



GEA Mechanical Equipment US, Inc.
GEA Westfalia Separator Division
100 Fairway Court | Northvale, New Jersey | 07647

Mechanical Engineering Submittal

Dewatering Decanter

Model: CF 7000

City of Taunton, MA – WWTF
Taunton, MA USA

Rev. 0
August, 2021



Note: Please address the Controls Signals questions on the P&ID per P. Carforo to C. Hendrickson email dated 8/16/21.

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Table of Contents

Cover Page	1
Table of Contents	
General Information	3
1 - GEA Contact Information	3
2 - Equipment Identification	4
3 - Warranty Certificate	5
4 - Centrifuge Data Sheet	7
5 - Centrifuge Design Data	9
6.a - Equipment Storage Instructions	10
6.b - Equipment Long Term Storage Guidelines	11
7 - Centrifuge Sample Factory Test Report	21
8.a - Training Outline	22
8.b - Training Document	27
Mechanical Design	95
9 - Bill of Materials	95
10 - P&ID 9149-5700-909	96
11 - Installation Plan 9149-4100-706	98
12.a - Installation Video	103
12.b - Installation Suggestions	104
12.c - Installation Guidelines	106
13 - Anchor Bolt System	166
14 - Solids & Liquids Flex Connectors	173
15.a - Bowl Motor	174
15.b - Scroll Motor	177
15.c - Motor IOM Manual	180
16 - Materials of Construction	236
17 - Abrasion Protection Features	237
18 - Bearing Life Calculations	240
19 - Centrifuge Manual	244
20 - Lubricating Device Instruction Manual	440
21 - Lubrication and Maintenance Schedule	456
22 - Factory Paint System & Procedures	474
23 - Sample Set of Tools	484
24.a - Spare Parts	506
24.b - Sample Spare Parts Catalog	507

Headquarters, Parts, & Repair Center Location:

**GEA MECHANICAL EQUIPMENT US, INC.
GEA Westfalia Separator Division
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Northvale, New Jersey 07647**

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For future reference, it is recommended that the user have available important information concerning the system. Please make sure that the following information provided is as complete as possible. This information will assist with the ordering of replacement parts and will be requested during any inquires at the factory.

Machine Application:	Dewatering
Machine Purchaser:	Veolia Water N.A.
Purchaser Contract Number:	987533
Purchaser Equipment ID No.:	SSP-7301 SSP-7302
Contract Date:	30-June-2021
Installation Location:	Taunton, MA
Westfalia Separator Project Number:	2652395848
Centrifuge Model Number:	UCF 7000
Year of Construction	2021
Number of Machines Ordered:	2
Serial Number(s):	8012-663 8012-664
Mechanical Submittal Revision	0
Submittal Issue Date:	August 2021

**GEA Mechanical Equipment US, Inc.
GEA Westfalia Separator Division**

**MATERIAL AND WORKMANSHIP WARRANTY
City of Taunton, MA Wastewater Treatment Facility Solids Handling Improvements**

Seller warrants to Veolia Water North America – Northeast, LLC (the “Buyer”) and City of Taunton, Massachusetts (“Owner”) that the equipment purchased from Seller is free from defects in material and workmanship to the extent provided in Section 3.04 of Specification Section 11350, for the warranty period set forth therein and will satisfy the process performance requirements set forth in Section 2.02 of Specification Section 11350 (when tested in accordance with Specification Section 01680) provided that: (i) the equipment is installed in accordance with Seller's specifications and instructions and is used and maintained normally and properly in accordance with Seller's instructions as to maintenance and operation, as set forth in written operation and maintenance manuals and instruction sheets furnished by Seller; (ii) the equipment is set for processing sludge consistent with the feed characteristics set forth in Section 2.02 of Specification Section 11350; (iii) the equipment has not been changed without the prior written approval of Seller; and only OEM parts and lubricants that affect the operation of the equipment have been used unless otherwise agreed by Seller; (iv) Buyer or Owner gives prompt written notice to Seller before the end of the warranty period specifying all alleged defects in the equipment purchased; (v) Buyer and Owner preserves and turns over to Seller and permits reasonable inspection by Seller of all allegedly defective equipment, parts or items and access to the equipment to observe its startup, operation and maintenance; and (vi) that to the extent that the Acceptance Testing and putting the equipment to use do not occur within 180 calendar days from the date of the shipment of the equipment to site or storage except for a delay caused solely by Seller, the applicable warranty periods will be deemed to have commenced on the date which is 180 calendar days after shipment of the equipment to site or storage.

Seller shall be responsible for furnishing all labor and materials necessary for repairs and replacements for all system components and controls furnished by the Seller which are defective under the terms of the warranty during the respective warranty period.

This warranty shall not cover (i) any equipment furnished by Buyer, Owner or any third party (other than a subcontractor of Seller), (ii) any defects arising from corrosion, abrasion, use of unsuitable lubricants, operation outside of prescribed temperature ranges, or negligent attendance or faulty operation, (iii) ordinary wear and tear, or (iv) any defects caused by errors on the part of the Buyer or Owner in not providing suitable premises in which the equipment is to be located, adequate foundation works, or adequate protection against influences within or outside the premises which may affect the equipment or its operation. Notwithstanding the warranty set forth above, Seller shall not warrant any equipment, where the vendor of such equipment (other than Seller) is specified by Buyer or Owner, for a period longer than warranted by the vendor.

THE WARRANTY OF MATERIAL AND WORKMANSHIP AND THE SATISFACTION OF THE PROCESS PERFORMANCE REQUIREMENTS SET FORTH ABOVE ARE THE ONLY WARRANTIES MADE BY SELLER AND ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SELLER DISCLAIMS ON BEHALF OF ITSELF, ITS AFFILIATES, SUBCONTRACTORS AND SUBSUPPLIERS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY, FITNESS FOR A SPECIFIC PURPOSE (OTHER THAN THE PURPOSE STATED IN THE OWNER'S SPECIFICATIONS SET FORTH IN THE ORDER), SUITABILITY OR PERFORMANCE. No other promise or affirmation of fact (including, but not limited to, statements regarding capacity or performance of the equipment) shall constitute a warranty of Seller or give rise to any liability or obligation on the part of Seller.

Seller's obligation under this warranty and guarantee is strictly and exclusively limited to furnishing repairs or replacements for equipment or parts determined to be defective on inspection by an authorized representative of Seller. Notwithstanding this exclusive remedy, if it is ultimately determined that the remedy fails in its essential purpose, then any action which may be brought against Seller subject to the terms of the order will be limited to 100% of the order price for the purchased equipment for which the exclusive remedy has so failed. Similarly, Seller's and its subcontractors' and subsuppliers' aggregate responsibility and liability, whether arising in contract or tort, including negligence and strict liability, under this Warranty shall not exceed the purchase price for the equipment purchased from Seller provided, however, that the limitation will not apply to any liability of Seller for direct damages claimed by third parties for such third parties' personal injury or physical property damage for which Seller is liable to the extent caused by the negligent acts or omissions or willful misconduct of the Seller, for all of which matters Seller shall only be liable up to an amount of \$1,000,000 in the aggregate. Seller assumes no responsibility and shall have no liability for any repairs or replacements by Buyer or Owner without Seller's prior written authorization.

In no event shall Seller, its subcontractors or subsuppliers be liable in contract or in tort or under any other legal context or theory, including negligence and strict liability, for any loss of revenues or profits or loss under purchases or

**GEA Mechanical Equipment US, Inc.
GEA Westfalia Separator Division**

**MATERIAL AND WORKMANSHIP WARRANTY
City of Taunton, MA Wastewater Treatment Facility Solids Handling Improvements**

contracts made in reliance on the performance or non-performance of the purchased equipment, or for any special, punitive, exemplary, indirect, incidental or consequential damages of any kind or character, including, but not limited to, loss of use of facilities or equipment or plant downtime, whether suffered by Buyer, Owner or any third party, or for any loss or damage to the extent arising out of the negligence of Buyer or Owner, their respective employees or agents or any third party.



Subject to modification

GEA biosolids Decanter prime 7000

Technical data | (Pre-) dewatering and thickening of municipal sludge

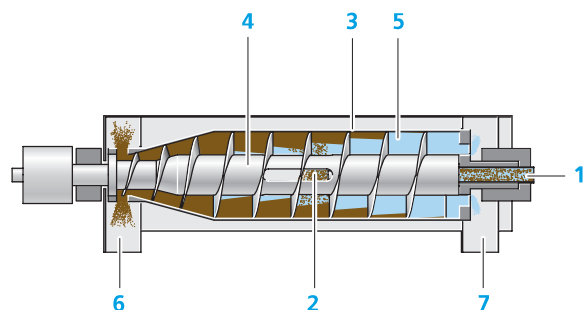
The GEA biosolids Decanter prime 7000 is a continuously operating centrifuge with horizontal solid-wall bowl developed specifically for (pre-) dewatering and thickening of municipal sludge. The frame is of open design with gravity discharge of the clarified phase.

Features

- Deep pond design for maximum separation efficiency
- Lowest power consumption (e.g. 0.7 kWh/m³/h)
- Highest g-force for maximum dewatering
- The scroll can be operated also with stationary bowl
- Gentle feed geometry for optimum flocculation and low wear
- Lowest space requirement (m³/h per m²)
- Good accessibility to all components
- Easy to operate and maintain
- Innovative adjustable scroll drive with the following features:
 - GEA **summationdrive**[®] with intelligent kinematics for high differential speeds and torques
 - Adjustable bowl speed via VFD
 - Highest efficiency of the drive since the variable speed motor feeds in energy rather than braking
 - Sensitive torque regulation
 - Automatic control of differential speed via VFD

Technical data GEA biosolids Decanter prime 7000

Operating principles and constructional features



- | | |
|----------------|---|
| 1 Product feed | 5 Separation chamber |
| 2 Distributor | 6 Solids discharge |
| 3 Bowl | 7 Discharge of the clarified liquid phase |
| 4 Scroll | |

Bowl	
g-volume	up to 1980 m ³
L/D ratio	4.0
Speed	up to 3150 rpm
g-force (z)	up to 3550 g
Main drive motor	
Rating	75 kW up to 250 kW (with VFD)
Speed at 50 Hz/60 Hz	1500 rpm/1800 rpm
Scroll drive	
Rating at 50 Hz	37 kW up to 75 kW (with VFD)
Rating at 60 Hz	29 kW up to 48 kW (with VFD)
Shipping data	
Decanter weight	up to 8850 kg
Case dimensions	4970 x 1820 x 1800 mm 2450 x 1700 x 1680 mm 2450 x 1250 x 1270 mm
Shipping weight	approx. 10,070 kg (combined)

Standard scope of delivery

- 3-phase AC motors
 - 400 V, 50 Hz or 460 V, 60 Hz
 - Make: WEG
 - Efficiency class: IE₃
 - Color: Black
- PLC make: with Siemens S7-1200 series
- VFD make: Schneider Altivar 9xx series
- Covers: Stainless steel
- Frame color: Opal Green RAL 6026
- Product-contacting parts: AISI 316
- Scroll protection: flame sprayed tungsten carbide
- Feed pipe flange compensator
- Standard GEA documentation package

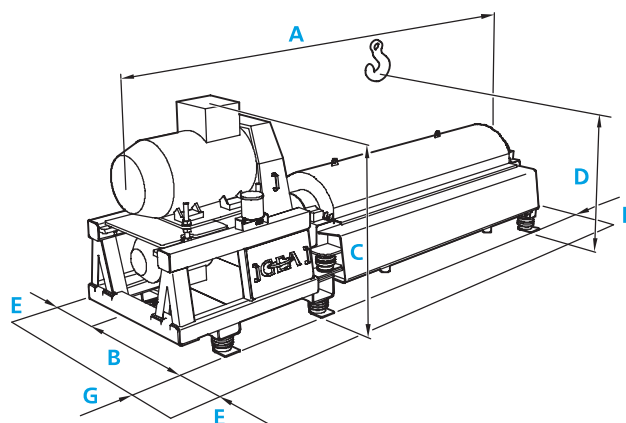
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Dimensions in mm (inch)



A	B	C	D
5800 (228)	1550 (61)	2350 (93)	>4100 (162)
E	F	G	
>500 (20)	>2100 (83)	>700 (28)	

Options

- Motor with space heaters (tropicalization)
- Motor acc. NEMA design
- Motor make: ABB
- Set of tools for machine dismantling and assembly
- Vibration control sensor, liquid side
- PLC make: with Allen Bradley Rockwell Compactlogix series
- VFD make: Danfoss FC 300 series or ABB ACS 880 series
- Bowl bearing temperature control, liquid and solids side
- Standard set of spares parts and / or set of revision parts
- Frame paint: different colors and high corrosion resistance
- Compliance to ATEX Zone I & II
- Slide gate, solid chute and liquid chutes
- Energy jets
- Scroll protection with sintered tungsten carbide tiles
- Multiple gearbox sizes incl. motorsizes on demand

Customer: City of Taunton, MA WWTF
Model: CF 7000



Overview: Sludge Dewatering

Sludge Description:	Blend of Primary & WAS
Feed Concentration:	4.0%
Hydraulic Feed Rate:	200 GPM
Solids Loading Rate:	4,000 #/hr DS

Performance:

Dewatered Cake Solids:	25 - 30%
Recovery:	≥ 95%
Polymer Dose Rate:	15 - 25 #/DT

Mechanical & Electrical:

Bowl Diameter:	(640 mm) 25.2 in
Bowl Length:	(2683 mm) 105.6 in
Bowl Speed:	3,150
Operating G-Force:	3,550
Main Drive HP:	75
Scroll Drive HP:	50

EQUIPMENT STORAGE:**1) SHORT TERM STORAGE [\leq 30 days duration]**

- a) For short term storage prior to installation, the equipment should be stored indoors, in a dry location, in their original crates. Top cover should be maintained on any opened crates.

2) LONG TERM STORAGE INSTRUCTIONS [$>$ 30 days duration – up to 1 year]

- a) For long term storage of the decanter equipment, the following is required:

i) General Requirements – Equipment in Original Shipping Crates:

- (1) Maintain equipment in the original shipping crates. Keep crates in a cool, dry location not exposed to weather elements.
- (2) Cover crates with tarps or other suitable cover to keep dust/debris off equipment. Ensure condensation does not build up on machine surface under the tarp.
- (3) Protective caps supplied with machine are to be maintained on machine ports. Seal all machine openings.
- (4) Control panel doors must be fully closed. Add desiccant to interior of panel to remove moisture.
- (5) Once per month: carry out visual inspection and perform the following to the equipment.
 - (a) Check all machine surfaces that are coated with corrosion / rust protection to ensure protective coating is maintained. Use Fuchs Lubricants Co type Decordyn GG, Chemsearch Rust Block, or equal. Remove old protective film and replace with new coating at least once per year.
 - (b) Check finish coat of machine painted surfaces. Apply touch up paint as needed.
 - (c) Check desiccant in panels. Replace as needed.
 - (d) Turn motor shafts ten revolutions and stop in a different position.

ii) During Installation; Prior to Start-Up:

- (1) In addition to the general requirements listed above, perform the following:
 - (a) Control panel doors are to be maintained closed. All Conduit connections are to be sealed [i.e. not open to atmosphere]. Insert silica-gel bags [desiccant] inside panels for moisture control.
 - (b) Add space heaters to control panels. The interior temperature should be maintained approximately 10°F above ambient.

iii) Prior to Start-Up for Regular Operation:

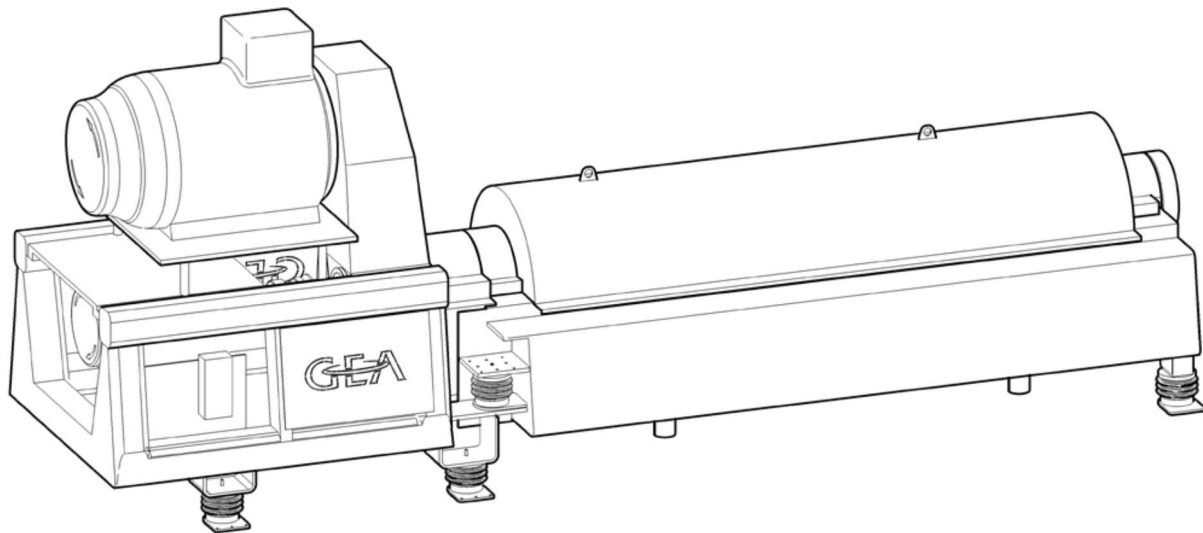
- (1) Complete installation of all piping, hoses, electrical connection, etc.
- (2) Check that gearbox and bearing are provided with their proper quantity and type of grease. Refer to the specific instructions in the lube and maintenance schedule and the installation guidelines.
- (3) Check vibration isolators for wear or damage. Replace worn parts as needed.
- (4) Check finish coat of machine. Apply touch up paint as needed
- (5) Replace PLC batteries, if needed.
- (6) **NOTE:** the work should be performed under the direct supervision of a certified GEA Westfalia Separator service technician.

Decommissioning & Long Term Storage Guidelines

Designation: Decanter

Model: waterMaster CF 7000

No. 8419-9001-800_13 | Edition 16.01.2014



8419000

ORIGINAL INSTRUCTION MANUAL
Subject to modification!

The authors are always grateful for comments and suggestions for improving the documentation. These can be addressed to:



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13 Decommissioning

13.1	Notes on long-time storage of the decanter and individual rotors	4
13.1.1	Decommissioning the decanter	4
13.1.2	Painted parts.....	4
13.1.3	Unpainted areas and galvanised parts	5
13.1.4	Gearbox / spare gearbox.....	5
13.1.5	Drive motors	5
13.2	Maintenance schedule (machine shut-down for a prolonged period) ...	6
13.2.1	Maintenance work once a month.....	6
13.2.2	Maintenance work once a year.....	6
13.2.3	Maintenance work before resuming operation	7
13.3	Disposing of the centrifuge	8
13.3.1	Disposing of utilities	8
13.3.2	Disposing of cleaning fluids	9

13.1 Notes on long-time storage of the decanter and individual rotors

The decanter/rotor will get damaged if it is not operated for a prolonged period and inadequate preserving measures are taken. This also applies for the time before commissioning.

When the machine is shut down for longer than 12 months, special measures are required to avoid the machine getting damaged during standstill.

If this action is not taken, the roller bearings of the machine in particular will be damaged by corrosion and one-sided load. This bearing damage results in high consequential costs.

The required preserving measures should be monitored by GEA Westfalia Separator Service.

13.1.1 Decommissioning the decanter

For a long-term storage (standstill longer than one year), the decanter must be prepared as follows after shut-down:

- Clean hood and catcher.
- Dismantle all feed and discharge lines of the machine and seal the openings.
 - Product feed
 - Solids discharge
 - Liquid discharge
 - Flocculent feed
- Remove the coupling. Slacken and remove the flat belts.
- Drain the gear oil from the gearbox and the surge reservoir. Fill in preserving oil.
- Only in case of grease-lubricated bowl bearings
 - Pack the bowl bearings with grease.
- Only in case of oil-lubricated bowl bearings:
 - Fill 0,05 litres of preserving oil into the bowl bearings (WS Part-No. 6969-0005-010).
 - In the case of individual rotors, additionally seal all holes.
- Tighten the bowl lock screws and lock with nuts.

13.1.2 Painted parts

An intact paint coating provides adequate corrosion protection. For this reason, painted parts must be examined for damage or changes once a month.

Touch up the damage in accordance with the instructions of the paint manufacturer.

13.1.3 Unpainted areas and galvanised parts

Unpainted areas and galvanised parts must be treated as follows:

- Carefully clean the area or part.
- Spray on corrosion protection wax (WS Part-No. 6969-0022-010) Note the exception in the following diagram.

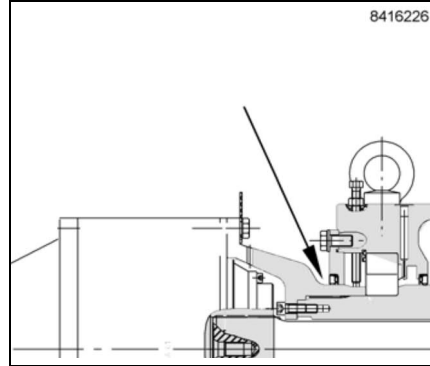


Fig. 111

- Treat this part of the hub with slushing oil (WS Part-No. 6969-0015-050).

- Check and, when necessary, touch up the corrosion protection once a month.

13.1.4 Gearbox / spare gearbox

The gearbox and spare gearboxes must be prepared as follows for long-term storage.

- Drain the lubricating oil completely, see chapter "Gear".
- Fill in 0.05 litre preserving oil (WS part no. 6969-0005-010) and close the gearbox.
- Carefully clean the gearboxes. Spray on corrosion protection wax (WS Part-No. 6969-0022-010) Check and, when necessary, touch up the corrosion protection once a month.

For the purpose of transporting the gearbox for inspection by the manufacturer, the gearbox must likewise be prepared as described above.

13.1.5 Drive motors

The drive motors must be prepared as follows for long-term storage.

- Option: Connect the space heaters for the motor winding. This is especially important in the case of high air humidity in the environment.
- Carefully clean the motor.
- Spray on anti-corrosive wax (see spare parts catalog).
- Check and, when necessary, touch up the corrosion protection once a month.

13.2 Maintenance schedule (machine shut-down for a prolonged period)

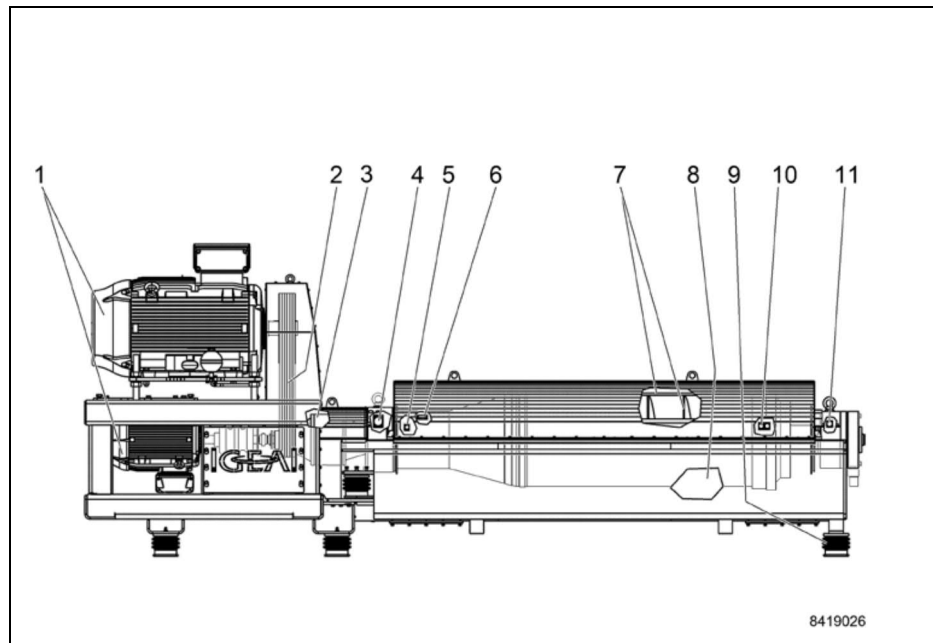


Fig. 112

Important: Machines decommissioned for longer than one year require regular maintenance to remain serviceable.

13.2.1 Maintenance work once a month			
Pos:	Machine part	Action	Operator
8	Decanters	<ul style="list-style-type: none"> ➤ Check paint finish. Touch up damage immediately. ➤ Check corrosion protection. If necessary, spray on corrosion protection wax (WS Part-No. 6969-0022-010) 	Tspec
7	Bowl	<ul style="list-style-type: none"> ➤ Rotate the bowl (minimum 10 revolutions) 	Tspec
3	Gearbox, input	<ul style="list-style-type: none"> ➤ Rotate the gearbox (minimum 10 revolutions) 	Tspec
1	Drive motors	<ul style="list-style-type: none"> ➤ Rotate the motor shaft (minimum 10 revolutions) 	Tspec

13.2.2 Maintenance work once a year			
Pos:	Machine part	Action	Operator
8	Decanter housing	<ul style="list-style-type: none"> ➤ Renew corrosion protection. ➤ Spray on corrosion protection wax (WS Part-No. 6969-0022-010) 	Tspec

13.2.3 Maintenance work before resuming operation			
Pos:	Machine part	Action	Operator
2	V-belts	➤ Mount belts.	Tspec
3	Gearbox	➤ Filling in new oil	Tspec
4 11	Bowl bearings	➤ Carry out "Pre-lubricate bowl bearings".	Tspec
6	Protective rings, clearers and bushes / Solids discharge	➤ Check wear and replace when necessary:	Tspec
7	Bowl and scroll	<ul style="list-style-type: none"> ➤ Check for wear. ➤ When wear, damage or corrosion is detected on load-bearing bowl parts, contact Westfalia Separator Service. 	Tspec
9	Vibration isolators / frame	<ul style="list-style-type: none"> ➤ Check the vibration absorbers for any changes. Replace the vibration absorbers in the case of the following abnormal signs: <ul style="list-style-type: none"> • Cracks • Deformations • Discoloration Defective vibration absorbers may cause substantial follow-up damage. 	Tspec
	Vibration isolators / drive		

Op = Operator / Skilled = Skilled worker / Tspec = Trained specialist

13.3 Disposing of the centrifuge

When the centrifuge has reached the end of its useful service life, the plant operator is responsible for proper and correct disposal.

It is recommended to commission a company specialized in the disposal of machines or to obtain information from GEA Westfalia Separator service.

- Observe the local disposal regulations.
- Be sure to adhere to applicable environmental protection legislation.
- Have electrical connections disconnected by qualified personnel, e.g. electricians.

IMPORTANT: Residual liquids in feed lines and utility lines can cause injury. Protective clothing must therefore be worn when dismantling lines.



WARNING

Danger of acid and alkali burns

After cleaning, hot lye and acid residues can still be in the centrifuge and the pipelines. When working on the centrifuge, contact with the lyes and acids can cause burns.

- Wear acid-resistant protective gear, e.g. protective goggles, protective gloves, protective overalls or protective suits.
- Take special care.
- Observe the standard operating procedures (SOPs) issued by the operator on handling acids and caustics as well as the local disposal regulations.
- Be sure to adhere to applicable environmental protection legislation.
- Drain residual liquids in feed lines and utility lines into suitable vessels and dispose of them properly.
- Observe regulations on product contact.

- Dismantle feed lines and utility lines, clean superficial impurities caused by lubricants or product with suitable media and dispose of separately.
- Dismantle all seals and non-metallic materials, clean them to remove lubricants and dispose of them separately or recycle.
- Separate and sort metal parts and recycle them.

13.3.1 Disposing of utilities

When the centrifuge is decommissioned, the gear oil must be drained and disposed of. The plant operator is responsible for the proper disposal of the utilities.

- Observe the local disposal regulations.
- Comply with applicable environmental protection legislation.
- Drain off gear oil into suitable vessels and dispose of it properly. See data sheet for oil quantity.

13.3.2 Disposing of cleaning fluids

Chemicals are used for the chemical cleaning process which are specified in the user information or a datasheet issued with the user information. They are dangerous and can cause injuries and environmental damage.



WARNING

Danger of acid and alkali burns

Danger of chemical burns when handling chemical cleaning fluids and danger of burns by hot water.

- Wear acid-resistant protective gear, e.g. protective goggles, protective gloves, protective overalls or protective suits.
- Take special care.
- Observe the standard operating procedures (SOPs) issued by the operator on handling acids and caustics as well as the local disposal regulations.
- Comply with applicable environmental protection legislation.
- Drain residual liquids in feed lines and utility lines into suitable vessels and dispose of them properly.
- Observe regulations on product contact.



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Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

GEA Mechanical Equipment

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www.gea.com

Unsere Auftrags-Nr.: 139 451 / 02 Typ: WATERMASTER CF 7000
Our Order No.: Model:

Besteller: Kunden Bestell-Nr.:
Purchaser: Customer's Order No.:

Empfänger: WWTP
Receiver:

Prüfstandslauf mit Flüssigkeit
Test bay run with liquid

Masch.-Fabr.-Nr.: 8008-190 Trommel-Fabr.-Nr.: 8008-190 Schnecken-Fabr.-Nr.: 8008-190
Machine Serial No.: Bowl Serial No.: Conveyor screw No.:

Betriebsbedingungen: Zulauf: 21 m³/h Trommeldrehzahl: 3150 min⁻¹
Load Conditions: Feed: Bowl speed:

Motordaten

Motor

Hersteller: WEG Motor-Nr.: 10.17.10.49.71 Motortyp: 444/5T
Manufacturer: Serial No.: Motor Model:

P = 75 kW U = 460 V I = 123,6 A n = 1783 min⁻¹ f = 60 Hz

Prüfdatum: 19. July 2013 Name des Prüfers: M. Dennebaum
Test date: Name of tester:

Der Dekanter wurde beim Probelauf mit Wasser getestet.
The decanter was tested by feeding water.

GEA Mechanical Equipment
GEA Westfalia Separator Group GmbH
Werner-Habig-Straße 1, 59302 Oelde, Deutschland
Abnahme / Inspection

07 13
Stempelung
Stamp

24. July 2013
Datum
Date

i.A.

M. Brewer

3202-BR
Hersteller-Prüfbeauftragter
Inspection Representative of the Manufacturer



GEA Centrifuge System
Dewatering Operations

January 2021

**For the following target audience: Operators, Electrical &
Instrumentation, and Maintenance Personnel**

Note: GEA Power-Point Presentations to be referenced and site demonstrations to be conducted in parallel to the below agenda topics.

1.0 OPERATIONS LESSON PLAN

NOTE: This section will include both classroom and hands-on training.

1.1 INTRODUCTION

- 1.1.1 Westfalia Separator History, Personnel, and Contact Information
- 1.1.2 Equipment & Process Specifications

1.2 SAFETY

- 1.2.1 Centrifuge – High Speed Piece of Rotating Equipment
- 1.2.2 Maintenance – Lockouts, Heavy Equipment to Lift
- 1.2.3 Electrical – High Voltage, Remote Starting, E-Stop Features
- 1.2.4 Follow OSHA, Plant Regulation
- 1.2.5 Use Common Sense

1.3 CENTRIFUGE FUNDAMENTALS

- 1.3.1 Centrifuge Components List
- 1.3.2 Rotating Assembly
 - 1.3.2.1 Cylindrical Section
 - 1.3.2.2 Conical Section
 - 1.3.2.3 Scroll
 - 1.3.2.4 Gear Box
- 1.3.3 Main Drive Motor Creates the “G” Force

1.4 CENTRIFUGE THEORY

- 1.4.1 Operating Principles
 - 1.4.1.1 Separates 2-3 different specific gravities
 - 1.4.1.2 Settling Pond
 - 1.4.1.3 Acceleration of Gravity
 - 1.4.1.4 Continuous Operation
- 1.4.2 Differential Speed (Scroll motor)
 - 1.4.2.1 Conveying the Solids
 - 1.4.2.2 Scroll Drive System
- 1.4.3 Ring Dams
 - 1.4.3.1 Pond Depth / Length of Beach
 - 1.4.3.2 Negative / Positive Beach

1.5 OPERATING THE MACHINE

- 1.5.1 Starting & Stopping
- 1.5.2 Functions
- 1.5.3 Security
- 1.5.4 Screen Displays
- 1.5.5 Process Data Collection
- 1.5.6 Vibration Monitoring
- 1.5.7 Alarm Conditions and Responses
- 1.5.8 Discuss Recommended Housekeeping Procedures
- 1.5.9 Troubleshooting Guide
 - 1.5.9.1 Is corrective maintenance or operating parameter adjustment required?



1.6 OPTIMIZING THE PROCESS

- 1.6.1 Effect of Torque
- 1.6.2 Type of Sludge
 - 1.6.2.1 Settling Characteristics
 - 1.6.2.2 Percent solids in the feed
- 1.6.3 Type of Polymer
 - 1.6.3.1 Concentration
 - 1.6.3.2 Induction Point

1.7 CONTROLLING THE PROCESS

- 1.7.1 Optimal Results
 - 1.7.1.1 Clean Centrate (% Recovery of Solids)
 - 1.7.1.2 Dewatered Cake (% Cake Dryness)
 - 1.7.1.3 Least Amount of Polymer (lbs/ton)
- 1.7.2 Automatic Control
 - 1.7.2.1 Constant Torque / Variable Differential
 - 1.7.2.2 Base Differential
 - 1.7.2.3 Control Begin
 - 1.7.2.4 Control Gradient
- 1.7.3 Manual Control
 - 1.7.3.1 Constant Differential / Variable Torque

1.8 TOUR OF THE CENTRIFUGE

- 1.8.1 The seminar convenes at the centrifuge for a review of the equipment and demonstration of the machine.
NOTE: It is suggested that the centrifuges be in operation at this time and be processing sludge.

1.9 QUESTION AND ANSWER PERIOD

- 1.9.1 Review and Discuss Topics of the Lesson

2.0 ELECTRICAL – INSTRUMENTATION LESSON PLAN

NOTE: This section will include both classroom and hands-on training.

1.1 INTRODUCTION

- 1.1.1 Introduction of Personnel
- 1.1.2 Westfalia Service Contact Information

1.2 CENTRIFUGE ELECTRICAL SAFETY

- 1.2.1 Emergency Stop Features
- 1.2.2 Alarm and Shutdown Sequences

1.3 CENTRIFUGE PANELS AND COMPONENTS OVERVIEW

- 1.3.1 Motor Control Panel Overview and Components
- 1.3.2 Local Control Panel Overview and Components
- 1.3.3 Operator Interface Unit



1.4 MOTOR CONTROL PANEL

- 1.4.1 Overview
- 1.4.2 Review VFD Parameters
- 1.4.3 Review Electrical Schematics
- 1.4.4 Common Faults and Troubleshooting

1.5 LOCAL CONTROL PANEL & OPERATOR INTERFACE

- 1.5.1 Overview
- 1.5.2 Review Torque Control Function and Parameters
- 1.5.3 Review Electrical Schematics / P&ID
- 1.5.4 Review Operator Interface Unit and Screens

1.6 VIBRATION MONITORING

- 1.6.1 Overview of Units
- 1.6.2 Review Vibration Setpoints
- 1.6.3 Review Electrical Schematics
- 1.6.4 Basic Troubleshooting Techniques

1.7 BEARING TEMPERATURE ELEMENTS

- 1.7.1 Overview of RTDs (Location and Type)
- 1.7.2 Review of Temperature Ranges
- 1.7.3 Review of Electrical Schematics
- 1.7.4 Review of Alarm Setpoints

• PLC COMPONENTS & PROGRAM

- 1.7.5 Overview
- 1.7.6 PLC Program Review & Discussion

1.8 HANDS-ON TRAINING

- 1.8.1 Walkthrough on Centrifuge Floor
- 1.8.2 Review of Motor Control Panel and Components
- 1.8.3 Review of Local Control Panel and Components
- 1.8.4 Review of Operator Interface Unit
- 1.8.5 Review of Centrifuge Instrumentation
- 1.8.6 Review of Troubleshooting Procedures
- 1.8.7 Review of Centrifuge Start-Up and Shut-Down
- 1.8.8 Centrifuge Safety Discussion
- 1.8.9 Question and Answer Period

NOTE: It is suggested that the centrifuges be in operation at this time and be processing sludge.

1.9 QUESTION AND ANSWER PERIOD

- 1.9.1 Review and Discuss Topics of the Lesson

3.0 MAINTENANCE LESSON PLAN

NOTE: This section will include both classroom and hands-on training.

3.1 INTRODUCTION



- 3.1.1 Introduction of Personnel
- 3.1.2 Westfalia Service Contact Information

3.2 SAFETY

- 3.2.1 Lockout Procedure
- 3.2.2 Tagout Procedure

3.3 MAINTENANCE PROCEDURES

- 3.3.1 General Maintenance Procedures
- 3.3.2 Preventative Maintenance Procedures and Intervals

3.4 TOUR & DISCUSSION OF CENTRIFUGE EQUIPMENT (Includes Items 3.5, 3.6, 3.7, 3.8)

- 3.4.1 The seminar convenes at the centrifuge for a review of the equipment and demonstration of machine

3.5 BELTS

- 3.5.1 Review Procedure for Inspections and Belt Testing
- 3.5.2 Removal of Centrifuge Inspection Cover
- 3.5.3 Removal of Belt Guards
- 3.5.4 Tension Belts
- 3.5.5 Install Belt Guards and Inspection Covers

3.6 LUBRICATION

- 3.6.1 Review Lubrication Procedures Chart
- 3.6.2 Discuss Lubrication Types
- 3.6.3 Discuss Appropriate Cleaning Practices and Intervals

3.7 ROTATING ASSEMBLY, SCROLL REMOVAL, AND INSPECTION

- 3.7.1 Review Procedures for Rotating Assembly Removal and Inspection
- 3.7.2 Review Procedures for Scroll Removal and Inspection
- 3.7.3 Remove Cover and Inspect Bowl

3.8 QUESTION AND ANSWER PERIOD

- 3.8.1 Review and Discuss Topics of the Lesson

GEA Dewatering Centrifuge Training



GEA North America

100 Fairway Court

Northvale, New Jersey 07647 USA

GEA North America Worldwide

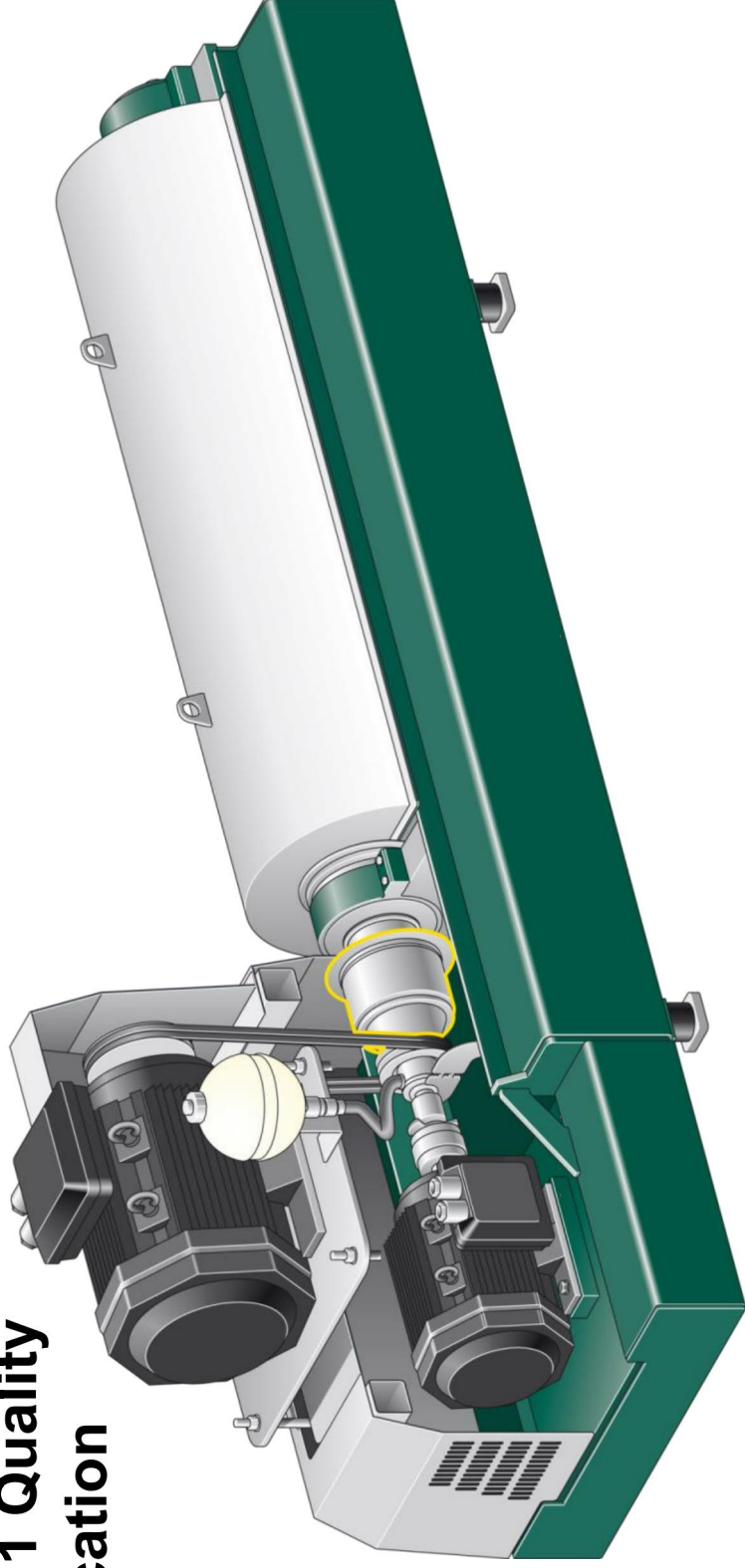
120 years Manufacturing Centrifuges

60 Years Manufacturing Decanter Centrifuges

Annual Centrifuge Sales of \$800 Million

Over 4,000 Employees

**ISO 9001 Quality
Certification**



incorporated in the State of New York, 1950

Headquartered In Northvale, New Jersey

- **Serving North America For Over 60 Years**
- **Over 10,000 Centrifuges Installed in N. America**
- **ISO 9001 Quality Certification**

Sales	Six Regional Sales/Service Offices
Service	40+ Service Personnel
Parts	\$10,000,000 Inventory
Repair	Wholly owned, Full Service, Total Repair Capability, Scroll Exchange Program



Contact: Mike Richmond, Northvale service manager

Telephone: 201-767-3900 (headquarters)
1-800-509-9299 (toll free number)

Hours: 8:30 – 5:00 EST
Monday - Friday

***For after hours emergencies:
Telephone: 201-767-3900 and follow instructions***

SAFETY

2

**The centrifuge
is a piece of
high speed
rotating
equipment -**



**Keep hands, body, and clothing away
from moving parts**

SAFETY



Never power-up the centrifuge with guards removed.

**Always lockout and tag the power source before beginning
work on the centrifuge or electrical panels.**

Follow OSHA and plant regulations.

SAFETY

Be on the lookout for other potential hazards



Centrifuges may at times produce high noise levels.

Wear hearing protection in loud noise areas.

Follow OSHA and plant regulations.

SAFETY

**Be on the lookout
for tripping hazards**



**hoses, power cords, and other
obstructions on the floor can present
tripping hazards**

Follow OSHA and plant regulations.



SAFETY

**Be on the lookout
for slip and fall hazards**

**water leaks, oil leaks, and leaks of
polymer solution can create a
hazardous slippery surface.**

Follow OSHA and plant regulations.

SAFETY

Be on the lookout for other potential hazards

**spraying leaks can
cause eye injuries**



**Wear eye protection and protective
clothing when appropriate**

Follow OSHA and plant regulations.

The Centrifuge Mechanical Overview

Centrifuge fully assembled



MAIN COMPONENTS

The two main components of the centrifuge are the bowl and the scroll

The bowl is a hollow vessel having a cylindrical section and a conical section



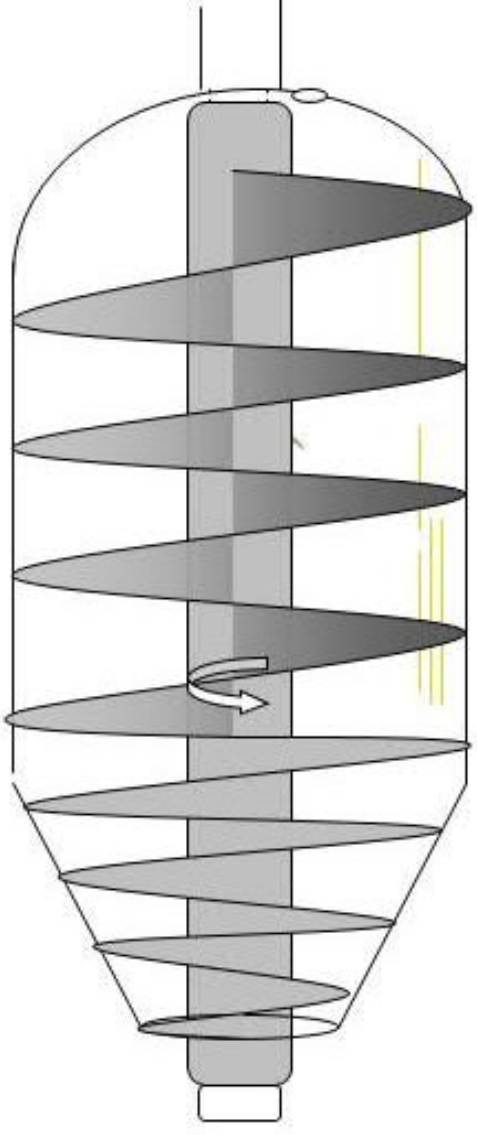
Wall thickness about 1 inch



Cone section

Cylinder section

The SCROLL is a screw conveyor that fits inside the BOWL

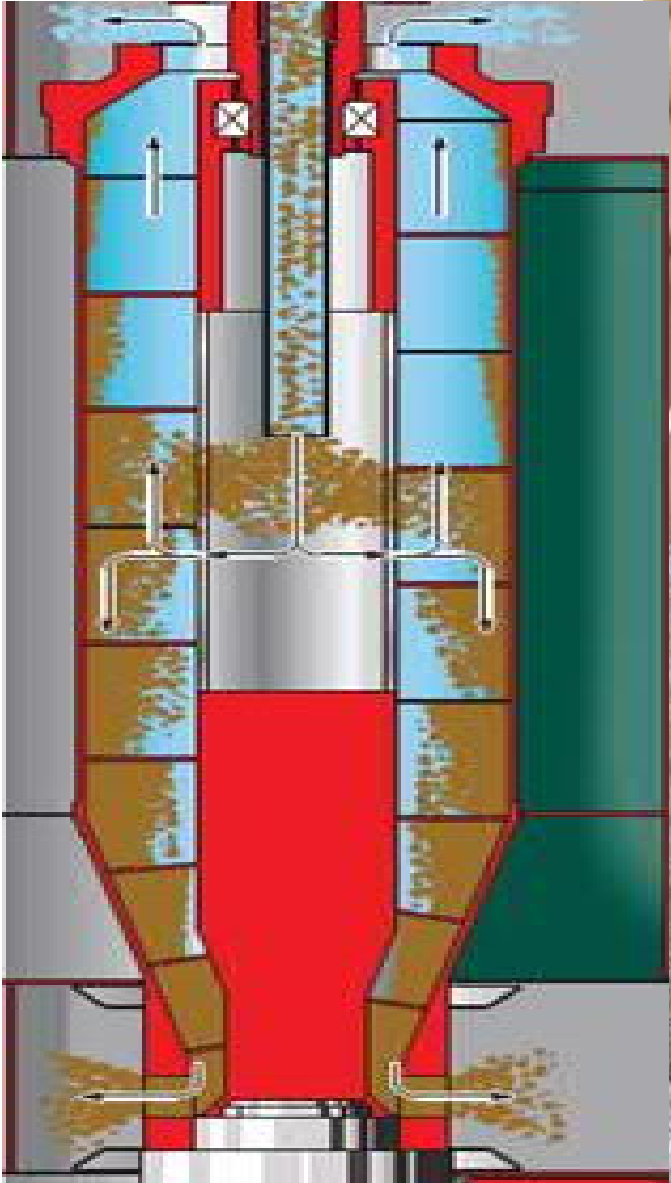


TYPICAL CC TYPE SCROLL



In operation, the scroll turns inside the bowl to convey dewatered cake toward the conical end of the bowl from which the cake discharges

Clarified concentrate drains out from ports at the liquid end of the bowl



Other Hardware

frame, motors, chutes

Under the belt guards and covers

FRAME, BOWL MOTOR,
SCROLL MOTOR, GEARBOX,
ROTOR, SPLASH GUARDS

BELT GUARDS

COVER

BOWL

MOTOR

GEAR

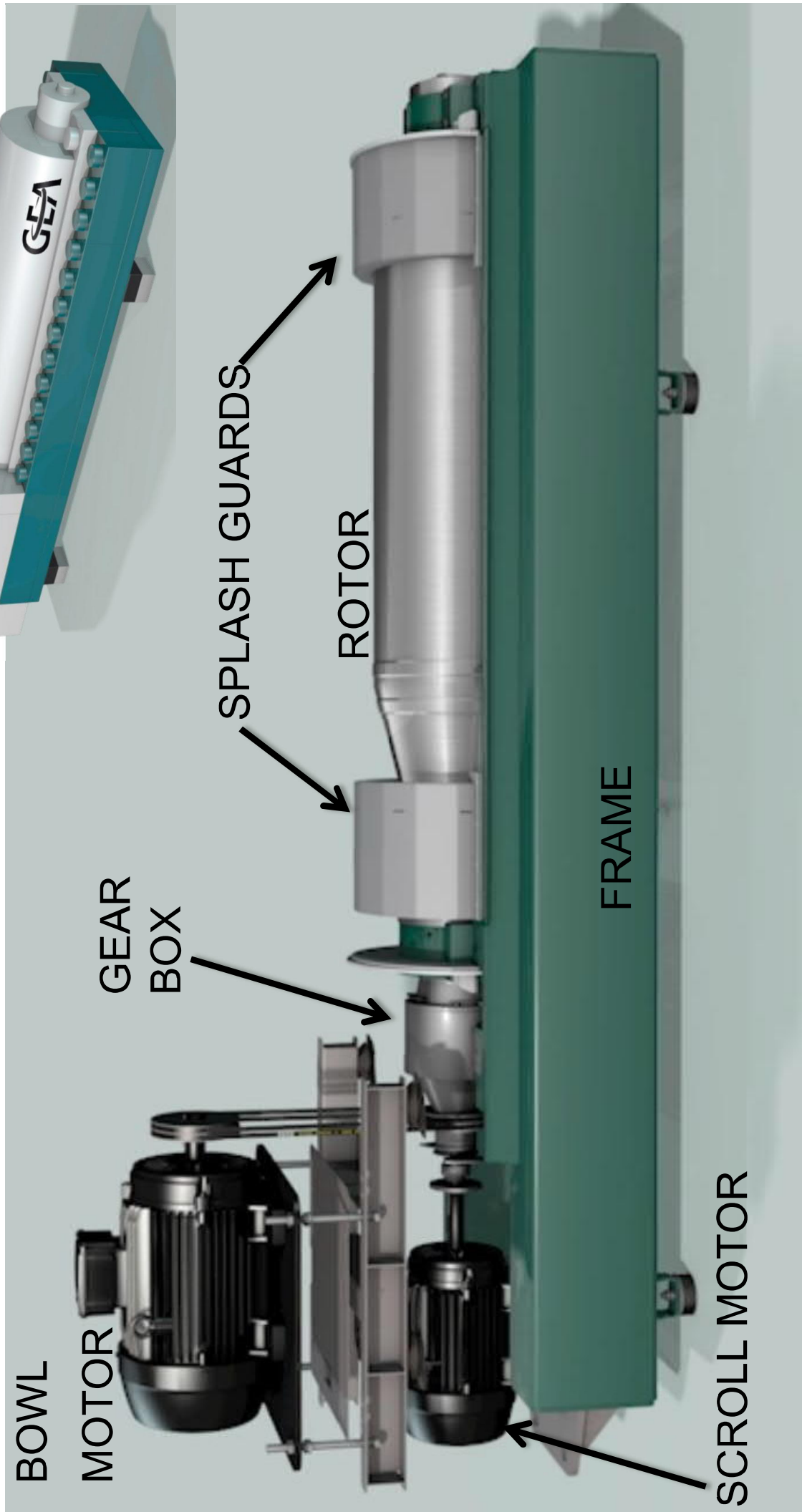
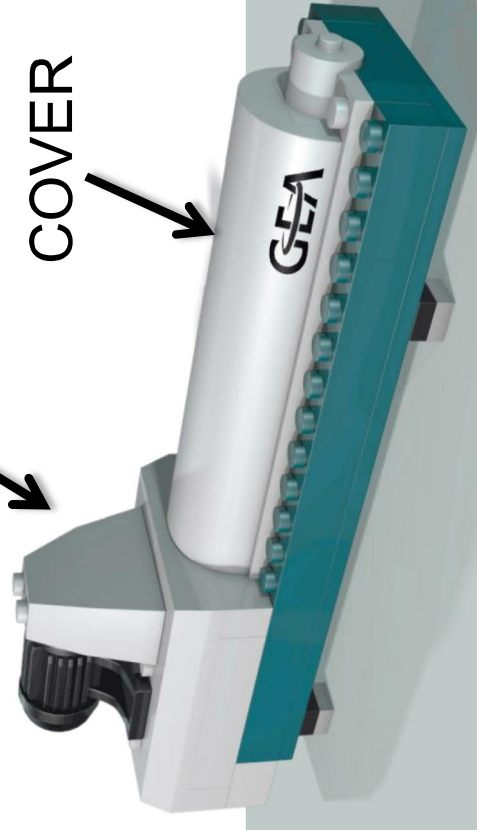
BOX

SPLASH GUARDS

ROTOR

FRAME

SCROLL MOTOR



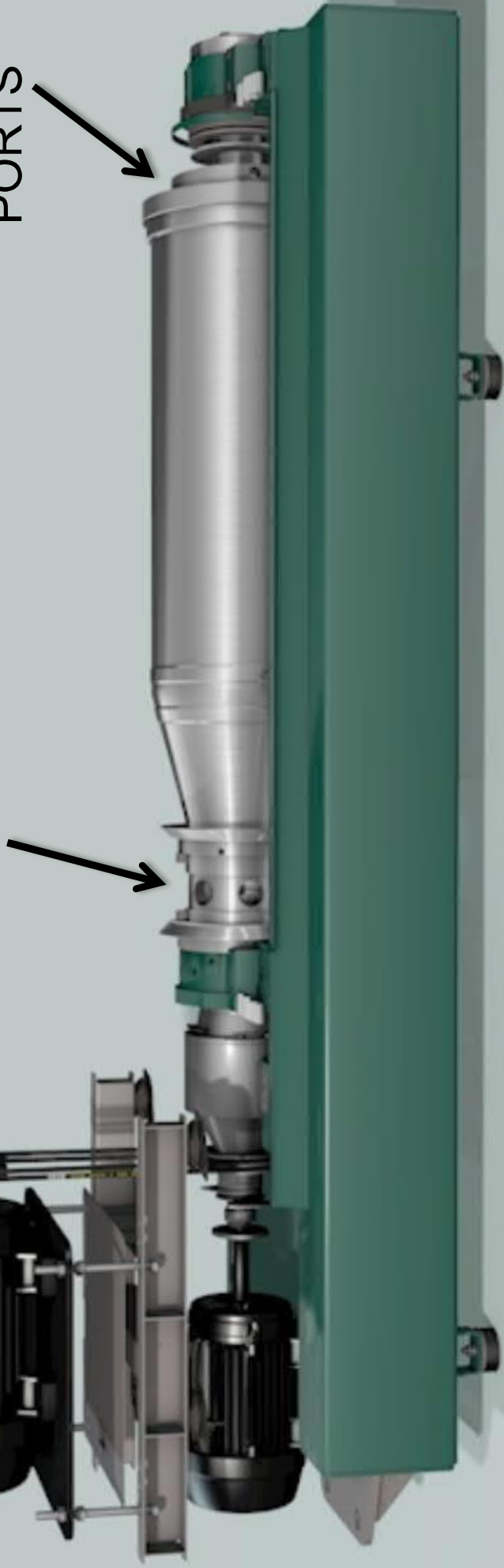
UNDER THE SPLASH GUARDS:
CAKE DISCHARGE PORTS
CENTRATE WEIRS



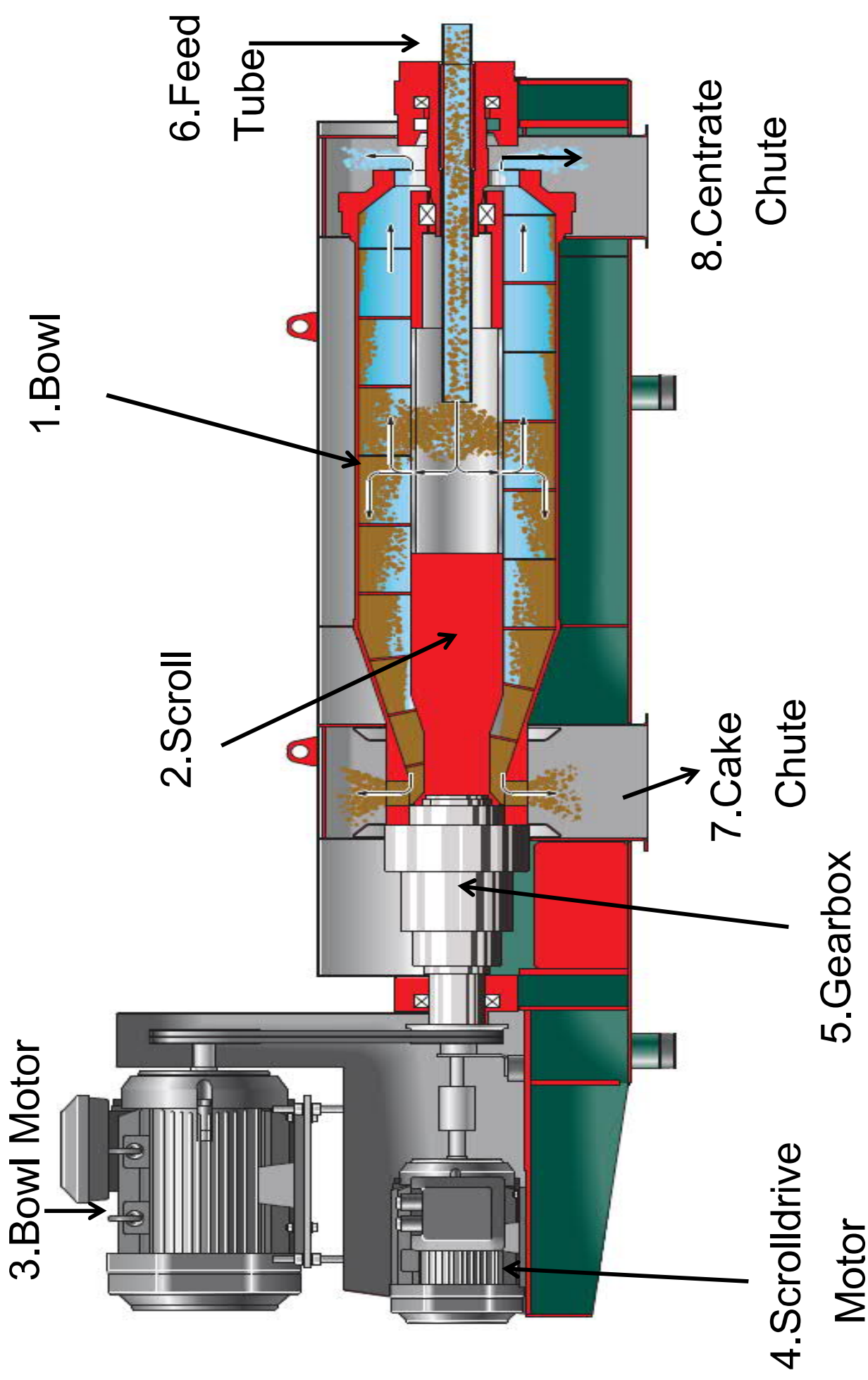
CAKE
DISCHARGE
PORTS



CENTRATE
DISCHARGE
PORTS

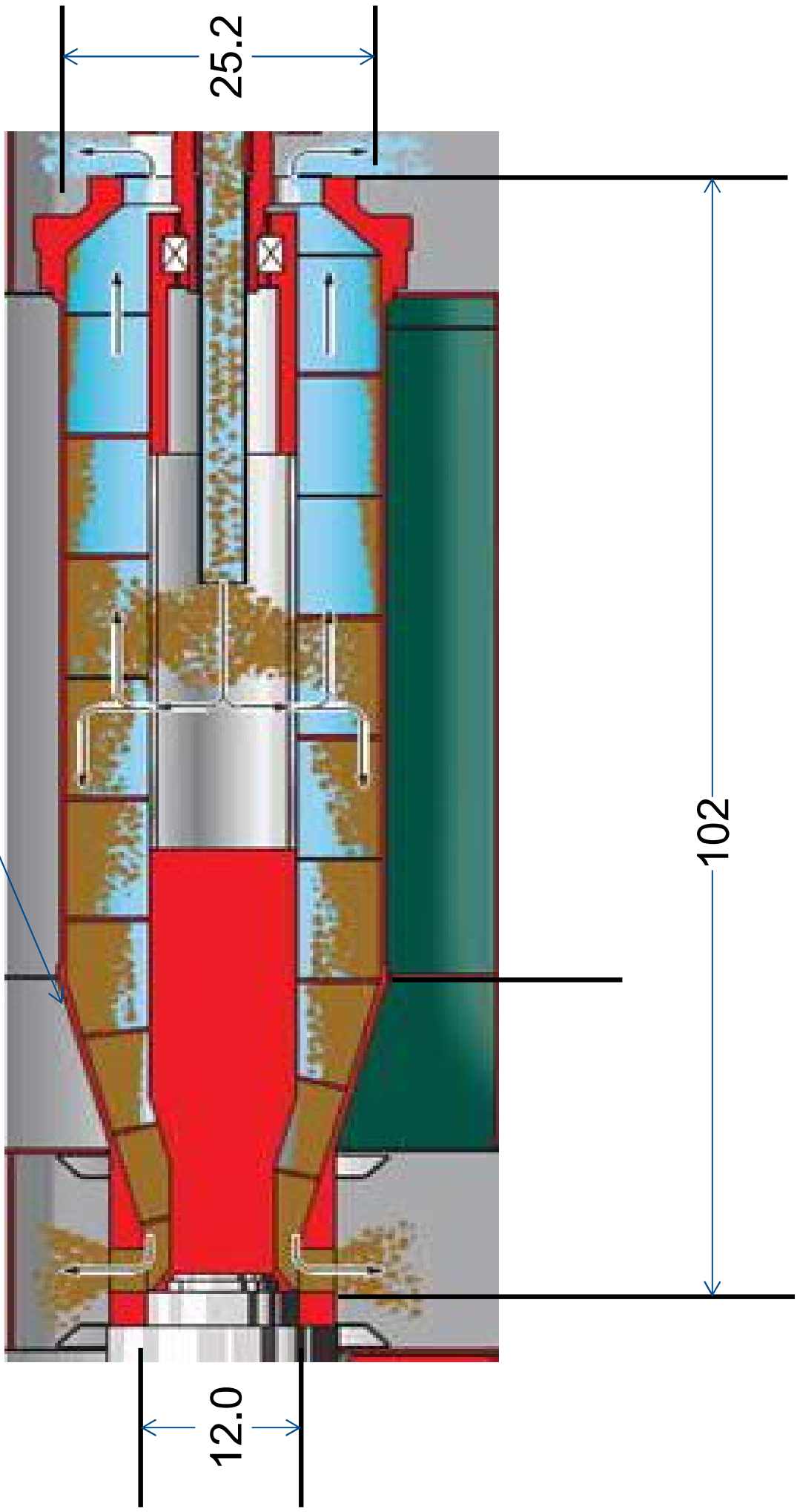


centrifuge components in cross section

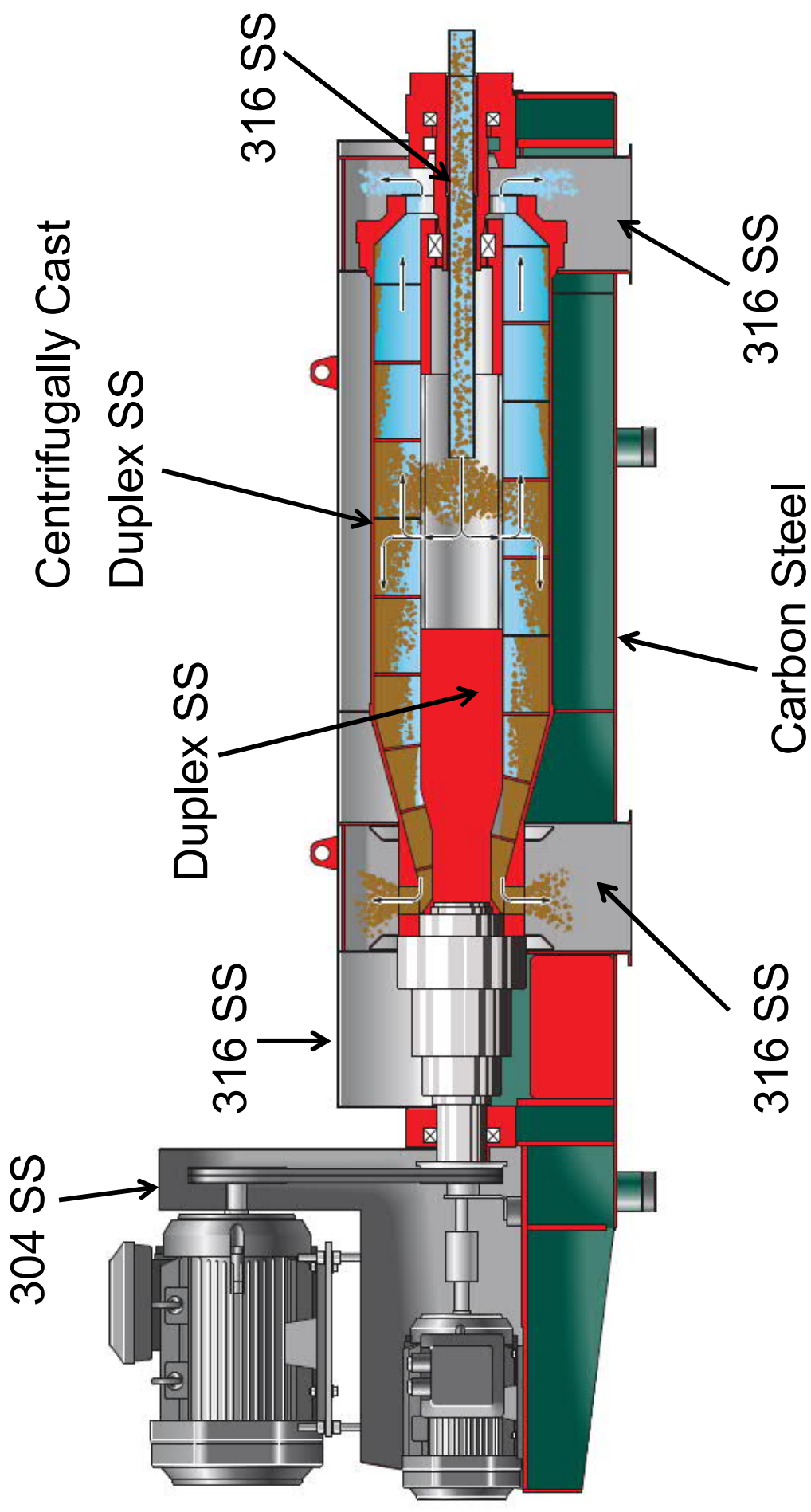


Bowl Geometry

8 degree for softening sludge

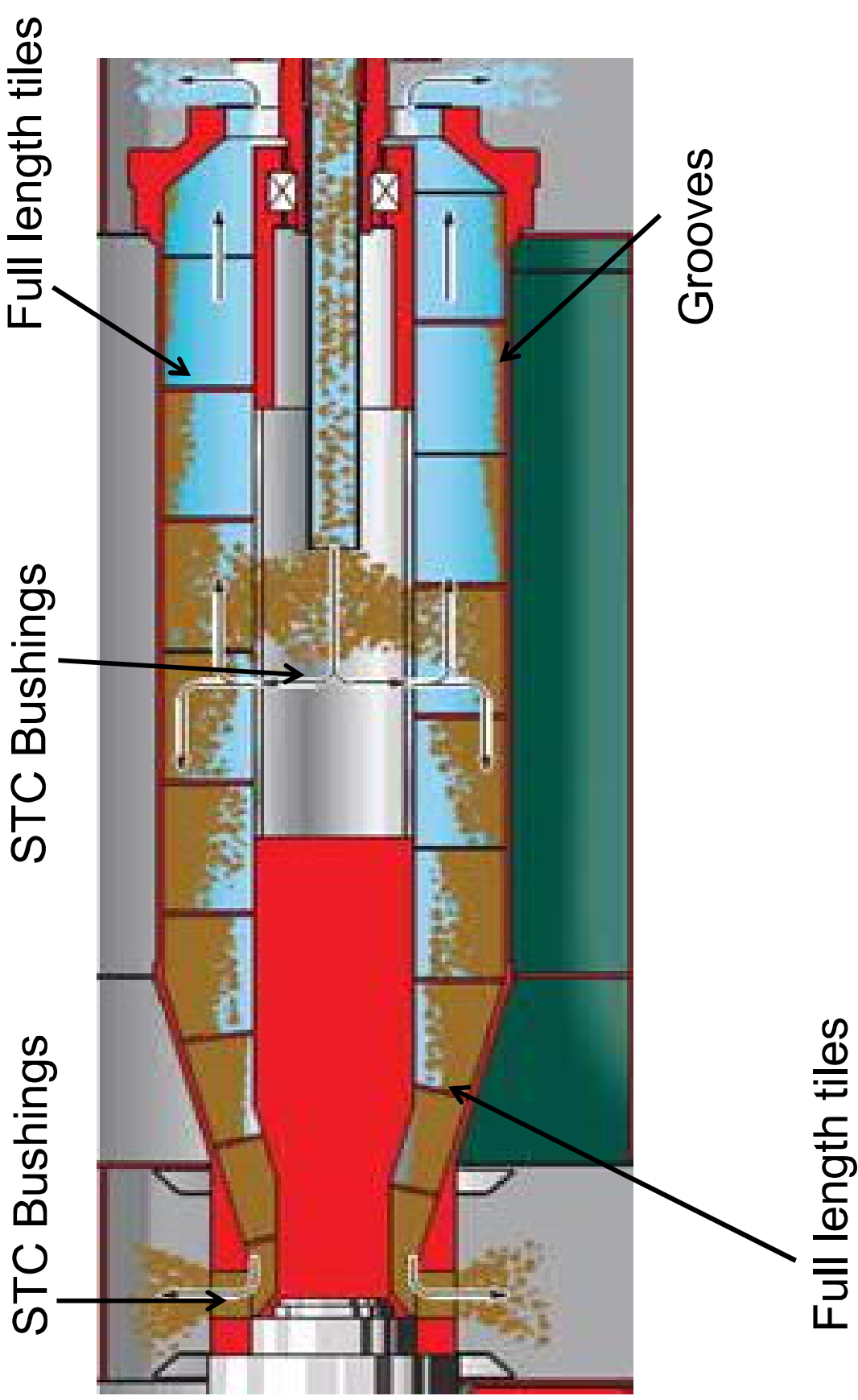


Materials of Construction: all wetted parts are made of stainless steel



No fiberglass covers!

All parts that would be prone to abrasion are constructed of sintered tungsten carbide for long life



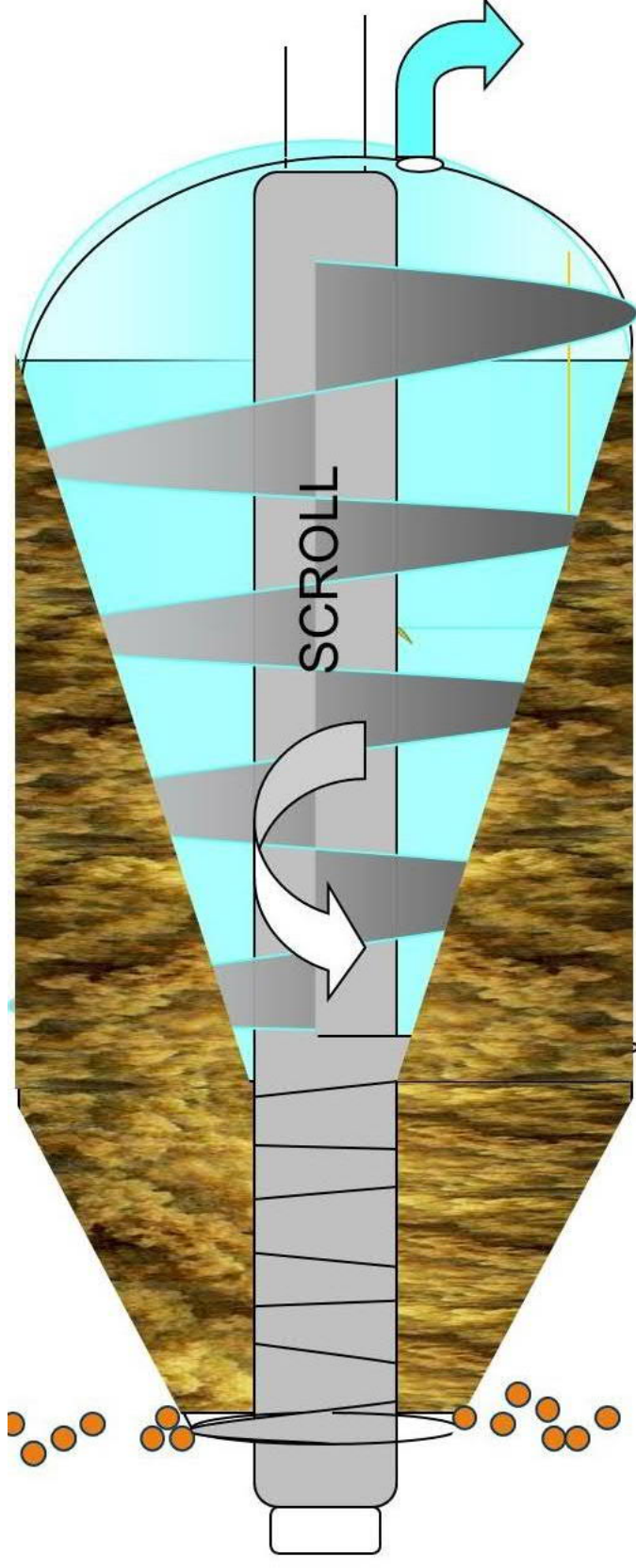
Sintered Tungsten Carbide Tiles on the tips of the scroll flights



2 mm³ wear loss (ASTM G65)
Full length Super-tiles

4

Operating Principles of CENTRIFUGAL SEPARATION



The primary functions of the dewatering centrifuge are:

Dewatering a continuous stream of solid particles.

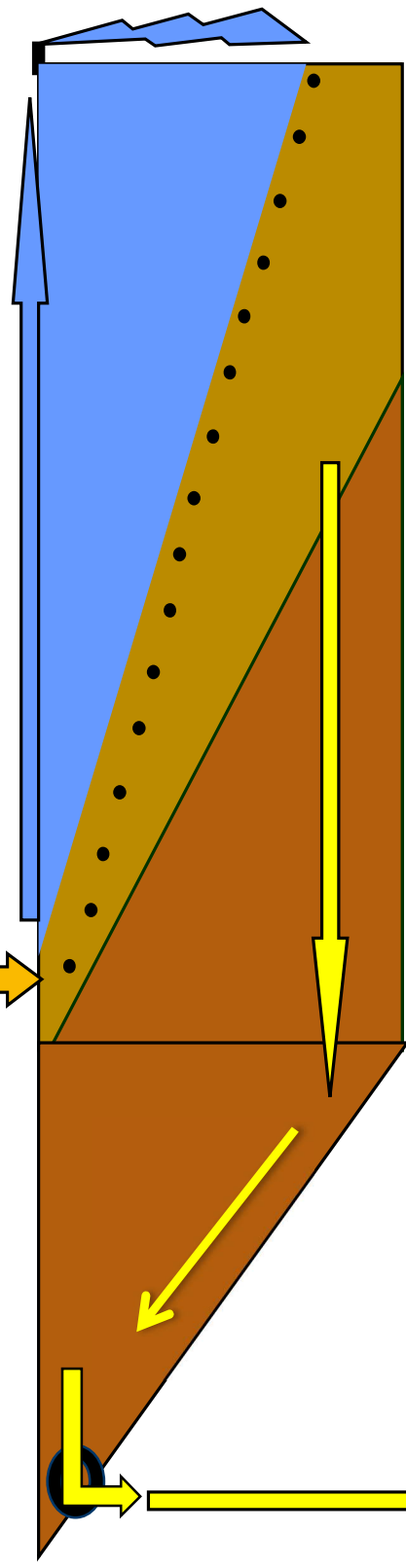
Clarifying of a continuous stream of liquid.

