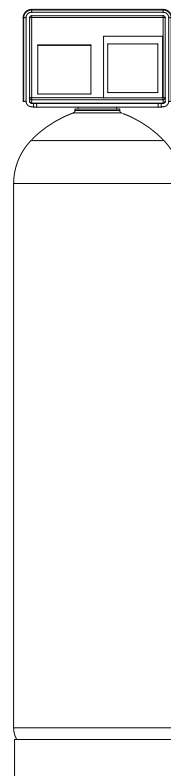


Operation manual
Filter systems
GENO-mat KF-Z / MS-Z / AK-Z
Deacidification systems
GENO-mat TE-Z



Edition September 2018
Order no. 035 129 950-inter

Grünbeck Wasseraufbereitung GmbH
Josef-Gruenbeck-Str. 1 · 89420 Hoehstaedt
GERMANY
☎ +49 9074 41-0 · 🖨 +49 9074 41-100
www.gruenbeck.com · info@gruenbeck.com



A company certified by TÜV SÜD
in accordance with DIN EN ISO 9001,
DIN EN ISO 14001 and SCC

Table of contents

A General	5
1 Preface	
2 How to use this operation manual	
3 General safety information	
4 Shipping and storage	
5 Disposal	
B Basic information	9
1 Laws, regulations, standards	
2 Designated application/area of application	
3 Function	
C Product description.....	13
1 Type plate	
2 Technical specifications	
3 Intended use	
4 Scope of delivery	
5 Optional accessories	
6 Consumables	
D Installation.....	19
1 General installation information	
2 Preliminary works	
3 How to connect the system	
E Start-up.....	16
1 How to start up the system	
F Operation.....	27
1 How to operate the control unit	
G Maintenance.....	30
1 Basic information	
2 Inspection (functional check)	
3 Maintenance	
4 Spare parts	
5 Operation log	

All rights reserved.

© Copyright by Grünbeck Wasseraufbereitung GmbH

Printed in Germany

Effective with the date of edition indicated on the cover sheet.

-We reserve the right to modifications, especially with regard to technical progress-

Reprints, translations into foreign languages, electronic storage or copying - even in part - of this operation manual are only permitted with the explicit written approval of Grünbeck Wasseraufbereitung GmbH.

Any type of duplication not authorised by Grünbeck Wasseraufbereitung is a copyright violation and subject to legal action.

Responsible for contents:

Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1 • 89420 Hoechstädt/Do., Germany

Tel. +49 9074 41-0 • Fax +49 9074 41-100

www.gruenbeck.de • service@gruenbeck.de

Print: Grünbeck Wasseraufbereitung GmbH

Josef-Grünbeck-Str. 1, 89420 Hoechstädt/Do., Germany

grünbeck



EU Declaration of Conformity

This is to certify that the systems designated below meets the safety and health requirements of the applicable European guidelines in terms of its design, construction and execution.

If the systems are modified in a way not approved by us, this certificate is void.

Manufacturer: Grünbeck Wasseraufbereitung GmbH
Josef-Grünbeck-Str. 1
89420 Hoechstädt/Do., Germany

Responsible for documentation: Markus Pöpperl

Description of the system: Filter systems
Deacidification systems

Device type: GENO-mat KF-Z / MS-Z / AK-Z
GENO-mat TE-Z


Device no. Refer to type plate

Applicable EC guidelines: Low voltage (2014/35/EU)
EMC (2014/30/EU)

Applied harmonised standards, in particular: DIN EN 61000-6-2:2006-03
DIN EN 61000-6-3:2011-09

Applied national standards and technical specifications, in particular: DIN 19636-100:2008-02

Place, date and signature: Hoechstädt, 26.09.2018

p.p. 
M. Pöpperl
Dipl.-Ing. (FH)

Function of signatory: Head of Technical Product Design

A General

1 | Preface

Thank you for opting for a Grünbeck product. Backed by decades of experience in the area of water treatment, we provide solutions for all kind of processes.

Drinking water is classified as food and requires particular care. Therefore, always ensure the required hygiene in operating and maintaining systems involved in the drinking water supply. This also applies to the treatment of water for industrial use if repercussions for the drinking water cannot completely be excluded.

All Grünbeck systems and devices are made of high-quality materials. This ensures reliable operation over many years, provided you treat your water treatment systems with the required care. This operation manual assists you with important information. Therefore, carefully and thoroughly read the operation manual before installing, operating or maintaining the system.

Customer satisfaction is our prime objective and providing customers with qualified advice is crucial to Grünbeck. If you have any questions concerning this system, possible extensions or general water and waste water treatment, our field staff, as well as the experts at our headquarters in Hoechststedt, are available to help you.

For help and advice Please consult the representatives responsible for your region (see www.gruenbeck.com). or get in touch with our service centre which can be reached during office hours:

Phone: +49 9074 41-333

Fax: +49 9074 41-120

Email: service@gruenbeck.de

We can connect you with the appropriate expert more quickly if you provide the required system data. In order to have the required data handy at all times, please copy it from the type plate to the overview in chapter C-1.

2 | How to use this operation manual

This operation manual is intended for the operators of our systems. It is divided into several chapters (a letter is assigned to each of them) which are listed in the “Table of contents” on page 2 in alphabetical order. In order to find the specific information you are looking for, check for the corresponding chapter on page 2.

The headers and page numbers with chapter information make it easier to find your way around in the manual.

3 | General safety information

3.1 Symbols and notes Important information in this operation manual is characterised by symbols. Please pay particular attention to this information to ensure the hazard-free, safe and efficient handling of the system.



Danger! Failure to adhere to this information will cause serious or life-threatening injuries, extreme damage to property or inadmissible contamination of the drinking water.



Warning! Failure to adhere to this information may cause injuries, damage to property or contamination of the drinking water.



Caution! Failure to adhere to this information may result in damage to the system or other objects.



Note: This symbol characterises information and tips to make your work easier.



Tasks with this symbol may only be performed by Grünbeck's technical service/authorised service company or by persons expressly authorised by Grünbeck.



Tasks with this symbol may only be performed by qualified electrical experts according to the VDE guidelines or according to the guidelines of a similar local institution.



Tasks with this symbol may only be performed by water companies or approved installation companies. In Germany, the installation company must be registered in an installation directory of a water company as per §12(2) AVBWasserV (German Ordinance on General Conditions for the Supply of Water).

3.2 Operating personnel

Only persons who have read and understood this operation manual are permitted to work with the system. The safety guidelines are to be strictly adhered to.

3.3 Intended use

The system may only be used for the purpose outlined in the product description (chapter C). The guidelines in this operation manual as well as the applicable local guidelines concerning the drinking water protection, accident prevention and occupational safety must be adhered to.

In addition, appropriate application also implies that the system may only be operated when it is in proper working order. Any malfunctions must be repaired at once.

