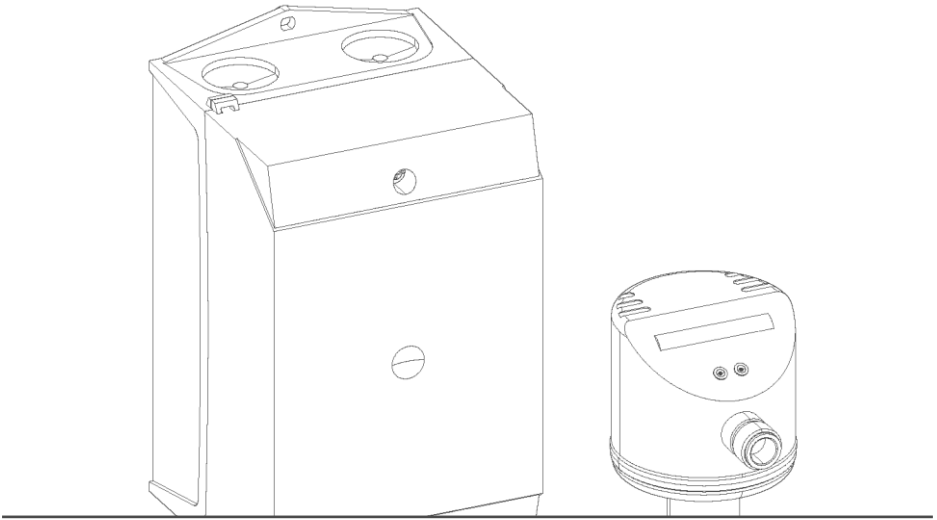


We understand water.



Accessories | Flow controller

Operation manual

grünbeck

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Original operation manual
Edition: August 2023
Order no.: 10022450000_en_005

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1 Introduction

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

- ▶ Read this manual before operating 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 product below:

- Accessories Flow controller

1.2 Other applicable documents

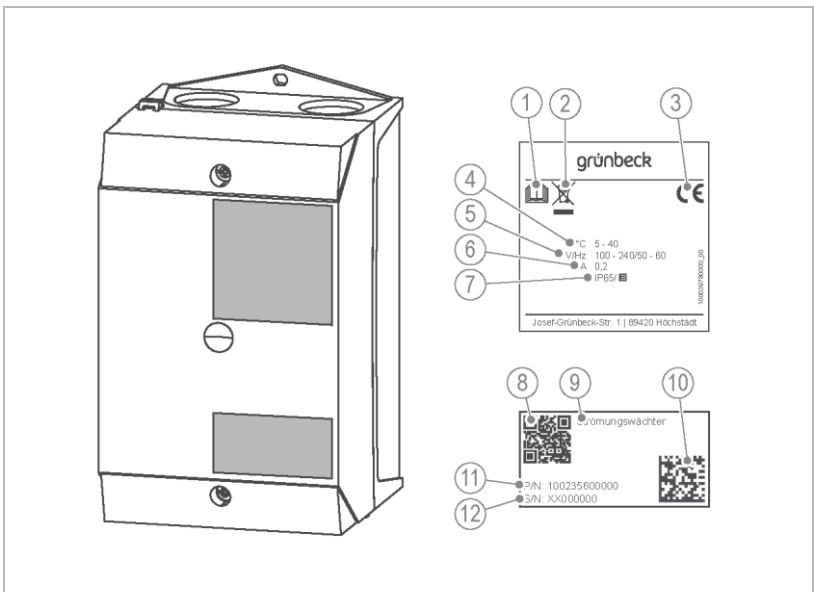
- Manuals of measuring and control systems spaliQ Professional and GENO-CPR-tronic 02
- Electric circuit diagram of flow controller

1.3 Product identification

You can identify your product based on the product designation and the order number shown on the type plate.

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









The type plate is located on the front of the switch box.



Designation	
1	Obey the operation manual
2	Disposal information
3	CE mark
4	Ambient temperature
5	Power supply
6	Rated current

Designation	
7	Protection
8	QR code
9	Product designation
10	Data matrix code
11	Order no.
12	Serial no.

