



Translation of original instructions with installation instructions
Automatic Metal-Edge Filter with Radial Scraper Cleaning
AF 71 G
AF 71 GX1

Cast design

Mat. No. of original instructions
76121941



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2 General safety instructions

2.1 Safety instructions for installation and operating personnel

This translation of the original instructions contains important safety information which must be heeded at all times during installation, normal operation and maintenance.

Non-observance can result in the following risks to persons and the environment as well as in damage to the machine or plant:

- ⇒ Failure of critical functions of the machine or plant or of its component parts.
- ⇒ Danger to persons from electrical or mechanical effects as well as from chemical reactions.
- ⇒ Danger to the environment owing to the leakage of hazardous substances.

Before installation / start-up:

- Read this translation of the original instructions carefully.
- Make sure that installation and operating personnel are adequately trained.
- Make sure the contents of the original instructions are fully understood by the responsible persons.
- Define areas of responsibility and competence.
- Prepare a maintenance schedule.

During operation of the plant:

- Keep this translation of the original instructions handy at the place of use.
- Heed the safety instructions. Always operate the machine / plant in accordance with its ratings.

If in doubt:




- Consult the manufacturer.

2.2 Warning structure








Where possible, warnings are structured according to the following system:

Signal word	
Possibly with symbol	Nature and source of the danger ⇒ Potential consequences of non-observance • Action to avert the danger.

2.3 Warning symbols used

 DANGER!
Immediate danger! ⇒ Non-observance will result in serious or fatal injury.
 WARNING!
Potentially dangerous situation! ⇒ Non-observance can result in serious or fatal injury.
 CAUTION!
Potentially dangerous situation! ⇒ Non-observance can result in minor or moderate injuries.
CAUTION! (without a symbol)
Potentially dangerous situation! ⇒ Non-observance can result in property damage.

2.4 Other symbols used

	Danger: High voltage!
	Danger information about explosion protection
	Information about environmental protection
	Protective clothing must be worn!
	Eye protection must be worn!
	Respirator must be worn!
	Hand symbol: Indicates general information and recommendations
•	Bullet: Indicates the order in which actions are to be carried out
⇒	Arrow: Indicates responses to actions

3 Glossary

Aerosol:

Distribution of tiny liquid droplets (or solid particles) in a gas within the outer phase.

Agglomerate:

Structure made up of several small particles which have formed a ball (agglomerated) as a result of physical forces.

Initial differential pressure:

Differential pressure at the start of the filtration process (when the filter element is "clean").

Differential pressure (Δp):

Pressure difference between the dirty side and the clean side.

Filter element:

Cylindrical structure consisting of a profiled inner core with triangular wires wound or welded onto it. The suspension to be filtered flows from the outside to the inside. Solids are retained on the outer surface of the filter element.

Filter cake:

Layer that is built up by the solids retained on the surface of the filter element.

Filtrate:

Fluid that is filtered.

Filtration mode:

The metal-edge filter operates normally and the drain valve is closed.

Homogenisation:

A system of substances is given a uniform composition.

Concentrate:

Quantity of residues enriched with solids that is periodically discharged from the automatic filter. Further treatment may be necessary, depending on the application.

Cooling lubricant:

Cooling lubricant according to DIN 51385.

Siphon:

U-shaped pipe. A siphon cannot be drained without a valve.

Suspension (dirty suspension):

System of substances to be filtered, generally consisting of solids in a liquid.

Pilot control:

5/2-way valves operated by the controller that switch pneumatic valves.

4 General information

4.1 Manufacturer

Filtration Group GmbH
Schleifbachweg 45
D-74613 Öhringen
Phone +49 7941 6466-0
Fax +49 7941 6466-429
fm.de.sales@filtrationgroup.com
www.filtrationgroup.com

4.2 Information about the original instructions

FG Mat. No.: 76121941
Date: 13.06.18
Version: 11

4.3 ATEX model code



II	2	G	c	T3
1.	2.	3.	4.	5.
1.	II	Valid for use above ground		
2.	Use in:	Zone 1 2	Zone 2 3	
3.	Atmosphere G = Gas D = Dust	G	G	
4.	Types of protection c = Constructional safety			
5.	T3 = The maximum surface temperature on the filtration device is 200°C.			

(Space for name-plate)

(Space for ATEX name-plate)

The Ex type of protection is only valid in conjunction with the declaration of conformity.

5 Intended application

⚠ DANGER!

PROHIBITED:

- Use for other purposes without prior consultation with the manufacturer.
- Use in hazardous areas unless explicitly mentioned in the contract documentation.
- Use with smouldering, burning or sticky particles.
- Use with highly explosive fluids or pastes.

⚠ CAUTION!

This FG metal-edge filter is only allowed to be used in accordance with the operating conditions specified in the contract documentation and in the original instructions. All forms of use which deviate from or exceed the limits of use described above are considered to be contrary to the intended purpose. The manufacturer is not liable for any damage resulting from such use.

CAUTION!

Conditionally allowed:

- Use of solvents (in consultation with the manufacturer!)
- Reverse flow through the filter (pressure < 0.6 bar).

FG metal-edge filters are designed for filtering fluids or pastes up to a maximum viscosity of 500,000 mPas and can be cleaned either manually or automatically without interrupting operation.

Main applications:

- Cooling lubricant filtration
- Product filtration
- Preseparation in a filter cascade
- Protective filtration before or after certain process steps
- Process filtration
- Destruction of unwanted agglomerates

If the filter is used with isocyanate, the shaft seals must be replaced every six months.

6 Machine description

6.1 Principle of the process

Filtration

A triangular wire is wound immovably on a threaded, profiled inner core. The gap width and thus the filter rating are determined by the thread pitch. The suspension flows through the filter element from the outside to the inside. Particles settle on the outside of the element. There is a significantly enlarged cross-section downstream of the narrowest gap due to the triangular geometry. Clogging is practically eliminated as a result.

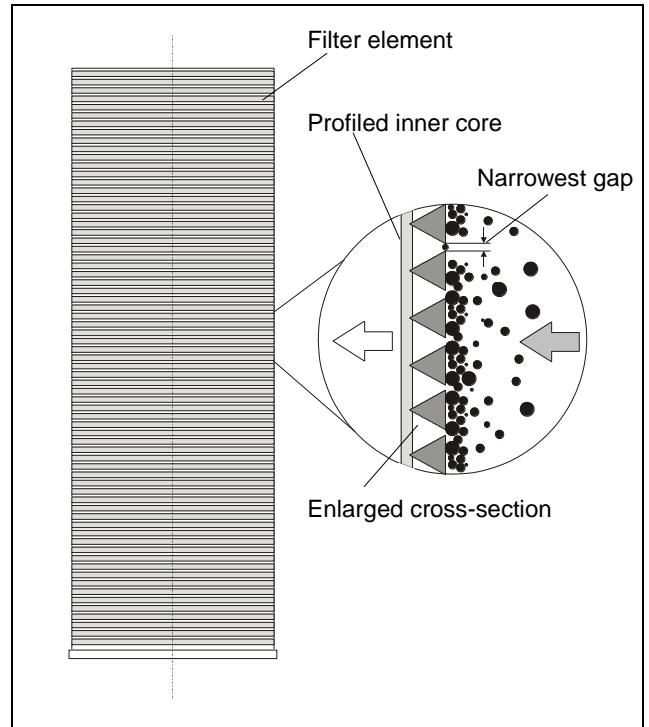


Fig. 1: Separation principle on the filter element

Cleaning

The particles that settle on the coiled or welded cartridge cause the differential pressure between the dirty side and the clean side to increase.

If this pressure difference exceeds a (settable) threshold, a cleaning cycle is started. The filter element begins to turn. The filter cake is detached from the element by the scraper.

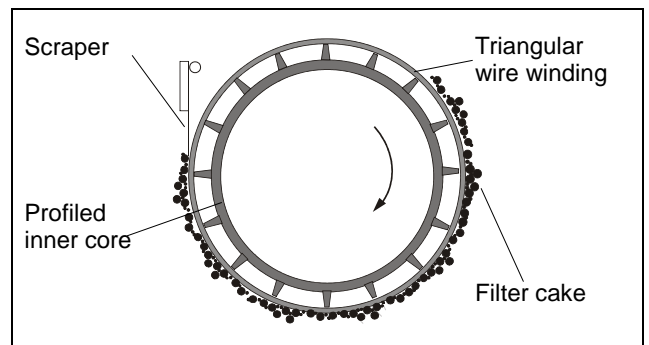


Fig. 2: Cleaning

To start a cleaning cycle

A cleaning cycle can be started in the following ways:

- Manually
- By means of a differential pressure switch
- By means of a time switch
- Controlled by a machine tool

6.2 Main components of the metal-edge filter

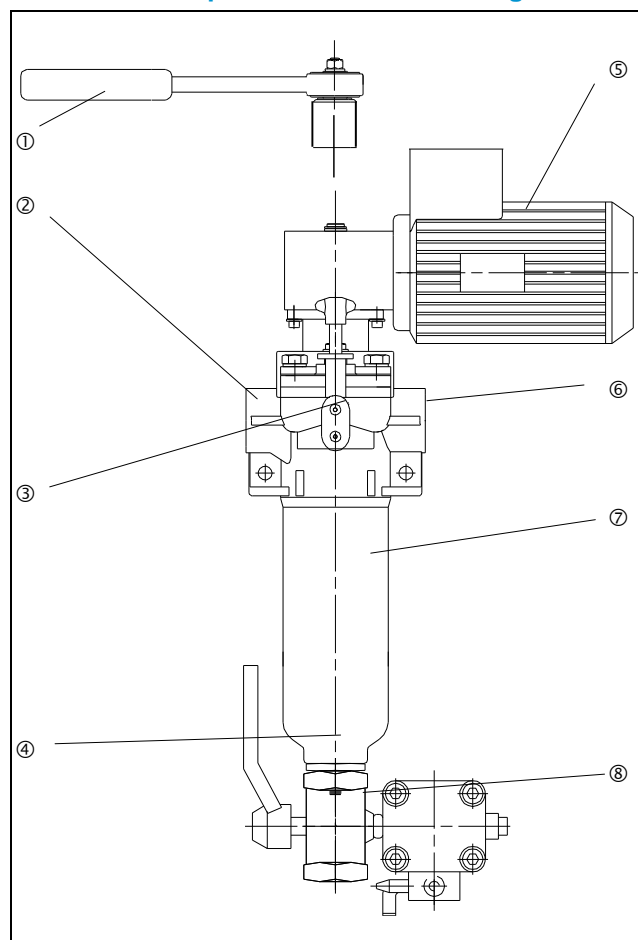


Fig. 3: Diagram of the main components

1	Ratchet for manual operation of the filter element
2	Suspension inlet
3	Differential pressure measurement connections
4	Drain opening
5	Gear motor for driving the filter element
6	Clean side discharge
7	Filter housing
8	Pneumatic or manual drain valve

6.3 Operating principle of a metal-edge filter

- 1 Dirty suspension flows into the metal-edge filter.
- 2 The suspension flows through the filter element. Particles settle on the outside of the element.
- 3 The filtered fluid reaches the clean side and exits the filter.

