Instruction manual

BEGEROW

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01/04 WP

BECO-COMPACT® PLATE 200 SF-E

The depth filtration system for laboratory and pre-production applications

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1 USER INFORMATION

This instruction manual is aimed at **several** groups of persons. Prior to connecting and commissioning the BECO-COMPACT® PLATE depth filtration system, the installation and operating staff must familiarize themselves with the instruction manual.
The instruction manual was prepared according to the current state of our practical experience and areas of application. The safety devices integrated into the device do not acquit users from their obligation to operate the device attentively and carefully.

The "staff" groups are assumed to be properly trained in the handling of filtration systems for food, chemical and pharmaceutical applications. Familiarity with the regulations regarding explosion protection and handling of dangerous substances is assumed.

Staff qualification/training

Staff involved in the operation, maintenance, inspection and installation must be qualified appropriately. The operator should provide precise information about the scope of responsibility, the responsible persons, and staff supervision. If the staff do not have the required knowledge or experience, BEGEROW staff or staff authorized by BEGEROW must provide appropriate training and instructions. If necessary, the machine/device operator may ask the manufacturer/supplier to carry out such training. The operator must ensure that the staff fully understand and implement the content of this instruction manual.

The safety instructions specified in the instruction manual **must** be followed. Section 2 contains general safety instructions and a summary.

All safety instructions are associated with a safety symbol, e.g.:

Hazard warning

Important notes are indicated by a cross symbol:

IMPORTANT NOTE +

Notes attached directly at machines/devices must be followed and maintained in a fully legible state.

2 SAFETY INSTRUCTIONS

2.1 GENERAL SAFETY INSTRUCTIONS

2.1.1 General

- ▷ All our machines/devices are manufactured according to the current state of the art and checked at our premises. They are packaged to avoid damage in transit.
- ▷ After careful unpacking and checking of the consignment, immediately notify the carrier of any transport damage, unless agreed otherwise. Any claims for compensation should be filed with the carrier. The transport risk passes to the customer as soon as the shipment has left our warehouse, unless agreed otherwise.
- ▷ Ensure proper storage conditions, if the device is not used immediately.
- ▷ Protect the machines/devices from cold, moisture and dust, as well as from mechanical influences.
- ▷ Installation and maintenance should be carried out by appropriately trained staff.

2.1.2 Structural requirements

- ▷ The supporting surface must be designed for the floor load per foot as specified in the technical information.
- ▷ Adequate ventilation of the premises must be ensured if CO_2 or other gases are used.
- ▷ The lighting must be designed to ensure proper recognition of the control and monitoring devices.

2.1.3 Risks of non-compliance with the safety instructions

Non-compliance with the safety instructions could result in risks for persons, machines/devices, the product, and the environment. Non-compliance with the safety instructions nullifies any claims for compensation.
The risks of non-compliance include the following:
- Failure of important machine/device functions
- Failure of specified servicing and maintenance procedures
- Risks for persons through electrical, mechanical or chemical influence
- Risks for persons or the environment through leakages of dangerous substances

2.1.4 Safe working practices

The safety instructions specified in this manual, the current national accident prevention regulations, and the internal working, operating and safety regulations of the company must be followed.

2.1.5 Safety instructions for the operator

- Pressure vessels must not be operated without relief valve.
- Safety devices must not be bypassed, modified or deactivated.
- If hot or cold machine or device components pose a risk, the customer must provide protection from contact with these components.
- Leakages of dangerous material (e.g. explosive, toxic, hot) should be dealt with in such a way that risks for persons or the environment are avoided. Statutory regulations must be complied with.
- Prior to opening the machine/device, all supply and discharge lines must be sealed and the vent and drain lines must be open to ensure that the system is pressureless.
- After completion of maintenance or assembly tasks and prior to startup, the device must be checked for tightness.
- Any tubes or pipes that my discharge liquids directly to the environment must be installed securely to avoid personal injury.
- The relief valve drain must face downwards.

2.1.6 Unauthorized modification and fabrication of spare parts

Any modification or changes of the machines/devices require approval by the manufacturer. Safety is ensured by using original spare parts and accessories approved by the manufacturer. The manufacturer cannot accept any liability for consequences arising from the use other parts.

2.2 SPECIAL SAFETY INSTRUCTIONS

All safety instructions listed here are repeated as appropriate in the individual sections.

The **maximum permissible operating overpressure** is 3.2 bar and must not be exceeded!

Measures should be taken to prevent unauthorized persons from working or manipulating the BECO-INTEGRA® PLATE.

Warning regarding excessive unfiltrate content and additional application of filter aids and/or activated carbon.

⇨ The filter system is specifically designed for clarification filtration with depth filter sheets.

Caution: danger of crushing! No persons may be present in the pressing area, and no objects must protrude into this area.

