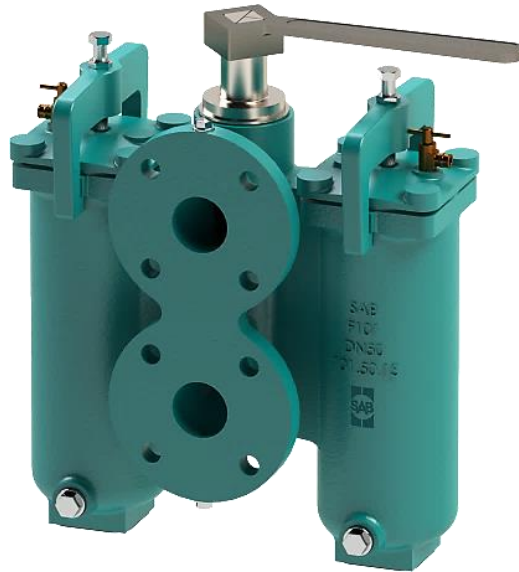


Instructions for Use



Duplex Filter Type F101

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These Instructions for Use are a translation of the original Instructions for Use and must be kept for the entire lifetime of the Duplex Filter!

As part of the device described here, this document must be made available to every user in a suitable form.

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Rev.	Datum Date	Beschreibung Description	Erstellt Created	Geprüft Checked	Freigegeben Approved
0	23/02/2021	Compiled by	D. Szisnat	M. Stark	D. Band
1					
2					
3					

1 Important basic information


In addition to the instructions in these Instructions for Use, the information relevant for safety, notes and relevant contents from supplier documentation must be strictly observed.

The filter housing is manufactured as a pressure vessel according to the state of the art and recognised safety regulations. Nevertheless, dangers to life and limb of the user or third parties cannot be ruled out during use, as well as possible damage to property.

Georg Schünemann GmbH (hereinafter referred to as SAB) shall not be liable for any personal injury, damage to property and pecuniary loss resulting from disregard of the Instructions for Use, operating errors or improper use.

If the contents of these Instructions for Use are not understood or further information is required, the Service Department of SAB is available for help and further information.

Liability and warranty

 Information
<ul style="list-style-type: none"> SAB shall only and exclusively assume the warranty for spare parts ordered from SAB. Wear parts are excluded from the warranty. Compatibility with the duplex filter cannot be guaranteed for spare parts sourced from third parties without previous agreement and approval by SAB. No changes may be made to the duplex filter without the approval of SAB!

Our current "General Terms and Conditions of Sale and Delivery" which can be viewed on the SAB website (see cover page for web address) are always applicable.

Warranty and liability claims for personal injury and property damage are void if they are attributable to one or more of the following causes:

- non-intended use of the duplex filter!
- improper installation, start-up, operation and maintenance of the duplex filter!
- operation of the duplex filter with defective filter components!
- failure to comply with personnel requirements!
- disasters caused by outside influence and force majeure!
- gross negligence!

2 Safety

Observance of the Instructions for Use

These Instructions for Use describe the function and handling of the duplex filter and contain all the information required by the personnel of the owner to be able to transport, assemble, install, operate, dismantle and dispose of the duplex filter in accordance with its intended use.

The Instructions for Use must always be completely observed, kept in the immediate vicinity of the product and made available to all personnel at all times.

These Instructions for Use must be supplemented with instructions, including supervisory and reporting obligations, to take account of special operational characteristics, e.g. with regard to process organisation, work procedures and personnel deployed as well as their protective equipment. Such obligations may also cover, for example, the provision and wearing of personal protective equipment.

Qualified Personnel

All transport, assembly, commissioning, maintenance / repair, inspection, dismantling and disposal work must be performed by personnel with the appropriate qualifications for this work.

In addition, these persons must have the following qualifications:

1. Verified instruction and authorisation for the use of the duplex filter.
2. Verified instruction and authorisation in the handling of the safety devices

The relevant supporting documents must be submitted to SAB on request and in the event of a warranty claim.

Country-specific, company-internal, specification-typical, professional association and general safety guidelines must be observed.

General prohibition of alcohol and drugs for operating and skilled personnel must be ensured by the owner.

Personal Protective Equipment

Personal protective clothing according to EN 14605 must be worn during all work by the qualified personnel carrying out the work.