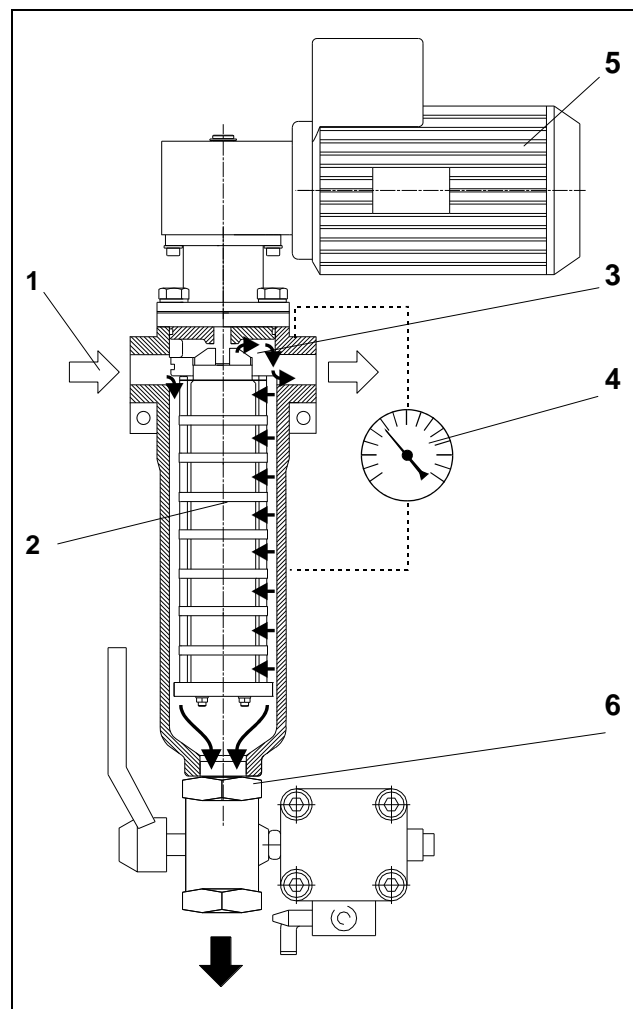


Fig. 4: Operating principle of a metal-edge filter

- 4 A cleaning cycle is started when the maximum differential pressure is reached (optional) or after a preset time.
- 5 The filter element is turned either by the gear motor or by the ratchet. The separated particles are detached by the stationary scraper. The filtration process is not interrupted.
- 6 The enriched particles on the dirty side can be periodically discharged.


7 Technical data

7.1 General data

Electrical power consumption*	230 V AC/400 V 3NPE
	0.06 to 0.072 kW
Noise emission (peaks):	< 70 dB(A)
Dimensions:	See data sheet
Min. dismantling clearance above filter:	250 mm
Total dry weight without valves:	10 kg
Max. permissible operating pressure:	< 100 bar
Max. perm. diff. pressure of coiled cartridge:	< 30 bar
Max. perm. diff. pressure of welded cartridge:	< 10 bar

*See also name-plate on gear motor

7.2 Order-specific data

	<p>The name-plate is rendered invalid if the segmented element or the inner assembly is modified.</p> <ul style="list-style-type: none">• Please request a new name-plate from the manufacturer.
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This data is order-specific and can be taken from the name-plate.



8 Transport and storage


Transport

- Always transport horizontally in the original packaging.
- Avoid vibrations.


Storage


- Always store horizontally in the original packaging.
- Always store in a dry, frost-free room.



	<p>Seaworthy packaging is specified in the contract documentation as an option.</p>
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9 Installation

⚠ DANGER!	
	<p>Explosion hazard!</p> <p>⇒ Risk of injury to persons or damage to property.</p> <ul style="list-style-type: none">• This FG automatic filter is only allowed to be installed and operated in the category specified in the contract documentation (offer / order confirmation).• If no category is specified: Do not operate the FG automatic filter in hazardous areas!• The owner is responsible for zone classification.• The owner is solely responsible for implementing the necessary explosion protection measures!• If in doubt, please consult the responsible authorities.

⚠ DANGER!	
	<p>Explosion hazard!</p> <p>⇒ Risk of injury to persons or damage to property.</p> <ul style="list-style-type: none">• The unit is only allowed to be installed, accepted and tested by a suitably trained person (99/98/EC).

⚠ WARNING!	
<p>If the unit is installed by unauthorised persons:</p> <p>⇒ Risk of injury.</p> <p>⇒ All warranty claims are rendered invalid.</p> <ul style="list-style-type: none">• The unit must be installed by a suitably trained person!	

9.1 Installation

⚠ DANGER!	
	<p>Explosion hazard!</p> <p>⇒ Risk of injury to persons or damage to property.</p> <ul style="list-style-type: none">• Check the conductivity between all components!• Note the maximum permissible resistance: $R < 10 \Omega$• Make sure earthing is provided on the site.
	<p>It must be possible to remove the inner assembly in order to carry out maintenance work.</p>

- Prepare a suitable seat on which to mount the filter (e.g. wall bracket).
- Be sure to allow the required clearances for dismantling and discharging (see data sheet).
- Pick up the metal-edge filter and remove it from the packaging.
- Bolt the metal-edge filter to the prepared seat (2 x mounting hole $D = 11 \text{ mm}$).
- Remove the protection caps on the connections.
- Connect the pipes.

Pressure relief

- Design measures must be incorporated to prevent inadmissible excess pressure on the dirty side.
- Install pressure relief valves if necessary.

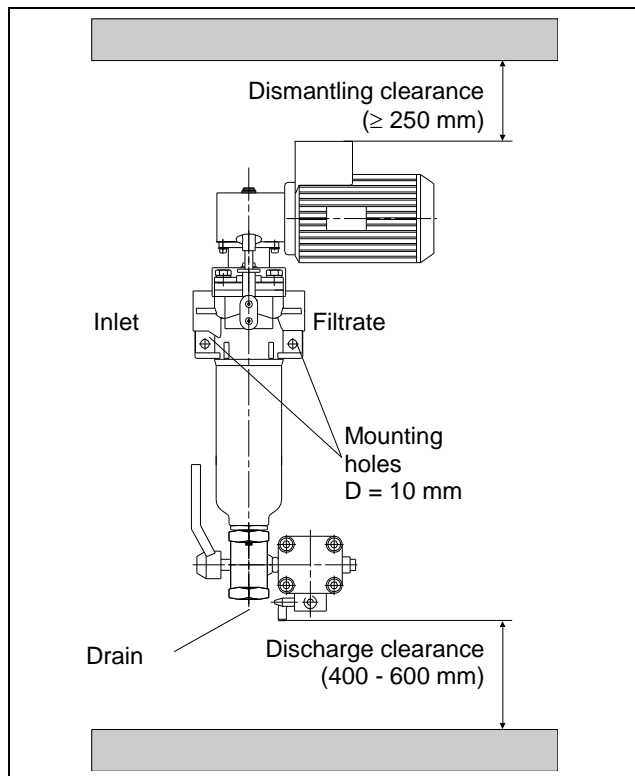


Fig. 5: Mechanical installation

9.2 Installation of the drain line

CAUTION!

High pressure at the drain valve!

- ⇒ Risk of injury to persons or damage to property.
- Depressurise prior to installing or dismantling.

- Make sure the drain line is securely fastened.
- Don't discharge concentrate into the atmosphere.
- Provide splash protection if necessary.
- Lay the pipes without a siphon if possible.
Sedimented concentrate leads to a risk of clogging!

9.3 Electropneumatic connections

DANGER!



Danger of electric shock!

- ⇒ Risk of serious or fatal injury in case of contact with electrical components.
- All electrical installation work must be carried out by a suitably qualified electrician!

9.3.1 Connection to the customer's controller

Gear motor

- Refer to the name-plate and / or the contract documentation for details of the ratings (see also terminal diagram).
- Connect the gear motor ⑤.
- Install a suitable motor circuit-breaker.

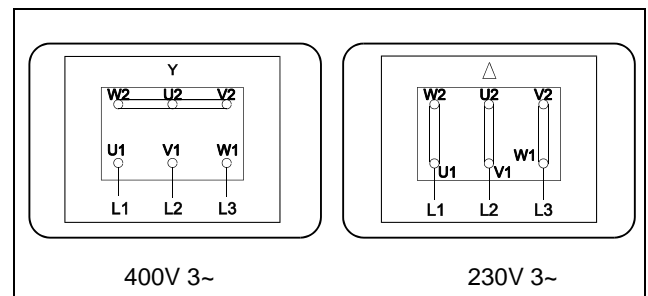


Fig. 6: Standard gear motor connections

Differential pressure switch (optional)

- Connect the differential pressure switch (to ③) as a normally open or normally closed contact. Refer to the documentation in the Appendix for the switching capacity.

