

# Operating and maintenance instructions

## Strainers Basket-type strainers Hat-type screens



Strainers, Basket-type strainers, Hat-type screens

  
**KROMBACH**  
ARMATUREN  
*be safe*

**CRANE**

03 / 2009

Operating manual no.:  
**BUW-300c E**

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Date 19.03.2009  
 Prepared: J.Brauns  
 Tested: E.Böcking  
 E.Klappert  
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# 1. General

## 1.1. Area of Application


This operating manual applies for strainers of the kinds *y-type* >SF<, *pot-design* >SFT<, basket-type strainers >SKF< and hat-type screens >HS< made by the company Friedrich Krombach GmbH Armaturenwerke.

The operating manual also applies to identical valves from other companies if these valves were delivered through Krombach and the contract documents for the delivered valves expressly mentions this operating manual.


Before the devices are used, the manual must be read carefully and completely.

If there are any discrepancies or if anything is unclear, please contact KROMBACH.





## 1.2. Warning of Danger

 <b>Caution</b>	<p><b>If the following caution and warning notes are not observed, this can lead to dangerous situations</b> and the manufacturer's warranty could become ineffective.</p> <p>In case of any questions, please contact KROMBACH.</p>
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### 1.2.1. FITTING, MAINTENANCE AND OPERATING PERSONNEL

 <b>Danger</b>	<p>To avoid endangering persons and equipment, expert staff must be used for fitting, maintenance and operation. (see DIN IEC 3/B/244/CDV)</p>
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### 1.2.2. PERFORMANCE OF INSTALLATION WORK TO VALVES

 <b>Danger of life!</b>	<p>Fitting work on pressurized parts of the valve may only be carried out when the pipeline is depressurized. The fitting must have cooled down to ambient temperature before work is started.</p>
 <b>Danger of life!</b>	<p>Fitting work on pressurized parts of fittings for caustic or toxic flow media may only be carried out following additional emptying and bleeding of the valve and the respective pipeline.</p>
 <b>Caution</b>	<p>Fittings are subject to the same safety regulations as the pipeline system they are installed in. This manual only states the safety instructions that have to be heeded <b>in addition</b> for the fittings.</p>
 <b>Caution</b>	<p>The manufacturer's specifications are valid for attachment parts.</p> <p>The manufacturer's manuals contain additional safety instructions for the attached parts.</p> <p>The mentioned safety measure also apply to the heating jacket if available.</p>

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## 1.3. Identification and Designation of the Product

### 1.3.1. GENERAL DESIGNATION

The valve must be checked for correlation with the specification after delivery, by the customer and before installation in the system.

Standard-series valves produced by Krombach are marked by:

- ⇒ FK Manufacturer's mark
- ⇒ DN Nominal diameter
- ⇒ PN Nominal pressure in bar
- ⇒ Material number for valve housing and stopper/cover

### 1.3.2. DESIGNATION WITH TYPE DESIGNATION PLATE

Valves that have been designed and confirmed for special operating data have a type plate attached.

The type plate has the following marking:

- ⇒ FK Manufacturer's mark
- ⇒ DN Nominal diameter
- ⇒ Maximum operating pressure in bar at maximum operating temperature in °C
- ⇒ Bj. Model year
- ⇒ Consignment no. or factory no.

### 1.3.3. CE DESIGNATION

Valves that are subject to CE marking are marked additionally by:

- ⇒ CE mark
- ⇒ Code of the issuing office

### 1.3.4. VALVES FOR OXYGEN

Valves for oxygen (O<sub>2</sub>) have additional markings:

- ⇒ "Oil and grease-free, suitable for oxygen"

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## 1.4. Delivery Condition, Transport and Storage


The valves are delivered with an outer coating, sealed with protective caps.

Valves made of stainless steel are not coated.

