GENO®-flushing compressor 1988 K
operation manual

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EN ISO 14001, DIN EN ISO 13485 and SCC
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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.

Manufacturer: Grünbeck Wasseraufbereitung GmbH  
Josef-Grünbeck-Strasse 1  
89420 Höchstädt/Do., Germany

Responsible for documentation: Markus Pöpperl

System designation: GENO®-flushing compressor

System type: 1988 K

System number: Refer to type designation plate

Applicable EC guidelines:
- Machinery Directive (2006/42/EC)
- EC Low-Voltage Directive (2006/95 EC)

Applied harmonised standards in particular:
- DIN EN ISO 12100 - 1
- DIN EN ISO 12100 - 2
- DIN EN 61000-6-2, DIN EN 61000-6-3,
- first regulation concerning the Product and Devices Safety Act (regulation concerning the marketing of electrical equipment for use within specific voltage ranges - 1. GPSGV).

Applied national standards and technical specifications, in particular:
- DIN 31000/VDE 1000 (03.79)

Date / Manufacturer signature: 17.04.13  
Markus Pöpperl  
Dipl. Ing. (FH)

Function of signatory: Head of Design Department for Serial Products
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, please 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 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 Hoechstaedt, are available to help you.

Please consult the representatives responsible for your region for help and advice (see www.gruenbeck.de). In case of emergency, please get in touch with our service hotline at +49 9074 41-333. We can connect you with the appropriate expert more quickly if you provide the required system data. In order to have access to this data at all times, please insert the information from the type designation plate into the overview in chapter C, section 1.
2 | Warranty

All Grünbeck Wasseraufbereitung GmbH devices and systems are produced using state-of-the-art production methods and are subjected to comprehensive quality controls. All warranty claims are subject to our General Terms and Conditions.

Terms and Conditions of Sale and Delivery (excerpt)

11. Warranty

a) If goods and services are supplied which are obviously defective, the Customer must report such defects within 8 (eight) days after receipt of such goods and services in order to maintain the liability claims.

b) If the defect is of such a nature that only a spare part needs to be replaced, Grünbeck shall have the right to request the Purchaser to replace the new part delivered by us if the costs for sending a technician to the Purchaser's site are unreasonably high.

c) The warranty periods are:
- two years: for devices for private use (natural persons)
- one year: for devices for industrial or commercial use (companies)
- two years: for all DVGW-certified devices, also for industrial or commercial use within the framework of the liability agreement with the ZVSHK after delivery/acceptance. This excludes electrical parts and parts which are subject to wear and tear. The warranty period shall only apply if the operation manual is observed meticulously, if the device is mounted, commissioned, operated and maintained properly, and/or if a maintenance contract is concluded within the first six months. If these requirements are not met, the warranty shall be void. The warranty shall be void if the purchaser uses dosing agents or chemicals supplied by other manufacturers and if the quality and composition of such dosing agents or chemicals is beyond Grünbeck’s control. Grünbeck shall not be liable for defects or damage resulting from inept handling or operation.

d) Grünbeck shall only be liable if the Customer performs the maintenance work as stated in the operation manual or has the maintenance work performed in such a way and if the Customer uses spare parts supplied or recommended by Grünbeck.

e) Grünbeck shall not be liable for damage resulting from frost, water or electrical over-voltage or from parts which are subject to wear and tear. This applies in particular to electrical parts.

f) The claims of the Purchaser are limited to repair or replacement, as the case may be, at the discretion of Grünbeck. Grünbeck shall have the right to several attempts to repair. If Grünbeck fails to repair or replace the defective delivery within a reasonable time, the Customer shall have the right to either cancel the contract or demand an appropriate reduction of the purchase price.

g) In case of complaints with regard to systems that are not installed in Germany, the warranty claim will be settled by the local technical service authorised by Grünbeck. If no technical service is designated in the specific country, the assignment of Grünbeck’s technical service shall end at the German border. All additional cost, apart from the material required, shall be borne by the customer.

3 | 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.
4 | General safety information

4.1 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.

**Attention!** 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 the technical customer service/authorised service company or by persons who have been 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).

4.2 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.

4.3 Designated application

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.
4.4 Protection from water damage

Warning! In order to properly protect the installation site from water damage:
1. a sufficiently dimensioned floor drain system must be available or
2. work must be continually supervised.

4.5 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!
Have the system installed and operated by a specialist company. The operation manual must be strictly adhered to! Inspections and maintenance must be performed at the intervals specified!

Particular dangers on the compressor aggregate!

Warning!
1. Do not operate the flushing compressor below 5°C. If the flushing compressor is undercooled – without connection voltage – wait until the temperature has adjusted.

2. The compressor aggregate and lines become very hot when operated and remain hot for some time after being switched off. Contact with hot parts results in burns. It must be ensured that no flammable materials are allowed to come into contact with these parts.

3. The flushing compressor may only be operated in a well-ventilated and dust-free room. The air sucked in by the compressor aggregate must not contain flammable vapours or mist, e.g., paint solvents, which could lead to a fire or explosion.

4. The cooling air flow on the compressor aggregate must not be blocked. The system must thus be set up a distance of at least 50 cm from any obstacles.
5. Use the accessories suitable for the specific application and operating pressure and observe the relevant safety information.

6. Regularly check that the safety devices, electrical lines, safety valve and tubes are in perfect condition.

7. In the case of any damage to electrical or pressurised components, disconnect these from the mains or depressurise them and have them checked/repaired by a specialist.

8. Hold or secure free tube ends as these could cause injuries by whipping around. When releasing the tube coupling, the coupling piece is to be held securely in order to avoid injuries caused by the tube whipping back quickly.

9. Do not "play" with compressed air or aim it at others! Do not use compressed air to clean clothes.

10. Ear protection must be used when working with the flushing compressor.

11. Depressurise the pressure vessel via the drain valve prior to transporting the flushing compressor.

12. Do not make any changes to the safety valve and pressure vessel.

13. The compressor aggregate features a motor circuit breaker which automatically interrupts the current supply in the event of an overload. In this case, pull the plug out of the mains and wait a few minutes before resetting the motor circuit breaker and then put the plug back in. If the motor circuit breaker should be triggered again, disconnect the power supply and contact the Grünbeck technical customer service/authorised service company.

**Danger!** Disinfectants are hazardous substances. When using optional disinfectants, the relevant safety information and safety data sheets are to be observed and the prescribed protective equipment is to be used.

**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.
5 | Shipping and storage

**Attention!** 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.

6 | Disposal of used parts and materials

Used parts and materials are to be disposed of or made available for recycling purposes according to the applicable local guidelines.

If a material is subject to specific regulations, adhere to the instructions indicated on the packing.

If in doubt, contact your local waste disposal authority or the manufacturer for more information.

Since the compressor does not contain lubricants, the condensation can be disposed of as waste water.
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 (raw water). This operation manual takes into consideration the current regulations and stipulates information that you will need for the safe operation of your water treatment 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.

