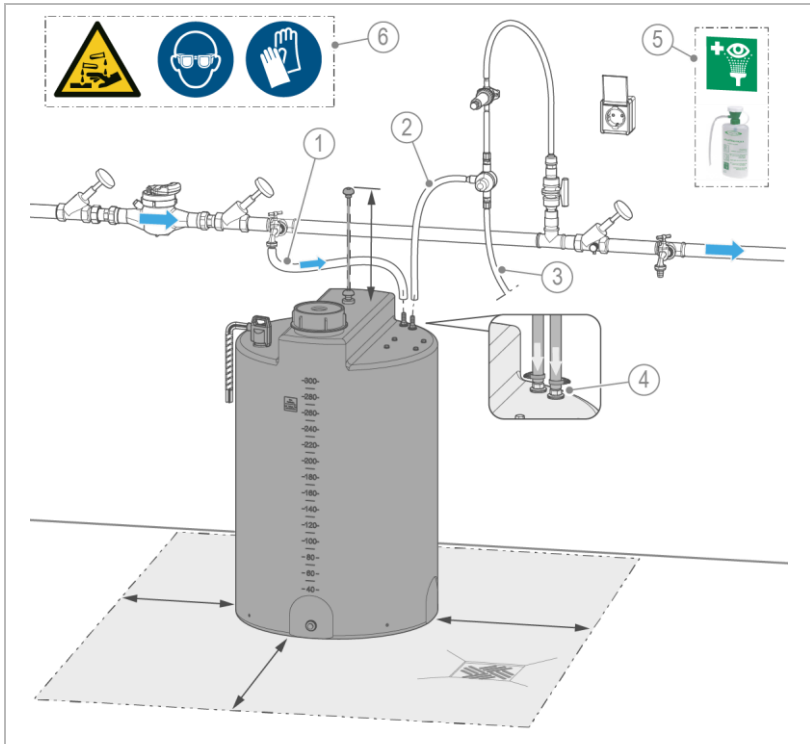


The eye wash unit must be installed at an easily accessible, visible and suitable place.

- Safety labelling of the work place.
- Spill tray to collect the dosing solution in case of leaks

5.3.1 Setting up the dosing tank

HMI version

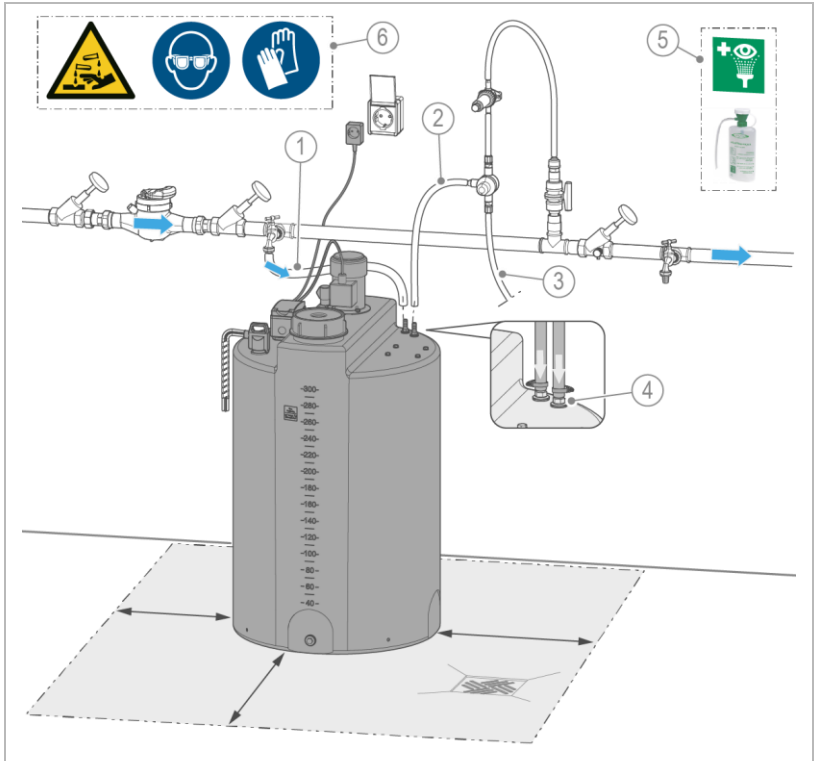


Designation	
1	Water supply line
2	Return line of overflow valve
3	Dosing line
4	Hose connections for water supply and return line

Designation	
5	Eye wash unit
6	Safety labelling in case of hazardous chemicals

1. Connect a water supply line to one of the hose connections.
2. Connect the return line of the overflow valve to one of the hose connections.

ARW version



Designation

- 1 Water supply line
- 2 Return line of overflow valve
- 3 Dosing line
- 4 Hose connections for water supply and return line

Designation

- 5 Eye wash unit
- 6 Safety labelling in case of hazardous chemicals

1. Connect a water supply line to one of the hose connections.
2. Connect the return line of the overflow valve to one of the hose connections.

5.3.2 Installing the dosing pump



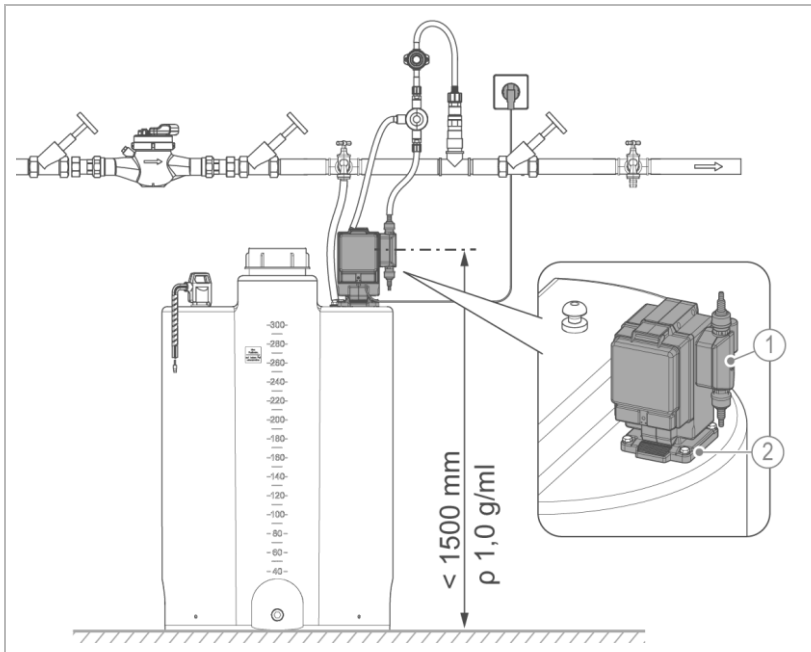
Obey the operation manual of GENODOS pump GP.



