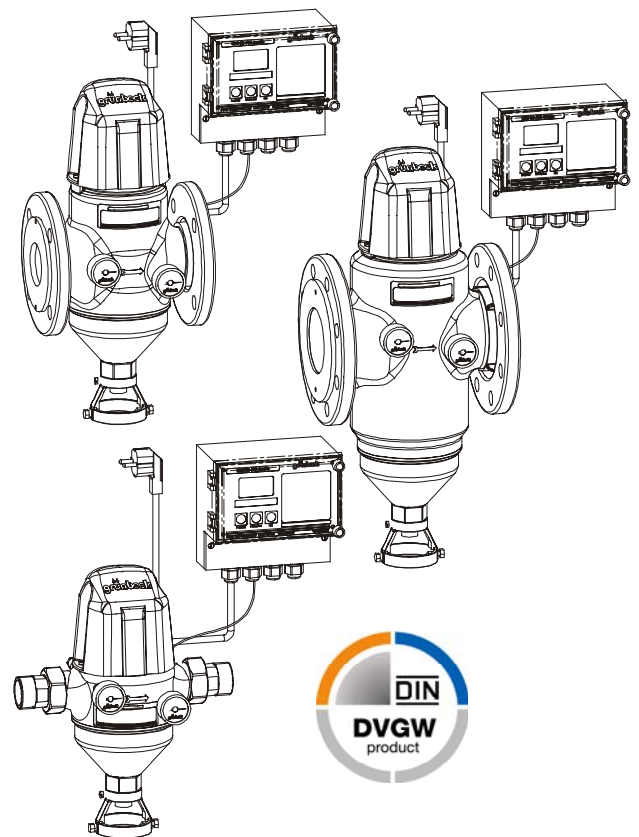


Operating Manual GENO[®] Backwash Filter MXA 1" – MXA DN 100



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EC Declaration of conformity

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

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

System designation:	<u>GENO®-Backwash Filter</u>	
System type:	<u>Type:MXA 1"; MXA 1¼"; MXA 1½"; MXA 2";</u> <u>MXA DN 65; MXA DN 80; MXA 100;</u>	
System number:	<u>see type designation plate</u>	
Applicable EC guidelines:	EC Guideline EMC (89/336/EWG ver. 92/31/EWG) EC Low Voltage Guideline (73/23/EWG and 93/68/EWG)	
Applied harmonized standards, in particular:	DIN EN 50 081-1, DIN EN 50 082-2, 1 st Guideline on Device Safety dated June 11, 1979 (BGB1)	
Applied national standards and technical specifications, in particular:	<u>DIN 1988, DIN 19632</u>	
Date / Manufacturer signature:	<u>06.03.03</u>	<u>i. V. </u> M. Pöpperl Dipl. Ing. (FH)
Function of signatory:	<u>Head of Department Design Series Products</u>	

A General Information

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 processes.

Drinking water is classified as food and requires particular care. Therefore, always ensure the required hygiene in operating and maintaining systems for drinking water treatment. This also applies to the treatment of water for industrial or domestic 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 the systems with the required care. This operating manual assists you with important information. Therefore, read the complete manual before installing, operating or maintaining your system.

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

Advice and assistance For advice and assistance contact the representative for your area (refer to the list enclosed). In case of emergency, call our Service Hotline at +49-9074-41-333. We can connect you with the appropriate expert quickly if you provide the required system data. Please write this data from the type designation plate on the overview on page C-1 so that it will be available when you need it.

2 Warranty

All devices and systems supplied by Grünbeck Wasseraufbereitung GmbH are manufactured according to the most recent technical standards and subjected to a comprehensive quality assurance system. All warranty claims are subject to our General Terms and Conditions (see below):

General Terms of Sales and Delivery (extract)

.....

11. Warranty

- a) If system components are supplied which are obviously defective, the customer must report such defects within eight days after receipt of such goods in order to maintain the liability claims.
- b) If the defect is such that only a spare part needs to be replaced, we shall have the right to request the customer to replace the new part delivered by us if the costs for sending a technician to the customer's site are unreasonably high.
- c) The general warranty period is
 - two years: for devices intended for private use (for natural persons)
 - one year: for devices intended for industrial or commercial use (for companies)
 - two years: for all DVGW-tested devices, industrial and commercial use included within the framework of the warranty agreement with the ZVSHK after delivery resp. acceptance. This excludes electrical parts and parts which are subject to wear and tear. The warranty shall only apply, if the operating instructions are strictly observed and correct mounting, installation, operation and maintenance of the devices are performed and / or the signing of a maintenance contract takes place within the first six months. If these requirements are not met, the warranty shall expire. The warranty shall also expire if the customer uses dosing agents or chemicals supplied by other manufacturers and if the quality and the composition of such dosing agents and chemicals is beyond our control. We will not be liable for defects and damages resulting from inexpert handling.
- d) We shall only be liable if the customer performs the maintenance work or has the maintenance work performed according to our operating instructions and if the customer uses spare parts and chemicals supplied or recommended by us.
- e) We will not be liable for damages resulting from frost, water or over-voltage or if wearing parts are concerned. This applies in particular to electrical parts.
- f) The claims of the customer are limited to repair or replacement as decided by us. We shall have the right to several repairs. If the repair or delivery of a replacement part is not performed within a reasonable period of time, the customer shall have the right to a reduction of the purchase price or a cancellation of the contract, as decided by the customer.

.....

3 General safety information

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

Symbols and notes Important notes in this operating manual are characterised by symbols. Please pay particular attention to these notes to ensure danger-free, safe and productive system operation.



Danger! Failure to adhere to these notes will cause serious or life-threatening injury, extreme damage to property or inadmissible contamination of drinking water.



Warning! Failure to adhere to these notes may cause injury, damage to property or contamination of the drinking water.



Attention! Failure to adhere to these notes may result in damage to the system or other objects.



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



Tasks with this symbol may only be performed by Grünbeck's technical service 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 the local water works or an approved installation company.

Description of Special Sources of Danger

Danger due to electrical energy! → Do not touch electrical components with wet hands! Disconnect mains plug before working on electrical system parts! Any faulty cables must be replaced by authorised personnel immediately.

Danger due to mechanical energy! System parts may be under overpressure. Danger of injuries and material damage due to leaking water and unexpected movement of system parts → Check pressure pipes regularly. Depressurise system before carrying out repair and maintenance works.

Health risk due to polluted drinking water! → The system may only be installed by an authorised company. Strictly observe operating instructions! Ensure sufficient flow, after longer periods of standstill start up system according to instructions. Observe inspection and maintenance intervals!



Caution! In the case of a power failure or a failure of the transformer fuse during the rinsing process, it will not be completed automatically anymore. Please note the instructions in chapter G "Troubleshooting".



Note: By signing a maintenance contract you make sure that all necessary works are carried out in due time. However, you perform the intermediate inspections yourself.

4 Transportation and Storage



Caution! The system may be damaged by frost or high temperatures. Avoid exposure to frost during transportation and storage! Do not install or store system close to objects with strong radiation of heat.

The system may only be transported and stored in its original packing. Make sure that the system is treated carefully and placed with the right side up (if indicated on the packing).

5 Disposal of Used Parts and Materials

Used parts and materials must be disposed or recycled according to the regulations applicable on site.

If used parts are subject to special instructions, follow the corresponding information on the packing.

In case of doubt, please contact your local institution for waste disposal or the manufacturer.

B Basic Information

1 Laws, Regulations, Standards

When handling drinking water, certain rules are unavoidable for the sake of health protection. These operating instructions take the applicable regulations into account and give you all the directions required for the safe operation of your water treatment system.

Among other things the rules prescribe that

- only authorised specialist companies are allowed to modify water supply equipment substantially.
- checks, inspections and maintenance works of installed devices must be carried out regularly.

2 Protection of Drinking Water

Drinking water is still the most important food which cannot be replaced by anything else. Also in trade and industry, water or drinking water is vital.

For the protection of drinking water those parties who are involved directly, such as water supply companies, system mounting companies (plumbers) and users are forced to observe legal and technical regulations.

Dirt getting into the drinking water supply due to construction works or damages is not only unpleasant, but may also have dangerous consequences, since deposits are a potential place especially for germs, such as viruses and bacteria, to settle and breed. Dirt, small solid particles, as e.g. small rust particles or grains of sand, may cause corrosion and malfunction of the piping and fittings. For these reasons the German standard DIN 1988 prescribes the integration of filters in domestic water installations made of metal and copper pipes. It is recommended also in the case of plastic pipes. Grünbeck filters offer a persistently safe protection against dirt particles in drinking water.

3 Filtration

The filtration principle is based on nature. When rainwater passes through the individual layers of earth into the ground water, coarse impurities are held back in the soil. While the filtration speed in nature is very slow and the retained impurities cannot be removed, technical filters can either be backwashed or dirty filter elements can be replaced.

C Product Description

1 Type Designation Plate

The type designation plate is located at the casing of the backwash filter. Inquiries or orders can be answered more quickly if you state the data indicated on the type designation plate. Please complete the form below in order to have the necessary data always at hand.

GENO® Backwash Filter MXA

Serial Number: /

Order Number:

2 Design

GENO® backwash filter, type MXA, for inline installation into the piping. The brass materials used are zinc-reduced. All parts coming into contact with the medium meet the requirements of the German Food and Commodities Act (LMBG).

3 Appropriate Application

GENO® backwash filters MXA are designed for the filtration of drinking and industrial water. They protect the water pipes and the connected water-carrying system components from malfunction and corrosion caused by undissolved impurities (particles) such as rust particles, sand, etc. They are equipped with a 100 µm filter element as standard.

After consultation with Grünbeck, it is also possible to use the backwash filters with special filter elements (50 µm, 200 µm or 500 µm) for filtration of well, process and cooling water. They are not suitable for chemically treated circulation water. If used for water containing coarse dirt particles, a coarse dirt trap must always be installed upstream of the backwash filter.

The filters are neither suitable for oils, fats, solvents, soaps and other greasy media nor for filtering water-soluble substances.

