Operating Manual
Flow Limiter BA, BB, BC, BF
Mechanical flow limiter

- High reliability
- Installation in any orientation
- Suitable for hot water
- Thread connection, flange connection

B-EN_BA-BB-BC-BF-20211021

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These instructions facilitate the safe and efficient handling of a flow limiter (referred to as "device" in the following). The instructions are an integral part of the device and must be kept within easy reach for the personnel in the immediate vicinity of the device at all times. Personnel must carefully read and understand these instructions before commencing all work. The basic requirement for safe work is adherence to all safety and handling instructions stipulated in these instructions. The local accident-prevention regulations and general safety standards and regulations for the field of application of the device also apply. Illustrations in these instructions are provided to aid general understanding and might deviate from the actual model. No claims can be derived from any such differences.

Limitations of liability
All details and instructions in this manual have been compiled under consideration of the valid standards and regulations, the current state-of-technology and our many years of knowledge and experience. The manufacturer does not accept any liability arising from:

- non-observance of any details in these instructions
- improper use of the device, or use that is not in accordance with these instructions
- use of non-trained personnel
- unauthorized retrofitting or technical changes that have not been authorized by the manufacturer
- use of non-approved replacement parts

The duties and obligations agreed upon in the delivery contract apply in full, as well as the general terms and conditions, the terms of delivery by the manufacturer and the valid legal regulations applicable at the conclusion of the contract.

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Content

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1. Overview
1.1 Short descriprion

Fig. 1: Flow limiter BF

The flow limiters of the series BA, BB, BC and BF limit the flow of water through pipelines. They keep the flow rate constant in case of fluctuations in the flow rate. The flow limiters operate purely on a mechanical principle and do not require any auxiliary electrical energy.

The flow limiters use a regulating star. This regulating star is deflected if the pressure difference in the device increases. This limits the cross-section where the flow can pass through. The flow limiters work in a control pressure range between 2 and 10 bar / 29 and 145 psi.

1.2 Warranty and guarantee provisions
Warranty and guarantee provisions are contained in the general terms and conditions of the manufacturer.

1.3 Customer service
For technical support, please contact our customer service department. Furthermore, our staff is always interested in receiving new information and experiences gained from application of the device, which may be useful in improving our products info@schmidt-messtechnik.de).

2. Safety
This chapter provides an overview of important safety aspects required for optimum protection of personnel as well as for safe installation and safe operation of the device.

Non-observance of the handling and safety instructions listed in this manual may result in hazardous/dangerous conditions and in damage to property.

2.1 Explanation of symbols
Safety instructions
Safety instructions in this manual are marked by symbols. The safety instructions are preceded by signal words that indicate the level of danger/ hazard.

To prevent accidents or injury to persons as well as damage to property, always observe the safety instructions and proceed carefully.

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Danger!

This combination of symbol and signal word indicates an immediate, dangerous condition that results in death or serious injury if it is not avoided.

Warning!

This combination of symbol and signal word indicates an immediate, dangerous condition that results in death or serious injury if it is not avoided.

Caution!

This combination of symbol and signal word indicates a possibly dangerous condition that might result in minor or slight injury if it is not avoided.

Notice!

This combination of symbol and signal word indicates a possibly dangerous condition that might result in damage to property and to the environment if it is not avoided.

Tips and recommendations

This symbol emphasizes useful tips and recommendations as well as information for efficient and failure-free operation.

Signs used in these instructions
The following signs and highlightings are used in these instructions to identify handling instructions, the description of results, lists/enumerations, references and other elements:

1. Designates step-by-step handling instructions

⇒ Designates a state or an automatic sequence as a result of a specific operating step

- Designates randomly ordered enumerations and list entries

↳ Designates references to chapters in these instructions

2.2. Correct use in accordance with these instructions
The device is designed and constructed exclusively for the intended use described herein.

Danger!

The Fahrenheit and PSI measurement units in these operating instructions have been rounded down for easier readability!

Always refer to the metric units for calculations and dimensioning of e.g. the pipe system!

Table 1: Correct use in non-hazard areas
The flow limiter serves exclusively to limit or regulate the continuous flow of water within a temperature range of 0 °C to 200 °C / 32 °F to 392 °F. The required control pressure is between 2 and 10 bar / 29 psi and 145 psi. The maximum operating pressure is 10 bar / 145 psi.

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Correct use in explosion-hazard zones

Danger!

This device is not certified for the use in explosion-hazard zones!

Warning!

Danger due to incorrect use!
Incorrect use of the flow limiter may result in dangerous conditions

- Use the flow limiter only within the stipulated performance limits
- Do not subject the flow limiter to severe temperature fluctuations
- Do not use the flow limiter with quick-acting valves
- Do not use the flow limiter with solenoid valves
- Do not subject the flow limiter to vibrations
- Do not subject the flow limiter to pressure surges
- Do not use the flow limiter with media containing solids or abrasives
- Use the flow limiter only with media previously approved by the manufacturer

All claims for damages due to incorrect usage are excluded.

2.3 Special precautions
To reduce health risks and prevent dangerous conditions, observe the safety instructions listed here as well as the safety instruction in the other chapters of these Operating Instructions.

These operating instructions cannot cover all conceivable dangers because many dangers arise, not from the device itself, but from the respective media flowing through it. Always observe the appropriate safety data sheets when using hazardous media!

2.3.1 Mechanical hazards

Warnung!

Risk of injury due to fractured housing and leakage!
Unauthorized temperatures or excessive pressure may cause the flow limiter body or the process connections to burst. Injuries may be caused by flying parts and escaping media.