⇨ High contact pressure may lead to severe injuries, and hard objects may destroy the filter elements.

Caution during the application of cleaning agents or solvents.

⇨ Verify compatibility with all materials including gaskets.

⇨ Keep system pressures low, protect filter according to occupational safety practice.

Warning regarding hot surface during sterilization.

⇨ Protect the device from contact, since the surface becomes very hot. Wear protective gloves.

⇨ Work on the electrical system must only carried out by skilled personnel.

⇨ Never disconnect live connections.

2.3 UNACCEPTABLE OPERATING MODES

- The reliability the supplied machines/devices is only guaranteed for appropriate use according to the following sections of the instruction manual. The limit values specified in the technical data must not be exceeded.
- The machine/devices must be pressureless and empty before any maintenance or repair work is carried out. The procedure described in the instruction manual for shutting down the machines/devices must be followed.
- Machines/devices containing hazardous media must be cleaned prior to opening.
- All safety and protection devices must be reinstalled or reactivated immediately after work on the device is complete.
- The machines/devices must be operated according to the procedures specified by Begerow and contained in this instruction manual, or according to customized instructions prepared by our process engineers.

3 TEST CERTIFICATES

The product inspection and compression test for our machines/devices is carried out by technical experts or specialists at our premises. The documents for the product inspection and compression test are archived at the manufacturer.
The operator is responsible for an initial inspection prior to commissioning and recurring inspections of the machines/devices. The relevant national regulations must be followed.

4 PRODUCT DESCRIPTION

4.1 TECHNICAL DATA

Filter area per filter sheet	0.035 m²
Filter sheet format	200 x 200 mm
Max. operating overpressure	3.2 bar
Max. operating temperature	90° C
Pump delivery volume	0.5 - 45 l/min.
Max. pump pressure	3.2 bar
Pump motor capacity	0.37 kW 230V, 50 Hz 2800 rpm
Connections (inlet and outlet)	hose socket 20 mm
Weight (empty)	approx. kg

The individual filter components consist of the following materials:

Parts in contact with media	-stainless steel ASI 304L - plastic
Other parts except spindle nut	-stainless steel ASI 304 - brass
Spindle nut	- bronze

4.2 PERFORMANCE DATA

The filter performance depends on the liquid to be filtered, the nominal throughput, the depth filter sheets used, and the particle size in the liquid to be filtered.

4.3 DEVICE DESCRIPTION

The filter consists of a stationary frame. The filter elements (filtrate plate and unfiltrate plates) are supported by two support bars mounted between the fixed starter plate at one end and the movable end plate on the opposite side. A central spindle on the side of the movable end plate compresses the filter packet between the starter and end plates. The pump mounted on the frame can be used as a separate feed pump for liquids or for generating the filtration pressure.

4.4 AREA OF APPLICATION / INTENDED USE

The BECO-COMPACT® PLATE 200 SF-E is used for the filtration of liquids. It operates according to the principle of filtration with depth filter sheets. Unfiltrate flows in parallel across all depth filter sheets. Step filtration is only possible via a baffle plate. The baffle plate separates the filter packets of the individual filtration stages.
Depending on the application, undesirable solid matter, unfiltrate particles or micro-organisms can be removed from the liquid to be filtered. The filtration strength is determined by the type of depth filter sheet used. Filtration tasks ranging from coarse clarification to sterile applications are possible.
To ensure safe operation of the filter, for each application the chemical compatibility of the product to be filtered with the gaskets and material of the device (frame and filter elements) must be verified.
The maximum permissible operating overpressure and temperature must not be exceeded.

5 Transport, storage, installation

5.1 TRANSPORT

All our machines/devices are thoroughly checked prior to leaving our factory and are properly packed to avoid damage in transit. Appropriate auxiliary equipment must be used for transferring our machines/devices, paying due attention to the center of gravity.

5.2 STORAGE

Ensure proper storage conditions, if the machine/device is not used immediately. The manufacturer cannot accept any liability for damage caused by improper storage or transport at the customer's premises.
Protect the machines/devices from cold, heat, moisture and dust, as well as from mechanical influences.

5.3 INSTALLATION INSTRUCTIONS

1.	Remove the device carefully from the box and remove the packaging material.
2.	Install the device at its intended position.
3.	Connection of the feed pump (see separate instructions in the Appendix (Section 12).

⇨ **Work on the electrical system must only carried out by appropriately trained staff.**

⇨ **Never disconnect live connections.**

6 Information regarding the site of operation

6.1 SPACE REQUIREMENTS

The space required for the BECO-COMPACT® PLATE 200 SF-E is approx. 1 m², plus access around the filter.

6.2 QUALITY OF THE FOUNDATIONS

The foundation must be designed for the floor load per foot as specified in the technical information. The base must be resistant against influences occurring during operation of the machines/devices (e.g. water, cleaning solution etc.).