 <b>Caution</b>	<p><i>Strainers / basket-type strainers</i></p> <p>These must be stored dry in their original packaging and/or sealed with protective caps. <b>Sealing surfaces and threads in particular must not be damaged mechanically or through any other factors.</b></p>
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 <b>Caution</b>	<p><i>Hat-type screens</i></p> <p>The surfaces are protected against corrosion for transport and storage only by means of spray oil. Corrugated card and bubble film are used as an intermediate layer and cladding to protect the sealing surfaces and filter fabric from external force and damage.</p> <p>The packaging should not be removed until directly before fitting work is to be carried out. Make sure the strainer is set down on a soft base.</p> <p>Careful cleaning and inspection for cleanness must be carried out before installation.</p>
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 <b>Caution</b>	<p>Valves for oxygen are delivered welded in film. Transport and storage must be carried out in such a way that the film does not become damaged. Only undamaged transport film guarantees freedom from oil and grease as packed after manufacture.</p>
--	---

 <b>Danger of life!</b>	<p>The lifting equipment must be hooked to the lanyard rings welded on or to the valve housing.</p> <p>The coating, attachment/accessory parts must not become damaged by the lifting equipment being hooked on.</p> <p>Lifting equipment must not be hooked to attachment parts.  <b>ACCIDENT HAZARD! DAMAGE</b> to the product!</p>
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The valves should be stored in closed, dry rooms on a firm clean base.

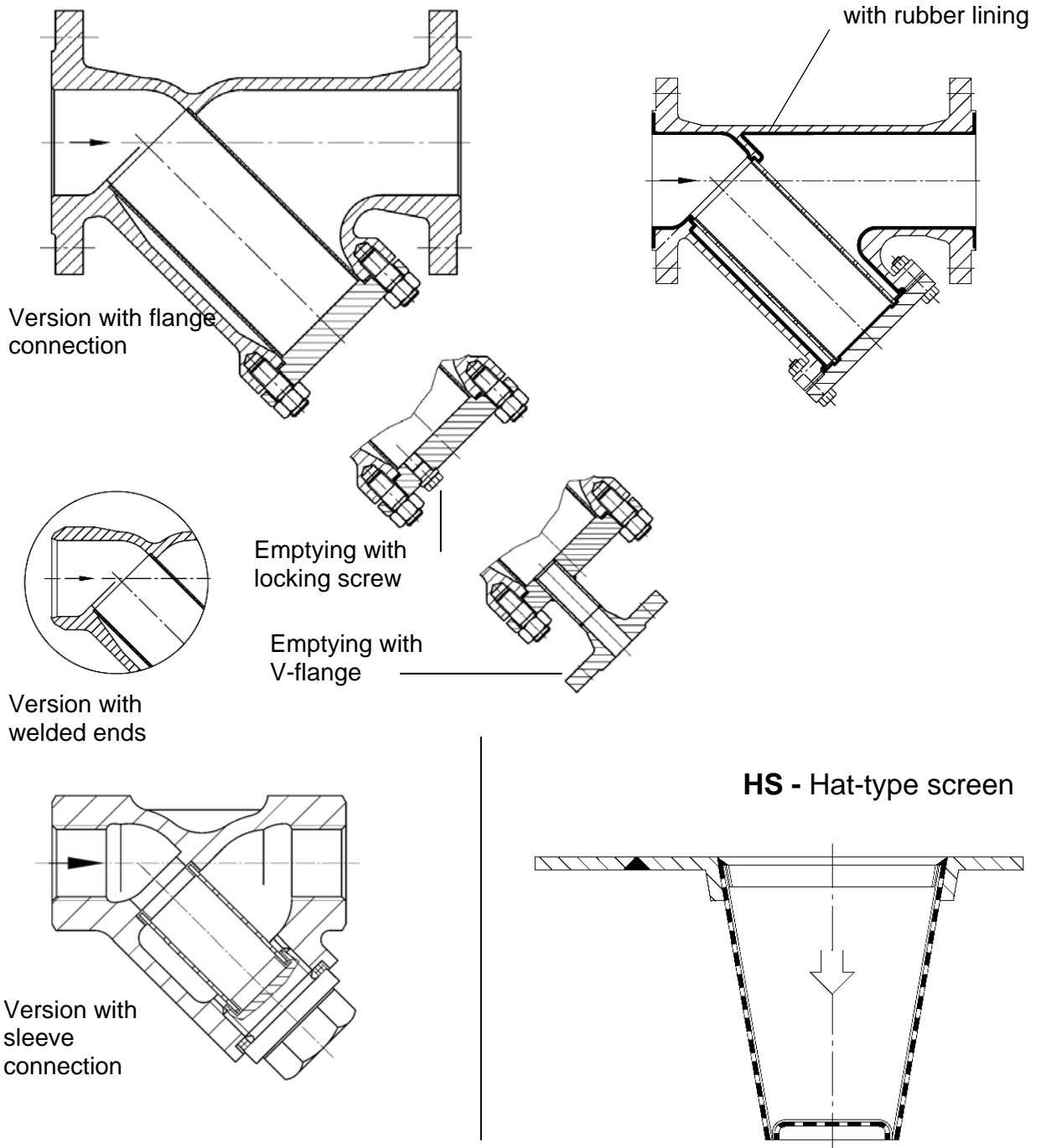
### Strainers, Basket-type strainers, Hat-type screens