For filter elements 50 µm, 100 µm, 200 µm, 500 µm, refer to spare parts.



Note: The GENO® backwash filters MXA are exclusively suited for pressurised applications.

Also refer to the following note!



Note: In the case of power failure or failure of the transformer fuse during the backwash process, it will not be completed automatically anymore. Any inadmissible leakage of water caused thereby can be avoided by installing a safety valve (refer to chapter 6.2, Accessories). It must be noted, however, that a power failure during an ongoing backwash process can almost be excluded.

4 Principle of Operation and Functional Description of the GENO®-RS-tronic Controller

There are four different possibilities to initiate the backwash process: time interval, differential pressure (can be switched off), external signal and manual release.

The time interval can be set between 1 hour and 99 days. For interval duration ≥ 1 day, the starting time can be programmed additionally. The time interval is generally active. Furthermore an off-period can be activated during which backwash will not take place at all. Before and after the off-period, the backwash process will be carried out automatically.

The differential pressure sensor measures the differential pressure between filter inlet and outlet and initiates a backwash process if approximately 0.4 bar are exceeded. The differential pressure evaluation can be switched off.

It is also possible to start the backwash process via an external voltage-free contact. The input can also be reprogrammed for external backwash locking.

The backwash process proceeds as follows: A servomotor opens the drain valve, by initially clocking ten times and then rotating continuously. The rotation is controlled by means of a micro-switch. After a sufficient number of micro-switch pulses has been counted, the sense of rotation is reversed and the drain valve is closed again. Also during the closing process the micro-switch pulses are counted. If the rotation is blocked due to dirt or wear, the controller will detect the problem and try to "solve" it automatically, if possible. In case this is not successful, corresponding error messages will be given (refer to chapter G, Troubleshooting).

For remote control, a voltage-free error signalling contact is available as well as a voltage-free contact signalling an ongoing backwash process. The controller monitors the number of backwash processes and, possibly in connection with a maintenance time interval, informs about the remaining backwash processes in the current maintenance interval by means of a bar graph shown on the display.

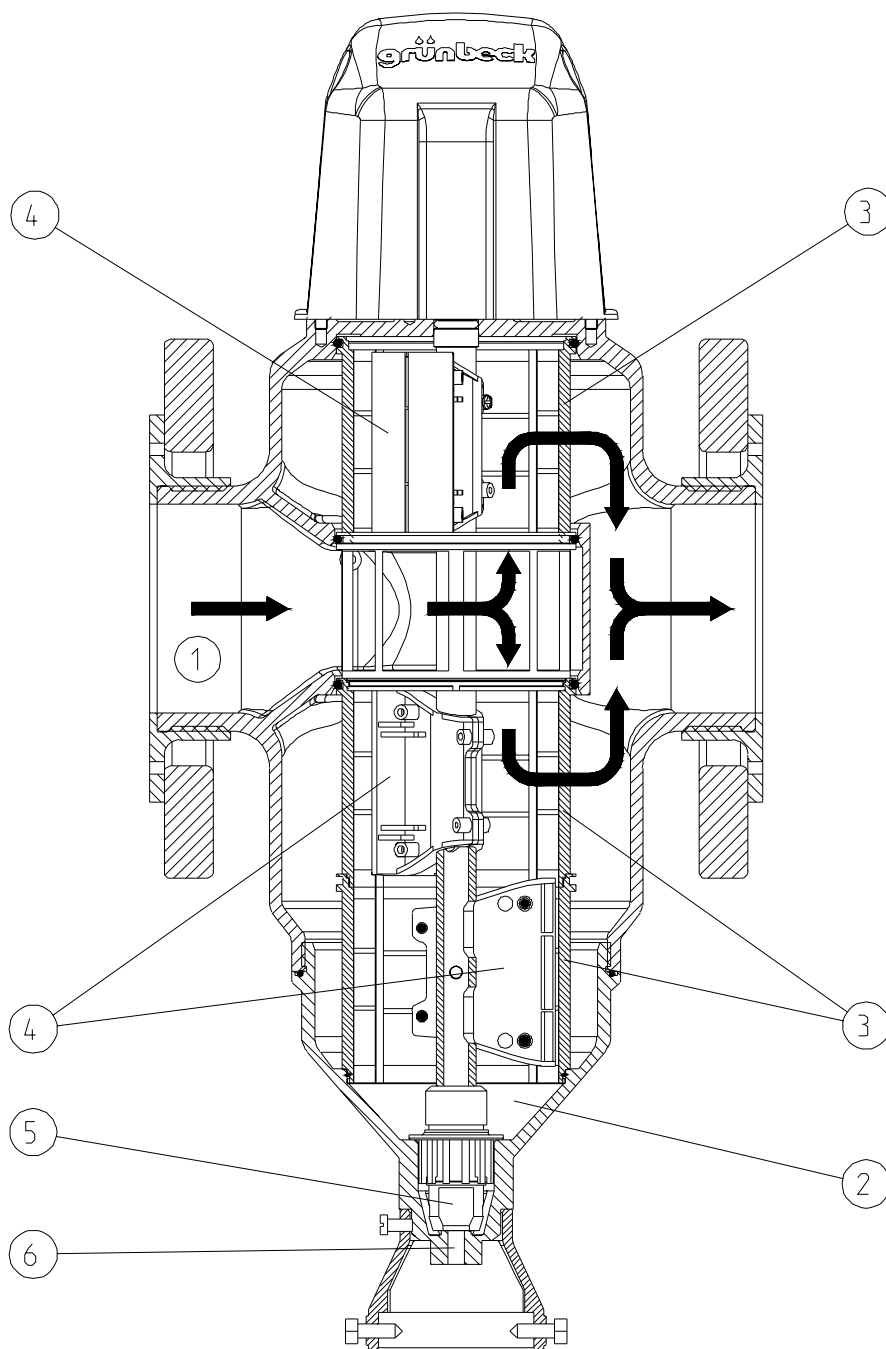


Fig. C-1: Full sectional view with arrows indicating flow direction and item numbers

5 Principle of Operation and Functional Description of the Filter Unit

Unfiltered raw water reaches the filter via the connection (item 1), flows through the filter element (item 3) from the inside to the outside and is filtrated thereby. Impurities adhere to the filter element. Larger and heavier dirt particles settle at the bottom of filter cylinder (item 2).

The drive unit on the filter top carries out the backwash process by turning the backwash nozzle (item 4) and lifting the lower drain nozzle (item 5), thus opening the drain outlet (item 6). During the rotary movement, the backwash nozzle brushes over the filter surface radially, the filter element is cleaned.

The coarse impurities removed by the backwash nozzle (item 4) and those having already settled in the filter cylinder (item 2) during the filtration process are washed out.

The backwash proceeds by a reversal of the flow direction, i.e. filtrated water passes through the filter element from the outside to the inside via the backwash nozzle (item 4). Only those areas are cleaned where the backwash nozzle is actually moving over.



Note: During the backwash process, the supply of filtrated water is maintained.

6 Technical Data/Specifications

Table C-1: Technical Data		GENO® Backwash Filter, Type MXA						
		1“	1¼ “	1½ “	2“	DN 65	DN 80	DN 100
Connection data								
Nominal connection size	[DN]	25	32	40	50	65	80	100
Drain connection HT pipe	[DN]	50						
Electrical data		230 V / 24 V / 50 Hz / 10 VA						
Protection system		IP 54						
Performance data								
Flow rate at 0.2 bar pressure loss	[m³/h]	8.5	12	22	27	33	60	66
K _V value	[m³/h]	18	25	46	56	69	124	138
Filter fineness	[µm]	100						
Upper filtration fineness acc.to DIN 19632	[µm]	110						
Lower filtration fineness acc. to DIN 19632	[µm]	90						
Nominal pressure (PN)	[bar]	16						
Min. flow pressure	[bar]	2						
Max. operating pressure at water temperature	[bar/°C]	10/90						
Differential pressure release	[bar]	approx. 0.4 – 0.5						
Consumption data								
Quantity of backwash water at 3 bar water pressure and backwash time of 1,5 min., approx.	[l]	40						
Max. backwash volume flow at 9 bar, approx.	[m³/h]	4						
Dimensions and weights								
A: Installation length without screw connections	[mm]	190	190	206	206	-	-	-
B: Installation length with screw connections	[mm]	276	281	342	323	-	-	-
B: Installation length without counter flanges; flanges PN 16 acc. to DIN	[mm]	-	-	-	-	220	250	250
C: Min. distance to wall	[mm]	90	90	90	90	100	103	110
D: Overall height above connection centre	[mm]	153	153	233	233	233	243	243
E: Overall height filter bottom to connection centre	[mm]	194	194	212	212	212	302	302
F: Total height	[mm]	347	347	445	445	445	545	545
G: Space above filter top	[mm]	130						
H: Space required for replacing filter element	[mm]	100	100	minimum 100 optimum 215			minimum 100 optimum 315	
I: Hole circle diameter of flange	[mm]	-	-	-	-	145	160	180
J: Max. seal face	[mm]	-	-	-	-	122	140	158
K: Number of screws M16	[pc.]	-	-	-	-	4	8	8
Weight empty with control unit GENO®-RS-tronic, approx.	[kg]	8.6	8.7	12.7	12.7	14.8	19	20
Test mark/certification code								
DIN/DVGW certification code		NW-9301BO0194						
Environmental data								
Max. water temperature	[°C]	90						
Max. ambient temperature	[°C]	40						
Ordering no.		107 450	107 455	107 460	107 465	107 470	107 475	107 480

