



**Operating and
Maintenance Instructions**

Pit Purification System

SCHROEDER INDUSTRIES

Please keep for future reference

Operating Instructions Pit Purification System (PPS)

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SYSTEM DESCRIPTION

The Pit Purification Solution (PPS) is a portable unit providing staged filtration for cleaning drill water. All filters are made of coated carbon steel or non-corrosive stainless steel. The operating system is simple, the water to be cleaned passes through a series of filters providing progressively finer filtration. The final filtration is achieved by bag filtration which can easily be changed to a micron rating of the user's choice.

The drill water first passes through a twist flow strainer (ATF), which is effective at removing coarse particles through a unique inlet arrangement and housing design that uses a centrifugal separator and an inline filter to separate solids from the fluid. Raw water enters tangentially to create a cyclonic flow. Centrifugal force moves the larger, heavier particles to the housing wall where they are accelerated downward by the decreasing diameter of the housing. While the larger, heavier particles are forced against the outer wall of the housing then down and out of the unit, the lighter, smaller particles can pass through the 200 micron slotted tube element in the center of the housing and move on to the backflushing filter (RF3).

The water then enters a backflushing filter (RF3) that captures solid particulate that are smaller in size. Slotted, conical tube element allows for efficient backwash. The "Wedge Wire" design of the elements provides for a wider opening on the effluent or downstream side of the element. This precludes particles becoming lodged and blinding the element. In the PPS the RF3 is fitted with 50 micron slotted tube elements. A rotating arm allows a reverse jet of water through the elements to provide a back wash flow to the elements. Because of the way these first two filters operate, they have the added bonus of not requiring the elements to be replaced, and thus can remain functional indefinitely.

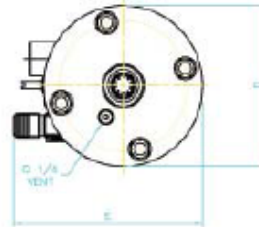
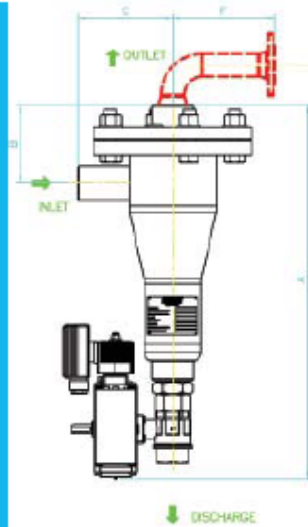
Next in line is a duplex bag filter housing, which features an extremely high dirt holding capacity. Filtered water from the RF3 passes to the duplex bag filters. Water passes through a progressively tighter series of bag elements: 25, 15 and 10 micron. Unlike the first two mechanical filters, the bag filters will need to be changed out periodically when they are full or there is indication of pressure drop at the bag housings. From the bag housings, the filtered water is delivered into a storage container for use at the driller's discretion.

The PPS can also include an optional last filter, the Schroeder Q-size filter. This filter, which utilizes element cartridges that are 39" in length, is available in several micron ratings and can provide another level of fine filtration if necessary.

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Automatic Twist Flow Strainer

ATF
 250 gpm
 945 L/min
 230 psi
 15 bar

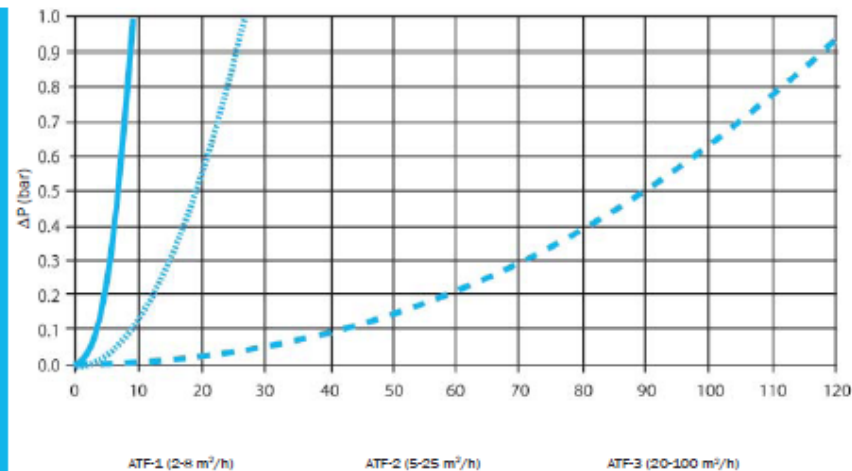


	A		B		C		D		E		F	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
ATF-1	19.34	491	4.06	103	4.92	125	8.27	210	9.83	250	-	-
ATF-2	53.95	1395	9.28	236	9.57	243	13.39	340	20.64	524	10.83	270
ATF-3	82.05	2084	13.78	350	12.7	322	17.52	445	24.21	615	10.25	260

Filter Housing Specifications

Filtration Rate:	200 - 500 μ m slotted tube only		
Housing Material:	Stainless Steel or Carbon Steel		
Size:	1	2	3
Flow Rate:	30 gpm (114 L/min)	75 gpm (280 L/min)	250 gpm (945 L/min)
Pressure Rating:	87 psi (6 bar)	150 or 230 psi (10 or 16 bar)	150 or 230 psi (10 or 16 bar)
Connections:	1" NPT	2" Flange	4" Flange
Filter Area:	23 sq. in.	5 sq. in.	267 sq. in.
Weight:	33 lbs. (15 kg)	132 lbs. (60 kg)	440 lbs. (195 kg)
Volume:	0.5 gal (2 L)	2.8 gal (10 L)	14.5 gal (55 L)

Pressure Drop Graph



Operating Instructions Pit Purification System (PPS)

Automatic Twist Flow Strainer

How to Build a Valid Model Number for a ATF:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
ATF										

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
ATF	2	EPZ	1	E	N	10	O	X	UKS2	200

= ATF2EPZ1EN10OXUKS2200

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
Filter Series	Size	Control Type	Voltage	Housing Material	Discharge Valve	Pressure Rating	Accessories	Modification Number	Element Set	Filtration Rating
ATF	1 = Inlet/outlet 1" NPT 2 = Inlet/outlet 2" ANSI flange 3 = Inlet/outlet 4" ANSI flange	0 = No controls M = Manual valve EP = Electro-pneumatic discharge valve, without timer control EPZ = Electro-pneumatic discharge valve, with timer control E = Electric discharge valve, without timer control EZ = Electric discharge valve, with timer control	1 = 230 VAC, 50 Hz 2 = 24 VDC 3 = 110VAC, 60 Hz	N = Carbon steel E = Stainless steel A = for ANSI flanges, also add A J = for JIS flanges, also add J T = NPT thread (size 1 only), also add T	0 = None N = discharge valve cast iron, coated in stainless steel, washer in stainless steel E = Ball valve stainless steel (std for size 1) B = Discharge valve cast iron, coated, washer in bronze	6 = 90 psi 10 = 145 psi (10 bar) - sizes 2 & 3 only 16 = 230 psi (16 bar) - sizes 2 & 3 only	0 = none 1 = mounting frame (sizes 2 & 3 only) 2 = mounting brackets (sizes 2 & 3 only) 3 = differential pressure gauge in aluminum (fitted to customer's equipment) 4 = differential pressure gauge in stainless steel (fitted to customer's equipment) 5 = differential pressure gauge in brass (fitted to customer's equipment)	X = latest version supplied	UKS1 = conical slotted tube for size 1 UKS2 = conical slotted tube for size 2 UKS3 = conical slotted tube for size 3 USKS1 = conical slotted tube SuperFlush for size 1 USKS2 = conical slotted tube SuperFlush for size 2 USKS3 = conical slotted tube SuperFlush for size 3	200 = 200 µm 300 = 300 µm 500 = 500 µm

Filter Model Number Selection

RF3-C

RF3-0

RF3-1

RF3-2

RF3-2.5

RF3-3

RF3-4

RF3-5

RF3-6

RF3-7

RF3-8

BTU/PTS

RF4-1

RF4-2

BWF

RFH-1

RFH-2

RFH-4

Operating Instructions Pit Purification System (PPS)

1 SAFETY INSTRUCTIONS

The safe handling and smooth operation of the filter cannot be guaranteed unless the basic safety information and safety regulations are fully understood and complied with.

Always keep these Operating and Maintenance Instructions in the immediate vicinity of the filter. In addition, the general as well as the local regulations on accident prevention and environmental protection must be made available and must be observed.

These Operating & Maintenance Instructions contain the most important directions for operating the filter safely.

They must be observed by everybody working with the filter.

All safety and warning notices attached to the filter must be kept in a legible condition.

- In accordance with our Terms and Conditions of Sale, our guarantee is subject to the use of original Schroeder spares only and to correct working practice, as per service and maintenance instructions.
- It is the responsibility of the operator to comply with the water regulations of the country concerned.
- Statutory accident prevention regulations, safety regulations and safety data sheets for fluids must be observed.
- Maintenance and fitting work must only be carried out by trained personnel using the correct tools on filters which are “not in operation”, which are depressurised and which have cooled down.
- Water polluting fluids must not be allowed to enter the soil or watercourses or sewerage systems. Please ensure safe and environmentally friendly disposal of hydraulic fluids. Oil drip trays, suction equipment and absorbent material must be to hand.



Whenever work is carried out on the filter, be aware that hot oil could escape which can cause injury due to high pressure or high temperature. Appropriate precautions must be taken.



For fluids which form potentially explosive mixtures, protective measures must be taken to comply with relevant Directives.

Operating Instructions Pit Purification System (PPS)

1.1 Explanation of symbols used



This symbol indicates safety recommendations which, if not observed, can endanger personal safety.



This symbol gives important information on the correct usage of the filter. Failure to observe these recommendations can lead to damage to the filter or environmental damage to the surrounding area.



Where you see this sign, you will find user tips and particularly useful information. They will assist you to maximise all the functions of the filter.

1.2 Appropriate use

The filter is designed exclusively for the filtration of non-hazardous fluids, provided their temperature does not exceed the boiling point at atmospheric pressure.

- The **boiling point** at atmospheric pressure of fluids to be filtered must be higher than the maximum permissible working temperature of the filter.
- The **maximum working temperature**, the **maximum working pressure** and the **maximum differential pressure** must not be exceeded.



According to PED 97/23/EC the pressure vessel is approved exclusively for operation with fluids (vapour pressure < 0.5 bar) of Group 2.

The maximum permitted cycles according to AD 2000 Notice S1-1.4 must be noted and complied with



Exact specifications regarding the maximum working temperature or the maximum working pressure may be obtained from the type code label of the filter.

The filter must not be used to filter substances which will corrode the materials used.

Any other use is regarded as inappropriate. SCHROEDERProcess Technology GmbH is not liable for any damage resulting from such use.

Appropriate use also demands

- compliance with all instructions in the operating manual, and
- ensuring that all maintenance and servicing work is correctly performed.

Operating Instructions Pit Purification System (PPS)

1.3 Protective measures to prevent burns

With operating temperatures of 65°C and above, the surface of the filter housing may reach temperatures which could cause skin burns.

If the filter is operated at temperatures of over 65°C, protective equipment must be provided to prevent contact with the filter housing. This may include insulation, protective guards, warning notices for the mandatory wearing of protective gloves etc.

2 INSTALLATION

Check that the installation site has sufficient load-bearing capacity.

Before installation, ensure that the filter is complete and in perfect condition. Remove the plastic caps or other covers from the flange or threaded connections.



Before fitting the filter check the details given on the type code label regarding permitted operating pressure and operating temperature. If the specifications on the system correspond to those of the filter, the filter can be installed in the system.

When installing the filter in the line, ensure it is free of any strain and that there is good access to the filter – in particular with regard to changing the filter element.

The filter must be tightly secured in the pipe at all three ports (inlet, outlet and drain). Suitable mounting technology for the filter housing is available as an optional accessory.

All lines leading to and from the filter should be fitted with shut-off valves. In addition, an appropriate vent valve must be fitted to the cover plate.



Since stainless steel threads are prone to seizing, they must be lubricated with a suitable anti-seize agent before fitting.

Ensure that the connected pipes do not exert any mechanical stress on the filter housing. The housing connections are not designed for any additional connection load.



Technical measures must be taken to ensure that the max. permitted operating parameters such as pressure and temperature (see type code label) are not exceeded.

Check the chemical and thermal resistance of housing and seals in relation to the product to be filtered.

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2.1 Installation of the timer control (optional accessory EPZ)



To prevent damage during transportation, the pilot valve solenoid is fitted but is displaced by 90°.

Before installing and commissioning the timer control the solenoid of the pilot valve may need to be re-fitted to ensure that the control unit of the timer control is easily accessible after the filter has been installed.

To align the control panel:



1. Undo the hexagonal nut on the top of the solenoid (spanner, size 14)
2. Pull off the solenoid with the timer control (Caution: do not lose the washer!)
3. Rotate the whole assembly by 90° and replace it on the pilot valve, so that the control panel is facing forwards and therefore easily accessible.
4. Secure the solenoid again by tightening the hexagonal nut.



Before commissioning the filter, ensure that the pilot valve and control panel for the timer control have been correctly installed.

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3 COMMISSIONING

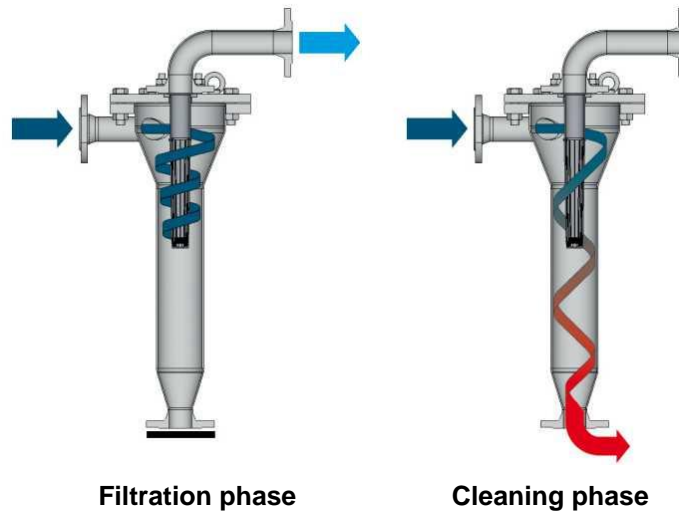


The filter is designed exclusively for use in a machine or system. Before the end product is put into operation, ensure that it complies with Directive 98/37/EC.

3.1 Function of the filter



The AutoFilt® TwistFlow Strainer ATF is a filter which operates intermittently. Discharge of the collected contamination and cleaning of the filter element is controlled by a timer which governs when the discharge valve on the bottom of the housing is opened.



For the selection and setting of suitable discharge intervals see section 3.3

3.2 Commissioning the filter

ATF-1:

1. Check that the designated filter element has been fitted and that the cover plate seal is present. To do this, remove the housing cover plate.
2. Replace the housing cover plate and tighten the bolts to the prescribed torque (see table 2, Section 4.4).

ATF-2, ATF-3 and ATF-4

1. Check that the designated filter element has been fitted and that the cover plate seal is present. To do this, remove the fitted 90° elbow.
2. Re-fit the flange of the 90° elbow on the housing and tighten the bolts to the prescribed torque (see table 2, Section 4.4).
3. Fill the filter and vent it via the vent screw in the cover plate.
4. Slowly increase the pressure in the filter housing and check the vessel for leakages.
In the event of leakages, immediately depressurise the vessel and establish

Operating Instructions Pit Purification System (PPS)

the cause of the leakage. If necessary, drain the housing, open it and check for damaged parts.

5. If no leakages are detected when pressurizing, the filter can be put into operation

3.3 Commissioning of the timer control (optional accessory EPZ)

Before commissioning the filter the timer control of the electrical pilot valve must be programmed, i.e. the required discharge interval must be set.

The discharge interval corresponds to the time during which the filter operates continuously (filtration phase) and the discharge valve is closed. During this time the contamination is collected in the lower part of the vessel.

After this time the discharge valve is opened for approximately 2-4 seconds (cleaning phase) and the collected contaminated particles are flushed out of the filter by the untreated fluid flowing into the filter.



The length of the discharge interval depends on the type of contamination (in particular the density and particle size distribution) as well as its concentration in the untreated fluid.

For this reason, the optimum time interval must be determined individually by the operator for each application.

We recommend that the time interval is initially set to 10 minutes. If this time proves to be too long (e.g. the filter becomes blocked) the time interval should be shortened correspondingly.

If the filter is operating correctly the time interval can also be extended in stages if required.

The following table serves as a guideline here:



Guide values for sand-type contaminants [density approx. 2 kg/dm³]	
<i>Concentration of contamination in the untreated fluid</i>	<i>Typical time interval for discharge</i>
approx. 500 mg/l	approx. 5 minutes
approx. 50 mg/l	approx. 10 minutes
approx. 5 mg/l	approx. 30 minutes

Table 1: Typical discharge intervals for sand-type contaminants

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3.3.1 Installation of the Valve

Connect the compressed air supply to position 1 (middle) of the valve

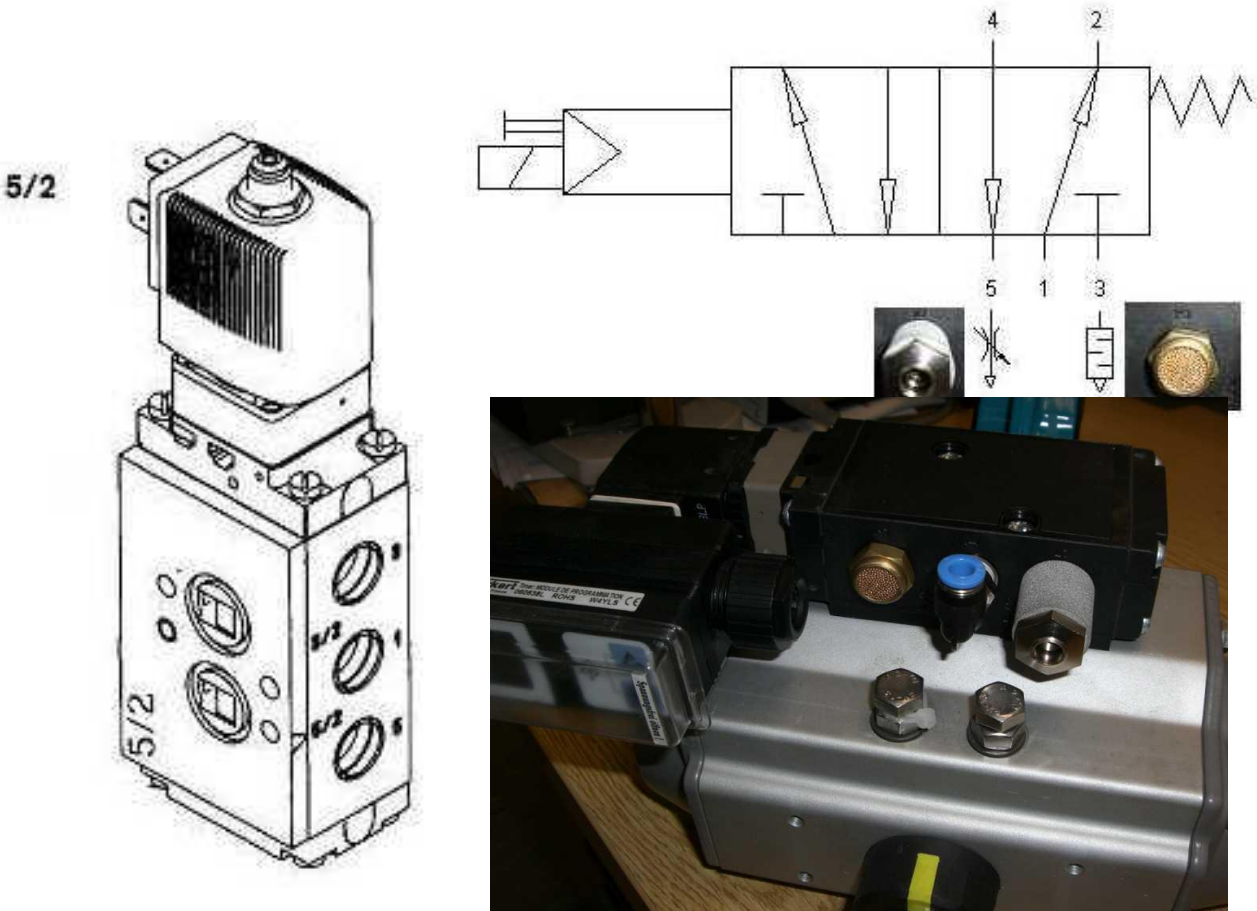


Figure 1: Installation of the Valve

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3.3.2 Connecting the Control Unit

Connect the cables (here: e.g. 230 V L1; N; PE)

The two positions at the right are for externally resetting the timer control unit (optional) (cf. Figure 2).



Figure 2: Connecting the Timer Control Unit

3.3.3 Manual Actuation (Test)

The valve can be manually actuated by pressing the red button, thus enabling the discharge valve to be opened manually



Figure 3: Manual Actuation

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3.3.4 Programming the Timer Unit

3.3.4.1 Pulse Generator

Figure 4 shows control unit 1077-2 for programming timer unit 1078-2.