In case of dosing solutions with a density of 1.0 g/ml, the dosing pump can be installed max. 1500 mm from the floor (maximum suction head).



The dosing tank is prepared for installation of the dosing pump (fastening material included).



Designation

1 GENODOS pump GP

Designation

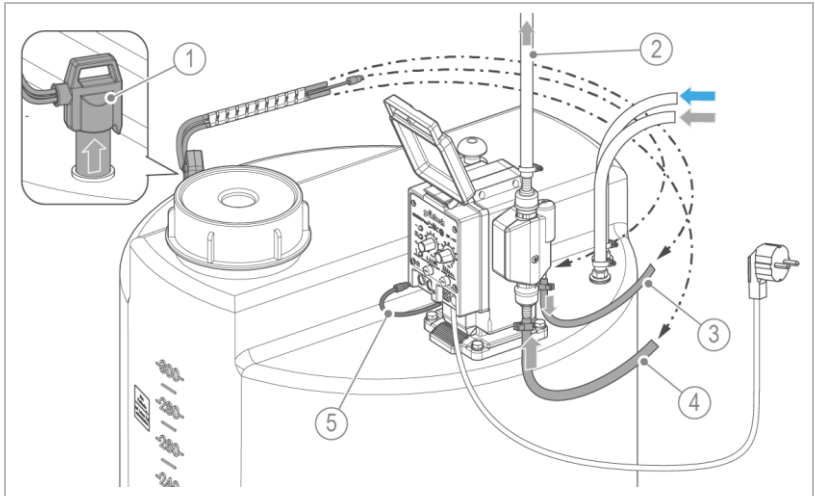
2 Screws

► Fasten the dosing pump on the dosing tank using the screws.

5.4 Connecting the suction lance to the dosing pump



The suction line and the return line of the suction lance are marked.



Designation

- | | |
|---|------------------------------|
| 1 | Suction lance |
| 2 | Dosing line |
| 3 | Return line (to dosing tank) |

Designation

- | | |
|---|---------------------------------|
| 4 | Suction line |
| 5 | Connector plug for empty signal |



Obey the operation manual of GENODOS pump GP.

1. Fasten the suction line and the return line of the suction lance on the lower connection of the dosing pump.
2. Fasten the dosing line on the upper connection of dosing pump.
3. Plug the connector for the empty signal into the contact point (black, on the left) on the dosing pump.

6 Start-up/commissioning



The initial start-up/commissioning of the product must be carried out by technical service personnel only.



WARNING

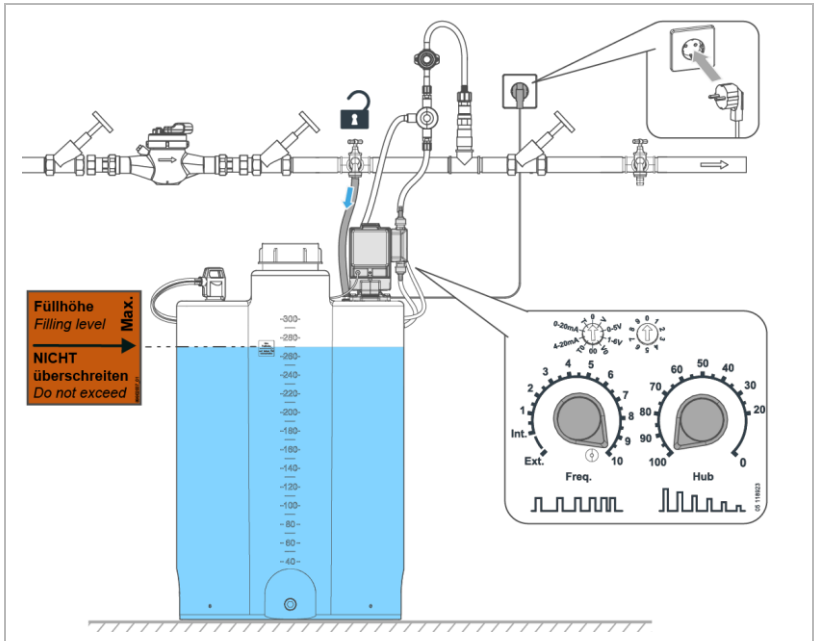
Leaking dosing solution if system is leaky.

- Chemical burns from the use of alkali, chlorine and acid
- ▶ Carry out the initial filling of the dosing pump with water only.
- ▶ Check the dosing system for leaks using water during initial start-up.
- ▶ Do not use the dosing chemical until the system is tight.

Prerequisites for initial start-up

1. Before initial start-up, check that all the components required for the safe operation of the dosing system have been installed.
2. Check whether a collection vessel is required, e.g. in case of dosing chemicals such as chlorine, acids and alkalis.
 - a Make sure that the collection vessel holds the volume of the dosing solution in case of leaks.

6.1 Checking the dosing system



1. Make sure that all lines are securely connected.
 - a Retighten the clamps, if necessary.
2. Make sure that the return hose to the dosing tank is connected.
3. Make sure that all required contact connections are connected.
4. Fill the dosing tank with water up to the marking.
5. Plug the mains plug of the dosing pump into the socket.
6. Set the internal/external control selector to **Int. 10** (for GP-../40).
7. Set the stroke length controller to **100**.

- » The dosing pump is set to maximum dosing capacity and stroke frequency
- » The LED operation indicator flashes green with each stroke.
- 8. Make sure that all hose connections are securely fastened.
- 9. Make sure that all mains cables and contact lines are safely routed to prevent tearing.
- 10. Check all connections and the entire dosing system for leaks.
 - » Leaks in the system can be detected in time.
- 11. Unplug the mains plug of the dosing pump from the socket.