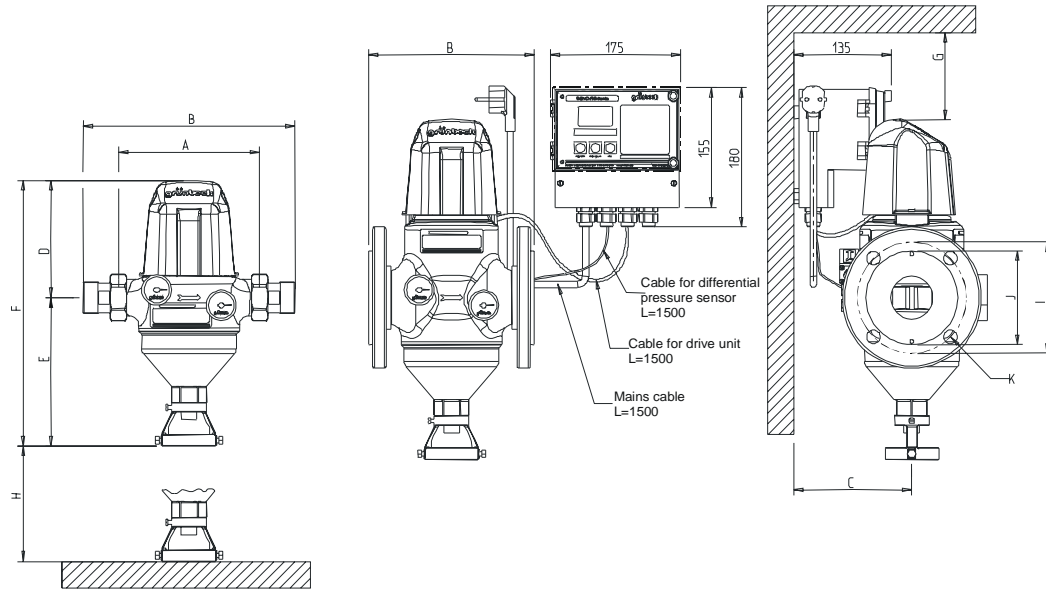


Fig. C-2: Dimensional drawing of GENO® backwash filter MXA

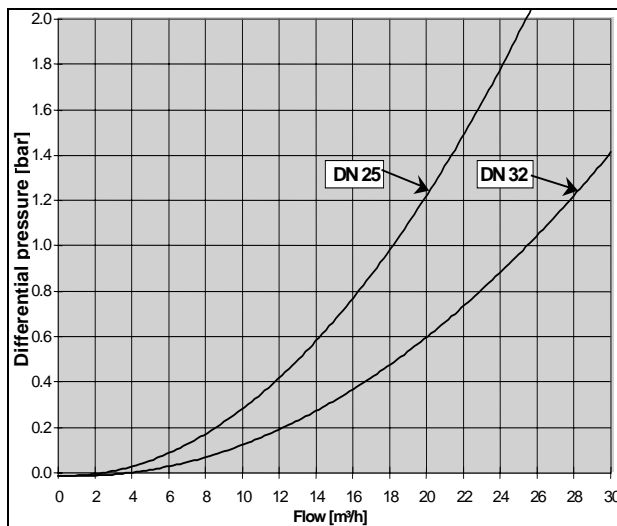


Fig. C-3: Pressure loss curves MX/MXA DN 25 & 32

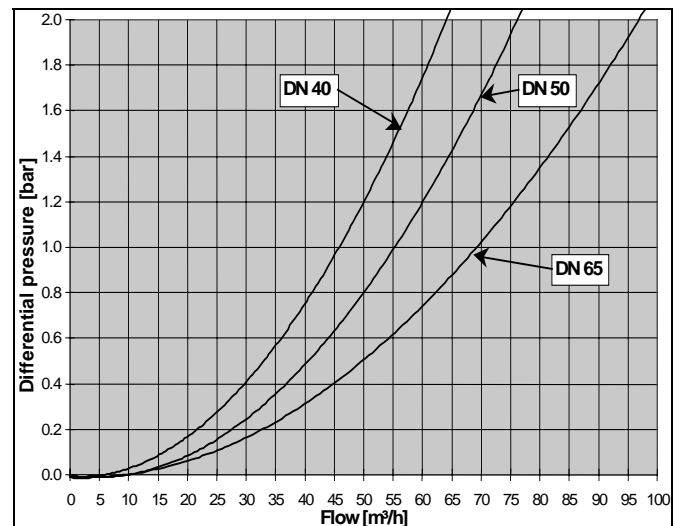


Fig. C-4: Pressure loss curves MX/MXA DN 40, 50 & 65

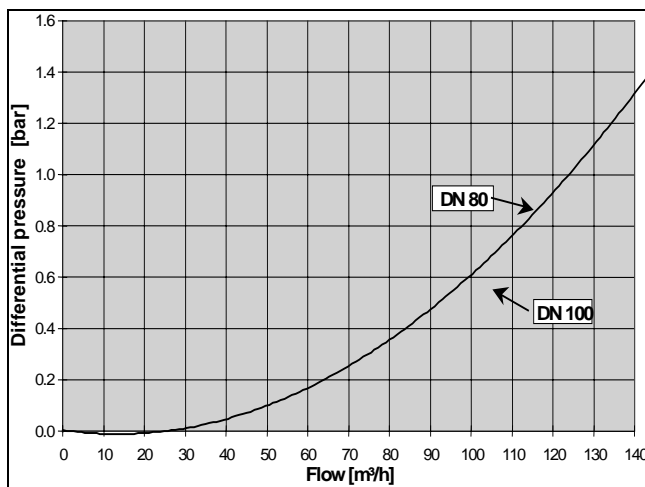


Fig. C-5: Pressure loss curves MX/MXA DN 80 & 100

7 Scope of Delivery

7.1 Standard Equipment

GENO[®] backwash filter MXA for inline installation into piping, including integrated flushing water connection according to DIN 1988, automatic drive unit and separate GENO[®]-RS-tronic controller. Pressure gauge 0 - 16 bar on raw and pure water side. Water meter screw connections with seals up to DN 50. For DN 65 and higher, flanges according to DIN (counter flanges and necessary seals are not included in the scope of delivery).

7.2 Accessories



Note: It is possible to retrofit existing systems with optional components. Please contact your regional sales representative or the Grünbeck headquarters for further information.

- Safety valve for MXA

Ordering no. 107 850

The safety valve consists of a solenoid valve closed in the absence of current and controlled by GENO[®]-RS-tronic. It is installed at the flushing water outlet to avoid inadmissible leakage of water.

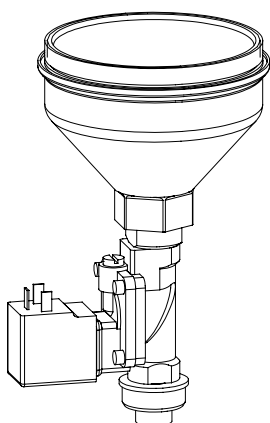


Fig. C-6 Safety valve

D Installation

1 General Installation Instructions

The installation site must provide enough space. The required connections have to be made before starting the installation. Dimensions and connections are listed in table C-1.

The installation site must be frost-proof. Protection of the system from chemicals, colorants, solvents and vapours must be ensured.

1.1 Sanitary Installation – In- structions

For installation of the GENO® backwash filter MXA, certain rules must be observed by all means. Additional recommendations facilitate the operation of the system. The installation instructions described here are shown in Fig. D-2.

Mandatory rules



The installation of the GENO® backwash filter MXA is a major modification of the drinking water installation and may therefore only be carried out by authorised specialist companies.



Caution! GENO® backwash filters MXA are suitable for applications under pressure exclusively. When mounted on the suction side, backwashing is not possible.



Note: In the factory, the GENO® backwash filters MXA are pre-assembled with a flow direction from left to right. If the flow direction is to be from right to left, the mounted differential pressure sensor should be remounted (please observe the flow direction arrow on the differential pressure sensor casing). It should be possible to read the pressure gauges from the front.

- Local installation rules, general guidelines (e.g. WVU, DIN, DVGW, ÖVGW or SVGW), the technical data and due application (see chapter C 3-5) of the GENO® backwash filter MXA must be observed.
- To drain the flushing water, a drain connection of minimum DN 50 is required.
- If used with water containing coarse dirt particles, a coarse particle filter must precede the GENO® backwash filter.

1.2 Electrical Installation - Instructions

For electrical connection, a shock-proof socket is sufficient. It must correspond to the data specified in table C-1 and may only be 1.2 m away from the GENO®-RS-tronic controller.



Caution! Socket must carry a constant voltage (do not connect to light and heating switches at the same time).

