



Instruction Manual

SB02, SB03, SB04

All metal flow limiter



PKP Prozessmesstechnik GmbH
Borsigstraße 24
D-65205 Wiesbaden-Nordenstadt
Tel.: ++49-(0)6122-7055-0
Fax: ++49-(0)6122-7055-50
Email: info@pkp.de

Safety Information

General Instructions

To ensure safe operation, the device may only be operated in accordance with the specifications in the operating instructions. In use, the regulations for the respective application, as well as the legal and safety regulations must also be observed. Correspondingly the same applies to the use of accessories.

Intended use

The flow limiters of the series SBxx are used for maintaining, or respectively limiting, a constant volume flow of liquids.

The flow limiters of the series SBxx may not be used as the sole means to avoid dangerous situations on machines and systems.

Machines and systems must be designed and constructed so that faulty conditions or malfunctions cannot lead to hazardous situations for the operator.

The flow limiters may be used only within the specified temperature limits stated in the data sheet.

It must be ensured that the medium does not freeze.

The operating pressure specified in the data sheet must not be exceeded at any time.

The predetermined flow direction must be complied with.

The static pressure at the inlet of the limiter (upstream) must always be greater than or equal to the pressure at the outlet of the limiter. The pressure difference between the inlet pressure and the outlet pressure (control pressure) must not exceed 10 bar.

To ensure the specified operation of the flow limiter, a minimum control pressure of 2 bar is required.

Qualified Personnel

The flow limiters of the series Sbxx may only be installed by qualified personnel who are able to use the equipment professionally. Qualified personnel are persons who are familiar with the installations, assembly, start-up and operation of these devices and have the appropriate qualifications for their job.

Functional description

The flow limiters work purely mechanically and require no external power. The cross-sectional area available to the flow medium changes due to changes in pressure, so that the flow rate remains nearly constant. The flow limiters operate in a pressure range between 2 to 10 bar.

Installation

Process connection

Attention:

The following requirements must be adhered to, otherwise the flow limiter or the plant will be damaged:

- a suitable process connection must be available
- check connection size
- check screw-in depth
- use suitable sealants (liquid sealants will damage the flow limiters)
- seal correctly
- the flow direction must be observed.

Preparatory work

- The flow limiter must not be installed as a supporting part in a pipe system
- the medium must not contain any solids
- If necessary, check rust inhibitor and antifreeze before use for compability

Warning:

The following requirements must be met, otherwise the function of the flow limiter will be impaired:

- Changes in cross section, branch-offs or elbows in the piping affect the function. There must be an unimpeded flow section of 10 x DN (rated width) upstream and 5 x DN (rated width) downstream of the flow limiter. Never reduce the pipe diameter immediately before the limiter!

Maintenance and servicing

Due to the small number of moving parts the limiters require little maintenance. However regular function checks and maintenance will not only increase the life and reliability of the device, but of the whole plant or system.

Maintenance intervals depend on

- the degree of contamination of the medium
- the operating conditions (e.g. vibrations)

During maintenance, at a minimum, the following points must be checked:

- check for leaks from the limiters
- check for soiling and contamination

The operator must determine suitable maintenance intervals based on the local conditions and circumstances.

Recommendation:

- In most cases, rinsing with clean medium will be sufficient. In persistent cases (e.g. lime scale deposits) conventional cleaning agents may be used, provided they are not aggressive to the materials of the limiter.

Troubleshooting guide

No flow	Check that medium is flowing through the pipe line
Flow is too low	Control pressure too low: increase control pressure soiling: clean the flow limiter regulating star is defective: replace the flow limiter
Flow too high	Control pressure too high: reduce control pressure soiling: clean the flow limiter regulating star is defective: replace the flow limiter

Technical specifications

Minimum control pressure: 2 bar
(3 bar to limiter at
40 l/min)

Maximum control pressure: 10 bar

Maximum temperature: 200 °C

Measuring accuracy for 1...30 l/min:

by 2 l/min: ± 15 % off flow value

from 3 l/min: ± 10 % off flow value

Accuracy for 40 l/min: ± 15 % off flow value

Materials

Brass version:

Body:	brass
Regulating star:	1.4310
cone:	1.4301
Rivet:	1.4301
Retaining ring:	1.4122

