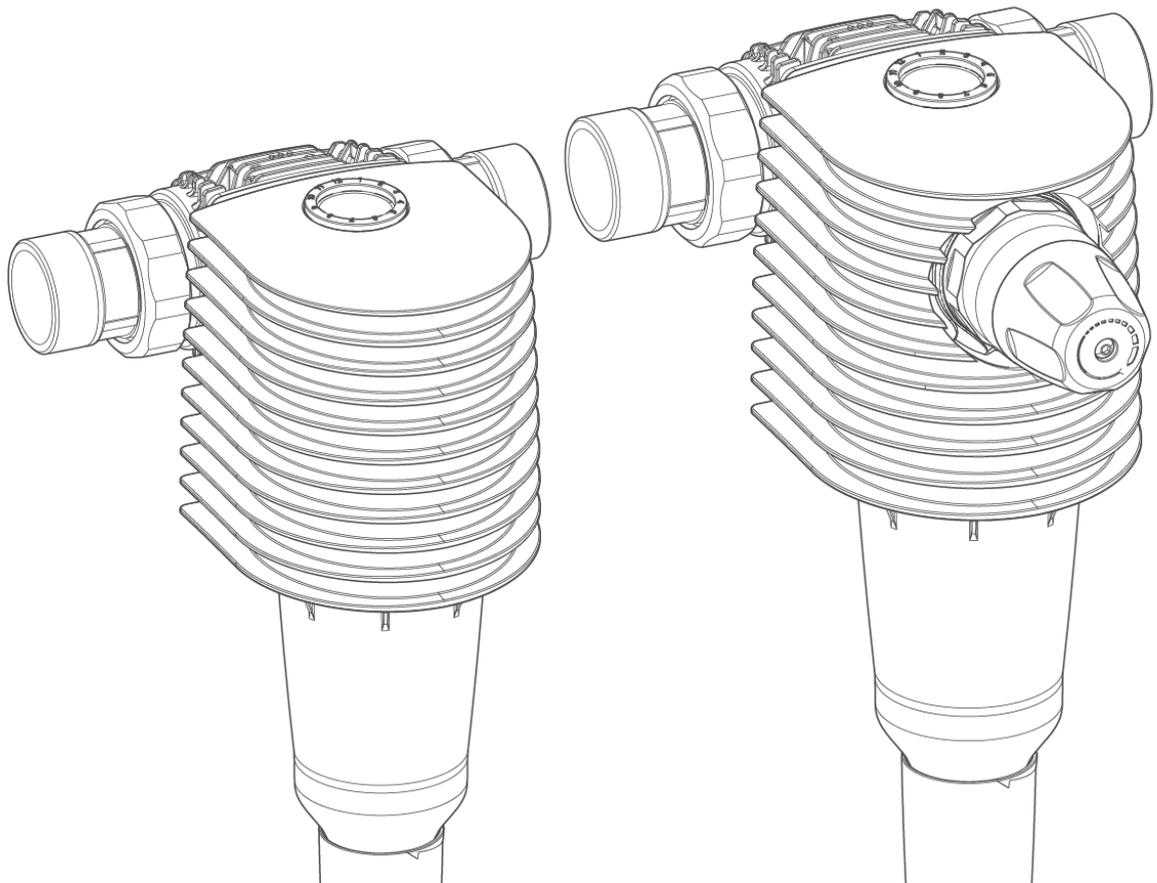


We understand water.



Backwash filter | BOXER RX/RDX 1½" – 2"

Operation manual

grünbeck

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We reserve the right to technical modifications<sup>1</sup>.  
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**Original operation manual**  
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# 1 Introduction

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

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

Illustrations in this manual are for basic understanding and can differ from the actual design.

## 1.1 Validity of the manual

This manual applies to the products below:

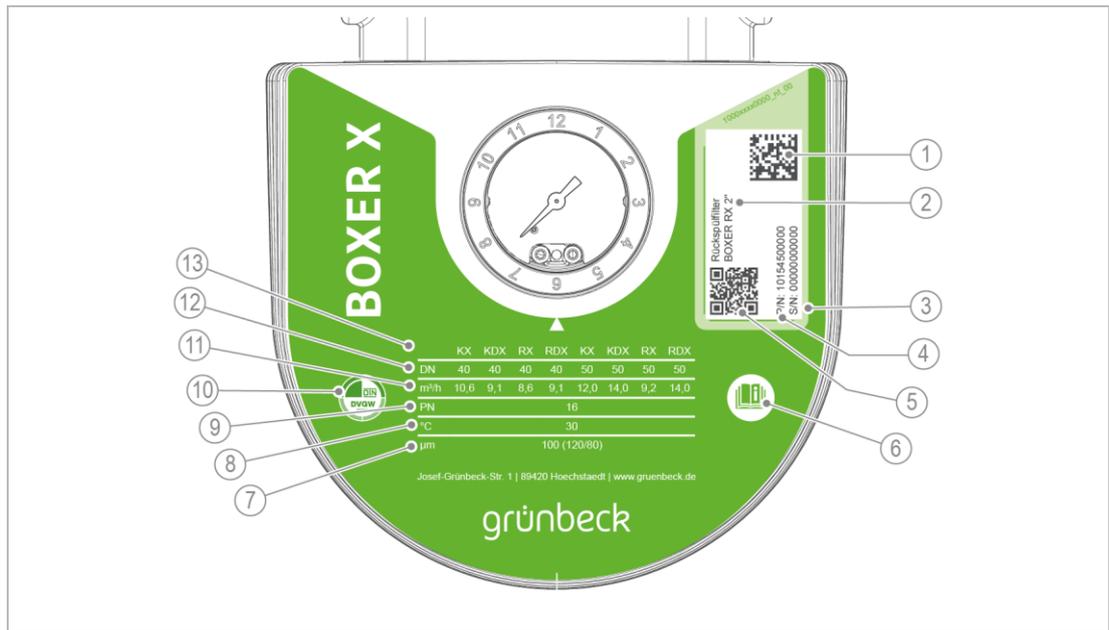
- Backwash filter BOXER RX 1½" (DN 40)
- Backwash filter BOXER RX 2" (DN 50)
- Backwash filter BOXER RDX 1½" (DN 40)
- Backwash filter BOXER RDX 2" (DN 50)

## 1.2 Product identification

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

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

The type plate is located on the filter head.



Designation	
1	Data matrix code
2	Product designation
3	Serial no.
4	Order no.
5	QR code
6	Obey the operation manual
7	Pore size

Designation	
8	Water temperature
9	Nominal pressure
10	DVGW test mark
11	Flow rate
12	Nominal connection diameter
13	Product type

### 1.3 Symbols used

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

## 1.4 Depiction of warnings

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



**SIGNAL WORD** Type and source of hazard

- Possible consequences
- ▶ Preventive measures

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

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

## 1.5 Demands on personnel

During the individual life cycle phases of the product, different people carry out work on the product. The respective tasks require different skills.

### 1.5.1 Qualification of personnel

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

## 1.5.2 Authorisations of personnel

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

	Operator/ user	Owner/ operating company	Qualified specialist	Technical service
Transport and storage		x	x	x
Installation and mounting			x	x
Start-up/Commissioning			x	x
Operation and handling	x	x	x	x
Cleaning	x	x	x	x
Inspection	x	x	x	x
Maintenance				
semi-annually		x	x	x
annually			x	x
Troubleshooting		x	x	x
Repair			x	x
Decommissioning and restart/recommissioning			x	x
Dismantling and disposal			x	x

## 2 Safety

### 2.1 Safety measures

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

#### 2.1.1 Pressure-related hazards

- Components can be under pressure. There is a risk of injuries and damage to property due to escaping water and unexpected movement of components. Check the pressure lines and the product for leaks at regular intervals.
- Before starting repair and maintenance work, make sure that all affected components are depressurised.

### 2.2 Product-specific safety instructions



#### WARNING

Excessive contamination of the filter element

- Health risk due to contamination of the drinking water
- ▶ Comply with the intervals and recommendations for inspection and maintenance of the filter.

### 2.3 Conduct in emergencies

#### 2.3.1 In case of water leaks

1. Close the shut-off valves for the water flow upstream and downstream of the filter.
2. Locate the leak.
3. Eliminate the cause of the water leak.