6.2 Preparing dosing chemicals

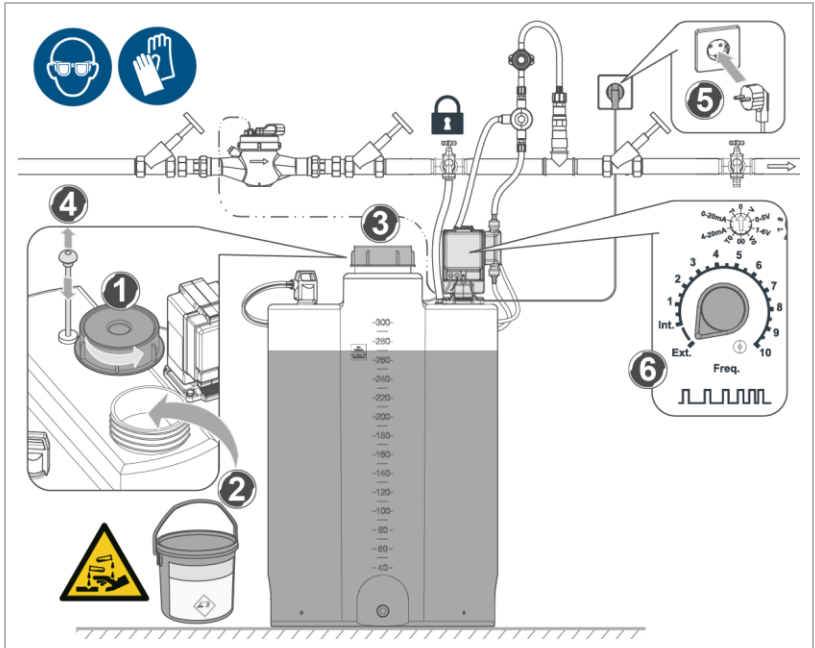


WARNING

Skin and eye contact with dosing solution

- Chemical eye burns, irritation of the skin and the respiratory tract
- ▶ Use safety goggles, protective gloves and sturdy clothing.
- ▶ Obey the safety data sheet of the dosing chemical.

- ▶ Make sure that the dosing pump is de-energised.



1. Open the screw cap of the dosing tank.
2. Prepare the dosing solution in accordance with the preparation instructions of the chemical.
3. Close the screw cap.
4. Thoroughly mix the dosing solution using the hand mixer.
 - a In case of an automatic agitator: Set the timer to permanently ON (1) and stir the dosing solution.
5. Plug the mains plug of the dosing pump into the socket.
6. Set the selector switch to internal **Int.** or external control **Ext.** depending on which dosing function is required.
7. Completely open a water withdrawal point downstream of the dosing point.

8. Adjust the dosing capacity, if necessary, and check the dosing pump for function.

6.3 Carrying out trial operation

1. Take a water sample and check the dosing capacity.
 - a Adjust the dosing capacity, if necessary.
2. Carry out a final functional check on the dosing system.
3. Fill in the start-up/commissioning log (refer to chapter 13.1).

6.4 Handing over the product to the owner/operator/operating company

- ▶ Explain to the owner/operator/operating company how the product works.
- ▶ Use the manual to brief the owner/operator/operating company and answer any questions.
- ▶ Inform the owner/operator/operating company about the need for inspections and maintenance.
- ▶ Hand over all documents to the owner/operator/operating company for keeping.

6.4.1 Disposal of packaging

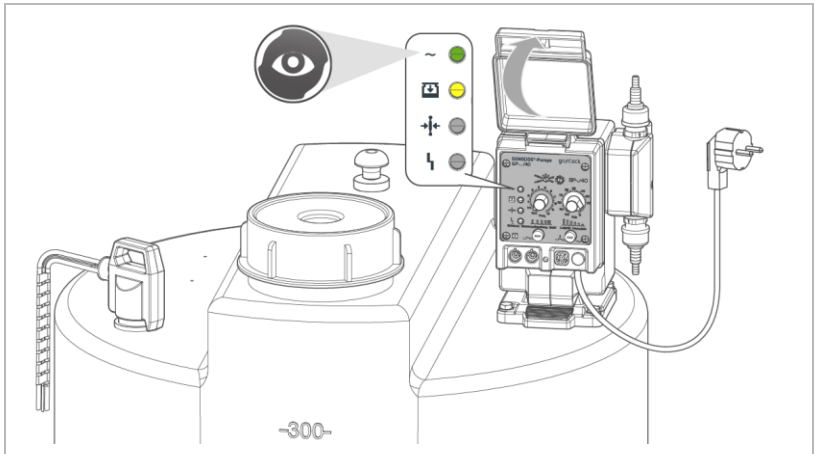
- ▶ Dispose of packaging material as soon as it is no longer needed (refer to chapter 11.2).

7 Operation

7.1 Operating the dosing pump



For operation of the dosing pump, refer to the operation manual of GENODOS pump GP.

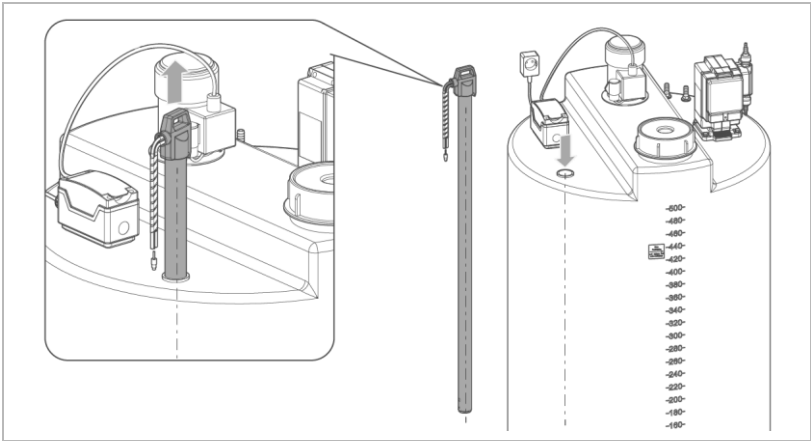


- ▶ Check the dosing pump for function at regular intervals.
 - » The LED operation indicator must light up green.
- ▶ Check the empty signal for function (refer to chapter 8.4).
 - » The LED empty signal must light up yellow.