CLARIFIER ANALOY

Sludge
Feed
Inlet

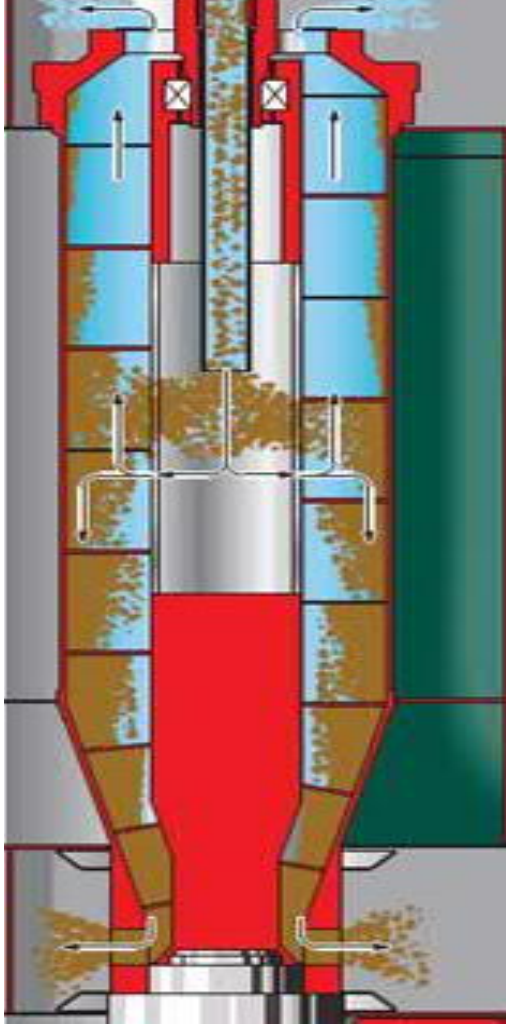


Hydraulic Flow Of Liquid



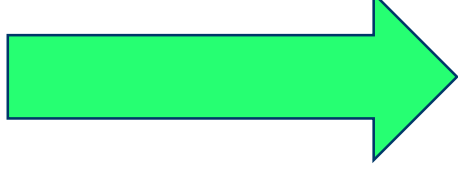
Solids
Discharge

Mechanical Scrolling Of solids



HOW CAN EFFECTIVE DEWATERING OCCUR IN SUCH A SMALL VOLUME ?

**Rapid sedimentation
results from multiplication
of G-force**



G-force Math

G-force increases with increasing Diameter and Bowl Speed

Calculation of Centrifugal Force

$$\text{"g" force} = \text{Bowl dia. (in.)} \times (\text{Bowl rpm})^2 \times 1.42 \times 10^{-5}$$

Increasing the bowl diameter increases the G-force

Increasing the bowl rotational speed also increases the "g" force

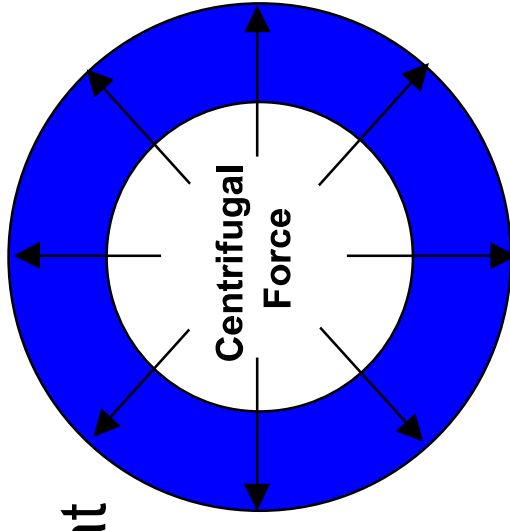
"g" force is a function of the square of the rpm so that doubling the bowl speed quadruples the "g" force.

CF 7000 @ 2940 rpm = 3250 XG

CF 7000 @ 2000 rpm = 1500 XG

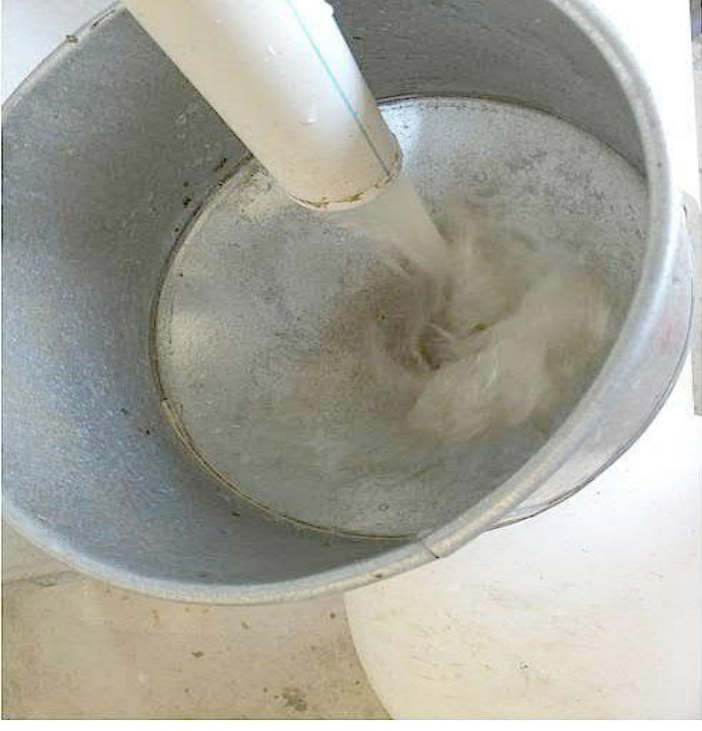
CF 7000 @ 1500 rpm = 850 XG

The GEA centrifuge is designed to produce a G-force near 3000 XG





THE SLUDGE DEWATERING PROCESS



BACKGROUND

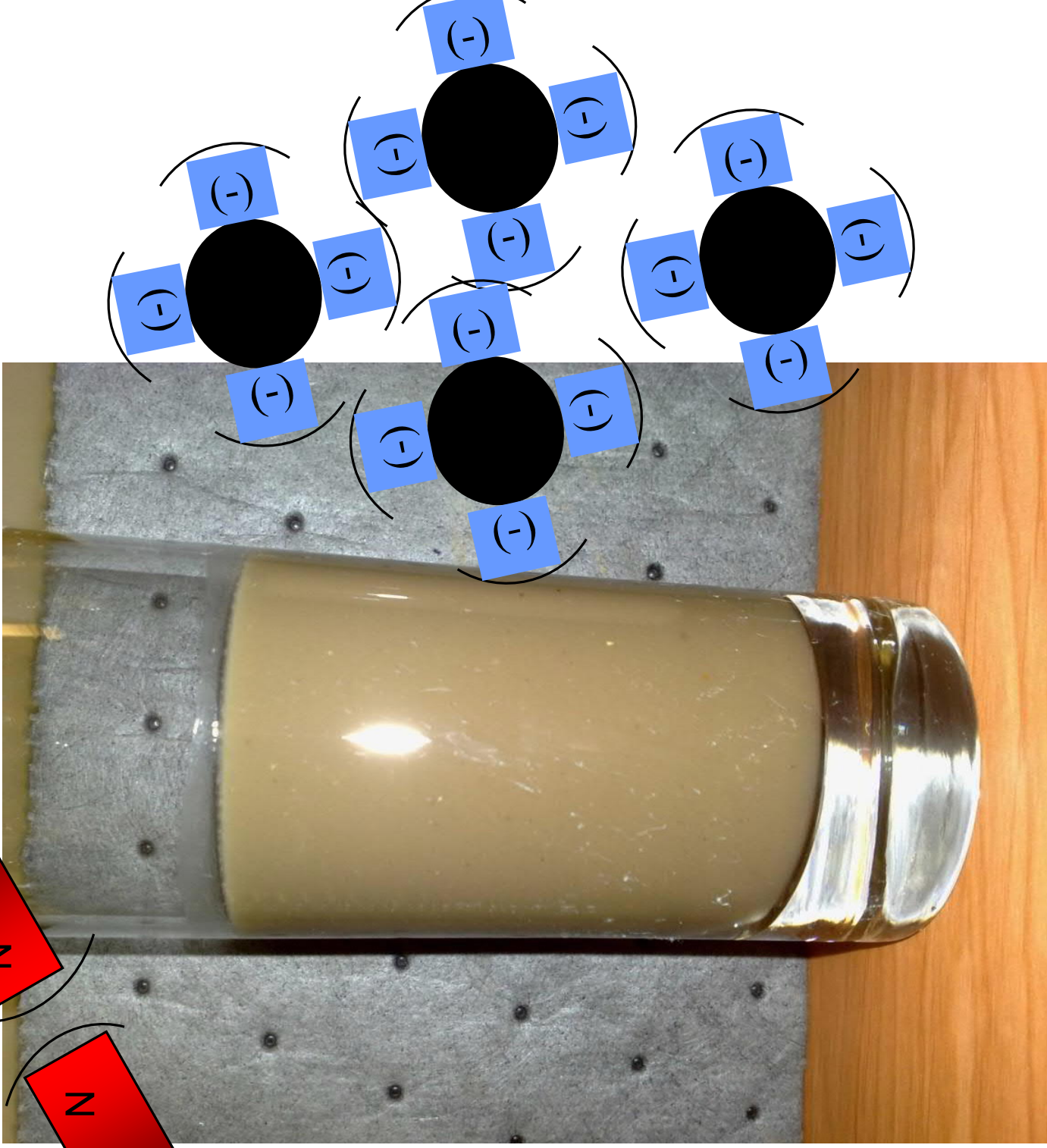
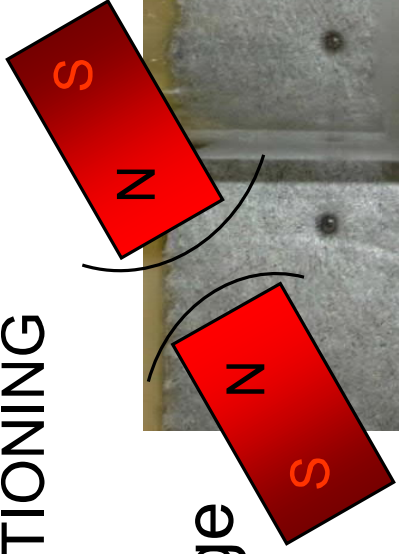
Gravity sedimentation causes sludge to concentrate until it reaches a point of hindered settling. For Softening sludge that may be 15, 20, or 30%TS Beyond the limit of hindered settling no further concentration occurs.



SOLIDS CONDITIONING

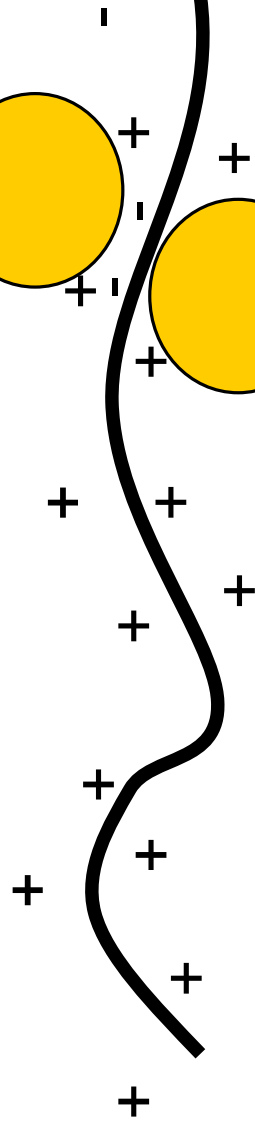
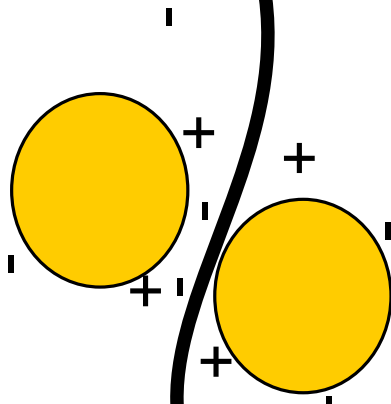
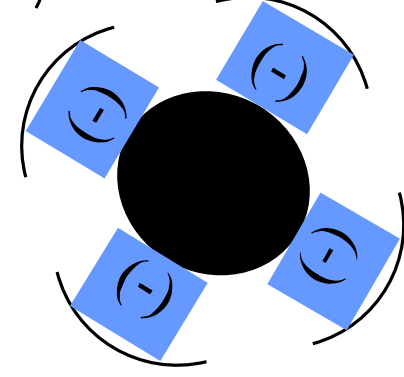
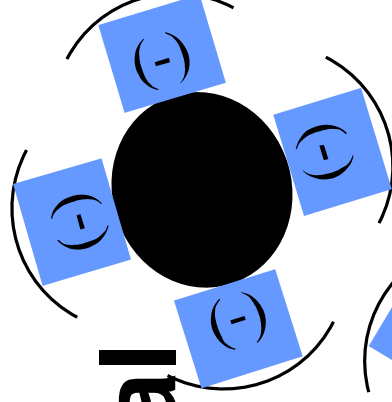
In nature sludge particles are surrounded by electrostatic charges

These cause a mutual repulsion between particles which maintains space between them and keeps them in stable aqueous suspension

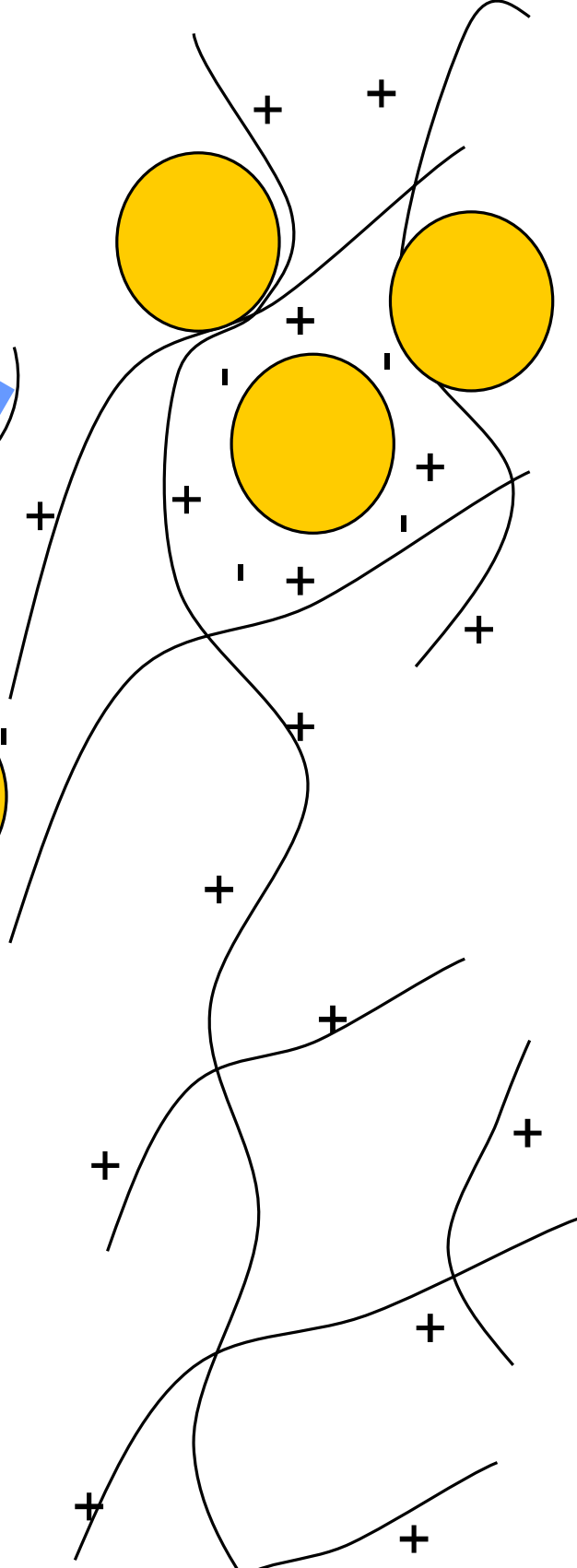


POLYMER SELECTION POLYELECTROLYTES

Are used to counteract the mutual
repulsion of sludge particles



LINEAR



CROSS-
LINKED

POLYMER SELECTION: JAR TEST

The addition of polymer to sludge flocculates the solids and expresses free water from the flocs



The formation of discrete shear-resistant flocs is necessary for effective dewatering.

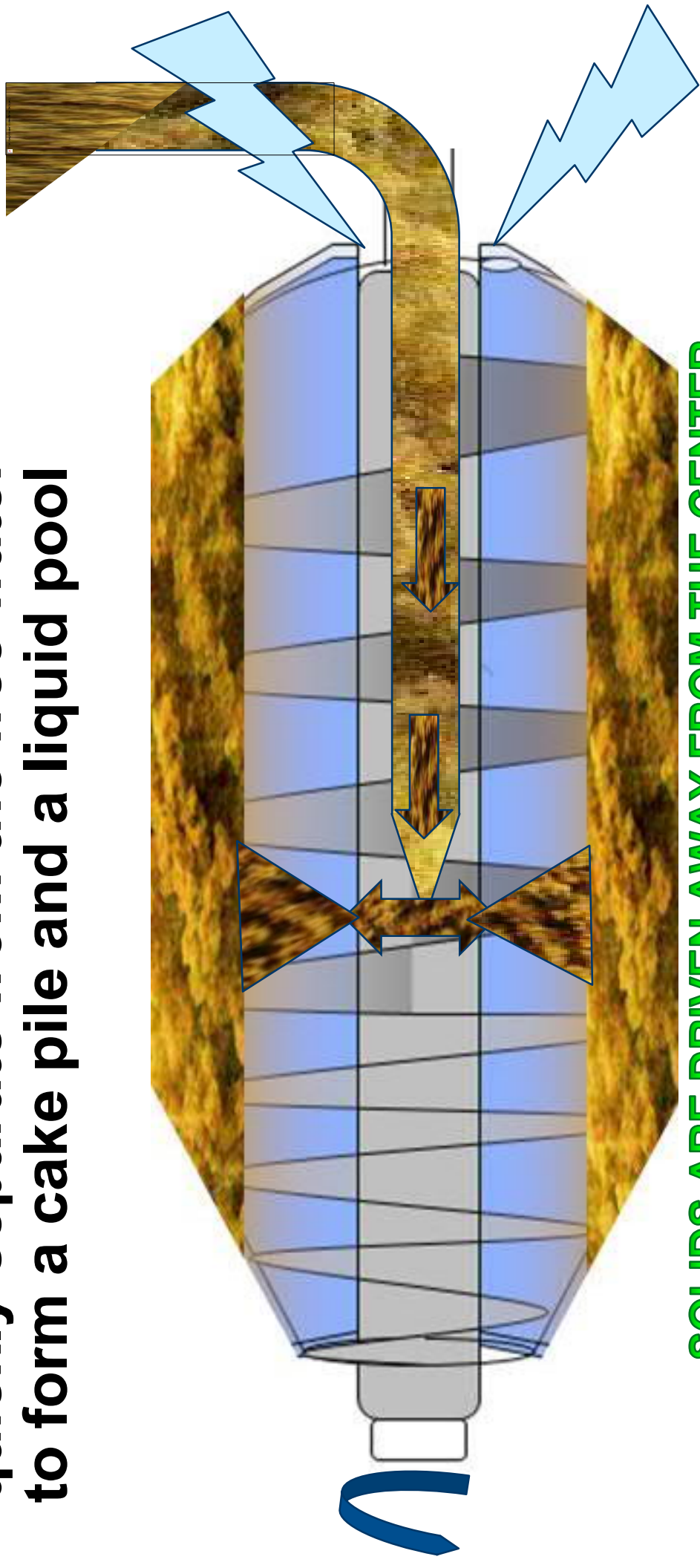
DOSAGE CALCULATIONS

	typical: 0.2 to 0.3%	typical: 15% of feed gpm
For Diluted Polymer	Polymer solution	Polymer solution
Polymer Dosage =	$\frac{\% \text{-activity}}{\text{Feed sludge \%TS}} \times$	$\frac{\text{flow gpm}}{\text{Feed sludge flow gpm}} \times$
Active-lbs/ton	2000	2000

Example: $\frac{0.3 \times 10 \times 2000}{20 \times 70 \times 1.197} = 3.6 \text{ Active-lbs/ton}$

SOLIDS SEPARATION

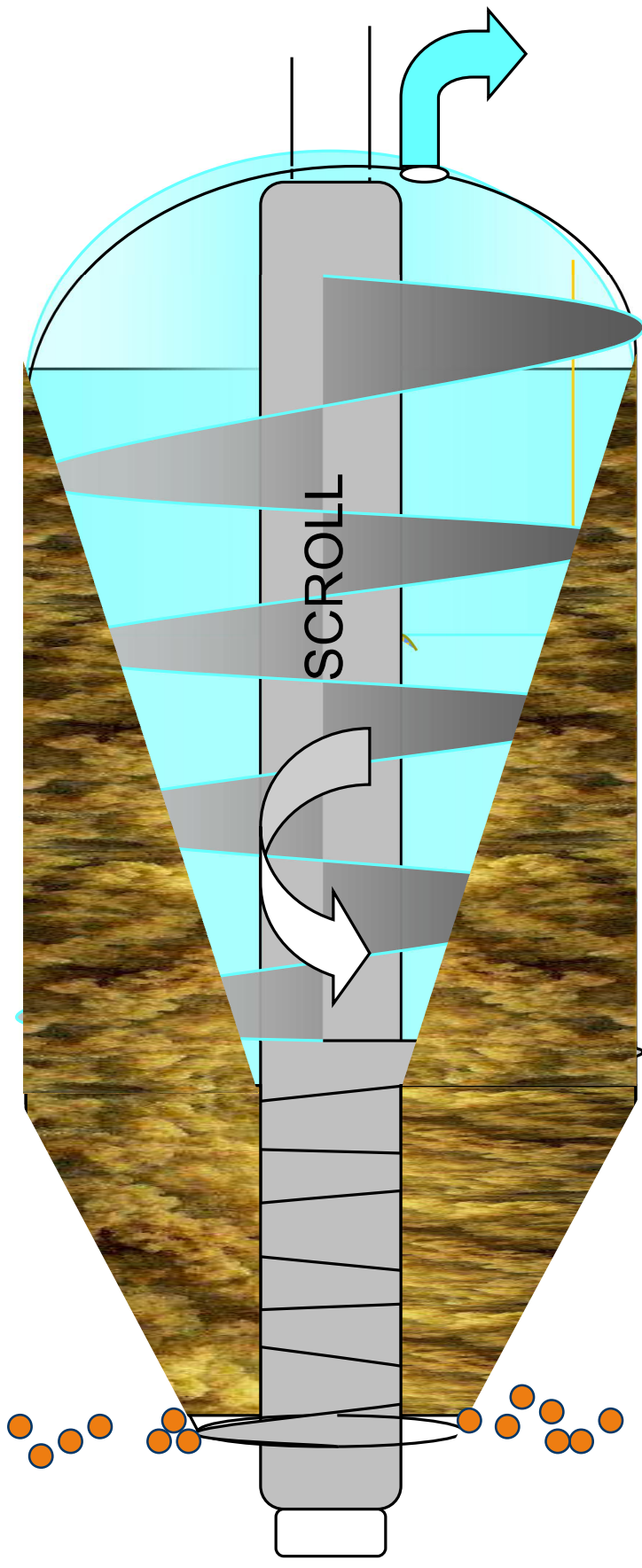
When the polymer/sludge mix enters the spinning centrifuge the flocculated solids quickly separate from the free water to form a cake pile and a liquid pool



SOLIDS ARE DRIVEN AWAY FROM THE CENTER OF ROTATION, OUT AGAINST THE BOWL WALL

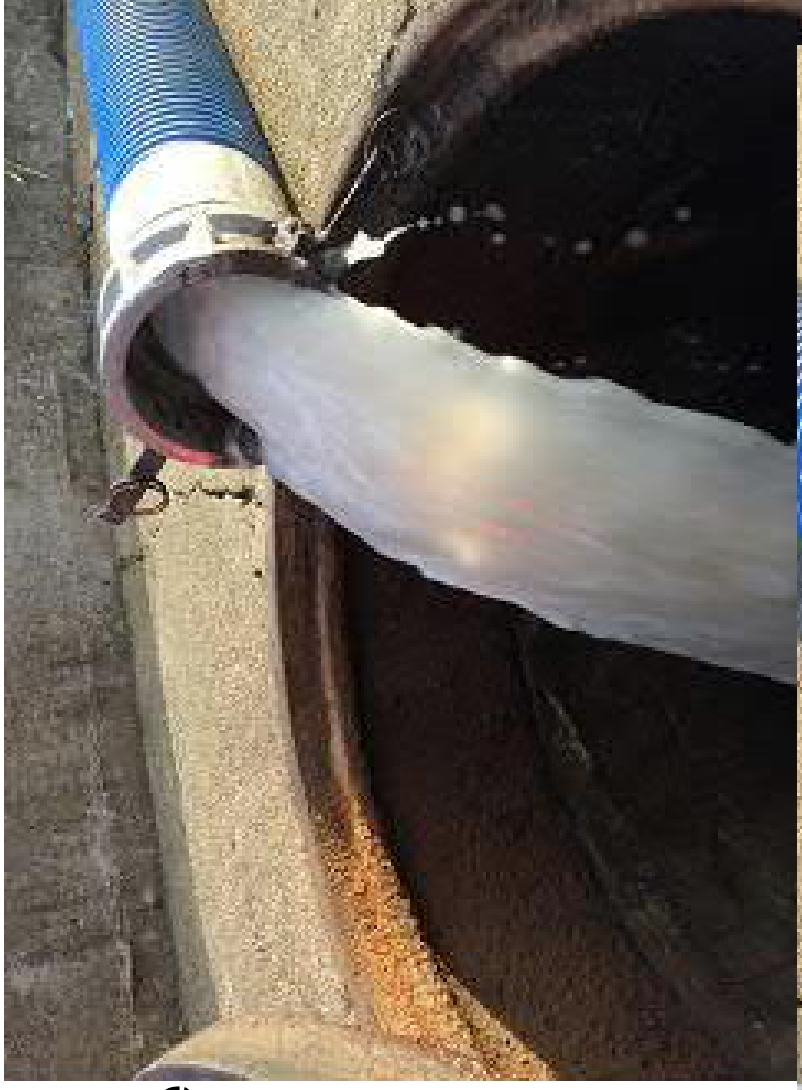


The Scroll scrapes dewatered solids off the bowl wall and transports them toward the conical end of the centrifuge from which they discharge.



**Solids are discharged as cake
Liquid is discharged as centrate**

**Find the proper amount of
polymer addition
by observation of the cake
and the centrate**



Go to Animation

PROCESS OPTIMIZATION: 7

CONTROLLING
CAKE DRYNESS and
CENTRATE CLARITY

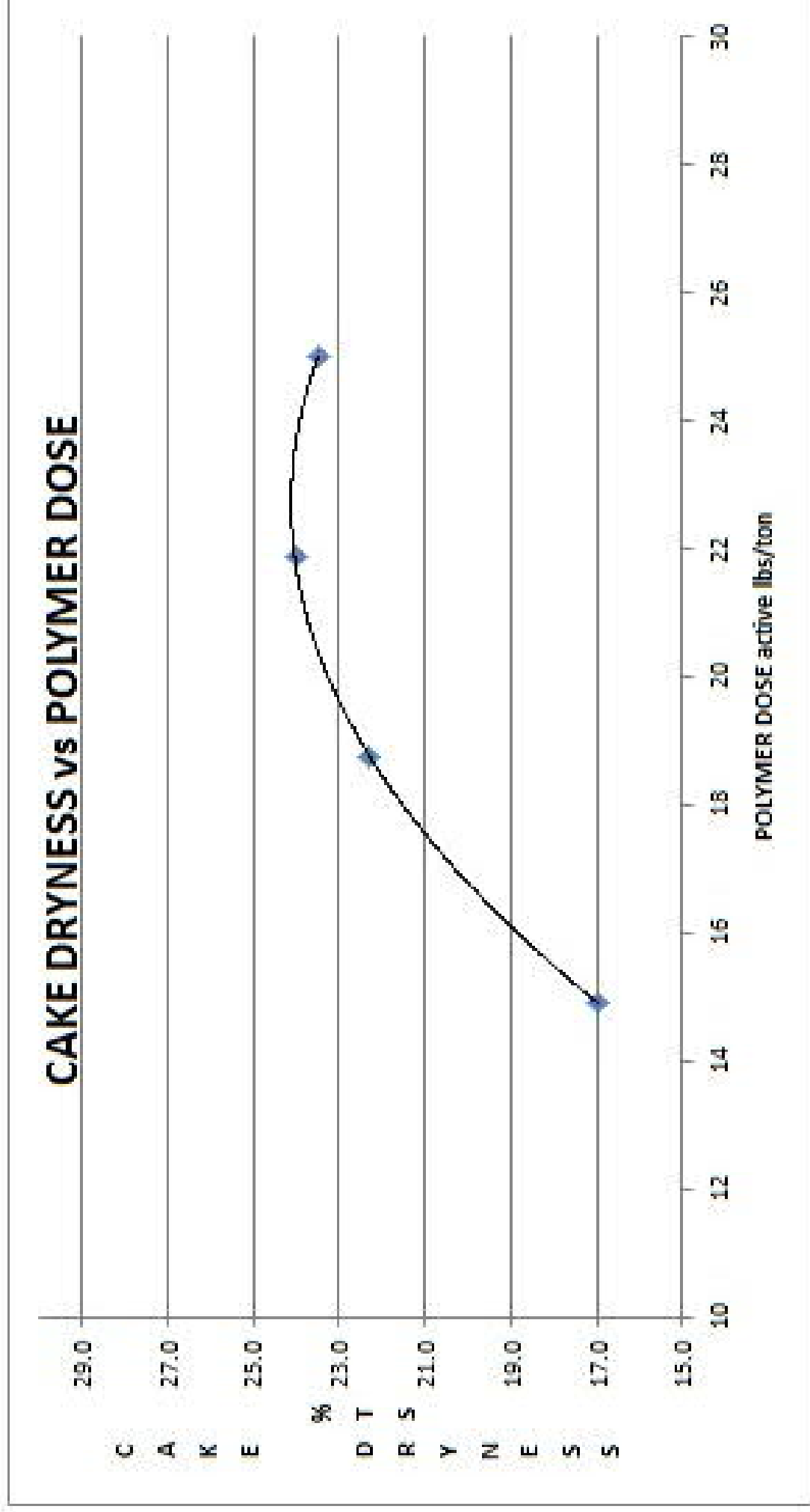


BY CONTROLLING

POLYMER DOSE and
SCROLLING TORQUE



Controlling Cake Dryness : OPTIMUM DOSE



Optimum
Dosage

is needed
for

Optimum
Dryness





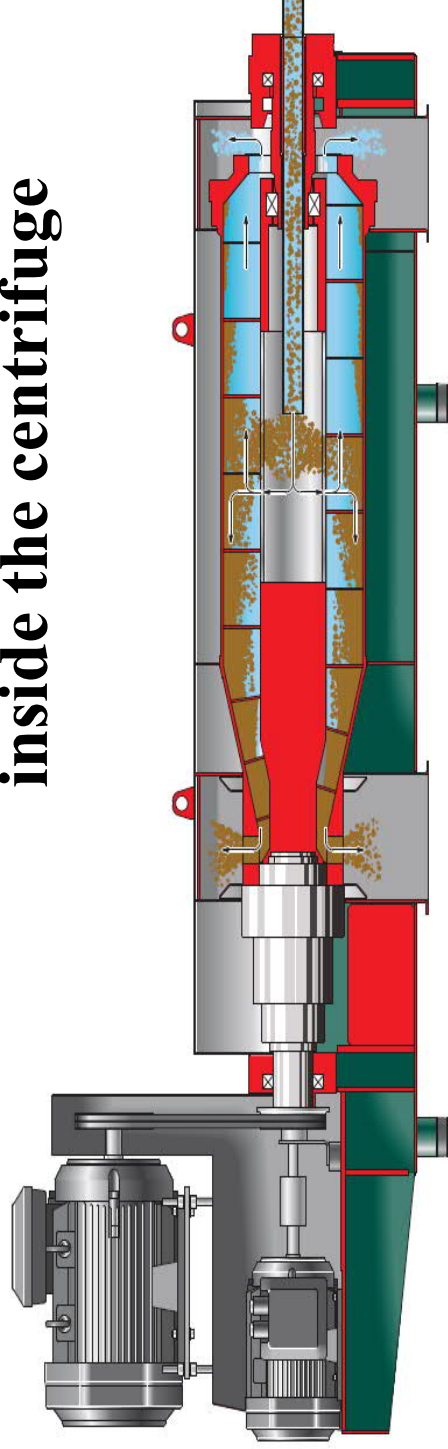
Relationship: **Scrolling Torque to Cake Dryness**

The scroll is driven by an electric motor.

The amount of torque that must be exerted by that motor in order to turn the scroll is called the scrolling torque: 0 to 100%

The Scrolling torque is proportional to the dryness of the cake

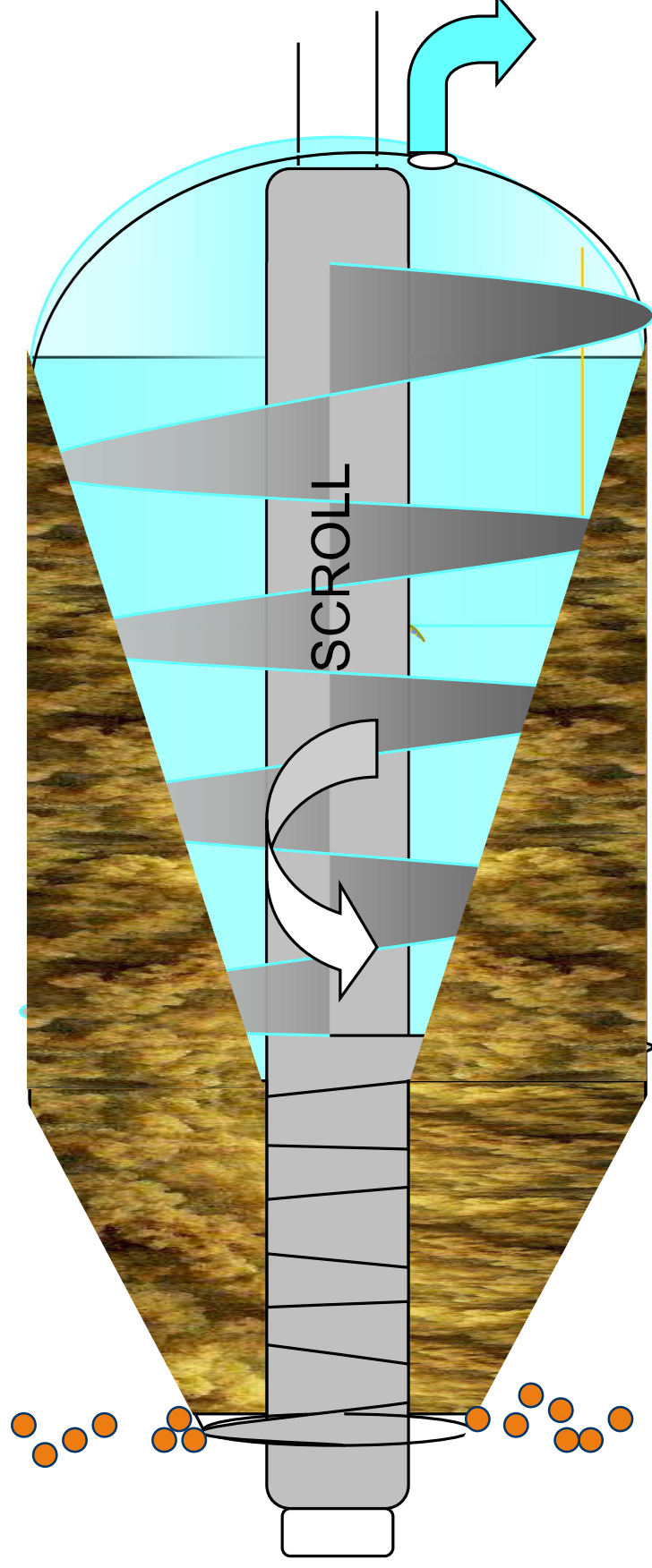
inside the centrifuge





RECALL THAT:

The Scroll scrapes dewatered solids off the bowl wall and transports them toward the conical end of the centrifuge from which they discharge.

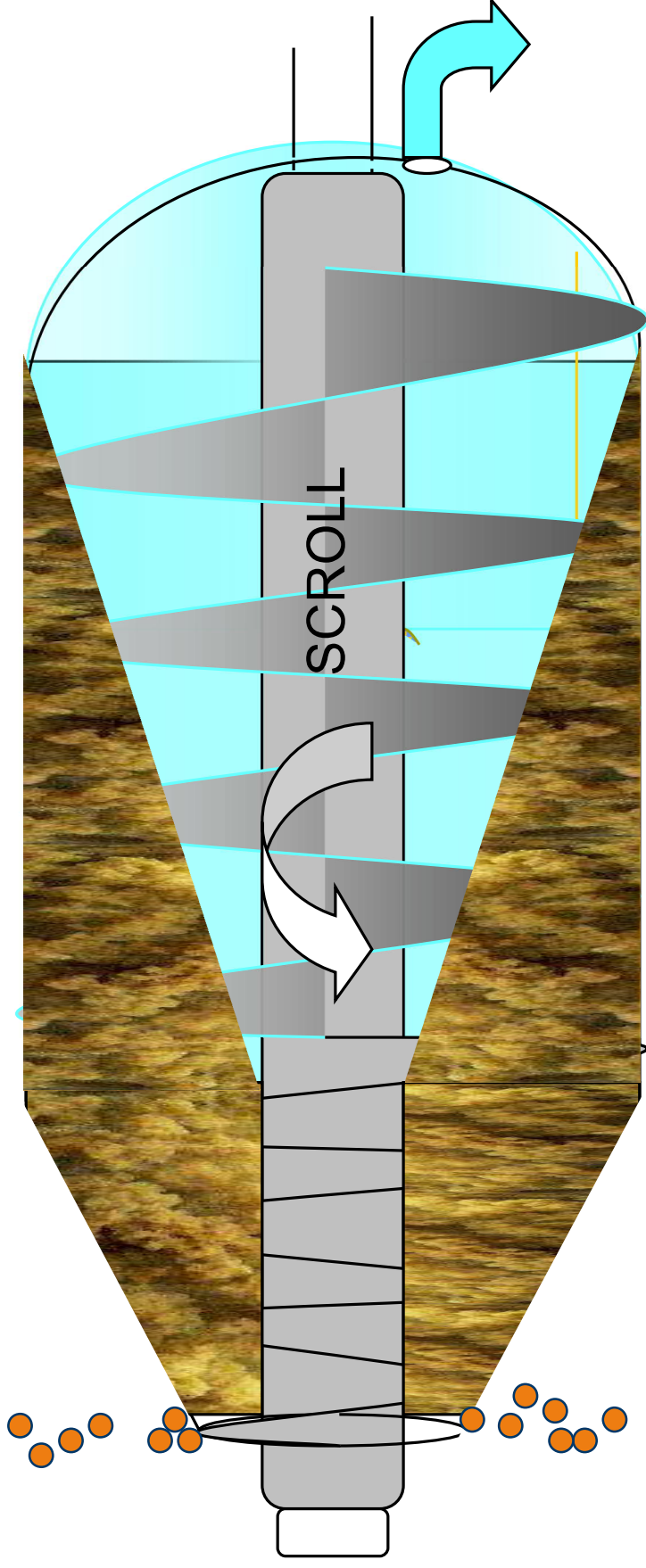


Dry cake resists the action of the scroll more than does wet cake, therefore, Higher scroll-motor torque reflects dryer cake in the centrifuge.



SCROLL RPM DETERMINES CAKE PILE SIZE AND DRYNESS

The size of the cake pile that we maintain inside the centrifuge determines the residence time available for solids to dewater. Longer residence time increases cake dryness.



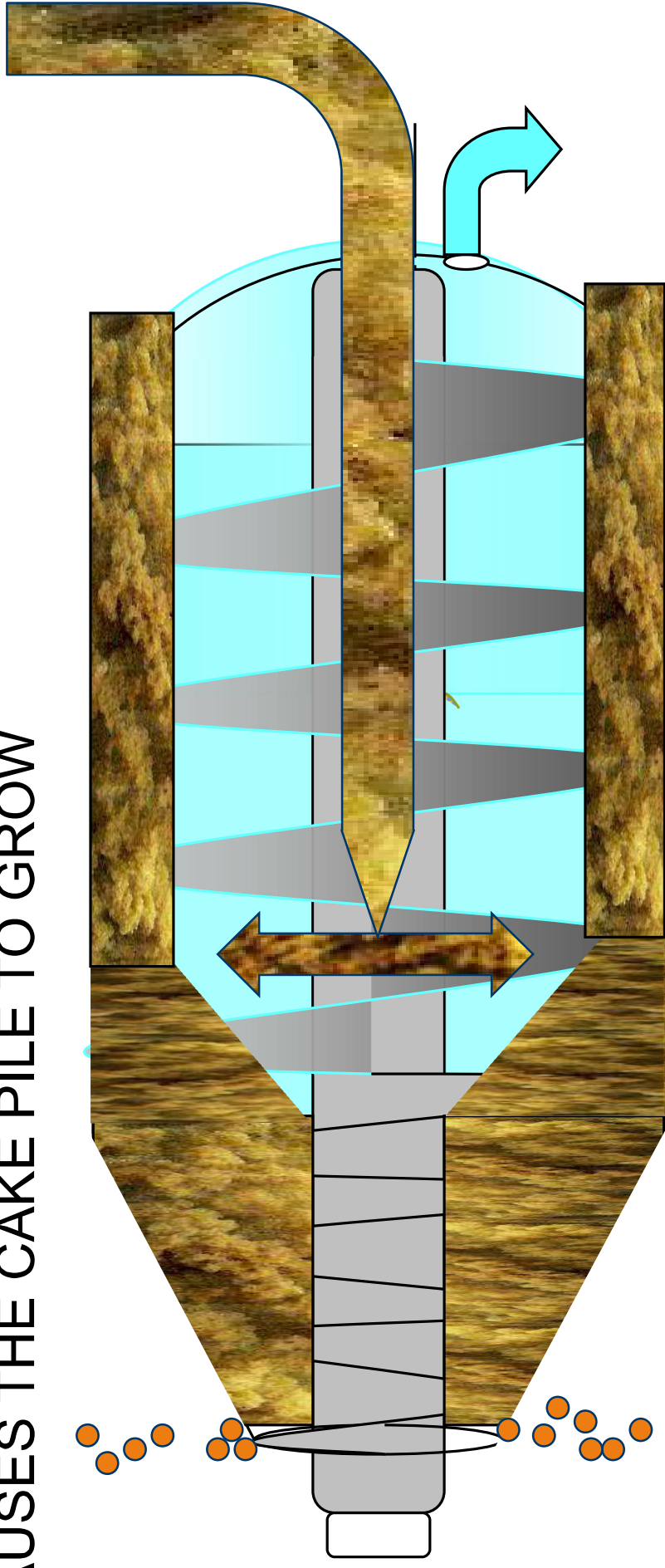
By varying the speed of the scroll, we push solids through the centrifuge faster or slower so that the size of the cake pile can be controlled.



FOR A CONSTANT SLUDGE FEED LOADING INTO THE CENTRIFUGE

CAKE WILL DEPOSIT INSIDE THE CENTRIFUGE AT A CONSTANT RATE

DISCHARGING CAKE SLOWER THAN THE DEPOSITION RATE CAUSES THE CAKE PILE TO GROW



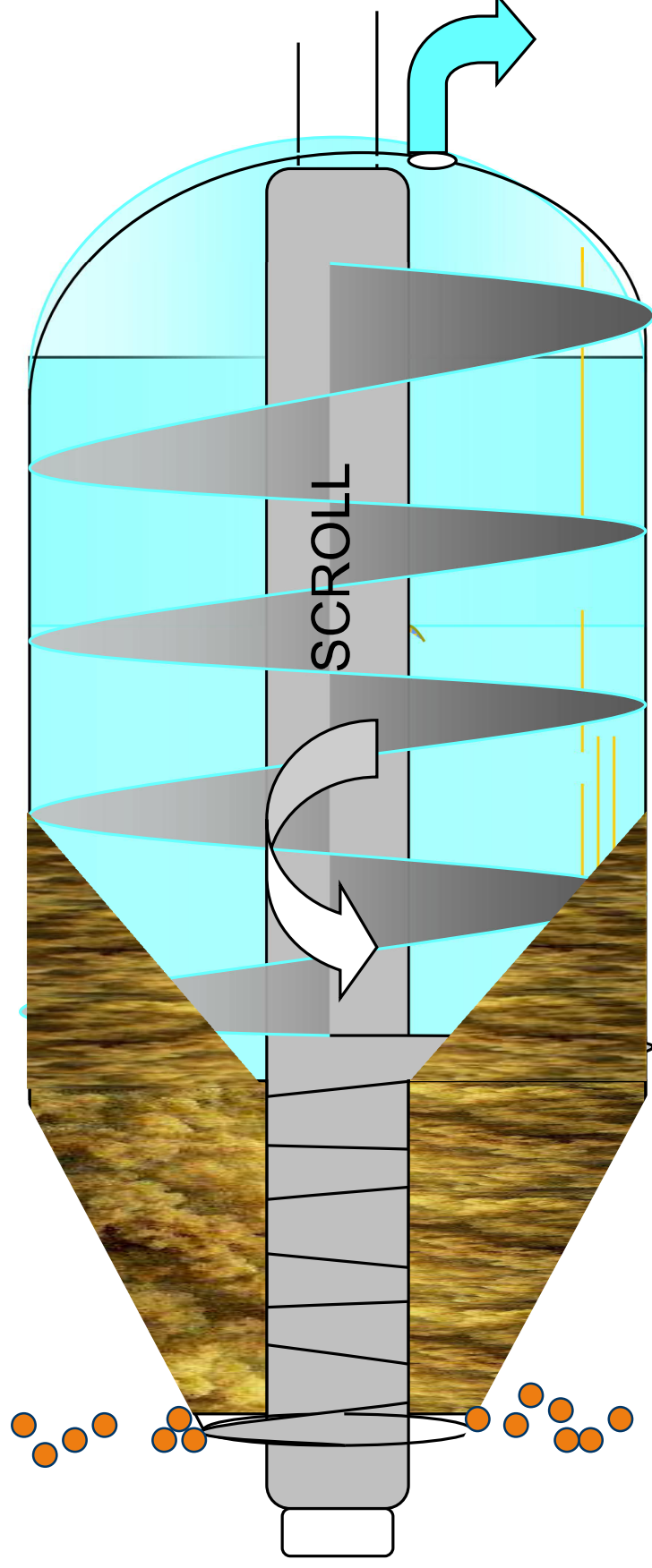
DISCHARGING CAKE FASTER THAN THE DEPOSITION RATE CAUSES THE CAKE PILE TO SHRINK

VARYING THE SCROLL RPM VARIES THE CAKE DISCHARGE RATE



Assuming that the optimum polymer dose has been added
WHEN THE CAKE PILE IS SMALL, THE TORQUE IS
USUALLY LOW AND THE CAKE IS WET

SMALL CAKE PILE: LOW SCROLLING TORQUE

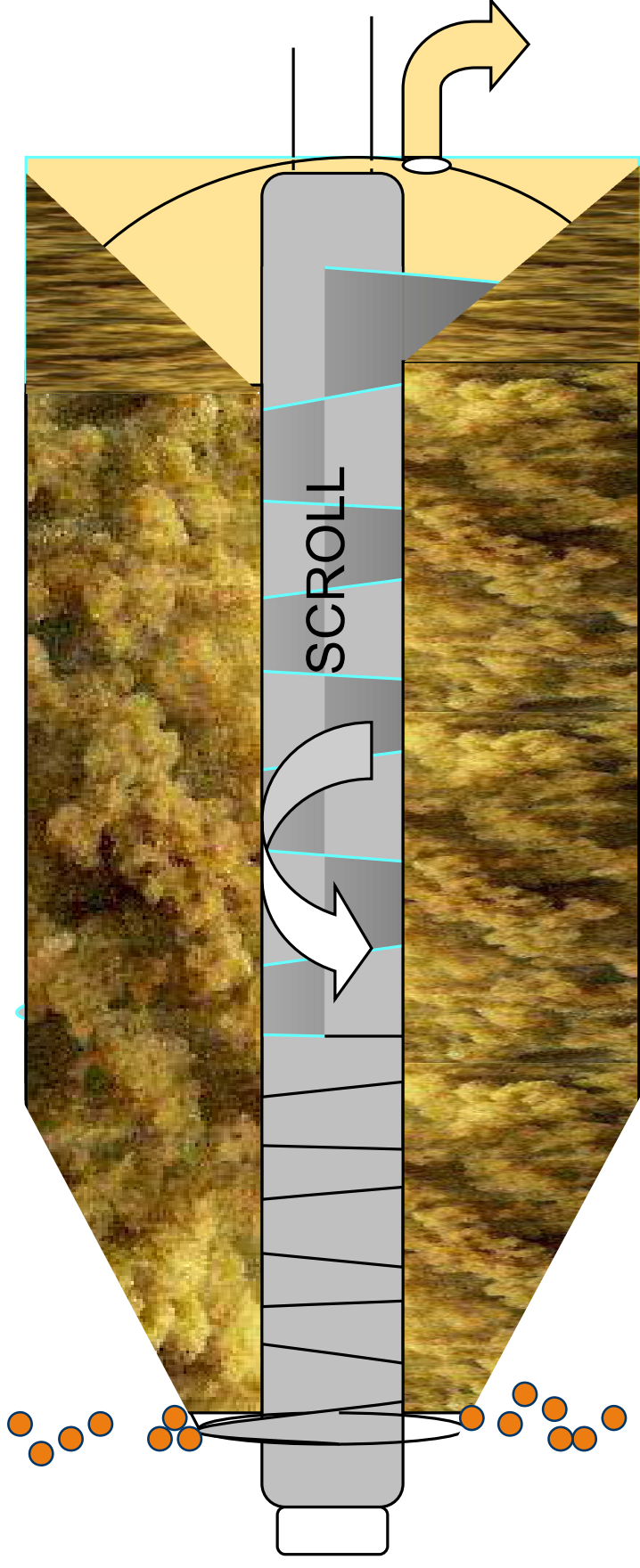


LOW TORQUE: CLEAN CENTRATE BUT WET CAKE



Assuming that the optimum polymer dose has been added
WHEN THE CAKE PILE IS VERY LARGE, THE TORQUE IS
USUALLY VERY HIGH AND THE CAKE IS VERY DRY

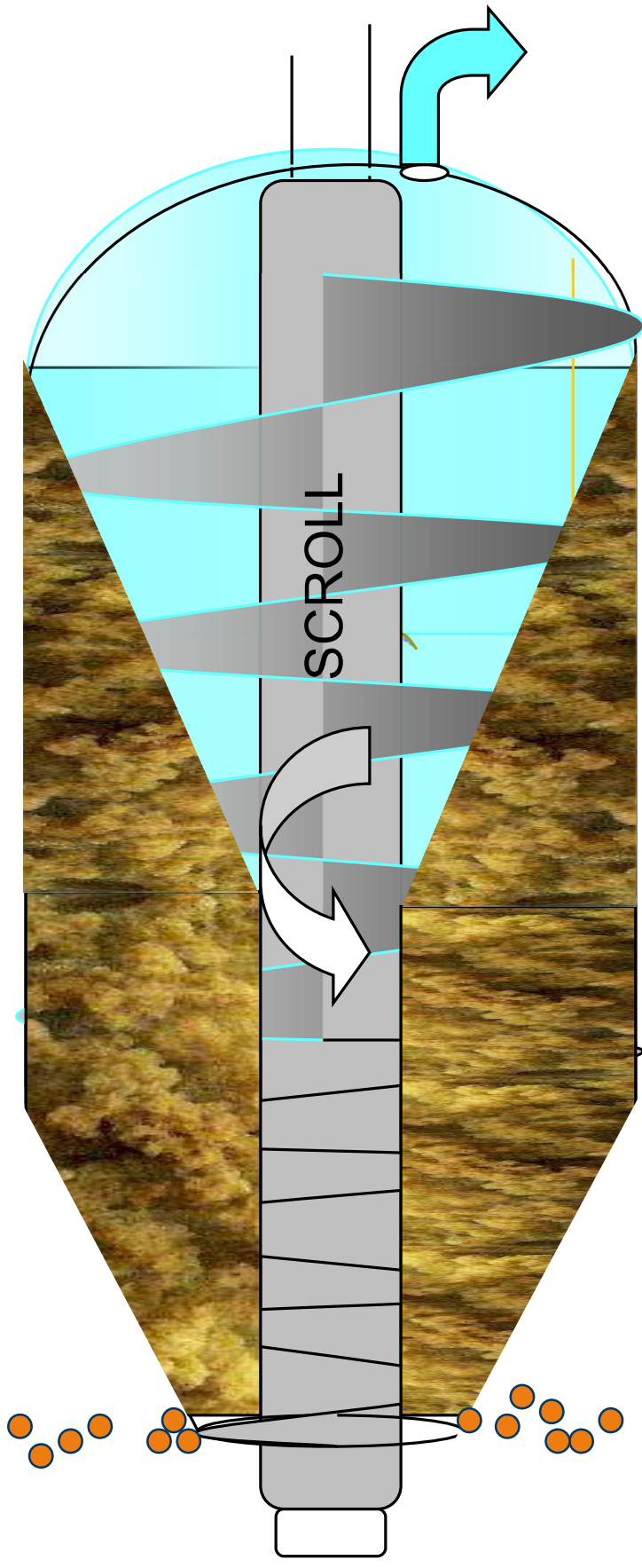
LARGE CAKE PILE: HIGH SCROLLING TORQUE



HIGH TORQUE: DRY CAKE BUT DARK CENTRATE



OPTIMUM CAKE PILE: OPTIMUM SCROLLING TORQUE



OPTIMUM TORQUE: CLEAN CENTRATE AND DRY CAKE

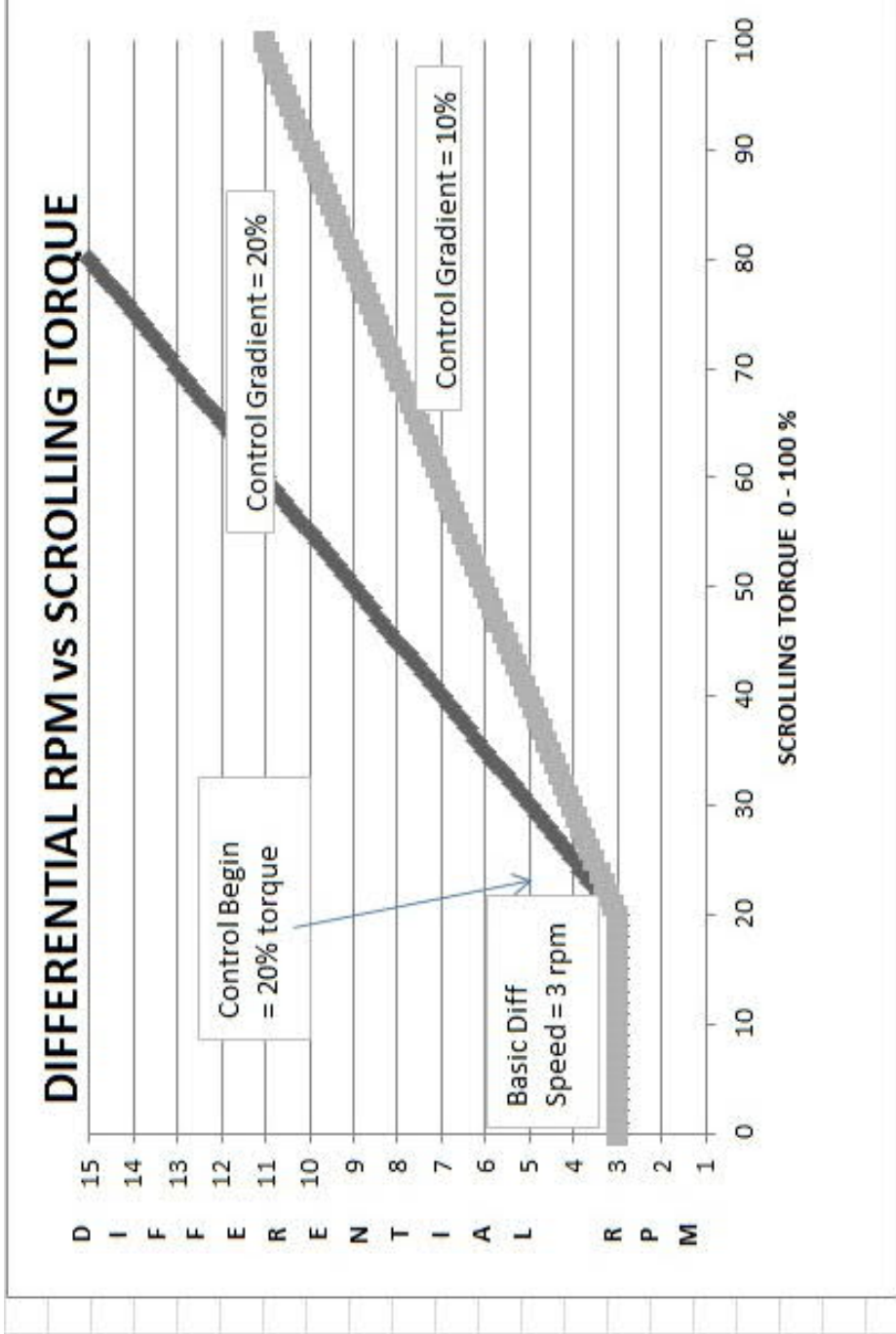
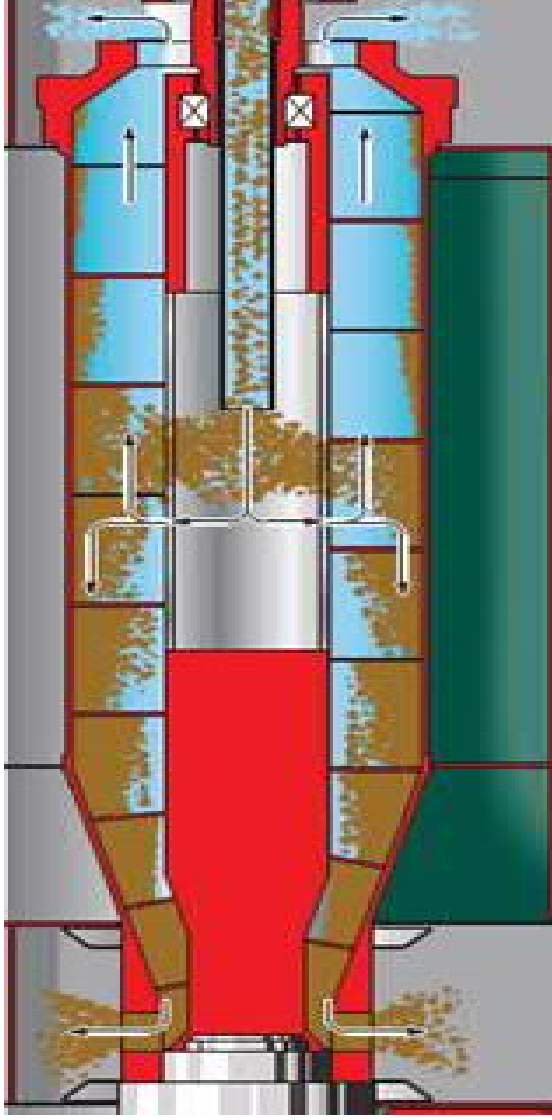
With that in mind we strive to operate at the highest torque achievable while maintaining a clean concentrate. Depending on sludge quality this may be 30 to 65%.

For mechanical protection of the gearbox the torque should be maintained below 70%. An alarm will trigger at 80%.

This strategy yields the driest cake while keeping a high level of solids recovery.

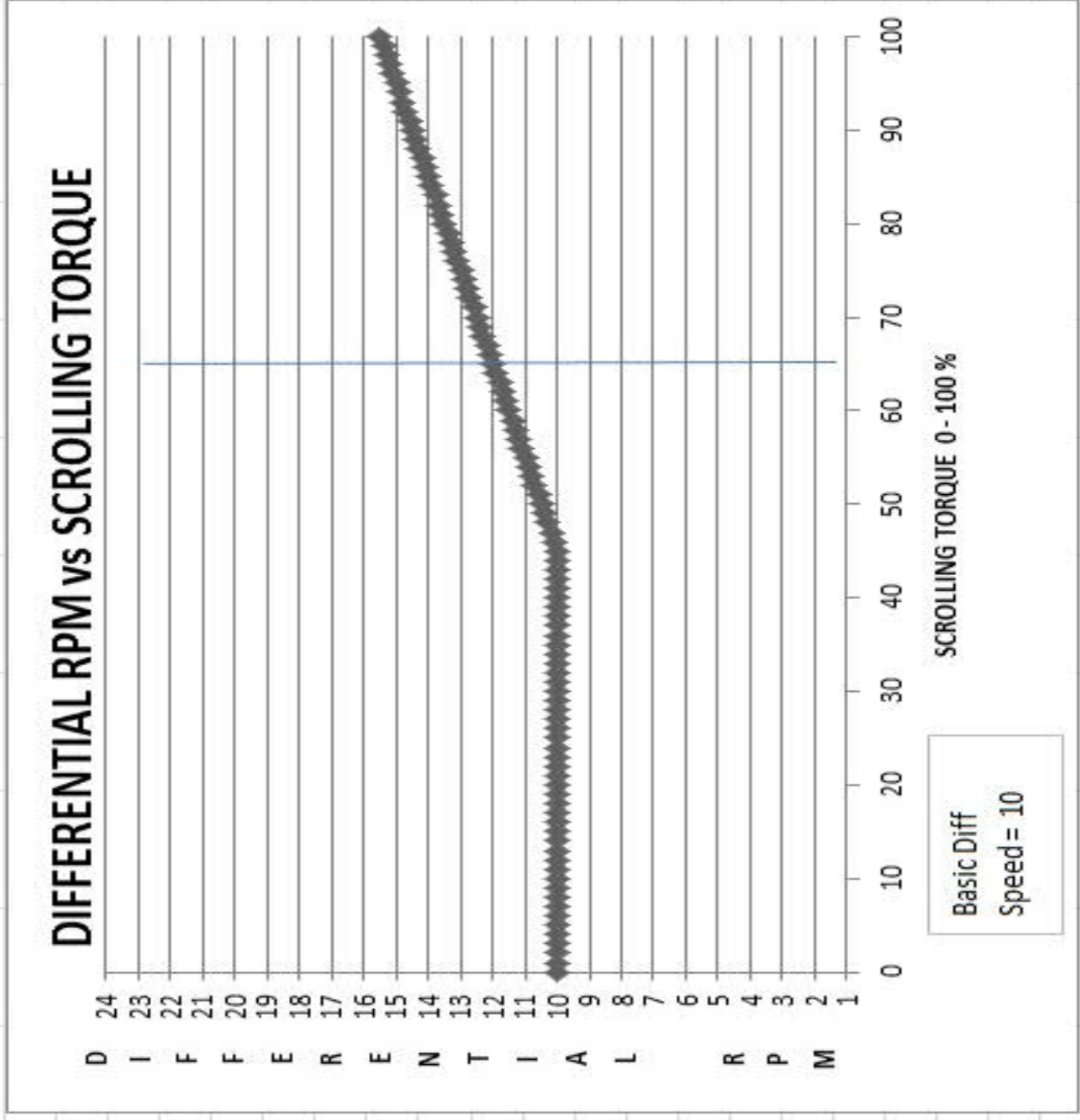
By trial and error the optimum torque level for operation will be found.

SJM Torque Control



Basic Diff =	3
Control Begin =	20
Gradient =	10

SJM Torque Control



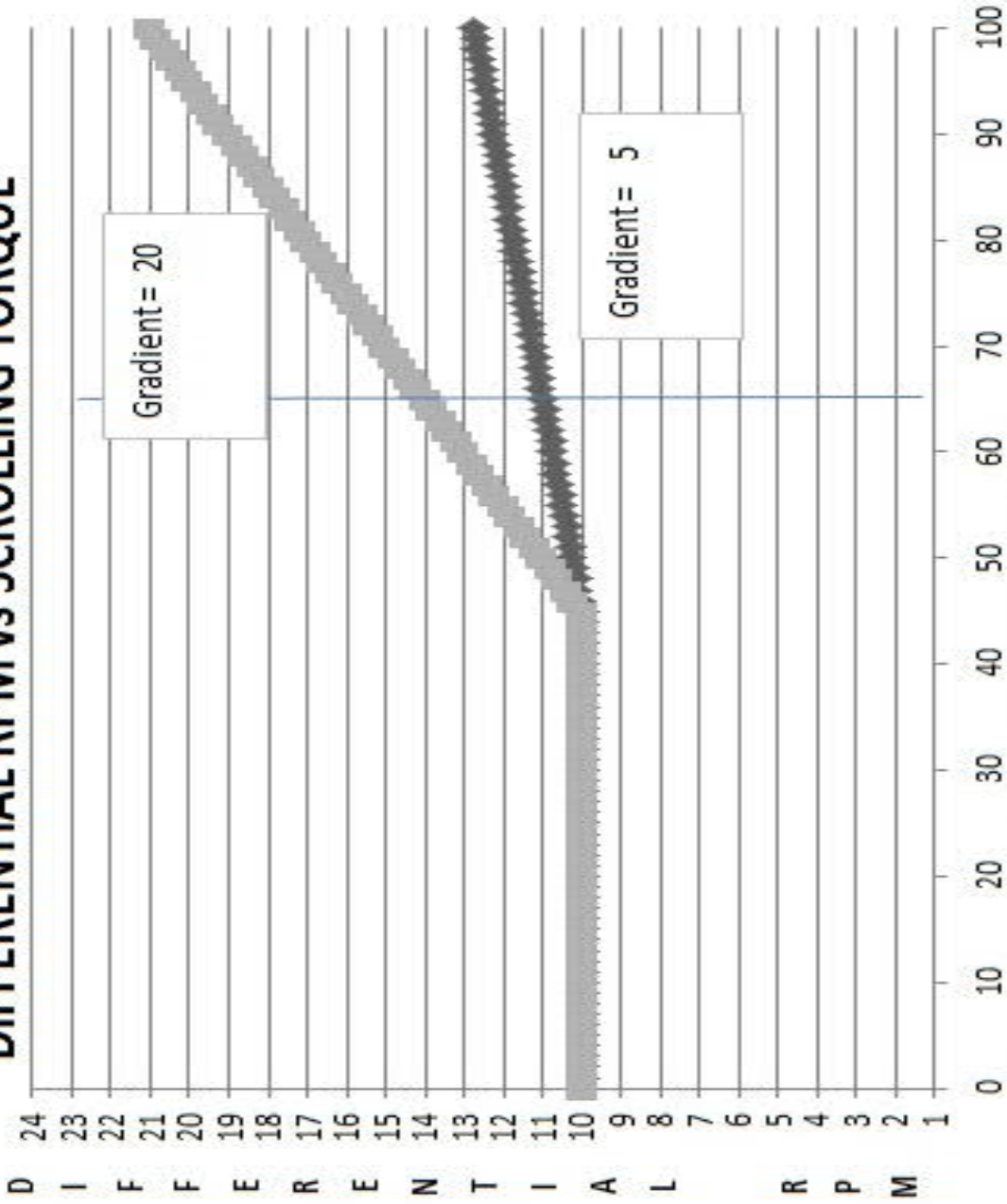
Basic Diff =	10
Control Begin =	45
Gradient =	10

Basic Diff
Speed = 10

SCROLLING TORQUE 0 - 100 %

SJM Torque Control

DIFFERENTIAL RPM vs SCROLLING TORQUE



Basic Diff
Speed = 10

Gradient = 5

Gradient = 20

Basic Diff = 10
Control Begin = 45
Gradient = 5

Basic Diff = 10
Control Begin = 45
Gradient = 20



What's different from the old units?

1. SJM scroll control
2. Alarm Reset procedure
3. Flying restart
4. Shutdown procedure

Sample Screen Shots – Project specific Screen Shots to be provided at a later date (under separate cover).

SAMPLE

01-MAIN SCREEN - /Hopewell_807834_9908_R0// (Display)

5:03:42 PM 9/11/2018 ACTIVE MODE: **DECANTER OFF** USER: sssssssssssssssssssssssss

ALL VALVE / DEVICES IN AUTO ALARM STATUS: **E-STOP**

START LOCKOUT TIME REMAIN (MIN)

CF 8000

DECANTER NOT READY FOR SLUDGE

SCROLL MODE: **TORQUE**

NNN	TORQUE (%)
NN.N	DIFF. SPEED (RPM)
NNNN	BOWL SPEED (RPM)

PROCESS START PROCESS STOP PROCESS CONTROL SCROLL CONTROL ALARM STATUS ALARM RESET FLUSH & SHUTDOWN SCREEN SELECT

02-ALARM HISTORY - /Hopewell_807834_9908_R0// (Display)

5:04:09 PM 9/11/2018 ACTIVE MODE: **CIP** USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: **E-STOP**

ALARM HISTORY

Alarm time	Acknowledge time	Message
* 9/11/2018 5:04:09 PM	5:04:09 PM 9/11/2018	ABCDE FGHIJK LMNOPQ RSTUV WXYZ ABCDE FGHIJK LMNOPQ RSTUV WXYZ

MAIN SCREEN ALARM STATUS ACK ALARM ALARM RESET SCREEN SELECT

03-ALARM LIST - /Hopewell_807834_9908_R0// (Display)

5:04:32 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: E-STOP

UNACKNOWLEDGED ALARMS

Alarm time	Device / Message
9/11/2018 5:04:32 PM	ABCDE FGHIJK LMNOPQ RSTUV WXYZ ABCDE FGHIJK LMNOPQ RSTUV WXYZ

ACTIVE ALARMS

Device / Message - Active Alarms
ABCDE FGHIJK LMNOPQ RSTUV WXYZ ABCDE FGHIJK LMNOPQ RSTUV WXYZ

MAIN SCREEN ALARM STATUS ACK ALARM ALARM RESET ALARM HISTORY SCREEN SELECT

05-MAINT MODE - /Hopewell_807834_9908_R0// (Display)

5:04:50 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: E-STOP

MAINTENANCE MODE

MAINTENANCE MODE	ON	OFF	MAINT MODE ON
SCROLL MOTOR	START	STOP	RUNNING
BOWL MOTOR	START	STOP	RUNNING
CENTRIFUGE HOURS	HOUR RESET		NNNNNNN

MAIN SCREEN ALARM STATUS ALARM RESET GREASE INTERVAL START SCREEN SELECT

11-CEN SETPOINTS - /Hopewell_807834_9908_R0// (Display)

5:06:09 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE

ALARM STATUS: E-STOP

CENTRIFUGE SETPOINTS 1

	SETPOINT	ACTUAL
BOWL SPEED SETPOINT (RPM)	NNNN	NNN
CENTRIFUGE START-UP TIME (MIN)	NNN	NNN
FLUSH WTR OFF DURING NORMAL SHUT DOWN (RPM)	NNNN	NNNN
FLUSH WTR ON DURING START-UP (RPM)	NNNN	NNNN
FLUSH WTR ON DURING START-UP DURATION (MIN)	NNN	NNN
IDLE MODE FLUSH INTERVAL (MIN)	NNN	NNN
IDLE MODE FLUSH DURATION (SEC)	NNN	NNN
SCREW CONVEYOR 1 FWD CLEAR TIME (SEC)	NNN	NNN
SCREW CONVEYOR 2 FWD CLEAR TIME (SEC)	NNN	NNN

MAIN SCREEN ALARM STATUS ALARM RESET CENTRIFUGE SETPOINTS 2 SCREEN SELECT

12-CEN SETPOINTS 2 - /Hopewell_807834_9908_R0// (Display)

5:06:23 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE

ALARM STATUS: E-STOP

CENTRIFUGE SETPOINTS 2

	SETPOINT	ACTUAL
GRINDER PROCESS START DELAY TIME (SEC)	NNN	NNN
POLYMER PROCESS START DELAY TIME (SEC)	NNN	NNN
SLUDGE FEED PROCESS START DELAY TIME (SEC)	NNN	NNN
SLUDGE PUMP START-UP DURATION (SEC)	NNN	NNN
SLUDGE PUMP START-UP SPEED (%)	NNN	NNN
POLYMER PUMP START-UP DURATION (SEC)	NNN	NNN
POLYMER PUMP START-UP SPEED (%)	NNN	NNN

MAIN SCREEN ALARM STATUS ALARM RESET CENTRIFUGE SETPOINTS 1 SCREEN SELECT

21-AUTO-MANUAL STATUS - /Hopewell_807834_9908_R0// (Display)

5:08:41 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: E-STOP

AUTO-MANUAL / LOCAL-REMOTE STATUS

	Status	Mode
AIR-OIL SOLENOID VALVE	CLOSE	MANUAL
CENTRIFUGE FLUSH WATER VALVE	CLOSE	MANUAL
CONVEYOR FLUSH VALVE	CLOSE	AUTO
INCLINE SCREW CONEYOR	REV	
CROSS SCREW CONVEYOR	ON	
SLUDGE PUMP	OFF	
POLYMER PUMP	OFF	
GRINDER	OFF	

MAIN SCREEN ALARM STATUS ALARM RESET SCREEN SELECT

22-FLUSH AND SHUTDOWN PARAM - /Hopewell_807834_9908_R0// (Display)

5:08:54 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: E-STOP

FLUSH AND SHUTDOWN

SETPOINT

FLUSH WATER OFF TORQUE (%) NNN

PRODUCT CLEAR TIMER (MIN) NNN

FLUSH & SHUTDOWN FLUSH & SHUTDOWN ABORT

MAIN SCREEN ALARM STATUS ALARM RESET SCREEN SELECT

23-ANALOG SCALING - /Hopewell_807834_9908_R0// (Display)

5:09:08 PM 9/11/2018 ACTIVE MODE: CIP USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: E-STOP

ANALOG SCALING

SETPOINT FOR 20 MA

CENTRIFUGE VIBRATION (MM/SEC)	NN.N
CENTRIFUGE BOWL SPEED (RPM)	NNNNN
CENTRIFUGE GEAR INPUT SPEED (RPM)	NNNNN
BOWL VFD MOTOR CURRENT (A)	NNN.N
POLYMER FEED PUMP SCALED OUTPUT (Corresponding to 0-100% output)	NN.NN

MAIN SCREEN ALARM STATUS ALARM RESET SCREEN SELECT

29-SCROLL CONFIGURATION - /Hopewell_807834_9908_R0// (Display)

5:09:37 PM 9/11/2018 ACTIVE MODE: DECANTER OFF USER: sssssssssssssssssssssssss

VALVE / DEVICE NOT IN AUTO / REMOTE ALARM STATUS: E-STOP

SCROLL CONFIGURATION

Scroll Control Type: Speed Torque Speed

Scroll Control Output: ymin % ymax % Scroll Delay Time 2-gear sec

Scroll Control During Start-up: Without With Without Scroll Control Value During Start-up %

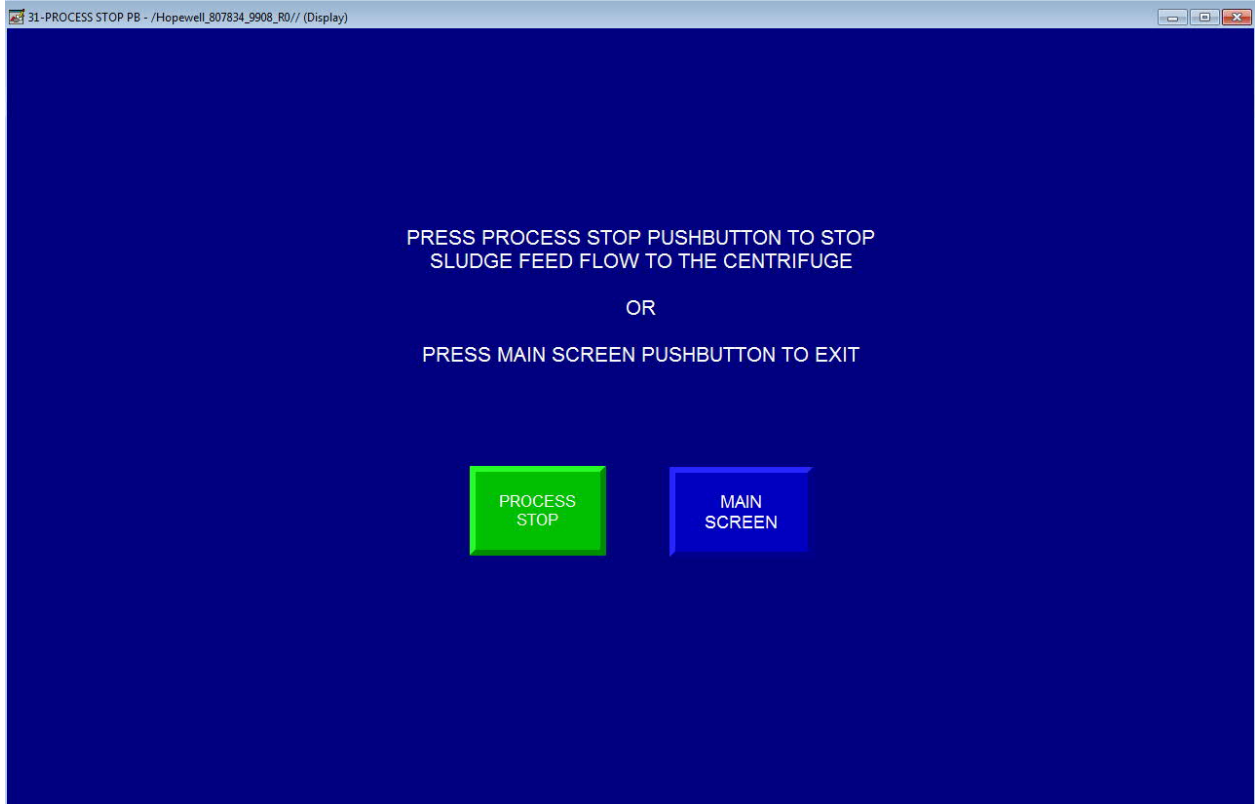
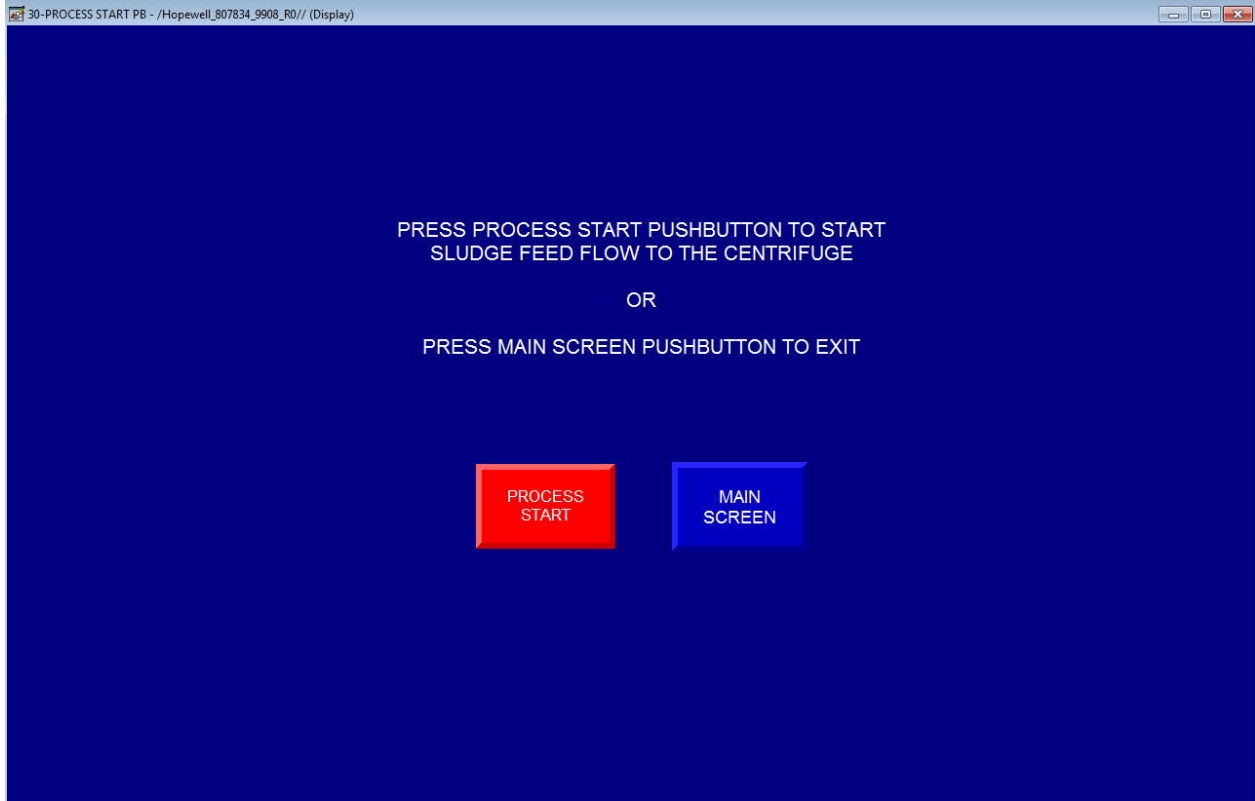
* Scroll Speed Limitation: Min Max No

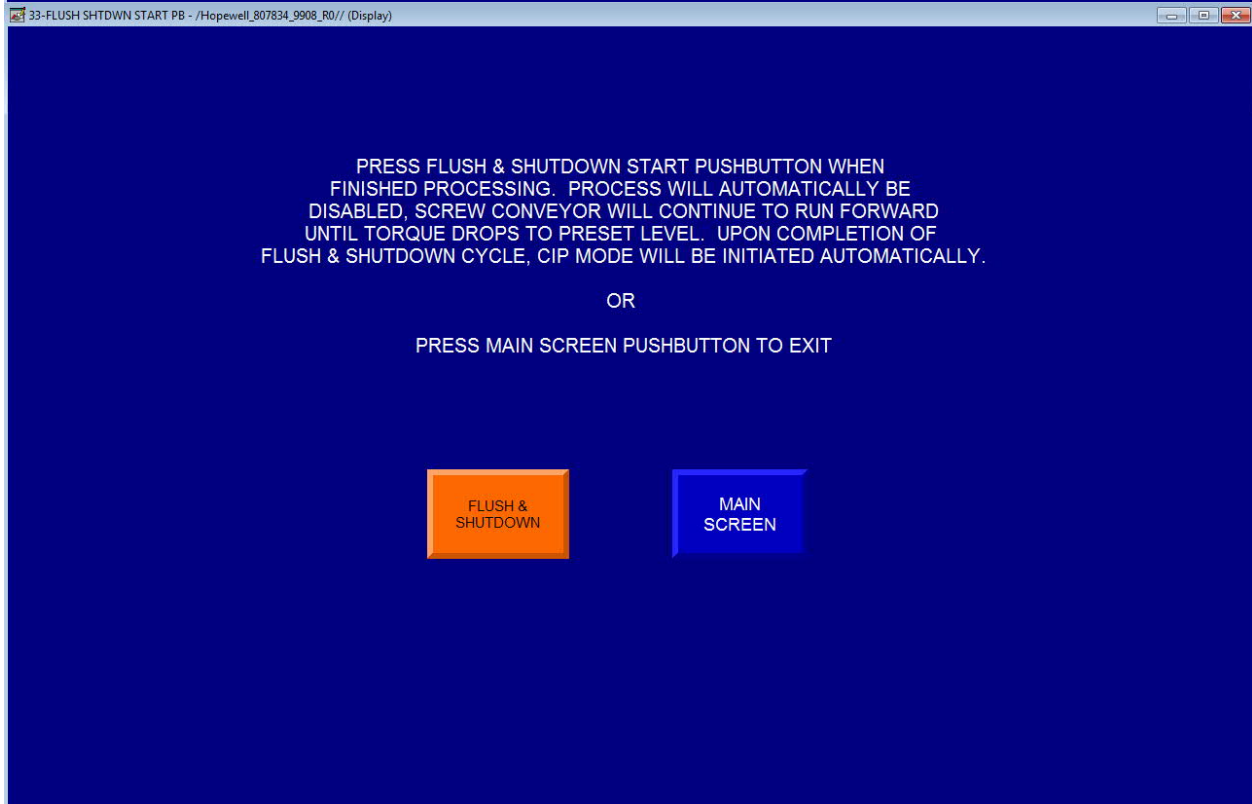
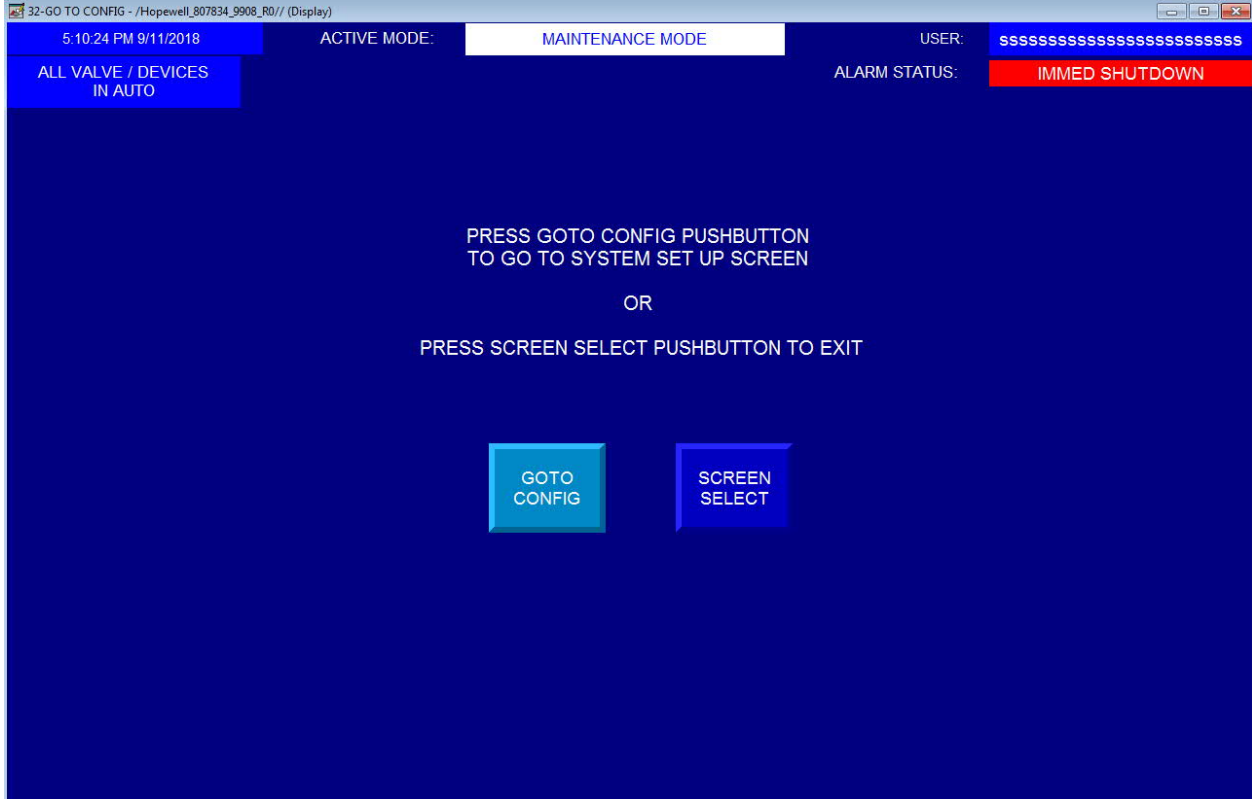
* No = There is no speed limitation, e.g. decanter series 20, 53, 466, 505, 63 and 75.