## 3 Product description

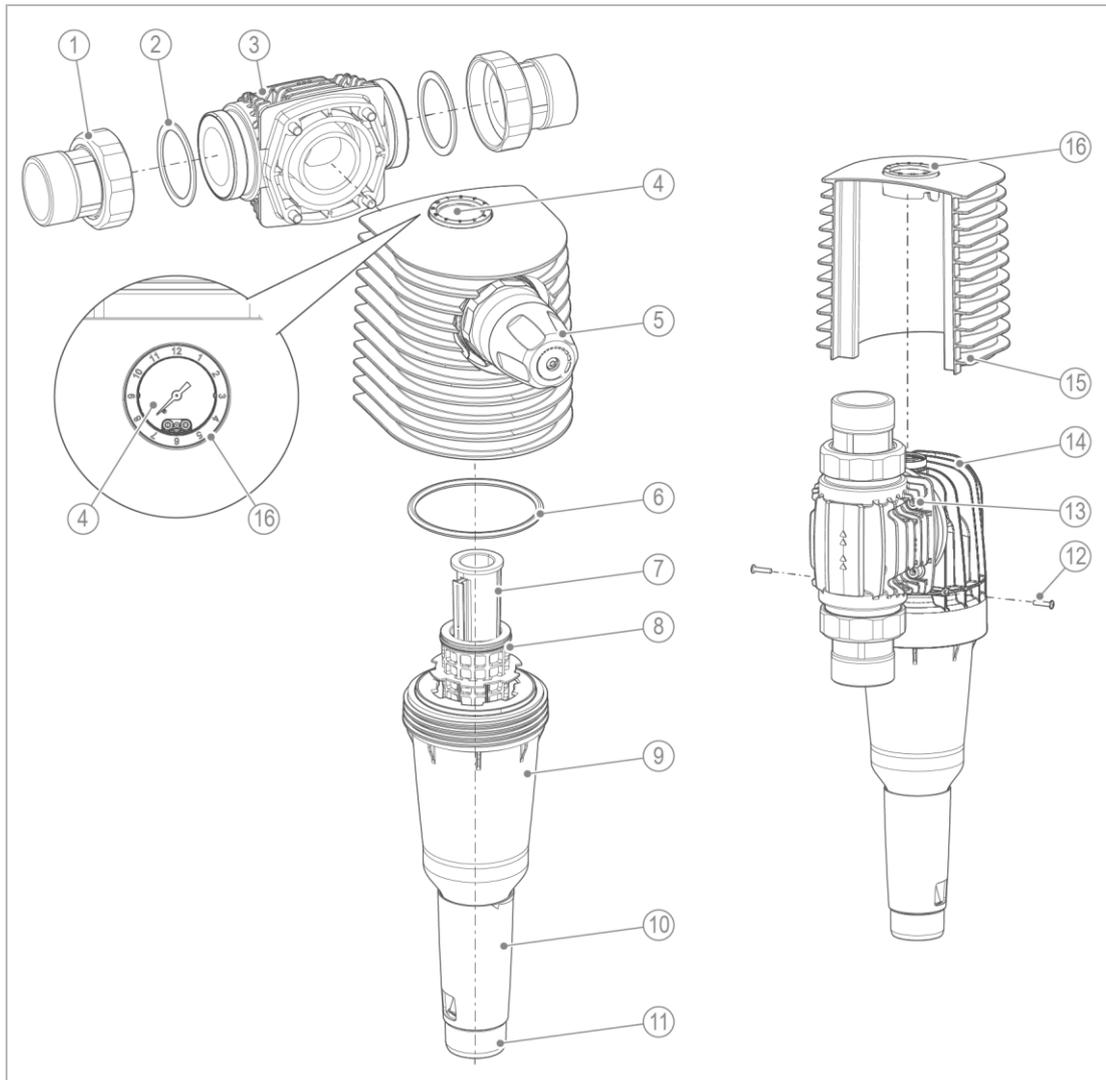
### 3.1 Intended use

- The backwash filters BOXER RX and BOXER RDX are designed for filtering drinking water.
- The backwash filter RDX with pressure reducer, in addition, is suitable for the adjustment of the outlet pressure on the withdrawal side in order to maintain the max. admissible operating pressure stipulated in DIN EN 806-2.
- The filters can be used for positive and negative pressure applications. The adjustment of the outlet pressure on the withdrawal side, however, only works when applied in the positive pressure range.
- The backwash filters are designed according to the stipulations of DIN EN 13443-1, DIN 19628 and DIN EN 1567 and intended for installation in drinking water pipes according to DIN EN 806-2 (installation immediately downstream of the water meter).
- They protect the water pipes and connected water-carrying system parts from disturbances and corrosion damage due to undissolved impurities (particles) such as rust particles, sand, etc.

#### 3.1.1 Foreseeable misuse

- The filters are not suitable for circulation water that has been treated with chemicals.
- They are neither suitable for oils, greases, solvents, soaps and other lubricating media, nor for the separation of water-soluble substances.

### 3.2 Product components



**Designation**

Water meter screw connection

Seal

Connection flange

Pressure gauge

Pressure reducer cartridge

O-ring

Impeller

Filter element

**Designation**

Filter cylinder

Backwash handwheel

Drain outlet

Fixing screws for cover

Cylinder screws for connection flange

Filter head

Cover

Maintenance ring

### 3.3 Functional description

The unfiltered drinking water flows into the filter through the inlet side and from the outside in through the filter element and to the pure water outlet. Thus, foreign particles of a size > 100 µm are retained.

Depending on their size and weight, foreign particles stick to the filter element, or they fall straight down into the filter cylinder.

The drain is opened by turning the backwash handwheel up to the stop, and a backwash is carried out.

The water flows through the primary screen to the filter element and then flows through the filter element in reverse direction of standard filtration. The particles sticking to the filter element are effectively removed by the integrated, rotatable impeller and are washed out to the drain.

In the backwash filter BOXER RDX, the flow-optimised pressure reducer, which is designed according to DIN EN 1567, additionally enables the outlet pressure on the withdrawal side to be set to 1 – 6 bar (factory setting: 4 bar).

### 3.4 Accessories

Your product can be retrofitted with accessories. Please contact your local Grünbeck representative or Grünbeck's headquarters in Hoechstädt/Germany for details.

Illustration	Product	Order no.
	<p><b>Drain connection DN 50</b> for professional installation acc. to DIN EN 1717 with integrated siphon to discharge the backwash water to the drain</p>	<p><b>188 875</b></p>

## 4 Transport and storage

### 4.1 Transport

- ▶ Transport the product in its original packaging only.

### 4.2 Storage

- ▶ Protect the product from the impacts below when storing it:
  - Dampness, moisture
  - Environmental impacts such as wind, rain, snow, etc.
  - Frost, direct sunlight, severe heat exposure
  - Chemicals, dyes, solvents and their vapours

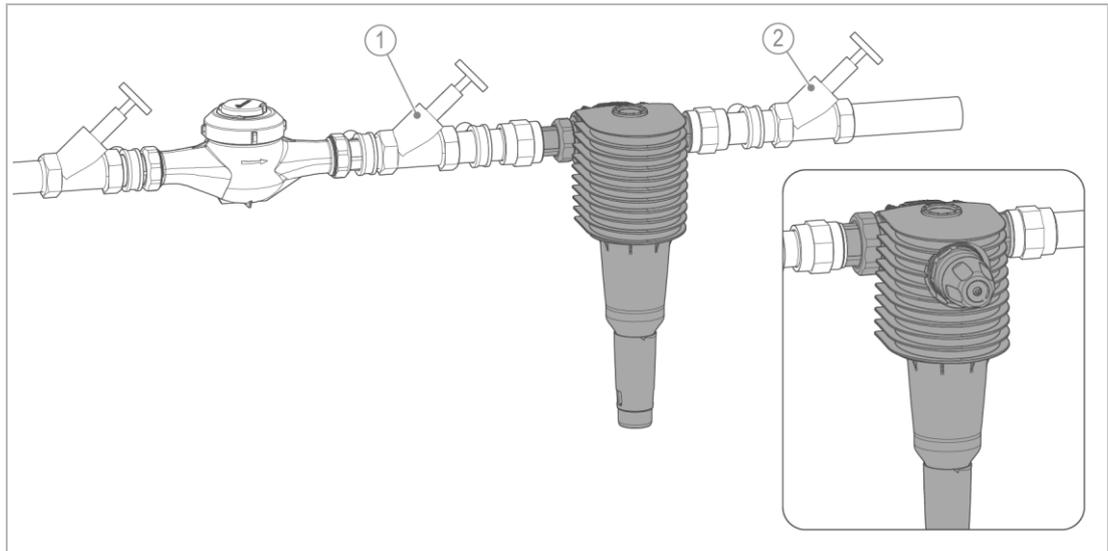
# 5 Installation



The installation of the system represents a major intervention into the drinking water system and must be done by a qualified specialist only.