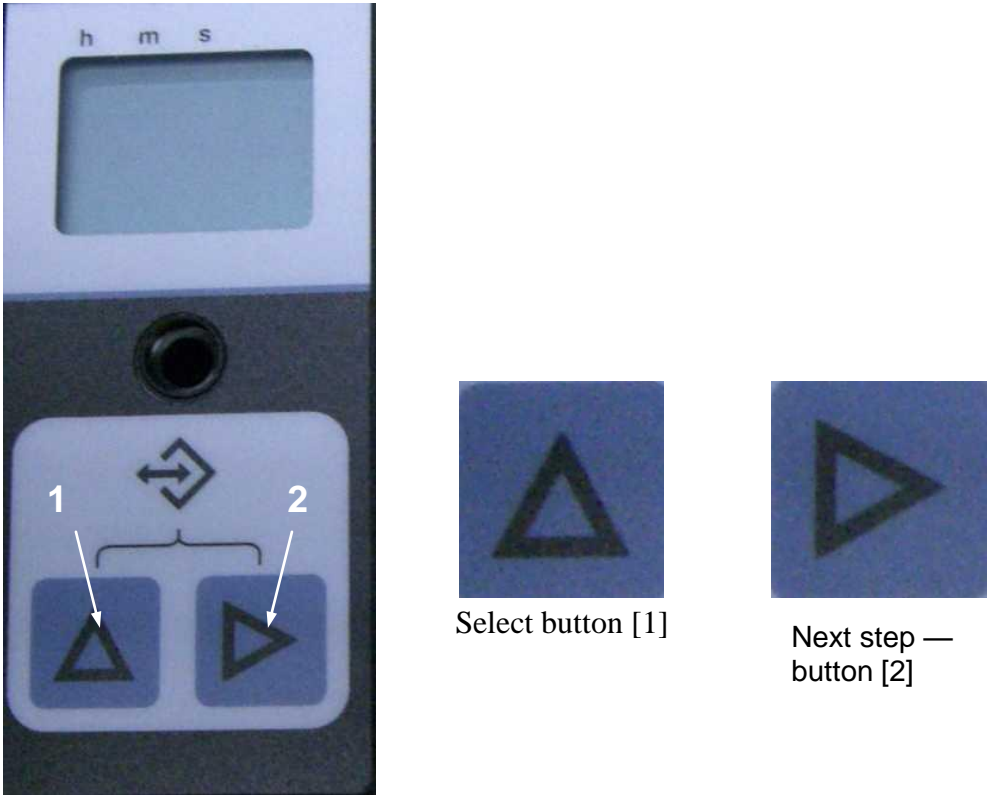


Figure 4: Control Unit of the Timer Unit

Programming is done via the two buttons [1] and [2].

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3.3.4.2 External Reset Function

Programming mode



Press buttons [1] and [2] (see Figure 4) simultaneously to switch to programming mode. In programming mode, set the cycle timer using selector button [1].



Button [2] is now used to set the external reset contact. Selection is done using button [2].

The symbol (see Figure 5) is set here for standard applications.

For further information, refer to the operating instruction booklet provided by Bürkert, to be found in the Annex of this manual.



Figure 5: Symbol Indicator

3.3.4.3 Programming the Time Values

Button [2] enables you to access the timer values.

The following timer settings can now be entered:

- T_{on} - discharge valve opening time
- T_{off} - filtration time

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T_{on} Setting

First set the time unit to “seconds” (s) and enter the time in seconds using button [1] (cf. Figure 5).

Standard setting: 3 s

Use button [2] to access the next timer value.



Figure 6: Programming T_{on}

T_{off} Setting

First set the time unit to “minutes and seconds” (m+s) and then enter the time in minutes and seconds as shown in Figure 6.

Standard setting: 10 min

First set the minutes using button [1], then press button [2] and enter the seconds setting by pressing button [1] again.

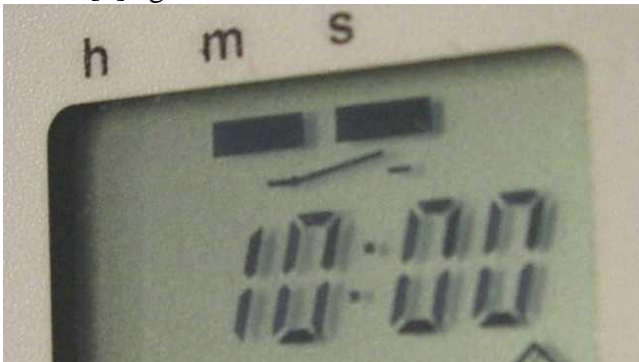


Figure 7: Programming T_{off}

Use button [2] to conclude programming; now timer control is active, i.e. the discharge valve opens for the set time T_{on} followed by timer T_{off} counting down the time.

To enter the time interval, please refer to the enclosed operating instruction booklet of the manufacturer (Bürkert Instruction Manual, *Timer Unit 1078-2 Together with Control Unit 1077-2*). See Annex 1 and 2.

Operating Instructions Pit Purification System (PPS)

4 MAINTENANCE

4.1 General

This section describes maintenance work which should be carried out periodically. The operational safety and life expectancy of the filter, and whether it is ready for use, depend to a large extent on regular and careful maintenance.

General instructions:

- Spare parts must fulfil the technical requirements specified by the manufacturer. This is always guaranteed for SCHROEDER original spares.
- Tools, working area and equipment must be kept clean.
- After disassembling the filter, clean all parts, check for damage or wear and replace if necessary.
- When changing a filter element a high level of cleanliness must be observed

The service life of the filter housing is restricted by the maximum number of cycles specified (see Section 1.2). The cycles must therefore be recorded in writing.

4.2 Maintenance measures

Daily maintenance:

- Check operating pressure and operating temperature, take account of max. values
- Check housing externally for leakage. Check seal at every filter change.

Monthly maintenance:

- Check condition of the housing as a whole.
- Regularly check the wall thickness of the housing, especially when filtering highly abrasive media.

Repeat tests:

- Repeat tests to be carried out by specialist or technical expert according to local and official regulations.

4.3 Changing interval for element

We recommend that the elements are changed or cleaned after specified intervals – but after 1 year at the latest. For instructions on changing the element, see section 5.



Slotted tube elements which are undamaged after cleaning can be re-used if required!

Operating Instructions Pit Purification System (PPS)

When to change the element will depend on the design of filter and the operating conditions of the filter. Where there is heavy contamination, it may be necessary to have shorter changing or cleaning intervals.

Similarly, the element should be changed or cleaned after repairs, fluid changes or other maintenance work on the system.

4.4 Torque values

ATF-1	Bolt	Torque value
Cover plate	M 16	115 Nm
Element	M 6	8 Nm
ATF-2 & ATF-3	Bolt	Torque value
Cover plate	M 20	225 Nm
90° elbow inlet	M 16	115 Nm
ATF-4	Bolt	Torque value
Cover plate	M24	320 Nm
90° elbow inlet	M20	225 Nm

Table 2: Torque values

5 CHANGING THE FILTER ELEMENT

The filter must be shut down before changing the filter element.



Maintenance work on the filter, such as changing the filter element, must only be carried out once the filter has been depressurised. The shut-off valves must be turned off to prevent fluid flowing into the filter about to be cleaned!
The filter must be depressurised and have cooled down!



Filter element ATF-1

Installation height for element:
approx. 300 mm

Element dimensions:

Length of element: 215 mm

Diameter (top): 70 mm

Diameter (bottom): 30 mm

Figure 8: Filter element ATF-1

Operating Instructions Pit Purification System (PPS)



Filter element ATF-2
Installation height for element: approx. 450 mm

Element dimensions:
Length of element: 400 mm
Diameter (top): 80 mm
Diameter (bottom): 40 mm

Figure 9: Filter element ATF-2

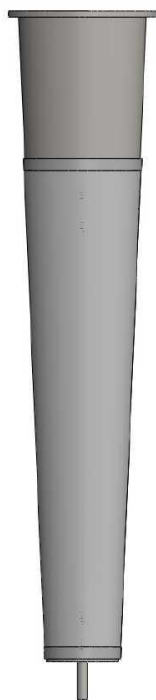


Filter element ATF-3
Installation height for element:
approx. 850 mm

Element dimensions:
Length of element: 794 mm
Diameter (top): 140 mm
Diameter (bottom): 85 mm

Figure 10: Filter element ATF-3

Operating Instructions Pit Purification System (PPS)



Filter element ATF-4

Installation height for element:
approx. 1250 mm

Element dimensions:

Length of element: 1134 mm

Diameter (top): 244 mm

Diameter (bottom): 126 mm

Figure 11: Filter element ATF-4

For instructions on changing the filter element, see section 5.1.

For start-up, see section 3.2.

Operating Instructions Pit Purification System (PPS)

5.1 Changing the filter element – ATF-1

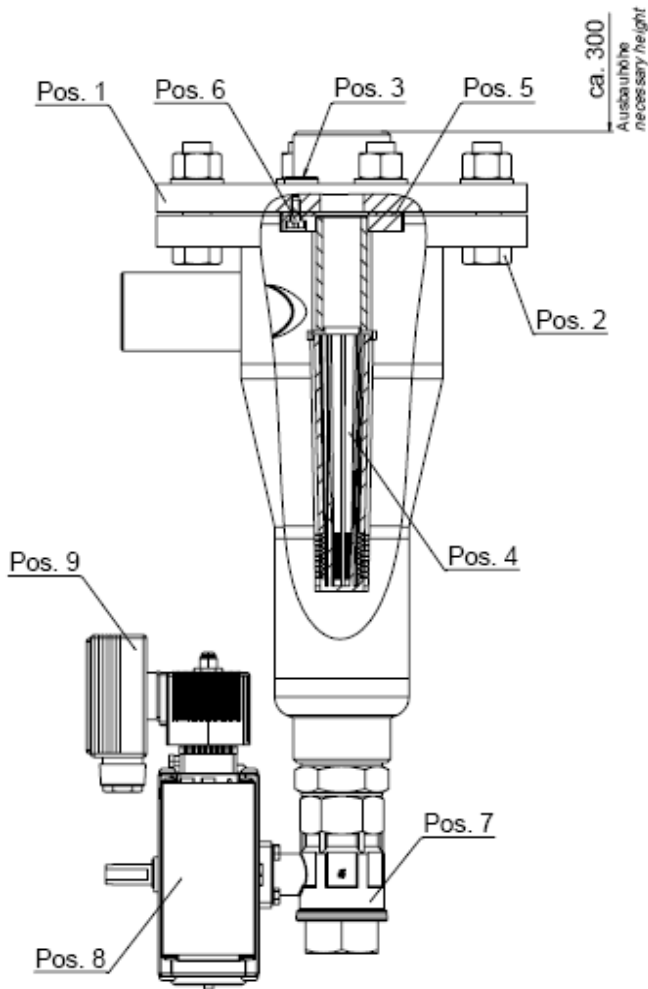


Figure 12: Diagram of ATF-1

<i>Item</i>	<i>Designation</i>
1	Filter cover plate
2	Cover plate bolts ATF housing
3	Vent screw
4	Filter element
5	Filter element seal
6	Element mounting screws
7	Discharge valve incl. drive
8	5/2-way pneumatic valve
9	Timer control incl. operating unit

Table 3: Key to Fig. 4

Operating Instructions Pit Purification System (PPS)

1. Unscrew top vent screw (item 3) to release pressure.
2. Open discharge valve (item 7) and drain any fluid into a suitable container. This fluid must be cleaned before it is reintroduced into the system.
3. Unscrew cover plate bolts (item 2) and remove cover plate (1).
4. Unscrew mounting screws on filter element (item 6) and remove the filter element (item 4) with the seal (item 5) from the cover plate. Check filter element for damage and clean or replace.
5. Check filter housing and cover plate for damage and clean if necessary; (check the sealing surfaces in particular!).
6. Check seal (item 5); replace if necessary.
7. Reassemble filter following steps in reverse order.



Apply a suitable anti-seize agent to stainless steel thread on the cover plate, otherwise the stainless steel thread can become damaged.

Operating Instructions Pit Purification System (PPS)

5.2 Changing the filter element – ATF-2, ATF-3 and ATF-4

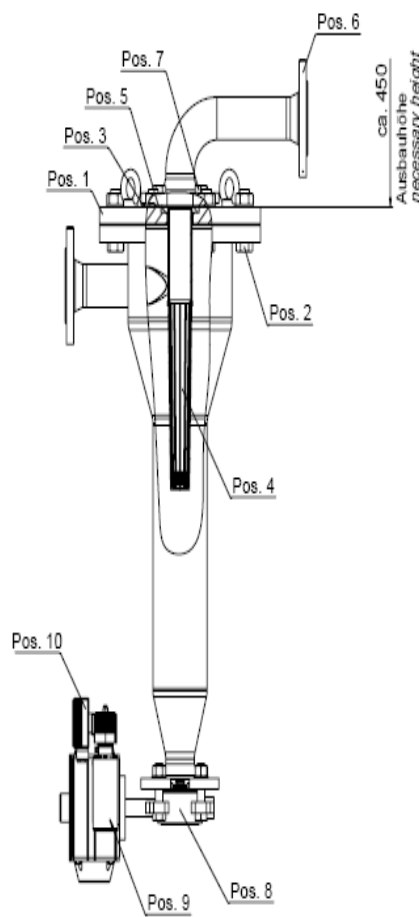


Figure 13: Diagram of ATF-2

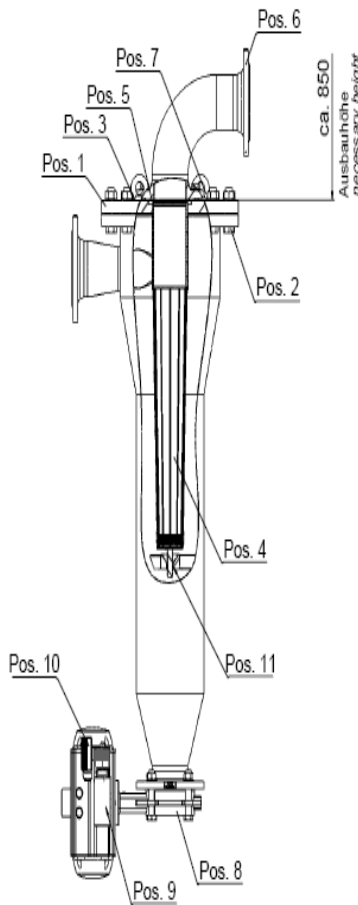


Figure 14: Diagram of ATF-3

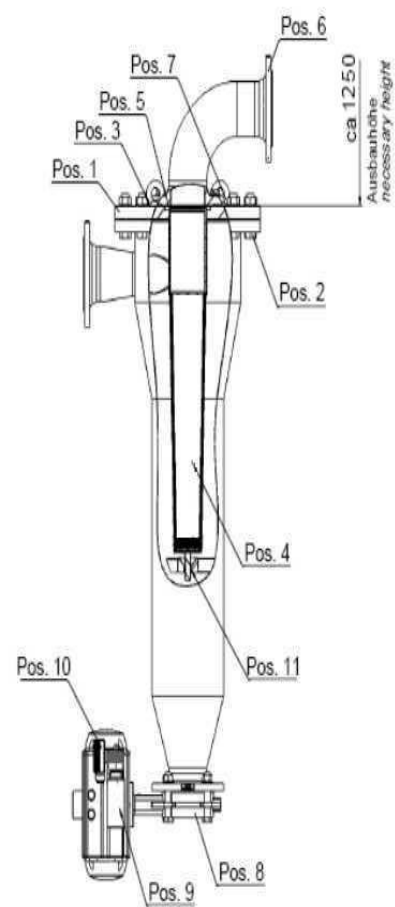


Figure 15: Diagram of ATF-4

<i>Item</i>	<i>Designation</i>
1	Filter cover plate
2	Cover plate bolts ATF housing
3	Vent screw
4	Filter element
5	Filter element seal
6	90° elbow
7	Fixing bolts
8	Discharge valve incl. drive
9	5/2-way pneumatic valve
10	Timer control incl. operating unit
11	Element locating spigot

Table 4: Key to Fig. 13, Fig. 14 and Fig. 15

1. Unscrew top vent screw (item 3) to release pressure.

Operating Instructions Pit Purification System (PPS)

2. Open discharge valve (item 8) and drain any fluid into a suitable container. This fluid must be cleaned before it is reintroduced into the system.
3. Loosen 90° elbow (item 6) on both sides, remove bolts and lift off.
4. Remove seal (item 5).
5. Take hold of the filter element (item 4) on the inside and pull upwards out of the housing. Check filter element for damage and clean or replace.
6. Check sealing surfaces of the cover plate (item 1) for damage and clean if necessary.
7. Place the filter element (item 4) vertically in the housing. Make sure that the element lies exactly on the sealing surface and that the element tip is located in the element spigot in the housing (item 11).



When inserting the filter element, ensure that it is introduced vertically and lies exactly on the sealing surface.

If the filter element is fitted incorrectly, the element or the filter could be damaged!

8. Check seal (item 5) – replace if necessary – and place on the sealing surface.



The seal both seals the filter element against the housing and also seals the elbow.

We therefore recommend that the seal is replaced at every element change!

9. Replace 90° elbow (item 6) onto the element or seal from the top and screw tightly on both sides.



Apply a suitable anti-seize agent to stainless steel thread on the cover plate, otherwise the stainless steel thread can become damaged.

Operating Instructions Pit Purification System (PPS)

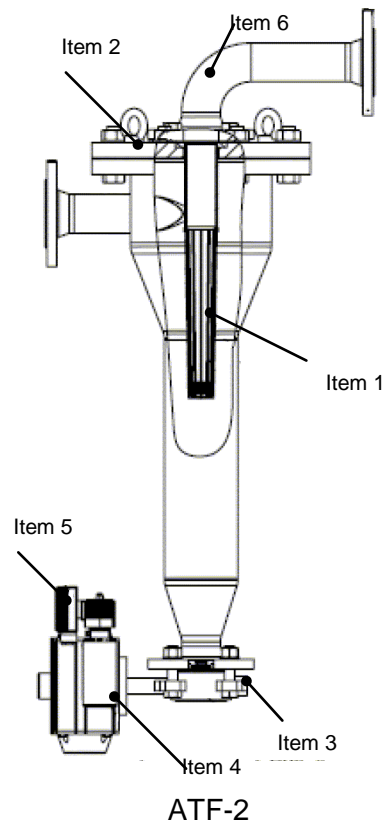
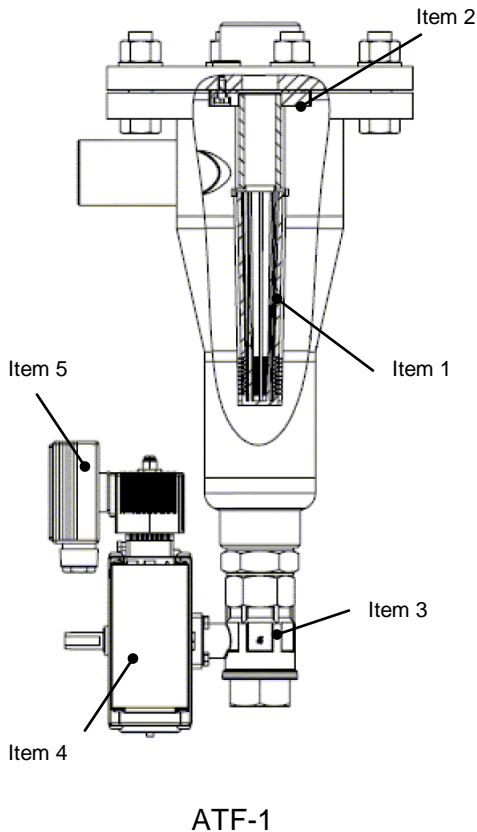
6 REPLACEMENT PARTS

Item:	Designation:	ATF-1	ATF-2	ATF-3	ATF-4
1	Filter element XXXXXXXX	X	X	X	X
1	Filter element coated with SuperFlush XXXXXXXX	X	X	X	X
2	Filter element seal kit XXXXXXXX	X	X	X	X
3	Discharge valve incl. drive XXXXXXXX (without pilot valve and controls)	X	X	X	X
4	5/2 way pneumatic valve XXXXXXXX	X	X	X	X
5	Timer control incl. operating unit XXXXXXXX	X	X	X	X
6	90° elbow XXXXXXXX	O	X	X	X
7	Manual cleaning unit (hand lever) XXXXXXXX	X	X	X	X

Table 5: Spare parts ATF



XXXXXXX: Please always specify the part number of the filter here (see type code label).
Please note that when ordering replacement parts, you must specify the part number of the filter. Only then can we guarantee that the correct spare part will be supplied.



Operating Instructions Pit Purification System (PPS)

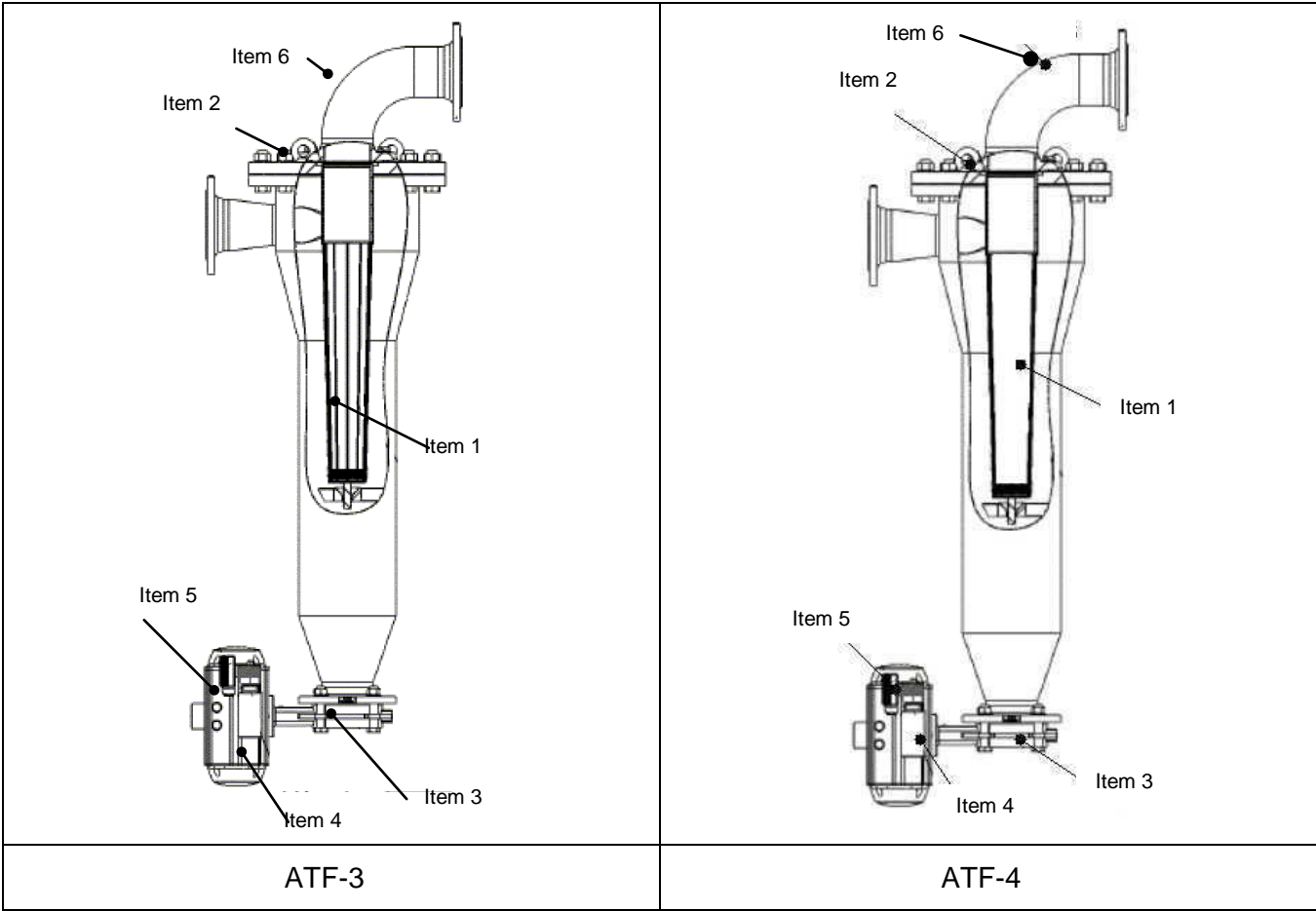


Figure 16: Spare Parts for ATF

Operating Instructions Pit Purification System (PPS)



XXXXXXX: Please always specify the part number of the filter here (see type code label).
Please note that when ordering replacement parts, you must specify the part number of the filter. Only then can we guarantee that the correct spare part will be supplied.

