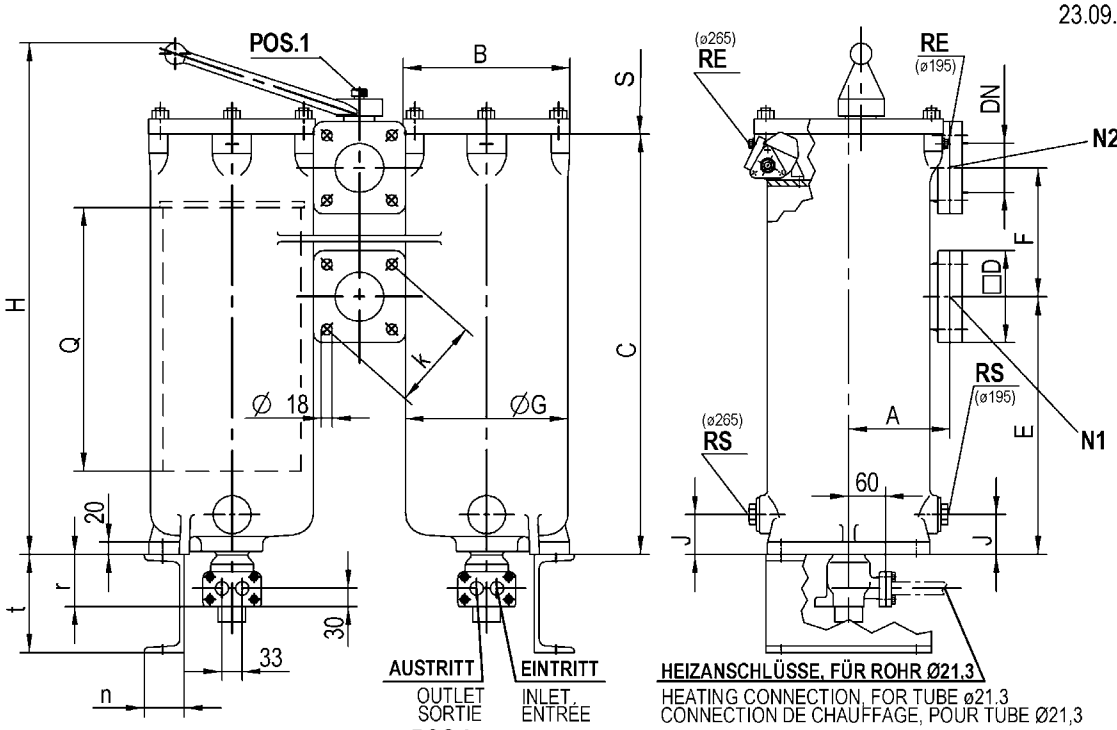
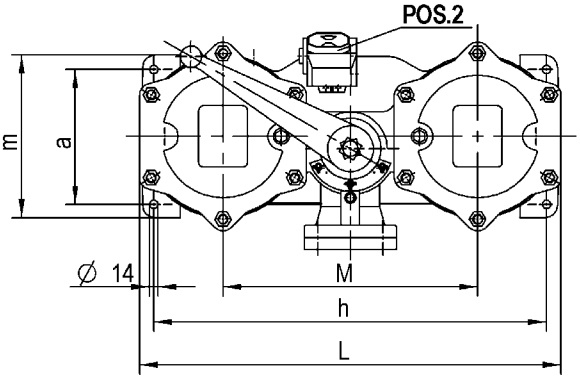
DESCRIPTION AND OPERATING INSTRUCTIONS

FOR THE DUPLEX FILTER

Contents:

Z45555
TYP2.06.5.4
23.09.2002





N1 FILTEREINTRITT
FILTERINLET
ENTRÉE DE FILTRE

N2 FILTERAUSTRITT
FILTEROUTLET
SORTIE DU FILTRE

BEI RINGSIEB DURCHFLUSS ENTGEGENGESETZT
WITH RING-ELEMENTS FLOW IN OPOSITE DIRECTION
AVEC DES PANIERS À ANNEAUX LE PASSAGE EST EN SENS CONTRAIRE

FÜR KORSIEB NICHT GEEIGNET
NOT QUALIFIED FOR BASKET- OR STAR PLEATET ELEMENTS
N'EST PAS POUR PANIERS ÀCORBEILLE OU ÀTRELLIS PLISSÉ

RE ENTLÜFTUNG G1/4
AIR ESCAPE
DÉSAÉRATION

RS ENTLEERUNG
DRAIN
VIDANGE

S SIEBAUSBAU
DISMOUNTING OF THE FILTERELEMENT
DEMONTAGE DU PANIER

S=Q BEI MANTEL- UND RINGSIEB
BY MULTIMANTLE AND RING FILTERELEMENT
POUR LES PANIERS À MANTEAUX ET ANNEAUX

GEHÄUSE GEGOSSEN, EN-GJL-250
CASING CASTED, EN-GJL-250
CORPS MOULÉ, EN-GJL-250

POS.1 DRUCKAUSGLEICH
EQUALIZATION OF PRESSURE
ÉQUILIBRAGE DE PRESSION

AUF WUNSCH, ON REQUEST, SUR DEMANDE

POS.2 DIFFERENZDRUCKANZEIGER
DIFFERENCE PRESSURE INDICATOR
INDICATEUR DE DIFF.DE PRESSION

ALLGEMEINTOLERANZEN DIN ISO 2768-v
TOLERANCE DIN ISO 2768-v
TOLÉRANCE DIN ISO 2768-v

PN1 BETRIEBSÜBERDRUCK FILTERRAUM IN BAR BEI 120°C
WORKING PRESSURE, FILTER COMPARTMENT IN BAR AT 120°C
PRESSION DE SERVICE, CHAMBRE DE FILTRATION EN BAR POUR 120°C