In accordance with DIN EN 806-2 and DIN EN 1717, the product is installed in the cold water pipe downstream of the water meter and upstream of distribution pipes or the appliances to be protected.

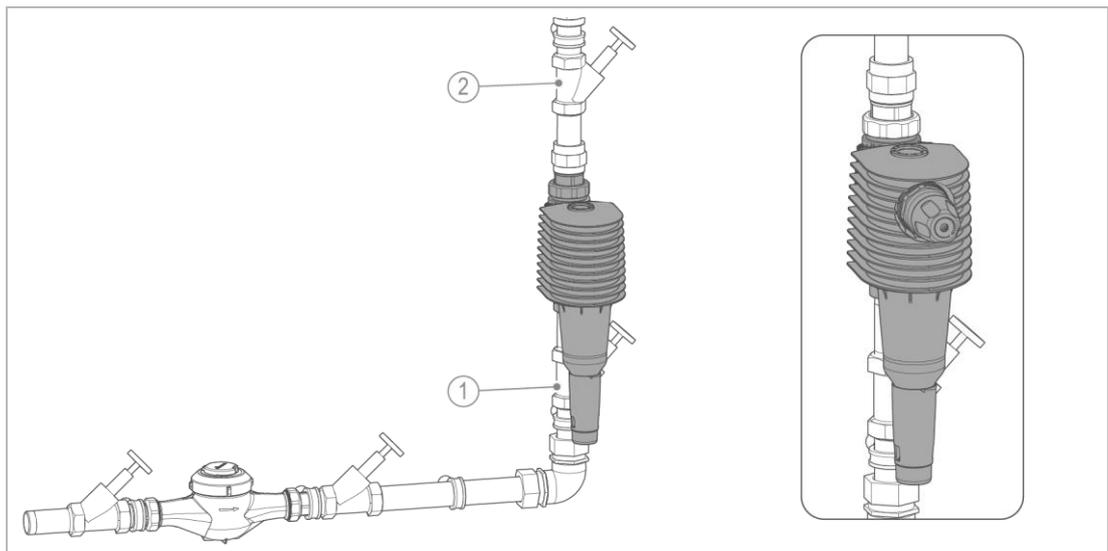
## Installation example in horizontal pipe



**Designation**  
14 Inlet shut-off valve

**Designation**  
15 Outlet shut-off valve

## Installation example in vertical pipe



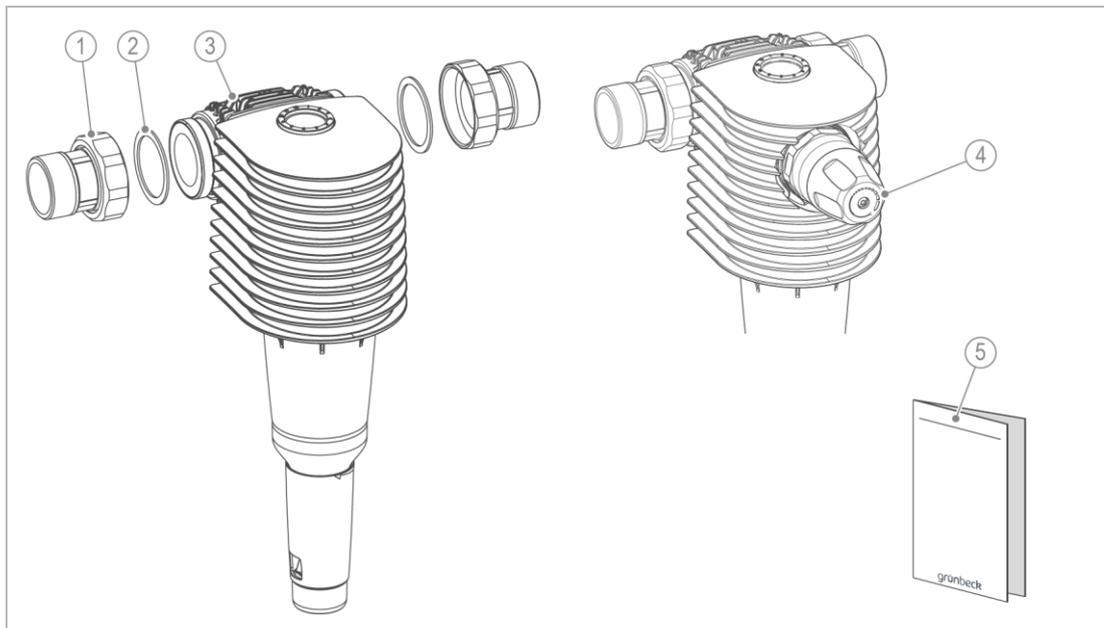
**Designation**  
16 Inlet shut-off valve

**Designation**  
17 Outlet shut-off valve

## 5.2 Requirements for the installation site

- The installation site must be frost-proof and ensure the filter's protection from chemicals, dyes, solvents and their vapours as well as from direct sunlight.
- The installation site must be away from heat sources (e.g. washing machines, boilers and hot water pipes).
- The installation room must provide a floor drain. If no floor drain is available, an appropriate safety device must be installed in order to prevent water damage.
- The installation site must be adequately illuminated and ventilated.
- The installation site must be easily accessible for maintenance purposes.

## 5.3 Checking the scope of supply



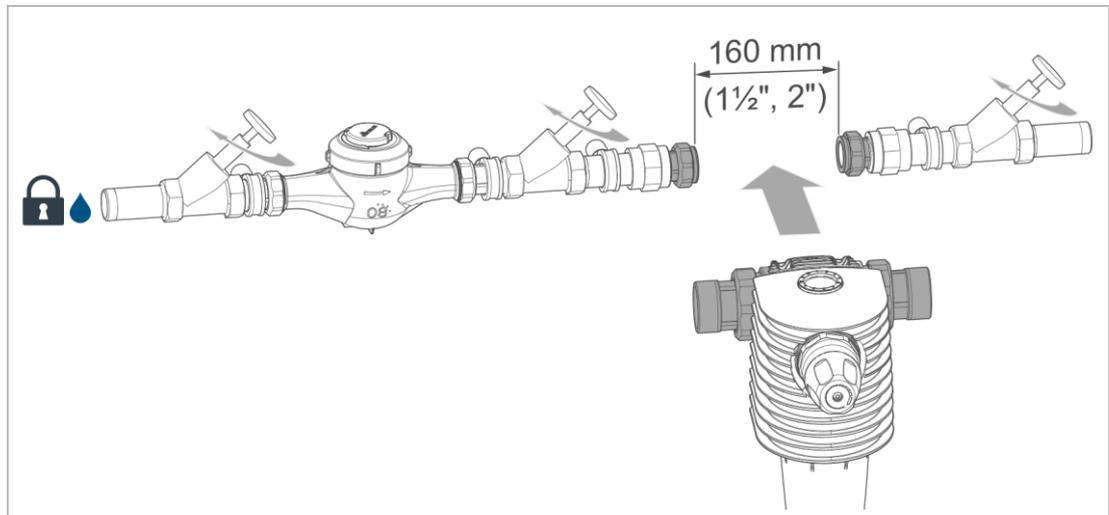
Designation	
18	Water meter screw connections
19	Seals
20	Backwash filter BOXER RX or RDX

Designation	
21	Pressure reducer in case of BOXER RDX
22	Quick reference manual

- Check the scope of supply for completeness and damage.