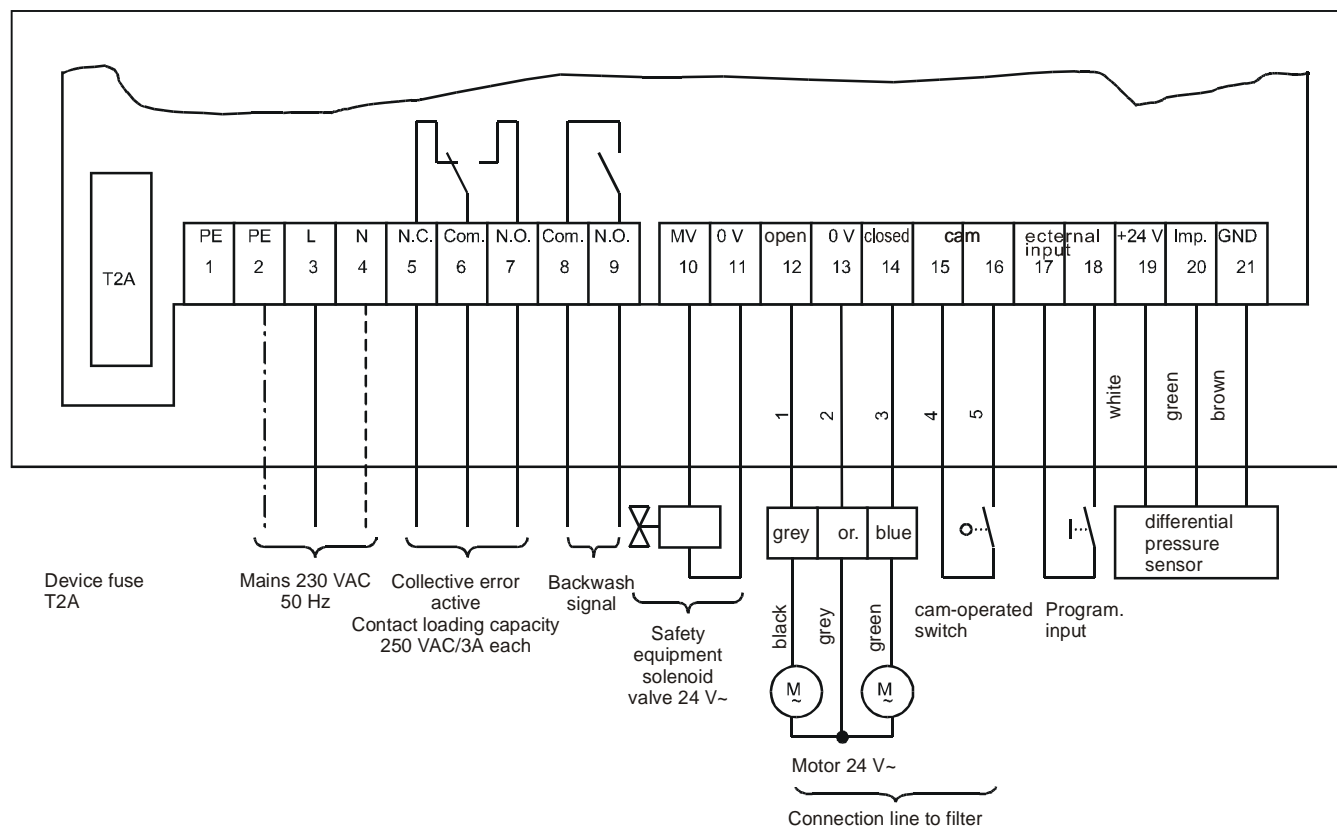


Fig. D-1: Wiring diagram GENO® backwash filter MXA

2 Preparatory Work

1. Unpack all components of the system.
2. Check for completeness and perfect condition.

3 Connect System

3.1 Sanitary Connection, Connection of Water Supply



Caution! According to DIN 1988, the feeding pipe must be rinsed before start-up. The system may be damaged by impurities and corrosion particles.

1. Connect water supply according to the installation example (Fig. D-2) and observe the instructions and recommendations of chapter D-1 as well as the flow direction.



Note: The flushing water connection is enclosed separately in the packing.

The flushing water connection is slid over the collar of the filter cylinder and fastened by means of the fixing screw.

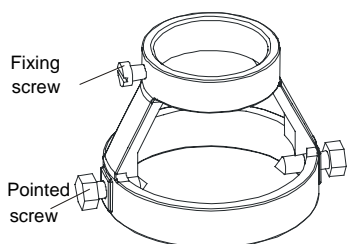


Fig. D-1: Flushing water conn.

2. Connect drain.



Note: A HT pipe DN 50 can be fastened using the two lateral pointed-top screws.

3. Install GENO® backwash filters MXA only horizontally and stress-free.
4. Ensure free discharge and back pressure-free drainage of the flushing water.

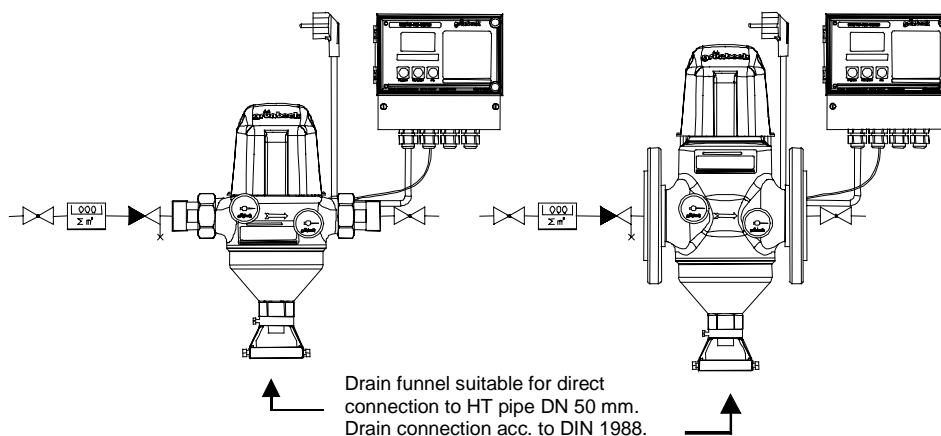


Fig. D-2: Installation example of GENO® backwash filter MXA

E Starting up



The work described here may only be carried out by trained technical personnel. We recommend to let the Grünbeck technical service or an authorised specialist company start up the system.

1 Starting up the Device



Note: GENO® backwash filters MXA are supplied generally with open drain outlet. To avoid unnecessary leakage of water via the drain outlet, the following start-up instructions must be observed.

1. Perform electrical connection (connect mains plug, differential pressure cable, connection lines to the filter and error signalling or accessories, if applicable) according to Fig. D-1.
-



Note: On connection, the open drain outlet is closed automatically!

2. Set operating parameters at the controller (see chapter F).
 - Set time.
 - Set possible off-periods.
3. Open shutoff valves upstream and downstream of the device.
4. Vent pipe at the nearest connection point downstream of the device.
5. Check visually. Make sure that no water leaks at any point of the device.
6. Perform backwash process:
(Precondition: The time is shown on the display (standard display)). By pressing the backwash key **R** longer than 5 seconds, the backwash process is started manually.
7. The backwash filter is now ready for operation.

F Operation

1 Introduction



Note: According to DIN 1988, backwash filters must be backwashed every two months by the user. Depending on the actual operating conditions, it might be necessary to backwash the filter earlier.

With the backwash controller GENO[®]-RS-tronic, the prescribed backwash intervals according to DIN 1988 (every 2 months) are ensured.

By pressing the backwash key **R** longer than 5 seconds, a manual backwash process can be started at any time, if the standard display (time) is shown.



Note: In the case of heavy impurities, the standard drain outlet of \varnothing 6.5 mm can be enlarged to max. \varnothing 7.5 mm. This measure increases the cleaning efficiency per backwash process and at the same time the quantity of backwash water per backwash process.

The GENO[®]-RS-tronic monitors all operating conditions and controls all functions of the GENO[®] backwash filter, type MXA. It ensures the correct operation of the device.



Fig. F-1: GENO[®]-RS-tronic controller



Warning! Faulty operation or faulty settings may cause dangerous operating conditions which result in personal injuries or damages to health and equipment.

Do not make other settings than those described in this chapter!



Any other modifications to the controller may only be carried out by the Grünbeck technical service.

2 Operate Controller

2.1 Operating Keys and Display



Wrench

- appears in the case of error messages
- is shown, if the maintenance interval has expired or if the number of completed backwash processes is higher than admissible.



Clock

- indicates interval-controlled backwash:
- is static, if the interval-controlled backwash mode is active.
- is blinking during an interval-controlled backwash process.
- is switched off, if a backwash off-period is active.



Differential pressure

- indicates backwash controlled by differential pressure:
- is static, if differential pressure evaluation is active.
- is blinking during a backwash process released by differential pressure.
- is switched off, if a backwash off-period is active.



Ext. display

- indicates backwash initiated by an external control signal:
- is static, if the programmable input for external backwash release is activated.
- is blinking during a backwash process initiated by an external signal.
- is switched off, if a backwash off-period is active.



Unit

- indicates the unit of the opposite numerical values, e.g. seconds, minutes, hours, days).



Numerical values

- show the time during normal operation (= standard display)
- show the operating parameters on the info level.
- show the numerical value of the parameter in the menu on the user menu level.

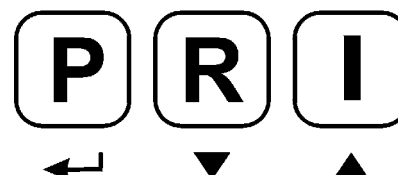
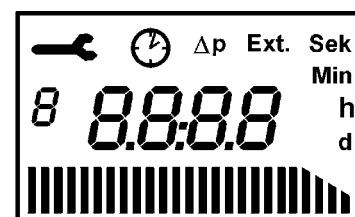


Fig. F-2: GENO®-RS-tronic;
operating keys and display



Parameter No. (small)

- indicates the parameter number of the current menu level in all menus.
- „H“ is blinking during manual backwash and backwash after error – confirm.
- „A“ is blinking during automatic backwash 5 minutes before and at the end of an off-period.
- „E“ is blinking if the programmable input is set to backwash locking and the external signal is waiting.
- „C“ is blinking if the filter is set to the CLOSE position after connecting the mains voltage.
- „C“ is static if a programming level is to be opened and the Code No. is displayed.



Maintenance display

- indicates the smaller value of the two values as percentage:
- remaining days of the current maintenance interval or
- remaining number of backwash processes during the current maintenance interval.

Program Normal operation:

- switches to user menu level (press longer than 2.5 seconds).



User menu level:

- opens parameters
- saves settings and closes parameters.

Back-wash

Normal operation:

- starts manual backwash (press longer than 5 seconds).



User menu level:

- returns to the previous parameter.
- decreases numerical values.

Info



Normal operation:

- starts the info level.
- switches from one display to another.

User menu level:

- switches to the next parameter.
- increases numerical values.

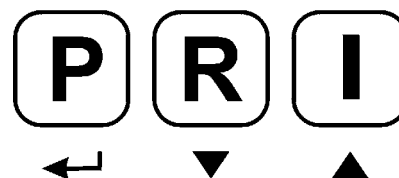
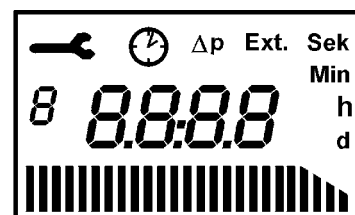


Fig. F-2: GENO®-RS-tronic;
operating keys and display

2.2 Read Operating Status

Info Level




Standard display



The display informs permanently about the operating condition of the system. The following parameters are shown in the standard display:

- Which functions have been activated to start backwash process.
- Which function has started the current backwash process.
- A backwash off-period is active.
- The remaining time to the next maintenance or the remaining number of backwash processes to the next maintenance.
- The time stored in the system.