Please also note that the functional capability of the filter is without exception only guaranteed when original SCHROEDER spare parts are used.

7 OPTIONAL ACCESSORY

For mounting the ATF-2 and ATF-3 a base frame is available as an optional accessory.



When using the base, ensure that it is anchored securely to the floor before commissioning the filter.

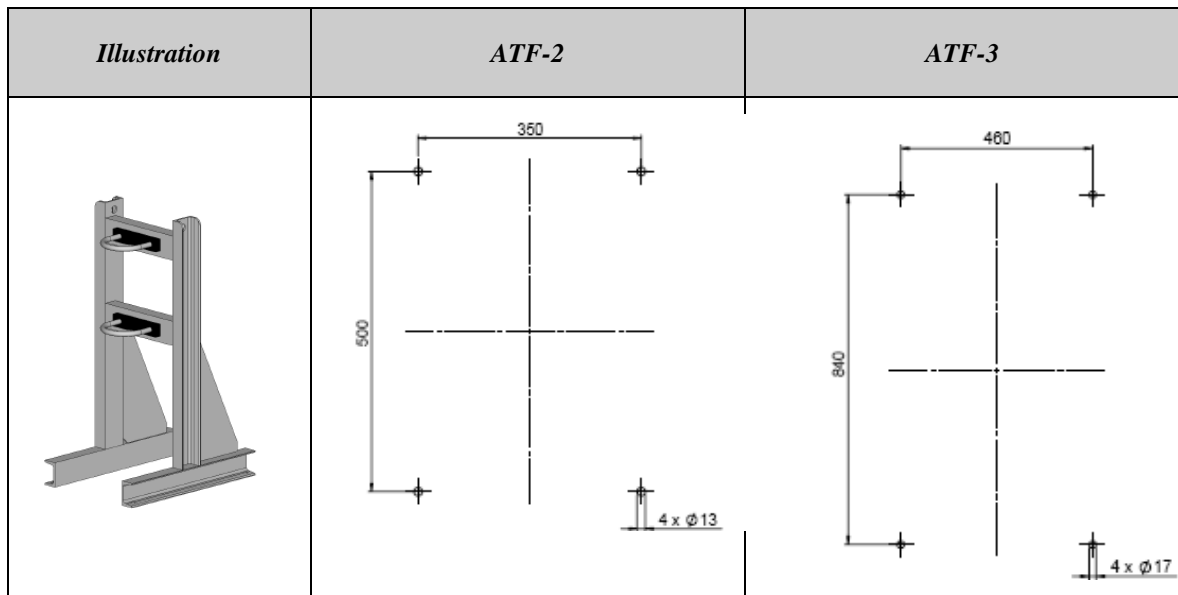


Figure 17: Base frame for the ATF-2 and ATF-3 with drilling pattern for mounting

Operating Instructions Pit Purification System (PPS)

8 TECHNICAL SPECIFICATIONS

<i>Technical data:</i>	<i>ATF-1</i>	<i>ATF-2</i>	<i>ATF-3</i>	<i>ATF-4</i>
Permitted operating pressure	16 bar	10 bar	10 bar	10 bar
Permitted operating temperature	-10°C to +90°C			
No. of filter elements	1	1	1	1
Volume	approx. 1.8 dm ³	13.5 dm ³	55 dm ³	230 dm ³
Weight of filter housing	approx. 15 kg	approx. 70 kg	approx. 150 kg	approx. 420 kg
Weight of base (optional accessory)	/	approx. 33 kg	approx. 82 kg	/
Dimensions of base (optional accessory)	/	390x890x550 mm	510x1420x900 mm	/

Table 6: Technical data

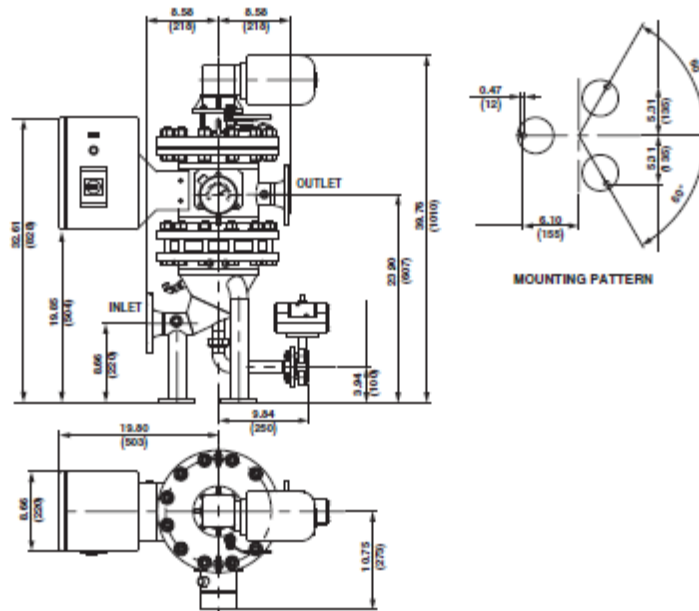
Operating Instructions Pit Purification System (PPS)

Back-Flushing Filter AutoFilt® RF3

RF3-C

20-120
gpm

80-470
L/min

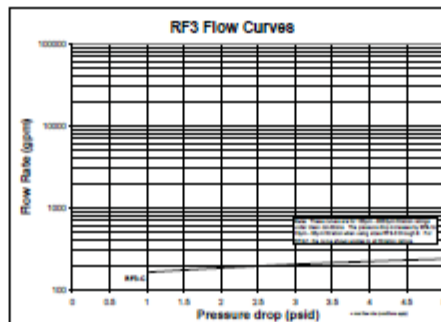


- NOTES:
 1. Metric dimensions in ().
 2. Drawings may change without notice. Contact Factory for certified drawings.

Specifications

Flange Size:	2" ANSI B18.5 150#
Flow Range:	20-120 gpm (80-470 L/min)
Working Pressure:	150 psi (10 bar)
Max. Working Temperature:	184°F (80°C)
Empty Weight:	258 lbs. (116 kg)
Housing Volume:	5 gallons (20 L)
Filter Area:	331 in. ² (2140 cm ²)
No. of Filter Elements:	8
Back Flush Flange Size:	1" ANSI B18.5 150#
Back Flush Volume:	7 gallons (25 L/cycle) Electric-Pneumatic Controls (EPT) 35 gallons (125 L/cycle) All Electric Controls (EI)

Pressure
Drop
Information
Based on
Flow Rate
and Viscosity



Operating Instructions Pit Purification System (PPS)

Back-Flushing Filter AutoFit® RF3

RF3-C

How to Build a Valid Model Number for a RF3:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11	BOX 12
RF3											

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
RF3	C	EPT	NG	N	1	3	1	KS1000	C	ASME

= RF3-C-EPTNG-N-1-3-0/KS1000-CASME

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX 9	BOX 10	BOX 11
Filter Series RF3	Flange Size C	Drive Control / Connecting Voltage EPT = Electric pneumatic cycle control, Ap dependent EU = Electric control, Ap dependent PT = Pneumatic cyclic control, Ap dependent, size C-4 PTZ = Pneumatic cyclic timed control, size C-4 7 = 3X415V/N/PE 60Hz 8 = 3X460V/X/PE 60Hz	Housing Material and Coating N = Standard steel 1.0038, outside primed NM = Standard steel 1.0038, outside primed, inside metallurgical painted NG = Standard steel 1.0038, outside primed, inside rubber coated E = Stainless steel 1.4571 A = with ANSI-flanged, additional A at the end	Shut-Off Valve Material N = Standard Steel E = Stainless Steel	Differential Pressure Gauge 1 = Pressure Chamber, Aluminum 3.258302 2 = Pressure chamber, Stainless steel 1.4305 3 = with pressure mediators stainless steel 315 Ti	Flange Position 1 = Filter outlet opposite filter inlet (standard) 2 = Filter outlet offset 90° clockwise to standard 3 = Filter outlet offset by 180° clockwise to standard 4 = Filter outlet offset by 270° clockwise to standard	Modification Number 0 = Latest version supplied by factory	Element Set KD25 = Conical SuperMesh KD40 = Conical SuperMesh KS50 = Conical slotted tubes KS100 = Conical slotted tubes KS200 = Conical slotted tubes KS300 = Conical slotted tubes KS400 = Conical slotted tubes KS500 = Conical slotted tubes KS1000 = Conical slotted tubes KS1500 = Conical slotted tubes KS2000 = Conical slotted tubes KS2500 = Conical slotted tubes KS3000 = Conical slotted tubes	Size of Element Set USE SAME CODE SELECTED IN FILTER SIZE	Vessel Certification Omit = standard version ASME = ASME version

Filter Model Number Selection

RF3-0

RF3-1

RF3-2

RF3-2.5

RF3-3

RF3-4

RF3-5

RF3-6

RF3-7

RF3-8

BTU/PTS

RF4-1

RF4-2

BWF

RFH-1

RFH-2

RFH-4

STP

Operating Instructions Pit Purification System (PPS)

1 SAFETY

1.1 Basic guidelines on safety

The safe handling and smooth operation of the self-cleaning filter cannot be guaranteed unless the basic safety guidelines and safety regulations are fully understood and complied with.

Be sure to keep the operating instructions in the immediate vicinity of the self-cleaning filter at all times.

As a supplement to the operating instructions, the general as well as the local regulations regarding the prevention of accidents and environmental protection should be made available and observed.





These operating instructions contain important directions for operating the Schroeder RF3 self cleaning filter safely.

These operating instructions must be observed by all persons working with the self-cleaning filter.

Ensure that all instructions relating to the safety and potential hazards of the self-cleaning filter are always kept in a legible condition.

1.2 Explanation of symbols

The following symbols are used in these Operating Instructions for indicating hazards and indicating useful hints:

	This symbol indicates general safety recommendations which, if not observed, can endanger personal safety.
	This symbol indicates safety recommendations which, if not observed, can endanger personal safety through electric shock.
	This symbol indicates important information for the correct usage of the self-cleaning filter. Failure to observe these instructions can lead to damage to the self-cleaning filter or to environmental damage to the surrounding area.
	Where you see this sign you will find user tips and particularly useful information. They will assist you to maximise all the functions of the self-cleaning filter.

Operating Instructions Pit Purification System (PPS)

1.3 Appropriate use

The Schroeder RF3 self-cleaning filter is designed exclusively for the filtration of low-viscosity fluids. The self-cleaning filter is only suitable for filtering fluids if their temperature does not exceed the boiling point at atmospheric pressure.

- The **boiling point** at atmospheric pressure of fluids to be filtered must be greater than the maximum permissible working temperature of the self-cleaning filter.
- The **maximum working temperature** and the **maximum working pressure** must not be exceeded.



Exact specifications regarding the maximum working temperature or the maximum working pressure may be obtained from the type code label.

Any other use is regarded as inappropriate. Schroeder Industries LLC is not liable for any damage resulting from such use.

Appropriate use also includes

- Compliance with all instructions from the operating instructions, and
- Ensuring that all maintenance and servicing work is correctly performed.

1.4 Potential hazards in handling the Schroeder self-cleaning filter

The Schroeder RF3 self-cleaning filter is constructed according to current technology and recognized safety regulations.

Nevertheless, there could be a risk to persons or material damage could occur to the filter or other material assets.

The Schroeder RF3 self-cleaning filter must be used only:

- For its designated purpose.
- Under conditions that fully satisfy the safety regulations.

Any faults that could compromise safety must be eliminated immediately.

1.5 Obligations of the operator and operating staff

The operator undertakes to allow only those persons to operate the self-cleaning filter who

- Are familiar with the basic regulations concerning industrial safety and accident prevention and who have been instructed in the handling of the self-cleaning filter.
- Have read and understood the operating instructions.

The responsibilities of the staff must be clearly defined with regard to the installation, commissioning, operation, maintenance and repair of the equipment.

Apprenticed or untrained staff may only work on the self-cleaning filter under the supervision of an experienced operator.

If personal protective equipment or clothing is required, the operator must provide this.

Operating Instructions Pit Purification System (PPS)

1.6 Action in an emergency

In an emergency, turn the main switch off immediately and / or immediately shut off the compressed air supply to the self-cleaning filter. Close the inlet and outlet lines of the self-cleaning filter.

1.7 Service and maintenance, troubleshooting

Ensure that the specified maintenance and inspection work is carried out at the required times.

Inform the operating staff prior to starting any maintenance and servicing work.

Check all parts of the installation and operating media before and after the self-cleaning filter to ensure that they cannot be inadvertently activated or released.

In the event of any maintenance, servicing and repair work, the self-cleaning filter should be secured as follows:

- Turn off the main switch.
- Attach a warning sign to prevent it being switched on again.
- Shut off the inlet and outlet lines of the self-cleaning filter and attach warning signs to the relevant shut-off valves.

After completing the maintenance work, check that the safety equipment is operating smoothly. Check that all connections (plugs and screws) that were loosened have now been tightened.

1.8 Electrical hazards

All work on the electrical equipment must be carried out only by a qualified electrician.

The electrical parts of the self-cleaning filter must be regularly checked. Any loose contacts must be rectified immediately.

The control box must always be kept locked.

It may be accessed only by authorised staff.

If work needs to be performed on electrically live parts, a second person must be called in to turn off the main switch, if necessary.

1.9 Protective measures to prevent burns

With operating temperatures of 65°C and above, the surface of the filter housing, the manifold and the cover plate may reach temperatures which could cause skin burns.

If the self-cleaning filter is operated at temperatures between 65°C and 90°C, protective equipment must be provided to prevent contact with the filter housing, manifold and cover plate. This may include insulation, protective grids, warning signs for the mandatory wearing of protective gloves, etc.

1.10 Structural changes to the self-cleaning filter

Do not make any structural changes to the self-cleaning filter without the approval of the manufacturer.

Immediately replace any parts of the equipment that are not in perfect condition.

Use only original spare parts. For parts obtained elsewhere, we cannot guarantee that they are designed and manufactured to a specification appropriate for the load and safety requirements.

Operating Instructions Pit Purification System (PPS)

2 TRANSPORT AND STORAGE

2.1 Transport

The self-cleaning filter is supplied in a box or in a wooden crate.

Lifting tackle (such as a fork-lift truck, a crane) with a load capacity that is greater than the empty weight of the self-cleaning filter must be used for transporting.

To facilitate transport of the self-cleaning filter, ring bolts are attached to the cover plate.

The self-cleaning filter should be lifted only by the ring bolts!

Size	C	0	1	2	2.5	3	4	5	6	7	8
Approx. empty weight in kg	116	145	240	365	450	570	750	1020	1610	1950	2730
Shipping weight in kg	170	210	375	615	640	855	1100	1450	2100	2600	3550

Table 1: Approximate shipping weight of the self-cleaning filter



Keep the self-cleaning filter upright!

2.2 Storage

Temperature: from 5°C to 40°C

Dimensions, L x W x H: see Technical Specifications of the self-cleaning filter

Empty weight: see Table .



Note that the self-cleaning filter must be stored only in a clean condition! See also Section. 7.3.and 7.4.

Operating Instructions Pit Purification System (PPS)

3 TECHNICAL DESCRIPTION OF THE SELF-CLEANING FILTER

The Schroeder RF3 is a fully automatic self-cleaning filter designed to extract particles from low-viscosity fluids.

When the set operating parameters are exceeded, the self-cleaning filter automatically initiates regeneration (back-flushing) of the contaminated filter elements.

The self-cleaning filter operates continuously, so that the filtration process is not interrupted when the filter elements are flushed.

The self-cleaning filter requires minimum maintenance. No elements need to be replaced under normal operating conditions.

3.1 Operational description

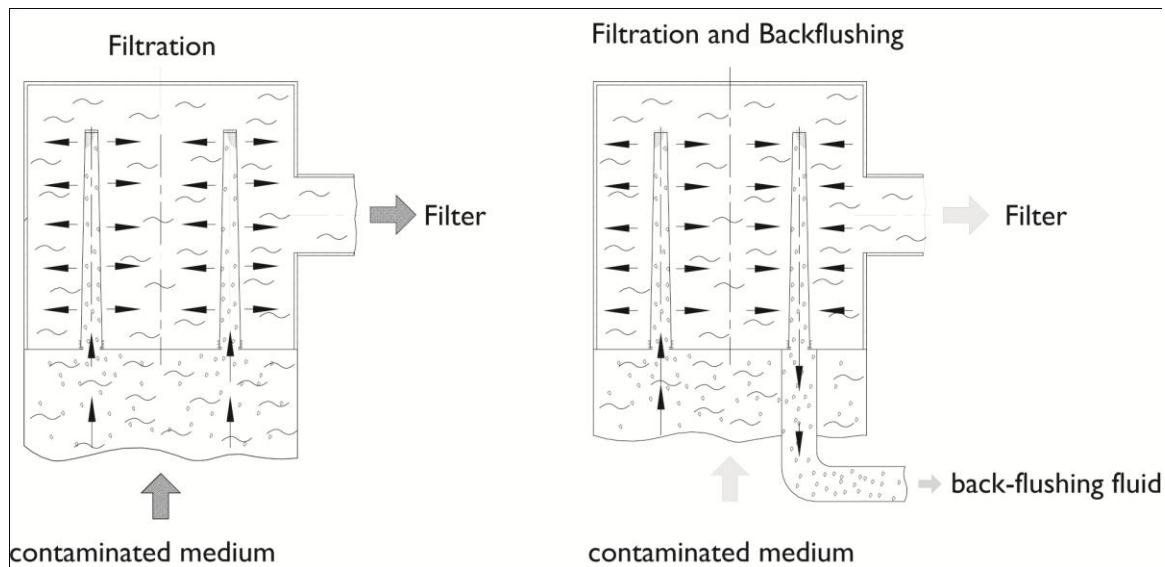


Figure 1: Operating principle of the self-cleaning filter

Filtration

The fluid to be filtered flows through the slotted-tube filter elements of the self-cleaning filter, passing from the inside to the outside.

During this process particles of contaminant collect on the inside of the filter elements.

As the level of contamination increases, the differential pressure between the contaminated and clean sides of the filter increases.

When the differential pressure reaches its pre-set value, self-cleaning starts automatically.

To trigger automatic self-cleaning

Self-cleaning is triggered automatically:

- When the pre-set differential pressure value is exceeded,
- When triggered by the pre-set timer,
- When the **TEST** key is pressed.

As soon as self-cleaning has been triggered, the filter starts to regenerate the filter elements.

Operating Instructions Pit Purification System (PPS)

Back-flushing of the filter elements – back-flushing cycle

- The geared motor rotates the flushing arm under the filter elements to be cleaned. The flow of contaminated fluid to the filter elements is now interrupted.
- The back-flushing valve is opened.
- The pressure drop between filtrate side and back-flushing line flushes a small part of the filtrate backward into the filter elements to be cleaned. The contamination particles collected on the inside of the filter elements are loosened and flushed into the back-flushing line via the flushing arm.
- As soon as the "back-flushing time per element" has elapsed, the back-flushing valve is closed.

All the filter elements are thus back-flushed in succession.

A back-flushing cycle is terminated when all the filter elements have been individually flushed.

Rapid opening of the pneumatic back-flushing valve (control modes EPT and PT, see Section 5) generates a pressure surge (cyclic pulse) in the openings of the filter elements that provides an additional cleaning effect to the back-flushing process.

3.2 Adjustable operating parameters of the self-cleaning filter

The following operating parameters can be pre-set on the self-cleaning filter:

- 1) Differential pressure trigger point for back-flushing
- 2) Timer (EPT, EU and PTZ control modes)
- 3) Back-flushing time for each element
- 4) Speed of the geared motor (only PT control)

3.3 Construction of the self-cleaning filter

The geared motor is located on the cover plate of the self-cleaning filter. It is connected to the flushing arm via universal joints and drive shafts.

Below the drive unit are located:

- The position switch for cyclic control, and
- The position switch for the zero position of the flushing arm.

The filter elements are arranged in a circle around the drive shaft and are held in place by two plates and screws. The control box is mounted on the housing of the self-cleaning filter. It contains the control unit and the differential pressure gauge.

The pressure drop between the inlet of the fluid to be filtered and the outlet of the filtrate is measured by the differential pressure gauge.

A shut-off valve is incorporated into the back-flushing line. It opens this line as soon as individual filter elements are flushed.

A vent plug for venting the self-cleaning filter is incorporated into the cover plate.

The inlet manifold contains a plug or a blank flange for residual drainage of the self-cleaning filter.

