3 TECHNICAL DATA

3.1 MACHINE DATA

ELEPHANT Filter Type	10.16
Year of Construction	2003

3.2 DIMENSIONS AND WEIGHTS

Height	mm	1824
Length	mm	4955
Width	mm	2156
Mesh size micron	µm	350
Operational Weight	Short Tons	8.5
Overflow Weight	Short Tons	15.8

3.3 Power Requirements

Type of ELEPHANT motor	SEW Eurodrive	FA1276DV132M 4-V/TF
Power of ELEPHANT motor (at 460V/ 60Hz)	hp	10

3.4 Operational Data

Throughput	gpm	265
Inlet mass flow	ppm	14,000
Inlet consistency	%	1.4
Inlet freeness	CSF	N/A
Shower water pressure	psi	60
Shower water consumption	gpm	128
Min. Disc- Speed	Hz	30
Max. Disc- Speed	Hz	80

3.5 OPTIONAL CHEMICAL ADDITIVES

In case chemical or other additives are required, the amount and type of dosage of these additives will be determined during start-up.

The following additive is/are to be used in this operation:

Dilution	%	N/A
Dosage	mg/l	N/A
Dosage Rate	l/min	N/A
Flow Rate	m^3/h	N/A

3.6 SYSTEM INTEGRATION

APPLICATION

INLET

The input flow to the ELEPHANT Filter is composed of the following streams:

- (see also Chapter 10.2)

4 TECHNICAL DESCRIPTION

4.1 USE

The ELEPHANT is a highly efficient thickener/filter for waste water, sludge, and fine rejects and a handy and robust washer for stock.

The machine consists chiefly of an inlet distributor, filtrate collector, and thickened outlet, all enclosed in a single housing (see "Figure 4-1: ELEPHANT Disc Filter

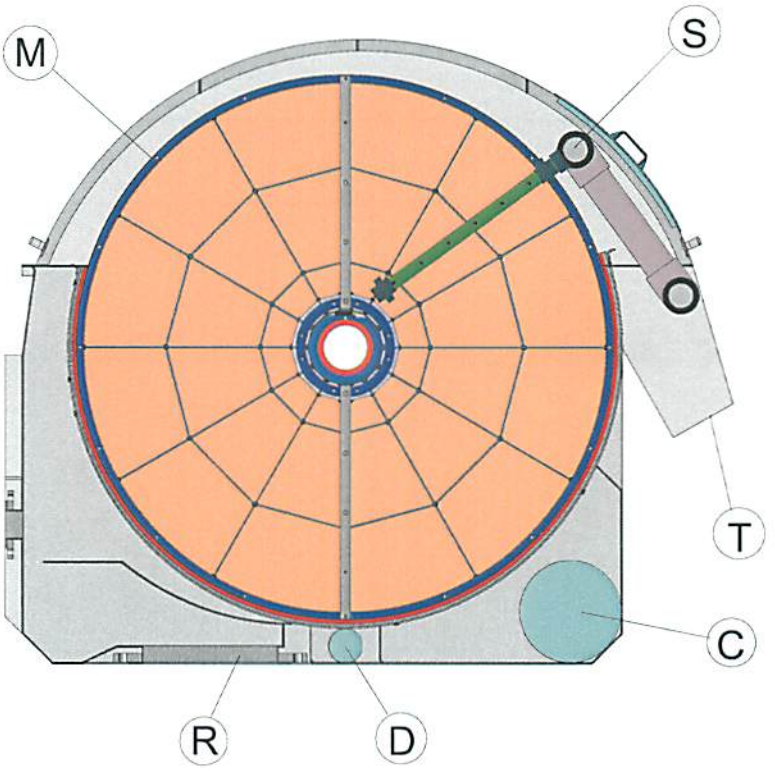


Figure 4-1: ELEPHANT Disc Filter

S =	Shower water nozzles	R =	Raw water inlet
D =	Drain	C =	Filtrate outlet
T =	Thickened outlet	M =	Screen disc

Pairs of discs are mounted on a horizontal shaft. The diameter of the discs and the number of discs on the shaft vary according to the size of the specific model installed.

The discs can be covered with a variety of screens (nylon or steel fabric) to assure an optimum solution for every application.

In general a stainless-steel fabric is used with mesh openings that vary between 250 and 500 µm.

The robust, but simple, design assures easy operation, low maintenance, and maximum availability.

4.2 Principle of Operation

The water to be treated passes through the inlet distributor and enters the space between one of the pairs of screen discs (see"Figure 4-2: Filtration", p. 4-2). All particles that are larger than the width of the mesh are held back by the screen and form a layer on the screen. This layer is called an assistant filter layer or "filter cake".

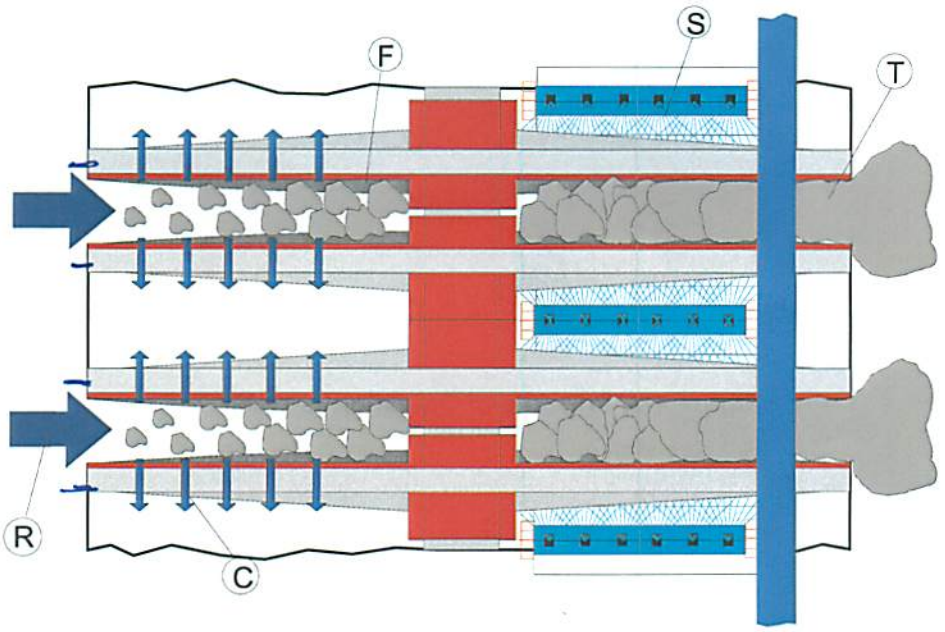


Figure 4-2: Filtration

R = Raw Water
S = Shower water
C = Filtrate
T = Thickened
F = Filter Cake

The buildup of this assistant filter layer also causes particles to be held back that are smaller than the mesh size of the screen being used.

To prevent the screens from becoming clogged by the ever increasing buildup of this filter cake, the screen discs rotate in the direction of the thickened outlet. By this the solids are concentrated and transported to the outlet chute At this point the

thickened material is expelled from rotating discs (see "Figure 4-3: Principle of Operation", p. 4-3).

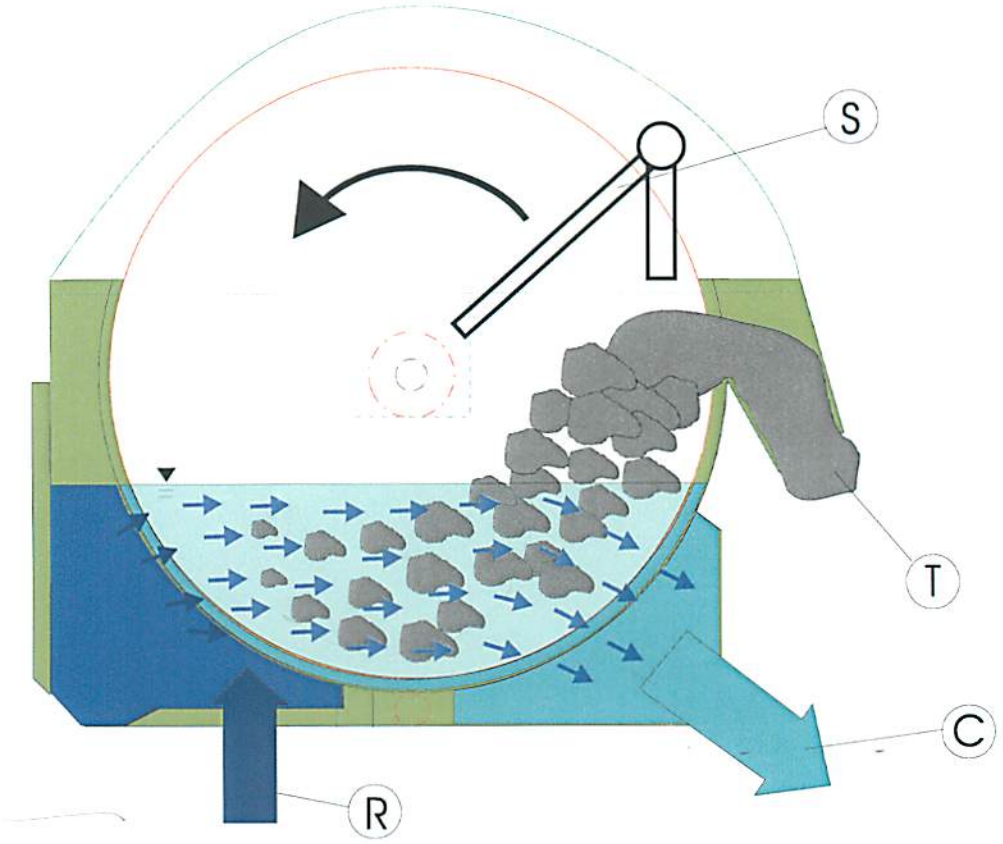


Figure 4-3: Principle of Operation

R = Raw Water
T = Thickened
S = Shower water
C = Filtrate

To assure that the screens remain totally free of pollutants, and to prevent the buildup of resins, gums, or similar blockages, the screens are cleaned by shower water nozzles in the upper part of the ELEPHANT Filter (see "Figure 4-3: Principle of Operation", p. 4-3). In this manner a cleaned screen surface is made available after every rotation.

The water passes out through the screens in the filtrate collector and is now ready to be channeled away for further uses.

In general the operation of the ELEPHANT filter needs adjustment to compensate for variations in throughput and in the composition of the incoming water to be treated. An input level is established at the outset and then maintained by a control that increases or decreases the rate of rotation of the disc. If the level of the water being processed rises, the rate of rotation is speeded up. If the level falls, the rate of rotation is slowed down.

The rate of rotation for normal operation ("design speed") is established separately for every application. For simple washing operations a high rotation speed is preferable, since this helps remove the ash and improves performance, and the in this case undesirable assistant filter layer only builds up slowly.

In contrast, a slow rotation speed is preferable for heavy-duty filtering and thickening operations. In this case the assistant filter layer builds up relatively quickly and fine particles are also held back.

4.3 CONSTRUCTION

The ELEPHANT Filter consists of several components: the tank, the motor and its gear drive, the shaft, the discs, the disc seal, the shower water pipes, and the cover.

TANK

The tank is divided into two chambers, the vat and the filtrate collector. Each is connected to the other by the tub in which the discs rotate. The tank has fixtures for the water supply and features an integral design which makes additional reinforcements or a supporting frame unnecessary.

MOTOR

The motor causes the discs to rotate. It is frequency-controlled and the rotation speed can be infinitely varied between 7 and 20 rotations per minute.

SHAFT

The shaft is supported at both ends by shuttle roll bearings and driven by a conical gear motor. Along its length several pairs of discs face each other which are covered with screening fabric.

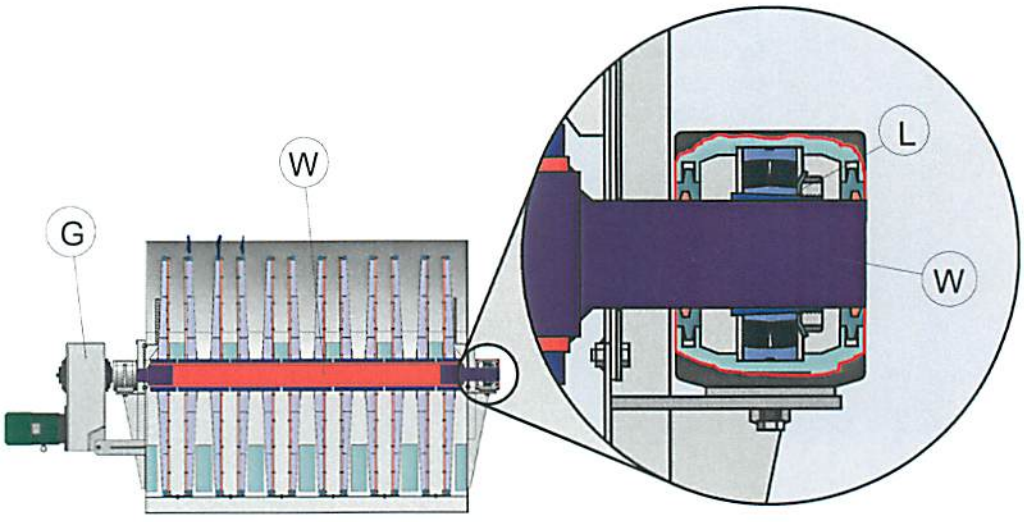


Figure 4-4: Motor and Shaft

G = Gear Drive W = Shaft L = Bearings

DISCS

Each disc consists of a welded frame construction to which a support mesh and the actual screen have been screwed. Each is fastened to the shaft with a clip. Depending on the application, the screen can be covered a variety of sieve mesh diameters ranging from 50 to 1200 µm.