In order to ensure drinking water quality, the issue of hygiene in installations is becoming increasingly important. On the one hand, when commissioning the installation there is the issue of cleaning by means of flushing and then, depending on water hardness, the implementation of measures to prevent lime scale. On the other hand, there are sanitation measures such as sanitation flushing, disinfection, the removal of lime scale and rust as well as the creation of a protective layer by means of mineral dosing. These measures result from the latest requirements of the German drinking water ordinance and standards, in particular DIN EN 806-4.

The DVGW work sheet W 557 describes the "cleaning and disinfection of drinking water installations"

It serves as the basis for avoiding and eliminating microbial contamination and undesired deposits in drinking water installations as defined by the drinking water ordinance. It describes the cleaning of drinking water installations and the system disinfection of drinking water installations or parts thereof and designates which disinfection methods are to be applied and when as well as preventative measures for avoiding microbial contamination.

The continuous disinfection of drinking water (drinking water disinfection) is, in contrast, described in DVGW work sheet W 556 (under preparation).
2 | Differentiation between "system disinfection" and "disinfection of the drinking water"

"System disinfection" is a complete measure for disinfection of a drinking water installation and, during this time, drinking water is not available to consumers. "System disinfection" is only a long term solution if the causes of contamination are remedied.

"Disinfection of the drinking water" is transient long-term disinfection before and/or during the technical sanitation of the drinking water installation. The addition of disinfection by the water supplier must be taken into account.

3 | Basis as per W 557, section 4

Drinking water must not impair the health of consumers. In addition to the long-term protection of drinking water resources and preparation and distribution in accordance with the generally recognised codes of practice this also requires a properly planned, set up and operated drinking water installation.

In particular, the drinking water installation can become contaminated when newly constructed and during repairs. Contamination with pathogens is a key danger. As long as the contamination remains suspended or dissolved in the water, it is possible to flush it out of the drinking water installation without any great difficulties. The first step in remedying pollution is always cleaning. This is also true with microbial contamination. Micro-organisms embedded in particles or corrosion products are virtually impossible to kill off with disinfectants as these are unable to access the micro-organisms. For this reason, the particles or corrosion products must be removed by flushing or other cleaning measures. System disinfection may be necessary as an additional safety measure.

In existing drinking water installations with zinc-coated steel pipelines in the hot water area, the water can become discoloured after even a brief stagnation time due to corrosion. Flushing and other cleaning measures are either not or only briefly effective in such cases. The dosing of inhibitors can result in an improvement.
Regardless of whether there is immediate discolouration of the water or not, corrosion causes deposits to build up. These can be due to precipitation in the hot water area or from the flushing in of solid particles from the supply network (e.g., rust particles). If there are deposits, there is a risk that these will be mobilised when a large amount of water is withdrawn and, consequently, the water is discoloured or becomes clouded. Moreover, deposits facilitate the multiplication of micro-organisms which can, in turn, result in microbial pollution. In order to prevent this, the installation must be cleaned if it contains deposits.

In drinking water installation which are planned, built, commissioned, operated and maintained in accordance with the generally recognised codes of practice, the microbiological sound quality of the drinking water is ensured at the withdrawal point. In particular the following must be ensured:

- Operation as intended (including regular withdrawal of water at all withdrawal points)
- Temperature of the cold drinking water not in excess of 25°C
- Temperature of the hot drinking water in the entire circulation system not below 55°C
- Regular maintenance

If the microbiological parameters of the limit values of the drinking water ordinance are exceeded or if the technical action value of the drinking water ordinance is reached or exceeded or the requirements of the UBA (Federal Environmental Agency) recommendations are not complied with, microbial contamination must be eliminated in the interests of health protection. In such cases, system disinfection may be additionally necessary after cleaning.

**Note:** Cleaning measures and system disinfection are only effective in the long term if the causes of pollution, in particular in connection with microbial contamination, have been remedied.
C  Product description

1 | Type designation plate

Queries and orders can be processed more quickly if you quote the data on the type designation plate (fig. C-1) of your flushing compressor. Please amend the serial number in the overview below in order to always have the data required at hand.

| GENO®-flushing compressor 1988 K |
| Serial number: | Order no.: 151 200 |

Fig. C-1: GENO®-flushing compressor 1988 K type designation plate
2 | Flushing compressor components

Fig. C-2: GENO®-flushing compressor1988 K components

1. Tubular frame
2. Compressor aggregate
3. Compressed air vessel
4. Type designation plate
5. Dosing connection for optional dosing system
6. Control connection for optional dosing system
7. Mains cable
8. Air suction filter
9. Control unit
10. Solenoid valve
11. Non-return valve
12. Pressure display for air pulses
13. Flushing air pressure regulator with filter
14. Compressed air connection quick coupling
15. Pressure regulator condensate drain valve
16. Pressure display for compressed air vessel
17. Compressed air vessel condensate drain valve
18. Safety valve
19. Pressure switch
20. Motor circuit breaker
3 | Function

Fig. C-3: Control of the GENO®-flushing compressor 1988 K

- Pulse display
- Flow display
- Continuous air blast ON/OFF
- Disinfection
- Water/air mix
- Compressed air
**Compressed air**
To use as a compressed air supply, the flushing compressor must be fitted with a standard compressed air connection with quick coupling. With this function, no air or dosing agent is added to the water.

**Water/air mix**
For the flushing of pipes with a water/air mix.
The flushing compressor is flushed through with water from an on-site source. Volume-controlled addition of compressed air in periodic pulses in order to increase the flushing efficiency. The flushing air pressure automatically adjusts to a value which exceeds the existing water pressure. The water flow is indicated in the LED display in m³/h.

If the disinfectant GENO®-Baktox (chlorine dioxide) is to be used, the separate, independent dosing system MOBIdos (without flushing compressor) is used.

**Continuous air blast**
In order to increase the efficiency of cleaning, this function can be connected to the water/air mix, e.g., with sanitation flushing.

**Disinfection**
For system disinfection (disinfection of a drinking water installation) with GENO®-Chlor A or GENO®-perox using the optional dosing system GENODOS® DM-SK (see note below).

The GENO®-flushing compressor 1988 K is flushed through with water from an on-site source. Volume-controlled supply of disinfectant to the dosing connection on the flushing compressor. The dosing pump is controlled by the controller of the flushing compressor and the dosing pulses are indicated on the LED display (for dosing systems and disinfectants, please refer to Accessories).