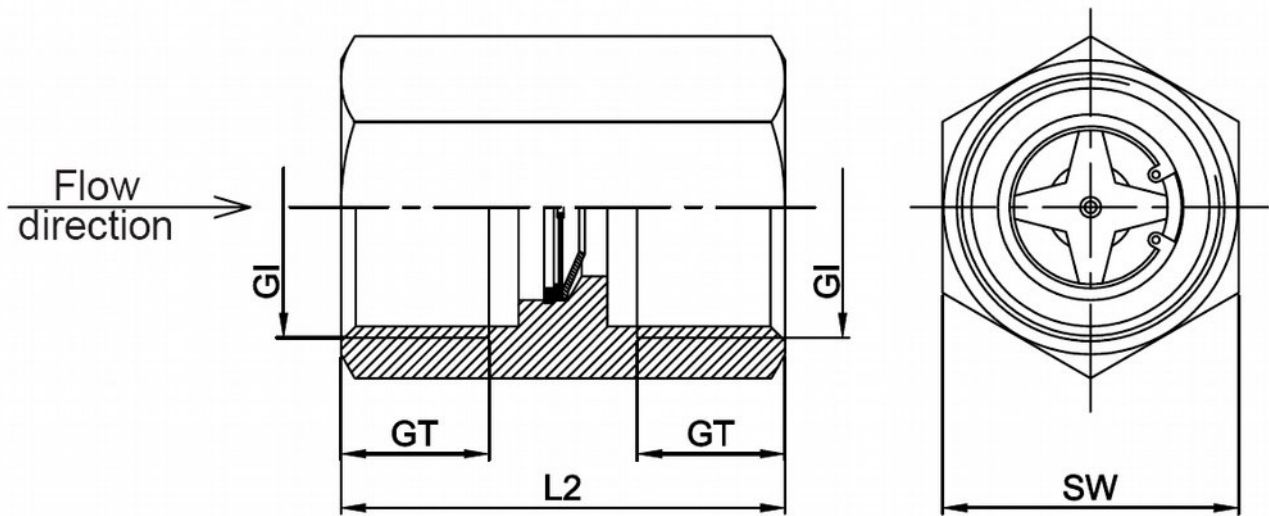
Stainless steel version:

body:	1.4305
Regulating star:	1.4310
cone:	1.4301
Rivet:	1.4301
Retaining ring:	1.4122

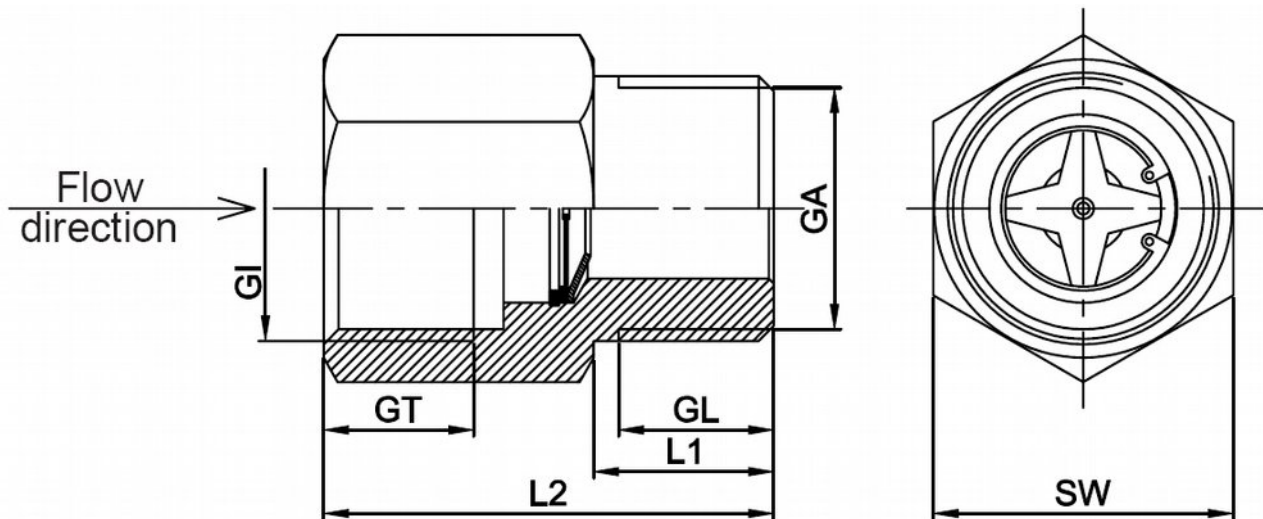
Dimensions

SB02:

Double-sided female thread:

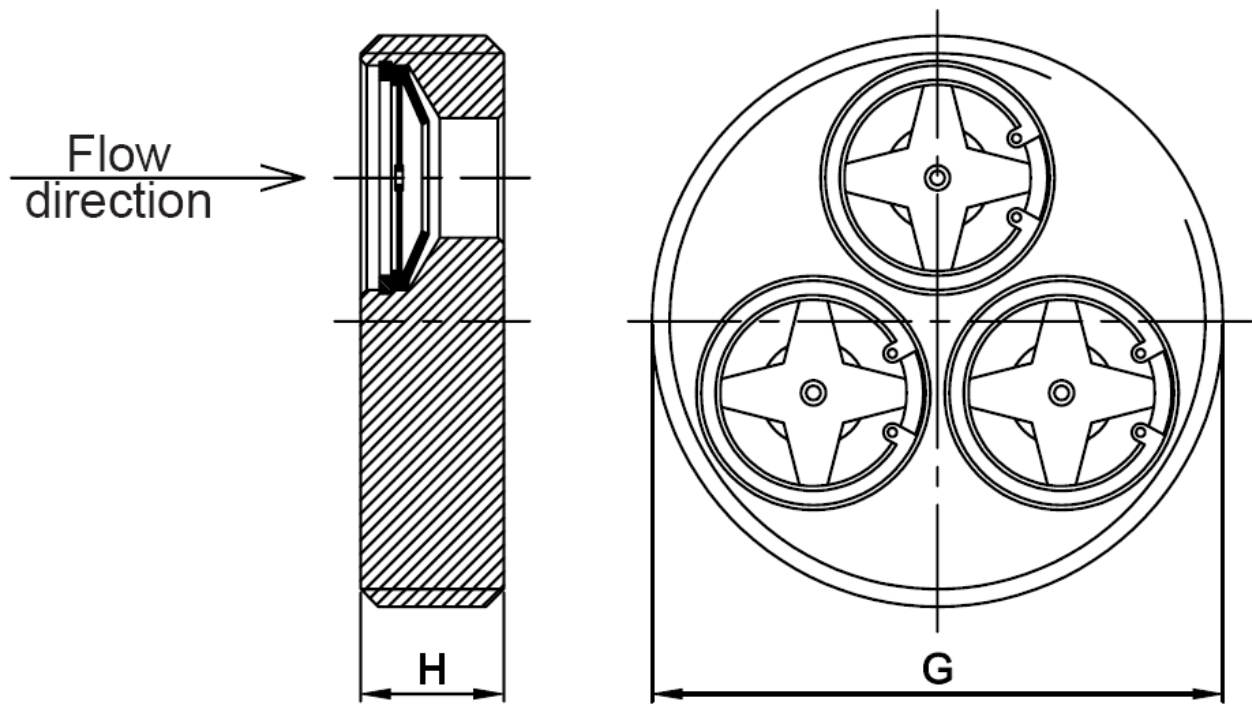


Input female thread, output male thread



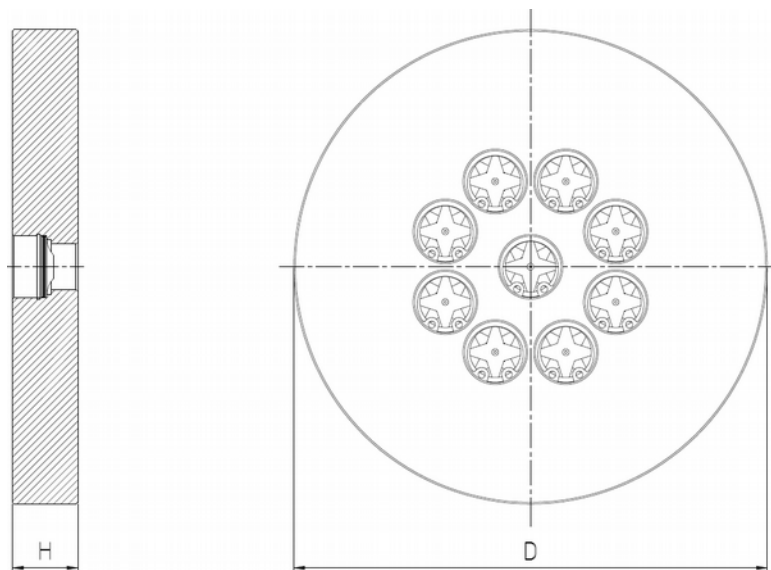
Type	GI	GA	L1	L2	GT	GL	SW
SB02.1	G ½ female	-	-	43	14	-	24
SB02.2	G ¾ female	-	-	45	15	-	30
SB02.3	G ½ female	G ½ male	16	43	14	14	24
SB02.4	G ¾ female	G ¾ male	18	45	15,5	15	30