Further operating parameters can be displayed at any time.

0. Press "Info" key  Has the backwash function been activated by an differential pressure signal? (0 = off / 1 = active).
1. Press "Info" key  The backwash interval currently programmed is displayed in XX hours or XX days.
2. Press "Info" key  Has a backwash off-period been activated? (0 = no / 1 = yes).

3. Press "Info" key **I**.
If no backwash off-period has been activated, display 5 appears,
otherwise
the starting time of the backwash off-period XX:XX is displayed.
4. Press "Info" key **I**.
The stop time of the backwash off-period YY:YY is displayed.
5. Press "Info" key **I**.
XX:YY is displayed:
XX = number of pulses for opening
YY = number of pulses for closing
The values set in the factory are: XX = 36
 YY = 34...40
The value displayed is only updated during backwash.
6. Press "Info" key **I**.
The display returns to the standard display (time).

2.3 Start Manual Backwash Process

"Manual backwash" is started by pressing the "Backwash" key **R** longer than 5 seconds while the standard display (time) is shown.

2.4 External Backwash Release

This control input is suited to be connected to a voltage-free contact. If it is closed longer than 1 second, a backwash process will be started provided that no off-period is currently active, no error Er 3 or Er 5 has occurred and no backwash process is ongoing.

2.5 Confirm Errors

All errors Er 1 ... Er 6 may be confirmed by pressing any key. If the cause of error was not eliminated and cleared, the error re-appears after a short time.

2.6 Setting Operating Parameters

2.6.1 Principle of Operation

To set parameters, the menu or programming level must be started first.

Start menu level	User menu level: Press P key longer than 2.5 seconds, or
Start programming level	Programming menu level: Press P and R key simultaneously for more than 1 second. Select code 113 with R or I key and confirm with P key.
Select parameter	On each menu level, the I key switches to the next, the R key to the previous parameter.
Open parameter	If the parameter to be changed is reached, it can be opened by pressing the P key, the displayed value is blinking.
Change parameter	In the open parameter (displayed value blinking), the R and I keys switch to lower or higher values.
Close parameter without saving	If the blinking value is not to be changed, the parameter is closed again by pressing the R and I simultaneously.
Save parameter	If the right value (blinking) is displayed, it is stored by pressing the P key. The parameter is closed and the display shows the set value permanently.
Quit menu level	After all required settings have been made, the menu level is closed by pressing the R and I key simultaneously, and the standard display (time) is shown again.
Automatic return to standard display	If no entry is made for more than 1 minute, the program returns to the standard display. Unsaved data will be lost.

2.6.2 Standard Settings (User Menu Level)



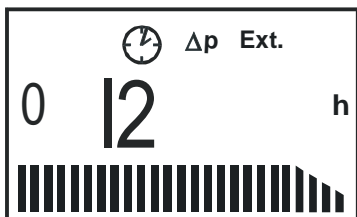
Note: On start-up, the standard settings must be adjusted to the local conditions.



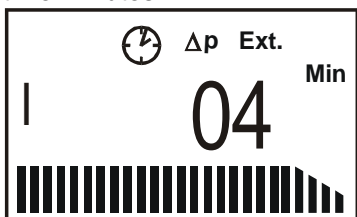
Note: Boldface instructions are mandatory for the progress of the procedure. All other instructions can be ignored, if the value shown in the display remains unchanged.

Start user menu level

Display/setting
time-hour



Display/setting
time-minutes



1. Press "Program" **(P)** key for more than 2.5 seconds.

If the displayed time corresponds to the actual time, steps 2. – 4. can be ignored.

2. To open the parameter ⇒ press "Program" **(P)** key.
3. If the display is blinking, adjust the time by choosing a lower or higher value with the **(R)** or **(I)** key.
4. Save setting by pressing the **(P)** key.
The value is displayed without blinking.

5. Press "Info" **(I)** key to switch to the following parameter.

If no changes are required, continue with step 7.

6. Set correct value by repeating steps 2 – 4 analogously.

7. Press the keys **(R)** and **(I)** simultaneously to return to the standard display.



Caution! In case of power failure, the time must be re-programmed as it starts again at 00:00.

However, all time-dependent parameters such as backwash locking, interval-controlled backwash, etc. remain stored.

2.6.3 Extended Setting (User Programming Level)

**Factory
settings**



Note: In this menu, you can adjust the operating mode of the GENO®-RS-tronic controller to your requirements and the quality of the raw water. Consider, however, that

- insufficient backwash may cause an inadmissible high pressure loss at the filter or even blocking of the filter.
- excessive backwash also requires shorter maintenance intervals.



Note: Boldface instructions are mandatory for the progress of the procedure. All other instructions can be ignored if the displayed value remains unchanged.

Start user programming level

Standard display



Standard display required

The display informs permanently about the operating status of the system.

1. Press Program **P** and Function **R** key simultaneously until the display changes.

Code entry



The programming level is active.

The required menu must be selected first.

The digits (000) are blinking. They must be set so that they show **Code 113** for the user programming level.

2. Count upwards by pressing the Info **I** key, until **C 113** is displayed

OR

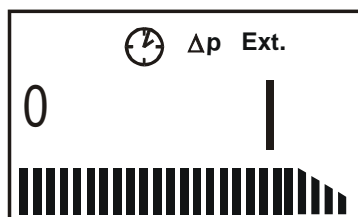
count downwards by pressing the Function **R** key, until **C 113** is displayed.

By keeping the **R** or **I** key pressed, the digits are rolling faster, for precise adjustment, tip the keys.

3. Press Program **P** key to confirm Code 113.



Display / setting
evaluation of the differential
pressure signal



With the help of the differential pressure sensor, the GENO®-RS-tronic controller defines automatically if a backwash process becomes necessary.

**Factory
settings**

1

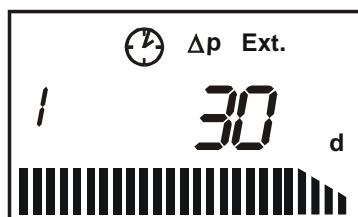
Possible settings:

- 0 = automatic evaluation switched off
- 1 = automatic evaluation switched on

4. Press Program **(P)** key to open the parameter, the displayed value is blinking.
5. Use the **(R)** or **(I)** key to set the displayed value to the required function.
6. Press Program **(P)** key to save the set value, the displayed value stops blinking.

7. Press Info **(I) key to switch to the following parameter.**

Display / setting of the back-
wash interval



Interval backwash process is always active and can be programmed within the following range:

1 ... 23 hours (h) ... 1 ... 99 days (d)

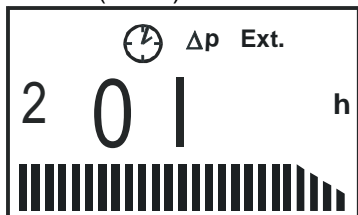
30 d

When setting 1 ... 23 h, the backwash process will take place every clock hour. When setting 1...99 d, the backwash time is programmed as described under step 11.

8. Press Program **(P)** key to open the parameter, the displayed value is blinking.
9. Use the **(R)** or **(I)** key to set the displayed value to the required value.
10. Press Program **(P)** key to save the set value, the displayed value stops blinking.

11. Press Info **(I) key to switch to the following parameter. If the backwash interval is set to 1...23 h, the following two parameters are skipped..**

Display / setting
starting time of the backwash
interval (hours)



If the set value of the backwash interval is ≥ 1 d, the starting time of the backwash process can be programmed in addition (here: hours):

**Factory
settings
01:**

12. Press Program **(P)** key to open the parameter, the displayed value is blinking.
13. Use the **(R)** or **(I)** key to set the displayed value to the required value.
14. Press Program **(P)** key to save the set value, the displayed value stops blinking.

15. Press Info **(I) key to switch to the following parameter.**

Display / setting
starting time of the backwash
interval (minutes)



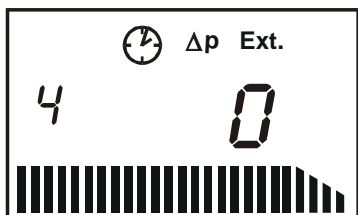
If the set value of the backwash interval is ≥ 1 d, the starting time of the backwash process can be programmed in addition (here: minutes):

:00

16. Press Program **(P)** key to open the parameter, the displayed value is blinking.
17. Use the **(R)** or **(I)** key to set the displayed value to the required value.
18. Press Program **(P)** key to save the set value, the displayed value stops blinking.

19. Press Info **(I) key to switch to the following parameter.**

Display / setting of the back-
wash off-period function



With the help of the backwash off-period function, any backwash process can be prevented for a programmable period of time.

Possible settings

- 0 = backwash off-period function switched off
- 1 = backwash off-period function switched on

0

20. Press Program **(P)** key to open the parameter, the displayed value is blinking.
21. Use the **(R)** or **(I)** key to set the displayed value to the required value.
22. Press Program **(P)** key to save the set value, the displayed value stops blinking

23. Press Info **I** key to switch to the following parameter. If the backwash off-period function is switched off, the following four parameters are skipped.

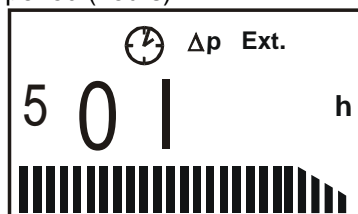
Factory
settings



Note: If the backwash off-period function is activated, a backwash process always takes place automatically 5 minutes before and at the end of the off-period.

There must be at least one hour between **end** and **beginning**, e.g. end 23:30 h, beginning 00:30 h. For interval-controlled backwash (interval ≥ 1 d), a time must be chosen during which **no** backwash off-period is active.

Display / setting
beginning of backwash off-
period (hours)



If the backwash off-period function has been activated, the starting time of the backwash off-period can be programmed in addition (here: hours):

01:

24. Press Program **P** key to open the parameter, the displayed value is blinking.
25. Use the **R** or **I** key to set the displayed value to the required value.
26. Press Program **P** key to save the set value, the displayed value stops blinking.