1.4 Symbols used

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

1.5 Depiction of warnings

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






SIGNAL WORD

Type and source of hazard

- Possible consequences
- ▶ Preventive measures

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

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

1.6 Demands on personnel

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

1.6.1 Qualification of personnel

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

1.6.2 Authorisations of personnel

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

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

1.6.3 Personal protective equipment

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

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



Protective gloves



Safety goggles

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.
- Only use genuine spare parts for maintenance or repair.

2.1.1 Electrical hazards

- There is an immediate danger of fatal injury from electric shock when touching live parts. Damage to the insulation or individual components can be lethal.
- Only have qualified electricians carry out electrical work on the system.
- In case of damage to live components, switch off the voltage supply immediately and arrange for repair.
- Switch off the supply voltage before working on electrical system parts. Discharge residual voltage.
- Never bridge electrical fuses. Do not disable fuses. Use the correct current ratings when replacing fuses.
- Keep moisture away from live parts. Moisture can cause short-circuits.
- Make sure that the socket features a protective earth conductor (PE). Retrofit the socket with an adapter, if necessary.

2.1.2 Groups of persons requiring protection

- Children must not play with the product.
- This product is not designed to be used by persons (including children) with reduced capabilities, lack of experience or lack of knowledge. Unless they are supervised, have been instructed on the safe use of the product and understand the resulting hazards.
- Children must be supervised to make sure that they do not play with the product.
- Cleaning and maintenance must not be carried out by children.

3 Product description

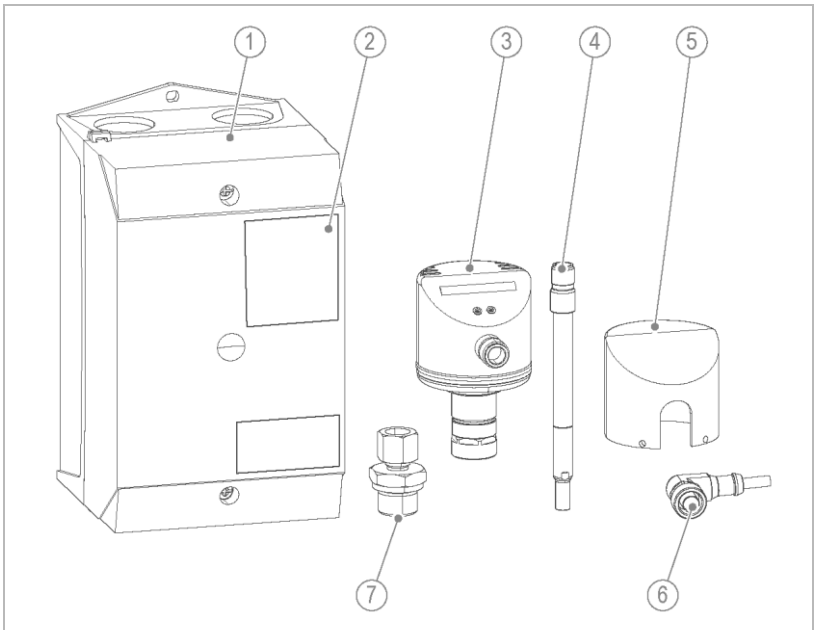
3.1 Intended use

The flow controller must only be used as an accessory for the measuring and control systems spaliQ Professional and GENO-CPR-tronic 02.

The flow controller is designed for monitoring the flow of the pool water circulation.

The flow controller is designed for installation into an on-site filtrate pipe provided by the client.

3.2 Product components



Designation	Designation
1 Switch box	5 Protective cap
2 Type plate	6 Sensor cable
3 Evaluation unit	7 Compression-type fitting
4 Flow sensor	

3.3 Functional description

The flow controller measures the flow velocity according to the calorimetric measuring principle and switches the output.