Automatic drain valve (optional)

- Provide a suitable compressed air supply.
- Provide a suitable 5/2-way valve for piloting.



Refer to the contract documentation for special designs.

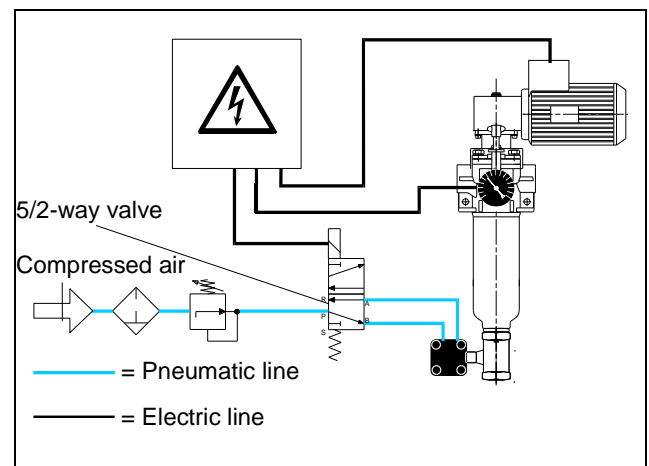


Fig. 7: Electropneumatic connections



Required on the switch box:

- Hand release for cleaning
- Hand release for drain valve

9.3.2 Connection to a FG controller (optional)

Connect the power connector, gear motor, differential pressure indicator (optional) and pilot valves (optional) in accordance with the enclosed circuit diagram.

9.4 Control options

Control of the cleaning process differs according to the application. The control options described here are examples and are simply intended to serve as a guide.

9.4.1 Time-controlled cleaning, manual draining

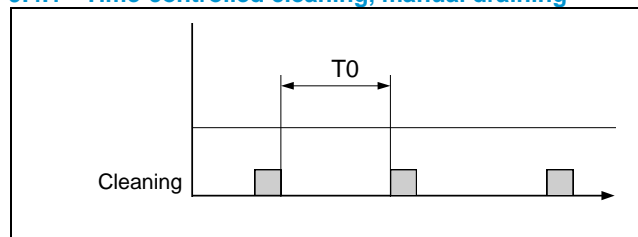


Fig. 8: Time-controlled cleaning

Parameter	Description	Recommended value
T0	Interval time	60 s to 24 h

9.4.2 Time-controlled cleaning and draining

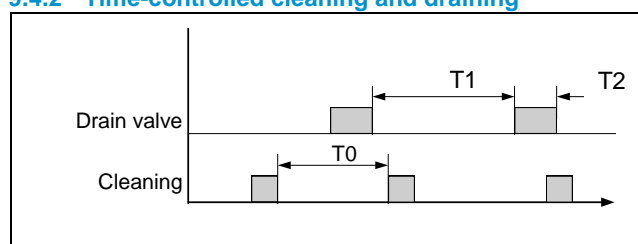
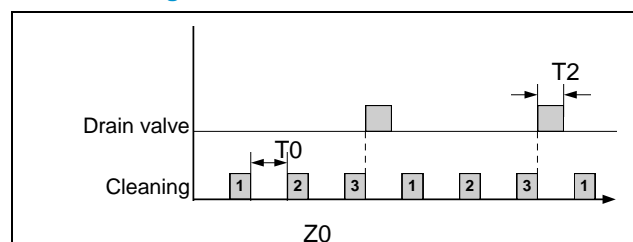


Fig. 9: Time-controlled cleaning / draining

Parameter	Description	Recommended value
T0	Interval time for cleaning	60 s to 24 h
T1	Interval time of drain valve	60 s to 24 h
T2	Opening time of drain valve	2 to 5 s

9.4.3 Time-controlled cleaning, counter-controlled draining



Time-controlled cleaning, counter-controlled draining

Parameter	Description	Recommended value
T0	Interval time for cleaning	60 s to 24 h
Z0	Cleaning counter	3 to 5
T2	Opening time of drain valve	2 to 5 s

9.4.4 Differential pressure / time-controlled cleaning

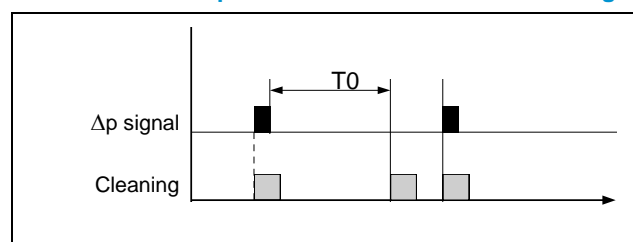


Fig. 10: Differential pressure / time-controlled cleaning

Parameter	Description	Recommended value
T0	Max. interval time	6 to 30 s

10 Start-up

⚠ DANGER!

This FG metal-edge filter must not be put into service until the relevant machinery into which it is to be incorporated has been declared in conformity with the applicable EC directives, harmonised standards, European standards or equivalent national standards.

⚠ DANGER!



Explosion hazard!

- ⇒ Risk of injury to persons or damage to property.
- The FG automatic filter must be completely vented prior to start-up if it is to be used with media that capable of forming explosive gases.
- The FG automatic filter must be completely filled with fluid.
- Take steps to prevent air pockets.

⚠ DANGER!

Danger due to high pressure in the filter!

- ⇒ Risk of injury to persons or damage to property.
- Do not allow concentrate to spatter into the atmosphere!

- Check that the protection caps have been removed from the connections.
- Remove all foreign particles from the filter.
- Check the pipe connections.
- Tighten all screws.
- Flush the pipes.

10.1 Functional test

To check the direction of rotation of the gear motor

- Unscrew the cover of the gear motor ⑤.
- Start up the gear motor briefly (< 1 s).
- Compare the direction of rotation of the shaft with that shown by the arrow (clockwise).
- Reverse the terminal connections of the gear motor if necessary.
- Screw the cover of the gear motor back on again.

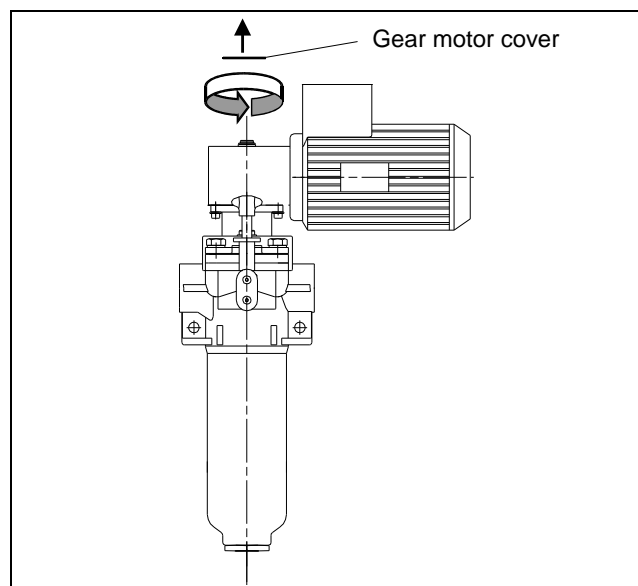


Fig. 11: Direction of rotation of the gear motor

To check the differential pressure contact switch ③ (optional)

- Set the contact to zero differential pressure.
 - ⇒ The contact switch is switched.
- Set the contact to the setpoint.
- Refer also to the documentation in the Appendix.

To test the function of the drain valve ⑥ (optional)

- Connect compressed air to the pilot valve.
- Press the hand release for the pilot valve.
 - ⇒ The drain valve opens.
- Set the hand release to the "off" position.
 - ⇒ The drain valve closes.

10.2 Operating settings

- Switch on the controller.
- Open the inlet.
- Make a note of the initial differential pressure (optional).

⚠ CAUTION!

- ⇒ The bearings can heat up if the pump is run dry!
- The filter must be completely vented!

Settings for time-controlled cleaning

- Set the times according to the operating conditions and correct them if necessary.

Settings for differential pressure-controlled cleaning with a contact gauge

- Adjust the set differential pressure to the setpoint (refer to the contract documentation).

Initial differential pressures

The initial differential pressures vary according to the application.

General guide:

Installation on discharge side: $\Delta p \leq 0.3 \text{ bar}$

Installation on suction side: $\Delta p \leq 0.03 \text{ to } 0.1 \text{ bar}$

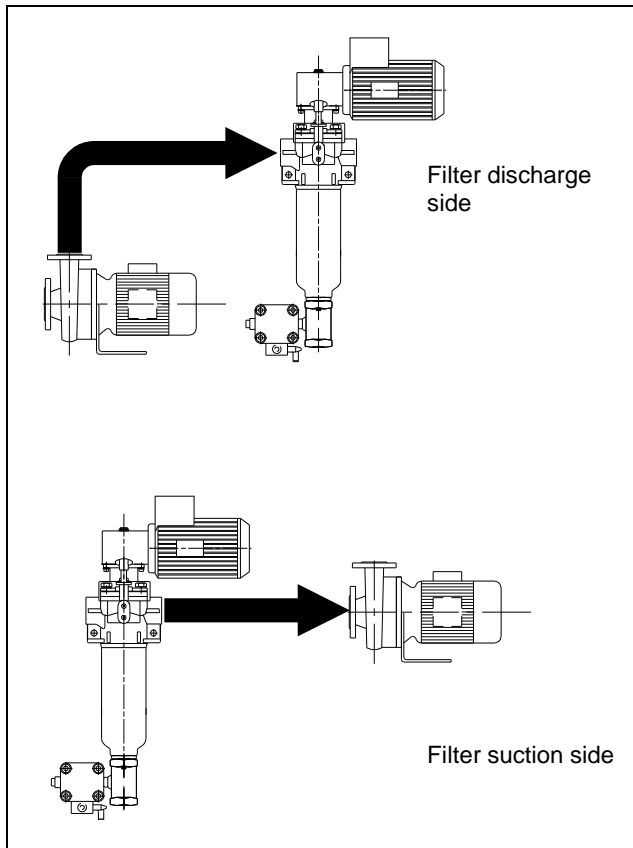


Fig. 12: Initial differential pressures



At the end of a cleaning cycle, the differential pressure should return almost to the original initial differential pressure. If not, the cleaning function is faulty (in this case, please consult the manufacturer).