3.4 Protection from water damage

Warning! In order to properly protect the installation site from water damage:

- a) a sufficiently dimensioned floor drain system must be available or
 - b) a safety device (see chapter C Accessories) must be installed.
-

Warning! Floor drains that discharge to a lifting system do not work in case of a power failure.

3.5 Indication of specific dangers

Danger due to electrical energy! → Do not touch electrical parts with wet hands! Disconnect the system from mains before starting work on electrical parts of the system. Have qualified experts replace damaged cables immediately.

Danger due to mechanical energy! System parts may be subject to overpressure. Danger of injury and damage to property due to escaping water and unexpected movement of system parts. → Check pressure pipes regularly. Depressurise the system before starting repair or maintenance work on the system.

Hazardous to health due to contaminated drinking water! → The system may only be installed by a specialist company. The operation manual must be strictly adhered to! Ensure that there is sufficient flow. The pertinent guidelines must be followed for starting-up after extended periods of standstill. Inspections and maintenance must be performed at the intervals specified!



Note: By concluding a maintenance contract, you ensure that all of the required tasks are performed on time. You may perform the interim inspections yourself.

4 | Shipping and storage



Caution! The system may be damaged by frost or high temperatures. In order to avoid damage of this kind:

Protect from frost during transportation and storage!

Do not install or store the system next to objects which radiate a lot of heat.

The system may only be transported and stored in its original packing. Ensure that it is handled with care and placed the right side up (as indicated on the packing).

5 | Disposal

Comply with the applicable national regulations.

5.1 Packaging

Dispose of the packaging in an environmentally sound manner.

5.2 Product



If this symbol (crossed out waste bin) is on the product, European Directive 2012/19/EU applies to this product. This means that this product and the electrical and electronic components must not be disposed of as household waste.



Find out about local regulations on the separate collection of electrical and electronic products.

Use the collection points available to you for disposing of your product.



For information on collection points for your product, contact your municipality, the public waste disposal authority, an authorised body for the disposal of electrical and electronic products or your waste collection service.

B Basic information

1 | Laws, regulations, standards

In the interest of good health, rules cannot be ignored when it comes to the processing of drinking water. This operation manual takes into consideration the current regulations and stipulates information that you will need for the safe operation of your filter system.

Among other things, the regulations stipulate that

- only approved companies are permitted to make major modifications to water supply facilities
- and that tests, inspections and maintenance on installed devices are to be performed at regular intervals.

2 | Designated application/area of application

Gravel filter KF-Z

In general, gravel filter systems are used for the conventional filtration of impurities in cases where a fine filtration by means of cartridge filters would be too costly due to an exceptionally high degree of pollution. The quartz gravel used retains undissolved substances such as sand, etc.

Heavy metal compounds in dissolved form such as iron and manganese, however, cannot be removed.

The filter must be backwashed if there is an accumulation of dirt particles and a pressure drop by approx. 0.3 bar (overpressure). The backwash is carried out from the bottom to the top, opposite to the regular direction of flow.

Multi-layer filter MS-Z

Multi-layer filters mostly are used for the conventional filtration of impurities in cases where a fine filtration by means of cartridge filters would be too costly due to an exceptionally high degree of pollution.

The hydro-anthrasite H used in addition to quartz gravel is a filter material composed of carefully sieved, thermally-treated carbon for the treatment of drinking and process water. The abrasion-resistant filter material has a rough surface by which a finer filtrate is achieved compared to a filtration by gravel alone.

The multi-layer filter is able to retain undissolved substances such as sand, etc. Heavy metal compounds in dissolved form such as iron and manganese, however, cannot be removed. The filter must be backwashed if there is an accumulation of dirt particles and a pressure drop by approx. 0.3 bar (overpressure). The backwash is carried out from the bottom to the top, opposite to the regular direction of flow.

Activated carbon filter AK-Z

The activated carbon filter is used to dechlorinate the water. If possible, the water to be dechlorinated should be free of mechanical impurities.

Activated carbon is able to react with the available, free chlorine via surface reaction. The chloride thus produced does not clog up the activated carbon filter but is discharged with the water. The surface reaction capacity is reduced over time due to the amount of impurities present in the water.

For this reason, and to remove any carbon abrasions that might have occurred, it is essential to backwash the filter on a weekly basis.

If the residual chlorine concentration exceeds the set admissible value on leaving the activated carbon filter, the activated carbon should be replaced. A replacement, however, should take place every two years at the latest.

**Deacidification system
TE-Z**

Corresponding to its carbonate hardness, all water contains a certain amount of free carbon dioxide which is necessary to dissolve the carbonate hardness present in the water. If there is more free carbon dioxide contained in the water than necessary, the water is characterised as tending to precipitate lime. This aggressive carbonic acid prevents the formation of protective scale/rust layers in the piping and is therefore removed by means of a deacidification filter. At the same time that the acid is removed, minor impurities are also removed by filtration.

We would like to point out explicitly that due to the limited amount of filtration material available, only a partial deacidification can be achieved.

We therefore recommend installing an EXADOS dosing unit downstream of the deacidification filter in order to add EXADOS-spezial.

In order to prevent the filter material from clogging and to flush out impurities, it is necessary to backwash the filter. The backwash is carried out from the bottom to the top, opposite to the regular direction of flow.

The Hydrolit-Ca deacidification material used is consumed based on the hydration of the excess carbon dioxide. (Consumption per g of converted CO₂ approx. 2.5 g).

It is therefore necessary to check the filling level from time to time and to refill, if necessary. The system must be flushed through every time it is refilled.

If an increased bacterial count is to be expected from the well water, we recommend to have a disinfection performed at regular intervals by our technical service.

3 | Function

The GENO-mat filter systems for the filtration of impurities / partial deacidification work with an active insoluble catalytic filter material. A central control valve automatically controls the operating cycles filtration, backwash and first filtrate.

3.1 Filtration

The raw water enters the exchanger tank via the raw water inlet and flows through the filter material from top to bottom. According to the filter type, the dirty water is filtered from top to bottom. The filtered pure water is then directed via the lower distributing nozzle and the riser pipe through the pure water outlet into the piping system.

3.2 Backwash

During the backwash process, the filter bed is forcibly flushed from bottom to top and thus loosened up. Impurities retained during the filtration process are washed out via the drain outlet at the control valve. The filter system must be backwashed every 6 days at the latest (for the setting refer to chapter F).

3.3 First filtrate

By an automatic switch-over of the central control valve, the filter bed will forcibly be flushed from top to bottom. This first filtrate is discharged to the drain and afterwards the filter system is ready for operation once again.

3.4 Control unit

The GENO-mat filter systems / deacidification systems are time-controlled via an electrical timer.

In order to properly use the automatic timer control, the time interval between two filter sequences (backwash interval in days) must be set.