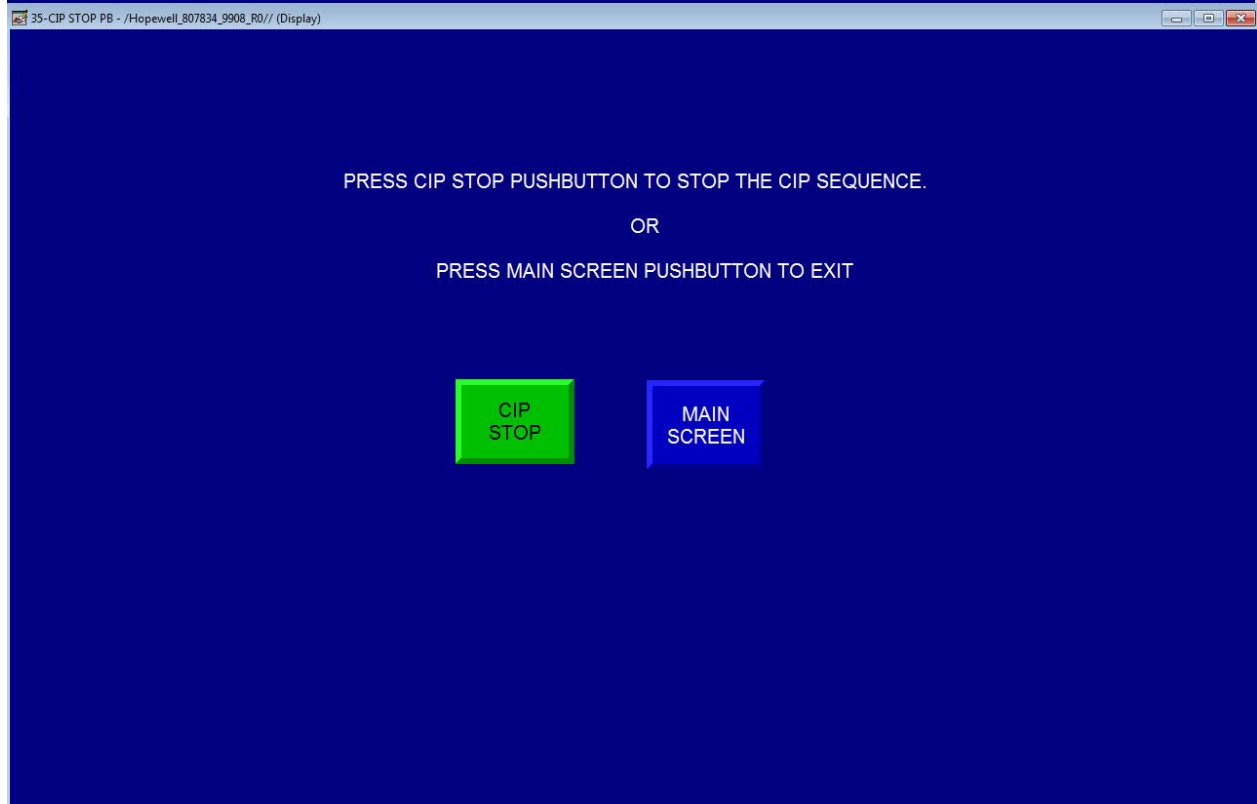
* Max = The gear input speed is always lower than the gear housing speed, e.g. decanter series 45 and 501, with secondary gear ratio = 3, and all decanter series 30. Scroll frequency limited to approx. 17-80 Hz.

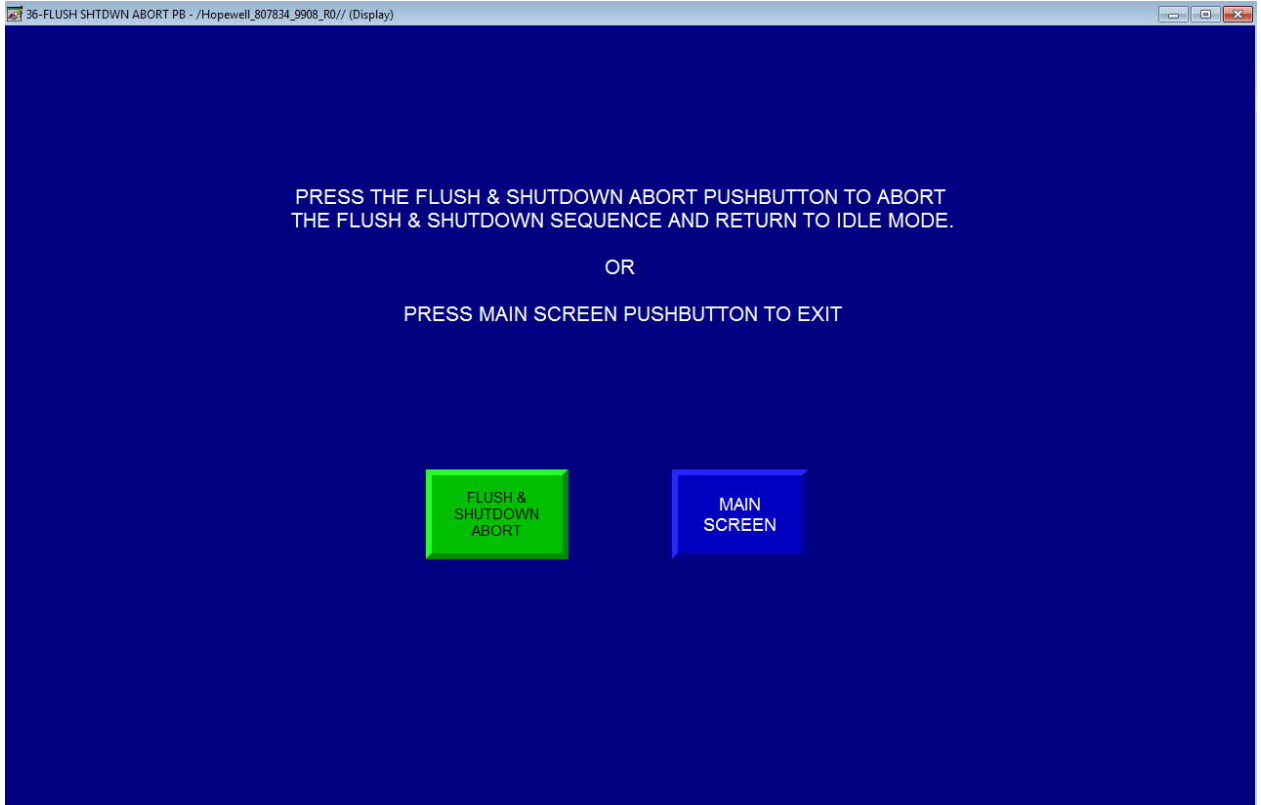
* Min = The gear input speed is always higher than the gear housing speed, e.g. decanter series 45 and 501, with secondary gear ratio = 6. Scroll frequency limited to approx. 52-87 Hz.

MAIN SCREEN ALARM STATUS ALARM RESET SCREEN SELECT



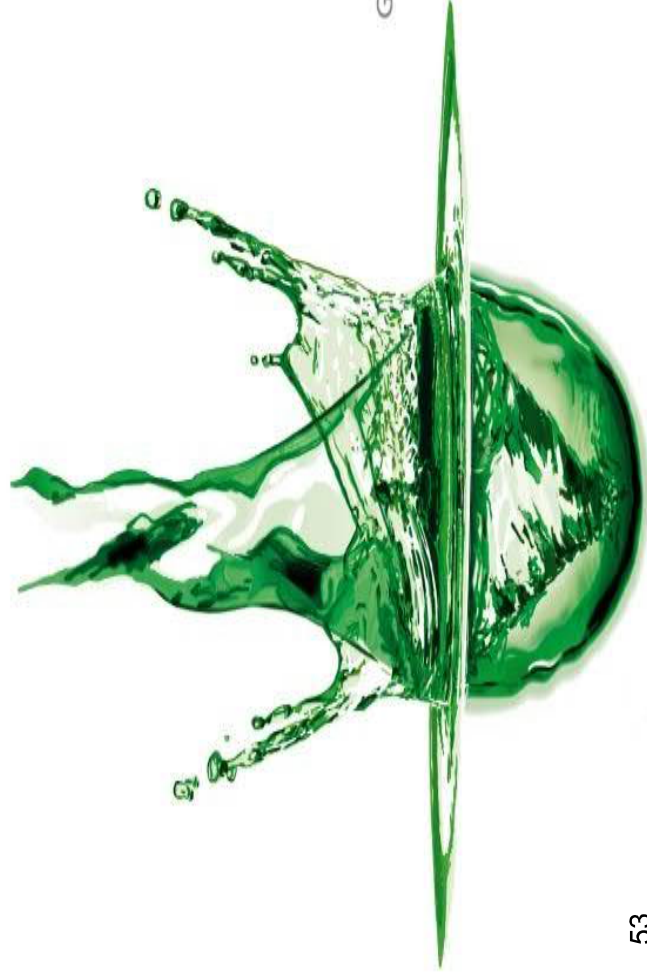






	SETPOINT	ACTUAL
OIL PRE LUBE TIME (SEC)	NNNNN	NNNNN
OIL PULSE INTERVAL (PAUSE) - STARTING (SEC)	NNNNN	NNNNN
OIL PULSE DURATION (PULSE) - STARTING (SEC)	NNNNN	NNNNN
OIL PULSE INTERVAL (PAUSE) - RUNNING (SEC)	NNNNN	NNNNN
OIL PULSE DURATION (PULSE) - RUNNING (SEC)	NNNNN	NNNNN

THIS CONCLUDES THE
CENTRIFUGE TRAINING
PRESENTATION THANK YOU
FOR YOUR ATTENTION!



Liquids to Value

GEA Mechanical Equipment / GEA Westfalia Separator

Below is a summary of the Scope of Supply for the Taunton, MA Wastewater Treatment Plant project, GEA No. 2652395848:

Two (2) CF 7000 Centrifuge with 75 HP Bowl motor and 50 HP Scroll Motor

Two (2) Solids (Cake) discharge flexible connectors

Two (2) Centrate flexible connectors

Two (2) Centrifuge Local Control Panels for Centrifuges including HMI, UL rated

One (1) Lot of Centrifuge Spare Parts

One (1) Lot of Centrifuge Special Tools

Three (3) Hard copies of O&M manuals – final version

Four (4) Hard Copies of Training Documentation – approved version

Two (2) Lot of GEA Technical services at the jobsite (10 days / 3 trips including T & E)

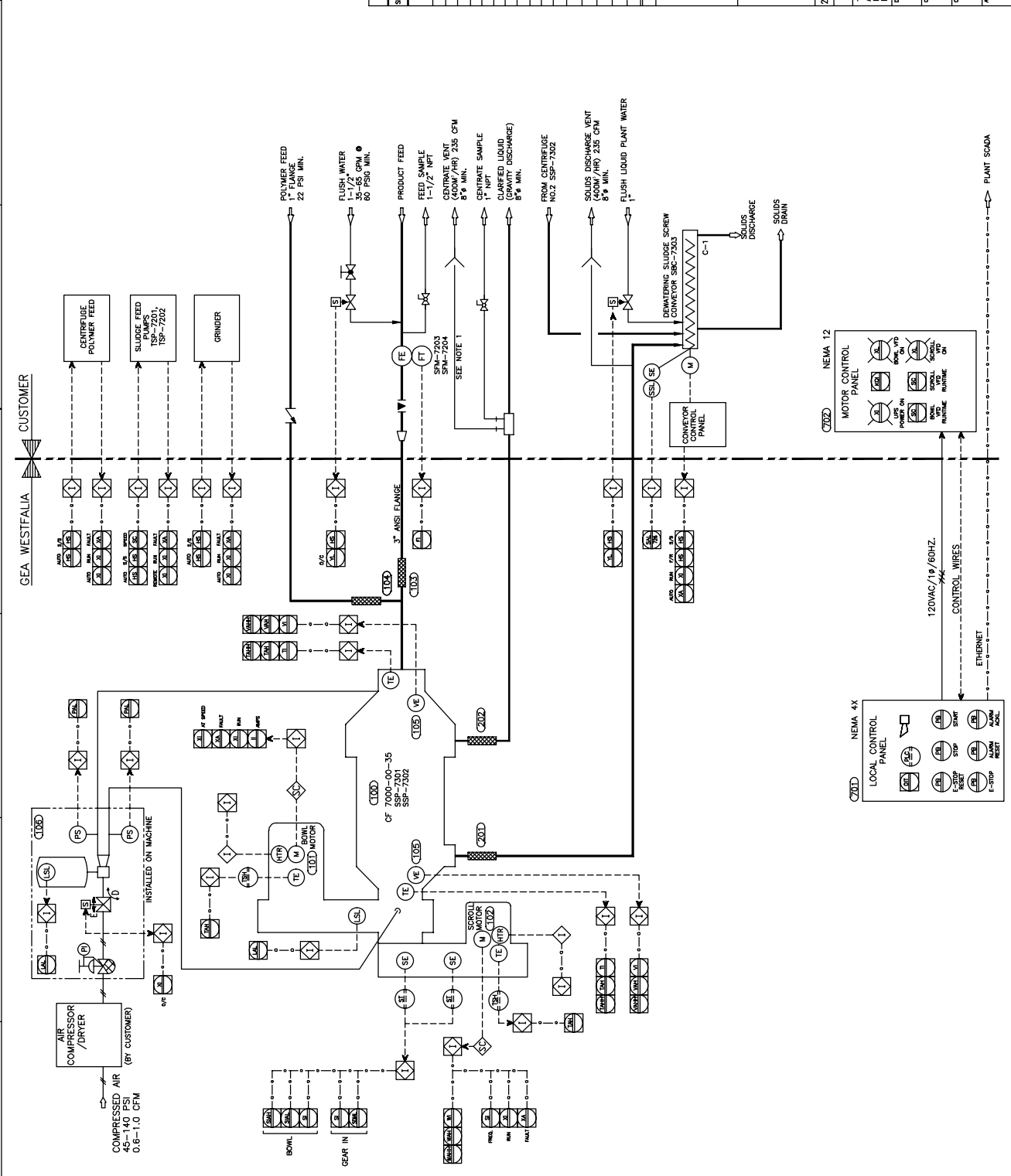
Two (2) Shop Test of Centrifuge including certificates

Two (2) Non-consecutive on-site maintenance trips

Two (2) Warranty, 12 months after acceptance

Two (2) Lot of shipping services for above items to jobsite.

No.	DESCRIPTION	DATE	APPROVED
0	RELEASED FOR APPROVAL	18/AUG/21	SBK



BILL OF MATERIALS

SEQ. NO.	DESCRIPTION	SIZE	CONN. TYPE	ITEM NO.	QTY.
100	CF 7000-00-35 (S/N 8012-6630)	-	-	9987-0331-509	1
101	MAIN MOTOR	-	-	9987-0331-510	1
102	SCROLL MOTOR	-	-	WITH MACHINE	1
103	PRODUCT FEED FLEX	3"	FLANGE	WITH MACHINE	1
104	POLYMER FEED FLEX	1"	HESE	WITH MACHINE	2
105	VIBRATION SENSOR	-	-	WITH MACHINE	1
106	OIL-AIR LUBRICATION	-	-	WITH MACHINE	1
201	SOLIDS DISCHARGE FLEX	-	-	9149-8882-094	1
202	CENTRATE DISCHARGE FLEX	-	-	9149-8882-094	1
701	LOCAL CONTROL PANEL	-	-	9200-0516-1B9	1
702	MOTOR CONTROL CENTER	-	-	BY CUSTOMER	1

LIST OF REFERENCE DRAWINGS

LCP WIRING DIAGRAM	9149-5901-571
MCC WIRING DIAGRAM	BY CUSTOMER
FOUNDATION DETAIL	9149-4100-706
INSTALLATION PLAN	9149-4100-706
DESCRIPTION	DRAWING NUMBER

NOTES:
 1. CUSTOMER SUPPLIED VENT CONNECTIONS ARE TO BE LOCATED BETWEEN THE CENTRIFUGE AND FLOOR.
 2. ALL FIELD PIPING, WIRING, AND INTERCONNECTIONS BY OTHERS.

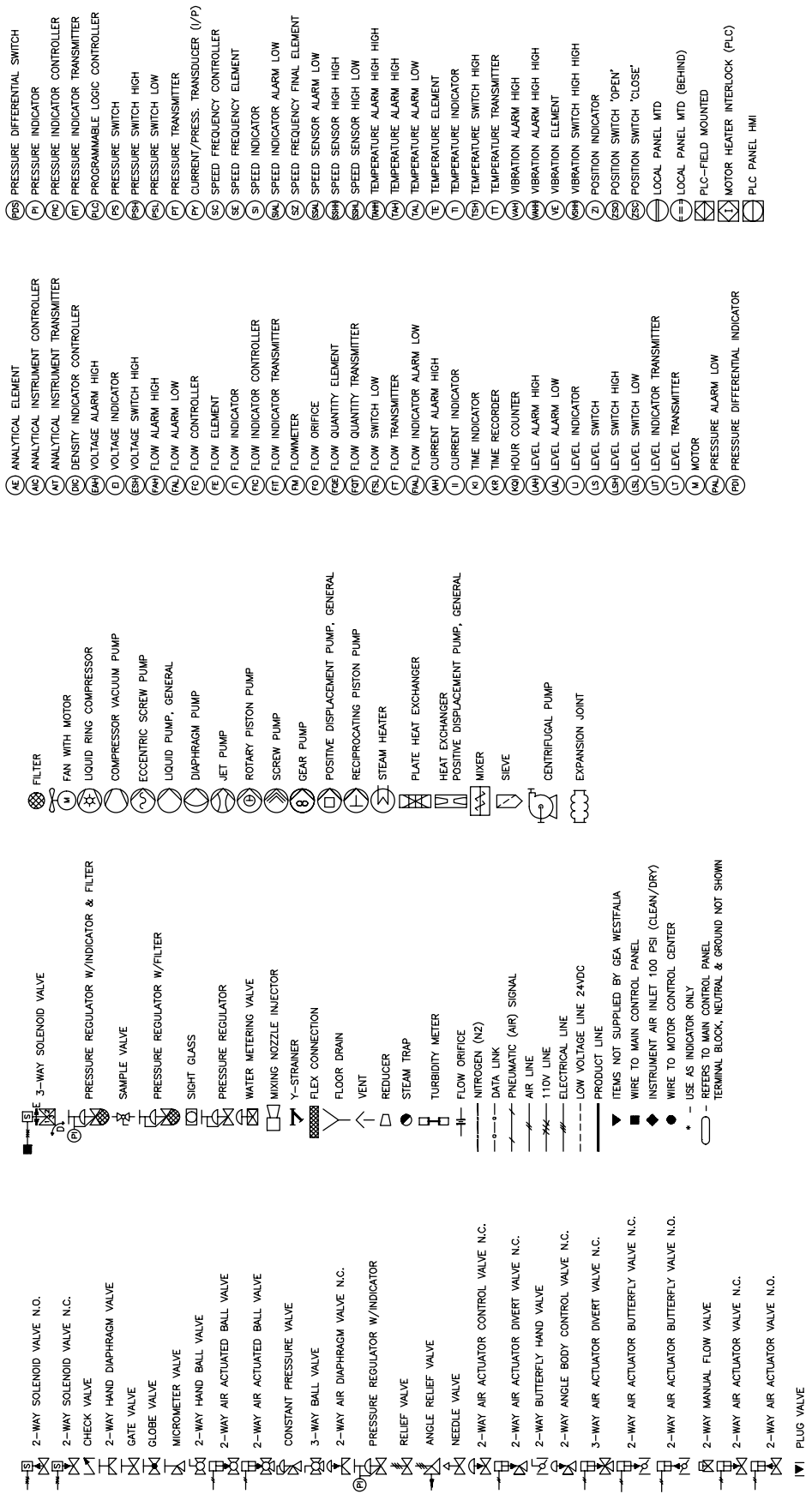
WESTFALIA NUMBER	CUSTOMER NUMBER	TAMONT, MA	CUSTOMER	DRAWING REVISION	END USE	QTY
2622365848	9875333			CF 7000	MACHINE	2

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Drawn: AR Date: 10/AUG/21
 Checked: L.L.C. Date: 18/AUG/21
 Checked: L.M. Date: 18/AUG/21
 Approved: S.B.K. Date: 18/AUG/21

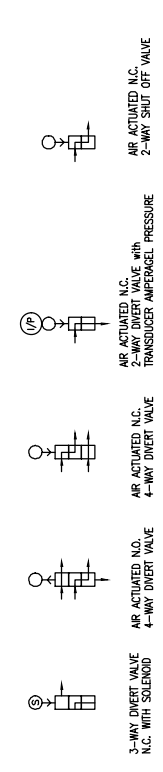
Westfalia Separator Division
 PIPING & INSTRUMENTATION DIAGRAM
 CF 7000-00-35

Sheet: 1 OF 2



- 4E ANALYTICAL ELEMENT
- 4C ANALYTICAL INSTRUMENT CONTROLLER
- 4T ANALYTICAL INSTRUMENT TRANSMITTER
- 4D DENSITY INDICATOR CONTROLLER
- 4M DENSITY INDICATOR TRANSMITTER
- 4H VOLTAGE ALARM HIGH
- 4I VOLTAGE INDICATOR
- 4N VOLTAGE SWITCH HIGH
- 4M FLOW ALARM HIGH
- 4L FLOW ALARM LOW
- 4C FLOW CONTROLLER
- 4E FLOW ELEMENT
- 4I FLOW INDICATOR
- 4C FLOW INDICATOR CONTROLLER
- 4T FLOW INDICATOR TRANSMITTER
- 4M FLOWMETER
- 4O FLOW ORIFICE
- 4E FLOW QUANTITY ELEMENT
- 4M FLOW QUANTITY TRANSMITTER
- 4L FLOW SWITCH LOW
- 4I FLOW SWITCH HIGH
- 4T FLOW TRANSMITTER
- 4L FLOW INDICATOR ALARM LOW
- 4H CURRENT ALARM HIGH
- 4I CURRENT ALARM LOW
- 4I CURRENT INDICATOR
- 4I TIME INDICATOR
- 4R TIME RECORDER
- 4K HOUR COUNTER
- 4H LEVEL ALARM HIGH
- 4L LEVEL ALARM LOW
- 4I LEVEL INDICATOR
- 4S LEVEL SWITCH
- 4H LEVEL SWITCH HIGH
- 4L LEVEL SWITCH LOW
- 4T LEVEL INDICATOR TRANSMITTER
- 4T LEVEL TRANSMITTER
- 4M MOTOR
- 4L PRESSURE ALARM LOW
- 4D PRESSURE DIFFERENTIAL INDICATOR

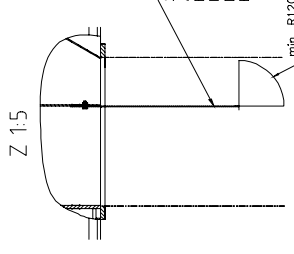
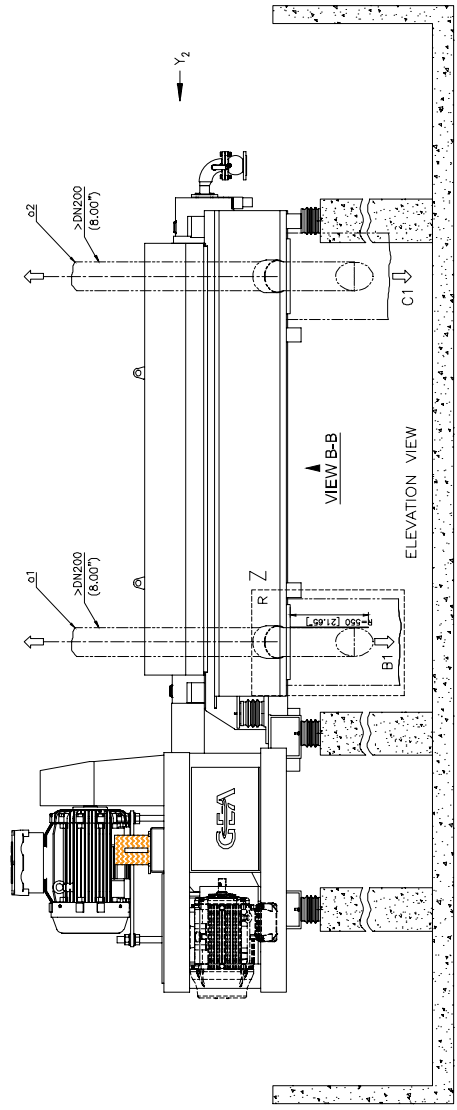
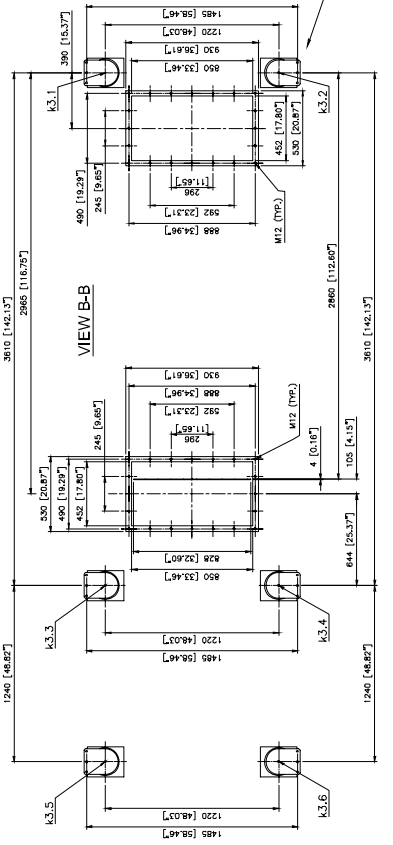
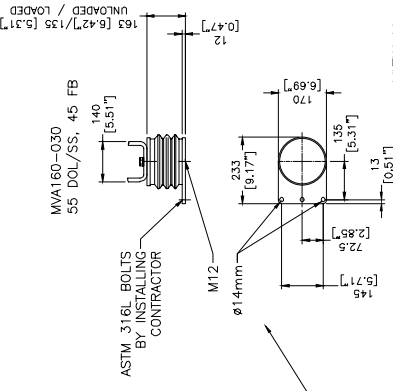
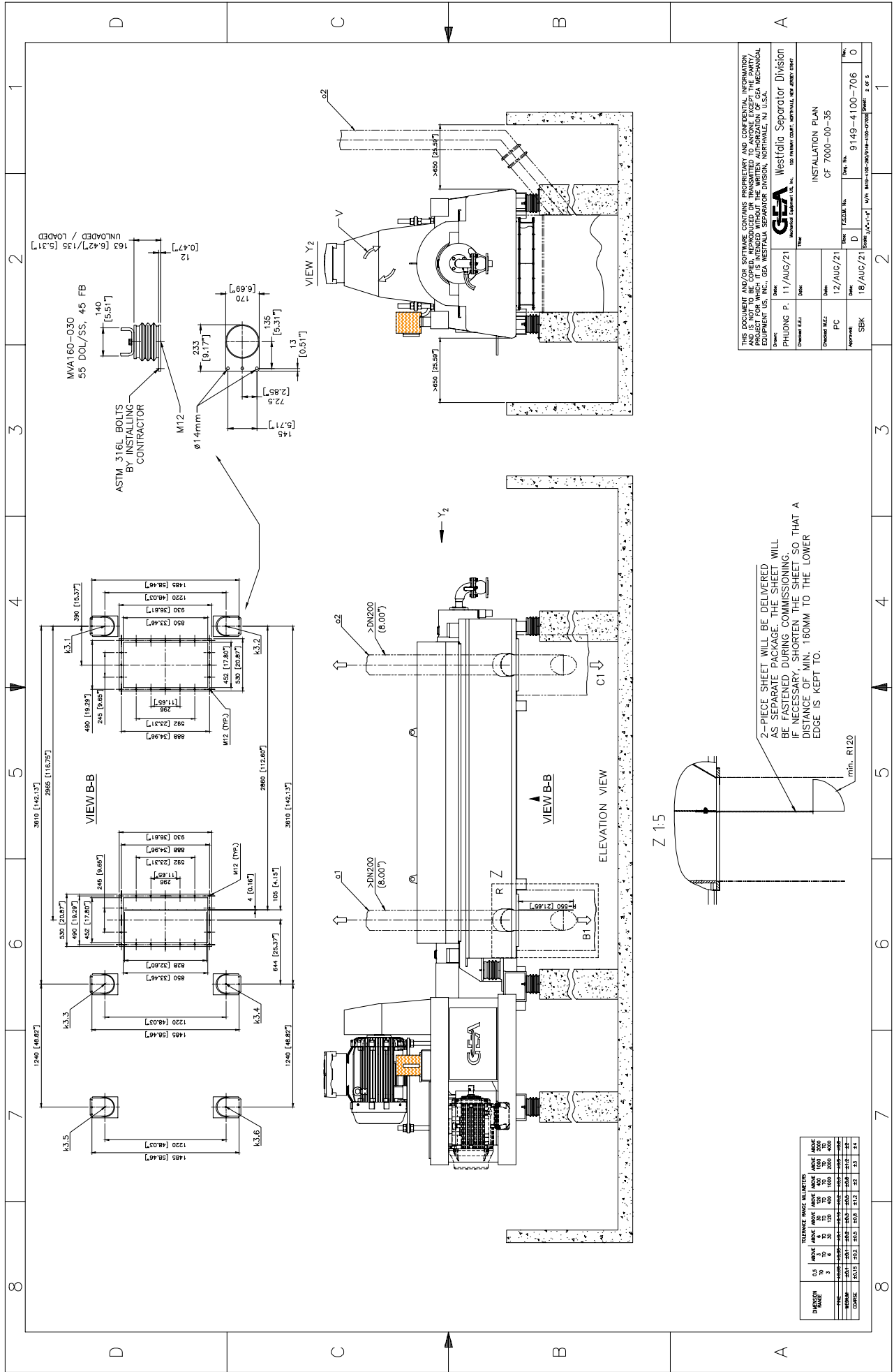
- 4D5 PRESSURE DIFFERENTIAL SWITCH
- 4I PRESSURE INDICATOR
- 4C PRESSURE INDICATOR CONTROLLER
- 4T PRESSURE INDICATOR TRANSMITTER
- 4C PROGRAMMABLE LOGIC CONTROLLER
- 4S PRESSURE SWITCH
- 4N PRESSURE SWITCH HIGH
- 4L PRESSURE SWITCH LOW
- 4T PRESSURE TRANSMITTER
- 4Y CURRENT/PRESS. TRANSDUCER (I/P)
- 4C SPEED FREQUENCY CONTROLLER
- 4E SPEED FREQUENCY ELEMENT
- 4I SPEED INDICATOR
- 4L SPEED INDICATOR ALARM LOW
- 4M SPEED FREQUENCY FINAL ELEMENT
- 4M SPEED SENSOR ALARM LOW
- 4M SPEED SENSOR HIGH HIGH
- 4M SPEED SENSOR HIGH LOW
- 4M SPEED SENSOR HIGH HIGH
- 4M TEMPERATURE ALARM HIGH HIGH
- 4M TEMPERATURE ALARM HIGH
- 4M TEMPERATURE ALARM LOW
- 4E TEMPERATURE ELEMENT
- 4I TEMPERATURE INDICATOR
- 4T TEMPERATURE SWITCH HIGH
- 4T TEMPERATURE SWITCH LOW
- 4T TEMPERATURE TRANSMITTER
- 4H VIBRATION ALARM HIGH
- 4M VIBRATION ALARM HIGH HIGH
- 4E VIBRATION ELEMENT
- 4M VIBRATION SWITCH HIGH HIGH
- 4I POSITION INDICATOR
- 4S POSITION SWITCH 'OPEN'
- 4S POSITION SWITCH 'CLOSE'
- 4M LOCAL PANEL MTD
- 4M LOCAL PANEL MTD (BEHIND)
- 4M PLC-FIELD MOUNTED
- 4M MOTOR HEATER INTERLOCK (PLC)
- 4M PLC PANEL HMI



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Drawn	AR	Date	10/AUG/21
Checked E.E.	LM	Date	18/AUG/21
Checked M.Z.	PC	Date	18/AUG/21
Approved	SRK	Date	18/AUG/21

Project: PIPING & INSTRUMENTATION DIAGRAM
 Drawing No.: 9149-5700-909
 Sheet: 2 OF 2

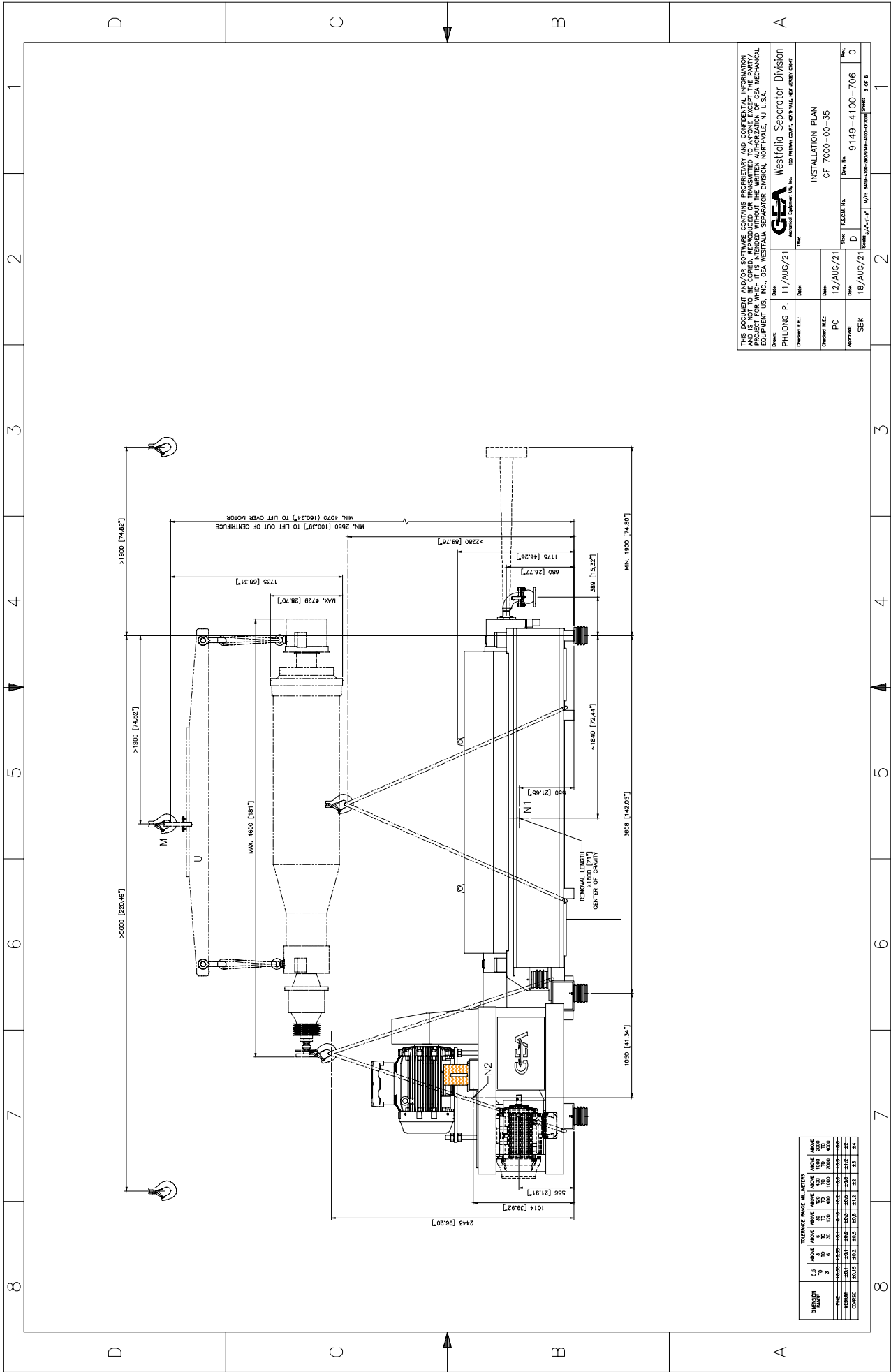


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DATE:	PHUONG P. 11/AUG/21
DESIGNED BY:	PHUONG P.
CHECKED BY:	
DATE:	12/AUG/21
DESIGNED BY:	PC
CHECKED BY:	
DATE:	16/AUG/21
DESIGNED BY:	
CHECKED BY:	

PROJECT NO.	9149-4100-706
REV.	0
DATE	
BY	
CHECKED BY	
DATE	
BY	
CHECKED BY	
DATE	

DIMENSION	TOLERANCE	UNITS	
		MM	IN
±0.5	±0.02	±0.02	±0.0008
±1.0	±0.04	±0.04	±0.0016
±2.0	±0.08	±0.08	±0.0032
±3.0	±0.12	±0.12	±0.0048
±4.0	±0.16	±0.16	±0.0064
±5.0	±0.20	±0.20	±0.0080
±6.0	±0.24	±0.24	±0.0096
±7.0	±0.28	±0.28	±0.0112
±8.0	±0.32	±0.32	±0.0128
±9.0	±0.36	±0.36	±0.0144
±10.0	±0.40	±0.40	±0.0160
±12.0	±0.48	±0.48	±0.0192
±15.0	±0.60	±0.60	±0.0240
±20.0	±0.80	±0.80	±0.0320
±25.0	±1.00	±1.00	±0.0400
±30.0	±1.20	±1.20	±0.0480
±40.0	±1.60	±1.60	±0.0640
±50.0	±2.00	±2.00	±0.0800
±60.0	±2.40	±2.40	±0.0960
±70.0	±2.80	±2.80	±0.1120
±80.0	±3.20	±3.20	±0.1280
±100.0	±4.00	±4.00	±0.1600
±120.0	±4.80	±4.80	±0.1920
±150.0	±6.00	±6.00	±0.2400
±200.0	±8.00	±8.00	±0.3200
±250.0	±10.00	±10.00	±0.4000
±300.0	±12.00	±12.00	±0.4800
±400.0	±16.00	±16.00	±0.6400
±500.0	±20.00	±20.00	±0.8000
±600.0	±24.00	±24.00	±0.9600
±800.0	±32.00	±32.00	±1.2800
±1000.0	±40.00	±40.00	±1.6000
±1200.0	±48.00	±48.00	±1.9200
±1500.0	±60.00	±60.00	±2.4000
±2000.0	±80.00	±80.00	±3.2000
±2500.0	±100.00	±100.00	±4.0000
±3000.0	±120.00	±120.00	±4.8000
±4000.0	±160.00	±160.00	±6.4000
±5000.0	±200.00	±200.00	±8.0000
±6000.0	±240.00	±240.00	±9.6000
±8000.0	±320.00	±320.00	±12.8000
±10000.0	±400.00	±400.00	±16.0000



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GEA Westfalia Separator Division
 GE A Westfalia Separator Division, Inc. 100 FARMER CIRCLE, NORTHVALE, NJ 07047

DATE: PHUONG P. 11/AUG/21
 CHECKED: E.L. 12/AUG/21
 DRAWN: PC 18/AUG/21
 APPROVED: SBK 18/AUG/21

INSTALLATION PLAN
 CF 7000-00-35
 SHEET NO. 9149-4100-706
 OF 5

DIMENSION NAME	TOLERANCE		NAME		NUMBER	
	mm	inch	mm	inch	mm	inch
±0.5	±0.020	±0.008	±0.5	±0.020	±0.5	±0.020
±1.0	±0.040	±0.016	±1.0	±0.040	±1.0	±0.040
±2.0	±0.080	±0.031	±2.0	±0.080	±2.0	±0.080
±3.0	±0.120	±0.047	±3.0	±0.120	±3.0	±0.120
±4.0	±0.160	±0.063	±4.0	±0.160	±4.0	±0.160
±5.0	±0.200	±0.079	±5.0	±0.200	±5.0	±0.200
±6.0	±0.240	±0.095	±6.0	±0.240	±6.0	±0.240
±7.0	±0.280	±0.111	±7.0	±0.280	±7.0	±0.280
±8.0	±0.320	±0.127	±8.0	±0.320	±8.0	±0.320
±9.0	±0.360	±0.143	±9.0	±0.360	±9.0	±0.360
±10	±0.400	±0.159	±10	±0.400	±10	±0.400
±12	±0.480	±0.191	±12	±0.480	±12	±0.480
±15	±0.600	±0.236	±15	±0.600	±15	±0.600
±20	±0.800	±0.315	±20	±0.800	±20	±0.800
±25	±1.000	±0.394	±25	±1.000	±25	±1.000
±30	±1.200	±0.473	±30	±1.200	±30	±1.200
±40	±1.600	±0.631	±40	±1.600	±40	±1.600
±50	±2.000	±0.789	±50	±2.000	±50	±2.000
±60	±2.400	±0.947	±60	±2.400	±60	±2.400
±70	±2.800	±1.105	±70	±2.800	±70	±2.800
±80	±3.200	±1.263	±80	±3.200	±80	±3.200
±90	±3.600	±1.421	±90	±3.600	±90	±3.600
±100	±4.000	±1.579	±100	±4.000	±100	±4.000
±120	±4.800	±1.911	±120	±4.800	±120	±4.800
±150	±6.000	±2.363	±150	±6.000	±150	±6.000
±200	±8.000	±3.149	±200	±8.000	±200	±8.000
±250	±10.000	±3.935	±250	±10.000	±250	±10.000
±300	±12.000	±4.721	±300	±12.000	±300	±12.000
±400	±16.000	±6.299	±400	±16.000	±400	±16.000
±500	±20.000	±7.877	±500	±20.000	±500	±20.000
±600	±24.000	±9.455	±600	±24.000	±600	±24.000
±700	±28.000	±11.033	±700	±28.000	±700	±28.000
±800	±32.000	±12.611	±800	±32.000	±800	±32.000
±900	±36.000	±14.189	±900	±36.000	±900	±36.000
±1000	±40.000	±15.767	±1000	±40.000	±1000	±40.000

- A1 : PRODUCT FEED, DN80 (3")
- A2 : POLYMER FEED DN25 (1")
- B1 : SOLIDS DISCHARGE
- B1.1 : SOLIDS DISCHARGE FLEX (9149-2832-094)
- C1 : LIQUID DISCHARGE (PRESSURELESS)
- C1.1 : LIQUID DISCHARGE (PRESSURELESS)
- C2 : LIQUID DISCHARGE (PRESSURELESS)
- C5 : OILBATH UNIT COMPRESSED AIR FOR LUBRICATION, 3/8"
- J2 : LEAKAGE OF FEED TUBE GAP, PIPE #603.3 (2.38")
- K3.5/3.6 : DRIVE MOTOR SIDE
- K3.3/3.4 : DRIVE BELT SIDE
- K3.1/3.2 : FEET LIQUID SIDE
- M : ELECTRIC TROLLEY HOIST
 - MIN. LIFTING CAPACITY 10M/MIN.
 - MIN. LIFTING CAPACITY 4000 KG (8820 LBS) FOR FILLED BOWL (BOWL COMPLETE WITH SCROLL)
 - CENTER OF GRAVITY - FRAME + BOWL + GEARBOX
 - CENTER OF GRAVITY - FRAME + BOWL + GEARBOX (CORE MAXIMUM MAIN MOTOR AND GEAR TYPE PQA 417)
- N1 : SOLIDS VENT
- N2 : LIQUIDS VENT
- o1 : DIRECTION OF MOTOR ROTATION
- o2 : DIRECTION OF MOTOR ROTATION
- V : VIBRATION ISOLATORS 135mm COMPRESSED / 163mm NOT COMPRESSED
- Y : LIFTING DEVICE

DEPENDING ON THE INSTALLATION HEIGHT OF THE DECANTER, A WORKING PLATFORM MUST BE INSTALLED FOR ASSEMBLY, OPERATION AND MAINTENANCE.

THE LOCALLY VALID REGULATIONS MUST BE OBSERVED.

WEIGHTS	
	LBS
Centrifuge	6250
Main Motor	13750
Gear Box	670
Bowl Filling	1447
	600
	1320
	825
	1815
Total	8345

1. The model CF7000 has 6 legs. For calculation of structural loads, the load is distributed evenly.
2. The loads are reported below the viscodampers
3. The dynamic loads are oscillating at a frequency equal to the bowl speed.
4. The resonance frequency of the entire centrifuge is in the range of 3-8Hz
5. The Bowl Filling is the weight of the product in a full bowl assuming a specific gravity of 1.5
6. A safety factor of 1.2 has been applied to the static load to allow for variations in machine designs and product buildup

TABLE OF CALCULATION THE SUPPORTING FORCES

RESONANCE FREQUENCY OF ENTIRE DECANTER VISCO DAMPER 3-8HZ	STATIC LOAD F OF ENTIRE DECANTER (N)	MAX. STATIC LOAD (N) (VIBRATION ISOLATOR*)	VERTICAL DYNAMIC LOAD VIBRATION ISOLATOR AT OPERATING SPEED (N)	WHEN CROSSING RESONANCE FREQUENCY (N)
K3.1; K3.2; K3.3 K3.1; K3.2; K3.3	F = 8345 * 12 = 100140 N	16.67% * F 0.1667 * 100140N = 16693N	± 0.67% * F 0.0067 * 100140 = 671 N	± 1% * F 0.01 * 100140 = 1001 N

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GEA Westfalia Separator Division
 GEA Mechanical Equipment U.S., Inc.
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 Date: 18/AUG/21

INSTALLATION PLAN
 CF 7000-00-35

Scale: K3.0/K3.6
 Scale: D

Sheet No.: 9149-4100-706
 of 5

NOTES AND HINTS FOR PLANNING THE INSTALLATION OF DECANTERS

THE FOLLOWING DOCUMENTATION HAS TO BE REFERRED TO:

- MACHINE DESCRIPTION AND OPERATION PRINCIPLES
 - DESCRIPTION AND OPERATING PRINCIPLES OF SUPPLEMENTARY EQUIPMENT
 - TERMINAL PLAN AND WIRING DIAGRAM FOR THE ELECTRICAL INSTALLATION
- THE FOLLOWING REQUIREMENTS ARE MADE ON THE FEED AND DISCHARGE LINES AND SOLIDS DISCHARGE:

- FLEXIBLE TO AVOID THE TRANSMISSION OF VIBRATIONS
- VALVES AND PUMPS MUST BE ADAPTED TO THE PRODUCT
- PROTECTED DEVICES ACCORDING TO EN 294 MUST AFFORD THE FOLLOWING PROTECTION:
 - OPERATING PERSONNEL MUST NOT BE ENDANGERED BY DISCHARGED PRODUCT.
 - DANGER ZONES MUST BE MADE INACCESSIBLE.
- THE FEED LINE A SHUT-OFF DEVICE SO AS TO BE ABLE TO INTERRUPT THE PRODUCT SUPPLY IN CASE OF OPERATING MALFUNCTIONS.
- SHOULD ENABLE UNIFORM PRODUCT SUPPLY WITH A CONSTANT SOLIDS CONTENT
- DESIGN THE SOLIDS DISCHARGE TO PREVENT DAMMING
- ENSURE ADEQUATE DE-AERATION OF THE SOLIDS CHUTE OR DOWNSTREAM SOLIDS TANK ETC.
- THE SOLIDS DISCHARGE MUST BE PROVIDED WITH A FLOW-DIVERGING DEVICE BECAUSE LIQUID DISCHARGES THROUGH THE SOLIDS OUTLET DURING START-UP, SHUT-DOWN AND FLUSHING.

WHEN RATING THE SUPPORTING CONSTRUCTION (FOUNDATION), THE LOADS AS SPECIFIED IN THE TABLE BELOW MUST BE TAKEN INTO ACCOUNT FOR VIBRATORY SUBSTRUCTURES. WE RECOMMEND A RATING IN THE RANGE OF 1.5 TO 2.0. RESONANCE FREQUENCIES OF THE SUBSTRUCTURE ARE AT LEAST 30 % ABOVE THE OPERATING SPEED OF THE DECANTER.

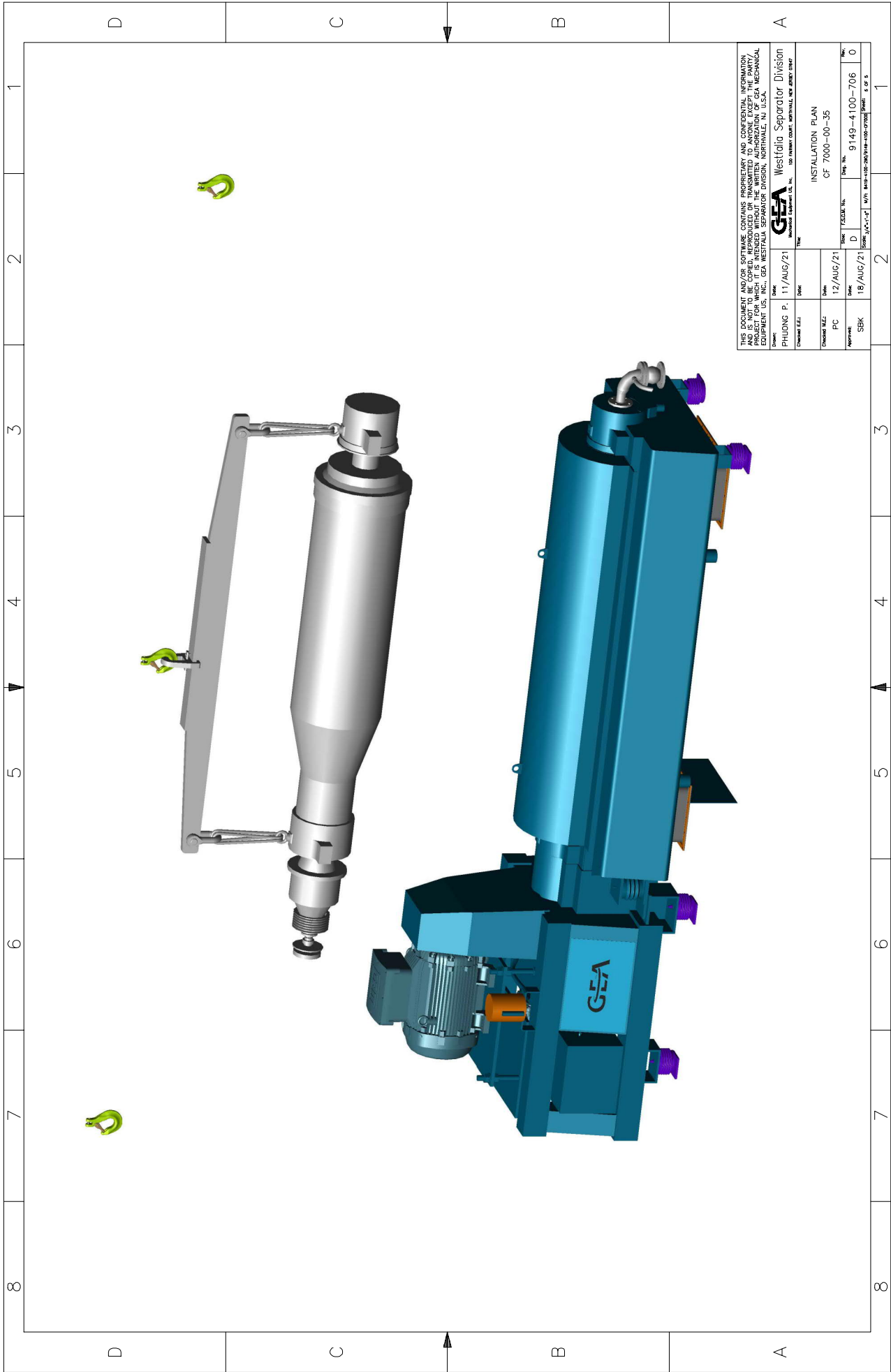
THE NATURAL FREQUENCIES OF THE SUPPORTING CONSTRUCTION AND THOSE OF THE ADJACENT CONSTRUCTION MAY NOT BE NEAR TO THE DECANTER OPERATING SPEEDS IN CASE OF LOAD BY THE DECANTER.

SUBJECT TO MODIFICATION.

NOTES:

1. ALL CONNECTIONS MUST BE FLEXIBLE
2. FOR PROPER VENTING OF DISCHARGE HOPPERS REFER TO THE INSTALLATION MANUAL-IMPROPER VENTING CAN LEAD TO LEAKAGE PROBLEMS
3. FOR FURTHER INFORMATION PLEASE SEE INSTALLATION MANUAL

DIMENSION	TOLERANCE		MATERIAL		SURFACE	
	mm	inch	mm	inch	mm	inch
D	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
E	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
F	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
G	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
H	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
I	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
J	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
K	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
L	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
M	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
N	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
O	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
P	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
Q	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
R	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
S	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
T	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
U	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
V	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
W	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
X	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
Y	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05
Z	0.5	±0.02	100	±0.05	1000	±0.05
	1	±0.05	100	±0.05	1000	±0.05



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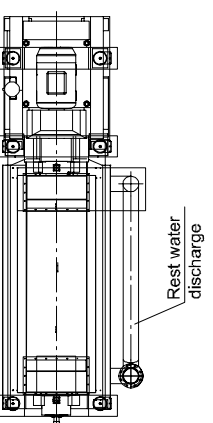
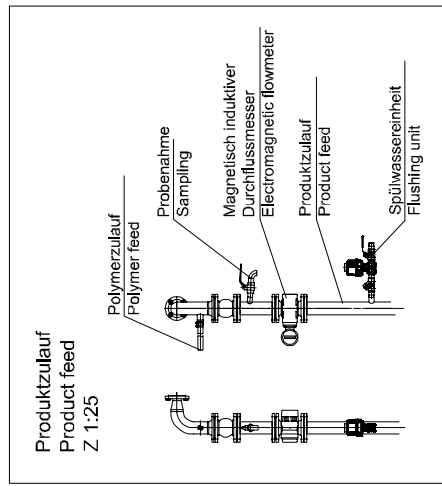
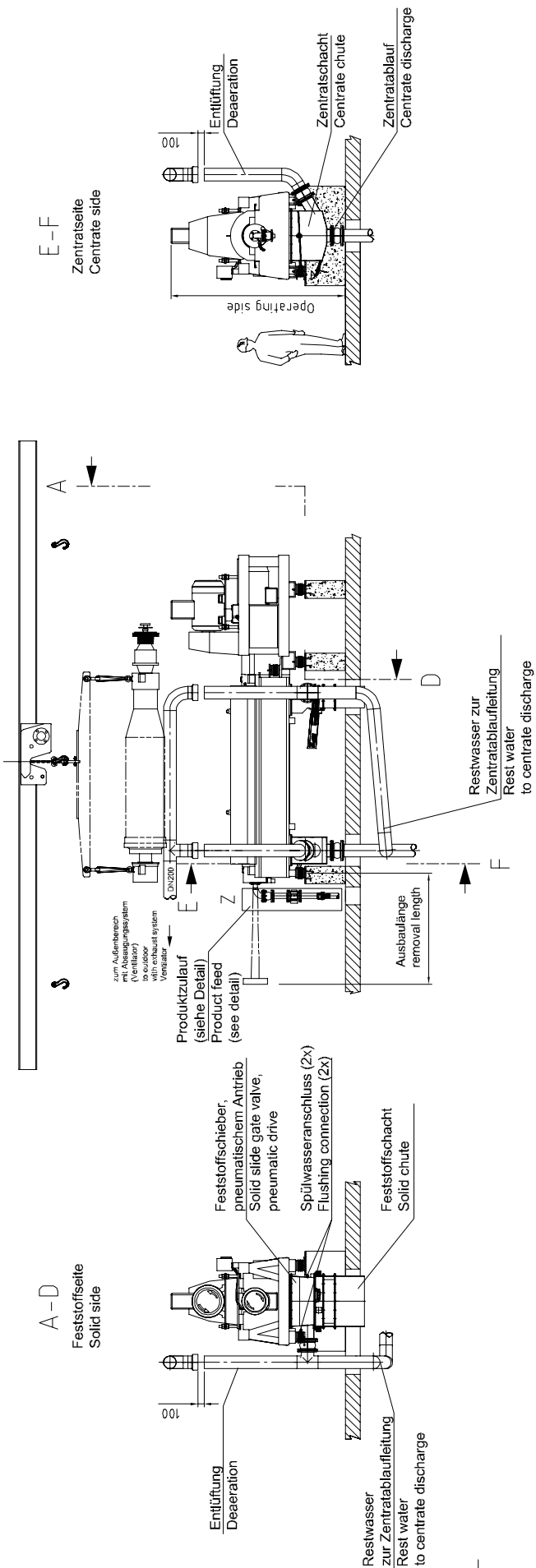
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Project No.:	91149-4100-706	Sheet No.:	0
Plant:		Plant:	

INSTALLATION PLAN
 CF 7000-00-35

The following video includes GEA's recommendations for proper installation of the Centrifuge:

<http://video.gea.com/installation-of-gea-decanters-cf-1>



Dekanter CF 7000
siehe Maßblatt
8419-4100-160
Decanter CF 7000
see dimensioned drawing
8419-4100-160

Dekanter CF 8000
siehe Maßblatt
8420-4100-020
Decanter CF 8000
see dimensioned drawing
8420-4100-020



Diese Zeichnung ist als unverbindlicher Installationsvorschlag zu verstehen. Der exakte Planungs- und Lieferumfang wird durch Angebot / Vertrag definiert. Maßblatt und Planungsblätter beachten!
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Änderungsnummer Rev. Data	Name	Datum/Date		Gezeichnet/Checked		Geprüft/Reviewed		Technische Zeichnung/Technical Drawing No.		Blattnummer/Sheet No.	
		12.04.2018						prime 7000 / prime 8000	prime 7000 / prime 8000	1	2
<p>GEA</p> <p>Westfälische Maschinen- und Apparatebau GmbH 59125 Oelde, Germany</p> <p>ISO 9001:2015 ISO 14001:2015 ISO 45001:2018</p> <p>General Information Aussagen gemäß ISO 2768 MKS No.</p>											
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<p>Erreicht durch / Reached by:</p> <p>Bemerkung: Aufstellungsplan Hinweise zur Installation prime 7000 / prime 8000</p>											
<p>ISO 7243/3 Maßstab/Scale 1:50 Blatt/Sheet 1 Blattreihenfolge/Sheet sequence 2</p>											

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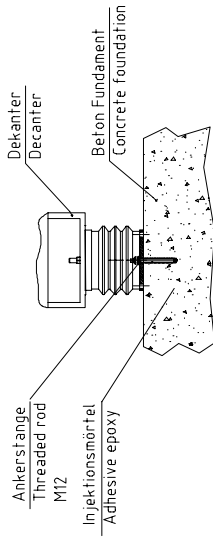
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Alternative Dekanteraufstellungen Alternative decanter set-ups

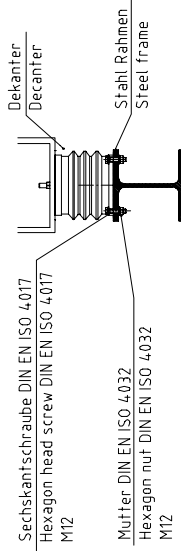
Kundenseitige Dekanteraufstellung auf einem Betonfundament Decanter set-up by the customer at concrete foundation

Vorschlag: Aufstellung mittels Ankerstangen
z.B. Fa. HILTI Typ HIT-V-R (A4-70)
und Injektionsmörtel Fa. HILTI Typ HIT-RE 500SD
Einzelheiten zur Montage nach Montageanleitung Fa. HILTI

Proposal: Mounting by adhesive and epoxy anchor system HILTI
For example threaded rods type HIT-V-R (A4-70) and
adhesive epoxy type HIT-RE-500 SD
Further information by HILTI



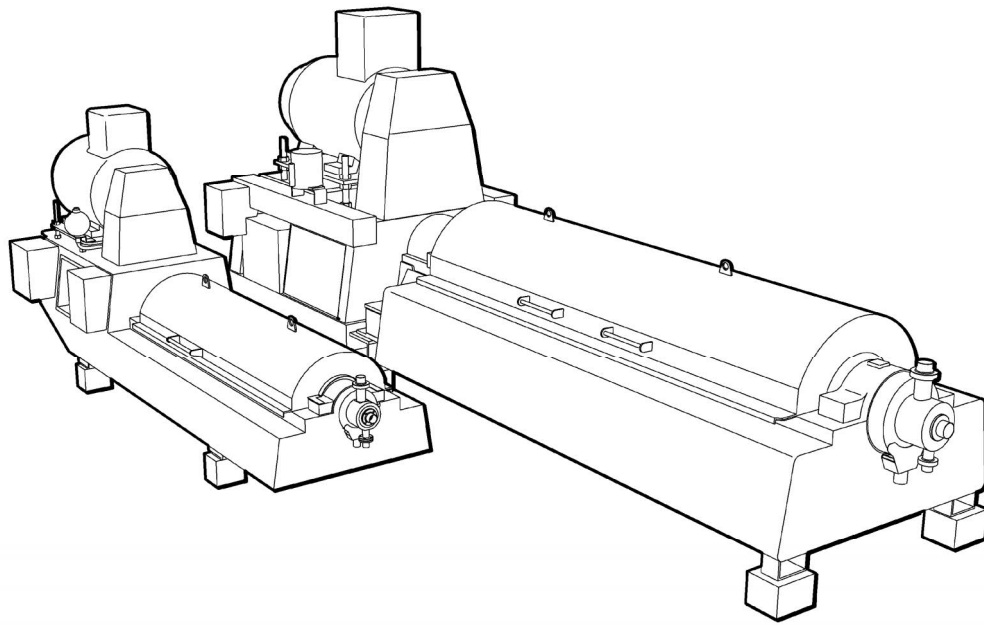
Kundenseitige Dekanteraufstellung auf einem Stahlrahmen Decanter set-up by the customer at steel frame



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Maßstäblichkeit und Planungshinweise beachten!
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The exact planning and delivery scope will be defined by offer / contract!
Refer to dimensioned drawings and layout recommendations!
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Änderungswahlweise im ETS-System gespeichert and ETS-System resident. Überfluren/overwrite! Surface flush according to ISO 1502	Ersetzt durch / Replaced by:		Ersetzt durch / Replaced by:	
Gen./Drawn 12.04.2018	Name Boris Br	Beschreibung Aufstellungsplan Hinweise zur Installation prime 7000 / prime 8000		ISO 1502 Meßmaß/Scale
Geprüft Checked		prime 7000 / prime 8000		Blattanzahl 2
Normierung Normenreferenz		Drawing No. ENV_A_1860		Blattanzahl 2
		Hersteller GEA		AZ
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Planning and installation guidelines

Designation: Decanter

Model: CF 3000 - 8000

No. 8690-9601-000

Edition 14.10.2019



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ORIGINAL INSTRUCTION MANUAL
Contents subject to modification!

The authors are always grateful for remarks and suggestions
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1	Transport and storage	5
1.1	Safety during transport	6
1.2	Storage instructions for the decanter.....	6
1.3	Using load-suspension devices safely	7
1.3.1	Load fastening points for the hoist.....	9
1.4	Using lifting eye bolts or lifting eye nuts as load handling devices.....	10
2	Assembly and installation	11
2.1	Safety during assembly and installation	12
2.2	Required documents for planning the installation	12
2.3	Environmental requirements.....	13
2.4	Allow for sufficient space for maintenance work.	13
2.5	Requirements to be met by the load suspension devices	14
2.6	Demands on the configuration of the installation	14
2.7	Requirements to be met by feed and discharge lines	14
2.7.1	Rating of compensators.....	15
2.8	Configuration of the liquid chute	16
2.9	Configuration of the solid chute	17
2.10	Seals between frame and discharge chute	19
2.11	Configuration of the vent	21
2.12	Overflow on the liquid side	25
2.13	Flush connections.....	25
2.14	Hydrohermetic system.....	25
2.15	Mechanical seal.....	25
2.16	Compressed air connection.....	25
2.17	Inert gas connections	26
2.18	Special aspects when operating in hot conditions.....	27
2.19	Terminal box positions of the electrical components.....	28
2.19.1	Terminal box designations and their functions	29
2.20	Maintain sufficient space for ventilating the gearbox.....	30
2.21	Plan space requirements to drain the oil of the drum bearings	31
2.22	Viscosity damper	32
2.23	Planning the frame/foundation.....	33
2.24	Transporting the decanter	34
2.25	Decanter installation and alignment	36
2.25.1	Installation and alignment of decanter sizes 3000 to 6000	36
2.25.2	Installation and alignment of decanter sizes 7000 to 8000	39
2.26	Carry out voltage equalization	45
2.27	Decanter with supply cabinet.....	45
3	Operation	47
3.1	Recommendations for chemical cleaning (CIP)	48
3.1.1	Recommended parameters	48
3.1.2	P&ID with CIP return	48
3.1.3	Identification of connections and components	51
3.1.4	Throughput	53
3.1.5	Recommended standard procedure	54
3.1.6	Valve positions.....	58

1 Transport and storage

1.1	Safety during transport	6
1.2	Storage instructions for the decanter.....	6
1.3	Using load-suspension devices safely	7
1.3.1	Load fastening points for the hoist.....	9
1.4	Using lifting eye bolts or lifting eye nuts as load handling devices.....	10

1.1 Safety during transport

When the centrifuge is transported with hoists and fork-lift trucks, hazards can occur. Risk of injury and material damage are a threat when unsuitable persons are deployed and unsuitable or damaged lifting gear is used.

Therefore, pay attention to the following points during transportation:

- Assign only qualified personnel with the task of transporting the centrifuge.
- Use approved and intact lifting gear and hoists for transportation.
- Use only suitable hoists with adequate lifting capacity.
- If applicable: Arrest the bowl with the aid of the bowl lock screws.
 - The bowl bearings will otherwise get damaged.
- Remove/loosen the coupling of the secondary motor.
 - Otherwise the motor shaft/gear shaft will be damaged.

1.2 Storage instructions for the decanter

Requirements for the storage room

The storage room must meet the following requirements:

- cool, 15 – 25 °C
- dry, approx. 65 % relative humidity (perspiration water formation must be prevented)
- dark (avoid direct sunlight and UV radiation)
- dust-free
- moderately ventilated
- free from aggressive media (e.g. salts, acids, lyes, solvents)

Painted parts

An intact paint coating provides adequate corrosion protection. For this reason, painted parts must be examined for damage or changes once a month.

Touch up the damage in accordance with the instructions of the paint manufacturer.

Unpainted areas and galvanised parts

Unpainted areas and galvanised parts must be treated as follows:

- Carefully clean the area or part.
- Spray-on anti-corrosive wax, see the lubrication and maintenance schedule.
- Check and, when necessary, touch up the corrosion protection once a month.

Gearbox / spare gearbox (oil-lubricated)

The gearbox and spare gearboxes must be prepared as follows for long-term storage.

- Drain lubricating oil completely, see chapter "maintenance / Draining gear oil".
- Fill 0.05 litres of corrosion inhibiting oil, see lubrication and maintenance schedule, close the gearbox.
- Carefully clean the gearboxes.
- Spray-on anti-corrosive wax, see the lubrication and maintenance schedule.
 - Check and, when necessary, touch up the corrosion protection once a month.

For the purpose of transporting the gearbox for inspection by the manufacturer, the gearbox must likewise be prepared as described above.

Drive motors

The drive motors must be prepared as follows for long-term storage.

- Option: Connect the space heaters for the motor winding. This is especially important in the case of high air humidity in the environment.
- Carefully clean the motor.
- Spray-on anti-corrosive wax, see the lubrication and maintenance schedule.
- Check and, when necessary, touch up the corrosion protection once a month.

1.3 Using load-suspension devices safely

The working load limit of the slings depends on the method of use. They may only be used for their intended purpose.

Unintended use may cause the slings to tear. There is risk to the life and limb of persons and of damage to property.

For the reduction of the working load limit in individual cases, see the manufacturer's specifications.

GEA Westfalia Separator recommends the use of round slings made of synthetic fibres.

Observe the points below when using load-suspension devices.

- Inspect slings for damage before each use.
- Do not use damaged or incomplete load-suspension devices and slings.
- Use slings only in the way approved by the manufacturer.
- Never load the slings beyond their maximum working load limit (WLL). The WLL specification is located on the sling label.
- Conduct regular training for slingers and individuals assigned to perform transport work.
- Use only the sling points specified in the documentation.
- Use only suitable fork-lift trucks and hoists with an adequate capacity.
- Pack and secure the load in accordance with the CTU (Cargo Transport Unit) transport guidelines before transporting it.
- Observe all regional regulations and laws governing transport and transport securing.

Lifting accessories for transporting the centrifuge

Ground conveyors and hoisting equipment for transporting the system to the centrifuge must be provided by the operating company.

Hoists (e.g. a crane) suitable for dismantling or installing heavy components must be provided by the operator.

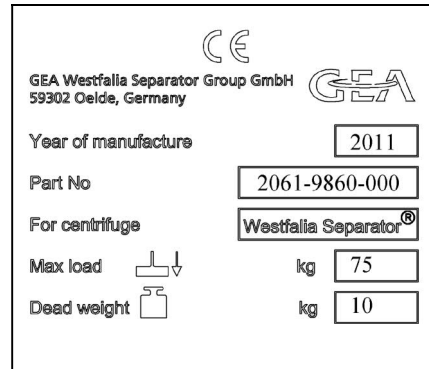
- Hood
- Bowl
- Drive
- etc.