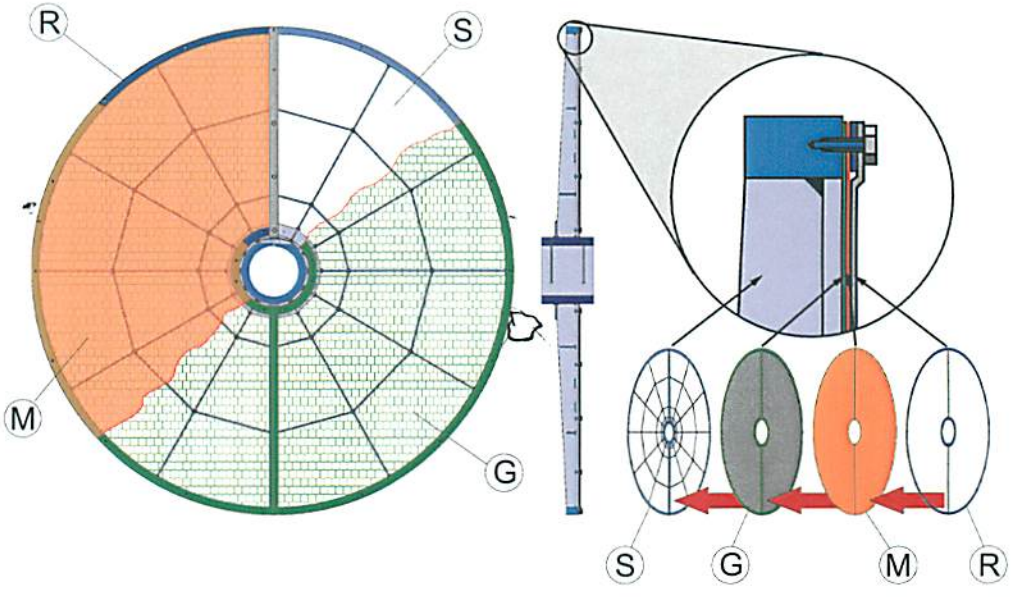


Figure 4-5: Disc Detail

S = Disc G = Support Mesh
M = Screen R = Ring

Disc Seals

The seal between each disc and the tub is a very important component of the ELEPHANT Filter. Each seal assures that the inlet and thickened area is reliably separated from the filtrate area, forcing the water to pass through the screening surfaces.

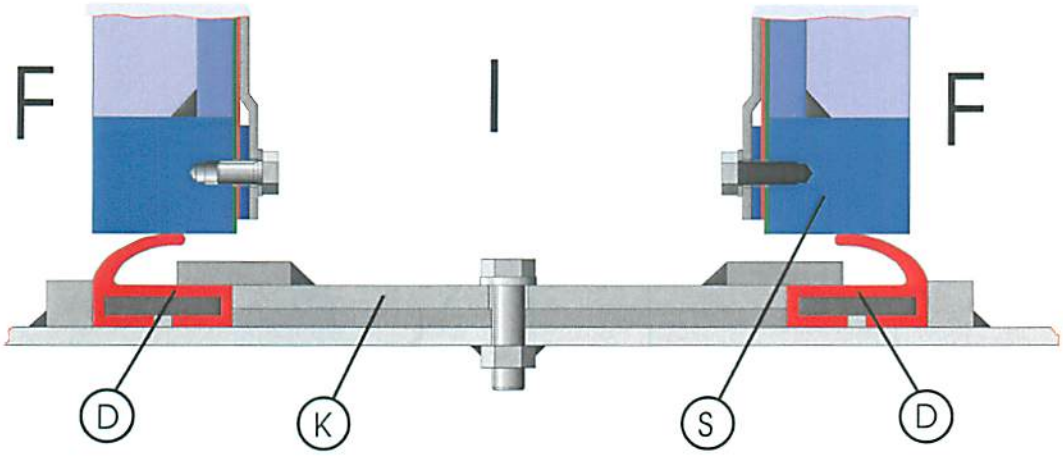


Figure 4-6: Disc Seal Detail

F = Filtrate
D = Seal
K = Seal Clamp Plate
I = Inlet
S = Disc

Shower Water Pipes

Another system component consists of shower water pipes to assure that the filter fabric is continuously cleaned of impurities during operation. The shower water pipes are made of stainless steel. Distribution pipes branch off at right angles in the filtrate area each of which are equipped with flat-shower water nozzles.

Cover

The final component is the covering that serves both to close off the top of the system to prevent shower water from leaving the system as well as to protect operating personnel from dangers which could occur as a result of the rotating parts. In addition, its presence keeps odors to a minimum.

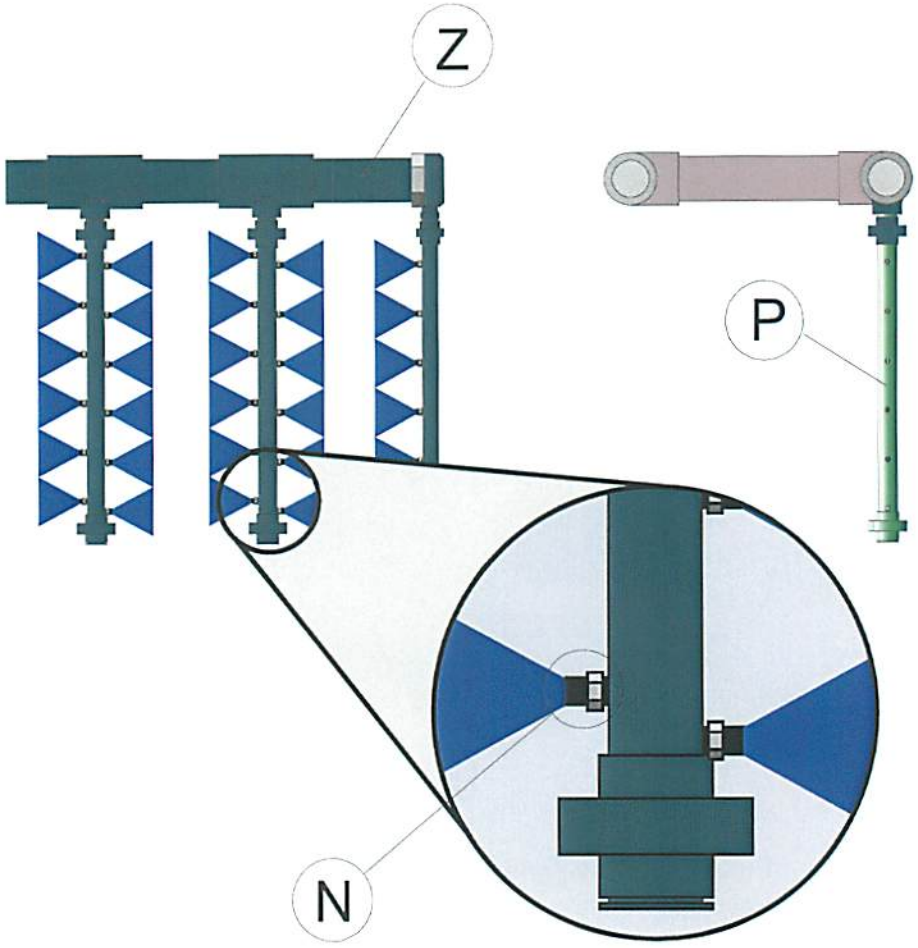


Figure 4-7: Shower water pipes

Z = Main shower water pipe
N = Shower water nozzle
P = Shower water pipe

Error!

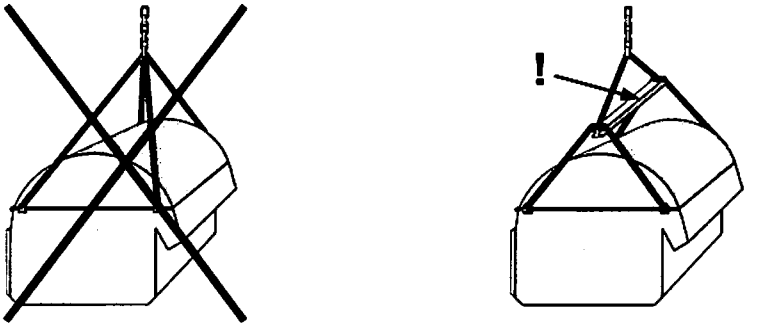
5.3 MOVING THE MACHINE AND MACHINE PARTS

Make sure that the cables and lifting devices you plan to use are appropriate for the weight and size of the machine.

Only use cables and lifting devices that are free of defects. Only attach cables at the intended attaching places, as marked.

In lifting the machine parts great care must be taken to ensure that these are not damaged by the lifting appliance.

Use a supporting framework that precludes any pressure – especially any lateral pressure – from being applied to the top lid. To achieve this, the cables or ropes used in the lifting process must be attached in such a way that they run parallel to the sides of the housing and to the top of the lid, as shown in Figure 5-1.



Wrong Right

Figure 5-1: Wrong and Right Ways to Lift the ELEPHANT

5.4 DISPOSING OF PACKING MATERIALS

Dispose of the packing materials in a way that does not harm the environment.

Please take these materials to an appropriate recycling site.

Please respect current regulations in this regard.

5.5 PRECONDITIONS FOR INSTALLATION

The machine has to be positioned so that, around it, there is a minimum free space of 200 mm. For easy mounting, positioning and assembly there should be additional space to this 200 mm.

In the equipment where walking area has to be considered there has to be a minimum free space of 1 m.

In order that the equipment will work according to the correct technical parameters, please check what follows:

- Equipment installation plan.
- For equipment assembling refer to the installation drawing made by the customer or the supplier.
- Drawing with overall dimensions - General Assembly.
- Civil works drawing

5.6 INSTALLATION

Please refer also to chapter 8.4("Maintenance of individual units") and the detail drawings in chapter 10.4.

DIMENSIONS OF THE STEEL-GIRDER CONSTRUCTION / FOUNDATION

The steel girder construction must be checked against its assembly drawing and its measurements and angles adjusted accordingly so that the bearing edges and surfaces can serve as reference coordinates for further measurements.

In other words, the steel base performs an important role in establishing a measurement reference base for the ELEPHANT. Proper adjustment of its position within the building at the time of installation will help avoid interference with the operation of other machinery and will assure that pipe fittings are properly isometric.

The ELEPHANT must be completely level to assure optimum operation. For this reason it is mandatory for the (steel) base to be checked with a leveling device or surveyor's theodolite and corrected, if necessary, to make it level and true to the prescribed horizontal dimensions.

→ Dimensional variances need to be corrected at the footings of the base by the use of shims or leveling screws.

→ Final correction for dimensional variances can be achieved by placing metal shims between the base of the ELEPHANT and the top of the steel frame.

→ For this purpose the dimensional variances must be recorded at the respective measurement points so that the right metal shims can be inserted at the conclusion of the ELEPHANT installation process.

LIFTING THE ELEPHANT INTO POSITION

While following the instructions given above, especially as concerns the supporting framework, an appropriately sized overhead crane must be used to lift the ELEPHANT and to position it over the prepared installation location.

If the lifting and positioning process includes manual guidance, please note that there is a serious risk of crushing and the danger of loss of life or limb during this operation. Only trained, experienced, professional personnel may be allowed to perform this task. No-one is to stand under the machine while it is suspended in the air.

LEVELING THE ELEPHANT

Exact horizontal positioning of the ELEPHANT is very important for its operation. For this reason please perform the leveling process as described below:

→ Remove the lid

→ Use a spirit level to check that the ELEPHANT has been placed in a level position. Be sure to use the level on all four rims of the housing in this process.

→ If the ELEPHANT is not level along all horizontal dimensions, make corrections, either by attaching and adjusting positioning screws at the base of the machine, or by using appropriate support disks.

SECURING THE ELEPHANT

There are two angle brackets on each of the two opposite, lateral sides with pre-drilled bolt holes. These angle brackets are to be used to bolt the machine to the underlying steel base as shown in Figure 5-2.

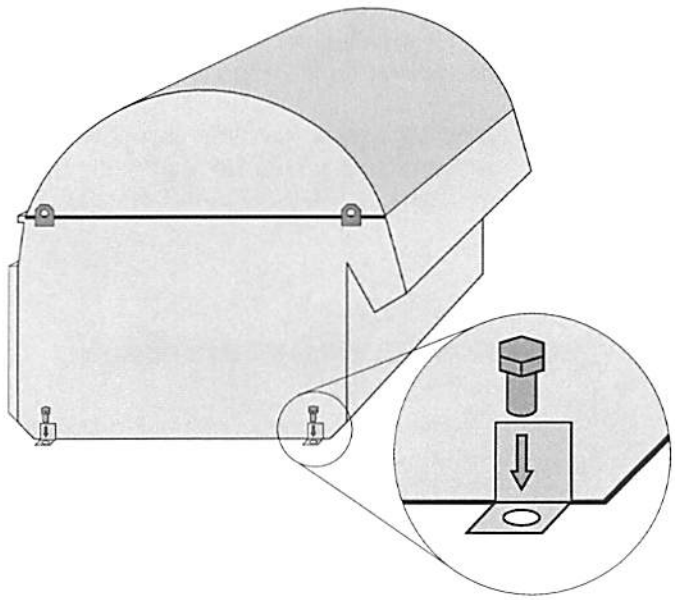


Figure 5-2: Securing the ELEPHANT

ELECTRICAL CONNECTIONS

If the electrical panel is delivered by meri arrange the electrical connection following what is shown on the electrical schematic attached to the panel. Electrical and electronic equipment can influence themselves reciprocally due to the power connection or other metallic connections.

