DESCRIPTION AND OPERATING INSTRUCTIONS FOR THE

BACK-FLUSHING FILTER TYPE 6.61.07

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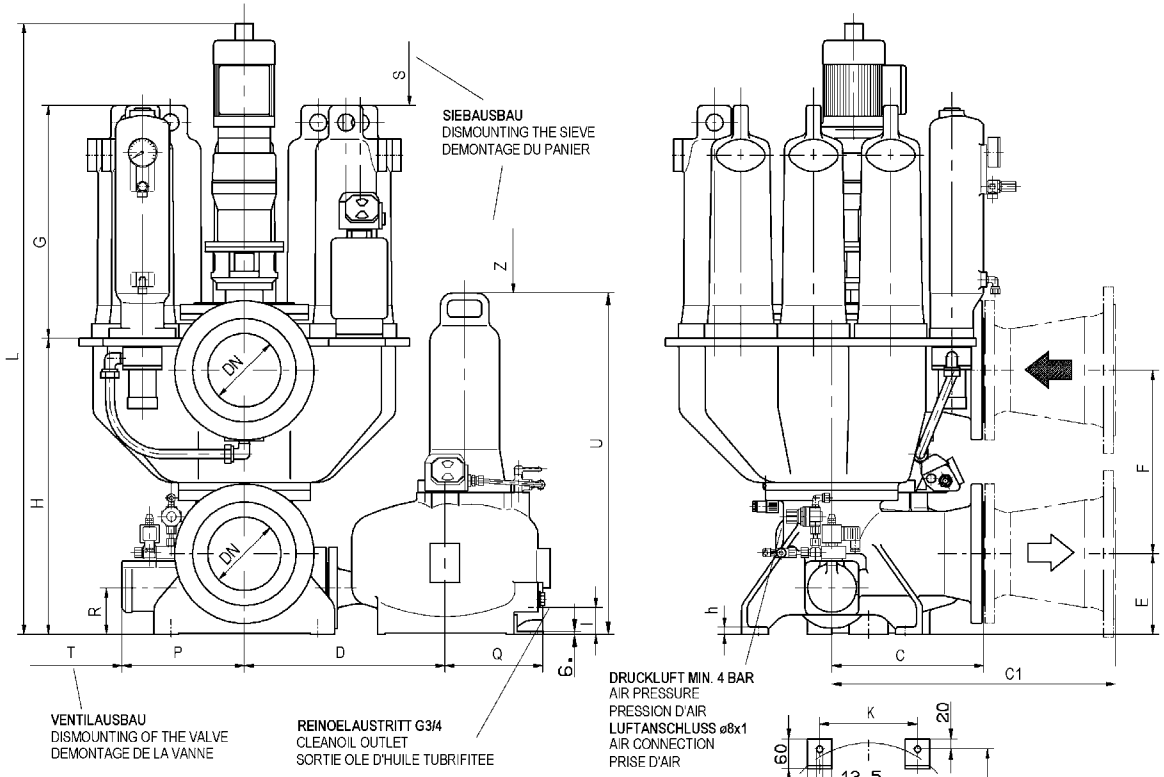
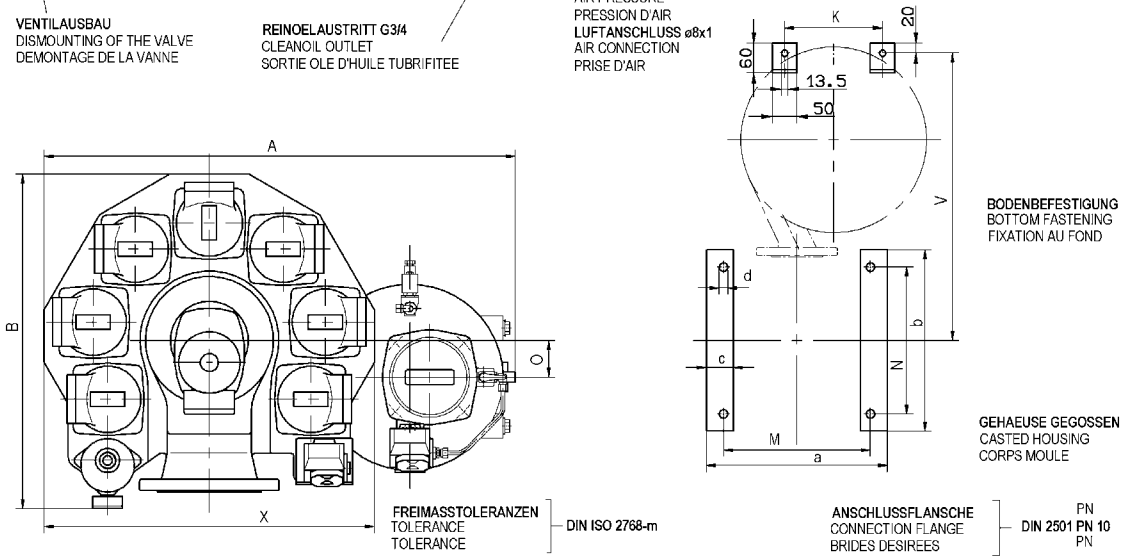
Commission No.

C O N T E N T S

Z45558
TYP6.61.07
15.07.99





FREIMASSTOLERANZEN
TOLERANCE
TOLERANCE
DIN ISO 2768-m

ANSCHLUSSFLANSCHE
CONNECTION FLANGE
BRIDES DESIREES
PN
DIN 2501 PN 10
PN

GR.	DN	KAMMER-ANZAHL	A	B	C	C1	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U	V	X	Z	a	b	c	d	h	GEWICHT KG	INHALT LTR
10	80	4	895	500	200	-	380	135	315	476	515	55	200	1110	200	200	75	250	200	95	300	200	700	560	600	560	270	270	55	18	15	227	67
	100																															242	
15	150	7	965	690	310	-	410	165	375	476	605	55	200	1250	300	300	75	250	200	95	300	200	700	590	680	560	370	370	55	18	15	372	100
	200				-	580																										422	
20	200	6	1250	800	335	-	575	225	475	485	750	55	246	1420	400	400	150	350	235	125	300	250	950	770	850	810	500	500	75	27	25	663	206
	250				-	645																										733	
25	250	8	1420	890	400	-	650	250	530	485	800	55	246	1535	470	470	150	350	235	125	300	250	950	845	1030	810	570	570	75	27	25	769	286
	300				-	740																										857	
35	350	11	1550	1150	575	-	700	300	675	485	970	55	246	1800	550	550	150	350	235	125	300	250	950	895	1200	810	650	650	80	27	25	1193	576
	400				-	1075																										1363	

SUBJECT TO ALTERATIONS!

FULLY AUTOMATIC BACK FLUSHING
FILTER WITH FLUSH OIL TREATMENT

AENDERUNGEN VORBEHALTEN!

**VOLLAUTOMATISCHER RUECKSPUELFILTER
MIT SPUELOELAUFBEREITUNG TYP 6.61.07**

MODIFICATIONS RESERVEES!

FILTRE AUTOMATIQUE AVEC
PREPARATEUR D'HUILE

Description of flushing-oil processing systems
(see drawing Z 33703 pages 1 + 2 for Type 6.60.07)
(see drawing Z 33701 pages 1 + 2 for Type 6.61.07)

General information

The fully-automated back-flushing filter with the flushing-oil processing system is ideally suited for filtration of fuels and lubricating oils.

In the flushing-oil processing system, liquid flushed back from out of the filter system is generated.

The filter elements of the back-flushing filter are cleaned automatically and without any interruption in operation, by back flushing by means of compressed air (please revfer to separate description).

The filter element for flushing-oil processing is a cartridge which has to be replaced by a new cartridge affter it has become saturated.

The flushing-oil processing system consists mainly of the following components:

Casing with inlet and outlet;
Filter chamber;
Filter element;
Solenoid valve;
Differential pressure indicator.

N.B.:

An air supply is nedded for correct operation of the flushing-oil processing system (3-7 bars). This air supply is connected to the solenoid valve and is already installed by the works, if the flushing-oil processing system is fitted.

Mode of operation

During back-flushing from the filtrations system, the back-flushing liquid reaches the non-pressurised flushing-oil processing system. Once the filter flushing process is complete and the sludge outlet has closed, then the solenoid valve (which is connected to the flushing-oil processing system) is activated and switches over.

The supply of compressed air then reaches the flushing-oil processing system and forces the flow medium through the flushing cartridge, whereafter it reaches the outlet flange in a clean condition.

The dirt particles retained at the flushing-oil cartridge cause an increasing differential pressure between the inlet and the outlet. On attainment of the maximum premissible value in this differential pressure, the differential pressure indicator gives a visual indication for the flushing-oil processing system and a zero-voltage alarm is set off.

If this alarm continues to sound uninterruptedly for more than 2 minutes, then the flushing-oil cartridge must be replaced by a clean cartridge.

N. B.:

In order to ensure correct filter operation, it is absolutely essential that alarms be connected and acted upon at the installation premises. The back-flushing filtration function will be disrupted if the alarms are ignored.

The capacity of the flushing-oil cartridge to absorb dirt can be exploited to the maximum only if it is ensured that the flushing-oil cartridge is replaced after 2 minutes constant alarm.

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 semblies 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 $\Delta p1$.

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 selcted 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 intiated (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.