General Safety Instructions


The following safety instructions must be understood as complementary to existing applicable national laws and accident prevention regulations. These Instructions for Use are only an aid and do NOT relieve the owner of his responsibility for the operation of the duplex filter.


All safety instructions, including those in the individual chapters of these Instructions for Use, must be observed. The accident prevention regulations shall be made available to everyone.

The following safety instructions must be strictly observed:

- If hot or cold machine or system parts cause hazards, these parts must be secured against contact on site.
- Leakages of hazardous conveyed materials must be removed so that no hazards are caused to persons or the environment. Legal requirements and local environmental protection regulations must be complied with.
- Work on the duplex filter is always only permitted in a depressurised state.
- Filter systems containing hazardous substances must be decontaminated. Harmful substances and used filter media must be disposed of properly in accordance with the applicable legal regulations.
- In the standard version, the filter must not be used in ATEX protection zones.
- External fire has not been taken into account for the housing design and manufacture.
- The duplex filter in the version with clamp or lever closure cannot be used for the filtration of hazardous media (e.g. toxic, flammable or corrosive)!

Intended use of the duplex filter

 Warning
<p>Risk of serious personal injury and property damage</p> <p>Serious personal injury and damage to property can result from improper use, incorrect positioning, assembly, installation or operation.</p> <ul style="list-style-type: none"> • Observe the intended use of the duplex filter. • All work must be carried out correctly and only by qualified personnel.

 Information
<ul style="list-style-type: none"> • If required, SAB Service will be happy to provide help and further information (for contact details, see cover page). • Any use other than that specified under "Intended use of the duplex filter" and under "Technical Data" shall be considered as non-intended use. Warranty and liability claims for personal injury and damage to property resulting from this are void and are the responsibility of the owner. • The local work and safety regulations must be observed.


The duplex filter is intended for industrial filtration of liquid media (media characteristics according to Article 13; Group 2 according to Pressure Equipment Directive 2014/68/EU).


Unless otherwise agreed, the standard medium temperature is 0° C / +80° C at an ambient temperature of -10 °C / +40 °C.

The duplex filter can be used outdoors and in buildings.

The specified internal and external inspections / maintenance must be strictly complied with.

3 Transport

 Danger
<p>Danger from suspended loads</p> <p>Risk of serious injury when lifting loads.</p> <ul style="list-style-type: none"> • Do not step under suspended loads! • The local accident prevention regulations must be observed!

 Danger
<p>Risk of the load falling.</p> <p>There is a risk of the load falling due to incorrect lifting gear and incorrect attachment of the load.</p> <ul style="list-style-type: none"> • Only use secured lifting gear in accordance with the accident prevention regulations. • The lifting gear must be adapted to the weight of the load to be lifted. • Only attach the lifting hooks to the lifting eyes provided on the duplex filter. Do not attach any additional loads. • If no lifting eyes are available, transport straps with sufficient load-bearing capacity must be looped around the duplex filter.

Examine the delivery immediately on receipt for completeness and any transport damage. Transport damage must be reported immediately to the transport company. If necessary, use appropriate and sufficiently dimensioned means of transport.

Start-up must be prevented in the event of damage.

Storage



Information

SAB shall not be liable for damage to the duplex filter if it is stored for longer than 6 months from the date of delivery. The correct storage is the responsibility of the consignee.

It must be ensured for storage that the delivery is placed in a secured and roofed place or covered with a tarpaulin to protect it from moisture and that spigots, screw connections as well as attachment parts remain unstressed. The duplex filter must not be stored in a corrosive atmosphere, the relative humidity should be <65%.

If stored for longer than 6 months, the packaging must be checked regularly for damage and replaced if necessary.

4 Installation and assembly



Information

- Appropriate protective equipment (see chapter 2 "Safety" → "Personal Protective Equipment") must be worn when working on and with the duplex filter.
- The direction of flow must be observed, never mix up inlet and outlet connections!
- Make sure that there are no foreign bodies in the housing (e.g. tools)!
- Only work on the housing when it is depressurised!

Installation and assembly may only be carried out by qualified and trained personnel.

The duplex filter is installed upright in the pipeline, using suitable seals and connecting elements. The connected pipelines must not transfer any mechanical stresses to the filter housing, as the housing connections are not designed for any additional nozzle loads.

The cast duplex filter consists of two identical single filters. The single filters consist of a cast housing, cover, seals and the basket or ring strainer insert.