Operating Instructions Pit Purification System (PPS)

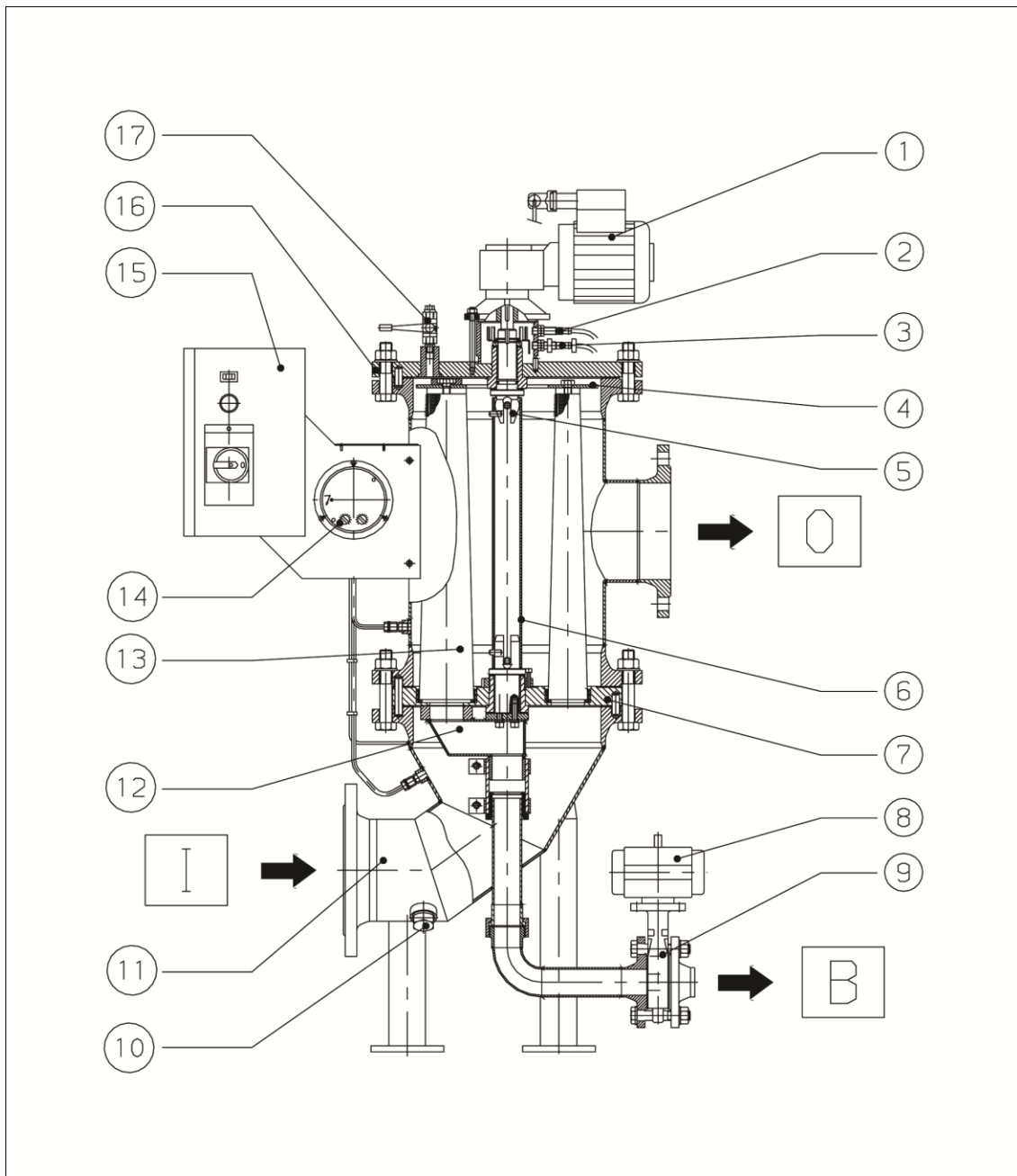


Figure 2: Construction of the self-cleaning filter

1	Geared motor	8	Actuator	15	Controls
2	Position switch for elements	9	Back-flushing valve	16	Cover plate
3	Position switch for zero position	10	Drain plug or blank flange drain	17	Vent valve
4	Upper element mounting plate	11	Inlet manifold		
5	Universal joint	12	Flushing arm	I	Inlet
6	Intermediate shaft	13	Filter elements	O	Outlet
7	Lower element mounting plate	14	Differential pressure gauge	B	Back-flushing line

Operating Instructions Pit Purification System (PPS)

4 DESCRIPTION OF THE MAIN COMPONENTS

Control modes

- Electro-pneumatic cyclic control (EPT)
- Electrical control (EU)
- Pneumatic cyclic control (PT)
- Pneumatic cyclic control with timer (PTZ)

Power supply of the individual components

Control mode	EPT	EU	PT and PTZ
Geared motor	electric	electric	pneumatic
Actuator of the back-flushing valve	pneumatic	electric	pneumatic
Differential pressure gauge	electric	electric	pneumatic
Position switch	electric	electric	pneumatic
Control unit	electric	electric	pneumatic

Table 2: Power supply of the components

4.1 Filter elements

Slotted-tube elements made of stainless steel are used.

Operating Instructions Pit Purification System (PPS)

4.2 Geared motor

The geared motor rotates the flushing arm of the self-cleaning filter under the filter element to be flushed.

The gear unit is a worm gear unit. This type of gear is particularly quiet and efficient.

All work on the gear unit must only be carried out when it is stationary.

Notices affixed to the gear unit, such as type code plate, direction of rotation arrows, etc., must be observed. They must be kept free from paint and dirt. Missing plates must be replaced.

Cooling



The surface of the gear unit or the gear motor should be kept free of dirt.

The drives may overheat if positioned in strong direct sunlight. Provide appropriate protection such as a cover, roofing or similar!

Commissioning

Motox® drives are supplied with the appropriate lubricants ready for operation depending on the specified operating conditions.



In the case of gear units which require housing ventilation, the necessary vent screw is supplied separately. Before starting up the gear unit, replace the corresponding blanking plug with the vent screw.

Maintenance and repair

Measures	Time period
Check gear unit noise for changes	daily
Check gear unit for leakage	monthly
Initial oil change after start up	after approx. 2000 operating hours, or after 3 years at the latest
Subsequent oil changes	every 3 years or 10000 operating hours
Clean vent plug	every 3 months
Check fixing bolts are securely tightened	annually

Table 3: Maintenance and repairs - geared motor

Operating Instructions Pit Purification System (PPS)

To change the oil



When changing the oil the gear unit must always be filled with the same oil grade as used previously. Mixing oils of different grades is not permissible.

When changing over from mineral oil to synthetic oil or from one type of synthetic oil to another type of synthetic oil, the gear unit must be flushed through thoroughly with the new oil grade.



The oil should be drained off after shut-down, while the gear unit is still warm.

Shut down the drive unit by switching off the **self-cleaning** filter.
Place a suitable container under the oil drain plug of the gear unit housing.



When changing the oil, the old oil should be collected in a suitable container. Any oil spillages which have occurred must be cleaned up at once with absorbent material.

Unscrew the vent screw on top of the housing.
Unscrew oil drain plug and drain oil off into the container.



There is a risk of scalding from the hot oil emerging. Wear protective gloves.

Screw in oil drain plug.
Check condition of seal ring; use new seal ring if necessary.



Fill gear unit with fresh oil using a filling filter (max. filtration rating 60 µm).

Lubricants

Oil selection must always be determined by the oil viscosity (ISO VG class) specified on the type code plate of the gear unit. The stated viscosity class is valid for the agreed operating conditions.



To avoid any misunderstandings, we would like to point out that this recommendation does not imply any exemption in the warranty sense for the quality of the lubricant provided by your supplier. Each lubricant manufacturer must guarantee the quality of his own product.

Operating Instructions Pit Purification System (PPS)

Lubricant	Designation according to DIN 51502	ARAL	BP	DEA	ESSO	Klüber	MOBIL	SHELL	TRIBOL	Optimol
Synthetic Oils	OIL PGLP ISO VG460	Degol GS460	Enersyn SG-XP 460	Polydea PGLP 460	GLYCO-LUBE 460	Syntheso D460EP	Glygoyle HE460	TIVELA OIL SD	TRIBOL 800/460	Optiflex A460
	OIL PGLP ISO VG220	Degol GS220		Polydea PGLP 220	GLYCO-LUBE 220	Syntheso D220EP	Glygoyle 30	TIVELA OIL WB	TRIBOL 800/220	Optiflex A220

Table 4: Lubricant selection for geared motor

Synthetic lubricants (polyglycols) in accordance with designation PGLP to DIN 51502. These oils have a high ageing resistance and favorable effect on the efficiency of the gear unit.

They are suitable for the following operating temperatures:

PGLP ISO VG 220: -35° C to +100° C

PGLP ISO VG 460: -15° C to +100° C

The maximum temperatures can be exceeded by 10K for a short time.

Cleaning the vent plug

The vent plug must be cleaned when a coating of dust has collected - at least every 3 months.

For this purpose, the vent plug should be unscrewed, rinsed in benzene or a similar cleaning agent and dried or blown through with compressed air.



Ensure adequate ventilation. Do not inhale vapors. Do not smoke.
Explosion hazard.

Cleaning the drive.

Shut down the gear unit by switching off the self-cleaning filter.

Keep drives free of dirt and dust, etc. in order to ensure sufficient heat dissipation.



Cleaning the drive with a high-pressure cleaning device is not permissible.
Do not use sharp-edged tools.

Operating Instructions Pit Purification System (PPS)

Check all fixing bolts are securely tightened.

Shut down the gear unit by switching off the self-cleaning filter.
Check all fixing bolts are securely fastened using a torque wrench.

Thread size	Tensile strength	Torque rating
M 6	8.8	10 Nm
M 8	8.8	25 Nm
M 10	8.8	50 Nm
M 12	8.8	90 Nm
M 16	8.8	210 Nm
M 20	8.8	450 Nm
M 24	8.8	750 Nm
M 30	8.8	1500 Nm
M 36	8.8	2500 Nm

Table 5: Torque ratings for fixing bolts - geared motor



Unserviceable bolts should be replaced by new ones of the same tensile strength and type.

Maintenance of seals

The seal lips must be greased when changing radial seals. Apply grease generously in the space between bearings and seals.

Seals must be fitted square to the shaft, without damaging the seal lips.

This also must be done for the dry-running axial seals.

Split seals on bearing plates, bearing caps and greasing grooves in the split seals must be greased with anti-friction bearing grease.

Technical Data

	RF3 sizes C-2.5	RF3 sizes 3-4	RF3 sizes 5-8
Type	CAF 10 M1B 6 U	CAF 21 M1C 12	CAF 41 M1C 12
Total gear ratio:	463.65	251.66	251.66
Motor output:	0.16 hp	0.16 hp	0.16 hp
Output shaft speed:	5.3 rpm	5.3 rpm	5.3 rpm
Quantity of lubricating oil:	0.22 dm ³	0.7 dm ³	0.9 l dm ³ / 0.2 dm ³
Safety type:	54	54	54

Table 6: Technical specifications - geared motor with electrical motor (EPT and EU)

Operating Instructions Pit Purification System (PPS)

4.2.1 Compressed air motor PT

Construction

The compressed air motor consists basically of a rotor with rotor shaft, housing, bearing cap, vanes, roller bearing and seal ring

The rotor is heat-shrunk onto the rotor shaft.

The vanes sit loosely in the grooves of the rotor and are supported by the housing bore.

Function

In order to guarantee that the compressed air motor functions smoothly, the compressed air must be filtered and lubricated.

It is important that no contamination from the pipes can enter the motor.

If the expansion is too high on the air outlet, it can lead to icing.

The torque after the start is higher than the start torque because of the position of the fins in relation to the inlet.

Technical Data

	RF3 sizes C to 4
Total gear ratio:	463.65
Quantity of lubricating oil:	0.22 dm ³
Compressed air motor speed:	300 - 3000 rpm
Required speed of compressed air motor:	927.3 rpm
Output speed:	2.00 rpm
Air consumption:	16.5 - 42 nm ³ /h at $\Delta p = 5.6$ bar
Air consumption at required motor speed:	25 nm ³ /h at $\Delta p = 5.6$ bar
Air consumption / cycle:	0.2 nm ³ /cycle at $\Delta p = 5.6$ bar

Table 7: Technical specifications - drive with compressed air motor – PT

Maintenance of the compressed air motor

If, after some operating time, the motor is not running smoothly any more, this is usually caused by sticky oil residues which affect the free movement in the rotor slides.

In this case, we recommend that you do not disassemble the motor immediately, but flush it with paraffin.

Proceed as follows:



Ensure adequate ventilation. Do not inhale vapors. Do not smoke.
Explosion hazard.

Wear protective mask! Protect face!

- Unscrew the air line and the silencer from the motor and place several drops of paraffin in the inlet.
- Re-connect the air line and let the motor run for a few minutes at low pressure (approx. 0.5 bar) and low speed.
- Re-connect the silencer.

Operating Instructions Pit Purification System (PPS)

4.3 Back-flushing valve

The back-flushing valve opens or closes the back-flushing line and is activated automatically by the controls with the aid of the actuator.

EPT control mode:	single-action pneumatic actuator with integrated control valve and adjustable exhaust throttle.
EU control mode:	dual-action electric actuator.
PT control mode:	single-action pneumatic actuator with adjustable exhaust throttle.

4.3.1 Actuator - back-flushing valve EPT & PT

Function

The incoming compressed air drives the pistons outwards, causing the drive shaft to turn anti-clockwise. As long as the pressure is maintained between the pistons, the drive shaft also remains locked in the same end position.

When the air is released, the springs drive the pistons inward. This causes the drive shaft to rotate clockwise and the valve closes.

Technical Data

<u>ball valve</u>	Sizes C - 0		Size 1		Sizes 2 to 2.5		Sizes 3 to 8	
Air consumption per stroke: (at operating pressure)	0.24 l/stroke		0.55 l/stroke		0.9 l/stroke		2.0 l/stroke	
	Start	End	Start	End	Start	End	Start	End
Pneumatic torque Nm (at 6 bar operating pressure)	28	18	60	41	111	74	267	181
Spring torque Nm	25	16	50	32	88	53	187	112

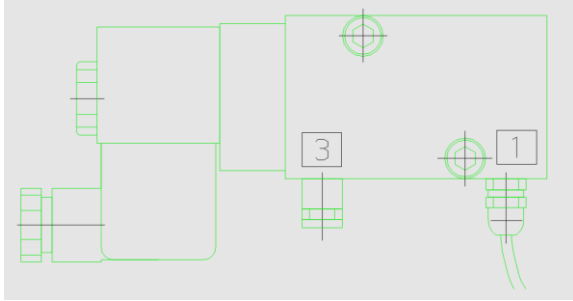
<u>butterfly valve</u>	Sizes C to 2.5		Size 3		Sizes 4 to 5		Sizes 6 to 8	
Air consumption per stroke: (at operating pressure)	0.24 l/stroke		0.29 l/stroke		0.55 l/stroke		0.9 l/stroke	
	Start	End	Start	End	Start	End	Start	End
Pneumatic torque Nm (at 6 bar operating pressure)	28	18	38	23	60	41	111	74
Spring torque Nm	25	16	36	21	50	32	88	53

Operating Instructions Pit Purification System (PPS)

4.3.1.1 Exhaust flow control - back-flushing valve EPT & PT

Mounting type:	Cartridge
Connection size:	G 1/4
Nominal width:	5 mm
Operating pressure range:	0 to 10 bar

4.3.1.2 Control valve - back-flushing valve EPT



3/2 Directional control valve	
Connection size:	G1/4
operating pressure min.:	2 bar
operating pressure max.:	8 bar
Switching time:	Opening 13 ms Closing 16 ms
Operating voltage:	24VDC
Safety type:	IP 65

4.3.2 Actuator - back-flushing valve EU

Description

- Positioning angle limited to 90° - EU
- Limit switch (Open and Closed)
- Handwheel for emergency use
- Mechanical position indicator
- Temperature monitor in the motor coil

Technical Data

Size of the back-flushing filter	C-8	C-8
Electrical connection:	1 x 120 VAC	1 x 230 V - AC
Nominal current:	0.40 A	2.5 A
Starting current:	0.60 A	3.5 A
Nominal power:	0.45 kW	0.20 kW
Nominal torque:	40 ft. lb.	180 Nm
Starting torque in the end position:	45 ft. lb.	200 Nm
Positioning time (rise time) EU:	12 sec / 90°	5 sec / 90°
Safety class:	IP 67	IP 65

Operating Instructions Pit Purification System (PPS)

4.4 Differential pressure gauge

The differential pressure gauge measures the pressure drop between the contaminated and clean sides.

EPT and EU control modes:	Metric Pressure Gauge 2 adjustable micro-switches SAE Pressure Gauge – 1 adjustable micro switches
PT control mode:	1 adjustable pneumatic switch

Differential pressure trigger for back-flushing

The differential pressure trigger point for back-flushing can be set on the pressure gauge to between 0 and 1.6 bar with the aid of a screwdriver. (SAE Pressure Gauge 0 to 15 PSI)

The factory (default) setting is 0.5 bar. (SAE Pressure Gauge 7.0 PSI)

This value should only be altered after consultation with Schroeder Industries LLC.



If the differential pressure trigger is set to a very low value, this can lead to continuous back-flushing!
This must be avoided to prevent unnecessary fluid loss, as the filter elements of the self-cleaning filter are as a rule sufficiently cleaned by a single back-flushing cycle.

You should ensure that the required pressure drop between filter outlet and back-flushing line (at least 1.5 bar) is maintained when a high differential pressure trigger point is set. See also Section 6.3.

Function

In the rest position, the spring forces on both sides of the diaphragm are balanced.

The differential pressure creates an imbalance at the diaphragm, which moves the diaphragm system against the measurement range springs until a new equilibrium is reached.

When subjected to excessive pressure, the diaphragm rests on metal supporting plates.

A centrally mounted tappet transfers the movement of the diaphragm system to the indicator and the actuating elements of the switches.

Operating Instructions Pit Purification System (PPS)

4.4.1 Metric Pressure Gauge

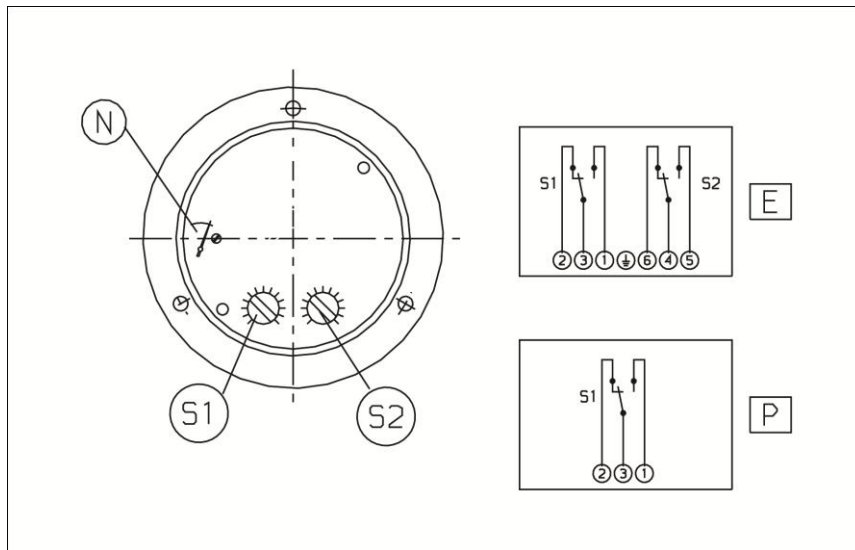


Figure 3: Differential pressure gauge with connection diagram

E:	Connection diagram for electrical micro-switches
P:	Connection diagram for pneumatic switch
N:	Switching point adjustment switch S1 – differential pressure trigger for back-flushing
S1:	Switching point adjustment switch S1 – differential pressure trigger for back-flushing
S2:	Switching point adjustment switch S2 – not required for differential pressure gauge with pneumatic switch

Measuring lines

The pressure connections are marked on the unit with + and -symbols.

Fit the pressure connection lines according to these markings:

- + higher pressure
- lower pressure

Zero-point correction

- Charge both measuring chambers with the available static system pressure.
- Remove cover.
- Set the pointer to zero point using the zero point correction screw.
- Re-fit cover.

Switching point setting

Remove the plugs in the cover.

Set the required switching points in accordance with the markings on the approximate-value scale, using a screw driver.

The setting accuracy attainable with the approximate value scale is $\pm 5\%$.

More precise settings can be carried out by the manufacturer. This can also be carried out by the customer, provided that the necessary auxiliary equipment is available (test pressure gauge, ohmmeter etc).

Replace (screw-in) the plugs on completion of the setting operations.

Operating Instructions Pit Purification System (PPS)

Technical Data

Measuring range:	0 to 1.6 bar
Max. static operating pressure:	25 bar
Max. pressure load:	overpressure protected, on one side, up to nominal system pressure, on + and - side, negative pressure protected
Permissible ambient temperature:	-10 +70° C
Permissible medium temperature:	70° C
Measuring accuracy:	+/- 3 % of full scale range
Switching hysteresis	approx. 3 %
Electrical micro-switches (EPT und EU)	
Load data / contacts:	U= max. = 30 V DC, I max. = 2.0 A, Pmax. = 60 W
Measuring Diaphragm:	Beryllium Copper
Pneumatic switches (PT)	
Air consumption:	approx. 35 nl/h
Working pressure:	0.2 to 1.0 bar (2.9 to 15 PSI)
Output signal:	0.05 bar, depending on the switching conditions, or working pressure

Table 8: Technical specifications – Metric differential pressure gauge

4.5 Position switches

Two position switches are located under the geared motor. They ensure the correct position of the flushing arm during filtering and flushing.