- Output open when no medium is flowing, or no flow is present
- Output closed when medium is flowing, or flow is present

The measuring and control systems spaliQ Professional or GENO-CPR-tronic 02 evaluate the signal of the flow controller as follows:

- Output open:
No enabling of dosing outputs and/or deactivation of enabling of dosing outputs and switch-off of dosing pumps
- Output closed:
Enabling of control possible or activation of enabling of dosing outputs and switch-on of dosing pumps possible

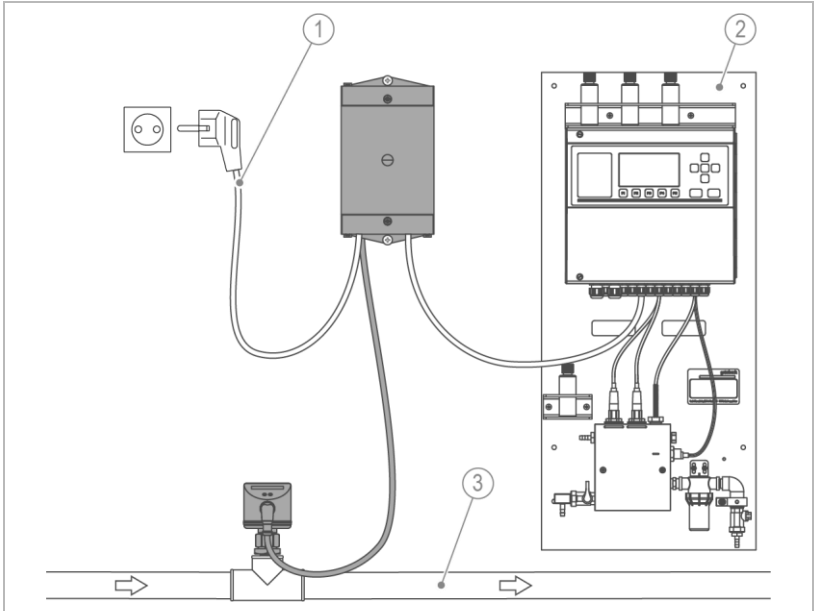
3.4 Storage

- ▶ 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

4 Installation



The installation of the flow controller must be carried out by a qualified specialist only.



Designation

- 1 Supply voltage
- Measuring and control system
- 2 spaliQ Professional or GENO-CPR-tronic 02

Designation

- 3 Filtrate pipe

4.1 Requirements for the installation site


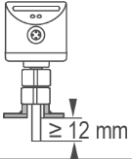
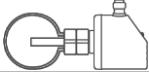
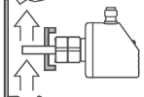
- Obey the local installation directives, general guidelines and technical specifications.
- The installation site must be frost-proof and ensure the system's protection from direct sunlight, chemicals, dyes, solvents and their vapours, etc.

Electrical installation

- Schuko socket (type F, CEE 7/3) with permanent power supply. The socket must not be coupled with light switches, emergency heating switches or the like.

4.1.1 Requirements:

Comply with the requirements below when installing the product:

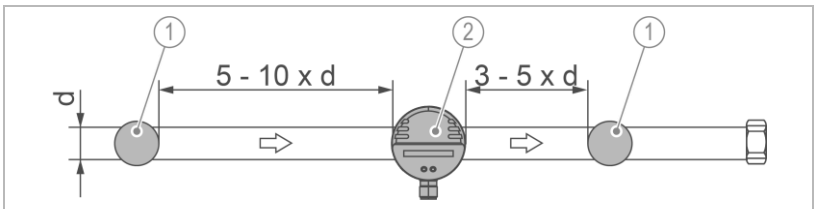
	<p>The tip of the sensor must be completely surrounded by water.</p>
	<p>The immersion dip of the flow sensor must at least be 12 mm and must not extend beyond the middle of the pipe.</p>
	<p>In horizontal pipes, installation should be lateral.</p>
	<p>In vertical pipes, installation should be in the riser pipe.</p>

	<p>In horizontal pipes, installation from below is only possible if the line is free of deposits.</p>
	<p>In horizontal pipes, installation from above is only possible if the line is completely filled with water.</p>
	<p>The tip of the sensor must not touch the pipe wall.</p>
	<p>Installation into downpipes that are open at the bottom is not possible.</p>