SB03:



G size of limiter disk (male thread G)	max. number of limiter- elements	Flow rate from ... to (l/min.)	H [mm]
3/4"	1	1...30 and 40	12
1 1/2"	3	3-120	12
2"	5	5-200	15
2 1/2"	7	7-280	15
3"	9	9-360	15

SB04:



Nominal size (DN)	Standard	Number Drilled holes	Pressure stage of Intermediate flange	Minimum flow [l/min]	Maximum flow [l/min]	H [mm]	D [mm]
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
DN 50	ASME	4	300 lbs	4	120	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
DN 80	ASME	9	300 lbs	9	270	23,9	150
DN 100	DIN	14	PN 16	14	420	20,0	165
DN 100	ASME	14	300 lbs	14	420	23,9	182

SB02

Flow Limiter

- without additional power requirements
- saves energy by limiting the flow rate to the actually needed flow
- compact design
- easy to install
- all metal version without-plastic internals
- materials brass or stainless steel
- P_{\max} : 10 bar, T_{\max} : 200 °C



Description:

The model SB02 flow limiters are used to limit the flow of water or waterlike media to a fixed value. They make sure that this fixed flow rate stays constant despite varying upstream or downstream pressures.

Contrary to the commonly used products of this kind the SB02 limiter do not utilize a plastic membrane as limiting device.

Instead the SB02 work with a spring loaded stainless steel variable orifice. Due to the differential pressure across the limiter this variable orifice changes its aperture continuously. Through increasing the orifice size with falling pressure or decreasing it with rising pressure the flow rate will always remain constant.

Typical applications:

For water and waterlike media. Usable in water distribution systems in the industry, in car wash installations, for sanitary applications and in water treatment systems.

Models:

Process connection:

- G 1/2 female thread on both sides
- G 3/4 female thread on both sides
- 3/4" NPT female thread on both sides
- input G 1/2 female thread, output G 1/2 male thread
- input G 3/4 female thread, output G 3/4 male thread
- input 3/4" NPT female thread, output 3/4" NPT male thread

Flow Rates:

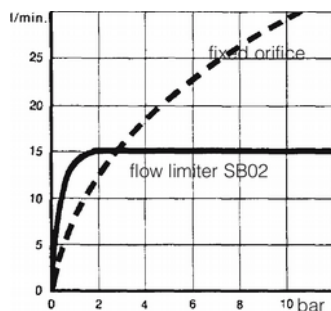
1...30 l/min in steps of 1 l/min and 40 l/min water

The flow rates are defined by the design of the units and cannot be changed by the user.

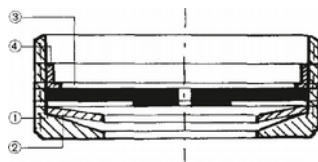
By adding several individual elements, almost any flow rate values can be achieved (see data sheet SB03)

Principle of Operation:

The orifice size decreases proportional to the upstream pressure, therefore the flow rate remains constant.



- 1) housing
- 2) ring
- 3) variable orifice
- 4) fixing ring



Technical Data:

Min. control pressure: 2 bar
(3 bar with limiter at 40 l/min)

Max. operating pressure: 10 bar

Max. media-temperature: 200 °C

Accuracy for 1...30 l/min:

bis 2 l/min: ± 15 % of flow value

ab 3 l/min: ± 10 % of flow value

Accuracy for 40 l/min: ± 15 % of flow value

Order Code:

Order number SB02. 1. 1. 10. 0

Flow limiter

Process connection:

- 1 = G 1/2 female thread on both sides
- 2 = G 3/4 female thread on both sides
- 2N = 3/4" NPT female thread on both sides
- 3 = input G 1/2 female, output G 1/2 male
- 4 = input G 3/4 female, output G 3/4 male
- 4N = input 3/4" NPT female, output 3/4" NPT male

Materials:

- 1 = brass
- 2 = stainless steel 1.4305, 1.4310, 1.4301

Flow rates:

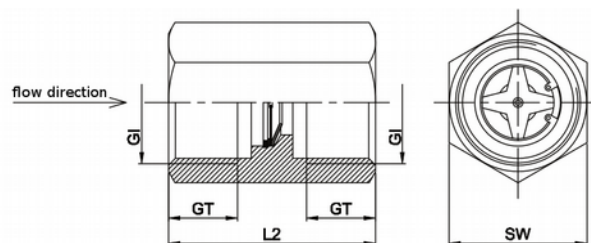
- 01...30 = flow rate in l/min
- 40 = 40 l/min