7.2 Operating the suction lance



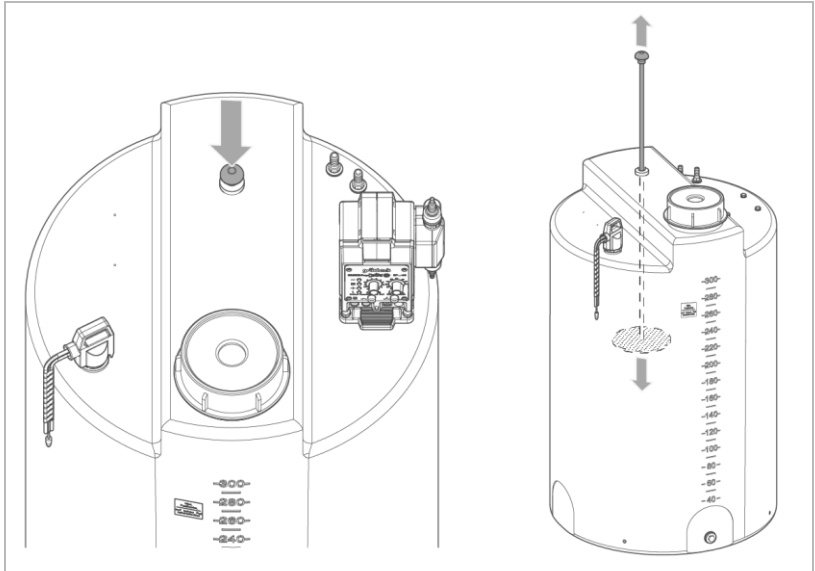
- ▶ Pay attention to hygiene when operating the suction lance.
- ▶ Do not touch the lower part of the suction lance with your bare hands. Use protective gloves.
- ▶ Do not put the suction lance on the floor.



1. Disconnect the lines from the dosing pump if the suction lance needs to be removed completely, for instance for cleaning purposes.
2. Pull the suction lance upwards at the handle.
3. Vertically insert the suction lance into the dosing tank from above.

7.3 Operating the hand mixer

HMI version



1. Pull the hand mixer upwards at the handle.
2. Mix the dosing solution by tamping.
3. Insert the hand mixer into the tank as far as it will go.



With the hand mixer, you can mix the dosing solution at any time to prevent the dosing chemical from settling.

7.4 Operating the automatic agitator



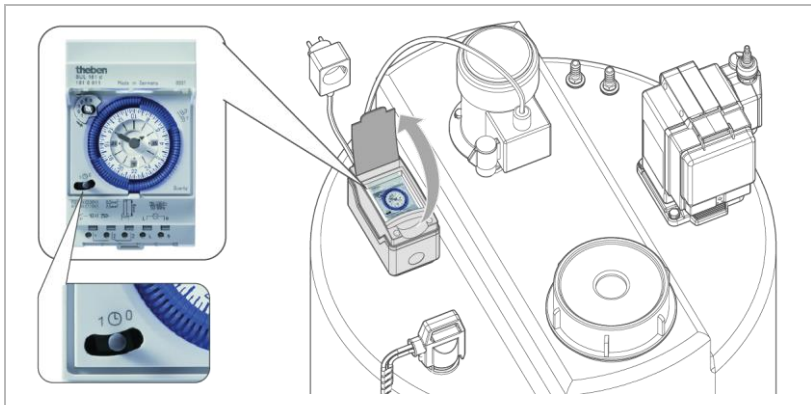
For operation of the analogue timer control, refer to the operation manual of the timer manufacturer.



WARNING Rotating shaft and stirrer

- Reaching into the dosing tank during the mixing process can result in serious injuries due to the rotating agitator.
- ▶ Never reach into the dosing tank or touch the agitator when it is running.
- ▶ Before working on the automatic agitator, make sure that it is de-energised.

ARW version



- ▶ Set the analogue timer according to your requirements.
 - » The automatic agitator automatically switches off after the set time period.



If necessary, you can also start the automatic agitator manually at the timer. Set the switch to permanently ON (1).

7.5 Taking samples

- ▶ Regularly take samples to check the concentration of the dosing solution.



During sampling, take into consideration that there will be fluctuating concentrations (clouds) of the dosing chemical in the medium (e.g. water) depending on the dosing pulse or pulse sequences.

- ▶ When taking samples, make sure that the concentration is balanced by the volume of the sample taken.

7.6 Refilling dosing chemicals

- ▶ Prepare a new dosing solution in time (refer to chapter 6.2).
- ▶ Put the dosing system into operation again (refer to chapter 6.3).
- ▶ Document the chemical consumption (refer to the checklist in chapter 13).

7.7 Changing the dosing chemical

- ▶ Have the changeover from one chemical used to another chemical carried out by qualified personnel (refer to chapter 8.5).

8 Maintenance and repair

Maintenance and repair includes cleaning, inspection and maintenance of the product.



The responsibility for inspection and maintenance is subject to local and national requirements. The owner/operator/operating company is responsible for compliance with the prescribed maintenance and repair work.



By concluding a maintenance contract you make sure that all maintenance work will be carried out on time.

- ▶ Only use genuine spare and wearing parts from Grünbeck.

8.1 Cleaning



Have the cleaning work only carried out by persons who have been instructed on the risks and dangers that can arise from the product.



WARNING

Cleaning live components

- Risk of electric shock
- Sparking possible due to short circuit
- ▶ Switch off the voltage supply – as well as any external voltage – before starting the cleaning work.
- ▶ Do not use any high-pressure equipment for cleaning and do not blast electrical/electronic devices with water.

NOTE

Do not clean the system with cleaning agents containing alcohol/solvents.

- These substances damage the plastic components
- Varnished surfaces are affected.
- ▶ Use a mild/pH-neutral soap solution.

- ▶ Use personal protective equipment.
- ▶ Only clean the outside of the system.
- ▶ Do not use any strong or abrasive cleaning agents.
- ▶ Wipe the surfaces with a damp cloth.
- ▶ Dry the surfaces with a cloth.