## 2. Product

### 2.1. Drawings

#### SF - Strainer y-type

#### Variants

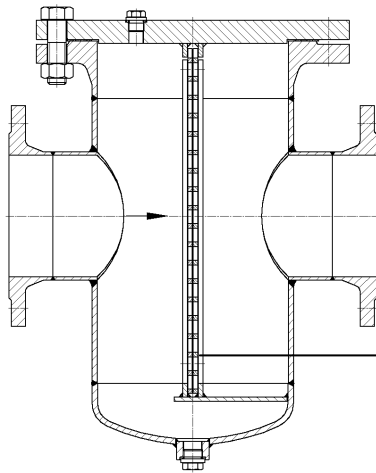


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**SFT - Strainer**  
in pot-design

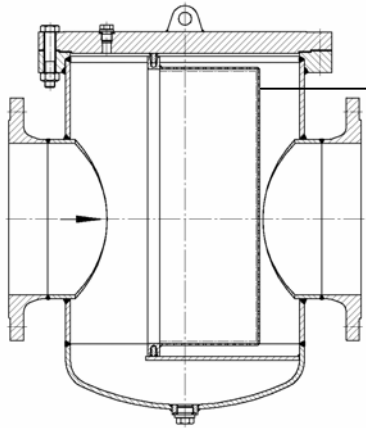
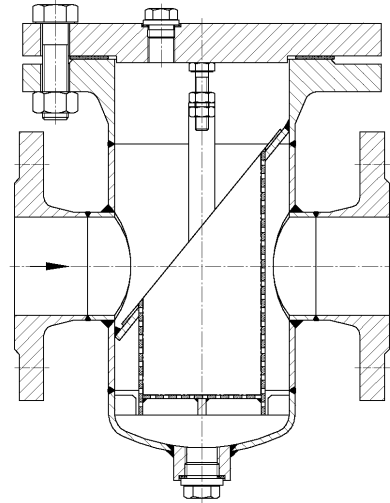
**SKF - Basket-type**  
strainer