11 Normal operation

⚠ DANGER!

Danger due to high pressure in the automatic filter!

⇒ Risk of injury to persons or damage to property.

- Do not allow concentrate to spatter into the atmosphere!



Dispose of concentrate in a manner which does not pollute the environment! Consult the responsible authorities before deciding upon the most suitable disposal method.

The following parameters must be monitored daily during normal operation:

- Differential pressure
- Concentrate bowl level
- Controller functions

Flushing the drain line

⚠ CAUTION!

A high proportion of fine dirt particles in a long pipe can lead to clogging!

⇒ Risk of injury to persons or damage to property.

- Flush the drain line daily / weekly, depending on the application.

To flush the drain line

- Open the drain valve ⑧ manually for approx. 10 to 15 s.
- ⇒ The drain line is flushed.

12 Shutting down the metal-edge filter

12.1 Temporary shut-down

On the installed metal-edge filter controller:

- Switch OFF the main switch.

12.2 Prolonged shut-down (>48 h)

- Start a manual cleaning cycle.
- Clean the metal-edge filter (refer to section 14.3 "Cleaning the filter", page 14).
- Fill the filter completely with fluid.
- Switch OFF the main switch.




12.3 Emergency shut-down

- Switch OFF the main switch.
- ⇒ The power supply is interrupted.

13 Troubleshooting

Fault	Possible cause	Remedy
Gear motor does not turn	Motor circuit breaker tripped	Reset the motor circuit breaker Test the gear motor
	Substance to be filtered has solidified	Clean the filter
Valve does not open	Not enough compressed air	Increase the pressure
	Pilot valve defective	Test the pilot valve
	Pilot valve incorrectly connected	Check the electrical and pneumatic connections
Initial differential pressure no longer reached	Solids concentration too high	Use a suitable prefilter
	Gear motor rotating in wrong direction	Check the direction of rotation
	Cleaning time too short	Increase the cleaning time (the gear motor should be turned at least 1 or 2 turns)
Increased concentration of dirt on clean side	Filter element defective	Check the filter element and if necessary replace
	Seals brittle	Check the seals and if necessary replace
Excessive leakage at shaft seal		Tighten or replace the shaft seal

14 Maintenance

 DANGER!	
	Explosion hazard! ⇒ Risk of injury to persons or damage to property.
	<ul style="list-style-type: none"> Work is only allowed to be carried out in hazardous areas if appropriate safety precautions are implemented. Safety precautions must be implemented by the owner.
 WARNING!	
If the unit is maintained by unauthorised persons: ⇒ Risk of injury. ⇒ All warranty claims are rendered invalid.	
<ul style="list-style-type: none"> The unit must be maintained by a suitably trained person! 	

Before all maintenance work:

- Shut down the metal-edge filter.
- Take steps to prevent the unit from being switched on again by unauthorised persons.




- Take any necessary safety precautions (protective clothing, eye protection, etc.).




- Carry out the maintenance work.
 - Start up the metal-edge filter again.
 - Observe the metal-edge filter.
- ⇒ Does it operate normally?

14.1 Inspection and maintenance schedule

- Refer also to the contract documentation.

	Component	Activity	Comments
Weekly	Metal-edge filter	Visual inspection	Leakage, differential pressure ¹
	Pipes	Clean	
Monthly 	Filter	Check, clean	Wear
	FG metal-edge filter	Check the leakage resistance between conductive components	< 10 Ω
Every six months if filter used with isocyanate	Shaft seal	Shaft seal Replace	
Yearly or when cooling lubricant replaced	Bearings	Visual inspection	Clearance
	Valves	Functional test	
	Filter	Clean	
	Seal kit		

	The necessary inspection and maintenance work is dependent on the particular application. Please consult the manufacturer if necessary.
---	---

¹ Optional

14.2 Removing the inner assembly

⚠ DANGER!

The filter is pressurised!

- First relieve the pressure!
- Then open the filter!



The numbers indicated in parentheses correspond to those used in the spare parts drawing.

- 1
 - Close the filter inlet and outlet.
 - Relieve the pressure in the pipe if necessary.

- 2
 - Open the air-release valve.
 - Open the drain valve.

⇒ The filter is discharged.

- 3
 - Turn off the compressed air supply.

- 4
 - Disconnect the gear motor.

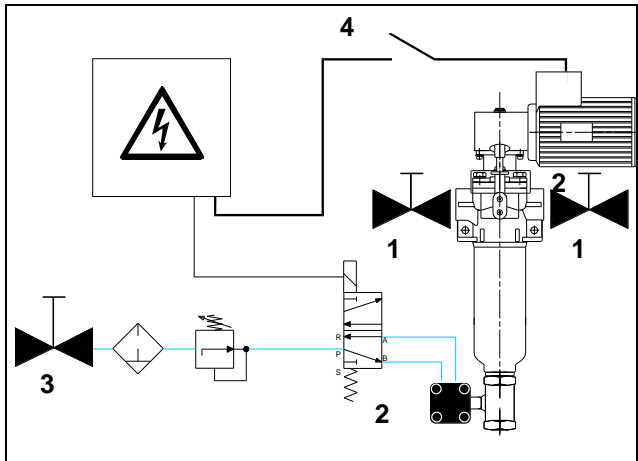


Fig. 13: Disconnecting the filter

- 5
 - Loosen the screws on the cover (14).
- 6
 - Remove the housing.

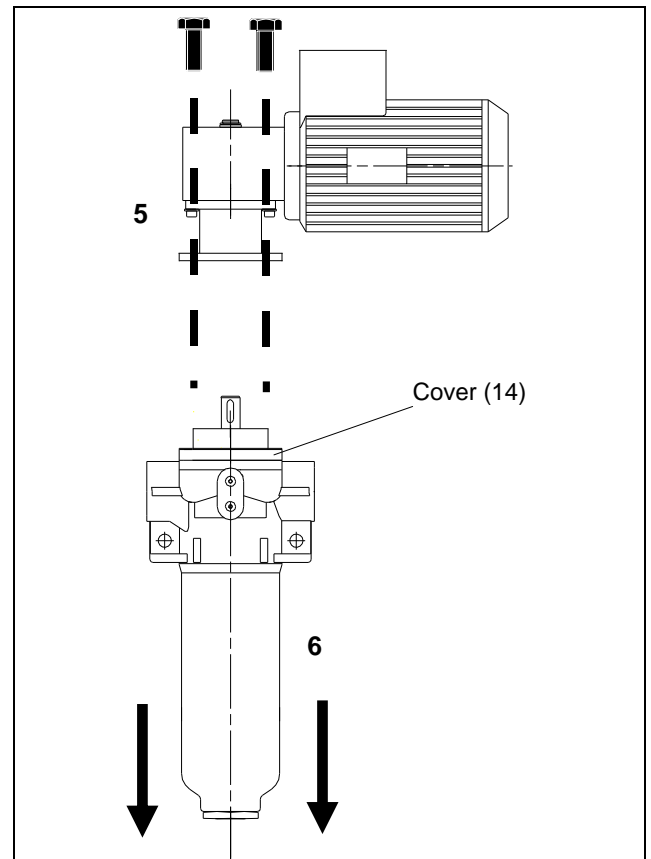


Fig. 14: Removing the gear motor and cover

- Lay the inner assembly down carefully on a level surface, taking care not to damage the filter element.

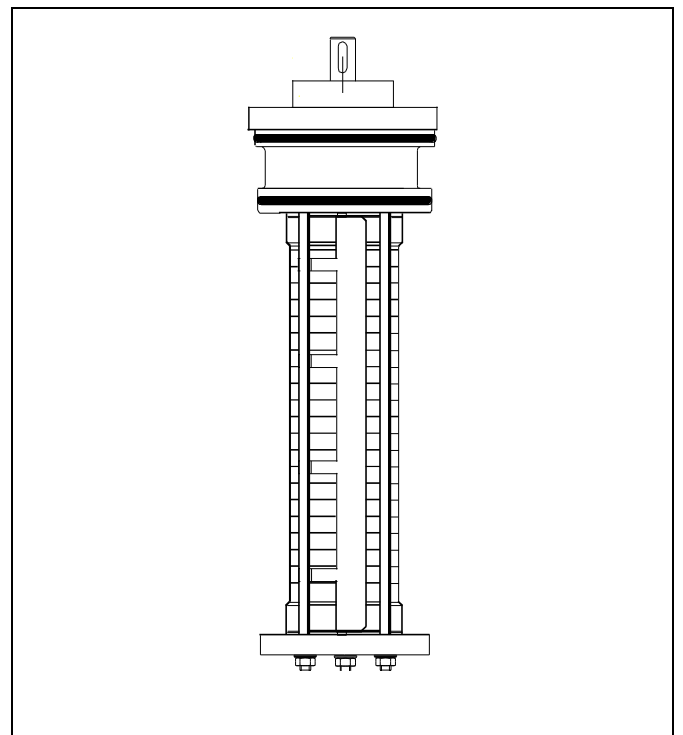


Fig. 15: Inner assembly

To install

- Install in reverse order.

14.3 Cleaning the filter

14.3.1 Cleaning the inner assembly



- Wear protective clothing and equipment appropriate to the hazard potential of the medium (e.g. eye protection, respirator, protective clothing, etc.).
- Remove any coarse impurities by mechanical means.
- Wash out the inner assembly in a suitable cleaning solution.
- Carefully blow out the inner assembly with a steam jet or compressed air.