6.3 INFRASTRUCTURE LIST

If possible, the filtrate feed and discharge lines should have the same cross sections as the feed and discharge flanges of the device.

6.4 SAFETY INSTRUCTIONS

The instructions listed in this section must be followed to ensure trouble-free and safe operation.

The **maximum permissible operating overpressure** is 3.2 bar and must not be exceeded!

Adequate ventilation of the premises and proper, safe exhaust must be ensured if CO_2 or other gases are used.

7 Operating materials

7.1 SUBSTANCES TO BE FILTERED

The use of media other than beer, wine, sugar syrup, fruit juices, alcohol, cold, sterilization and degassed water requires written approval from the manufacturer.

7.2 CLEANING MATERIALS

Acid:	citric acid	80-85 °C	max. 1 %
Alkaline solution:	caustic soda (NaOH)	80-85 °C	max. 1.5 %

(examples: acid, alkaline solution, disinfectant)

Caution during the application of cleaning agents or solvents.

- ⇨ The durability of the gaskets must be ensured.
- ⇨ The agents must not attack stainless steel.
- ⇨ Keep system pressures low, protect filter according to occupational safety practice.
- ⇨ The suppliers' safety instructions for these products must be followed.

7.3 SAFETY INSTRUCTIONS

During the sterilization, the device is heated to 82-131 °C - risk of burns!

Warning regarding hot surface during sterilization.

- ⇨ Protect the device from contact, since the surface becomes very hot. Wear protective gloves.

8 Using the device

8.1 GENERAL

8.1.1 Control and monitoring unit

The pressure gauge and the thermometer (for hot filtration to be installed by the customer in the supply line) must be monitored according to the technical specification.

8.1.2 Measures before initial startup

The piping (also hose connection) of our machines/devices must be sealed and checked by appropriately qualified staff.

Commissioning

Prior to commissioning, the inlet and outlet valves, plates, filter elements, fittings and rubber sleeves must be cleaned with warm water. Avoid using aggressive chemicals, particularly caustic soda. After cleaning, the filter should be checked for proper assembly.

8.1.3 Preconditions for optimum function

SELECTING THE SHEET TYPE
The choice of sheet type for a particular filtration depends on the required filtration effect and throughput, and on the characteristics of the liquid to be filtered. We therefore recommend seeking advice from our agency to consider adjusting your choice of sheet type based on the first filtration results. Sharper filtration reduces the throughput rate. Conversely, a larger throughput rate can only be achieved by reducing the current filtration depth accordingly.

WORN OUT DEPTH FILTER SHEETS
If a filtration pressure of 1.0 bar occurs at the start of the filtration despite rinsing, the sheets are clogged and should be replaced. Failure to do so may mean that the filtration has to be interrupted if, despite high pressure, the throughput rate is no longer satisfactory.

8.2 FILTER COMPONENTS

The BECO-COMPACT® PLATE 200 SF-E is a convertible plate and frame filter with square filter elements used for holding depth filter or support sheets. BEGEROW offers a wide range of industry-specific depth filter sheet types, so that the filter system can be individually adapted to the respective customer requirements for special applications. By using a baffle plate the filter can operate as a combination filter, i.e. two consecutive filtration stages can be realized in a single filtration step.

The BECO-COMPACT® PLATE 200 SF-E is an independent filter device consisting of the following main components:

- ▹ mobile frame with movable pressing lid and fixed lid, rightening spindle,
- ▹ drip pan
- ▹ feed pump
- ▹ fittings, consisting of pressure gauge, outlet valve and blind plugs.
- ▹ filter elements (filtrate and unfiltrate plates), each with 2 gaskets
- ▹ 2 end plates
- ▹ 1 baffle plate

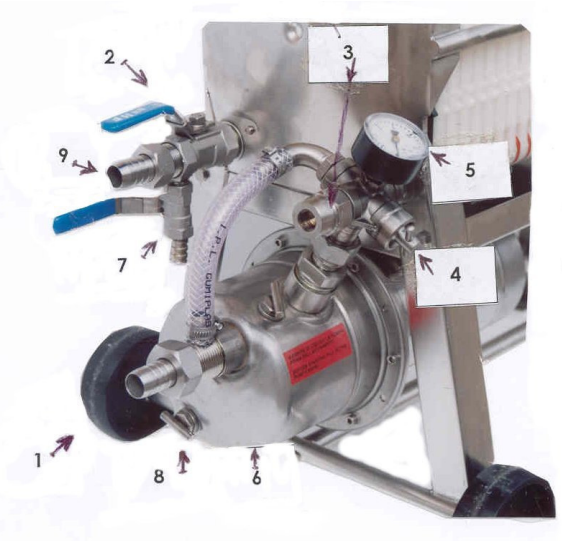


Fig. 2

1 supply connection
2 outlet valve
3 plug
4 bypass valve
5 pressure gauge
6 EBARA impeller pump
7 valve for clarity check
8 connections for cleaning
9 outlet connection

Figure 2 shows the filter ready for filtration. The discharge valve (2) for the filtered liquid is open.
Pressure and flow can be controlled via the bypass valve (4).