C Product description

1 | Type plate


The type plate is located on the control valve of the GENO-mat filter/deacidification system. In order to speed up the processing of your inquiries or orders, please specify the data shown on the type plate when contacting Grünbeck. Please copy the indicated information to the table below in order to have it readily available whenever necessary.

GENO-mat filter system / deacidification system

KF-Z / MS-Z AK-Z TE-Z

Serial number:

Order no.:



grünbeck

Filter system GENO-mat KF-Z 20/10

Nominal connection size	1"
Nominal flow max.	1,5 m ³ /h
Operating pressure min./max.	2,5 / 6,0 bar
Nominal pressure	PN 10
Electrical data	230 V/50 Hz/10 VA
Water temperature max.	30 °C
Ambient temperature max.	40 °C
Order no.	129 500.inter
Serial no.	Observe operation manual!

Grünbeck Wasseraufbereitung GmbH | Josef-Grünbeck-Str. 1 | 89420 Hoechstädt | www.gruenbeck.com

Fig. C-1: Type plate of a filter system

2 | Technical specifications

The GENO-mat filter/deacidification systems are individual systems with integrated bypass for the supply of raw water during the backwash process. It is equipped with a timer control. The backwash is released after a set time interval.

All system data are summarized on the reverse in table C-1. The data refers to the standard versions of the GENO-mat filter/deacidification systems. Possible deviations in case of special versions are listed separately, if applicable.



Caution! Electrically operated valves. In case of a power failure during the backwash, water may enter the drain. In case of power failure, check the system and shut-off the water supply, if necessary.

Table C-1: Technical specifications				GENO-mat filter systems							
				20/10	25/13	30/14	40/17	40/18	50/19	60/20	
Connection data											
Nominal connection diameter				DN 25 (1")				DN 40 (1½")			
Nominal pressure				PN 10							
Min./max. operating pressure [bar]				2.5/6.0							
Nominal flow rate max. KF-Z		[m³/h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0		
Nominal flow rate max. MS-Z		[m³/h]	1.5	2.0	3.0	4.0	5.0	6.0	8.0		
Nominal flow rate max. AK-Z		[m³/h]	0.25	0.5	1.0	1.2	1.5	2.0	3.0		
Nominal flow rate max. TE-Z		[m³/h]	0.5	1.0	1.5	2.0	2.5	3.0	4.0		
Filter material KF-Z											
Quartz gravel	3.0-5.6	I	[kg]	9	15	20	28	20	61	90	
Quartz sand	1.0-2.2	II	[kg]	4	30	38	50	90	100	160	
Filter sand	0.4-0.8	III	[kg]	20	30	50	70	90	150	230	
Filter material MS-Z											
Quartz gravel	3.0-5.6	I	[kg]	9	15	20	30	20	67	100	
Quartz sand	1.0-2.2	II	[kg]	8	25	50	82	90	180	267	
Hydro-anthrasite H	0.6-1.6	III	[l]	8	17	26	24	64	50	78	
Filter material AK-Z											
Quartz gravel	3.0-5.6	I	[kg]	9	15	20	20	20	30	30	
Hydradin CC 8 x 30	0.5-2.5	II	[kg]	10	16	25	40	50	90	140	
Filter material TE-Z											
Quartz gravel	3.0-5.6	I	[kg]	9	15	20	20	20	30	30	
Hydrolit-Ca	1.0-3.0	II	[kg]	20	25	70	90	120	220	320	
Backwash capacity [m³/h]				1.6	2.3	3.4	5.7				
Backwash time [min]				10							
Water/ambient temperature, max. [°C]				30/40							
Power supply [V]/[Hz]				230/50							
Connected load [VA]				10							
Protection/protection class				IP 54/⊕							
Min. drain connection				DN 50				DN 70			
Total empty weight KF-Z		[kg]	43	88	124	175	228	351	529		
Total empty weight MS-Z		[kg]	31	65	99	151	170	312	455		
Total empty weight AK-Z		[kg]	29	44	61	67	98	160	219		
Total empty weight TE-Z		[kg]	39	53	106	137	168	290	399		
Operating weight* (incl. water)		[kg]	67	127	200	272	344	573	833		
Operating weight** (incl. water)		[kg]	53	100	167	240	268	515	732		
Operating weight*** (incl. water)		[kg]	45	77	125	164	193	339	462		
Operating weight**** (incl. water)		[kg]	57	93	163	214	257	456	633		
Order no.	KF-Z*	129 ...	500	505	510	515	520	525	530		
Order no.	MS-Z**	129 ...	550	555	560	565	570	575	580		
Order no.	AK-Z***	129 ...	800	805	810	815	820	825	830		
Order no.	TE-Z****	129 ...	850	855	860	865	870	875	880		

3 | Intended use

The system is adjusted to the water demand to be expected at the installation site. It is not suitable for considerably differing performances. The maximum flow must not be exceeded under any circumstances.

The system may only be operated if all components are installed properly. Safety devices must never be removed, bridged or otherwise tampered with.

Designated application of the system also implies that the information contained in these operating instructions and all safety guidelines applying at the installation site be observed. Furthermore, the maintenance and inspection intervals have to be observed.

4 | Design

5-cycle control valve made of red bronze with time-dependent control via timer. Control valve top with rotating disks to set the back-wash intervals; cover for protection against splash water and unauthorised access.

Exchanger tank made of pressure resistant plastic with fixtures for water flow control and retention of filter material.

The control unit is interference-free. Power supply by means of a transformer plug with 1.5 m feed line.

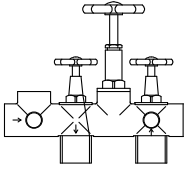
5 | Scope of supply

- 5.1 Basic configuration**
- Exchanger tank in double walled plastic housing
 - Filter materials (quartz gravel, quartz sand, filter sand, Hydrafin CC 8 x 30, Hydrolit-Ca, Hydroanthrasit H).
 - Control valve made of red bronze with integrated timer control.
 - Operation manual

6 | Optional accessories



Note: It is possible to retrofit existing systems with optional components. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstädt for details.

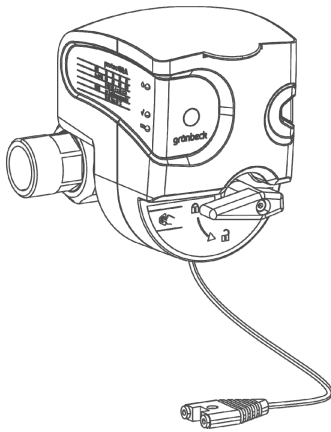


Mounting kit 1:

for convenient hydraulic connection, Compact valve block R 1" internal thread, integrated bypass with shut-off valve, shut-off valves for hard and soft water, outlet for raw water (e.g. garden hose), 2 connection hoses

Mounting kit R 1" (up to size 30/14)

125 845



protectliQ safety device

Product for the protection against water damage in one- and two-family homes.