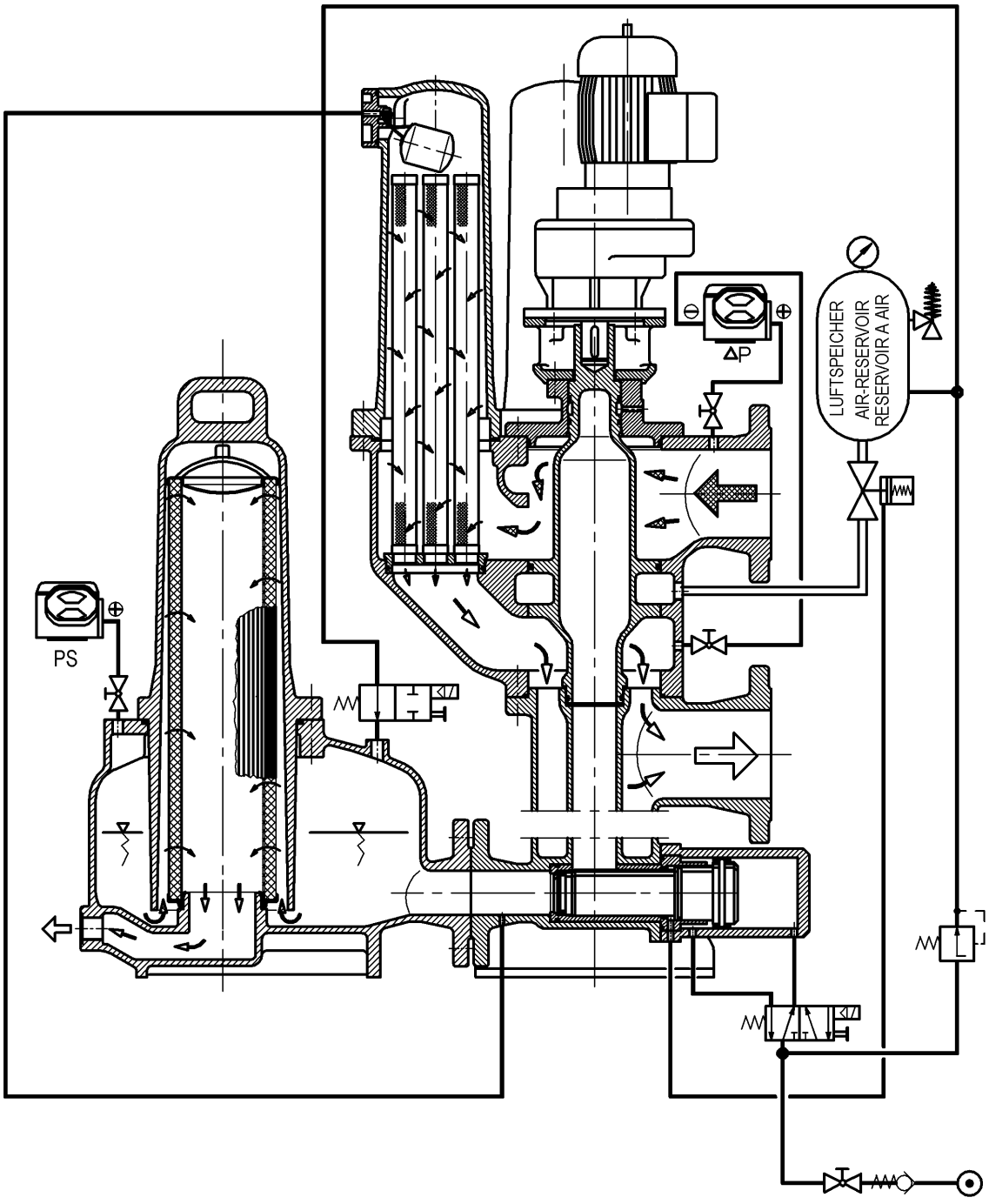
5. Filtration Phase

(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.

Z33701 BL.1
TYP6.61.07
12.02.98



TYP 6.61.07	FILTRATIONSPHASE 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 optcally 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!)

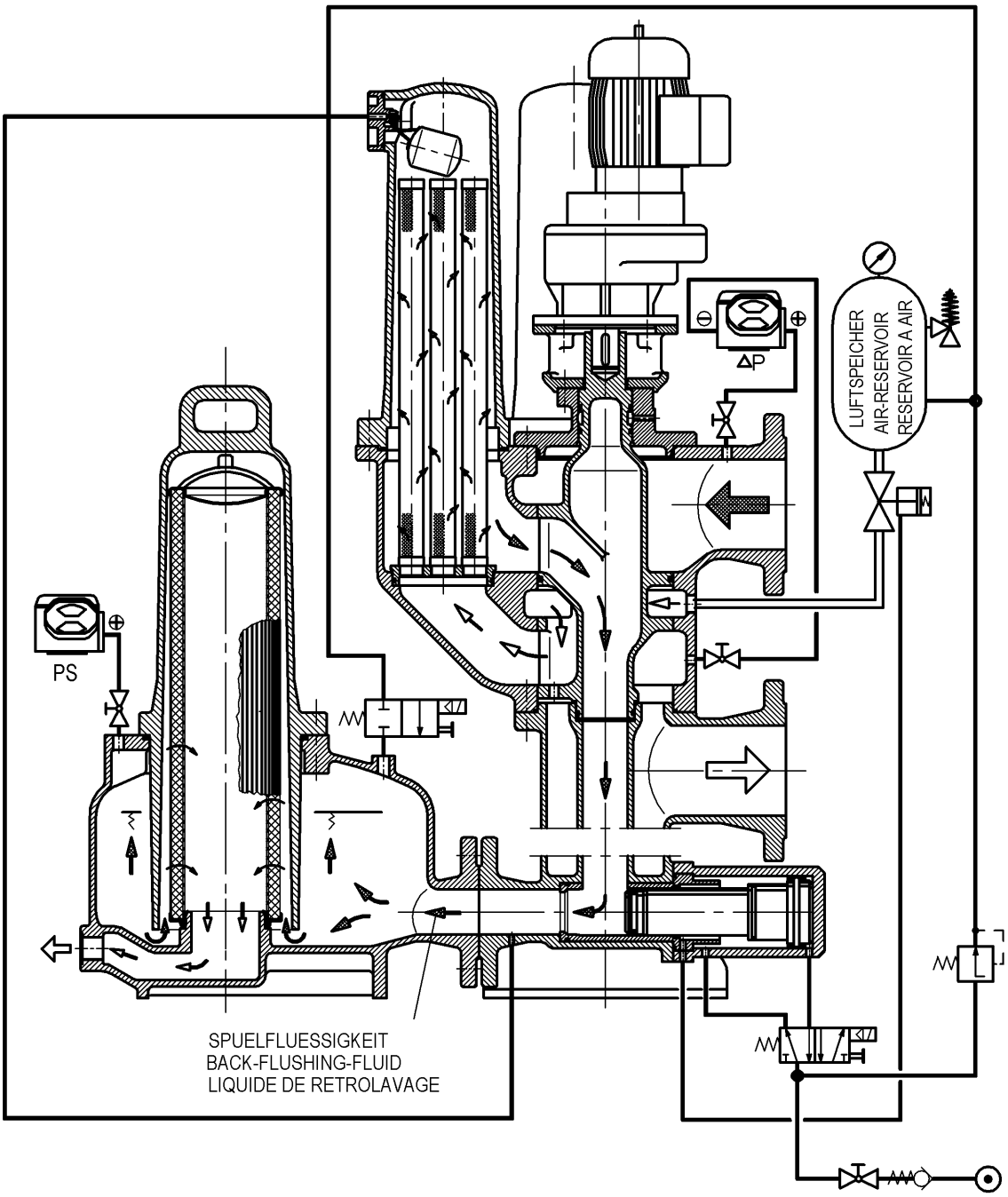
This allows the compressed air in the upper region of the plug to immediately expand and thus creates additional space for the fluid displaced (by the air) in the backflushing cycle.

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.

Z33701 BL.2
TYP6.61.07
12.02.98



TYP 6.61.07	RUECKSPUELPHASE BACK-FLUSHING-PHASE POSITION DE LAVAGE A CONTRE-COURANT

ELECTRONIC CONTROL FOR BACK-FLUSHING FILTERS FROM BOLL & KIRCH TYPE 2100

Terminal diagrams version 1 (ser. No. 4302597):

Fil.-1	Type 6.61.07		Z 37811
Fil.-2	Type 6.61		Z 37810
Fil.-3	Type 6.61	Alarm Δp activation	Z 37877
Fil.-5	Type 6.60	Alarm Δp activation	Z 37879
Fil.-6	Type 6.14/6.17/6.18/6.19/6.44		Z 37793
Fil.-8	Type 6.61.07	Alarm Δp activation	Z 40299
Fil.-9	Type 6.62		Z 40181
Fil.-10	Type 6.62	Alarm Δp activation	Z 40182

Terminal diagrams version 2 (ser. No. 4303608):

Fil.-4	Type 6.60	Z 37878
Fil.-7	Type 6.23/6.24/6.23.1/6.24.4	Z 37795

SPECIAL FEATURES:

- Display in housing cover with 5-place, 7-segment display
- Display of the back-flushing phase "Flushing"
- Display of the number of back-flushing cycles
- Display of faults in code
- An LED in the display indicates the mains power supply
- 3 keys for operating the control
- CPU card with non-volatile E-Eprom and Eprom as program memory
- I.O. card in control box

A T T E N T I O N !

Subject:El. control type 2100

The transformer type and the terminal designation of the transformer had to be changed owing to the introduction of the European voltage of 400 V.

Old type designation:4AM 8095-OAR70-ON
New type designation:4AM 8095-OAXOO-ON

The primary and secondary voltages of 220 V were previously at the terminals 1 and 3; with the new transformer now at terminals 1 and 2.