Installation distances

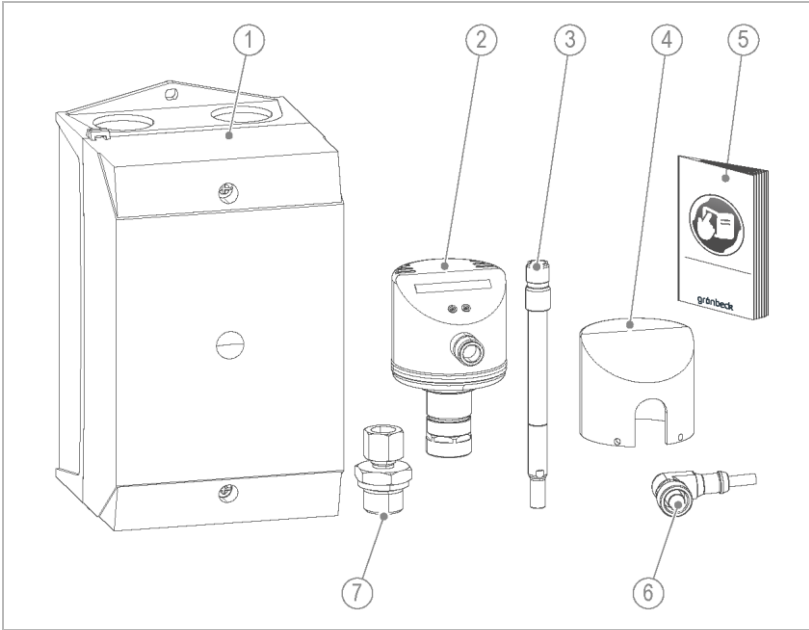
Built-in parts in the pipe, bends, valves, reductions or similar cause water turbulences, which impairs the function of the flow controller.

- Keep the distances upstream and downstream of the flow controller.



<p>Designation</p>	<p>Designation</p>
<p>1 Interfering factors</p>	<p>2 Flow controller</p>

4.2 Checking the scope of supply

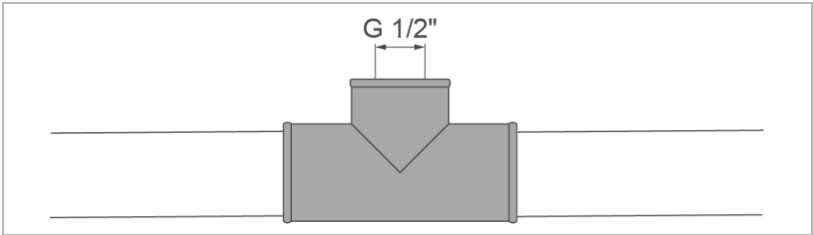


Designation	Designation
1 Switch box	5 Technical documentation
2 Evaluation unit	6 Sensor cable
3 Flow sensor	7 Compression-type fitting
4 Protective cap	

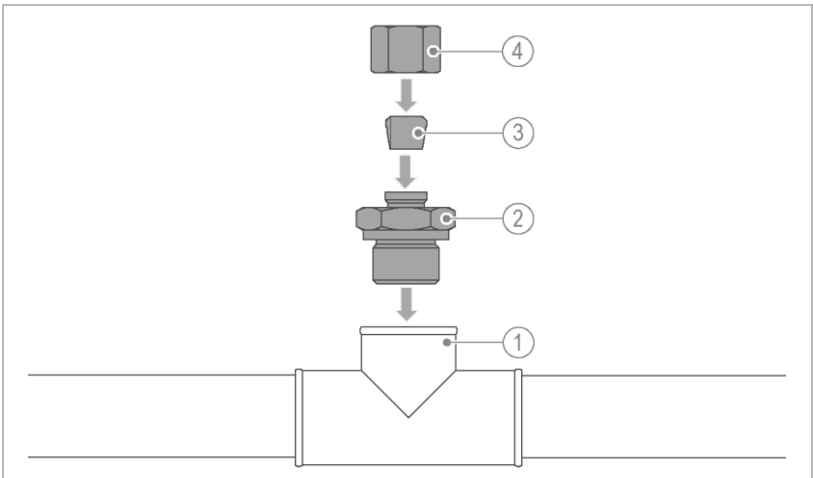
► Check the scope of supply for completeness and damage.

