

**DESCRIPTION AND OPERATING INSTRUCTIONS FOR THE  
BACK-FLUSHING FILTER TYPE 6.61**

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Commission-No.

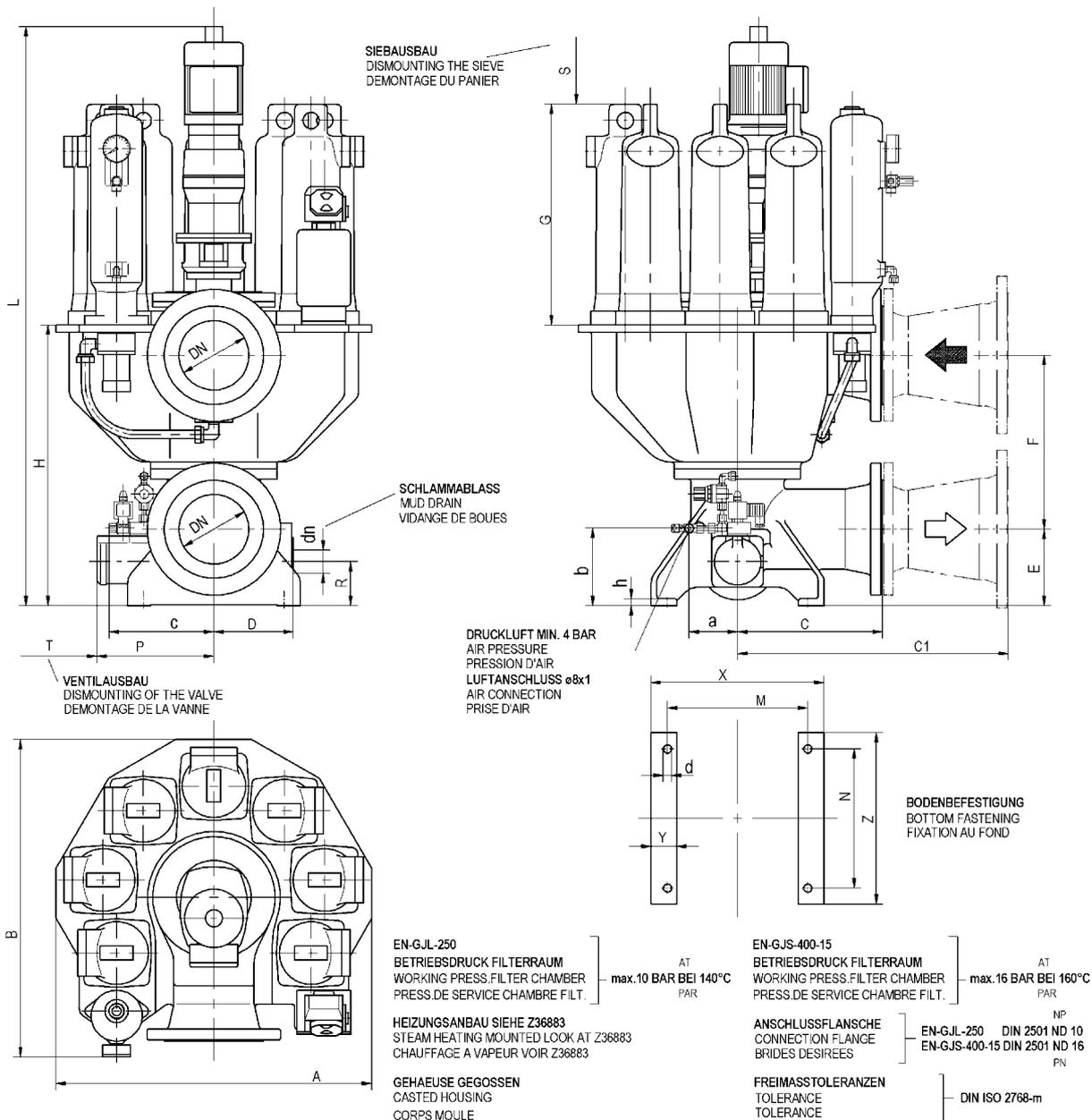
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We reserve the right to change this description without any prior notice!