For additional types, please inquire

126 400

7 | Consumables

Only use genuine consumables in order to ensure the reliable operation of the system.

7.1 Wearing parts

In case of heavy duty, seals and control pistons are subject to a certain wear and tear. Wearing parts are listed below.



Note: Although these are wearing parts, we grant a limited warranty period of 6 months.

Seals, control piston, injector, actuator

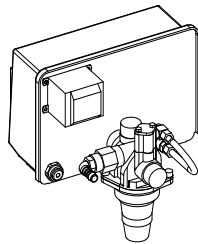


Fig. C-3: Control valve
Nominal connection diameter
DN 25 (1")

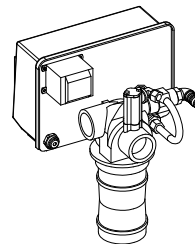


Fig. C-4: Control valve
Nominal connection diameter
DN 40 (1½")

D Installation and operation

1 | General installation instructions

The installation site must provide adequate space. A foundation of a sufficient size and adequate carrying capacity must be provided. The required connections must be provided prior to the installation. For dimensions and connection data, please refer to table C-1.



Note: For the installation of systems with optional accessories (see chapter C, item 5), also observe the operation manuals supplied with these components.

1.1 Water installation

When installing the filter/deacidification systems, certain binding rules must be observed. Additional recommendations are given in order to facilitate the handling of the systems. The installation information described below is also illustrated in fig. D-2.

Binding rules



The installation of the GENO-mat filter/deacidification systems represents a major interference with the drinking water system. Therefore, only authorised experts may install such systems. In Germany, the installation company must be registered in an installation directory of a water company as per §12(2) AVBWasserV (German Ordinance on General Conditions for the Supply of Water).

- Observe local and general installation guidelines.
- Provide a drain connection to discharge the backwash water.
- The installation room must have a floor drain (DN 100). If no floor drain is available, a corresponding safety device has to be installed.
- Observe the flow direction!



Warning! Floor drains that discharge to a lifting system do not work in case of a power failure.

Recommendations

- Provide a sampling valve and a pressure gauge (0-10 bar) directly upstream and downstream of the filter/deacidification systems. This simplifies the sampling for the regular determination of the iron concentration (functional check).

1.2 Electrical installation

A shock-proof plug is adequate for the electrical connection. However, it must comply with the specifications given in table C-1, may not be further than 1.20 m away from the GENO-mat filter/deacidification systems and must carry constant voltage (do not couple with light switch)!

2 | Preliminary Work

1. Unpack all system components.
2. Check for completeness and perfect condition.
3. Place the filter tank at the designated location.



Note: Filter/deacidification systems must be filled on site.

4. Unscrew control valve from pressure cylinder.
5. Centre the nozzle jet in the pressure cylinder and close if off by means of adhesive tape or paper wadding.
6. Fill in the filter layers according to the filter/deacidification system type

Filter layer I Bottom	KF-Z, MS-Z, AK-Z, TE-Z
Filter layer II Middle	KF-Z, MS-Z, AK-Z, TE-Z
Filter layer III Top	KF-Z, MS-Z

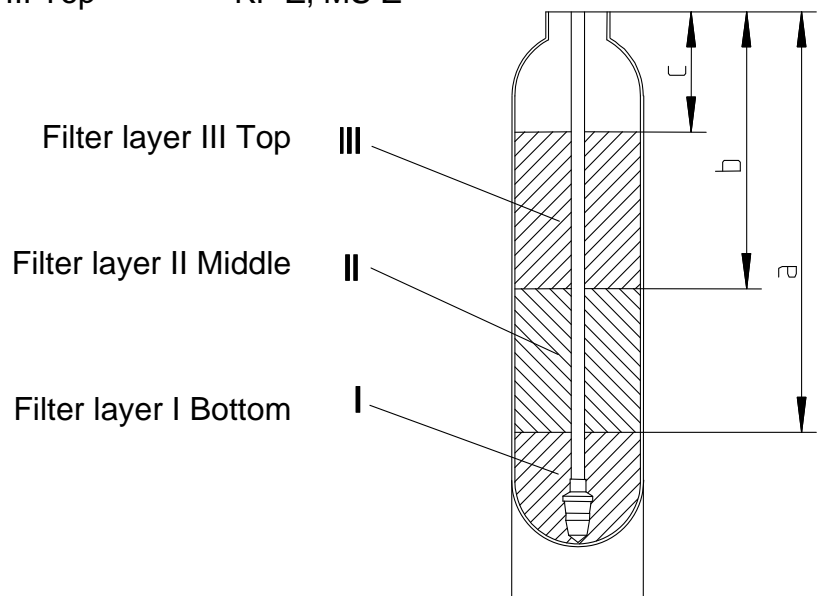


Fig. D-1: Filling of filter layers

Table D-1: Filling volumes ¹⁾	Gravel filter system GENO-mat KF-Z							
	20/10	25/13	30/14	40/17	40/18	50/19	60/20	
Filling volumes and consumption data								
Bottom filter layer I, quartz gravel 3.0 - 5.6T	[kg]	9	15	20	28	20	61	90
Bottom filter layer I, quartz gravel 3.0 - 5.6T	[l]	6	11	14	20	14	44	64
Bottom filter layer I (dimension a)	[mm]	870	1110	1140	1380	1460	1290	1480
Middle filter layer II with quartz sand 1.0 – 2.2	[kg]	4	30	38	50	90	100	160
Middle filter layer II with quartz sand 1.0 – 2.2	[l]	3	20	25	33	60	67	107
Middle filter layer II (dimension b)	[mm]	800	720	850	1070	1000	1010	1110
Top filter layer III with quartz sand 0.4 – 0.8	[kg]	20	30	50	70	90	150	230
Top filter layer III with quartz sand 0.4 – 0.8	[l]	13	20	33	47	60	100	153
Top filter layer III with quartz sand 0.4 – 0.8	[mm]	410	330	470	630	540	600	590
Free board, approx.	[l]	10	9	32	36	32	95	107

¹⁾ All indications are approximate.

Table D-2: Filling volumes ¹⁾	Multi-layer filter GENO-mat MS-Z							
	20/10	25/13	30/14	40/17	40/18	50/19	60/20	
Filling volumes and consumption data								
Bottom filter layer I, quartz gravel 3.0 - 5.6T	[kg]	9	15	20	30	20	67	100
Bottom filter layer I, quartz gravel 3.0 - 5.6T	[l]	6	11	14	21	14	48	71
Bottom filter layer I (dimension a)	[mm]	880	1110	1140	1360	1460	1270	1450
Middle filter layer II with quartz sand 1.0 – 2.2	[kg]	8	25	50	82	90	180	267
Middle filter layer II with quartz sand 1.0 – 2.2	[l]	5	17	33	55	60	120	178
Middle filter layer II (dimension b)	[mm]	720	780	760	850	1000	770	840
Top filter layer III with Hydroanthasit H 0.6–1.6	[kg]	4	9	13	12	32	25	39
Top filter layer III with Hydroanthasit H 0.6–1.6	[l]	8	18	26	24	64	50	78
Top filter layer III (dimension c)	[mm]	490	440	460	630	510	560	580
Free board, approx.	[l]	13	14	31	36	28	87	104

¹⁾ All indications are approximate.