Lifting accessories for repairing the centrifuge

Lifting equipment and slings required for dismantling or installing the bowl or scroll are available in the separate spare parts catalogue "Tools set". The tools set is not included in the standard scope of supply.

Use slings safely and observe the following points:

- Use only slings with a nameplate.



The nameplate on the sling shows the following data:

- CE mark
- Manufacturer
- Year of manufacture
- Part number
- Intended use
- maximum load
- inherent weight

Fig. 1 Example of a nameplate

- Use sling gear only as described in this instruction manual.
- Observe the permitted loading limit.
- Check the sling for visible damage before each use.
- Use only slings in perfect condition.
- Do not carry out repairs to slings.
- Send damaged slings to the manufacturer.
- Always screw in threaded rods as far as they will go.
- Tighten all nuts fully.
- Tighten all bolts fully.
- Do not walk under suspended loads.

1.3.1 Load fastening points for the hoist

The decanter is delivered optionally with lifting devices for the scroll and bowl.

The following table shows the load fastening point dimensions.

Due to the sharp edges at the load fastening points, the direct use of round slings or ropes is **not admissible**.

If the existing crane hook is too large, use a suitable means of fastening (e.g. an adequately dimensioned shackle).

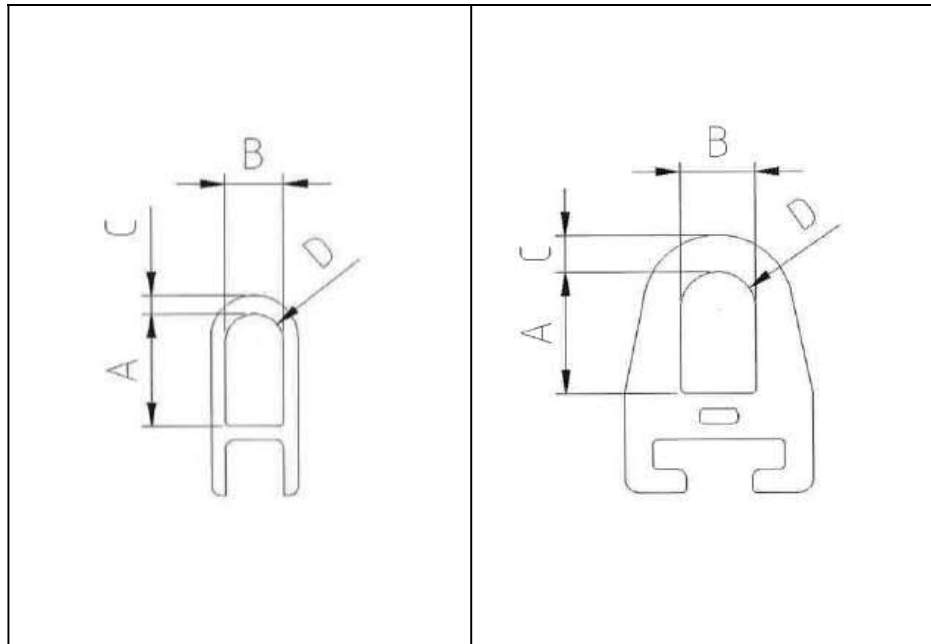


Fig. 2

Fig. 3

Decanter size	Scroll lifting device	Bowl lifting device
3000	Shackle with rope	Shackle with rope
4000 5000	A = 120 B = 60 C = 25 D = 30 T = 20	Shackle with rope
6000 7000	A = 120 B = 60 C = 25 D = 30 T = 20	A = 120 B = 60 C = 40 D = 30 T = 50
8000	A = 130 B = 80 C = 25 D = 40 T = 30	A = 130 B = 80 C = 40 D = 40 T = 60

1.4 Using lifting eye bolts or lifting eye nuts as load handling devices

Incorrect use of lifting eye bolts or lifting eye nuts during transport can lead to serious accidents, e.g. due to overload.



WARNING

Deformed lifting eye bolts or lifting eye nuts due to overload!

Danger to life and limb through falling loads when lifting eye bolts or lifting eye nuts break!

Observe the following points to avoid accidents:

- The pertinent standards and guidelines of the national associations in the country of origin on the operation of load handling devices in lifting mode
- Only trained specialists are authorized to mount lifting eye bolts or lifting eye nuts.

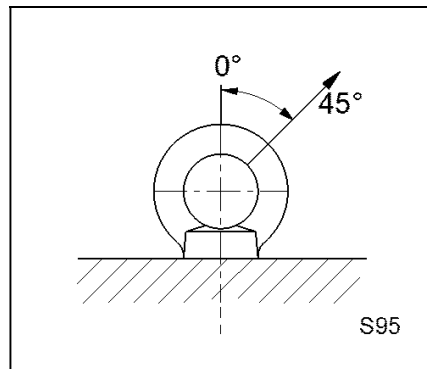


Fig. 4

- Mount lifting eye bolts or lifting eye nuts only as illustrated.
- Screw in lifting eye bolts or lifting eye nuts completely.
- Attach load handling devices as vertically as possible, e.g. chains.
 - Pull max. 45° diagonally.
 - Modes of assembly other than those shown are not admissible, e.g. lateral pull.

2 Assembly and installation

2.1	Safety during assembly and installation	12
2.2	Required documents for planning the installation	12
2.3	Environmental requirements.....	13
2.4	Allow for sufficient space for maintenance work.	13
2.5	Requirements to be met by the load suspension devices	14
2.6	Demands on the configuration of the installation	14
2.7	Requirements to be met by feed and discharge lines	14
2.7.1	Rating of compensators.....	15
2.8	Configuration of the liquid chute	16
2.9	Configuration of the solid chute	17
2.10	Seals between frame and discharge chute	19
2.11	Configuration of the vent	21
2.12	Overflow on the liquid side	25
2.13	Flush connections.....	25
2.14	Hydrohermetic system.....	25
2.15	Mechanical seal.....	25
2.16	Compressed air connection.....	25
2.17	Inert gas connections	26
2.18	Special aspects when operating in hot conditions.....	27
2.19	Terminal box positions of the electrical components.....	28
2.19.1	Terminal box designations and their functions	29
2.20	Maintain sufficient space for ventilating the gearbox.....	30
2.21	Plan space requirements to drain the oil of the drum bearings	31
2.22	Viscosity damper	32
2.23	Planning the frame/foundation.....	33
2.24	Transporting the decanter	34
2.25	Decanter installation and alignment	36
2.25.1	Installation and alignment of decanter sizes 3000 to 6000	36
2.25.2	Installation and alignment of decanter sizes 7000 to 8000	39
2.26	Carry out voltage equalization	45
2.27	Decanter with supply cabinet.....	45

2.1 Safety during assembly and installation

Pay attention to the following points during assembly and installation:

- Install the centrifuge at the installation site in accordance with the installation diagrams.
- For rating piping, refer to the specifications in the P&ID (Piping and Instrumentation Diagram) in the installation diagram and in the datasheets.
- Connect all feed and discharge lines flexibly to the centrifuge by means of U-shaped conduits or compensators.
 - Loading the pipelines through tensile force is not admissible.
 - All pipe joints are rated without taking into consideration tensile forces.
- Do not fit a shut-off device in the frame drain or connect it with closed piping.

Exception	A shut-off device is required to prevent harmful gases from escaping during maintenance work.
Required measure	Take appropriate action to ensure that the centrifuge only starts when such shut-off devices are completely open.

Fastening material

Unsuitable fastening material endangers the statics and operating safety of the centrifuge. This can lead to damage to the centrifuge.

- Use the specified fastening means. They are rated for machine frame and foundation.

2.2 Required documents for planning the installation

Careful planning of the installation is crucial in terms of service life, safety and operating readiness of the centrifuge.

The following documents are required:

- Order-specific dimensioned drawing
- Order-specific P&ID (Piping and Instrumentation Diagram)
- Order-specific equipment list
- Terminal and circuit diagram
- Decanter instruction manual
- Additional manuals (if applicable), e.g. for oil+air lubrication of the bowl bearings

2.3 Environmental requirements

Favourable ambient conditions are:

- The decanter is standing in a closed hall.
- The decanter is free-standing and well ventilated.
- The decanter has low dust exposure. The standard values in industrial environments are not exceeded.
- Uniform ambient temperatures prevail between min. 5 °C and max. 40 °C.

In the following cases GEA Westfalia Separator must be contacted for more precise clarification of the optimum installation.

Unfavourable ambient conditions are:

- The decanter is standing outdoors.
 - The decanter must be pre-heated to a temperature of +5 °C if there is a risk of frost.
- The decanter is installed at a poorly ventilated site. Bearings and gears are subjected to thermal strain.
- The decanter is exposed to large differences in temperature. Condensate water impairs lubrication of the bowl bearings.

NOTICE

Inadmissible ambient conditions are:

- Corrosive vapours or fumes damage the decanter.
 - In such cases, it is absolutely necessary to provide suction.
- Disturbing external vibrations.
 - Avoid disturbing external vibrations since they can endanger the operating safety of the decanter.
- Ambient temperatures below 5 °C prevail.
- Ambient temperatures above 40 °C are prevailing.

2.4 Allow for sufficient space for maintenance work.

When planning the installation of the centrifuge, ensure that the centrifuge is easily accessible from all sides.

Keep to the minimum clearances from walls of buildings or other machines so that the following points are assured.

- All machine parts must be readily accessible for maintenance and repair work.
- Sufficient space must be available for setting down large machine parts safely.
 - Protective hoods
 - Bowl
 - Drive motors

2.5 Requirements to be met by the load suspension devices

- Hoists and cranes must be adequately dimensioned for the weights of the machine components. Refer to the order-specific dimensioned drawing.
- A crane must be able to travel in two axes.
- If a monorail crane is used, there are two possibilities:
 - The crane runs in the rotor axis, refer to the order-related dimensioned drawing (preferred direction).
 - The crane runs at right angles to the rotor axis at the height of the centre of gravity of the rotor. (For the centre of gravity of the rotor, refer to the dimensioned drawing. This is useful only in exceptional cases, as the centre of gravity of the rotor may be displaced by adhering solids.)

2.6 Demands on the configuration of the installation

- Configure the installation so that backflows of product or utilities cannot occur.
- Ensure uniform feed rates. Recommendation: Mono pump
- Ensure uniform feed concentration. Recommendation: Agitator

2.7 Requirements to be met by feed and discharge lines

- Valves and pumps must be adapted to the product.
- Do not connect feed and discharge lines firmly to the centrifuge. Provide flexible connections.
- Contact with the rotating bowl must be excluded.
- Operating personnel must not be endangered by discharged product. Danger zones must be made inaccessible.
- The feed must be provided with a shut-off device so as to be able to interrupt the product supply in case of operating malfunctions.
- The feed system should enable uniform product supply with a constant solids content.

2.7.1 Rating of compensators

Compensators installed in the lines on the centrifuge must meet the following requirements:

Size	Motion absorption [mm]		Adjusting forces [N/mm]	
	axial	lateral	axial	lateral
Up to DN 15	± 6	± 3	50	50
DN 20 to DN 40	± 10	± 5	100	100
DN 50 to DN 100	± 10	± 5	100	200
DN 125 to DN 200	± 15	± 5	200	400

Materials

The material selection must take into consideration the following requirements:

- Corrosion-resistant
- Resistant against product specifications
 - Temperature
 - Acids
 - Lyes
 - Solvents
- Resistant against the specified environmental conditions
- Light-resistant when installed outdoors
- If applicable, suitable for use in the food and/or pharmaceutical sector

Pressure range for the compensators

- In the feed line: PN6
- In the discharge line centripetal pump and paring tube PN16

2.8 Configuration of the liquid chute

Open chute

Liquid chutes adapted optimally to the decanter can be procured from GEA Westfalia Separator.

Take into account the following points when building your own constructions:

- Provide a vent.
- Fit a compensator.
- Protect operating personnel. To do this:
 - Prevent contact with rotating parts.
 - Prevent danger through discharging product.
- Rate conveying equipment (e.g. pumps) to handle the throughput capacity of the decanter. In case of doubt, contact GEA Westfalia Separator.
- Fit a sampling cock (recommendation).

Paring tube

- Provide a vent.
- Fit a compensator.
- Liquid (product) must be discharged into a tank next to the decanter without pressure.
 - Vent the tank.
 - In the case of increased backpressure, the leakage at the paring tube will increase.

Centripetal pump

- Liquid (product) is discharged under pressure.
- Provide a compensator between the connections at the decanter and the discharging pipe.

2.9 Configuration of the solid chute

Solid chutes adapted optimally to the decanter can be procured from GEA Westfalia Separator.

Please take into account the following points when installing your self-made configurations:

- Design the solids discharge to prevent damming. Build-up of product can lead to heavy damage to the decanter. A malfunction in the solids discharge installations or solids bridging can cause build-up of solids in the decanter. If there is a build-up, the decanter must be switched off and the fault must be eliminated. To prevent build-up / switch off the decanter in due time
 - install solids probe.
 - install overflow.
 - plan sufficient volume.
- Ensure adequate venting of the solids chute and downstream solids tank. See also chapter "Assembly and installation/design of the venting system".
- Provide an elastic connection piece (e.g. compensator) when closed discharge is required.
- In the case of open discharge, provide a compensator with elastic connection to the decanter.
- When a closed solid discharge is necessary, e.g. in the case of a gastight design, only a round stainless steel compensator can be used due to the required tightness.
 - This results in a transition between the angular discharge at the housing of the centrifuge to round.
 - Select an adequately large nominal width.
 - Prevent bridging.
- Protect operating personnel. To do this:
 - Prevent contact with rotating parts.
 - Prevent danger through discharging product.
- Rate conveying equipment (e.g. pumps, conveyor belts or solid slides) to handle the throughput capacity of the decanter. In case of doubt, contact GEA Westfalia Separator.
- During start-up, run-down and flushing the decanter, liquid discharges through the solid discharge. A special discharge system must be provided for this. E.g.:
 - Slide gate valve
 - Residual water discharge at trough conveyor
 - etc.

- Install a two-piece metal sheet as an extension - (see sketch).
 - The metal sheet serves to avoid deposits of solids in the frame.
 - Metal sheets are supplied separately with the decanter.
 - If necessary, the sheet metal must be shortened to the extent that the minimum clearances to adjacent components shown below are adhered to (e.g. walls of chutes, trough conveyors).

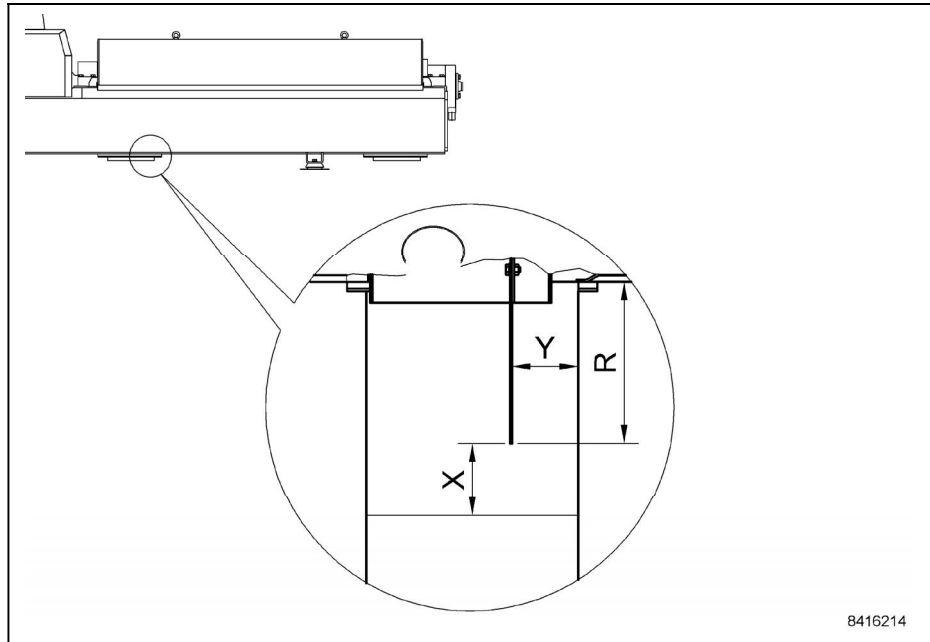


Fig. 5

Decanter size	X	Y	R
3000	min. 95 mm	min. 95 mm	Refer to the order-specific dimension sheet.
4000	min. 120 mm	min. 120 mm	
5000	min. 155 mm	min. 155 mm	
6000	min. 170 mm	min. 170 mm	
7000	min. 120 mm	min. 120 mm	
8000	min. 240 mm	min. 240 mm	

2.10 Seals between frame and discharge chute

(Seals are supplied with the decanter)

Option 1: Decanters with suspended catchers

(only for sizes 3000 to 6000)

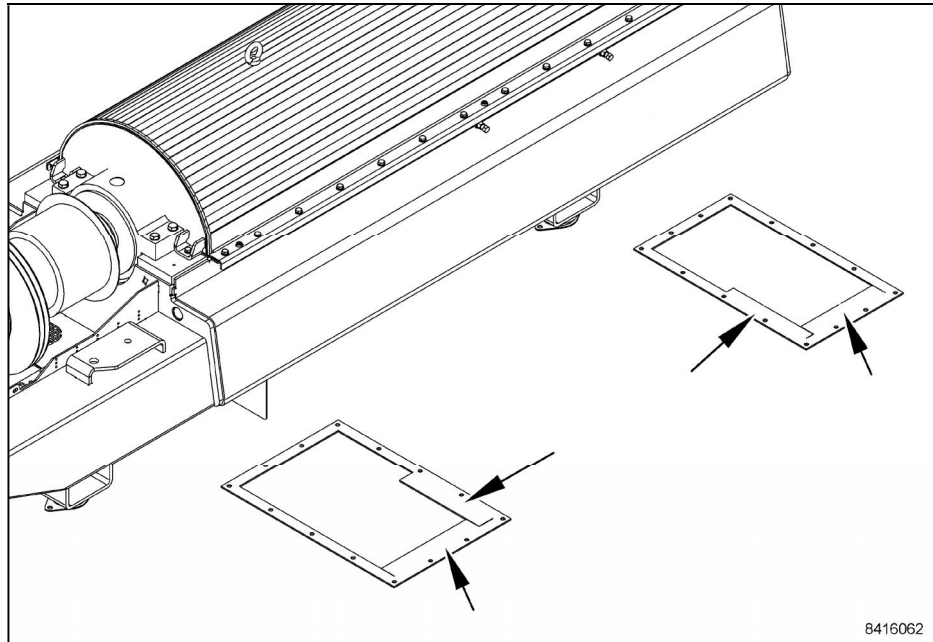


Fig. 6

The seals between the frame and discharge chute are not symmetrical.

IMPORTANT: The wide webs must be located at the marked positions. The shape of the seals influences the air flow in the decanter. Incorrect fitting leads to inadmissible product deposits.

Option 2: Decanter with one-piece catcher
(Sizes 3000 to 8000)

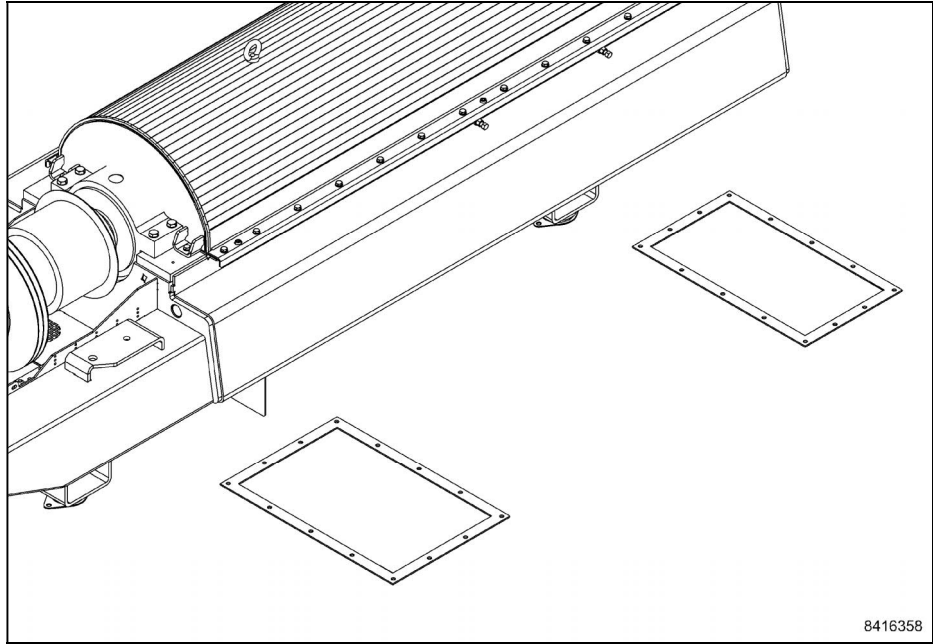


Fig. 7

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2.11 Configuration of the vent

The correct venting of the liquid and solid catchers is essential for operating the decanter.

Inadequate venting leads to damage to the decanter (e.g. solid deposits in the housing) or backmixing of the separated phases.

For venting without additional ventilators, the maximum pipe length must not exceed 15 m. The specification applies to smooth tubes with a maximum of two pipe bends. The following table shows the necessary diameters for the vent pipes and the maximum air flows to be expected:

Decanter size		Liquid side	Solids side
3000	Connection	DN100	DN100
	Max. air flow [m ³ /h]	50	100
4000	Connection	DN150	DN150
	Max. air flow [m ³ /h]	150	150
5000	Connection	DN150	DN150
	Max. air flow [m ³ /h]	220	220
6000	Connection	DN150	DN200
	Max. air flow [m ³ /h]	300	300
7000	Connection	DN200	DN200
	Max. air flow [m ³ /h]	400	400
8000	Connection	DN200	DN200
	Max. air flow [m ³ /h]	400	400

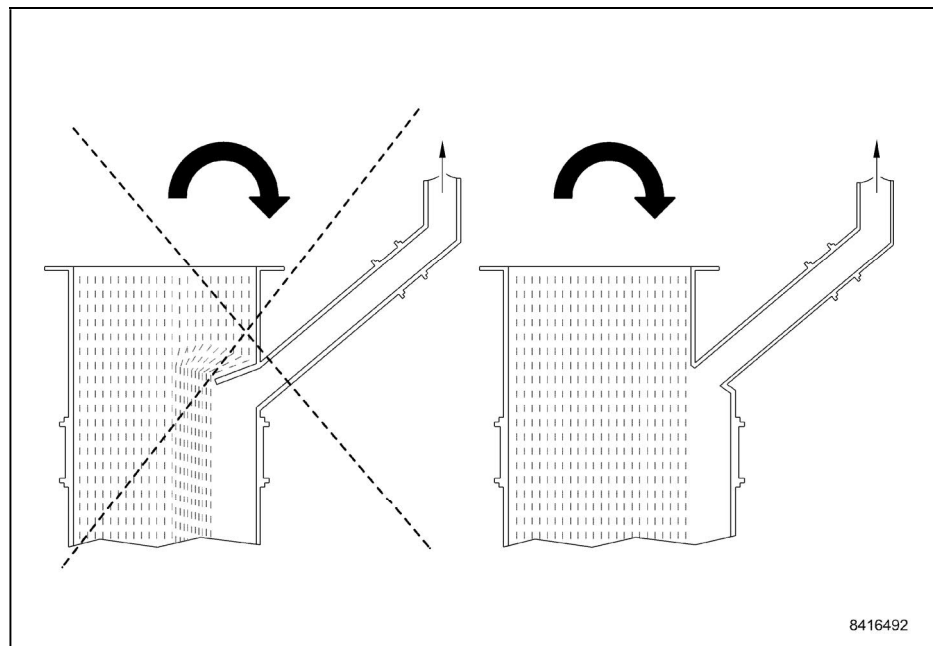


Fig. 8 Direction of rotation of bowl seen from the liquid side.

Please take into account the following points when installing your self-made configurations:

- The vent line must be laid on the right-hand side of the decanter (as seen from the supply side).
 - If this is not done, ejected solids from the rotating bowl may block the vent line.
- The connection point of the vent line must be laid as close as possible to the discharge chute of the decanter.
- The connection point must be laid so that no blockage occurs as a result of deposited or dammed solids.
 - Any connections for discharging blocked product out of the solids chute must be fitted below the vent point.
- Lay the vent line with a constant fall to prevent aerosol residues from the exhaust air from accumulating in the line (trap).
- The air stream in the vent contains solid particles, liquid or vapours. Since they can deposit or condensate in the vent line, we recommend providing inspection ports and cleaning possibilities.
- Vent the solid catcher and liquid catcher separately from one another.
- If several machines have to be vented together, contact GEA Westfalia Separator.
- If a gate valve is fitted in the chute on the solid side, the vent must be located above the gate valve.

IMPORTANT: Designs with centripetal pump must also have a vent fitted below the liquids chute. In doing so, make sure that the pipe supports on the cover also serve as the leakage and hood flushing water drains.

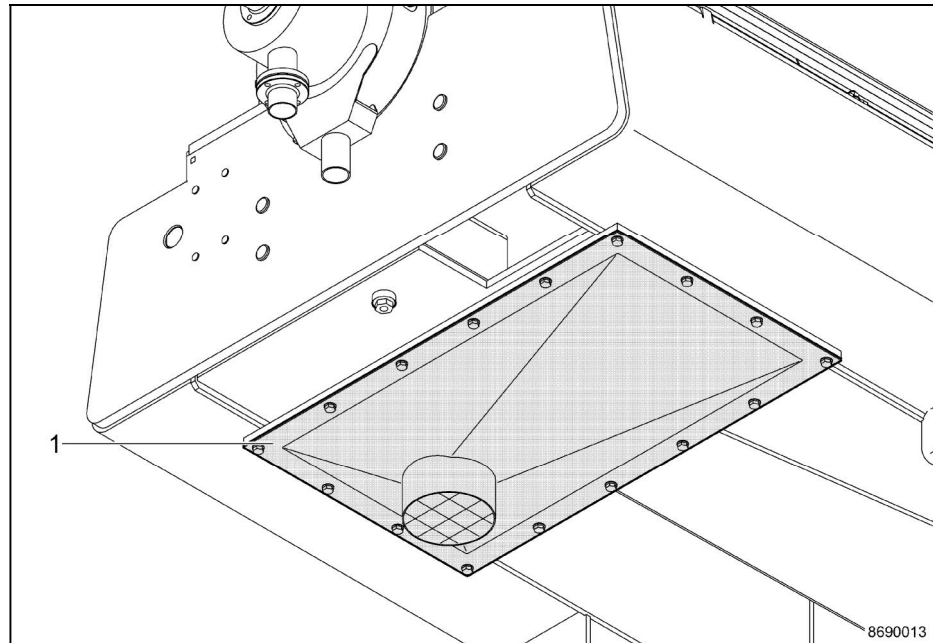


Fig. 9

If two liquid phases are freely discharged, the venting must be carried out as shown in the example below.

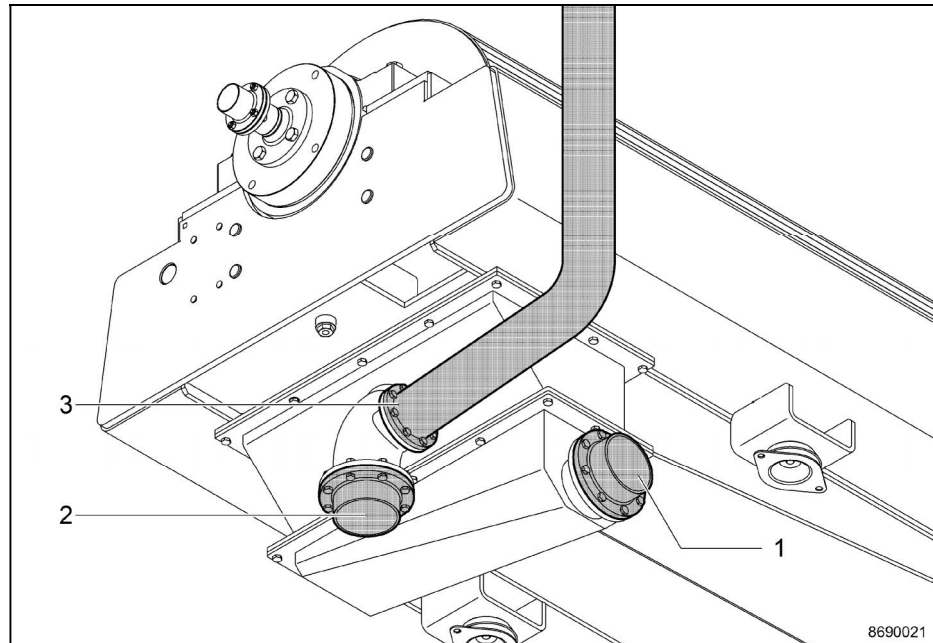


Fig. 10

- Pipe phase (1): no venting
- Regulating ring phase (2): venting required
- Venting pipe (3): not included in the scope of delivery

2.12 Overflow on the liquid side

(does not apply to designs with a rotating feed tube)

After the decanter shuts down, liquid escapes via the feed tube overflow on the liquid side. Up to 20 litres of liquid can escape, depending on the application and the size of the machine. This liquid must be collected and discharged.

In the case of open designs, the overflow can be connected to the chute on the liquid side via a flexible hose.

2.13 Flush connections

Flush connections must be taken into consideration in accordance with the order-specific dimensioned drawing.

The required water pressures and water volumes are specified in the P&ID.

Use only clean flush liquid for the hood flushing. Flush liquid already contaminated (e.g. from the centripetal pump discharge) soils the flush nozzles.

2.14 Hydrohermetic system

The feed pressure as specified in the decanter instruction manual must be adhered to for the hydrohermetic system.

The required pressure range and the required water volumes are specified in the P&ID.

In addition, free draining of the hydrohermetic system water must be ensured so that the water can drain without pressure.

If the hydrohermetic system is not used, the hydrohermetic system disc has to be removed and replaced with a different disc. This ensures that this space can be flushed properly.

2.15 Mechanical seal

Outer cooling: Ensure that cooling water is available, even in case of a power cut. The permitted max. pressure (see machine documentation) must not be exceeded, excessive pressure can lead to damage to the gaskets.

Inner cooling: If a medium is fed via the connection of the outer cooling (flushing liquid, flocculant, washing water for solids washing), the max. pressure (see machine documentation) must not be exceeded. Excessive pressure can lead to damage to the gaskets.

2.16 Compressed air connection

For models in the size range 3000 to 5000 an optional oil-air lubrication is available. The oil-air lubrication is included in the standard scope of delivery for the seize 6000 and larger.

The required air volumes and pressures are specified in the supplementary manual.

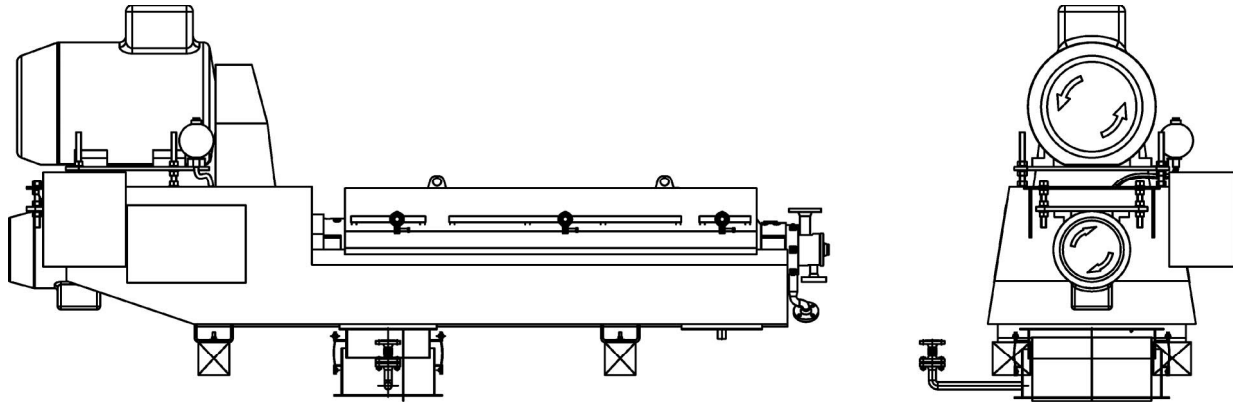
2.17 Inert gas connections

In the case of a decanter with inert gas blanketing, there is no venting of the discharge chutes on the liquid or solid side.

To displace air from the decanter, the latter is purged with inert gas (e.g. nitrogen).

A connection to the ventilation system must be created on the solid chute, or alternatively on the solid tank, for the discharge of the displaced air.

A piping configuration is shown below by way of example. Concrete dimensions are given in the order-specific dimensioned drawing.



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Fig. 11

If an inert gas supply unit is included in the scope of delivery, refer to the corresponding user documentation.

2.18 Special aspects when operating in hot conditions

Steam must not pass through the decanter when it is at standstill. The steam would endanger the maintenance personnel and be an influential factor regarding corrosion in the decanter.

- Shut-off devices in the feed and discharge lines must be installed such that the shut-down decanters can be isolated.
- Vent lines must be planned and installed in such a way that the shut-off devices cannot be bypassed.
- The decanter may only be started when the shut-off devices are open.

2.19 Terminal box positions of the electrical components

The following illustrations show the places on the decanter where auxiliary electrical components (e.g. A vibration absorber) can be wired into the terminal box. The illustrations are a guide for planning the subsequent cable runs from the separate terminal boxes to the control cabinet.

IMPORTANT: Depending on the design and configuration, not all terminal boxes are actually present on the decanter.

Decanter sizes 3000 to 6000

The following table shows examples of the terminal box positions on decanter sizes 3000 to 6000. Actual dimensions can be found on the order-specific dimension sheet.

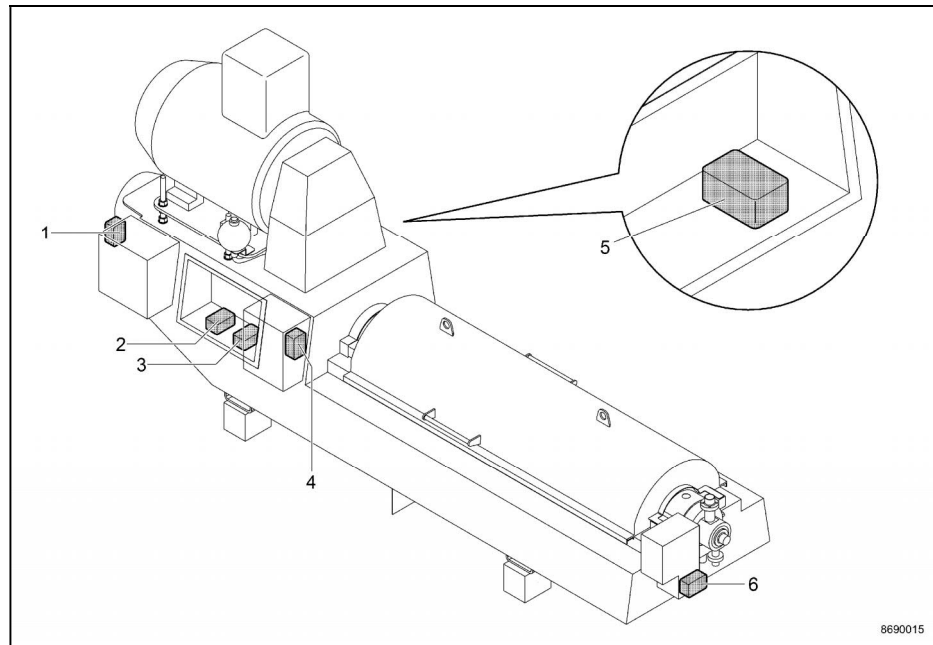


Fig. 12

Decanter sizes 7000 to 8000

The following table shows examples of the terminal box positions on decanter sizes 7000 to 8000. Actual dimensions can be found on the order-specific dimension sheet.

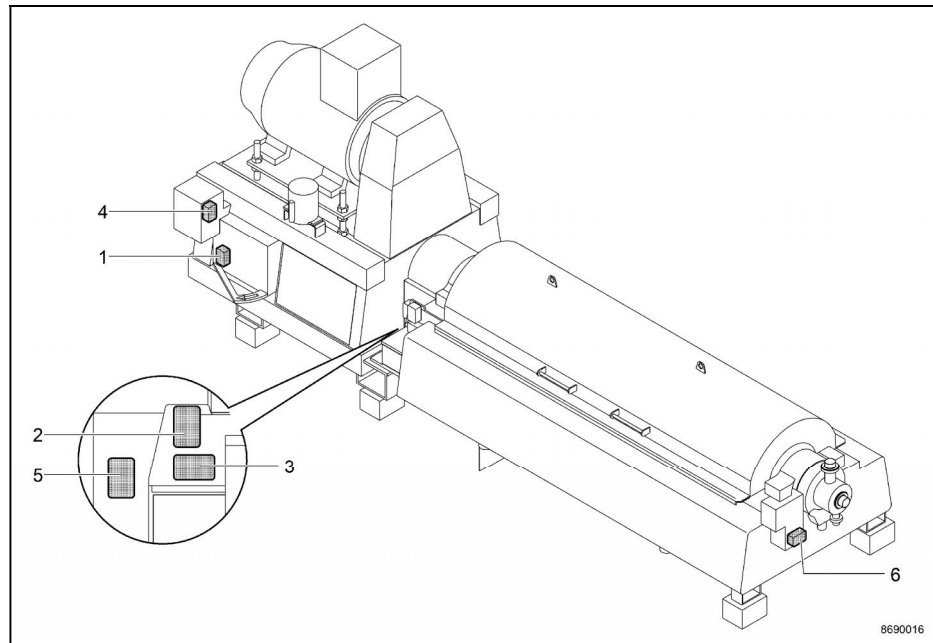


Fig. 13

2.19.1 Terminal box designations and their functions

Item	Terminal box designation	Terminal box function
1	X9 (X48)	Terminal box – Oil/air unit complete
2	X7 (X47)	Terminal box – Speed sensor complete
3	X11	Terminal box – Vibration absorber complete
4	X42	Terminal box – Control unit (Varipond P)
5	X41	Terminal box – Temperature monitor complete (drive temperature measurement)
6	X44	Terminal box – Water pressure reducing valve complete (hydrohermetic system)
	X40	Terminal box – Cooling water supply (mechanical seal), Alternative
	X23	Actuator complete (Varipond E) alternative

2.20 Maintain sufficient space for ventilating the gearbox

The following points should be considered when designing the foundation for the decanter and before assembly:

Space must be provided in the foundation on the drive side next to the solids chute, so that air can circulate for cooling the gearbox. A minimum clearance of 250 mm (X) must be maintained below the machine in the area of the protective grille.

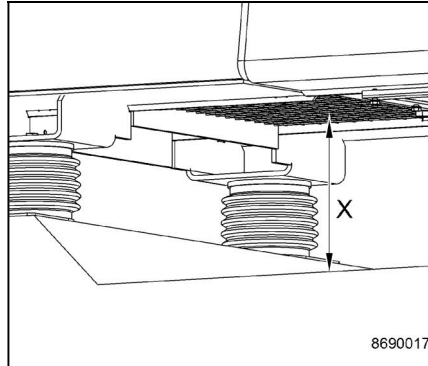


Fig. 14

View of sizes 3000 to 6000

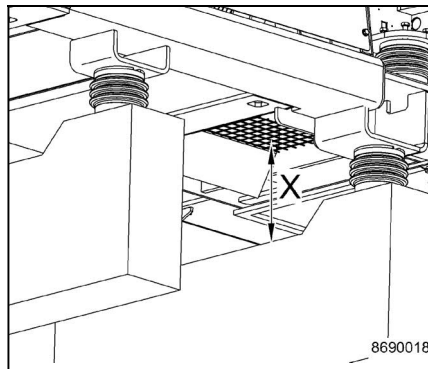


Fig. 15

View of sizes 7000 to 8000

2.21 Plan space requirements to drain the oil of the drum bearings

To drain the old oil of the drum bearings, the area below the oil drain plugs (1) each next to the solids and liquid discharge must be kept free at a height of at least 250 mm. This space is required for an oil collecting pan and as also to access the oil drain plug.

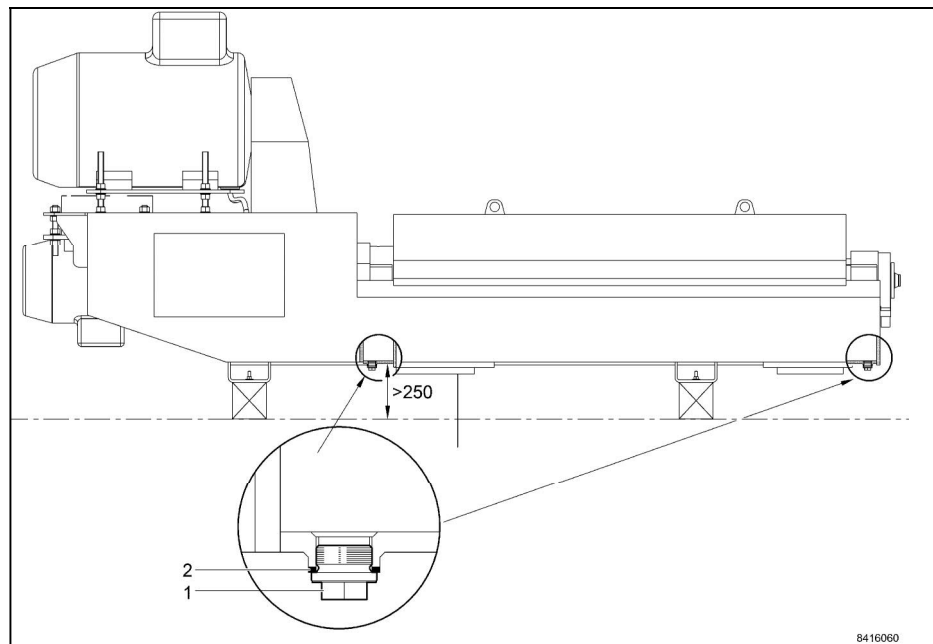


Fig. 16

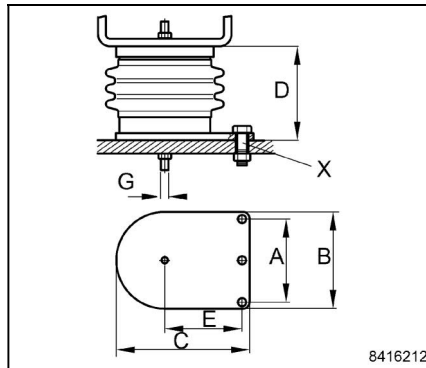
IMPORTANT: Check gasket (2) for damage and replace if necessary.

2.22 Viscosity damper

The viscosity damper can be fastened on the foundation or frame in two different ways.

- Via a centric screw.
This variant is suitable for steel frames.
- Via screws that are located at the side of the damper.
This variant is suitable for concrete foundations.

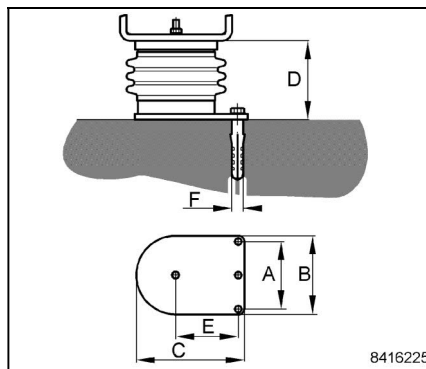
Connecting elements are not included in the supply schedule!



Fastening arrangement on a steel frame.

The lateral holes X can optionally be used.

Fig. 17



Fastening arrangement on a concrete foundation

Fig. 18

Main motor	A	B	C	E	F
depending on the design	The dimensions are given in the separate dimensioned drawing.				

2.23 Planning the frame/foundation

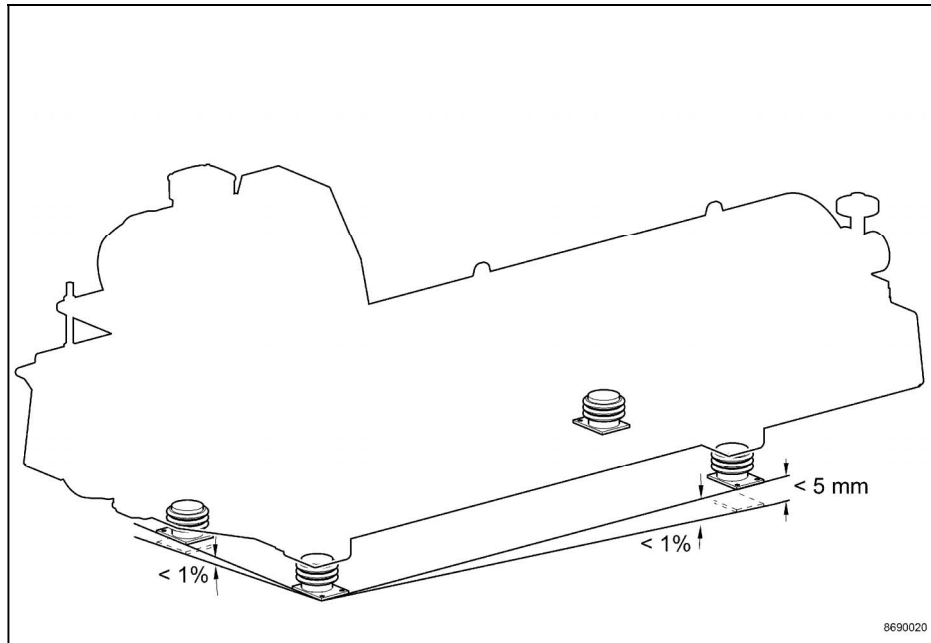


Fig. 19

- Comply with the building regulations of the country of operation.
- The foundation must correspond to the specifications. See load specifications and dimensions in the order-related dimension sheet.
- The foundation must be designed so that no vibrations are transferred from the environment to the centrifuge.
- The supporting points must be of rigid, solid design in the form of a concrete structure or steel structure. Individual points of support must not give way under load.
- The resonant frequency of the frame must be outside the installation frequencies (see order-related dimension sheet for details) of the centrifuge and the operating speed range of the centrifuge. The margin from the first resonant frequency of the lower part of the frame to the maximum operating speed must be at least 30%.
- A centrifuge must be installed as level as possible. The difference in height between the supporting points must be maximum 5 mm. Differences in height must be offset with shims at the supporting points.

2.24 Transporting the decanter

The decanter is checked in its completely assembled state. Depending on its size, the decanter is packed for shipping in one or several crates.

That notwithstanding, sets of tools or replacement and maintenance parts may be delivered in additional crates.

Decanter sizes 3000 and 4000 are delivered in one crate.

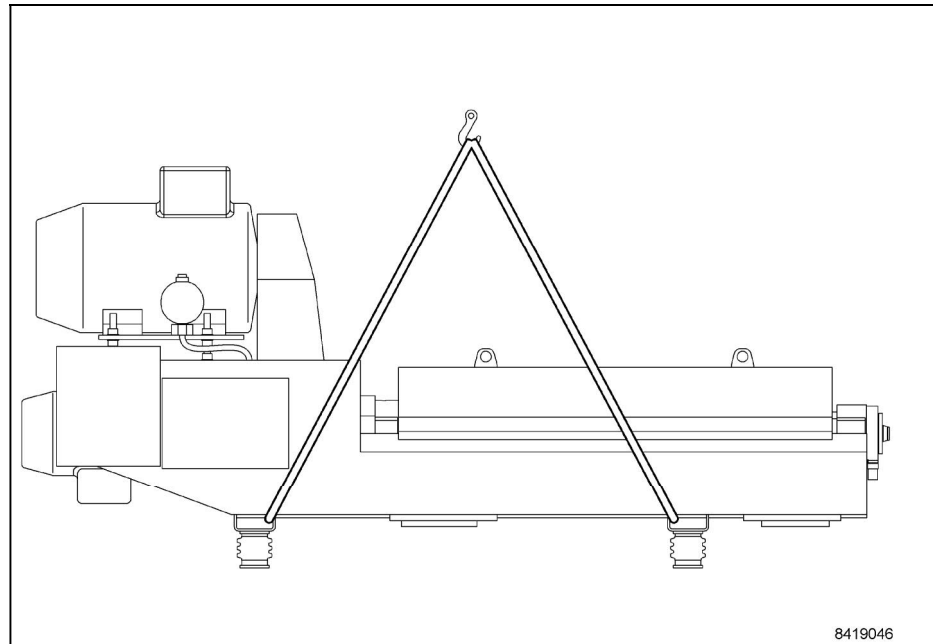


Fig. 20

Decanter sizes 5000 and 6000 are delivered in two crates. Note that the main motor is usually packed separately.

Decanter sizes 7000 and 8000 are packed and delivered in three crates.

- Drive frame with back drive motor (1)
 - The decanter frame with the top part of the catcher and installed bowl including the gearbox (2)
 - Main motor (3)
- Unpack the components in the given order.

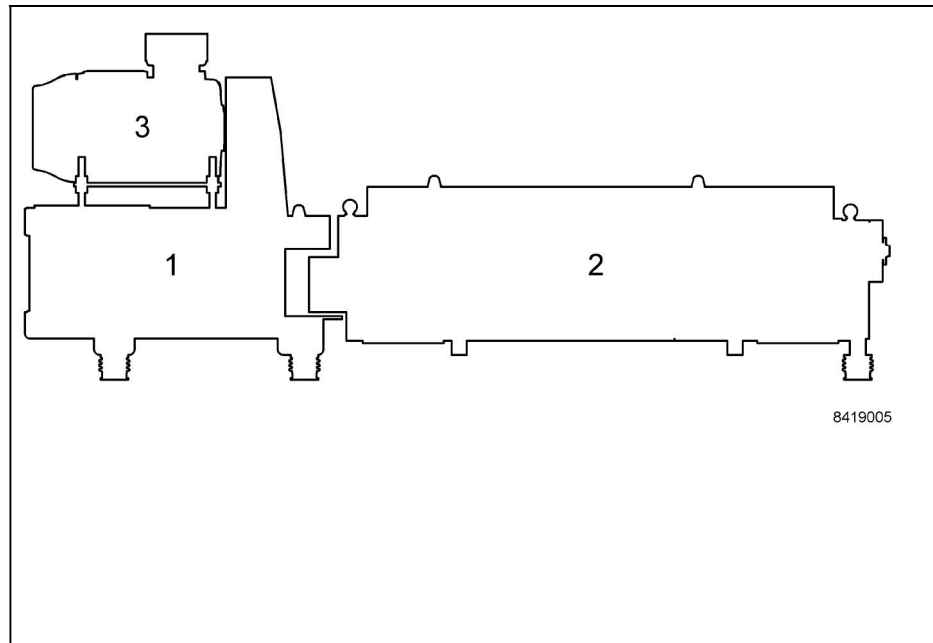


Fig. 21

Attaching hoists for decanters sizes 7000 and 8000

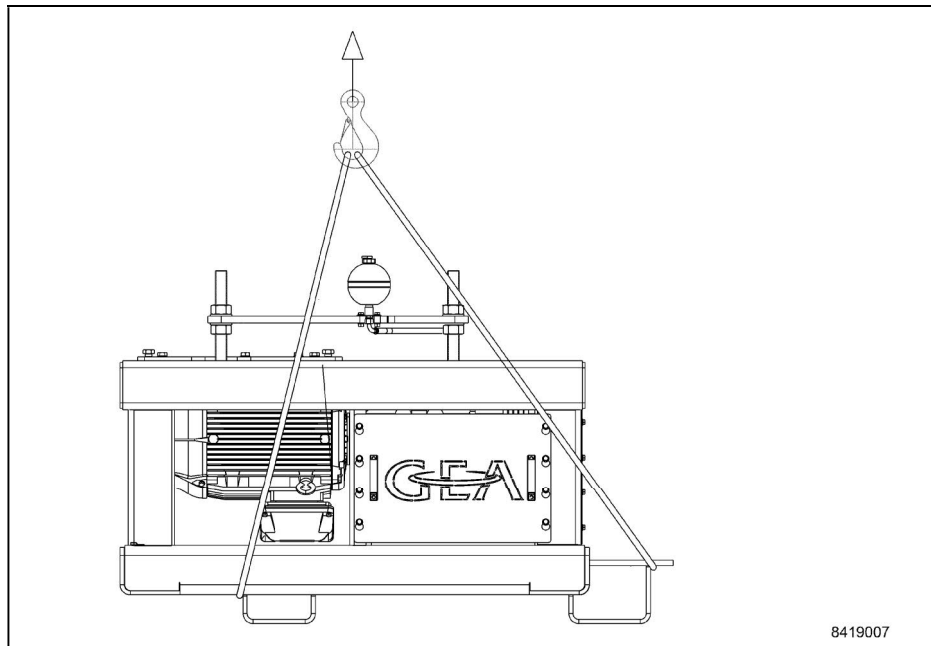


Fig. 22

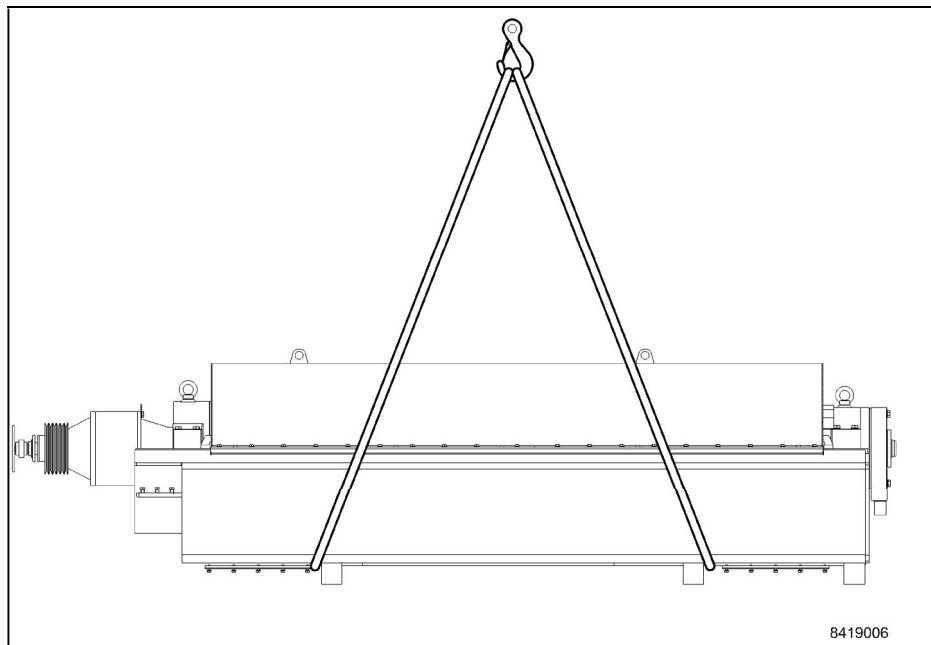
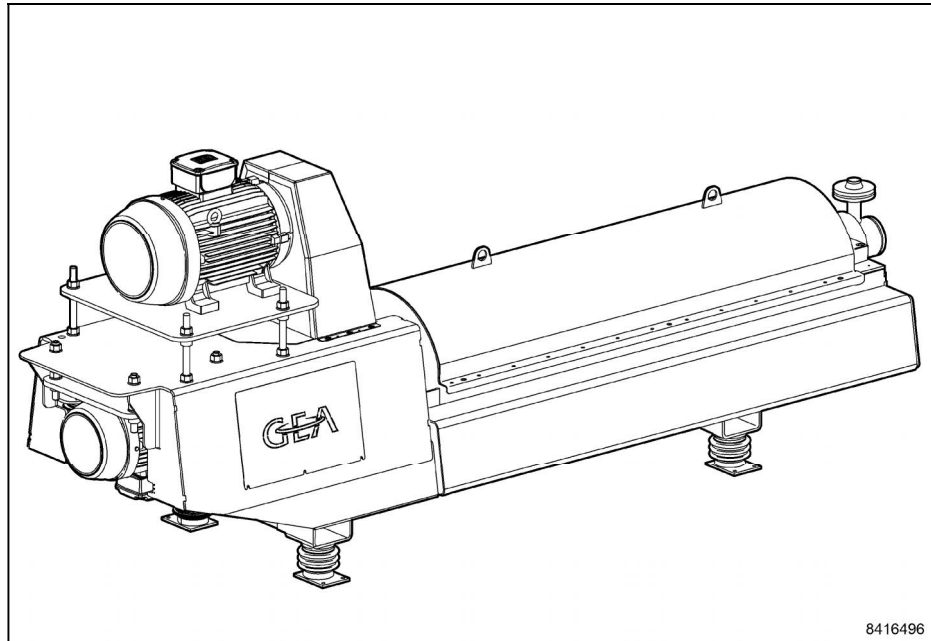


Fig. 23

2.25 Decanter installation and alignment

2.25.1 Installation and alignment of decanter sizes 3000 to 6000

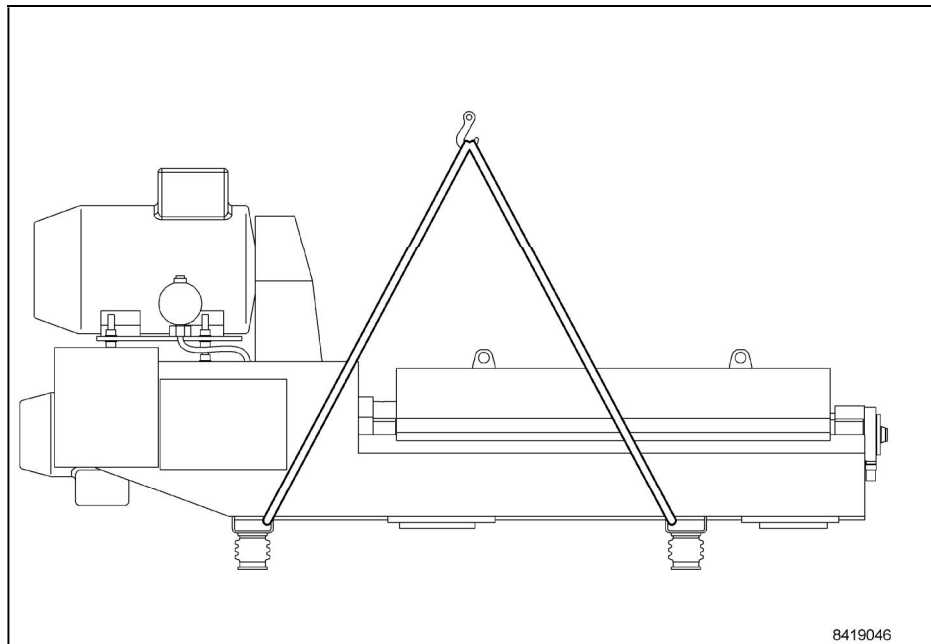
The installation of the small sizes 3000 to 6000 is somewhat different from that of sizes 7000 to 8000.

Decanter sizes 3000 to 6000

8416496

Fig. 24

IMPORTANT: The installation and alignment of the sizes 7000 to 8000 is described in the chapter: "Installation and alignment of series - 7000 to 8000 decanter sizes".



8419046

Fig. 25

- Suspend the decanter from hoist as illustrated (applies to complete decanter including rotor).
 - Required min. load capacity: Refer to the order-specific dimension sheet.
- Set up the decanter on a solid base and level the frame with the aid of a spirit level.
 - Differences in height at the points of support must be offset with shims.
 - See also chapter "Planning frame or foundation".

- Screw the frame feet to the base.
- If necessary, install the main motor, see chapter "Assembly and installation / Installing the main motor" in the decanter instruction manual.

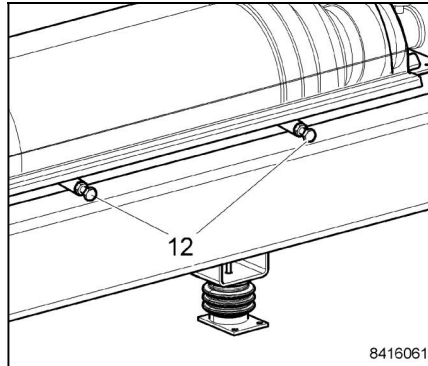


Fig. 26

- Remove the two bowl lock screws (12) and replace them with short screws.
 - The short screws are included in the scope of delivery.

Exception: The bowl lock screws on the bearing housings must be removed and replaced with short screws for the size 6000. Two screws each on the solid side and the liquid side.

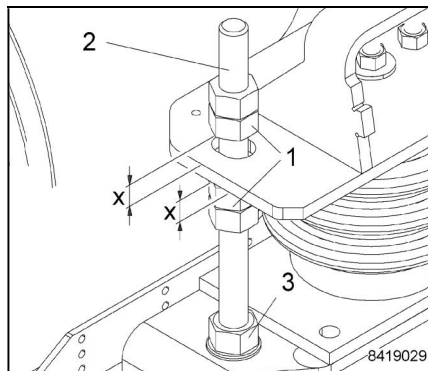


Fig. 27

- Loosen nuts (1) of the transportation securing device on the actuator by approx. 15 mm (X) and lock.
 - Carry out on all 4 threaded rods.
 - Threaded rods (2) must not have contact with the motor bracket foot.
 - If necessary, re-align the threaded rods in the frame.

2.25.2 Installation and alignment of decanter sizes 7000 to 8000



- The film for the erection of decanter sizes 7000 to 8000 can be found by following the QR Code

<http://video.gea.com/installation-guide-for-2-part-decanter-frames>

Fig. 28

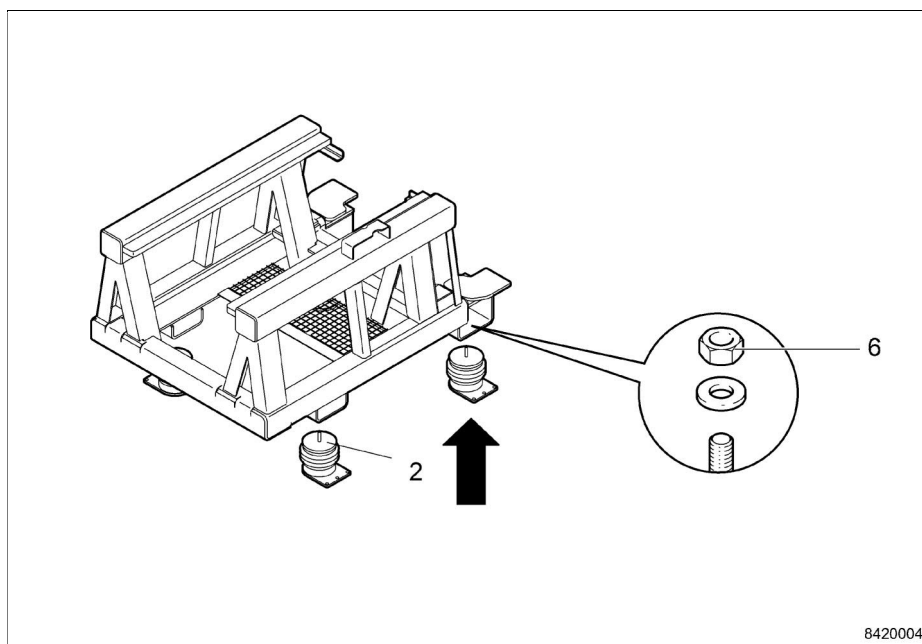
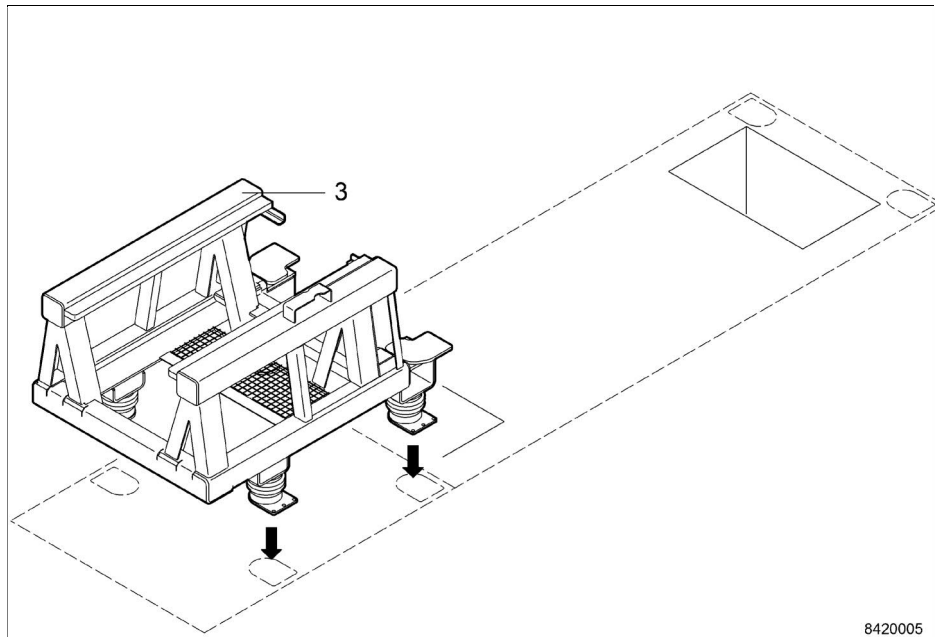


Fig. 29

8420004

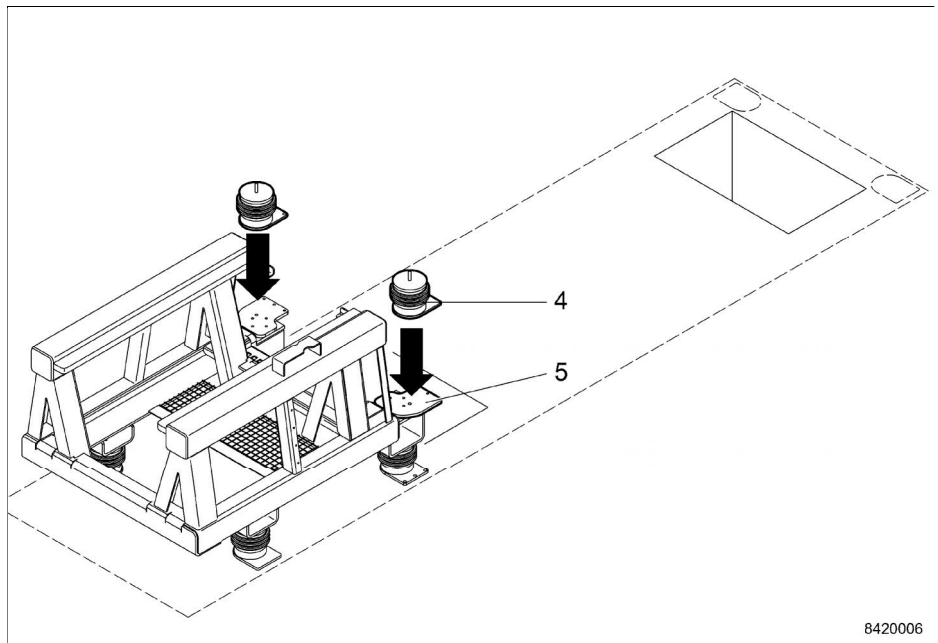
- Fasten viscosity dampers (2) to the drive frame.



8420005

Fig. 30

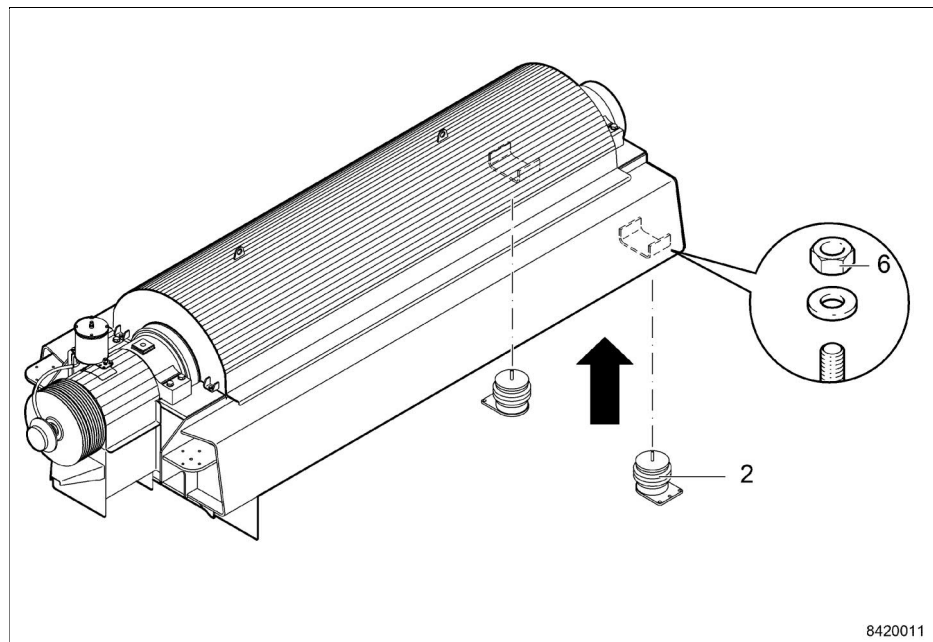
- Sketch the erection points on the foundation.
 - Refer to the order-specific dimension sheet.
 - Pay attention to cut-outs for solid and liquid discharge.
- Erect the drive frame but do not yet fasten it.



8420006

Fig. 31

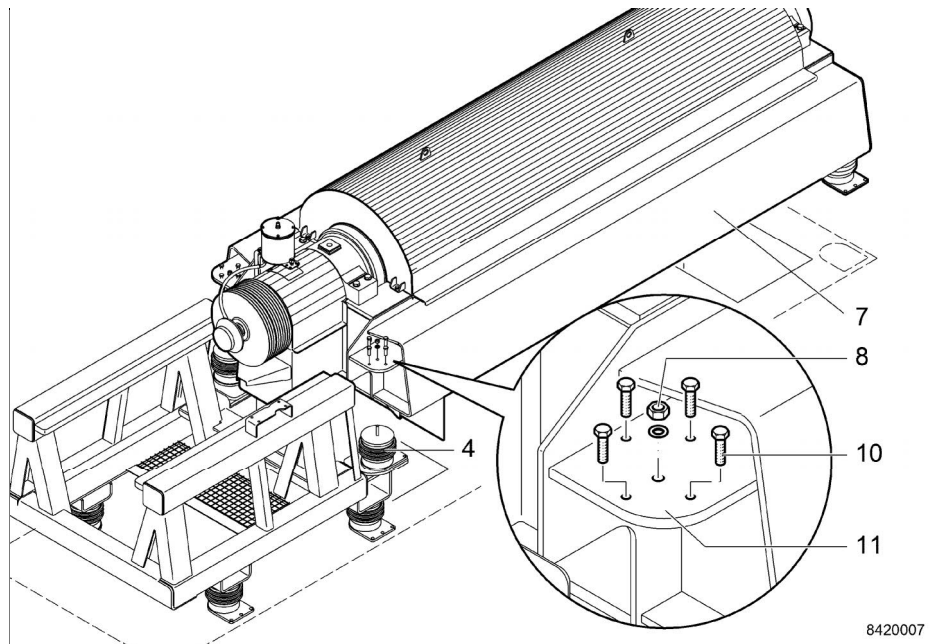
- Fasten viscosity dampers (4) to drive frame (5).



8420011

Fig. 32

- Fasten viscosity dampers (2) to the decanter frame.



8420007

Fig. 33

- Screw screws (10) into the plates (11) of the decanter frame (7).
- Place decanter frame (7) on the viscosity dampers (4).
- Fit washers and nuts (8). Do not tighten the nuts yet (8).

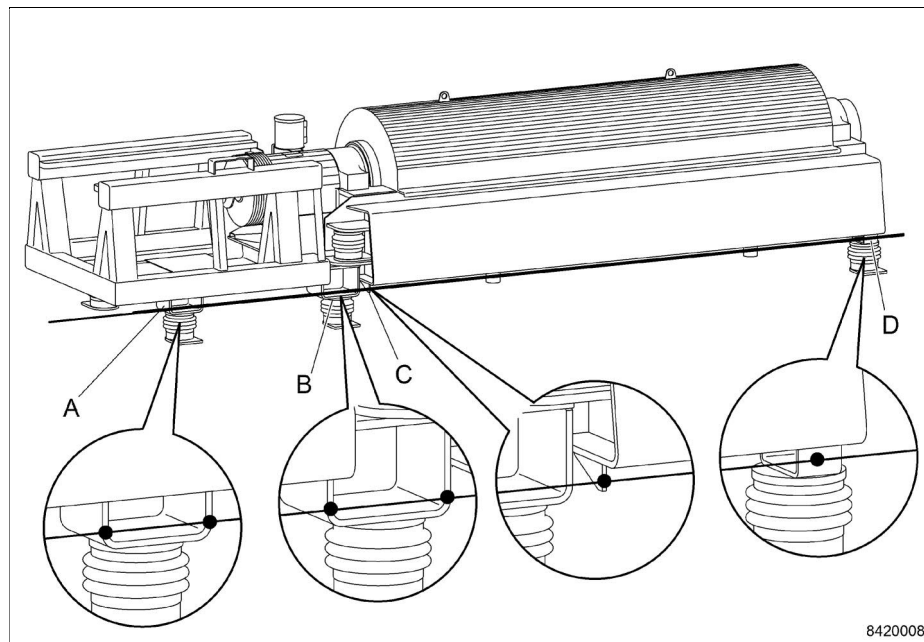


Fig. 34

Align the drive and decanter frame in the longitudinal axis.

- Align the drive and decanter frame so that both frames are in line with each other.
 - Attach a suitable cord at (A) and (D).
 - Align the frames until the points (A), (B), (C) and (D) rest against the taught cord.
- Screw the viscosity dampers to the base.

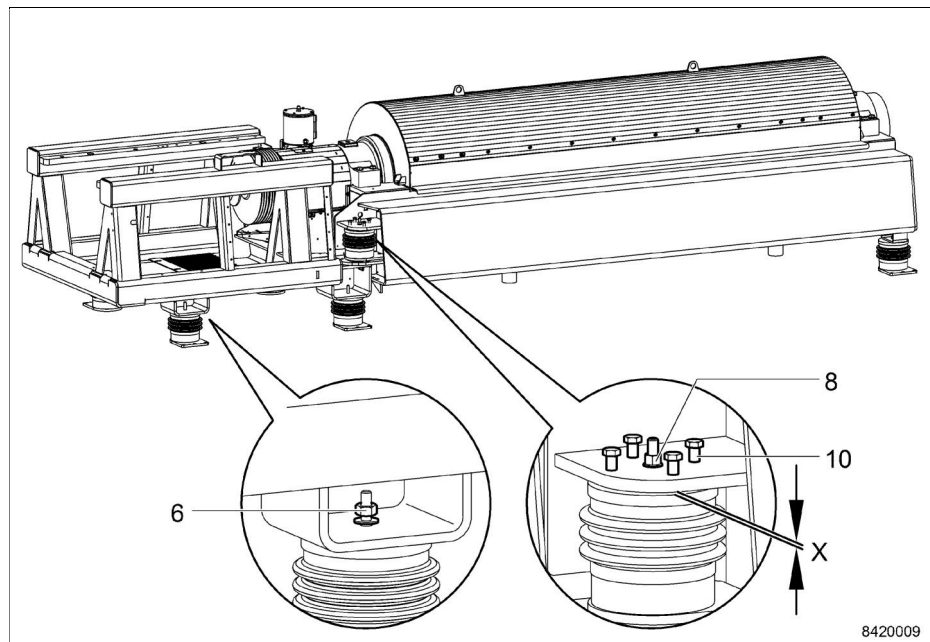


Fig. 35

Aligning the drive and decanter frame horizontally

- Use a suitable spirit level.
- The height of the decanter frame can be adjusted with the aid of screws (10).
 - The distance (X) must be identical on both sides.
- Tighten all nuts (6) and (8).

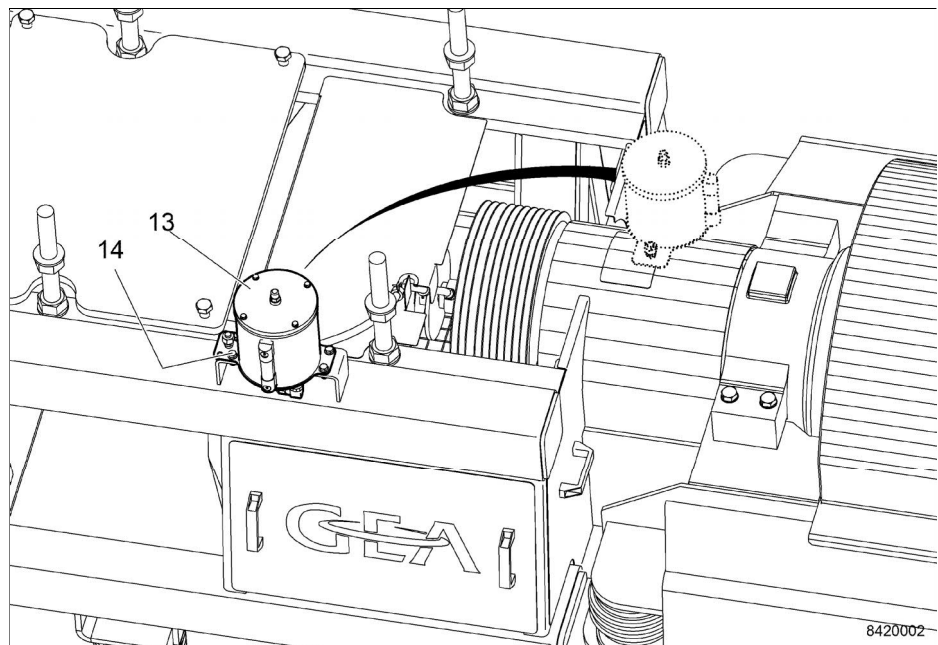
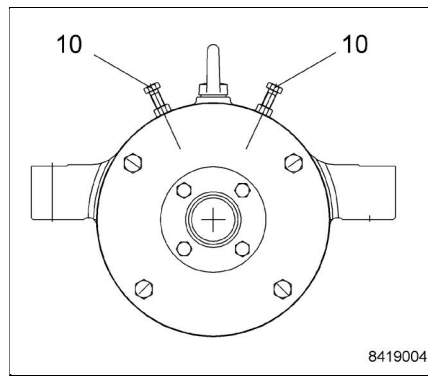


Fig. 36

- Move the oil vessel (13) from the decanter frame to the drive frame and fasten it. Remove the empty holder from the decanter frame.