4.3 Water installation

4.3.1 Installing the compression-type fitting and the flow sensor



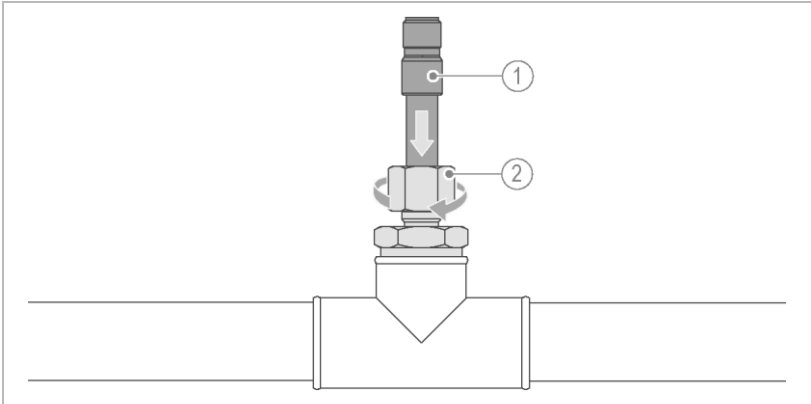
1. Prepare installation on site.



Designation	Designation
1 Process connection	3 Progressive ring
2 Screw connection	4 Union nut

2. Insert the screw connection into the process connection.

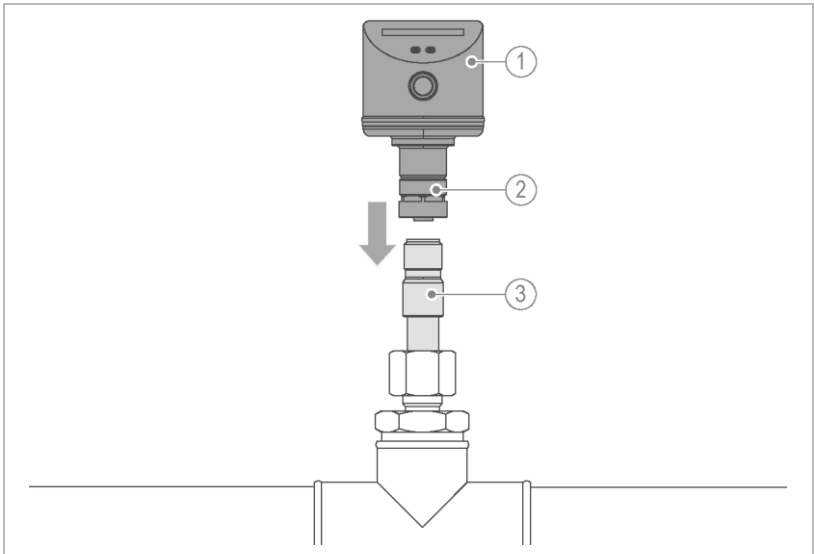
3. Firmly tighten the screw connection.
4. Grease all components of the compression-type fitting.
5. Insert the progressive ring.
 - a Make sure that the tapered end points into the cone.
6. Insert the union nut



Designation	Designation
1 Flow sensor of flow controller	2 Union nut of compression-type fitting

7. Insert the flow sensor into the compression-type fitting.
8. Tighten the union nut hand-tight.
9. Slide in the flow sensor to the desired immersion depth.
10. Align the flow sensor
11. Tighten the union nut with a maximum of 2 turns.

4.3.2 Installing the flow controller



Designation	Designation
1 Evaluation unit of the flow controller	2 Union nut
	3 Flow sensor of flow controller

1. Place the evaluation unit on the flow sensor.
2. Tighten the union nut of the evaluation unit hand-tight.



Connect the flow sensor directly to the evaluation unit. Connection via an extension cable is not permitted.

4.3.3 Installing the switch box

- ▶ Install the switch box on a level, vertical surface which is free from vibrations.
Be aware of the length of the sensor cable (3 m).
- ▶ Do not install the switch box directly above or next to the chemical canister or the dosing system used.

4.4 Electrical installation



The electrical installation must be carried out by a qualified electrician only.

- ▶ Make the electrical connection using the wiring diagram.

5 Start-up/commissioning



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

1. Check the installation.
2. Use the personal protective equipment.
3. Perform high-flow and low-flow adjustment while the swimming pool system is in operation (refer to chapter 6.6).
4. Check the operating display on the flow controller.
 - » The current flow must be above the switching point (refer to chapter 6.2).
5. Check the measuring and control system spaliQ Professional or GENO-CPR-tronic 02 for proper operation.
 - » **No filtrate flow** must not appear on the display.
 - » The dosing pumps must be enabled.
6. Restrict the flow in the filtrate pipe during operation until the flow is below the switching point of the flow controller.
7. Check the operating display on the flow controller.
 - » The LED to indicate the switching point lights up red and only the LEDs on the left of the switching point are illuminated in green.
8. Check the measuring and control system spaliQ Professional or GENO-CPR-tronic 02 for proper operation.
 - » **No filtrate flow** must be displayed.
 - » The dosing pumps must be switched off.
9. Open the flow restrictor of the filtrate pipe.