Note: If the transformer is exchanged, it is imperative to assign the terminals correctly according to the transformer nameplate. Incorrect terminal assignment results in damage to the coils of the solenoid valves.

27.09.98/ PC 085-98GB

GENERAL

BOLL & KIRCH manufactures back-flushing filters for industry and shipbuilding.

The back-flushing filters are able to determine the degree of contamination of the filter elements during operation and, if a limit value is exceeded, to automatically clean the filter elements.

The electronic control described here will replace the relay control and improve operation and servicing functions.

The electronic control type 2100 is rated for a 3-phase primary voltage of 220 V, 380 V, 440 V and 500 V with a tolerance of ± 10 %.

The following must be observed before commissioning:

During mounting or installation of the control type 2100 attention must be paid to precise earthing of the control box especially in view of the EMC
Moreover, no additional live cables > 220 V should be laid within a distance of about 1 m from the power supply cables.

Note: The desired primary voltage / operating voltage must be checked and selected by re-arranging the FASTON lug on the transformer. The jumpers are as follows:

Jumper 1 - 31=550 V; AC; 3 ” operating voltage
Jumper 1 - 6=500 V; AC; 3 ” operating voltage
Jumper 1 - 5 =440 V; AC; 3 ” operating voltage
Jumper 1 - 4=380 V; AC; 3 ” operating voltage
Jumper 1 - 3=220 V; AC; 3 ” operating voltage

The control voltage for the solenoid valves is always **220 V.**
The frequency is 50 Hz or 60 Hz.

The power supply line is laid to terminals 1, 2 and 3 with 3-phase voltage.
The protective earth conductor "PE" of the power supply line must be laid to the 10-pin "PE" terminal strip or to the earth screw inside the control box.

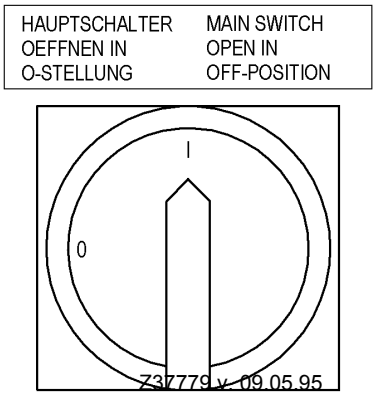
Now all the electric components on the filter are to be wired according to the relevant wiring diagram.

Note: The control is designed for a max. rated current of 1.0 A - and a starting current of 3.0 A . Therefore, the control is unsuitable for a 1-phase operating voltage network.

COMMISSIONING OF THE ELECTRONIC CONTROL

Note: The main switch is designed with an additional auxiliary contact "N". Potential-free use to indicate "Control in operation" is possible via the routing of the contact "N".

When the control is turned on with the main switch, the relevant control version including the LED operating light appear in the display.



Possible control versions:

Fil.-1 for type 6.61.07

Fil.-2 for type 6.61/6.61.1

Fil.-3for type 6.61 with alarm Δp activation

Fil.-4for type 6.60

Fil.-5for type 6.60 with alarm Δp activation

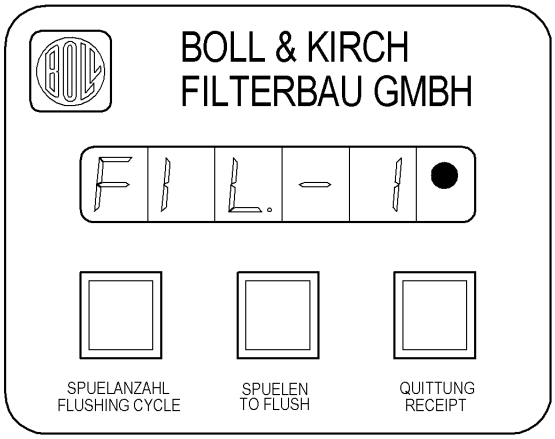
Fil.-6for type 6.14/6.17/6.18/6.19/6.44

Fil.-7for type 6.23/6.24/6.23.1/6.24.4

Fil.-8for type 6.61.07 with alarm Δp activation

Fil.-9for type 6.62

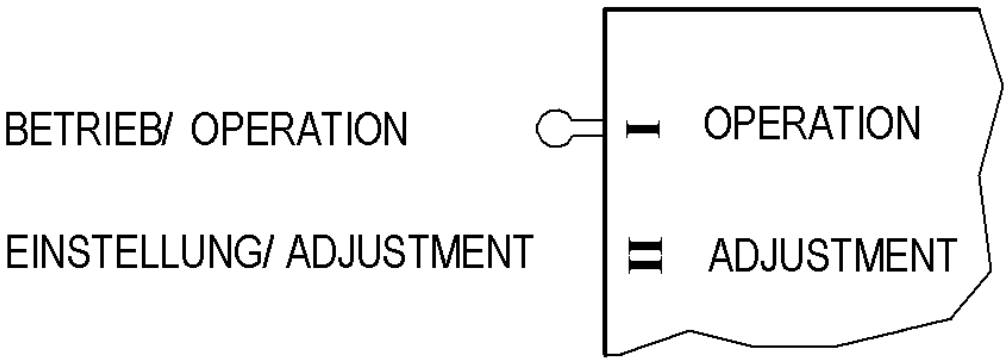
Fil.-10for type 6.62 with alarm Δp activation



Z37779 v. 09.05.95

There are 3 keys under the display to operate the electronic control.

The following description is only relevant when the lever position of the selector switch on the CPU card on the inside of the door is at "Operation".



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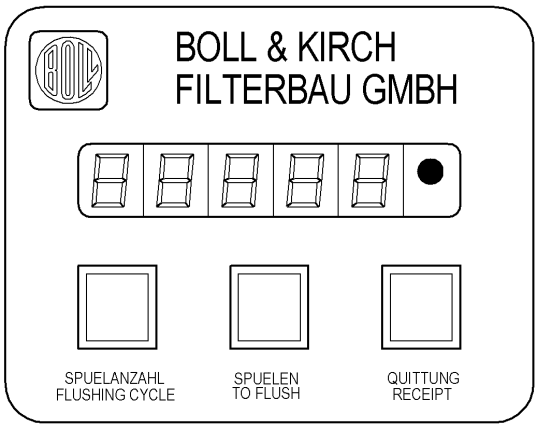
KEYBOARD:

On activation of the key **"Flushing cycle"** the number of back-flushing cycles of the filter is displayed. This display is protected against power failure.

On activation of the key **"Flush"** a back-flushing operation is initiated by the electronic control and the message "Sp. 1" appears in the display.

On activation of the key "**Acknowledge (Reiceipt)"** any fault messages are deleted but only if the cause of the fault has been remedied.



Z37779 v. 09.05.95

FAULT MESSAGES IN THE DISPLAY

The following faults can be shown in the display in code:

Note: In the event of any fault relating to EMC no memory contents are deleted in controls supplied after 1 January 1998.

For type 6.61.07 (Fil.-1)

Fe. 0 meansovercurrent tripping or motor not wired

Fe. 1 meansmax. differential pressure reached

Fe. 2 meansflushing oil cartridge is saturated

For type 6.61/6.61.1 (Fil.-2)

Fe. 0 meansovercurrent tripping or motor not wired

Fe. 1 meansmax. differential pressure reached

For type 6.60 (Fil.-4)
For type 6.23/6.24/6.23.1/6.24.4 (Fil.-7)
For type 6.62 (Fil.-9)

Fe. 1 meansmax. differential pressure reached

For type 6.14/6.17/6.18/6.19/6.44 (Fil.-6)

Fe. 0 meansovercurrent tripping or motor not wired

Fe. 1 meansmax. differential pressure reached

For type 6.61 (Fil.-3) with alarm Δp activation
For type 6.61.07 (Fil.-8) with alarm Δp activation

Fe. 0 meansovercurrent tripping or motor not wired

Fe. 1 meansmax. differential pressure reached

Fe. 3 meansΔp alarm "Back-flushing activation by differential pressure"

For type 6.60 (Fil.-5) with alarm Δp activation
For type 6.62 (Fil.-10) with alarm Δp activation

Fe. 1 meansmax. differential pressure reached

Fe. 3 meansΔp alarm "Back-flushing activation by differential pressure"

In the case of the fault messages Fe.0 (overcurrent tripping or motor not wired) and Fe. 1 (max. differential pressure reached) the potential-free alarm contacts 11, 12 and 13 are also activated as change-over contacts at the same time.

In the case of the fault message Fe. 3 (Back-flushing activation by differential pressure) the potential-free alarm contacts 14, 15 and 16 are activated as change-over contacts.

The fault message Fe.2 (flushing oil cartridge is saturated) is only shown on the display.
No routing via potential-free contact.

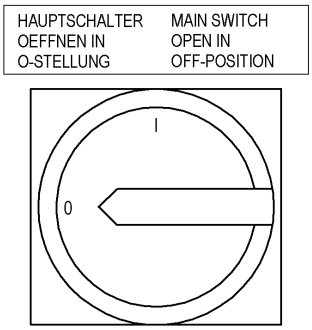
The fault message in the display cannot be deleted by activating the "Acknowledge (Receipt)" key until the fault has been remedied.

For the reliable orientation of the software after deletion of the fault message, it is recommended to turn off the control with the main switch for about 10 seconds and then turn it on again.

If the control is not switched off with the main switch (reset function), the time-dependent back-flushing activation is no longer automatically triggered although the fault has been remedied.

ADAPTION (IN MODE PA. ...) BY THE OPERATOR FOR TYPE 2100

In order to adapt the operating data during filter operation, the main switch must be turned to the "0" position.