27. Press Info **I** key to switch to the following parameter.

Display / setting
beginning of the backwash
off-period (minutes)



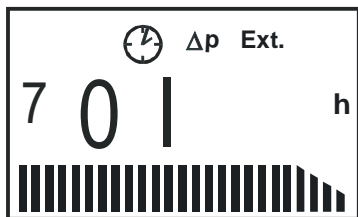
If the backwash off-period function has been activated, the starting time of the backwash off-period can be programmed in addition (here: minutes):

:00

28. Press Program **P** key to open the parameter, the displayed value is blinking.
29. Use the **R** or **I** key to set the displayed value to the required value.
30. Press Program **P** key to save the set value, the displayed value stops blinking.

31. Press Info **I** key to switch to the following parameter.

Display / setting
end of the backwash off-
period (hours)



If the backwash off-period function has been activated, the stop time of the backwash off-period can be programmed in addition (here: hours):

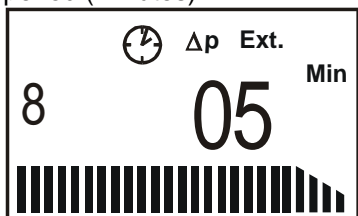
**Factory
settings**

01:

32. Press Program **P** key to open the parameter, the displayed value is blinking.
33. Use the **R** or **I** key to set the displayed value to the required value.
34. Press Program **P** key to save the set value, the displayed value stops blinking.

35. Press Info **I key to switch to the following parameter.**

Display / setting
end of the backwash off-
period (minutes)



If the backwash off-period function has been activated, the stop time of the backwash off-period can be programmed in addition (here: minutes):

:05

36. Press Program **P** key to open the parameter, the displayed value is blinking.
37. Use the **R** or **I** key to set the displayed value to the required value.
38. Press Program **P** key to save the set value, the displayed value stops blinking.

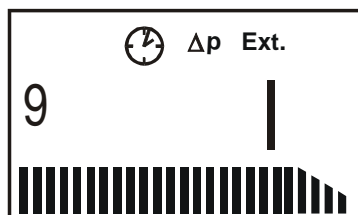
39. Press Info **I key to switch to the following parameter.**



Note: As the user of the GENO® backwash filter, type MXA, generally you have the possibility of carrying out the necessary maintenance and inspections yourself or to let the Grünbeck technical service do it for you. If you do the maintenance work yourself, this can be set at the controller. In this case, you will receive an error message after 1,500 backwash processes, which reminds you of the due inspection.

See also chapter H, Inspection / Maintenance, of these operating instructions!

Display / setting of the maintenance responsibility



Selection of maintenance responsibility.

Possible settings:

- 0 = maintenance carried out by operator himself
- 1 = maintenance carried out by technical service company

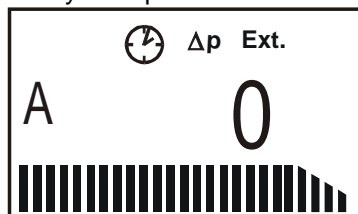
factory-set values

1

40. Press „Program“ **(P)** key to open the parameter, displayed value is blinking.
41. Use the **(R)** or **(I)** key to set the displayed value to the required function.
42. Press „Program“ **(P)** key to save the set value, the displayed value stops blinking.

43. Press **(I) key to switch to the following parameter. In case the maintenance responsibility is programmed on the technical service company, the following parameter cannot be reached by pressing the **(I)** key.**

Confirm maintenance carried out by the operator



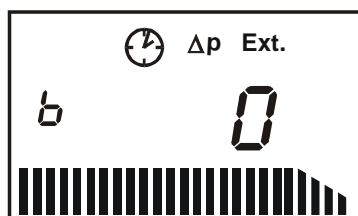
After a maintenance was carried out by the operator, this must be entered into the GENO®-RS-tronic controller.

0

44. Press „Program“ **(P)** key to open the parameter, displayed value is blinking.
45. Use the **(I)** key to set the displayed value to 1.
46. Press „Program“ **(P)** key to save the set value, the displayed value stops blinking, and the displayed value **0** automatically re-appears. The new maintenance interval is started.

47. Press Info **(I) key to switch to the following parameter.**

Display / operating mode of the GENO®-RS-tronic controller



Programming of the operating mode of the GENO®-RS-tronic controller.

- 0 = operating mode for filter type **MXA**
- 1 = operating mode for filter type **MSA**

0

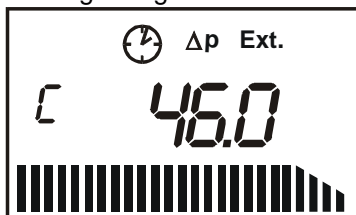
Major differences of both operating modes:

At type MXA, the rotation is controlled by means of micro-switch impulses; sense of rotation during backwash

48. Press „Program“ **(P)** key to open the parameter, the displayed value is blinking.
49. Use the **(R)** or **(I)** key to set the displayed value to the required value.
50. Press „Program“ **(P)** key to save the set value, the displayed value stops blinking.

51. Press Info **(I) key to switch to the following parameter.**

MXA: rotation speed of gear
MSA: gearing



When special motors and special gears are used, the controller GENO®-RS-tronic must be adjusted to them:
At GENO® backwash filter type MSA:
remove filter cover and read off the gearing at the name plate of the gear.

Werkseinstellwerte

MXA:
8 1/min

MSA
46:1

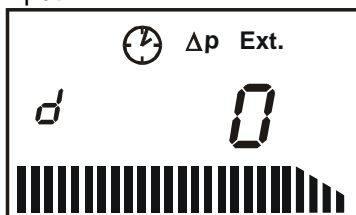
setting range MXA: 01,0 ... 15,0 1/min

setting range MSA: 31:1, 46:1, 62:1

52. Press "Program" **(P)** key to open the parameter, displayed value is blinking.
53. Use the **(R)** or **(I)** key to set the displayed value to the required value.
54. Press "Program" **(P)** key to save the set value, the displayed value stops blinking.

55. Press Info **(I) key to switch to the following parameter.**

Function of the programmable input



The programmable input is designed for the connection of an external voltage-free input and can be occupied with the following functions:

- 0 = external release of backwash (in the display „Ext.“ is blinking during backwash process)
- 1 = external lock of backwash (in the display „E“ is blinking while the signal is present)

0

By means of these possibilities, two backwash filters can be operated in parallel, so that both cannot backwash simultaneously. For this purpose the input for external lock of backwash must be programmed at both controllers and connected with the signal output backwash of the other controller.

56. Press "Program" **(P)** key to open the parameter, displayed value is blinking.
57. Use the **(R)** or **(I)** key to set the displayed value to the required value.
58. Press "Program" **(P)** key to save the set value, the displayed value stops blinking.

59. Press key **(I) and **(R)** simultaneously in order to return to the basic display.**

G Troubleshooting

Even for those systems which have been designed and manufactured most carefully and are operated correctly, malfunctions cannot be excluded completely. Table G-1 lists possible disturbances during operation of the GENO® backwash filter, type MXA, their causes and troubleshooting measures.



Note: If any of the disturbances cannot be eliminated by the instructions given in table G-1, contact the technical service by all means (see attached directory)! State type of system, serial number and displayed error message, if possible.

Table G-1: Troubleshooting

Disturbance	Cause	Troubleshooting
Er 1	Control does not receive enough pulses from the micro-switch. <ul style="list-style-type: none"> • Motor stuck or defective • Mechanical connection between motor and hexagonal bolt worn • Thread wear • Micro-switch set incorrectly or defective 	Call for Grünbeck technical service, if water leaks through the drain outlet, close filter manually (description see below).
Er 2	Control receives too many pulses from the micro-switch. <ul style="list-style-type: none"> • Rubber sealing to drain outlet out of place • Mechanical connection below hexagonal bolt worn • Micro-switch set incorrectly or defective 	Call for Grünbeck technical service, if water leaks through the drain outlet, close filter manually (description see below).
Er 3	Filter element cannot be cleaned anymore due to heavy contamination of the raw water	In the case of extremely heavy impurities, we recommend to install a coarse particle filter preceding the backwash filter. Call for Grünbeck technical service.
Er 4	Maintenance interval expired or admissible number of backwash processes per maintenance interval exceeded.	Call for Grünbeck technical service. Carry out maintenance and confirm code 113, position A on user programming level.
Er 5	Differential pressure sensor or its connection line defective.	Replace sensor with connection line.
Er 6	Increasing thread wear.	Carry out maintenance immediately. A damage as described under Er 1 or Er 2 is very likely to occur.
No display, motor is not revolving anymore.	Device fuse defective.	Replacement, see Fig. D-1.

Confirm errors

By pressing the **P** , **R** or **I** key, an error is confirmed.

If an error is confirmed, the drive unit closes the filter for an appropriate period of time to make sure that it is closed, and starts a backwash process for checking.

Close filter manually



Caution! It may be necessary to close the backwash filter manually to prevent inadmissible leakage of water due to disturbances. We recommend to follow the below instructions.

- Remove mains plug from the controller.
- Close water supply to and from the backwash filter.
- Loosen fixing screws from the cover and remove cover from the filter. Disconnect the cables from the micro-switch and remove the motor with fixing plate from the filter casing.
- Turn the hexagonal bolt anticlockwise until the mechanical stop using either an SW 16 wrench or an appropriate slotted screw driver.



Note: If the filter is closed too tightly, the torque required to open the filter cannot be achieved by the drive unit. If the backwash filter is to be restarted manually after closing, a backwash process has to be initiated manually by all means to check whether the drive unit is able to run the backwash process correctly.

- Reopen water supply slowly – no water should flow to drain anymore.

H Inspection / Maintenance

1 Basic Information

To ensure a perfect long-term operation of the GENO® backwash filter, some routine maintenance works are necessary. Especially in the field of drinking water supply, the required measures are defined by standards and guidelines. The local rules must be observed by all means.