PN2 BETRIEBSÜBERDRUCK HEIZRAUM IN BAR BEI 200°C
WORKING PRESSURE, HEATING COMPARTMENT IN BAT AT 200°C
PRESSION DE SERVICE, CHAMBRE DE CHAUFFAGE EN BAR POUR 200°C

BESTELLBEISPIEL
ORDERING EXAMPLE
EXEMPLE DE COMMANDE

TYP	øG	Q	DN
2.06.5.4	265	500	80

øG	Q	DN min.	DN max.	PN1	PN2	A	B	C	□D	E	F	H	J	L	M	S	a	h	øk	m	n	r	t	RS	GEW. kg	INHALT LTR.
195	250	65	80	10	14	135	□200	425	130	175	195	580	45	520	320	350	160	480	130	200	45	68	120	G1/2	85	2x10
	500	80	100			155		695	150	420	210	840	50	550	350	610		510	150					G1	130	2x17
265	500	80	100	10	14	165	270	685	150	420	210	840	65	685	415	600	220	640	150	270	60	65	160	G1	195	2x32

SUBJECT TO ALTERATIONS

ÄNDERUNGEN VORBEHALTEN!

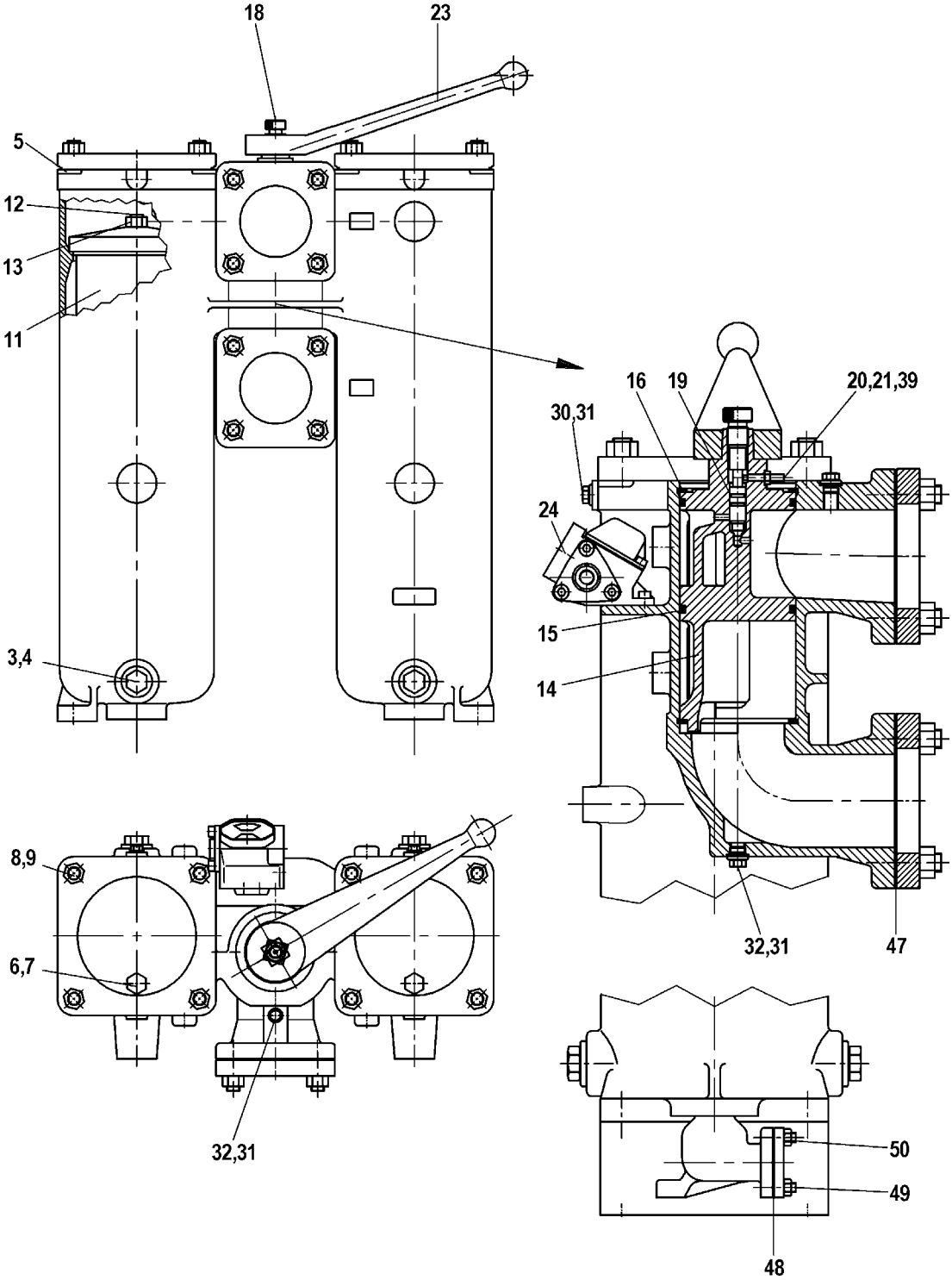
MODIFICATIONS RÉSERVÉES

DUPLEX FILTER

DOPPELFILTER 2.06.5.4

FILTRE DOUBLE

Z39143
TYP2.06.5
10.04.2000



SPARE PART LIST

ERSATZTEILLISTE TYP 2.06.5(.4)

LIST DES PIÈCES DE RECHANGE

ERSATZTEILLISTE TYP 2.06.5 (.4)

SPARE PART LIST **LISTE DES PIECES DE RECHANGE**

Typenschlüssel:

2.06.5. =	Doppelfilter aus GG25	duplex filter made of GG25	Filtre double en GG25
G . =	Gehäusedurchmesser	cabin diameter	diamètre du corps
Q . =	Filtereinsatzlänge	length of the filter element	longueur du panier
DN .=	Anschlußflansche	connection flanges	brides désirées

Pos. Nr.	Bezeichnung Designation Designation	G 265 Q 500 DN 80	St.	G 195 Q 500 DN 80	St.	G 195 Q 250 DN 65	St.
3	Verschlußschraube screw plug vis	2000191	2	2000191	2	2000189	2
4	Dichtung gasket joint	3270006	2	3270006	2	3270006	2
5	O-Ring (Viton) O-Ring O-Ring (Perbunan)	3030183 3040131	2	----------		----------	
5	Flachdichtung gasket joint	----------		3380008	2	3380008	2
6	Verschlußschraube screw plug vis	2000189	2	2002885	2	2002885	2
7	Dichtung gasket joint	3270003	2	3270002	2	3270002	2
8	Stiftschraube stud bolt vis	2009088	6	2009088	4	2009088	4
9	Mutter nut écrou	2100007	6	2100007	4	2100007	4
11	Siebeinsatz filter element élément filtrant	Fabr.Nr. Filtertyp		Fabr.No. Filtertype		Fabr.No. Type de Filtre	
12 *)	Anker bolt vis	WN 5.1.90 (1) WN 5.1.91 (2)	2	WN 5.1.83 (1) WN 5.1.84 (2)	2	WN 5.1.81 (1) WN 5.1.82 (2)	2
13 *)	Mutter nut écrou	2100035	2	2100033	2	2100033	2
14	Küken cock robinet	Z35933	1	Z35933	1	Z35932	1
15	O-Ring (Viton) O-Ring O-Ring (Perbunan)	3030075 3040121	2	3030075 3040121	2	3030175 3040119	2

Pos. Nr.	Bezeichnung Designation Designation	G 265 Q 500 DN 80	St.	G 195 Q 500 DN 80	St.	G 195 Q 250 DN 65	St.
16	Sicherungsring retaining ring anneau de protection	2200002	1	2200002	1	2200001	1
18	Druckausgleichküken cock for equalizuation of pressure robinet d'equilibroge de pression	Z44750	1	Z44750	1	Z44750	1
19	O-Ring (Viton) O-Ring O-Ring (Perbunan)	3034796 3040094	2	3034796 3040094	2	3034796 3040094	2
20	Schraube screw vis	2007497	2	2007497	2	2007497	2
21	Federring spring ressort	2209799	2	2209799	2	2209799	2
23	Hahnschlüssel reversing handle clé	WN 48.3 SW 27	1	WN 48.3 SW 27	1	WN 48.3 SW 27	1
24	Differenzdruckanzeiger differ. press. indicator indi. de diff. de pressure	Typ Druck		Type Pressure		Type Pression	
30	Verschlußschraube screw plug vis	2002885	2	2002885	2	2002885	2
31	Dichtung gasket joint	3270002	4	3270002	4	3270002	4
32	Verschlußschraube screw plug vis	2002885	2	2002885	2	2002885	2
39	Mutter Nut ecrou	2100003	1	2100003	1	2100003	1
47	Dichtung gasket joint	3380041	2	3380041	2	3380040	2
48	Dichtung gasket joint	4-18109	1	4-18109	1	4-18109	1
49	Stiftschraube stud bold vis	2000001	4	2000001	4	2000001	4
50	Mutter Nut ecrou	2100004	4	2100004	4	2100004	4

*) Bei Mantelsieb (1) und Kerzeneinsatz (2) zusätzlich.
These items are supplementary by multimantle- (1) and filtercandle-element (2)
En supplément avec panier á manteaux (1) et cartouches (2) filtrantes.

INSTALLATION AND OPERATING INSTRUCTIONS FOR

BOLL DUPLEX FILTERS

1. Description

Duplex filters which can be changed over consist of two filter housings operated in parallel by a two-stage change-over device. The filter housings are designed to meet the current regulations for a particular pressure range, the filter elements are provided with an appropriate safety factor for the differential pressures indicated on the filter nameplates. The maximum differential pressure for filter meshes is 0.8 bar, for micro-cartridges 2 bar.
Duplex filters are used in cases where the contaminated filter elements have to be regenerated without interrupting the filtration process.

The change-over devices, i.e. cylindrical plugs, ball valves or double-stage change-over valves, permit change-over without pressure shocks. Owing to the design of the change-over device it is not possible for both filter chambers to be switched off at the same time.

According to the AD Information Sheets, the filter housings are only rated for internal overpressure. Additional external forces and moments at the connection flanges of the filter are to be avoided (possibly support feed lines).

2. Installation

When the filter is attached to its foundation, the filter housing must be free from strain. The same applies to the connected piping. The connections for the inlet and outlet depend on the strainer element used (see works standard WN 211). Pay attention to the arrow marked on the housing.

Heated filters with shut-off devices:
- Special equipment needed for heatable filters -

a) Steam-heated filters:
Safety valves for the filter chamber set to operate at the relief pressure which is 10 % above the max. admissible operating pressure of the filter housing.

b) Electrically heated filters:
Thermostats which cut off the power supply to the heating element at a max. admissible temperature of 150 °C in the filter chamber and one safety valve per filter pot.

Heating of the filter serves to offset the heating loss at the filter during the filtration process or before start-up of the plant to heat the liquid in the filter.

It is imperative for the pressure equalising cock to only remain closed in the cleaning phase so that there is no inadmissible pressure build-up through the thermal expansion of the medium in the isolated chamber.

In smaller duplex filters without pressure compensation the heat expansion of the medium is so low that there is no risk to the components.