Z100292

TYP 6.61  
21.06.04



GR.	DN	KAMMER-ANZAHL	A	B	C	C1	D	E	F	G	H	L	M	N	P	R	S	T	X	Y	Z	a	b	c	d	h	dh	GEWICHT KG	INHALT LTR
10	80	4	600	460	200	-	140	135	315	476	515	1110	200	200	250	95	300	200	270	55	270	105	165	225	18	15	50	200	38
	100																											215	
15	150	7	680	690	310	-	170	165	375	476	605	1250	300	300	250	95	300	200	370	55	370	105	165	225	18	15	50	345	71
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25	250	8	1030	890	400	-	350	250	530	485	800	1535	470	470	350	125	300	250	570	75	570	165	165	240	27	25	100	726	230
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35	350	11	1200	1150	575	-	400	300	675	485	970	1800	550	550	350	125	300	250	650	80	650	165	165	240	27	25	100	1150	520
	400				-																							1075	

SUBJECT TO ALTERATIONS!  
FULLY AUTOMATIC BACK  
FLUSHING FILTER

**ÄNDERUNGEN VORBEHALTEN!**  
**VOLLAUTOMATISCHER RUECKSPUELFILTER**  
**TYP 6.61**

MODIFICATIONS RESERVEES!  
FILTRE AUTOMATIQUE

## 2. General

The fully automatic back-flushing filter is used to filter a variety of fluids, but chiefly for the filtration of fuels, lubricating oils, caustic solutions and emulsions. The filter elements assemblies are cleaned automatically by compressed air assisted back-flushing without interrupting the filtration process. One clean chamber is always held in reserve.

This self-cleaning filter consists basically of the following parts:

The lower housing with connection flange for filter outlet and connection flange for the removal of flushing fluid (sludge discharge).

The change-over system housing with the filter inlet, on which the filter chambers containing the candle elements and the automatic vent are set out. In the centre of the housing is the stop plug with refill bore.

The geared motor.

The air supply with non-return valve, shutt-off valve and pressure regulator.

The safety valve.

The differential pressure indicator  $\Delta p_1$ .

The flushing valve with manual actuation.

The limit switch.

The EL.-control system in its own switch box separate from the filter.

### 3. Installation of the Filter

Care must be taken during installation of the filter that the pipelines attached to the filter inlet and outlet are clean and not under tension.

The pipeline selected for the sludge discharge is to be no smaller than the size indicated on the type sheet. To avoid back-pressure arising in the pipe, it is to be laid on a gradient and vented.

The terminal board on the filter is to be connected to the terminal board in the switch cabinet by means of the control system cable (see circuit diagram).

When the filter is used in aqueous media, it is imperative to observe the following:

- 3.1 It must be ensured that the filter does not run dry even after the supply pump has been switched off (owing to hardening of dirt).
- 3.2 If this condition cannot be fulfilled, at least the EL.- control must be designed so that, even when the supply pump is switched off, back-flushing is initiated every 2 hours by a time relay.



Flushing operations into a completely empty chamber for test purposes are permitted without any restrictions. Flushing into a partially filled chamber results in increased loading of the filter candles. Back-flushing for installation (pipe) or control reasons into a filter chamber which is only partially filled is therefore inadmissible.



The filter housings are only designed for internal overpressure in accordance with the AD Information Sheets. Additional external forces and moments at the filter connection flanges are to be avoided (possibly by supporting the supply lines).



When installing the filters, make sure that any oil or fuel which leaks due to improper handling cannot result in a fire or injury.

#### 4. Commissioning

The following requirements must be met for the commissioning of the filter:

- 4.1 Clean and dry compressed air for the control system at between 4 and 10 bar operating pressure, must be available at the open shut-off valve.
- 4.2 Switch on the electricity using the "Main Switch" on the switch box. The "Power" lamp respectively LED-operating display lights up. (Activation of the main switch initiates a back-flushing cycle.)
- 4.3 To check the EL.- control system a back-flushing cycle should now be performed by activating the "Manual" trip on the switch box.
- 4.4 Open the slide valve at the filter outlet. Slowly open the slide valve at the filter inlet (avoiding pipe hammer). A further back-flushing cycle is to be performed using the Manual trip on the switch box. Once the back-flushing operation is completed, the "Flushing" respectively the display "SP.1" lamp goes out. If these conditions are met, the filter is in the start position and is therefore ready for operation.