Table D-3: Filling volumes ¹⁾	Activated carbon filter GENO-mat AK-Z							
	20/10	25/13	30/14	40/17	40/18	50/19	60/20	
Filling volumes and consumption data								
Bottom filter layer I, quartz gravel 3.0 - 5.6T	[kg]	9	15	20	20	20	30	30
Bottom filter layer I, quartz gravel 3.0 - 5.6T	[l]	6	11	14	14	14	21	21
Bottom filter layer I (dimension a)	[mm]	880	1100	1130	1430	1460	1380	1620
Top filter layer II with Hydrafin CC (0.5 – 2.5)	[kg]	10	16	25	40	50	90	140
Top filter layer II with Hydrafin CC (0.5 – 2.5)	[l]	21	33	52	83	104	188	292
Top filter layer II (dimension b)	[mm]	270	460	540	650	660	600	630
Free board, approx.	[l]	6	16	39	38	48	96	119

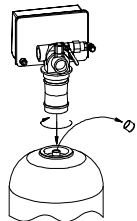
¹⁾ All indications are approximate.

Table D-4: Fill volumes ¹⁾	GENO-mat TE-Z deacidification system						
	20/10	25/13	30/14	40/17	40/18	50/19	60/20
Filling volumes and consumption data							
Bottom filter layer I, quartz gravel 3.0 - 5.6T [kg]	9	15	20	20	20	30	30
Bottom filter layer I, quartz gravel 3.0 - 5.6T [l]	6	11	14	14	14	21	21
Bottom filter layer I quartz gravel (dimension a) [mm]	880	1100	1130	1430	1460	1380	1620
Middle filter layer II Hydrolit CA [kg]	20	25	70	90	120	220	320
Middle filter layer II Hydrolit CA [l]	20	25	70	90	120	220	320
Middle filter layer II Hydrolit CA (dimension b) [mm]	300	620	340	590	540	460	530
Free board, approx. [l]	6	24	21	32	32	64	90

1) All indications are approximate.



Centre riser pipe,
fill with filter material

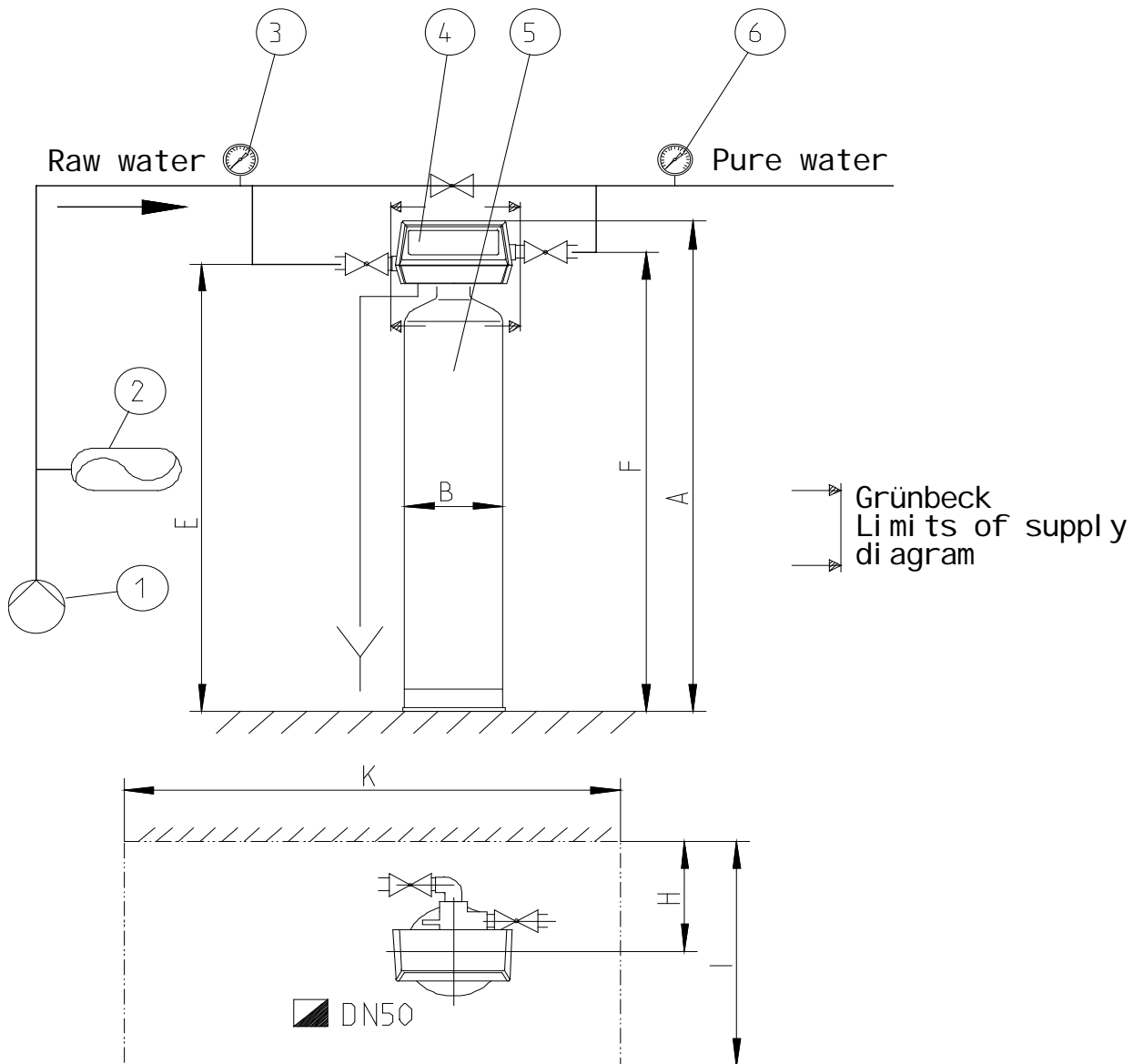


Remove protective cap,
secure control valve

1. Fill filter tank up to 50 % with water.
2. Check whether the riser pipe is covered by a protective cap, plug on the protective cap, if necessary. The protective cap prevents material from entering the riser pipe.
3. Centre the filter tank in the riser pipe.
4. Fill the tank with filter material. By using the funnel supplied with the system (refer to figure). Refer to Table D-2 for fill volumes.
5. Fill up the filter tank with water.
6. Centre the riser pipe properly and exactly.
7. Clean the filter tank's screw thread and the sealing surface for the connection of the control valve from any filter material that might be clinging to them.
8. Remove the protective cap from the riser pipe.
9. Put the control valve from above onto the riser pipe and fasten it by turning it to the right.