3. Start-up

3.1 Pressure filters (> 0.1 bar pressure in the filter)

Set the change-over device to the mid-position, both chambers in service, pressure equalising cock open.
Open air vents of both chambers (with venting screws only about 1 turn).
Start plant up slowly.
Close air vents when the air has escaped and the liquid has started to emerge.
Isolate one filter chamber by operating the change-over device, leave the pressure equalising cock open; while one of the filter chambers is being used for filtering, the isolated chamber is on stand-by until the admissible differential pressure has built up as a result of clogging.
At a differential pressure of 0.8 bar in filter meshes or 2 bar in micro-cartridge filters change over to the clean filter chamber as follows:

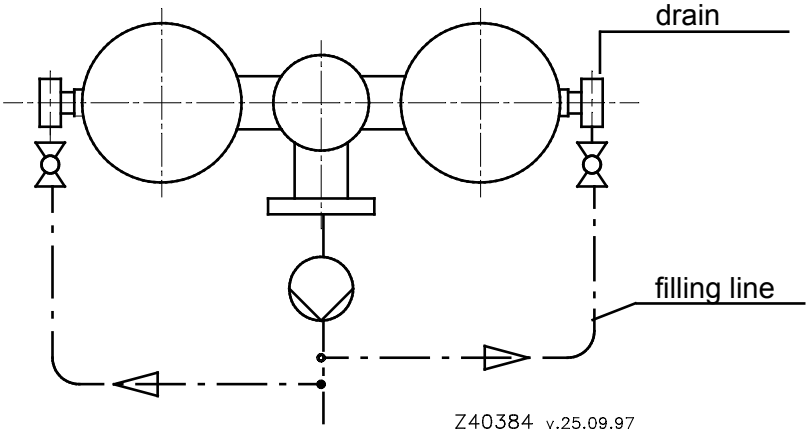
Cleaning

- Check that the pressure equalising cock is open and whether the stand-by chamber is full by briefly opening the air vents.
- Change over.
- Close pressure equalising cock.
- Open the air vent on the isolated filter; this releases the liquid pressure and it is then possible to check whether the change-over device has cut off the flow to the filter chamber.
  In contrast to the change-over and ball valve devices, complete sealing is not possible with the plug-type system; by opening the sludge outlet, liquid leaking during the cleaning process can be drained off.
- Remove the housing cover from the isolated filter chamber.
- Drain liquid down to the strainer base in the case of basket strainers; drain filter housing completely in the case of mantle strainers, cartridge strainers and micro-cartridges.
- Remove the filter element vertically upwards.

- Clean filter element (see operating instructions "Strainer cleaning"); renew disposable elements and install them in the filter.
- Before mounting the cover, check that the seal is in perfect condition and seated properly.
  It is imperative to renew seals which have become hardened and deformed.
  Screw cover on, the air vent remains open.
  Open pressure equalising cock or, if not installed, set change-over device to mid position until the air has been vented.
- Close air vent. This filter is now on stand-by.

3.2 **Suction filters** (< 0.1 bar pressure in filter)

Recommended container filling for suction filters



- Fill and vent both filter halves.
- Isolate one of the filters with the change-over device, close pressure equalising cock.
- Start up the plant. While one filter chamber is being used for filtration, the isolated chamber is on stand-by. When the differential pressure across the filter reaches the maximum allowed by the pump suction head, a change-over to the other filter half must be made.
- Open pressure equalising cock.
- Change over.
- Close pressure equalising cock.
- Open air vent on the isolated filter half.

Air may be drawn in if the level drops.

- Dismantle the housing cover from the isolated filter half.
- Drain liquid down to the strainer base.
- Remove filter element vertically upwards.
- Clean filter element (see operating instructions "Strainer cleaning"). Renew disposable elements and install in the filter.
- Fill filter housing (see Fig.).
- Before mounting the cover, check that the seal is in perfect condition and seated properly.
  It is imperative to renew seals which have become hardened and deformed.
  Close air vent.
- The cleaned filter half is ready on stand-by. This procedure is to be repeated from section as and when required.

It is not permitted to fill the filter against the indicated flow direction of the filter elements.

4. Servicing:

Servicing of the duplex filter comprises checking and, if necessary, renew the seals and filter elements. If the filter is provided with rust-inhibiting paint, touch up or repaint as and when required.
When filtering cooling water or media which may cause sedimentation on the change-over device, it is advisable to activate the change-over device as often as possible and at regular intervals in order to prevent clogging.

OPERATING INSTRUCTIONS
FOR SEGMENTAL COCK CHANGE-OVER VALVE
FOR BOLL DUPLEX FILTER TYPE 2.06.5 AND 2.06.7

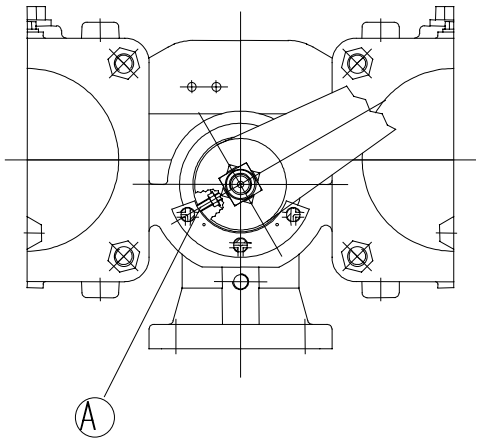
1. General

The segmental cock valve is used as a change-over element in duplex filters.
The flow diagram, Fig. 1, shows the change-over arrangement and the filter chamber in use.

The special design and the limited change-over movement of the segmental cock (2) prevent pressure surges and interruptions to the flow.