Use shielded cables for the control connections. Otherwise, install cables separate from each other so that the signals can not interfere with each other.

Control cables must always be placed at least at 10 cm from eventual parallel power cables. If control cables should cross power cables, keep a crossing angle of 90°.

The distance between ELEPHANT unit and electrical panel location site has to be so that the cable length connecting the panel and motor/fan on the equipment must absolutely not overtake 15 meters. If for layout reasons that distance has to be more, you will have to provide the devices and/or systems against interference/EMC (electromagnetic compatibility).

→ Arrange the electrical connections following your electrical schematics and the wiring schematics.

→ Connect the motor and the fan with the control cabinet / motor control room (MCC)

Ensure that the cooling fan is not connected to the motor. The fan must have its own electrical connection to the system. Otherwise the motor will heat up and will be damaged.

MECHANICAL CHECK

After completion of all assembly and installation work it is imperative that the ELEPHANT is driven on a test run.

This can be done by temporarily connecting-up the drive motor via an extension cable.

In the process the following points should again be checked and improved as necessary:

- Continuous contact disc sealing and the discs.
- No squeezing or marked buckling of the disc sealing.
- Free running of the discs.
- No damages to the screens.

6 OPERATION

6.1 SAFETY MEASURES DURING OPERATION

Before you start operating the system, make sure that all subsystems are ready for operation. This means that no switches are left set in "maintenance mode" and that the overall operational situation is ready for the subsystems to function properly. For example, check that pumps can not run dry, that the appropriate valves are open, etc. Make sure that all electrical units are protected by the proper fuses or circuit breakers. It is a good idea to visually inspect all subsystems and drives, especially those which can not be directly seen or monitored from the operating room, and to check that all components are in "operation mode".

Make sure that starting up the system will not disrupt any other processes and that both the raw and filtrate flow only into the appropriate containers and channels.

PROTECTIVE DEVICES

Anyone who comes into the vicinity of the system needs to be aware of potential dangers to their personal safety.

Rotating parts such as drive belts, couplings, shafts, rotors, etc. can catch loose articles of clothing, long hair, jewelry, or parts of the body.

The machine must never be operated without its required protective devices.

PERSONAL SAFETY

Unpredictable events can endanger the lives of those who are in the vicinity of the machine.

To assure a quick response to any dangerous situation, be sure that you and your staff know the exact location of the EMERGENCY SHUTOFF switch and that you check that this switch is in working order each time before starting up the system. Be sure that this switch remains clearly visible and easily accessible at all times.

6.2 STARTING OPERATION

PRECONDITIONS

The following conditions must be checked before the system can be started up:

- The shower water pipes must be filled and pressured (this is also true for systems where operation without shower water is possible).
- All electrical and mechanical connections must be completed.
- The filtrate outlet and the thickened exhaust must be operating. (For example, the filtrate outlet valve must be open and the thickened material spiral conveyor must be operating).
- All moveable parts must be lubricated.

START-UP

Manual Operation

To begin system operation, perform the following steps in the order given:

→ Open the shower water inlet at its valve (see also detail drawings Chapter 10.4). The shower water pressure must have reached 50-60 psi at the time the system is actually started.

→ Turn the rotation control to about 80% of its maximum rate.

→ Switch the motor on.

Make sure that the discs are rotating properly (with the water flowing in, as described in Chapter 4.2!) and that the motor cooling fan is running.

→ Switch the main inlet pump on and gradually increase the flow up to the operating level.

The system should reach a stable operating level after about 20 minutes.

→ If your system is intended to operate without shower water, you should turn off the shower water at this time.

→ Switch to automatic operation.

The ELEPHANT Filter ought to regulate itself at this point.

Automatic Operation

During automatic operation the system will start up by itself.

6.3 OPERATION

Except for routine maintenance the ELEPHANT Filter requires no special monitoring.

Provided neither the maximum throughput nor the maximum solids load is exceeded, all variances (such as consistency and throughput) are compensated for by the automatic speed control.

6.4 STOPPING OPERATION

To switch the system off, proceed as follows:

→ Switch to manual operation.

→ If the shower water inlet is closed, open it.

→ Adjust the rotation level to about 50% of its maximum rate.

→ Wait until no further thickened is expelled and the water in the system appears to be relatively clear.

→ Now shut off the motor.

→ Close the shower water inlet.

If the system is not going to be used for an extended time, it ought to be emptied and cleaned.

7 HELP FOR TECHNICAL PROBLEMS

The following sections describe possible problems, their causes, and the most important measures to follow to resolve them. In most cases you should be able to resolve these problems quickly at your own site.

Moreover, **meri** staff is available to answer your questions at any time. Please refer to the information in Chapter 11.2, "Contact Information, to locate the **meri** office or authorized **meri** distributor responsible for your area.

7.1 MACHINE PROBLEMS

SCREEN DISCS DO NOT ROTATE

→ Stop the system (see Chapter 6.4, "Stopping Operation", p. 6-3) and check the motor, the gear drive, the bearings, and the level transmitter (see Chapter 12).

MOTOR FAILS TO OPERATE

→ Stop the system (see Chapter 6.4, "Stopping Operation", p. 6-3) and follow the instructions provided by the motor manufacturer (see Chapter 12).

GEAR DRIVE IS NOT WORKING

→ Stop the system (see Chapter 6.4, "Stopping Operation", p. 6-3) and follow the instructions provided by the gear-drive manufacturer (see Chapter 12).

SHOWER WATER NOZZLES ARE PLUGGED

→ Stop the system (see Chapter 6.4, "Stopping Operation", p. 6-3) and clean the shower water nozzles (see Chapter 8.3).

7.2 TECHNOLOGICAL PROBLEMS

RISING OF FILTRATE SOLIDS CONTENT

→ Check the screens for damage and replace damaged ones (see Chapter 8.3).

→ Check the seals between the screen discs and the tub and between the screen discs and the filtrate collector and replace any leaking seals.

→ Check the level transmitter for proper functioning and remove any accumulated dirt. This device regulates the rate of disc rotation and thus the rate of throughput.

For systems in which flaking agents are used:

→ Check the dosage of the additives (see Chapter 3.5).

FALL IN THROUGHPUT

→ Check the level transmitter for proper functioning and remove any accumulated dirt. This device regulates the rate of disc rotation and thus the rate of throughput.

→ Check the shower water nozzles for accumulated dirt (see Chapter 8.2) and make sure that the shower water pressure is correct I (see Chapter 3.4, "Operational Data").

→ Check the screens for accumulated dirt (such as resin buildup) and clean them if necessary.

For systems in which flaking agents are used:

→ Check the dosage of the additives (see Chapter 3.5).

FALL IN SOLIDS CONTENT OF THICKENED

→ Check the level transmitter for proper functioning and remove any accumulated dirt. This device regulates the rate of disc rotation and thus the rate of throughput.

→ Check the solid content of the incoming water to be treated for changes in the amount of solids to be processed.

For systems in which flaking agents are used:

→ Check the dosage of the additives (see Chapter 3.5).

8 MAINTENANCE

8.1 SAFETY MEASURES DURING MAINTENANCE

SAFETY DEVICES

Always make sure that all safety devices are reinstalled at the conclusion of any maintenance work.

PERSONAL SAFETY

Before beginning any maintenance work, make sure that the main switch to the machine is switched off and that all machines related to the filter's operation are also switched off. Also take measures to assure that none of these units can accidentally be switched back on before the maintenance work is completed.

Similarly, make sure that the machine itself and all feed pipes have been emptied and are not under pressure.

SAFE OPERATION

To assure safe operation after maintenance work has been completed, only use faultless fasteners (screws, nuts, etc.) and new seals when reassembling the unit.

8.2 PERIODIC SERVICE

ELEPHANT Filter systems are designed to require only minimum maintenance. Nevertheless, it is important to check system functions from time to time. Routine maintenance will assure that your system lasts a long time. If you follow the maintenance guidelines shown below, you will maximize the operational availability of your system while also assuring that it functions safely.

In general, all parts that move or that provides support should be considered parts that will wear out. This is especially true for bearings and similar items. See Chapters 10 and 12 for additional information.

Table 8-1: Periodic Servicing Guidelines

✕ = Check ● = Overhaul or Replace	Every...		
	Week	6 Months	12 Months
Shower water nozzles	✕		
Bearings		✕	
Sieve Screens	✕		
Shaft Seals		✕	
Disc Seals	✕	●	
Bearing Seals		✕	
Level Transmitter		✕	

Note: the information in this chart is only intended to provide a general guideline, based on previous experiences. Your application may require other service intervals.

meri is not responsible for damages which arise as a result of improper handling or servicing, nor for damages which arise from using replacement parts that do not come from meri, except in cases where meri has provided a written exception.

8.3 LUBRICATION

Sufficient lubrication will assure long and trouble-free operation of the system. The lubrication intervals and the lubricants themselves are specifically tailored to address the needs of each system.

- The system is delivered with pre-lubricated parts. The machine should be lubricated again before it is placed in service.
- The lines must be lubricated at the designated lubrication nipples. The positions of these nipples are shown in the detail drawings in Chapter 10.4.
- Proper lubrication has been achieved when the lubricant begins to ooze out of the supporting piece. This excess lubricant should be wiped off at the conclusion of the lubrication process.
- Re-lubrication is necessary after every 500 hours of operation.
- Lubricants should have the following characteristics: multipurpose or anti-friction Lithium-soap based agent without fillers, water-repellent, corrosion-inhibiting, and stable at temperatures up to at least 125°C.
- Recommended brands:
  - Mobil Mobilith AW2
  - Shell Alvaniz Grease +
  - Esso Beacon 2

  or equivalents

8.4 MAINTENANCE OF INDIVIDUAL DEVICES

Unless otherwise indicated, the descriptions for all part correspond to those given in the lists and illustrations shown in Chapter 10.

Note: During all maintenance work take care not to damage the sieve screen fabric.

CHANGING THE SCREENS

To change the screens proceed as follows:

→ Take the system out of service and empty it (see Chapter 6.4, "Stopping Operation", p. 6-3).

→ Unscrew the cover fastening and remove the cover.

→ Unscrew all the screws that hold the screen in place (see Chapter 10.4). To help in this process, you may turn the motor on for a short duration to rotate the disc a little to gain access to the other screws.

BEFORE SWITCHING ON THE MOTOR FOR THIS PURPOSE, MAKE SURE THAT NO PARTS COULD GET CAUGHT OR JAMMED AND THAT NO-ONE IS IN THE IMMEDIATE VICINITY OF THE ELEPHANT FILTER.

→ Remove the screen half and shower water them off.

→ Clean the surface where the screen touches the disc.

→ Attach the screen half. To help in this process, you may turn the motor on for a short duration to rotate the disc a little to gain access to the other screws.

BEFORE SWITCHING ON THE MOTOR FOR THIS PURPOSE, MAKE SURE THAT NO PARTS COULD GET CAUGHT OR JAMMED AND THAT NO-ONE IS IN THE IMMEDIATE VICINITY OF THE ELEPHANT FILTER.

→ Close the cover and fasten it in place.

The system is now ready again for operation to resume (see Chapter 6.2, "Starting Operation").