**Note:** For system disinfection we recommend the independent and mobile dosing system MOBIdos (order no. 160 150) which comes complete with a system divider and is suitable for all three disinfectants listed in the DVGW work sheet W 577; GENO®-perox (hydrogen peroxide) GENO+-Baktox (chlorine dioxide) and GENO®-Chlor A (sodium hypochlorite or chlorine).
4 | Designated application

The GENO®-flushing compressor 1988 K is suitable for the following applications:

**Flushing of pipes**

with a water/air mix

- prior to the commissioning of drinking water installations as per DIN EN 806-4 and DVGW work sheet W 557.
- prior to disinfection of drinking water installations as per DIN EN 806-4 and DVGW work sheet W 557.
- in the case of corroded and silted up pipes lines prior to mineral dosing.
- of silted up floor heating systems.

**System disinfection**

Disinfection of drinking water installations as per DIN EN 806-4 and DVGW work sheet W 557 with GENO®-Chlor A or GENO®-perox, using the optional dosing system GENODOS® DM-SK.

The GENO®-flushing compressor 1988 K may only be operated once all components have been properly installed. Safety devices must NEVER be removed, bridged or otherwise tampered with.

Designated application also involves following the information given in this operation manual and the safety regulations which apply at the site of operation as well as compliance with the maintenance and inspection intervals.
5 | Application limits

Flushing of drinking water installations prior to commissioning with a mixture of water and air as per DIN EN 806-4 and DVGW work sheet W 557 with a recommended minimum flow speed of 0.5 m/s.

- up to DN 50 use of a flushing compressor
- with DN 65 and 80 parallel connection* of two flushing compressors, with DN 80 parallel connection* of up to three flushing compressors is possible.

Sanitation of corroded or silted up pipe lines with a mixture of water and air with a recommended minimum flow speed of 1.5 m/s.

- up to DN 32 use of a flushing compressor
- with DN 40 and 50 parallel connection of two flushing compressors.

*parallel connection is possible with accessories.
6 | Technical specifications

All flushing compressor data is summarised in Table C-1. The data refers to the standard versions of the flushing compressors. Possible deviations in case of special versions are listed separately, if applicable.

<table>
<thead>
<tr>
<th>Table C-1: Technical specifications</th>
<th>GENO®-flushing compressor 1988 K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection data</td>
<td></td>
</tr>
<tr>
<td>Power supply [V]/[Hz]</td>
<td>230/50</td>
</tr>
<tr>
<td>Protection/protection class</td>
<td>IP 20/I</td>
</tr>
<tr>
<td>Flushing connections</td>
<td>1” male thread</td>
</tr>
<tr>
<td>Max. water flow [m³/h]</td>
<td>5</td>
</tr>
<tr>
<td>Working water temperature* (recommended) [bar]</td>
<td>1-5 (4-5)</td>
</tr>
<tr>
<td>Connection for compressed air</td>
<td>quick-acting coupling connector</td>
</tr>
<tr>
<td>Nominal pressure</td>
<td>PN 10</td>
</tr>
<tr>
<td>Performance data</td>
<td></td>
</tr>
<tr>
<td>Compressor aggregate [bar]</td>
<td>8 (oil-free)</td>
</tr>
<tr>
<td>Max. power input [kW]</td>
<td>1.5</td>
</tr>
<tr>
<td>Operating mode</td>
<td>S1 (suitable for continuous operation)</td>
</tr>
<tr>
<td>Air suction capacity [l/min]</td>
<td>200</td>
</tr>
<tr>
<td>Volume of pressure tank [litres]</td>
<td>10</td>
</tr>
<tr>
<td>Dimensions and weights&quot;</td>
<td></td>
</tr>
<tr>
<td>A Width of flushing compressor [mm]</td>
<td>390</td>
</tr>
<tr>
<td>B Height of flushing compressor [mm]</td>
<td>625</td>
</tr>
<tr>
<td>C Depth of flushing compressor [mm]</td>
<td>330</td>
</tr>
<tr>
<td>Operating weight without accessories [kg]</td>
<td>21.8</td>
</tr>
<tr>
<td>Shipping weight, completely packed [kg]</td>
<td>25.2</td>
</tr>
<tr>
<td>General</td>
<td></td>
</tr>
<tr>
<td>Water temperature [°C]</td>
<td>5 - 30</td>
</tr>
<tr>
<td>Ambient temperature [°C]</td>
<td>5 - 35</td>
</tr>
<tr>
<td>Order no.</td>
<td>151 200</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* On-site water inlet

Fig. C-4: Dimensioned drawing of the GENO®-flushing compressor 1988 K
7 | Scope of supply

7.1 Basic configuration

GENO®-flushing compressor 1988 K, complete, packed in a box with operation manual and 2 flexible connection tubes DN 25 (1" excess), each 1.5 m in length with spare O-rings.

7.2 Accessories

Note: The GENO®-flushing compressor 1988 K can be retrofitted with accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstaedt for details.

Adjusting pieces

for installation downstream of the entrance filter, e.g., for integration of the flushing compressor, dosing system, softening or as an intermediate piece for rinsing longer pipelines (screen connections and seals are included in the scope of supply).

<table>
<thead>
<tr>
<th>Adjusting Piece</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>128 001</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>128 401</td>
</tr>
<tr>
<td>1 1/2&quot;</td>
<td>128 402</td>
</tr>
<tr>
<td>2&quot;</td>
<td>128 403</td>
</tr>
</tbody>
</table>

Tube extension set for the flushing compressor and MOBIdos dosing system

Consisting of:

- 2 flexible connection tubes, each 1.5 m long
- 2 coupling pieces
- 4 spare O-rings

Packed in a box 151 820
Connection fitting cases $\frac{3}{4}''$, 1'', 1$\frac{1}{4}''$, 1$\frac{1}{2}''$, 2''
For integration of the flushing compressor in the pipelines, e.g., in place of an existing filter, adjusting piece, softening system, dosing system. Consisting of:

- Connection fittings to be fitted, for example, in place of an adjusting piece, for $\frac{3}{4}''$, 1'', 1$\frac{1}{4}''$, 1$\frac{1}{2}''$, 2'' (variable installation length, as of approx. 175 mm), 2 adapters with seals for each nominal width.
- Connection fittings for installation at the location of a filter with an installation length of 100 mm, one flushing adapter $\frac{3}{4}''$, 1'', 1$\frac{1}{4}''$ each (fixed installation length, 100 mm).
- Boxer K fine filter with connection set for assembly of the fine filter on the flushing compressor inlet.
- Connection set for system divider for assembly of an optional system divider DN25/32 on the flushing compressor inlet.
- 2 connection brackets with spare O-rings.
- Mounting instructions.

Complete in 130 mm Sortimo case, suitable for Sortimo vehicle equipment.

Connection fitting cases 1$\frac{1}{2}''$, 2'', DN 65, DN 80
For parallel connection of two or, with DN 80, up to three flushing compressors in piping, e.g., in place of an existing filter, adjusting piece, softener, dosing system. Consisting of:

- Connection fittings for 1$\frac{1}{2}''$, 2'', DN 65, DN 80 (variable installation length, as of approx. 190 mm) 2 adapters or reducing flange with seals for each nominal width.
- 2 blind caps.
- 6 connection brackets with spare O-rings.
- Mounting instructions.