8.1.1 Cleaning in case of leaking dosing solution



WARNING

Skin and eye contact with dosing solutions

- Chemical eye burns and irritation of the skin and the respiratory tract
 - ▶ Use safety goggles, protective gloves and sturdy clothing.
 - ▶ Obey the safety data sheet of the dosing chemical.
1. Absorb leaked dosing solution with appropriate means.
 - a Use binding agents, if necessary.
 2. Clean the areas until they are completely dry.

8.2 Intervals



By way of regular inspections and maintenance, malfunctions can be detected in time and system failures might be prevented.

- ▶ As owner/operator/operating company determine which components must be inspected and maintained at which intervals (load-dependent). These intervals are subject to the actual conditions such as: water condition, degree of impurities, environmental impacts, consumption, etc.

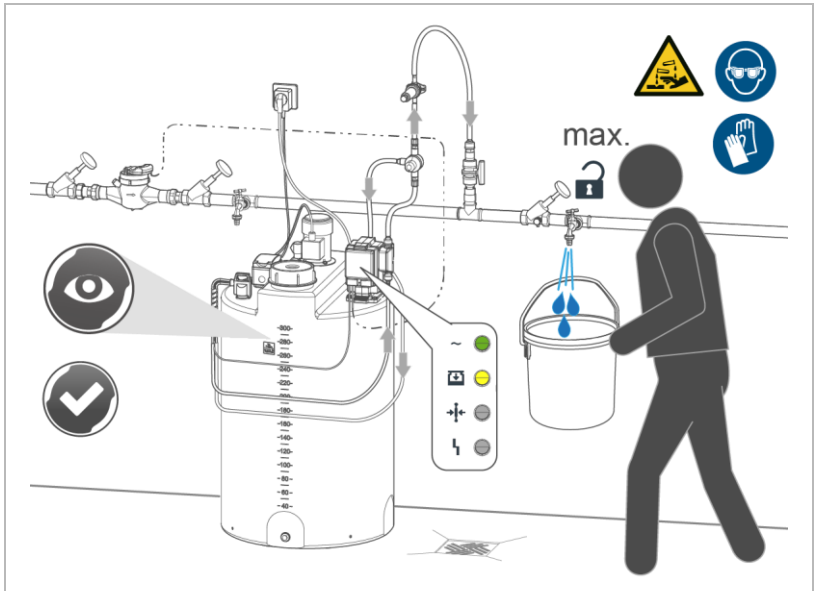
The interval table below shows the minimum intervals for the activities to be carried out.

Task	Interval	Tasks
Inspection	2 months	<ul style="list-style-type: none"> • Check the dosing system for leaks • Check the dosing pump for function • Check the dosing chemical for content, shelf life and availability
Maintenance	6 months	<ul style="list-style-type: none"> • Check the dosing pump for function • Check the empty signal • Check the entire dosing system for leaks • Check the automatic agitator for function • Check the dosing and stir it, if necessary • Assess consumption of the dosing chemical
	annually	<ul style="list-style-type: none"> • Check the dosing pump for its condition and for leaks • Clean components coming into contact with chemicals and replace them, if necessary • Check flow rates and dosing volumes • Check all system parts for their condition and function. • Replace wearing parts, if necessary • Clean additional components of the dosing system (accessories) and check them for function
Repair	5 years	<ul style="list-style-type: none"> • Recommendation: replace wearing parts

8.3 Inspection

You as owner/operator/operating company can do the regular operational checks and inspections yourself.

- ▶ Carry out an inspection at least every 2 months.



3. Visually check the entire dosing system for leaks.
 - a Pay attention to puddles on the floor.
 - a Visually check the dosing pump and dosing lines for leaks.
4. Check the dosing pump for function during water withdrawal.
5. Check the dosing chemical for content, shelf life and availability.

8.4 Maintenance

Regular work is required in order to ensure the proper functioning of the product in the long term. DIN EN 806-5 recommends regular maintenance to ensure trouble-free and hygienic operation of the product.

- ▶ Use personal protective equipment (refer to chapter 1.6.3).

8.4.1 Semi-annual maintenance

1. Check the dosing pump for function.
2. Check the empty signal for function.
 - a Pull the suction lance from the dosing solution.
 - » The dosing pump must output a **Pre-alarm** or an **Empty signal**.
3. Check the entire dosing system for leaks.
 - a Check all connections for a tight fit.
4. Check the agitator for function.



WARNING

Rotating shaft and stirrer

- Reaching into the dosing tank during the mixing process can result in serious injuries due to the rotating agitator.
 - ▶ Never reach into the dosing tank or touch the agitator when it is running.
 - ▶ Before working on the automatic agitator, make sure that it is de-energised.
- a Clean the shaft and the stirrer, if necessary.
 - b Manually start the automatic agitator at the timer.

5. Check the consistency of the dosing solution in the dosing tank.
 - a Stir the dosing solution, if necessary.
6. Assess consumption of the dosing chemical in relation to the water consumed.
 - a Document consumption (refer to chapter 13).

8.4.2 Annual maintenance



This maintenance work must be carried out by technical service personnel or by qualified specialists trained by Grünbeck.

In addition to semi-annual maintenance, the work below must be carried out as well:

1. Carry out function-preserving cleaning of all components coming into contact with chemicals.
 - b Replace the components, if necessary.
2. Check flow rates and dosing volumes.
 - a In case a deviating amount of dosing solution is added, check the dosing volume by gauging.
3. Check the function and condition of all system components (refer to the maintenance checklist in chapter 13).
4. Carry out a wear test on safety-relevant components (refer to the operation manual of GENODOS pump GP).
5. Check all additional components of the dosing system (refer to the maintenance checklist in chapter 13):
 - a Clean the individual components.
 - b Check the components for function.

6. Carry out a final functional check on the dosing system.
 - a Take a water sample and check the dosing capacity.
7. Record the maintenance in the operation log (refer to chapter 13).

8.5 Changing the dosing chemical



Have the changeover of the dosing chemical carried out by authorised personnel only.