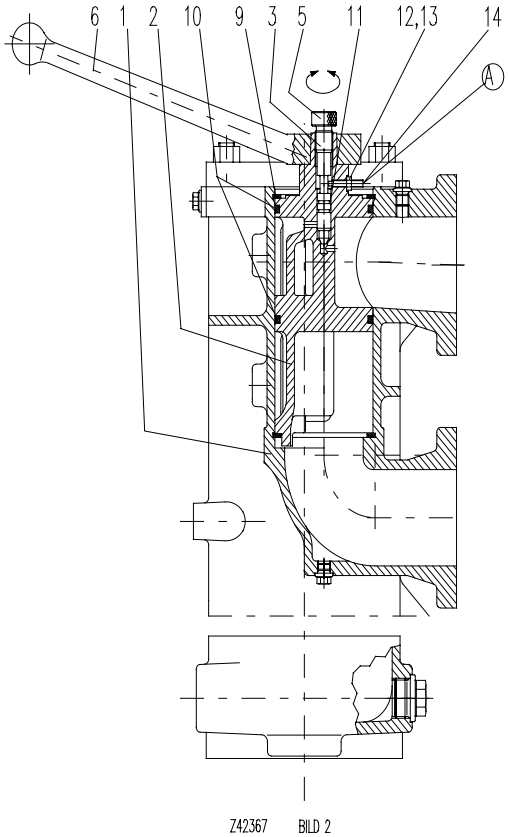
Ease of movement and pressure-tightness of the segmental cock (2) are achieved by means of exact fits and small friction surfaces.

Z42367 BILD 1



2. Operation

In the operating mode the pressure equalisation knob must always be open, i.e. both filter chambers are under operating pressure.



Z42367 BILD 2

Change-over

The segmental cock (2) is moved through 120° by turning the valve lever (6) to the left or right.
The pin "A" in Fig. 1 points towards the appropriate symbol indicating which chamber the medium is flowing through.
The pressure equalisation knob (3) is closed by turning the knurled screw (5) clockwise until screwed in full. This covers a bore located at right angles to the cock axis.
The relevant filter chamber is filled through this open transverse bore.
The isolated filter chamber is pressure-relieved by loosening the venting screw and can then be cleaned (see Operating Instructions for Duplex Filters and Operating Instructions for Strainer Cleaning).

When the filter chambers are operated in parallel, the pin „A“ in Fig. 1 is in the central position pointing towards the relevant symbol.
In this position both filter chambers are in operation.
The illustration in Fig. 2 shows the parallel-operation position of the segmental cock.

3. Dismantling and installation of the valve

3.1 Isolate the filter from the plant.
3.1.1 Relieve the pressure in both filter chambers.
3.1.2 Drain the medium from both filter chambers (at least down to the lower filter chamber port).

3.2 Dismantle segmental cock (2).
3.2.1 Remove circlip (9) with pliers to DIN 5256 C.
3.2.2 Pull cock (2) out of valve housing (1).
3.2.3 Examine segmental cock (2) and housing bore for damage and repair if necessary.
3.2.4 Check O-rings (10) for damage and replace if necessary.

3.3 Dismantle pressure equalisation knob (3).
3.3.1 Undo lock nut (12).
3.3.2 Unscrew threaded pin (14) until the knob (3) can be unscrewed.
3.3.3 Unscrew knob (3) completely.
3.3.4 Check knob (3) and O-ring (11) for damage and replace if necessary.

3.4 Assembly
3.4.1 Position O-rings (10) in the grooves of the cleaned and oiled segmental cock (2).
3.4.2 Insert segmental cock (2) into the housing bore and press down until the groove for the circlip (9) is exposed.
In this way the correct stop of the cock is also guaranteed.

Ensure that the circlip (9) is properly seated as it must withstand the full operating pressure through the cock.

3.4.3 Position circlip (9) in groove using pliers.
3.4.4 Oil the O-ring (11) and position it in the knob groove (3).
3.4.5 Oil the knob bore and screw knob (3) in full.
3.4.6 Screw threaded pin (14) right in full.
Then unscrew the threaded pin (14) by one turn so that the threaded pin (14) does not block the movement of the knob (3).
Secure threaded pin (14) with hexagonal nut (13.1) and spring washer (13).
3.4.7 Check segmental cock (2) and pressure equalisation knob (3) for ease of movement.
3.4.8 For commissioning of the filter, refer to Operating Instructions for Duplex Filters.

CLEANING THE MULTI-MANTLE FILTER ELEMENTS

1. The multi-mantle filters consist of up to 6 nested filter elements.
Fields of application are filter meshes < 200 µm.
In order to prevent flow short-circuits, the joins of the individual components are sealed with O-rings.

2. The admissible differential pressures depend on the multi-mantle filter diameter:

Filter Ø (mm)	Δp max. adm. (bar)	Δp max. oper. (bar)
86 - 230	8	1,2
290	5	0,8
356 - 434	3,5	0,8

3. **Accessories of the filter element**

The following items can be supplied as accessories:

- magnetic primary filter (19)
- magnetic secondary filter (20)

4. **Maintenance**

4.1 Clean and inspect multi-mantle filter elements at regular intervals. The length of these intervals depends on the amount of dirt that has accumulated.

4.2 Carry out the first cleaning operation immediately after the installation has been flushed. A rising pressure loss is a sign of increasing dirt accumulation.
The differential pressure is not to exceed 0.8 or 1.2 bar (suitable monitoring appliances are available from BOLL & KIRCH).

Before you open the filter chambers, observe the operating instructions for single and duplex filters.

5. **Cleaning**

5.1 Shut off single filter or change over duplex filter. Release pressure from the filter housing by undoing the venting screw and remove the housing cover. Open the drain screw in the filter base and drain contents completely. Slacken the self-locking nut (4) on the central tie rod (5) and lift out the inner filter with the lifting eye (18). Lift the remaining filter elements out individually by gripping the inside of the filter ring.