WARNING!

Danger of aerosol formation!

- All work must be carried out in a room with a suitable extraction system!

- Clean (or if necessary replace) and oil the seals.

14.3.2 Cleaning the filter housing



- Wear protective clothing and equipment appropriate to the hazard potential of the medium (e.g. eye protection, respirator, protective clothing, etc.).
- Remove any coarse impurities by mechanical means.
- Wash out the filter housing in a suitable cleaning solution.

14.4 Replacing the filter element

DANGER!



Danger of electric shock!

- ⇒ Risk of serious or fatal injury in case of contact with electrical components.
- All electrical installation work must be carried out by a suitably qualified electrician!

WARNING!

If the unit is maintained by unauthorised persons:

- ⇒ Risk of injury.
- ⇒ All warranty claims are rendered invalid.
- The unit must be maintained by a suitably trained person!



The numbers indicated in parentheses correspond to those used in the spare parts drawing.

- De-energise and disconnect the gear motor.
- Loosen the hexagon screws (9) on the motor stator.
- Carefully pull the gear motor and / or the star handle vertically off the shaft.

To remove the filter element

- Loosen and remove the hexagon nuts (22).
- Remove the centre flange (20).
- Carefully remove the scraper (30).
- Carefully pull the filter element down to remove it.

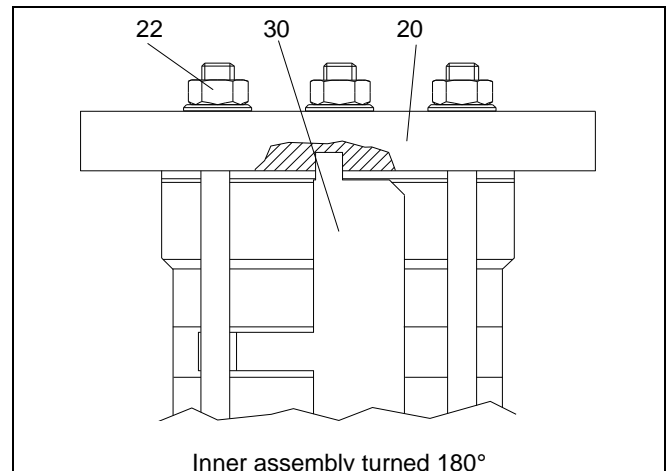




Fig. 16: Removing the inner assembly

To install the filter element

- Install in reverse order.

14.5 Replacing the scraper

⚠ DANGER!	
	Danger of electric shock! ⇒ Risk of serious or fatal injury in case of contact with electrical components. • All electrical installation work must be carried out by a suitably qualified electrician!
⚠ WARNING!	
If the unit is maintained by unauthorised persons: ⇒ Risk of injury. ⇒ All warranty claims are rendered invalid. • The unit must be maintained by a suitably trained person!	
⚠ CAUTION!	
Danger of crushing! ⇒ The scrapers have preloaded springs. • Never attempt to reach between the scraper and the coiled cartridge!	
	The numbers indicated in parentheses correspond to those used in the spare parts drawing.

- De-energise and disconnect the gear motor.
- Loosen the hexagon screws (9) on the motor stator.
- Carefully pull the gear motor and / or the star handle vertically off the shaft.

To remove the scraper

- Loosen and remove the hexagon nut (22).
- Remove the centre flange (20).
- Carefully remove the scraper (30).

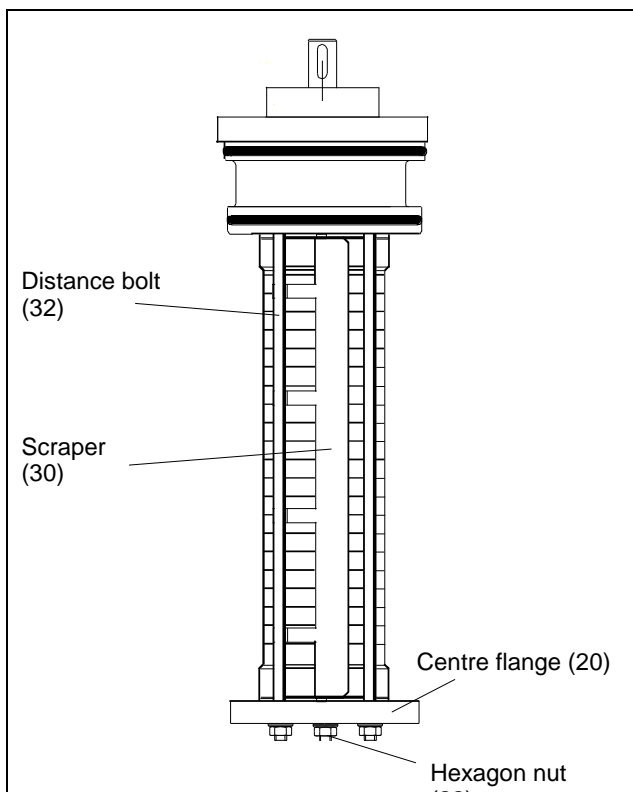





Fig. 17: Replacing the scraper

After installing:

- The scraper guide must rest in the slots provided.
- The scraper must rest correctly on the filter element.
- The scraper must be inserted straight.
- Check all screws and tighten them if necessary.

14.6 Replacing the Quad-Ring / backup ring or lip seal

⚠ DANGER!	
	Danger of electric shock! ⇒ Risk of serious or fatal injury in case of contact with electrical components. • All electrical installation work must be carried out by a suitably qualified electrician!
⚠ WARNING!	
If the unit is maintained by unauthorised persons: ⇒ Risk of injury. ⇒ All warranty claims are rendered invalid. • The unit must be maintained by a suitably trained person!	
	The numbers indicated in parentheses correspond to those used in the spare parts drawing.
	The Quad-Ring / backup ring or lip seal must always be replaced together with the two bushes.

- De-energise and disconnect the gear motor.
- Loosen the hexagon screws (9) on the motor stator.
- Carefully pull the gear motor and / or the star handle vertically off the shaft.

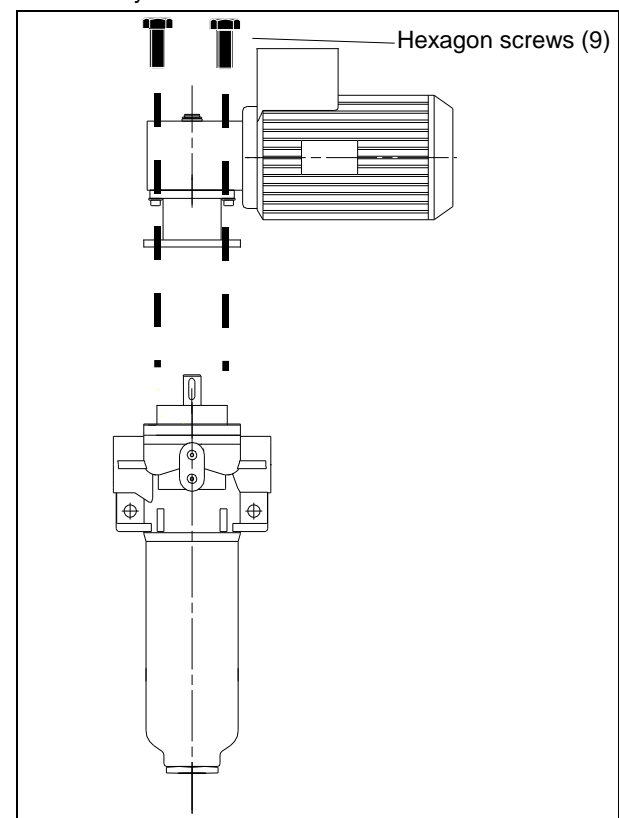


Fig. 18: Removing the gear motor

To remove the Quad-Ring / backup ring or lip seal

- Remove the inner assembly (section 14.2).
- Remove the filter element (section 14.4).
- Loosen the cylinder head screws (11).
- If necessary, drive the upper grooved pin out of the shaft and pull the shaft down vertically to remove it.
- Remove the sealing flange (13) and the upper bush (12).
- The Quad-Ring (34) / backup ring (33) or lip seal (40) is now accessible and can be replaced.

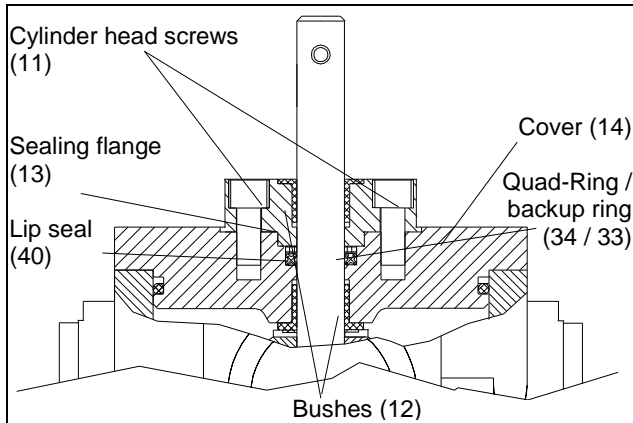


Fig. 19: Preparing to replace the Quad-Ring / backup ring or lip seal

To install the Quad-Ring / backup ring or lip seal

- Insert the Quad-Ring (34).
- Insert the backup ring (33).
- Insert the lip seal (40) if necessary.
- Insert the shaft vertically from below and drive in the upper grooved pin again if necessary.
- Insert the sealing flange (13) and the upper bush (12).
- Tighten the cylinder head screws (11).

Slight leakage is normal and necessary for lubrication.

14.7 Replacing the bearing bushes

⚠ DANGER!	
	Danger of electric shock!
	⇒ Risk of serious or fatal injury in case of contact with electrical components. <ul style="list-style-type: none"> • All electrical installation work must be carried out by a suitably qualified electrician!
⚠ WARNING!	
If the unit is maintained by unauthorised persons:	
⇒ Risk of injury. ⇒ All warranty claims are rendered invalid. <ul style="list-style-type: none"> • The unit must be maintained by a suitably trained person! 	
	The numbers indicated in parentheses correspond to those used in the spare parts drawing.
	The Quad-Ring / backup ring or lip seal must always be replaced together with the two bushes.