EPT and EU control modes:	Inductive proximity switches
PT and PTZ control mode:	Pneumatic rotary slide valves

4.5.1 Inductive proximity switches EPT & EU

Operating voltage:	15-34 DC
Current consumption (without load):	30 mA
Max. current carrying capacity:	200mA
Switching distance:	2 mm
Housing:	Brass nickel plated
Safety class:	IP 54

Operating Instructions Pit Purification System (PPS)

4.5.2 Rotary slide valves PT & PTZ

Connection size:	R 1/8"
Nominal width:	3.5 mm
Nominal flow rate (P - A):	120 l/min
Operating pressure range:	2.8 to 8 bar
Operating temperature range:	-10 to + 60 °C

4.6 Compressed air supply PT & PTZ

4.6.1 Compressed air - control valve and filter PT & PTZ

Technical Data

Control valve and filter with automatic condensate drain:	
Normal nominal flow rate:	1400 l/min
Pre-pressure range:	1.5 to 12 bar
Working pressure range:	0.5 to 12 bar
Temperature range:	-10° C to + 60° C
Filtration rating:	40 µm

Operating and maintenance

Commissioning:	Slowly pressurize the compressed air unit. Pull the pressure setting button upwards (away from the housing) to unlock it. Turn the pressure setting button until the desired pressure is shown on the pressure gauge. Push the pressure setting button down.
Replacing the filter element:	Turn off the compressed air supply. Vent the compressed air maintenance unit. Unscrew the filter bowl in an anti-clockwise direction. Hold the new filter element at the lower end only. Refit the parts in the reverse order to that used for dismantling.
Cleaning the filter bowl:	Use only: Water or soap solution (max.+60°C); benzene (free from aromatic compounds)

Operating Instructions Pit Purification System (PPS)

Troubleshooting - compressed air - control valve and filter

Fault	Possible cause	Action
No pressure display	Shut-off valve closed	Open shut-off valve
	Pressure not set	Set the pressure using pressure setting switch
	Pressure gauge faulty	Replace pressure gauge
Low flow (operating pressure fails when compressed air is applied)	Filter element is dirty	Replace filter element
	Restriction between shut-off valve and maintenance unit	Check line
Pressure increases above set operating pressure	Faulty valve cone on sealing seat	Return to Schroeder
Audible air leak at setting button	Valve seat damaged	Return to Schroeder
Audible air leak at bleed valve	Bleed valve leaking	Tighten or replace

4.6.2 Compressed air - Lubricator PT & PTZ

Technical Data

Lubricator with metal protection cage:	
Normal nominal flow rate:	2300 l/min
Working range of lubricator:	up to 3.0 l/min
Temperature range:	- 10° C to + 60 °C
Suitable oils: Hydraulic oil to DIN 51524 Part 2 with a viscosity of 32 mm ² /s at 40°C (HLP 32)	Festo special oil OFSW-32 ARAL Vitam GF 32 BP Energol HLP-HM32 ESSO Nuto H 32 Mobil DTE 24
Quantity of oil:	45 ml

Operating and maintenance

Fill lubricator with oil	Open the vent screw until the air noise is no longer audible. Unscrew the lubricator bowl in an anti-clockwise direction. Fill the lubricator bowl with oil. Screw on the lubricator bowl again. Tighten the vent screw again.
Set the desired amount of oil on the lubricator:	Turn the regulating screw until the required amount of oil is set. Turn anti-clockwise: to increase the number of oil-drops. Turn clockwise: to reduce the number of oil-drops.
Cleaning the lubricator:	Use only: Soap solution (max.+60°C); benzene (free from aromatic compounds)

Troubleshooting - compressed air - lubricator

Fault	Possible cause	Action
No oil supply	Regulating screw closed (as supplied)	Open regulating screw
	Oil level too low	Replenish oil

5 CONTROL UNIT

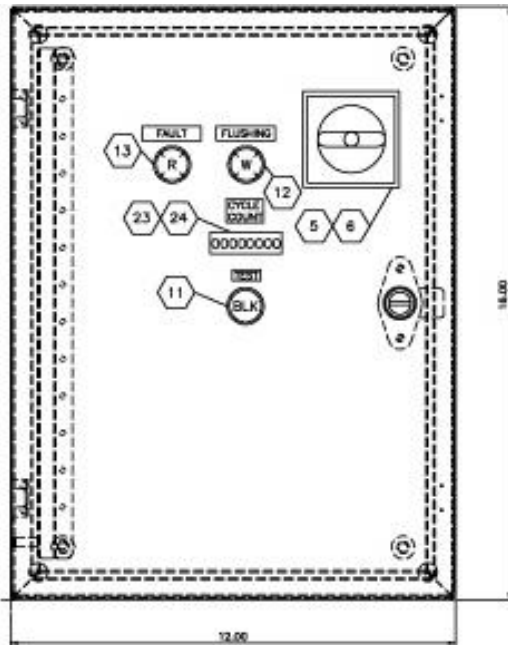


Figure 4: Front panel of the self-cleaning filter with PLC

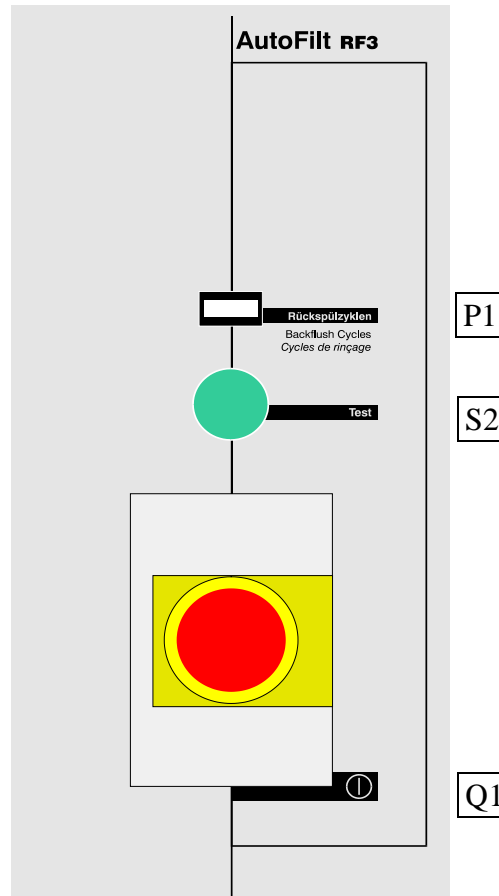


Figure 4A: Front panel of the back-flushing filter

5.1 Electro-pneumatic and electrical control – EPT and EU

Item 5/6: Main shut off (Q1) ← Does not need to be bold font

- Item 11: Manual test button (S2)
- Item 12: Back flush indicator light
- Item 13: Fault light
- Item 23/24: Cycle counter (PI)

The power supply unit and all the electrical control equipment are located in the control box (Safety class IP 55). All operating sequences are controlled automatically via a control board.

The power supply to the self-cleaning filter is turned on and off via the main switch.

Counter for back-flushing cycles (PI)

The counter records the number of complete back-flushing cycles, i.e. back-flushing of all filter elements.

Main switch and motor protection switch (Q1)

The geared motor is turned off in the event of an electrical fault. Possible causes of faults are:

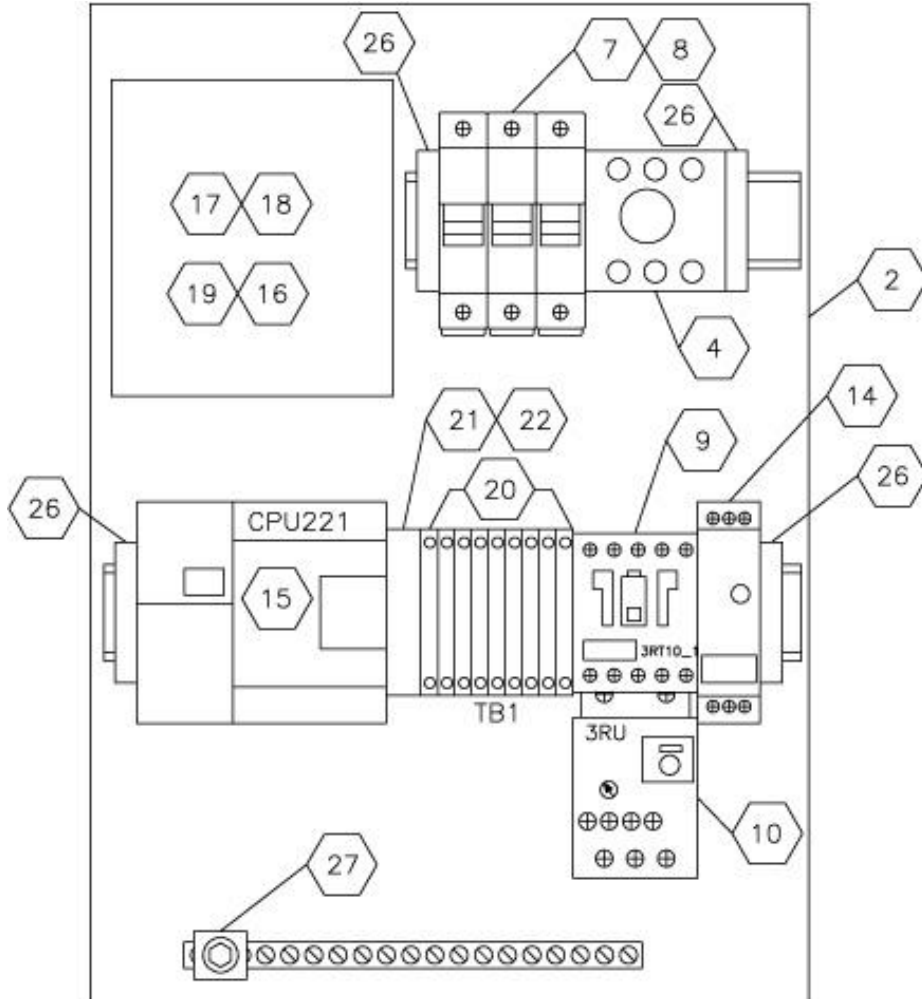
- Overheating
- Short circuit

Operating Instructions Pit Purification System (PPS)

Manual start of back-flushing – test switch (S2)

The **Test** key can be used by the operating staff to start a back-flushing cycle independently of the operating parameters.

This key must be held down for about 3 seconds.



- Item 2: Base plate
- Item 4: Main disconnect
- Item 7/8: Fuse bank
- Item 9: Motor contactor
- Item 10: Thermal overload protector
- Item 14: Timer
- Item 15: PLC
- Item 16-19: Transformer
- Item 20: Terminal block
- Item 21/22: Fuse block
- Item 26: Terminal ends
- Item 27: Ground strip

Figure 4B: Electrical PLC Panel

Operating Instructions Pit Purification System (PPS)

LED signal lights

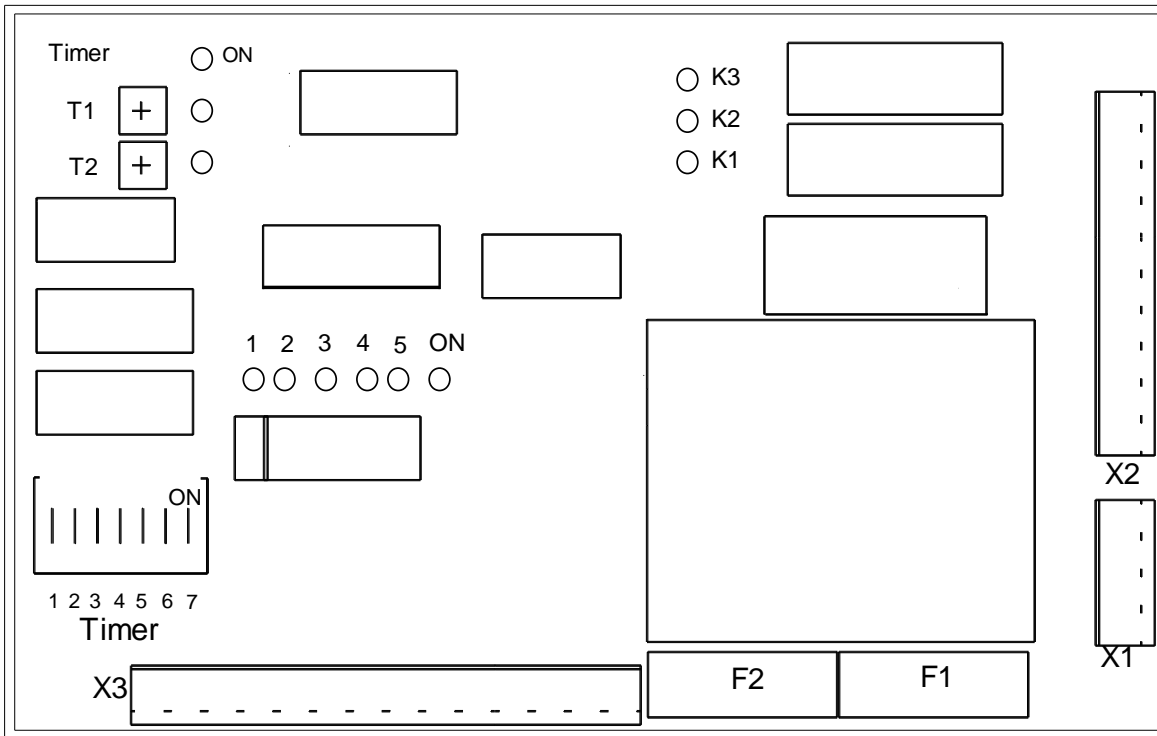


Figure 4C: Board

LED	Function EPT control	Function EU control
1	Differential pressure exceeded	
2	Test key pressed	
3	Cyclic pulse (flushing arm below filter element)	Back-flushing valve open
4	Flushing arm at zero position	
5	Unassigned	
ON	Back-flushing filter turned on	
Timer ON	Timer ON	
T1	Response time	
T2	Back-flushing time	Reverse flow protection in operation
K1	Back-flushing in operation	
K2	Geared motor in operation	Back-flushing valve or geared motor in operation
K3	Not usable (used internally)	Unassigned

Operating Instructions Pit Purification System (PPS)



All work on electrical installations must only be carried out by a **qualified electrician!**

Response time of the differential pressure trigger – potentiometer T1

The response time is the time which must elapse, once the differential pressure trigger point has been reached or exceeded, as measured by the differential pressure gauge, before the back-flushing cycle is initiated. The response time is set so that pressure fluctuations and pressure impulses cannot prematurely trigger a back-flushing cycle. The response time of between 0.3 and 10 seconds can be set at the potentiometer. The default factory setting is approx. 3 seconds.



Potentiometer T1 is sealed and must not be adjusted!

Back-flushing time per element – potentiometer T2 on EPT control

The opening time of the shut-off valve and thus the back-flushing time for each filter element is set at the potentiometer.

EPT control: Default factory setting is approx. 1.5 seconds.

“Reverse flow protection” for actuator - potentiometer T2 on EU control

The „reverse flow protection“ of the shut-off valve is set at the potentiometer.

EU control: Default factory setting is approx. 10 seconds.

Timer

If the timer is activated, the control system of the back-flushing filter automatically initiates a back-flushing cycle once the pre-set maximum filtration time without back-flushing – the set time – has been exceeded. The time can be set on the controls to between 45 minutes and 47.25 hours.

1	2	3	4	5	6	7
24 h	12 h	6 h	3 h	90 min.	45 min.	ON

The set times are added.

For activation to occur, switch no. 7 must be pressed afterwards.



If switch 7 is set to "ON" before a time has been set, the filter elements will be continuously back-flushed! This must be avoided, as the filter elements of the back-flushing filter are as a rule adequately cleaned by a single back-flushing cycle.

6 INSTALLATION – MOUNTING AND CONNECTING

6.1 Installation

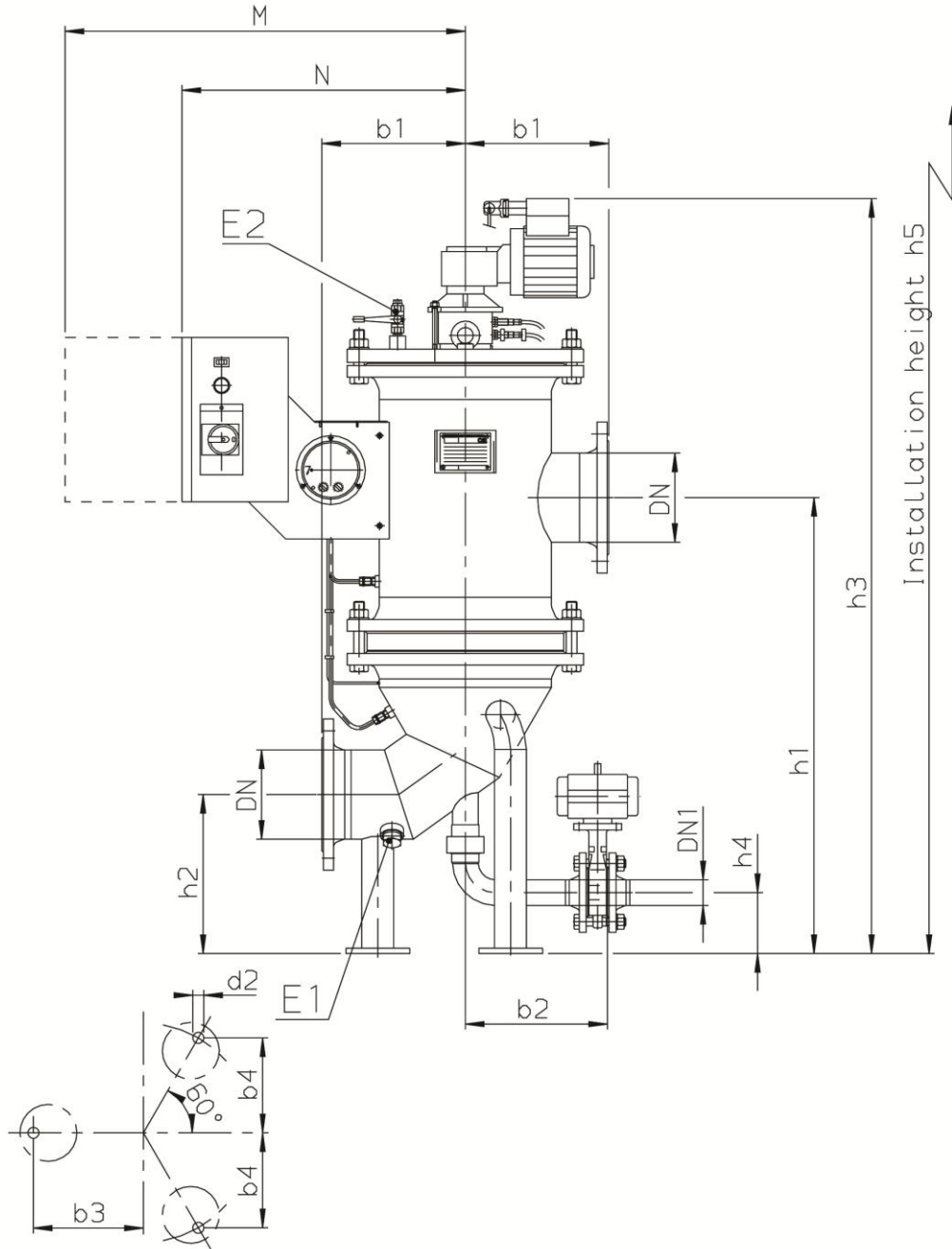


Figure 5: Installation of the self-cleaning filter, Sizes C to 2

Operating Instructions Pit Purification System (PPS)

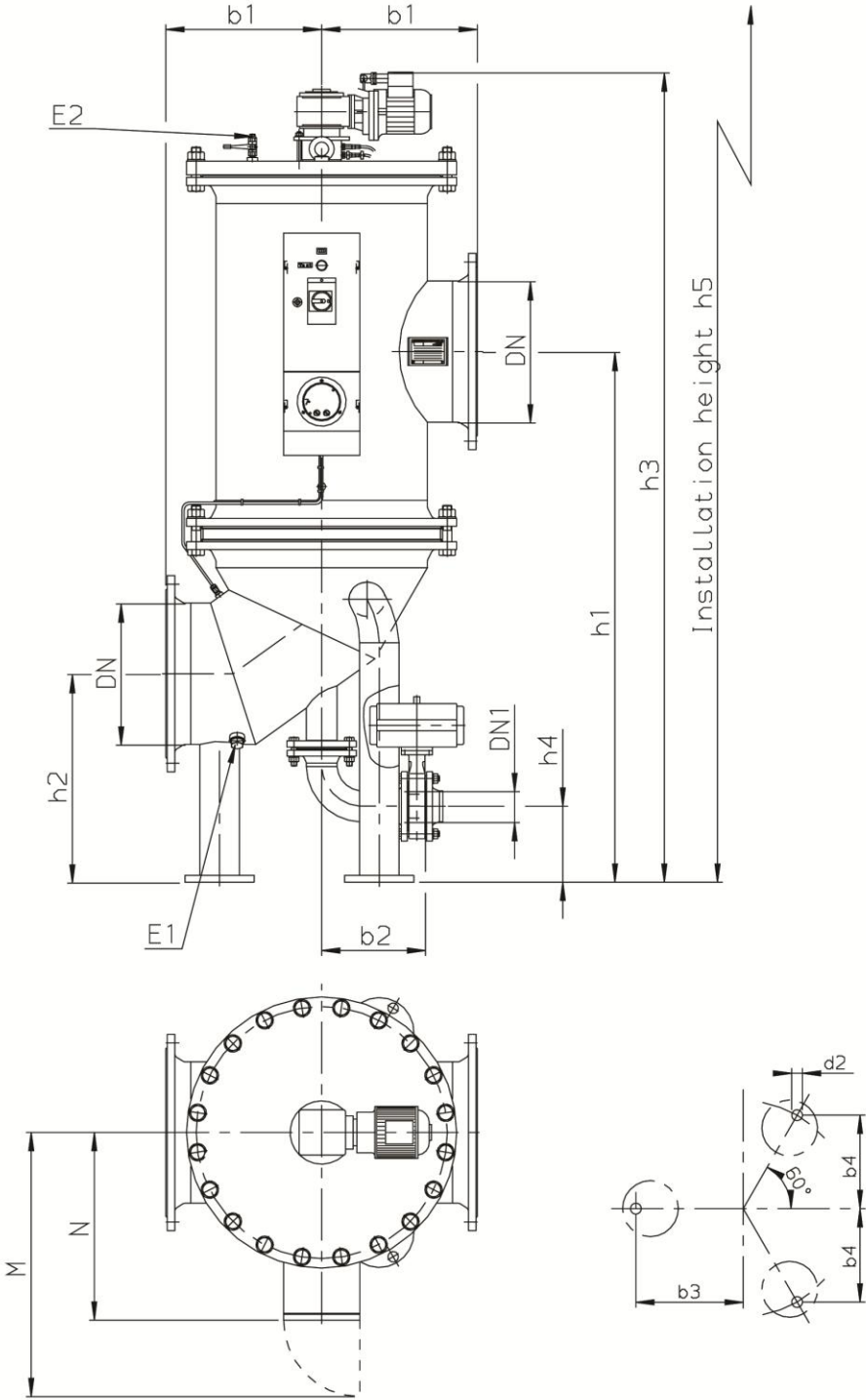


Figure 6: Installation of the self-cleaning filter, Sizes 2.5 to 7

Operating Instructions Pit Purification System (PPS)

Size	DN	DN1	b1	b2	b3	b4	h1	h2	h3	h4	h5
RF3-C	50	25	200	259	155	135	579	220	970	100	1100
RF3-0	100	25	200	259	155	135	740	250	1305	100	1543
RF3-1	150	40	270	375	210	186	860	300	1425	115	1663
RF3-2	200	50	325	450	270	235	1000	400	1565	120	1805
RF3-2.5	250	50	325	450	270	235	1300	400	2075	120	2810
RF3-3	300	65	380	405	322	278	1380	500	2185	155	2938
RF3-4	400	80	450	435	375	357	1525	600	2330	220	3083
RF3-5	500	80	550	435	485	420	1635	600	2415	200	3130
RF3-6	600	100	625	450	596	515	1745	675	2615	200	3330
RF3-7	700	100	750	450	653	565	1805	700	2650	200	3365
RF3-8	900	150	900	560	716	620	2543	1000	3517	229	4500

Size	d2	M	N	E1	E2	Volume dm ³	Weight kg	Filter elements
RF3-C	12	723	503	G ½"	G ¼"	20	116	6
RF3-0	12	691	471	G ½"	G ¼"	25	145	6
RF3-1	15	753	533	G ¾"	G ¼"	60	240	6
RF3-2	18	795	575	G ¾"	G ¼"	105	365	8
RF3-2.5	18	660	440	G ¾"	G ¼"	190	450	6
RF3-3	18	864	644	G ¾"	G ¼"	280	570	9
RF3-4	22	915	695	G ¾"	G ¼"	425	750	18
RF3-5	27	966	746	DN 40	G ¼"	635	1020	24
RF3-6	30	1067	847	DN 40	G ¼"	998	1610	40
RF3-7	30	1118	898	DN 40	G ¼"	1355	1950	42
RF3-8	30	1070	850	DN 40	G ¼"	2710	2730	54

Table 9: Installation dimensions of the self-cleaning filter RF3

The self-cleaning filter is supplied complete with all necessary connections. The installation site must be level and dry.