The strainer insert is already installed when delivered.

Appropriate measuring devices must be installed in the inlet and outlet or optionally a differential pressure measuring device to record the differential pressure.

Attention: These described shut-off devices, piping parts and fittings for differential pressure measurement are not included in the scope of delivery!

In normal operation, only one filter pot has to be operated, so that the other one is available as a full reserve. This is switched to during the cleaning phase. This ensures that filter operation is not interrupted. During start-up operation, both filters can be operated in parallel by setting the stopcock plug (10) to the centre position. This reduces the pressure loss in the filter. This is particularly advantageous with viscous media that do not heat up until during operation (cold start).

The change-over lever (9) always faces in the direction of the filter pot in operation.

The seals must be clean, undamaged and properly seated. All screw connections must be checked for their leak tightness.

Mounting the strainer insert



No.	F101D	F101DS
		
1.	Loosen the hexagon nut (7) and hexagon head bolt (8).	Loosen the hexagon nuts (12).
2.	Remove the clamp (6).	Remove the hexagon nuts (12).
3.	Remove the cover (4).	
4.	Insert the strainer insert (3) into the duplex filter. Make sure that the support ring of the strainer insert is correctly positioned in the duplex filter or on any existing strainer support seal. The strainer insert thus seals directly to the housing.	
5.	The sealing surface and the seal (11) must be checked for damage and cleanliness before closing.	
6.	Ensure that the seal (11) is properly seated.	
7.	Close the filter with the cover (4).	
8.	Lock the cover (4) with the clamp (6), hexagon head bolt (8) and the hexagon nut (7).	Lock the cover (4) using the stud bolts (13) and hexagon nuts (12).

Table 1 Installation instructions

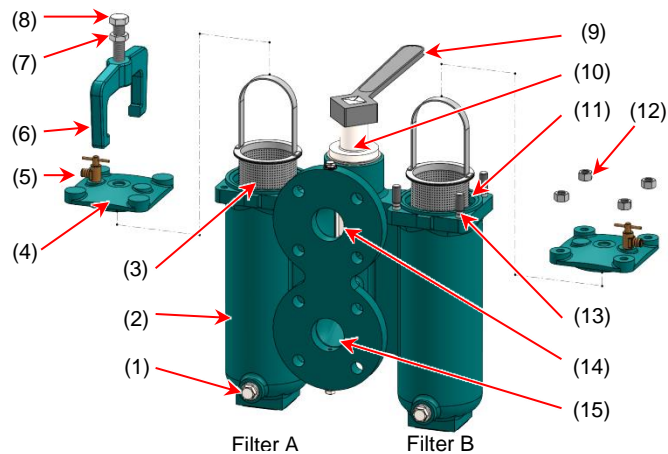


Fig. 1 Components of the duplex filter

Pos.	Description	Pos.	Description	Pos.	Description
1	Drain screw	6	Clamp (F101D)	11	Seal
2	Housing	7	Hexagon nut (F101D)	12	Hexagon nuts (F101DS)
3	Strainer insert	8	Hexagon head bolt (F101D)	13	Studs (F101DS)
4	Cover	9	Change-over lever	14	N1 Inlet
5	Vent valve	10	Stopcock plug	15	N2 Outlet

Table 2 Components of the duplex filter

Operating principle and function

The medium flows through the upper connection N1 inlet (14) into the duplex filter.

The medium flows through the strainer insert from the inside to the outside.

The cleaned medium leaves the duplex filter through the lower connection elbow N2 outlet (15).

Start-up

It must be ensured that all connecting and locking elements are correctly installed and firmly tightened before start-up.

Initial condition for the start-up: All valves (inlet, outlet and vent valves) are closed.

1. Bring the Change-over lever into the operating position (in the direction of the filter bowl to be put into operation).
2. Open the vent valve.
3. Open the inlet valve slowly.
Avoid sudden opening as this may damage the filter housing and strainer insert.
4. Close the vent valve as soon as the medium discharges (in the case of dangerous or aggressive liquids, appropriate measures must be taken to prevent spraying out).
5. Check the entire system for possible leaks under pressure load. Rectify leaks if necessary. In the event of leaks:
 - a) Shut off the inlet.
 - b) Carefully relieve the pressure via the bleed or drain screw.
 - c) Empty the duplex filter.
 - d) Check the duplex filter for damaged parts.
 - e) Repeat the start-up procedure.
6. Open the outlet valve slowly to avoid pressure surges.
7. Adjust the desired throughput slowly.