If changing the chemical is necessary due to a change in the water quality or after rehabilitation, the dosing system must be flushed with drinking water that complies with the German Drinking Water Ordinance (TrinkwV).

NOTE

Change the dosing chemical only with prior flushing of the dosing system.

- Mixing different dosing chemicals can result in a failure of the dosing system.
- Functional failure/damage to the dosing system possible.
- ▶ Flush the dosing system according to the flushing instructions.

8.5.1 Flushing instructions

1. Disconnect the system from mains.
 2. Completely drain the dosing tank and flush it with a large amount of water.
 3. Fill a maximum amount of fresh water into the dosing tank.
 4. Connect the system to mains.
 5. Let the dosing pump operate at full dosing capacity until the chemical residues in the dosing lines, suction lance and dosing pump have been flushed out.
 - » The dosing system is flushed.
- Put in the new dosing chemical.

8.5.2 Replacing components



Replacing the pump head, dosing hose and dosing valve guarantees that no residues of the old dosing chemical remain in the dosing system.

Replacing the components is necessary in the exceptional cases below:

- Crystallisation/chemical reactions
- Dosing pump defective/sucking air

8.6 Spare parts

For an overview of the spare parts, refer to our spare parts catalogue at www.gruenbeck.com. You can order the spare parts from your local Grünbeck representative.

8.7 Wearing parts



The replacement of wearing parts must be carried out by technical service personnel only.

Wearing parts are listed below:

- Seals
- All valves and membranes on the dosing pump
- Automatic agitator (bearings, rotary shaft seals)

9 Troubleshooting



WARNING

Skin and eye contact with dosing solutions

- Chemical eye burns and irritation of the skin and the respiratory tract
- ▶ Use safety goggles, protective gloves and sturdy clothing.
- ▶ Obey the safety data sheet of the dosing chemical.



For further fault messages on the dosing pump:

- Refer to the operation manual of GENODOS pump GP

For ARW version:

- Refer to the operation manual of the automatic agitator
-
- ▶ Use personal protective equipment for troubleshooting (refer to chapter 1.6.3).

9.1 Observations

Observation	Explanation	Remedy
Suction lance does not draw, dosing capacity declines	Suction lance clogged, crystalline deposits and contamination of chemical-carrying parts	▶ Check, clean and thoroughly flush suction and return line
	Foot valve and level sensor dirty or defective	▶ Replace the suction lance by a new one
	Incorrect cabling or damaged connector plug for empty signal	▶ Check the cabling and/or replace the plug-in connection
	Liquid level undershot	▶ Refill dosing solution or prepare new one
	Suction connection is leaking	▶ Seal the suction connection
	A different dosing chemical is being used (concentration)	▶ Thoroughly clean the dosing system ▶ Have parts coming into contact with chemicals replaced by technical service personnel
Automatic agitator does not switch on or stalls during operation	Power failure	▶ Check connection line of control unit and mains voltage
	Fuses defective	▶ Check fuses and replace them
	Electric motor is overheated	▶ Check the stirrer for a tight fit and free running ▶ Have damaged automatic agitator replaced by technical service personnel

Observation	Explanation	Remedy
	Solids or fibres on agitator	<ul style="list-style-type: none"> ▶ Switch off the agitator and remove fibres and solids ▶ Check consistency of dosing solution ▶ Check mixing process and readjust it, if necessary
Dosing pump does not dose or doses to little	Suction side leaky or clogged	<ul style="list-style-type: none"> ▶ Clean the suction lance ▶ Check the suction line for leaks
	Suction head too high	<ul style="list-style-type: none"> ▶ Reduce the distance between the dosing tank and the dosing pump
Leaks at the connection points	Hose expanded too far	<ul style="list-style-type: none"> ▶ Detach the hose on the connection kit in question and cut off approx. 1 cm ▶ Re-attach and secure the hose

If a malfunction cannot be eliminated, the technical service personnel or a qualified specialist trained by Grünbeck can take further measures.

- ▶ Contact technical service.



10 Decommissioning

If a longer standstill of the system is planned, the system must be decommissioned.

10.1 Temporary standstill

1. Flush the dosing system with clear water.
2. Disconnect the dosing pump and the automatic agitator from mains.

10.2 Restart/recommissioning

1. Connect the dosing pump and the automatic agitator to mains.
2. Put the system into operation again (refer to chapter 5.4).

10.3 Final shutdown

- ▶ Check whether shutting down the system has an effect on the functional integrity of your installation.
- ▶ Have a qualified specialist dismantle the system components (refer to chapter 11.1).

11 Dismantling and disposal

11.1 Dismantling



The work described herein represents an intervention into your water system.

- ▶ Have this work carried out by qualified specialists only.



WARNING Pressurised media lines

- After the mains plug is unplugged, media lines on the pressure side are still under pressure
- Dosing media splashing out
- ▶ Use personal protective equipment.
- ▶ Relieve the pressure on the pressure side of the dosing pump before working on the dosing pump, its equipment or the dosing lines.

1. Drain the dosing tank.



Obey the disposal instructions and information in the safety data sheet of the chemical.

2. Flush the system with raw water.
 - » The dosing tank, the dosing pump and all lines must be free of chemical residues.
3. Disconnect all system components from mains.
4. Drain the system.
5. Disconnect the electric connections.
6. Remove the dosing pump.
7. Disconnect the entire system from the water installation.
8. Take the system away (refer to chapter 4).

11.2 Disposal

- ▶ Obey the applicable national regulations.

Packaging

- ▶ Dispose of the packaging in an environmentally sound manner.

NOTE

Danger to the environment due to incorrect disposal

- Packaging materials are valuable raw materials that can be reused in many cases.
- Incorrect disposal can cause hazards to the environment.
- ▶ Dispose of packaging materials in an environmentally sound manner.
- ▶ Obey the local disposal regulations.
- ▶ If necessary, commission a specialist company with the disposal.

Dosing chemical and dosing tank

- ▶ Obey the safety data sheet of the dosing chemical.
- ▶ Flush the dosing tank with plenty of water.
- ▶ Dispose of residual chemicals.

Product



If this symbol (crossed-out wheelee bin) is on the product, this product or its electrical and electronic components must not be disposed of as household waste.