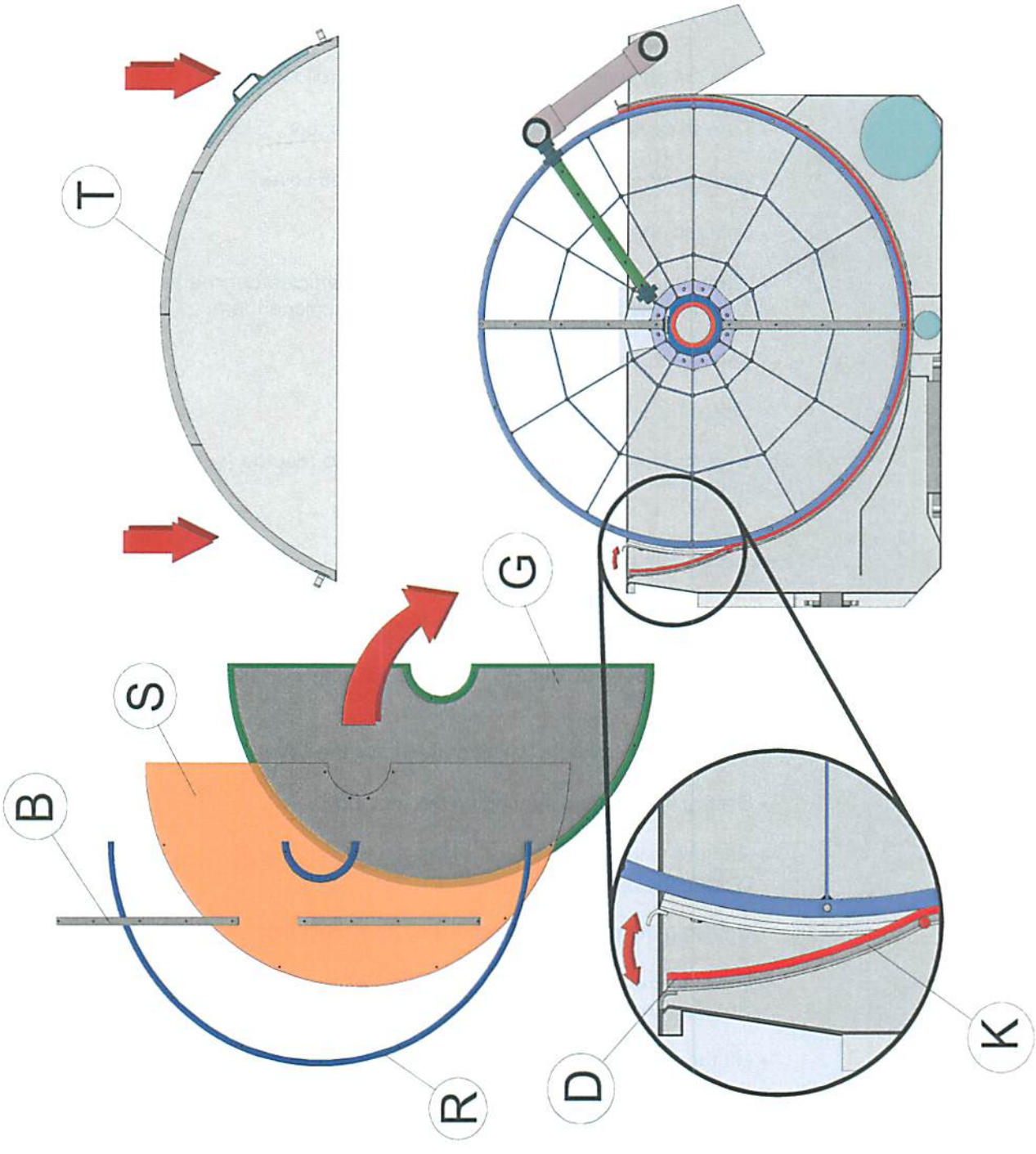


Figure 8-1: Maintenance

B = Screen attachment plate
R = Screen attachment ring
G = Support Mesh
K = Upper vat part
S = Screen
T = Cover
D = Disc seal

CLEANING THE SHOWER WATER NOZZLES

To clean the shower water nozzles proceed as follows:

→ Take the system out of service (see Chapter 6.4, "Stopping Operation").

→ Unscrew the cover fastening and remove the cover.

→ Unscrew the shower water nozzles

→ Clean the shower water nozzles (larger particles can be removed with a wire) and blow them out with compressed air or replace them.

→ Replace the shower water nozzles.

→ Close the cover and fasten it in place.

The system is now ready again for operation to resume (see Chapter 6.2, "Starting Operation").

CHANGING THE DISC SEALS

To change the disc seals proceed as follows:

→ Take the system out of service and empty it (see Chapter 6.4, "Stopping Operation").

→ Unscrew the cover fastening and remove the cover.

→ Unscrew the torque support on the gear box.

→ Remove wires from motor. Make sure machine is de-energized at MCC or power source!

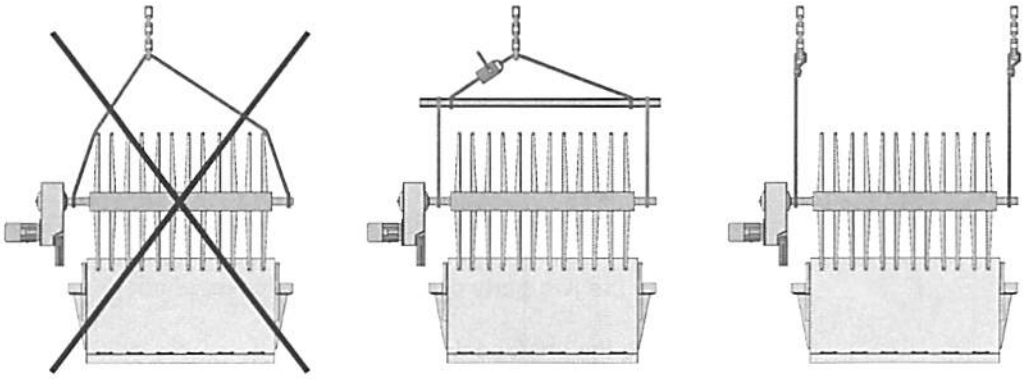
→ Unfasten the entire bearing housing from machine.

→ For machines of model size ".16" and ".22":
Unscrew the locking mechanism for the upper vat part and lift it open.

→ Lift the shaft.

Ensure that the discs were not damaged when raising the shaft.

Proceed as shown in figure 8-2.



WRONG OK BETTER

Figure 8-2: Rising of the shaft

→ Unfasten the seal clamp plates and remove them.

→ Pull the seal inward (to the space between a pair of discs) and remove the seal.

→ Remove the old seal from the seal ring and place the seal ring in the new seal.

→ Insert the new seal.

→ Fasten the seal clamp plates to the tub.

→ Replace the shaft.

Check the position of lip of the disc seal after replacing the shaft. The disc seal has to be installed according to figure 4-6.

→ For machines of model size ".16" and ".22":
Lower the upper vat part and fasten the locking mechanism.

→ Re-fasten bearing housing making sure set pins align properly.

→ Replace the torque support.

→ Replace motor leads.

→ Close the cover and fasten it in place.

The system is now ready again for operation to resume (see Chapter 6.2, "Starting Operation").

CHANGING THE SHAFT SEAL

To change the shaft seals proceed as follows:

→ Take the system out of service (see Chapter 6.4, "Stopping Operation").

→ Unscrew the cover fastening and remove the cover.

→ Loosen the two parts of the shaft seal cover plate

→ Remove the shaft seal.

→ Insert the new seal.

→ Fasten the two parts of the shaft seal cover plate

→ Close the cover and fasten it in place.

The system is now ready again for operation to resume (see Chapter 6.2, "Starting Operation").

WORKING ON THE DISCS

To work on the discs you have to remove them from the shaft. To do this, proceed as follows:

→ Take the system out of service and empty it (see Chapter 6.4, "Stopping Operation").

→ Unscrew the cover fastening and remove the cover.

→ Unscrew the torque support.

→ Remove wires from motor. Make sure machine is de-energized at MCC or power source!

→ Un-bolt entire bearing housing.

→ For machines of model size ".16" and ".22":
Unscrew the locking mechanism for the upper vat part and lift it open.

→ Lift the shaft.

Ensure that the discs were not damaged when raising the shaft.

Proceed as shown in figure 8-2.

→ Put a mark on the shaft showing the position where the discs are clamped to it.

→ Open the clip which clamps the disc to the shaft.

→ Remove the disc.

→ You can now perform the required work on the disc

Never work on the discs, when they are installed on the shaft.

→ Put the disc back onto the shaft.

Place the discs exactly in the same position as they have been.

→ Close the clip which clamps the disc to the shaft.

→ Replace the shaft.

Check the position of lip of the disc seal after replacing the shaft. The disc seal has to be installed according to figure 4-6.

→ For machines of model size ".16" and ".22":
Lower the upper vat part and fasten the locking mechanism.

→ Re-fasten bearing housing.

→ Replace the torque support.

→ Replace motor leads.

→ Close the cover and fasten it in place.

The system is now ready again for operation to resume (see Chapter 6.2, "Starting Operation").

9 REPLACEMENT PARTS

9.1 ORDERING REPLACEMENT PARTS

All spare parts can be ordered through **meri** in Munich, Germany, as well as through certain **meri** offices and authorized **meri** distributors. Please check Chapter 11.2, to locate the office responsible for your area.

The **meri** customer service department will expedite orders as soon as they are received. To assure speedy processing, please make sure you include the following information:

1. Machine type
2. Machine serial number
3. Spare part number, description, and quantity

The part number consists of the following:

Project-No./Machine-No./Type/Detail drawing number/position number. (see chapter 10.4 for detail drawings)
(z.B. 00355/00854/ET6.16/D2/2)

The data you can find in the table of parts in column "order number".

Providing this information completely and clearly is the best way to assure that your order is taken care of as quickly as possible. If, for whatever reason, you can not find the proper part order number, please describe the part exactly and also the part of the system in which it is found.

Order address:

Meri Papertec

2620 E Glendale Ave

Appleton, WI 54911

Telefon: (920) 734-8485

Fax: (920) 734-8299

e-mail: info@meri.com

9.2 WEAR PARTS

Table 9-1: Wear Parts List

Description	Part Number	Pieces per Unit
Bearing Seal	07726\01428\ET10.16\D5\1	2
Disc Seal	07726\01428\ET10.16\D6\7	1 per Disc
Shaft Seal	07726\01428\ET10.16\D5\4	3
Screen Halves disk (30 ~ 1200 µm)	07726\01428\ET10.16\D7\2.2	2 per Disc

9.3 SPARE PARTS

Table 9-2: Spare Parts List

Description	Order Number	Pieces per Unit
Electric Motor	07726\01428\ET10.16\D2\1	1
Shaft Bearings	07726\01428\ET10.16\D5\2	2
Bearing Housing	07726\01428\ET10.16\D5\3	2
Wheel (w/o screen)	07726\01428\ET10.16\D2\5	5
Rotor	07726\01428\ET10.16 \D3\5	1
Auma electric	07726\01428\ET10.16\D2\7	1
Shower water nozzles	07726\01428\ET10.16\D4\1	5 per Disc

10 COMPONENT PART INDEX

10.1 PART INDEX

The Detail Drawing Numbers refer to the information in Chapter 10.4.

Table 10-1: Component List

List Number	Description	Detail Drawing Nº	Nº Within Drawing
1	Vat	1	1
2	Cover	1	2
3	Thickened chute	1	3
4	Upper vat part	1	4
5	Inlet flange	1	5
6	Motor	2	1
7	Ventilating fan	2	2
8	Gear drive	2	3
9	Shower water connection	2	4
10	Wheel (w/o screen)	2	5

List Number	Description	Detail Drawing Nº	Nº Within Drawing
11	Disc	2 / 6	5 / 1
12	Level transmitter flange	2	6
13	Torque support	3	1
14	Shaft	3 / 5 / 7	2 / 4 / 1
15	Drain	3	3
16	Disc fastening	3	4
17	Shower water nozzle	4	1
18	Shower water inlet	4	2
19	Shower water pipe	4	3
20	Shower water pipe fastening	4	4
21	Shower water inlet fastening clamp	4	5
22	Bearing housing	5	1
23	Bearing seal	5	1
24	Bearing	5	3
25	Shaft seal	5	4

List Number	Description	Detail Drawing Nº	Nº Within Drawing
26	Bearing fastening	5	6
27	Screen supporting mesh	6 / 7	2.1
28	Screen	6 / 7	2.2
29	Screen attachment ring	6 / 7	3
30	Screen attachment plate	6 / 7	4
31	Disc seal clamp plate fastener	6	5
32	Screen fastener	6	6
33	Disc seal	6	7
34	Seal ring	6	8
35	Disc seal clamp plate	6	9
35	Expulsion Aid	7	5

10.2 FLOW DIAGRAM

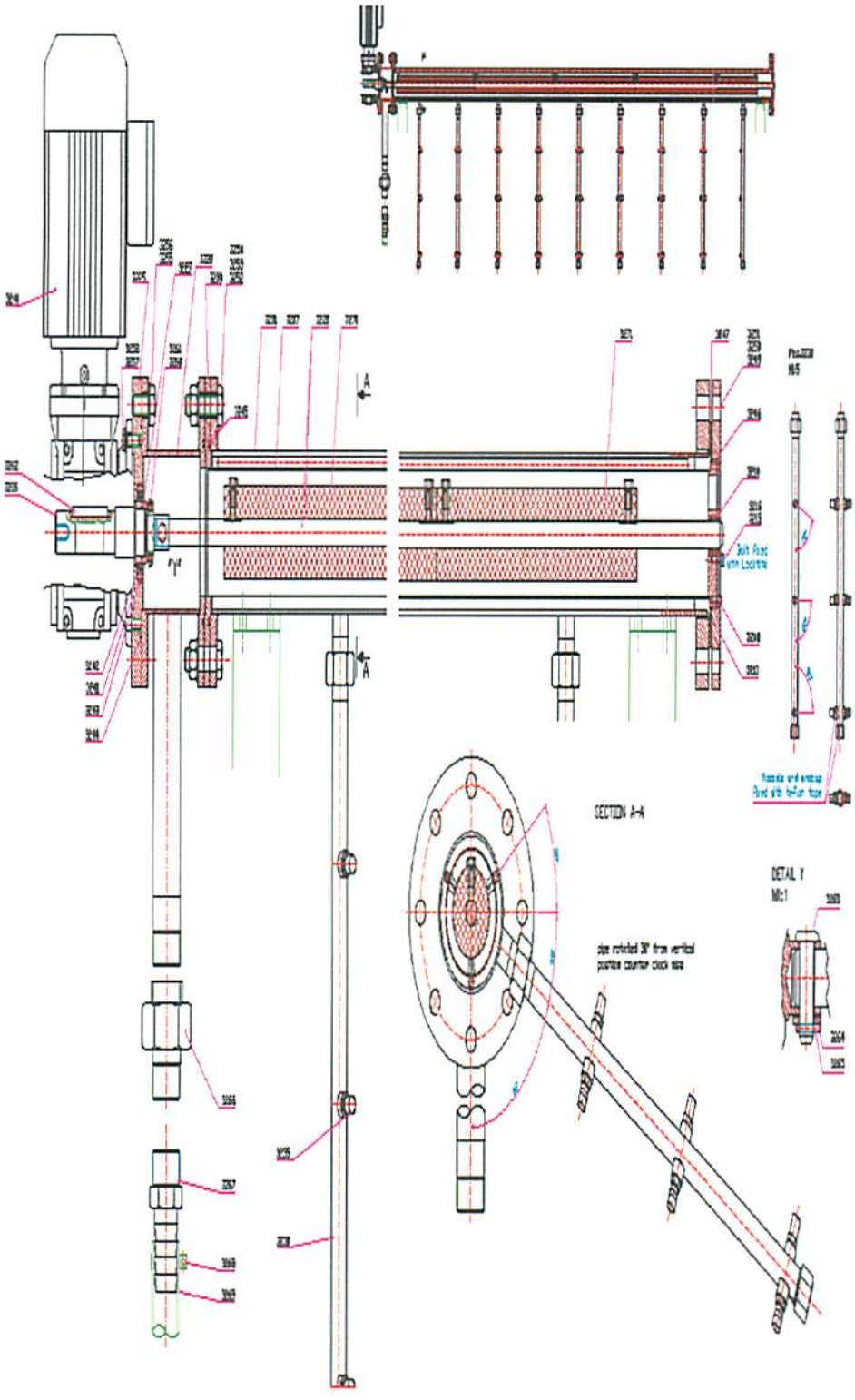


Figure 4-8: New Shower water pipe motor

5 INSTALLATION

5.1 IMPORTANT

Before installation begins, these instructions are to be read by the engineer in charge of safety, the person supervising the installation, and every person who is taking part in any facet of the installation process.