**Variants**



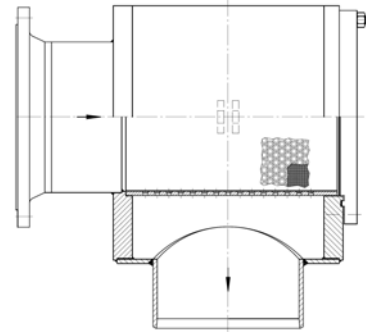
with welded ends

with strainer plates

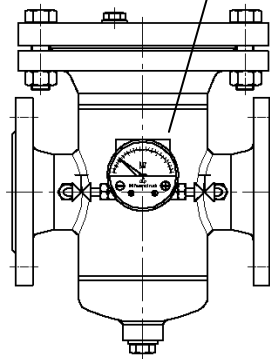


with semi-circular screen

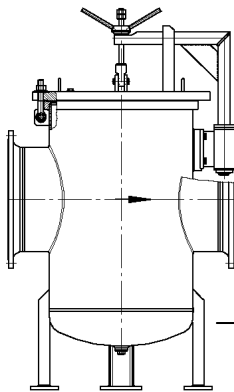
as corner screen



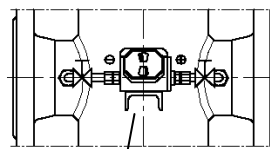
with differential pressure manometer



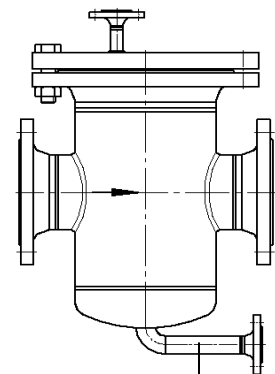
with lifting and swivelling feature, folding screws



with bases



with differential pressure indicator



with alternative bleeding / emptying

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Prepared: J.Brauns  
Tested: E.Böcking  
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## 2.2. Product Description

### 2.2.1. PROPER USE

The valves have been exclusively designed for installation in a pipeline system to protect high-quality system parts from damage and soiling by foreign particles that are present in the flow medium.

 <b>Danger of life!</b>	<p>A valve may not be used if its permissible pressure/temperature range (= "rating") is not sufficient for the operating conditions. The permissible values can be seen on the valve's type plate. If the fitting is to be used outside of these values, approval from KROMBACH is compulsory.  <b>Disregarding this regulation can lead to danger to life and limb and cause damage in the pipeline system.</b></p>
 <b>Danger</b>	<p>It must be guaranteed that the parts of the valve that come into contact with the media are made of materials suitable for the media used. KROMBACH will not accept liability for any damage caused by corrosion through aggressive media.  <b>Disregarding this regulation can lead to danger to life and limb and cause damage in the pipeline system.</b></p>
 <b>Danger of life!</b>	<p><i>If a valve has to be removed from a pipeline:</i>  Medium can escape from the pipe or from the valve.  In the case of media that can be harmful to health or are hazardous, the pipeline has to be completely emptied before the valve is removed. Be careful of <b>residue that can flow out of the valve or the pipe</b>, or have remained <b>in the valve (under pressure)</b>.</p>
 <b>Danger</b>	<p>Make sure that valves that have been operated at operating temperatures of &gt; 50°C or &lt; 20°C and the pipeline connections cannot be touched by the operator, in order to protect the operator from injury.</p>

⇒ Flowing speeds in permanent operation must be observed analogue to the following table.

>SF< = 1.8 m/s	>SFT< = 2.5 m/s	>SKF< = 2.5 m/s	>HS< = 2.0 m/s
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⇒ Abnormal operating conditions such as vibrations, pressure surges, erosion, cavitation and more than small shares of solids in the medium – in particular abrasive solids – must be clarified with KROMBACH.

⇒ The use of abrasive media is not recommended.

⇒ The valves should not be used for media that are prone to inner deposits.

⇒ Strainers are suitable for liquids, gases and vapours.

⇒ The fittings are not intended for pulsating compressive stress with a high number of stress cycles

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E.Klappert  
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## 2.2.2. METHOD OF OPERATION

**Strainers >SF, SFT<, Basket-type strainers >SKF<, Hat-type screens >HS <**

- ⇒ The foreign particles contained in the flow medium are trapped depending on the mesh width of the screen material installed.
- ⇒ Depending on the design type, the particles filtered out of the flow medium are collected upstream from the screen material at a flat screen, a semi-circular screen or in a screen basket.