## 5.4 Water installation

### 5.4.1 Preparing the pipe



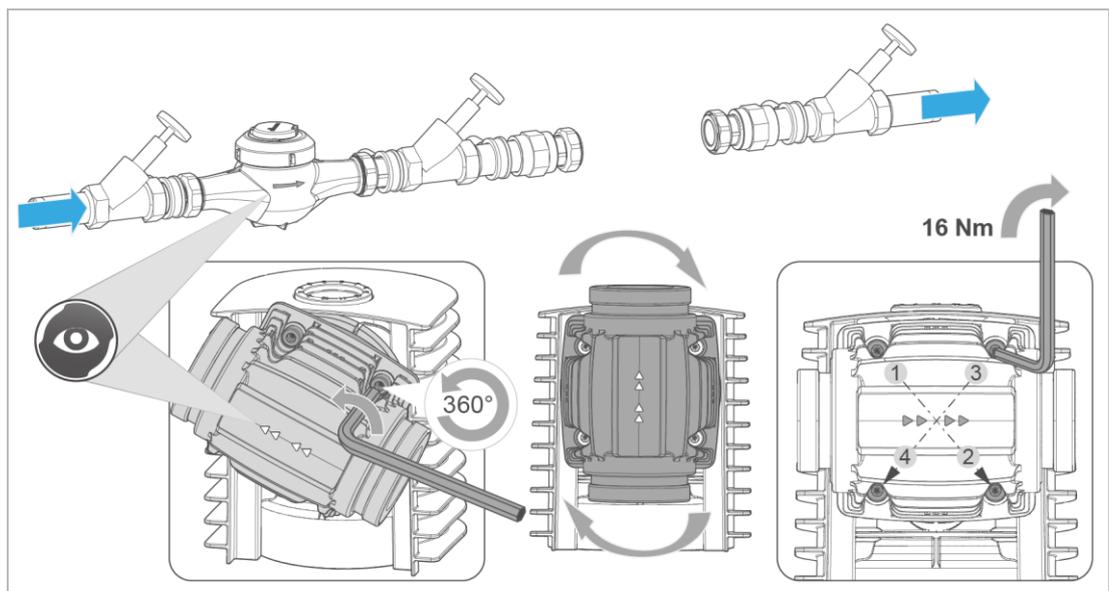
- Install the water meter screw connection in the pipe. The distance between the two seals must be 160 mm.

### 5.4.2 Mounting the filter



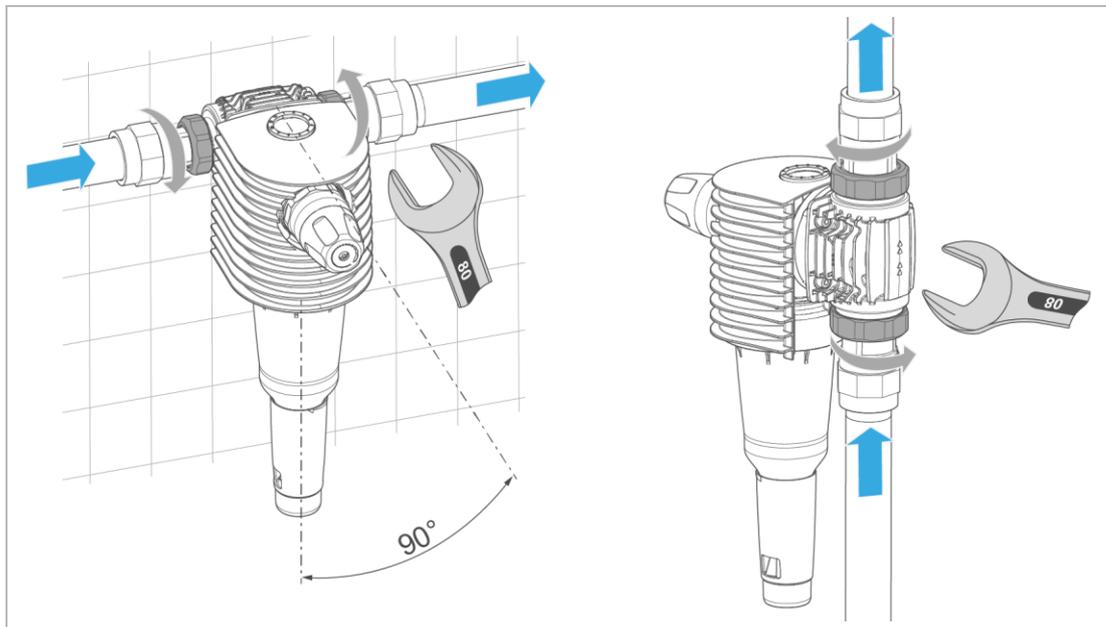
The rotatable connection flange enables the filter to be adapted to any flow direction given on site.

1. Check the flow direction given on site.



4. Loosen the 4 cylinder screws (SW 6) with an Allen key – approx. 1 full turn counterclockwise (do not unscrew).

5. Rotate the connection flange into the position matching your flow direction (refer to the marking on the connection flange).
6. Tighten the 4 cylinder screws crosswise (torque 16 Nm) – tighten them clockwise.



7. Install the filter without mechanical stress and firmly tighten the union nuts.

### 5.4.3 Attaching the backwash connection



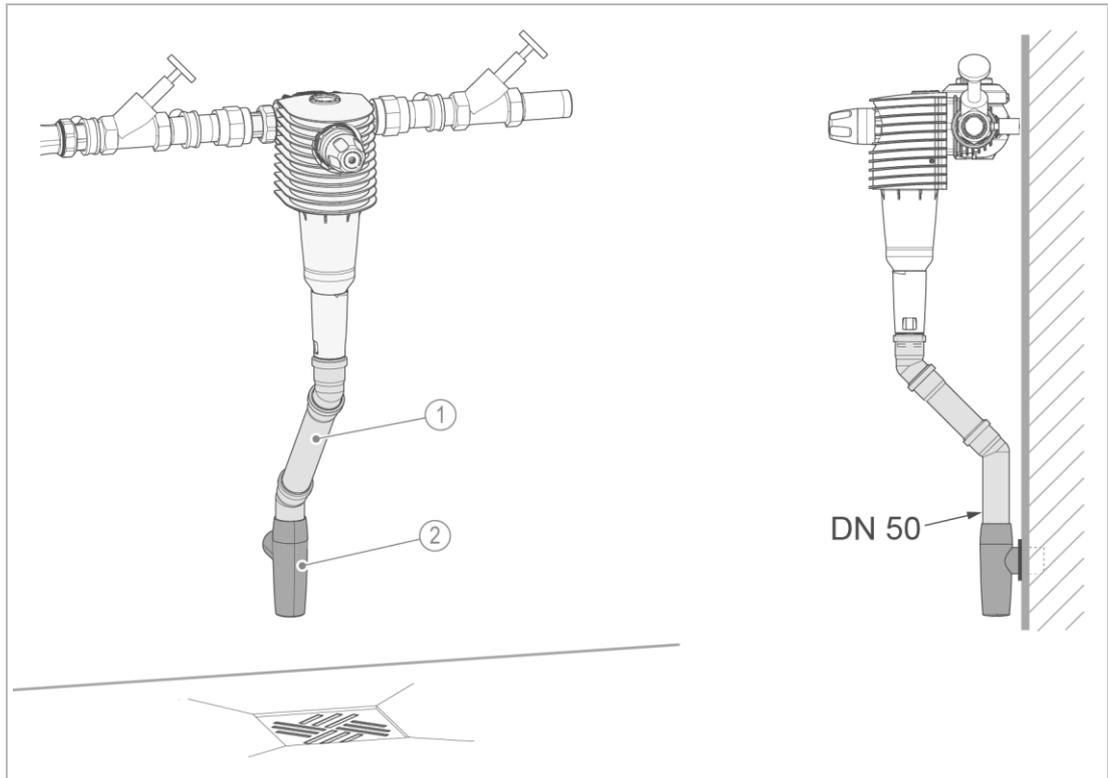
If it is not possible to install a waste water pipe, the backwash water can be collected in a bucket/container.



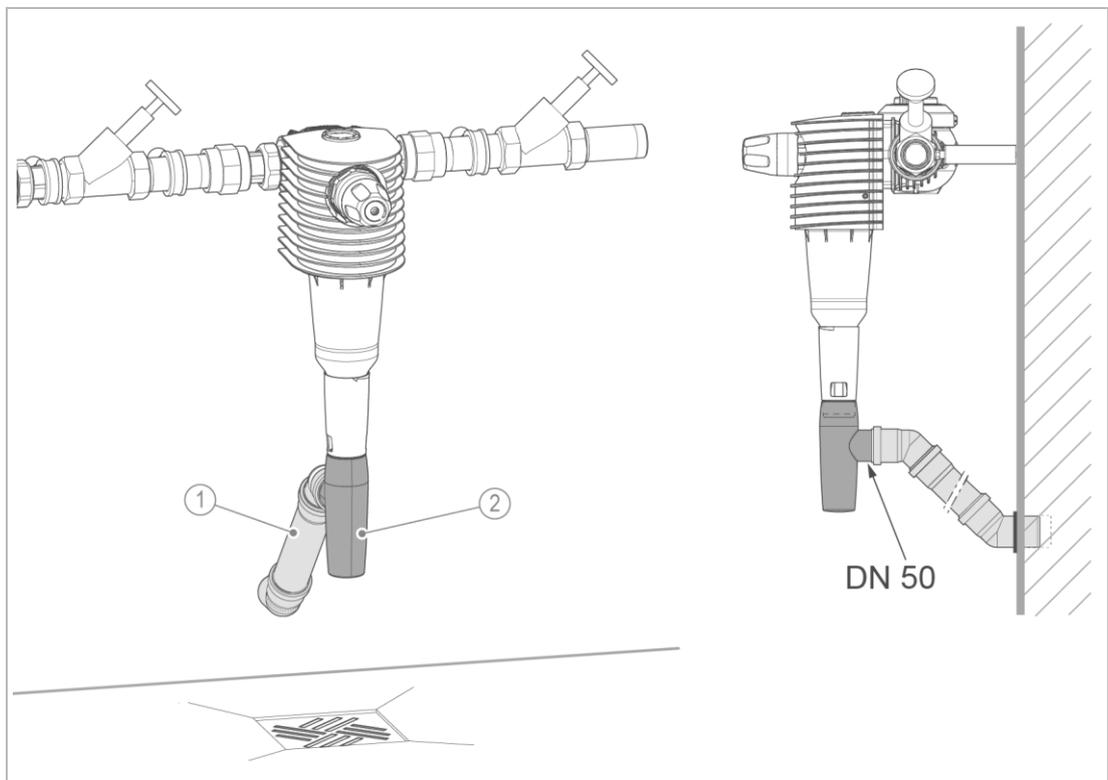
Refer to the installation instructions of the drain connection (order no. 100105420000).