After viewing the parts of the system to be installed, please take the time to inspect the intended installation site to plan the possible methods of transporting the materials to their final destination. Also check the lifting devices that will be available, and establish intermediate staging areas.

If installation takes place without the presence of an installation engineer from **meri** (or an engineer explicitly authorized by **meri** to perform this installation), **meri** will not assume any liability for damages, which can be attributed to improper handling or installation of the system.

5.2 UNPACKING THE MACHINE

→ Unfasten the machine from its shipping container(s).

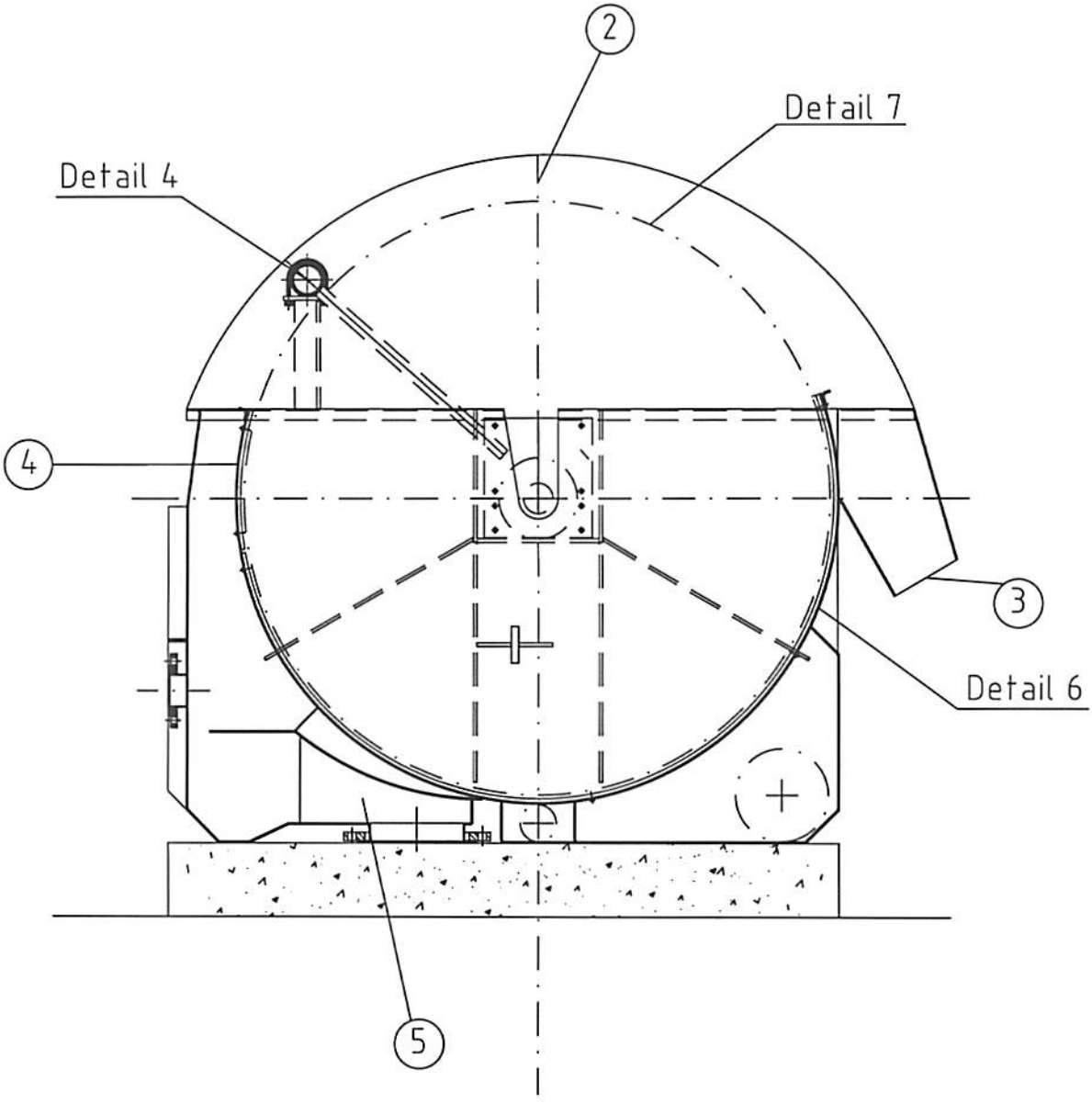
→ Use the shipping list to check that all items have been delivered.

→ Check the delivery for any damages which may have occurred in shipping.

Notify **meri** or your authorized **meri** distributor immediately to report any damaged or missing parts before continuing with the installation.

10.4 DETAIL DRAWINGS

Detail 1



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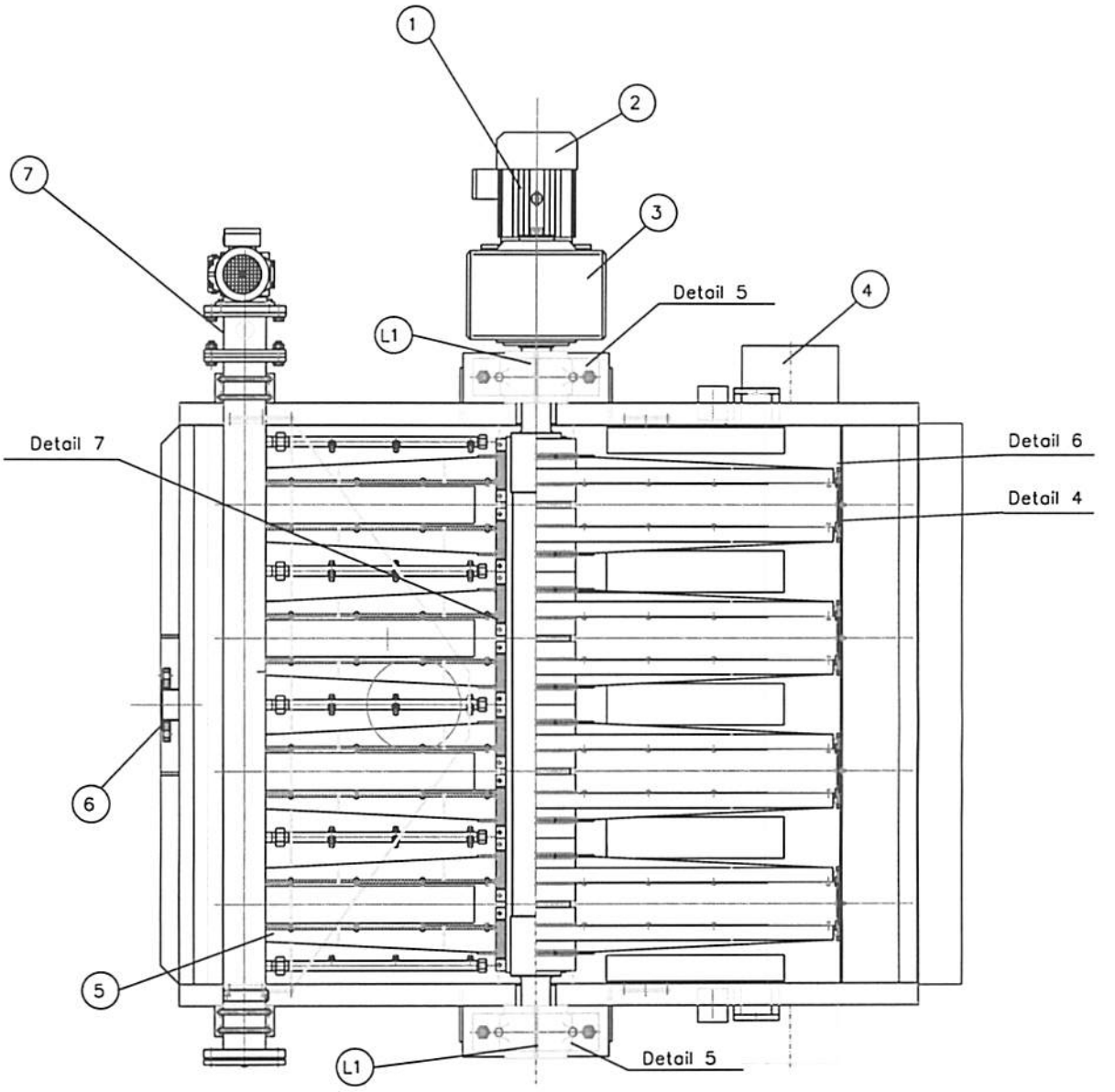
Detail 1

File: DET_ET_01.dwg



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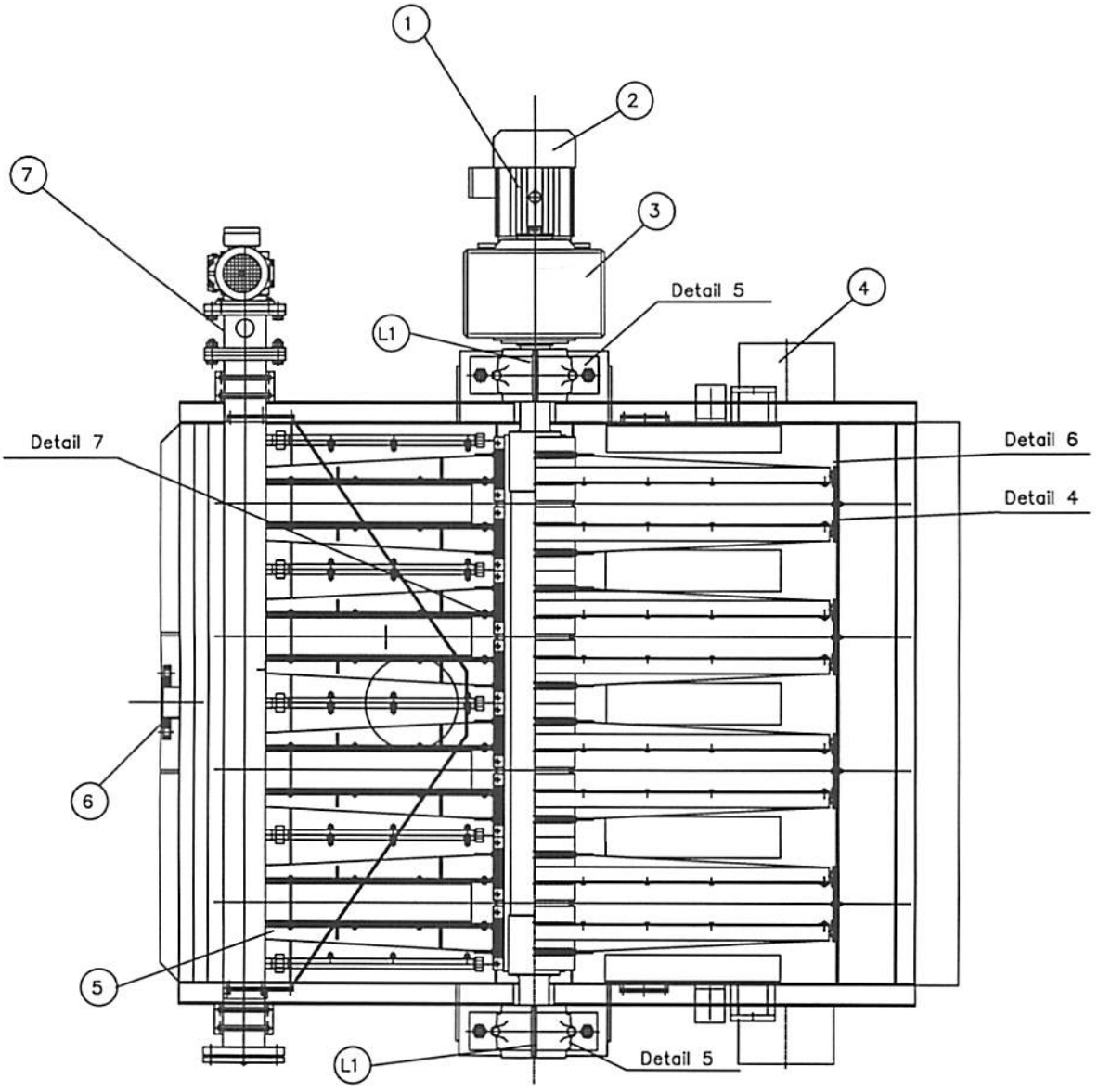
Detail 2