The clarity check valve (7) is used for testing the liquid during filtration.

8.2.1 Filter chassis

The filter chassis is manufactured in a single frame size covering the complete range of filter surface areas. The filter chassis consists of the following components:

8.3 PRINCIPLE OF OPERATION

The BECO-COMPACT® PLATE 200 SF-E operates according to the principle of filtration with depth filter sheets. Undesirable haze substances are removed from the liquids to be filtered. Special BECO depth filter sheets are available for a wide range of applications.

8.4 COMMISSIONING

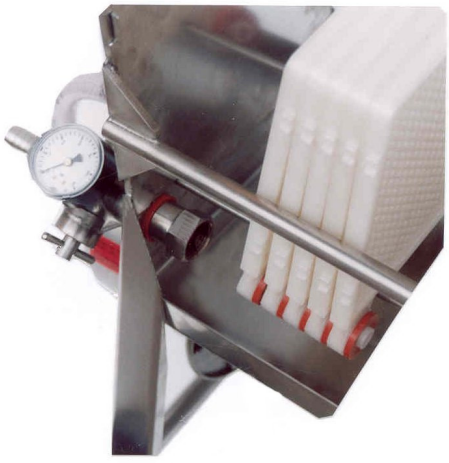


Fig. 1

The plate and frame filter has two basic functions: The impeller pump can be used separately for transferring liquid or for filtration. Figure 1 shows the filter position that enables liquid transfer via the impeller pump without filter. In this case the filter must be opened, the filter plates removed, and the plugs (3) screwed down to seal the unit. The outlet connection (9) is unscrewed and installed at the previous position of plug (3) with dual thread. The pump can now be used separately.

Prior to commissioning, the BECO-COMPACT® PLATE 200 SF-E should be cleaned with an alkaline cleaning agent and subsequently rinsed to ensure neutrality.

We recommend the use of liquid SIHA power cleaner, a strong alkaline cleaning agent, which has been tried and tested for CIP cleaning of devices. SIHA power cleaner is available from BEGEROW under article number 7.2003 in container sizes of 6, 15 or 40 liters.
SIHA power cleaner can be used in the temperature range between 10-85 °C and in a concentration of 1-5%. We recommend using a 2% solution, ideally with warm water at approx. 50 °C.

If highly concentrated cleaning agents or disinfectants are used, compatibility with the filter materials must be ensured.

8.4.1 Procedure

- Precleaning
- Configuration of the filter packet
- Inserting the BECO depth filter sheets
- Pre-pressing of the filter packet
- Sterilization (if required)
- Wetting or rinsing (if required)
- Final pressing of the filter packet
- Priming
- Filtering
- Discharging
- Cleaning

The necessity and sequence of the process steps "sterilizing, wetting and regenerating" is determined by the particular process sequence and product characteristics.

8.4.2 Configuration of the filter packet

Filtration with the liquid flowing through depth filter sheets once:

For single-cycle filtration, the baffle plate identified by a black dot is removed. For the change-over from single-cycle to dual-cycle filtration, the outlet (2) on the movable metal plate is closed with a plug, so that the liquid is discharged through outlet 3 (outlet valve in Figure 2), which is open.

Filtration with the liquid flowing through depth filter sheets twice:

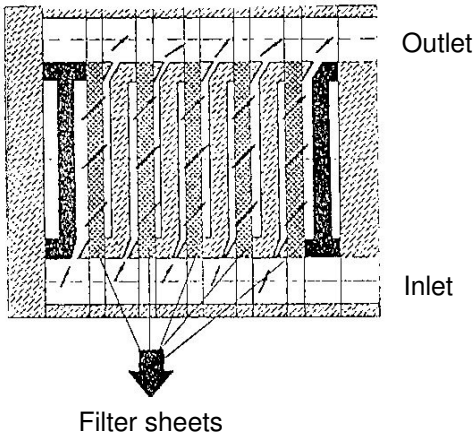
The filter is equipped with a baffle plate that enables dual filtration. During dual filtration, the liquid is first filtered through coarser depth filter sheets and then through finer sheets. The liquid enters channel A and is filtered into channel B-B1 through coarse depth filter sheets. Because outlet 3 is plugged, the liquid flows through channel B-B1 towards the finer depth filter sheets at B1. From here, the liquid is filtered in the opposite direction into channel A1. After dual filtration, the liquid is discharged through outlet 2 (Figure 3). Outlet 3 (discharge valve in Figure 2) is closed.