Complete in 130 mm Sortimo case, suitable for Sortimo vehicle equipment.
GENODOS® DM-SK dosing system
As an accessory for the flushing compressor, for disinfection of piping with GENO®-Chlor A or GENO®-perox comprising:

- Dosing pump GP 10/40, self-deaerating, for degassing media, controlled via contact water meter of flushing compressor, power supply 230 V, 50 - 60 Hz.
- Dosing line with dosing valve for connection at the flushing compressor.
- Suction lance with empty signal and pre-alarm, suitable for 10 kg or 20 kg transport canisters.
- Chlorine water inspection device, 10 - 160 mg/.

Complete and packed in cardboard box. 160 442

Note: For system disinfection we recommend the independent and mobile dosing system MOBIdos (order no. 160 150) which comes complete with a system divider and is suitable for all three disinfectants listed in the DVGW work sheet W 577; GENO®-perox (hydrogen peroxide) GENO®-Baktox (chlorine dioxide) and GENO®-Chlor A (sodium hypochlorite or chlorine).

Euro system divider GENO®-DK 2, 1” 132 530

Dosing solutions
GENO®-Chlor A (25 kg) 210 012
GENO®-perox (1 litre) 170 320
GENO®-perox (10 kg) 170 325

Water inspection devices
Water inspection system 170 138
Chlorine 10 - 160 mg/l (20 analyses)
Water inspection system 170 128
Chlorine 0.1 - 2.0 mg/l and pH value 6.9 - 8.2 (150 analyses)
Water inspection system 170 167
Peroxide 100 - 1,000 mg/l (100 analyses)
Water inspection system 170 136
Peroxide 0.5 - 25 mg/l (100 analyses)
Closing plug case, 60 x ½" closing plugs
Closing plugs to be fitted at withdrawal points, also suitable for leakage tests and to deaerate the drinking water installation. The closing plug can be equipped with an optional flushing fitting (see case with flushing fittings) to perform the flushing.

The closing plugs are made up of two parts, a base body and screw cap, both of which are made of brass with a dirt-repellent plastic coating. The small diameter of just 35 mm without ribbing allows tiles to be laid without the need for disassembly and requires only small holes to be made in the tiles.

Consisting of:
- 60 closing plugs
- 20 spare O-rings
- 1 desiccant bag
- Mounting instructions.

Complete in 130 mm Sortimo case, suitable for 151 160 Sortimo vehicle equipment.

Closing plug set, 20 x ½" closing plugs in a box
incl. 20 spare O-rings 151 170
Case with flushing fittings, 20 flushing fittings with accessories
In order to use these flushing fittings, the above mentioned closing plugs are needed. See case with closing plugs or set of closing plugs.

The flushing fitting is connected to the closing plug for flushing and serves to drain off the flushing water when flushing through piping. It can also be used to draw off construction water, to fill baths and showers and bridge piping (for this use a pressure-resistant tube.
The flushing fittings are made up of 2 parts, a shut-off ball fitting and screw-off tube connection, both of which are made of chrome-plated brass. Thanks to the ball-type shut-off valve, a large and free cross section for the flushing is available. The screw-off tube connection allows the tube to stay fitted to the nozzle.

As the closing plug and the flushing fitting are two separate entities, only the closing plug remains behind at the construction site for the time between installation and start-up. Thus, the flushing fitting can be used at several construction sites - just like a tool. Furthermore, the introduction of impurities due to unauthorised access is prevented.
Consisting of:
- 20 flushing fittings.
- 20 hose clamps.
- 1 roll of tubing, 15 m
- Mounting instructions.

Complete in 130 mm Sortimo case, suitable for Sortimo vehicle equipment.

Hose for flushing fittings
50 m roll
Flushing water calming tank
When flushing through drinking water installations, the flushing water calming tank serves to ensure steady draining of the flushing water into a floor drain or toilet. As per DVGW work sheet W 557 when flushing with a mixture of air and water, the withdrawal points must be fitted with the relevant equipment in order to separate the air from the flushing water.

Up to 6 flushing tubes with max. 5 m³/h can be safely attached to the flushing water calming tank. Thanks to the integrated free outlet, safe separation of the drinking water installation and the drain is ensured and back suction is prevented. Individuals at the withdrawal points are protected against aerosols and the water flows steadily into the drain. The discharge of pollution and clouding in the flushing water is visible. A substructure box is included in the scope of supply for draining off water, e.g., into a toilet. This box is also used to transport various connection parts.

- Flow
  Qmax 5 m³/h
- Inlet connection
  6 x tube nozzles 13 mm
  (cap nut 3/4“)
- Outlet connection HT pipe DN 100
- Dimensions (without connections)
  (B x T) 400 x 300 mm
- Height (without/with substructure box)
  340/660 mm.
- Height outlet connection
  (without/with substructure box) 175/498 mm

151 020
7.3 Consumables

To ensure reliable operation of the flushing compressor, only use original consumables.

- Air suction filter for the compressor aggregate. 151 665e
- Filter insert for the flushing air pressure regulator. 899 50 943

7.4 Spare parts

Spare parts and consumables are available from the representatives responsible for your region.

7.5 Wearing parts

Seals and moving parts are subject to a certain degree of wear and tear.

Note: Although these are wearing parts, we grant a limited warranty period of 6 months. The same applies for electrical components.
D Installation for flushing and disinfection of drinking water installations

1 | General installation instructions

Note: The general and safety instructions in chapter A as well as the designated application, application limits and technical specifications in chapter C must be observed.

Note: For the installation of the flushing compressor with accessories (see chapter C), the relevant operation manuals must also be followed.

Note: Prior to using the flushing compressor, it may be necessary to perform the work described under maintenance and care in chapter H.

1.1 Electrical installation

A Schuko socket is required for electrical installation. This must comply with the specifications in chapter C, "Technical specifications" or the type designation plate. The flushing compressor must be set up close to this Schuko socket. The flushing compressor mains cable is approx. 1.8 m in length.
1.2 Sanitary Installation

When installing the GENO®-flushing compressor 1988 K certain rules must always be followed. Additional recommendations facilitate work with the GENO®-flushing compressor 1988 K.

**Binding rules**

The installation of a flushing compressor represents a major intervention in the drinking water installation and thus must only be performed by an approved installation company.

Observe the local installation guidelines and the general regulations.

**Warning!** Risk of infection due to germ-infested water. In stagnant water germs can multiply beyond safe limits. Ensure good hygiene when working on and with the flushing compressor. Always drain off any remaining water / disinfect parts which have come into contact with water.