- De-energise and disconnect the gear motor.
- Loosen the hexagon screws (9) on the motor stator.
- Carefully pull the gear motor and / or the star handle vertically off the shaft.

To remove the bushes

- Remove the inner assembly (section 14.2).
- Remove the filter element (section 14.4).
- Loosen the cylinder head screws (11).
- If necessary, drive the upper grooved pin (37) out of the shaft (35) and pull the shaft down vertically to remove it.
- Remove the sealing flange (13) and the upper bush (12).
- Tap out the upper bush (12) carefully using a taper punch or a screwdriver.
- The Quad-Ring (34) / backup ring (33) or lip seal (40) is now accessible and can be removed.
- Unscrew the cover (14) and remove it.
- Tap out the lower bush (12) carefully using a taper punch or a screwdriver.

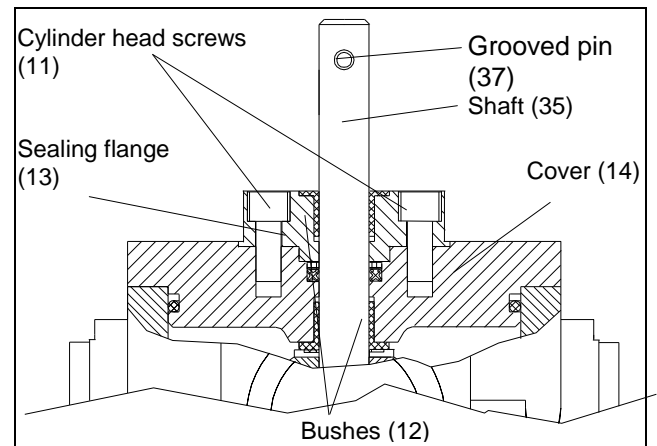


Fig. 20: Preparing to replace the bushes

To install the bushes

- Carefully tap the lower bush (12) into the cover with a mallet. The bush must be inserted straight.
- Carefully tap the upper bush (12) into the sealing flange with a mallet. The bush must be inserted straight.
- Install the remaining parts in reverse order.

15 Spare parts drawing AF 71 G

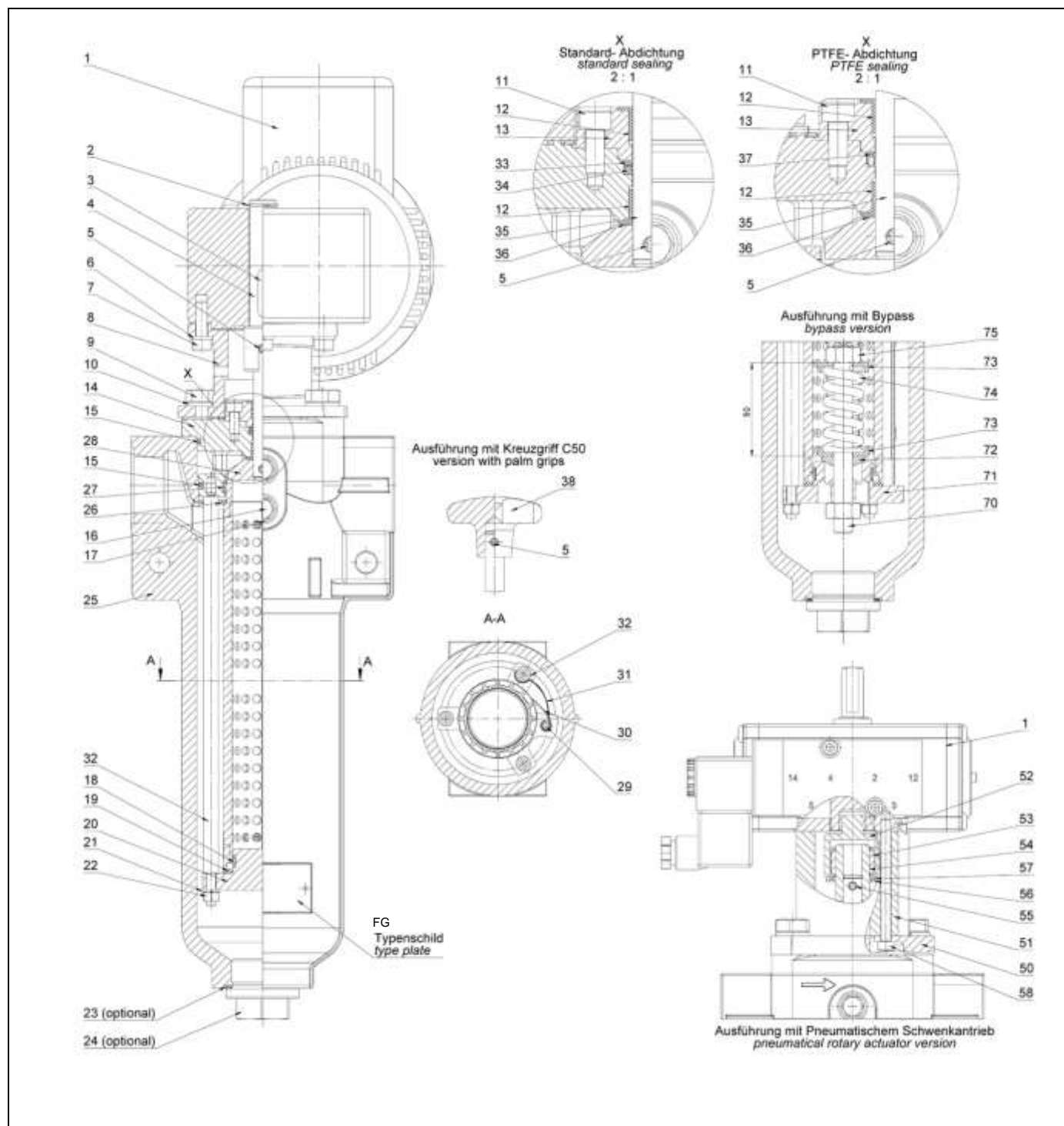


Fig. 21: Spare parts drawing AF 71 G

16 List of parts AF 71 G

AF7117	AF 7137	AF 7111	AF 7113			
2	2	2	2	hexagon nut	75	6kt-Mutter ISO 4032 M10
1	1	1	1	valve spring	74	Ventilfeder
2	2	2	2	washer	73	Scheibe
1	1	1	1	valve disc	72	Ventilteller
1	1	1	1	centre flange	71	Zentrierflansch
1	1	1	1	threaded bolt	70	Gewindebolzen
4	4			cylinder head screw	58	Zyl.-Schraube ISO 4762 M5x65 8.8
1	1			axial bearing disc	57	Anlaufscheibe 20x28x1,5 PTFE
1	1			shim ring	56	Pass-Scheibe 20x28x1
1	1			clamping pin	55	Spannstift ISO 8752 4x30
1	1			bush	54	Hülse AF71/G1 D18/D10x25 Schwenk 1.2210
1	1			drawn cup roller clutch	53	Hülsenfreilauf AF71/G1 HF 1816
1	1			housing of drawn cup roller clutch	52	Fleilaufaufnahme AF72-113/G HF 1816
1	1			bellhousing top slew drive	51	Motorblock AF71/G1 Unterteil Schwenk
1	1			bell housing botom slew drive	50	Motorblock AF71/G1 Oberteil Schwenk
		1		cross grip	38	Kreuzgriff C50
1	1	1	1	lip seal	37	Lippendichtung 10/14,5/3,6 PTFE
1	1	1	1	washer	36	Pass-Scheibe 10x16x0,5
1	1	1	1	drive shaft	35	Antriebswelle
1	1	1	1	ring	34	Quad-Ring NBR 10.2x2.62
1	1	1	1	backup ring	33	Stützring 10x14.8x1.2
3		3	3	distance bolt	32	Distanzbolzen AF 711
	3			distance bolt	32	Distanzbolzen AF 713
2	4	2	2	spring	31	Blattfeder
1		1	1	scraper	30	Abstreifer AF 711
	1			scraper	30	Abstreifer AF 713
1		1	1	pin	29	Stift AF 711
	1			pin	29	Stift AF 713
1	1	1	1	retainer	28	Mitnehmer
1	1	1	1	guide ring	27	Führungsring 39x6.4
1	1	1	1	axial bearing ring	26	Dichtring DIN 7603 A39x46 PTFE
	1			housing	25	Gehäuse AF7113
1		1	1	housing	25	Gehäuse AF7111
1	1	1	1	closing screw	24	Verschlußschraube GI DIN 910
1	1	1	1	sealing ring	23	Dichtring A33x39 DIN 7603
3	3	3	3	hexagon nut	22	6Kt-Mutter M5 ISO 4032
3	3	3	3	spring washer	21	Federring A5 DIN 127
1	1	1	1	centre flange	20	Zentrierflansch
1	1	1	1	sealing ring	19	Dichtring DIN 7603 A32x13,5 C4400
1	1	1	1	guide ring	18	Führungsring 28x6.4
2	2	2	2	sealing ring	17	Dichtring A10x13.5 DIN 7603
2	2	2	2	closing screw	16	Verschlußschraube G 1/8 DIN 910
2	2	2	2	o-ring	15	O-Ring 63.17x2.62 FPM
1	1	1	1	cover	14	Deckel
1	1	1	1	sealing flange	13	Dichtflansch
2	2	2	2	bush	12	Buchse 10x13x5 Gleitlager
2	2	2	2	cylinder head bolt	11	Zylinderschraube M5x12 ISO 4762
4	4	4	4	spring washer	10	Federring A10 DIN 127
			4	hexagon screw	9	6Kt-Schraube M10x30 ISO 4017
		4		hexagon screw	9	6Kt-Schraube M10x25 ISO 4017
4	4			hexagon screw	9	6Kt-Schraube M10x35 ISO 4017
			1	motorflange	8	Motorbock
			4	cylinder head bolt	7	Zylinderschraube M6x16 ISO 4762
			4	spring washer	6	Federring B6 DIN 127
1	1	2	2	straight grooves pin	5	Spannstift ISO 8752 4x18
			1	motor shaft	4	Motorwelle
			1	parallel keys	3	Paßfeder 5x5x25 ISO 773
			1	retaining ring for shafts	2	Sicherungsring
			1	motor	1	Getriebemotor
1	1			pneumatic rotary actuator	1	Pneumatischer Schwenkantrieb
Qty.				Designation	Lfd Nr.	Bezeichnung
	Please request a separate spare parts drawing and list of spare parts for special designs.					