- Keep within the stipulated operating conditions
- Wear personal protective equipment
- Avoid severe temperature fluctuations
- Avoid pressure surges

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Warning!

Risk of injury on sharp edges and pointed corners!
Sharp edges and pointed corners can cause abrasions and skin cuts

- Proceed with caution when working near sharp edges and pointed corners
- If in doubt, wear protective gloves

If the flow monitor is used for toxic, corrosive or very hot/cold media, there is a risk of serious injury from escaping media.

- Observe details in the safety data sheet of the media
- Comply with the safety, accident prevention and environmental protection regulations appropriate to the media used
- Wear personal protective equipment in accordance with the safety data sheet

2.3.2 Hazards from high or low temperatures

Hot or cold surfaces

Warning!

Risk of injury from hot or cold surfaces!
Surfaces of components may heat up/cool down dramatically due to the media flowing through them. Skin contact with hot or cold surfaces may cause severe skin burn or frostbite.

- Always wear temperature resistant protective work clothing and protective gloves when working near hot/cold surfaces
- Before commencing work, make sure that all surfaces have been cooled down or warmed up to ambient temperature

2.3.3 Hazards caused by media

Hazardous media

Warning!

Risk of injury from hazardous media!

2.4 Personnel requirements

Warning!

Risk of injury due to insufficiently trained and qualified personnel!
If unqualified personnel work on the device or are located within its hazard zone, dangers arise which may result in serious injury and considerable damage to property.

- All work must be performed by qualified personnel only.
- Keep unqualified personnel away from hazard zones.

Authorized personnel is to be restricted to those persons who can be expected to perform their work reliably. Persons whose ability to respond is influenced, e.g. by drugs, alcohol or medication, are not authorized.

Observe the age and occupational regulations at the site when choosing personnel.

The following lists the personnel qualifications for the various areas of activity:

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Qualified personnel
Due to their specialized training, knowledge and experience as well as their knowledge of the relevant standards and regulations, qualified personnel are able to independently perform the work assigned to them as well as to detect and avoid possible risks and dangers.

2.5 Personal safety equipment
Personal safety equipment is used to protect personnel from hazards or dangers that might impair their safety or health during work.

When performing the various tasks at, and with the device, personnel must wear personal safety equipment. Special reference is made of this in the individual chapters within these Operating Instructions. The following provides a description of the personal safety equipment:

- Always wear appropriate personal safety equipment required in the various chapters of these Operating Instructions before commencing work.
- Comply with the personal safety equipment instructions posted within the work area.

Description of personal safety equipment
As specified in the Safety Data Sheet of the medium, protective equipment must be worn when handling hazardous media. In addition, the specifications of the system operator must be followed. If no protective equipment is specified, suitable protective gloves and goggles must be worn.

The protective equipment is used to protect against hazardous media leaks and hazardous media residue in the device.

Goggles

The goggles are used to protect the eyes from flying debris and splashing fluid.

Protective gloves

Protective gloves protect the hands from friction, burns, grazing, abrasion, surface cuts or deeper injuries, as well as from direct contact with hot or cold surfaces.

2.6 Environmental protection

Notice!

Risk to the environment due to improper handling of environmentally hazardous substances!
Serious environmental damage may result if substances harmful to the environment are handled incorrectly, especially if they are disposed of improperly.

- Always observe the instructions listed below on the handling and disposal of substances harmful to the environment.
- If harmful substances are released into the environment, take immediate countermeasures. If there is doubt, contact the local authorities, inform them of the damage and request information on suitable countermeasures to be taken.

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Cleaning fluids
Solvent-based cleaning fluids contain toxic substances. They must never be released into the environment and must be disposed of by a waste management company.

Lubricants
Lubricants such as greases and oils contain toxic substances. They must never be released into the environment and must be disposed of by a waste management company.

2.7 Responsibility of the owner
Owner
The owner is the person who operates the device himself for business or commercial purposes or who cedes such use/application to a third-party and who, during operation of the device, has full legal product stewardship for protection of the user, the personnel or third-parties.

Duties of the owner
The device is used in the commercial sector. The owner of the device is therefore subject to legal obligations pertaining to work safety.

In addition to the safety instructions contained in these Operating Instructions, the safety, accident prevention and environmental protection regulations applicable to the field of application of the device must be observed

In particular, this includes:
- The owner must inform himself regarding the valid health and safety regulations and must perform a risk assessment to additionally determine the risks resulting from the special work conditions arising at the location at which the device is used, especially in regard to the media used. He must then implement these within Operating Instructions for use of the device.
- **For the USA:**
  The "Occupational Health and Safety Act" of 1970 stipulates that it is the duty of the owner to provide a safe workplace. He must hereby ensure that the device is operated and maintained compliant to valid commercial, industry-al, local, federal and state laws, standards and regulations.
- **For Canada**:
  The "Canadian Centre for Occupational Health and Safety Act" of 1978 stipulates that all Canadians have “…a fundamental right to a healthy and safe working environment.” It is therefore the duty of the owner to provide a safe workplace. He must ensure that the device is operated and maintained compliant to valid commercial, industrial, local, provincial, territorial and federal laws, standards and regulations.
- Appropriate to the working conditions and the media used, the owner must affix signs within the working area that inform the user of the hazards and dangers present.
- During the entire period of use of the device, the owner must check periodically to ensure that the Operating Instructions correspond to the current state of regulations, and he must make adjustments as necessary.
- The owner must clearly regulate and deter-mine responsibilities for installation, operation, troubleshooting, maintenance and cleaning.
- The owner must fit/retrofit suitable safety equipment within the complete plant/system.
- The owner must ensure that all staff/personnel have thoroughly read and understand these instructions before handling the device. Additionally, he must train the personnel at regular intervals and warn them of dangers. The owner must provide the personnel with the required safety equipment and must instruct them that its wear is mandatory

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Additionally, the owner is responsible for ensuring that the device is always kept in a technically perfect condition. The following therefore applies:

- The owner must implement suitable safety measures, appropriate to the media used.
- Different media have different severities of influence on the soiling and wear of/to the device. The owner must set suitable maintenance intervals, depending on the media flowing through the device..
- The owner must ensure that the maintenance intervals described in these Operating Instructions are adhered to at all times.
- The owner must ensure that the device is completely free of all residual media before disposal. Remains of corrosive or toxic materials must be neutralized.