The baffle plate (4) has a lock and a black dot that is visible from above. It faces in the direction of the liquid outlet on the movable black metal plate (Figure 3), where the outlet connection is installed in place of the plug.

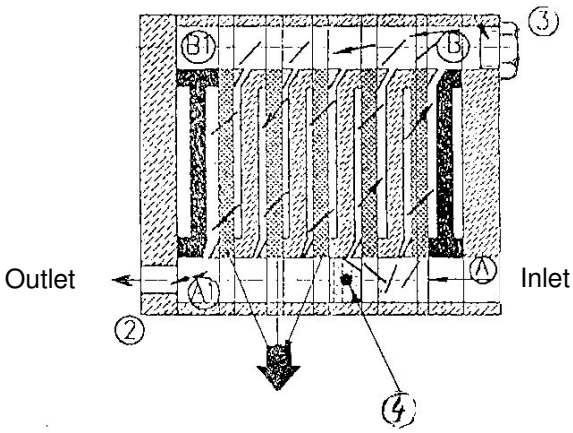
Filtration with shorter filter

This filter is used for the filtration of smaller quantities of liquid. White filter plates are removed, but never more than half the number of plates. The black edge filter plates remain in the filter. This saves depth filter sheets.

Single



Dual



8.4.3 Inserting the BECO depth filter sheets

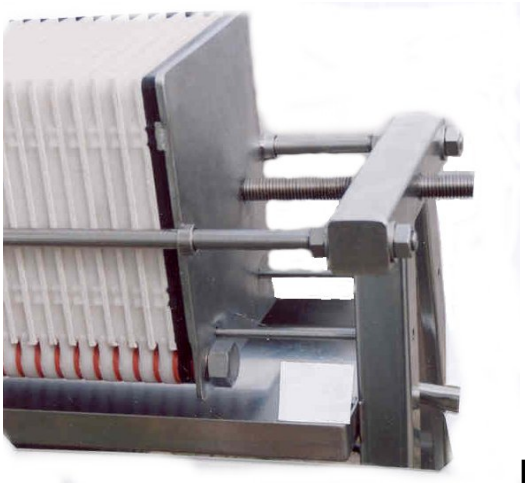
A depth filter sheet is a homogeneous entity. During manufacture, a rough inlet side and a smooth outlet side is created. Using a mechanical process, the outlet is treated to make it act like a fiber fleece. The depth filter sheet surface is rougher on the unfiltrate side (inlet) rough than on the filtrate side (outlet). The filtrate side shows the BECO logo, the type designation and the production number.

The depth filter sheets are inserted such that the finer side faces the valves. All depth filter sheets face in the same direction. Depth filter sheets are only inserted between the plastic plates.

For dual filtration, the baffle plate is inserted in any position such that the dot faces the connection on the movable plate. Between the fixed plate and the dot the depth filter sheets are inserted in the same way as for single filtration. Beyond the dot, the depth filter sheets are inserted in the opposite direction.

8.4.4 Pre-pressing of the filter packet

Prior to sterilizing and rinsing, the filter packet is subjected to a pre-pressing pressure. The pre-pressing pressure is reached once the depth filter sheets are slightly compacted. For sterilization the filter packet must not be pressed further, because thermal expansion could damage the filter elements and the frame.



Filter packet in pressed state.

Fig. 3

8.4.5 Sterilization

The BECO-COMPACT® PLATE 200 can be sterilized with hot water. Sterilization should preferably be carried out in the direction of the flow. The following procedure should be followed to ensure safe sterilization:

Warning regarding hot surface during sterilization.

⇨ Protect the device from contact, since the surface becomes very hot. Wear protective gloves.

8.4.5.1 Sterilization with hot water

The hot water sterilization procedure is equivalent to the steam procedure.

- ▹ Use hot water at 85-90 °C. The flow velocity should match the nominal capacity of the filter. Do not exceed a system pressure of 300 kPa. The hot water used must be free from any contamination.
- ▹ For sterilization, only compact the filter packet slightly so that the depth filter sheets are just sealed.
- ▹ Ensure that all vent valves are open. Release all blind caps at the outlet pieces, so that hot water can freely flow through the inside of the filter.
- ▹ Slightly open all drain valves in order to ensure good flow.
- ▹ Connect the hot water supply to the filter inlet.
- ▹ Carefully open the hot water valve. During the complete sterilization process, ensure that the maximum permissible pressure and temperature are not exceeded.
- ▹ Fill the filter with hot water. Ensure adequate venting during the sterilization.
- ▹ The sterilization time is at least 20 minutes from the time when the temperature of the hot water reaches 85 °C at the filter outlet (depending on requirements).
- ▹ Prevent re-infection after the sterilization by maintaining positive pressure inside the filter.

8.4.6 Rinsing

Rinsing of the filter packet serves to cool down the filter after sterilization, and to swell the depth filter sheets to ensure optimum filtration characteristics. At the same time, sealing of the filter around the edge is improved.