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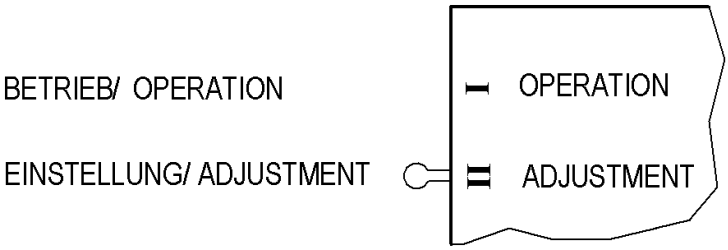
A selector switch is located on the CPU card on the inside of the door.



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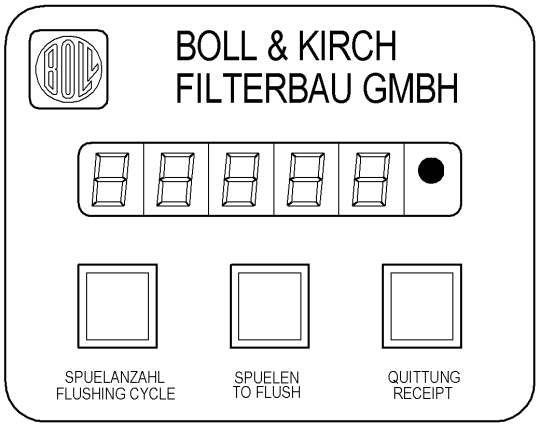
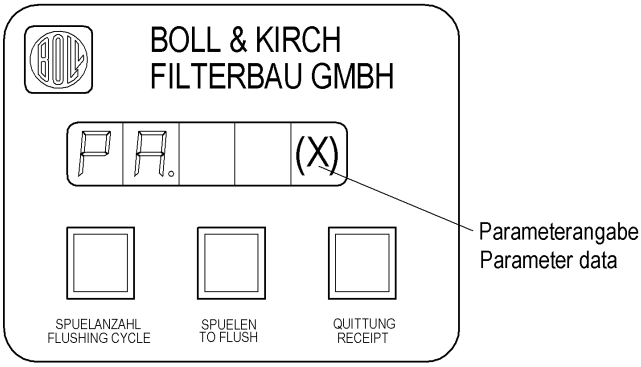
Turn the selector switch to the bottom position "Adjustment II".
Turn the main switch on the door front ON.
"Fil.-..." now appears in the display, depending on the filter type, and the LED operating light comes on.



Z37779 v. 09.05.95

If none of the three control keys is activated, the display is switched over after a short period to the display PA. ...

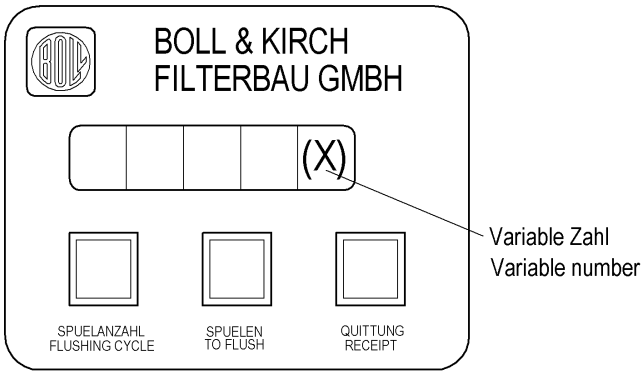
The numbers in the parameter display "PA. ..." depend on the filter type in question and can vary between "PA.1" and "PA.10".



Z37779 v. 09.05.95

The operator may only adapt the operating data of the parameters PA.2, PA.3, PA.4 and PA.8 to the prevailing operating conditions.

After activation of the "Acknowledge (Receipt)" key a variable number appears in the display.
This number must now be adapted to suit the operating conditions.



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PA.2 Time-dependent back-flushing activation in hours from 0-59 h.
Adjustable in 1 h increments.
In all control versions

PA.3 Time-dependent back-flushing activation in minutes from 0-59 min.
Adjustable in 1 min. increments.
In all control versions

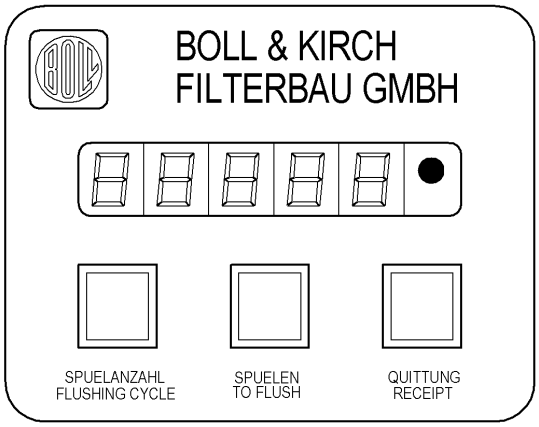
PA.4 Back-flushing time from 5 sec. to 100 sec.
Adjustable in 1 sec. increments
In all filter types apart from 6.23/6.24/6.23.1/6.24.4

PA.8 Flushing frequency monitoring
0 = Off; 1 = On
With filter type 6.60 alarm Δp activation
With filter type 6.61 alarm Δp activation
With filter type 6.61.07 alarm Δp activation
With filter type 6.62 alarm Δp activation

The number is increased with the key **"Flushing cycle"**.

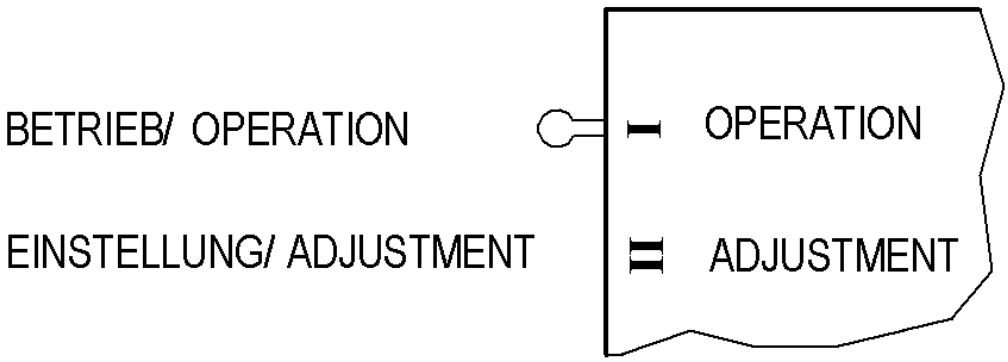
The number is reduced with the key **"Flush"**.

When the right number has been reached, it must be acknowledged with the **"Acknowledge (Receipt)"** key.