5.2 Place the individual filter elements into containers with cleaning agent and brush off with not too hard a brush (e.g. nylon brush).

5.3 Now blow compressed air at about 4 bar through the filter element cleaned in the above manner from the clean side. To this end insert the cleaning gun type 5.02 (22) into the openings located in the upper filter ring and blow through the filter surface from the inside with up and down motions.

5.4 In the case of persistent dirt or paint encrustation, place the filter into a container (e.g. as shown in drawing No. 3-23700) with cleaning agent (to sheet KV 349) and allow to soak for up to 4 hours. Make sure that the filter is not completely immersed but that the upper ring remains free. This prevents dirt from reaching the clean side.

5.5 Remove filter and continue to treat as described under points 5.2 and 5.3.

5.6 If necessary, repeat points 5.4 and 5.5.

5.7 For final cleaning, rinse the filter in clean cleaning fluid (e.g. petroleum ether, paraffin, hot water or similar) and blow through again. Then check fabric for cleanness and damage. Assess cleaning effect by holding the filter element against the light. Use a torch for finer fabrics. If the light penetrates evenly, the fabric has been cleaned well.

5.8 Check all seals including cover seals. Seals which have become hard and deformed must be renewed without fail.

6. **Cleaning appliances**

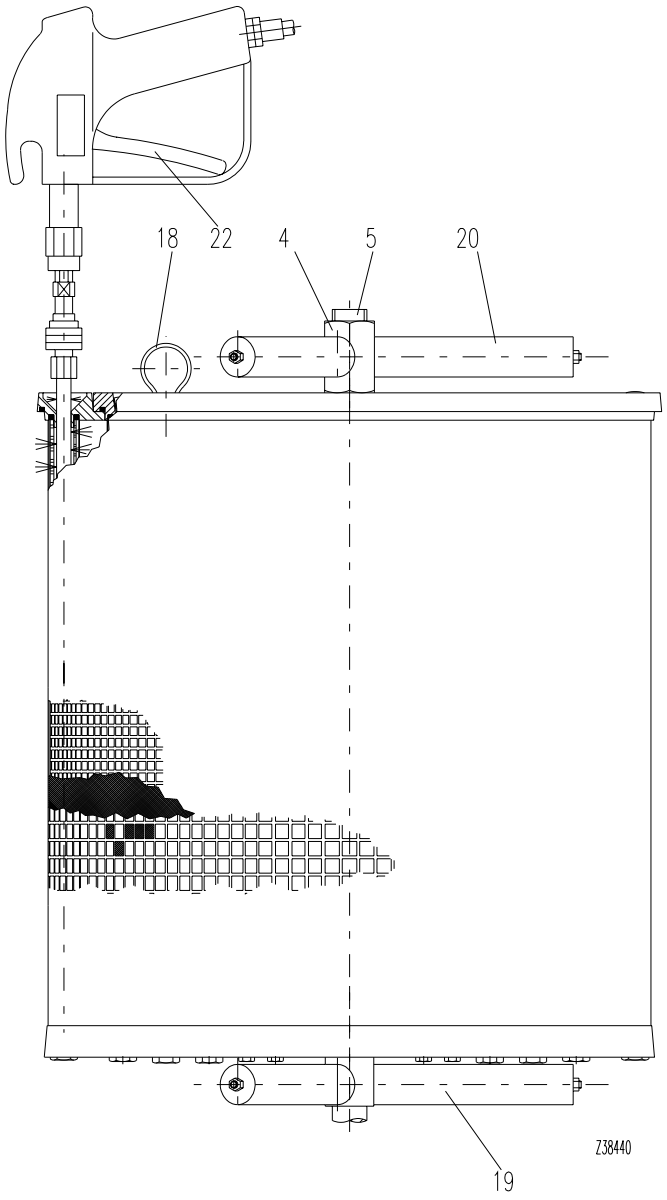
6.1 2 cleaning containers to drawing No. 3-23700.

6.2 Cleaning gun, type 5.02.

6.3 10 mm spanner.

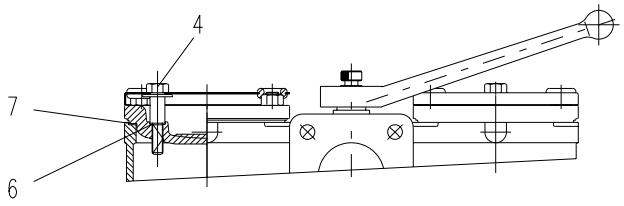
6.4 Compressed air connection, max. 6 bar.

For particularly convenient and thorough filter cleaning we recommend our cleaning trolley type 5.04 with cartridge filter, pump and cleaning gun.