- Max. relative humidity: 80%



If the self-cleaning filter is operated at temperatures between 65°C and 90°C, then suitable protection measures to prevent burns must be taken. See Section 1.9.

The ambient temperature must be in the range from 0°C to 50°C.

The self-cleaning filter must be protected from weather effects and water spray.

The installation site must be to at least the dimensions shown in Figure 5 or Figure 6 and Table 9.

The self-cleaning filter should be accessible from all sides for maintenance purposes. Sufficient space must be available above the filter housing so that the filter elements can be easily replaced, see Figure 5 or Figure 6 and Table 9.

Operating Instructions Pit Purification System (PPS)

6.2 Repositioning the flanges of the self-cleaning filter

6.2.1 Turning the inlet and outlet flanges

The position of the inlet flange relative to the outlet flange can be changed at any time. You can rotate the position of the output flange through 0°, 90°, 180° or 270°.

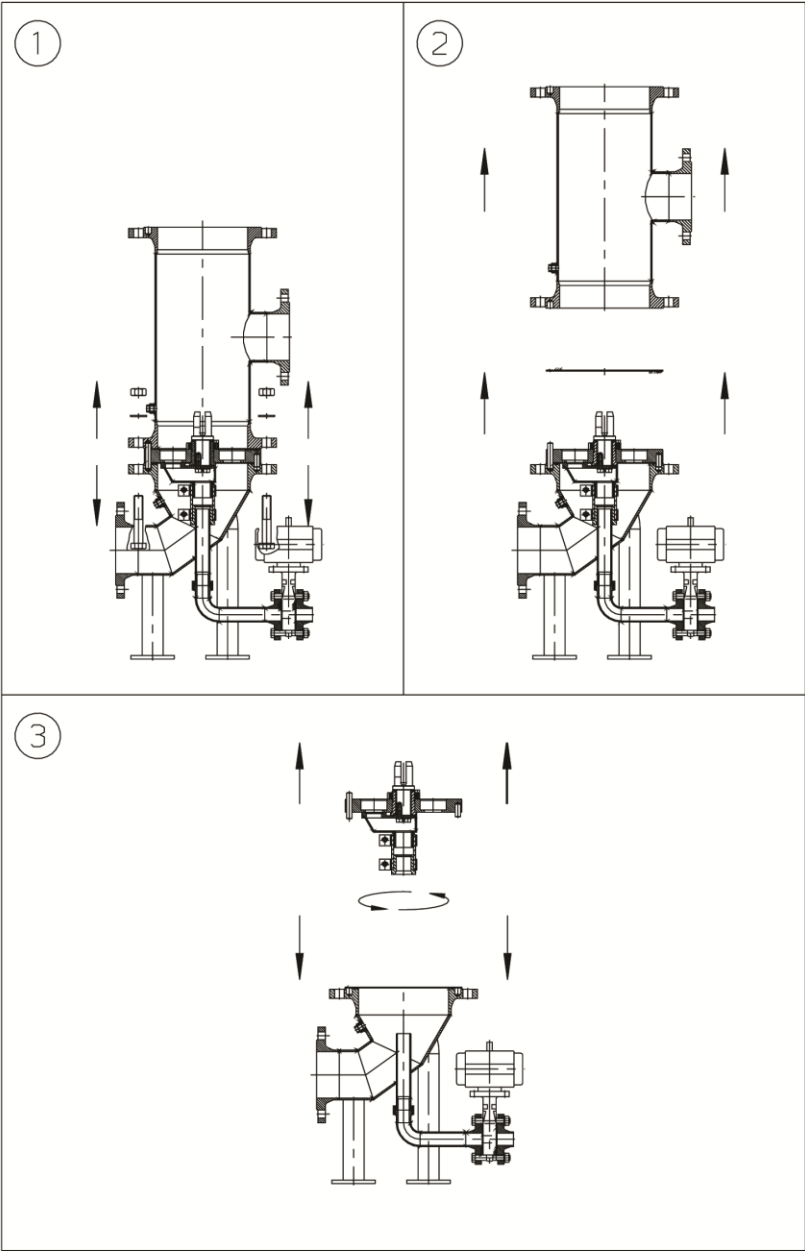


Figure 7: Repositioning the inlet and outlet flanges

Operating Instructions Pit Purification System (PPS)



Lifting tackle (such as a crane) is required to dismantle the filter housing and the element mounting plate.
The load capacity is shown in Table.

Size	RF3-C	RF3-0	RF3-1	RF3-2	RF3-2.5	RF3-3	RF3-4	RF3-5	RF3-6	RF3-7	RF3-8
Approx. weight in kg	36	60	80	130	170	190	250	340	530	650	850

Table10: Weight of the self-cleaning filter housing



Before rotating the inlet and outlet flanges, please check that the following cables and hoses are long enough:

- the control cable to the shut-off valve (EPT & EU)
- the compressed air line to the shut-off valve (PT)
- the hose line from the inlet manifold to the differential pressure gauge

If any lengths are insufficient, please contact Schroeder Industries LLC

To reposition the inlet and outlet flanges, proceed as follows:

1. Turn the **self-cleaning** filter off completely, see Section 7.3.
2. Remove the filter elements. See Section 8.4.1.
3. Disconnect the power cables to the **self-cleaning** filter (EPT & EU).
4. Disconnect the compressed-air supply to the **self-cleaning** filter (PT).
5. Disconnect the compressed-air line to the shut-off valve (EPT & PT).
6. Disconnect the control cable to the shut-off valve (EPT & EU).
7. Disconnect the hose line at the inlet manifold, used to measure the differential pressure.

Refer also to Figure .

8. Loosen the bolts at the lower housing flange of the **self-cleaning** filter.
9. Dismantle the housing and the gasket.
10. Raise the lower element mounting plate together with the flushing arm and turn it to the required position.



When replacing the lower element mounting plate, note the position of the detent pins. There are two pins on the underside and one pin on the upper side of the plate.

11. Place the gasket onto the lower element mounting plate of the **self-cleaning** filter
12. Place the filter housing onto this lower element mounting plate.



When replacing the housing, note the position of the detent pin.

13. Tighten the bolts on the housing of the **self-cleaning** filter. See Table, page 59, for the torque rating.
14. Reconnect the hose line for measuring the differential pressure to the inlet manifold.
15. Reconnect the compressed-air line to the shut-off valve (EPT & PT).
16. Reconnect the control cable to the shut-off valve (EPT & EU).
17. Re-fit the filter elements, see Section 8.4.2.
18. Reconnect the **self-cleaning** filter, see Section 6.3.
19. Reconnect the power supply cables to the **self-cleaning** filter (EPT & EU), see Section 6.4.
20. Reconnect the compressed-air supply to the **self-cleaning** filter (PT), see Section 6.5.

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The filter can now be put back into operation, see Section 7.2.

6.2.2 Repositioning the back-flushing line

The position of the back-flushing line can be changed at any time to lie at almost any angle.

To rotate the back-flushing line, proceed as follows:

1. Turn the **self-cleaning** filter off completely, see Section 7.3.
2. Disconnect the compressed-air line to the shut-off valve (EPT & PT).
3. Disconnect the control cable to the shut-off valve (EPT & EU).
4. Loosen the swivel nut or the flange connection in the back-flushing line.
5. Fix the back-flushing line with the shut-off valve in the required position and tighten the swivel nut or the flange connection again.
6. Reconnect the compressed-air line to the shut-off valve (EPT & PT).
7. Reconnect the control cable to the shut-off valve (EPT & EU).

The filter can now be put back into operation, see Section 7.2.

Operating Instructions Pit Purification System (PPS)

6.3 Mounting

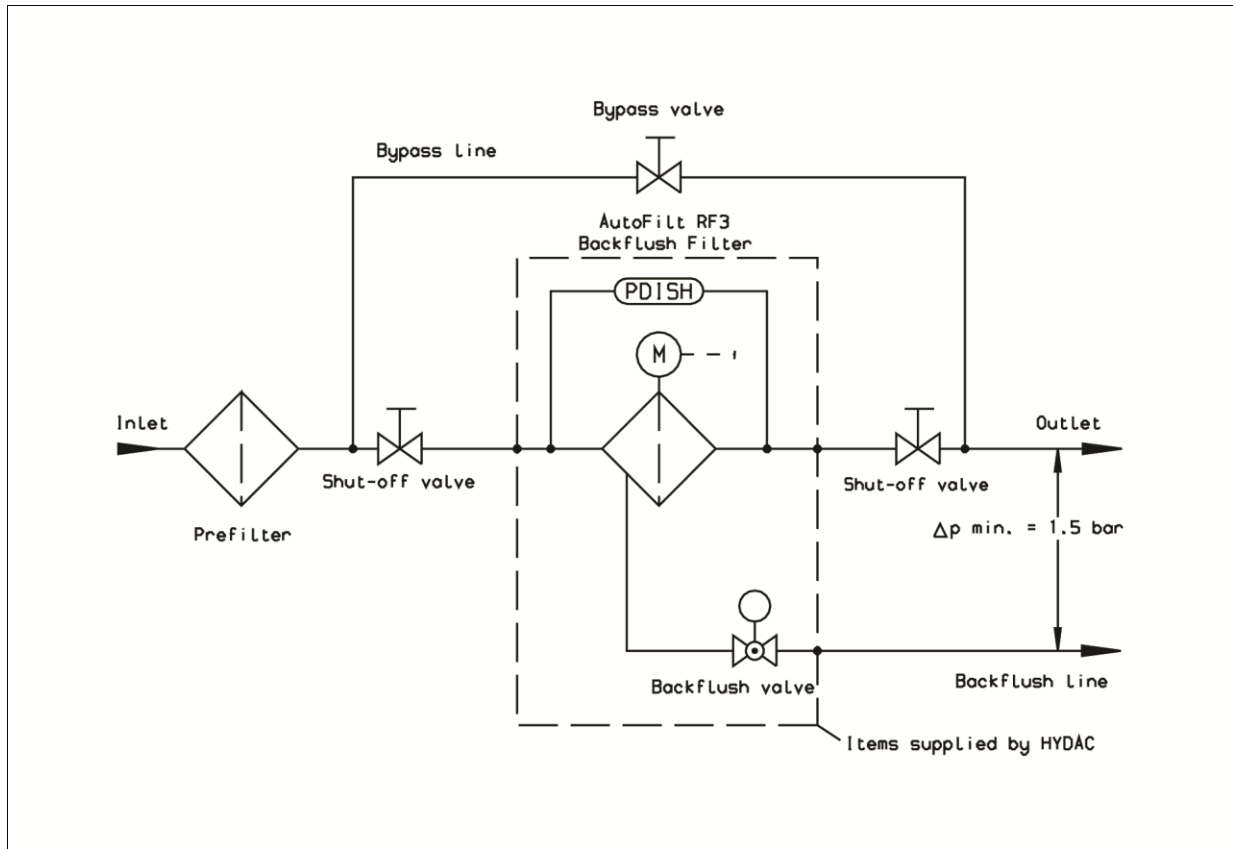


Figure 8: Installation circuit diagram of the self-cleaning filter

The filter housing must be placed vertically on a level surface and its feet must be fixed firmly to the base with anchor bolts.

The self-cleaning filter must not be used as a pipe support. Ensure that the filter is flexibly mounted so that pipe forces are not transferred to the filter.



We recommend that a pre-filter (wire mesh or perforated metal sheet) is installed before the self-cleaning filter in order to protect it from coarse contamination.

<u>Filtration rate recommendation:</u>	self-cleaning filter	Pre-filter
	Less than 500µm	3 mm
	Greater than 500µm	10 mm

Fluid lines

Inlet	Inlet of fluid to be filtered
Outlet	Outlet of filtrate
Back-flushing line	Outlet of back-flushing fluid
Drain	Plug or blank flange for residual draining of the self-cleaning filter
Vent	Plug for venting the self-cleaning filter

Operating Instructions Pit Purification System (PPS)

Inlet and outlet lines

When connecting the lines, please observe the specified direction of flow. The inlet and outlet are marked with corresponding labels.



To maintain the fluid flow even during any maintenance work, it is advisable to provide a bypass line with suitable shut-off valves. See Figure 8.

6.3.1 Mounting the outlet line for the back-flushing liquid

The outlet line for the back-flushing liquid is connected to the shut-off valve of the **self-cleaning** filter via a flange. Its nominal width must not be smaller than that of the shut-off valve. The line should as far as possible be mounted with a slight slope (no pressure).



A pressure drop of at least 1.5 bar must exist between the filtrate outlet of the self-cleaning filter and the back-flushing line during back-flushing, to ensure smooth operation of the self-cleaning filter. See Figure 8.

If back pressure occurs in the **self-cleaning** line (e.g. due to fixed equipment such as manifolds), then the pressure at the filtrate outlet of the **self-cleaning** filter must be increased by the amount of this back pressure.

Shut off valve (butterfly valve)

1. The flanges have to be spread in order to ease the installation of the valve. The disc must be partially open.
2. Set all stay-bolts by keeping the disc slightly open and do not tighten the nuts.
3. Open completely the disc. Ensure that the piping is aligned. Tighten diagonally opposite the nuts until the flanges are in contact with the body of the valve. Never use gaskets or grease.



Never weld the flanges when valve is installed!

6.4 Connecting the power supply – EPT and EU



Voltages present in the electrical control box and in the mains supply are life threatening.
Opening the control box and all work on the electrical equipment of the installation must only be performed by authorised personnel (qualified electricians).

Connect the power supply of the **self-cleaning** filter to the terminal strip in the control box. Exact specifications and data may be obtained from the circuit diagram provided.

Operating Instructions Pit Purification System (PPS)

6.5 Connecting the compressed air supply – EPT, PT and PTZ

Please use shut-off valves in order to switch off the compressed air supply for mounting and maintenance.

The compressed air supply of the self-cleaning filter has a maximum value of 6 bar and must not drop below 4 bar!

⇒ Connection: G 1/4" DIN ISO 228



The compressed air must be free of condensate and solid particles. If this cannot be guaranteed, then a suitably sized filter with condensate drain must be fitted before the compressed air supply connection.

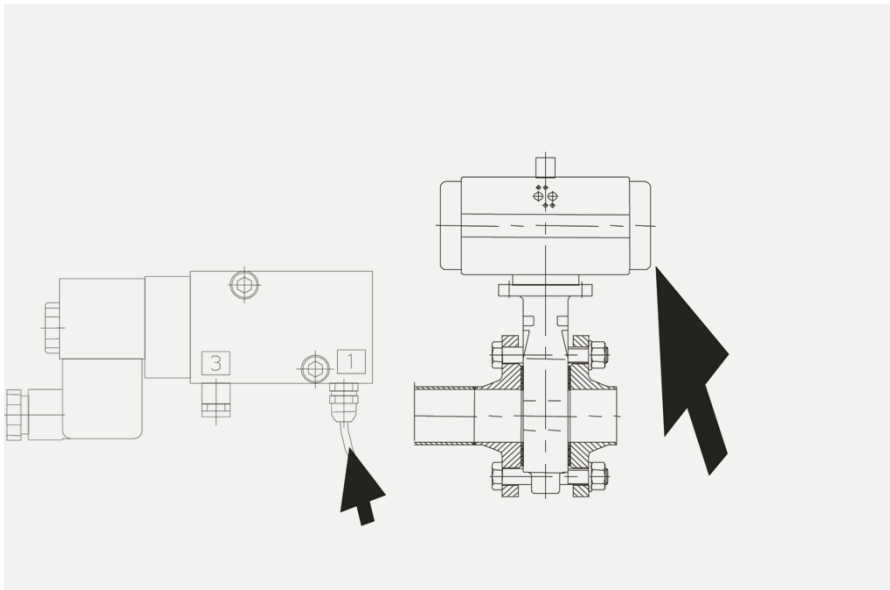


Figure 9: Connecting the compressed air supply – EPT

	Compressed air supply connection
	Exhaust flow control valve

7 USING THE SELF-CLEANING FILTER

7.1 Operating and monitoring elements

Operating element	Function
Main switch	Switches the power supply of the self-cleaning filter off. (Only for back-flushing filters with electro-pneumatic or electrical cyclic control – EPT and EU.)
Test key	Switches back-flushing on manually. Key must be pressed for about 3 seconds until test run is initiated.
Differential pressure gauge	Sets the differential pressure trigger of the back-flushing cycle and allows visual monitoring of this pressure at the self-cleaning filter.
Compressed air - control valve and filter (only PT & PTZ)	Regulates the compressed air supply
Controls	Adjusts the other operating parameters, see also Section 5. and Section 7.2.1

Table 11: Operating elements - Controls

7.2 Commissioning the self-cleaning filter

Action before commissioning

Before commissioning the self-cleaning filter, check that

- all inlet and outlet lines are correctly connected and shut-off,
- the power supply is connected (EPT & EU),
- the compressed air supply is connected (EPT, PT & PTZ),
- the blanking plug on the vent valve is screwed in.
- the drain plug or the blank flange drain has been correctly attached to the opening provided at the elbow of the back-flushing filter.
- the blanking plug on the geared motor has been replaced by the vent plug which is supplied loose, see Section 4.2.
- the compressed air lubricator is filled with oil (PT only), see Section 4.6.2.



Tighten the bolts on the housing and on the cover plate to the designated torque rating. See Table

Operating Instructions Pit Purification System (PPS)

Commissioning

When commissioning the self-cleaning filter, proceed as follows:

1. Check the setting of the differential pressure trigger on the differential pressure gauge, see Section 4.4.
2. Open the compressed air supply line and set the working pressure of compressed air to between 5 and 6 bar (EPT & PT).
Turn on the main switch (EPT & EU).
3. Unscrew the blanking plug on the vent valve.
4. Now open the shut-off valve in the inlet line slightly so that the filter housing slowly fills with liquid.
5. Open vent valve on the cover plate of the self-cleaning filter slightly.
6. If liquid flows out of the vent plug hole, then close this again.
7. Now open the shut-off valve in the inlet line fully.
8. Now press the **Test** key (for approx. 3 seconds) to start a test run of the back-flushing process.



If pressure surges occur during the back-flushing process that could damage the pipe system or installations fitted further down the line, they can be mitigated by reducing the exhaust air-stream with the aid of the exhaust flow control valve fitted onto the back-flushing valve (EPT & PT).

9. After completion of the test run, vent the self-cleaning filter once more. The filter housing is now completely filled with fluid.
10. Screw in the blanking plug on the vent valve again.
11. Then open the shut-off valve in the outlet line.



If fluid escapes from the cutting ring threads of the pressure gauge hoses when commissioning, please proceed as follows:

- switch off main switch
- close shut-off valves at the inlet and outlet to de-pressurize the filter.
- afterwards, tighten up the cutting ring threads.
- the self-cleaning filter can now be operated again.

The filter is now fully operational.
The self-cleaning filter now operates fully automatically.



Vent the self-cleaning filter regularly to prevent the formation of an air cushion in the self-cleaning filterhousing.

7.2.1 Setting the operating parameters

You can set the following operating parameters on the self-cleaning filter:

- 1) Differential pressure trigger of the back-flushing cycle, see Section 4.4.
- 2) Timer (EPT, EU and PTZ control), see Section 5.
- 3) Back-flushing time per element, see Section 5.
- 4) Speed of the geared motor (PT and PTZ control), see Section **Error! Reference source not found.**

Operating Instructions Pit Purification System (PPS)

7.3 Decommissioning of the self-cleaning filter

1. Clean the self-cleaning filter by pressing the Test key (for approx. 3 seconds).
2. After the back-flushing cycle has run, close the outlet and inlet lines of the self-cleaning filter.
3. Unscrew the blanking plug on the vent valve.
4. For venting, open the vent valve on the cover plate of the self-cleaning filter.
5. Open the drain plug or the blank flange drain on the manifold of the self-cleaning filter so that the filter runs dry.



Keep a sufficiently large container to hand to collect the fluid.
See type code label: "Contents in litres"
The back-flushing line must be at zero pressure before starting to drain.

6. Now empty the back-flushing line by pressing the **Test** key.
7. After the subsequent back-flushing cycle has run, switch off the self-cleaning filter:
 - Close the compressed air supply line (EPT & PT) and/or
 - Turn off the **main switch** (EPT & EU).
8. As soon as the self-cleaning filter has been completely drained:
 - close the vent valve on the self-cleaning filter,
 - close the vent valve with the blanking plug,
 - plug the drainage hole on the self-cleaning filter.
9. For information on de-commissioning the RF3 for longer downtimes, see Section 7.4.
10. For storage, see Section 2.2.

7.4 Decommissioning the RF3 for longer downtimes

If the filter is to be out of operation for a longer period, please proceed as follows:

- De-commission the self-cleaning filter, see Section 7.3
- Remove the filter elements, see Section 8.4.1
- Clean the filter elements using a high pressure cleaner and check them for damage. Replace any damaged filter elements with new ones.
- Check the element seals and replace any damaged seals.
- Clean the inside and check the corrosion protection of the filter bowl. If it is damaged, repair the corrosion protection. If the corrosion protection is damaged irreparably, please consult Schroeder Industries LLC.
- Ensure that the flushing arm can turn easily.



It is advisable to mount the intermediate shaft to aid turning.

- Dry the inside of the bowl and the filter elements.
- Fit the elements, refer to Section 8.4.2

Operating Instructions Pit Purification System (PPS)

Back-flushing test run without fluid.