- Undo all four bowl lock screws (10) and secure (solid side and liquid side).

Fig. 37

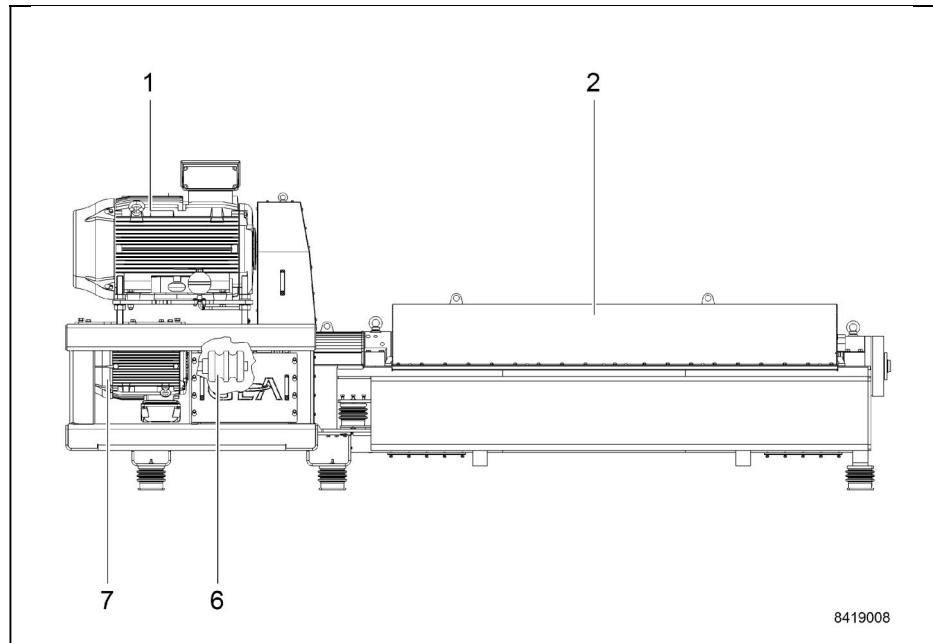
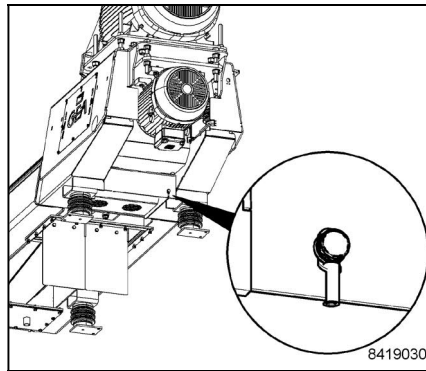


Fig. 38

- Fit main motor (1), see chapter "Servicing / fitting the main motor" in the decanter instruction manual.

2.26 Carry out voltage equalization



- To ensure safe operation of the decanter, voltage equalisation **MUST** be carried out according to EN 60204-1.

Fig. 39

Omitting voltage equalisation will have the following consequences:



DANGER

Danger to life through electric voltage!

As soon as a live power line gets into contact with the machine housing, electric shock may occur.

- Measuring signals of monitoring devices can be distorted (e.g.: vibration monitoring, bearing temperature monitoring).
- Magnetism can give rise to bearing failure.

2.27 Decanter with supply cabinet

Optional, there is a supply cabinet for each decanter. It contains additional components such as the oil+air aggregate or the control unit for Varipond P, which are otherwise fitted at the decanter. The supply cabinet is used e.g. for sanitary installation or for extreme conditions.

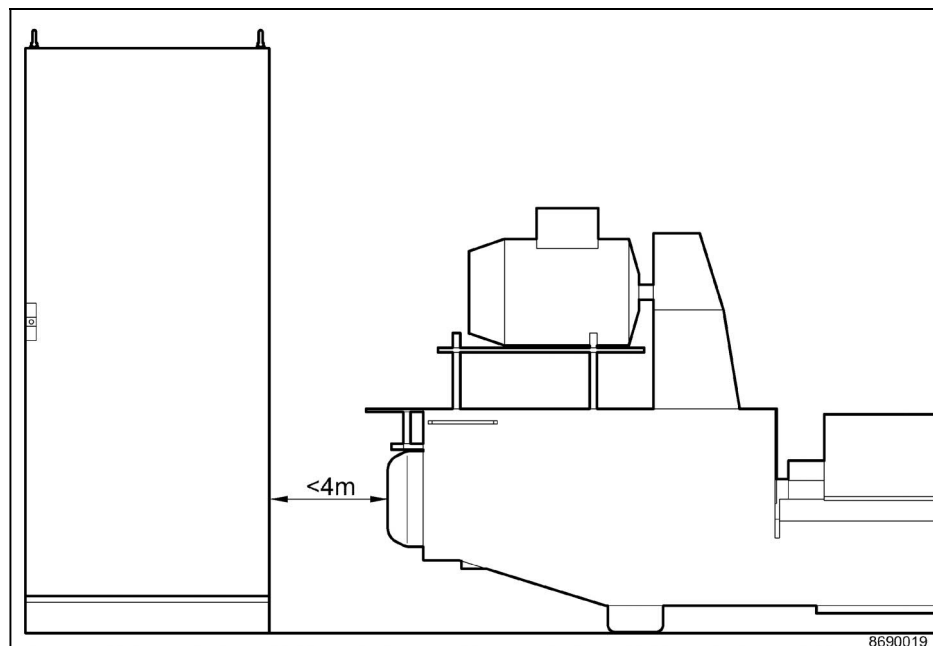


Fig. 40

Install the optionally available supply cabinet maximum 4 m away from the decanter.

NOTE: Larger distances would result in inadmissibly high pressure losses in the hoses of the oil-air lubrication.

3 Operation

3.1	Recommendations for chemical cleaning (CIP)	48
3.1.1	Recommended parameters	48
3.1.2	P&ID with CIP return	48
3.1.3	Identification of connections and components	51
3.1.4	Throughput	53
3.1.5	Recommended standard procedure	54
3.1.6	Valve positions.....	58

3.1 Recommendations for chemical cleaning (CIP)

CIP (Cleaning In Place) refers to the chemical cleaning of equipment, plant parts and the decanter centrifuge in a cleaning cycle that does not require the disassembly of individual components.

Purpose of the cleaning:

- To create physically clean and chemically pure surfaces

Basic cleaning agents:

- Caustic for removing organic matter (including foam-reducing agents)
- Acid for removing inorganic substances (including foam-reducing agents)
- Drinking water for initial and final flushing
- Disinfecting agents (if required)

The cleaning agent must have a chlorine concentration of less than 200 ppm, because chlorine has a corrosive effect on stainless steel components. In order to prevent corrosion, only recommended cleaning agent may be used.

The efficiency of the cleaning process is dependent on:

- The type of cleaning agent used
- The concentration
- The temperature
- The cleaning time
- The flow rate of the cleaning agent

3.1.1 Recommended parameters

Cleaning solution type:

- Caustic: Sodium hydroxide (NaOH)
- Acid: Nitric acid (HNO₃); phosphoric acid (H₃PO₄)
- Disinfecting agents:
 - Peracetic acid (C₂H₄O₃)
 - Peroxyacetic acid (CH₃COOH)
 - Hypochlorous acid (HClO)
 - Hydrogen peroxide (H₂O₂)

Concentration:

- Caustic: max. 2 %
- Acid: max. 1 %
- Disinfecting agents: max. 0.1 % and max. 200 ppm chlorine concentration

Temperature:

- Caustic: max. 85°C
- Acid: max. 55°C
- Disinfecting agents: max. 20°C

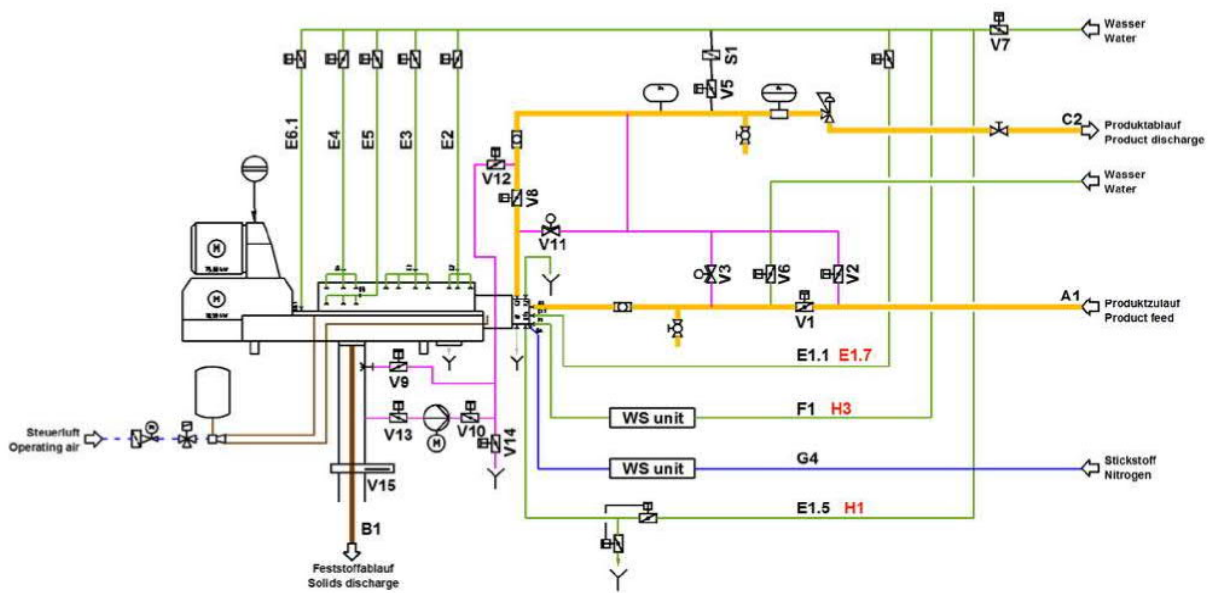
Duration

- see the recommended standard procedure

3.1.2 P&ID with CIP return

- During the cleaning process the product discharge valve V4 is set to 3 bar.
 - **Attention:** Higher discharge pressure can lead to mechanical failure of internal components.
- The valves V2, V3, V6, V7 and V11 must be designed accordingly if the production process requires leak-free valves.
- A shut-off valve can be optionally installed in discharge line C2 to avoid backflow when the decanter is at standstill.
- C2 Cleaning agent return flow
 - A1 Cleaning agent inlet
 - B1 Cleaning agent outlet

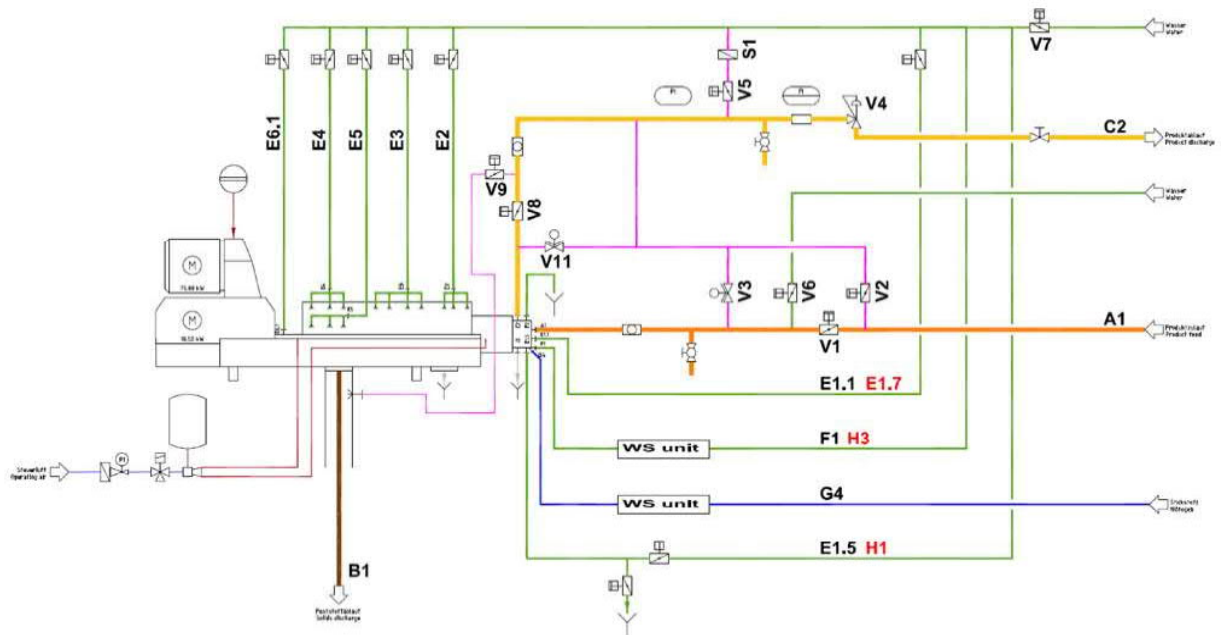
P&ID with CIP return



8416502

Fig. 41

P&ID without CIP return



8416498

Fig. 42

3.1.3 Identification of connections and components

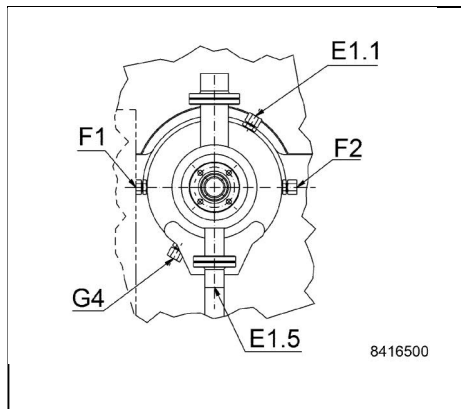


Fig. 43 Stationary feed tube

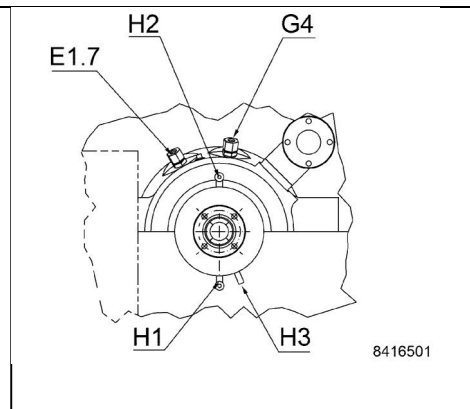


Fig. 44 Rotating feed tube

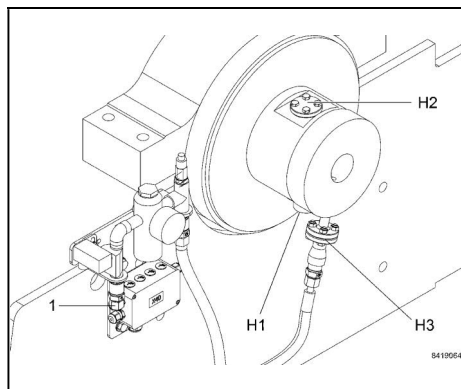


Fig. 45 Inner cooling

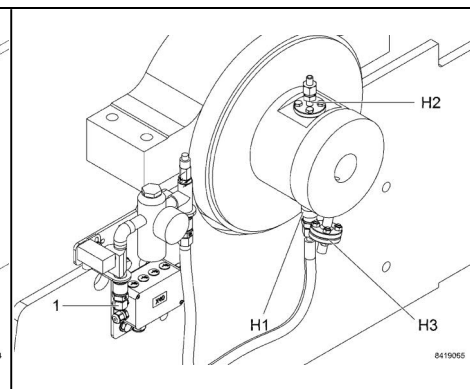


Fig. 46 Outer cooling

E1.1	Flushing connection feed tube gap bearing hub / feed tube
E1.5	Flushing connection scroll body
E1.7	Flushing connection gap discharge / bearing hub
E2	Flushing connection catch chamber liquid side
E3	Flushing connection bowl
E4	Flushing connection catch chamber solid side
E5	Flushing connection catch chamber solid side
E6.1	Flushing connection sealing catch chamber solid side
F1	Hydrohermetic inlet
F2	Hydrohermetic outlet
G4	Varipond gas connection
H1	Slide-ring packing Feed for outer cooling; venting and flushing with inner cooling
H2	Slide-ring packing Discharge for outer cooling; closed for inner cooling
H3	Slide-ring packing Inlet for inner cooling, flushing for outer cooling
S1	Strainer
V1	Inlet valve
V2	CIP bypass valve
V3	CIP inlet valve
V4	Product discharge control valve
V5	CIP inlet flush valves
V6	Water inlet valve
V7	Water inlet flush valves
V8	Product discharge valve
V9	CIP valve solid catcher
V10	Shut-off valve CIP pump
V11	CIP valve outlet
V12	CIP bypass valve solid catcher
V13	Shut-off valve CIP pump
V14	Shut-off valve channel
V15	Solid slide gate

3.1.4 Throughput

The max. permissible CIP inlet flow rate to the decanter at high bowl speed must be below the max. inlet flow rate during production.

During the CIP process, the cleaning solution drains through the liquid side and solid side.

The discharged amount of cleaning agent on the solid side depends on the throughput, bowl speed and weir diameter.

- High throughput results in more discharge from the solid side.
- Low bowl speed results in more discharge from the solid side.
- Small weir diameter results in more discharge from the solid side.

Max. CIP inlet flow rate at low bowl speed on the CIP valves V3 and V11		Decanter Size
2.5 m ³ /h	11 gpm	3000
3.5 m ³ /h	15 gpm	4000
4.5 m ³ /h	20 gpm	5000
7 m ³ /h	31 gpm	6000
10 m ³ /h	44 gpm	7000
14 m ³ /h	62 gpm	8000

- The CIP valves V3 and V11 must be set to limit the max. CIP inlet flow rate to the decanter.
- Product discharge valve V4 is set to 3 bar.

3.1.5 Recommended standard procedure

Important information

- Observe the product data sheets and the safety precautions of the manufacturer.
 - Caustic, acids, disinfectants
- The cleaning process can be adapted to the production process, for example:
 - Omission of the acid purification step (time sequence on "0")
 - Changing the cleaning period
 - Changing the cleaning temperature
- Before re-starting the system for the production:
 - Remove the CIP cleaning agent from all product and flushing lines
- In order to ensure the flushing functions, an adequate amount of available CIP medium corresponding to the installation must be provided.

➤ Discharge of the CIP media:

Discharge connections J1, J2, F2 and E1.5 must be designed to safely collect CIP medium and to prevent discharge into the operating environment. (i.e backflow preventers, piping sizes are not reduced, piping is enclosed). Warning labels are recommended to alert operators to the possibility of CIP medium leakage. Special attention is required when equipment is installed at higher levels and personnel have access below.

Standard procedure in tabular form:

	Action	Pe- riod [min]	Temp. [°C]	Requirements
	Production stop / CIP start			
A	Pre-flushing with water	10	20	Decanter operation at high bowl speed in "Flush" state Open indicated flushing valves via timer pulse/pause: E6.1, E5, E4, E3, E2, E 1.1, E1.5, E1.7, H3, H1, F1, G4
	Stop Decanter			Stop decanter with shutdown program to flush out product residues
B	Caustic cleaning	15	50	Decanter operation at high bowl speed in "CIP high speed" state Open indicated flushing valves via timer pulse/pause: E6.1, E5, E4, E3, E2, E 1.1, E1.5, E1.7, H3, H1, F1, G4
C	Caustic cleaning	20	50	Decanter operation at low bowl speed in "CIP low speed" state Open indicated flushing valves via timer pulse/pause: E5, E4, E3, E2, H3, H1 Flushing valves are closed below 1000 rpm bowl speed: E6.1, E1.1, F1, E1.5, E1.7
	Caustic cleaning	20	75	Decanter operation at low bowl speed in "CIP low speed" state Open indicated flushing valves via timer pulse/pause: E5, E4, E3, E2, H3, H1 Flushing valves are closed below 1000 rpm bowl speed: E6.1, E1.1, F1, E1.5, E1.7
	Flushing with water	5	75	Decanter operation at low bowl speed in "CIP low speed" state Open indicated flushing valves via timer pulse/pause: E5, E4, E3, E2, H3, H1 Flushing valves are closed below 1000 rpm bowl speed: E6.1, E1.1, F1, E1.5, E1.7
	Acid cleaning	10	55	Decanter operation at low bowl speed in "CIP low speed" state Open indicated flushing valves via timer pulse/pause: E5, E4, E3, E2, H3, H1 Flushing valves are closed below 1000 rpm bowl speed: E6.1, E1.1, F1, E1.5, E1.7
D	Acid cleaning	10	55	Decanter operation at high bowl speed in "CIP high speed" state Open indicated flushing valves via timer pulse/pause: E6.1, E5, E4, E3, E2, E 1.1, E1.5, E1.7, H3, H1, F1, G4
	Final flushing with water	5	20	Decanter operation at high bowl speed in "CIP high speed" state Open indicated flushing valves via timer pulse/pause: E6.1, E5, E4, E3, E2, E 1.1, E1.5, E1.7, H3, H1, F1, G4
E	Final flushing with water	5	20	Decanter operation at low bowl speed in "CIP low speed" state Open indicated flushing valves via timer pulse/pause: E5, E4, E3, E2, H3, H1 Flushing valves are closed below 1000 rpm bowl speed: E6.1, E1.1, F1, E1.5, E1.7
F	Optional: Disinfecting agents	5	20	Decanter operation at high bowl speed in "CIP high speed" state Open indicated flushing valves via timer pulse/pause: E6.1, E5, E4, E3, E2, E 1.1, E1.5, E1.7, H3, H1, F1, G4
G	Optional: Disinfecting agents	5	20	Decanter operation at low bowl speed in "CIP low speed" state Open indicated flushing valves via timer pulse/pause: E5, E4, E3, E2, H3, H1 Flushing valves are closed below 1000 rpm bowl speed: E6.1, E1.1, F1, E1.5, E1.7

Standard procedure in graphical form

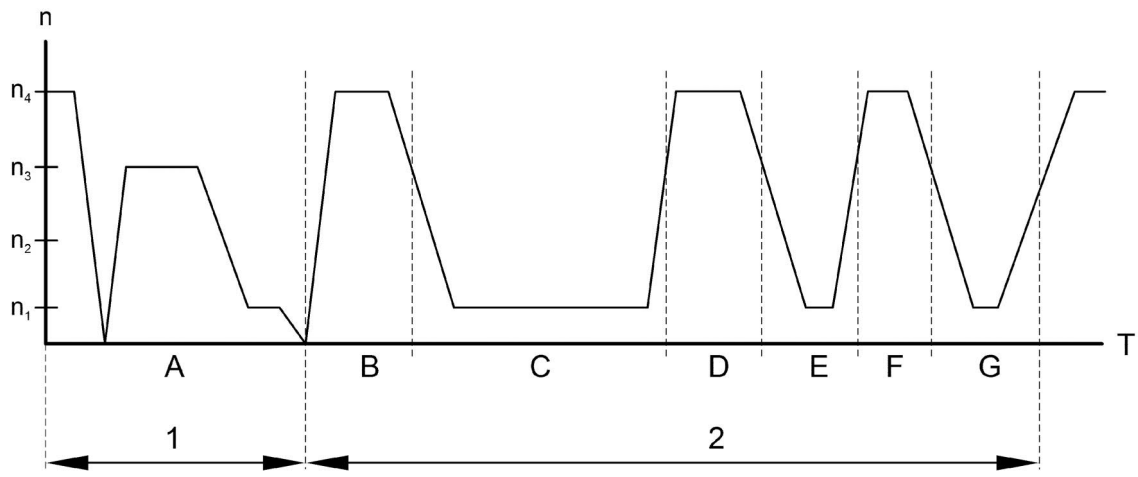


Fig. 47

8416497

Speed ranges

Speed range	Designation
n ₄	Operating speed, CIP high speed
n ₃	Bowl drive with FC: Upper flushing speed
n ₂	Speed at which the flush liquid supply is closed.
n ₁	Bowl drive with FC: Lower flushing speed, CIP low speed

Programs

Shutdown program	
1 A	Water 20 °C
CIP program	
2 B	Caustic 50 °C
2 C	Caustic 50 °C Caustic 75 °C Water 75 °C Acid 55 °C
2 D	Acid 55 °C Water 20 °C
2 E	Water 20 °C
2 F	Disinfection
2 G	Disinfection

Important: It must be ensured that at “CIP high bowl speed”, the CIP throughput supplied via A1 is discharged via return line C2 or outlet B1.

3.1.6 Valve positions

In the various states of “Flush”, “CIP high speed”, and “CIP low speed”, the valves in the piping around the decanter are switched as follows to obtain the desired flow directions.

P&ID with CIP return

State: Flush water after end of production “high speed”

Valve	Position
V1	closed
V2	closed
V3	closed
V4	open / 3bar
V5	closed
V6	open
V7	open
V8	open
V9	pulse / pause
V10	closed
V11	closed
V12	open
V13	closed
V14	closed
V15	open

State: CIP

“high speed”

Valve	Position
V1	open
V2	closed
V3	closed
V4	open / 3bar
V5	open
V6	closed
V7	closed
V8	open
V9	pulse / pause
V10	open
V11	closed
V12	closed, open after x sec
V13	open
V14	open, closed after x sec
V15	closed

State: CIP

“low speed”

Valve	Position
V1	closed
V2	open
V3	alternating V11 pulse / pause
V4	open / 3bar
V5	open
V6	closed
V7	closed
V8	closed
V9	pulse / pause
V10	open
V11	alternating V3 pulse / pause
V12	closed, open after x sec
V13	open
V14	open, closed after x sec
V15	closed

P&ID without CIP return

State: Flush water after end of production “high speed”

Valve	Position
V1	closed
V2	closed
V3	closed
V4	open / 3 bar
V5	closed
V6	open
V7	open
V8	open
V9	Pulse / pause
V11	closed

State: CIP

“high speed”

Valve	Position
V1	open
V2	closed
V3	closed
V4	open / 3 bar
V5	open
V6	closed
V7	closed
V8	open
V9	Pulse / pause
V11	closed

State: CIP

“low speed”

Valve	Position
V1	closed
V2	open
V3	Alternating V11 pulse / pause
V4	open / 3 bar
V5	open
V6	closed
V7	closed
V8	closed
V9	Pulse / pause
V11	Alternating V3 pulse / pause



We live our values.

Excellence · Passion · Integrity · Responsibility · GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 index.

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gea.com

1. The CF 7000 is anchored to a structural steel frame or concrete pad (done by others) using 1/2" anchor bolts. Use two anchor bolts per leg, for a total of twelve (12) bolts per machine. Anchor Bolts are to be provided by installing contractor.

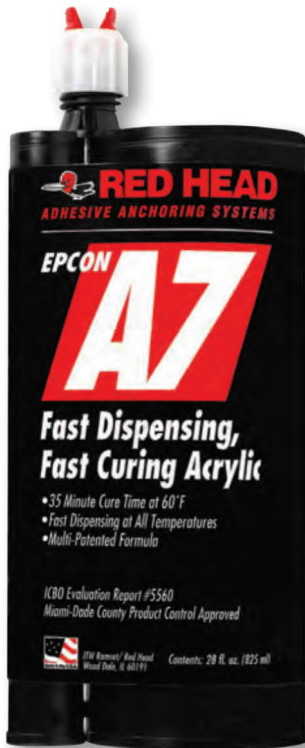
The recommended anchor system is given below:

Material:	AISI 316 stainless steel
Hole Diameter:	9/16"
Bolt Size:	1/2"
Embedment Depth: (for concrete)	By installing contractor / structural engineer
Anchor Material: (for concrete)	Epoxy chemical anchor system per enclosed reference sheets

Refer to the CF-7000 Installation Plan, Drawing No. 9149-4100-706, for additional details.

A7

**Easy to Use—
A7 Saves You
Time and Money**



A7-28



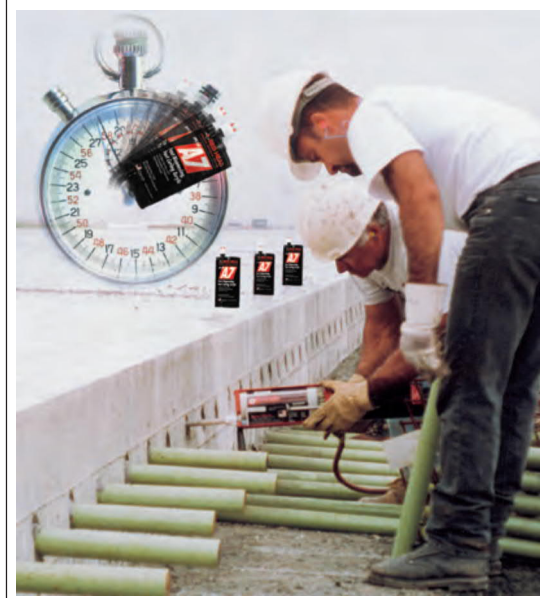
A102

DESCRIPTION/SUGGESTED SPECIFICATIONS*

*Suggested Specifications see pages 23

Fast Dispensing, Fast Curing Acrylic Adhesive

The acrylic resin and hardening agent are completely mixed as they are simultaneously dispensed from the dual cartridge through a static mixing nozzle, directly into the anchor hole. A7 can be used with threaded rod or rebar (for fastening to hollow base materials, see page 43 and 46).



**How Can
An Adhesive
Anchor Save
You Money?**

- Incredibly fast dispensing and rod installation times
- Significantly faster curing times
- Easy to use (no-heating) even at freezing cold temperatures
- Requires less adhesive

ADVANTAGES

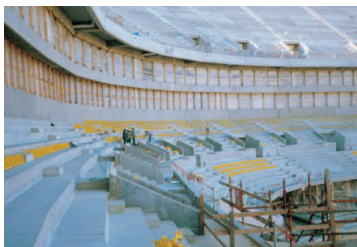
- All weather formula
- No drip, no sag, easy clean up
- Fast & easy dispensing, even 28 ounce cartridge can be hand dispensed
- Fast curing time, 35 minutes at 60°F
- Not mix ratio sensitive
- NSF 61 approved
- Rods are easier to insert into the hole with A7 compared with other adhesives
- Works in damp holes and underwater applications
- Requires less adhesive—can be used in 1/16" oversized or 1/8" oversized holes
- **One formula** for both hollow and solid base materials

Curing Times



BASE MATERIAL (F°/C°)	WORKING TIME	FULL CURE TIME
100°/ 38°	5 minutes	25 minutes
80°/ 27°	5.5 minutes	30 minutes
60°/ 16°	7 minutes	35 minutes
40°/ 4°	15 minutes	75 minutes
20°/ -7°	35 minutes	6 hours
0°/ -18°	4 hours	24 hours

APPLICATIONS



Stadium Seating

The fast dispensing, fast curing properties of A7 made it ideal for installing over 70,000 seats in this NFL football stadium and many others.



Roadway Doweling

A7 dispenses so quickly and rebar inserts so easily that contractors find installed costs are lower than many other products including grout for doweling.



Scaffolding Attachment

Fast curing adhesive in 28 ounce cartridges kept this project moving upwards without delays.

FEATURES



ANCHORAGE TO SOLID CONCRETE

Threaded Rod (Carbon or Stainless Steel) or Rebar supplied by contractor; rod does not need to be chisel pointed

A7 adhesive completely fills area between rod and hole creating a stress free, high load anchorage

Pre-drilled hole in concrete; see performance tables for suggested hole sizes

APPROVALS/LISTINGS

ICC Evaluation Service, Inc. – #ER-5560

City of Los Angeles – RR#25379

DOT Approvals

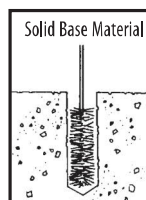
NSF Standard 61 Certified for Drinking Water Components



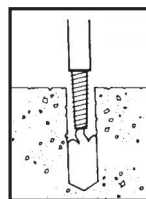
Certified to ANS/NSF 61

For the most current approvals/listings visit: www.itw-redhead.com

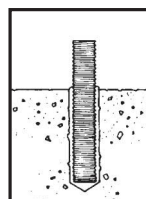
INSTALLATION STEPS



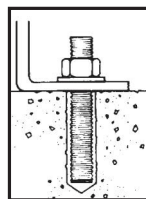
1. Drill 1/16" oversize diameter holes for 1/4"–1/2" diameter threaded rods and #3 rebar. Drill 1/8" oversize diameter holes for 5/8"–1-1/4" diameter threaded rods, #4 rebar, grout filled blocks and brick pinning. Clean out hole from bottom with forced air. Complete hole preparation with brush and repeat cleaning with forced air (leave no dust or slurry).



2. When starting new cartridge or new nozzle, dispense and discard enough adhesive until uniform light grey color is achieved. Insert the nozzle into the bottom of the hole and fill to 1/2 the hole depth.



3. Insert rod slowly by hand into the bottom of the hole with a slow twisting motion. This insures adhesive fills voids and crevices and uniformly coats the anchor rod.






4. See table for working times and curing times. After the suggested cure time is met, install and tighten fixture into place.



**A100
Dispenser**

A7-8 fl. oz. Ordering Information

PART NUMBER	DESCRIPTION	BOX QTY
 A7-8	Fits Hilti® P2000 dispensing tools 8 Fluid Ounce Cartridge A7	12
 A24	Mixing Nozzle for A7-8 Cartridge Nozzle diameter fits 3/8" to 5/8" holes (overall length of nozzle 6-3/8")	24
 A101	Heavy Duty Hand Dispenser for A7-8 Cartridge	1

Refer to page 49 for ordering information on brushes, hole plugs, and extension tubing for deep holes.

ESTIMATING TABLE

CLAMPING FORCE PROVIDED ON PAGES 26

ROD In. (mm)		DRILL HOLE DIA. INCHES		EMBEDMENT DEPTH IN INCHES (mm)												
				1 (25.4)	2 (50.8)	3 (76.2)	4 (101.6)	5 (127.0)	6 (152.4)	7 (177.8)	8 (203.2)	9 (228.6)	10 (254.0)	11 (279.4)	12 (304.8)	13 (330.2)
1/4 (6.4)	5/16	259.5	129.7	86.5	64.9	51.9	43.2	37.1	32.4	28.8	25.9	23.6	21.6	20.0	18.5	17.3
3/8 (9.5)	7/16	150.2	75.1	50.1	37.6	30.0	25.0	21.5	18.8	16.7	15.0	13.7	12.5	11.6	10.7	10.0
1/2 (12.7)	9/16	108.1	54.1	36.0	27.0	21.6	18.0	15.4	13.5	12.0	10.8	9.8	9.0	8.3	7.7	7.2
5/8 (15.9)	11/16	77.6	38.8	25.9	19.4	15.5	12.9	11.1	9.7	8.6	7.8	7.1	6.5	6.0	5.5	5.2
	3/4	55.4	27.7	18.4	13.8	11.1	9.2	7.9	6.9	6.1	5.5	5.0	4.6	4.3	4.0	3.7
3/4 (19.1)	13/16	54.7	27.3	18.2	13.7	10.9	9.1	7.8	6.8	6.1	5.5	5.0	4.6	4.2	3.9	3.6
	7/8	43.6	21.8	14.6	10.9	8.8	7.3	6.3	5.5	4.9	4.4	4.0	3.6	3.4	3.1	2.9
7/8 (22.2)	15/16	52.5	26.2	17.5	13.1	10.5	8.7	7.5	6.6	5.8	5.2	4.8	4.4	4.0	3.7	3.5
	1	36.4	18.2	12.2	9.1	7.3	6.1	5.2	4.5	4.0	3.6	3.3	3.0	2.8	2.6	2.4
1 (25.4)	1-1/16	44.9	22.4	15.0	11.2	9.0	7.5	6.4	5.6	5.0	4.5	4.1	3.7	3.5	3.2	3.0
	1-1/8	34.4	17.2	12.0	8.6	7.5	6.0	5.0	4.3	3.7	3.3	3.0	2.7	2.5	2.3	2.1
1-1/4 (31.8)	1-5/16	28.7	14.4	9.6	7.2	5.7	4.8	4.1	3.6	3.2	2.9	2.6	2.4	2.2	2.1	1.9
	1-3/8	22.4	11.2	7.6	5.6	4.5	3.8	3.2	2.8	2.5	2.3	2.1	1.9	1.7	1.6	1.5

* The number of anchoring installations is based upon calculations of hole volumes using ANSI tolerance carbide tipped drill bits, the nominal areas of the reinforcing bars and the stress areas of the threaded rods. These estimates do not account for waste.

PERFORMANCE TABLE

A7 Acrylic Adhesive **Average Ultimate Tension and Shear Loads^{1,2,3} for Threaded Rod Installed in Solid Concrete**

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MAX. CLAMPING FORCE AFTER PROPER CURE Ft.-Lbs. (Nm)	EMBEDMENT IN CONCRETE In. (mm)	2000 PSI (13.8 MPa) CONCRETE		4000 PSI (27.6 MPa) CONCRETE	
				ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)	ULTIMATE TENSION Lbs. (kN)	ULTIMATE SHEAR Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	13 - 18 (17-24)	1-1/2 (38.1)	N/A	N/A	3,734 (16.6)	4,126 (18.3)
			3-3/8 (85.7)	5,852 (26.0)	5,220 (23.2)	10,977 (48.8)	5,220 (23.2)
			4-1/2 (114.3)	7,729 (34.4)	5,220 (23.2)	11,661 (51.9)	5,220 (23.2)
1/2 (12.7)	9/16 (14.3)	22 - 25 (29-33)	2 (50.8)	N/A	N/A	6,022 (26.8)	8,029 (35.7)
			4-1/2 (114.3)	10,798 (48.0)	8,029 (35.7)	17,162 (76.3)	8,029 (35.7)
			6 (152.4)	14,210 (63.2)	8,029 (35.7)	17,372 (77.3)	8,029 (35.7)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	55 - 80 (74-108)	2-1/2 (63.5)	N/A	N/A	7,330 (32.6)	11,256 (50.1)
			5-5/8 (142.9)	16,417 (73.0)	15,967 (71.0)	26,504 (117.9)	15,967 (71.0)
			7-1/2 (190.5)	18,747 (83.4)	15,967 (71.0)	29,381 (130.7)	15,967 (71.0)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	106 - 160 (143-216)	3 (76.2)	N/A	N/A	8,634 (38.4)	20,126 (89.5)
			6-3/4 (171.5)	18,618 (82.8)	20,126 (89.5)	29,727 (132.2)	20,126 (89.5)
			9 (228.6)	23,934 (106.5)	20,126 (89.5)	37,728 (167.8)	20,126 (89.5)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	185 - 250 (250-338)	3-1/2 (88.9)	N/A	N/A	13,650 (60.7)	20,920 (92.9)
			7-7/8 (200.0)	N/A	29,866 (132.9)	44,915 (199.8)	29,866 (132.9)
			10-1/2 (266.7)	36,881 (164.1)	29,866 (132.9)	48,321 (215.0)	29,866 (132.9)
1 (25.4)	1-1/16 (27.0) or 1-1/8 (28.6)	276 - 330 (374-447)	4 (101.6)	N/A	N/A	16,266 (72.2)	33,152 (147.5)
			9 (228.6)	32,215 (143.3)	37,538 (167.0)	48,209 (214.5)	37,538 (167.0)
			12 (304.8)	46,064 (204.9)	37,538 (167.0)	63,950 (284.5)	37,538 (167.0)
1-1/4 (31.8)	1-5/16 (33.3) or 1-3/8 (34.9)	370 - 660 (501-894)	5 (127.0)	N/A	N/A	21,838 (97.1)	33,152 (147.5)
			11-1/4 (285.8)	45,962 (204.5)	58,412 (259.8)	56,715 (252.3)	58,412 (259.8)
			15 (381.0)	62,208 (276.7)	58,412 (259.8)	84,385 (375.4)	58,412 (259.8)

1 Allowable working loads for the single installations under static loading should not exceed 25% capacity or the allowable load of the anchor rod.

2 Ultimate load values in 2000 and 4000 psi stone aggregate concrete. Ultimate loads are indicated for the embedment shown in the Embedment in Concrete column. Performance values are based on the use of high strength threaded rod (ASTM A193 Gr. B7). The use of lower strength rods will result in lower ultimate tension and shear loads.

3 Linear interpolation may be used for intermediate spacing and edge distances (see pages 28-29).

PERFORMANCE TABLE

A7 Acrylic Adhesive **Allowable Tension Loads¹ for Threaded Rod Installed in Solid Concrete**

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE TENSION LOAD BASED ON ADHESIVE BOND STRENGTH		ALLOWABLE TENSION LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1)	N/A	934 (4.2)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
		3-3/8 (85.7)	1,460 (6.5)	2,740 (12.2)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
		4-1/2 (114.3)	1,930 (8.6)	2,915 (13.0)	2,080 (9.3)	4,340 (19.3)	3,995 (17.8)
1/2 (12.7)	9/16 (14.3)	2 (50.8)	N/A	1,505 (6.7)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
		4-1/2 (114.3)	2,700 (12.0)	4,290 (19.1)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
		6 (152.4)	3,550 (15.8)	4,340 (19.3)	3,730 (16.6)	7,780 (34.6)	7,155 (31.8)
5/8 (15.9)	11/16 (17.5) or 3/4 (19.1)	2-1/2 (63.5)	N/A	1,832 (8.2)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
		5-5/8 (142.9)	4,100 (18.3)	6,625 (29.5)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
		7-1/2 (190.5)	4,685 (20.8)	7,345 (32.7)	5,870 (26.1)	12,230 (54.4)	11,250 (50.0)
3/4 (19.1)	13/16 (20.6) or 7/8 (22.2)	3 (76.2)	N/A	2,158 (9.6)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
		6-3/4 (171.5)	4,655 (20.7)	7,430 (33.1)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
		9 (228.6)	5,980 (26.6)	9,430 (42.0)	8,490 (37.8)	17,690 (78.7)	14,860 (66.1)
7/8 (22.2)	15/16 (23.8) or 1 (25.4)	3-1/2 (88.9)	N/A	3,413 (15.2)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)
		7-7/8 (200.0)	N/A	11,230 (49.9)	11,600 (51.6)	25,510 (113.5)	20,835 (92.7)
		10-1/2 (266.7)	9,220 (41.0)	12,080 (53.7)	11,600 (51.6)	25,510 (113.5)	20,834 (92.7)
1 (25.4)	1-1/16 (27.0) or 1-1/8 (28.6)	4 (101.6)	N/A	4,067 (18.1)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
		9 (228.6)	8,050 (35.8)	12,050 (53.6)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
		12 (304.8)	11,515 (51.2)	15,985 (71.1)	15,180 (67.5)	31,620 (140.7)	26,560 (118.1)
1-1/4 (31.8)	1-5/16 (33.3) or 1-3/8 (34.9)	5 (127.0)	N/A	5,460 (24.3)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)
		11-1/4 (285.8)	11,490 (51.1)	14,175 (63.1)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)
		15 (381.0)	15,550 (69.2)	21,095 (93.8)	23,800 (105.9)	49,580 (220.6)	34,670 (154.2)

1 Use lower value of either bond or steel strength for allowable tensile load.



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PERFORMANCE TABLE

DRILL HOLE DIAMETERS
PROVIDED ON PAGES 22, 24 AND 25

A7 *Allowable Shear Loads¹ for Threaded Rod Installed in Acrylic Adhesive Solid Concrete*

THREADED ROD DIA. In. (mm)	DRILL HOLE DIAMETER In. (mm)	MIN. EMBEDMENT DEPTH In. (mm)	ALLOWABLE SHEAR LOAD BASED ON CONCRETE STRENGTH		ALLOWABLE SHEAR LOAD BASED ON STEEL STRENGTH		
			2000 PSI (13.8 MPa) CONCRETE Lbs. (kN)	4000 PSI (27.6 MPa) CONCRETE Lbs. (kN)	ASTM A307 (SAE 1018) Lbs. (kN)	ASTM A193 GR. B7 (SAE 4140) Lbs. (kN)	ASTM F593 AISI 304 SS Lbs. (kN)
3/8 (9.5)	7/16 (11.1)	1-1/2 (38.1)	N/A	1,031 (4.6)	1,040 (4.6)	2,170 (9.7)	1,995 (8.9)
		3-3/8 (85.7)	1,305 (5.8)	1,305 (5.8)	1,040 (4.6)	2,170 (9.7)	1,995 (8.9)
1/2 (12.7)	9/16 (14.3)	2 (50.8)	N/A	2,005 (8.9)	1,870 (8.3)	3,895 (17.3)	3,585 (15.9)
		4-1/2 (114.3)	2,005 (8.9)	2,005 (8.9)	1,870 (8.3)	3,895 (17.3)	3,585 (15.9)
5/8 (15.9)	11/16 (17.5)	2-1/2 (63.5)	N/A	2,814 (12.5)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
	or 3/4 (19.1)	5-5/8 (142.9)	3,990 (17.8)	3,990 (17.8)	2,940 (13.1)	6,125 (27.2)	5,635 (25.1)
3/4 (19.1)	13/16 (20.6)	3 (76.2)	N/A	5,030 (22.4)	4,250 (18.9)	8,855 (39.4)	7,440 (33.1)
	or 7/8 (22.2)	6-3/4 (171.5)	5,030 (22.4)	5,030 (22.4)	4,250 (18.9)	8,855 (39.4)	7,440 (33.1)
7/8 (22.2)	15/16 (23.8)	3-1/2 (88.9)	N/A	5,230 (23.3)	5,800 (25.8)	12,760 (56.8)	10,730 (47.7)
	or 1 (25.4)	7-7/8 (200.0)	7,465 (33.2)	7,465 (33.2)	5,800 (25.8)	12,760 (56.8)	10,730 (47.7)
1 (25.4)	1-1/16 (27.0)	4 (101.6)	N/A	8,288 (36.9)	7,590 (33.8)	15,810 (70.3)	13,285 (59.1)
	or 1-1/8 (28.6)	9 (228.6)	9,385 (41.7)	9,385 (41.7)	7,590 (33.8)	15,810 (70.3)	13,285 (59.1)
1-1/4 (31.8)	1-5/16 (33.3)	5 (127.0)	N/A	8,288 (36.9)	11,900 (52.9)	24,790 (100.3)	18,840 (83.8)
	or 1-3/8 (34.9)	11-1/4 (285.8)	14,600 (64.9)	14,600 (64.9)	11,900 (52.9)	24,790 (100.3)	18,840 (83.8)

1 Use lower value of either concrete or steel strength for allowable shear load.

PERFORMANCE TABLE

A7 *Recommended Edge Distance Requirements for Shear Loads Installed in Solid Concrete*

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) 100% LOAD CAPACITY	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (50% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (10% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7)	4-3/16 (106.4)	3-7/16 (87.3)	2-5/16 (58.7)	13/16 (20.6)
1/2 (12.7)	4-1/2 (114.3)	5-5/8 (142.9)	4-5/8 (117.5)	3-1/8 (79.4)	1-1/8 (28.6)
5/8 (15.9)	5-5/8 (142.9)	7 (177.8)	5-3/4 (146.1)	3-1/8 (79.4)	1-3/8 (34.9)
3/4 (19.1)	6-3/4 (171.5)	8-7/16 (214.2)	6-15/16 (176.2)	4-5/8 (117.5)	1-5/8 (41.3)
1 (25.4)	9 (228.6)	11-1/4 (285.8)	9-1/4 (235.0)	6-1/4 (158.8)	2-1/4 (57.2)
1-1/4 (31.8)	11-1/4 (285.8)	14-1/16 (357.2)	11-5/8 (295.3)	7-7/8 (200.0)	2-7/8 (73.0)

Combined Tension and Shear Loading—for A7 Adhesive Anchors

Allowable loads for anchors under tension and shear loading at the same time (combined loading) will be lower than the allowable loads for anchors subjected to 100% tension or 100% shear. Use the following equation to evaluate anchors in combined loading conditions:

$$\left(\frac{N_a}{N_s}\right)^{5/3} + \left(\frac{V_a}{V_s}\right)^{5/3} \leq 1$$

N_a = Applied Service Tension Load

N_s = Allowable Tension Load

V_a = Applied Service Shear Load

V_s = Allowable Shear Load

PERFORMANCE TABLE

A7 Recommended Edge Distance Requirements for Acrylic Adhesive Tension Loads Installed in Solid Concrete

ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL EDGE DISTANCE In. (mm) (100% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (90% LOAD CAPACITY)	INTERPOLATED EDGE DISTANCE In. (mm) (80% LOAD CAPACITY)	MINIMUM EDGE DISTANCE In. (mm) (70% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	2-1/2 (63.5) 3-3/8 (85.7)	1-15/16 (49.2) 2-5/8 (66.7)	1-3/8 (34.9) 1-7/8 (47.6)	13/16 (26.2) 1-1/8 (28.6)
1/2 (12.7)	4-1/2 (114.3) 6 (152.4)	3-3/8 (85.7) 4-1/2 (114.3)	2-5/8 (66.7) 3-1/2 (88.9)	1-7/8 (47.6) 2-1/2 (63.5)	1-1/8 (28.6) 1-1/2 (38.1)
5/8 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	4-3/16 (106.4) 5-5/8 (142.9)	3-1/4 (82.6) 4-3/8 (111.1)	2-5/16 (58.7) 3-3/8 (79.4)	1-3/8 (34.9) 1-7/8 (47.6)
3/4 (19.1)	6-3/4 (171.5) 9 (228.6)	5-1/16 (128.6) 6-3/4 (171.5)	3-15/16 (100.0) 5-1/4 (133.4)	2-13/16 (71.4) 3-3/4 (95.3)	1-5/8 (15.9) 2-1/4 (57.2)
1 (25.4)	9 (228.6) 12 (304.8)	6-3/4 (171.5) 9 (228.6)	5-1/4 (133.4) 7 (177.8)	3-3/4 (95.3) 5 (127.0)	2-1/4 (57.2) 3 (76.2)
1-1/4 (31.8)	11-1/4 (285.8) 15 (381.0)	8-7/16 (214.3) 11-1/4 (285.8)	6-9/16 (166.7) 8-3/4 (222.2)	4-3/4 (120.7) 6-1/4 (158.8)	2-7/8 (73.0) 3-3/4 (95.3)

PERFORMANCE TABLE

A7 Recommended Spacing Requirements for Tension Loads Installed in Concrete, Lightweight Concrete and Hollow Block

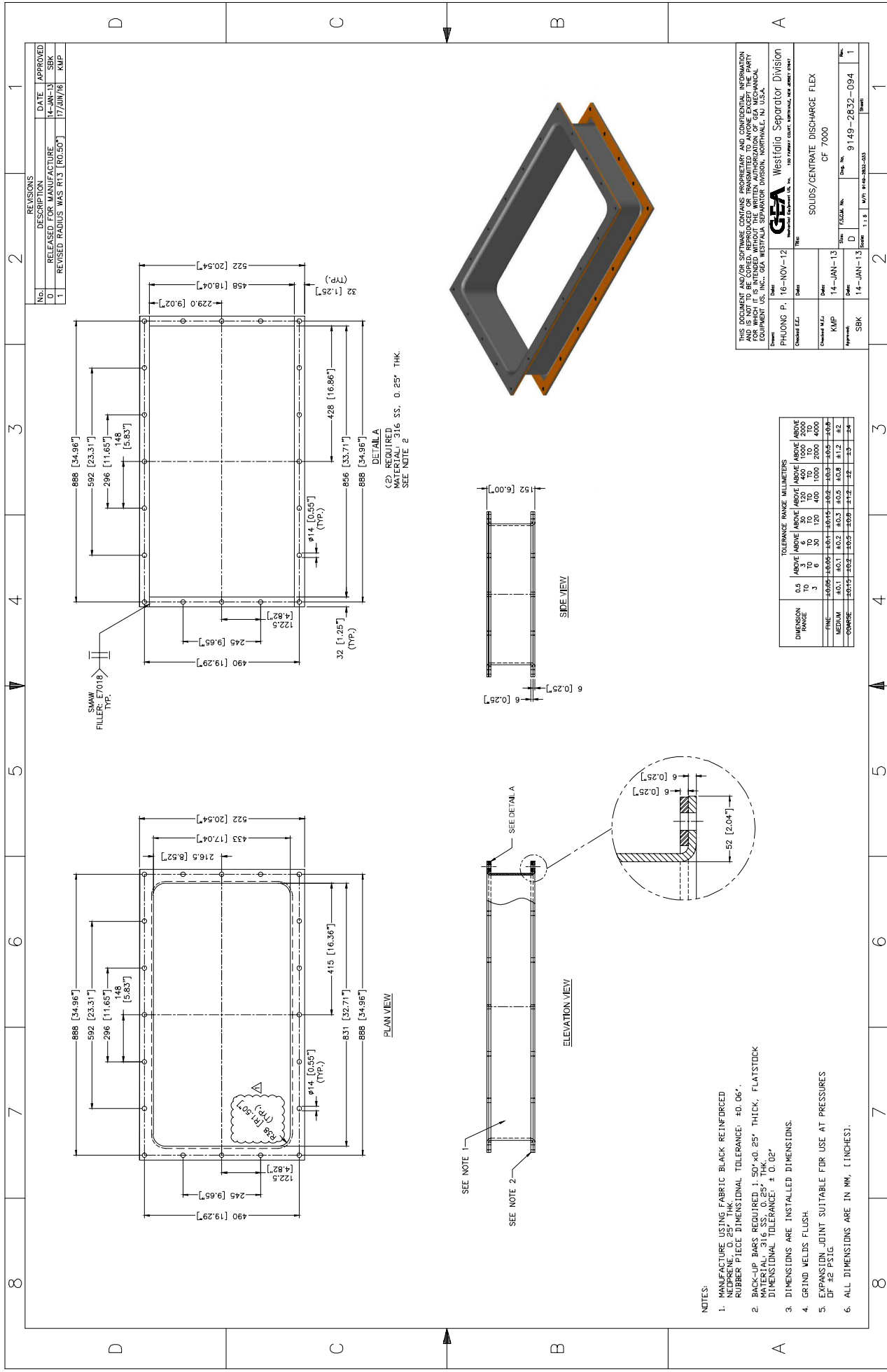
ANCHOR DIAMETER In. (mm)	EMBEDMENT DEPTH In. (mm)	CRITICAL SPACING In. (mm) (100% LOAD CAPACITY)	INTERPOLATED SPACING In. (mm) (90% LOAD CAPACITY)	MINIMUM SPACING In. (mm) (80% LOAD CAPACITY)
3/8 (9.5)	3-3/8 (85.7) 4-1/2 (114.3)	4-3/16 (106.4) 5-5/8 (142.9)	2-1/2 (63.5) 3-3/8 (85.7)	13/16 (20.6) 1-1/8 (28.6)
1/2 (12.7)	4-1/2 (114.3) 6 (152.4)	5-5/8 (142.9) 7-1/2 (190.5)	3-3/8 (85.7) 4-1/2 (114.3)	1-1/8 (28.6) 1-1/2 (38.1)
5/8 (15.9)	5-5/8 (142.9) 7-1/2 (190.5)	7 (177.8) 9-3/8 (238.1)	4-3/16 (106.4) 5-5/8 (142.9)	1-3/8 (34.9) 1-7/8 (47.6)
3/4 (19.1)	6-3/4 (171.5) 9 (228.6)	8-7/16 (214.3) 11-1/4 (285.8)	5 (127.0) 6-3/4 (171.5)	1-5/8 (41.3) 2-1/4 (57.2)
1 (25.4)	9 (228.6) 12 (304.8)	11-1/4 (285.8) 15 (381.0)	6-3/4 (171.5) 9 (228.6)	2-1/4 (57.2) 3 (76.2)
1-1/4 (31.8)	11-1/4 (285.8) 15 (381.0)	14-1/16 (357.2) 18-3/4 (476.3)	8-1/2 (215.9) 11-1/4 (285.8)	2-7/8 (73.0) 3-3/4 (95.5)

A7 Adhesive Edge/Spacing Distance Load Factor Summary for Installation of Threaded Rod and Reinforcing Bar^{1,2}

LOAD FACTOR	DISTANCE FROM EDGE OF CONCRETE
Critical Edge Distance—Tension	
100% Tension Load	→ 0.75 x Anchor Embedment
Minimum Edge Distance—Tension	
70% Tension Load	→ 0.25 x Anchor Embedment
Critical Edge Distance—Shear	
100% Shear Load	→ 1.25 x Anchor Embedment
Minimum Edge Distance—Shear	
10% Shear Load	→ 0.25 x Anchor Embedment
LOAD FACTOR	DISTANCE FROM ANOTHER ANCHOR
Critical Spacing—Tension	
100% Tension Load	→ 1.25 x Anchor Embedment
Minimum Spacing—Tension	
80% Tension Load	→ 0.25 x Anchor Embedment
Critical Spacing—Shear	
100% Shear Load	→ 1.25 x Anchor Embedment
Minimum Spacing—Shear	
25% Shear Load	→ 0.25 x Anchor Embedment

1 Use linear interpolation for load factors at edge distances or spacing distances between critical and minimum.

2 Anchors are affected by multiple combination of spacing and/or edge distance loading and direction of the loading. Use the product of tension and shear loading factors in design.



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GEA Westfalia Separator Division
 100 FARMLEY COURT, NORRISVILLE, NJ 07857-0007

Date: 16-NOV-12
 Checked E.L.T.
 Checked M.L.P.
 Approved: SBK

Drawn: PHUONG P.
 Title: SOLIDS/CENTRATE DISCHARGE FLEX
 CF 7000
 Date: 14-JAN-13
 Part No.: 9149-2832-094
 Sheet: 1 of 1
 W/P: 9149-2832-033

DATA SHEET

Bowl Motor



Three Phase Induction Motor - Squirrel Cage

Customer : GEA WESTFALIA SEPARATOR
 Customer reference : 5390-5893-339

Product line : IP55 - W22 - IE3 PLUS Multitensão Product code : 11751819

Frame : 280S/M	Cooling method : IC411 - TEFC
Insulation class : F	Mounting : B3T
Duty cycle : S1	Direct of rotation ¹ : Both
Ambient temperature : -20 °C to +40 °C	Starting method : Direct on line
Altitude : 1000 m.a.s.l	Approx. weight ³ : 729 kg
Degree of protection : IP55	Moment of inertia (J) : 2.25 kgm ²
Design : N	



Output	75 kW	75 kW	75 kW	75 kW
Poles	4	4	4	4
Frequency	50 Hz	50 Hz	50 Hz	60 Hz
Rated voltage	380/660 V	400/690 V	415 V	460 V
Rated current	136/78.1 A	130/75.5 A	127 A	116 A
L. R. Amperes	1034/594 A	988/574 A	965 A	916 A
LRC (p.u.)	7.6	7.6	7.6	7.9 x Code J
No load current	36.2/20.8 A	38.6/22.4 A	40.6 A	36.6 A
Rated speed	1480 rpm	1485 rpm	1485 rpm	1785 rpm
Slip	1.33 %	1.00 %	1.00 %	0.83 %
Rated torque	484 Nm	483 Nm	483 Nm	401 Nm
Locked rotor torque	200 %	230 %	250 %	270 %
Breakdown torque	250 %	280 %	300 %	340 %
Service factor	1.00	1.00	1.00	1.25
Noise level ²	69.0 dB(A)	69.0 dB(A)	69.0 dB(A)	73.0 dB(A)
Locked rotor time	26 s (hot)	26 s (hot)	26 s (hot)	47 s (hot)
	47 s (cold)	47 s (cold)	47 s (cold)	85 s (cold)
Efficiency (%)	50%	94.8	94.7	94.6
	75%	95.2	95.2	95.2
	100%	95.5	95.6	95.7
Power factor	50%	0.78	0.75	0.73
	75%	0.85	0.83	0.82
	100%	0.88	0.87	0.86

	Drive end	Non drive end	Foundation loads
Bearing type	NU316-C3	6316-C3	Maximum traction : 9096 N
Lubrication interval	9000 h	13000 h	Maximum compression : 16247 N
Lubricant amount	34 g	34 g	
Lubricant type	MOBIL POLYREX EM		

This revision replaces and cancels the previous one, which must be eliminated.

(1) When viewed from the drive end.
 (2) Measured at 1m and with tolerance of +3dB(A).
 (3) Approximate weight subject to changes after manufacturing process.
 (4) At the rated point.

These are average values based on tests with sinusoidal power supply, subject to the tolerances stipulated in IEC 60034-1.

Rev.	Summary of changes	Performed	Checked	Date
Performed by	tiagogb	004986/2015		Page Revision
Checked by	pauloaugusto			
Date	26/10/2018			
		1/2	4	

DATA SHEET



Three Phase Induction Motor - Squirrel Cage

Customer : GEA WESTFALIA SEPARATOR
Customer reference : 5390-5893-339

Product line : IP55 - W22 - IE3 PLUS Multitensão Product code : 11751819

Notes:

Motor suitable for VFD use

25HZ 200VD 27,2KW 735RPM 105,5A 353NM
50HZ 400VD 55,0KW 1489RPM 105,5A 353NM
60HZ 400VD 55,0KW 1787RPM 105,5A 294NM

25HZ 200VD 37,1KW 735RPM 130A 482NM
50HZ 400VD 75,0KW 1485RPM 130A 482NM
60HZ 400VD 75,0KW 1782RPM 130A 401NM

30HZ 230VD 37,2KW 885RPM 116A 401NM
60HZ 460VD 75,0KW 1785RPM 116A 401NM ←
72HZ 460VD 75,0KW 2142RPM 116A 334NM

The vibration and noise level informed are valid when motor is operating with roller bearings respecting their minimum radial load. Thus, WEG reserves the right to test the motor with ball bearings.

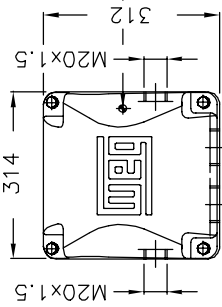
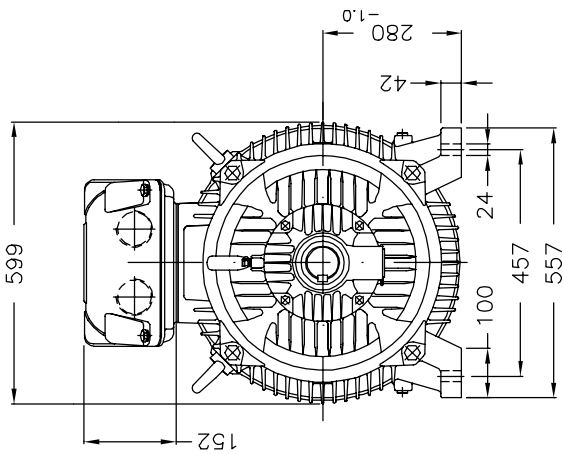
Standards	Specification : IEC 60034-1	Vibration : IEC 60034-14
	Tests : IEC 60034-2	Tolerance : IEC 60034-1
	Noise : IEC 60034-9	

Rev.	Summary of changes	Performed	Checked	Date
Performed by	tiagogb		004986/2015	
Checked by	pauloaugusto		Page	Revision
Date	26/10/2018		2/2	4

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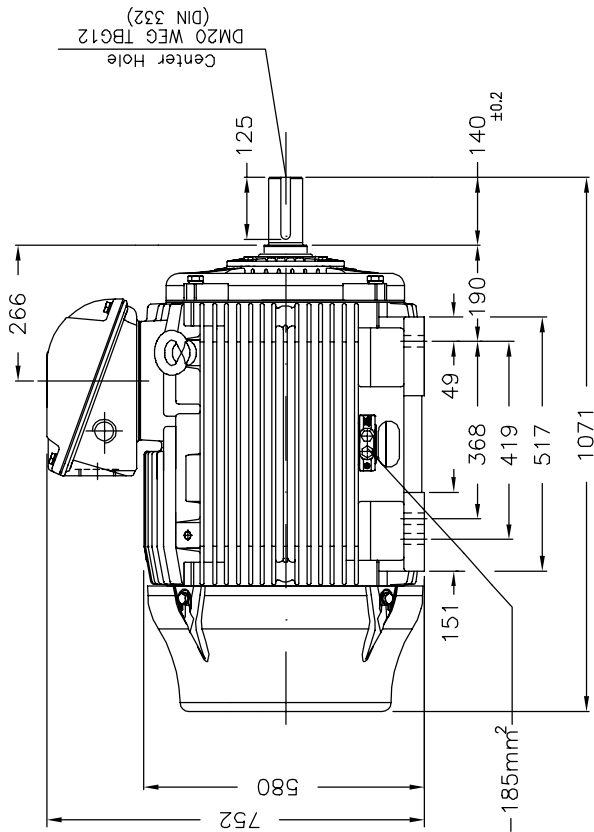
EIXO	X
PADRÃO	
OPCIONAL	
ESPECIAL	

Dimensões em mm
Dimensions in mm

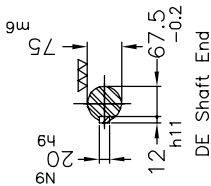


Main terminal box

Grounding for leads 35-70mm²



Grounding for leads 25-185mm²



DE Shaft End

THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.

Rolamento dianteiro de rolos NU-316 C3 / NU-316 C3 DE roller bearing
Resistência de aquecimento 110 a 127 V / Space heaters 110 to 127 V
Balanceamento reduzido ¼ chaveta / Reduced balancing with half key
Saída dos cabos voltada para a traseira / Cables outlet directed to NDE
Plano de pintura 211P / Painting plan 211P
Forma construtiva B3T / Mounting B3T

GEA WESTFALIA SEPARATOR GMBH

500001313873	ALTERADO CONFORME NOTA 414393940	PKREYSSIG	MIENSCOR	03.07.2017	03
500001088224	ALT CONFORME CLAIM 414007096	GEYERSON	CLEBERP	21.09.2015	02
ECM	LOC	SUMMARY OF MODIFICATIONS	EXECUTED	CHECKED	RELEASED
EXECUTED	SCARIMANNI	THREE PHASE W22 MOTOR - PREMIUM EFF			
CHECKED		FRAME 280SIMP55			
RELEASED	ALCIDESZ				
REL. DT	04.05.2011	WMO	JARAGUA DO SUL	ENGENHARIA DE PRODUTO	1 / 1



10001238549

000 03
SHEET 1 / 1

75 kW 04 Poles 50 Hz 412131974/0



DATA SHEET

Nr.: 110304/2013-A

Date: 09-JUL-2013

Three Phase Induction Motor - Squirrel Cage

Customer : GEA WESTFALIA SEPARATOR
 Product code : 12512303 - WS-Mat-Nr.: 5390-0885-039
 Product line : W22 - IE3 Premium Efficiency Multivoltage

<p>Frame : 225S/M Output : 45 kW Frequency : 50 Hz Poles : 4 Rated speed : 1475-1480-1480 rpm Slip : 1.67-1.33-1.33 % Rated voltage : 220-230-240/380/400/415V Rated current : 145-138-136/83.9/79.4/78.6 A L. R. Amperes : 1145-1091-1074/663/627/621 A LRC (p.u.) : 7.9 No load current : 51.5-55.7-58.6/29.8/32.0/33.9 A Rated torque : 292-291-291 Nm Locked rotor torque : 250-280-310 % Breakdown torque : 270-320-330 % Design : N Insulation class : F Locked rotor time : 13-13-13 s (hot) Service factor : 1.00 Duty cycle : S1 Ambient temperature : -20°C to +40°C Altitude : 1000 m.a.s.l</p>	<p>Enclosure : IP55 (TEFC) Mounting : B8T Direct of rotation : Both Weight* : 420 kg Moment of inertia : 0.6903 kgm² Noise level : 63.0 dB(A) (global) Foundation loads Maximum traction : 8712 N Maximum compression : 12832 N</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Load</th> <th>Power factor</th> <th>Efficiency (%)**</th> </tr> </thead> <tbody> <tr> <td>100%</td> <td>0.86-0.85-0.84</td> <td>94.8-94.8-94.8</td> </tr> <tr> <td>75%</td> <td>0.82-0.80-0.78</td> <td>94.7-94.8-94.8</td> </tr> <tr> <td>50%</td> <td>0.77-0.70-0.67</td> <td>94.3-94.2-94.0</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th></th> <th>Bearing</th> <th>Lubricant amount</th> </tr> </thead> <tbody> <tr> <td>Drive end</td> <td>6314-ZZ-C3</td> <td>---</td> </tr> <tr> <td>Non drive end</td> <td>6314-ZZ-C3</td> <td>---</td> </tr> </tbody> </table> <p>Lubrication interval: --- Polyrea Ester Oil WT/ENS</p>	Load	Power factor	Efficiency (%)**	100%	0.86-0.85-0.84	94.8-94.8-94.8	75%	0.82-0.80-0.78	94.7-94.8-94.8	50%	0.77-0.70-0.67	94.3-94.2-94.0		Bearing	Lubricant amount	Drive end	6314-ZZ-C3	---	Non drive end	6314-ZZ-C3	---
Load	Power factor	Efficiency (%)**																				
100%	0.86-0.85-0.84	94.8-94.8-94.8																				
75%	0.82-0.80-0.78	94.7-94.8-94.8																				
50%	0.77-0.70-0.67	94.3-94.2-94.0																				
	Bearing	Lubricant amount																				
Drive end	6314-ZZ-C3	---																				
Non drive end	6314-ZZ-C3	---																				

Notes:
 Motor suitable to operate with VFD with constant torque:

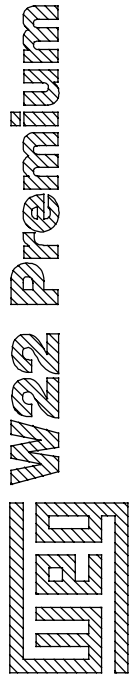
10 Hz 46 VD 5,7 kW 280 rpm 105,2 A 195 Nm 80K
 87 Hz 400 VD 53,0 kW 2598 rpm 105,2 A 195 Nm 80K

10 Hz 67 VY 5,7 kW 280 rpm 70,0 A 195 Nm 80K
 60 Hz 400 VY 36,4 kW 1784 rpm 70,0 A 195 Nm 80K
 60 Hz 460VY 36.4kW 1785rpm 61,2A 195Nm 80K ←

This revision replaces and cancels the previous one, which must be eliminated. The figures given herewith are regarded as guaranteed values and applied to sinusoidal power supplied motors, within permissible tolerances under IEC 60034-1. Noise level with tolerance of +3 dB(A). (*) Weight value can be changed without previous notification. (**) Efficiencies according to the indirect method of IEC 60034-2-1.

Performed by cariane	Checked deisej	Revision Nr.: 5 Date: 06-JAN-2015	Approved
-------------------------	-------------------	---	----------

12512303



PART NUMBER:5390-0885-039



MCD.TE1BFOX0\$ IEC 60034-1

3 ~ 225S/M-04		IP55 INS CL.F ΔT 80 K S1		SF 1.00 AMB 40°C							
V	Hz	kW	RPM	A	PF	IE code	100%	75%	50%		
220 Δ / 380 Y	50	45	1475	145 / 83.9	0.86	IE3	94.7	94.7	94.3		
230 Δ / 400 Y			1480	138 / 79.4	0.85		94.8	94.8	94.2		
240 Δ / 415 Y			1480	136 / 78.6	0.84		95.0	94.5	93.6		
- / 460 Y	60		1780	- / 69.9	0.85						
6314-ZZ-C3 6314-ZZ-C3 POLYREA ESTER OIL WT/ENS											
						NEMA Eff 95% 60HP 460 V 60Hz 1780 RPM		69.9 A PF0.85 Des A Code J SF 1.15 CC029A		Alt 1000 m.a.s.l. 424 kg	

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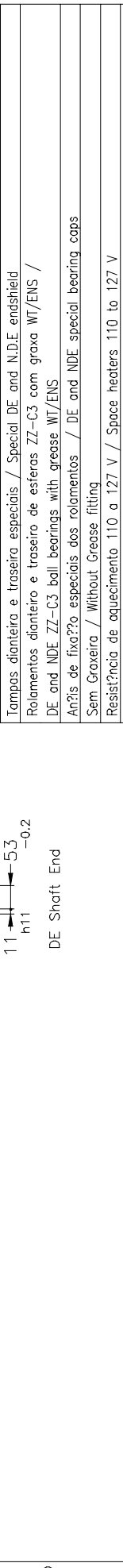
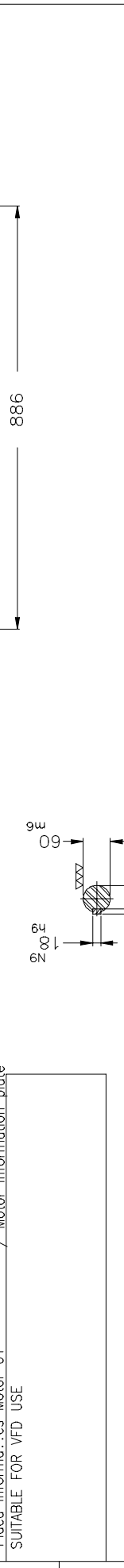
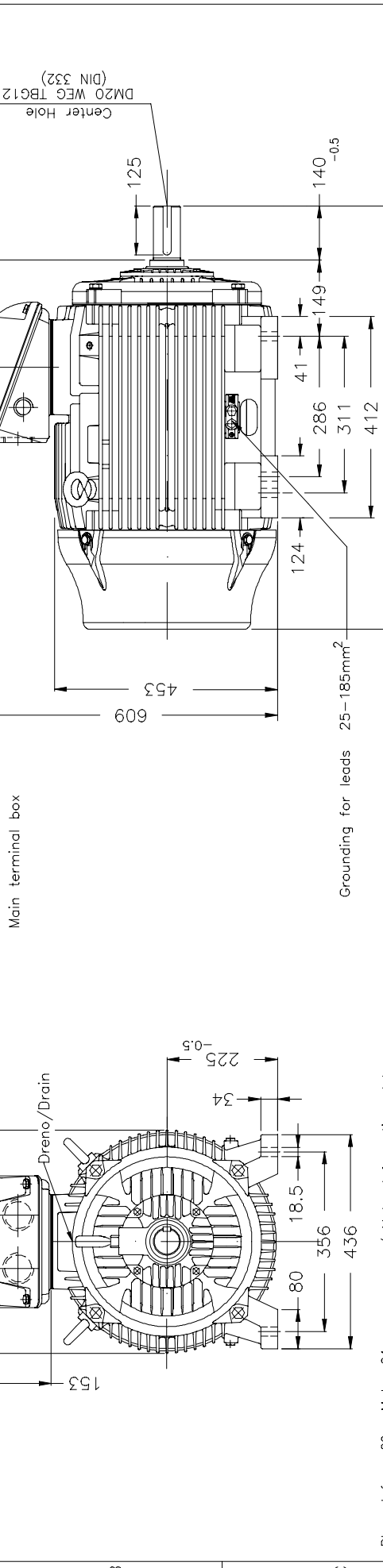
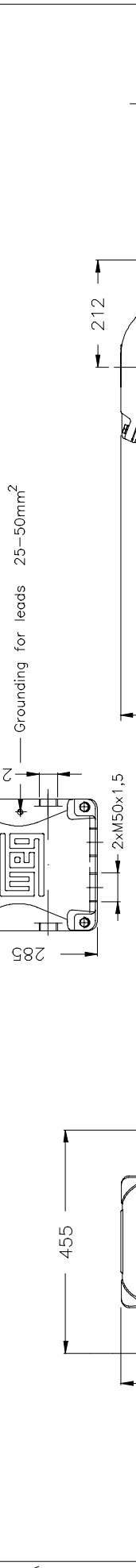
2 Dimensões em mm
Dimensions in mm

3

4

5 THIS IS AN UPDATED REVISION, THE PREVIOUS ONE MUST BE DISREGARDED.

6



Placa Informaões Motor 01 / Motor information plate
SUITABLE FOR VFD USE

Grounding for leads 25-50mm²

Grounding for leads 25-185mm²

Grounding for leads 25-185mm²

ECM LOC

EDUARDOCT1

PATRIKAL

17.07.2013

WM/O

JARAGUÁ DO SUL

ENGENHARIA DE PRODUTO

FRANCOES

BEISEL

EXECUTED

RELEASED

10002371970

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06

1 / 1

GEA WESTFALIA SEPARATOR

THREE PHASE W2 MOTOR - PREMIUM EFF
FRAME 2255IM IP55

ALT. CONFORME CLAIM 41454783

ALT. CONFORME CLAIM 41388727

SUMMARY OF MODIFICATIONS

FRANCOES 25.10.2016 06

BEISEL 18.06.2015 05

RELEASED

DATE

VER

WEG

45 kW 04 Poles 50 Hz 412880532/01

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Tampas dianteira e traseira especiais / Special DE and N.DE endshield
Rolamentos dianteiro e traseiro de esferas ZZ-C3 com graxa WT/ENS /
DE and NDE ZZ-C3 ball bearings with grease WT/ENS
Anéis de fixação especiais dos rolamentos / DE and NDE special bearing caps
Sem Graxeira / Without Grease fitting
Resistência de aquecimento 110 a 127 V / Space heaters 110 to 127 V
Planicidade especial dos pés conforme IEEE841/API 541 /
Special foot flatness according IEEE841/API 541
Plano de pintura 211P / Painting plan 211P
Forma construtiva B8T / Mounting B8T
GEA WESTFALIA SEPARATOR

Manual geral de instalação, operação e manutenção de motores elétricos

Installation, operation and maintenance manual of electric motors

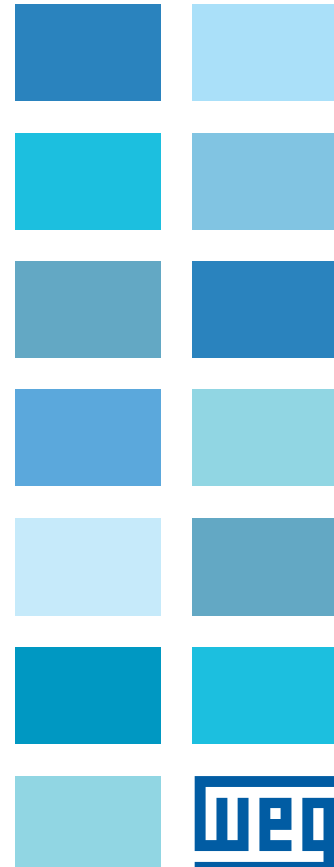
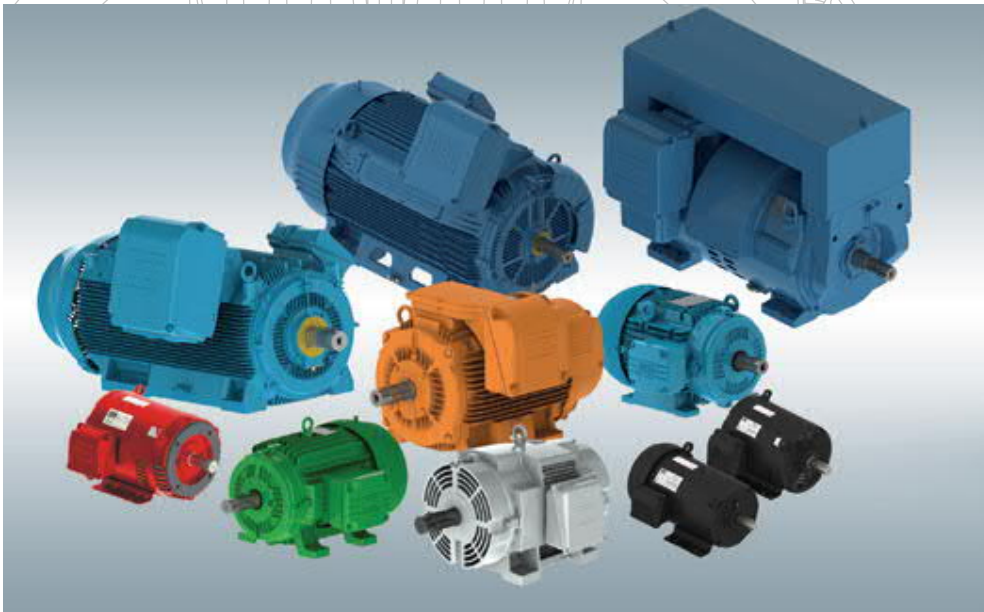
Manual general de instalación, operación y mantenimiento de motores eléctricos

Installations-, betriebs- und wartungsanleitung für elektrische motoren

Manual de instalare, exploatare și întreținere a motoarelor electrice

Ръководство за монтаж, експлоатация и поддръжка на електродвигатели

Руководство по установке, эксплуатации и техническому обслуживанию электрических двигателей



Português

2

English

57

Español

111

Deutsch

166

Română

221

Български

275

Русский

332



INSTALLATION, OPERATION AND MAINTENANCE MANUAL OF ELECTRIC MOTORS

This manual provides information about WEG induction motors fitted with squirrel cage, permanent magnet or hybrid rotors, low, medium and high voltage, in frame sizes IEC 56 to 630 and NEMA 42 to 9606/10.