3 | How to connect the system

1. Establish the water connection as described in the erection drawing (fig. D-2 (a) (b)). Observe all requirements and general installation instructions.



- | | |
|--|--|
| ① Pump (provided by others) | ④ Control valve operating voltage |
| ② Membrane expansion vessel (provided by others) | ⑤ GENO-mat filter system incl. filter material |
| ③ Pressure gauge inlet pressure (by others)) | ⑥ Pressure gauge outlet pressure (by others) |

Fig. D-2 (a) : GENO-mat filter/deacidification systems erection drawing

Table D-5: Installation dimensions ¹⁾		GENO-mat filter systems						
		20/10	25/13	30/14	40/17	40/18	50/19	60/20
A	Total height [mm]	1360	1620	1620	1900	1900	1870	2100
B	Pressure cylinder Ø [mm]	210	260	340	370	420	550	620
E	Connection height/ raw water piping [mm]	1160	1420	1420	1710	1710	1680	1910
F	Connection height/ pure water piping [mm]	1210	1470	1470	1735	1735	1705	1935
H	Distance to wall [mm]	200	230	280	280	300	365	405
I	Foundation depth [mm]	400	450	500	500	550	600	650
K	Foundation length [mm]	705	755	860	860	900	1030	1110

¹⁾ All indications are approximate.



Caution! Dirt and corrosion particles might damage the system (control valve). Flush the supply pipe prior to start-up.

2. Establish waste water connection as per DIN EN 1717. Shorten the rinse water hose to the correct length and guide it to the drain. Ensure there is a free outlet (min. 20mm) to the drain. Secure the hose with suitable fittings to prevent the hose from moving about (regeneration water is pressurised).



Caution! Danger of damage and malfunctions due to a waste water backflow. Therefore, do not bend the hose and do not lead it higher than the system height.

3. Connect the mains plug to the socket (see 1.2).
4. Water the system (not the KF-Z)
In order to prevent the filter material from being washed out, it must be watered for 24 hours.

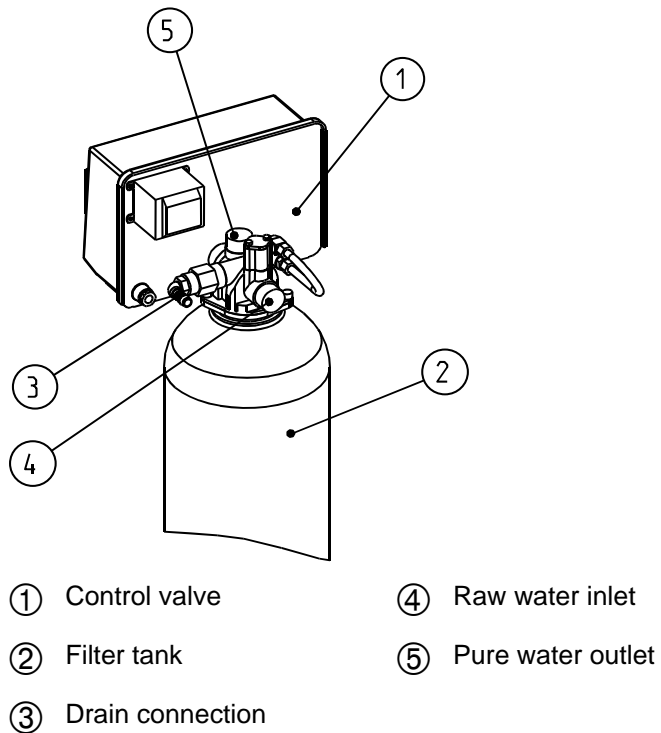


Fig. D-2 (b): GENO-mat filter system, rear view

E Start-up



The work described below may only be performed by trained experts. We recommend having the start-up performed by Grünbeck's technical service/authorised service company.



Warning! Danger of contamination due to stagnation! According to VDI 6023, filling the system with drinking water before normal operation commences is prohibited.

The GENO-mat filter/deacidification systems must therefore first be connected to the drinking water system immediately prior to commissioning.

1 | How to start up the system

1. Open the valve at the raw water inlet.
 2. Open the valve at the pure water outlet.
 3. Perform a visual check. Ensure that no water leaks from the system anywhere.
 4. Rinse out fine particles
The filter material contains a small amount of fine particles which must be flushed by means of a backwash prior to start-up. Release a manual regeneration (refer to chapter F, item 1.4).
-



Note: The backwash process must be repeated until the backwash water that flows to the drain in the process step „first filtrate“ is clear.

5. Take a water sample at the sampling valve downstream of the system.
6. Determine the iron concentration by means of the water test kit.
7. Fill in the cover sheet and column 1 in the operation log.

F Operation

1 | How to operate the control unit

The control unit regulates the operation of the filter/deacidification systems.

1.1 How to set the time The filter/deacidification systems are factory-set in a way that the automatic regeneration is always released at 2:00 am (at night). Upon start-up or after a power failure, the current time must be set.

1. Loosen the screw at the housing cover (top right).
2. Open the housing cover.
3. Press and hold the red button (Fig. F-1, Item 6).
4. Turn the 24 hour disk until the reference arrow (Fig. F-1, Item 2) points to the current time.
5. Release the red button (Fig. F-1, Item 6).



Note: In case the preset time for the backwash (2:00 am) should be unfavourable for internal reasons, set a time which deviates from the current time at the 24 hour disk in order to adjust the starting time for the backwash.

Example:

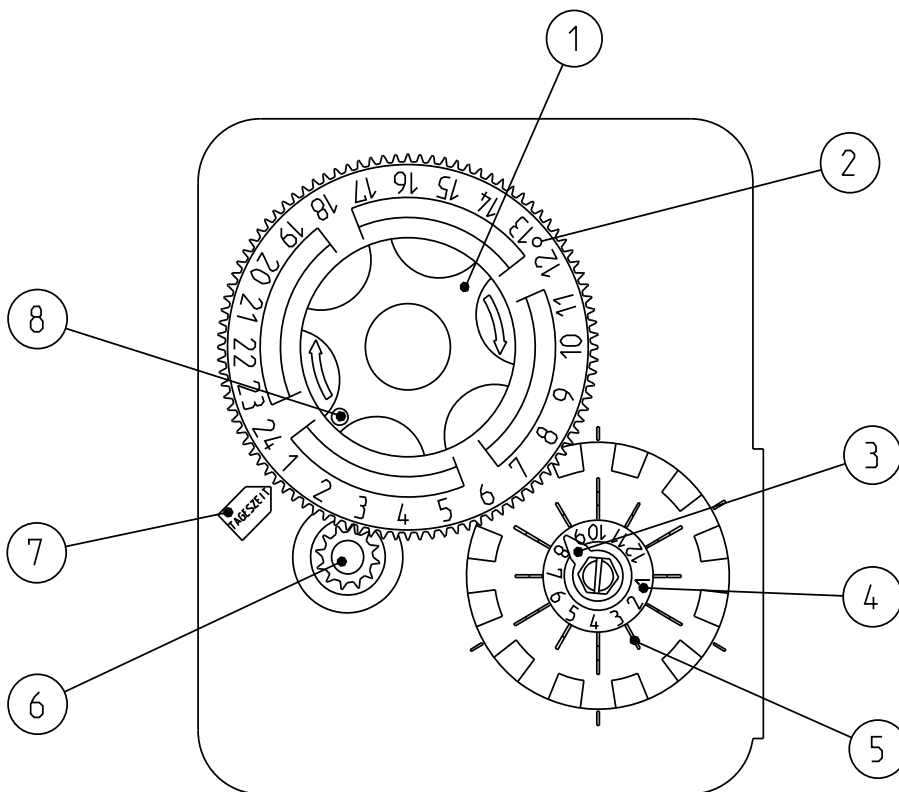
Desired starting time of the backwash: 22:00