5 Operation

Flow through the duplex filter as evenly as possible. Pressure surges, intermittent pumping and interruption of the flow can result in damage to the strainer inserts used.

Check the duplex filter at regular intervals. The following should be noted:

1. Vent the duplex filter at regular intervals.
Air pockets in the filter can render part of the filter surface ineffective.
2. Check the duplex filter regularly for leaks.
3. Check the operating pressure and the operating temperature regularly.
4. Check the current differential pressure / degree of soiling of the strainer insert regularly.

If this is within the range of the maximum value specified by the owner for replacement or cleaning, the filter must be taken out of service and serviced.

Switching Process

In the case of media that have a corrosive effect on the materials of the filter, the changeover must be performed regularly 2-3 times per week.

Ending the operation

The duplex filter filter must be emptied as far as the available pumping possibilities allow (at least to below the strainer support).

1. Close the inlet and outlet.
2. When the drain screw and the vent screw are opened slowly at the same time, the housing is drained and vented.
3. Do not open the housing until it is completely depressurised!
4. After loosening the closing elements, open the filter cover and check the level.

The duplex filter is now ready for maintenance.

To change the strainer inserts, see chapter 4 "Installation and assembly" → "Mounting the strainer insert".

In the case of prolonged downtimes or if the medium hardens, the filter housing must be completely emptied, the strainer inserts removed and the housing cleaned with a suitable cleaning agent.

Maintenance and care

As soon as one filter half is dirty, the clean filter half is put into operation by slowly switching the stopcock plug.

1. Depressurise the filter pot to be cleaned using the venting and draining equipment.
2. Loosen the cover fasteners using a suitable tool and open the filter.
3. Drain filter using the drain equipment until the level is at least underneath the strainer support
4. Pull the strainer insert upwards out of the housing (use lifting gear if necessary).
5. Clean the strainer insert by blowing out or blasting with compressed air, water or steam.
If necessary, the strainer must be soaked in an appropriate medium and cleaned. Under certain circumstances, optimum cleaning of the strainer is achieved using ultrasound.
6. For all types of cleaning, it must be ensured that the filter fabric (if present) is not damaged
7. Check the sealing elements for possible damage and replace if necessary.

Seal manufacturers often point out that in the case of pressure-tight connections, the seals must be replaced after the connection has been opened.

In practice, the seals are often used many times. Resulting leaks are not a sign of system malfunction, but normal wear.

Maintenance Schedule

System part	Activity	Interval
Seals	Check, replace if necessary	as required / at least 1x/year
Housing	Check interior for deposits, clean if necessary	as required / at least 1x/year
basket strainer / ring strainer	Clean and remove and replace with new one	as required

Table 3 Maintenance Schedule

Submissions to the factory / complaints

If the duplex filter is returned to SAB for major repairs or servicing or in the event of a complaint, it must be emptied. In addition, it must be decontaminated when used with hazardous substances.

The SAB contamination declaration must be completed and enclosed with the delivery; the current version can be requested from SAB.

6 Service, spare parts and advice

For spare parts, filter accessories and advice, SAB sales personnel and SAB Service are available (see cover page for contact details).