The motor lines indicated below have additional information that can be checked in their respective manuals:

- Smoke Extraction Motors;
- Electromagnetic Brake Motors;
- Hazardous Area Motors.

These motors meet the following standards, if applicable:

- NBR 17094-1: Máquinas Elétricas Girantes - Motores de Indução - Parte 1: trifásicos.
- NBR 17094-2: Máquinas Elétricas Girantes - Motores de Indução - Parte 2: monofásicos.
- IEC 60034-1: Rotating Electrical Machines - Part 1: Rating and Performance.
- NEMA MG 1: Motors and Generators.
- CSA C 22,2 N°100: Motors and Generators.
- UL 1004-1: Rotating Electrical Machines - General Requirements.

If you have any questions regarding this manual please contact your local WEG branch, contact details can be found at www.weg.net.



TABLE OF CONTENTS

1. TERMINOLOGY	61
2. INITIAL RECOMMENDATIONS	62
2.1. WARNING SYMBOL.....	62
2.2. RECEIVING INSPECTION.....	62
2.3. NAMEPLATES.....	63
3. SAFETY INSTRUCTIONS	66
4. HANDLING AND TRANSPORT	67
4.1. LIFTING.....	67
4.1.1. Horizontal motors with one eyebolt.....	67
4.1.2. Horizontal motor with two eyebolts.....	68
4.1.3. Vertical motors	69
4.1.3.1. Procedures to place W22 motors in the vertical position.....	69
4.1.3.2. Procedures to place HGF and W50 motors in the vertical position.....	70
4.2 Procedures to place W22 vertical mount motors in horizontal position.....	71
5. STORAGE	73
5.1. EXPOSED MACHINED SURFACES	73
5.2. STORAGE	73
5.3 BEARINGS	74
5.3.1 Grease lubricated bearings	74
5.3.2 Oil lubricated bearings	74
5.3.3 Oil Mist lubricated bearings.....	75
5.3.4 Sleeve bearing	75
5.4. INSULATION RESISTANCE	75
5.4.1. Insulation resistance measurement.....	75
6. INSTALLATION	78
6.1. FOUNDATIONS.....	79
6.2. MOTOR MOUNTING	81
6.2.1. Foot mounted motors.....	81
6.2.2. Flange mounted motors	81
6.2.3. Pad mounted motors	82
6.3. BALANCING.....	82
6.4. COUPLINGS.....	82
6.4.1. Direct coupling.....	83
6.4.2. Gearbox coupling.....	83
6.4.3. Pulley and belt coupling	83
6.4.4. Coupling of sleeve bearing motors.....	83
6.5. LEVELING	84
6.6. ALIGNMENT.....	84
6.7. CONNECTION OF OIL LUBRICATED OR OIL MIST LUBRICATED MOTORS.....	85
6.8. CONNECTION OF THE COOLING WATER SYSTEM	85
6.9. ELECTRICAL CONNECTION	85
6.10. CONNECTION OF THE THERMAL PROTECTION DEVICES.....	89
6.11. RESISTANCE TEMPERATURE DETECTORS (PT-100)	90
6.12. CONNECTION OF THE SPACE HEATERS.....	91

6.13. STARTING METHODS	92
6.14. MOTORS DRIVEN BY FREQUENCY INVERTER	93
6.14.1. Use of dV/dt filter.....	93
6.14.1.1. Motor with enameled round wire	93
6.14.1.2. Motor with prewound coils	93
6.14.2. Bearing insulation	94
6.14.3. Switching frequency.....	94
6.14.4. Mechanical speed limitation.....	94
 7. COMMISSIONING	 95
7.1. INITIAL START-UP	95
7.2. OPERATING CONDITIONS	97
7.2.1.Limits of vibration	98
 8. MAINTENANCE	 99
8.1. GENERAL INSPECTION.....	99
8.2. LUBRICATION.....	99
8.2.1. Grease lubricated rolling bearings	100
8.2.1.1. Motor without grease fitting	103
8.2.1.2. Motor with grease fitting.....	103
8.2.1.3. Compatibility of the Mobil Polyrex EM grease with other greases	104
8.2.2. Oil lubricated bearings	104
8.2.3. Oil mist lubricated bearings.....	105
8.2.4. Sleeve bearings	105
8.3. MOTOR ASSEMBLY AND DISASSEMBLY	106
8.3.1. Terminal box.....	107
8.4. DRYING THE STATOR WINDING INSULATION	107
8.5. SPARE PARTS.....	108
 9. ENVIRONMENTAL INFORMATION	 109
9.1. PACKAGING.....	109
9.2. PRODUCT.....	109
 10. TROUBLESHOOTING CHART X SOLUTIONS	 110

1. TERMINOLOGY

Balancing: the procedure by which the mass distribution of a rotor is checked and, if necessary, adjusted to ensure that the residual unbalance or the vibration of the journals and/or forces on the bearings at a frequency corresponding to service speed are within specified limits in International Standards.
[ISO 1925:2001, definition 4.1]

Balance quality grade: indicates the peak velocity amplitude of vibration, given in mm/s, of a rotor running free-in-space and it is the product of a specific unbalance and the angular velocity of the rotor at maximum operating speed.

Grounded Part: metallic part connected to the grounding system.

Live Part: conductor or conductive part intended to be energized in normal operation, including a neutral conductor.

Authorized personnel: employee who has formal approval of the company.

Qualified personnel: employee who meets the following conditions simultaneously:

- Receives training under the guidance and responsibility of a qualified and authorized professional;
- Works under the responsibility of a qualified and approved professional.

Note: The qualification is only valid for the company that trained the employee in the conditions set out by the authorized and qualified professional responsible for training.



2. INITIAL RECOMMENDATIONS



Electric motors have energized circuits, exposed rotating parts and hot surfaces that may cause serious injury to people during normal operation. Therefore, it is recommended that transportation, storage, installation, operation and maintenance services are always performed by qualified personnel.

Also the applicable procedures and relevant standards of the country where the machine will be installed must be considered.

Noncompliance with the recommended procedures in this manual and other references on the WEG website may cause severe personal injuries and/or substantial property damage and may void the product warranty.

For practical reasons, it is not possible to include in this Manual detailed information that covers all construction variables nor covering all possible assembly, operation or maintenance alternatives.

This Manual contains only the required information that allows qualified and trained personnel to carry out their services. The product images are shown for illustrative purpose only.

For *Smoke Extraction Motors*, please refer to the additional instruction manual 50026367 available on the website www.weg.net.

For brake motors, please refer to the information contained in WEG 50021973 brake motor manual available on the website www.weg.net.

For information about permissible radial and axial shaft loads, please check the product technical catalogue.



The user is responsible for the correct definition of the installation environment and application characteristics.



During the warranty period, all repair, overhaul and reclamation services must be carried out by WEG authorized Service Centers to maintain validity of the warranty.

2.1. WARNING SYMBOL



Warning about safety and warranty.

2.2. RECEIVING INSPECTION

All motors are tested during the manufacturing process.

The motor must be checked when received for any damage that may have occurred during the transportation.

All damages must be reported in writing to the transportation company, to the insurance company and to WEG. Failure to comply with such procedures will void the product warranty.

You must inspect the product:

- Check if nameplate data complies with the purchase order;
 - Remove the shaft locking device (if any) and rotate the shaft by hand to ensure that it rotates freely;
 - Check that the motor has not been exposed to excessive dust and moisture during the transportation.
- Do not remove the protective grease from the shaft, or the plugs from the cable entries. These protections must remain in place until the installation has been completed.

2.3. NAMEPLATES

The nameplate contains information that describes the construction characteristics and the performance of the motor. Figure 2.1 and Figure 2.2 show nameplate layout examples.

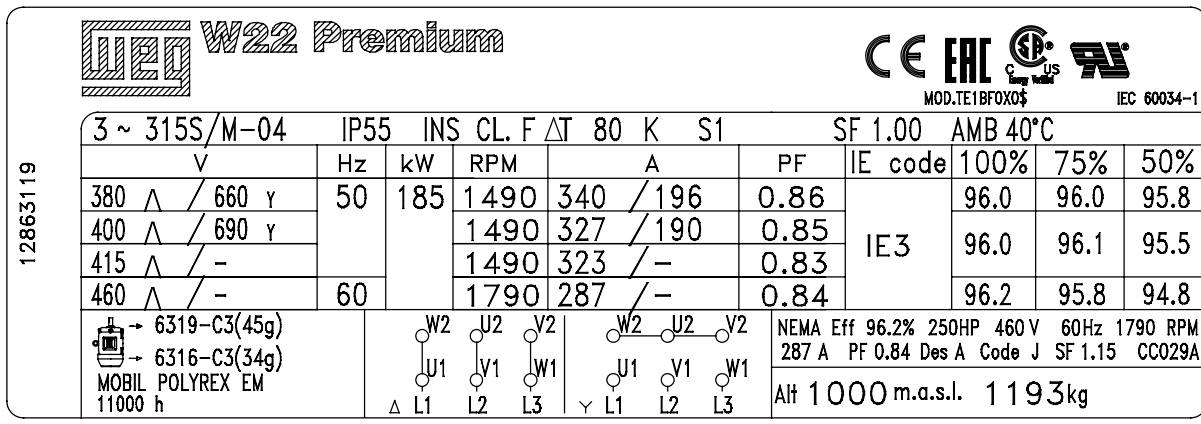
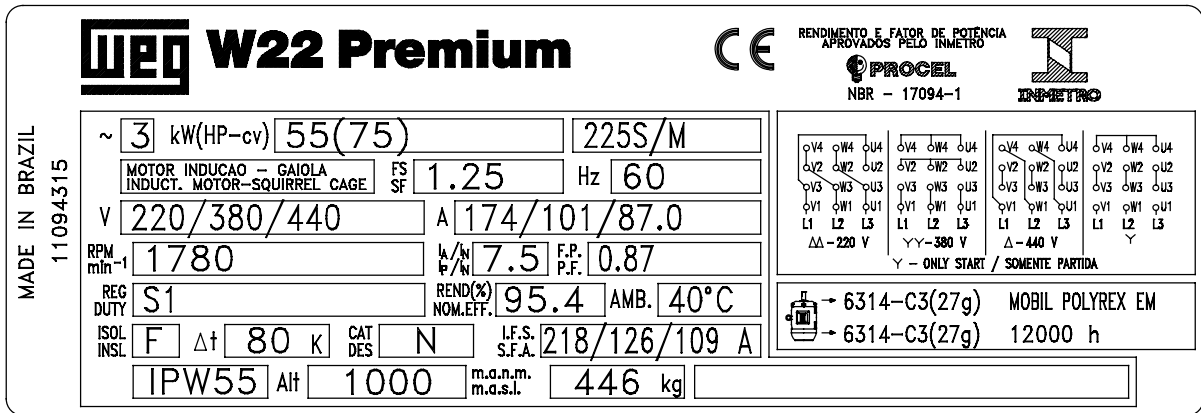
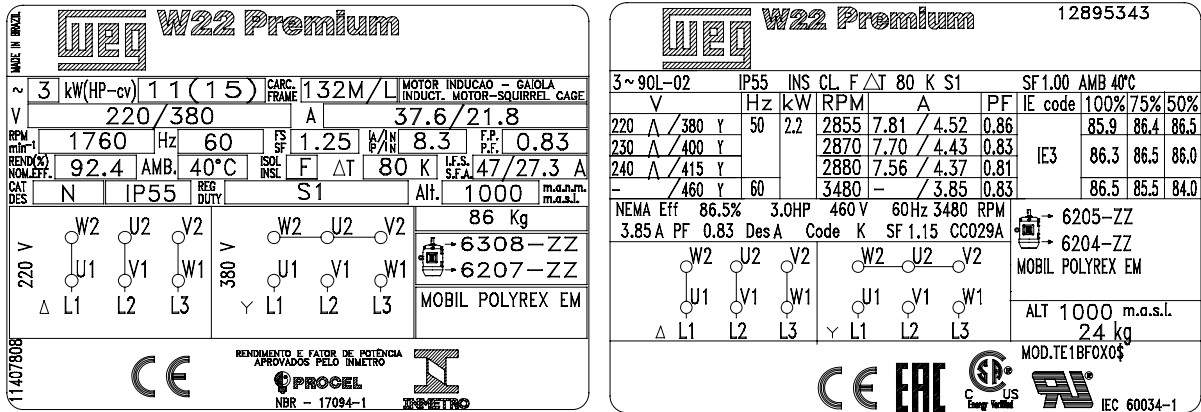


Figure 2.1 - IEC motor nameplate

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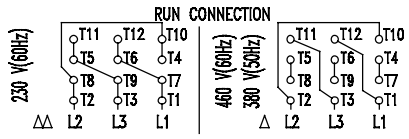
MADE IN BRAZIL 12714027	WEG HGF		CE NBR-17094-1		
	~ 3 kW(HP-cv) 370(500)	CARC. FRAME 315C/D/E			
	MOTOR INDUCAO - GAIOLA INDUCT. MOTOR-SQUIRREL CAGE	FS SF 1.00 Hz 60			
	V 380	A 680	→ 6320-C3(51g) MOBIL POLYREX EM → 6316-C3(34g) 4500 h		
	RPM min ⁻¹ 1784	kVA 6.8 F.P. 0.86			
	REG DUTY S1	REND(%) NOM.EFF. 96.1	AMB. 40°C		
	ISOL INSL. F Δt 80 K CAT DES N	L.F.S. S.F.A.			
	IP55 Alt 1000	m.a.n.m. m.a.s.l. 2161 kg			

12309946	WEG HGF		EAC CE VDE 0530 IEC 60034		
	~ 3 kW 560	FRAME 355C/D/E			
	V 460	Hz 60			
	A 841	SF 1.00	→ 6322-C3(60g) MOBIL POLYREX EM → 6319-C3(45g) 4500 h		
	min ⁻¹ 1783	P.F. 0.87			
	DUTY S1	AMB. 40°C			
	INS. CL. F Δt 80 K	IP55			
	Alt 1000 m.a.s.l. WEIGHT 3114 kg				

ENGLISH

11437961	W22 Inverter Duty Motor Severe Duty		MODEL:01018ET3E215T-W22			
	PH 3 HP(kW) 107.5	FRAME 213/5T	RPM 1760			
	V 208-230/ 460	Hz 60	SF 1.25	NEMA NOM. EFF. 91.7%		
	A 24.8/ 12.4	INS. CL. F Δt 80 k	P.F. 0.83	DUTY CONT.		
	SFA 31/15.5	A ENCL. TEFC	IP55	AMB. 40°C	ALT. 1000 m.a.s.l.	
	50Hz 1 OHP 380V 15.0A 1445RPM SF 1.0	CODE H DES B				
				→ 6308-ZZ → 6207-ZZ MOBIL POLYREX EM MOD.TE1BFOXON 182Lbs		
	USABLE AT 208V 27.4A FOR USE ON VPWM VFD 1000:1VT, 20:1CT, 1.0SF, I3.					
	Class I, Div. 2, Gr. A, B, C & D - T3 CC029A					
	Class I, Zone 2, IIC - T3 Class II, Div. 2, Gr. F and G - T4					

Figure 2.1 - IEC motor nameplate

MADE IN BRAZIL 11166657									Class I, Div. 2, Gr. A, B, C & D - T3 Class I, Zone 2, IIC - T3 Class II, Div 2, Gr. F and G - T4		
	Inverter Duty Motor Severe Duty		FOR SAFE AREA		MOD.TE1BFOXON		CAUTION: USE SUPPLY WIRES SUITABLE FOR 110°C				
	PH	3	HP(kW)	75(55)	FRAME	364/5T					
	V	208-230/460		Hz	60						
	A	186-168/84.1		SF	1.25						
	RPM	1775		SFA	210/105 A		INS. CL.	F		Δt 80 k	
	NEMA NOM. EFF.	95.4 %		P.F.	0.86						
	CODE	G	DES	B	AMB.	40°C		DUTY	CONT.		
	ENCL.	TEFC		TYPE	IP55		WEIGHT	923 Lbs		→ 6314-C3(27g) MOBIL POLYREX EM → 6314-C3(27g) 12000 h	
	USABLE AT 208V	186 A	50Hz	75HP	380V	103 A	1465 RPM	SF1.0		FOR USE ON VPWM VFD 1000:1VT, 20:1CT, 1.0SF,T3.	
							ALT.	1000 m.a.s.l.			




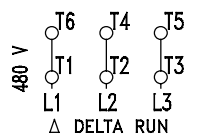
MADE IN BRAZIL 12774002											
	PH	3	HP	700	FRAME	6806/7/8T					
	V	480		Hz	60						
	A	755		SF	1.00						
	RPM	1192		SFA			INS. CL.	F		→ 6324-C3(72g) MOBIL POLYREX EM → 6319-C3(45g) 4500 h	
	NEMA NOM. EFF.	96.5 %		P.F.	0.85						
	CODE	G	DES		AMB.	40°C		DUTY	CONT.		
	ENCL.	TEFC		TYPE	ET		WEIGHT	8339 Lbs			
	Alt.	1000 m.a.s.l.									

Figure 2.2 - NEMA motor nameplate

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3. SAFETY INSTRUCTIONS



The motor must be disconnected from the power supply and be completely stopped before conducting any installation or maintenance procedures. Additional measures should be taken to avoid accidental motor starting.



Professionals working with electrical installations, either in the assembly, operation or maintenance, should use proper tools and be instructed on the application of standards and safety requirements, including the use of Personal Protective Equipment (PPE) that must be carefully observed in order to reduce risk of personal injury during these services.



Electric motors have energized circuits, exposed rotating parts and hot surfaces that may cause serious injury to people during normal operation. It is recommended that transportation, storage, installation, operation and maintenance services are always performed by qualified personnel.

Always follow the safety, installation, maintenance and inspection instructions in accordance with the applicable standards in each country.

4. HANDLING AND TRANSPORT

Individually packaged motors should never be lifted by the shaft or by the packaging. They must be lifted only by means of the eyebolts, when supplied. Use always suitable lifting devices to lift the motor. Eyebolts on the frame are designed for lifting the machine weight only as indicated on the motor nameplate. Motors supplied on pallets must be lifted by the pallet base with lifting devices fully supporting the motor weight.

The package should never be dropped. Handle it carefully to avoid bearing damage.



Eyebolts provided on the frame are designed for lifting the machine only. Do not use these eyebolts for lifting the motor with coupled equipment such as bases, pulleys, pumps, reducers, etc..

Never use damaged, bent or cracked eyebolts. Always check the eyebolt condition before lifting the motor.

Eyebolts mounted on components, such as on end shields, forced ventilation kits, etc. must be used for lifting these components only. Do not use them for lifting the complete machine set.

Handle the motor carefully without sudden impacts to avoid bearing damage and prevent excessive mechanical stresses on the eyebolts resulting in its rupture.



To move or transport motors with cylindrical roller bearings or angular contact ball bearings, use always the shaft locking device provided with the motor.

All HGF motors, regardless of bearing type, must be transported with shaft locking device fitted.

Vertical mounted motors with oil-lubricated bearings must be transported in the vertical position. If necessary to move or transport the motor in the horizontal position, install the shaft locking device on both sides (drive end and non-drive end) of the motor.

4.1. LIFTING



Before lifting the motor ensure that all eyebolts are tightened properly and the eyebolt shoulders are in contact with the base to be lifted, as shown in Figure 4.1. Figure 4.2 shows an incorrect tightening of the eyebolt.

Ensure that lifting machine has the required lifting capacity for the weight indicated on the motor nameplate.



Figure 4.1 - Correct tightening of the eyebolt



Figure 4.2 - Incorrect tightening of the eyebolt



The center-of-gravity may change depending on motor design and accessories. During the lifting procedures the maximum allowed angle of inclination should never be exceeded as specified below.

4.1.1. Horizontal motors with one eyebolt

For horizontal motors fitted with only one eyebolt, the maximum allowed angle-of-inclination during the lifting process should not exceed 30° in relation to the vertical axis, as shown in Figure 4.3.

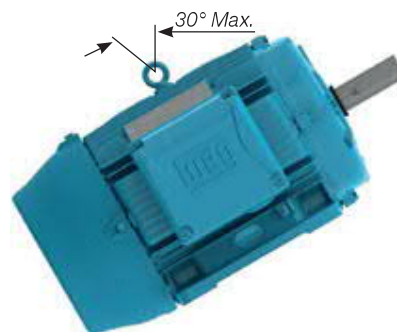


Figure 4.3 - Maximum allowed angle-of-inclination for motor with one eyebolt

4.1.2. Horizontal motor with two eyebolts

When motors are fitted with two or more eyebolts, all supplied eyebolts must be used simultaneously for the lifting procedure.

There are two possible eyebolt arrangements (vertical and inclined), as shown below:

- For motors with vertical lifting eyebolts, as shown in Figure 4.4, the maximum allowed lifting angle should not exceed 45° in relation to the vertical axis. We recommend to use a spreader beam for maintaining the lifting elements (chain or rope) in vertical position and thus preventing damage to the motor surface;



Figure 4.4 - Maximum resulting angle for motors with two or more lifting eyebolts

- For HGF, W40 and W50 motors, as shown in Figure 4.5, the maximum resulting angle should not exceed 30° in relation to the vertical axis;

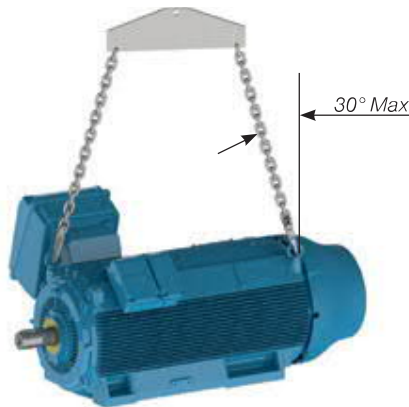


Figure 4.5 - Maximum resulting angle for horizontal HGF, W40 and W50 motors

- For motors fitted with inclined eyebolts, as shown in Figure 4.6, the use of a spreader beam is required for maintaining the lifting elements (chain or rope) in vertical position and thus preventing damage to the motor surface.



Figure 4.6 - Use of a spreader beam for lifting

4.1.3. Vertical motors

For vertical mounted motors, as shown in Figure 4.7, the use of a spreader beam is required for maintaining the lifting element (chain or rope) in vertical position and thus preventing damage to the motor surface.



Figure 4.7 - Lifting of vertical mounted motors



Always use the eyebolts mounted on the top side of the motor, diametrically opposite, considering the mounting position. See Figure 4.8.



Figure 4.8 - Lifting of HGF and W50 motors.

4.1.3.1. Procedures to place W22 motors in the vertical position

For safety reasons during the transport, vertical mounted Motors are usually packed and supplied in horizontal position.

To place W22 motors fitted with eyebolts (see Figure 4.6), to the vertical position, proceed as follows:

1. Ensure that the eyebolts are tightened properly, as shown in Figure 4.1;
2. Remove the motor from the packaging, using the top mounted eyebolts, as shown in Figure 4.9;



Figure 4.9 - Removing the motor from the packaging

3. Install a second pair of eyebolts, as shown in Figure 4.10;



Figure 4.10 - Installation of the second pair of eyebolts

4. Reduce the load on the first pair of eyebolts to start the motor rotation, as shown in Figure 4.11. This procedure must be carried out slowly and carefully.



Figure 4.11 - End result: motor placed in vertical position

These procedures will help you to move motors designed for vertical mounting. These procedures are also used to place the motor from the horizontal position into the vertical position and vertical to horizontal.

4.1.3.2. Procedures to place HGF and W50 motors in the vertical position

HGF motors are fitted with eight lifting points: four at drive end and four at non-drive end. W50 motors are fitted with nine lifting points: four at drive end, one in the central part and four at non-drive end. The motors are usually transported in horizontal position, however for the installation they must be placed in the vertical position.

To place an these motors in the vertical position, proceed as follows:

1. Lift the motor by using the four lateral eyebolts and two hoists, see Figure 4.12;



Figure 4.12 - Lifting of HGF and W50 motors with two hoists

2. Lower the hoist fixed to motor drive end while lifting the hoist fixed to motor non-drive end until the motor reaches its equilibrium, see Figure 4.13;



Figure 4.13 - Placing HGF and W50 motors in vertical position

3. Remove the hoist hooks from the drive end eyebolts and rotate the motor 180° to fix the removed hooks into the two eyebolts at the motor non-drive end, see Figure 4.14;



Figure 4.14 - Lifting HGF and W50 motors by the eyebolts at the non-drive end

4. Fix the removed hoist hooks in the other two eyebolts at the non-drive end and lift the motor until the vertical position is reached, see Figure 4.15.



Figure 4.15 - HGF and W50 motors in the vertical position

These procedures will help you to move motors designed for vertical mounting. These procedures are also used to place the motor from the horizontal position into the vertical position and vertical to horizontal.

4.2 Procedures to place W22 vertical mount motors in horizontal position

To place W22 vertical mount motor in horizontal position, proceed as follows:

1. Ensure that all eyebolts are tightened properly, as shown in Figure 4.1;
2. Install the first pair of eyebolts and lift the motor as shown in Figure 4.16;



Figure 4.16 - Install the first pair of eyebolts

3. Install the second pair of eyebolts, as shown in Figure 4.17;



Figure 4.17 - Install the second pair of eyebolts

4. Reduce the load on the first pair of eyebolts for rotating the motor, as shown in Figure 4.18. This procedure must be carried out slowly and carefully;



Figure 4.18 - Motor is being rotated to horizontal position

5. Remove the first pair of eyebolts, as shown in Figure 4.19.



Figure 4.19 - Final result: motor placed in horizontal position

5. STORAGE

If the motor is not installed immediately, it must be stored in a dry and clean environment, with relative humidity not exceeding 60%, with an ambient temperature between 5 °C and 40 °C, without sudden temperature changes, free of dust, vibrations, gases or corrosive agents. The motor must be stored in horizontal position, unless specifically designed for vertical operation, without placing objects on it. Do not remove the protection grease from shaft end to prevent rust.

If the motor are fitted with space heaters, they must always be turned on during the storage period or when the installed motor is out of operation. Space heaters will prevent water condensation inside the motor and keep the winding insulation resistance within acceptable levels. Store the motor in such position that the condensed water can be easily drained. If fitted, remove pulleys or couplings from the shaft end (more information are given on item 6).



The space heaters should never be energized when the motor is in operation.

5.1. EXPOSED MACHINED SURFACES

All exposed machined surfaces (like shaft end and flange) are factory-protected with temporary rust inhibitor. A protective film must be reapplied periodically (at least every six months), or when it has been removed and/or damaged.

5.2. STORAGE

The stacking height of the motor packaging during the storage period should not exceed 5 m, always considering the criteria indicated in Table 5.1:

Table 5.1 - Max. recommended stacking height

Packaging type	Frame sizes	Maximum stacking quantity
Cardboard box	IEC 63 to 132 NEMA 143 to 215	Indicated on the top side of the cardboard box
Wood crate	IEC 63 to 315 NEMA 48 to 504/5	06
	IEC 355 NEMA 586/7 and 588/9	03
	W40 / W50 / HGF IEC 315 to 630 W40 / W50 / HGF NEMA 5000 to 9600	Indicated on the packaging

Notes:

- 1) Never stack larger packaging onto smaller packaging;
- 2) Align the packaging correctly (see Figure 5.1 and Figure 5.2);



Figure 5.1 - Correct stacking

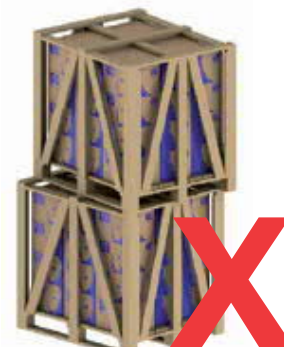


Figure 5.2 - Incorrect stacking

3) The feet of the crates above should always be supported by suitable wood battens (Figure 5.3) and never stand on the steel tape or without support (Figure 5.4);

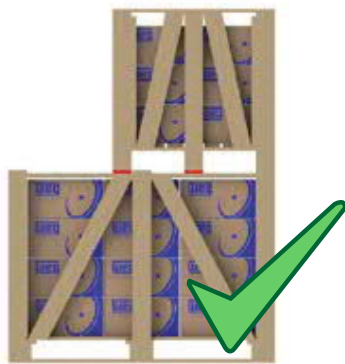


Figure 5.3 - Correct stacking

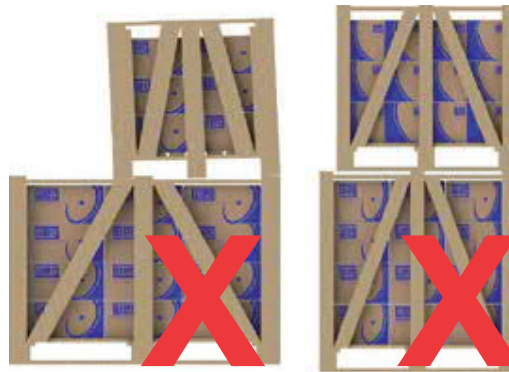


Figure 5.4 - Incorrect stacking

4) When stacking smaller crates onto longer crates, always ensure that suitable wooden supports are provided to withstand the weight (see Figure 5.5). This condition usually occurs with motor packaging above IEC 225S/M (NEMA 364/5T) frame sizes.



Figure 5.5 - Use of additional battens for stacking

5.3 BEARINGS

5.3.1 Grease lubricated bearings

We recommend rotating the motor shaft at least once a month (by hand, at least five revolutions, stopping the shaft at a different position from the original one). If the motor is fitted with shaft locking device, remove it before rotating the shaft and install it again before performing any handling procedure. Vertical motors may be stored in the vertical or in horizontal position. If motors with open bearings are stored longer than six months, the bearings must be relubricated according to item 8.2 before commissioning of the motor. If the motor is stored for longer than 2 years, the bearings must be replaced or removed, washed, inspected and relubricated according to item 8.2.

5.3.2 Oil lubricated bearings

The motor must be stored in its original operating position and with oil in the bearings. Correct oil level must be ensured. It should be in the center of the sight glass.

During the storage period, remove the shaft locking device and rotate the shaft by hand every month, at least five revolutions, thus achieving an even oil distribution inside the bearing and maintaining the bearing in good operating conditions. Reinstall the shaft locking device every time the motor has to be moved.

If the motor is stored for a period equal or longer than the oil change interval, the oil must be replaced according to Item 8.2, before starting the operation. If the motor is stored for a period of over two years, the bearings must be replaced or removed, washed according to manufacturer instructions, checked and relubricated according to Item 8.2. The oil of vertical mounted motors is removed to prevent oils leaks during the transport. After receiving the motor the bearings must be lubricated.

5.3.3 Oil Mist lubricated bearings

The motor must be stored in horizontal position. Lubricate the bearings with ISO VG 68 mineral oil in the amount indicated in the Table 5.2 (this is also valid for bearings with equivalent dimensions). After filling with oil, rotate the shaft by hand, at least five revolutions)

During the storage period, remove the shaft locking device (if any) and rotate the shaft by hand every week, at least five revolutions, stopping it at a different position from the original one. Reinstall the shaft locking device every time the motor has to be moved. If the motor is stored for a period of over two years, the bearings must be replaced or removed, washed according to manufacturer instructions, checked and relubricated according to item 8.2.

Table 5.2 - Amount of oil per bearing

Bearing size	Amount of oil (ml)	Bearing size	Amount of oil (ml)
6201	15	6309	65
6202	15	6311	90
6203	15	6312	105
6204	25	6314	150
6205	25	6315	200
6206	35	6316	250
6207	35	6317	300
6208	40	6319	350
6209	40	6320	400
6211	45	6322	550
6212	50	6324	600
6307	45	6326	650
6308	55	6328	700

The oil must always be removed when the motor has to be handled. If the oil mist system is not operating after installation, fill the bearings with oil to prevent bearing rusting. During the storage period, rotate the shaft by hand, at least five revolutions, stopping it at a different position from the original one. Before starting the motor, all bearing protection oil must be drained from the bearing and the oil mist system must be switched ON.

5.3.4 Sleeve bearing

The motor must be stored in its original operating position and with oil in the bearings. Correct oil level must be ensured. It should be in the middle of the sight glass. During the storage period, remove the shaft locking device and rotate the shaft by hand every month, at least five revolutions, and at 30 rpm, thus achieving an even oil distribution inside the bearing and maintaining the bearing in good operating conditions. Reinstall the shaft locking device every time the motor has to be moved.

If the motor is stored for a period equal or longer than the oil change interval, the oil must be replaced, according to Item 8.2, before starting the operation.

If the motor is stored for a period longer than the oil change interval, or if it is not possible to rotate the motor shaft by hand, the oil must be drained and a corrosion protection and dehumidifiers must be applied.

5.4. INSULATION RESISTANCE

We recommend measuring the winding insulation resistance at regular intervals to follow-up and evaluate its electrical operating conditions. If any reduction in the insulation resistance values are recorded, the storage conditions should be evaluated and corrected, where necessary.

5.4.1. Insulation resistance measurement

We recommend measuring the winding insulation resistance at regular intervals to follow-up and evaluate its electrical operating conditions. If any reduction in the insulation resistance values are recorded, the storage conditions should be evaluated and corrected, where necessary.



The insulation resistance must be measured in a safe environment.

The insulation resistance must be measured with a megohmmeter. The machine must be in cold state and disconnected from the power supply.



To prevent the risk of an electrical shock, ground the terminals before and after each measurement. Ground the capacitor (if any) to ensure that it is fully discharged before the measurement is taken.

It is recommended to insulate and test each phase separately. This procedure allows the comparison of the insulation resistance between each phase. During the test of one phase, the other phases must be grounded. The test of all phases simultaneously evaluates the insulation resistance to ground only but does not evaluate the insulation resistance between the phases.

The power supply cables, switches, capacitors and other external devices connected to the motor may considerably influence the insulation resistance measurement. Thus all external devices must be disconnected and grounded during the insulation resistance measurement.

Measure the insulation resistance one minute after the voltage has been applied to the winding. The applied voltage should be as shown in Table 5.3.

Table 5.3 - Voltage for the insulation resistance

Winding rated voltage (V)	Testing voltage for measuring the insulation resistance (V)
< 1000	500
1000 - 2500	500 - 1000
2501 - 5000	1000 - 2500
5001 - 12000	2500 - 5000
> 12000	5000 - 10000

The reading of the insulation resistance must be corrected to 40 °C as shown in the Table 5.4.

Table 5.4 - Correction factor for the insulation resistance corrected to 40 °C

Measuring temperature of the insulation resistance (°C)	Correction factor of the insulation resistance corrected to 40 °C	Measuring temperature of the insulation resistance (°C)	Correction factor of the insulation resistance corrected to 40 °C
10	0.125	30	0.500
11	0.134	31	0.536
12	0.144	32	0.574
13	0.154	33	0.616
14	0.165	34	0.660
15	0.177	35	0.707
16	0.189	36	0.758
17	0.203	37	0.812
18	0.218	38	0.871
19	0.233	39	0.933
20	0.250	40	1.000
21	0.268	41	1.072
22	0.287	42	1.149
23	0.308	43	1.231
24	0.330	44	1.320
25	0.354	45	1.414
26	0.379	46	1.516
27	0.406	47	1.625
28	0.435	48	1.741
29	0.467	49	1.866
30	0.500	50	2.000

ENGLISH

The motor insulation condition must be evaluated by comparing the measured value with the values indicated in Table 5.5 (corrected to 40 °C):

Table 5.5 - Evaluation of the insulation system

Limit value for rated voltage up to 1.1 kV (MΩ)	Limit value for rated voltage above 1.1 kV (MΩ)	Situation
Up to 5	Up to 100	Dangerous. The motor can not be operated in this condition
5 to 100	100 to 500	Regular
100 to 500	Higher than 500	Good
Higher than 500	Higher than 1000	Excellent

The values indicated in the table should be considered only as reference values. It is advisable to log all measured values to provide a quick and easy overview on the machine insulation resistance.

If the insulation resistance is low, moisture may be present in the stator windings. In this case the motor should be removed and transported to a WEG authorized Service Center for proper evaluation and repair (This service is not covered by the warranty). To improve the insulation resistance through the drying process, see section 8.4.



6. INSTALLATION



The insulation resistance must be measured in a safe environment.

Check some aspects before proceeding with the installation:

1. Insulation resistance: must be within the acceptable limits. See item 5.4.
2. Bearings:
If the motor is installed without running immediately, proceed as described in item 5.3.
3. Operating conditions of the start capacitors: If single-phase motors are stored for a period of over two years, it is recommended to change the start capacitors before motor starting since they lose their operating characteristics.
4. Terminal box:
 - a. the inside of the terminal box must be clean and dry;
 - b. the contacts must be correctly connected and corrosion free. See 6.9 and 6.10;
 - c. the cable entries must be correctly sealed and the terminal box cover properly mounted in order to ensure the degree of protection indicated on the motor nameplate.
5. Cooling: the cooling fins, air inlet and outlet openings must be clean and unobstructed. The distance between the air inlet openings and the wall should not be shorter than $\frac{1}{4}$ (one quarter) of the diameter of the air inlet. Ensure sufficient space to perform the cleaning services. See item 7.
6. Coupling: remove the shaft locking device (where fitted) and the corrosion protection grease from the shaft end and flange just before installing the motor. See item 6.4.
7. Drain hole: the motor must always be positioned so the drain hole is at the lowest position (If there is any indication arrow on the drain, the drain must be so installed that the arrow points downwards).
Motors supplied with rubber drain plugs leave the factory in the closed position and must be opened periodically to allow the exit of condensed water. For environments with high water condensation levels and motor with degree of protection IP55, the drain plugs can be mounted in open position (see Figure 6.1). For motors with degree of protection IP56, IP65 or IP66, the drain plugs must remain at closed position (see Figure 6.1), being opened only during the motor maintenance procedures.
The drain system of motors with Oil Mist lubrication system must be connected to a specific collection system (see Figure 6.12).

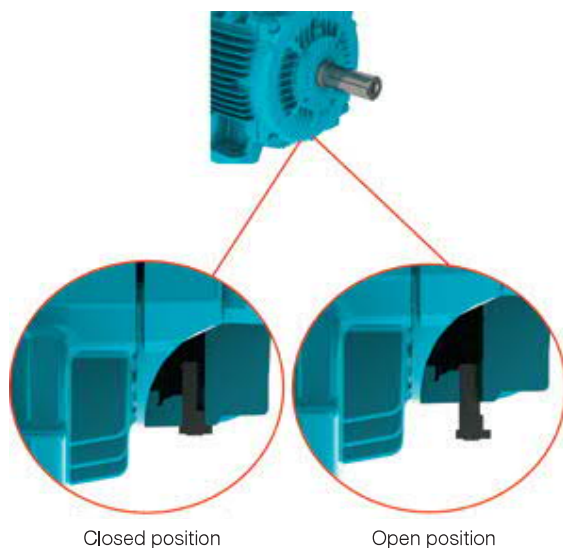


Figure 6.1 - Detail of the rubber drain plug mounted in closed and open position

8. Additional recommendations:

- a. Check the direction of motor rotation, starting the motor at no-load before coupling it to the load;
- b. Vertical mounted motors with shaft end down must be fitted with drip cover to protect them from liquids or solids that may drop onto the motors;
- c. Vertical mounted motors with shaft end up should be fitted with water slinger ring to prevent water ingress inside the motor.
- d. The fixing elements mounted in the threaded through holes in the motor enclosure (for example, the flange) must be properly sealed.



Remove or fix the shaft key before starting the motor.



Changes on the motor construction (features), such as installation of extended grease fittings or modification of the lubrication system, installation of accessories at alternative locations, etc., can be carried out only after prior written consent from WEG.

6.1. FOUNDATIONS

The foundation is the structure, structural element, natural or prepared base, designed to withstand the stresses produced by the installed equipment, ensuring safe and stable performance during operation. The foundation design should consider the adjacent structures to avoid the influences of other installed equipment and no vibration is transferred through the structure

The foundation must be flat and its selection and design must consider the following characteristics:

- a) The features of the machine to be installed on the foundation, the driven loads, application, maximum allowed deformations and vibration levels (for instance, motors with reduced vibration levels, foot flatness, flange concentricity, axial and radial loads, etc. lower than the values specified for standard motors).
- b) Adjacent buildings, conservation status, maximum applied load estimation, type of foundation and fixation and vibrations transmitted by these constructions.

If the motor is supplied with leveling/alignment bolts, this must be considered in the base design.



Please consider for the foundation dimensioning all stresses that are generated during the operation of the driven load.
The user is responsible for the foundation designing and construction.

The foundation stresses can be calculated by using the following equations (see Figure 6.2):

$$F_1 = 0,5 * g * m - (4 * T_b / A)$$

$$F_2 = 0,5 * g * m + (4 * T_b / A)$$

Where:

F_1 and F_2 = lateral stresses (N);

g = gravitational acceleration (9,8 m/s²);

m = motor weight (kg);

T_b = breakdown torque (Nm);

A = distance between centerlines of mounting holes in feet or base of the machine (end view) (m).



The motors may be mounted on:

- Concrete bases: are most used for large-size motors (see Figure 6.2);
- Metallic bases: are generally used for small-size motors (see Figure 6.3).

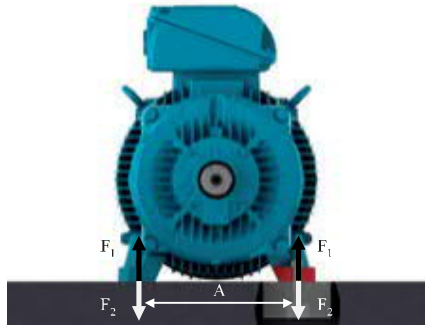


Figure 6.2 - Motor installed on concrete base



Figure 6.3 - Motor installed on metallic base

The metallic and concrete bases may be fitted with sliding system. These types of foundations are generally used where the power transmission is achieved by belts and pulleys. This power transmission system is easier to assemble/disassemble and allows the belt tension adjustment. Other important aspect of this foundation type is the location of the base locking screws that must be diagonally opposite. The rail nearest the drive pulley is placed in such a way that the positioning bolt is between the motor and the driven machine. The other rail must be placed with the bolt on the opposite side (diagonally opposite), as shown in Figure 6.4 .

To facilitate assembly, the bases may have the following features:

- Shoulders and/or recesses;
- Anchor bolts with loose plates;
- Bolts cast in the concrete;
- Leveling screws;
- Positioning screws;
- Steel & cast iron blocks, plates with flat surfaces.

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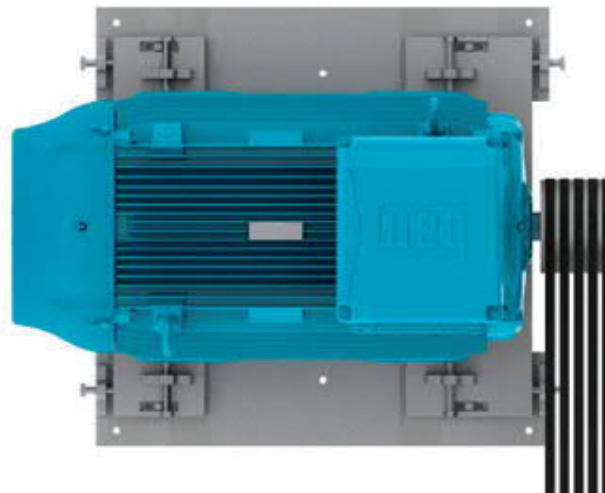


Figure 6.4 - Motor installed on sliding base

After completing the installation, it is recommended that all exposed machined surfaces are coated with suitable rust inhibitor.

6.2. MOTOR MOUNTING



Footless motors supplied with transportation devices, according to Figure 6.5, must have their devices removed before starting the motor installation.

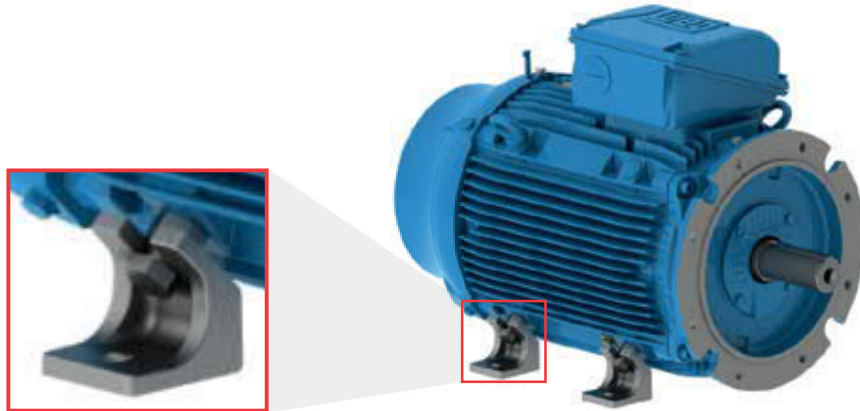


Figure 6.5 - Detail of the transportation devices for footless motors

6.2.1. Foot mounted motors

The drawings of the mounting hole dimensions for NEMA or IEC motors can be checked in the respective technical catalogue.

The motor must be correctly aligned and leveled with the driven machine. Incorrect alignment and leveling may result in bearing damage, generate excessive vibration and even shaft distortion/breakage.

For more details, see section 6.3 and 6.6. The thread engagement length of the mounting bolt should be at least 1,5 times the bolt diameter. This thread engagement length should be evaluated in more severe applications and increased accordingly.

Figure 6.6 shows the mounting system of a foot mounted motor indicating the minimum required thread engagement length.

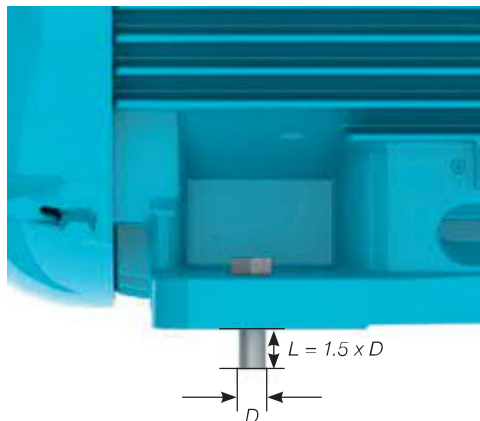


Figure 6.6 - Mounting system of a foot mounted motor

6.2.2. Flange mounted motors

The drawings of the flange mounting dimensions, IEC and NEMA flanges, can be checked in the technical catalogue.

The coupling of the driven equipment to the motor flange must be properly dimensioned to ensure the required concentricity of the assembly.

Depending on the flange type, the mounting can be performed from the motor to the driven equipment flange (flange FF (IEC) or D (NEMA)) or from the driven equipment flange to the motor (flange C (DIN or NEMA)).

For the mounting process from the driven equipment flange to the motor, you must consider the bolt length, flange thickness and the thread depth of the motor flange.



If the motor flange has tapped through-holes, the length of the mounting bolts must not exceed the tapped through-hole length of the motor flange, thus preventing damage to the winding head.

For flange mounting the thread engagement length of the mounting bolt should be at least 1.5 times the bolt diameter. In severe applications, longer thread engagement length may be required. In severe applications or if large motors are flange mounted, a foot or pad mounting may be required in addition to the flange mounting (Figure 6.7). The motor must never be supported on its cooling fins.

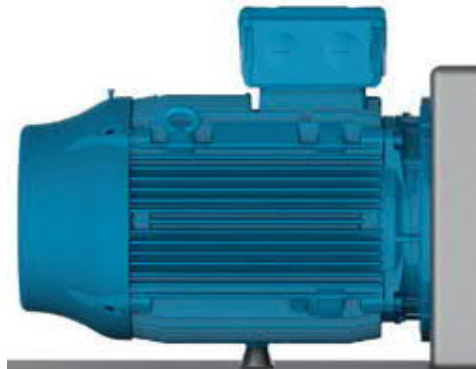


Figure 6.7 - Mounting method of flange mounted motors with frame base support

Note:

When liquid (for example oil) is likely to come into contact with the shaft seal, please contact your local WEG representative.

6.2.3. Pad mounted motors

Typically, this method of mounting is used in axial fans. The motor is fixed by tapped holes in the frame. The dimensions of these tapped holes can be checked in the respective product catalogue. The selection of the motor mounting rods/bolts must consider the dimensions of the fan case, the installation base and the thread depth in the motor frame.

The mounting rods and the fan case wall must be sufficiently stiff to prevent the transmission of excessive vibration to the machine set (motor & fan). Figure 6.8 shows the pad mounting system.

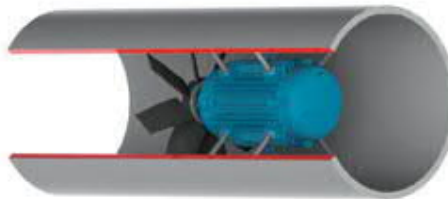


Figure 6.8 - Mounting of the motor inside the cooling duct

6.3. BALANCING

Unbalanced machines generate vibration which can result in damage to the motor. WEG motors are dynamically balanced with “half key” and without load (uncoupled). Special balancing quality level must be stated in the Purchase Order.



The transmission elements, such as pulleys, couplings, etc., must be balanced with “half key” before they are mounted on the motor shaft.

The balance quality grade meets the applicable standards for each product line.

The maximum balancing deviation must be recorded in the installation report.

6.4. COUPLINGS

Couplings are used to transmit the torque from the motor shaft to the shaft of the driven machine. The following aspects must be considered when couplings are installed:

- Use proper tools for coupling assembly & disassembly to avoid damages to the motor and bearings;
- Whenever possible, use flexible couplings, since they can absorb eventual residual misalignments during the machine operation;
- The maximum loads and speed limits informed in the coupling and motor manufacturer catalogues cannot be exceeded;
- Level and align the motor as specified in sections 6.5 and 6.6, respectively.



Remove or fix the shaft key firmly when the motor is operated without coupling in order to prevent accidents.

6.4.1. Direct coupling

Direct coupling is characterized when the Motor shaft is directly coupled to the shaft of the driven machine without transmission elements. Whenever possible, use direct coupling due to lower cost, less space required for installation and more safety against accidents.



Do not use roller bearings for direct coupling, unless sufficient radial load is expected.

6.4.2. Gearbox coupling

Gearbox coupling is typically used where speed reduction is required. Make sure that shafts are perfectly aligned and strictly parallel (in case of straight spur gears) and in the right meshing angle (in case of bevel and helical gears).

6.4.3. Pulley and belt coupling

Pulleys and belts are used when speed increase or reduction between motor shaft and driven load is required.



Excessive belt tension will damage the bearings and cause unexpected accidents such as breakage of the motor shaft.

6.4.4. Coupling of sleeve bearing motors



Motors designed with sleeve bearings must be operated with direct coupling to the driven machine or a gearbox. Pulley and belts can not be applied for sleeve bearing motors.

Motors designed with sleeve bearings have 3 (three) marks on the shaft end. The center mark is the indication of the magnetic center and the 2 (two) outside marks indicate the allowed limits of the rotor axial movement, as shown in Figure 6.9.

The motor must be so coupled that during operation the arrow on the frame is placed over the central mark indicating the rotor magnetic center. During start-up, or even during operation, the rotor may freely move between the two outside marks when the driven machine exerts an axial load on the motor shaft. However, under no circumstance, the motor can operate continuously with axial forces on the bearing.

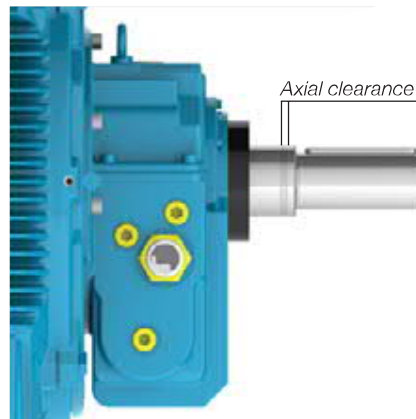


Figure 6.9 - Axial clearance of motor designed with sleeve bearing





For coupling evaluation consider the maximum axial bearing clearance as shown in Table 6.1. The axial clearance of the driven machine and coupling influence the maximum bearing clearance.

Table 6.1 - Clearance used for sleeve bearings

Bearing size	Total axial clearance (mm)
9*	3 + 3 = 6
11*	4 + 4 = 8
14*	5 + 5 = 10
18	7,5 + 7,5 = 15

* For Motors in accordance with API 541, the total axial clearance is 12.7 mm

The sleeve bearings used by WEG were not designed to support axial load continuously. Under no circumstance must the motor be operated continuously at its axial clearance limits.

6.5. LEVELING

The motor must be leveled to correct any deviations in flatness arising from the manufacturing process and the material structure rearrangement. The leveling can be carried out by a leveling screw fixed on the motor foot or on the flange or by means of thin compensation shims. After the leveling process, the leveling height between the motor mounting base and the motor cannot exceed 0,1 mm.

If a metallic base is used to level the height of the motor shaft end and the shaft end of the driven machine, level only the metallic base relating to the concrete base.

Record the maximum leveling deviations in the installation report.

6.6. ALIGNMENT

The correct alignment between the motor and the driven machine is one of the most important variables that extends the useful service life of the motor. Incorrect coupling alignment generates high loads and vibrations reducing the useful life of the bearings and even resulting in shaft breakages. Figure 6.10 illustrates the misalignment between the motor and the driven machine.

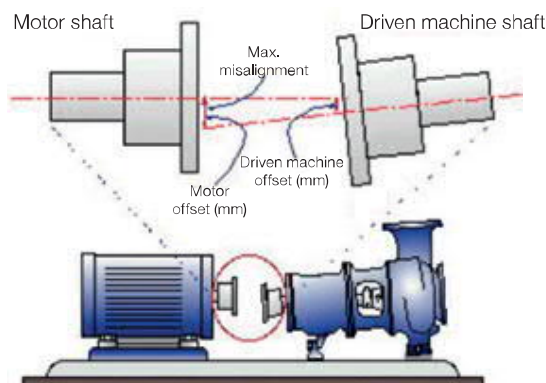


Figure 6.10 - Typical misalignment condition

Alignment procedures must be carried out using suitable tools and devices, such as dial gauge, laser alignment instruments, etc.. The motor shaft must be aligned axially and radially with the driven machine shaft.

The maximum allowed eccentricity for a complete shaft turn should not exceed 0.03 mm, when alignment is made with dial gauges, as shown in Figure 6.11. Ensure a gap between couplings to compensate the thermal expansion between the shafts as specified by the coupling manufacturer.

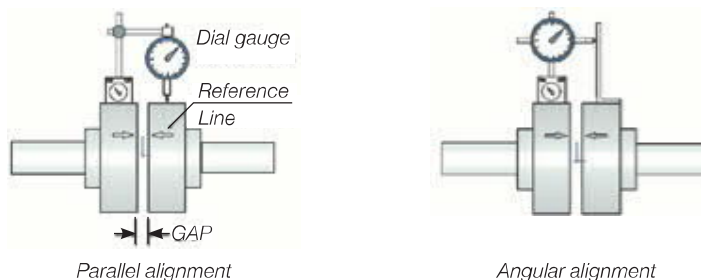


Figure 6.11 - Alignment with dial gauge

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If alignment is made by a laser instrument, please consider the instructions and recommendations provided by the laser instrument manufacturer.

The alignment should be checked at ambient temperature with machine at operating temperature.



The coupling alignment must be checked periodically.

Pulley and belt couplings must be so aligned that the driver pulley center lies in the same plane of the driven pulley center and the motor shaft and the shaft of the driven machine are perfectly parallel.

After completing the alignment procedures, ensure that mounting devices do not change the motor and machine alignment and leveling resulting into machine damage during operation.

It is recommended to record the maximum alignment deviation in the Installation Report.

6.7. CONNECTION OF OIL LUBRICATED OR OIL MIST LUBRICATED MOTORS

When oil lubricated or oil mist lubricated motors are installed, connect the existing lubricant tubes (oil inlet and oil outlet tubes and motor drain tube), as shown in Figure 6.12. The lubrication system must ensure continuous oil flow through the bearings as specified by the manufacturer of the installed lubrication system.

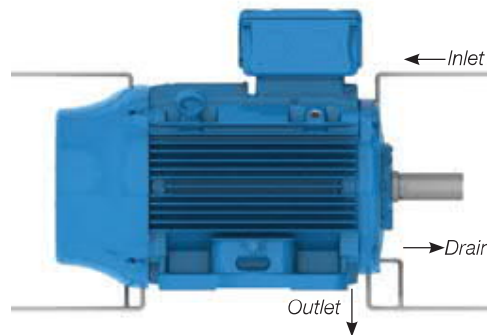


Figure 6.12 - Oil supply and drain system of oil lubricated or oil mist lubricated motors

6.8. CONNECTION OF THE COOLING WATER SYSTEM

When water cooled motors are installed, connect the water inlet and outlet tubes to ensure proper motor cooling. According to item 7.2, ensure correct cooling water flow rate and water temperature in the motor cooling system.

6.9. ELECTRICAL CONNECTION

Consider the rated motor current, service factor, starting current, environmental and installation conditions, maximum voltage drop, etc. to select appropriate power supply cables and switching and protection devices. All motors must be installed with overload protection systems. Three-phase motors should be fitted with phase fault protection systems.



Before connecting the motor, check if the power supply voltage and the frequency comply with the motor nameplate data. All wiring must be made according to the connection diagram on the motor nameplate. Please consider the connection diagrams in the Table 6.2 as reference value.

To prevent accidents, check if motor has been solidly grounded in accordance with the applicable standards.



Table 6.2 - Typical connection diagram for three-phase motors.


Configuration	Quantity of leads	Type of connection	Connection diagram
Single speed	3	-	
	6	Δ - Y	
	9	YY - Y	
		$\Delta\Delta$ - Δ	
	12	$\Delta\Delta$ - YY - Δ - Y	
Double speed Dahlander	6	YY - Y Variable Torque	
		Δ - YY Constant Torque	
		YY - Δ Constant Output	
	9	Δ - Y - YY	
Double speed Double winding	6	-	

Equivalent table for lead identification

Lead identification on the wiring diagram		1	2	3	4	5	6	7	8	9	10	11	12
Single speed	NEMA MG 1 Part 2	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12
	IEC 60034-8	U1	V1	W1	U2	V2	W2	U3	V3	W3	U4	V4	W4
	JIS (JEC 2137) - up to 6 terminals	U	V	W	X	Y	Z						
	JIS (JEC 2137) - above 6 terminals	U1	V1	W1	U2	V2	W2	U5	V5	W5	U6	V6	W6
Double speed (Dahlander / Double winding)	NEMA MG 1 Part 2 ¹⁾	1U	1V	1W	2U	2V	2W	3U	3V	3W	4U	4V	4W
	IEC 60034-8	1U	1V	1W	2U	2V	2W	3U	3V	3W	4U	4V	4W
	JIS (JEC 2137)	1U	1V	1W	2U	2V	2W	3U	3V	3W	4U	4V	4W

1) NEMA MG 1 Part 2 defines T1 to T12 for two or more winding, however WEG adopts 1U to 4W.

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 **WARNING** - Local Standards have priority on the definition of the connection standards.

The connections presented below are a reference for the connection of the customer's power cables on low voltage motors with terminal block. The terminal blocks presented below are the standard for each product line, however variations may occur. It is recommended the use of terminals made of electrolytic copper or brass, similar to the terminals used on the motors cables.

W21 and W22

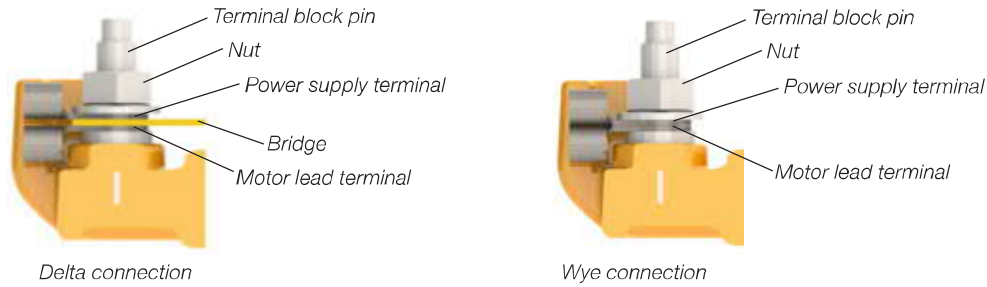


Figure 6.13 - Connection for W21 and W22 motors with terminal block

W50 and HGF

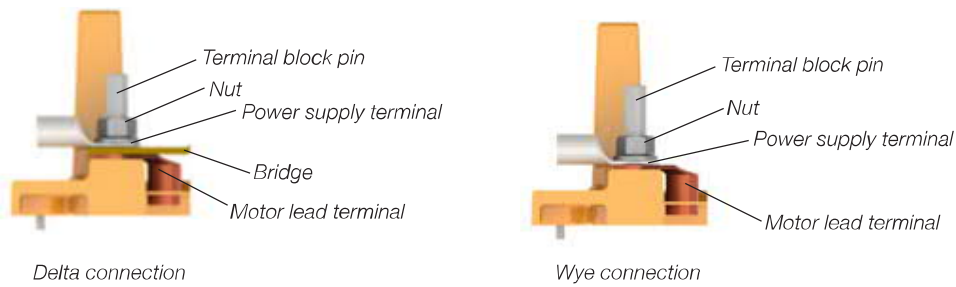


Figure 6.14 - Connection for W50 and HGF motors with terminal block

If motors are supplied without terminal blocks, insulate the cable terminals with suitable insulation material that meets the power supply voltage and the insulation class indicated on the motor nameplate.

Ensure correct tightening torque for the power cable and grounding connections as specified in Table 8.11

The clearance distance (see Figure 6.15) between non-insulated live parts with each other and between grounded parts must be as indicated in Table 6.3.

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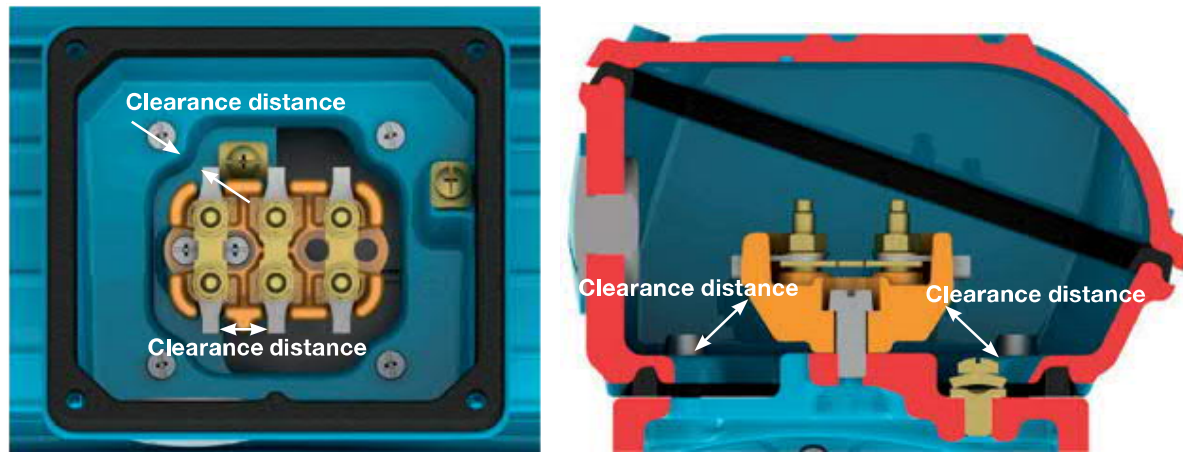


Figure 6.15 - Clearance distance representation

Table 6.3 - Minimum clearance distance (mm) x supply voltage

Voltage	Minimum clearance distance (mm)
$U \leq 440$ V	4
$440 < U \leq 690$ V	5,5
$690 < U \leq 1000$ V	8
$1000 < U \leq 6900$ V	45
$6900 < U \leq 11000$ V	70
$11000 < U \leq 16500$ V	105

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Even when the motor is off, dangerous voltages may be present inside the terminal box used for the space heater supply or winding energization when the winding is used as heating element. Motor capacitors will hold a charge even after the power has been cut off. Do not touch the capacitors and/or motor terminals, before discharging the capacitors completely.



After the motor connection has been completed, ensure that no tool or foreign body has been left inside the terminal box.



Take the required measures in order to ensure the degree of protection indicated on the motor nameplate:

- unused cable inlet holes in the terminal boxes must be properly closed with blanking plugs;
- components supplied loose (for example, terminal boxes mounted separately) must be properly closed and sealed.

The cable inlets used for power supply and control must be fitted with components (for example, cable-glands and conduits) that meet the applicable standards and regulations in each country.



If the motor is fitted with accessories, such as brakes and forced cooling systems, these devices must be connected to the power supply according to the information provided on their nameplates and with special care as indicated above.

All protection devices, including overcurrent protection, must be set according to the rated machine conditions. These protection devices must protect the machine against short circuit, phase fault or locked rotor condition. The motor protection devices must be set according to the applicable standards.

Check the direction of rotation of the motor shaft. If there is no limitation for the use of unidirectional fans, the shaft rotation direction can be changed by reversing any two of the phase connections. For single-phase motor, check the connection diagram indicated on the motor nameplate.

6.10. CONNECTION OF THE THERMAL PROTECTION DEVICES

If the motor is supplied with temperature monitoring devices, such as, thermostat, thermistors, automatic thermal protectors, Pt-100 (RTD), etc., they must be connected to the corresponding control devices as specified on the accessory nameplates. The non-compliance with this procedure may void the product warranty and cause serious material damages.

 Do not apply test voltage above 2,5 V on thermistors and current above 1 mA on RTDs (Pt-100) according to IEC 60751 standard.

Figure 6.16 and Figure 6.17 show the connection diagram of the bimetal thermal protector (thermostats) and thermistors, respectively.

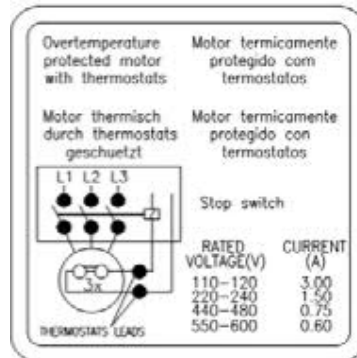


Figure 6.16 - Connection of the bimetal thermal protectors (thermostats)

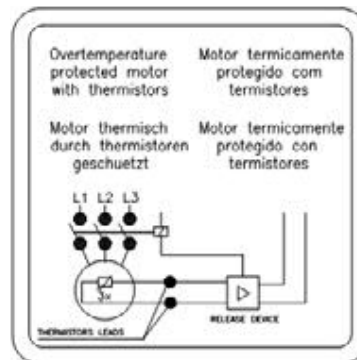


Figure 6.17 - Thermistor connection

The alarm temperature limits and thermal protection shutdowns can be defined according to the application; however these temperature limits can not exceed the values in Table 6.4.

Table 6.4 - Maximum activation temperature of the thermal protections

Component	Insulation class	Maximum temperature of the protection setting (°C)	
		Alarm	Tripping
Winding	B	-	130
	F	130	155
	H	155	180
Bearing	All	110	120

Notes:

- 1) The number and type of the installed protection devices are stated on the accessory nameplate of the motor.
- 2) If the motor is supplied with calibrated resistance, (for example, Pt-100), the motor protection system must be set according to the operating temperatures indicated in Table 6.4.

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6.11. RESISTANCE TEMPERATURE DETECTORS (PT-100)

The thermocouples Pt-100 are made of materials, whose resistance depends on the temperature variation, intrinsic property of some materials (usually platinum, nickel or copper), calibrated resistance. Its operation is based on the principle that the electric resistance of a metallic conductor varies linearly with the temperature, thus allowing a continuous monitoring of the motor warm-up through the controller display ensuring a high level of precision and answer stability. These devices are widely used for measuring temperatures in various industry sectors.

In general these devices are used in installations where precise temperature control is required, for example, in installation for irregular or intermittent duty.

The same detector may be used for alarm and tripping purposes.

Table 6,5 and Figure 6,18 show the equivalence between the Pt-100 resistance and the temperature.

Table 6.5 - Equivalence between the Pt-100 resistance and the temperature

°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
-29	88.617	17	106.627	63	124.390	109	141.908	155	159.180
-28	89.011	18	107.016	64	124.774	110	142.286	156	159.553
-27	89.405	19	107.404	65	125.157	111	142.664	157	159.926
-26	89.799	20	107.793	66	125.540	112	143.042	158	160.298
-25	90.193	21	108.181	67	125.923	113	143.420	159	160.671
-24	90.587	22	108.570	68	126.306	114	143.797	160	161.043
-23	90.980	23	108.958	69	126.689	115	144.175	161	161.415
-22	91.374	24	109.346	70	127.072	116	144.552	162	161.787
-21	91.767	25	109.734	71	127.454	117	144.930	163	162.159
-20	92.160	26	110.122	72	127.837	118	145.307	164	162.531
-19	92.553	27	110.509	73	128.219	119	145.684	165	162.903
-18	92.946	28	110.897	74	128.602	120	146.061	166	163.274
-17	93.339	29	111.284	75	128.984	121	146.438	167	163.646
-16	93.732	30	111.672	76	129.366	122	146.814	168	164.017
-15	94.125	31	112.059	77	129.748	123	147.191	169	164.388
-14	94.517	32	112.446	78	130.130	124	147.567	170	164.760
-13	94.910	33	112.833	79	130.511	125	147.944	171	165.131
-12	95.302	34	113.220	80	130.893	126	148.320	172	165.501
-11	95.694	35	113.607	81	131.274	127	148.696	173	165.872
-10	96.086	36	113.994	82	131.656	128	149.072	174	166.243
-9	96.478	37	114.380	83	132.037	129	149.448	175	166.613
-8	96.870	38	114.767	84	132.418	130	149.824	176	166.984
-7	97.262	39	115.153	85	132.799	131	150.199	177	167.354
-6	97.653	40	115.539	86	133.180	132	150.575	178	167.724
-5	98.045	41	115.925	87	133.561	133	150.950	179	168.095
-4	98.436	42	116.311	88	133.941	134	151.326	180	168.465
-3	98.827	43	116.697	89	134.322	135	151.701	181	168.834
-2	99.218	44	117.083	90	134.702	136	152.076	182	169.204
-1	99.609	45	117.469	91	135.083	137	152.451	183	169.574
0	100.000	46	117.854	92	135.463	138	152.826	184	169.943
1	100.391	47	118.240	93	135.843	139	153.200	185	170.313
2	100.781	48	118.625	94	136.223	140	153.575	186	170.682
3	101.172	49	119.010	95	136.603	141	153.950	187	171.051
4	101.562	50	119.395	96	136.982	142	154.324	188	171.420
5	101.953	51	119.780	97	137.362	143	154.698	189	171.789
6	102.343	52	120.165	98	137.741	144	155.072	190	172.158
7	102.733	53	120.550	99	138.121	145	155.446	191	172.527
8	103.123	54	120.934	100	138.500	146	155.820	192	172.895
9	103.513	55	121.319	101	138.879	147	156.194	193	173.264
10	103.902	56	121.703	102	139.258	148	156.568	194	173.632
11	104.292	57	122.087	103	139.637	149	156.941	195	174.000
12	104.681	58	122.471	104	140.016	150	157.315	196	174.368
13	105.071	59	122.855	105	140.395	151	157.688	197	174.736
14	105.460	60	123.239	106	140.773	152	158.061	198	175.104
15	105.849	61	123.623	107	141.152	153	158.435	199	175.472
16	106.238	62	124.007	108	141.530	154	158.808	200	175.840

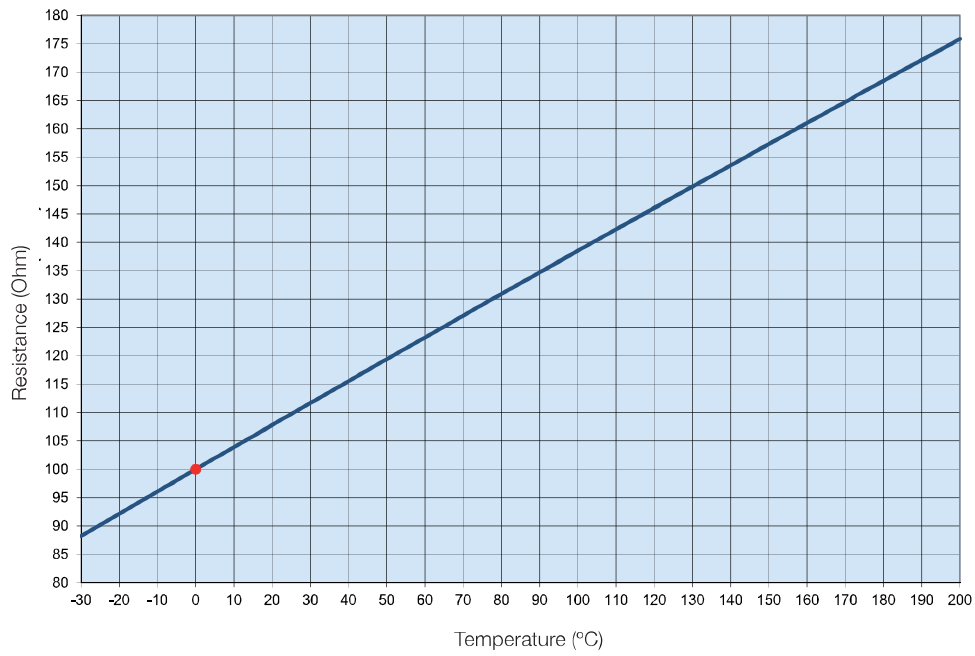


Figure 6.18 - Ohmic resistance of the Pt-100 x temperature

6.12. CONNECTION OF THE SPACE HEATERS

Before switching ON the space heaters, check if the space heaters connection have been made according to the connection diagram shown on the space heater nameplate. For motors supplied with dual voltage space heaters (110-127/220-240 V), see Figure 6.19.

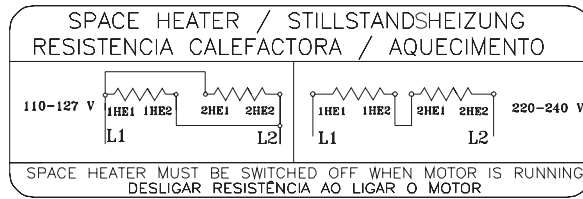


Figure 6.19 - Dual voltage space heater connection



The space heaters should never be energized when the motor is in operation.

6.13. STARTING METHODS

Whenever possible, the motor starting must be Direct On Line (DOL) at rated voltage. This is the most simple and feasible starting method. However, it must only be applied when the starting current does not affect the power supply. Please consider the local electric utility regulations when installing a motor.

High inrush current may result in:

- a) high voltage drop in the power supply line creating unacceptable line disturbance on the distribution system;
- b) requiring oversized protection system (cables and contactor) increasing the installation costs.

If DOL starting is not allowed due to the reasons mentioned above, an indirect starting method compatible with the load and motor voltage to reduce the starting current may be used.

If reduced voltage starters are used for starting, the motor starting torque will also be reduced.

Table 6.6 shows the possible indirect starting methods that can be used depending on the number of the motor leads.

Table 6.6 - Starting method x number of motor leads

Number of leads	Possible starting methods
3 leads	Autotransformer Soft-starter
6 leads	Star-Delta Autotransformer Soft-starter
9 leads	Series/Parallel Part winding Autotransformer Soft-starter
12 leads	Star-Delta Series/Parallel Part winding Autotransformer Soft-starter

Table 6.7 shows examples of possible indirect starting methods to be used according to the voltage indicated on the motor nameplate and the power supply voltage.