After completion of a back-flushing cycle, the next backflushing operation can only be initiated (manually or by means of the differential pressure indicator) after a time delay.

This time delay corresponds to the time preset on the time relay "K1A" or the preselected time "PA.5" in the electronic control. It is needed to guarantee that the cleaned filter chamber is filled.

**NOTE:** *Possible time interval calculation for time-dependent back-flushing*

Let the filter run for 24 hours using the differential pressure and establish the number of back-flushing operations (flushing cycle counter or display).

Calculate the average flushing interval.

Set the flushing interval (shortened by 30%) on the time relay or PA.2.

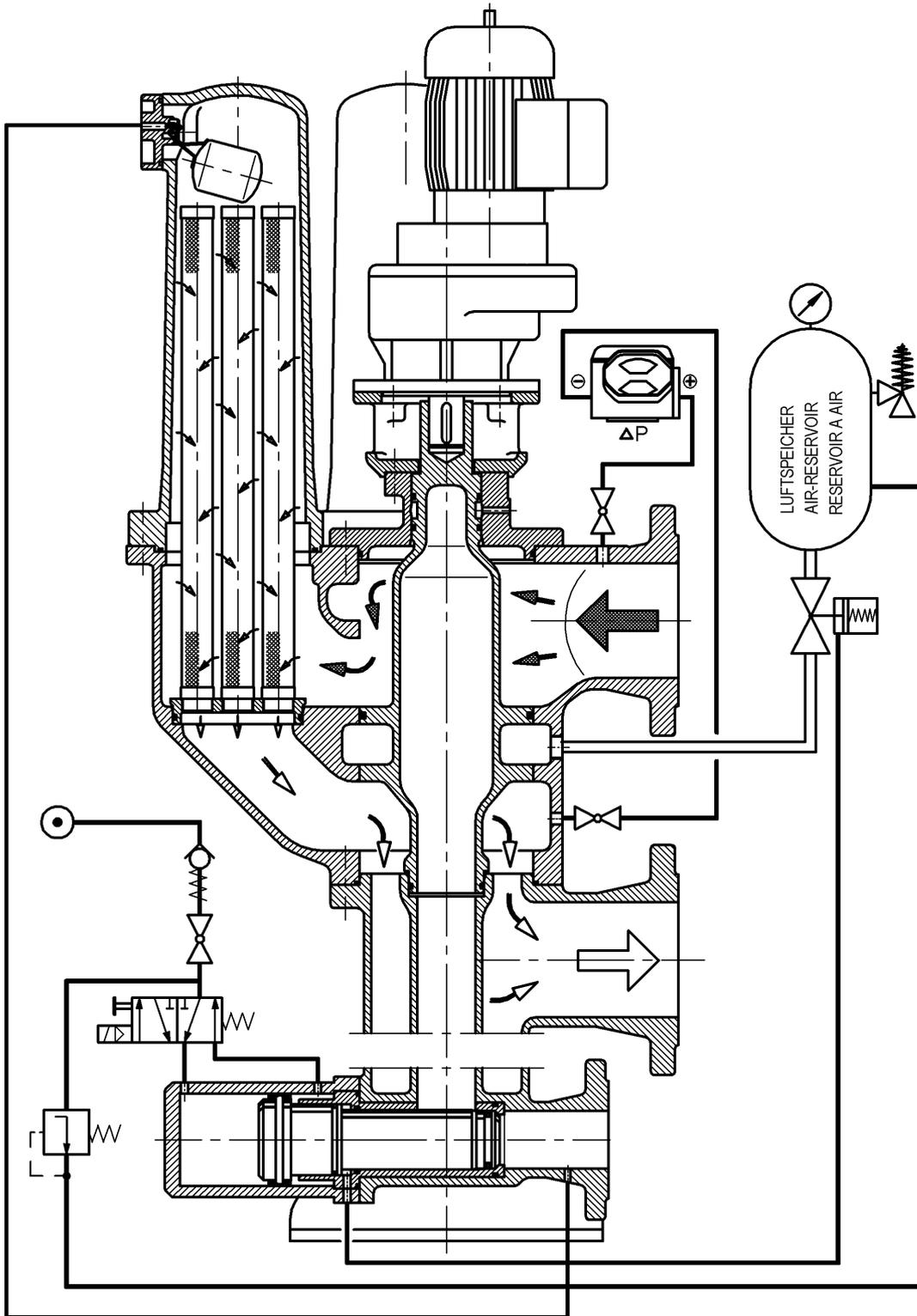
## 5. Filtration Phase

(see Drawing Z 32326 p. 1 or Z 33701 p. 1)

The medium to be filtered flows down into the change-over system housing and passes from there through the chamber inlet and the connected filter chambers to the candle elements. The medium flows through the filter elements from the outside to the inside and the contamination in the medium is retained on the filter mesh of the candle elements. The cleaned fluid passes to the filter outlet.

In this position the air supply (by means of the solenoid valve) keeps the sludge discharge closed and compressed air is maintained in the air receiver ready for the next backflushing cycle.

Z32326 BL.1  
TYP 6.61  
12.02.98



TYP 6.61      FILTRATIONS-PHASE  
FILTRATION-PHASE  
PHASE DE FILTRATION

## 6. Back-Flushing Operation

(See Drawing Z32326 p. 2 or Z33701 p. 2)

The contamination retained on the candle elements produces an increasing pressure differential between the filter inlet and outlet. This difference in pressure is indicated optically on the differential pressure indicator when a set value is reached and an electrical contact triggers the back-flushing.

When the back-flushing cycle is initiated, the geared motor is switched on and the change-over plug rotates from the chamber held in reserve to the filter chamber to be cleaned. Connection of the reserve chamber, together with its clean candle elements, causes an immediate reduction in the pressure differential. When the stop plug reaches the filter chamber to be cleaned the rotation is stopped by means of a cam plate and a limit switch.

The solenoid valve (from the sludge discharge) is then switched electrically and air from the air supply passes to the rear side of the sludge discharge valve shaft. The sludge discharge valve opens and pressure is released from the chamber now shut off. (See Note!)



This allows the compressed air in the upper region of the plug to immediately expand and thus creates additional space for the fluid displaced (by the air) in the backflushing cycle.