**Note:** Prerequisites for flushing, disinfection and commissioning of a drinking water installation:

- a house connection for the water supply which has been flushed through by a water company and approved for use,
- availability of water as per the German water drinking ordinance (TrinkwV),
- that pressure and leakage tests have been performed on the drinking water installation as per DIN EN 806-4 6.1 and that the results were documented
- that a filter as per DIN EN 13443-1 is fitted on the house connection.
Suitable connections must be ensured on-site for integration of the flushing compressor into the installation. That's why, during planning and installation, an adjusting piece should be fitted immediately downstream of the filter (see chapter C, accessories) in order, when commissioning, to have the option of temporarily connecting the relevant devices, such as a pressure booster, flushing compressor or disinfection device. In subsequent operation, water treatment systems, e.g., water softeners, can be integrated at this point if the quality of the water should render this necessary.

Fig. D-1: House connection with fine filter and adjusting piece
2 | Installation of the flushing compressor in pipelines

The flushing compressor is integrated into the installation using the flexible connection tubes included in the scope of supply.

Note: The information on flow direction must be followed when installing the flushing compressor in the piping.

Note: For the installation examples shown below, the optional connection fitting cases are required (see accessories).

Fig. D-2: House connection with fine filter and flushing compressor
2.1 Integration of a flushing compressor in place of a filter with an installation length of 100 mm

**Warning!** When using the filter from the connection fitting case, a new filter cartridge must be used for each flushing operation.

For this connection type, the parts for the nominal widths ¾", 1" and 1¼" are included in the connection fitting cases ¾" - 2". In each case the installation length is 100 mm.

- Replace the on-site filter with a flushing adapter.

- Fit the BOXER® K fine filter with double screw connection G1" on the flushing compressor. Fit the adapter IG 1"-24 mm on the filter on the inlet side. Then connect with the connection tubes.

![Diagram of installation example](image)

Fig. D-3: Installation example of integration of a flushing compressor in place of a fine filter
2.2 Integration of a flushing compressor in piping in place of, for example, an adjusting piece

For this connection type, the parts for the nominal widths 1", 1 ¼", 1 ½" and 2" are included in the connection fitting cases ¾" - 2".

The installation length of these fittings is variable and in conjunction with the connection bracket they can be used as of an installation length of approx. 175 mm.
As of an installation length of approx. 300 mm, connection is possible without a bracket.

**With shorter distances, installation with a connection bracket**
(e.g., in place of a 1" and 1¼" adjusting piece with 190 mm).

- Replace the on-site adjusting piece with adapters and brackets and integrate the flushing compressor with connection tubes.

Fig. D-4: Installation example of a flushing compressor with connection bracket
With longer distances, installation without a connection bracket (e.g., in place of a 1 ½" and 2" adjusting piece with 330 mm).

Fig. D-5: Installation example of a flushing compressor without connection bracket
2.3 Integration of several parallel-connected flushing compressors in piping in place of, for example, an adjusting piece

For this connection type, the parts for the nominal widths 1½", 2", DN 65 and DN 80 are included in the connection fitting cases 1½" - DN 80.

With 1½", 2" and DN 65 for parallel connection of 2 flushing compressors
With DN 80 for parallel connection of 2 or 3 flushing compressors

The installation length of these fittings is variable.

- As of an installation length of approx. 300 mm, the connection pipes can be fitted directly on the adapters as shown below.
- If the connection bracket is also used, a connection can be made as of an installation length of approx. 190 mm.

If with DN 80 only two flushing compressors are used, the two other connections on the reducing flanges are sealed with caps.

- Replace the on-site adjusting piece or device with an adapter and integrate the flushing compressor with connection tubes.

![Fig. D-6: Installation example of parallel integration of two flushing compressors](image-url)
2.4 Additional assembly of an optional system divider on the flushing compressor for disinfection of pipelines

**System divider on the flushing compressor inlet**
The components necessary for this connection version are included in the connection fitting cases ¾" - 2".

- Install the system divider with insert 1 ¼" - IG 1" and cap nut G 2" on the flushing compressor.

- On the inlet side of the system divider install the insert 1 ¼" - 24 mm with cap nut G 2".

![Fig. D-7: Example of assembly of the system divider on the flushing compressor inlet](image)

**Filter and system divider on the flushing compressor inlet**

- Install the system divider with insert 1 ¼" - IG 1" and cap nut G 2" on the flushing compressor.

- On the inlet side on the system divider, install the BOXER K fine filter with insert 1 ¼" - IG 1" and cap nut G 2".

- On the inlet side on the BOXER K fine filter, install the adapter IG 1" - 24 mm.

![Fig. D-8: Example of assembly of the filter and system divider on the flushing compressor inlet](image)
3 | Installation of accessories for draining the flushing water

**Note:** For the installation examples shown below, the optional closing plug and flushing fitting cases as well as the flushing water calming tank are required (see chapter C, accessories)

**Warning!** The flushing tube to the drain must be secured during flushing as the water flows out in a pressurised and pulsating manner. For hygiene reasons the ends of tubes must not be pushed into drain pipes and drains or connected to these. To prevent back suction, proper separation of the drinking water installation from the drain must be ensured via a free outlet. As per DVGW work sheet W 557 when flushing with a mixture of air and water, the withdrawal points must be fitted with the relevant equipment in order to separate the air from the flushing water. This serves to protect individuals at the withdrawal points against aerosols.

These requirements are satisfied through use of the flushing water calming tank (see fig. 10 and 11), order no. 151 020.

If Grünbeck closing caps have already been fitted on the withdrawal points, e.g., for checking the pressure of new installations, the cap can be screwed off and the flushing fitting can be directly connected.

If standard closing plugs, or in the case of existing installations other fittings (e.g., angle valves, …), are attached, these are to be replaced with the Grünbeck closing plugs. The flushing fitting is fitted to the Grünbeck closing plug and the flushing tube is guided to the drain.

Fig. D-9: Closing plug and flushing fitting assembly
Fig. D-10: Example of installation of the flushing water calming tank with floor drain

Fig. D-11: Example of installation with toilet bowl

Fig. D-12: Withdrawal point on bath fitting with closing plug and flushing fitting as well as flushing insert from the manufacturer in the flush-mounted device for separate flushing of hot and cold water lines.
4 | Preparation of the drinking water installation for rinsing

Proper planning of the flushing process pays off during implementation. We therefore recommend assessing the installation and checking the installation plans to ensure they are up-to-date before flushing. Particularly with sanitation flushing, any new angle valves and spare parts for the fittings which may be required can be kept in reserve and the customer can be informed of their necessity in advance.

1. Sensitive fittings (e.g., WC flushing fittings, thermostatic mixers) are to be disassembled or avoided in order to prevent flushing in contamination.

2. Surface-mounted fittings should be disassembled prior to flushing.

3. In the case of flush-mounted fittings, suitable flushing fittings and special flushing connections from the manufacturer can be used for flushing. With fittings which cannot be disassembled or avoided, the fine filters are to be either removed or the instructions provided by the fitting manufacturer are to be followed.
4. Drinking water heaters and water treatment devices (e.g., softening and dosing systems) must be removed or avoided.