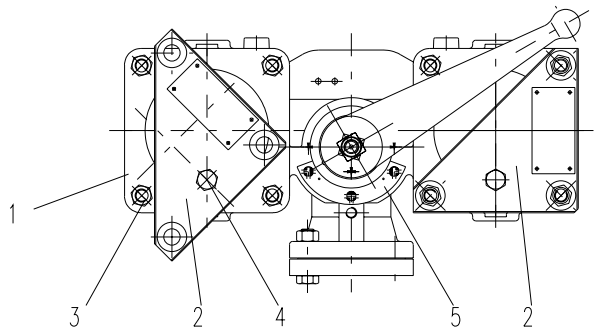


COVER SECURING DEVICE FOR DOUBLE FILTERS

Z37134



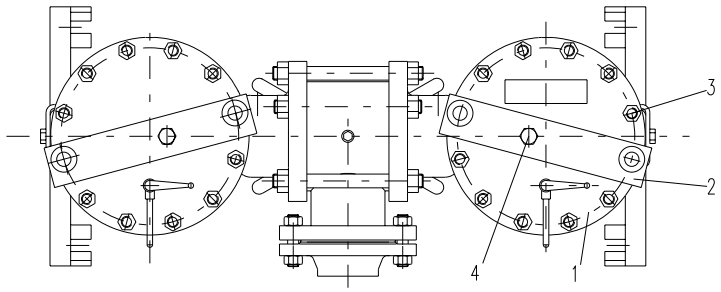
TYP 2.02.5 / 2.06.5



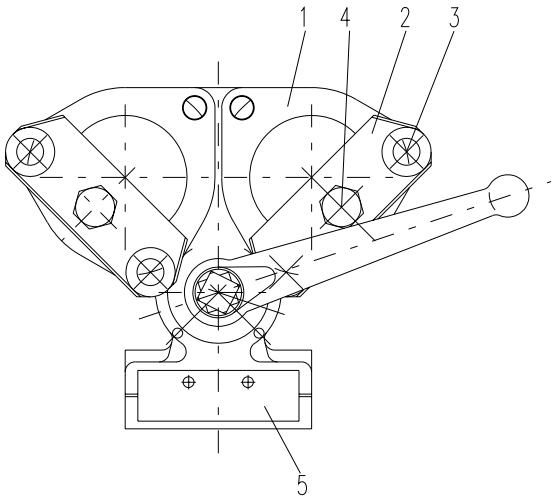
The function of the cover securing device is to prevent the uncontrolled excape of lubricantes and fuels in the case of operating errors. The cover plate (2) covers a minimum number of cover screws (3), so that the cover (1) cannot be removed with out actuating the venting facility (4).

The filter chamber is relieved through the venting screw (4). With the correct switching position, the service pressure of the filter chamber falls immediately and hardly any fuel excapes. Otherwise, the venting screw is immediately closed and the fuel discharge is limited.

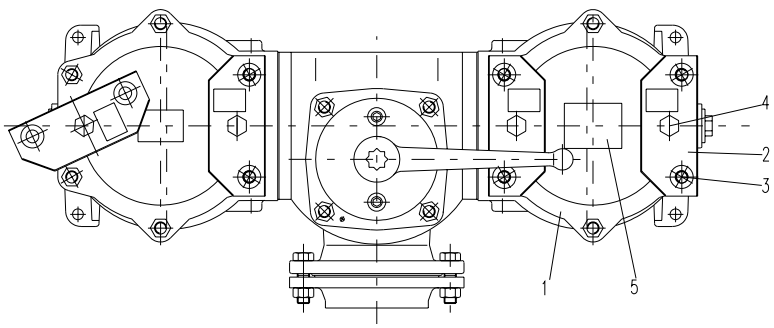
TYP 2.78.2 / 2.68.2 / 2.62.9



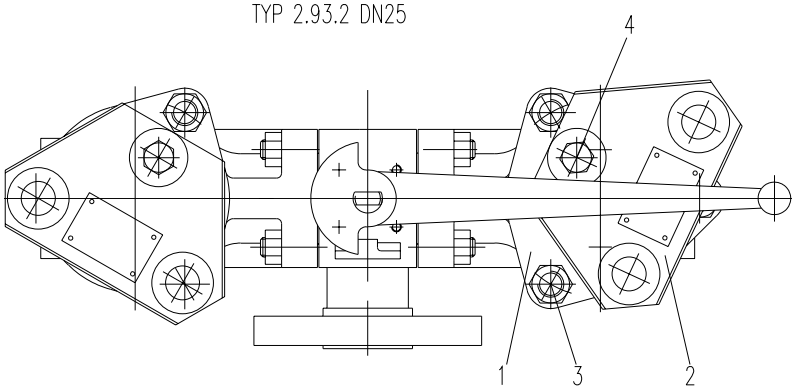
TYP 2.04.5



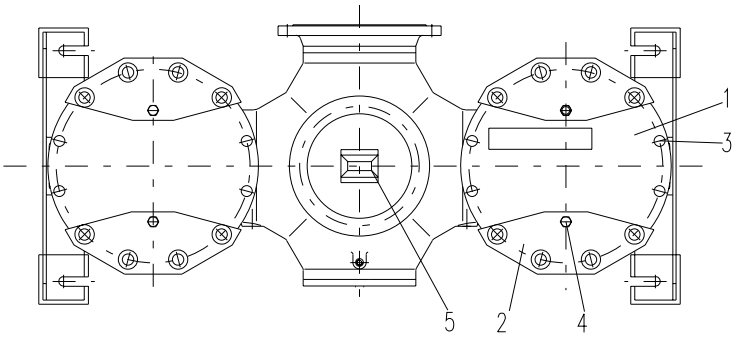
TYP 2.05.5



TYP 2.93.2 DN25



TYP 2.93.2 / 2.62.9 DN50-80



Operation:

1. Establish on the circuit diagram (5) with chamber is switched off.

2. Unscrew the venting screw of this chamber (4) to the point where the cover plate (2) can swivel over the cover screws (3)

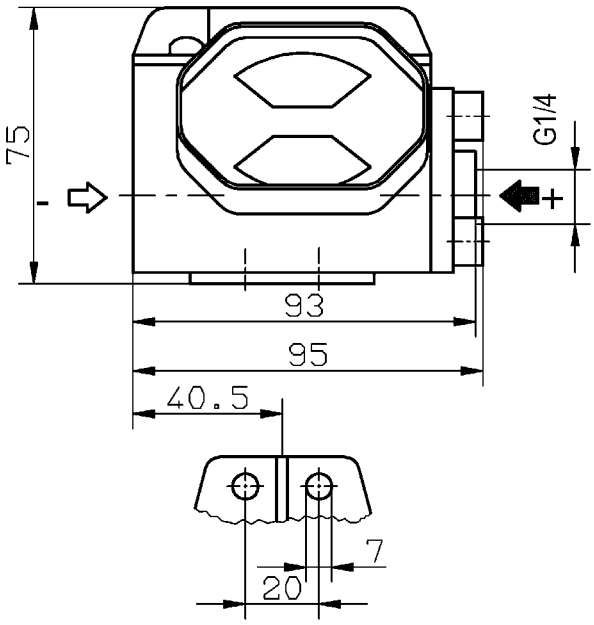
3. Loosen cover screws (3) and remove cover (1).