17 Spare parts drawing AF 71 GX1

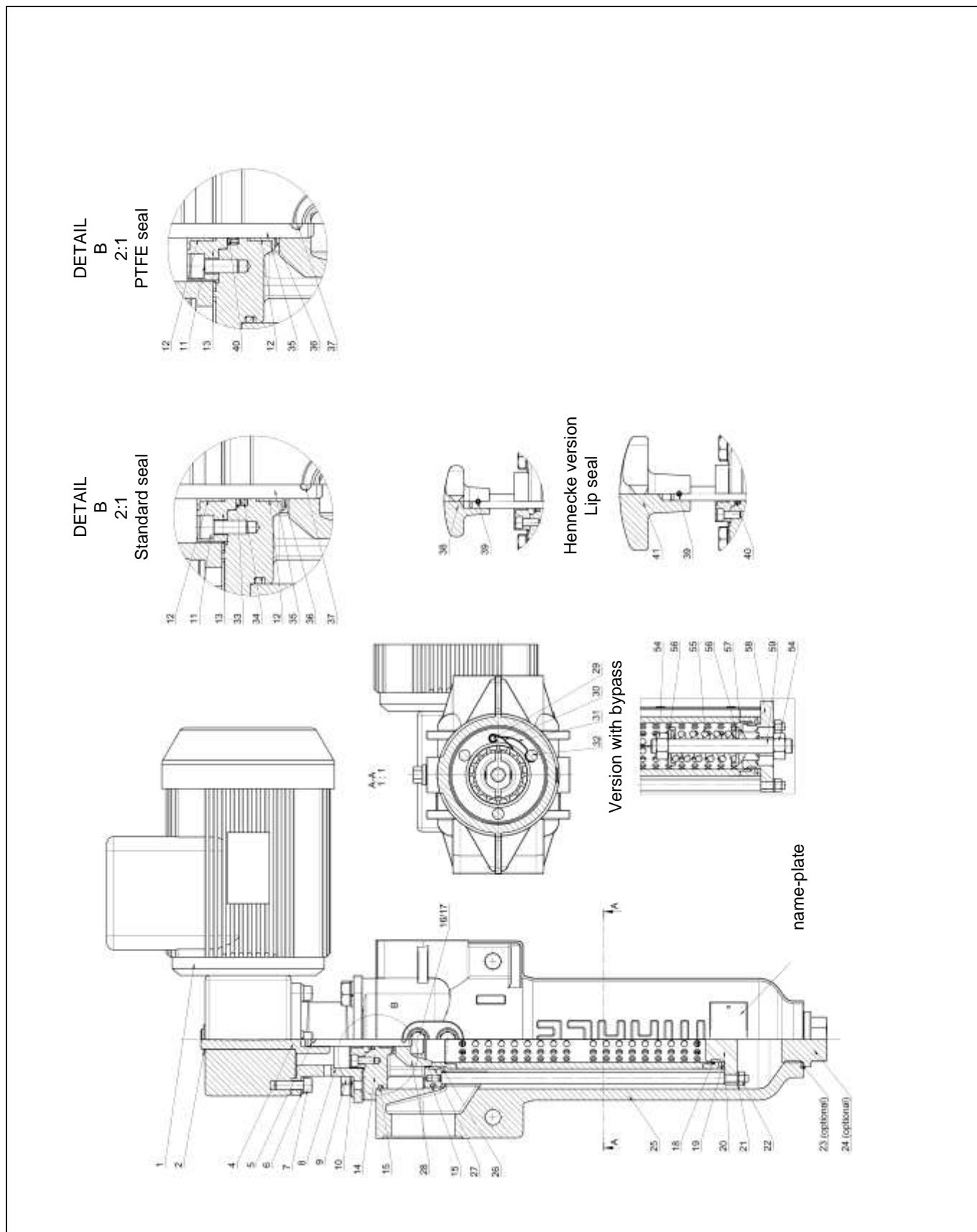




Fig. 22: Spare parts drawing AF 71 GX1

18 List of parts AF 71 GX1

AF 7131	AF 7133			
1	1	Threaded bolt	59	Gewindebolzen
1	1	Centre flange	58	Zentrierflansch
2	2	Washer	56	Scheibe
1	1	Valve spring	55	Ventilfeder
2	2	Hexagon nut	54	6kt.-Mutter ISO 4032 M10
1		Palm grip	41	Kreuzgriff A80 (Ausführung Hennecke)
1	1	Lip seal	40	Lippendichtung 10/14,5/3,6 PTFE
1		Clamping pin	39	Spann-Stift ISO 8752 3x16
1		Palm grip	38	Kreuzgriff C50
1	1	Grooved pin	37	Zylinderkerbstift ISO 8740 4x16
1	1	Shim ring	36	Pass-Scheibe 10x16x0,5
1	1	Shaft	35	Antriebswelle
1	1	Quad-Ring	34	Quad-Ring FPM 10,2x2,62
1	1	Backup ring	33	Stützring 10x14,8x1,2
3	3	Distance bolt	32	Distanzbolzen
4	4	Flat spring	31	Blattfeder
1	1	Scraper	30	Abstreifer 713
1	1	Scraper shaft	29	Stift AF713
1	1	Coupling fork	28	Mitnehmer
1	1	Radial bearing ring	27	Führungsring 39x6,4
1	1	Axial bearing disc	26	Dichtring DIN 7603 PTFE A39x46
1	1	Housing	25	Gehäuse
1	1	Screw plug	24	Verschlussschraube DIN 910 G1
1	1	Sealing ring	23	Dichtring DIN 7603 33x39
3	3	Hexagon nut	22	6kt.-Mutter ISO 4032 M5
3	3	Spring washer	21	Federring DIN 127 A5
1	1	Centre flange	20	Zentrierflansch
1	1	Axial bearing disc	19	Dichtring DIN 7603 PTFE A32x42
1	1	Radial bearing ring	18	Führungsring 28,9
2	2	Sealing ring	17	Dichtring Cu A10x13.5 DIN 7603
2	2	Screw plug	16	Verschlußschraube G 1/8 DIN 910
2	2	O-ring	15	O-Ring 63.17x2.62 FPM;PTFE
1	1	Cover	14	Deckel
1	1	Sealing flange	13	Dichtflansch
2	2	Bush	12	Buchse 10x12x9 IglidurX
2	2	Cylinder head screw	11	Zylinderschraube M5x12 ISO 4762
4	4	Spring washer	10	Federring A10 DIN 127
4		Hexagon screw	9	6Kt-Schraube M10x25 ISO 4017
	4	Hexagon screw	9	6Kt-Schraube M10x30 ISO 4017
	1	Bell housing	8	Motorbock
	1	Cylinder head screw	7	Zylinderschraube M6x16 ISO 4762
	1	Spring washer	6	Federring A6 DIN 127
	1	Grooved pin	5	Zylinderkerbstift 4x20 ISO 8740
	1	Motor shaft	4	Motorwelle
	1	Feather key	3	Passfeder 5x5x25 ISO 773 A
	1	Snap ring	2	Sicherungsring DIN 471 14x1
	1	Gear motor	1	Getriebemotor
Qty.	Designation		Benennung/DIN Bezeichnung	
	Please request a separate spare parts drawing and list of spare parts for special designs.			

19 List of spare parts AF 71 G / AF 71 GX1

	Edelstahl Stainless steel	C-Stahl Carbon steel	
Scraper z, pc.	70553240	70553240	Abstreifer Z AF713./G1 vp.
Scraper z, pc.	70553242	70553242	Abstreifer Z AF711./G1 vp.
Seal kit, lip seal pc.	70552828	70552828	Dichtsatz Lippend. vp.
Seal kit, PTFE. pc.	76198352	76198352	Dichtsatz PTFE vp.
Seal kit, FPM, pc.	76148647	76148647	Dichtsatz FPM vp.
Bearing bush kit, pc.	76148654	76384333	Buchsensatz vp.
Designation	Mat. No.	Mat. No.	Benennung/DIN Bezeichnung
	Please request a separate spare parts drawing and list of spare parts for special designs.		

20 Declaration of incorporation

As defined by the EC Machinery Directive

EU – Einbauerklärung EU Declaration of incorporation Déclaration relative au montage UE



Der Hersteller
The manufacturer
Le producteur

Filtration Group GmbH
Schleifbachweg 45
74613 Öhringen
Telefon 07941 6466-0
Telefax 07941 6466-429

erklärt hiermit, dass das folgende Produkt
hereby declares that the following product
déclare par la présente que le produit suivant

Produktbezeichnung:
Product designation:
Désignation du produit :
Typenbezeichnung:
Type designation:
Désignation du type :
Funktionsbeschreibung:
Machine description:
Description du fonctionnement :

Automatik-Kantenspaltfilter
Automatic metal edge filter
Filtres automatiques à fentes

AF 71 G

Filtration von Feststoffen
Filtration of solids
Filtration de solides

den in der Anlage dargestellten grundlegenden Anforderungen der Richtlinie 2006/42/EU entspricht.
conforms to the essential requirements of the Machinery Directive 2006/42/EU pursuant to the Annex.
répond aux exigences fondamentales de la directive 2006/42/UE, décrites en annexe.