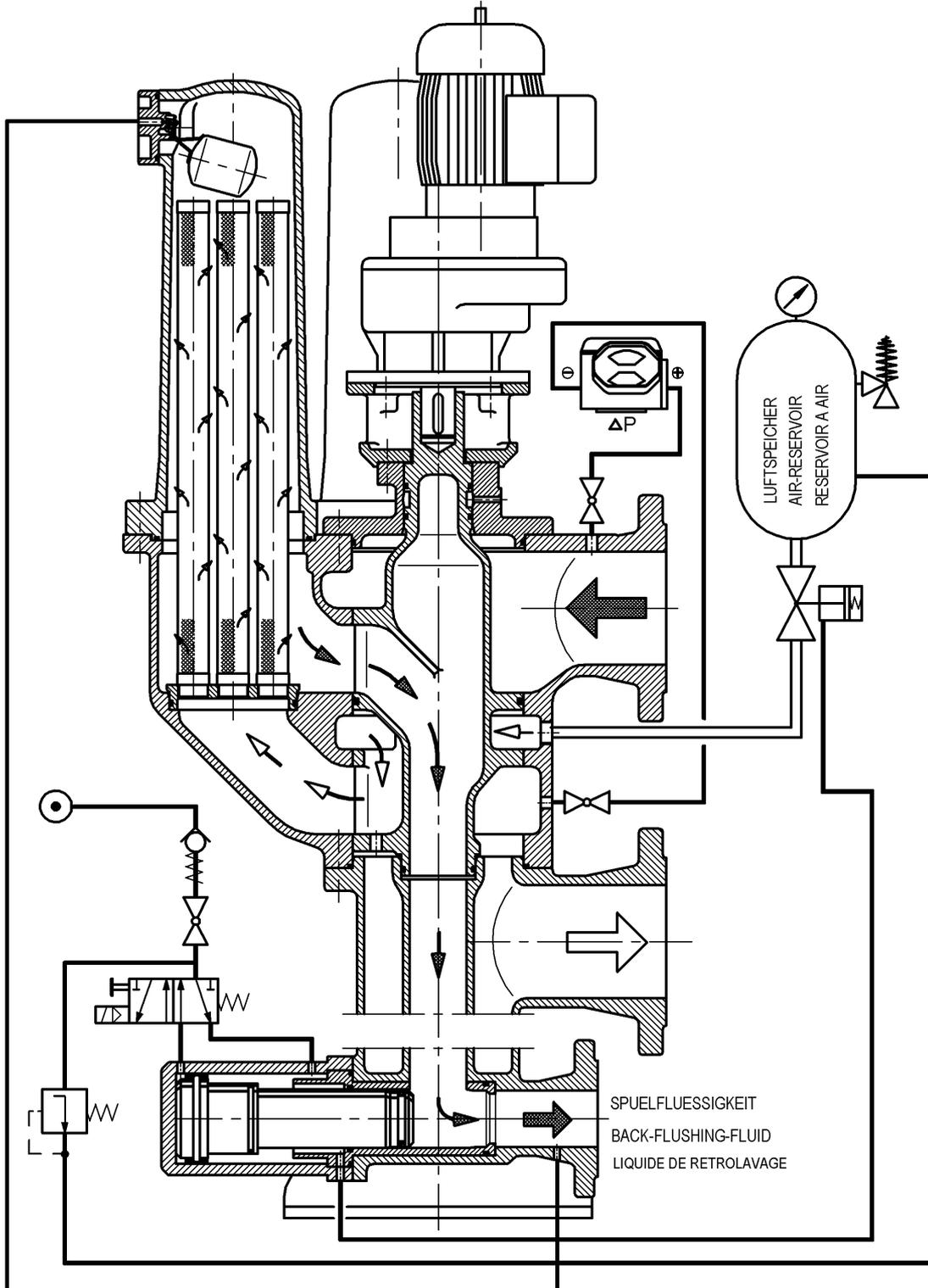
While the sludge discharge valve shaft is opening, the control system air reaches the attached flushing valve (once the pressure has been released on the filter chamber). The flushing valve opens and the compressed air from the air receiver dispatches the clean fluid present and pushes it in the counter current direction through the mesh of the screw-in candle elements.

The pressure drop thus generated flushes off the contamination deposited on the mesh and washes it out of the filter housing via the open sludge discharge valve.

The air flow is continued for a short period (flushing period) before the solenoid valve is electrically switched over, causing the sludge discharge valve to close. At the same time the flow of air from the control system to the connected flushing valve is interrupted and thus also stops the flow of the stored back-flushing air. The backflushed filter chamber is now refilled with clean medium through the refill bore until operating pressure is achieved.

Only then is the delay of the electric control cancelled for the next back-flushing operation.

Z32326 BL.2  
TYP6.61  
12.02.98



TYP 6.61

RUECKSPUELPHASE  
BACK-FLUSHING-PHASE  
POSITION DE LAVAGE A  
CONTRE-COURANT

## 10. Servicing

Even automatic filters require inspection and servicing at regular intervals. It is to be noted in particular that despite regular back-flushing the filter mesh can become clogged in the course of time, depending on the quality of the medium and the by-pass cleaning available.

Contamination on the mesh can be removed by cleaning the candle element manually using an appropriate solvent (see Section 13). An increase in the clogging on the mesh can be inferred from the progressively shorter intervals between back-flushing cycles. The number of back-flushing cycles can be seen on the "Flushing Cycle Counter" respectively display on the switch box.