Before starting the test run, check that:

- there is no pressure in the back-flushing line.
- the shut-off valve on the filter inlet and outlet is closed.

- Open the compressed air line and set the operating pressure of the compressed air to between 5 and 6 bar (EPT & PT).
- Switch on the main switch (EPT & EU).

Manual start of back-flushing cycle - Test switch

- Use the **Test** key to start the back-flushing cycle irrespective of the operating parameters. Key must be held down for approx. 3 seconds.



Check that all components are functioning in accordance with the requirements. If there are function faults, eliminate these. To find the causes of faults and to eliminate them, see Section 8.3.

If all parts are functioning in accordance with the requirements:

- Switch off the main switch (EPT & EU)
- Shut-off the compressed air line (EPT & EU)

The filter can now be out of operation for longer downtimes.



If the filter is disconnected from the pipe system, the flanges must be plugged to prevent foreign bodies from entering the filter.



If the self-cleaning filter is to be out of operation for more than 6 months, then the geared motor must be filled with a long term preservative. Please contact Schroeder Industries LLC or the gear manufacturer direct.

- For storage, see Section 2.2., Page 39
- Re-commissioning is carried out according to Section 7.2 Commissioning the self-cleaning filter.

Operating Instructions Pit Purification System (PPS)

8 MAINTENANCE OF THE SELF-CLEANING FILTER

8.1 Inspection by operating staff

Individual part	Action	Frequency
Self-cleaning filter	Check for any externally visible damage	Monthly
	Vent self-cleaning filter, see also Section 7.2.	On a regular basis, to prevent formation of an air cushion in the self-cleaning filter housing.
Geared motor	Function check	See Section 4.2.
Compressed air - Lubricator (PT and PTZ)	Check oil level, if necessary replenish oil	Weekly

Table 12: Inspection schedule

Operating Instructions Pit Purification System (PPS)

8.2 Maintenance work

Individual part	Action	Frequency
Self-cleaning filter Filter elements	Filter inspection	At the regular inspection of the installation
	Remove the filter elements, see Sec.8.4 and visual inspection	At the regular inspection of the installation
	Cleaning with high-pressure cleaner	Possibly after visual inspection
Hoses	Check	At the regular inspection of the installation
	Replace	As required
Seals	Check	At the regular inspection of the installation
	Replace	As required
Geared motor	See Section 4.2.	
Differential pressure gauge	See Section 4.4	
Shut-off valves	Function check	At the regular inspection of the installation
	Replace	As required
Position switch	Function check	At the regular inspection of the installation
	Replace	As required
Compressed air - control valve and filter (PT only)	See Section 4.6.1.	As required
Compressed air - Lubricator (PT & PTZ)	See Section 4.6.2.	As required
Self-cleaning filter with corrosion protection	Visual inspection of the internal corrosion protection layer	At the regular inspection of the installation
If corrosion protection layer is damaged	Repair corrosion protection layer	As required, as soon as possible
If corrosion protection layer is irreparably damaged	Contact Schroeder Industries LLC	As required, as soon as possible

Table 13: Maintenance schedule

Operating Instructions Pit Purification System (PPS)

8.3 Faults and their elimination



All work on the electrical equipment of the self-cleaning filter must be carried out only by a **qualified electrician!**

8.3.1 Troubleshooting – self-cleaning filter with electro-pneumatic or electrical cyclic control – EPT and EU

Fault	Fault source	Cause	Action	
Leakage at the filter	Pressure gauge hoses	Cutting rings	Tighten cutting rings. If necessary, replace hoses and cutting rings, see Section 7.2.	
	Leakage at the cover plate or bowl	Seal missing, or damaged	Replace seal, see Section 8.4 and 6.2.1.	
		Bolts	Tighten bolts, see Table Page 81.	
No back-flushing although the differential pressure gauge has exceeded the pre-set limit	ON light on board does not light up - Fuses	Fuses have responded	Check whether there is a fault such as a short circuit: If yes: Replace component If not: Insert or replace fuse	
	- Power supply	Filter is not connected to the power supply	Connect the filter to the power supply. Follow the circuit diagram of the filter.	
	- Main switch	Main switch not on	Turn on main switch	
	- Motor protection switch responded	Power consumption of geared motor too high due to – overheating – short circuit	Check geared motor. See Section 4.2.	
			Flushing arm is blocked by a foreign body	– Stop the self-cleaning filter completely, see Section 7.3 – Open filter – Remove foreign body
			Incorrect setting of motor protection switch	Compare setting of the motor protection switch with the data on the type code label of the geared motor.
	Loose connector	Connector has worked loose or has been disconnected	Check all electrical connections: – geared motor – position switch of cyclic control – position switch for zero position – drive of back-flushing valve	
	Geared motor	Fault in geared motor	See Section 4.2.	
Continuous back-flushing	Excessive contamination of fluid to be filtered.	Differential pressure trigger has been exceeded. The contamination of the fluid to be filtered is too high for the filter type	Reduce contamination	

Table14: Troubleshooting – self-cleaning filter with electro-pneumatic, electrical cyclic control or electrical control

Operating Instructions Pit Purification System (PPS)

Fault	Fault source	Cause	Action
	Differential pressure trigger	Setting of differential pressure trigger is too low	Check the setting of the differential pressure trigger, see Section 4.4. If necessary, increase this pressure
	Pressure differential filtrate – back-flushing line	Pressure differential between filtrate outlet and back-flushing line too low, filter elements are not sufficiently cleaned.	<ul style="list-style-type: none"> – Increase pressure at inlet – Reduce pressure of back-flushing line Note the specifications in Section 6.3
	Filter elements	Filter elements are permanently contaminated	<ul style="list-style-type: none"> – Stop the self-cleaning filter, see Section 7.3 – Remove filter elements, Section 8.4.1 – Clean filter elements with high-pressure cleaner. If the filter elements cannot be cleaned or are damaged, <ul style="list-style-type: none"> → fit new filter elements – Insert filter elements, Section 8.4.2
	Timer	Timer switched on without setting a time	Check the setting of the timer and increase it if required, see Section 0
	Shut-off valve does not open	<u>Only EPT:</u> Compressed air supply of the pneumatic actuator is not connected	<ul style="list-style-type: none"> – Set up compressed air supply – Compressed air supply min. 4 bar max. 6 bar
		<u>Only EPT:</u> Solenoid valve is not connected to the control unit	Check whether the solenoid valve in the flush position is supplied with power – LED K1 in the control box lights up If yes: Check function of the solenoid valve and replace if necessary If not: Check connector and power cable and replace if necessary
		<u>Only EU:</u> Shut-off valve is not connected to the control unit	Check whether the shut-off valve in the flush position is supplied with power – LED K1 in control box lights up. If yes: Check function of shut-off valve and replace if necessary If not: Check or replace connector and power cable
		Excessive torque of shut-off valve. Valve is blocked	<ul style="list-style-type: none"> – Stop the self-cleaning filter, see Section 7.3 – Disconnect shut-off valve – Remove foreign housing
		Actuator defective	Replace actuator
	Wrong rotation direction of geared motor	Incorrect polarity	Compare the rotation direction of the geared motor with the direction arrow marked on the motor. If the direction is wrong, then the polarity of the power supply must be reversed (only by a qualified electrician!).
Leakage at the shut-off valve	Leakage at the spindle seal		Tighten the spindle seal..

Table14: Troubleshooting – self-cleaning filter with electro-pneumatic, electrical cyclic control or electrical control

Operating Instructions Pit Purification System (PPS)

8.3.2 Troubleshooting – self-cleaning filter with pneumatic control – PT

Fault	Fault source	Cause	Action
Leakage at the filter	Pressure gauge hoses	Cutting rings	Tighten cutting rings. If necessary, replace hoses and cutting rings, see Section 7.2.
	Leakage at the cover plate or bowl	Seal missing, or damaged	Replace seal, see Section 8.4 and 6.2.1.
		Bolts	Tighten bolts, see Table.
No back-flushing even though differential pressure gauge has exceeded the set limit	Compressed air supply	Compressed air supply is not connected to the filter	Connect the filter to the compressed air supply. Ensure that the required pressure of min. 4 bar and max. 6 bar is available
	Flushing arm is blocked	Flushing arm is blocked by a foreign body	<ul style="list-style-type: none"> – Stop the self-cleaning filter completely, see Section 7.3 – Open filter – Remove foreign body
Continuous back-flushing, differential pressure trigger is exceeded	Excessive contamination of fluid to be filtered	The contamination of the fluid to be filtered is too high for the filter type	Reduce contamination
	Setting of differential pressure trigger	Setting of differential pressure trigger is too low	Check the setting of the differential pressure trigger, see Section 4.4. Increase this pressure if required
	Pressure differential filtrate – back-flushing line	Pressure differential between filtrate outlet and back-flushing line too low, filter elements are not sufficiently cleaned.	<ul style="list-style-type: none"> – Increase pressure at inlet – Reduce pressure of back-flushing line Note the specifications in Section 6.2
	Filter elements	Filter elements are permanently contaminated	<ul style="list-style-type: none"> – Stop operation of the self-cleaning filter, see Section 7.3 – Remove filter elements, see Section 8.4.1 – Clean filter elements with high-pressure cleaner. If the filter elements cannot be cleaned or are damaged, → insert new filter elements – Insert filter elements, see Section 8.4.2.
	Rotary slide valves	Excessive distance between the rotary slide valves (position switches) so that they do not switch	Re-adjust the rotary slide valves
	Shut-off valve does not open	Torque of the shut-off valve too high Shut-off valve is blocked	<ul style="list-style-type: none"> – Stop the self-cleaning filter, see Section 7.3 – Dismantle shut-off valve – Remove foreign body

Table15: Troubleshooting – self-cleaning filter with pneumatic cyclic control

Operating Instructions Pit Purification System (PPS)

Fault	Fault source	Cause	Action
Continuous back-flushing, differential pressure trigger is exceeded	Wrong rotation direction of geared motor	Compressed air supply connected incorrectly to geared motor	Compare the rotation direction of the geared motor with the direction arrow marked on the motor. If the direction is wrong, the connection on the geared motor for the compressed air supply must be changed.
	Loose hose connections	Plug connections have been disconnected	Check all hose connections: – geared motor – position switch of cyclic control – position switch for zero position – back-flushing valve
	Geared motor	Fault in geared motor	See Section 4.2 and 4.2.1. Check compressed air - lubricator
	Compressed air - lubricator	Compressed air of the geared motor is not lubricated sufficiently.	Check oil level, replenish oil if necessary, see Section 4.6.2. Adjust the required amount of oil, see Section 4.6.2.
Continuous back-flushing; differential pressure trigger below limit	Speed of geared motor	Speed of geared motor too high	Set speed on GRO flow control valve to 2 rpm, see Section Error! Reference source not found.
	Rotary slide valves	Rotary slide valves are stuck	Free rotary slide valves or replace them
		Distance of rotary slide valves to cam plate too small	Re-adjust rotary slide valves so that they switch again
Timer (only PTZ)	Timer set with insufficient time (only PTZ)	Check setting of timer and increase if required, see Section Error! Reference source not found.	
Leakage at the shut-off valve	Leakage at the spindle seal		Tighten the spindle seal.

Table15: Troubleshooting – self-cleaning filter with pneumatic cyclic control

Operating Instructions Pit Purification System (PPS)

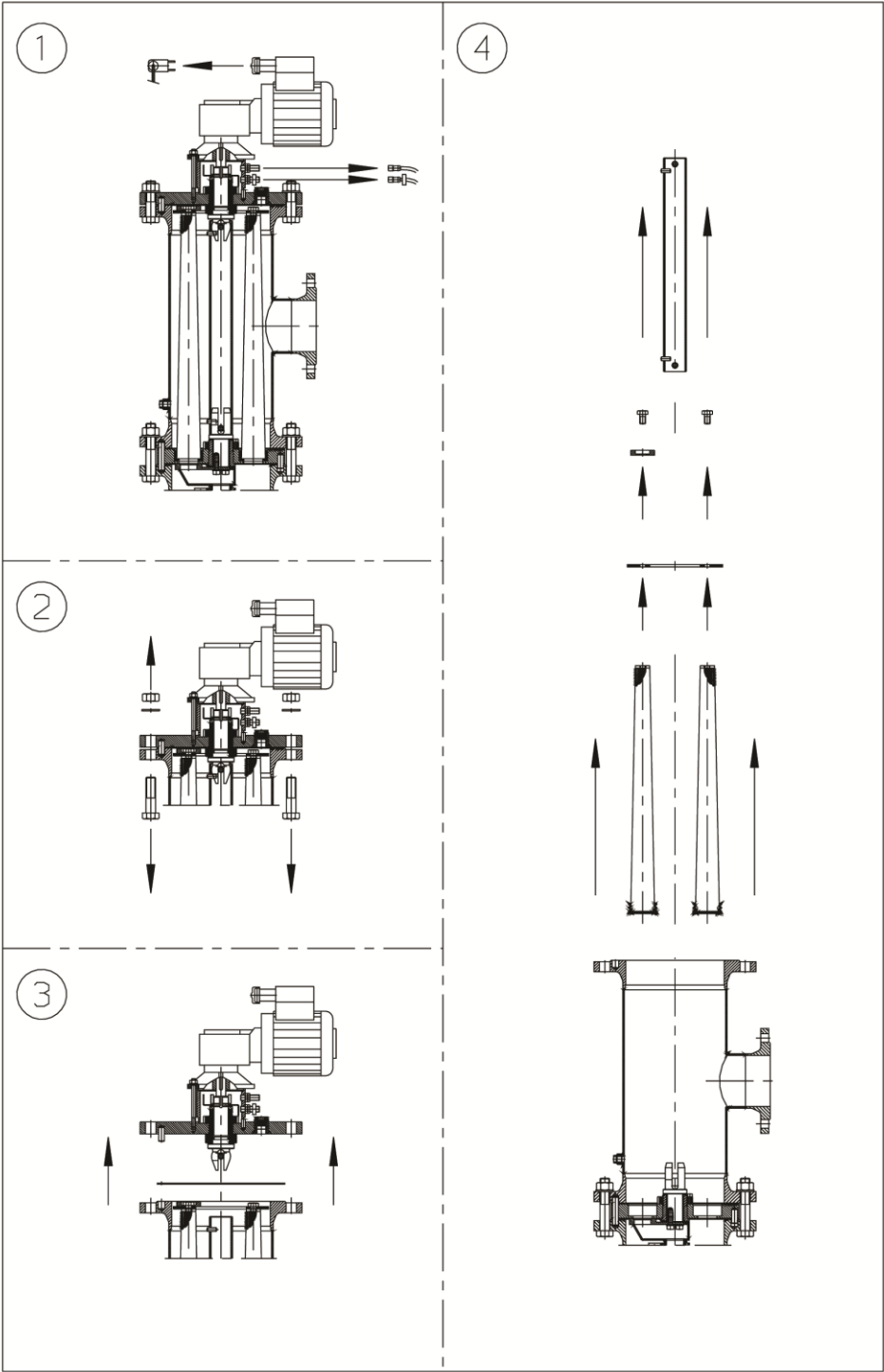


Figure 10: Removing the filter elements

Operating Instructions Pit Purification System (PPS)

8.4 Removing and fitting the filter elements



From size 1, lifting tackle (such as a crane) is required for removing the cover plate and the element mounting plate. See Table 9 for the required load capacity.

Size	1	2	2.5	3	4	5	6	7	8
Approx. weight in kg	50	80	100	110	175	220	400	500	700

Table16: Weight of the self-cleaning filter cover plate with geared motor

8.4.1 Removing the filter elements

Before removing the filter elements, check that

- the self-cleaning filter is not in operation, see Section 7.3.

Now proceed as follows, see also Figure :

1. Disconnect the geared motor and the position switches.
2. Loosen the bolts on the cover plate of the self-cleaning filter.
3. Remove the cover plate and the gasket of the filter housing.
4. Pull out the intermediate shaft.
5. Loosen the mounting bolts of the filter elements.
6. Remove the spacers and the upper element mounting plate.
7. Now carefully pull the filter elements out of the lower element mounting plate.



Ensure that the element seals do not remain in the lower element mounting plate. Keep the seals in a safe place.

Operating Instructions Pit Purification System (PPS)

8.4.2 Fitting the filter elements

After the filter elements have been removed, new or cleaned elements can be fitted into the self-cleaning filter.



Before fitting, check that the element seals are undamaged, and whether there is a seal for each element.

Proceed as follows:

1. Carefully fit the filter elements into the lower element mounting plate of the self-cleaning filter.
2. Carefully fit the spacers and the upper element mounting plate into the self-cleaning filter.
3. Tighten the mounting bolts of the filter elements.
4. Insert the intermediate shaft.
5. Place the gasket onto the housing of the self-cleaning filter.
6. Place the cover plate onto the housing of the self-cleaning filter.



When replacing the cover plate, note the position of the detent pin.

7. Tighten the bolts on the cover plate of the self-cleaning filter. See Table for the torque rating.
8. Connect up the geared motor and the position switches.

Bolt	Torque rating without rubber coating	Torque rating rubber coated
M 20	200 Nm	75
M 24	320 Nm	200
M 27	470 Nm	230
M 30	640 Nm	320
M 33	870 Nm	430

Table17: Torque rating for bolts (cover plate and housing)

Operating Instructions Pit Purification System (PPS)

9 MODEL CODE SCHROEDER RF3

Filter Series	Flange Size	Drive Control/Connecting Voltage	Housing Material and Coating	Shut-Off Valve Material	Differential Pressure Gauge
RF3	C 0 1 2 2.5 3 4 5 6 7 8	EPT = Electric pneumatic cycle control, Δp dependent EU = Electric control, Δp dependent PT = Pneumatic cyclic control, Δp dependent, size C-4 PTZ = Pneumatic cyclic timed control, size C-4 7 = 3x415V/N/PE 60Hz 8 = 3x460V/X/PE 60Hz	N = standard steel outside primed NM = Standard steel 1,0038, outside primed, inside metallogal painted NG = Standard steel 1,0038, outside primed, inside rubber coated E = Stainless Steel 1.4571 A = with ANSI-flanged additional A at the end	N = Standard-Steel E = Stainless Steel	1 = Pressure Chamber Aluminum 3.258302 2 = Pressure Chamber, Stainless Steel 1.4305 3 = with pressure mediators stainless steel 315 TI

Filter Model Number Selection

Flange Position	Modification Number	Element Set	Size of Element Set	Vessel Certification
1 = Filter outlet opposite filter inlet (standard) 2 - Filter outlet offset 90° clockwise to standard 3 - Filter outlet offset by 180° clockwise to standard 4 - Filter outlet offset by 270° clockwise to standard	0 = Latest version supplied by factory	KD25 = Conical SuperMesh KD40 = Konical SuperMesh KS50 = Conical slotted tubes KS100 = Conical slotted tubes KS200 = Conical slotted tubes KS300 = Conical slotted tubes KS400 = Conical slotted tubes KS500 = Conical slotted tubes KS1000 = Conical slotted tubes KS1500 = Conical slotted tubes KS2000 = Conical slotted tubes KS2500 = Conical slotted tubes KS3000 = Conical slotted tubes	USE SAME CODE SELECTED IN FILTER SIZE	Omit = standard version ASME = ASME version

Filter Model Number Selection

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10 TECHNICAL SPECIFICATIONS

Type	RF3-C	RF3-0	RF3-1	RF3-2	RF3-2.5	RF3-3
Maximum working pressure	16 bar	10 bar	10 bar	10 bar	10 bar	10 bar
Maximum working temperature	90°C	90°C	90°C	90°C	90 °C	90°C
Empty weight	116 kg	145 kg	240 kg	365 kg	450 kg	570 kg
Operating weight	136 kg	170 kg	300 kg	470 kg	640 kg	850 kg
Volume	20 dm ³	25 dm ³	60 dm ³	105 dm ³	190 dm ³	280 dm ³
Number of filter elements	6	6	6	8	6	9

Type	RF3-4	RF3-5	RF3-6	RF3-7	RF3-
Maximum working pressure	6 bar	6 bar	6 bar	6 bar	6 bar
Maximum working temperature	90°C	90°C	90°C	90°C	90°C
Empty weight	750 kg	1020 kg	1610 kg	1950 kg	3000 kg
Operating weight	1175 kg	1655 kg	2610 kg	3305 kg	5920 kg
Volume	425 dm ³	635 dm ³	998 dm ³	1355 dm ³	2710 dm ³
Number of filter elements	18	24	40	42	54

Table 18: Technical specifications - self-cleaning filter



The technical data given in Table and only apply to the standard series of the Schroeder RF3 self-cleaning filter. Technical data for all special self-cleaning filters are listed on a data sheet attached to these operating instructions. "Special self-cleaning filter" refers to all self-cleaning filters with a drawing number at the end of the model code. See also Section 9.