The following points should be noted:

- Always rinse in the direction of the flow. The flow velocity should be 15 l/h, and depth filter sheet format 20x20 should be used.
- The filter should be vented during and after priming.
- The rinsing duration depends on the particular requirements.

For products that must not be mixed, different techniques can be used depending on the product:

- The system is not rinsed at all.
- The initial quantity of filtered liquid is returned to the feed tank and mixed with the main quantity.
- A defined quantity is passed through the system or circulated and then discarded.

8.4.7 Final pressing of the filter packet

Prior to the filtration, the filter packet should be compacted with the specified contact pressure. In order to minimize drip losses, the contact force of the rightening spindle was specified to ensure sufficient edge sealing of the depth filter sheets. The required contact pressure is reached once the rightening spindle can no longer be moved freely without auxiliary means. The average thickness of a BECO depth filter sheet after compaction is between 0.8 and 1.8 mm, depending on the sheet type.

8.4.8 Priming

Depending on the procedure, the empty filter is filled with liquid, or the rinsing medium is displaced by the liquid to be filtered. Adequate venting must be ensured during this process.

Note the following during priming:

- ▹ Close the drain valves.
- ▹ Leave the vent valves open.
- ▹ The filter inlet and outlet valves remain open or are closed depending on the procedure, and are opened slowly before or after priming.
- ▹ Adequate venting must be ensured during priming and during the complete filtration process.

8.4.9 Filtering

Feed pump

The centrifugal pump mounted on the device is used for supplying the product. It is a variable-pressure pump with a flat characteristic curve (see instruction manual in the Appendix, Section 12). The outlet valve at the filter must be set for the required flow rate.

Pressure shocks

The procedure should be set up such that continuous product flow is ensured. Pressure shocks must be avoided during filtration. Frequent pressure shocks can cause particles and micro-organisms retained in the filter sheet to be pushed through the filter sheet. Frequent pressure shocks reduce the overall throughput, since the structure of the depth filter sheet may be damaged. The filtration result can no longer be assured.

Adequate venting must be ensured during the complete filtration process. Air inclusions in the filter packet lead to a reduction in effective filter area and have a negative impact on the filtration result. Trapped air flows through the filter sheet relative to the liquid to be filtered, but with significantly higher speed, which means that it can take retained substances with it.

Pressure conditions

Monitoring of the filtration mainly consists of observing the pressure conditions in the filter packet and the clarifying level of the filtrate being discharged. The maximum permissible operating pressure of the BECO-COMPACT® PLATE 200 is 3.20 bar, the maximum permissible differential pressure is 3.0 bar. The maximum permissible differential pressure between the unfiltrate side and the filtrate side mainly depends on application-specific requirements and are based on the required product safety and the mechanical stability of the depth filter sheet. The instructions of the depth filter suppliers must be followed. A pressure gauge for monitoring the pressure conditions is provided at the filter inlet. If a counterpressure is present at the filter outlet, the customer should provide a pressure gauge for pressure monitoring.

Hazing

If hazing is detected at the filter outlet or by a technical device (turbidity meter), the filtrate does not meet the required quality standard, and the filtration should be stopped immediately. Check whether the depth filter sheets were inserted properly;

- ▹ the choice of depth filter sheet is correct (correct clarifying sharpness?);
- ▹ a depth filter sheet was damaged;
- ▹ the filtrate plates or outlet channels are contaminated.

Finding the right BECO depth filter sheet requires pre-trials to be carried out. You may seek advice from our filtration specialists at any time, who will be pleased to provide assistance for the selection of the correct BECO depth filter sheet and can carry out any laboratory pre-trials that may be required.

End of filtration

The filtration should be stopped once the maximum permissible pressure difference or the maximum permissible operating pressure in the filter system is reached. During filtration, the pressure increased due to increasing trub retention of the depth filter sheets.

8.4.10 Emptying

The filter packet can be emptied in different ways. Depending on the application, the product can be displaced with an appropriate solvent, with compressed air, or with an inert gas. If compressed air or inert gas is used, unfiltrate may be pushed through the depth filter sheet to the filtrate side. This may cause clouding of the filtrate. The filtrate may have to be collected separately during draining.
The pressure of compressed air or inert gas should be reduced via a pressure reducing valve in order to avoid damaging the filter or the depth filter sheets. The compressed air used must be free from contaminants. Depending on the depth filter sheet type, the maximum pressure should be between 10 and 30 kPa.

8.4.11 Cleaning

In order to avoid residues that may have a negative impact on subsequent filtrations, the BECO-COMPACT® PLATE 200 should be cleaned thoroughly after every filtration. The filter elements and outlet channels on the filtrate side must be treated with care. In most cases, a simple water jet is sufficient for cleaning. The filter elements can be removed from the filter chassis if the device is to be cleaned in a rinser or cleaning bath.