5. Flushing of circulation lines.
Prepare installation (e.g., see Fig. 15) and flush the hot water line in the same way as described in point 8.
Then:
- Close the withdrawal points (1).
- Open the shut-off valve on the outlet tube (2) and flush the circulation line.
- If in larger installations, shut-off valves (3) are installed on each level in the circulation line, these are to be flushed in succession, starting at the highest point.

Fig. D-15: Example of installation of the circulation line

1. Withdrawal points
2. Outlet tube with shut-off valve
3. Shut-off valves
4. Drinking water manifold
5. Drinking water filter, e.g., BOXER® KD
6. In the case of low water pressure, it may be necessary to integrate a pressure booster when flushing in order to achieve the necessary minimum flow speed. A sufficient flow speed and the correct inlet pressure are important for the success of flushing. We recommend a water inlet pressure of approx. 4-5 bar. Pressure-reducing fittings (e.g., pressure regulators) which reduce the inlet pressure to below the recommended pressure should thus be removed. Under ideal conditions, the compressed air bubble which is fed in is kept short, water turbulence is ensured and the dirt is discharged. If the inlet pressure is not sufficient or the flow rate is low, the air bubble expands too quickly and, consequently, the water and air are unmixed which reduces the effectiveness of cleaning.

7. Determine the flushing sections. Depending on the size of the installation and how the piping is arranged, the installation may have to be flushed in sections. The maximum flushing section length must not exceed 100 m. We recommend providing for separation points when planning and installing and also fitting adjusting pieces (see accessories).

8. Determine the flushing order. Flushing must be performed starting with the nearest withdrawal point and finishing with the point which is furthest away. Accordingly, the ascending pipes are to be flushed in the following order, A, B and then C. The floor lines are flushed starting with I, then II and then III as well as in the floor lines from 1 to 3 to ensure that contamination is flushed out of the installation via the shortest route, see Fig. D-16.

Fig. D-16: Flushing order of the installed sections
9. Determine the minimum flow speeds of the flushing sections. DIN EN 806-4 6.2.3 recommends a minimum flow speed of 0.5 m/s in each piping section when flushing drinking water installations prior to commissioning. With sanitation flushing of corroded piping, we recommend a minimum flow speed of 1.5 m/s.

Table based on EN 806-4 6.2.3 Table 7. Recommended minimum flow rate and minimum number of withdrawal points which are to be opened for flushing depending on the largest nominal diameter of the piping in the flushed section for the minimum flow speeds of 0.5 m/s / 1.5 m/s.

<table>
<thead>
<tr>
<th>Largest nominal diameter of the piping in the flushed section [DN] [Inches]</th>
<th>25 1&quot;</th>
<th>32 1 ¼&quot;</th>
<th>40 1 ½&quot;</th>
<th>50 2&quot;</th>
<th>65 2 ½&quot;</th>
<th>80 3&quot;</th>
<th>100 4&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>The following thus applies for flushing with a minimum flow rate of 0.5 m/s</td>
<td>Recommended minimum volumetric flow rate [m³/h]</td>
<td>0.9</td>
<td>1.4</td>
<td>2.3</td>
<td>3.5</td>
<td>6.0</td>
<td>9.0</td>
</tr>
<tr>
<td></td>
<td>Parallel connection of flushing compressors [Number]</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Minimum number of withdrawal points with DN 15 or equivalent cross sectional area which are to be fully opened [Number]</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>The following thus applies for sanitation flushing with a minimum flow rate of 1.5 m/s</td>
<td>Recommended minimum volumetric flow rate [m³/h]</td>
<td>2.7</td>
<td>4.3</td>
<td>6.8</td>
<td>10.6</td>
<td>17.9</td>
<td>27.1</td>
</tr>
<tr>
<td></td>
<td>Parallel connection of flushing compressors [Number]</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Minimum number of withdrawal points with DN 15 or equivalent cross sectional area which are to be fully opened [Number]</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>12</td>
<td>20</td>
<td>30</td>
</tr>
</tbody>
</table>

Note: The current flow in m³/h can be read off the GENO®-flushing compressor 1988 K display.
5 | Preparation of the drinking water installation for disinfection as per DVGW work sheet W 557

**Danger!** During disinfection of the system, drinking water is not available to consumers from the drinking water installation. It must be ensured that no water intended for drinking can be withdrawn from the treated system by taking suitable measures. If necessary, drinking water must be made available from a different source.

**Danger!** There must be a sufficient number of personnel available to perform system disinfection. The personnel must be instructed beforehand; if necessary suitable safety equipment is to be made available. Risks due to chemicals are to be avoided by taking suitable measures.

**Note:**
- Before initiating a disinfection measure, the cause and location of the contamination must be established as far as possible. System disinfection is only a long term solution if the causes of contamination are remedied. Otherwise the success hereof is only short term.
- As per DVGW work sheet W 557 the system must always be cleaned prior to system disinfection. This essentially involves flushing the piping with a mixture of water/air and cleaning (e.g., descaling ...) the apparatus and parts.
- In order to disinfect all withdrawal points, these must be identified, documented and made accessible for disinfecting beforehand. An up-to-date as-completed drawing (revision plan) should be available.
- System disinfection places a strain on the component materials used in the drinking water installation which can result in the installation being damaged (see W 557 7.5). Regular system disinfection in order to prevent contamination is thus not recommended. Contaminated components, e.g., apparatus and fittings, which cannot be disinfected by taking the designated measure must be removed and either disinfected separately or replaced. In order to minimise partial material corrosion, it is recommended that disinfection be performed in stages.
- Dead lines must be removed from the drinking water installation prior to disinfection.
- By way of principle, it is said that micro-organisms can only be effectively killed or inactivated when the disinfectant can act directly on the later. As such, sufficient concentrations of the disinfectant must be able to access all areas of the drinking water installation.
- Dosing of the disinfectant is done in a volume-controlled manner upstream of the system section to be disinfected.

The GENO®-flushing compressor 1988 K is installed in the same way as in the installation examples in fig. D-3, D-4, D-5. In addition, a system divider is installed in the water inlet line to the flushing compressor, as shown in fig. D-7, D-8, D-17 Please note the relevant instructions for assembly of the dosing system.

Fig. D-17: GENO®-flushing compressor 1988 K with optional dosing system GENODOS® DM-SK

1. Drinking water filter, e.g., BOXER® KD (on-site)
2. Connection pieces (accessories in case with connection fittings ¾”-2”)
3. Dosing solutions (accessory)
4. GENODOS® DM-SK dosing system (accessory)
5. GENO®-DK 2, 1 system divider (accessory)
E  Flushing and disinfection of drinking water installations

Note: The DVGW work sheet W 557 Cleaning and Disinfection of Drinking Water Installations and ZVSHK (German Central Association Plumbing, Heating, Air Conditioning) instruction sheet “Flushing, disinfection and commissioning of drinking water installations” include all the key requirements for practical application.