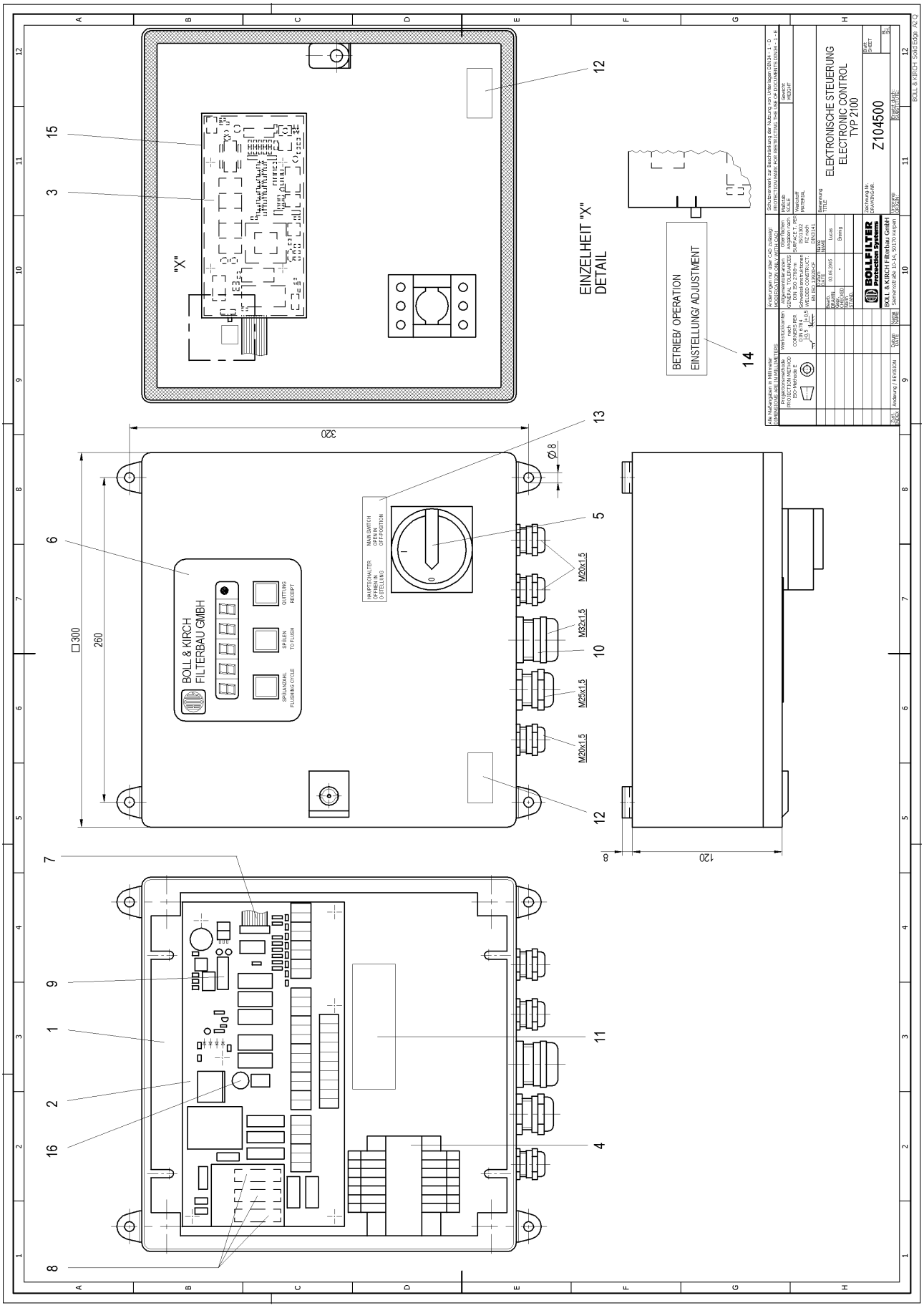
Z37779 v. 09.05.95

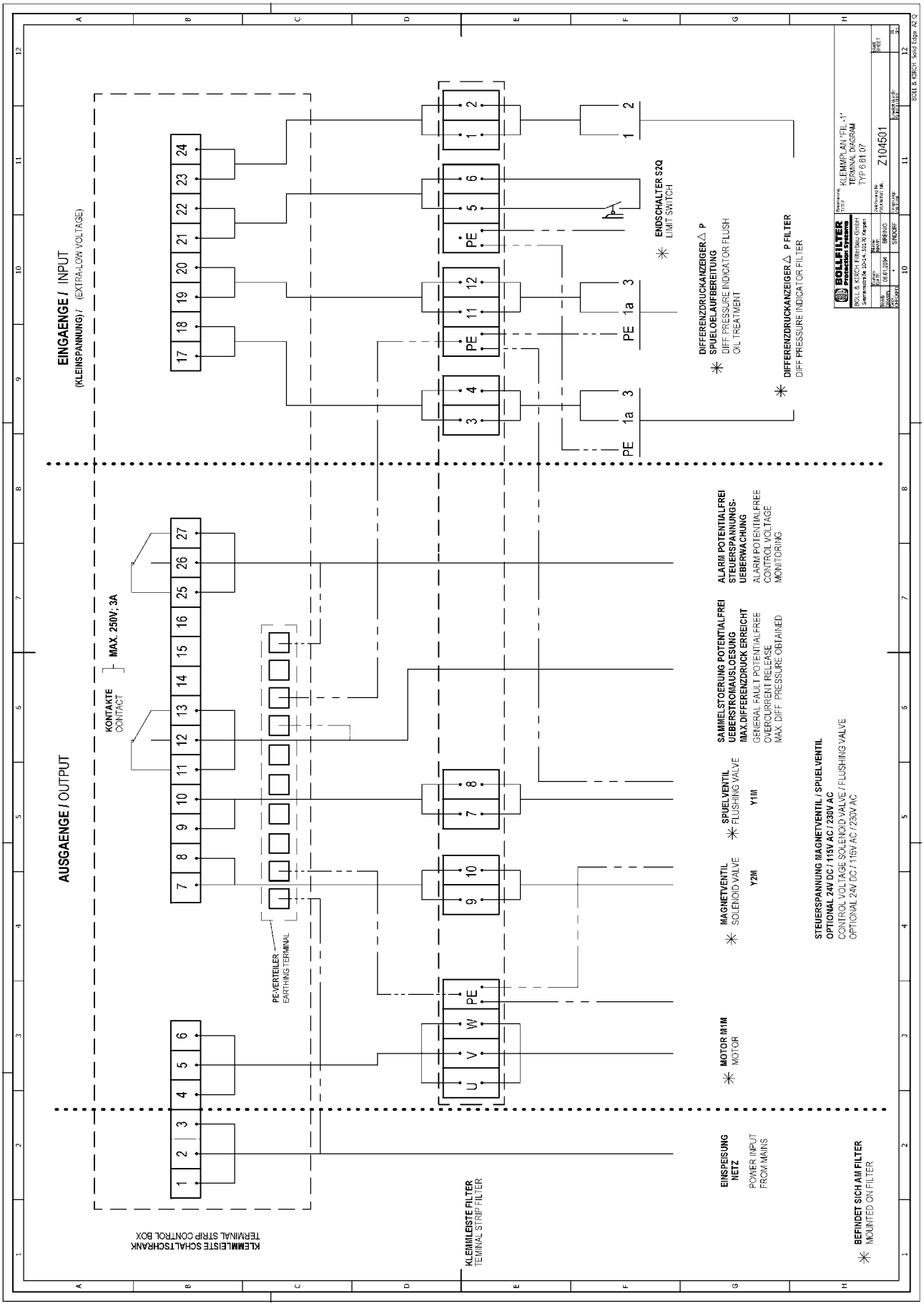
On completion of the entries it is imperative for the "Acknowledge (Receipt)" key to be activated at least twice for software reasons (The display also changes to the next parameter display).
Now turn the selector switch back into the top position "Operation".



Z37779 v. 09.05.95

The abbreviation of the filter control selected, Fil.- ..., now appears in the display.


ELEKTRONISCHE STEUERUNG
ELECTRONIC CONTROL
TYP 2100
Z104600
BOLL & KIRCH Filterbau GmbH
BOLLFILTER Protection Systems
EINZELHEIT "X"
DETAIL
BETRIEB/ OPERATION
EINSTELLUNG/ ADJUSTMENT
BOLL & KIRCH FILTERBAU GMBH
320
300
260
M20x1.5
M32x1.5
M25x1.5
M20x1.5
Ø8
120


EINGAENGE / INPUT
(KLEINSPANNUNG) / (EXTRA-LOW VOLTAGE)
AUSGAENGE / OUTPUT
KONTAKTE
CONTACT
MAX. 250V; 3A
PE-VERTEILER
EARTHING TERMINAL
KLEMMLEISTE SCHALTSCHRANK
TERMINAL STRIP CONTROL BOX
KLEMMLEISTE FILTER
TEMINAL STRIP FILTER
EINSPEISUNG
NETZ
POWER INPUT
FROM MAINS
BEFINDET SICH AM FILTER
MOUNTED ON FILTER
MOTOR M1M
MOTOR
MAGNETVENTIL
SOLENOID VALVE
Y2M
SPUELVENTIL
FLUSHING VALVE
Y1M
SAMMELSTOERUNG POTENTIALFREI
UEBERSTROMAUSLOESUNG
MAX.DIFFERENZDRUCK ERREICHT
GENERAL FAULT POTENTIALFREE
OVERCURRENT RELEASE
MAX. DIFF. PRESSURE OBTAINED
ALARM POTENTIALFREI
STEUERSPANNUNGS-
UEBERWACHUNG
ALARM POTENTIALFREE
CONTROL VOLTAGE
MONITORING
STEUERSPANNUNG MAGNETVENTIL / SPUELVENTIL
OPTIONAL 24V DC / 115V AC / 230V AC
CONTROL VOLTAGE SOLENOID VALVE / FLUSHING VALVE
OPTIONAL 24V DC / 115V AC / 230V AC
ENDSCHALTER S2Q
LIMIT SWITCH
DIFFERENZDRUCKANZEIGER △ P
SPUELOELAUFBEREITUNG
DIFF PRESSURE INDICATOR FLUSH
OIL TREATMENT
DIFFERENZDRUCKANZEIGER △ P FILTER
DIFF PRESSURE INDICATOR FILTER
BOLLFILTER Protection Systems
KLEMMPLAN "FIL -1"
TERMINAL DIAGRAM
TYP 6.61.07
Z104501

DOCUMENTATION PARTS LIST Date 25.05.04

Document 4300073

Description
Electronic Control
Typ 2100 Variante 1

Assembly Drawing: Z104500
Terminal Diagram

Fil.-1	Typ 6.61.07	Z104501
Fil.-2	Typ 6.61	Z104502
Fil.-3	Typ 6.61 Alarm Delta P	Z104503
Fil.-5	Typ 6.60 Alarm Delta P	Z104505
Fil.-6	Typ 6.18 / 6.19 / 6.44	Z104506
Fil.-8	Typ 6.61.07 Alarm Delta P	Z104508
Fil.-9	Typ 6.62	Z104509
Fil.-10	Typ 6.62 Alarm Delta P	Z104511

Item	ID no.	Description	Qty	Unit
00001	4306540	control box	1	pcs.
00001	4507593	wall fastening support	1	pcs.
00002	4200101	IO-Board	1	pcs.
00003	4800004	CPU-Board	1	pcs.
00004	4200079	Transformer	1	pcs.
00005	4205076	main switch	1	pcs.
00006	4201002	display	1	pcs.
00007	4101010	Ribbon Cable Connector	1	pcs.
00008	4201111	fuse unit	3	pcs.
00009	4201120	fuse unit	1	pcs.
00010	7002	cable gland	3	pcs.
00010	7003	cable gland	1	pcs.
00010	7004	cable gland	1	pcs.
00011	7006	label	1	pcs.
00012	7007	label	1	pcs.
00013	7008	label	1	pcs.
00014	7009	label	1	pcs.
00015	7011	covering sheet	1	pcs.
00016	4201571	fuse unit	1	pcs.

Erstellt / Prepared: 19.04.04 Breinig
Geprüft / Approved: 19.04.04 Sindorf

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.