According to DIN 1988, part 8,

- the filter must be backwashed at least every 2 months. In the case of contaminated water due to an increased pressure loss, a backwash process is required earlier.
- for systems with DVGW certification code, yearly maintenance is sufficient. Maintenance works may only be carried out by the technical service or an authorised specialist company.



Note: By signing a maintenance contract, you make sure that all necessary works are carried out in due time.

2 Inspection (Functional Check)

Routine inspections can be carried out by the user. It is recommended to check the device initially at short intervals, afterwards as required. Inspection is mandatory every 2 months.

Inspection works:

- Check visually, make sure that no water leaks at any point of the filter.
- Carry out backwash process.
By pressing the Backwash **R** key longer than 5 seconds, manual backwash is started. The standard display (time) must be shown.
- Check the differential pressure of the device via the pressure gauges by opening the nearest extraction point.

3 Maintenance



In accordance with DIN 1988, part 8, maintenance works on drinking water treatment plants may only be carried out by the Grünbeck technical service or an authorised specialist company.

3.1 Overview: Maintenance Works

1. Check tightness of the filter.
To check the tightness of the device, apply the highest possible operating pressure to the filter. Observe max. admissible operating pressure!
In particular, check tightness:
 - at water meter screw unions or flange
 - at pressure gauges and dummy plugs
 - between filter top and filter cylinder
 - at drain outlet
 - between driving pin and casing, remove filter cover, if necessary.
2. Carry out backwash process (see chapter F, Operation).
3. Check differential pressure of the device by extracting water.
To check the differential pressure, open several adjacent extraction points. The differential pressure can be read from the two pressure gauges and thus impurities in the filter can be detected.



Note: To check points 4 and 5, it is required to open the GENO[®] backwash filter (see chapter 3.2, Open the filter). We recommend to proceed in the following order:

4. Check filter element visually for condition (impurities, possible damages).
5. Check thread of drain nozzle and pipe nozzle for wear.

3.2 Open Filter



Caution! Follow the steps and instructions mentioned below by all means to "Open filter" and "Dismount pipe nozzle". Otherwise there is a risk of damaging the backwash filter.

- Close the shutoff valves upstream and downstream of the filter.
- Start manual backwash process (see chapter F, Operation):
As soon as backwash water passes through the drain valve, remove the mains plug after approx. 5 seconds to empty the filter (by disconnecting the mains plug, the backwash nozzle remains in its position so that the filter can drain).
- Unscrew filter cylinder by turning it to the left.
- Remove filter element and check for persistent impurities and possible damages. Also check the condition of the O-rings of the filter element.
- Depending on the type of filter, different filter element combinations are assembled (see Fig. H-1). If a filter element is damaged, you can replace either the single element or the complete element set. The element sets can be detached via snap locks.

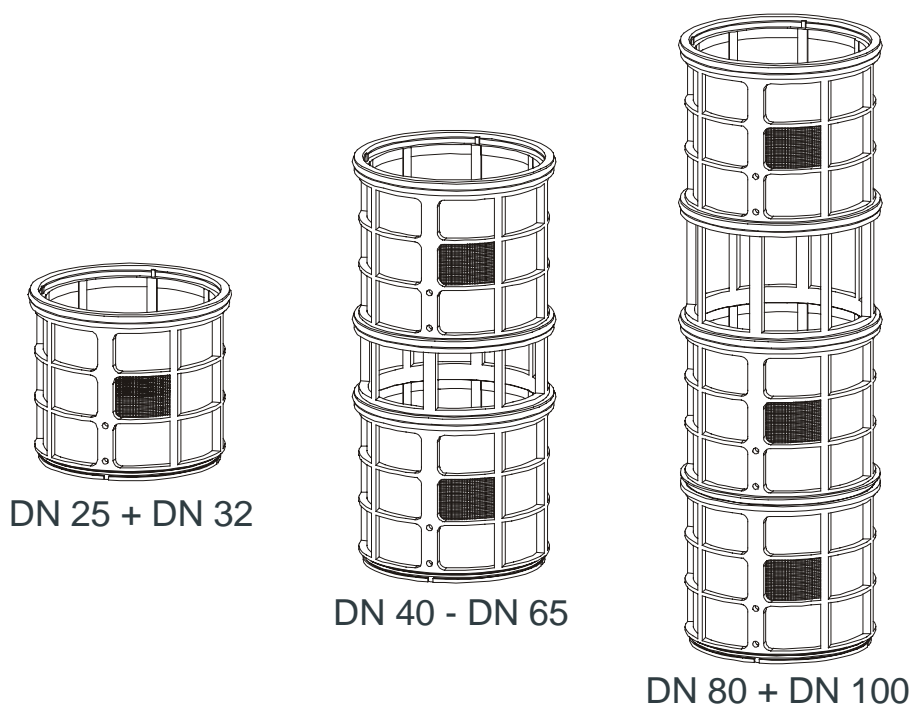


Fig. H-1: Filter element combinations

- Unscrew drain nozzle (see also chapter H-3) from pipe nozzle and check thread coating as well as O-ring on the pipe nozzle for wear.
- If the thread is still in good condition, clean it and lubricate with food-safe. (e.g. UNI-Siliwn LG 41) grease.



Note: In the case of thread wear, the drain nozzle and the pipe nozzle must be replaced.

- Screw drain nozzle onto pipe nozzle by turning it to the right until the O-ring on the pipe nozzle is just not visible anymore.
- Mount filter element:
Depending on the type of filter, insert the single filter element or the pre-assembled filter set with the mounted O-rings over the pipe nozzle into the casing. Make sure that the "large" diameter is always positioned upwards in the filter casing and the "smaller" diameter downwards, in the direction of the filter cylinder.



Note: The filter element must always be mounted in the casing with the "large" diameter, \varnothing 98 mm, upwards first.

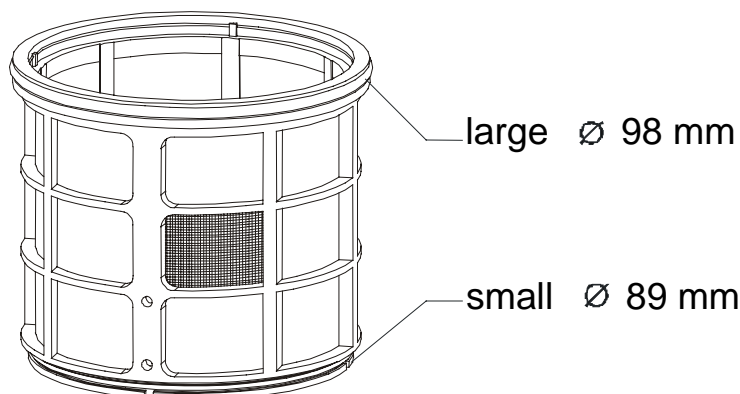


Fig. H-2: Filter element



Caution! Mount filter cylinder:

Here it is of particular importance that the spanner flat of the drain nozzle is fitted carefully into the two-flat bolt of the filter cylinder. This is the only way to mount the filter cylinder correctly. As shown in Fig. H-3, both spanner flats must be positioned parallel to each other.

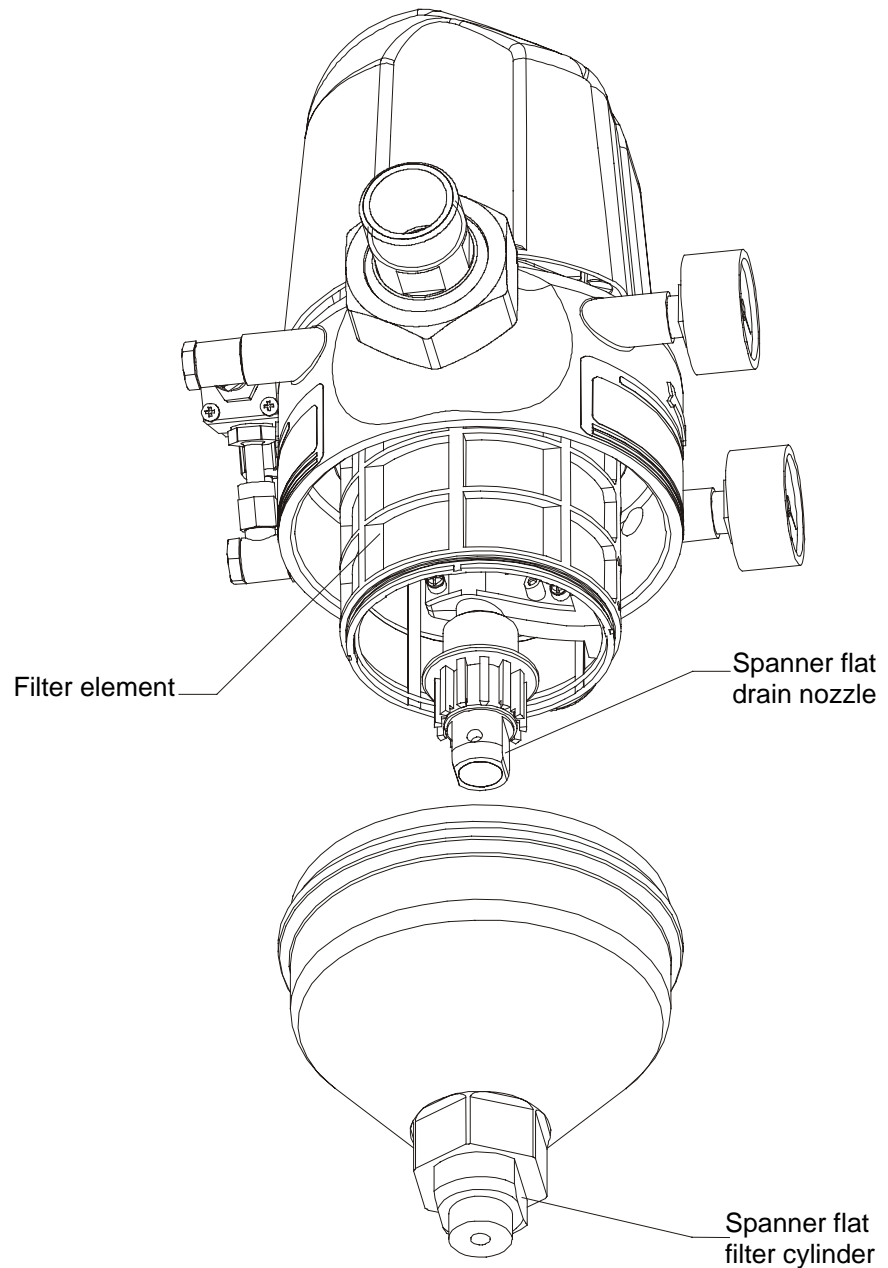


Fig. H-3: Mount filter cylinder

- **Start up backwash filter:**
The backwash filter can be started up again according to the instructions in chapter E, Starting up.