3 Design and function
3.1 Overview

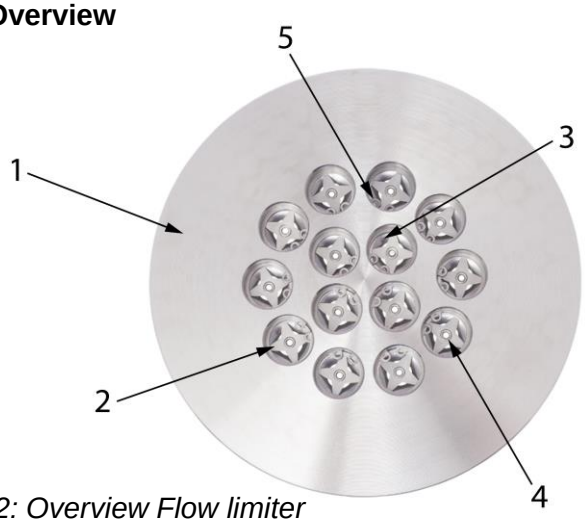

Fig. 2: Overview Flow limiter
1 Device body (BF = Flange)
2 Regulating star
3 Cone
4 Rivet
5 Retaining ring

3.2 Device description
The flow limiters of the series BA, BB, BC and BF limit the flow of water through pipelines. They keep the flow rate constant in case of fluctuations in the flow rate. The flow limiters operate purely on a mechanical principle and do not require any auxiliary electrical energy.

The flow limiters use a regulating star. This regulating star is deflected if the pressure difference in the device increases. This limits the cross-section where the flow can pass through. The flow limiters work in a control pressure range between 2 and 10 bar / 29 and 145 psi.

Applications for the flow limiters BA, BB, BC and BF are e. g. water supply for machines and equipment, irrigation, water treatment. The flow limiter ensures that an almost constant flow rate is achieved.

4 Transport, packaging and storage
4.1 Safety instructions for transport

Improper transport

Notice!

The device could be damaged if transported improperly!
Objects to be transported may fall or overturn if transported improperly. This may result in damage to the device and/or property.

- Proceed carefully when unloading transported packages, both on delivery and when transporting inhouse. Observe the symbols and instructions on the shipping box
- Remove packaging material just prior to assembly

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4.2 Transport inspection
On delivery, make an immediate check for completeness and check for transport damages.

If there are any visible external transport damages, proceed as follows:
- Do not accept the delivery
- Note the damage in the shipping documents or on the delivery note of the transporter and have the driver confirm by signature
- Initiate a claim for damages

Make a claim for each fault as soon as it is detected. Claims for damages can only be invoked within the valid claim periods.

4.3 packaging
Packaging
The packaging serves to protect the individual components from transport damages, corrosion and other damages until they are installed. Do not discard the packaging and only remove the device from the shipping box immediately before installation.

Handling packaging materials
Dispose of packaging material in accordance with the valid legal regulations and local ordinances.

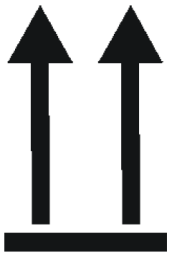
Notice!

Danger to the environment due to incorrect disposal!

Packaging is made of valuable raw materials and can be reused in many cases or usefully processed and recycled. Improper disposal of packaging materials may pose a danger to the environment.
- Dispose of packaging material in an environmentally safe manner
- Comply with the local disposal regulations. If necessary, have the packaging disposed of by approved specialists.

4.4 Symbols on the shipping box

Top



The arrows indicate the top side of the package. They must always point upwards, otherwise the content may be damaged.

Fragile

Designates packages with breakable or damageable contents.
Handle the package carefully and do not allow it to fall or be subjected to jarring or severe vibration.

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4.5 Storage
Storing the packages
Store the packages under the following conditions:
- Do not store in the open
- Store dry and dust-free
- Do not subject to any aggressive media
- Protect from direct sunlight
- Avoid mechanical vibrations and shocks
- Storage temperature: 0 to 35 °C / 32 °F to 95°F
- Relative humidity: max. 60 %
- Do not stack
- If storing for longer than 3 months, regularly check the general condition of all parts as well as of the packaging.

Storage instructions in addition to the instructions listed here may be listed on the packages. Follow these instructions also.

5 Installation and initial startup
5.1 Safety
Incorrect installation and initial startup

Warning!

Risk of injury due to incorrect installation and initial startup!
Incorrect installation and initial startup may result in severe injury and considerable damage to property..
- Ensure that the site is sufficiently cleared of obstructions before commencing work
- Handle open or sharp edged components carefully
- Ensure that the assembly location is orderly and clean! Parts and tools lying about or on top of each other are potential causes for accidents
- Assemble components properly. Observe the stipulated tightening torque of screws
- Before initial startup, make sure that all installation work has been performed and completed in compliance with the specifications and instructions in these Operating Instructions

5.2 Requirements at the place of installation
The place of installation must meet the following requirements:
- The device must not be under water.
- The surrounding area must be sufficiently illuminated.
- There must be sufficient space to prevent accumulation of trapped heat.
- The device must not be installed as a supporting part in a pipe construction.
- The device may not have anything affixed to, or suspended from it.
- The flow limiter must be installed in such a way as to preclude damage by outside force. It must be ensured that the flow limiter cannot be damaged. If necessary, install an appropriate impact protection device.
- A suitable process connection for the device must be available.