## 2.2.3. DESIGN AND TECHNICAL DATA

The technical design of the strainers / hat-type screens corresponds to the images under 2.1. and the **enclosed documentation**.

All the dimensions, materials, special versions, accessories and any further specifications can be found in the enclosed ORDER-RELATED DOCUMENTATION.

- ⇒ For pressure limits, see the pressure-temperature diagram for special material application and the brochure.
- ⇒ The screen inserts of the y-type strainers >SF< are equipped with a supporting screen, depending on the type and nominal diameter.
- ⇒ Pot-design strainers >SFT< are equipped with a flat screen up to and including nominal diameter DN 150 and with a semi-circular screen > DN 150.
- ⇒ Basket-type strainer >SKF< are equipped with a strainer basket.
- ⇒ With hat-type screens >HS< the filter material must always be facing the direction of flow
- ⇒ The screen materials of the strainers are sometimes exchangeable, and are supported by a support screen / perforated metal depending on the type and nominal diameter, whereby the screen inserts achieve great stability and high bursting safety.
- ⇒ The screen inserts in the strainer are held in place in grooves, sliding rails or similar. They can be removed and cleaned or replaced after the cover has been opened in a pressureless state, see section 1.2.
- ⇒ The hat-type screens are clamped over the screen clamping ring between a pair of flanges.
- ⇒ The maximum permissible differential pressure for y-type strainers, SF, is 1.5 bar, for pot-design/basket-type strainers, SFT/SKF, 2 bar. The flow speed of the flow medium should not exceed the reference speeds, see section 2.2.1.
- ⇒ Strainers, SF, can be equipped with an emptying muff/locking screw in the cover.
- ⇒ Pot-design strainers/basket-type strainers, SFT/SKF, are equipped with a bleeding stopper (muff) in the cover and an emptying stopper (muff) on the base.
- ⇒ Strainers can be made of a wide range of different materials, in a zinc-plated version, with inner coating or inner rubber lining.

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## 2.3. Installation into the Piping

### 2.3.1. GENERAL INSTRUCTIONS

- ⇒ Before installation in the pipeline, the valve must be checked to make sure that it matches the specification for the installation location.
- ⇒ Remove the locking cover, protective films or other packaging from the valve.
- ⇒ Clean the valve of storage and transport dirt and protective material.
- ⇒ The connection pipeline and pipeline connection flanges must be parallel and the correct distance apart.
- ⇒ When media are used at an operating temperature of under 0°C, the valve has to be dry before it is put into operation.
- ⇒ When the system is to be coated after the valve is installed, the spindles of any cover lifting equipment or the attached measuring and display instruments must remain free of coating.
- ⇒ Pipelines designed for steam to flow through them must be routed in such a way that condensation draining is possible and water hammers are excluded.

### 2.3.2. INSTALLATION POSITION AND DIRECTION

The normal installation position, **>SF<**, is in a horizontal pipeline with the filter muff slanted and the cover downwards.

The normal installation position, **>SFT/SFK<** is in a horizontal pipeline with the cover upwards.

In the case of hat-type screens, the installation position is **always** such that the filter material is facing the material flow. Care must be taken that the strainer cone or truncated cone has enough space. A collision with other installed parts or impairment of measured sections must be avoided. Maximum care is required particularly with slides and near pump muffs. Installation near reduction spots should also be avoided.

The installation position of the strainers should be chosen in such a way that the screen or screen insert can be removed for cleaning. When the strainer cover is opened, the screen insert and the substances filtered out of the flow medium and trapped in the screen insert should not fall out onto the maintenance staff.

In the case of difficult space situations at the installation site, the **SF + SKF** strainer axes can be tilted at up to 90° from the vertical plane. The pot-design strainer, **SFT**, can also be turned through 180°. (Taking the respective safety precautions into account, see above)

When a strainer is installed into a vertical pipeline, the direction of flow must be from top to bottom.