- ▶ Install the drain connection (not included in the scope of supply, refer to chapter 3.4).
- ▶ Install a waste water pipe towards the drain.

**Example: Drain connection positioned on the drain**



**Example: Drain connection positioned on the filter**



**Designation**

Waste water pipe provided by client on site

**Designation**

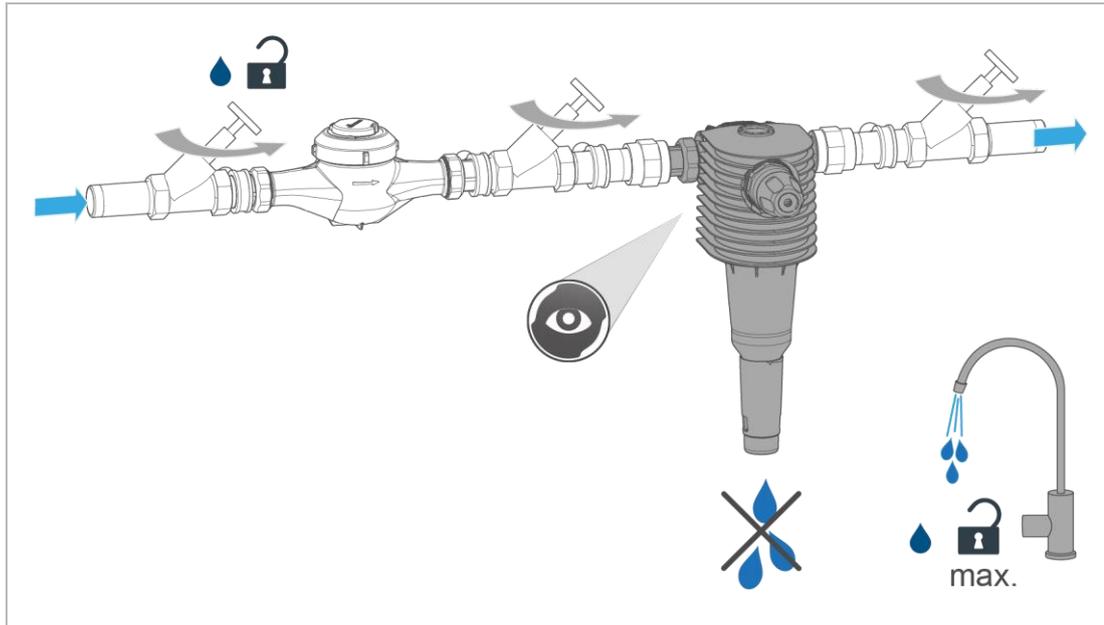
Drain connection DN 50 acc. to DIN EN 1717

## 6 Start-up/Commissioning



The initial start-up/commissioning of the product must be carried out by a qualified specialist only.

### 6.1 Checking the product

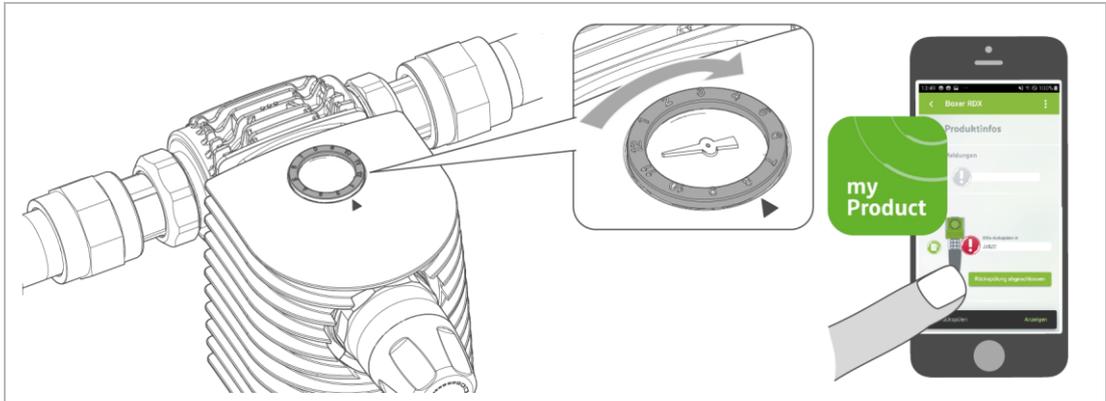


1. Open the shut-off valves.
2. Open the closest water withdrawal point downstream of the filter to the maximum.
  - » The filter is vented.
8. Check the filter for leaks.
9. Enter the initial start-up/commissioning in the operation log (refer to chapter 13).
  - » The filter is in operation.

## 6.2 Setting the month indicator



Via Grünbeck's myProduct app, you will receive a message about the timely backwash of the filter (refer to chapter 7.1).

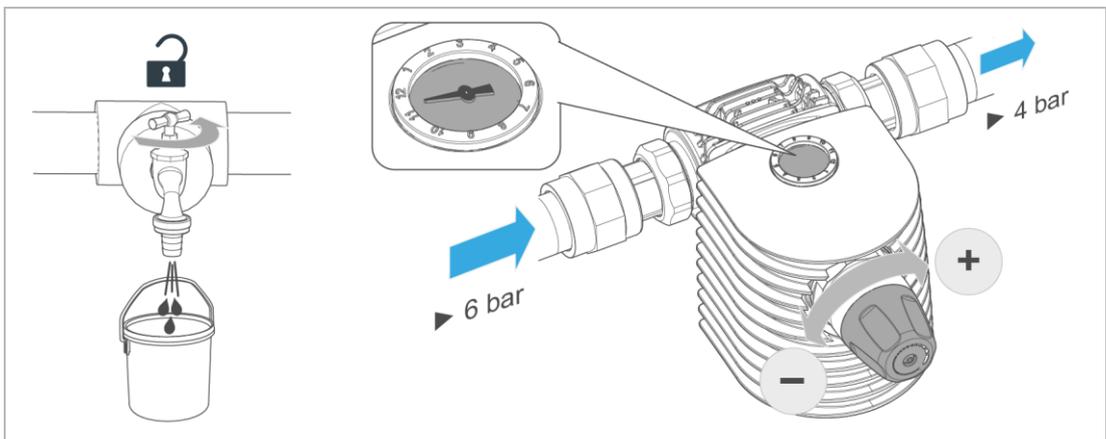


- ▶ Set the maintenance ring to the month of the next maintenance (alternatively, to the month of the next backwash – every six months at the latest).

## 6.3 Setting the pressure reducer (BOXER RDX)

The factory setting for the pressure reducer is 4 bar.

You can change this value as follows:

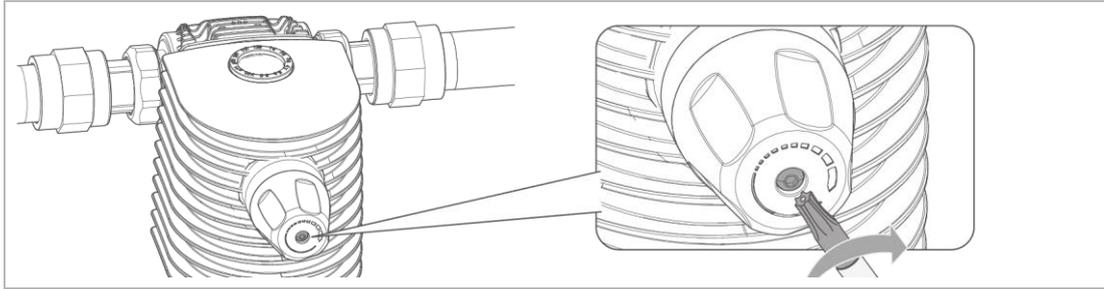


1. Set the required outlet pressure on the pressure reducer handwheel (turn clockwise = pressure increase, turn counterclockwise = pressure reduction).
2. Open and close a water withdrawal point.
  - » The outlet pressure adjusts itself.
3. Read the actual outlet pressure on the pressure gauge.
4. Repeat steps 1. – 3. until the desired pressure is reached.
  - » The desired outlet pressure is set.