5.3 Preparatory work
The following requirements must be met during installation to ensure correct functioning of the flow limiter:

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Warning!

Danger due to incorrect installation!
If the requirements listed above are not met when installing the flow limiter, dangerous/ hazardous conditions may arise.
- Do not install the flow limiter as a supporting part in a pipe system
- Do not use the flow limiter with quick-acting valves
- Do not use the flow limiter with solenoid valves

Unimpeded flow sections

Notice!
Regulation inaccuracy due to incorrect installation!
The regulation accuracy of the flow limiter is influenced by its position within the pipe system. Changes in cross-section, branch-offs or bends in the pipe system impair regulation accuracy.
- Ensure that the unimpeded flow sections are maintained
- Never reduce the pipe diameter immediately before the device

We recommend unimpeded flow sections, type BS-228.

- An unimpeded flow section of 10 x DN (rated width) must be maintained before the device.
- An unimpeded flow section of 5 x DN (rated width) must be maintained after the device.

Unimpeded outlet
If the pipe system ends at an unimpeded outlet, the flow limiter must not be installed directly in front of the opening. The device must always be completely filled with media to ensure regulation accuracy.

We recommend a Type SF, SFD or SFM strainer.

Prepare the device

Notice!

Risk of damage to property due to contamination!
Contamination and deposits may impair the free movement of the regulating star, thereby damaging the device.
- Ensure that there are no foreign particles in the device
- Ensure that the device is not soiled
- Do not use any medium containing solids

Due to quality assurance measures, there may be some test medium (water) residue in the device.
1. Unpack the device and visually inspect the device to ensure that it is free of packaging materials
2. Examine the device for residue of test medium and drain, if necessary
3. Check the device for soiling and flush with clean medium, if necessary

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3. Überprüfen Sie das Gerät auf Verschmutzungen und spülen Sie es ggf. mit sauberem Medium durch

5.4 Installation in the pipeline

Warning!

Risk of injury from pressurized lines!
If the pipeline is under pressure when installing the device, severe injury may result.

- Depressurize the pipeline before installing the device

Warning!

Risk of injury from hot or cold surfaces!
Pipelines can heat up or cool down dramatically due to the media flowing through them. Skin contact with hot or cold surfaces may cause severe skin burn or frost bite.

- Before commencing work, ensure that the system has been controlled to a temperature range between 0 and 40 °C / 32 and 104 °F.
- Do not touch any parts of the system that are either very hot or very cold.
- Always wear heat-resistant or cold-resistant protective work clothing and protective gloves when working near hot or cold surfaces

Warning!

Risk of injury from media in the pipe system
If the pipeline contains toxic or other hazardous media, severe injury may be caused by escaping media.

- Before installation, ensure that the pipeline is empty and does not contain any media residue
- Always wear personal protective equipment during installation
- Provide suitable draining devices (drip pans, collection tank, etc.)

Notice!

Installation of filters in the pipeline
If the medium is not free of contamination, filters must be installed.

Notice!

Risk of damage to device due to contamination in the pipeline!
Dirt and foreign particles entering the device can damage the device and impair its operation.

- Ensure that the pipeline is clean before installing the device
- If necessary, flush the pipeline with clean medium before installation

A suitable sealant must be selected, depending on the condition/composition of the pipelines, the medium and the operating and environmental conditions..

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Installing the device in the pipe system
Personnel:
- Qualified personnel

Protective equipment:
- As specified in the Safety Data Sheet of the medium, protective equipment must be worn when handling hazardous media. In addition, the specifications of the system operator must be followed. If no protective equipment is specified, suitable protective gloves and goggles must be worn.
- Protective gloves
- Goggles

1. Properly seal the pipeline
2. Install the device in the pipeline using a suitable tool. Observe the direction of flow on the device body

5.5 Initial startup
The following steps must be taken before initial startup and any subsequent startup (e.g. after removal and installation during maintenance).

Warning!

1. Ensure that the plant is operating vibration-free. Vibrations could destroy the device. This may result in serious injury to the user.

Warning!

2. Ensure that the medium is flowing continuously. Pulse-like staggered loads could destroy the device. This may result in serious injury to the user.

Notice!

3. Completely fill the pipelines. Partial filling(s) may result in malfunctions and damage to the device.

Notice!

4. Vent the pipeline. If there are air pockets in the line during the measurement, this could result in damage to the device caused by hydraulic shock. This may cause malfunctions.

Notice!

5. Ensure that the plant is operating without cavitation. Cavitation may result in malfunctions and damage to the device.

The static pressure at the flow limiter inlet must always be greater than or equal to the pressure at the flow limiter outlet. The pressure difference between the inlet pressure and the outlet pressure (control pressure) must not exceed 10 bar / 145 psi. To ensure that the flow limiter works properly, a minimum control pressure of 2 bar / 29 psi is required.

6 Operation
6.1 Operation basics
The flow limiter limits the flow through the pipe system. Upon purchasing the device, the flow rate has to be specified. Setting or reading-off the flow rate on the device is not possible.

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7 Troubleshooting
This chapter describes possible malfunctions of the device, their causes and repair.

If malfunctions persist or increase, shorten the maintenance interval to meet the actual operating conditions.

For malfunctions not described in this chapter, please contact the manufacturer.