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2006/42/EU über Maschinen entspricht.
The partly completed machinery must not be put into service until the relevant machinery into which this partly completed machinery is to be incorporated has been declared in conformity with the Machinery Directive 2006/42/EU.
La machine incomplète ne doit être mise en service qu'après avoir déterminé que la machine, dans laquelle la machine incomplète doit être montée, correspond aux dispositions de la directive machines 2006/42/UE.

Folgende harmonisierten Normen wurden angewandt:

The following harmonised standards have been used:
Les normes harmonisées ci-dessous ont été appliquées :

DIN EN ISO 12100:2011-03, DIN EN ISO 4414:2011-04

Der Hersteller verpflichtet sich, die speziellen Unterlagen zur unvollständigen Maschine, einzelstaatlichen Stellen auf Verlangen schriftlich zu übermitteln. Die zur Maschine gehörenden speziellen technischen Unterlagen nach Anhang VII Teil B wurden erstellt.
The manufacturer undertakes to transmit any specific documentation on the partly completed machinery to the appropriate national authorities in writing on request. All specific technical documentation belonging to the machinery has been compiled pursuant to Annex VII Section B.

Le fabricant s'engage à transmettre les documents spécifiques à la machine incomplète par écrit aux administrations nationales respectives sur leur demande. Les documents techniques spécifiques selon Annexe VII partie B faisant partie de la machine ont été établis.

Dokumentationsverantwortlicher/Abteilung:
Responsible for documentation/department:
Responsable de la documentation/Service :

Filtration Group GmbH
Schleifbachweg 45
74613 Öhringen

Unterzeichner:
Signatory:
Signataire :

Wolfram Zuck
Dipl.-Ing. (FH) Industrial Engineering
Managing Director, Plant Manager Öhringen

Öhringen,

Datum/Date/Date

03.07.2017

Unterschrift/Signature/Signature

Anlage/Annex/Annexe

3 Seiten/pages/pages



The filter must not be put into service until the complete unit is put into service!

Anlage zur Einbauerklärung gemäß Richtlinie
2006/42/EU für Automatik-Kantenspaltfilter
Annex to the Declaration of Incorporation pursuant to
the Machinery Directive 2006/42/EU for automatic metal
edge filter



Annexe à la déclaration de montage selon la directive
2006/42/UE pour filtres automatiques à fentes
Beschreibung der grundlegenden Sicherheits- und Gesundheits-
schutzanforderungen (soweit zutreffend) gemäß 2006/42/EU, An-
hang 1, die zur Anwendung kommen und eingehalten wurden.
List of the essential health and safety requirements (where applicable)
pursuant to 2006/42/EU, Annex 1, applied and fulfilled.
Description des exigences fondamentales relatives à la sécurité et à
la protection de la santé (si applicables) selon 2006/42/UE, annexe 1,
appliquées et respectées.

Grundlegende Anforderung Essential requirements Exigence fondamentale	Erfüllt Fulfilled Remplie
Grundsätze für die Integration der Sicherheit Principles of safety integration Principes d'intégration de la sécurité	ja yes oui
Materialien und Produkte Materials and products Matériaux et produits	ja yes oui
Konstruktion der Maschine im Hinblick auf die Handhabung Design of machinery to facilitate its handling Construction de la machine au regard de sa manipulation	ja yes oui
Steuerungen und Befehlseinrichtungen Control systems Commandes et dispositifs de commande	nein no non
Risiko des Verlusts der Standsicherheit Risk of loss of stability Risque de perte de la stabilité statique	ja yes oui
Bruchrisiko beim Betrieb Risk of break-up during operation Risque de rupture en fonctionnement	ja yes oui
Risiken durch herabfallende oder herausgeschleuderte Gegenstände Risks due to falling or ejected objects Risques dus à la chute ou à l'éjection d'objets	ja yes oui
Risiken durch Oberflächen, Kanten und Ecken Risks due to surfaces, edges or angles Risques dus aux surfaces, arêtes et angles	ja yes oui
Risiken durch Änderung der Verwendungsbedingungen Risks related to variations in operating conditions Risques dus à la modification des conditions d'utilisation	ja yes oui
Risiken durch bewegliche Teile Risks related to moving parts Risques dus à des parties mobiles	ja yes oui
Wahl der Schutzeinrichtung gegen Risiken durch bewegliche Teile Choice of protection against risks arising from moving parts Choix du dispositif de protection contre les risques dus à des parties mobiles	ja yes oui
Risiko unkontrollierter Bewegungen Risks of uncontrolled movements Risque de mouvements incontrôlés	ja yes oui
Anforderungen an Schutzeinrichtungen Required characteristics of guards and protective devices Exigences relatives aux dispositifs de protection	nein no non
Elektrische Energieversorgung Electricity supply Alimentation électrique	ja yes oui
Statische Elektrizität Static electricity Électricité statique	ja yes oui

Nichtelektrische Energieversorgung Energy supply other than electricity Alimentation en énergie non-électrique	ja yes oui
Montagefehler Errors of fitting Erreurs de montage	ja yes oui
Extreme Temperaturen Extreme temperatures Températures extrêmes	ja yes oui
Brand Fire Incendie	ja yes oui
Explosion Explosion Explosion	ja yes oui
Lärm Noise Bruit	ja yes oui
Vibrationen Vibrations Vibrations	ja yes oui
Strahlung Radiation Rayonnement	ja yes oui
Strahlung von außen External radiation Rayonnement depuis l'extérieur	ja yes oui
Emission gefährlicher Werkstoffe und Substanzen Emissions of hazardous materials and substances Emission de substances et matériaux dangereux	ja yes oui
Risiko, in eine Maschine eingeschlossen zu werden Risk of being trapped in a machine Risque de se faire enfermer dans une machine	nein no non
Ausrutsch-, Stolper- und Sturzrisiko Risk of slipping, tripping or falling Risque de dérapage, de trébuchement et de chute	nein no non
Blitzschlag Lightning Foudre	nein no non
Wartung der Maschine Machinery maintenance Entretien de la machine	nein no non
Zugang zu den Bedienungsständen und den Eingriffspunkten für die Instandhaltung Access to operating positions and servicing points Accès aux postes de commande et aux points d'intervention pour la maintenance	nein no non
Trennung von den Energiequellen Isolation of energy sources Séparation des sources d'énergie	nein no non
Eingriffe des Bedienungspersonals Operator intervention Interventions des opérateurs	ja yes oui
Reinigung innen liegender Maschinenteile Cleaning of internal parts Nettoyage de parties internes de la machine	nein no non
Informationen und Warnhinweise an der Maschine Information and warnings on the machinery Informations et avertissements sur la machine	ja yes oui
Warnung vor Restrisiken Warning of residual risks Avertissement quant aux risques résiduels	ja yes oui
Kennzeichnung der Maschinen Marking of machinery Marquage des machines	nein no non

Betriebsanleitung Instructions Mode d'emploi	ja yes oui
Nahrungsmittelmaschinen und Maschinen für kosmetische oder pharmazeutische Erzeugnisse Foodstuffs machinery and machinery for cosmetics or pharmaceutical products Machines pour denrées alimentaires et machines pour produits cosmétiques ou pharmaceutiques	nein no non
Handgehaltene und/oder handgeführte tragbare Maschinen Portable hand-held and/or hand-guided machinery Machines tenues à la main et/ou portables guidées à la main	ja yes oui

21 Declaration of conformity

EU – Konformitätserklärung
EU declaration of conformity
Déclaration de conformité UE



Der Hersteller
The manufacturer
Le producteur

Filtration Group GmbH
Schleißbachweg 45
74613 Öhringen
Telefon 07941 6466-0
Telefax 07941 6466-429

erklärt hiermit, dass das folgende Produkt
hereby declares that the following product
déclare par la présente que le produit suivant

Produktbezeichnung:
Product designation:
Désignation du produit :
Typenbezeichnung:
Type designation:
Désignation du type :
Funktionsbeschreibung:
Machine description:
Description du fonctionnement :

Automatik-Kantenspaltfilter
Automatic metal edge filter
Filtres automatiques à fentes

AF 71 G

Filtration von Feststoffen
Filtration of solids
Filtration de solides

allen einschlägigen Bestimmungen der Druckgeräterichtlinie 2014/68/EU, Anhang 1 entspricht.
conforms to all relevant provisions of the pressure equipment directive 2014/68/EU, annex I.
répond à toutes les dispositions applicables de la directive équipements sous pression 2014/68/UE, annexe I.

Angewendete harmonisierte Normen, insbesondere
Applied harmonized standards in particular
Normes harmonisées utilisées, notamment

AD 2000

Angewendete nationale Normen und technische Spezifikationen, insbesondere
Applied national norms and techn. specifications, especially
Normes et spécifications nationales utilisées, notamment

HP0, TRD/TRB

Und allen wesentlichen Schutzanforderungen der Ex-Richtlinie 2014/34/EU entspricht.
Conforms to all the basic requirements of the Ex-directive 2014/34/EU.
Répond à toutes les exigences essentielles de la Ex-directive 2014/34/UE.

Folgende harmonisierten Normen wurden angewandt:
The following harmonised standards have been used:
Les normes harmonisées ci-dessous ont été appliquées :

EN 1127-1 und EN 13463-1

Unterzeichner:
Signatory:
Signataire :

Wolfram Zuck
Dipl.-Ing. (FH) Industrial Engineering
Managing Director, Plant Manager Öhringen

Öhringen,

Datum/Date/Date

Unterschrift/Signature/Signataire



- The enclosed declaration of conformity only applies to discharge casings with a CE mark for categories I - IV or to complete filters in accordance with the Ex directive for categories 3G/2G.
- The standard version is designed for Group 2 liquids as defined by the EC Pressure Equipment Directive 97/23/EC Article 9.

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