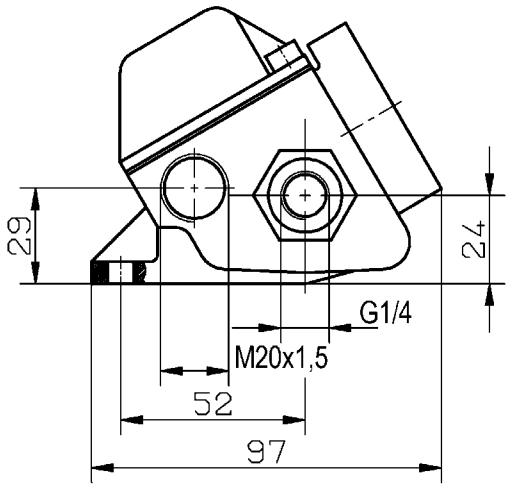
4. Assemble in reverse order

Check seals items 6 and 7 for damage.

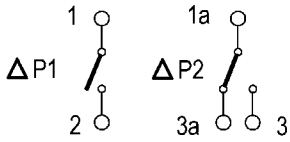
5. For sieve cleaning and commissioning, see Sieve Cleaning Operating Instructions and Double Filter Operating Instructions.

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

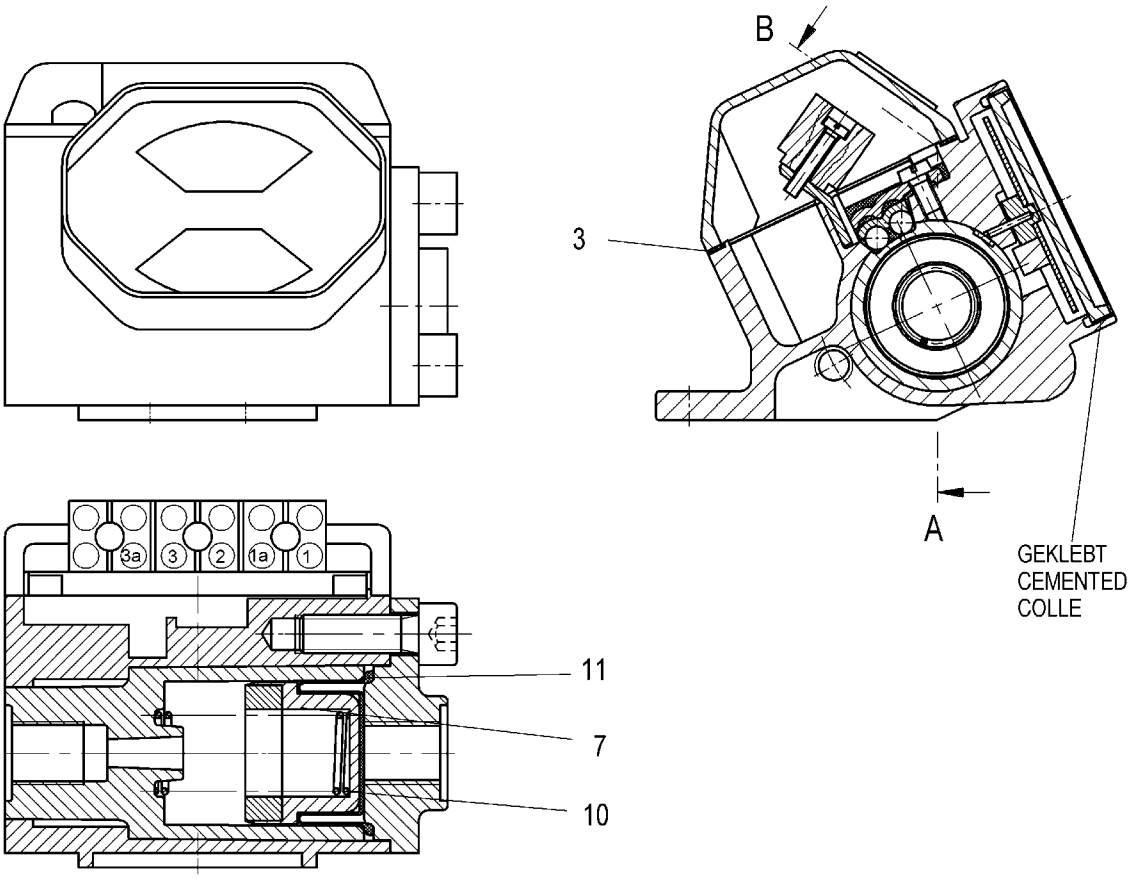
DESCRIPTION:
THE PURPOSE OF THIS DEVICE IS THE MEASUREMENT, AND VISUAL INDICATION OF THE DIFFERENCE IN PRESSURE BETWEEN TWO POINTS, AND THE ESTABLISHMENT OF AN ELECTRICAL CONTACT WHEN THE PRESSURE DIFFERENTIAL ATTAINS A SPECIFIED FIGURE.

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

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

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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Deutschland/Germany
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