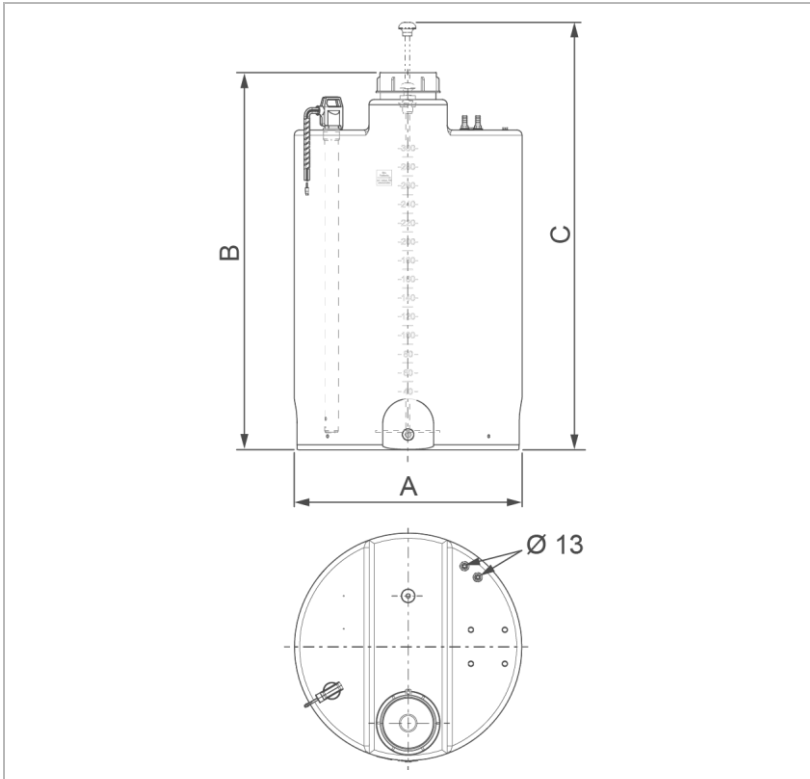
- ▶ Dispose of electrical and electronic products or components in an environmentally sound manner.
- ▶ If your product contains batteries or rechargeable batteries, dispose of them separately from your product.



For more information on take-back and disposal, go to www.gruenbeck.de.

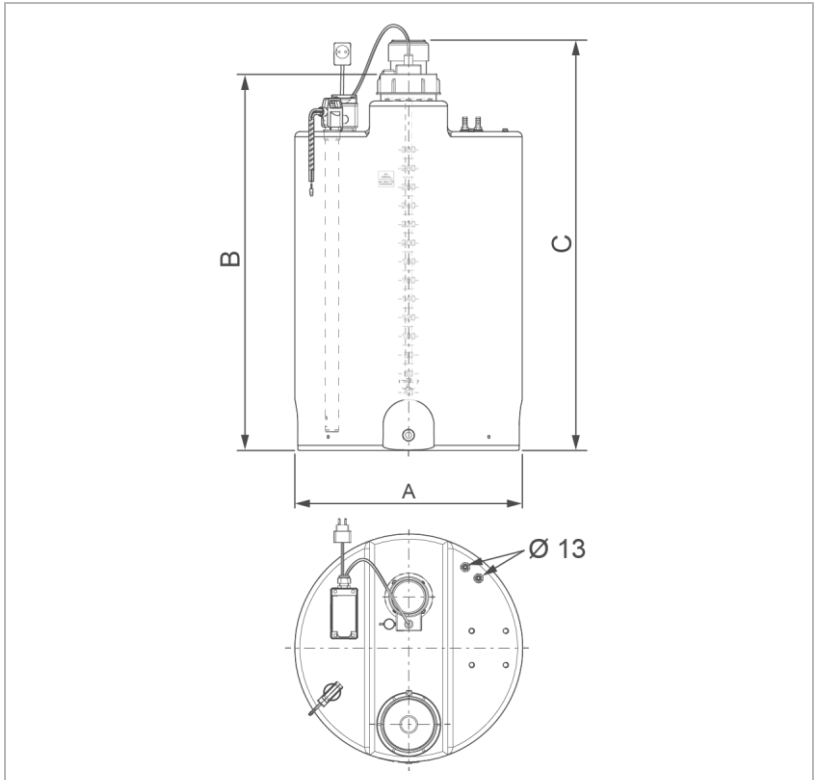
12 Technical specifications

HMI version



Dimensions and weights			60-HMI	100-HMI	200-HMI	300-HMI	500-HMI
A	Diameter	mm	420	460	600	670	790
B	Height with screw cap	mm	645	835	995	1110	1250
C	Height required	mm	1100	1400	1700	1950	2200
Operating weight		kg	~ 66	~ 108	~ 212	~ 315	~ 525
Empty weight		kg	~ 6	~ 8	~ 11.5	~ 15	~ 23

ARW version



Dimensions and weights			60-ARW	100-ARW	200-ARW	300-ARW	500-ARW
A	Diameter	mm	420	460	600	670	790
B	Height with screw cap	mm	645	835	995	1110	1250
C	Height required	mm	760	940	1060	1210	1350
Operating weight		kg	~ 71	~ 113	~ 217	~ 320	~ 528
Empty weight		kg	~ 11	~ 13	~ 16.5	~ 19.5	~ 27.5

Connection data		60-ARW	100-ARW	200-ARW	300-ARW	500-ARW
Power supply	V/Hz	230/50				
Rated current	A	0.35				
Connected load (operation)	kW	0.33				
Protection/protection class		IP44/⊕				
Filling volumes		60-HMI/ARW	100-HMI/ARW	200-HMI/ARW	300-HMI/ARW	500-HMI/ARW
Volume	l	60	100	200	300	500
General data		60-HMI/ARW	100-HMI/ARW	200-HMI/ARW	300-HMI/ARW	500-HMI/ARW
Temperature of dosing medium	°C	≤ 40				
Ambient temperature	°C	5 – 30				
Humidity (non-condensing)	%	≤ 95				
Order no.	HMI	1630 0002 0000	1630 0003 0000	1630 0004 0000	1630 0005 0000	1630 0006 0000
	ARW	1630 0007 0000	1630 0008 0000	1630 0009 0000	1630 0010 0000	1630 0011 0000

13 Operation log



- ▶ Document the initial start-up/commissioning and all maintenance activities.
- ▶ Copy the maintenance report.