7.1 Safety
Work performed incorrectly to remedy a malfunction

Warning!

Risk of injury due to incorrect repair of malfunction!
Work performed incorrectly may result in severe injury and considerable damage to property.
- Ensure that the site is sufficiently cleared before commencing work
- Ensure that the repair location is orderly and clean! Components and tools that are lying about or on top of each other are potential causes of accidents
- If components have been removed, observe correct assembly procedures. Reinstall all fixing/fastening elements and observe the prescribed tightening torque for the screws
- Before placing the device back into operation, ensure that all work has been performed and completed in compliance with the specifications and instructions in these Operating Instructions

Conduct in case of malfunction
The complete machine or system may be unsafe if there is a defect at the flow limiter (e.g. fractured housing).
The following always applies:
1. In case of malfunctions that present an immediate danger to persons or valuables, proceed according to the valid emergency plans for the system
2. Determine the cause of the malfunction
3. Before repair, ensure that there is no danger to persons from escaping media
4. If necessary, allow the pipeline and device to cool down or to warm up before commencing work
5. Malfunctions must be corrected by qualified personnel

The following troubleshooting guide provides an indication of who is qualified to repair the fault .

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7.2 Troubleshooting guide

Fault description	Cause	Remedy	Personnel
No flow through the pipe system	Pipe system is soiled	■ Clean the pipe system	Qualified personnel
	Flow limiter is soiled	■ Clean the flow limiter	Qualified personnel
Flow rate too low	Reulating pressure too low	■ Increase the regulating pressure	Qualified personnel
	Flow limiter is soiled	■ Clean the flow limiter	Qualified personnel
	Regulating star is damaged	■ Replace the flow limiter	Qualified personnel
Flow rate is too high	Regulating pressure is too high	■ Decrease the regulating pressure	Qualified personnel
	Flow limiter is soiled	■ Clean the flow limiter	Qualified personnel
	Regulating star is damaged	■ Replace the flow limiter	Qualified personnel

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8 Maintenance
8.1 Safety
Maintenance work performed incorrectly

Warning!

Risk of injury due to maintenance work performed incorrectly!
Maintenance work performed incorrectly can result in severe injury and considerable damage to property.

- Ensure that the site is sufficiently cleared before commencing work.
- Ensure that the repair location is orderly and clean! Components and tools that are lying about or on top of each other are potential causes for accidents.
- Before placing the device back into operation ensure that all work has been performed and completed in compliance with the specifications and instructions in these Operating Instructions.

8.2 Maintenance table
Maintenance interval and replacement of defective parts

Notice!

- Disassembling the device is prohibited! Disassembling the device will void the warranty!
- Disassembly and replacement of defective parts may only be performed by the manufacturer! Only maintenance work is allowed, which does not require disassembly.

The device must be returned to the manufacturer for maintenance requiring disassembly.

The following maintenance work can be performed without disassembling the device:

Intervall	Maintenance work	Personnel
As required	Check the device for any signs of leakage	Qualified personnel
	Clean the device	Qualified personnel

8.3 Removal from the pipe system
The flow limiter must first be removed from the pipe system before performing maintenance.

Warning!

Risk of injury from pressurized lines!
Severe injury may result if the pipe system is under pressure when removing the device.

- Depressurize the system before removing the device

Warning!

Risk of injury from hot or cold surfaces!
Pipelines can heat up/cool down dramatically due to the media flowing through them. Skin contact with hot or cold surfaces causes severe skin burn or frostbite.

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- Before removing the device, ensure that the
- machine or system and the flow limiter have been controlled to a temperature range between 0 and 40 °C
- Do not touch any part of the machine or system that is either very hot or very cold
- Always wear heat-resistant / cold-resistant protective work clothing and protective gloves when working near hot/cold surfaces

Warning!

Risk of injury from media in the pipe system!
If the pipe system contains hazardous media, severe injury may be caused by escaping media.
- Before removing the device, ensure that the pipe system is empty and does not contain media residue
- Always wear personal protective equipment when removing the device

Warnung!

Risk of injury from media residue in the device!
After the pipe system has been emptied, media residue may still be present inside the device. In the case of hazardous media, this could result in serious injury.
- When removing (de-installing the device from the pipe system), always wear personal protective equipment.
- All requirements specified in the media safety data sheet must be observed in accomplishing the work task.
- Residue of hazardous media in the device can result in serious injury**.**

Removing the device from the pipe system
Personnel:
- Qualified personnel

Protective equipment:
- As specified in the Safety Data Sheet of the medium, protective equipment must be worn when handling hazardous media. In addition, the specifications of the system operator must be followed. If no protective equipment is specified, suitable protective gloves and goggles must be worn.

1. Loosen the adapter union of the pipeline using a suitable tool. When doing so, lock the process connection or device body in place with a suitable tool.
2. Secure the device against falling and repeat Step 1 at the other process connection.

8.4 Measures to be taken after maintenance work
Take the following steps after completion of maintenance work and before switching on the device:
1. Check all previously loosened / released screw connections for tightness.
2. Clean the work area and remove all residual materials, packaging, substances or spills.

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9 Disassembly and disposal
After its period of useful life, the device must be disassembled and disposed of in an environmentally safe manner.

9.1 Safety

Warning!

Risk of injury if disassembled incorrectly!
- Ensure that the site is sufficiently cleared before commencing work
- Always wear protective equipment when handling hazardous media residue
- Handle open, or sharp edged components carefully
- Ensure that the workplace is orderly and clean! Components and tools that are lying about or on top of each other are potential causes for accidents
- Disassemble components professionally
- Secure components so that they do not fall or overturn
- If in doubt, contact the manufacturer

9.2 Disassembly
Before starting disassembly:
- Remove operating materials and packaging and dispose of properly.

Notice!