Options:

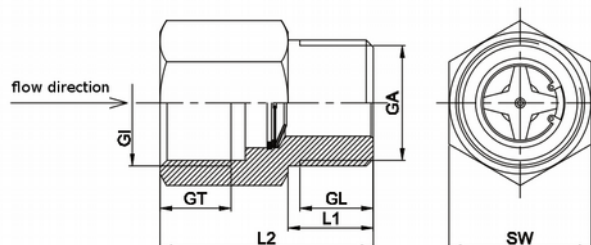
- 0 = without
- 1 = please specify in plain text

Dimensions:

Female threads on both sides:



Input female thread, output male thread:



Type	GI	GA	L1	L2	GT	GL	SW
SB02.1	G 1/2 female	-	-	43	14	-	24
SB02.2	G 3/4 female	-	-	45	15	-	30
SB02.3	G 1/2 female	G 1/2 male	16	43	14	14	24
SB02.4	G 3/4 female	G 3/4 male	18	45	15,5	15	30

Materials:

Brass version:

device body: brass
regulating star: 1.4310
cone: 1.4301
rivet: 1.4301
retaining ring: 1.4122

Stainless steel version:

device body: 1.4305
regulating star: 1.4310
cone: 1.4301
rivet: 1.4301
retaining ring: 1.4122

SB03

Flow Limiter for Large Flow Rates

- without additional power requirements
- saves energy by limiting the flow rate to the actually needed flow
- for pipe diameters DN 20...DN 80
- with male thread for mounting into existing pipes or complete with flow housing
- all metal version without plastic
- materials: brass or stainless steel
- P_{\max} : 10 bar, T_{\max} : 200 °C



Description:

The model SB03 flow limiters are used to limit the flow of water or waterlike media to a fixed value. They make sure that this fixed flow rate stays constant despite varying upstream or downstream pressures. Contrary to the commonly used products of this kind the SB03 limiter do not utilize a plastic membrane as limiting device. Instead the SB03 work with a spring loaded stainless steel variable orifice. Due to the differential pressure across the limiter this variable orifice changes its aperture continuously. Through increasing the orifice size with falling pressure or decreasing it with rising pressure the flow rate will always remain constant.

Typical applications:

For water and waterlike media. Usable in water distribution systems in the industry, in carwash installations, for sanitary applications and in water treatment systems.

Principle or operation:

See data sheet SB02

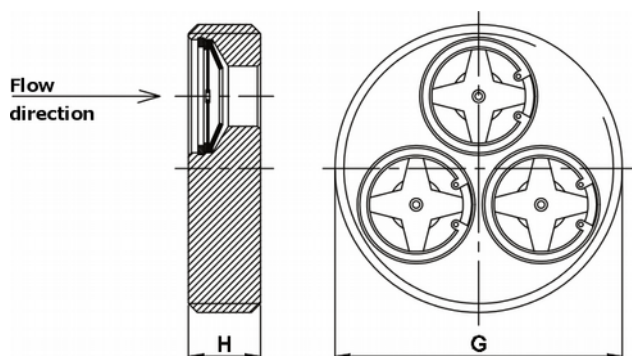
Flow rates:

Single limiting elements may be supplied for the following flow rates: 1...30 l/min water in steps of 1 l/min and for 40 l/min (only for G 3/4").

By adding several flow elements onto a common disc nearly all flow rates may be realized.

Versions and Dimensions:

The SB03 flow limiters are available as a disc with male thread.



G Disc size (male thread G)	Max. No. of limiting elements	Flow rate [l/min]	H [mm]
3/4"	1	1-40	12
1 1/2"	3	3-90	12
2"	5	5-150	15
2 1/2"	9	9-210	15
3"	13	13-270	15

Technical Data:

Min. regulating pressure: 2 bar
(3 bar for limiter to 40 l/min)

Max. process pressure: 10 bar

Max. medium temperature: 100 °C

Accuracy for 1...30 l/min:

up to 2 l/min: ± 15 % of average flow value

up to 3 l/min: ± 10 % of average flow value

Accuracy for 40 l/min: ± 15 % of average flow value

Order Code:

Order number	SB03.	1.	50.	100
Flow Limiter for large flow rates				
Disc material: 1 = Disc of brass, inserts of st. steel 2 = Disc of st. steel, inserts of st. steel				
Disc outer diameter: 20 = G 3/4 40 = G 1 1/2 50 = G 2 65 = G 2 1/2 80 = G 3				
Flow rate: xxx = in l/min. water				

Materials:

Brass version:	device body:	brass
	regulating star:	1.4310
	cone:	1.4310
	rivet:	1.4310
	retaining ring:	1.4122
St. st. version:	housing:	1.4571
	regulating star:	1.4310
	cone:	1.4301
	rivet:	1.4301
	retaining ring:	1.4122

SB04

Flow Limiters Flange Mounted

- **Flow quantity control without additional power requirements**
- **Energy saving by limiting the flow of liquids to the necessary flow rate**
- **For DIN/ASME flange PN16/300 lbs DN40...DN100**
- **Simple mounting between 2 flanges**
- **All metal design without plastic internals**
- **Material: stainless steel**
- **P_{max}: 10 bar, T_{max}: 200 °C**



Description:

The Flow limiters SB04 are developed to limit the flow of a liquid media to a certain amount. They assure that the flow amount will not exceed even by fluctuating inlet or outlet pressures.

In contrast to the most customary devices of this type the flow limiters SB04 have a spring element made of stainless steel instead of a usual plastic membrane.

Due to the differential pressure across the limiter this variable orifice changes its aperture continuously. Through increasing the orifice size with falling pressure or decreasing it with rising pressure the flow rate will always remain constant.

Typical application:

For water and watery media. Usable in water distribution systems in the industry, in car wash installations, for sanitary applications and in water treatment systems.

Method of operation and composition:

see data sheet SB02

Flow volumes:

The individual elements can be used for all flow rates from 1...30 l/min water in steps of 1 l/min each.

By adding several flow elements on to a common disc nearly all flow rates may be realized.

Technical Data:

min. control pressure: 2 bar

max. working pressure: 10 bar

max. media-temperature: 200 °C

accuracy for 1...30 l/min:

bis 2 l/min: ± 15 % of flow value

ab 3 l/min: ± 10 % of flow value

Materials:

Stainless steel version:

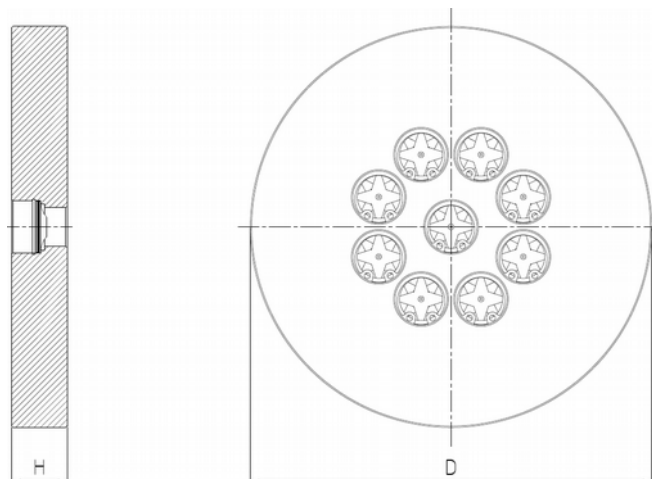
device body:	1.4305
regulating star:	1.4310
cone:	1.4301
rivet:	1.4301
retaining ring:	1.4122

Order Code:

Order number	SB04.	2.	40DA	100.	0
Flow limiters					
Disc material	2 = disc stainless steel, inserts stainless steel				
Disc / nominal sizes:	40DA = DN 40 DIN/ASME 50D = DN 50 DIN 50A = DN 50 ASME 65DA = DN 65 DIN/ASME 80D = DN 80 DIN 80A = DN 80 ASME 100D = DN 100 DIN 100A = DN 100 ASME				
Flow rate:	xxx = in l/min water				
Options:	0 = without 1 = please specify in plain text				

Versions and dimensions:

The flow limiters are available as discs for installation between two flanges.



Nominal size	Norm	Number of regulating stars	Pressure range of the intermediate flange	Min. flow [l/min]	Max. flow [l/min]	H [mm]	D [mm]
DN 40	DIN / ASME	2	PN 16 / 300 lbs	2	60	19,1	95
DN 50	DIN	4	PN 16	4	120	18	110
DN 50	ASME	4	300 lbs	4	120	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
DN 80	ASME	9	300 lbs	9	270	23,9	150
DN 100	DIN	14	PN 16	14	420	20,0	165
DN 100	ASME	14	300 lbs	14	420	23,9	182