10. Repeat steps **5** and **6**.

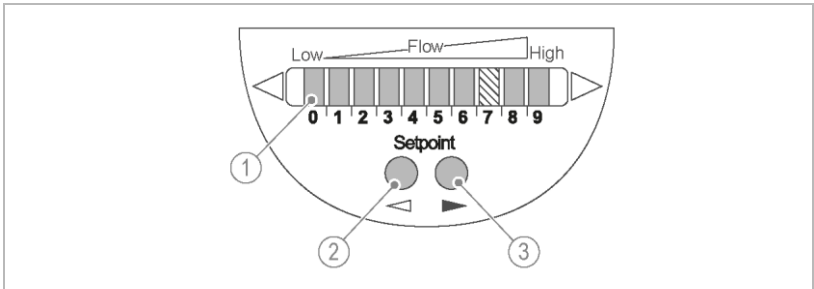
11. Lock the flow controller (refer to chapter 6.3).

» Start-up/commissioning was successful.

12. Fill in the operation log (refer to chapter 11).

6 Operation

6.1 Display and operating elements



Designation	Designation
1 LED display	3 Button 
2 Button 	

LEDs 0 to 9 represent the range of the monitored flow. The green LEDs indicate the current flow.

The position of the switching point is indicated by an illuminated LED. The colour of the LED informs about the switching of the output:

- Orange = Output closed
- Red = Output open

6.2 Operating displays

In case of a failure or interruption of the operating voltage, all settings are retained.

Display							
	<ul style="list-style-type: none"> Current flow below the display range 						
	<ul style="list-style-type: none"> Current flow within the display range Output open 						
	<ul style="list-style-type: none"> Current flow within the display range Output closed 						
	<ul style="list-style-type: none"> Current flow above the display range 						
	The LED lights up green		The LED lights up orange		The LED lights up red		The LED is flashing

6.3 Locking/unlocking the flow controller

The flow controller can be locked electronically to prevent unintentional, incorrect entries.

▶ Press and hold the and for 10 seconds.

» The display turns off, the product locks or unlocks.

6.4 Functional check

Check the flow controller for function by carrying out the instructions below:

1. Unlock the flow controller (refer to chapter 6.3).
2. Check the operating display on the flow controller.
 - » The current flow must be above the switching point (refer to chapter 6.2)
3. Check the measuring and control system spaliQ Professional or GENO-CPR-tronic 02 for proper operation.
 - » **No flow Filtrate** must not appear on the display.
 - » The dosing pumps must be enabled.
4. Restrict the flow of the filtrate pipe during operation until the flow is below the switching point of the flow controller.
5. Check the operating display on the flow controller.
 - » The LED to indicate the switching point lights up red and only the LEDs on the left of the switching point are illuminated in green.
6. Check the measuring and control system spaliQ Professional or GENO-CPR-tronic 02 for proper operation.
 - » **No flow Filtrate** must be displayed.
 - » The dosing pumps must be switched off.
7. Open the flow restrictor of the filtrate pipe.
8. Repeat steps **2** and **3**.
9. Lock the flow controller (refer to chapter 6.3).



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

6.5 Changing the switching point

In the cases below it makes sense to change the switching point:

- The flow fluctuates considerably or pulsates
- A quicker response time is desired
 - Low switching point = Quick reaction in case the flow increases
 - High switching point = Quick reaction in case the flow decreases

1. Briefly press  or .

» The LED for the switching point flashes.

2. Press  or  several times.

Each press of the button slides the flow by half an LED into the indicated direction.

» As soon as a button is pressed, the LEDs light up. The LEDs of the current switching point are flashing.

» If no button is pressed for 2 seconds, the flow controller takes over the set new value and goes into operating mode.

6.6 High-flow and low-flow adjustment

6.6.1 High-flow adjustment

1. Allow a normal flow to flow in the system
2. Switch on the supply voltage.
 - » All LEDs light up and go out again in steps.