**Caution**

The direction arrow on the valves must point in the flow direction on installation into the piping.

If there is a risk of the fittings freezing, fundamentally only the normal installation position is allowed and the fittings must be equipped with a discharge device in the middle of the housing.

Through the mode of operation, it is to be ensured that the fitting cannot be damaged by freezing medium.

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### 2.3.3. INSTALLATION

- ⇒ The valve has to be installed without tension in a **clean** pipeline.
- ⇒ Before the valve is installed, check that the connection dimensions of the valve flanges or the welding ends match those of the pipeline.
- ⇒ The flange seals must be centred.
- ⇒ The fastening screws on the connection flanges must be tightened evenly and crosswise.
- ⇒ Welded valves are to be welded in place without tension, taking technical rules into account.
- ⇒ The valve must not be used as a fixed point in the pipeline system.
- ⇒ Muff strainers are sealed at the narrow end by a flat seal, type SF335 with sealing tape.
- ⇒ Hat-type screens are inserted into the pipe opening with a seal between the clamping ring and flange.  
Screen and seal are centred to the inside by aligning the clamping ring to the flange edge. At the same time, centring is guaranteed by the screws through the hole circle.  
Then the counter-flange is connected with the second seal.

## 2.4. Commissioning

- ⇒ Before commissioning, a check must be carried out to ensure that the correct valve has been installed at the installation point, with the flow arrow pointing in the correct direction of flow.
- ⇒ All installation work must be completed correctly before operation is started.
- ⇒ Check the valve for leaks during and after it has been put into operation by means of visual inspection.
- ⇒ Hat-type screens that are used as "test screens" or "start-up screens" have not been designed and calculated for permanent use. Care must be taken that these screens are removed after flushing and before the operating process is initiated and replaced by a compensation ring if necessary.
- ⇒ Test screens are intended to check cleanness, start-up screens only for initial operation.

## 2.5. Maintenance

### 2.5.1. MAINTENANCE INTERVAL

Depending on the type of system and operating data involved, the valve will need some maintenance.

The maintenance interval must be specified by the system operator on the basis of his specific operational experience (see TRB 700).

The maintenance interval after which the screen or the screen insert has to be cleaned depends on the flow quantity, degree of soiling of the flow medium, the consistency and size of solid particles contained in the flow medium.

It must be noted that heavier soiling of the screen material can occur after initial operation of the system, caused by component soiling during the construction and assembly phase.

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## 2.5.2. DISMANTLING AND CLEANING THE SCREEN

This work has to be done without the valve under pressure, the requirements and instructions included in section 1.2 of this operating manual must be met or heeded.

Loosen the cover screws/stoppers<sup>\*)</sup>, remove the covers/stoppers, take the screen or screen insert out and clean it.

Loosen the screws and nuts of the hat-type screen-flange connections. The hat-type screen is pulled out of the dismantled pipe.

Remove the old seals from the covers (SF-SFT-SKF) / flanges (HS) and clean the sealing surfaces.

Check the screen or screen insert for damage and replace the damaged parts.

The screen must be cleaned with cleaning agents, a soft brush, jet cleaner or other suitable means. After cleaning the screen must be flushed in a way suitable for the medium used and dried with air. Any dirt still in the pipeline upstream from the screen must be removed.

Replace the cleaned screen or screen in the strainer.

Check the sealing surfaces on housing and cover/stopper and insert a new seal in a centred position.

Place the cover centred onto the housing seal and tighten the screws evenly cross-wise or attach the stopper.

In the start-up phase or after conversion work in the system, it can be necessary to repeat the screen cleaning since unexpected soiling can occur. We recommend keeping a sufficient supply of spare seals and a second, clean screen on hand for quick replacement if necessary for start-up.

\*) Stopper with muff connection

## 2.5.3. COVER SEAL

Check the cover seal for air-tightness. If it is not airtight, tighten the cover seal with the valve depressurised. If air-tightness is not achieved, a new cover seal must be used.