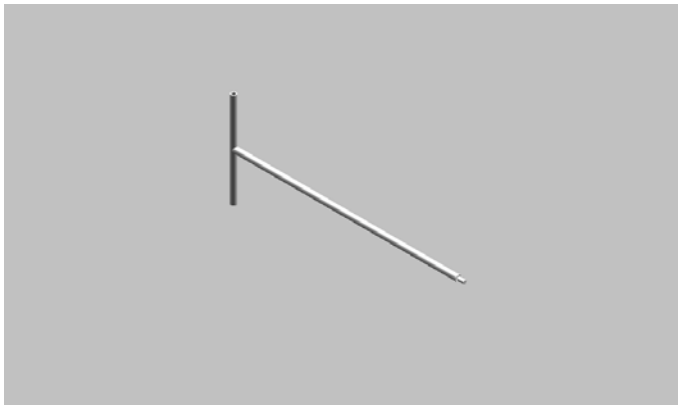
Check the sludge discharge for leaks every 10.000 flushing cycles. No medium should run from the end of the sludge discharge line during the filtration phase (except during the flushing cycle).

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

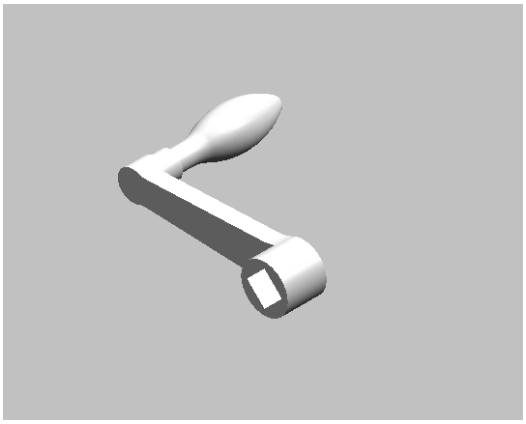
The following special tools are supplied for servicing the filter:

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 down-wards, 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.

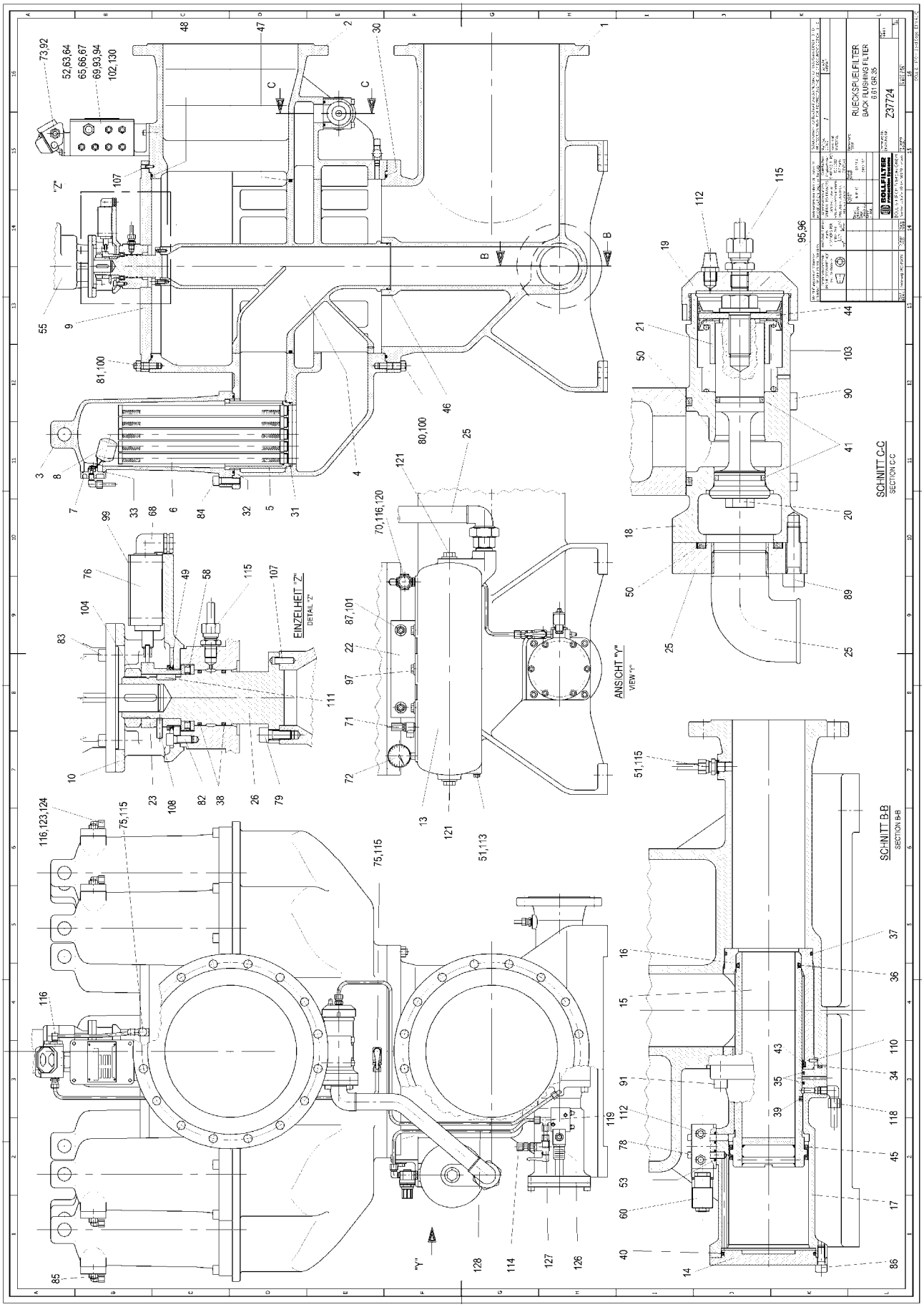
13.7 Almost 100 % cleaning is only possible manually, in our experience, by using the Type 5.04 High Pressure Cleaning Unit with BOLL CLEAN 2000.
See the separate description "Filter Cleaning Unit Type 5.04".

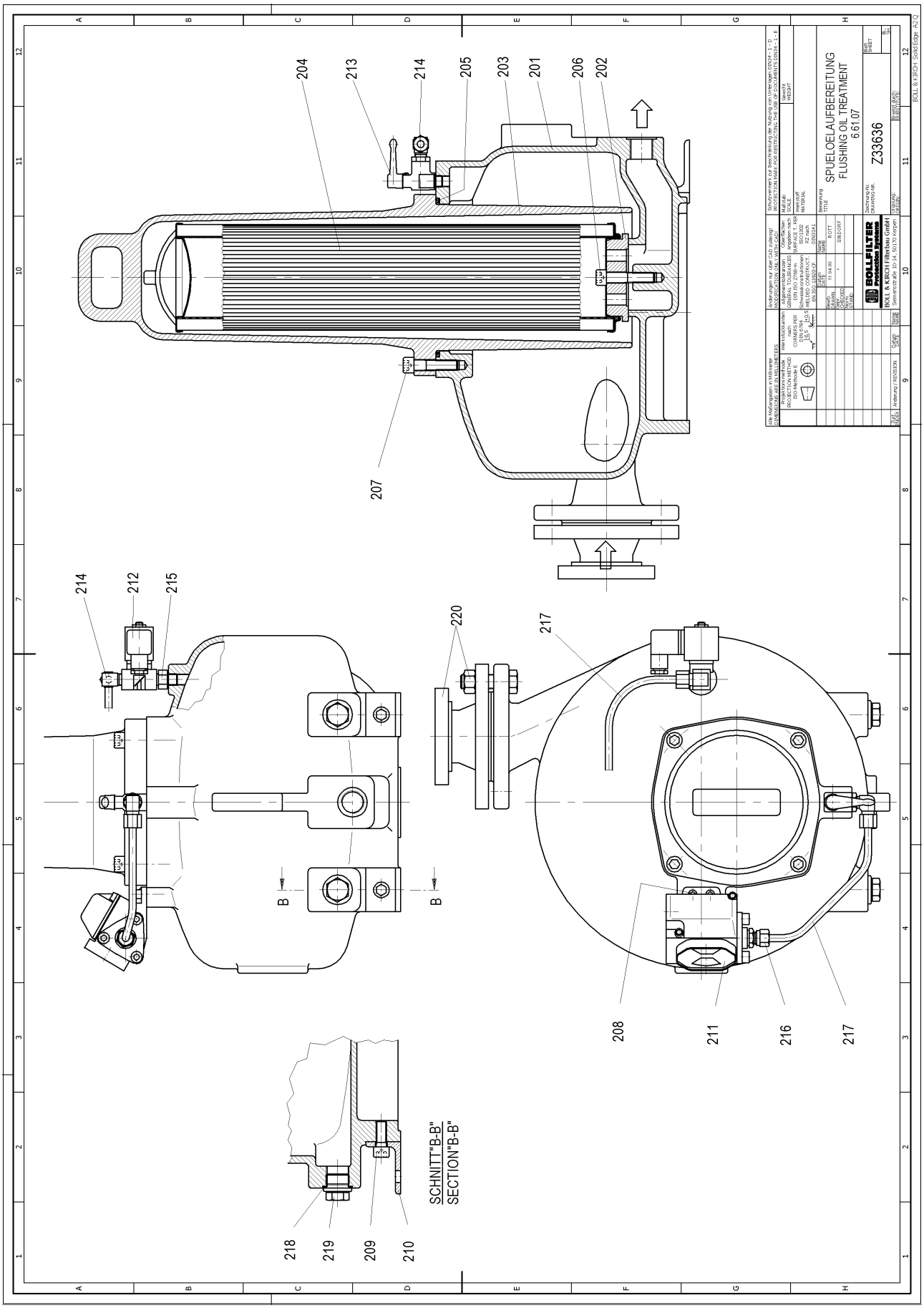
14. Manual operation of the automatic Filter

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 sharft. 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.