Table 6.7 - Starting methods x voltage

Nameplate voltage	Operating voltage	Star-delta	Autotransformer starting	Starting by series/parallel switch	Part-winding starting	Starting by Soft-starter
220/380 V	220 V 380 V	YES NO	YES YES	NO NO	NO NO	YES YES
220/440 V	220 V 440 V	NO NO	YES YES	YES NO	YES NO	YES YES
230/460 V	230 V 460 V	NO NO	YES YES	YES NO	YES NO	YES YES
380/660 V	380 V	YES	YES	NO	NO	YES
220/380/440 V	220 V 380 V 440 V	YES NO YES	YES YES YES	YES YES NO	YES YES NO	YES YES YES



The WQuattro line motors must be started direct on-line (DOL) or driven by a frequency inverter in scalar mode.

ENGLISH

6.14. MOTORS DRIVEN BY FREQUENCY INVERTER



The operation with frequency inverter must be stated in the Purchase Order since this drive type may require some changes of the motor design.



Wmagnet Motors must only be driven by WEG frequency inverter.

The frequency inverter used to drive motors up to 690 V must be fitted with Pulse With Modulation (PWM) with vector control.

When a motor is driven by a frequency inverter at lower frequencies than the rated frequency, you must reduce the motor torque to prevent motor overheating. The torque reduction (derating torque) can be found in the item 6.4 of the “Technical Guidelines for Induction Motors driven by PWM Frequency inverters” available on the site www.weg.net.

If the motor is operated above the rated frequency, please note:

- That the motor must be operated at constant output;
- That the motor can supply max. 95% of its rated output;
- Do not exceed the maximum speed and please consider:
 - max. operating frequency stated on the additional nameplate;
 - mechanical speed limitation of the motor.

Information on the selection of the power cables between the frequency inverter and the motor can be found in the item 6.4 of the “Technical Guidelines for Induction Motors driven by PWM Frequency inverters” available at www.weg.net.

6.14.1. Use of dV/dt filter

6.14.1.1. Motor with enameled round wire

Motors designed for rated voltages up to 690 V, when driven by frequency inverter, do not require the use of dV/dT filters, provided that following criteria are considered.

Criteria for the selection of motors with round enameled wire when driven by frequency inverter				
Motor rated voltage ¹	Peak voltage at the motor terminals (max)	dV/dt inverter output (max)	Inverter Rise Time ² (min.)	MTBP ² Time between pulses (min)
Vnom < 460 V	≤ 1600 V	≤ 5200 V/μs	≥ 0,1 μs	≥ 6 μs
460 ≤ Vnom < 575 V	≤ 2000 V	≤ 6500 V/μs		
575 ≤ Vnom ≤ 1000 V	≤ 2400 V	≤ 7800 V/μs		

Notes:

1. For the application of dual voltage motors, example 380/660 V, consider the lower voltage (380 V).
2. Information supplied by the inverter manufacturer.

6.14.1.2. Motor with prewound coils

Motors with prewound coils (medium and high voltage motors regardless of frame sizes, and low voltage motors from IEC 500 / NEMA 800 frame on), designed for the use with frequency inverters, do not require the use of filters, provided they comply with the criteria in Table 6.8.

Table 6.8 - Criteria to be considered when using motor with prewound coils to be drive by frequency inverters

Motor rated voltage	Type of modulation	Turn to turn insulation (phase-phase)		Phase-ground insulation	
		Peak voltage at the motor terminals	dV/dt at the motor terminals	Peak voltage at the motor terminals	dV/dt at the motor terminals
690 < Vnom ≤ 4160 V	Sinusoidal	≤ 5900 V	≤ 500 V/μs	≤ 3400 V	≤ 500 V/μs
	PWM	≤ 9300 V	≤ 2700 V/μs	≤ 5400 V	≤ 2700 V/μs
4160 < Vnom ≤ 6600 V	Sinusoidal	≤ 9300 V	≤ 500 V/μs	≤ 5400 V	≤ 500 V/μs
	PWM	≤ 14000 V	≤ 1500 V/μs	≤ 8000 V	≤ 1500 V/μs

6.14.2. Bearing insulation

Only the motors in IEC frame size 400 (NEMA 680) and larger are supplied, as standard, with insulated bearing. If motor must be driven by frequency inverter, insulate the bearing according to Table 6.9.

Table 6.9 - Recommendation on the bearing insulation for inverter driven motors

Frame size	Recommendation
IEC 315 and 355 NEMA 445/7 to L5810/11	<ul style="list-style-type: none"> ■ Insulated bearing/end shield ■ Grounding between shaft and frame by grounding brush
IEC 400 and larger NEMA 680 and larger	<ul style="list-style-type: none"> ■ Insulated NDE bearing ■ Grounding between shaft and frame by grounding brush



When motors are supplied with shaft grounding system, monitor the grounding brush constantly during its operation and, when it reaches the end of its useful life, it must be replaced by another brush with the same specification.

6.14.3. Switching frequency

The minimum inverter switching frequency must not be lower than 2 kHz and should not exceed 5 kHz.



The non-compliance with the criteria and recommendations indicated in this manual may void the product warranty.

6.14.4. Mechanical speed limitation

Table 6.10 shows the maximum speeds allowed for motors driven by frequency inverter.

Table 6.10 - Maximum motor speed (in rpm)

Frame size		DE-bearing	Maximum speed for standard motors
IEC	NEMA		
63-90	143/5	6201 6202 6203 6204 6205	10400
100	-	6206	8800
112	182/4	6207 6307	7600 6800
132	213/5	6308	6000
160	254/6	6309	5300
180	284/6	6311	4400
200	324/6	6312	4200
225-630	364/5-9610	6314	3600
		6315	3600
		6316	3200
		6319	3000
		6218	3600
		6220	3600
		6320	2200
		6322	1900
		6324	1800
		6328	1800
		6330	1800
		6224	1800
6228	1800		

Note:

To select the maximum allowed motor speed, consider the motor torque derating curve.

For more information on the application of frequency inverters, contact WEG or check the “Technical Guidelines for Induction Motors driven by PWM Frequency inverters” available at www.weg.net.

ENGLISH

7. COMMISSIONING

7.1. INITIAL START-UP

After finishing the installation procedures and before starting the motor for the first time or after a long period without operation, the following items must be checked:

- If the nameplate data (voltage, current, connection diagram, degree of protection, cooling system, service factor, etc.) meet the application requirements;
- If the machine set (motor + driven machine) has been mounted and aligned correctly;
- If the motor driving system ensures that the motor speed does not exceed the max. allowed speed indicated in Table 6.10;
- Measure the winding insulation resistance, making sure it complies with the specified values in item 5.4;
- Check the motor rotation direction;
- Inspect the motor terminal box for damage and ensure that it is clean and dry and all contacts are rust-free, the seals are in perfect operating conditions and all unused threaded holes are properly closed thus ensuring the degree of protection indicated on the motor nameplate;
- Check if the motor wiring connections, including grounding and auxiliary equipment connection, have been carried out properly and are in accordance with the recommendations in item 6.9;
- Check the operating conditions of the installed auxiliary devices (brake, encoder, thermal protection device, forced cooling system, etc.);
- Check bearing operating conditions. If the motors are stored and/or installed for more than two years without running, it is recommended to change the bearings, or to remove, wash, inspect and relubricate them before the motor is started. If the motor is stored and/or installed according to the recommendations described in item 5.3, lubricate the bearings as described in item 8.2. For the bearing condition evaluation, it is recommended to use of the vibration analysis techniques: Envelope Analysis or Demodulation Analysis.
- For roller bearing motors with oil lubrication, ensure:
 - The oil level should be in the center of the sight glass (see Figure 8.1 and 8.2);
 - That if the motor is stored for a period equal or longer than the oil change interval, the oil must be changed before starting the motor.
- When motors are fitted with sleeve bearings, ensure:
 - Correct oil level for the sleeve bearing. The oil level should be in the center of the sight glass (see Figure 8.3);
 - That the motor is not started or operated with axial or radial loads;
 - That if the motor is stored for a period equal or longer than the oil change interval, the oil must be changed before starting the motor.
- Inspect the capacitor operating condition, if any. If motors are installed for more than two years, but were never commissioned, it is recommended to change the start capacitors since they lose their operating characteristics;
- Ensure that the air inlet and outlet opening are not blocked. The minimum clearance to the nearest wall (L) should be at least $\frac{1}{4}$ of the fan cover diameter (D), see Figure 7.1. The intake air temperature must be at ambient temperature.

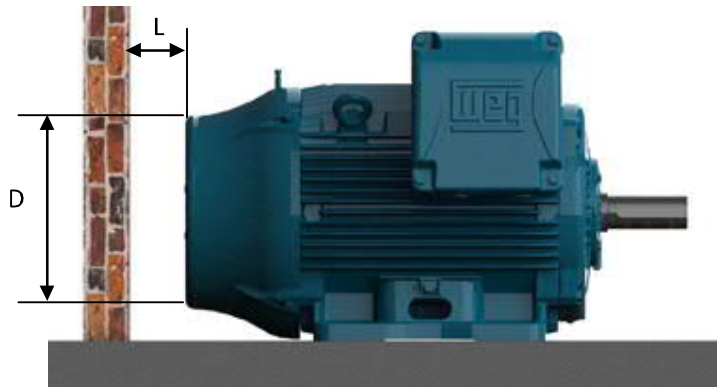


Figure 7.1- Minimum clearance to the wall

Please consider the minimum distances shown in the Table 7.1 as reference value;

Table 7.1 - Minimum distance between the fan cover and wall

Frame size		Distance between the fan cover and the wall (L)	
IEC	NEMA	mm	inches
63	-	25	0.96
71	-	26	1.02
80	-	30	1.18
90	143/5	33	1.30
100	-	36	1.43
112	182/4	41	1.61
132	213/5	50	1.98
160	254/6	65	2.56
180	284/6	68	2.66
200	324/6	78	3.08
225	364/5	85	3.35
250	404/5		
280	444/5	108	4.23
	445/7		
	447/9		
315	L447/9	122	4.80
	504/5		
	5006/7/8		
	5009/10/11		
355	586/7	136	5.35
	588/9		
	5807/8/9		
	5810/11/12		
400	6806/7/8	147	5.79
	6809/10/11		
450	7006/10	159	6.26
500	8006/10	171	6.73
560	8806/10	185	7.28
630	9606/10	200	7.87

- Ensure correct water flow rate and water temperature when water cooled motors are used. See item 7.2;
- Ensure that all rotating parts, such as pulleys, couplings, external fans, shaft, etc. are protected against accidental contact.

Other tests and inspections not included in the manual may be required, depending on the specific installation, application and/or motor characteristics.

After all previous inspections have been carried out, proceed as follows to start the motor:

- Start the motor on no-load (if possible) and check the motor direction of rotation. Check for the presence of any abnormal noise, vibration or other abnormal operating conditions;
- Ensure the motor starts smoothly. If any abnormal operating condition is noticed, switch off the motor, check the assembly system and connections before the motor is started again;
- If excessive vibrations are noticed, check if the motor mounting bolts are well tightened or if the vibrations are not generated and transmitted from adjacent installed equipment. Check the motor vibration periodically and ensure that the vibration limits are as specified in item 7.2.1;
- Start the motor at rated load during a short time and compare the operating current with the rated current indicated on the nameplate;
- Continue to measure the following motor variables until thermal equilibrium is reached: current, voltage, bearing and motor frame temperature, vibration and noise levels;
- Record the measured current and voltage values on the Installation Report for future comparisons.

As induction motors have high inrush currents during start-up, the acceleration of high inertia load requires an extended starting time to reach full speed resulting in fast motor temperature rise. Successive starts within short intervals will result in winding temperature increases and can lead to physical insulation damage reducing the useful life of the insulation system. If the duty cycle S1 / CONT. is specified on the motor nameplate, this means that the motor has been designed for:

- Two successive starts: first start from cold condition, i. e., the motor windings are at room temperature and the second start immediately after the motor stops;
- One start from hot condition, i. e., the motor windings are at rated temperature.

The Troubleshooting Chart in section 10 provides a basic list of unusual cases that may occur during motor operation with the respective corrective actions.

7.2. OPERATING CONDITIONS

Unless otherwise stated in the Purchase Order, electric motors are designed and built to be operated at altitudes up to 1000 meters above sea level and in a temperature range from -20 °C to +40 °C. Any deviation from the normal condition of motor operation must be stated on the motor nameplate. Some components must be changed if the ambient temperature is different from the specified one. Please contact WEG to check the required special features.

For operating temperatures and altitudes differing from those above, the factors indicated in Table 7.2 must be applied to the nominal motor power rating in order to determine the derated available output ($P_{max} = P_{nom} \times$ correction factor).

Table 7.2 - Correction factors for altitude and ambient temperature

T (°C)	Altitude (m)								
	1000	1500	2000	2500	3000	3500	4000	4500	5000
10							0.97	0.92	0.88
15						0.98	0.94	0.90	0.86
20					1.00	0.95	0.91	0.87	0.83
25				1.00	0.95	0.93	0.89	0.85	0.81
30			1.00	0.96	0.92	0.90	0.86	0.82	0.78
35		1.00	0.95	0.93	0.90	0.88	0.84	0.80	0.75
40	1.00	0.97	0.94	0.90	0.86	0.82	0.80	0.76	0.71
45	0.95	0.92	0.90	0.88	0.85	0.81	0.78	0.74	0.69
50	0.92	0.90	0.87	0.85	0.82	0.80	0.77	0.72	0.67
55	0.88	0.85	0.83	0.81	0.78	0.76	0.73	0.70	0.65
60	0.83	0.82	0.80	0.77	0.75	0.73	0.70	0.67	0.62
65	0.79	0.76	0.74	0.72	0.70	0.68	0.66	0.62	0.58
70	0.74	0.71	0.69	0.67	0.66	0.64	0.62	0.58	0.53
75	0.70	0.68	0.66	0.64	0.62	0.60	0.58	0.53	0.49
80	0.65	0.64	0.62	0.60	0.58	0.56	0.55	0.48	0.44

Motors installed inside enclosures (cubicles) must be ensured an air renewal rate in the order of one cubic meter per second for each 100 kW installed power or fraction of installed power. Totally Enclosed Air Over motors - TEAO (fan and exhaust / smoke extraction) are supplied without cooling fan and the manufacturer of the driven machine is responsible for sufficient motor cooling. If no minimum required air speed between motor fins is indicated on the motor nameplate, ensure the air speed indicated in the table 7.3 is provided. The values shown in Table 7.3 are valid for 60 Hz motors. To obtain the minimum air speed for 50 Hz motors, multiply the values in the table by 0,83.

Table 7.3 - Minimum required air speed between motor fins (metres/second)

Frame		Poles			
IEC	NEMA	2	4	6	8
63 to 90	143/5	13	7	5	4
100 to 132	182/4 to 213/5	18	12	8	6
160 to 200	254/6 to 324/6	20	15	10	7
225 to 280	364/5 to 444/5	22	20	15	12
315 to 450	445/7 to 7008/9	25	25	20	15

The voltage and frequency variations may affect the performance characteristics and the electromagnetic compatibility of the motor. The power supply variations should not exceed the values specified in the applicable standards. Examples:

- ABNT NBR 17094 - Parts 1 and 2. The motor has been designed to supply the rated torque for a combined variation in voltage and frequency:
 - Zone A: ±5% of the rated voltage and ±2% of the rated frequency;
 - Zone B: ±10% of the rated voltage and +3% -5% of the rated frequency.

When operated continuously in Zone A or B, the motor may show performance variations and the operating temperature may increase considerably. These performance variations will be higher in Zone B. Thus it is not recommended to operate the motor in Zone B during extended periods.

- IEC 60034-1. The motor has been designed to supply the rated torque for combined variation in voltage and frequency:
 - Zone A: ±5% of the rated voltage and ±2% of the rated frequency;
 - Zone B: ±10% of the rated voltage and +3% -5% of the rated frequency.

When operated continuously in Zone A or B, the motor may show performance variations and the operating temperature may increase considerably. These performance variations will be higher in Zone B. Thus it is not recommended to operate the motor in Zone B during extended periods. For multivoltage motors (example 380-415/660 V), a ±5% voltage variation from the rated voltage is allowed.

- NEMA MG 1 Part 12. The motor has been designed to be operated in one of the following variations:
 - $\pm 10\%$ of the rated voltage, with rated frequency;
 - $\pm 5\%$ of the rated frequency, with rated voltage;
 - A combined variation in voltage and frequency of $\pm 10\%$, provided the frequency variation does not exceed $\pm 5\%$.

If the motor is cooled by ambient air, clean the air inlet and outlet openings and cooling fins at regular intervals to ensure a free airflow over the frame surface. The hot air should never be returned to the motor. The cooling air must be at room temperature limited to the temperature range indicated on the motor nameplate (if no room temperature is specified, please consider a temperature range between $-20\text{ }^{\circ}\text{C}$ and $+40\text{ }^{\circ}\text{C}$).

Table 7.4 shows the minimum required water flow for water cooled motors considering the different frame sizes and the maximum allowed temperature rise of the cooling water after circulating through the motor. The inlet water temperature should not exceed $40\text{ }^{\circ}\text{C}$.

Table 7.4 - Minimum required water flow and the maximum allowed temperature rise of the cooling water after circulating through the motor

Frame size		Flow rate (litres/minute)	Maximum allowed water temperature rise ($^{\circ}\text{C}$)
IEC	NEMA		
180	284/6	12	5
200	324/6	12	5
225	364/5	12	5
250	404/5	12	5
280	444/5	15	6
	445/7		
	447/9		
315	504/5	16	6
355	586/7	25	6
	588/9		

Motors fitted with oil mist lubrication systems can be operated continuously for a maximum of one hour after the failure of the oil pumping system.

Considering the sun's heat increases the operating temperature, externally mounted motors should always be protected from direct sunlight exposure.

Each and every deviation from the normal operating condition (tripping of the thermal protection, noise and vibration level increase, temperature and current rise) should be investigated and corrected by WEG Authorized Service Centers.



Motors fitted with cylindrical roller bearings require a minimum radial load to ensure a normal operation. For information regarding the radial preload, please contact WEG.

7.2.1.Limits of vibration

The vibration severity is the maximum vibration value measured at all positions and in all directions as recommended in the standard IEC 60034-14. Table 7.5 specifies the limits of the maximum vibrations magnitudes according to standard IEC 60034-14 for shaft heights IEC 56 to 400, for vibrations grades A and B. The vibration severity limits in Table 7.5 are given as RMS values (Root Mean Square values or effective values) of the vibration speed in mm/s measured in free suspension condition.

Table 7.5 - Recommended limits for the vibration severity according to standard IEC 60034-14

Shaft height [mm]	$56 \leq H \leq 132$	$132 \leq H \leq 280$	$H > 280$
Vibration grade	Vibration severity on elastic base [mm/s RMS]		
A	1,6	2,2	2,8
B	0,7	1,1	1,8

Notes:

- 1 - The values in Table 7.5 are valid for measurements carried out with decoupled machines (without load) operated at rated voltage and frequency.
- 2 - The values in Table 7.5 are valid regardless of the direction of rotation of the machine.
- 3 - The values in Table 7.5 are not applicable to single-phase motors, three-phase motors powered by a single-phase system or to machines mounted in situ or coupled with inertia flywheels or to loads.

According to NEMA MG 1, the allowed vibration limit for standard motors is 0,15 in/s (peak vibration in in/s).

Note:

For the load operation condition, the use of the standard ISO 10816-3 is recommended for evaluating the motor vibration limits. In the load condition the motor vibration will be influenced by several factors, such as, type of the coupled load, condition of the motor fixation, alignment condition under load, structure or base vibration due to other equipments, etc..

8. MAINTENANCE

The purpose of the maintenance is to extend the useful life of the equipment. The non-compliance with one of these previous items can cause unexpected machine failures.

If motors with cylindrical roller or angular contact bearings are to be transported during the maintenance procedures, the shaft locking device must always be fitted. All HGF motors, regardless of the bearing type, must always be transported with the shaft locking device fitted.

All repairs, disassembly and assembly related services must be carried out only by qualified and well-trained personnel by using proper tools and techniques. Make sure that the machine has stopped and it is disconnected from the power supply, including the accessory devices (space heater, brake, etc.), before any servicing is undertaken.

The company does not assume any responsibility or liability for repair services or maintenance operations executed by non-authorized Service Centers or by non qualified service personnel. The company shall have no obligation or liability whatsoever to the buyer for any indirect, special, consequential or incidental loss or damage caused or arising from the company's proven negligence

8.1. GENERAL INSPECTION

The inspection intervals depend on the motor type, application and installation conditions. Proceed as follows during inspection:

- Visually inspect the motor and coupling. Check if abnormal noises, vibrations, excessive heating, wear signs, misalignment or damaged parts are noticed. Replace the damaged parts as required;
- Measure the insulation resistance according to the item 5.4;
- Clean the motor enclosure. Remove oil spills and dust accumulation from the motor frame surface to ensure a better heat transfer to the surrounding ambient;
- Check cooling fan condition and clean the air inlet & outlet openings to ensure a free air flow over the motor;
- Investigate the actual condition of the seals and replace them, if required;
- Drain the condensed water from inside the motor. After draining, reinstall the drain plugs to ensure the degree of protection as indicated on the motor nameplate. The motor must always be positioned so the drain hole is at the lowest position (see item 6);
- Check the connections of the power supply cables, ensuring the correct clearance distance between live and grounded parts, as specified in Table 6.3;
- Check if the tightening torque of the bolted connections and mounting bolts meets the tightening torque specified in Table 8.11;
- Check the status of the cable passages, the cable gland seals and the seals inside the terminal box and replace them, if required;
- Check the bearing operating conditions. Check for the presence of any abnormal noise, vibration or other abnormal operating conditions, like motor temperature rise. Check the oil level, the lube oil condition and compare the workings hours with the informed life time;
- Record and file all changes performed on the motor.



Do not reuse damaged or worn parts. Damaged or worn parts must be replaced by parts supplied by the manufacturer and must be installed as if they were the original parts.

8.2. LUBRICATION

Proper lubrication plays a vital role in the motor performance. Only use the grease or oil types, amounts and lubrication intervals recommended for the bearings. This information is available on the motor nameplate and the lubrication procedures must be carried out according to the type of lubricant (oil or grease).

When the motor is fitted with thermal protection devices for bearing temperature control, consider the operating temperature limits shown in Table 6.4.

The maximum operating temperature of motors used in special applications may differ from those shown in Table 6.4. The grease and oil disposal should be made in compliance with applicable laws in each country.



Please contact WEG when motors are to be installed in special environments or used for special applications.

8.2.1. Grease lubricated rolling bearings



Excess grease causes bearing overheating, resulting in bearing failure.

The lubrication intervals specified in Table 8.1, Table 8.2, Table 8.3, Table 8.4, Table 8.5, Table 8.6, Table 8.7 and Table 8.8 consider an absolute temperature on the bearing of 70 °C (up to frame size IEC 200 / NEMA 324/6) and 85 °C (for frame size IEC 225 / NEMA 364/5 and above), the motor running at rated speed, a motor mounted in horizontal position and greased with Mobil Polyrex EM grease. Any variation of the parameters listed above must be evaluated.

Table 8.1 - Lubrication intervals for ball bearings

Frame		Poles	Bearing designation	Amount of grease (g)	Lubrication intervals (hours)								
					ODP (Open Drip Proof)		W21 TEFC (Totally Enclosed Fan Cooled)		W22 TEFC (Totally Enclosed Fan Cooled)				
IEC	NEMA				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz			
90	143/5	2	6205	4	-	-	20000	20000	25000	25000			
		4											
		6											
		8											
100	-	2	6206	5	-	-	20000	20000					
		4											
		6											
		8											
112	182/4	2	6207/ 6307	9	-	-	20000	20000					
		4											
		6											
		8											
132	213/5	2	6308	11	-	-	20000	18400					
		4					20000	20000					
		6											
		8											
160	254/6	2	6309	13	20000	20000	18100	15700					
		4					20000	20000					
		6											
		8											
180	284/6	2	6311	18	20000	20000	13700	11500					
		4					20000	20000					
		6											
		8											
200	324/6	2	6312	21	20000	20000	11900	9800					
		4					20000	20000					
		6											
		8											
225 250 280 315 355	364/5 404/5 444/5	2	6314	27	18000	14400	4500	3600	5000	4000			
		4					20000	20000	11600	9700	14000	12000	
		6							16400	14200	20000	17000	
		8							19700	17300	24000	20000	
	4	6316	34	14000	*Upon request	3500	*Upon request	4000	*Upon request				
	6							20000	20000	10400	8500	13000	10000
	8									14900	12800	18000	16000
	2									18700	15900	20000	20000
	4	6319	45	20000	20000	*Upon request							
	6					9000	7000	11000	8000				
	8					13000	11000	16000	13000				
	4					17400	14000	20000	17000				
6	6322	60	20000	20000	7200	5100	9000	6000					
8					10800	9200	13000	11000					
							15100	11800	19000	14000			

ENGLISH

Table 8.2 - Lubrication intervals for cylindrical roller bearings

Frame		Poles	Bearing designation	Amount of grease (g)	Lubrication intervals (hours)						
					ODP (Open Drip Proof)		W21 TEFC (Totally Enclosed Fan Cooled)		W22 TEFC (Totally Enclosed Fan Cooled)		
IEC	NEMA				50 Hz	60 Hz	50 Hz	60 Hz	50 Hz	60 Hz	
160	254/6	2	NU309	13	20000	19600	13300	9800	16000	12000	
		4				20000	20000	20000	20000	25000	25000
		6									
		8									
180	284/6	2	NU311	18	18400	12800	9200	6400	11000	8000	
		4			20000	20000	20000	19100	25000	25000	
		6						20000			
		8									
200	324/6	2	NU312	21	15200	10200	7600	5100	9000	6000	
		4			20000	20000	20000	17200	25000	21000	
		6						20000			
		8									
225 250 280 315 355	364/5 404/5 444/5	4	NU314	27	17800	14200	8900	7100	11000	9000	
		6			20000	20000	13100	11000	16000	13000	
		8					16900	15100	20000	19000	
	445/7 447/9 L447/9	6	NU316	34	15200	12000	7600	6000	9000	7000	
					20000	19000	11600	9500	14000	12000	
					20000	20000	15500	13800	19000	17000	
	504/5 5008 5010/11	6	NU319	45	12000	9400	6000	4700	7000	5000	
					19600	15200	9800	7600	12000	9000	
					20000	20000	13700	12200	17000	15000	
	586/7 588/9	4	NU322	60	8800	6600	4400	3300	5000	4000	
					15600	11800	7800	5900	9000	7000	
					20000	20000	11500	10700	14000	13000	

Table 8.3 - Lubrication intervals for ball bearings - HGF line

Frame		Poles	Bearing designation	Amount of grease (g)	Lubrication intervals (hours)	
IEC	NEMA				50 Hz	60 Hz
315L/A/B and 315C/D/E	5006/7/8T and 5009/10/11T	2	6314	27	3100	2100
		4 - 8	6320	50	4500	4500
			6316	34	4500	4500
355L/A/B and 355C/D/E	5807/8/9T and 5810/11/12T	2	6314	27	3100	2100
		4 - 8	6322	60	4500	4500
			6319	45	4500	4500
400L/A/B and 400 C/D/E	6806/7/8T and 6809/10/11T	2	6315	30	2700	1800
		4 - 8	6324	72	4500	4500
			6319	45	4500	4500
450	7006/10	2	6220	31	2500	1400
		4	6328	93	4500	3300
			6322	60	4500	4500
		6 - 8	6328	93	4500	4500
			6322	60	4500	4500
500	8006/10	4	6330	104	4200	2800
		6 - 8	6324	72	4500	4500
			6330	104	4500	4500
560	8806/10	4 - 8			*Upon request	
630	9606/10	4 - 8				

Table 8.4 - Lubrication intervals for cylindrical roller bearings - HGF line

Frame		Poles	Bearing designation	Amount of grease (g)	Lubrication intervals (hours)	
IEC	NEMA				50 Hz	60 Hz
315L/A/B and 315C/D/E	5006/7/8 and 5009/10/11	4	NU320	50	4300	2900
		6 - 8			4500	4500
355L/A/B and 355C/D/E	5807/8/9 and 5810/11/12	4	NU322	60	3500	2200
		6 - 8			4500	4500
400L/A/B and 400C/D/E	6806/7/8 and 6809/10/11	4	NU324	72	2900	1800
		6 - 8			4500	4500
450	7006/10	4	NU328	93	2000	1400
		6			4500	3200
		8			4500	4500
500	8006/10	4	NU330	104	1700	1000
		6			4100	2900
		8			4500	4500
560	8806/10	4	NU228 + 6228	75	2600	1600
		6 - 8		106	4500	4500
630	9606/10	4	NU232 + 6232	92	1800	1000
		6		120	4300	3100
		8		140	4500	4500

Table 8.5 - Lubrication intervals for ball bearings - W50 line

	Frame		Poles	DE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)	NDE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)
	IEC	NEMA									
Horizontal mounting Ball bearings	315 H/G	5009/10	2	6314	27	4500	3500	6314	27	4500	3500
			4 - 8	6320	50		4500	6316	34		4500
	355 J/H	5809/10	2	6314	27	4500	3500	6314	27	4500	3500
			4 - 8	6322	60		4500	6319	45		4500
	400 L/K and 400 J/H	6806/07 and 6808/09	2	6218	24	3800	2500	6218	24	3800	1800
			4 - 8	6324	72	4500	4500	6319	45	4500	4500
450 L/K and 450 J/H	7006/07 and 7008/09	2	6220	31	3000	2000	6220	31	3000	2000	
		4	6328	93	4500	3300	6322	60	4500	4500	
6 - 8	4500										
Vertical mounting Ball bearings	315 H/G	5009/10	2	7314	27	2500	1700	6314	27	2500	1700
			4	6320	50	4200	3200	6316	34	4500	4500
			6 - 8			4500					
	355 J/H	5809/10	2	7314	27	2500	1700	6314	27	2500	1700
			4	6322	60	3600	2700	6319	45	4500	3600
			6 - 8			4500	4500				4500
	400 L/K and 400 J/H	6806/07 and 6808/09	2	7218	24	2000	1300	6218	24	2000	1300
			4	7324	72	3200	2300	6319	45	4500	3600
			6			4500	4300				4500
			8			4500	4500				
	450 L/K and 450 J/H	7006/07 and 7008/09	2	7220	31	1500	1000	6220	31	1500	1000
			4	7328	93	2400	1700	6322	60	4500	3500
6			4100			3500	4500				
8			4500			4500					

Table 8.6 - Lubrication intervals for cylindrical roller bearings - W50 line

	Frame		Poles	DE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)	NDE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)
	IEC	NEMA									
Horizontal mounting Roller bearings	315 H/G	5009/10	4	NU320	50	4300	2900	6316	34	4500	4500
			6 - 8			4500	4500				
	355 J/H	5809/10	4	NU322	60	3500	2200	6319	45		
			6 - 8			4500	4500				
	400 L/K and 400 J/H	6806/07 and 6808/09	4	NU324	72	2900	1800	6322	60		
			6 - 8			4500	4500				
450 L/K and 450 J/H	7006/07 and 7008/09	4	NU328	93	2000	1400	6322	60			
		6			4500	3200			4500		
8	4500	4500									

Table 8.7 - Lubrication intervals for ball bearings - W40 line

	Frame		Poles	DE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)	NDE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)
	IEC	NEMA									
Horizontal mounting Ball bearings	160M/L	254/6	2 - 8	6309	13	20000	20000	6209	9	20000	20000
			2 - 8	6311	18	20000	20000	6209	9	20000	20000
	180M/L	284/6	2 - 8	6311	18	20000	20000	6211	11	20000	20000
			2 - 8	6312	21	20000	20000	6211	11	20000	20000
	200M/L	324/6	2 - 8	6312	21	20000	20000	6211	11	20000	20000
			2 - 8	6314	27	18000	14400	6211	11	20000	20000
	225S/M	364/5	2	6314	27	18000	14400	6212	13	20000	20000
			4 - 8	6314	27	18000	14400	6212	13	20000	20000
	250S/M	404/5	2	6314	27	18000	14400	6212	13	20000	20000
			4 - 8	6316	34	20000	20000	6212	13	20000	20000
	280S/M	444/5	2	6314	27	18000	14400	6212	13	20000	20000
			4 - 8	6319	45	20000	20000	6314	27	20000	20000
	280L	447/9	2	6314	27	18000	14400	6314	27	18000	14400
			4 - 8	6319	45	20000	20000	6314	27	20000	20000
	315G/F	5010/11	2	6314	27	4500	4500	6314	27	4500	4500
			4 - 8	6319	45	4500	4500	6314	27	4500	4500
	355J/H	L5010/11	2	6218	24	2200	2200	6218	24	2200	2200
			4 - 8	6224	43	4500	4500	6218	24	4500	4500
	400J/H	L5810/11	2	6220	31	2200	2200	6220	31	2200	2200
			4 - 8	6228	52	4500	4500	6220	31	4500	4500
450K/J	L6808/09	2	6220	31	2200	2200	6220	31	2200	2200	
		4 - 8	6228	52	4500	4500	6220	31	4500	4500	

Table 8.8 - Lubrication intervals for cylindrical roller bearings - W40 line

	Frame		Poles	DE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)	NDE Bearing	Amount of grease (g)	50 Hz (h)	60 Hz (h)
	IEC	NEMA									
Horizontal mounting Roller bearings	225S/M	364/5	4 - 8	NU314	27	20000	20000	6314	27	20000	20000
	250S/M	404/5	4 - 8	NU316	34	20000	20000	6314	27	20000	20000
	280S/M	444/5	4 - 8	NU319	45	20000	18800	6314	27	20000	20000
	280L	447/9	4 - 8	NU319	45	20000	18800	6314	27	20000	20000
	315G/F	5010/11	4 - 8	NU319	45	4500	4500	6314	27	4500	4500
	355J/H	L5010/11	4 - 8	NU224	43	4500	4500	6218	24	4500	4500
	400J/H	L5810/11	4 - 8	NU228	52	4500	3300	6220	31	4500	4500
	450K/J	L6808/09	4 - 8	NU228	52	4500	3300	6220	31	4500	4500

For each increment of 15 °C above the bearing temperature, the relubrication intervals given in the Table must be halved. The relubrication interval of motors designed by the manufacturer for mounting in horizontal position, but installed in vertical position (with WEG authorization), must be halved.

For special applications, such as: high and low temperatures, aggressive environments, driven by frequency inverter (VFD - frequency inverter), etc., please contact WEG about the required amount of grease and the relubrication intervals.

8.2.1.1. Motor without grease fitting

Motors without grease fittings must be lubricated in accordance with the existing Maintenance Plan. Motor disassembly must be carried out as specified in Item 8.3. If motors are fitted with shielded bearings (for example, ZZ, DDU, 2RS, VV), these bearings must be replaced at the end of the grease service life.

8.2.1.2. Motor with grease fitting

To lubricate the bearings with the motor stopped, proceed as follows:

- Before lubricating, clean the grease nipple and immediate vicinity thoroughly;
- Lift grease inlet protection;
- Remove the grease outlet plug;
- Pump in approximately half of the total grease indicated on the motor nameplate and run the motor for about 1 (one) minute at rated speed;
- Switch-off the motor and pump in the remaining grease;
- Lower again the grease inlet protection and reinstall the grease outlet protection.

To grease the motor while running, proceed as follows:

- Before lubricating, clean the grease nipple and immediate vicinity thoroughly;
- Pump the total grease indicated on the motor nameplate;
- Lower again the grease inlet protection.



For lubrication, use only manual grease gun.

If Motors are provided with a spring device for grease removal, the grease excess must be removed by pulling the rod and cleaning the spring until the spring does not remove more grease.

8.2.1.3. Compatibility of the Mobil Polyrex EM grease with other greases

The Mobil Polyrex EM grease has a polyurea thickener and a mineral oil and it is not compatible with other greases.

If you need another type of grease, contact WEG.

It is not recommended to mix different types of greases. In such a case, clean the bearings and lubrication channels before applying new grease.

The used grease must have in its formulation corrosion and oxidation inhibitors.

8.2.2. Oil lubricated bearings

To change the oil of oil lubricated motor proceed as follows:

- Switch-off the motor;
- Remove threaded oil drain plug;
- Open the valve and drain the oil;
- Close the drain valve again;
- Reinstall the threaded oil drain plug;
- Fill-up with the type and amount of oil as specified on the nameplate;
- Check oil level. The oil level is OK when the lubricant can be viewed approximately in the center of the sight glass;
- Reinstall oil inlet plug;
- Check for oil leaks and ensure that all not used threaded plugs are closed with plugs.

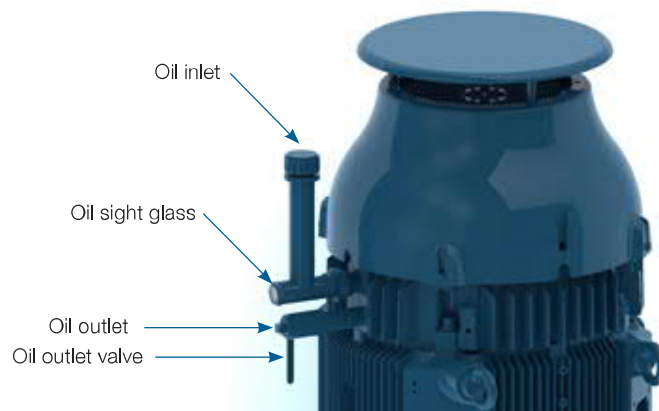


Figure 8.1 - Oil lubricated bearing - vertical mounting



Figure 8.2 - Oil lubricated bearing - horizontal mounting

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The bearing lubricating oil must be replaced as specified on the nameplate or whenever changes in the oil properties are noticed. The oil viscosity and pH must be checked periodically. The oil level must be checked every day and must be kept in the center of the sight glass. Please contact WEG, when oils with different viscosities should be used.

Note:

The HGF vertical mounted motors with high axial thrust are supplied with grease lubricated DE-bearings and with oil lubricated NDE-bearings. The DE-bearings must be lubricated according to recommendations in item 8.2.1. Table 8.9 specifies the oil type and the amount of oil required for this motor lubrication.

Table 8.9 - Oil properties for HGF vertical mounted motors with high axial thrust

Mounting - high axial thrust	Frame		Poles	Bearing designation	Oil (liters)	Interval (h)	Lubricant	Lubricant specification
	IEC	NEMA						
	315L/A/B e 315C/D/E	5006/7/8T e 5009/10/11T	4 - 8	29320	20	8000	FUCHS Renolin DTA 40 / Mobil SHC 629	ISO VG150 mineral oil with antifoam and antioxidant additives
	355L/A/B e 355C/D/E	5807/8/9T e 5810/11/12T	4 - 8	29320	26			
	400L/A/B e 400C/D/E	6806/7/8T e 6809/10/11T	4 - 8	29320	37			
	450	7006/10	4 - 8	29320	45			

8.2.3. Oil mist lubricated bearings

Check the service conditions of the seals and if replacement is required use only original components. Clean the seal components before assembly (bearing caps, end shields, etc.).

Apply joint sealant between the bearing caps and end shields. The joint sealant must be compatible with the used lubricating oil. Connect the oil lubricant tubes (oil inlet and oil outlet tubes and motor drain tube), as shown in Figure 6.12.

8.2.4. Sleeve bearings

The lubricating oil of sleeve bearings must be changed at the intervals specified in Table 8.10. To replace the oil, proceed as follows:

- NDE-bearing: remove the protection plate from the fan cover;
- Drain the oil through the drain hole located at the bottom of the bearing (see Figure 8.3);
- Close the oil drain hole;
- Remove the oil inlet plug;
- Fill the sleeve bearing with the specified oil and with the amount of oil specified in;
- Check the oil level and ensure it is kept close to the center of the sight glass;
- Install the oil inlet plug;
- Check for oil leaks.

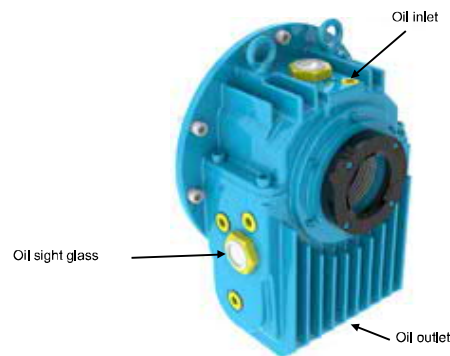


Figure 8.3 - Sleeve bearing

Table 8.10 - Oil properties for sleeve bearings

Frame		Poles	Bearing designation	Oil (liters)	Interval (h)	Lubricant	Lubricant specification
IEC	NEMA						
315	5000	2	9-80	2.8	8000	FUCHS Renolin DTA 10	ISO VG32 mineral oil with antifoam and antioxidant additives
355	5800						
400	6800						
450	7000						
315	5000	4 - 8	9-90	2.8	8000	FUCHS Renolin DTA 15	ISO VG46 mineral oil with antifoam and antioxidant additives
355	5800		9-100				
400	6800		11-110	4.7			
450	7000		11-125				
500	8000						

The lubricating oil must be replaced as specified on the nameplate or whenever changes on the oil properties are noticed. The oil viscosity and pH must be checked periodically. The oil level must be checked every day and kept in the center of the sight glass.

Please contact WEG, when oils with different viscosities are to be used.

8.3. MOTOR ASSEMBLY AND DISASSEMBLY



All repair services on motors should be always performed by qualified personnel and in accordance with the applicable laws and regulations in each country. Always use proper tools and devices for motor disassembly and assembly.



Disassembly and assembly services can be carried out only after the motor has been disconnected from the power supply and is completely stopped.

Dangerous voltages may be present at the motor terminals inside the terminal box since capacitors can retain electrical charge for long periods of time even when they are not connected directly to a power source or when space heaters are connected to the motor or when the motor windings are used as space heaters. Dangerous voltages may be present at the motor terminals when they are driven by frequency inverter even when they are completely stopped.

Record the installation conditions such as terminal connection diagram, alignment / leveling conditions before starting the disassembly procedures. These records should be considered for later assembly.

Disassemble the motor carefully without causing scratches on machined surfaces or damaging the threads.

Assemble the motor on a flat surface ensuring a good support base. Footless motors must be fixed/locked on the base to prevent accidents.

Handle the motor carefully to not damage the insulated components such as windings, insulated rolling bearings, power cables etc..

Seal elements, such as joint seals and bearing seals should always be replaced when wear or damage is noticed.

Motors with degree of protection higher than IP55 are supplied with joint and screw seal Loctite 5923 (Henkel) Clean the components and apply a new coat of Loctite 5923 on the surfaces before assembly.

For the W50 and HGF motor lines provided with axial fans, the motor and the axial fan have different markings for indicating the direction of rotation for prevent incorrect assembly.

The axial fan must be assembled so that the indicative arrow for direction of rotation is always visible, viewing the non-drive end side. The marking indicated on the axial fan blade, CW for clockwise direction of rotation or CCW for counterclockwise direction of rotation, indicates the direction of rotation of the motor viewing the drive end side.

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8.3.1. Terminal box

Proceed as follows to remove the terminal box cover and to disconnect/connect the power supply cables and the cables of the accessory devices:

- Ensure that during the screw removal the terminal box cover does not damage the components installed inside the terminal box;
- If the terminal box cover is fitted with lifting eyebolt, lift the terminal box cover always by its lift eyebolt;
- If motors are supplied with terminal blocks, ensure the correct tightening torque on the motor terminals as specified in Table 8.11;
- Ensure that the cables do not contact sharp edges;
- Ensure that the original IP degree of protection is not changed and is maintained as indicate on the motor nameplate. The power supply cables and the control cables must always be fitted with components (cable glands, conduits) that meet the applicable standards and regulations of each country;
- Ensure that the pressure relief device is in perfect operating condition, if provided. The seals in the terminal box must be in perfect condition for reuse and must be reinstalled correctly to ensure the specified degree of protection;
- Ensure the correct tightening torque for the securing bolts of the terminal box cover as specified in Table 8.11.

Table 8.11 - Tightening torque for the securing bolts [Nm]

Screw type and seal	M4	M5	M6	M8	M10	M12	M14	M16	M20
Hex bolt/hex socket bolt (rigid joint)	-	3,5 to 5	6 to 9	14 to 20	28 to 40	45 to 70	75 to 110	115 to 170	230 to 330
Combined slotted screw (rigid joint)	1,5 to 3	3 to 5	5 to 10	10 to 18	-	-	-	-	-
Hex bolt/hex socket bolt (flexible joint)	-	3 to 5	4 to 8	8 to 15	18 to 30	25 to 40	30 to 45	35 to 50	-
Combined slotted screw (flexible joint)	-	3 to 5	4 to 8	8 to 15	-	-	-	-	-
Terminal blocks	1 to 1,5	2 to 4 1)	4 to 6,5	6,5 to 9	10 to 18	15,5 to 30	-	30 to 50	50 to 75
Grounding terminals	1,5 to 3	3 to 5	5 to 10	10 to 18	28 to 40	45 to 70	-	115 to 170	-

Note: 1) For 12-pin terminal block, apply the minimum torque of 1.5 Nm and maximum torque of 2.5 Nm.

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8.4. DRYING THE STATOR WINDING INSULATION

Dismantle the motor completely. Remove the end shields, the rotor with the shaft, the fan cover, the fan and the terminal box before the wound stator with the frame is transferred to the oven for the drying process. Place the wound stator in the oven heated to max. 120 °C for two hours. For larger motors a longer drying time may be required. After the drying process has been concluded, allow the stator to cool to room temperature. Measure the insulation resistance again as described in item 5.4. Repeat the stator drying process if the required insulation resistance does not meet the values specified in Table 5.3. If the insulation resistance does not improve despite several drying processes, evaluate the causes of the insulation resistance drop carefully and an eventual replacement of the motor winding may be required. If in doubt contact WEG.



To prevent electrical shock, discharge the motor terminals immediately before, and after each measurement. If the motor is equipped with capacitors, these must be discharged before beginning any repair.



8.5. SPARE PARTS

When ordering spare parts, always provide complete motor designation, indicating the motor type, the code number and the serial number, which are stated on the motor nameplate.

Spare parts must always be purchased from WEG authorized Service Centers. The use of non-original spare parts can cause motor failure, performance drop and void the product warranty.

The spare parts must be stored in a clean, dry and properly ventilated room, with relative air humidity not exceeding 60%, with ambient temperature between 5 °C and 40 °C, free of dust, vibrations, gases, corrosive smokes and at constant temperature. The spare parts must be stored in their normal mounting position without placing other components onto them.

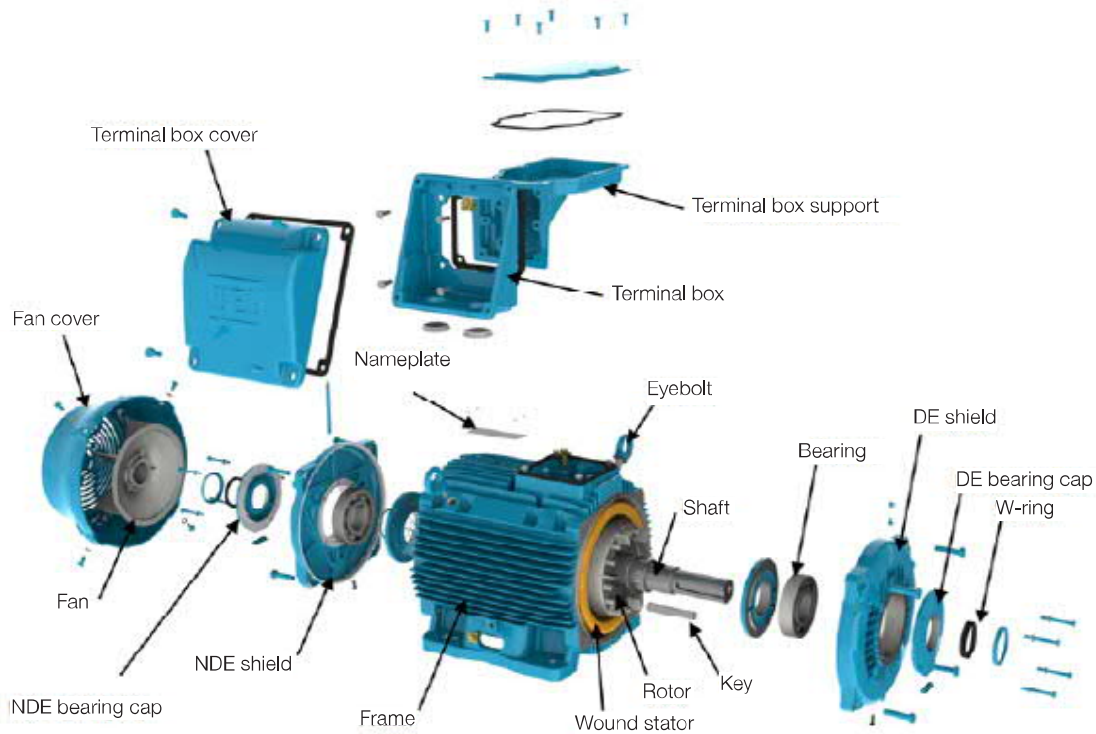


Figure 8.4 - Exploded view of the components of a W22 motor

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9. ENVIRONMENTAL INFORMATION

9.1. PACKAGING

WEG electric motors are supplied in cardboard, plastic or wooden packaging. These materials can be recycled and must be disposed according to the applicable laws and regulations in each country. All wood used in the packaging of WEG motors come from the company reforestation program and is not submitted to any chemical conservation treatment.

9.2. PRODUCT

Electric motors consist mainly of ferrous metals (steel plates and cast iron), non ferrous metals (copper and aluminum) and plastic materials.

In general, electric motors have relatively long service live. However when they must be discarded, WEG recommends to dismantle the motor, sort the different materials and send them for recycling.

No-recyclable materials should be disposed of at industrial landfills according to the applicable environmental laws and regulations in each country, or co-processed in cement kilns or incinerated.

The recycling service providers, the disposal in industrial landfills, the waste co-processing or the incineration process must be properly authorized by the state environment agency to carry out these activities.



10. TROUBLESHOOTING CHART X SOLUTIONS

This troubleshooting chart provides a basic list of problems that may occur during motor operation, possible causes and recommended corrective actions. In case of doubts, please contact WEG Service Center.

Problem	Possible cause	Corrective action
Motor does not start, neither coupled nor decoupled	Power cables are interrupted	Check the control panel and the motor power supply cables
	Blown fuses	Replace blown fuses
	Wrong motor connection	Correct the motor connection according to connection diagram
	Locked rotor	Check motor shaft to ensure that it rotates freely
The motor starts at no-load, but fails when load is applied. It starts very slowly and does not reach the rated speed	Load torque is too high during start-up	Do not start the motor on load
	Too high voltage drop in the power cables	Check the installation dimensioning (transformer, cable cross section, relays, circuit breakers, etc.)
Abnormal/excessive noise	Defective transmission component or defective driven machine	Check the transmission force, the coupling and the alignment
	Misaligned / unlevelled base	Align / level the motor with the driven machine
	Unbalanced components or unbalanced driven machine	Balance the machine set again
	Different balancing methods used for motor and coupling balancing (halve key, full key)	Balance the motor again
	Wrong motor direction of rotation	Reverse the direction of rotation
	Loose bolts	Tighten the bolts
	Foundation resonance	Check the foundation design
	Damaged bearings	Replace the bearings
Motor overheating	Insufficient cooling	Clean air inlet and outlet and cooling fins
		Check the minimum required distance between the fan cover and nearest walls. See item 7
		Check air temperature at inlet
	Overload	Measure motor current, evaluate motor application and if required, reduce the load
	Number of starts per hour is too high or the load inertia moment is too high	Reduce the number of starts per hour
	Power supply voltage too high	Check the motor power supply voltage. Power supply voltage must not exceed the tolerance specified in item 7.2
	Power supply voltage too low	Check the motor power supply voltage and the voltage drop. Power supply voltage must not exceed the tolerance specified in item 7.2
	Interrupted power supply	Check the connection of the power cables
	Voltage unbalance at the motor terminals	Check for blown fuses, wrong commands, voltage unbalance in the power line, phase fault or interrupted power cables
Direction of rotation is not compatible with the unidirectional fan	Check if the direction of rotation matches the rotation arrow indicated on end shield	
Bearing overheating	Excessive grease/oil	Clean the bearing and lubricate it according to the provided recommendations
	Grease/oil aging	
	The used grease/oil does not match the specified one	
	Lack of grease/oil	Lubricate the bearing according to the provided recommendations
	Excessive axial or radial forces due to the belt tension	Reduce the belt tension
Reduce the load applied to the motor		

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* European Union Importers

Centrifuge Bowl: Centrifugally cast Duplex stainless steel

Conveyor Scroll: Centrifugally cast Duplex stainless steel with plasma-fused tungsten carbide on end of scroll flights

Bowl Seals / Gaskets: Nitrile (Buna-N) rubber

Feed Tube: AISI 316 Stainless steel

Polymer Feed Line: Reinforced PVC tygon tubing

Feed Chamber: Stainless steel complete with sintered tungsten carbide bushing inserts

Solids Discharge Ports: Field-replaceable sintered tungsten carbide

Solids Catch Chamber: AISI 316 Stainless steel complete with field replaceable stainless steel wear liner

Solids Discharge: AISI 316 Stainless steel

Liquid Catch Chamber: AISI 316 Stainless steel

Liquid Discharge: AISI 316 Stainless steel

Stand: Painted carbon steel

Casing: 2-piece design consisting of AISI 316 stainless steel product contact. Carbon steel non-product contact.

Fasteners: AISI 316 Stainless steel

Flexible Connectors: Reinforced Neoprene

Liquid-end Bowl Bearing: Oil lubricated Cylindrical Roller Bearing

Solids-end Bowl Bearing: Oil Lubricated Grooved Ball Bearing

Scroll Bearing: Angular Contact Ball Bearing on Liquid End
Grooved Ball Bearing on Solids End

Conveyor Scroll: Plasma-fused tungsten carbide on end of scroll flights along the whole length of Conveyor.
[Fig. 1a]

Scroll Feed Ports: Sintered tungsten carbide insert bushings
[Fig. 1b]

Solids Discharge Ports: Field replaceable sintered tungsten carbide inserts
[Fig. 2]

Solids Catch Chamber: Field replaceable type stainless steel wear liner.
[Fig. 3]

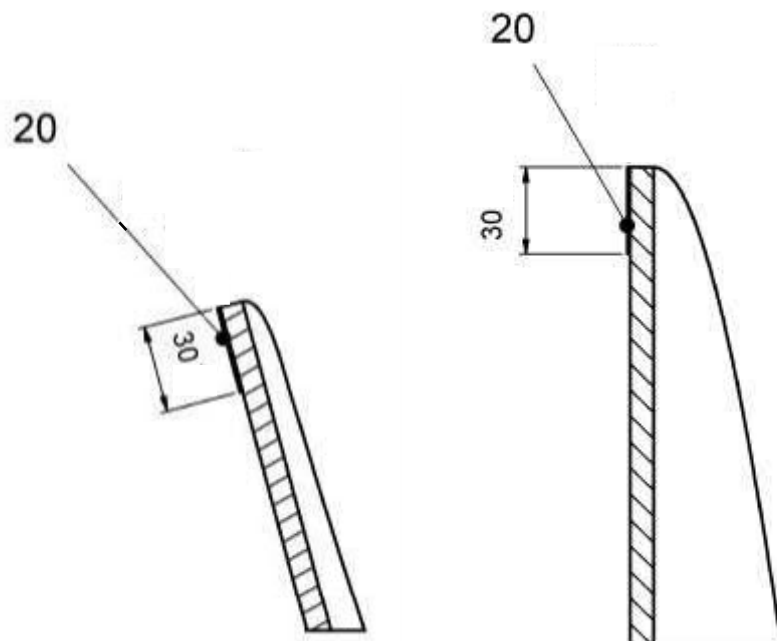


Figure 1a



UCF 7000 ABRASION PROTECTION FEATURES

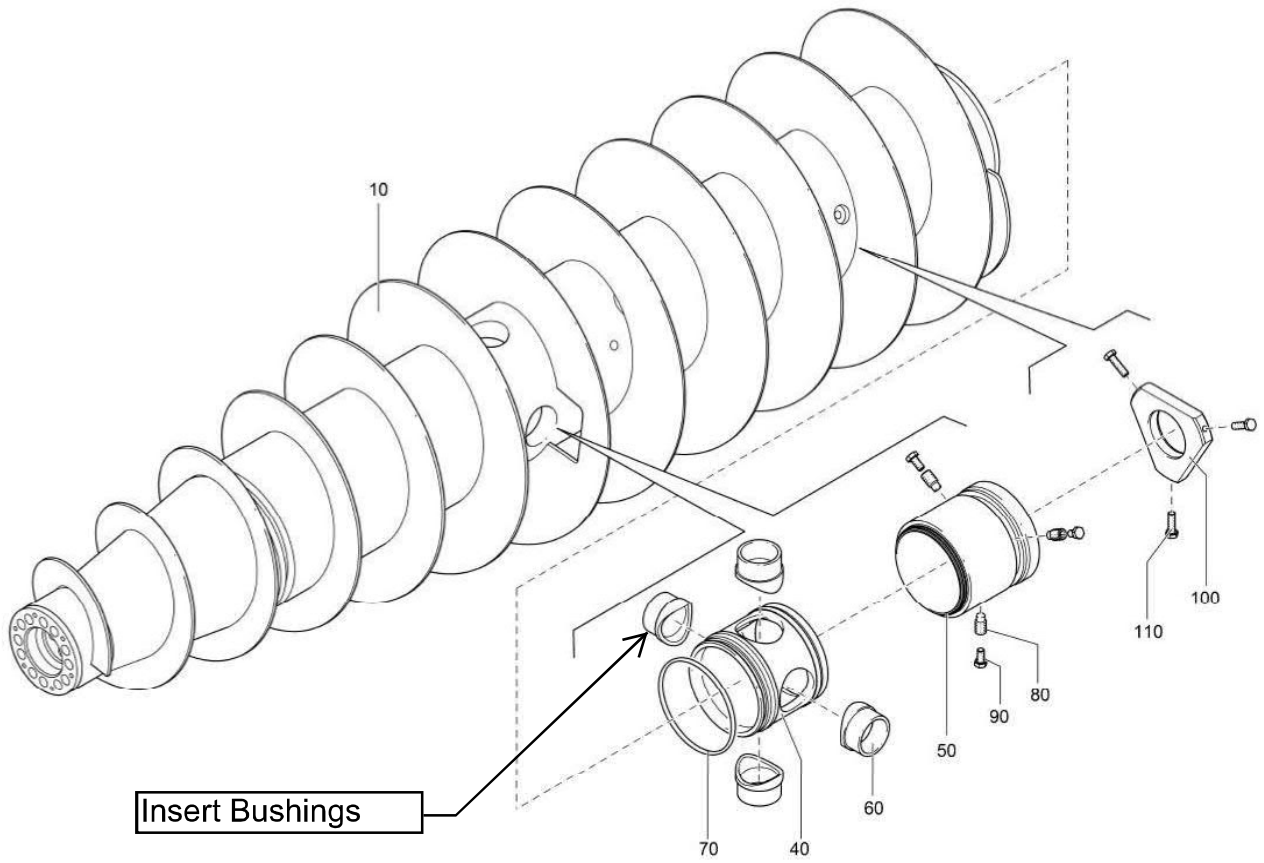


Figure 1b

Fig. 2 ~ Solids Discharge Abrasion Protection

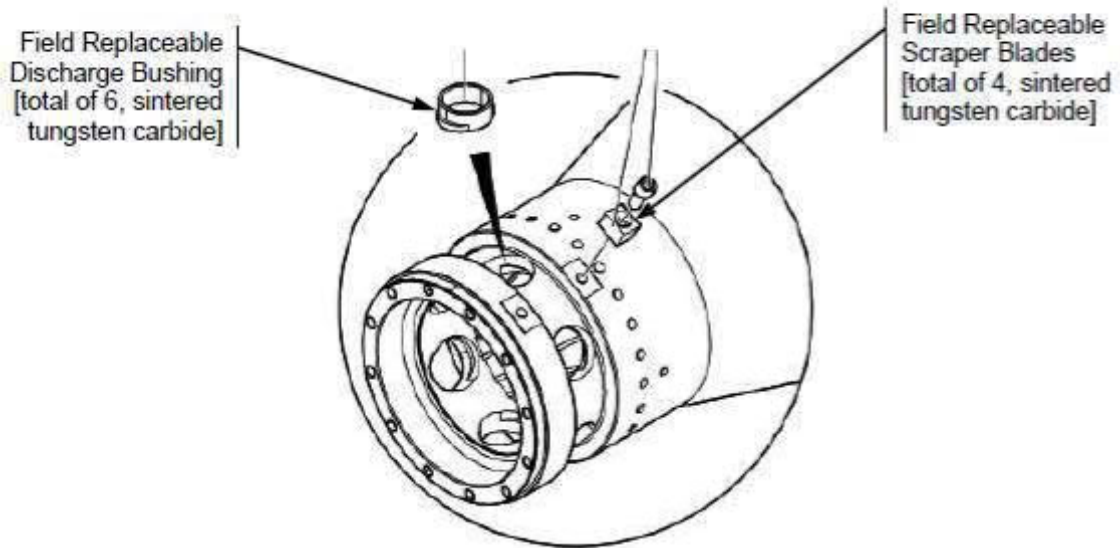
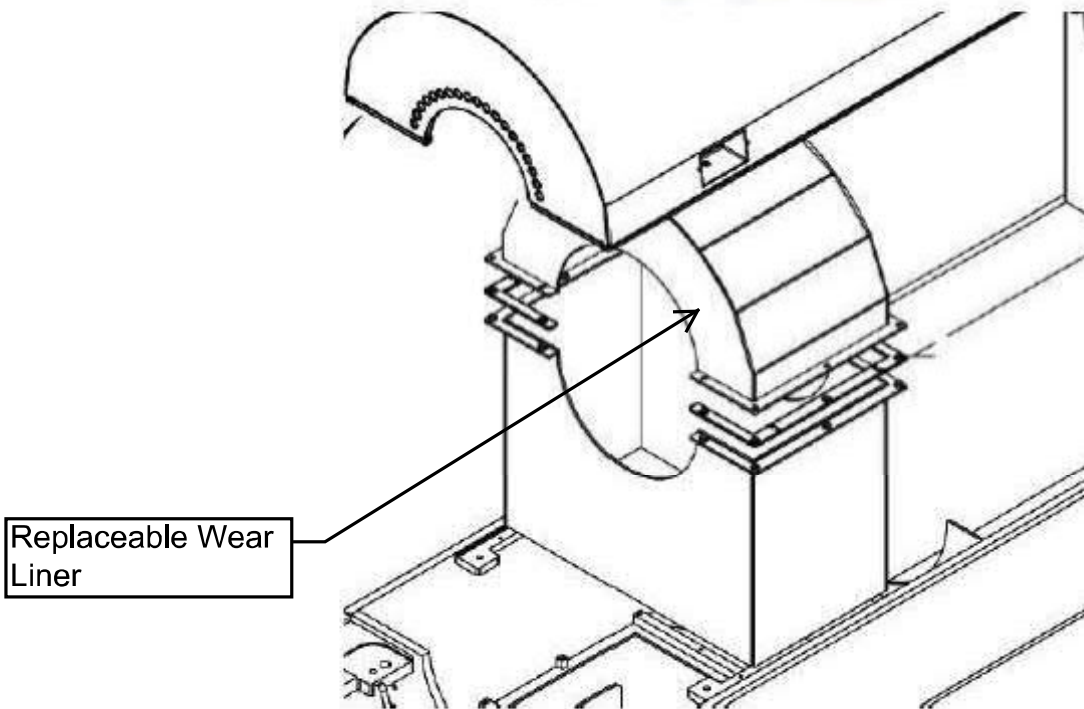
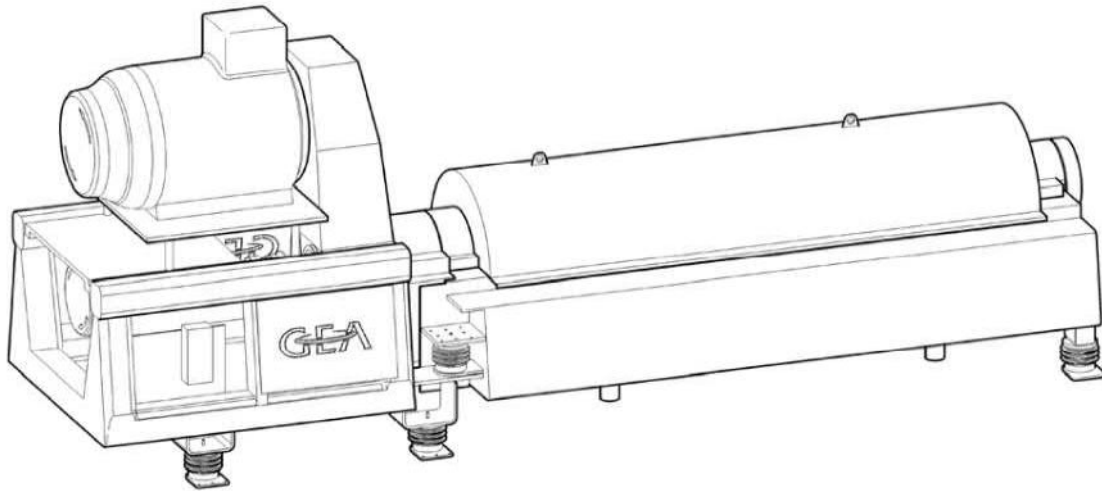


Fig. 3 ~ Solids Catch Chamber





8419000

Lifecycle calculation for ball and roller bearings

Decanter

CF 7000

No.: 8419-9054-001

Edition: 06.10.2017

1 General formula for calculating the bearing lifecycle according to DIN ISO 281

$$L_{10h} = \frac{1\,000\,000}{60 \cdot n} \left(\frac{C}{P} \right)^p$$

- L_{10h} = nominal bearing lifecycle, operating hours
 n = speed [min^{-1}]
 C = dynamic load rating [N]
 P = equivalent bearing load [N]
 p = exponent in equation for lifecycle determination
 - ball bearing $p = 3$
 - roller bearing $p = 10/3$

2 Results

The calculated nominal bearing lifetime is:

Bearing	Operating hours
Solids-side bowl bearing	207,183
Liquid-side bowl bearing	255,270
Solids-side scroll bearing	> 1,000,000
Liquid-side scroll bearing	687,896
Main motor (drive end)	329,333
Main motor (non-drive end)	> 1,000,000
Secondary motor (drive end)	> 1,000,000
Secondary motor (non-drive end)	> 1,000,000



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Instruction manual

Decanter

GEA biosolids Decanter prime 7000

GEA sludge Decanter prime 7000

GEA manure Decanter prime 7000

No. 8419-9001-300

Edition 28.10.2020

ORIGINAL DOCUMENT

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1	About this document	7
1.1	Application	8
1.2	Other applicable documents.....	8
1.3	Structure of the safety references	8
1.4	Target groups	10
1.4.1	Operator.....	10
1.4.2	Skilled worker	10
1.4.3	Trained specialist.....	10
1.5	Additional documentation	11
1.5.1	Training and Services	11
2	Safety precautions	13
2.1	Intended use	14
2.2	Reasonably foreseeable misuse	14
2.3	Qualification of the personnel	15
2.4	Responsibility of the plant operator	15
2.5	Modifications to the centrifuge	16
2.6	Requirements to be met by spare parts and consumables	16
2.7	Hazards through products and operating materials	17
3	Description	19
3.1	Noise emissions.....	20
3.2	Product hazards.....	20
3.3	Hazards caused by cleaning liquid	21
3.4	Hazards due to rotating machine parts	22
3.5	Personal protective equipment	22
3.6	Meaning of the safety markings.....	24
3.7	EMERGENCY STOP.....	27
3.8	Danger zones	27
3.9	Nameplate	28
3.10	Safety markings on the product.....	29
3.11	Total product.....	30
3.12	Bowl.....	31
3.13	Frame	32
3.14	Lubrication	32
3.15	Drive	33
3.16	Motor control.....	34
3.17	Temperature monitoring of the bowl bearings (option).....	35
3.18	Vibration monitoring of the decanter (option)	35
3.19	Function of the decanter.....	36
4	Technical data	37
4.1	Ambient conditions	38
4.2	Load on foundation	39
4.3	Motor data.....	40
4.4	Dimensioned drawing	41

5	Transport and storage	43
----------	------------------------------	-----------

5.1	Safety during transport	44
5.2	Storage instructions for the decanter.....	44
5.3	Using load-suspension devices safely	45
5.3.1	Declaration of conformity on load lifting attachments.....	47
5.3.2	Load fastening points for the hoist.....	48
5.4	Using lifting eye bolts or lifting eye nuts as load carrying equipment.....	49
5.5	Transporting the decanter	50

6	Assembly and installation	53
----------	----------------------------------	-----------

6.1	Safety during assembly and installation	54
6.2	Required documents for planning the installation	54
6.3	Environmental requirements.....	55
6.4	Allow for sufficient space for maintenance work.	55
6.5	Requirements to be met by the load suspension devices.....	56
6.6	Demands on the configuration of the installation	56
6.7	Requirements of feed and discharge lines	56
6.7.1	Rating of compensators.....	57
6.8	Configuration of the liquid chute	58
6.9	Configuration of the solid chute	59
6.10	Seals between frame and discharge chute	61
6.11	Configuration of the vent	63
6.12	Overflow on the liquid side	66
6.13	Flush connections.....	66
6.14	Hydrohermetic system.....	66
6.15	Mechanical seal	66
6.16	Compressed air connection.....	66
6.17	Inert gas connections	67
6.18	Special aspects when operating in hot conditions.....	67
6.19	Terminal box positions of the electrical components.....	68
6.19.1	Terminal box designations and their functions	69
6.20	Maintain sufficient space for ventilating the drive chamber.....	70
6.21	Space requirements for draining the bowl bearing oil	71
6.22	Viscosity damper	72
6.23	Planning the frame/foundation.....	73
6.24	Transporting the decanter	74
6.25	Decanter installation and alignment	77
6.25.1	Installation and alignment of series CF 7000 to CF 8000 decanters	77
6.26	Carry out voltage equalization	83
6.27	Decanter with supply cabinet.....	84
6.28	Connecting three-phase AC motors	85
6.29	Checking the direction of rotation of the motors.....	86
6.30	Connecting the control unit.....	87
6.31	Connecting the feed and discharge line assemblies	88

7	Settings	89
----------	-----------------	-----------

7.1	Changing speeds.....	90
7.2	Altering the bowl speed (frequency converter).....	90
7.3	Altering the differential speed (frequency converter).....	90
7.4	Mounting and adjusting the speed sensors.....	91
7.5	Adjust/check the gearbox temperature monitoring device.	92
7.6	Regulating ring.....	92
7.6.1	Removing the regulating ring.....	92
7.6.2	Fitting the regulating ring	94

8	Commissioning	95
8.1	Safety during commissioning.....	96
8.2	Checking the starting time of the bowl	96
8.3	Checking the run-down time of the bowl	96
8.4	Checking the direction of rotation of the bowl	97
8.5	Commissioning check list	98
8.6	Carry out test run	100
8.7	Preparing for re-starting.....	100
8.8	Start the centrifuge at operating state temperature.....	101
9	Operation	103
9.1	Safety during operation	104
9.2	What must be kept in mind when using third-party controls?.....	106
9.3	Immediate action in case of power outage.....	106
9.4	Pre-lubricating bowl bearings	107
9.5	Switching on the decanter	107
9.6	Operation	108
9.6.1	Operation with vibration monitoring equipment	109
9.7	Recommendations for cleaning after production.....	110
9.7.1	Shut-down program – P&ID flow chart	111
9.7.2	Throughput	112
9.7.3	Recommended standard procedure.....	113
9.7.4	Valve positions.....	115
9.7.5	Optional Varipond S - Flushing/Centripetal Pump Flushing	116
9.8	Thorough cleaning	117
9.9	Flush connections.....	117
9.10	Temporary decommissioning	118
9.11	Restarting	118
10	Trouble shooting	119
10.1	Safety when eliminating operating malfunctions	120
10.2	Trouble shooting.....	121
11	Maintenance	123
11.1	Safety during maintenance	124
11.2	Regular checks	125
11.2.1	Recurring checks on load suspension devices	125
11.3	Instructions on handling roller bearings.....	126
11.4	Maintenance schedule.....	127
11.5	Scroll	127
11.5.1	Admissible wear to scroll	127
11.6	Scroll bearings	128
11.6.1	Oil change (scroll bearing liquid side).....	129
11.7	Bowl	132
11.8	Bowl bearings	132
11.8.1	Emptying the oil collecting chambers	133
11.9	Tensioning the drive belt	134
11.10	Gearbox	136
11.10.1	Drain the gear oil.	137
11.10.2	Filling the gear oil.....	140
11.10.3	Vent gearbox (without circulation lubrication).....	142
11.11	Motor bearings.....	143

12	Repair	145
12.1	Avoiding damage during maintenance	146
12.1.1	Special tools	146
12.1.2	Standard tools.....	146
12.2	Screw torques.....	147
12.2.1	Screw torques in Newton meters (Nm)	147
12.2.2	Screw tightening torques in inch-pound (inlb)	148
12.3	Removing the bowl	149
12.4	Installing the bowl	156
12.5	Aligning the ring halves (option)	162
12.6	Removing the scroll	163
12.7	Fitting the scroll.....	165
12.8	Gearbox service.....	166
12.9	Dismantling the gear.....	166
12.10	Fitting the gearbox.....	167
12.11	Gaskets.....	168
12.11.1	Radial packing rings	168
12.12	Removing the main motor	169
12.13	Removing the secondary motor.....	170
12.14	Fitting the secondary motor	171
12.15	Fitting the main motor	172
12.16	Removing the coupling.	174
12.17	Fitting the coupling	175
12.17.1	Fitting the coupling (type A).....	175
12.17.2	Fitting the coupling (type B).....	177
12.18	Replacing belt pulleys.....	180
12.19	Replacing the motor belt pulley (taper lock bush)	182
13	Decommissioning	183
13.1	Notes on long-time storage of the centrifuge and individual rotors	184
13.1.1	Decommissioning the decanter	184
13.1.2	Painted parts.....	184
13.1.3	Unpainted areas and galvanised parts	185
13.1.4	Gearbox / spare gearbox.....	185
13.1.5	Drive motors	185
13.2	Maintenance schedule (machine shut-down for a prolonged period) ...	186
13.2.1	Maintenance work once a month.....	187
13.2.2	Maintenance work once a year.....	187
13.2.3	Maintenance work before resuming operation	187
13.3	Disposing of the centrifuge	188
13.3.1	Disposing of utilities	188
13.3.2	Disposing of cleaning fluids	189
14	Spare parts	191
14.1	Use only genuine spare parts.....	192
14.2	Notes on ordering spare parts	193
14.3	Storing wear parts and operating materials.....	194
14.3.1	Gaskets and drive belts	194
14.3.2	Roller bearings.....	195
14.3.3	Lubricants	195

1 About this document

1.1	Application	8
1.2	Other applicable documents	8
1.3	Structure of the safety references	8
1.4	Target groups	10
1.4.1	Operator.....	10
1.4.2	Skilled worker	10
1.4.3	Trained specialist.....	10
1.5	Additional documentation	11
1.5.1	Training and Services	11

1.1 Application

This document applies for all persons who work with or on the centrifuge.

It is applicable for the plant operator as a basis for creating standard operating procedures for conduct at the workplace at the centrifuge.

1.2 Other applicable documents

- Centrifuge datasheet
- P&ID (Piping & Instrumentation Diagram)
- Dimensioned drawing
- Documents on control of the centrifuge, e.g. descriptions and settings.
- Instruction manuals of components of other manufacturers such as motors and valves.
- Further order-specific documents if relevant.

1.3 Structure of the safety references

The centrifuge has been designed and built so that it functions and can be operated safely. Reference will be made in this manual to further potential risks by using warnings where appropriate.

A differentiation is made between hazards which result in damage to the centrifuge, plant components and environment and hazards which lead to possible or probable injury or loss of life.

Signal words and their meaning

DANGER

Denotes impending danger. If the preventive measures are not implemented, death or serious injury will be the consequence.

WARNING

Denotes a potentially dangerous situation. If the preventive measures are not implemented, death or serious injury may be the consequence.

CAUTION

Denotes a potentially dangerous situation. If the preventive measures are not implemented, minor injury may be the consequence.

NOTICE

Denotes a potentially damaging situation. If the preventive measures are not implemented, the centrifuge or something else in its vicinity can get damaged.

Danger signals



This is the danger signal. It warns of injury risks.

- Comply with all measures marked with the danger signal to avoid injury or death.

Structuring of the safety references according to the 5-point rule

1. **Danger signals as a warning of injury risks.**
2. **Signal words** signal the degree of risk.
3. **The type and source of the hazard** indicate from where the hazard originates.
4. **Explanation of the hazard** and **consequences in the case of non-compliance** describe the threat and the consequences of human error.
5. **Measures** give instructions to avoid the hazard.



DANGER

Type and source of the hazard

Explanation of the hazard and the consequences in the event of non-compliance.

➤ Measures to avert or minimise the hazard.



WARNING

Type and source of the hazard

Explanation of the hazard and the consequences in the event of non-compliance.

➤ Measures to avert or minimise the hazard.



CAUTION

Type and source of the hazard

Explanation of the hazard and the consequences in the event of non-compliance.

➤ Measures to avert or minimise the hazard.

NOTICE

Type and source of the hazard

Explanation of the hazard and the consequences in the event of non-compliance.

1.4 Target groups

The target groups for this documentation are all persons involved in installing, assembling, operating, maintaining and repairing the centrifuge.

What work may be carried out by what target group depends on the qualification of the personnel and on the type of work.

In the tables in the chapters **Troubleshooting** and **Maintenance** the responsible target group as well as the operation is specified.

1.4.1 Operator

Abbreviation: Op

The operator is employed by the customer and has been briefed in the following operations:

- Starting and shutting down the machine.
- Monitoring the machine and process (e.g. by means of indicators).
- Execution of easy re-lubrication and cleaning operations.

When given specific directions, the operator is able to carry out simple modifications to the process, e.g.:

- Adjusting temperatures, pressures and throughput capacities.
- Dosing additives.