File: DET_ET_02.dwg

Detail 2



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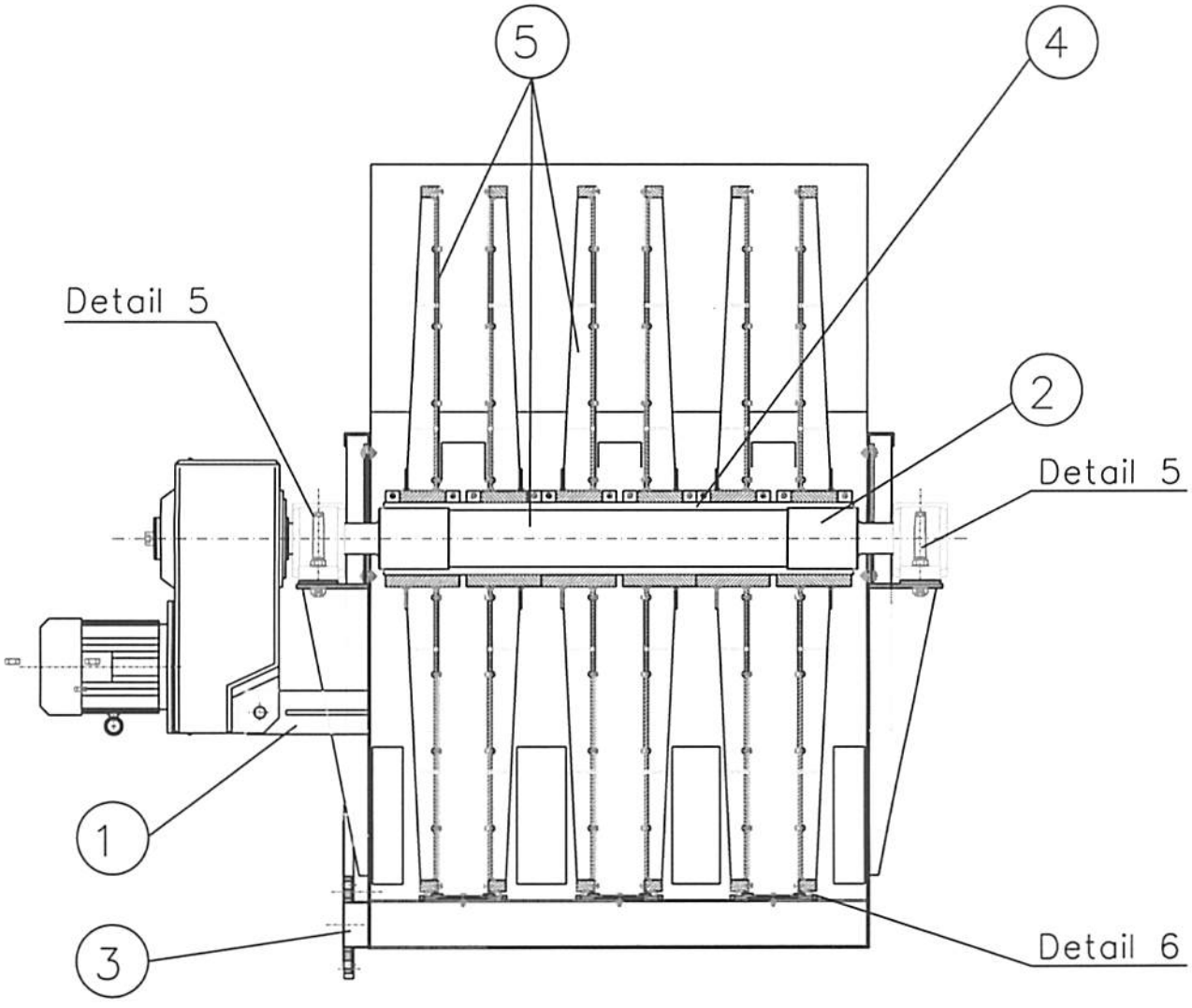
SYSTEMS & TECHNOLOGIES

Detail 2

File: DET_ET_02.dwg

Detail3



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Detail3

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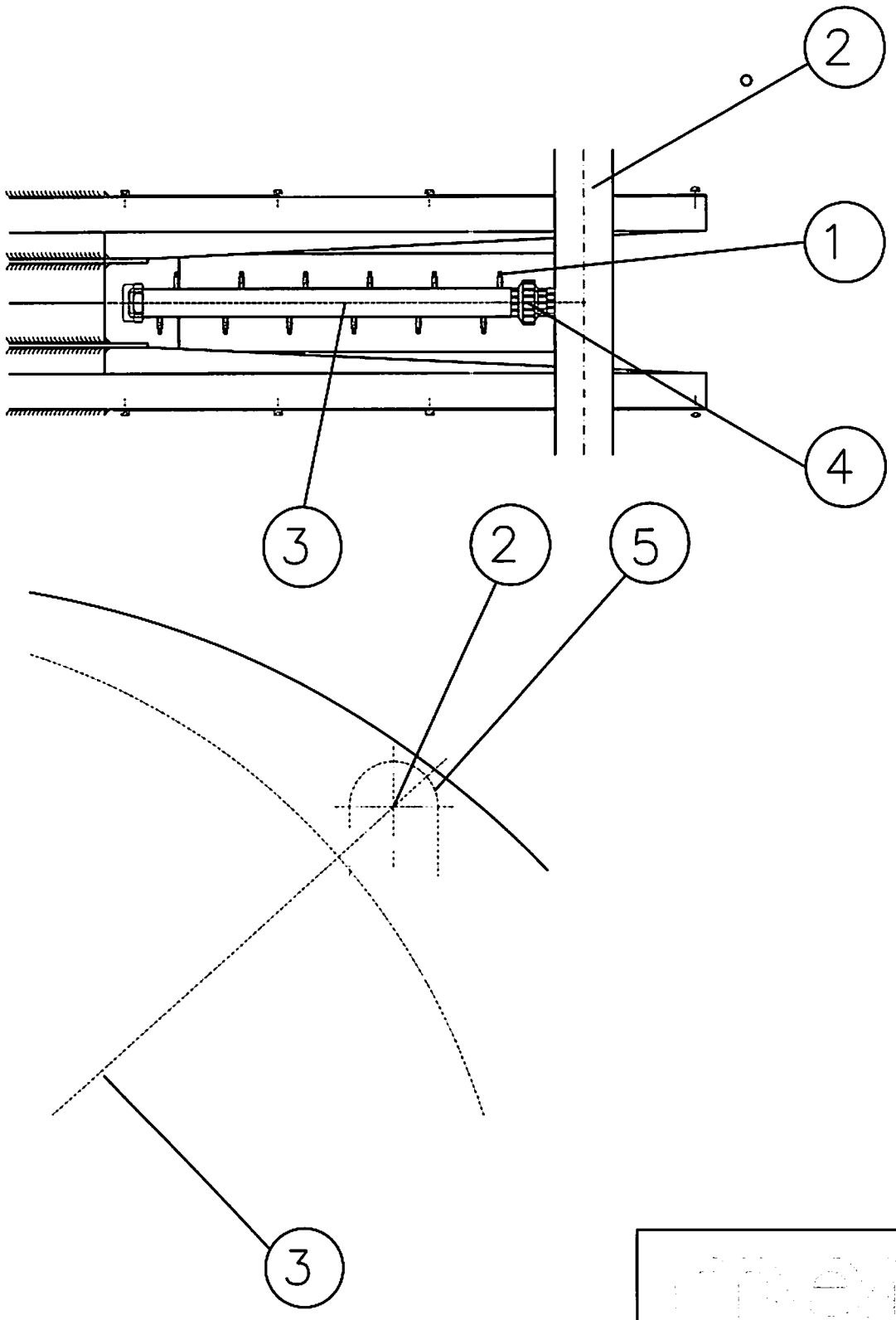
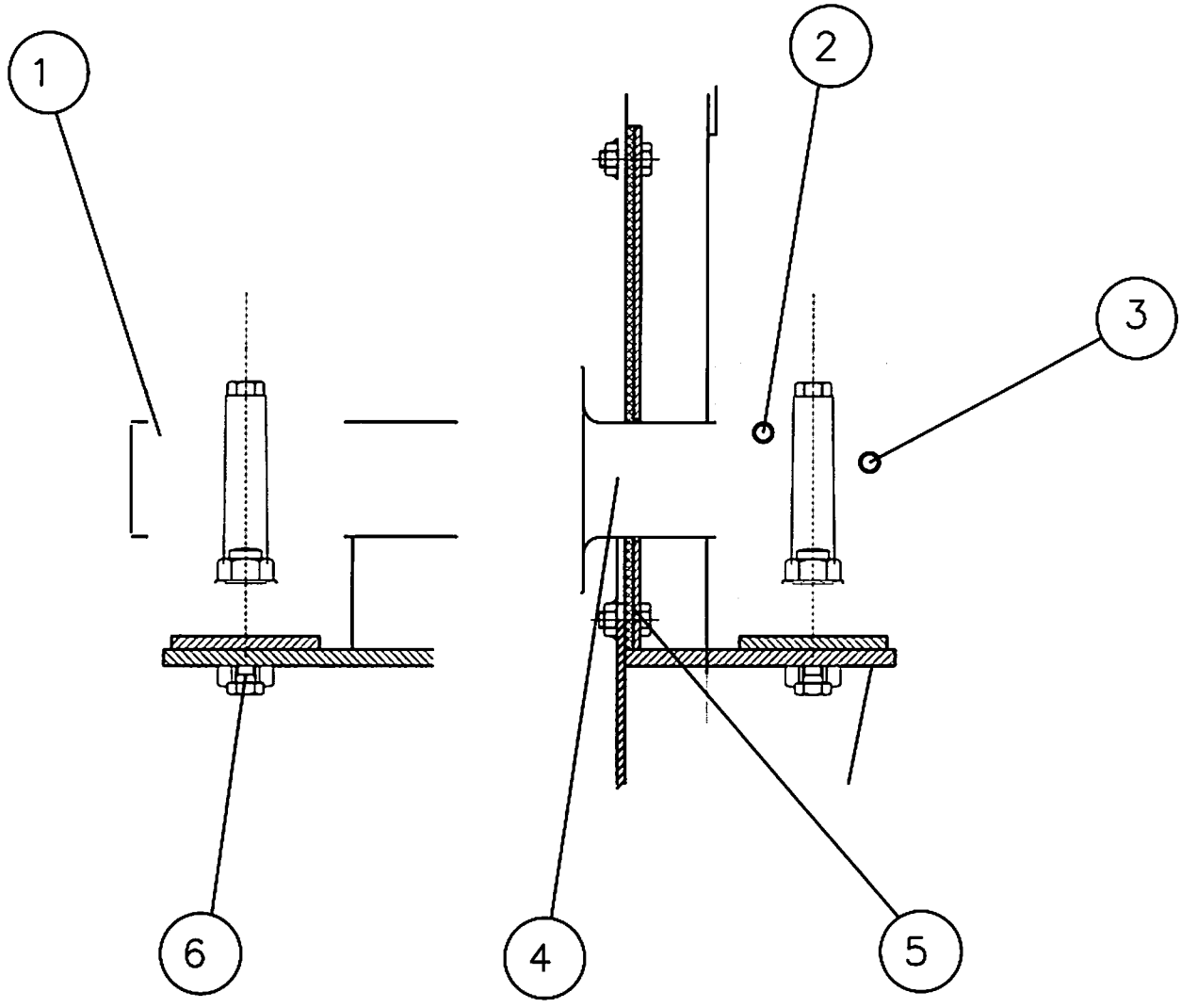
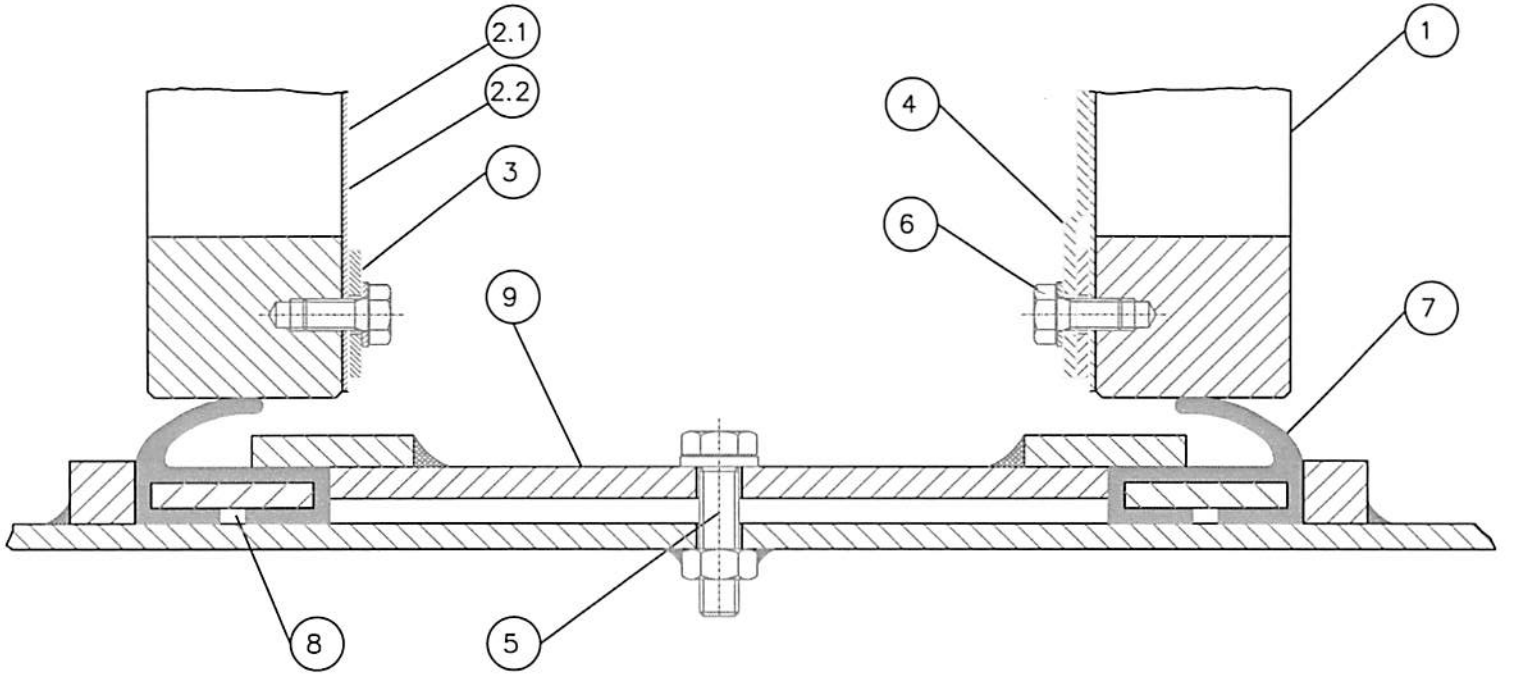