To maintain trouble-free operation the following points are to be noted:

- a) All connections are to be regularly checked for leaks.
- b) Candle elements are to be dismantled and inspected initially after 500 flushing cycles, then after 5.000 and later every 10.000 flushing cycles. If, however, a sharp reduction in the intervals between back-flushing cycles should occur, inspection and cleaning should be carried out sooner. If sudden lengthening of the intervals between back-flushing cycles should occur all candle elements must be inspected without fail for damage.



Before the cartridge elements are dismantled, the automatic filter must be completely drained by automatic back-flushing (i.e. all filter chambers). "Manual" activation on the control box. Care must be taken to ensure that the liquid level is below the cartridge element before the element is dismantled.



The candles are subjected to wear through reciprocal loading. It is therefore recommended that a complete candle filter element, the number of candle elements depending on the size of the filter, be kept in stock.



It is expedient to renew all seals when overhauling the filter.



Check the sludge discharge for leaks every 10.000 flushing cycles. No medium should run from the end of the sludge discharge line during the filtration phase (except during the flushing cycle).

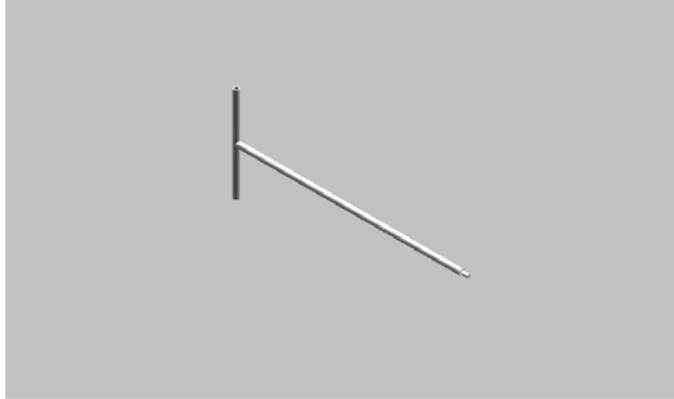
10.1

You must close the compressed air supply valve (item 127), then starting a manual backflushing, before you are allowed to removed the manometer (item 72). This well ensure that the compressed air reservoir (item 13) is pressure released.

## 11. Servicing Tools

The following special tools are supplied for servicing the filter:

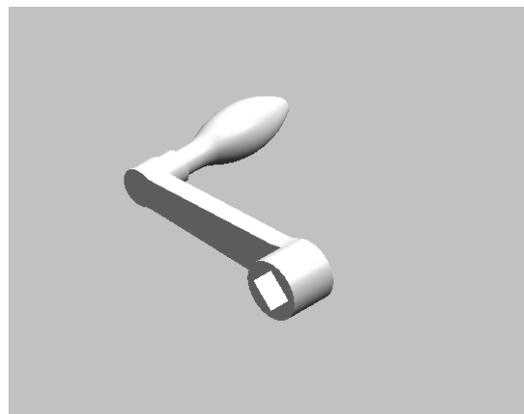
- 11.1 Special key with SW 10 or 14 for dismantling the filter chamber.



- 11.2 Special key for unscrewing the candle elements from the candle holder.



- 11.3 Key for opening the switch box and hand crank for operation during a power failure.



## 12. Candle Element Cleaning Agent "BOLL CLEAN 2000"

The choice of cleaning medium depends on the type of the contamination. With fuels recipitation of paraffin and asphalt or with lubricating oils mixing of different types of oil can form solid encrustations on the mesh. Effective cleaning of fine meshes is achieved by soaking in "BOLL CLEAN 2000" followed by blasting with compressed air using a cleaning gun.

### PRODUCT DESCRIPTION:

BOLL CLEAN 2000 is a fluid cleaning and degreasing agent with a wide range of application. It can be used for practically all cleaning and degreasing purposes.

BOLL CLEAN 2000 cleans rapidly, thoroughly and extremely economically.

Use of BOLL CLEAN 2000 renders safety precautions superfluous.

BOLL CLEAN 2000 has these outstanding characteristics without exhibiting the isadvantages of solvent cleaners.