During this time, the output is closed.


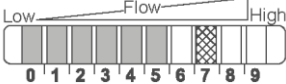
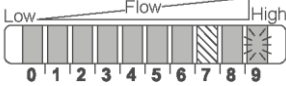
- » The device is in operating mode.
- 3. Press the ► button and hold it.
 - » LED 9 lights up and flashes after about 5 seconds.
- 4. Release the ► button.

6.6.2 Low-flow adjustment



Low-flow adjustment must take place after high-flow adjustment.

1. Allow a minimum flow to flow in the system or arrange for the flow to stop.
2. Press the ◀ button and hold it.
 - » LED 0 lights up and flashes after about 5 seconds.
3. Release the ◀ button.
 - » The device takes over the new value and goes into operating mode.
 - » The device is adapted to the flow conditions. At normal flow, the device shows the following:

Example	Display
<p>Example 1: Device adjusted</p>	
<p>Example 2: Device not adjusted Normal flow undershoots range of the display</p>	
<p>Example 3: Device not adjusted The normal flow exceeds the range of the display (LED 9 is flashing)</p>	

7 Maintenance and repair

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



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



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

- ▶ Only use genuine spare and wearing parts from Grünbeck.
- ▶ Use the personal protective equipment.
- ▶ Depressurise the product.

7.1 Cleaning

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

7.2 Maintenance



Maintenance must be carried out by Grünbeck's technical service personnel only.

Regular maintenance increases the operational reliability of your product.

- ▶ Conduct maintenance at least every 6 months.
- 1. Check the flow controller for deposits.
- 2. Clean the flow controller and proceed as follows to do so:
 - a De-energise the system.
 - b Depressurise the filtrate pipe.
 - c Loosen the union nut of the flow controller and remove the flow controller from the compression-type fitting.
 - d Clean the tip of the sensor with a clean, soft cloth. Firmly adhering deposits (e.g. scale) can be removed with a commercially available vinegar cleaner
 - e Rinse the tip of the sensor with clear water.
 - f Lubricate the thread on the compression-type fitting.
 - g Place the flow controller on the compression-type fitting.
 - h Tighten the union nut hand-tight.
 - i Align the flow controller.
 - j Tighten the union nut with a maximum of 2 turns.
- 3. Perform a functional check (refer to chapter 6.4).

7.3 Spare parts

For an overview on the spare parts, go to our spare parts catalogue at www.grünbeck.com. You can order the spare parts from your local Grünbeck representative.

8 Troubleshooting

- ▶ Use the personal protective equipment.
- ▶ Depressurise the product.

8.1 Fault messages on the flow controller

Display	Explanation	Remedy
All LEDs are flashing red	Adjustment not possible	▶ Check flow and installation, repeat readjustment, if necessary (refer to chapter 6.6).
	Incorrect installation of the flow sensor	▶ Check that all requirements have been met (refer to chapter 4.1.1).
	Difference between maximum flow and minimum flow is too low	▶ Increase the flow difference and carry out high-flow and low-flow adjustment again.
	Sequence of high-flow and low-flow adjustment not complied with	▶ Carry out both adjustment processes again in the correct order.
LEDs are flashing orange	Line break or short-circuit in the sensor line	▶ Check the connection between the flow sensor and the evaluation unit and replace the parts, if necessary.
Operating display and red LEDs are flashing alternately	Short-circuit at the switching output	▶ Rectify the short-circuit.
Display OFF	Voltage supply too low (< 19 V) or has failed	▶ Establish the voltage supply.
Flow controller does not respond to a press of the button	Flow controller locked	▶ Unlock the flow controller (refer to chapter 6.3).

Display	Explanation	Remedy
	Flow controller defective	▶ Replace the flow controller.
Operating display does not show anything	Feed line for power supply to control box of flow controller defective.	▶ Replace the feed line.
	M12 sensor cable defective	▶ Replace the sensor cable.
	Switch box of flow controller defective	▶ Replace the switch box.
	Flow controller defective	▶ Replace the flow controller.