2
1
4
3
2
5
3


1
2
3
6
4
5

Detail6



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Detail6

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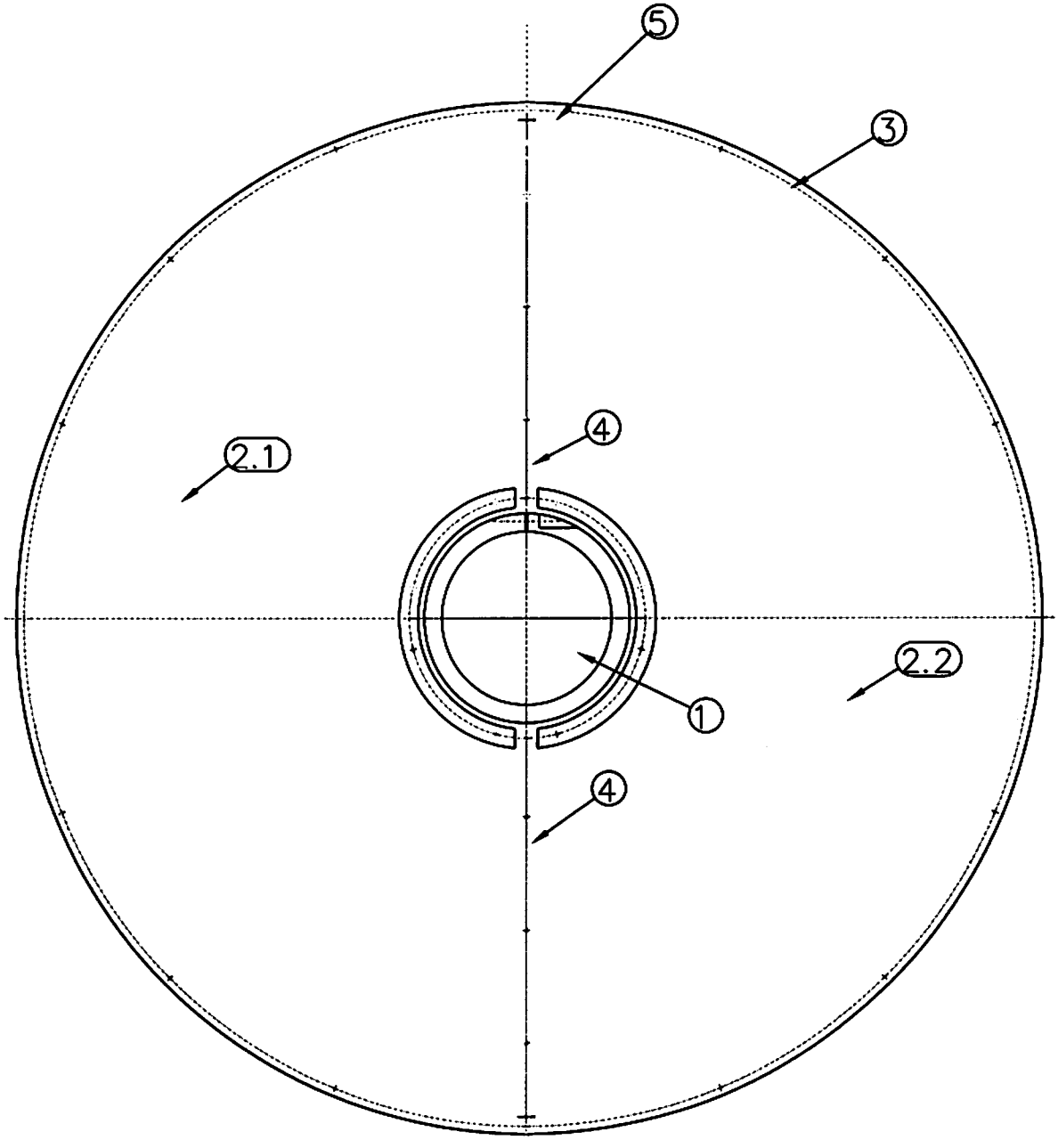
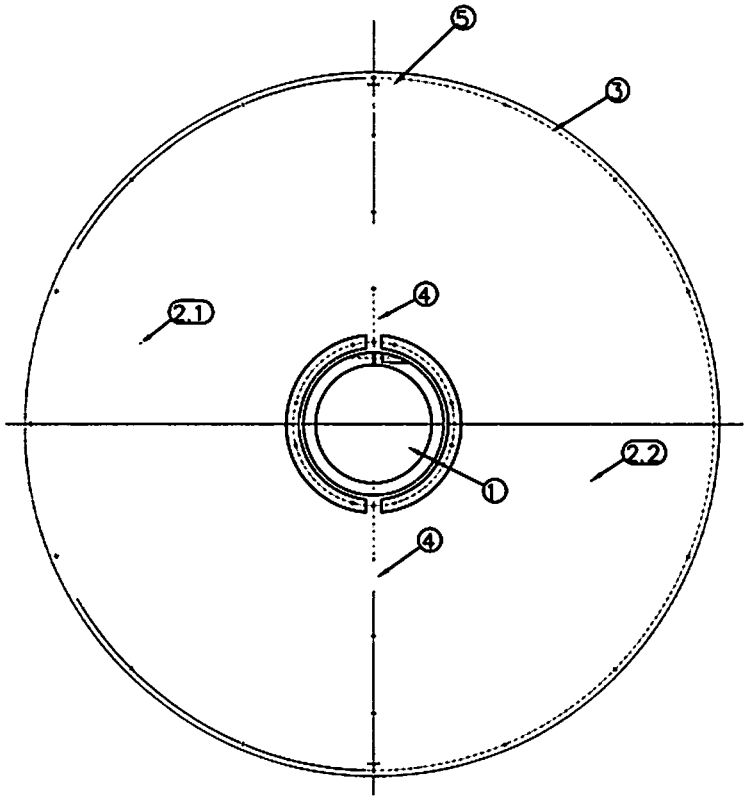
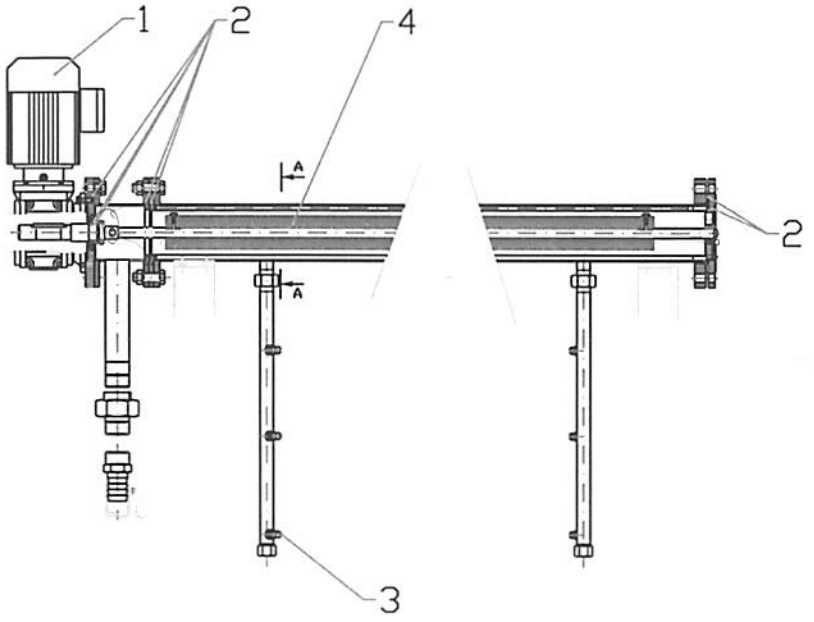
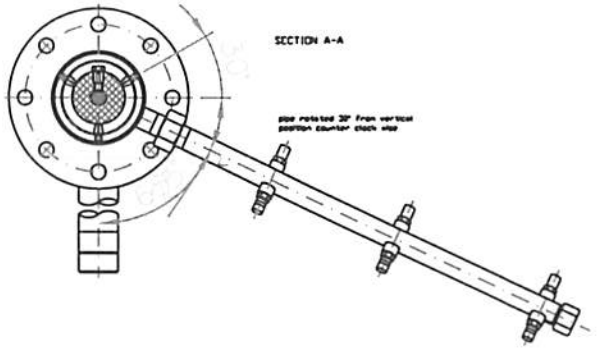

5
3
4
2.1
2.2
1
4

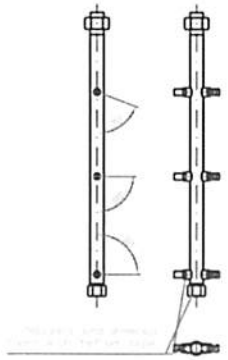


Schutzgitter 5000 Mycron
Sieb
Unterstützungs Gitter

10.3 OVERVIEW DRAWING - ASSEMBLY







Detail9

File: DET_ET_09

11 APPENDIX

11.1 THE USE OF POLYMERS DURING FILTRATION

In some applications polymers must be added to the water to be treated prior to its entry to the disc filter in order for the filtration to have a good effect.

To determine which products are best suited for a particular application among the wide spectrum of items available on the market, flaking tests, as a rule, can not be avoided. Recommendations for a choice among polymers can only be made on the basis of such tests or on the basis of experiences with comparable applications.

CALCULATIONS OF THE POLYMER DOSAGE

The following models are intended to aid in making various calculations concerning proper polymer dosages.

1) Polymer Consumption

In general the required polymer dosage is shown in ppm (parts per million). For example, 1 ppm would be the equivalent of 1 g/m³. To determine the hourly consumption rate, multiply the dosage in ppm by the average flow through the system.

Calculation example:

- Dosage: 2 ppm
- System flow: 250 m³/h
- → Consumption: = 2 ppm × 250 m³/h
  = 2 g/m³ × 250 m³/h
  = **500 g/h**

2) Polymer Dilution

Polymers are almost exclusively used in very diluted dosages. Chemical suppliers, as a rule, recommend diluted solutions of significantly less than one percent.

Calculation example:

– Consumption:	500 g/h = 0.5 kg/h
– Base concentration:	0.1 %
→ Required quantity of water:	= 5 kg/h/0.1%
	= 500 l/h

3) Polymer Consumption in Relation to Solid content of the Raw Water

Sometimes it is useful to relate the required polymer quantity to the amount of solid material in the raw water entering the system. For this you need to know the polymer consumption, the flow rate of the raw water entering the system, and the amount of solid content in the raw water.