→ Move clock forward 4 hours.

1.2 How to set the backwash interval

The maximum backwash interval is 12 days. Furthermore, an automatic backwash can be carried out after 6, 4, 3, 2 or 1 day(s) (factors of 12). Fig. F-1 indicates the setting for a backwash to be carried out every 2 days.

1. Determination of the backwash interval.
 - For hygienic reasons, a backwash should be carried out every 6 days (factory-setting).
 - If the differential pressure of the filter is > 0.3 bar above normal after 6 days due to a higher concentration of dirt in the water, a backwash process should be initiated every 4 days or at even shorter intervals.
 - The same applies in case of an early breakthrough of dirt particles.



- | | |
|---|--|
| ① Backwash wheel | ⑥ Button to set the time |
| ② Hour wheel | ⑦ Reference arrow for current time and operating state (black) |
| ③ Reference arrow (red) | ⑧ Reference point for operating state (white) |
| ④ Day disk | |
| ⑤ Steel switching pin (in home position moved to centre point, in switch position moved outwards) | |

Fig. F-1: Control unit and operating elements „front view“

2. Push the switching pin (Fig. F-1, Item 5) outwards for the 1st day.
3. Set the other switching pins as required.
On all days where the switching pins are pushed outwards, the backwash is released. In order to set, for example, a backwash interval of 3 days, the switching pins in positions 1, 4, 7 and 10 on the day disk must be pushed outwards (Fig. F-1, Item 4).

1.3 Reading the operating status

The current operating state may be read from the position of the reference point (Fig. F-1, Item 8) on the backwash wheel (Fig. F-1, Item 1).

The reference point (Fig. F-1, Item 8) lies opposite the reference arrow (Fig. F-1, Item 7).	Operating mode: pure water is available.
All other settings from the reference point (Fig. F-1, Item 8).	Backwash; the backwash wheel (Fig. F-1, Item 1) turns clockwise; the progress of the backwash can be read from the position of the reference point (Fig. F-1, Item 8).

The day disk (Fig. F-1, Item 4) turns counter-clockwise once in 12 days. The red reference arrow (Fig. F-1, Item 3) points to the position where a switching pin turned outwards releases a backwash. In the operating mode, the distance between the reference arrow (Fig. F-1, Item 3) and the following switching pin which is turned outwards is an indication for the number of days until the next backwash.

1.4 How to release a manual backwash

Manual regeneration should be released if

- the differential pressure of the filter/deacidification systems is more than 0.3 bar above normal before the timer control releases the backwash.
- the systems are restarted after longer periods of standstill.
- maintenance or repair work has been carried out.

Irrespective of the set backwash interval and the time, the backwash can be released manually at any time.

1. Check operating state.

Only in operating mode:

2. Turn backwash wheel (Fig. F-1, Item. 1) to the right by one catch (pay attention to the snap!).

The filter/deacidification systems start the backwash process, the backwash wheel (Fig. F-1, Item 1) slowly turns clockwise. After approx. 3 hours, the backwash is terminated and the white reference point (Fig. F-1, Item 8) is located opposite of the black reference arrow for the current time again (Fig. F-1, Item 7).

G Maintenance and Care

1 | Basic information

In order to guarantee the reliable function of filter/deacidification systems over a long period of time, some maintenance work has to be performed at regular intervals. This applies in particular to the backwash in the drinking water sector where the required measures are defined in the pertinent regulations and guidelines. All regulations and guidelines which apply at the installation site must be strictly adhered to.

DIN EN 806-5 stipulates:

- Inspection every 2 months
- Maintenance every 6 months
- Maintenance must be performed by the Grünbeck's customer service/authorised service company or by a specialised company.
- An operation log must be kept in order to document the maintenance work performed.



Note: A maintenance contract ensures that all the required maintenance work will be performed in due time.

The operation log is attached to this operation manual.

2 | Inspection (functional check)

You may perform the regular inspections yourself.

Summary: Inspection work

- Determine system pressure differential
- Check controller settings:
 - a) Time
 - b) Check backwash interval



Note: Minor deviations are normal and cannot be prevented technically. If you detect major deviations, please contact Grünbeck's customer service/authorised service company.

-
- Check the entire system for outward tightness.
 - Check control valve to drain for tightness (in operating mode).

3 | Maintenance



Maintenance work on the filter/deacidification systems may only be performed by Grünbeck's technical service/authorised service company or by an approved specialist.

An operation log must be kept for the filter/deacidification systems. In this operation log, the customer service technician records all maintenance and repair work performed. In case of malfunctions, this log helps to identify possible sources of error. In addition the log documents the proper system maintenance.

Make sure that all maintenance work is recorded in the operation log.

Summary: Maintenance work

- Read water pressure, flow pressure and if necessary water meter reading.
- Check release of backwash.
- Check control valve for tightness, replace wearing seals if necessary, check the proper function of the drive motor of the control valve, clean injector and sieve.
- Disinfect the system if required.
- Check the level of the filter material in the filter tank. If necessary, refill the filler material.

3.1 Disinfecting the GENO-mat filter/deacidification systems



Note: We recommend having the disinfection performed by Grünbeck's authorised technical service/authorised service company.