The outlet pressure is set according to DIN EN 806-2.

- ▶ Comply with the max. admissible operating pressure.



The screw of the pressure reducer cartridge can come loose.

- ▶ Tighten the screw during annual maintenance (refer to chapter 8.4.2) and whenever required.

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

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

### 6.4.1 Disposal of packaging

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

## 7 Operation/Handling

The filter is operated automatically and does not require any manual operation.

- ▶ Inspect the filter at regular intervals (refer to chapter 8.3).
- ▶ Carry out a backwash at regular intervals (refer to chapter 8.4).
- ▶ Flush the filter after a temporary shutdown (refer to chapter 10.1).

### 7.1 Installing Grünbeck's myProduct app



You can register your product using Grünbeck's myProduct app.

That way, you will receive a reminder to backwash the filter as well as additional information on your product

- ▶ Download Grünbeck's myProduct app and install it on your mobile device.
- » Registering your product extends your warranty by 1 year.

## 8 Maintenance and repair

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



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



By concluding a maintenance contract, you make sure that all maintenance work is done on time.

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

### 8.1 Cleaning



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

**NOTE:**

Do not clean the product with cleaning agents containing alcohol/solvents

- These substances damage the plastic components.
- ▶ Use a mild/pH-neutral soap solution.
  
- ▶ Only clean the outside of the product.
- ▶ Do not use any strong or abrasive cleaning agents.
- ▶ Wipe the surfaces with a damp cloth.

### 8.2 Intervals



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

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

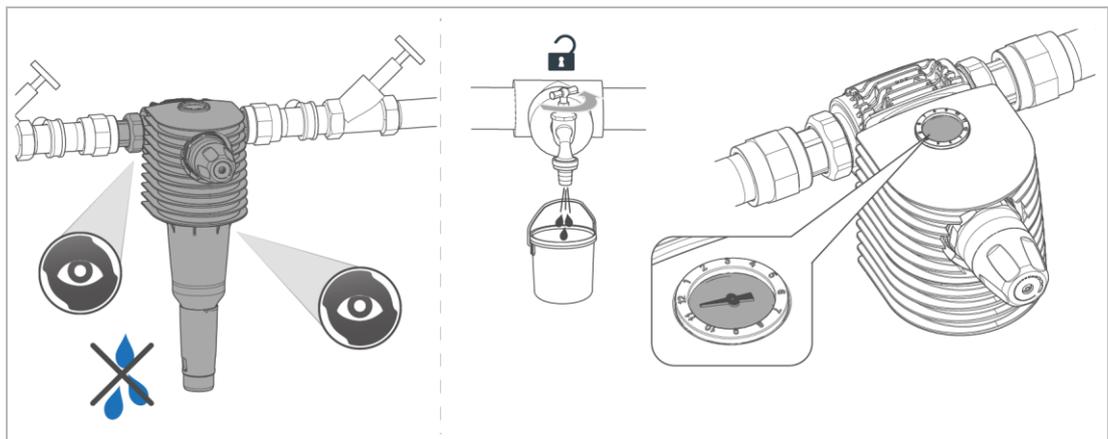
The interval table below shows the minimum intervals for the activities to be carried out.

Activities	Interval	Task
Inspection	2 months	<ul style="list-style-type: none"> <li>• Visual/functional check</li> <li>• Read the pressure (for BOXER RDX)</li> </ul>
Maintenance	6 months	<ul style="list-style-type: none"> <li>• Backwash</li> <li>• Condition and leak check</li> <li>• Set the maintenance ring</li> </ul>
	annually	<ul style="list-style-type: none"> <li>• Backwash</li> <li>• Check O-rings/flat seals for wear and tear</li> <li>• Check for tight fit</li> </ul>
Repair	5 years	<ul style="list-style-type: none"> <li>• Recommendation: replace filter element, seals, backwash valve, spring assembly</li> </ul>
	10 years	<ul style="list-style-type: none"> <li>• Recommendation: in addition to 5-year interval – replace filter cylinder</li> </ul>

## 8.3 Inspection

You as owner/operating company can do the regular inspections yourself.

- ▶ Carry out an inspection at least every 2 months and proceed as follows to do so:



1. Check the installation for leaks and function.
  2. Read the static pressure (zero flow) (for BOXER RDX).
  3. Fully open a water withdrawal point (generate max. flow) and read the flow pressure.
- ▶ Carry out a backwash in case of increasing contamination of the filter element and/or decreasing water pressure in the pipe network.

## 8.4 Maintenance

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



### WARNING

Irregular backwash of the filter

- Health risk due to contamination of the drinking water
- ▶ Comply with the intervals for inspection and backwash of the filter.

### 8.4.1 Semi-annual maintenance

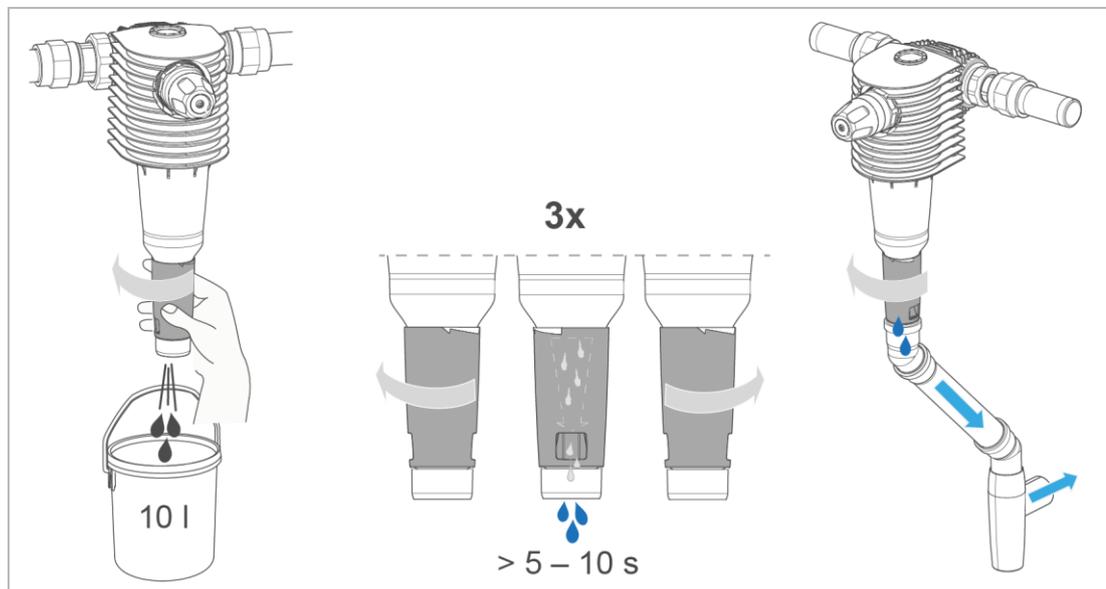
To carry out the semi-annual maintenance, proceed as follows:

#### 8.4.1.1 Filter backwash



During the backwash process, filtered pure water is still available.  
We recommend repeating the backwash process 3 times.