Operating Instructions Pit Purification System (PPS)

11 SPARE PARTS

Item Number	Description	Quantity	Item Number	Description	Quantity
1	SELF CLEANING FILTER	1	36	COUPLING, STR, .25 NPT FEM	1
2	NAMEPLATE, RF3 FILTER	1	37	HUB, CENTER	1
3	SIGN, BACKFLUSH	1	38	ELBOW, STREET, 0.5NPT, 304SS 150#	2
4	VALVE, G1/4 BALL 1000 PSI	1	39	SPACER UPPER DRIVESHAFT	1
5	SIGN, INLET	1	40	WASHER UPPER DRIVESHAFT	1
6	SIGN, OUTLET	1	41	DRIVE SHAFT, UPPER	1
7	RIVET, RH, SLOT, .07X.17	6	42	WASHER UPPER DRIVESHAFT	1
8	DECAL, DIRECTION ARROW	1	43	NUT, HH, M8	4
9	RIVET, POP, .12X.46,SS	8	44	KEYWAY 6MM X 6MM	1
10	CONNECTOR, PIPE, .25s.s.	1	45	SNAP RING, 30 MM DIA X 1.60 WIDE	2
11	BLEED SCREW, G1/4	1	46	BUSHING, UPPER DRIVESHAFT	2
12	BOLT, HH, .31-18UNCX.62,	4	47	WASHER, LOCK, SPLIT, M8	4
13	WASHER, LOCK, SPLIT, .31,	4	48	QUAD RING, BUNA – 216	1
14	GAUGE, DIFFERENTIAL PRESSURE	1	49	PLUG, NYLON	1
15	SENSOR, PROXIMITY, 24 VDC	2**	50	BOLT, HH, M6X20	1
16	PIN, MOTOR MOUNT	1	51	PLUG, SQ. HEAD PIPE	1
17	BACKFLUSH VALVE ASSEMBLY	1	52	STUD M8 X 90 THREADED	4
18	DRIVE SHAFT, LOWER	1	53	RETAINING PLATE	1
19	DISC, BF ARM, RF306, RF308	1	54	RING, BACK UP, 216, TEFLON	1
20	BUSHING, LOWER DRIVESHAFT	1	55	GEAR MOTOR, 115/230v	1
21	NUT, LOWER DRIVESHAFT	1	56	MOTOR MOUNT, RF302-10;0.16 H.P. MOTOR	1
22	BUSHING IN LOWER DRIVESHAFT BEARING	2	57	CONTROL PLATE BF ARM LOCATOR	1
23	WASHER, BF ARM	1	58	PIN, DOWEL, M12X36,SS	2
24	CS, SH, M8x30	4	59	PIN, DOWEL, M12X50,SS	1
25	WASHER, STAR, M8	4**	61	BOLT, HH, LID TO HOUSING	12**
26	PLATE, HOLDING	1	62	BOLT, HH, LOWER HOUSING	12**
27	BACK-FLUSH ARM	1	63	NUT, HH, HOUSING	24**
28	COUPLING, HOSE RF306	1	64	WASHER, FLAT, HOUSING	24**
29	ELEMENT SET	1	65	LIFTING LUG, .50-13, GAL V	2
30	HOUSING SET	1			
31	CONTROL PANEL, MAXIM 10 PLC, 115 VAC	1			
32	ELEMENT TUBE SHEET PLATE	1			
33	GASKET	3			
34	DRIVE SHAFT, MIDDLE	1			
35	WELDMENT, LID	1			

** Quantity Changes with Model Code

Table 19 Spare parts



XXXXXXXX: Please indicate part number of self-cleaning filter (see type code plate).

When ordering spare parts, please indicate part number of the self-cleaning filter (see type code plate) to guarantee that the correct parts are supplied.

Operating Instructions Pit Purification System (PPS)

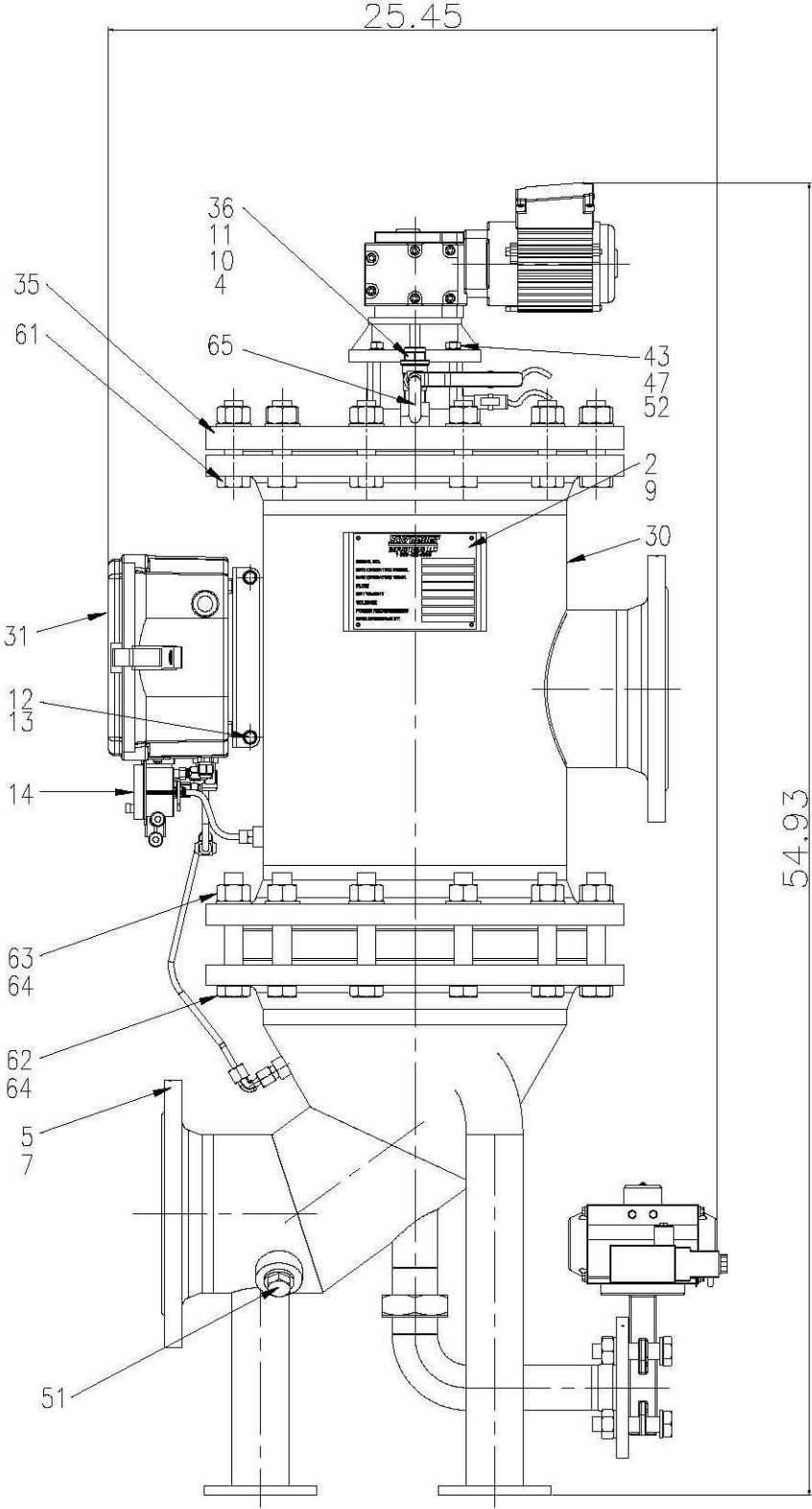


Figure 11: External Spare Part RF3

Operating Instructions Pit Purification System (PPS)

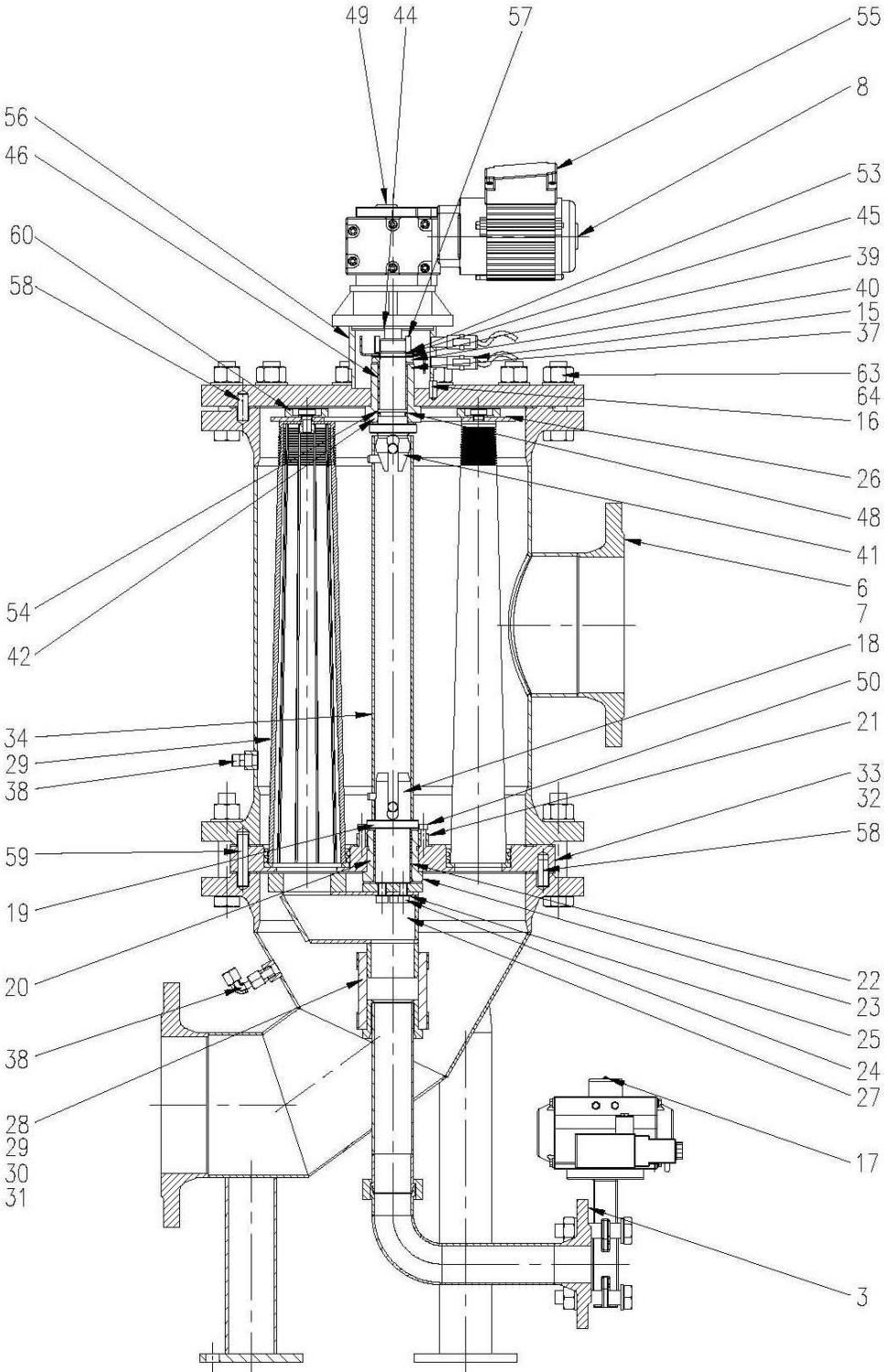


Figure 12: Internal Spare Parts RF3

Operating Instructions Pit Purification System (PPS)

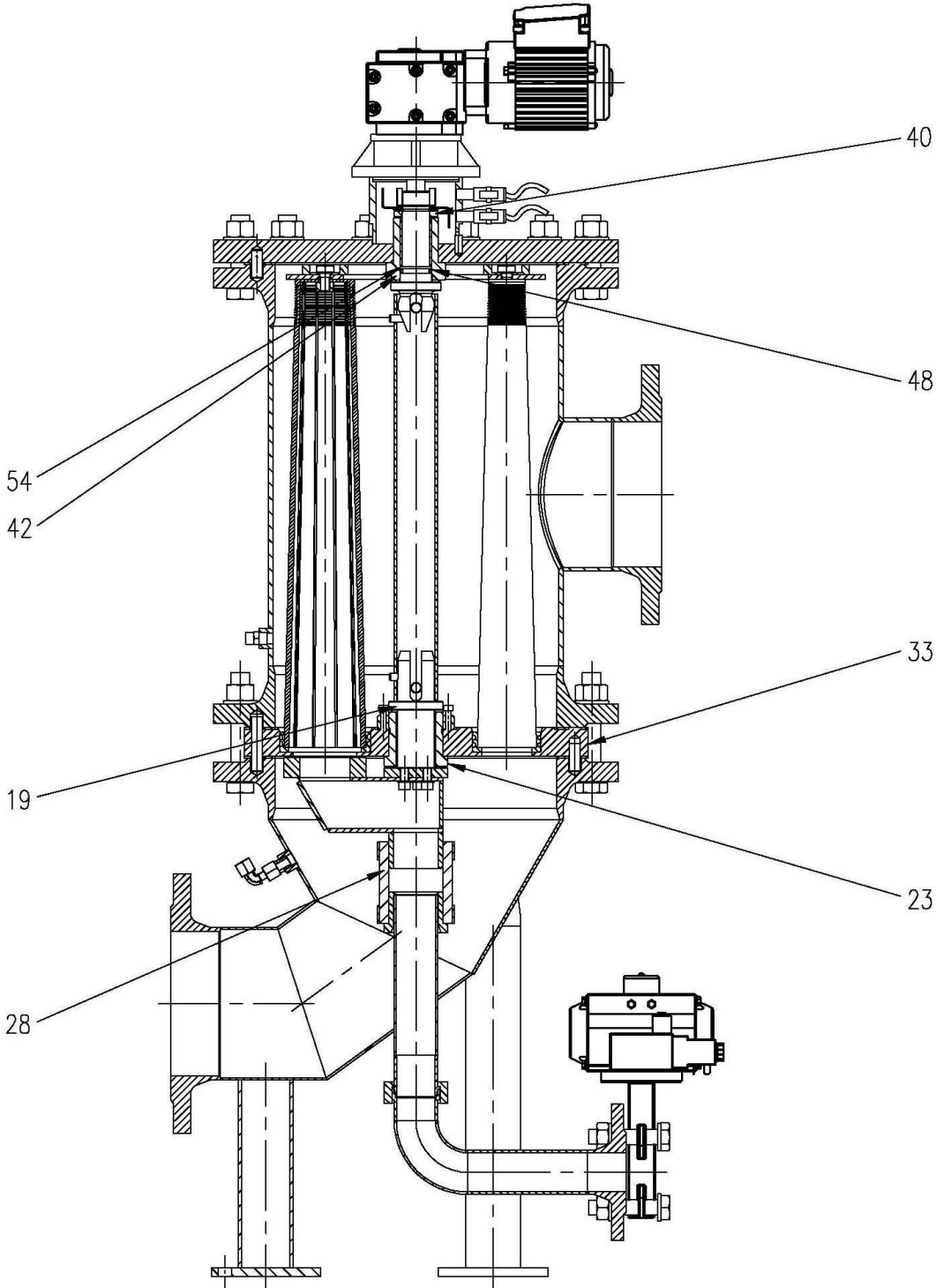


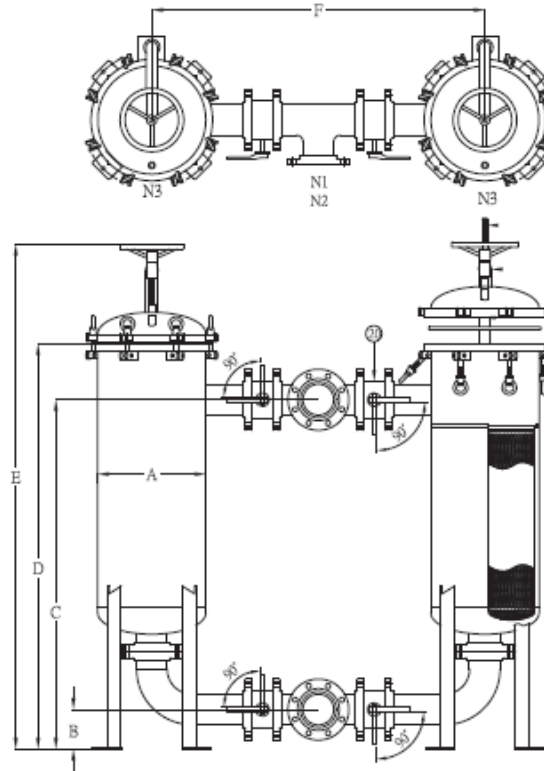
Figure 13: Seal Kit RF3

Operating Instructions Pit Purification System (PPS)

Duplex Multi Bag Housings

**DBH2 -
DBH10**

**Duplex
Multi Bag
Housing**
150 psi
10 bar



Dimensions

A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)	E Inches (mm)	F Inches (mm)	G Inches (mm)	N1	N2	N3
16 (406)	6 (148)	52 (1310)	60 (1520)	75 (1893)	49 (1250)	20 (516)	Inlet 3 / 150P SORF	Outlet 3 / 150P SORF	Vent. 5 / PT F

Specifications

Max. Working Pressure: 150 psi (10 bar)
 Max. Working Temperature: 165 °F (75 °C)
 Support Legs: Fixed
 Lid Closure: Swing Bolts

Operating Instructions Pit Purification System (PPS)

Duplex Multi Bag Housings

How to Build a Valid Model Number for a TFS:

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7
DBH	1					

Example: NOTE: One option per box

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5	BOX 6	BOX 7	
DBH	4	2	304S	4F	E	1	= BH42304S4FE1

BOX 1	BOX 2	BOX 3	BOX 4	BOX 5
Filter Series	Number of Bags	Bag Size	Material	Connection Size
DBH	2 3 4 6 8 10	2	304S = 304 Stainless Steel 316S = 316 Stainless Steel 316L = 316L Stainless Steel	3F = 3" Flange (2, 3, 4, and 6 bags) 4F = 4" Flange (2, 3, 4, 6, and 8 bags) 6F = 6" Flange (4, 6, 8, and 10 bags) 8F = 8" Flange (8 and 10 bags) 10 = 10" Flange (10 bags)
BOX 6	BOX 7			
Seal Material	Pressure Rating			
E = EPDM V = Viton	1 = 150 psi			

*Shaded selections are preferred order codes that designate shorter lead times.

Filter and Media are sold separately.

BH1
100 psi

Filter Model Number Selection
BH1
150 psi

BH2-
BH10

**DBH2-
DBH10**

Micron-
Rated/OAB

PPH/PPA



Product Photo

Operating Instructions Pit Purification System (PPS)

1 COMMISSIONING

1.1 Design

The Duplex Multi Bag Housing is designed to allow for nonstop filtration during bag element change out. The unit consists of two element housing, plumbed together in a manner that permits the isolation of one housing while the other remains in full operation.

- Four separate valves are used to segregate the fluid flow.
- Valves use the standard butterfly design, known for their effective seal, low pressure drop, and low cost.
- Valves are soft-seated to provide bubble-tight closure.
- Mechanical stops assure that the valves are completely open or closed and prevent the valve from being forced past center.
- The valve stem have a machined groove under the handle that is designed to shear if inordinate force is applied to the handle. This protects the valve seat from possible damage.
- Vents in filter housing lids speed evacuation and filling.

1.2 Operation

Please be sure that bag elements are securely seated in the baskets. The baskets must be used to support the elements; otherwise the fluid flow can rupture the element and render it useless.

Be sure to tighten all turn buckle bolts that secure the lids in place. Otherwise leaks can occur.

Be sure not to restrict the flow with the butterfly valve operation. When opening the valve on housing, always open the bottom, or effluent valve first. This allows for free flow through the housing as the influent, or top valve, is opened.

When closing a always close the top , or influent valve, first. allowing the housing to drain and not trapping fluid.

Lastly, close the effluent, or bottom valve, effectively isolating the housing.

Operating Instructions Pit Purification System (PPS)

2 REPLACEMENT PARTS

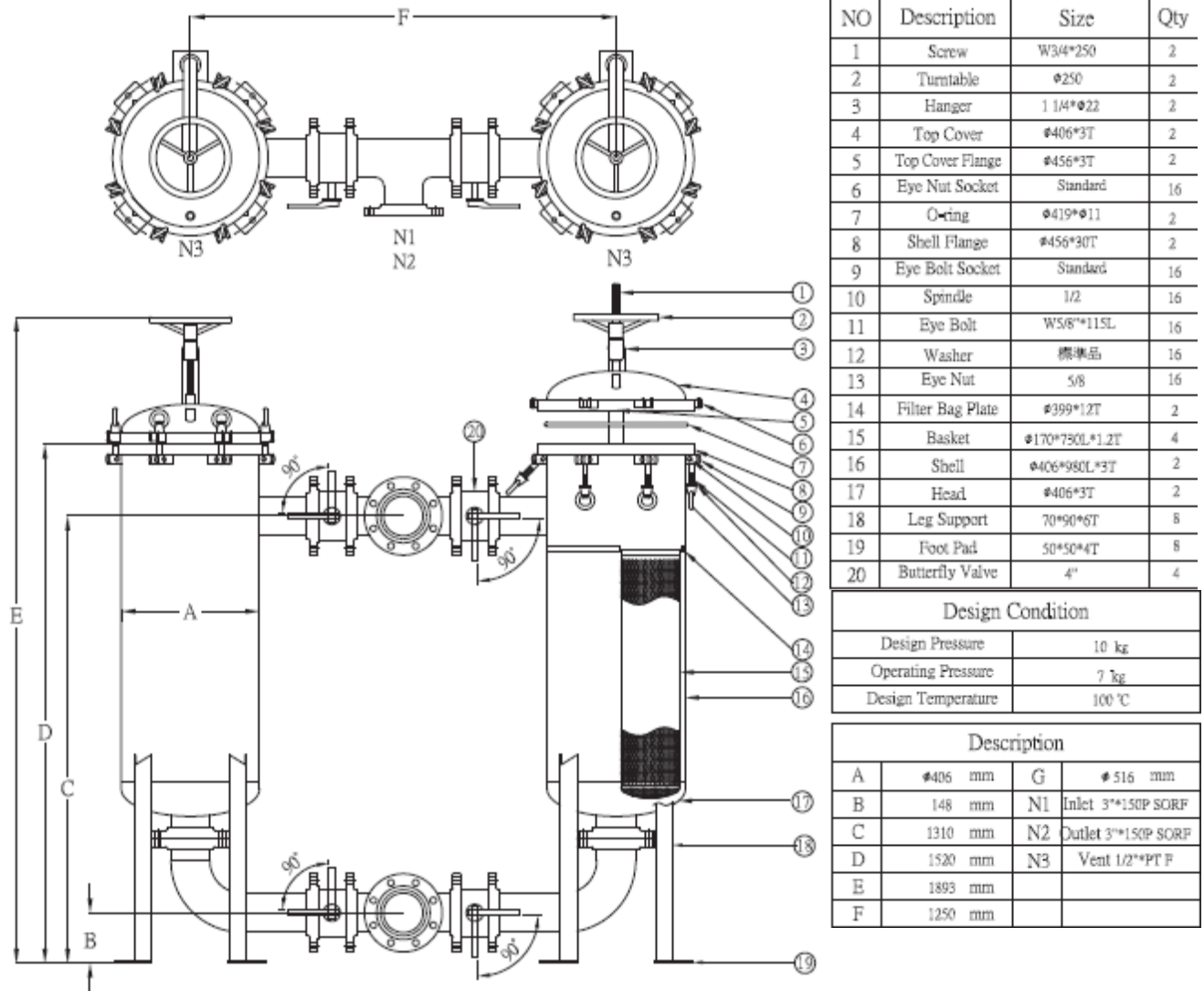


Figure 1 Spare parts drawing

Part Number	Description
GP-10088	Duplex Bag Housing Basket
GP-10089	Duplex Bag Housing Lid Hardware Kit
GP-10091	Duplex Bag Housing Lid Seal
HS-10098	Duplex Bag Housing 3" Butterfly Valve

Table 1 Spare parts list