Availability

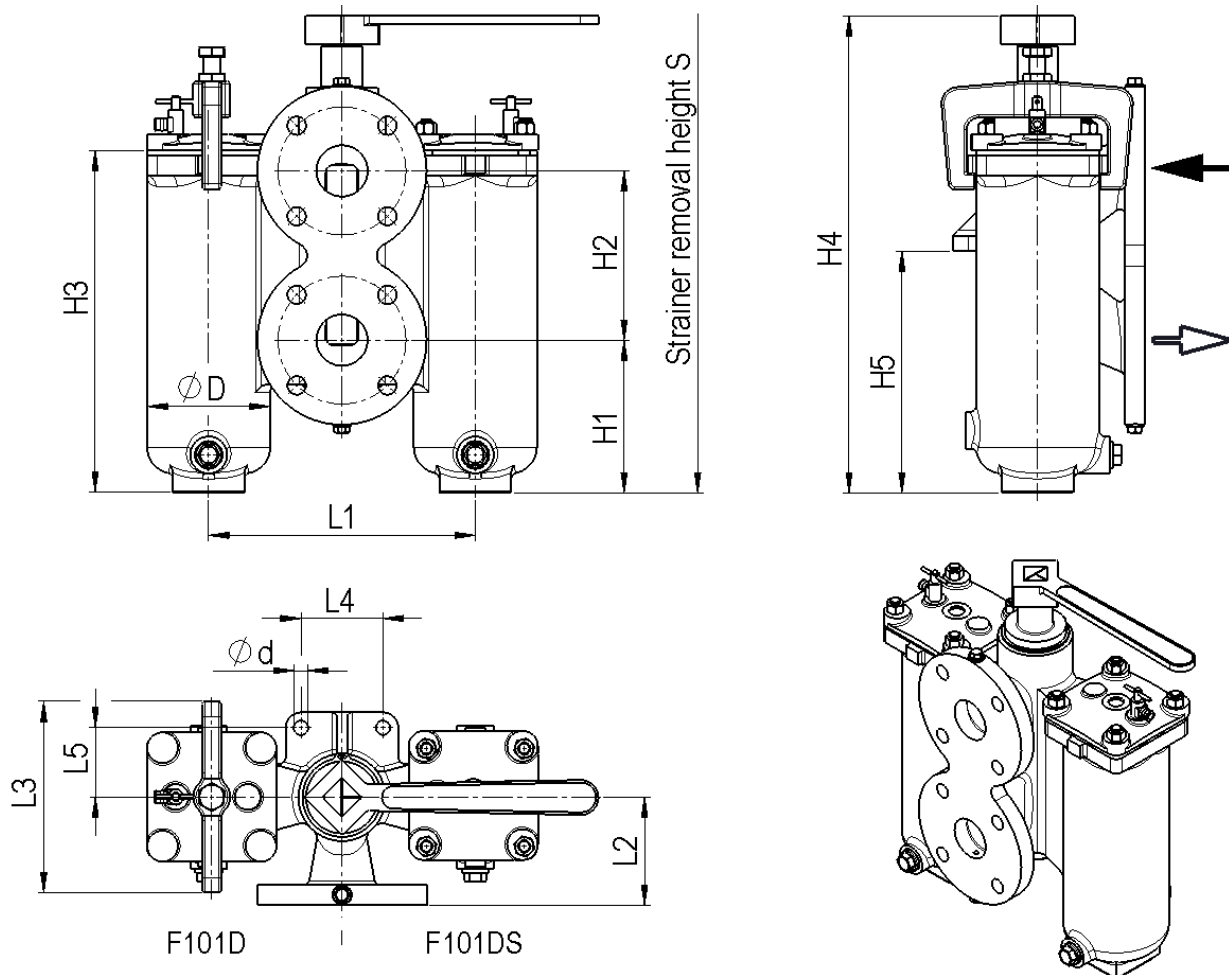
SAB always recommends the precautionary procurement and storage of spare parts if the filter system plays a decisive role in maintaining a production process.

Downtimes can thus be avoided or minimised.

Limitation of the number of load cycles / service life

The permissible number of load cycles service life according to AD- 2000 S1, section 1 .1.4 (unless otherwise agreed). The owner is advised that the number of load changes that have occurred must be recorded in a suitable way.

7 Technical Data



DN	PN bar	ØD mm	H1 mm	H2 mm	H3 mm	H4 mm	H5 mm	L1 mm	L2 mm	L3 mm	L4 mm	L5 mm	S mm	Ød mm	Contents dm³	Flow rate m³/h	Filter surface		Weight approx. kg	
																	KS*	RS*		
																		cm²		
15/20	10	70	50	105	160	260	105	148	90	105	50	42	300	14	0.55	3	110	-	16	
25	10	80	85	115	200	295	135	160	90	120	50	42	350	14	0.6	4.5	140	-	19	
32	10	100	105	140	245	370	165	190	90	145	60	50	450	14	1.25	7	270	480	27	
40	10	120	140	150	295	415	210	220	120	186	70	60	550	14	2.35	12	430	690	35	
50	10	120	148	165	333	465	235	260	105	186	80	68	620	14	4.55	18	500	790	40	

* KS = basket strainer

* RS = ring strainer

The flow rates are applicable for inlet speed of 2.5 m/s in pressure lines, viscosity of 1 mPas (water) and filter mesh sizes $\geq 80 \mu\text{m}$. We recommend half the flow rate for suction lines.