If industrial cleaners or solvents are used, compatibility with the materials used must be verified.

Caution during the application of cleaning agents or solvents.

⇨ Compatibility with the filter plates and gaskets must be verified.

⇨ Keep system pressures low, protect filter according to occupational safety practice.

9 MAINTENANCE

9.1 CARE

The machines/devices and their environment should be kept clean.

9.2 MAINTENANCE

The following points should be noted in order to ensure proper compaction of the filter packet, thus avoiding drip losses:

- ▷ The pressure spindle should always be lubricated appropriately.

Ensure that the instruction manual is read and understood prior to any maintenance work.

9.3 INSPECTIONS

The operator is responsible for carrying out initial and recurring inspections. The relevant national regulations must be followed.

9.4 REPAIR

The operator may carried out repairs himself using adequately trained staff, although it is recommended to use Begerow staff

9.5 SAFETY INSTRUCTIONS

Any modification or changes of the machine/devices require approval from the manufacturer. Safety is ensured by using original spare parts and accessories approved by the manufacturer. The manufacturer cannot accept any liability for consequences arising from the use other parts.

Maintenance may only be carried out by BEGEROW staff or by appropriately trained staff

10 SPARE PARTS

10.1 SPARE PARTS FOR THE DEVICE

Important note:

Only the serial nos. specified in the above spare parts list may be used for ordering spare parts.

Original parts and accessories are designed specifically for **BEGEROW** machines. We expressly point out that we are unable to check and approve any spare parts and accessories that were not supplied by us. The installation and/or use of such products may have a negative impact on the structural characteristics of the **BEGEROW** machines, thereby affecting the active and/or passive safety. The manufacturer will not accept any liability for damage caused by the used of non-original parts or accessories.

Please always specify the following when ordering spare parts:

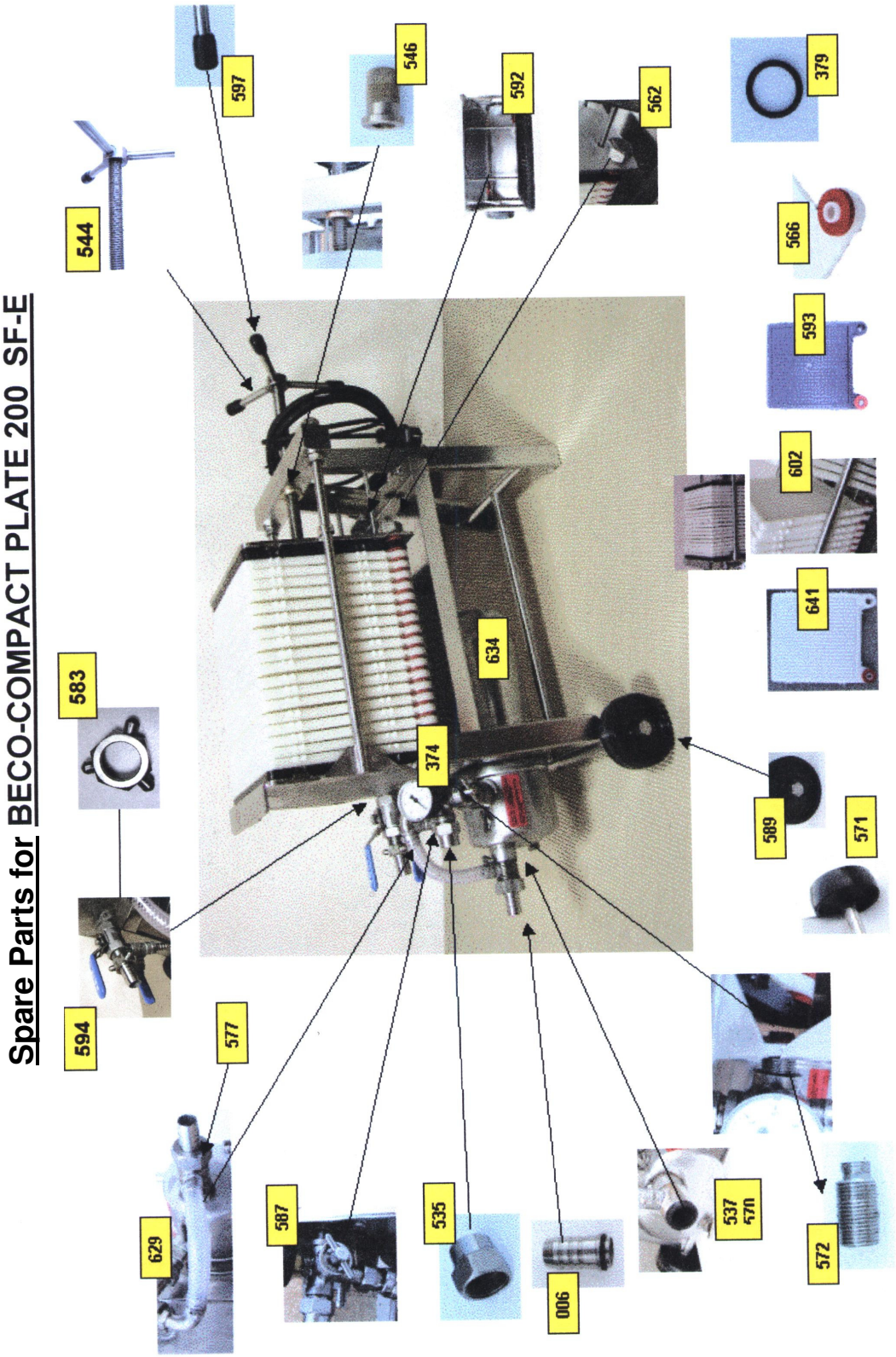
- Serial number and type designation
  (both can be found on the identification plate)
- Parts lists no. including item no., description, article no. and material
- Your delivery address
  (rail - mail - airport)