RUECKSPUELFILTER
BACK-FLUSHING FILTER
BFF GR 80
237724
EINZELHEIT "Z"
DETAIL "Z"
ANSICHT "Y"
VIEW "Y"
SCHNITT C-C
SECTION C-C
SCHNITT B-B
SECTION B-B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SCHNITT"B-B"
SECTION"B-B"
SPUELOELAUFBEREITUNG
FLUSHING OIL TREATMENT
6.61.07
Z33636
BOLLFILTER
Protection Systems
BOLL & KIRCH Filterbau GmbH

DOCUMENTATION PARTS LIST

Date 22.10.04
Page 1

Document 0622235

Description
automatic filter
6.61.07 Gr.35 DN350

Material EN-GJL-250
EN 1561
Assembly Z37724+Z33636
Dimension drawing Z45558

Filter room:
max. allowable pressure : 10 bar
max. allowable temperature : 140°C
Test pressure : 1,5 x Calculation pressure

Item	ID no.	Description	Qty	Unit
00001	6526487	housing lower part	1	pcs.
00002	6525267	change-over housing	1	pcs.
00003	6554391	filter chamber	11	pcs.
00003	2000017	stud bolt	22	pcs.
00004	6324521	cock plug	1	pcs.
00005	5051924	candle support	11	pcs.
00006	1104422	filter candle according to order	209	pcs.
00007	5953103	cover	11	pcs.
00008	2610023	float	11	pcs.
00008	2611123	pin	11	pcs.
00008	3530032	threaded pipe fitting	11	pcs.
00009	6406548	cover change over housing	1	pcs.
00010	5427288	motor flange	1	pcs.
00013	6534617	air reservoir	1	pcs.
00014	5001487	mud drain valve cover	1	pcs.
00015	5011387	mud drain valve ram	1	pcs.
00016	5032487	mud drain valve cover	1	pcs.
00017	5022487	mud drain housing	1	pcs.
00018	5025610	air valve housing	1	pcs.
00019	5025611	air valve cover	1	pcs.
00020	5005622	air valve ram	1	pcs.
00021	5006622	air valve bushing	1	pcs.
00022	6703467	mounting bow	1	pcs.
00023	5135681	cam disc	1	pcs.
00025	5032025	flange air valve	1	pcs.
00025	0604257	tubing	1	pcs.
00025	2503690	angle screwing	1	pcs.
00025	2502511	angle	1	pcs.
00026	5106234	coupling	1	pcs.
00030	3041421	o-ring	1	pcs.
00031	3030068	o-ring	11	pcs.
00032	3040129	o-ring	11	pcs.
00033	3142316	o-ring	11	pcs.
00034	3040163	o-ring	1	pcs.
00035	3532219	gasket	2	pcs.
00036	3030203	o-ring	1	pcs.
00037	3040106	o-ring	1	pcs.
00038	3030063	o-ring	2	pcs.
00039	3031277	o-ring	1	pcs.
00040	3040268	o-ring	1	pcs.
00041	3030060	o-ring	2	pcs.
00043	3544103	stripper	1	pcs.
00044	2785551	seal piston	1	pcs.
00045	2786811	double grooved ring	1	pcs.
00046	3041058	o-ring	1	pcs.
00047	3041066	o-ring	1	pcs.
00048	3041421	o-ring	1	pcs.
00049	3542193	truarc inverted ring	1	pcs.

DOCUMENTATION PARTS LIST Date 22.10.04
Page 2

0622235 automatic filter
6.61.07 Gr.35 DN350

Item	ID no.	Description	Qty	Unit
00040	3040268	o-ring	1	pcs.
00041	3030060	o-ring	2	pcs.
00043	3544103	stripper	1	pcs.
00044	2785551	seal piston	1	pcs.
00045	2786811	double grooved ring	1	pcs.
00046	3041058	o-ring	1	pcs.
00047	3041066	o-ring	1	pcs.
00048	3041421	o-ring	1	pcs.
00049	3542193	truarc inverted ring	1	pcs.
00050	3040118	o-ring	2	pcs.
00051	3270002	gasket	4	pcs.
00052	3380199	flat gasket	1	pcs.
00053	3040224	o-ring	2	pcs.
00055	4500100	gear motor	1	pcs.
00058	2708948	cylindrical roller bearing	1	pcs.
00060	4105912	appliance plug	1	pcs.
00060	2656655	5/2 way valve	1	pcs.
00060	4206553	coil	1	pcs.
00060	2614072	sound absorber	1	pcs.
00063	5950196	connection box	1	pcs.
00064	8450198	cover for connection box	1	pcs.
00065	4105616	clamp	15	pcs.
00065	4105617	clamp	6	pcs.
00065	4100015	distance plate	3	pcs.
00066	2000258	slotted cheese head screw	2	pcs.
00067	4105805	mounting rail	1	pcs.
00068	4160351	angle cable screwing	1	pcs.
00068	4160349	reducing ring	1	pcs.
00069	4160350	cable gland	4	pcs.
00069	4160349	reducing ring	4	pcs.
00069	4100104	cable gland	1	pcs.
00069	4160351	angle cable screwing	4	pcs.
00069	4160349	reducing ring	4	pcs.
00069	4870017	plug	1	pcs.
00070	2650017	high pressure control device	1	pcs.
00071	2660005	safety valve	1	pcs.
00072	2600044	pressure gauge	1	pcs.
00073	9902572	differential pressure indicator acc. t	1	pcs.
00075	2560063	angle ball valve	2	pcs.
00076	4200062	limit switch	1	pcs.
00078	2002155	hexagon socket head cap screw	2	pcs.
00079	2000143	hexagon socket head cap screw	4	pcs.
00080	2004112	stud bolt	16	pcs.
00081	2009088	stud bolt	16	pcs.
00082	2000131	hexagon socket head cap screw	4	pcs.
00083	2000132	hexagon socket head cap screw	4	pcs.
00084	2000279	hexagon socket head cap screw	55	pcs.
00085	2100006	hexagon nut	22	pcs.
00086	2000143	hexagon socket head cap screw	6	pcs.
00087	2000003	stud bolt	2	pcs.
00089	2000145	hexagon socket head cap screw	4	pcs.
00090	2001539	hexagon socket head cap screw	4	pcs.
00091	2000156	hexagon socket head cap screw	4	pcs.
00092	2000122	hexagon socket head cap screw	2	pcs.
00093	2000131	hexagon socket head cap screw	2	pcs.
00094	2000261	slotted cheese head screw	2	pcs.
00095	2000095	hexagon screw	1	pcs.
00096	2200009	disc	1	pcs.
00097	2000154	hexagon socket head cap screw	3	pcs.
00099	2000967	hexagon socket head cap screw	2	pcs.
00100	2100012	hexagon nut	32	pcs.

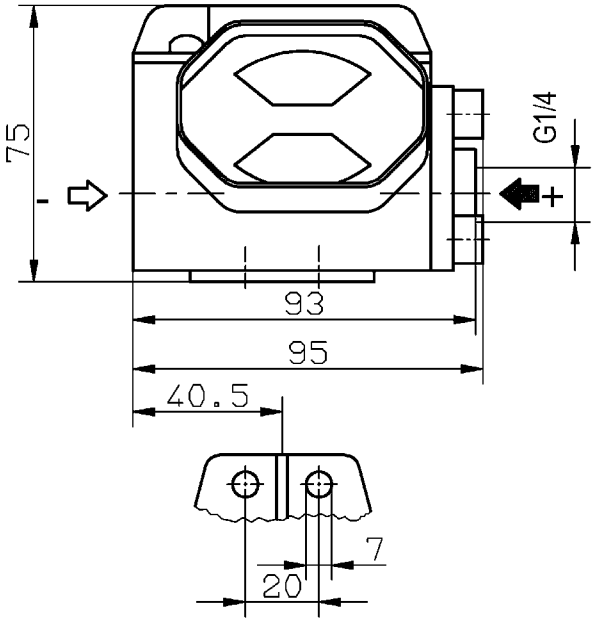
DOCUMENTATION PARTS LIST — Date 22.10.04 — Page 3

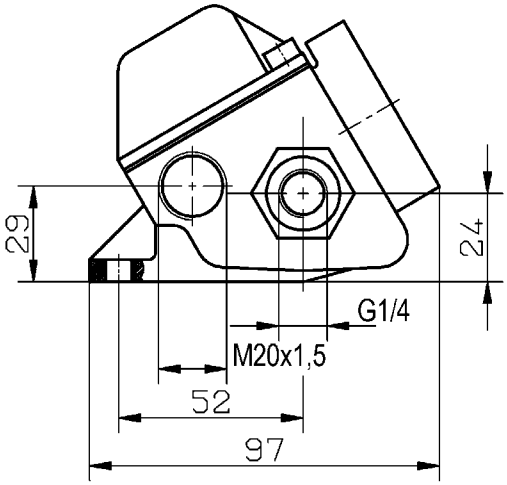
0622235 automatic filter
6.61.07 Gr.35 DN350