8.2 Fault messages on the measuring and control systems spaliQ Professional and GENO-CPR-tronic 02

Observation	Explanation	Remedy
No filtrate flow, despite of flow in the filtrate pipe	Flow impaired or restricted	▶ Check whether the filtrate pipe is damaged or locked.
	Connecting line between measuring and control system and switch box of flow controller defective	▶ Replace the connecting line.
	Flow controller defective	▶ Replace the flow controller.
	Feed line for power supply to control box of flow controller defective.	▶ Replace the feed line.
	Input of flow monitoring of filtrate on the measuring and control system spaliQ Professional or GENO-CPR-tronic 02 defective	▶ Replace the measuring and control system spaliQ Professional or GENO-CPR-tronic 02
	M12 sensor cable defective	▶ Replace the sensor cable.

Observation	Explanation	Remedy
	Switch box of flow controller defective	▶ Replace the switch box.
No flow in filtrate pipe, but no fault message No filtrate flow	Connecting line between measuring and control system spaliQ Professional or GENO-CPR-tronic 02 and switch box of flow controller defective	▶ Replace the connecting line.
	M12 sensor cable defective	▶ Replace the sensor cable.
	Flow controller defective	▶ Replace the flow controller.

9 Disposal

- ▶ Obey the applicable national regulations.

Packaging

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

Product



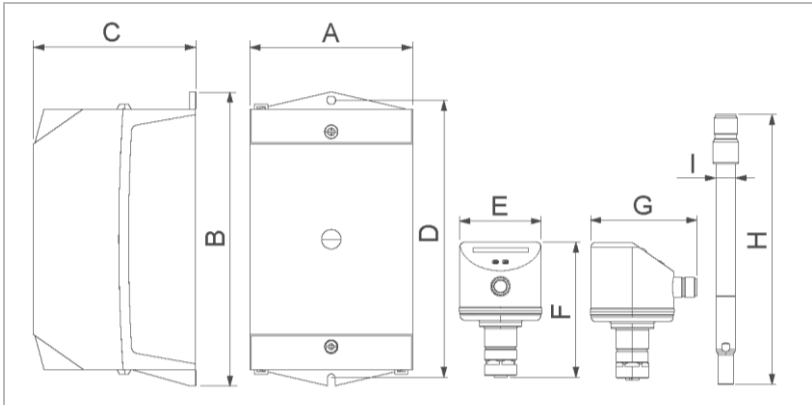
If this symbol (crossed-out wheellie bin) is on the product, this product or its electrical and electronic components must not be disposed of as household waste.

- ▶ 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.de.

10 Technical specifications



Dimensions and weights

A	Width of switch box	mm	100
B	Height of switch box	mm	160
C	Depth of switch box	mm	100
D	Distance between holes of switch box	mm	171
E	Diameter of evaluation unit	mm	50
F	Height of evaluation unit	mm	83
G	Depth of evaluation unit	mm	64
H	Length of flow sensor	mm	132
I	Diameter of flow sensor	mm	10
	Connection thread of evaluation unit		M12 x 1
	Shipping weight, approx.	kg	1.3

Connection data

Power supply	V/Hz	100 – 240/50 – 60
Rated current	A	0.2
Protection/protection class		IP65/

General data

Ambient temperature	°C	5 – 40
Max. humidity (non-condensing)	%	≥ 70
Order no.		100235590000

11 Operation log



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

Accessories Flow controller

Serial no.: _____

11.1 Start-up/commissioning log

Customer	
Name:	_____
Address:	_____
Remarks	

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

EU Declaration of Conformity

In accordance with the EU Low-Voltage Directive 2014/35/EU



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.

This certificate becomes void if the system is modified in any way not approved by us.

Flow controller

Serial no.: Refer to type plate

The aforementioned system also complies with the following directives and provisions:

- EMC (2014/30/EU)
- Directive on the Restriction of Hazardous Substances RoHS (2011/65/EU)

The following harmonised standards have been applied:

- DIN EN 12100:2011-03
- EN 61000-6-2:2005+AC:2005
- EN 61000-6-3:2007+A1:2011+AC:2012
- EN 61000-6-4:2007+A1:2011
- EN 61204-3:2000
- EN 55024:2010
- EN 55032:2012+AC:2013
- EN 62368-1:2014

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Hoechstaedt/Germany, 06/09/2023

By power of attorney Tobias Vogl

Management Research, Development & Construction

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Publisher's information


Technical documentation

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

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