1 | General

If a drinking water installation is not operated immediately after filling and flushing or disinfection, in accordance with DIN EN 806-4 6.2.1, the water must be replaced at regular intervals and at the latest after 7 days.

The prerequisites for flushing are installation and preparation as per chapter D, compliance with the instructions of the manufacturers of the parts used in the installation as well as observance of the local conditions and regulations.

2 | Flushing of pipes with a water/air mix

1. Close all withdrawal points.

2. Completely open all shut-off fittings (e.g., maintenance fittings) in the piping section to be flushed.

3. Insert the flushing compressor power plug and press the program button "water/air mix" on the flushing compressor control unit (the compressor aggregate fills the compressed air vessel).

4. Slowly open the on-site water inlet shut-off fitting. The flushing air pressure automatically adjusts to the water pressure (the compressed air is fed into the water stream in a volume-controlled and pulsatile manner as soon as there is a flow as a result of opening the withdrawal points).

5. Deaerate the entire drinking water installation via, for example, the withdrawal points and check that the components installed (e.g., bypasses ...) are leakproof.

6. Open the withdrawal points of the flushing section in accordance with the flushing order, fig. D-16 pos.
7. The volumetric flow is shown on the control unit of the flushing compressor. If the recommended minimum volumetric flow as per the table in chapter D 4 point 9 is not reached, this can be optimised by taking suitable measures, e.g., integration of a pressure booster (also see chapter D 4).

8. The duration of flushing is based on the length of the flushing section and should amount to a minimum of 15 seconds for each metre. The duration of flushing of each withdrawal point should be at least 2 minutes. Flushing can be concluded once particles are no longer flushed out of the withdrawal points and clear water emerges.

9. Once the necessary flushing parameters have been achieved, the withdrawal points are closed again in reverse order.

10. Close the water inlet again and depressurise the installation.

11. Flushing is documented in the flushing log. By way of additional documentation, in particular with sanitation flushing, photos of the dirt which has been flushed out are also recommended in order to demonstrate the success and necessity of flushing to the customer.

12. Disassemble the flushing compressor and flushing fittings and reinstall the installation.

13. If proof of the perfect condition of the water is required, arrange a water inspection.

14. Commission the installation and hand over to the operator.
3 | Performing system installation as per DIN EN 806-4 and DVGW work sheet W 557

**Danger!** Dosing of the disinfectant may only be performed in cold water, for this reason the warm water heater must be switched off and prevented from being accidentally turned on again.

**Danger!** The water does not comply with the German drinking water ordinance during the entire disinfection process. The authorised withdrawal of water must be prevented by taking suitable measures. Shut off/block the installation affected by disinfection from the other parts of the installation.

**Danger!** The safety data sheets, application instructions and information on disposal of the disinfectant used are to be observed and the designated personal protective equipment is to be worn.

**Warning!** The dosing system DM-SK as well as the accessories used must be in a hygienically perfect condition and, particularly when not used for extended periods, must be disinfected beforehand.

**Note:** The work sheet DVGW W 557 Cleaning and disinfection of drinking water installations summarises the key requirements for practical use.

**Note:** Disinfection should be performed in stages in order to minimise partial material corrosion.

A water/disinfectant mixture is used to disinfect pipelines.

The disinfectant GENO®-Chlor-A (chlorine) or GENO®-perox (hydrogen peroxide) is added with the dosing system GENODOS® DM-SK. The dosing pump is controlled by the flushing compressor electronics.

Make the settings on the GENODOS® dosing pump according to the designated disinfectant stipulated in Table 1.
### Table 1:

<table>
<thead>
<tr>
<th>Disinfectants</th>
<th>Water meter</th>
<th>GENODOS® dosing system</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Application concentration as per DVGW work sheet W 557</td>
<td>Size of the GENODOS® pump</td>
</tr>
<tr>
<td>GENO®-Chlor A</td>
<td>50 mg/l Flushing compressor</td>
<td>DM-SK 10/40</td>
</tr>
<tr>
<td>GENO®-perox</td>
<td>50 mg/l Flushing compressor</td>
<td>DM-SK 10/40</td>
</tr>
</tbody>
</table>

*with a water pressure of 5 bar, max. permissible flow 5 m³/h

Further information on performing disinfection is given in the operation manual of the dosing system GENODOS® DM-SK and in the DVGW work sheet W 557.
Rinsing of silted up floor heating systems

1 | General

⚠️ **Attention!** The prerequisite for flushing a heating system is a sufficiently large free flow cross section. If the free flow cross section is too small, the deposits which are loosened can block the cross section.

⚠️ **Attention!** Please note the maximum permissible operating pressure of the heating system to be flushed as well as the additional load which occurs due to the pulsatile flushing with the water/air mix, in particular with the continuous blast air function.

⚠️ **Warning!** To secure the drinking water supply, a system divider must be installed upstream of the flushing compressor.

2 | Preparation for rinsing

When flushing floor heating systems, filtered drinking water is fed in from the withdrawal point via a system divider into the inlet flow of the heating system and then drained off to the drainage system. A flushing water calming tank is installed to ensure the steady and safe draining off of flushing water. When flushing with a water/air mix, the flushing compressor is additionally integrated between the system divider and the floor heating system inlet flow.

Grünbeck recommends firstly completely emptying the floor heating system and flushing it through with water in order to rinse out most of the loose silt deposits. To improve the effectiveness of rinsing, the heating water should be conditioned with GENO®-safe A whilst the circulator pumps are still running. This enables improved infiltration, detachment and dispersing of rust and silt deposits. After an exposure time of approx. 6-8 weeks, flushing is performed again with water and then with a mixture of water and air in order to discharge the contamination in stages and prevent blockages.

If sensitive fittings are installed in the heating manifold, these must be completely opened or removed as per the manufacturer’s instructions. If, according to the manufacturer’s instructions, this is not possible or permissible, the heating system must be directly connected and flushed through. The description below assumes that flushing is possible via the heating manifold when the heating system shut-off fitting is completely open. The heating system to be flushed must be separated or blocked off from other parts of the heating installation. Do not perform flushing via the heating boiler.
• Fit an outlet tube to the return connection of the heating system to be flushed, guide this to the drain and fix in place or use a flushing water calming tank (see accessories).

• Install the system divider on the water inlet of the flushing compressor as per Fig. D-7 or D-8 and connect to a drinking water withdrawal point using a connection tube.

• Check the inlet water pressure and, if necessary, set to a value permissible for the heating system using an on-site pressure regulator.

• A shut-off fitting should be fitted to the inlet flow connection. Close this fitting to prevent heating water flowing back in the connection tube of the flushing compressor.

• Connect the water outlet of the flushing compressor with a connection tube on the shut-off fitting (inlet flow connection).