Dosing tank type: _____

Serial no.: _____

13.1 Start-up/commissioning log

Customer				
Name				
Address				
Installation/Accessories				
Floor drain present	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Euro system separator (make/type)	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Water softener installed upstream (make/type)	<input type="checkbox"/> Yes	<input type="checkbox"/> No		
Agitator on dosing tank	<input type="checkbox"/> manual	<input type="checkbox"/> automatic		
Dosing Active agent/amount				
Water pipe	<input type="checkbox"/> Galvanised steel	<input type="checkbox"/> Copper	<input type="checkbox"/> Plastic	<input type="checkbox"/> Stainless steel

BA_100206050000_en_005_Dosierbehälter 60-500 HMI-ARW.docx

Operating values						
Water pressure (flow pressure)						bar
Water meter reading						m ³
Room temperature						°C
Hardness unit	<input type="checkbox"/> °dH	<input type="checkbox"/> °f	<input type="checkbox"/> mol/m ³	<input type="checkbox"/> °e	<input type="checkbox"/> °ppm	
Raw water hardness (measured)						

Remarks					

Start-up/commissioning	
Company	
Service technician	
Work time certificate (no.)	
Date/signature	

Maintenance No.: _____



- ▶ Enter the measured values and operating data.
- ▶ Confirm the checks with **OK** or record any repairs carried out.

Operating values		
Dosing volume checked	<input type="checkbox"/> Yes	<input type="checkbox"/> No
ACTUAL dosing volume, NEW dosing volume	ml	ml
Dosing chemical (replacement available)	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Dosing chemical used		
Dosing chemical checked for content and shelf life		
Water pressure, flow pressure	bar	bar
Water meter reading		m ³

Maintenance work	OK (YES)	NO
Visual check		
Entire dosing system checked on the outside for damage, corrosion and leaks	<input type="checkbox"/>	
Function-preserving cleaning carried out	<input type="checkbox"/>	
Hygienic condition complied with	<input type="checkbox"/>	

Functional check of the individual components

Dosing pump		
Function of dosing pump checked by withdrawing water	<input type="checkbox"/>	
Suction, pressure and draining valve cleaned	<input type="checkbox"/>	
Suction, pressure and draining valve replaced	<input type="checkbox"/>	<input type="checkbox"/>
Pump head replaced	<input type="checkbox"/>	<input type="checkbox"/>
Dosing and venting membrane replaced	<input type="checkbox"/>	<input type="checkbox"/>
Valve pin in pump head replaced	<input type="checkbox"/>	<input type="checkbox"/>
Mains cable and mains plug checked for damage and a tight fit	<input type="checkbox"/>	
Hose connections checked for leaks	<input type="checkbox"/>	
Dosing hose checked for deposits and cleaned	<input type="checkbox"/>	
Dosing hose replaced	<input type="checkbox"/>	<input type="checkbox"/>

Maintenance work	OK (YES)	NO
Suction lance		
Suction lance and hoses checked for deposits and cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Suction lance replaced	<input type="checkbox"/>	<input type="checkbox"/>
Empty signal and switch-off of dosing pump in the event of an empty signal checked	<input type="checkbox"/>	<input type="checkbox"/>
Dosing tank with agitator		
Dosing tank filled with water while empty	<input type="checkbox"/>	<input type="checkbox"/>
New dosing solution prepared and water sample checked	<input type="checkbox"/>	<input type="checkbox"/>
Hand mixer checked for function	<input type="checkbox"/>	<input type="checkbox"/>
Stirrer (tamper) cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Automatic agitator checked for function	<input type="checkbox"/>	<input type="checkbox"/>
Agitator cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Agitator control setting checked	<input type="checkbox"/>	<input type="checkbox"/>
Dosing tank cleaned and checked for stability	<input type="checkbox"/>	<input type="checkbox"/>
Accessories (additional components of the dosing system)		
Spill tray cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Safety labelling (in accordance with Ordinance on Hazardous Substances) checked for presence and condition	<input type="checkbox"/>	<input type="checkbox"/>
Eye wash unit checked for presence and function; replaced, if necessary	<input type="checkbox"/>	<input type="checkbox"/>
Overflow valve checked for leaks and function	<input type="checkbox"/>	<input type="checkbox"/>
Pressure maintaining valves checked for leaks and function	<input type="checkbox"/>	<input type="checkbox"/>
Dosing group checked for leaks and function	<input type="checkbox"/>	<input type="checkbox"/>
Injection point cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Injection point replaced	<input type="checkbox"/>	<input type="checkbox"/>
Non-return valve of dosing group cleaned	<input type="checkbox"/>	<input type="checkbox"/>
Non-return valve of dosing group replaced	<input type="checkbox"/>	<input type="checkbox"/>
Water meter checked for leaks and pulse output	<input type="checkbox"/>	<input type="checkbox"/>
Pulse divider checked for pulse output	<input type="checkbox"/>	<input type="checkbox"/>
Digital timer control checked for function	<input type="checkbox"/>	<input type="checkbox"/>
Voltage-free level signal/collective fault	<input type="checkbox"/>	<input type="checkbox"/>
M-bus measuring transducer D-DAM checked for function	<input type="checkbox"/>	<input type="checkbox"/>
Carried out by		
Company		
Service technician	Date	Signature

Consumption of chemical

Dosing chemical: _____

1. Document the water volume that has flown through.
2. Document the amount of chemicals that has been consumed.
3. Evaluate the chemical consumption subject to the water volume that has flown through.

Date	Water volume	Amount of chemicals	Consumption OK	
			Yes	NO
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				

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Date	Water volume	Amount of chemicals	Consumption OK	
			Yes	NO
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				
			<input type="checkbox"/>	<input type="checkbox"/>
Note/Name:				

Publisher's information

Technical documentation

Should you have any questions or suggestions regarding this operation manual, please contact Grünbeck Wasseraufbereitung GmbH's Department for Technical Documentation directly.

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