Disassembly of the device is not permitted, except for disposal

Personnel:
- Qualified personnel

Protective equipment:
- As specified in the Safety Data Sheet of the medium, protective equipment must be worn when handling hazardous media. In addition, the specifications of the system operator must be followed. If no protective equipment is specified, suitable protective gloves and goggles must be worn.
- Protective gloves
- Goggles

1. Disassemble the device
2. Clean components properly and remove media residue
3. Dispose in an environmentally safe manner

9.3 Return Materials
9.3.1 Return Materials Authorization
For products being returned, regardless of the reason, the currently valid provisions of the returns policy set by the manufacturer will apply. Return shipments which do not comply with the returns policy may be refused by the manufacturer at the expense of the consignor.

9.4 Disposal
If no return or disposal agreement has been made, recycle disassembled components:
- Scrap metals
- Recycle plastic elements
- Dispose of the remaining components according to their material properties

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Notice!

Danger to the environment due to incorrect disposal!
Potential risk to the environment may arise due to incorrect disposal.
- Have electrical scrap, electronic components, lubricants and other supplies disposed of by approved specialists
- In case of doubt, obtain information on environmentally safe disposal from the local authority or special disposal expert

10 Technical data
10.1 Device data plate
The data plate is on the mechanical part of the flow monitor/flowmeter/flow limiter and contains the following information: manufacturer, device designation, item number, serial number

10.2 Operating data

Control pressure	2 - 10 bar / 29 - 145 psi
Operating pressure max.	10 bar / 145 psi
Media temperature max.	200 °C / 392 °F
Media temperature min.	0 °C / 32 °F
Accuracy	■ up to 2 l/min: ± 15 % of nominal value ■ at 3 l/min and higher: ± 10 % of nominal value

Notice!

It must be ensured that the medium does not freeze.

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10.3 General specifications

BA

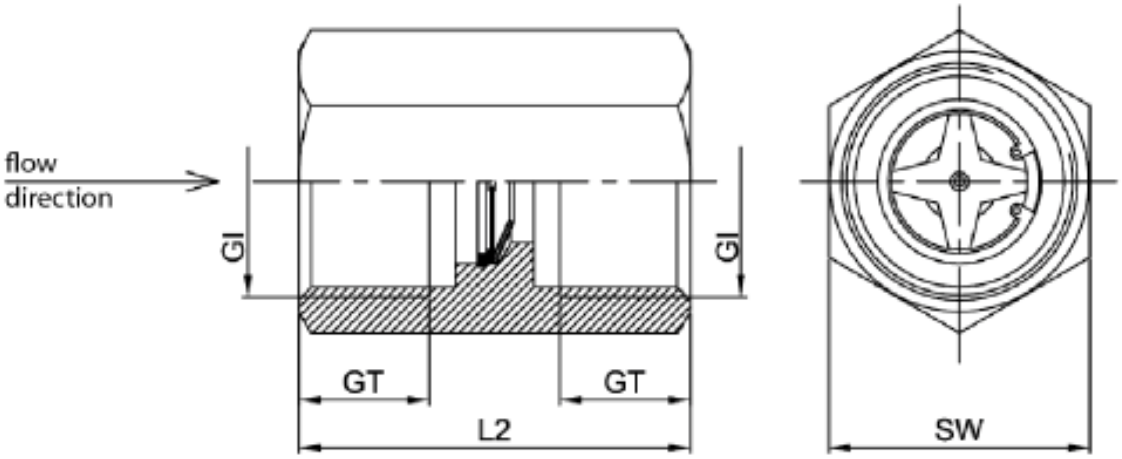

Abb. 4 Dimension sheet BA

Table 2: Overall dimensions BA

Type	Overall dimensions [mm]				Weight ca. [g]
	Gl	GT	SW	L2	
BA	1/2"	15	27	43	72
	3/4"	16,5	32	45	125

Flow rates: 1 - 30 l/min in 1 l/min steps

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BB

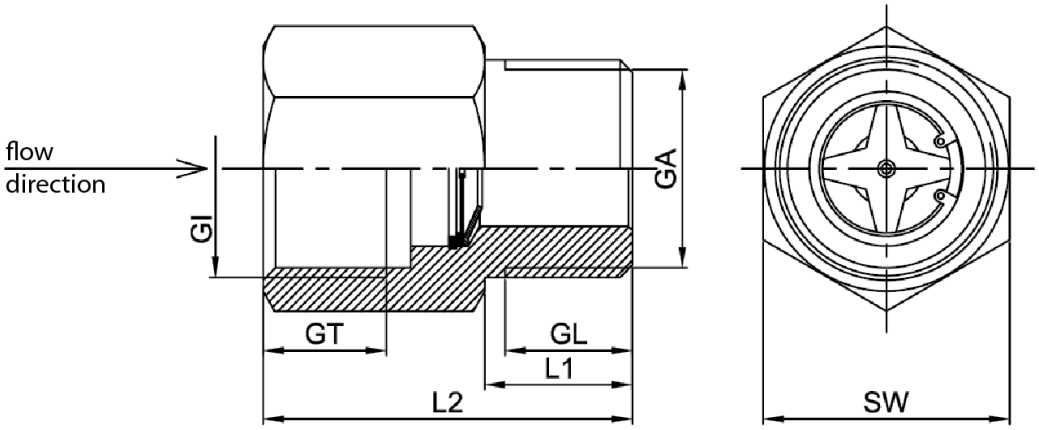

Fig. 5: Dimension sheet BB

Table 3: Overall dimensions BB

Type	Overall dimensions [mm]							Weight ca. [g]
	GI	GA	GT	GL	SW	L1	L2	
BB	1/2"	1/2"	15	14	27	16	43	104
	3/4"	3/4"	16,5	16	32	18	45	135