3.3 Dismount Pipe Nozzle

The pipe nozzle must be dismounted, if the thread is worn or if the two O-rings must be replaced due to wear.

- After opening the filter and dismounting the filter element, loosen the two hexagon socket screws of the cover to remove it.
- Disconnect the wires from the micro-switch (item 1). Now the drive unit (item 2) can be removed.
- Remove fixing plate (item 3) with micro-switch.
- Now push the pipe nozzle (item 4) upwards and remove the two half-disks (item 5).



Caution! At the pipe nozzle, namely at the mounting location of the half-disks, burrs may have formed due to wear. Before dismounting the pipe nozzle, the burrs must be removed using a file. The pipe nozzle may be pulled downwards only then.

If just the two O-rings are replaced, the pipe nozzle can be re-used.

In this case we recommend to deburr the pipe nozzle at the mounting location of the half-disks with a file before mounting the new O-rings. The filter can now be re-assembled.

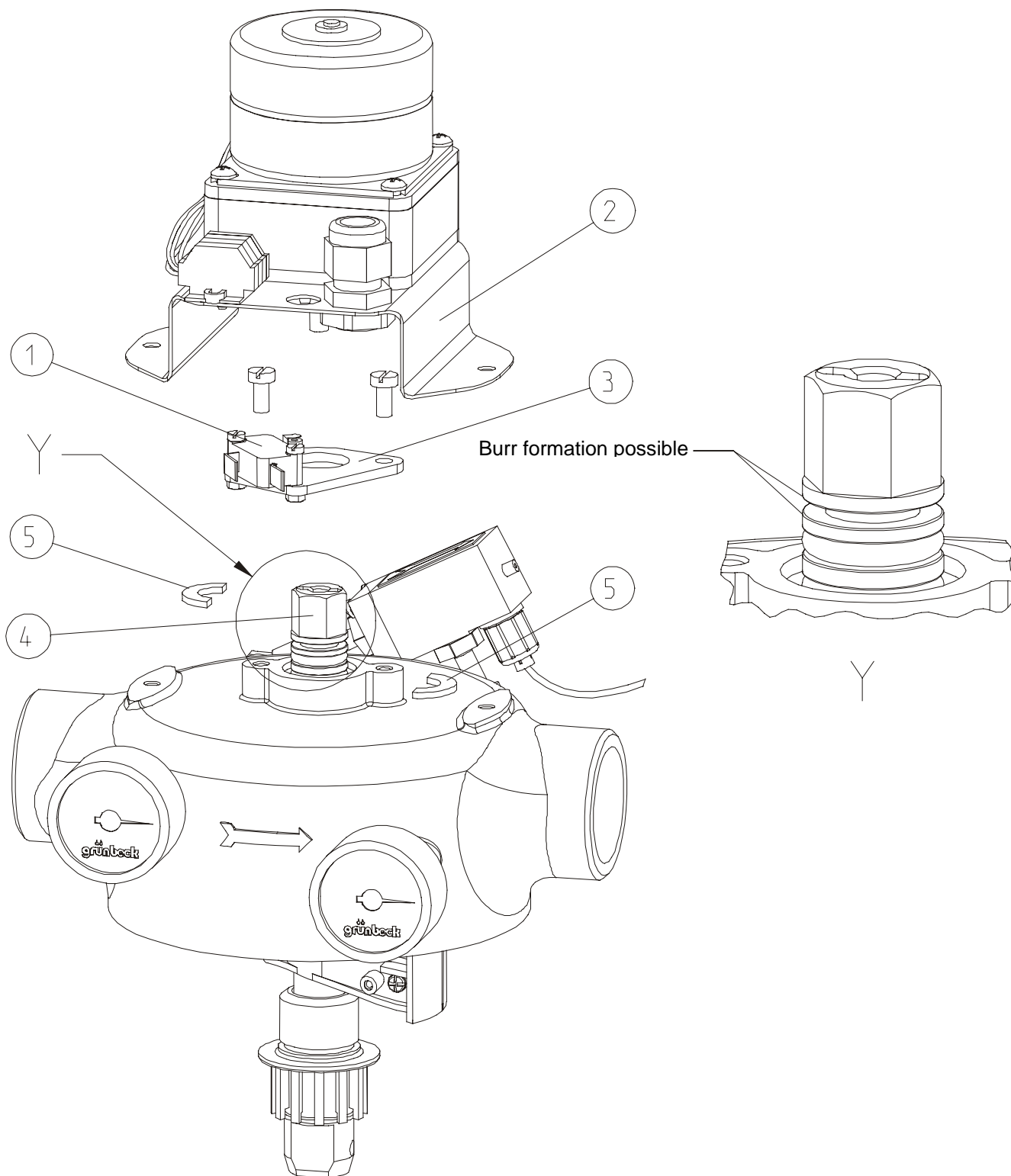


Fig. H-4 Drawing with item numbers for dismounting pipe nozzle

4 Spare Parts



Note: Please also note the General Terms of Warranty (see chapter A-2).

Spare parts and consumption material can be ordered from your regional agency (see attached directory) or by authorised specialist companies.

In operation, various parts are subject to a certain degree of wear or ageing.

Wear parts are:

drain nozzle (item 1), pipe nozzle (item 2), filter element (item 3), O-ring sealing pipe nozzle/casing (item 4)

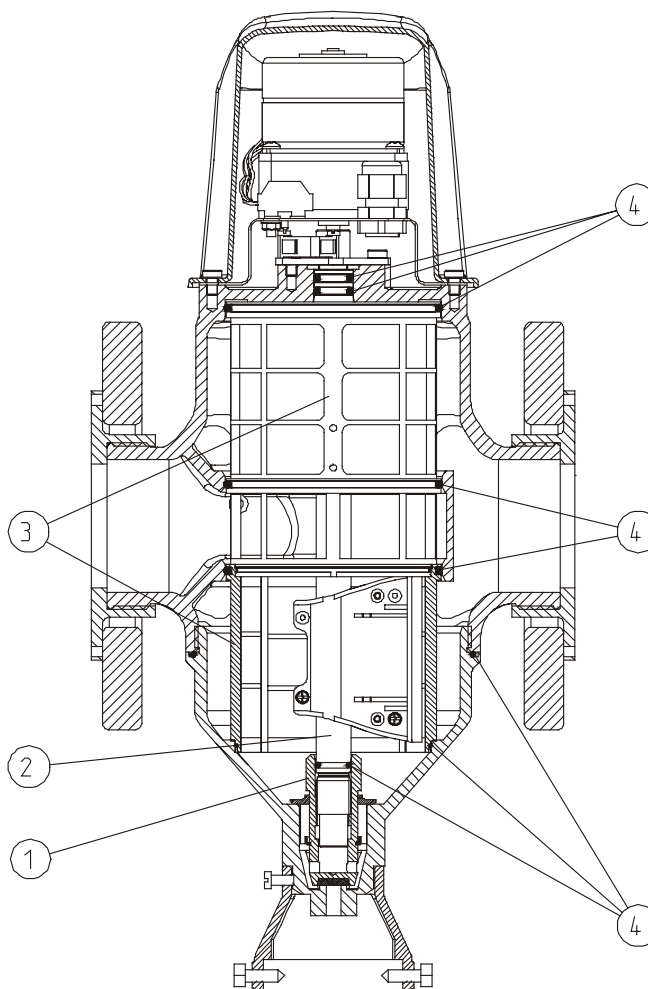


Fig. H-5 Sectional drawing of wear parts with item numbers



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

Replacement filter elements



Notice: Application of the filter elements
50 µm, 200 µm and 500 µm only after consultation.

Suitable for Filter type	Version	Packing Unit	Ordering no.
GENO® backwash filter MX/MXA 1" – 1¼"	filter fineness 50 µm	PU 1 piece	107 052
GENO® backwash filter MX/MXA 1½" – DN 65	filter fineness 50 µm	PU 1 piece	107 053
GENO® backwash filter MX/MXA DN 80 – DN 100	filter fineness 50 µm	PU 1 piece	107 054
GENO® backwash filter MX/MXA 1" – 1¼"	filter element 100 µm	PU 1 piece	107 061
GENO® backwash filter MX/MXA 1½" – DN 65	filter element 100 µm	PU 1 piece	107 062
GENO® backwash filter MX/MXA DN 80 – DN 100	filter element 100 µm	PU 1 piece	107 063
GENO® backwash filter MX/MXA 1" – 1¼"	filter element 200 µm	PU 1 piece	104 072
GENO® backwash filter MX/MXA 1½" – DN 65	filter element 200 µm	PU 1 piece	107 073
GENO® backwash filter MX/MXA DN 80 – DN 100	filter element 200 µm	PU 1 piece	107 074
GENO® backwash filter MX/MXA 1" – 1¼"	filter element 500 µm	PU 1 piece	107 082
GENO® backwash filter MX/MXA 1½" – DN 65	filter element 500 µm	PU 1 piece	107 083
GENO® backwash filter MX/MXA DN 80 – DN 100	filter element 500 µm	PU 1 piece	107 084

(further spare parts upon request)

Accessories

Safety device in case of power failure

for interruption of the backwash process in case of power failure.

Safety device		Ordering no.
backwash filter MXA 1" – DN 100	for new units ex works	upon request
backwash filter MXA 1" – DN 100	as retrofit kit	107 850