3 | Rinsing of floor heating systems with water and a mixture of water and air

**Attention!** The flushing tube to the drain must be secured during flushing as the water flows out in a pressurised and pulsating manner.

• Slowly open the on-site drinking water withdrawal point on the flushing compressor’s water inlet.

• To flush with water, slowly open the shut-off fitting on the inlet flow connection and monitor the flushing process.

• To flush with a mixture of water and gas, insert the power plug of the flushing compressor and press the program button "Flush with water + air" on the flushing compressor control unit.

• The flushing effect can be enhanced by also activating the "Continuous blast air" function.

• Monitor the progress of flushing on the outlet tube and on the flow display on the flushing compressor control unit. The duration of flushing depends on the degree of soiling.

• Flushing of the heating system is normally concluded when particles are no longer flushed out of the outlet tube and clear water emerges.

• Close the drinking water withdrawal point and then close the shut-off fitting on the inlet flow connection.
- Flush out all the heating systems to be cleaned one after the other as described above.
- On conclusion of flushing, disconnect the flushing compressor from the mains, disassemble the water connections, remove any remaining water and drain off the condensate on the flushing compressor (also see chapter 11, point 2, care work).
- Refit and check the heating system in a technically correct manner.
- Fill the heater as per VDI 2035 (see GENO-therm® program) and commission.

⚠️ **Attention!** If any parts come into contact with heating water (e.g. connection tubes from the flushing compressor to the inlet flow connection), these must be cleaned or labelled so that they are no longer used for flushing drinking water installations.
G  Troubleshooting

1 | Introduction

Operational errors cannot be completely ruled out even when the flushing compressors have been designed and produced with care and operated as intended. Table G-1 provides an overview of the possible errors when operating the flushing compressor, their causes and remediating.

**Note:** The general and safety instructions in chapter A as well as the designated application, application limits and technical specifications in chapter C must be observed.

**Danger!** Before performing any maintenance or care work on the flushing compressor, this must be disconnected from the mains, depressurised and effectively shut off and protected from pressure sources. Pull out the power plug and empty the drain valve.

**Note:** The compressor aggregate features a self-venting start unloader valve. With proper operation, a longer blast of air can be heard each time the system is started and a short blast of air is heard when the system is switched off.

**Note:** Grünbeck’s technical customer service/authorised service company must definitely be notified in case of errors that cannot be eliminated with the information given in table G-1! When reporting errors please also state the designation, order no. and serial no. of the flushing compressor.
## 2 | Error messages

<table>
<thead>
<tr>
<th>This is what you observe</th>
<th>This is the cause</th>
<th>This is what to do</th>
</tr>
</thead>
<tbody>
<tr>
<td>The compressor aggregate does not start. The motor makes a buzzing sound. Pull out the power plug immediately!</td>
<td>Motor voltage is too low due to small cable cross-section with a long cable length (e.g., extension cable).</td>
<td>For cables measuring 50 m in length, the cable cross-section should be at least 2.5 mm² with a 20 A fuse.</td>
</tr>
<tr>
<td>Ambient temperature is too low.</td>
<td>Do not operate the flushing compressor below 5°C. If the flushing compressor is undercooled – without connection voltage – wait until the temperature has adjusted.</td>
<td></td>
</tr>
<tr>
<td>No unloaded start.</td>
<td>No air is supplied despite the water flow. The air generator does not switch on.</td>
<td>Unload by releasing the air pressure via the pressure vessel's drain valve.</td>
</tr>
<tr>
<td>Filter element in the pressure regulator is soiled.</td>
<td>Switching-on point of the air generator is not undercut.</td>
<td>Restrain the water inlet pressure until less than 6 bar is shown on the small manometer (on the pressure regulator).</td>
</tr>
</tbody>
</table>
H  Maintenance and care

1 | Basic information

Some regular work is necessary in order to ensure the proper functioning of the flushing compressor in the long term. All regulations and guidelines which apply at the installation site must be strictly adhered to.

The following work is to be performed:

- Care work is required regardless of use.
- Inspection at least every 2 months.
- Maintenance at lease once per year.
- An operation log must be kept to document care, inspection and maintenance work (see the appendix for the operation log). In the case of operational errors, the operation log helps to identify possible error sources and verifies the proper monitoring of the flushing compressor.

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

Notes: Only use original consumables, accessories and spare parts (see chapter C, consumables)!

Danger! Before performing any care, maintenance or repair work on the flushing compressor, this must be disconnected from the mains, depressurised and effectively shut off and protected from other pressure sources. Pull out the power plug and empty the drain valve.

Warning! Risk of infection due to germ-infested water. In stagnant water germs can multiply beyond safe limits. Ensure good hygiene when working on and with the flushing compressor. Always drain off any remaining water / disinfect parts which have come into contact with water.
2 | Care work

This work must be performed regularly by a specialist regardless of how often the system is used.

Perform before use:
Flush out the water path with drinking water directly into the drain.
If necessary, disinfect the water path, depending on the period of time since the system was last used and application type (drinking water or heating system).

Perform after use:
- Drain off the condensation via the compressed air vessel's condensation drainage valve.
  Set up the flushing compressor so that the condensation drainage valve on the compressed air vessel points downwards and keep this open until only air comes out.
- Drain off the condensation via the flushing compressor's flushing air pressure regulator. For this, push the draining nozzle upwards.
- Remove any remaining water from the water path.

3 | Inspection

The regular inspections can be performed by the operator or by a trained expert contracted by him.

- Visual inspections to ensure the perfect condition of safety devices (e.g., housing parts, motor protective grid, ...), electric cables, tubes and actuate the safety valve (pull the ring downwards, air flows out. This is leakproof again when the ring is released).

In the case of any damage to electrical or pressurised components, disconnect these from the mains or depressurise them and have them checked/repaired by a specialist.
4 | Maintenance

Maintenance work must be performed regularly after use, or at least once per year, as otherwise the warranty claim will become void. Maintenance work must be carried out by properly trained specialists or the Grünbeck technical customer service/authorised service company.

Once per month or more frequently depending on how dirty the ambient air is, if the system is only used periodically once per year.

- Replace the air suction filter on the compressor aggregate.

⚠️ **Attention!** Never operate the compressor aggregate without the air suction filter!

At least once per year, possibly more often depending on contamination levels.

- Replace the filter insert on the flushing air pressure regulator of the flushing compressor.
- As part of maintenance activities, all the work listed under "Care work" and "Inspection" must also be performed.
<table>
<thead>
<tr>
<th>Work performed</th>
<th>Execution confirmed</th>
</tr>
</thead>
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<td>Care work</td>
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</tr>
<tr>
<td>Inspection</td>
<td>Name: .................</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Date/</td>
</tr>
<tr>
<td>Repair</td>
<td>Signature: ..........</td>
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<tr>
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# GENO®-flushing compressor 1988 K

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