3.1.1 Timer settings

- For the disinfection the corresponding regeneration tank and the appropriate regeneration agent are required (refer to 3.1 preparation of the regeneration agent).
- Flip the cover of the control valve to the side.
- Release a manual regeneration (refer to chapter F, item 1.4).
- Flip the timer to the right and wait for 10 minutes until limit switch 1 is free (Fig. G-1, picture 1) and the actuator of the control piston has stopped.
- Unplug mains plug.
- Open the ball valve on the back of the control valve and suck the regeneration agent from the connected regeneration tank.
- Close the ball valve again after the regeneration agent has been completely sucked off.
- Reconnect mains.
- Wait until limit switch 1 is pressed again (Fig. G-1, picture 2) and the actuator of the control piston has stopped.
- Unplug mains plug.
- Flush for at least 30 minutes in order to wash out all residues of the disinfection agent from the filter bed.
- Reconnect mains.
- The filter/deacidification systems are ready for operation again when the limit switches 1 and 2 are free (Fig. G-1, picture 3).
- Screw cover back on.

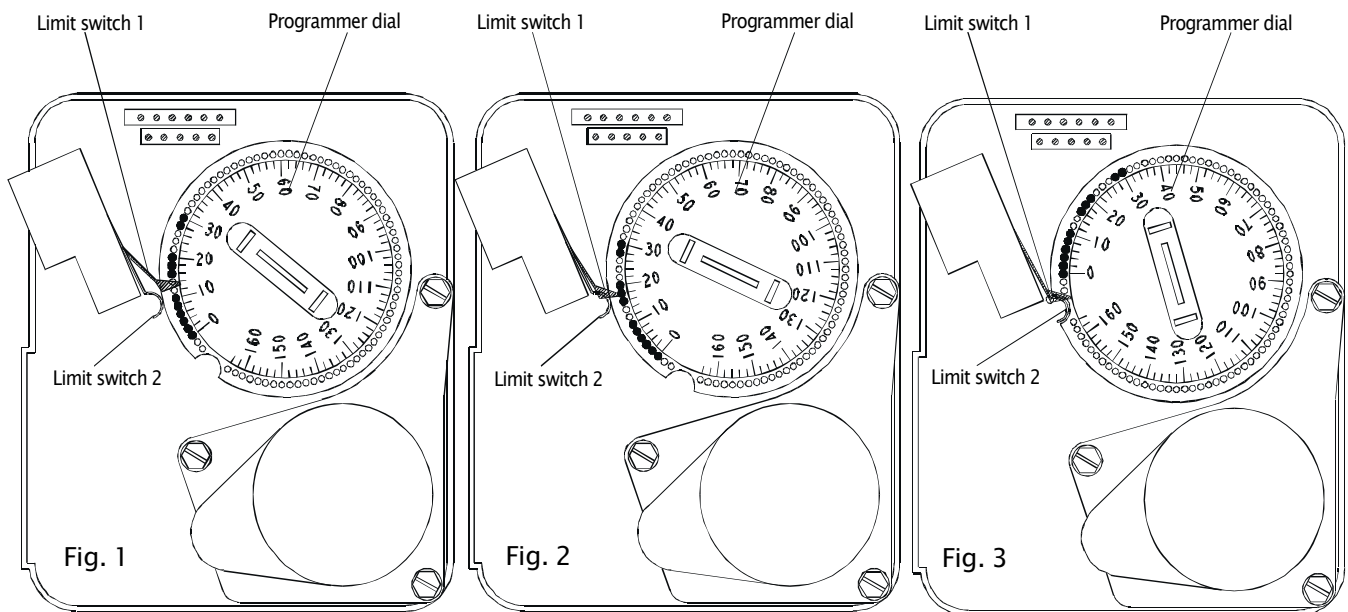


Fig. G-1: Rear of timer

3.2 Operation log

The operation log is located in chapter G, item 5 of this operation manual. When starting up the system, make sure to record all data on the cover sheet of the operation log and fill in the first column of the check list.

The customer service technician will fill in a column of the check list whenever maintenance is performed. This document provides evidence of proper maintenance.

4 Spare parts

You may order spare parts and consumables from your local Grünbeck representative (refer to www.gruenbeck.com).

Filtration/Deacidification

Filter systems GENO-mat KF-Z / MS-Z / AK-Z

Deacidification systems GENO-mat TE-Z

5 Operation log

Customer

Name:

Address:.....

.....

.....

GENO-mat filter/deacidification systems

KF-Z / MS-Z AK-Z TE-Z

(please check appropriate box)

Serial number:

Installed by.....

Filter: Make/Type/

20/10

25/13

30/14

40/17

40/18

50/19

60/20

Connection data

(please check appropriate box)

Drain connection DIN EN 1717

yes no

Floor drain available

yes no

Maintenance work required on filter/deacidification systems GENO-mat KF-Z, MS-Z, AK-Z, TE-Z Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)	Start-up		
Measured values			
Water pressure [bar] upstream and downstream of the system			
Flow pressure [bar] upstream and downstream of the system			
Water meter reading [m ³]			
Inspections and checks of control unit and control valve			
Release of backwash checked			
Injector and sieve cleaned			
Control valve checked for tightness			
Function of driving motor checked			
System "regeneration and disinfection"			
System treated with special granulate			
Connections, hose connections, seals			
Seals and hose connections checked			
Miscellaneous			
Notes			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			

Maintenance work required on filter/deacidification systems GENO-mat KF-Z, MS-Z, AK-Z, TE-Z Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)			
Measured values			
Water pressure [bar] upstream and downstream of the system			
Flow pressure [bar] upstream and downstream of the system			
Water meter reading [m ³]			
Inspections and checks of control unit and control valve			
Release of backwash checked			
Injector and sieve cleaned			
Control valve checked for tightness			
Function of driving motor checked			
System "regeneration and disinfection"			
System treated with special granulate			
Connections, hose connections, seals			
Seals and hose connections checked			
Miscellaneous			
Notes			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			

Maintenance work required on filter/deacidification systems GENO-mat KF-Z, MS-Z, AK-Z, TE-Z Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)			
Measured values			
Water pressure [bar] upstream and downstream of the system			
Flow pressure [bar] upstream and downstream of the system			
Water meter reading [m ³]			
Inspections and checks of control unit and control valve			
Release of backwash checked			
Injector and sieve cleaned			
Control valve checked for tightness			
Function of driving motor checked			
System "regeneration and disinfection"			
System treated with special granulate			
Connections, hose connections, seals			
Seals and hose connections checked			
Miscellaneous			
Notes			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			

Maintenance work required on filter/deacidification systems			
GENO-mat KF-Z, MS-Z, AK-Z, TE-Z			
Checklist			
Please enter measured values. Confirm checks with OK or enter repair work performed.			
Maintenance performed (date)			
Measured values			
Water pressure [bar] upstream and downstream of the system			
Flow pressure [bar] upstream and downstream of the system			
Water meter reading [m ³]			
Inspections and checks of control unit and control valve			
Release of backwash checked			
Injector and sieve cleaned			
Control valve checked for tightness			
Function of driving motor checked			
System "regeneration and disinfection"			
System treated with special granulate			
Connections, hose connections, seals			
Seals and hose connections checked			
Miscellaneous			
Notes			
Customer service technician			
Company			
Work time certificate (no.)			
Signature			