Identification of wear and tear parts in the parts lists / spare parts lists

In the parts lists, wear and tear parts are identified under "Code" according to the following criteria:

Code	Description	Examples
1	Wear and tear parts that the customer should always keep in stock, in order to ensure smooth operation of the system.	gaskets, limit switches, V-belts, toothed belts ...
2	Spare parts that may be required within approximately 2000 operating hours.	lamps, tubes ...
3	Parts that should be replaced after approximately 4000 operating hours.	Friction and roller bearings ...
9	Components containing wear and tear parts with codes 1, 2 and/or 3.	floating ring seals, gearing, valves, pumps ...

Spare parts for BECO-COMPACT® PLATE 200					
Item no.	**Qty.**	**Article no.**	**Description**	**Material**	**Code**
006	1	-	Outlet connection	AISI 304	-
374	1	-	Pressure gauge NG63, 1/4" axial	-	2
379	1	-	O-ring 17 x 2.5	silicone	1
535	1	-	Plug 3/4" - 3/8"	AISI 304	-
537	1	-	Connection kit	AISI 304	-
544	1	-	Spindle	AISI 304	-
546	1	-	Spindle nut DMR 24x43	bronze	-
562	1	-	Lock nut 3/4"	AISI 304	-
566	40	-	Element gasket	silicone	1
570	2	-	O-ring 24 x 3	silicone	1
571	2	-	Wheel 100 x 32	plastic	-
572	1	-	Sealed connection	AISI 304	-
577	2	-	Screw cap 1"	AISI 304	-
583	1	-	Nut with grips	AISI 304	-
587	1	-	Bypass valve	AISI 304	-
589	2	-	Screw with nut M12	AISI 304	-
592	2	-	Rod M6	AISI 304	-
593	2	-	End plate B200 (black)	plastic	2
594	1	-	Outlet valve	AISI 304	9
597	3	-	Arm	plastic	-
602	1	-	Baffle plate B200 (white)	plastic	2
634	1	-	Impeller pump EBARA M5 with connections	-	9
641	18	-	Filter plate B200	plastic	2


Spare Parts for BECO-COMPACT PLATE 200 SF-E
597
546
592
562
379
544
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10.2 SPARE PARTS ORDER FORM

A spare parts order form is provided in the Appendix, Section 13

11 DISPOSAL OF THE DEVICE

The device must be empty, clean and pressureless.

11.1 THE DEVICE

The device must be disposed of according to country-specific regulations.
It is made from high-quality stainless steel and should be recycled if possible.

11.2 THE DEPTH FILTER SHEETS

The sheets must be disposed of according to country-specific regulations.
After the filtration, the sheets will be contaminated with filtration residue.

11.3 FILTER RESIDUE

The sheets must be disposed of according to country-specific regulations.

12 APPENDIX

- Order form for spare parts
- Instruction manual for the "EBARA M5" impeller pump

All information is given to the best of our knowledge. They reflect current know-how and do not claim to be complete. No warranty is expressed or implied.

Users should always check the suitability of our products for their specific applications and exercise all due care in using them. The relevant instruction manuals should be followed carefully. Misuse of the product will result in all warranties being voided.

We reserve the right to make technical changes.

Sender, Company

.....

.....

.....

..... Date: .....

Begerow GmbH & Co.
An den Nahewiesen 24
D-55450 Langenlonsheim

Tel: +49 (0) 6704 - 204 01
Fax: +49 (0) 6704 - 204 121

Spare parts for BECO-COMPACT® PLATE 200 SF-E

Enquiry
Order

Machine No.: .....

f.a.o.: ..... Required by:.....

Quantity	Article no.	Description	