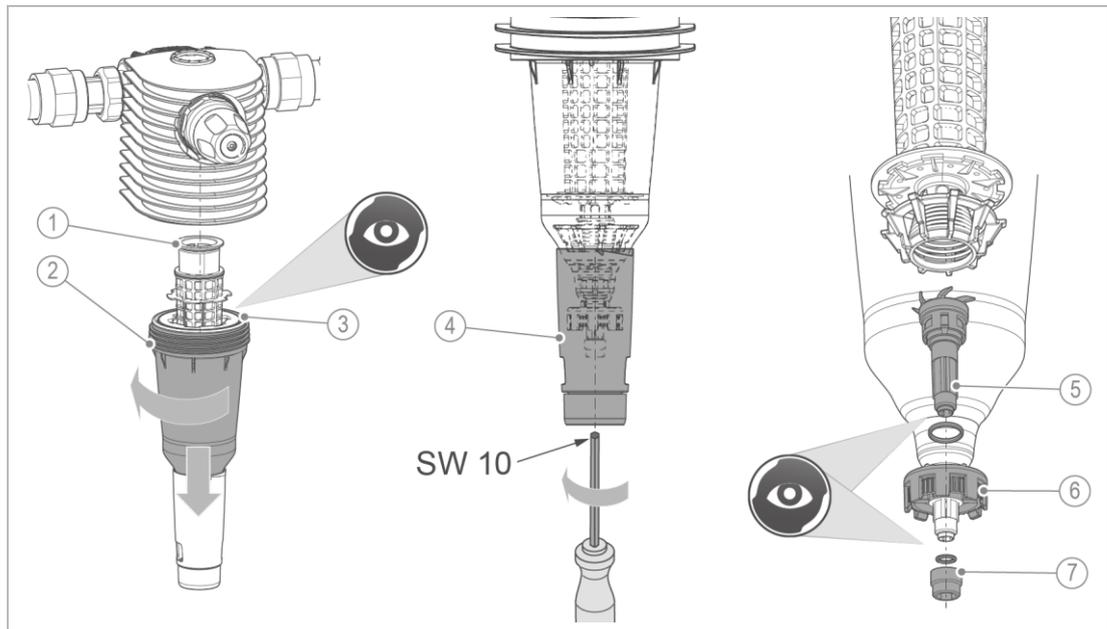
- ▶ Place a 10 l bucket under the filter (only if the filter is installed without a drain connection).



1. Turn the backwash handwheel in the direction of the arrow to the left up to the stop (do not turn the filter cylinder).
2. Hold the backwash handwheel in this position for 5 – 10 seconds.
3. Turn the backwash handwheel to the right back to its initial position until the clicking sound can be heard.
10. Set the date for the next maintenance (refer to chapter 6.2).

## 8.4.2 Annual maintenance

In addition to the semi-annual maintenance, the following work must be done:



### Designation

Impeller  
 Filter cylinder  
 O-ring of filter cylinder  
 Backwash handwheel

### Designation

Backwash valve incl. seal  
 Spring assembly  
 Fastening nut incl. seal

1. Check the O-rings and flat seals for wear and tear.
  2. Check the filter's tight fit in the pipe.
  3. Check the filter element for damage and dirt deposits.
  4. Check the pressure reducer cartridge (BOXER RDX) for a tight fit – retighten the screw, if necessary (refer to chapter 6.3).
  5. Check the impeller for smooth running.
- Replace worn components.

## 8.5 Spare parts

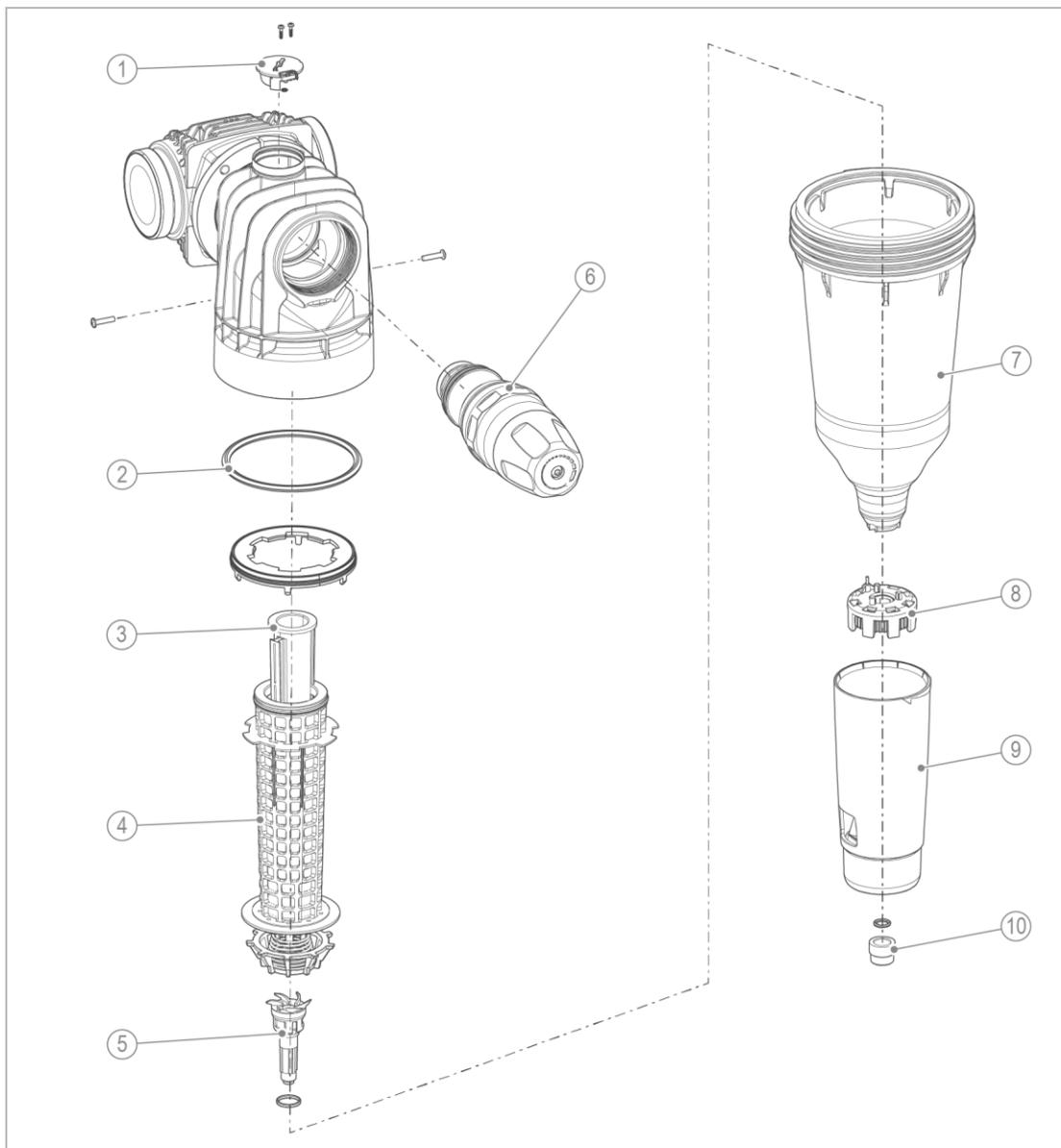
For an overview of the spare parts, refer to our spare parts catalogue at [www.grünbeck.com](http://www.grünbeck.com). You can obtain the spare parts from your local Grünbeck representative.

## 8.6 Wearing parts



Wearing parts must be replaced by qualified specialists only.

Wearing parts are listed below:



Designation
Pressure gauge
O-ring of filter cylinder
Impeller
Filter element
Backwash valve incl. seal

Designation
Pressure reducer cartridge
Filter cylinder
Spring assembly
Backwash handwheel
Fastening nut incl. seal

Tools required	Order no.
Strap wrench (to remove the filter cylinder)	105 805
Pipe socket wrench (for pressure reducer cartridge)	104000010001
Allen key 10 (for fastening nut)	
TORX T8 (for pressure gauge)	

- ▶ Have the seals replaced in the event of leaks, damage or distortions.
- ▶ Have defective or worn components replaced.

# 9 Troubleshooting



**WARNING**

Contaminated drinking water due to stagnation.

- Infectious diseases
- ▶ Have malfunctions eliminated immediately.

## 9.1 Observations

Observation	Explanation	Remedy
Water pressure at the withdrawal point too low (pressure loss too high)	The shut-off valves are not fully open	▶ Fully open the shut-off valves
	The filter element is dirty	▶ Carry out backwash
	The pressure reducer is not set correctly or is defective	▶ Check the pressure reducer and adjust it ▶ Replace defective pressure reducer
Taste of treated water negatively affected	Inappropriately long period of non-use (downtime)	▶ Withdraw water for several minutes ▶ Carry out backwash
Solids contained in the filtered water	Inappropriately high flow through the filter	▶ Check filter element for damage or leaks
	Filter element damaged or not installed correctly	▶ Have the filter element replaced by technical service
	Damaged impeller	▶ Have the impeller replaced by technical service
Water loss in the system	Faulty joint	▶ Check O-ring and seals for deformations or wear and tear ▶ Check filter head for damage ▶ Check connection flange for damage ▶ Have leaky components replaced by a qualified specialist



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

- ▶ Contact technical service.(refer to inner cover sheet).