Flow rates: 1 - 30 l/min in 1 l/min steps

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BC

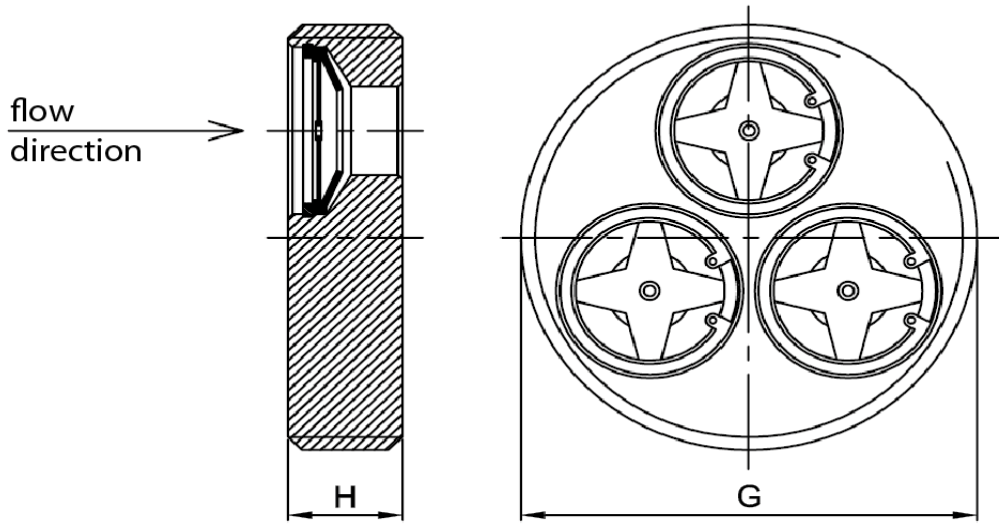

Fig. 6: Dimension sheet BC

Table 4: Dimension sheet BC

Type	Dimension sheet [mm]				Weight ca. [g]
	GI	H	Q_{min}	Q_{max}	
BC	3/4"	12	1	30	25
	1 1/2"	12	3	90	104
	2"	15	5	150	190
	2 1/2"	15	7	210	290
	3"	15	9	270	375

Between Qmin and Qmax the flow rate increases or decreases in 1 l/min steps.

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BF

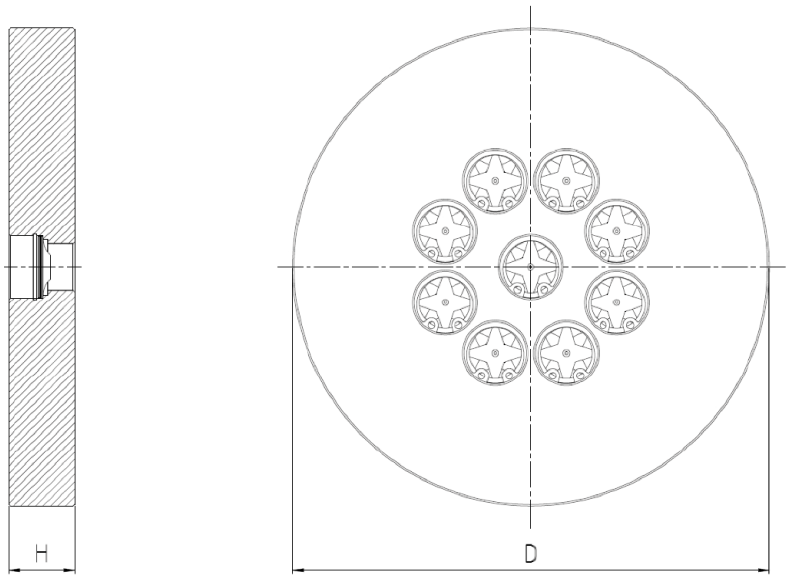

Fig. 7 Dimension sheet BF

Table 5: Overall dimensions BF

Typ	Overall dimensions [mm]							D [mm]
	Nominal width	Standard	No. of regulating stars	Pressure stage intermediate flange	Q_{min}	Q_{max}	H [mm]	
BF	DN 40	DIN / ASME	2	PN 16 / 300 lbs	2	60	19,1	95
	DN 50	DIN	4	PN 16	4	120	18,0	110

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Technical data

Typ	Overall dimensions [mm]							D [mm]
	Nominal width	Standard	No. of regulating stars	Pressure stage intermediate flange	Q_{min}	Q_{max}	H [mm]	
		ASME		300 lbs			23,9	113
	DN 65	DIN/ ASME	7	PN 16 / 300 lbs	7	210	23,9	130
	DN 80	DIN	9	PN 16	9	270	20,0	145
		ASME		300 lbs			23,9	150
	DN 100	DIN	14	PN 16	14	420	20,0	165
		ASME		300 lbs			23,9	182

Between Q_{min} and Q_{max} the flow rate increases or decreases in 1 l/min steps.