The cover seal must be changed without the valve under pressure, the requirements and instructions included in section 1.2 of this operating manual must be met or heeded.

## 2.5.4. SPINDLE AND BEARING SPOTS ON COVER LIFTING FEATURE

The spindle must be cleaned, spindle and bearing spots must be lubricated.

Use the lubricant "MP 1400" or equivalent, lubricate through lubricating nipples if available (see lubricating and maintenance instructions >SUW-001a<).

## 2.5.5. REPLACING THE SCREEN MATERIAL

In y-type strainers, only complete screens can be replaced.

In pot-design strainers, SFT, with flat screen, the screen material is clamped between perforated metal plates and can be replaced after the clamping screws have been loosened.

In pot-design strainers with semi-circular screen, SFT, or basket-type strainers, SKF, the screen material from DN 300 onwards is screwed into place using perforated metal strips and can be replaced after the screws have been loosened. In the case of smaller nominal diameters, only complete screens can be replaced.

The hat-type screens can only be replaced completely or removed for cleaning.

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## 2.6. Faults and Fault Rectification

Fault	Possible cause of the fault	Fault rectification
No flow or too little flow or loss of pressure too great	Flange caps not removed before installation.	Remove flange caps.
	Screen or screen insert soiled	Clean screen
	Valve too small for the operating data used	Check the operating data, use larger valve
Seal between housing and cover not airtight (cover seal)	Connection screws not tightened properly	With the valve not under pressure, tighten the screws or nuts carefully and evenly
	Wrong seal material	Check seal material for resistance to the medium and suitability for the operating data involved
Foreign particles in the flow medium downstream from the screen	Screen not installed	Insert screen if appropriate
	Screen material damaged	Replace screen material

## 2.7. Accessories

### 2.7.1. COVER LIFTING OR SWIVELLING FEATURE

If required, pot-type strainers can be delivered with a cover lifting or swivelling feature.

### 2.7.2. DIFFERENTIAL PRESSURE INDICATION

The degree of soiling of the screen can be checked by means of the differential pressure.

Strainers can be ordered and delivered with optical or electrical indication, or with differential pressure manometers. The attachment side and the measuring range for these accessories must be specified by the customer in the order.

### 2.7.3. SPECIAL ACCESSORIES AND SPECIAL VERSIONS

Additional specifications must be heeded for valves with special accessories or for special versions.

Special mounting, maintenance and operating instructions from the manufacturer are valid for accessories!

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## 2.8. Repair

Repairs and service work on valves may only be carried out by specially qualified staff or by the manufacturer, see also section 1.2.

### 2.8.1. REPAIRS BY THE MANUFACTURER

- ⇒ Due to increased efforts to protect the environment and the health of our staff, it is important that you inform us as to what substances have come into contact with the fittings cocks to be repaired by our staff.
- ⇒ Without this contamination declaration, our service technicians are not permitted to start work.
- ⇒ In order to avoid unnecessary expense and delays for you and us, in case of repair or replacement, alongside your order and the dispatch papers, we need your contamination declaration (a form is provided in the attachment or can be requested from us).

### 2.8.2. REPAIRS BY THE OPERATOR

If repair by the manufacturer is not possible, this is to be carried out by a service technician or trained staff of the operator. Only original spare parts are to be used.

## 2.9. Guarantee

The warranty for this product is regulated by the General Terms and Conditions of the company Friedrich Krombach GmbH Armaturenwerke and with the supply contract concluded.

- ⇒ During the warranty period, the fittings may only be removed or opened with the permission of the company KROMBACH or in the presence of a KROMBACH representative.

Friedrich Krombach GmbH Armaturenwerke | Marburger Str. 364 | 57223 Kreuztal  
Tel: +49-2732-520 00 | Fax: +49-2732-520 100 | [www.krombach.com](http://www.krombach.com)  
CRANE Energy Flow Solutions | [www.craneenergy.com](http://www.craneenergy.com)

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