Item	ID no.	Description	Qty	Unit
00101	2100006	hexagon nut	2	pcs.
00102	2003587	threaded flange screw	4	pcs.
00103	2307527	pressure spring	1	pcs.
00104	5002790	shaft nut	1	pcs.
00107	2300123	Straight Pin	2	pcs.
00108	2308746	half-round groove pin	1	pcs.
00110	2300007	Spring Type Straight Pin	1	pcs.
00111	2400109	feather key	1	pcs.
00112	2614171	sound absorber	3	pcs.
00113	2002885	screwed sealing plug	1	pcs.
00114	2608775	non return valve	1	pcs.
00115	2500024	screwing	6	pcs.
00116	2500025	screwing	11	pcs.
00116	2500025	screwing	2	pcs.
00118	2500029	screwing	1	pcs.
00119	2507461	screwing	1	pcs.
00120	2500005	threaded pipe fitting	1	pcs.
00121	2002908	screwed sealing plug	2	pcs.
00121	3276803	gasket	2	pcs.
00123	2505339	screwing	6	pcs.
00124	2500258	screwing	1	pcs.
00126	2500083	screwed socket	1	pcs.
00127	2560356	angle ball valve	1	pcs.
00128	0602652	tubing set	1	pcs.
00130	9401690	type plate	1	pcs.
00131	9407569	label: "in / out"	1	pcs.
00131	9400997	label: "on / off"	1	pcs.
00131	9407396	label: "mud drain"	1	pcs.
00131	9402898	label	1	pcs.
00131	9405704	label: " ... 2 lugs ... "	2	pcs.
00131	9403614	label: "compressed air connection"	1	pcs.
00131	9404642	label: "Delta P differential pressure	1	pcs.
00138	4007766	steel cable set	1	pcs.
00140	4300000	control box according to order	1	pcs.
00150	6705031	key	1	pcs.
00150	6705032	key for unscrewing the filter element	1	pcs.
00150	2300808	crank handle	1	pcs.
00150	6705030	key	1	pcs.
00201	6532794	sludge chamber	1	pcs.
00202	5002033	sieve support	1	pcs.
00203	6553071	filter chamber	1	pcs.
00204	1104423	Sieve Element According To Order	1	pcs.
00205	3040128	o-ring	1	pcs.
00206	2000158	hexagon socket head cap screw	1	pcs.
00207	2000157	hexagon socket head cap screw	4	pcs.
00208	2000122	hexagon socket head cap screw	2	pcs.
00209	2000154	hexagon socket head cap screw	2	pcs.
00210	5002034	mounting screw	2	pcs.
00211	9902572	differential pressure indicator acc. t	1	pcs.
00212	2660016	solenoid valve	1	pcs.
00212	4206553	coil	1	pcs.
00212	4105912	appliance plug	1	pcs.
00213	2560063	angle ball valve	1	pcs.
00214	2500025	screwing	2	pcs.
00215	2564886	removeable double nibble	1	pcs.
00216	2500024	screwing	1	pcs.
00217	7300002	precision tube nbk	1	Unit
			1.000	mm
00218	3270005	gasket	1	pcs.
00219	2000190	screwed sealing plug	1	pcs.

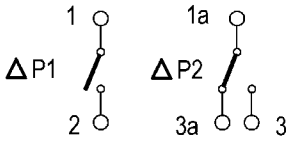
Überarbeitet am : 31.03.04
Überarbeitet von : Bogda

Z45550
TYP4.36.2
17.03.03





CIRCUIT DIAGRAM



SPECIFICATION:
PROTECTION CLASS: IP 65

ELECTR. DATA:	SWITCHING VOLTAGE	V≅	MAX.=	250	220
	FREQUENCY	HZ	MAX.=	0-60	0-60
	SWITCHING CURRENT	A	MAX.=	1	0.8
	MAKING AND/OR BREAKING CAPACITY				
		W/VA	MAX.=	60/60	40/60

MATERIAL : GD - ALUMINIUM
RATING : MAX. PRESSURE 100 BAR
MAX. TEMPERATURE 150°C

RANGES OF PRESSURE DIFFERENTIAL: DELTA P =
- 0 - 0.5 BAR
- 0 - 0.8 BAR
- 0 - 1.2 BAR
- 0 - 2.0 BAR
- 0 - 3.0 BAR

] TO BE SPECIFIED WHEN ORDERING

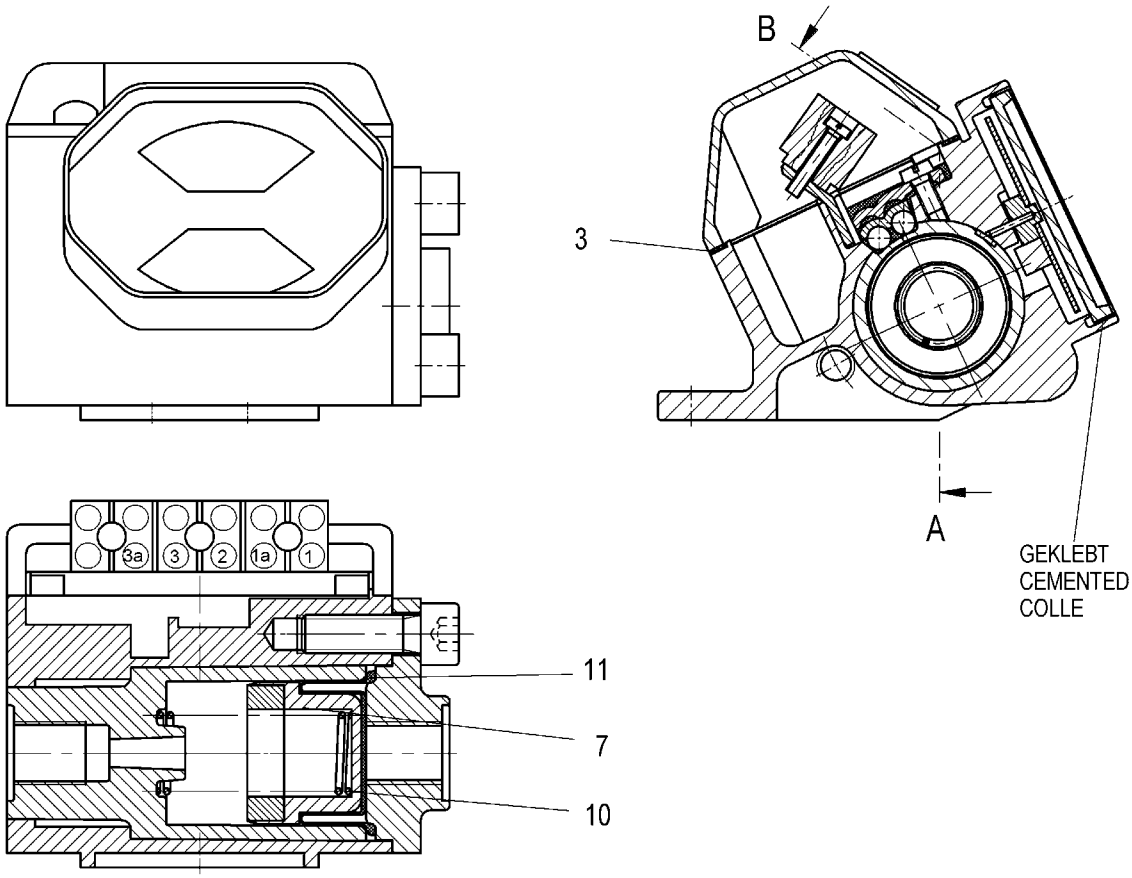
DESCRIPTION:
THE PURPOSE OF THIS DEVICE IS THE MEASUREMENT, AND VISUAL INDICATION OF THE DIFFERENCE IN PRESSURE BETWEEN TWO POINTS, AND THE ESTABLISHMENT OF AN ELECTRICAL CONTACT WHEN THE PRESSURE DIFFERENTIAL ATTAINS A SPECIFIED FIGURE.

METHOD OF OPERATION:
A PLUNGER SEALED BY A DIAPHRAGM SEPARATES THE SPACE UNDER PRESSURE INTO TWO CHAMBERS. A PRE-LOADED SPRING CAUSES THE PLUNGER TO TAKE UP ITS ZERO POSITION WHEN THE PRESSURE DIFFERENCE DELTA P IS ZERO. AS THE PRESSURE DIFFERENCE INCREASES (DELTA P > 0), THE PLUNGER IS FORCED TO MOVE AGAINST THE SPRING. AT THE SAME TIME, AN INDICATOR DISC IS MOVED MAGNETICALLY, AND THEREFORE VIRTUALLY WITHOUT FRICTION, AND THE TWO REED CONTACTS ARE ACTUATED.

THE RED SEGMENT OF THE INDICATOR DISC IS VISIBLE OVER A PRESSURE RANGE EQUAL TO APROX.50-100% DELTA P . THE FIRST REED CONTACT IS ACTUATED AT 75% DELTA P1, AND THE SECOND AT 100% DELTA P2.

DIFFERENTIAL PRESSURE CONTACT INDICATOR TYPE 4.36.2

Z21434
TYP4.36.2+4.46.2
11.02.94



A - B

BEI BESTELLUNG ANGEBEN
TO BE MENTIONED IN CASE OF ORDER
A MENTIONNER LORS DE LA COMMANDE

AUFTR.NR.:
ORDER NO.
NO DE COMMANDE

TYP 4.36.2

POS.NR.	BEZEICHNUNG	DESIGNATION	DESIGNATION	
11	ROLLMEMBRAN	DIAPHRAGM	DIAPHRAGME	
10	FEDER	SPRING	RESSORT	
7	KOLBEN	PISTON	PISTON	
3	DICHTUNG	GASKET	JOINT	

SPARE PARTS DRAWING

ERSATZTEILZEICHNUNG ZUM TYP 4.36.2 UND 4.46.2

PLAN DES PIECES DE RECHANGE

Bei Service- und Ersatzteilbedarf wenden Sie sich bitte an das Stammhaus oder an unsere Niederlassungen, Vertretungen oder Service-Stellen.
If you need service or spares for our products please contact our head office or our branch-offices, agencies or service-stations.

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