BOLL CLEAN 2000	is non-flammable
	does not require special marking
	does not have an irritating odour
	is not caustic
	is physiologically unobjectionable
	is biologically degradable
	is registered with the Federal Office for the Environment, Reg.-No. 04860019

BOLL CLEAN 2000 can be undercooled or overheated during storage but remains fully usable when returned to normal temperature.

### MESH CONTAMINATED WITH HEAVY OIL:

Elements contaminated with heavy oil must be soaked in a standard commercial solvent. After soaking the elements are cleaned in the BOLL & KIRCH Type 5.04 Cleaning Device using BOLL CLEAN 2000 and high pressure pump.

**INSTRUCTIONS FOR USE:**

Use of BOLL CLEAN 2000 is not restricted to a particular method of cleaning.

Depending on the operating conditions, BOLL CLEAN 2000 can be used in a dip bath, in a spraying plant, in steam jetting or in manual application using a cloth, brush or sponge. It can be used warm or cold.

BOLL CLEAN 2000 is miscible with water - even seawater.

Concentration for mesh cleaning: 1 : 2,5

Temperature: up to a maximum of 60 °C

The concentration depends on the type and thickness of the adhesive substance to be removed. When used in concentration below 1 : 30 rinsing is usually not required.

No visible film remains on the surface.

### 13. Manual Cleaning of the Candle Filter Elements



Before the cartridge elements are dismantled, the automatic filter must be completely drained by automatic back-flushing (i.e. all filter chambers). "Manual" activation on the control box. Care must be taken to ensure that the liquid level is below the cartridge element before the element is dismantled.

- 13.1 Remove the whole filter element assembly. Then soak the filter element assembly, with the openings of the candle elements facing down, in a suitable tank filled with solvent. Detached contaminants can then sink downwards out of the candle.
- 13.2 The soaking time and the relevant solvents are:
- a) In cold BOLL CLEAN 2000 cleaner the maximum soaking time is 24 hours.
  - b) In Filterclean (Vecom) the maximum soaking time is 12 hours.
  - c) In Reiniger B85 (Vecom) the maximum soaking time is 12 hours.
  - d) In gas oil the maximum soaking time is 48 hours.
- 13.3 After soaking remove the whole filter element assembly from the tank and place it on a suitable stand (e.g. perforated sheet metal) with the candle element opening pointing down and allow the solvent to drain.
- 13.4 Now with the cleaning gun supplied blow compressed air through the candles from the inside to the outside.

- 13.5 After this procedure the complete filter element assembly should be immersed in fresh cleaner, with the candle element opening downwards, and rinsed through with an up and down motion.



The washing procedure described in Section 13.5 should only be carried out in a separate tank using clean solvent. The solvent can then be used again for the next soaking procedure.

- 13.6 Allow the filter element assembly to drain again and dry it by blowing compressed air through it again from the inside to the outside. The manual cleaning procedure described here has produced adequate results (ca. 60 % clean) in similar applications.
- 13.7 Almost 100 % cleaning is only possible manually, in our experience, by using the Type 5.04 High Pressure Cleaning Unit with BOLL CLEAN 2000.  
See the separate description "Filter Cleaning Unit Type 5.04".