Calculation example:

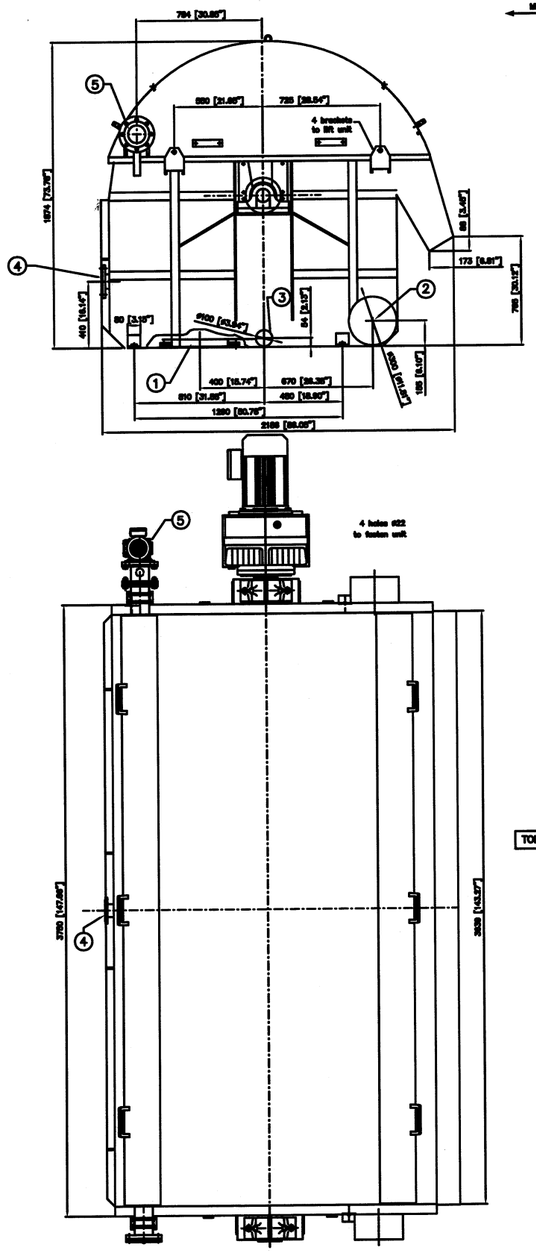
– Consumption:	500 g/h
– System flow:	250 m^3/h
– Solid content at entry:	1000 mg/l = 1 kg/m^3
→ Relative polymer consumption	= 500 g/h/(1 kg/m^3 × 250 m^3/h
	= 2 g/kg

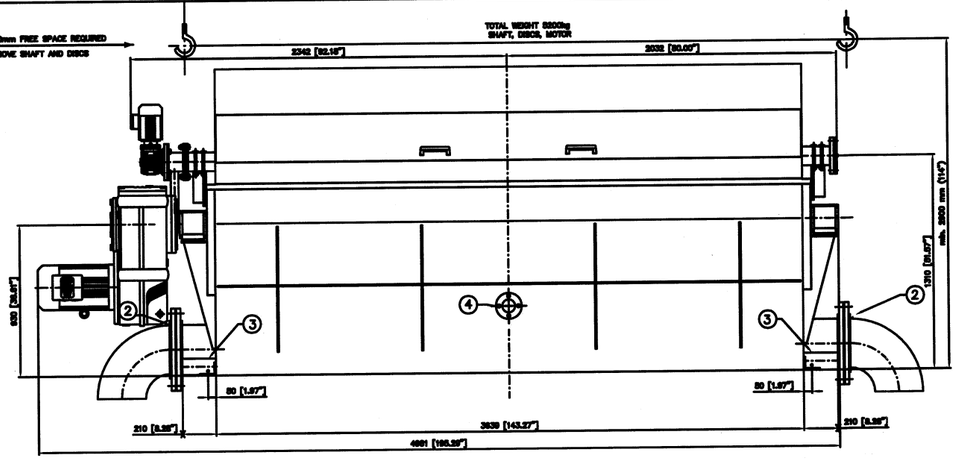
4) Checking the Calculation of the Polymer Dosage

To check whether the true polymer dosage corresponds to the hypothetical value, you need to know the base concentration of the polymer being used, the amount of the polymer solution being used, and the average system flow.

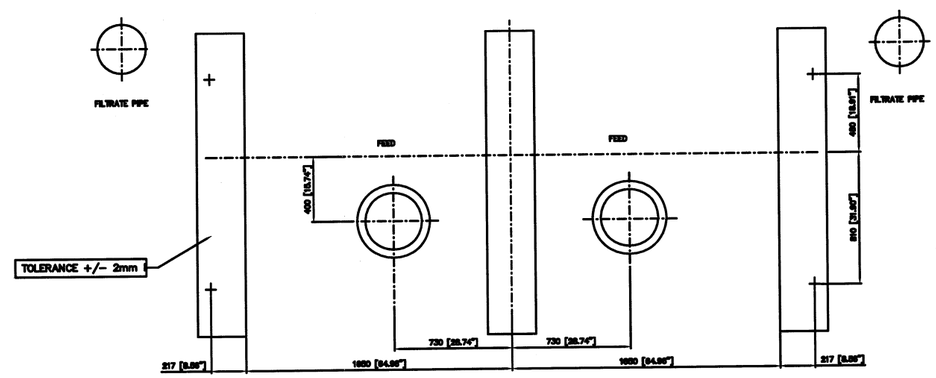
Calculation example:

– Base concentration:	0.1%
– Amount of polymer solution:	500 l/h
– System flow:	250 m^3/h
→ Dosage	= 500 l/h × 0.1% / 250 m^3/h
	= 0.5 kg/h / 250 m^3/h
	= 2 g/m^3
	= **2 ppm**





PROPOSAL STEEL SUPPORT TOP VIEW



NO LOAD ON FLANGES,PIPES MUST BE SUPPORTED PROPERLY

FILTRATE OUTLET AND DRAIN ENDS AS PIPE, NO FLANGES IN DELIVERY

DIMENSIONS ELEPHANT		
TYPE		ET10.16
Width	4843 mm	
Length	2156 mm	
Height	1874 mm	
1 Inlet	2x14"	ANSI
2 Filtrate	2x12"	ANSI
3 Drain	2x4"	ANSI
4 Level T.	3"	ANSI
5 Spraywater Connection	4"	ANSI
Spray water consumption	125 gpm	
Spray water pressure	60 psi bar	
Operating weight	20,395 lbs	
Overflow weight	27,560 lbs	
Power disc drive	10.0 hp	
Power brush drive	0.75 hp	

FINAL
STATUS: 21.05.07

SCA TISSUE FLAGSTAFF

MACHINE DRAWING ELEPHANT FILTER ET10.16

01248

07728

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ASC1-FS3/1

ASC1-FS3

merl

CONUSTRENNER 30 (2)/ELEPHANT FILTER 10.16
FLOWSHEET

LEGEND

SYMBOL NOTES

GRAPHIC SYMBOLS DIN 28004, DIN2429

- M MOTOR
- P PUMP
- RI RINGINJECTOR
- BV BALL VALVE
- CV CONTROL VALVE
- KV KNIFE VALVE
- SV SOLENOID VALVE
- S SAMPLE VALVE
- V VALVE

NORMAL POSITION OPEN

NORMAL POSITION CLOSED

RINGINJECTOR

FLOWMETER (IDM)

FLOWMETER (ROTAMETER)

PIPE CROSSING UNCONNECTED

PIPE CROSSING CONNECTED

PIPE REDUCTION

PIPE ENLARGEMENT

ELECTRICAL AND MEASUREMENT NOTES

DIN 19227/1, ISO 3511/1

F = FUNCTION, X = GROUP NUMBER
zz = COUNTING NUMBER

FLOW CONTROL VALVE

LEVEL INDICATION AND ALARM

FLOW INDICATION AND CONTROL

LEVEL TRANSMITTER

FLOW INDICATION

FLOW TRANSMITTER

FLOW RATIO INDICATION AND CONTROL

FREQUENCY (INDICATION AND) CONTROL

QUALITY SLUDGE DENSITY

QUALITY TURBIDITY REGISTRATION

CONSISTENCY SLUDGE INDICATION AND CONTROL

GROUP 02/xxx : CT 30 (pm/5)
GROUP 03/xxx : CT 30 (pm/6)
GROUP 04/xxx : ELEPHANT 10.16
GROUP 02.1xx : FEED CT 30 (pm/5)
GROUP 03.1xx : FEED CT 30 (pm/6)
GROUP 02.2xx : COARSE FLOW CT 30 (pm/5)
GROUP 03.2xx : COARSE FLOW CT 30 (pm/6)
GROUP 02.3xx : FINE FLOW CT 30 (pm/5)
GROUP 03.3xx : FINE FLOW CT 30 (pm/6)
GROUP 04.1xx : FEED ELEPHANT
GROUP 04.2xx : FILTRATE ELEPHANT
GROUP 02.4xx : SHOWER WATER CT 30 (pm/5)
GROUP 03.4xx : SHOWER WATER CT 30 (pm/6)
GROUP 04.3xx : SHOWER WATER ELEPHANT

NUMBER OF PUMP
Q = GPM
H = TDH
HP inst.

S= Sampling point: take into consideration 1" Ball valve

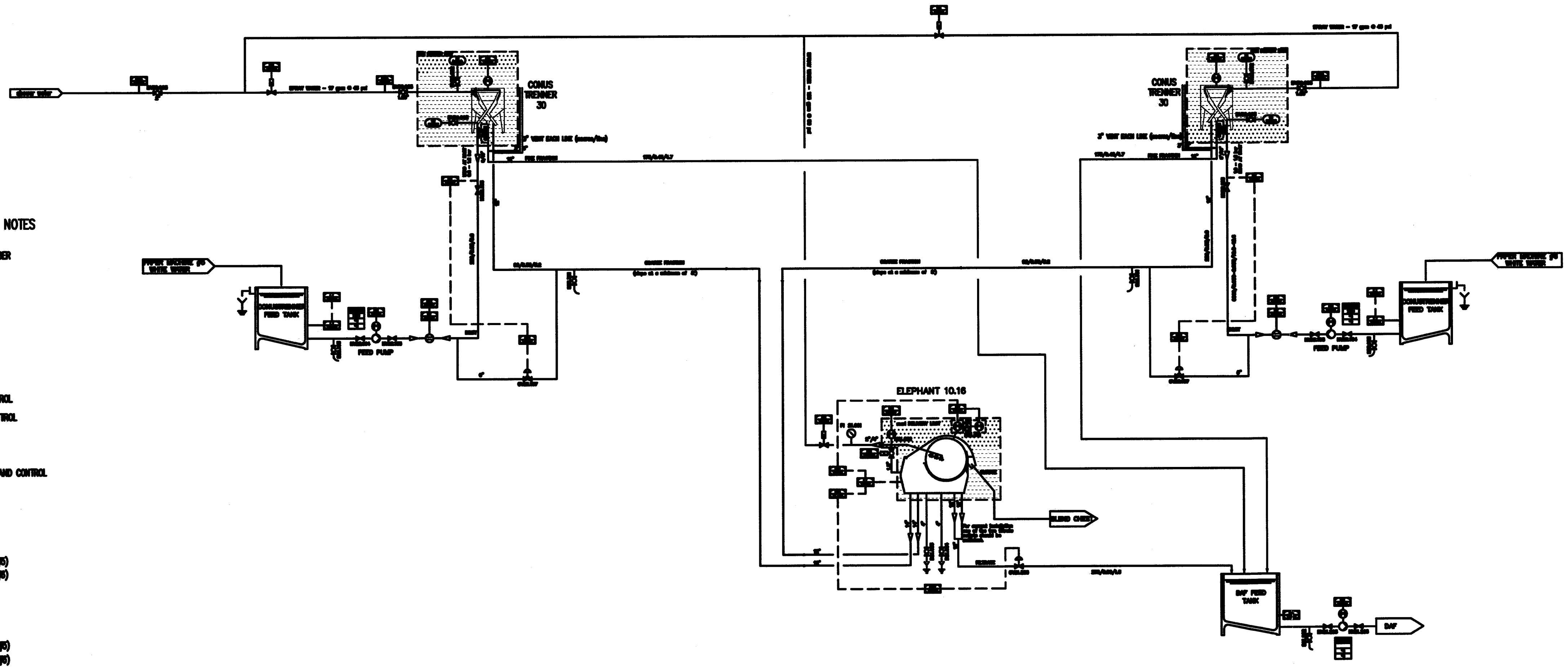
PIPING NOTES

FLOW VELOCITIES:
- vf1 = 3.3 ft/s
- vf2 = 1.6 ft/s
- vf3 = 9.8 ft/s

gpm / ppm / bdstpd

GENERAL NOTES

1) LOAD AT INLET FILTER 0.2 bar
2) NO PROCESS ALARMS IN LIST
3) FEED : m?30
*) TO BE SPECIFIED



FOR APPROVAL
STATUS: 23.05.07

VIR EQUIPMENT No.:	MANUFAC. No.:	MERI Code: 07724–FS2
Customer: SCA TISSUE FLAGSTAFF, AZ	Project Code: 07724	MERI Entsorgungstechnik GmbH, Lovisengstraße 18, 81673 München, Germany, Tel.: +49/89/393344, Fax: +49/89/5501979
Title: CONUSTRENNER ELEPHANT FILTER FLOWSHEET	Scale: – Size: A1 Sheet: of	
	Drg.-No.: FSA1–FS2/1	merl Entsorgungstechnik GmbH
	File: FSA1–FS2	

Rev.	Description	Date	Name	Check
H				
G				
F				
E				
D				
C				
B				
A				

A Joint Venture between VOITH PAPER and [illegible] Anlagentechnik