## 10 Decommissioning

It is not necessary to put your product out of operation.



In case of longer absences, e.g. holidays, precautionary hygiene measures according to VDI 3810-2 and VDI 6023-2 must be taken in order to maintain drinking water hygiene after downtimes.

### 10.1 Temporary shutdown

- ▶ Perform the activities below if the drinking water system has not been used for a longer period of time:

#### **After a downtime of $\leq 4$ weeks**

1. Open a water withdrawal point and completely flush the filter and the pipes.

#### **After a downtime of $> 4$ weeks**

1. Carry out a backwash (refer to chapter 8.4.1).
2. Open a water withdrawal point and completely flush the filter and the pipes.

# 11 Dismantling and disposal

## 11.1 Dismantling



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

- ▶ Have this work carried out by qualified specialists only.
  1. Close the shut-off valves upstream and downstream of the filter.
  11. Open a water withdrawal point – wait a few seconds.
    - » The pressure in the product and the pipe network is being relieved.
  12. Close the water withdrawal point.
  13. Carry out a backwash.
  14. Remove the filter from the pipe.
  15. Close the gap in your drinking water pipes, e.g. by using an adjusting piece.

## 11.2 Disposal

- ▶ Obey the applicable national regulations.

### Packaging

#### NOTE

Danger to the environment due to incorrect disposal

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

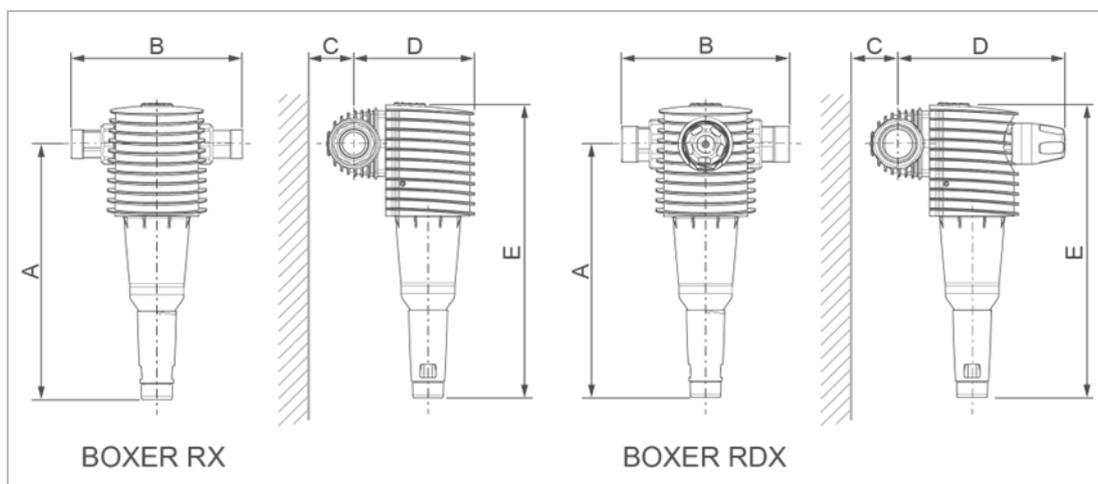
### Product

- ▶ Find out about the local regulations on the separate collection of electrical and electronic products.
- ▶ Make use of the collection points available to you for the disposal of your product.
- ▶ If your product contains batteries or rechargeable batteries, dispose of them separately from your product.



For more information on take-back and disposal, go to [www.gruenbeck.com](http://www.gruenbeck.com).

## 12 Technical specifications



Dimensions and weights			RX 1½"	RX 2"	RDX 1½"	RDX 2"
A	Installation height up to centre of connection	mm	420			
B	Installation length with/without screw connection	mm	283/160	277/160	283/160	277/160
C	Distance to wall	mm	≥ 90			
D	Installation depth up to centre of connection	mm	200	200	274	274
E	Total height	mm	488			
	Empty weight, approx.	kg	4.35	4.70	5.05	5.40

Connection data			RX 1½"	RX 2"	RDX 1½"	RDX 2"
Nominal connection diameter			DN 40	DN 50	DN 40	DN 50
Connection diameter			1½"	2"	1½"	2"

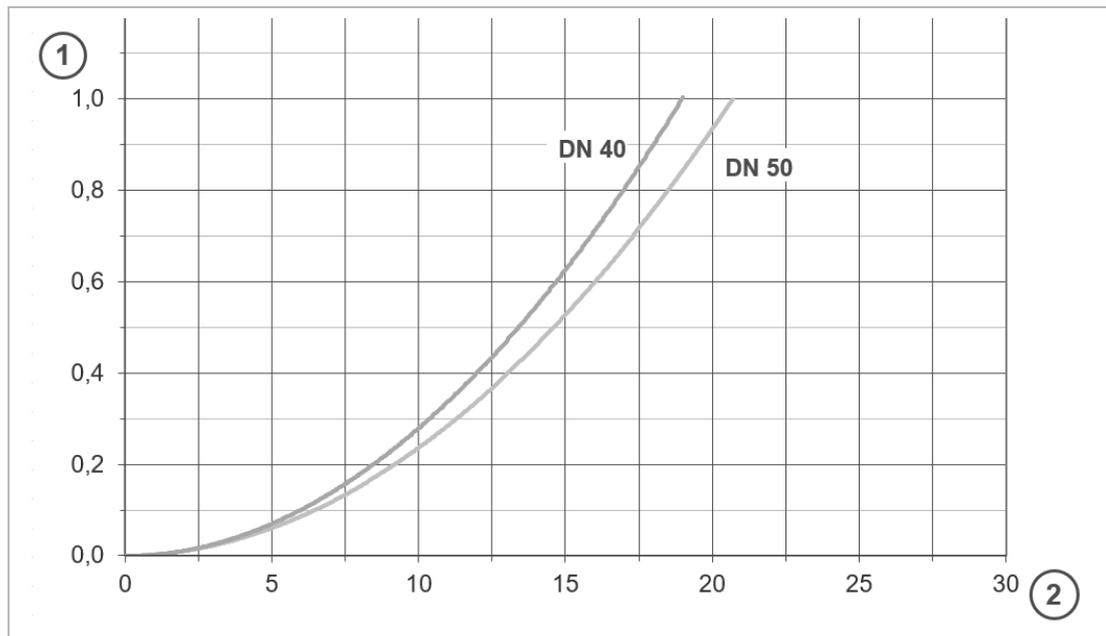
  

Performance data			RX 1½"	RX 2"	RDX 1½"	RDX 2"
Nominal flow at Δp 0.2 (0.5) bar	m³/h		8.6 (13.3)	9.2 (14.6)	-	-
Flow rate as per DIN EN 1567	m³/h		-	-	9.1	14.0
K <sub>v</sub> value	m³/h		19.0	20.7	-	-
Pore size	µm		100			
Largest/smallest pore size	µm		120/80			
Operating pressure	bar		2 – 16			
Nominal pressure			PN 16			

General data			RX 1½"	RX 2"	RDX 1½"	RDX 2"
Backwash water volume at an inlet pressure of 4 bar	l		~ 4			
Water temperature	°C		5 – 30			
Ambient temperature	°C		5 – 40			
DVGW registration number			NW-9301DL0161		NW-9311DL0166	
ÜA registration number			R-15.2.3-21-17496			
Office of the Vienna Provincial Government – City of Vienna						
<b>Order no.</b>			<b>101540</b> <b>000000</b>	<b>101545</b> <b>000000</b>	<b>101580</b> <b>000000</b>	<b>101585</b> <b>000000</b>

## 12.1 Pressure loss curves BOXER RX



Designation

Pressure loss in bar

Designation

Flow rate in m³/h

# 13 Operation log



- ▶ Document the initial start-up/commissioning and all maintenance activities.
- ▶ Copy the maintenance sheets, if necessary.

**Backwash filter BOXER** \_\_\_\_\_

Serial no.: \_\_\_\_\_

## 13.1 Start-up/Commissioning log

### Customer

Name: \_\_\_\_\_

Address: \_\_\_\_\_

### Installation/Accessories

Drain connection acc. to DIN EN 1717

Yes

No

Floor drain available

Yes

No

Safety device

Yes

No

### Operating values

Water pressure at raw water inlet

bar

Water pressure downstream of pressure reducer

bar

Residential water meter reading

m<sup>3</sup>

### Remarks

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

### Start-up/Commissioning

Company: \_\_\_\_\_

Service technician: \_\_\_\_\_

Work time certificate (no.): \_\_\_\_\_

Date/signature: \_\_\_\_\_





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