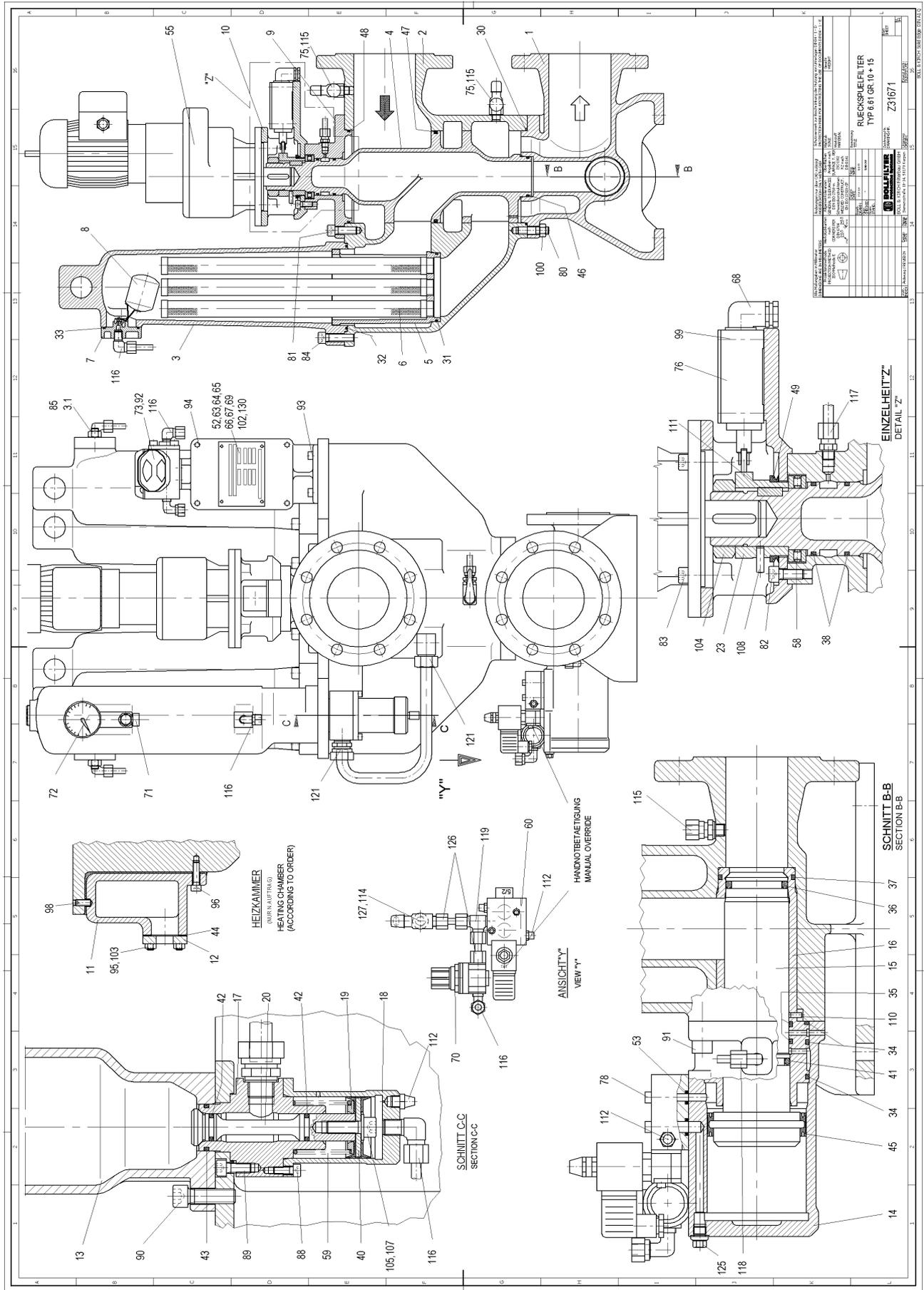
#### **14. Manual operation of the automatic Filter**

Before operating the filter manually, you have to switch off the main switch on the control box, in the interests of safety (self turning handle will cause violations).

Attach the crank handle supplied to the free end of the motor shaft. By rotating the motor (in either direction) the cam disc is rotated to the next changeover point (i.e. the next filter chamber). The cam and the limit switch must align precisely.

Back flushing is initiated directly by a manual actuation of the flushing valve (with a screw [60] driver). This manual actuation should last 12 seconds.

You have to wait 2 min. before changing over to the next filter chamber, to give time to fill up the backflushed filter chamber.



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REFERENCE NUMBER: 231671 DATE: 01.10.2010 DRAWING NO.: 231671	PRODUCT: RUCKSPULEFILTER TYP 8 81 GR 10 x 15 MATERIAL: STAINLESS STEEL WEIGHT: 12.5 kg DIMENSIONS: 100 x 150 x 150 mm	PROJECT: 231671 DRAWING NO.: 231671 DATE: 01.10.2010 SCALE: 1:1