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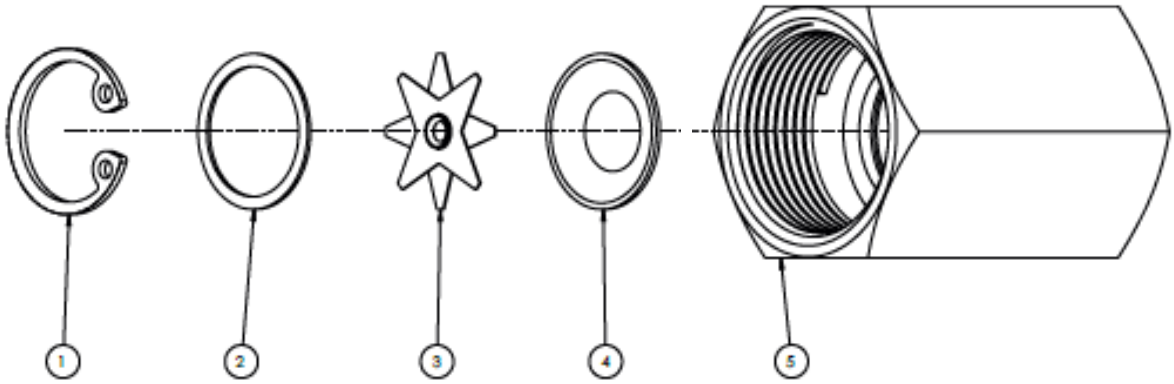
11 Annex
11.1 Replacement parts
The following replacement parts drawings provide an example of the construction of a BA type flow limiter and a BF type flow limiter. The actual configuration may vary depending on the model.



Item	Qty	Description
1	1	Retaining ring
2	1	Spacer ring
3	1	Regulating star
4	1	Cone
5	1	Device body

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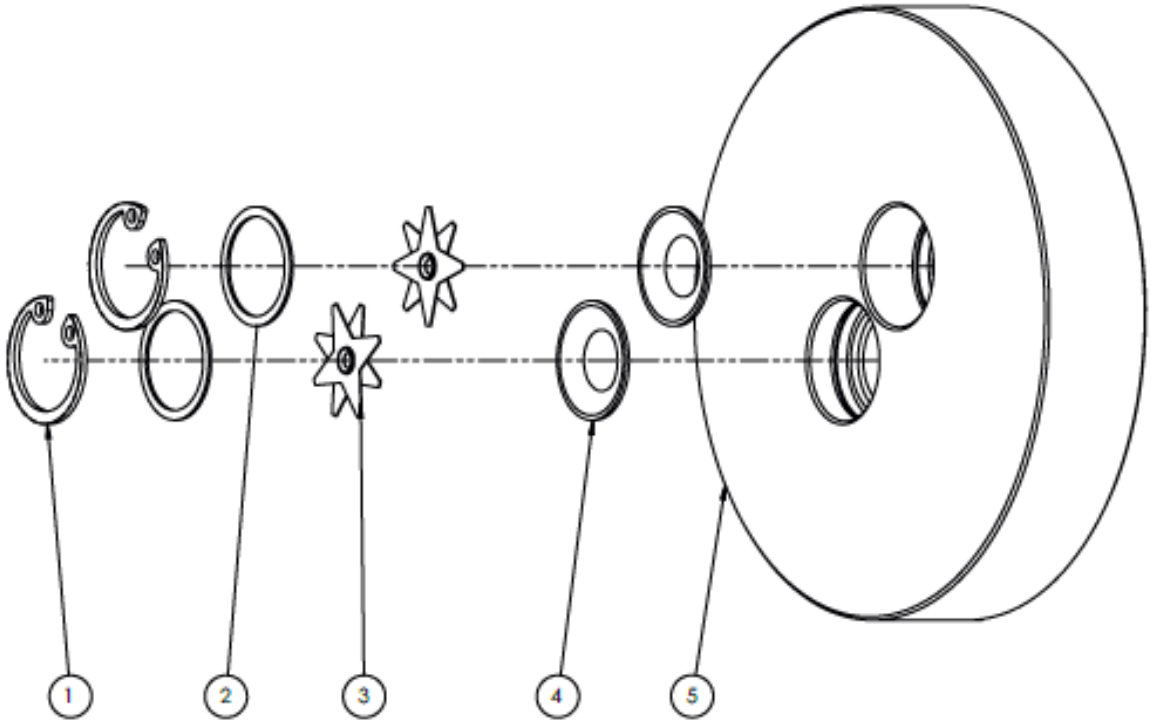

Item	Qty	Description
1	2	Retaining ring
2	2	Spacer ring
3	2	Regulating star
4	2	Cone
5	1	Device body

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11.2 Sealant

Before using a sealant, ensure that it is compatible with the media used and that it can be employed under the given operating conditions.

- Ensure proper seal
- Use a suitable sealant. Liquid sealants will damage the flow limiter if they flow into the device
- Always follow the sealant manufacturers instructions

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Important notes!
Technical changes and errors excepted.

These operating instructions are an integral part of the device and must be kept accessible to the personnel in the immediate vicinity of the device at all times. Persons who install, operate or service this device must read and understand these operating instructions carefully before starting any work. All safety instructions and instructions in this manual must be adhered to. In addition, the local accident prevention regulations and general safety regulations for the area of application of the device as well as all national and international legal regulations and technical standards apply.

All illustrations in this operating manual serve the basic understanding. Photos can be examples of a variant. The illustrations may differ from the actual design of the units. No claims can be deduced from any deviations.

The device has been designed and constructed exclusively for the intended use described here.

Persons installing, operating or maintaining this device must be technically qualified personnel and must comply with the applicable accident prevention regulations.

limitations of liability
All information and instructions in this operating manual have been compiled taking into account the applicable standards and regulations, the state of the art as well as our many years of knowledge and experience. Schmidt Mess- und Regeltechnik accepts no liability for damage due to

- Failure to observe this manual
- Improper use of the device
- Working by untrained personnel with this device
- Unauthorized modifications or technical modifications not approved by the manufacturer
- Use of unauthorized spare parts

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