1.4.2 Skilled worker

Abbreviation: Sworker

The skilled worker is normally employed by the customer and has been briefed in the following areas:

- Performing easy assembly work
- Performing routine maintenance work or servicing
- Limited settings and parametrization on the components and control system

The skilled worker has basic technical knowledge. The basic knowledge corresponds to a technical apprenticeship (mechanical or electrical).

The skilled worker is selected and deployed by the employer (plant operator).

GEA Westfalia Separator will carry out the briefing only in specific technical features that are part of the supply schedule and will indicate potential hazards.

This briefing is no substitute for an apprenticeship.

1.4.3 Trained specialist

Abbreviation: Tspec

The trained specialist normally belongs to the service team of GEA Westfalia Separator.

In exceptional cases, skilled workers employed by the customer can obtain a corresponding qualification and authorization by attending training courses held by GEA Westfalia Separator.

1.5 Additional documentation

Request further information and technical documentation from the following places:

- Directly from GEA Westfalia Separator in Oelde.
- From the nearest representative of GEA Westfalia Separator.
- Per Internet under: www.gea.com/contact

1.5.1 Training and Services

GEA Westfalia Separator regularly holds training courses for customer employees.

Training content is aimed at the customer's operating and service staff who work with the machine. The operator must know how the machine functions.

Trained operators assure the operating safety of the machine.

Many different applications require competent process engineering know-how. Only adequately trained employees in service ensure a high quality standard. This requires ongoing further training.

The demands on the qualification of the service staff are growing increasingly. GEA Westfalia Separator consequently offers a qualification model and training concept.

For further information about the training of operating and service personnel as well as GEA services:

- Contact local GEA representatives or
- Visit the website gea.com/services.

2 Safety precautions

2.1	Intended use	14
2.2	Reasonably foreseeable misuse	14
2.3	Qualification of the personnel	15
2.4	Responsibility of the plant operator	15
2.5	Modifications to the centrifuge	16
2.6	Requirements to be met by spare parts and consumables	16
2.7	Hazards through products and operating materials	17

2.1 Intended use

The centrifuge separates media with different densities by centrifugal force.

The centrifuge is intended exclusively for commercial operation. It is technically designed in compliance with the operating mode contractually agreed with the manufacturer and the specifications in the technical data of the centrifuge.

The centrifuge is suitable for the following applications:

- Separating liquid mixtures
- Separating solids from liquids
- To combine the tasks separating and solids removal

It must be noted that the solids to be discharged must always be sufficiently fluid to ensure a uniform solid discharge. In this connection, the rheological characteristics (deformation and flow behaviour) of the solids play an important role.

For information on process conditions, operating conditions, and environmental conditions, see:

- Centrifuge nameplate
- Data sheet

The following provisions must be met to ensure that the centrifuge is operated safely at all times.

- Use only original spare parts and original operating materials.
- Comply with limit values.
- Do not alter or upgrade the centrifuge.

For centrifuges outside hazardous areas, the following additional requirements apply:

- Do not feed product which is categorised as explosive.
- Do not deploy the centrifuge in zones classified as explosion hazardous.

2.2 Reasonably foreseeable misuse

This instruction manual contains information relating to intended use. Operation of the centrifuge that is not in conformity with the intended use is considered to be misuse.

Reasonably foreseeable misuse includes:

- Non-observance of this instruction manual
- Use of the centrifuge in areas where the legal basis does not comply with the manufacturer's declaration of conformity
- Use of non-original spare parts
- Use of non-permitted operating materials
- Exceeding the defined limit values
- Changing the process conditions, operating conditions and environmental conditions without the consent of the manufacturer.

Any misuse of the centrifuge can lead to severe damage to persons and property.

Operating modes that result in unbalance due to concentration of product and consequent caking are considered as not in conformity with the intended use. The plant operator is responsible for damage arising as a consequence of this non-conformance. The manufacturer is not liable.

2.3 Qualification of the personnel

Special knowledge and skills are required for working on and with centrifuges. The qualification of the personnel with this expertise is an important requirement for the operational reliability.

The requirements in respect of qualification levels are set out in the chapter "About this document / Target groups". They depend on the tasks assigned.

Faulty operation, assembly and handling errors can result in danger to life and limb as well as causing severe damage to property.

The plant operator must implement measures for the qualification of its personnel:

- Assign only reliable personnel to work on the centrifuge.
- Allow only authorized personnel to work on the centrifuge.
- Give special training and briefings to the personnel for the tasks assigned.
- Clearly define responsibilities.
- Make sure that the authorized persons have read and understood the **safety information** before beginning work.
- Make sure that the authorized persons have read and understood all sections of the **instruction manual** required for their work before beginning work.
- Give special briefings to persons who cannot read, and monitor their work.
- Persons still undergoing training may only be deployed under supervision.

2.4 Responsibility of the plant operator

The operation of a centrifuge is subject to rules and regulations for machine safety and occupational health and safety.

The order of the following rules and regulations is not a reflection of their priority. The list lays no claim to completeness.

- Regulations relating to safety and health (accident prevention regulations) based on Article 118a of the foundation treaty of the EEC, e.g. RL 89/655/EEC and follow-up versions or corresponding national regulations issued by the country of operation.
- Regular check of safety devices
- Compliance with the Machinery Directive 2006/42/EC or corresponding national regulations issued by the country of operation when working within the responsibility as manufacturer.
- Compliance with the German Equipment and Product Safety Act or corresponding national regulations issued by the country of operation when working within the responsibility as manufacturer.

The plant operator is responsible for complying with rules and regulations and the safety-conscious work of the assigned persons. These include the following measures:

- Ensuring that the statutory and other binding regulations on safety, accident prevention and health and safety protection are known and complied with.
- Only qualified and authorized personnel with technical understanding and fundamental technical knowledge and skills may be assigned to work on the centrifuge.
- Clearly define and notify responsibilities for tasks.
- Operate the centrifuge only in perfectly functional conditions in line with the intended use. For the intended use, refer to the section "**Intended use**".
- Before starting the machine, always check all safety devices.

- Have the centrifuge checked regularly by qualified persons for its operating safety. Have the centrifuge checked at least once a year in operational status and in accordance with the maintenance schedule.

2.5 Modifications to the centrifuge

Modifications to the centrifuge are prohibited. They represent an unintended use and endanger the operational reliability of the centrifuge. This may cause physical injury and damage to property.

- Clarify the planning and the measures for the modifications to the centrifuge with GEA Westfalia Separator.
 - If modifications to the centrifuge are necessary, e.g. due to new operational sequences or product changes, contact GEA Westfalia Separator.
 - Modifications or alterations to the centrifuge must be added to the documentation. The instruction manual, schedule for lubrication and maintenance, as well as the spare parts catalogue, must be adapted.

2.6 Requirements to be met by spare parts and consumables

Spare parts, wear parts and consumables can cause damage to persons and property if they do not meet the requirements.

Original spare parts and consumables from GEA Westfalia Separator Group satisfy all pre-conditions for the operating safety of the centrifuge.

- Use only original spare parts.
- Use only original operating materials.
- Use the order-specific spare parts catalog supplied.
- See the chapter "Spare parts" for ordering spare parts and consumables.
- Keep to the limit values.

2.7 Hazards through products and operating materials

Hazardous materials are all materials which, on physical contact, represent a hazard for the persons operating in the environment of the centrifuge.

Centrifuges which have been purpose-built for the operation with hazardous materials are marked with safety stickers.

Hazards resulting from the following product characteristics and operating materials are known from product observation.

- Hot products
- Cold products
- Hazardous, chemically critical products
- Hazardous, biologically critical products
- Detergent

3 Description

3.1	Noise emissions.....	20
3.2	Product hazards.....	20
3.3	Hazards caused by cleaning liquid	21
3.4	Hazards due to rotating machine parts	22
3.5	Personal protective equipment	22
3.6	Meaning of the safety markings.....	24
3.7	EMERGENCY STOP.....	27
3.8	Danger zones	27
3.9	Nameplate	28
3.10	Safety markings on the product.....	29
3.11	Total product.....	30
3.12	Bowl.....	31
3.13	Frame	32
3.14	Lubrication	32
3.15	Drive	33
3.16	Motor control.....	34
3.17	Temperature monitoring of the bowl bearings (option).....	35
3.18	Vibration monitoring of the decanter (option)	35
3.19	Function of the decanter.....	36

3.1 Noise emissions

Noise emissions from the centrifuge are caused by rotating machine parts, sound-emitting surfaces and resonant plant components.

The intensity of the noise emissions depend on the type of construction of the centrifuge, the operating mode and the ambient conditions.

The operating personnel must observe the local standard operating procedures (SOPs) issued by the plant operator and wear personal protective gear, e.g. ear protection.

Refer to the datasheet for the sound pressure level and sound power level.

Factors that increase the noise level in the area of the centrifuge:

- Reverberating walls (e.g. glass, tiles, tank walls etc.),
- Installation in corners of rooms.
- Resonant platforms.
- Resonant fittings.
- Auxiliary equipment (e.g. pumps, valves etc.).

The following measures reduce the noise nuisance for the operators:

- Install the centrifuges in separate rooms.
- Line the walls with sound absorbing materials.
- Organise internal processes so that centrifuge rooms have to be entered as rarely as possible.
- Use personal noise protection.

3.2 Product hazards

In the case of products which have to be allocated to a specific hazard class, adhere to the corresponding local safety precautions when handling these products.

The local standard operating procedures must be observed and the required personal protective gear must be worn.

In the event of accidents, keep to the local rules of conduct when handling products of the respective hazard class and take appropriate first-aid measures when injury is involved.

Following accidents, notify in-house or local emergency services immediately so that appropriate action can be taken. The emergency services comprise, for example, fire brigade, paramedics, security and other emergency facilities.

3.3 Hazards caused by cleaning liquid

For CIP (cleaning-in-place), only chemicals may be used that have been recommended by GEA Westfalia Separator.

The cleaning media are acids and caustics which can cause severe personal injury when used without due care.

Cleaning may under certain circumstances be carried out at high temperatures. The surfaces of the centrifuge, especially the hood and pipes, get hot.

The local standard operating procedures must be observed and the required personal protective gear must be worn, such as:

- Face protection and protective goggles
- Protective suit
- Protective gloves
- Protective boots or safety shoes
- Apron

The prevailing local rules of conduct pertaining to handling acids and caustics with a view to preventing accidents must be complied with.

Carry out first-aid measures when injury is involved.

Following accidents, notify in-house or local emergency services immediately so that appropriate action can be taken. The emergency services comprise, for example, fire brigade, paramedics, security and other emergency facilities.

Chemicals and incorrect concentrations of chemicals not specified and approved by GEA Westfalia Separator can cause damage through corrosion.

Chloric cleaning agents attack stainless steel and can lead to corrosion.

The corrosion can occur both on bowl parts as well as on the hood and the concentrate collector.

Carry out regular checks for damage and wear on sight glasses in product lines through which CIP liquid is fed.

Inadequate flushing can also lead to chemical residues entering the product rendering it useless.

The bowl gaskets can swell as a result of inadequate flushing.

3.4 Hazards due to rotating machine parts

The centrifuge is equipped with a metal bowl rotating at high speed which represents a high hazard potential on account of the rotational energy.

If not handled properly, open, rotating machine parts can be a danger for life and limb of the operating and maintenance personnel.

The bowl must therefore be stationary before starting work on the centrifuge.

Checking bowl standstill should not be based on just one information source, e.g. speed indicator. It must always be backed up by at least one further checking option.

Observing the motor fan alone, for example, is not a reliable method of checking standstill. The motor or its fan can be at standstill while the bowl is still rotating.

The following options are available for checking standstill on centrifuges depending on the version:

- Electric speed indicator.
- Visual speed check of the drive motor.
- Noise check.
- Vibration check.

3.5 Personal protective equipment

To prevent any hazard to limb or life, the prescribed personal protective equipment must be worn when operating the centrifuge or carrying out maintenance work and repair work at the centrifuge.

The personal safety equipment conforms to:

- Locally applicable accident prevention regulations
- Instruction manual of the operator or employer
- Instructions in the safety information in this instruction manual

Anybody working with or at the centrifuge is responsible that the personal protective equipment is worn and that it is in proper condition.

- Replace damaged safety equipment with new equipment.
- Clean dirty safety equipment.



Fig. 1

Wear hearing protection

- Wear hearing protection when working in a loud environment.

The noise level in a plant can exceed 85dB(A).

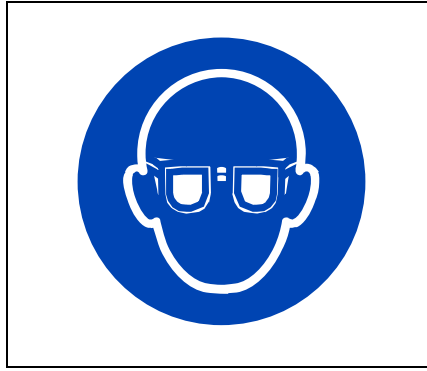


Fig. 2

Wear protective goggles

- Wear protective goggles when working on pipes and fittings.

Possible residues of caustic liquids in valves and pipes and piping systems not relieved from pressure.

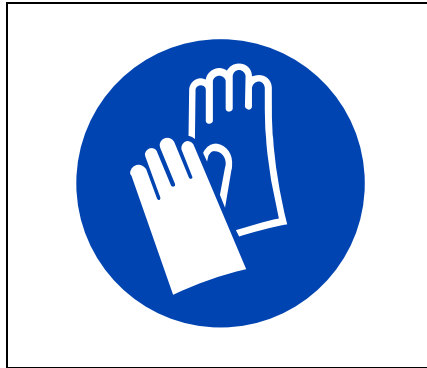


Fig. 3

Wear protective gloves

- When working at hot or cold surfaces of centrifuges and pipelines, wear protective gloves.

Possible temperature ranges:
-10 to +80 °C and 14 to 176 °F.



Fig. 4

Wear breathing protection

In potentially explosive areas even inert gases are used as protective gas, e.g. nitrogen.

- When there is the risk of undercutting the permitted oxygen content of the air, wearing adequate breathing protection is mandatory (see operating instructions of the operator).

3.6 Meaning of the safety markings

Used safety markings are attached as adhesive sign to the centrifuge and/or the control cabinet.

It is important for all persons working with or on the centrifuge to be able to identify the meaning of all the symbols on the safety stickers.

In case of non-compliance with the safety markings, GEA Westfalia Separator accepts no liability for resulting damage.



Fig. 5

This safety marking means:

- **Refer to the machine documentation.**
- Any person who is assigned the task of installing, operating, maintaining and repairing the machine must have read and understood the documentation.
- The documentation must be complete, kept near to the machine and be readily accessible to operating personnel.

In case of non-compliance with the above, GEA Westfalia Separator accepts no liability for resulting damage.



Fig. 6

This safety marking means:

- **Disconnect machine from power supply.**
- Danger of injury from electrical voltage and unintentional start-up of the decanter.

Before working on the decanter and electrical plant components:

- Ensure that the decanter is at a standstill.
- Disconnect all electrically supplied equipment from the power supply using the main switch.
- Secure the plant against unintended restarting with locking devices.



Fig. 7

This safety marking means:

- **Work on rotating bowl is prohibited.**
- Do not loosen any part and do not carry out any maintenance or repair work on the decanter before the bowl has come to a standstill.

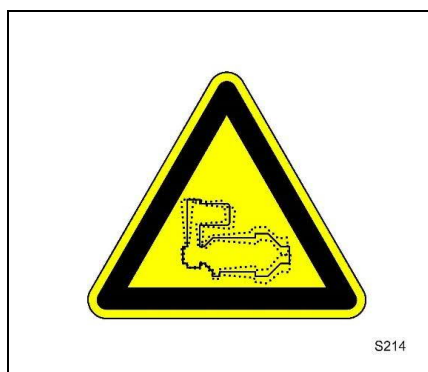


Fig. 8

This safety marking means:

- **Warning of unusual noises or vibrations.**
- Attention in the case of unusual noises or vibrations on the decanter.
- Follow the instructions in the instruction manual.
- Press EMERGENCY STOP.
- Bring persons into safety and leave the room.
- Do not enter the room again until the bowl has come to a standstill. Danger to life and limb through rotating machine parts!

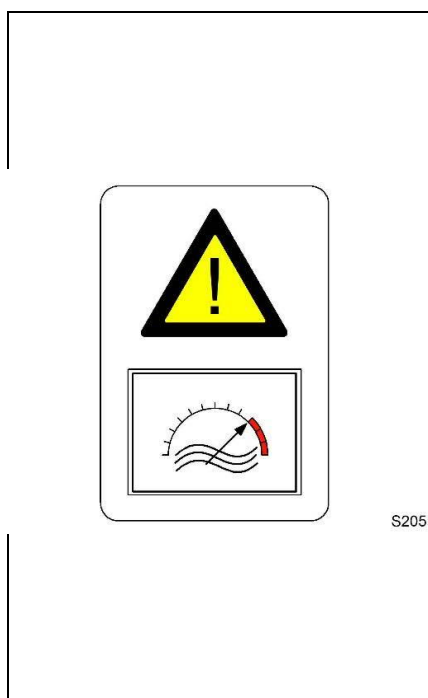


Fig. 9

This safety marking means:

- **Frequency converter operation.**
- When setting the frequency converter, do not exceed the admissible bowl speed (see type plate).
- Setting the parameters on the frequency converter may only be carried out by qualified specialists.
- When starting the machine after replacing drive parts, the bowl speed must be checked.
- The decanter may only be operated with an additional independent device for speed limiting. Risk of damage to the decanter.

This adhesive label is only used for frequency converter operation.

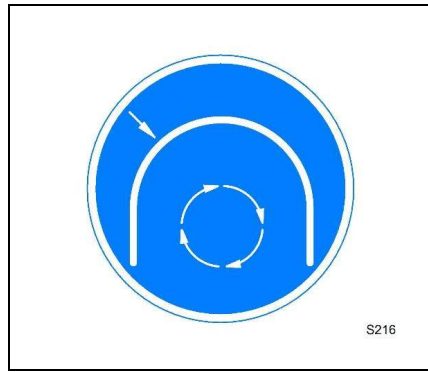


Fig. 10

This safety marking means:

- **Warning of hot or cold surfaces.**
- The surfaces of the decanter and plant components can be very hot or cold. Risk of injury!

This adhesive plate is used only for hot operation or extreme cold operation.



- Operate the machine only with protective equipment in accordance with EN 294.

Fig. 11

3.7 EMERGENCY STOP

EMERGENCY STOP restores functional safety in an emergency or hazardous situation. It ensures that processes are stopped and all moving parts are brought to a standstill as quickly as possible.

The centrifuge and all auxiliary equipment are not de-energised with the Emergency Stop. The functionality of all components is maintained even when the centrifuge is stationary. The voltage must be disconnected manually.

Shutdown **EMERGENCY STOP** can be initiated manually or is carried out automatically, if a vibration monitoring unit is available. EMERGENCY-STOP is triggered automatically when the centrifuge is vibrating and either vibration stage 2 is reached or after 5 minutes of vibration stage 1 status.

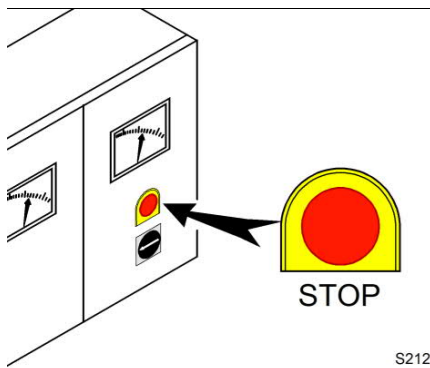


Fig. 12

EMERGENCY STOP button

- EMERGENCY STOP buttons are located on the control cabinet.
- Exact information on the position of the EMERGENCY STOP buttons can be found in the electrical documentation.
- The control cabinet is installed according to the specifications of the plant operator.
- The position of the EMERGENCY-STOP button is given in the SOP of the plant operator.

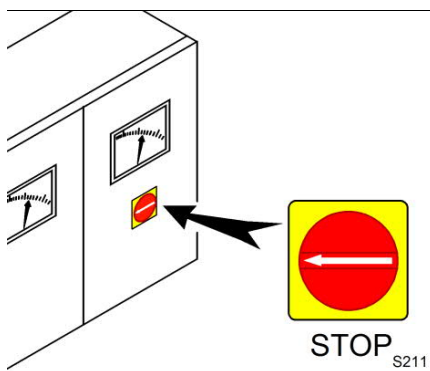


Fig. 13

Main switch

- Precise information on the position of the main switch on the cabinet is given in the electrical documentation.
- The control cabinet is installed according to the specifications of the plant operator.
- The position of the control cabinet with the main switch is given in the SOP of the plant operator.



3.8 Danger zones

Touch the centrifuge and the feed and discharge lines only when wearing protective gloves.

The surfaces reach temperatures of over 70 °C depending on the product processed and the operating speeds.

In normal operating mode, with mounted protective devices and functional supervisory equipment, there are no further danger areas on the centrifuge.

3.9 Nameplate

		GEA Westfalia Separator Group GmbH 59299 Oelde, Germany
Type	<input type="text"/>	
Year of manufacture	<input type="text"/>	Serial-No. <input type="text"/>
Max. permitted rated bowl speed in rpm		<input type="text"/>
Max. permitted density of product in kg/dm ³		<input type="text"/>
Heavy liquid, kg/dm ³	<input type="text"/>	Solids, kg/dm ³ <input type="text"/>
Min./max. Temperature of feed product in °C		<input type="text"/>
Min./max. Housing pressure range in bar		<input type="text"/>
Min./max. Throughput, m ³ /h		<input type="text"/>

3.10 Safety markings on the product

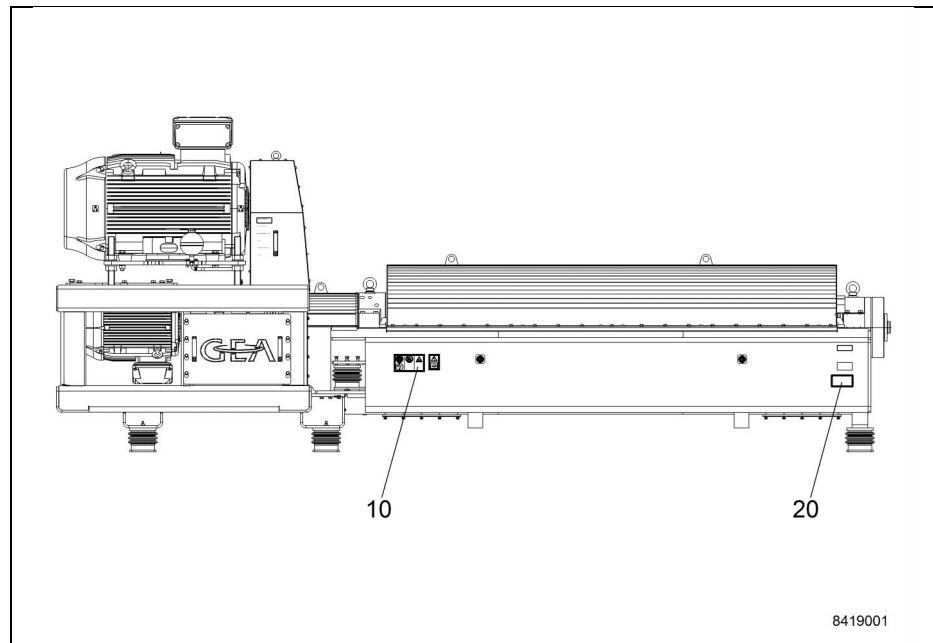
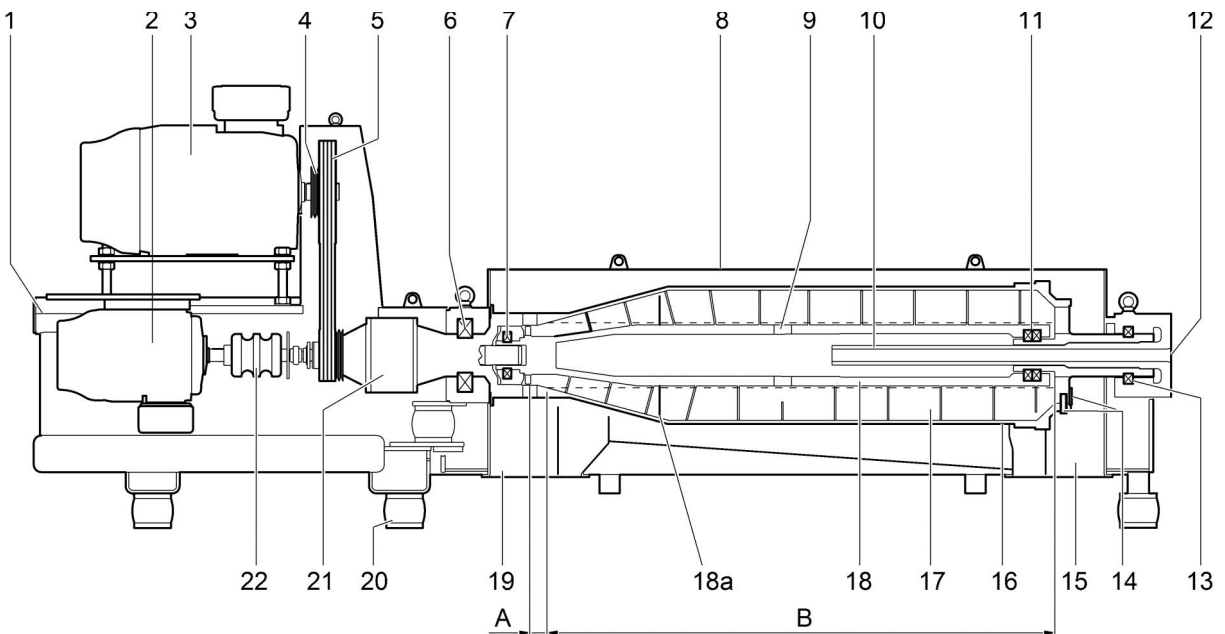


Fig. 14

10	<p>Safety markings Replace damaged safety markings immediately. Refer to the order-specific parts list.</p>
20	<p>Nameplate</p>

3.11 Total product



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Fig. 15

- A Dewatering zone
- B Clarifying zone
- 1 Frame (drive)
- 2 Secondary motor
- 3 Main motor
- 4 Scroll drive (not fitted on every version)
- 5 Bowl drive
- 6 Bowl bearings (solids side)
- 7 Scroll bearings (solids side)
- 8 Frame (decanter)
- 9 Distributor
- 10 Feed tube
- 11 Scroll bearing (liquid side)
- 12 Feed
- 13 Bowl bearings (liquid side)
- 14 Depending on design: regulating tubes or regulating rings
- 15 Depending on design: Gravity discharge of the clarified light or heavy liquid phase
- 16 Bowl
- 17 Separation chamber
- 18 Scroll
- 18a Immersion disk
- 19 Solids discharge
- 20 Vibration absorbers
- 21 Gearbox
- 22 Coupling

3.12 Bowl

The bowl is of cylindrical-conical design. Clarification and separation of the liquid phases takes place in the cylindrical section of the bowl, dewatering of the separated solids takes place in the conical section of the bowl.

Existing or possible wear and corrosion protection:

- All bowl and scroll parts coming in contact with the product are made of stainless steel.
- Exchangeable wearing bushes in the solids ejection ports of the bowl.
- Hard-faced scroll flights for products with erosive properties (on special request).

The clarifying and dewatering efficiency can be changed and hence adapted to the respective process. The following possibilities are available:

Exchanging the regulating ring. This produces the following tendency:

Option 1: Version without immersion disk (for crystalline products)

- Large inner diameter of the regulating ring produces a long dewatering zone (= good dewatering efficiency) and a short clarifying zone (= less good clarifying efficiency).
- Small inner diameter of the regulating ring produces a short dewatering zone (= less good dewatering efficiency) and a long clarifying zone (= good clarifying efficiency).

Option 2: Version with immersion disk (for pasty products)

- Small inner diameter of the regulating ring produces a high filling level of the bowl (= good dewatering efficiency).
- Large inner diameter of the regulating ring produces a lower filling level of the bowl (= less good dewatering efficiency).

Changing the differential speed range

This permits changing the layer thickness and dwell time of the solids in the dewatering zone. Tendency:

- High differential speeds produce a high residual moisture content with pasty solids.
- Low differential speeds produce a low residual moisture content but can lead to higher stressing of the scroll drive.

When processing crystalline solids, the opposite results are obtained.

Altering the bowl speed.

High bowl speeds generally improve the clarification and separation efficiency, but require higher drive power ratings. They can also make solids conveyance more difficult and increase material wear.

3.13 Frame

The frame consists of the decanter frame and the drive frame.

Decanter frame

The decanter frame consists of:

- a welded frame
- stainless steel catchers for the product discharges
- a bowl protective hood

Drive frame

The drive frame consists of:

- a welded frame
- the drive motors
- a guard

Vibration absorbers underneath the two frames largely prevent the transmission of vibrations.

3.14 Lubrication

Lubrication point	
Gearbox	The gearbox is filled with oil. The oil filling must be replaced regularly.
Bowl bearings	The bowl bearings are supplied with lubricant through an automatic oil-air lubrication system.
Scroll bearings	The scroll bearings are filled with oil. The oil filling must be replaced regularly.

The re-lubrication intervals and grease qualities are specified in the "Lubrication and maintenance schedule".

3.15 Drive

The decanter is driven by a three-phase AC motor.

Power transmission is via belts.

The belt pulleys are exchangeable so as to be able to alter the bowl and differential speeds.

The scroll is driven by a gear.

Option

The drive motor is controlled via a frequency converter. The bowl speed can be steplessly adjusted within certain ranges via the frequency converter.



DANGER

Danger to life through parts breaking at high speeds

If the decanter is operated at inadmissibly high speeds, machine parts can break and pose a high safety risk.



Fig. 16

- Never manipulate the frequency converter to exceed the permissible bowl speed (see nameplate).
- The machine may only be operated with an independent device for speed limitation.

Function:

The main motor drives the scroll and bowl at different speeds via drive belts and the gearbox.

The scroll drive power required for the control range is taken from the frequency-controlled secondary motor.

If the power consumption of this secondary motor rises above the maximum permissible value (due to increasing torque on the scroll), the controller increases the motor speed and hence the differential speed.

The differential speed increase accelerates the removal of the solids from the bowl. Reduction in the solids volume results in corresponding reduction of the torque at the scroll.

Consequently, the controller reacts to the decreasing torque by reducing the speed of the back drive motor.

If the torque does not drop despite the differential speed increase, the product feed is closed when "torque stage 1" is reached. If the torque continues to rise, the decanter is shut down on reaching "torque stage 2".

The back drive motor remains in operation for a preset time. This usually clears the solids out of the bowl. The machine can be re-started immediately after bowl standstill.

The minimum differential speed (and the position of the control range) depends on the gear and belt pulley ratios.

3.16 Motor control

Functions of the optional motor control for monitoring start-up and operation:

- Automatic start-up of the drive motors.
- Motor protection of the drive motors (PTC thermistor monitoring).
- Bowl and differential speed monitoring and indication during operation.
- Start-up time monitoring.
- Interlocking of the feed (solenoid valve or pump) during the start-up phase, so that the decanter can't be fed with product until the operating speed has been reached.
- Automatic differential speed increase in the case of excessively high scroll drive torque by increasing the speed of the back drive motor.
- Switching off the feed and shutting off the drive in case of faults
- Indication of the current consumption.
- Indication of the operating hours.
- Supply of flush liquid possible if the gear is overloaded and when the decanter is shut down.
- Monitoring of the gear lubrication.

If the decanter is correspondingly equipped, the following parameters and functions can additionally be monitored.

- Temperature of the bowl bearings.
- Vibrations of the decanter.
- Function of the automatic lubrication system for the bowl bearings.

3.17 Temperature monitoring of the bowl bearings (option)

Depending on the version and application, a PT 100 resistance feeler is fitted to each bearing point. By this means, mechanical damage is avoided or detected at an early stage.

In the case of oil-air lubrication of the bowl bearings, the temperature monitoring system is included in the standard scope of delivery.

Excessively high bearing temperatures can have the following causes:

- distortedly mounted roller bearings
- false roller bearings with insufficient bearing play
- overlubricated roller bearings

Optionally, the measured temperature can be displayed in the control. Threshold values for the bearing monitoring are programmed in the control. There is a preliminary alarm and a further alarm that results in shut down of the decanter.

3.18 Vibration monitoring of the decanter (option)

Depending on the version and application, the vibrations of the frame are monitored with a vibration recording device.

The signals are processed in the decanter control unit and, depending on the preset limit values, result in the triggering of an alarm or the shut-down of the decanter. By this means, mechanical damage is avoided or detected at an early stage.

Excessively high vibrations can have the following causes:

- Product deposits
- Worn roller bearings

Factory set limit values

For limit values see data sheet The data sheet is an integral part of the machine documentation.

3.19 Function of the decanter

The decanter is a horizontally mounted scroll centrifuge with cylindrical–conical solid wall bowl for the continuous separation of solids from suspensions.

The product to be processed (feedstock) enters the feed zone of the scroll via the centrally arranged feed tube, enters the separation chamber of the bowl through openings and is accelerated to operating speed.

The impact of the centrifugal force causes the solid particles to be deposited on the bowl wall in just a short time.

The scroll, which rotates at a higher speed than the bowl shell, continuously transports the ejected solids to the narrow end of the bowl.

In the dewatering zone, the solids are lifted from the fluid (due to the conical shape of the bowl) and freed of attached fluid via the centrifugal force.

The solids are ejected into the collection chamber of the housing at the end of the bowl.

The fluid flows between the scroll flights towards the cylindrical end of the bowl.

While passing through the clarifying zone the remaining impurities in the liquid are removed by centrifugal force and transported to the solids discharge.

The clarified liquid leaves the centrifugation chamber via an exchangeable regulating ring.

The liquid phase is discharged under pressure.

4 Technical data

4.1	Ambient conditions	38
4.2	Load on foundation	39
4.3	Motor data.....	40
4.4	Dimensioned drawing	41

4.1 Ambient conditions

The decanter is generally designed for operation in closed halls. The dust exposure must not exceed the standard values in industrial environments.

If the decanter is operated in environments which deviate from the specified values, the design must be modified accordingly.

The order-specific permitted ambient temperatures and product temperatures are given in the data sheet supplied with the decanter in accordance with EN 12547.

Incomplete specimen of the data sheet according to EN 12547

Centrifuge			
			Remarks
Type			
Serial no.			
Permitted rated bowl speed	min ⁻¹		
Permitted density of solids	kg/dm ³		max.
Permitted throughput capacity	m ³ /h		min/max.
Permitted temperature of feed product	°C		min/max.
Permitted housing pressure range	bar (g)		min/max.
Permitted operating speed range	min ⁻¹		min/max.
Bowl filling volume	l		approx.
Deceleration time of the bowl	min		approx.
Permitted vibration velocity Limit value 1 Limit value 2	mm/s RMS		Inquire measuring point at manufacturer's plant / refer to the dimensioned drawing.
Differential speed	min ⁻¹		
Decanter factor	%		
Ambient temperature	°C		min/max.
Warning "Bowl bearing temperature"	°C		
Shut-down "Bowl bearing temperature"	°C		
Switching point "Feed closed"	%		
Switching point "Decanter off"	%		
Sound pressure level	dB (A)		DIN EN ISO 3746
Sound power level	mW		DIN EN ISO 3746
Explosion hazarded zone of centrifuge			
Ex-marking			RL 2014/34/EC
Inert gas blanketing necessary			Yes/ No
Process values			
Intended use, Feed product			
Feed pressure	bar		min/max.
Discharge pressure	bar		min/max.

4.2 Load on foundation

The load on the foundation depends on the type of drive and the motors used.

Note order-specific dimensioned drawing !

4.3 Motor data

Main motor

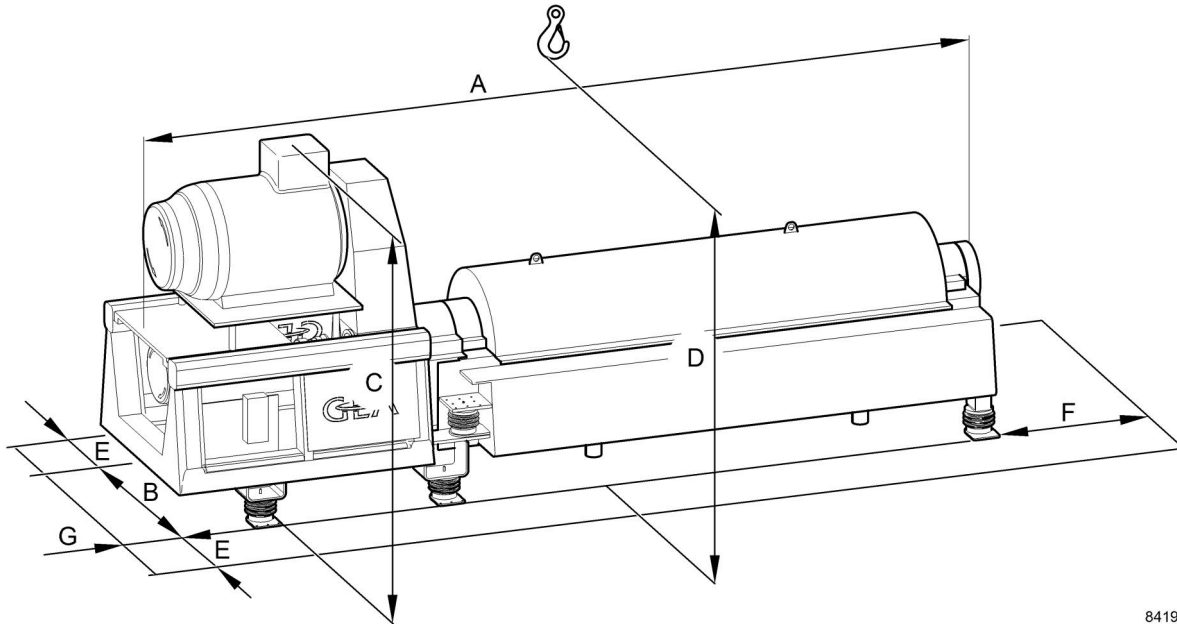
Type	Three-phase AC asynchronous motor
Capacity	depending on design: 75 kW – 250 kW
Speed	1500 min ⁻¹ (50 Hz) 1800 min ⁻¹ (60 Hz)
Enclosure	IP 55 / IP 56
Design	IMB3

Secondary motor

Type	Three-phase AC asynchronous motor	
Capacity	50 Hz	45 kW
	10-60 Hz	36 kW (60 Hz)
	10-87 Hz	52 kW (87 Hz)
Speed	50 Hz	1500 min ⁻¹
	60 Hz	1800 min ⁻¹
	87 Hz	2610 min ⁻¹
Enclosure	IP 55 / IP 56	
Design	IMB8	

4.4 Dimensioned drawing

For information only, do not use as a planning document!
Note order-specific dimensioned drawing!



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Fig. 17

		CF 7000	CF 8000
A	[mm]	5900	6350
B		1550	1675
C		2350	2550
D		>4100	>4300
E		>500	>500
F		>2100	>2500
G		>700	>700

5 Transport and storage

5.1	Safety during transport	44
5.2	Storage instructions for the decanter.....	44
5.3	Using load-suspension devices safely	45
5.3.1	Declaration of conformity on load lifting attachments.....	47
5.3.2	Load fastening points for the hoist.....	48
5.4	Using lifting eye bolts or lifting eye nuts as load carrying equipment.....	49
5.5	Transporting the decanter	50

5.1 Safety during transport

When the centrifuge is transported with hoists and fork-lift trucks, hazards can occur. Risk of injury and material damage are a threat when unsuitable persons are deployed and unsuitable or damaged lifting gear is used.

Therefore, pay attention to the following points during transportation:

- Assign only qualified personnel with the task of transporting the centrifuge.
- Transport weights exceeding 15 kg using a hoist.
- Use approved and intact lifting gear and hoists for transportation.
- Use only suitable hoists with adequate lifting capacity.
- If available: Arrest the bowl with the aid of the bowl lock screws.
 - The bowl bearings will otherwise get damaged.
- If available: Remove/loosen the coupling of the secondary motor.
 - Otherwise the motor shaft/gear shaft will be damaged.

5.2 Storage instructions for the decanter

Requirements for the storage room

The storage room must meet the following requirements:

- cool, 15 – 25 °C
- dry, approx. 65 % relative humidity (perspiration water formation must be prevented)
- dark (avoid direct sunlight and UV radiation)
- dust-free
- moderately ventilated
- free from aggressive media (e.g. salts, acids, lyes, solvents)

Painted parts

An intact paint coating provides adequate corrosion protection. For this reason, painted parts must be examined for damage or changes once a month.

Touch up the damage in accordance with the instructions of the paint manufacturer.

Unpainted areas and galvanised parts

Unpainted areas and galvanised parts must be treated as follows:

- Carefully clean the area or part.
- Spray-on anti-corrosive wax, see the lubrication and maintenance schedule.
- Check and, when necessary, touch up the corrosion protection once a month.

Gearbox / spare gearbox (oil-lubricated)

The gearbox and spare gearboxes must be prepared as follows for long-term storage.

- Drain lubricating oil completely, see chapter "maintenance / Draining gear oil".
- Fill 0.05 litres of corrosion inhibiting oil, see lubrication and maintenance schedule, close the gearbox.
- Carefully clean the gearboxes.
- Spray-on anti-corrosive wax, see the lubrication and maintenance schedule.
 - Check and, when necessary, touch up the corrosion protection once a month.

For the purpose of transporting the gearbox for inspection by the manufacturer, the gearbox must likewise be prepared as described above.

Drive motors

The drive motors must be prepared as follows for long-term storage.

- Option: Connect the space heaters for the motor winding. This is especially important in the case of high air humidity in the environment.
- Carefully clean the motor.
- Spray-on anti-corrosive wax, see the lubrication and maintenance schedule.
- Check and, when necessary, touch up the corrosion protection once a month.

5.3 Using load-suspension devices safely

The working load limit of the slings depends on the method of use. They may only be used for their intended purpose.

Unintended use may cause the slings to tear. There is risk to the life and limb of persons and of damage to property.

For the reduction of the working load limit in individual cases, see the manufacturer's specifications.

GEA Westfalia Separator recommends the use of round slings made of synthetic fibres.

Observe the points below when using load-suspension devices:

- Inspect slings for damage before each use.
- Do not use damaged or incomplete load-suspension devices and slings.
- Use slings only in the way approved by the manufacturer.
- Never load the slings beyond their maximum working load limit (WLL). The WLL specification is located on the sling label.
- Conduct regular training for slingers and individuals assigned to perform transport work.
- Use only the sling points specified in the documentation.
- Use only suitable fork-lift trucks and hoists with an adequate capacity.
- Pack and secure the load in accordance with the CTU (Cargo Transport Unit) transport guidelines before transporting it.
- Observe all regional regulations and laws governing transport and transport securing.

Lifting accessories for transporting the centrifuge

Ground conveyors and hoisting equipment for transporting the system to the centrifuge must be provided by the operating company.

Hoists (e.g. a crane) suitable for dismantling or installing heavy components must be provided by the operator.

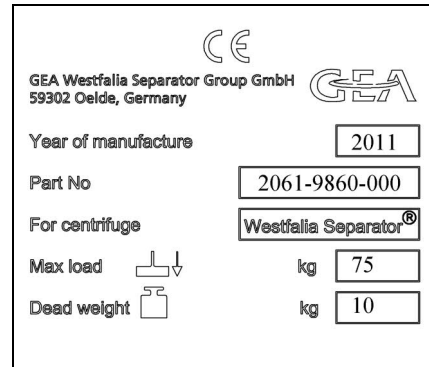
- Hood
- Bowl
- Actuator
- etc.

Lifting accessories for repairing the centrifuge

Lifting equipment and slings required for dismantling or installing the bowl or scroll are available in the separate spare parts catalogue "Tools set". The tools set is not included in the standard scope of supply.

Use slings safely and observe the following points:

- Use only slings with a nameplate.



The nameplate on the sling shows the following data:

- CE mark
- Manufacturer
- Year of manufacture
- Part number
- Intended use
- maximum load
- inherent weight

Fig. 18 Example of a nameplate

- Use sling gear only as described in this instruction manual.
- Observe the permitted loading limit.
- Check the sling for visible damage before each use.
- Use only slings in perfect condition.
- Do not carry out repairs to slings.
- Send damaged slings to the manufacturer.
- Always screw in threaded rods as far as they will go.
- Tighten all nuts fully.
- Tighten all bolts fully.
- Do not walk under suspended loads.

5.3.1 Declaration of conformity on load lifting attachments

Declaration of conformity on load lifting attachments

EC Declaration of Conformity

within the meaning of the EC Machinery Directive 2006/42/EG, Annex IIA

We hereby declare that the load lifting attachments supplied with the centrifuge

Type: Westfalia Separator load lifting attachment

complies with all pertinent stipulations of the EC Machinery Directive 2006/42/EC and follow-up guidelines.

The following harmonized standards were applied:

EN 12100 Safety of Machinery

The following national standards, guidelines and specifications were applied:

DIN EN 13155	Cranes - Non-fixed load lifting attachment
German Social Accident Insurance (DGUV) rule 1	General regulations
German Social Accident Insurance (DGUV) rule 100 - 500 K2.8	Operating load lifting attachments in hoist mode

The centrifuge instruction manual contains all necessary instructions on using load lifting attachments and shall be considered as their relevant manual.

This declaration is submitted as responsible for the following manufacturer / importer:

GEA Westfalia Separator Group GmbH
Werner-Habig-Str. 1
59302 Oelde, Germany

Duly authorized person for technical CE documentation:

GEA Westfalia Separator Group GmbH
Dirk Schlingmeyer
Werner-Habig-Str. 1
59302 Oelde, Germany

Date / Manufacturer's signature 07.03.2017



Managing Director: Tobias Dieckmann

5.3.2 Load fastening points for the hoist

The decanter is delivered optionally with lifting devices for the scroll and bowl.

The following table shows the load fastening point dimensions.

Due to the sharp edges at the load fastening points, the direct use of round slings or ropes is **not admissible**.

If the existing crane hook is too large, use a suitable means of fastening (e.g. an adequately dimensioned shackle).

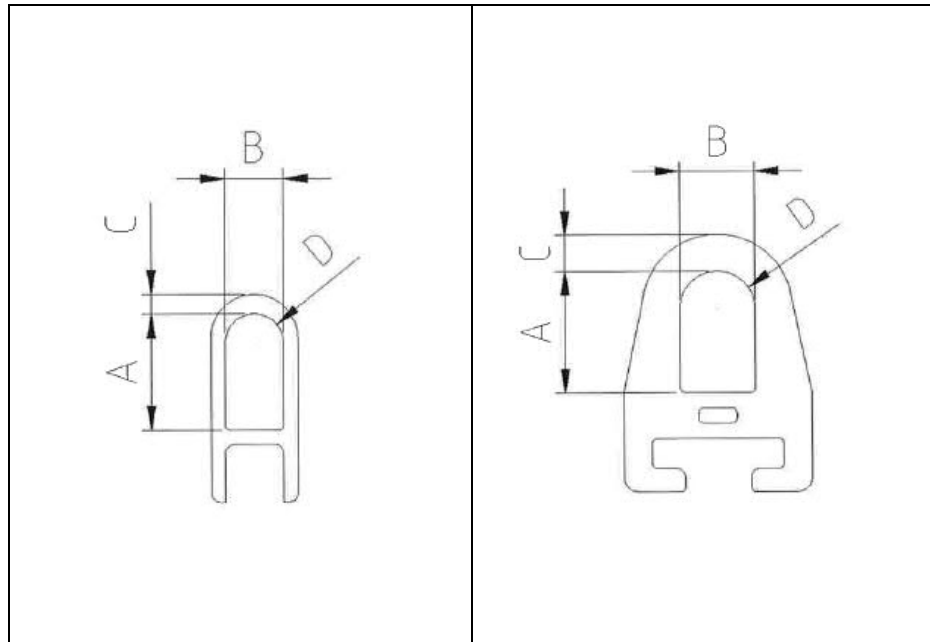


Fig. 19

Fig. 20

Decanter size	Scroll lifting device	Bowl lifting device
3000	Shackle with rope	Shackle with rope
4000 5000	A = 120 B = 60 C = 25 D = 30 T = 20	Shackle with rope
6000 7000	A = 120 B = 60 C = 25 D = 30 T = 20	A = 120 B = 60 C = 40 D = 30 T = 50
8000	A = 130 B = 80 C = 25 D = 40 T = 30	A = 130 B = 80 C = 40 D = 40 T = 60

5.4 Using lifting eye bolts or lifting eye nuts as load carrying equipment

Incorrect use of lifting eye bolts or lifting eye nuts during transport can lead to serious accidents, e.g. due to overload.



WARNING

Deformed lifting eye bolts or lifting eye nuts due to overload.

Danger to life and limb through falling loads when lifting eye bolts or lifting eye nuts break.

Observe the following points to avoid accidents:

- the pertinent standards and guidelines of the national associations in the country of origin on the operation of load-carrying equipment in lifting mode.
- Only trained specialists are authorized to mount lifting eye bolts or lifting eye nuts.

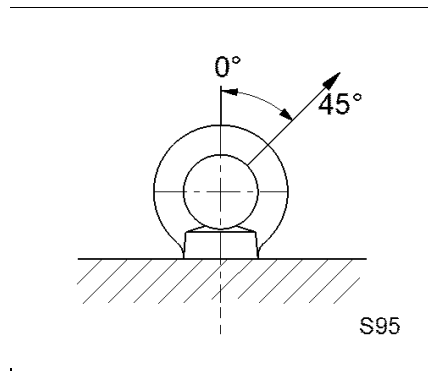


Fig. 21

- Mount lifting eye bolts or lifting eye nuts only as illustrated.
- Screw in lifting eye bolts or lifting eye nuts completely.
 - If this is not possible, screw the eye bolt or ring nut in by at least $1 \times d$ (= thread diameter).
- Attach load handling devices as vertically as possible, e.g. chains.
 - Pull max. 45° diagonally.
 - Modes of assembly other than those shown are not admissible, e.g. lateral pull.

5.5 Transporting the decanter

The decanter is delivered in three parts.

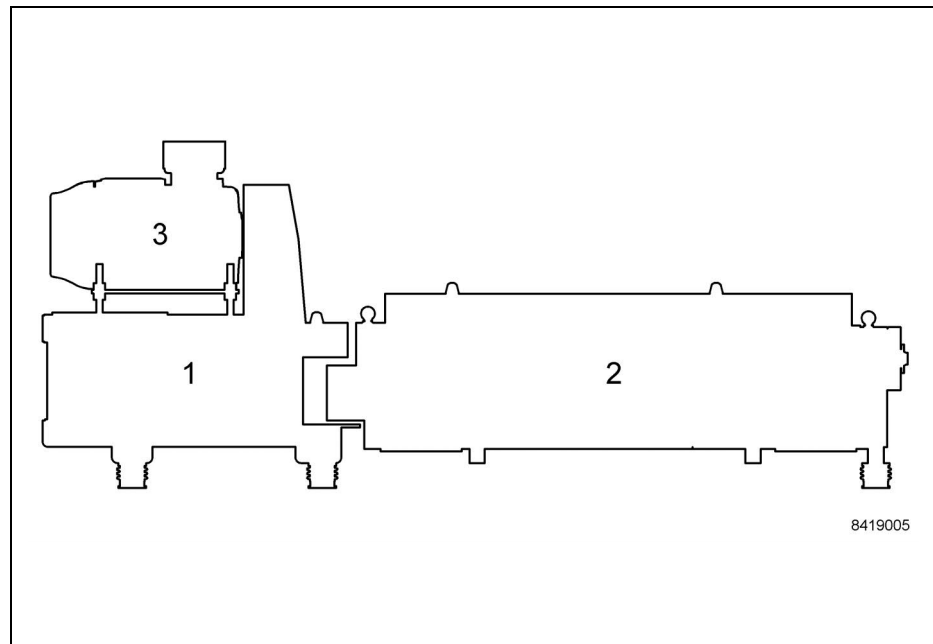


Fig. 22

- Drive frame with secondary motor (1)
 - Length: approx. 2200 mm
 - Required lifting capacity of the crane: min. 2100 kg
- Decanter frame with bowl and hood (2)
 - Length: approx. 4500 mm
 - Required lifting capacity of the crane: min. 5000 kg
- Main motor (3)
 - Length: dependent on the motor version (refer to order-specific dimension sheet!)
 - Required lifting capacity of the crane: dependent on the motor version (refer to order-specific dimension sheet!)

Attaching hoists

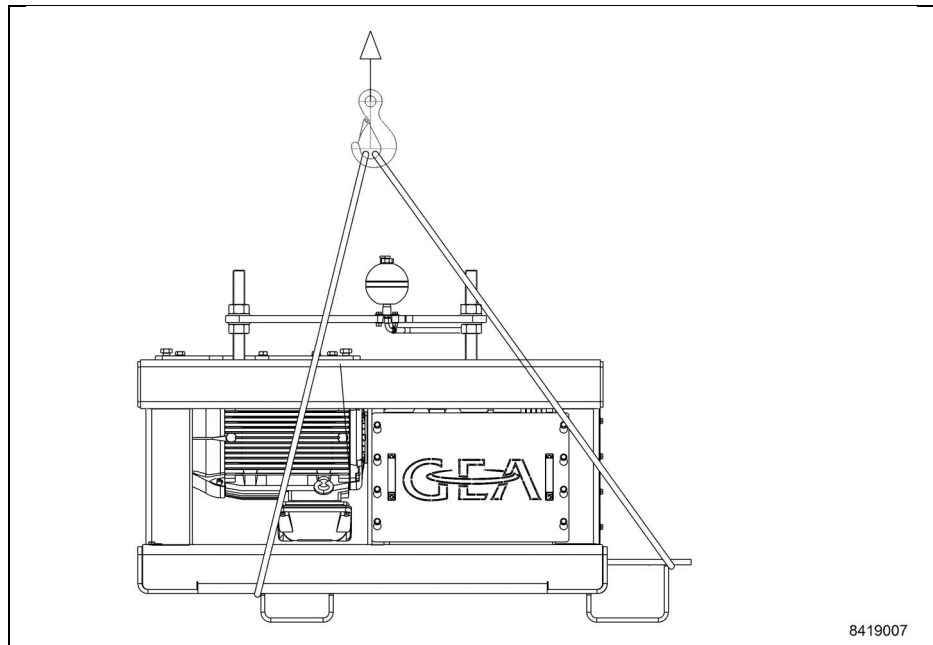


Fig. 23

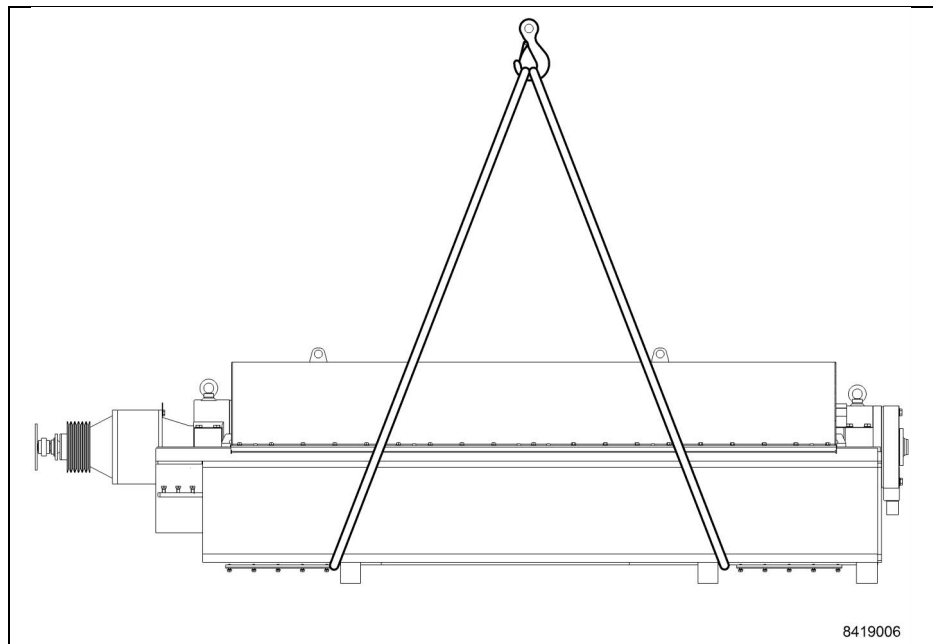


Fig. 24

6 Assembly and installation

6.1	Safety during assembly and installation	54
6.2	Required documents for planning the installation	54
6.3	Environmental requirements.....	55
6.4	Allow for sufficient space for maintenance work.	55
6.5	Requirements to be met by the load suspension devices	56
6.6	Demands on the configuration of the installation	56
6.7	Requirements of feed and discharge lines	56
6.7.1	Rating of compensators.....	57
6.8	Configuration of the liquid chute	58
6.9	Configuration of the solid chute	59
6.10	Seals between frame and discharge chute	61
6.11	Configuration of the vent	63
6.12	Overflow on the liquid side	66
6.13	Flush connections.....	66
6.14	Hydrohermetic system	66
6.15	Mechanical seal	66
6.16	Compressed air connection	66
6.17	Inert gas connections	67
6.18	Special aspects when operating in hot conditions.....	67
6.19	Terminal box positions of the electrical components.....	68
6.19.1	Terminal box designations and their functions	69
6.20	Maintain sufficient space for ventilating the drive chamber	70
6.21	Space requirements for draining the bowl bearing oil	71
6.22	Viscosity damper	72
6.23	Planning the frame/foundation.....	73
6.24	Transporting the decanter	74
6.25	Decanter installation and alignment	77
6.25.1	Installation and alignment of series CF 7000 to CF 8000 decanters	77
6.26	Carry out voltage equalization	83
6.27	Decanter with supply cabinet.....	84
6.28	Connecting three-phase AC motors	85
6.29	Checking the direction of rotation of the motors.....	86
6.30	Connecting the control unit.....	87
6.31	Connecting the feed and discharge line assemblies	88

6.1 Safety during assembly and installation

Pay attention to the following points during assembly and installation:

- Install the centrifuge at the installation site in accordance with the installation diagrams.
- For rating piping, refer to the specifications in the P&ID (Piping and Instrumentation Diagram) in the installation diagram and in the datasheets.
- Connect all feed and discharge lines flexibly to the centrifuge by means of U-shaped conduits or compensators.
 - Loading the pipelines through tensile force is not admissible.
 - All pipe joints are rated without taking into consideration tensile forces.
- Do not fit a shut-off device in the frame drain or connect it with closed piping.

Exception	A shut-off device is required to prevent harmful gases from escaping during maintenance work.
Required measure	Take appropriate action to ensure that the centrifuge only starts when such shut-off devices are completely open.

Fastening material

Unsuitable fastening material endangers the statics and operating safety of the centrifuge. This can lead to damage to the centrifuge.

- Use the specified fastening means. They are rated for machine frame and foundation.

6.2 Required documents for planning the installation

Careful planning of the installation is crucial in terms of service life, safety and operating readiness of the centrifuge.

The following documents are required:

- Order-specific dimensions sheet
- Order-specific P&ID (piping and instrumentation diagram)
- Order-specific equipment list
- Terminal and circuit diagram
- Decanter instruction manual
- Additional instruction manuals (if applicable), e.g. for oil+air lubrication of the bowl bearings

6.3 Environmental requirements

Favourable ambient conditions are:

- The decanter is standing in a closed hall.
- The decanter is free-standing and well ventilated.
- The decanter has low dust exposure. The standard values in industrial environments are not exceeded.
- Uniform ambient temperatures prevail between min. 5 °C and max. 40 °C.

In the following cases GEA Westfalia Separator must be contacted for more precise clarification of the optimum installation.

Unfavourable ambient conditions are:

- The decanter is standing outdoors.
 - The decanter must be pre-heated to a temperature of +5 °C if there is a risk of frost.
- The decanter is installed at a poorly ventilated site. Bearings and gears are subjected to thermal strain.
- The decanter is exposed to large differences in temperature. Condensate water impairs lubrication of the bowl bearings.

NOTICE

Inadmissible ambient conditions are:

- Corrosive vapours or fumes damage the decanter.
 - In such cases, it is absolutely necessary to provide suction.
- Disturbing external vibrations.
 - Avoid disturbing external vibrations since they can endanger the operating safety of the decanter.
- Ambient temperatures below 5 °C prevail.
- Ambient temperatures above 40 °C are prevailing.

6.4 Allow for sufficient space for maintenance work.

When planning the installation of the centrifuge, ensure that the centrifuge is easily accessible from all sides.

Keep to the minimum clearances from walls of buildings or other machines so that the following points are assured.

- All machine parts must be readily accessible for maintenance and repair work.
- Sufficient space must be available for setting down large machine parts safely.
 - Protective hoods
 - Bowl
 - Drive motors

6.5 Requirements to be met by the load suspension devices

- Hoists and cranes must be adequately dimensioned for the weights of the machine components. Refer to the order-specific dimensioned drawing.
- A crane must be able to travel in two axes.
- If a monorail crane is used, there are two possibilities:
 - The crane runs in the rotor axis, refer to the order-related dimensioned drawing (preferred direction).
 - The crane runs at right angles to the rotor axis at the height of the centre of gravity of the rotor. (For the centre of gravity of the rotor, refer to the dimensioned drawing. This is useful only in exceptional cases, as the centre of gravity of the rotor may be displaced by adhering solids.)

6.6 Demands on the configuration of the installation

- Configure the installation so that backflows of product or utilities cannot occur.
- Ensure uniform feed rates. Recommendation: Mono pump
- Ensure uniform feed concentration. Recommendation: Agitator

6.7 Requirements of feed and discharge lines

- Valves and pumps must be adapted to the product.
- Do not connect feed and discharge lines firmly to the centrifuge. Provide flexible connections (e.g. compensators).
- Contact with the rotating bowl must be excluded.
- Operating personnel must not be endangered by discharged product. Danger zones must be made inaccessible.
- The feed must be provided with a shut-off device so as to be able to interrupt the product supply in case of operating malfunctions.
- The feed line should enable uniform product supply with a constant solids content.

6.7.1 Rating of compensators

Compensators installed in the lines on the centrifuge must meet the following requirements:

Size	Motion absorption [mm]		Adjusting forces [N/mm]	
	axial	lateral	axial	lateral
Up to DN 15	± 6	± 3	50	50
DN 20 to DN 40	± 10	± 5	100	100
DN 50 to DN 100	± 10	± 5	100	200
DN 125 to DN 200	± 15	± 5	200	400

Materials

The material selection must take into consideration the following requirements:

- Corrosion-resistant
- Resistant against product specifications
 - Temperature
 - Acids
 - Lyes
 - Solvents
- Resistant against the specified environmental conditions
- Light-resistant when installed outdoors
- If applicable, suitable for use in the food and/or pharmaceutical sector

Pressure range for the compensators

- In the feed line: PN6
- In the discharge line centripetal pump and paring tube PN16

6.8 Configuration of the liquid chute

Open chute

Liquid chutes adapted optimally to the decanter can be procured from GEA Westfalia Separator.

Take into account the following points when building your own constructions:

- Provide a vent.
- Fit a compensator.
- Protect operating personnel. To do this:
 - Prevent contact with rotating parts.
 - Prevent danger through discharging product.
- Rate conveying equipment (e.g. pumps) to handle the throughput capacity of the decanter. In case of doubt, contact GEA Westfalia Separator.
- Fit a sampling cock (recommendation).

Paring tube

- Provide a vent.
- Fit a compensator.
- Liquid (product) must be discharged into a tank next to the decanter without pressure.
 - Vent the tank.
 - In the case of increased backpressure, the leakage at the paring tube will increase.

Centripetal pump

- Liquid (product) is discharged under pressure.
- Provide a compensator between the connections at the decanter and the discharging pipe.

6.9 Configuration of the solid chute

Solid chutes adapted optimally to the decanter can be procured from GEA Westfalia Separator.

Please take into account the following points when installing your self-made configurations:

- Design the solids discharge to prevent damming. Build-up of product can lead to heavy damage to the decanter. A malfunction in the solids discharge installations or solids bridging can cause build-up of solids in the decanter. If there is a build-up, the decanter must be switched off and the fault must be eliminated. To prevent build-up / switch off the decanter in due time
 - install solids probe.
 - install overflow.
 - plan sufficient volume.
- Ensure adequate venting of the solids chute and downstream solids tank. See also chapter "Assembly and installation/design of the venting system".
- Provide an elastic connection piece (e.g. compensator) when closed discharge is required.
- In the case of open discharge, provide a compensator with elastic connection to the decanter.
- When a closed solid discharge is necessary, e.g. in the case of a gastight design, only a round stainless steel compensator can be used due to the required tightness.
 - This results in a transition between the angular discharge at the housing of the centrifuge to round.
 - Select an adequately large nominal width.
 - Prevent bridging.
- Protect operating personnel. To do this:
 - Prevent contact with rotating parts.
 - Prevent danger through discharging product.
- Rate conveying equipment (e.g. pumps, conveyor belts or solid slides) to handle the throughput capacity of the decanter. In case of doubt, contact GEA Westfalia Separator.
- During start-up, run-down and flushing the decanter, liquid discharges through the solid discharge. A special discharge system must be provided for this. E.g.:
 - Slide gate valve
 - Residual water discharge at trough conveyor
 - etc.

- Install a two-piece metal sheet as an extension in the solid chute - (see sketch).
 - The metal sheet serves to avoid deposits of solids in the frame.
 - Metal sheets are supplied separately with the decanter.
 - If necessary, the sheet metal must be shortened to the extent that the minimum clearances to adjacent components shown below are adhered to (e.g. walls of chutes, trough conveyors).

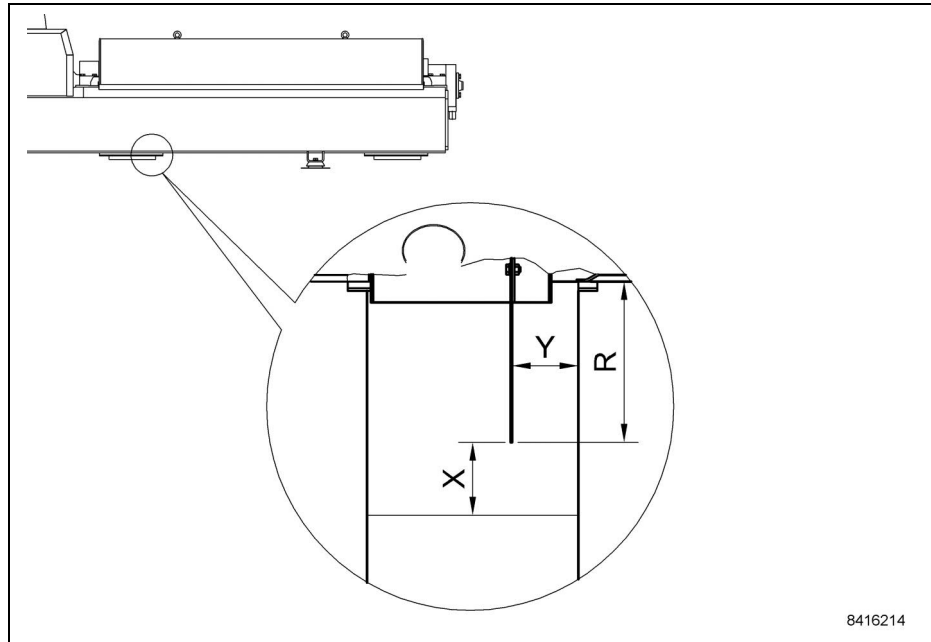


Fig. 25

Decanter size	X	Y	R
1000	min. 60 mm	min. 60 mm	
3000	min. 95 mm	min. 95 mm	
4000	min. 120 mm	min. 120 mm	Refer to the order-specific dimension sheet.
5000	min. 155 mm	min. 155 mm	
6000	min. 170 mm	min. 170 mm	
7000	min. 120 mm	min. 120 mm	
8000	min. 240 mm	min. 240 mm	

6.10 Seals between frame and discharge chute

(Seals are supplied with the decanter)

Option 1: Decanter with suspended catchers

(only for sizes 3000 to 6000)

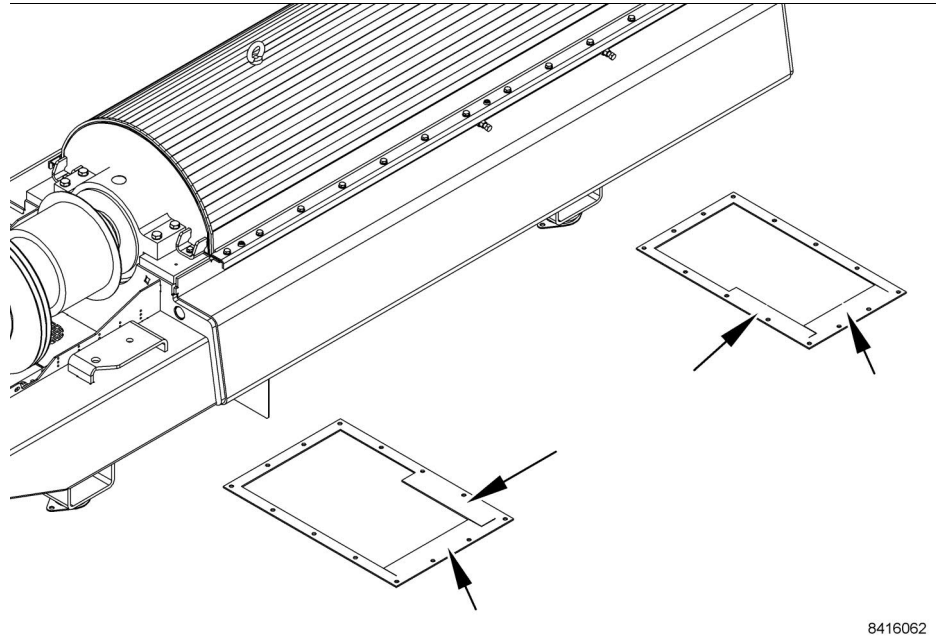
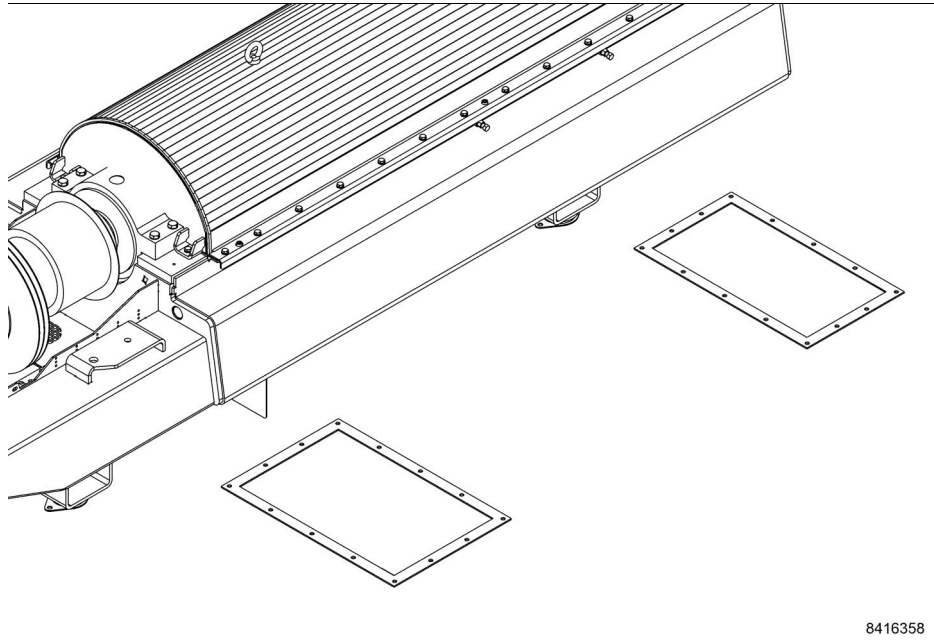


Fig. 26

The seals between the frame and discharge chute are not symmetrical.

IMPORTANT: The wide webs must be located at the marked positions. The shape of the seals influences the air flow in the decanter. Incorrect fitting leads to inadmissible product deposits.

Option 2: Decanter with single-piece catcher
(Sizes 1000 to 8000)



8416358

Fig. 27

6.11 Configuration of the vent

The correct venting of the liquid and solid catchers is essential for operating the decanter.

Inadequate venting leads to damage to the decanter (e.g. solid deposits in the housing) or backmixing of the separated phases.

For venting without additional ventilators, the maximum pipe length must not exceed 15 m. The specification applies to smooth tubes with a maximum of two pipe bends. The following table shows the necessary diameters for the vent pipes and the maximum air flows to be expected:

Decanter size		Liquid side	Solids side
1000	Connection	DN100	DN100
	Max. air flow [m ³ /h]	80	80
3000	Connection	DN100	DN100
	Max. air flow [m ³ /h]	50	100
4000	Connection	DN150	DN150
	Max. air flow [m ³ /h]	150	150
5000	Connection	DN150	DN150
	Max. air flow [m ³ /h]	220	220
6000	Connection	DN150	DN200
	Max. air flow [m ³ /h]	300	300
7000	Connection	DN200	DN200
	Max. air flow [m ³ /h]	400	400
8000	Connection	DN200	DN200
	Max. air flow [m ³ /h]	400	400

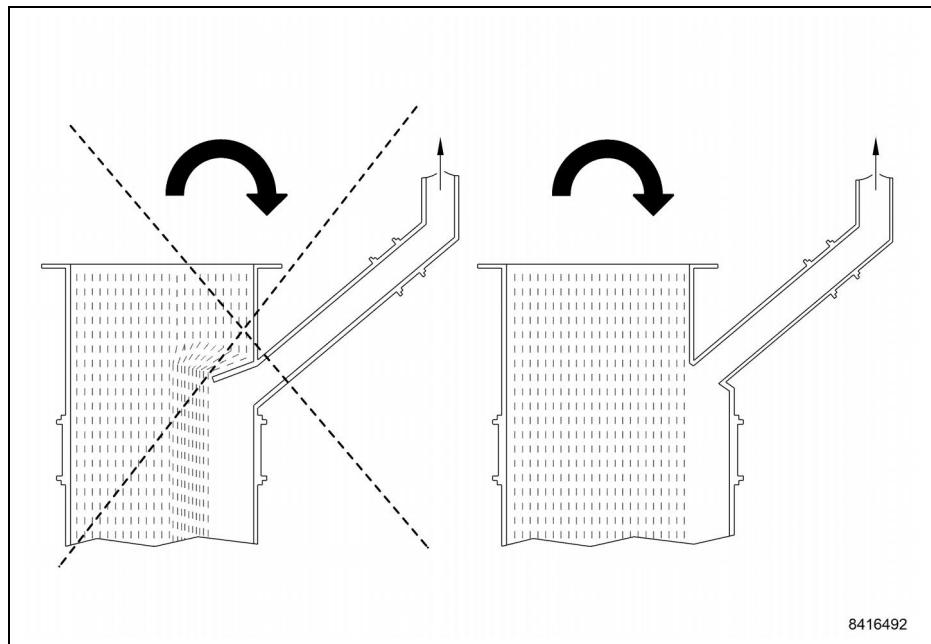


Fig. 28 Direction of rotation of bowl seen from the supply side.

If you are designing the drainage shafts yourself, take the following points into account:

- The vent line must be laid on the right-hand side of the decanter (as seen from the supply side).
If this is not done, ejected solids from the rotating bowl may block the vent line.
- The connection point of the vent line must be laid as close as possible to the discharge chute of the decanter.
- The connection point must be laid so that no blockage occurs as a result of deposited or dammed solids.
 - Any connections for discharging blocked product out of the solids chute must be fitted below the vent point.
- Lay the vent line with a constant fall to prevent aerosol residues from the exhaust air from accumulating in the line (trap).
- The air stream in the vent contains solid particles, liquid or vapours. Since they can deposit or condensate in the vent line, we recommend providing inspection ports and cleaning possibilities.
- Vent the solid catcher and liquid catcher separately from one another.
- If several machines have to be vented together, contact GEA Westfalia Separator.
- If a gate valve is fitted in the chute on the solid side, the vent must be located above the gate valve.

IMPORTANT: Designs with centripetal pump must also have a vent fitted below the liquids chute. In doing so, make sure that the pipe supports on the cover also serve as the leakage and hood flushing water drains.

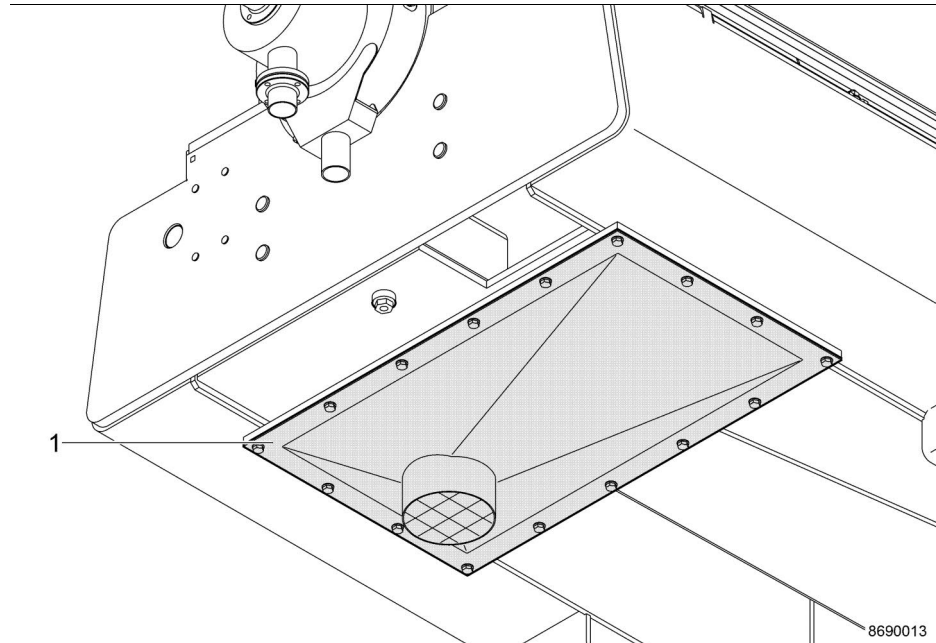


Fig. 29

If two liquid phases are freely discharged, the venting must be carried out as shown in the example below:

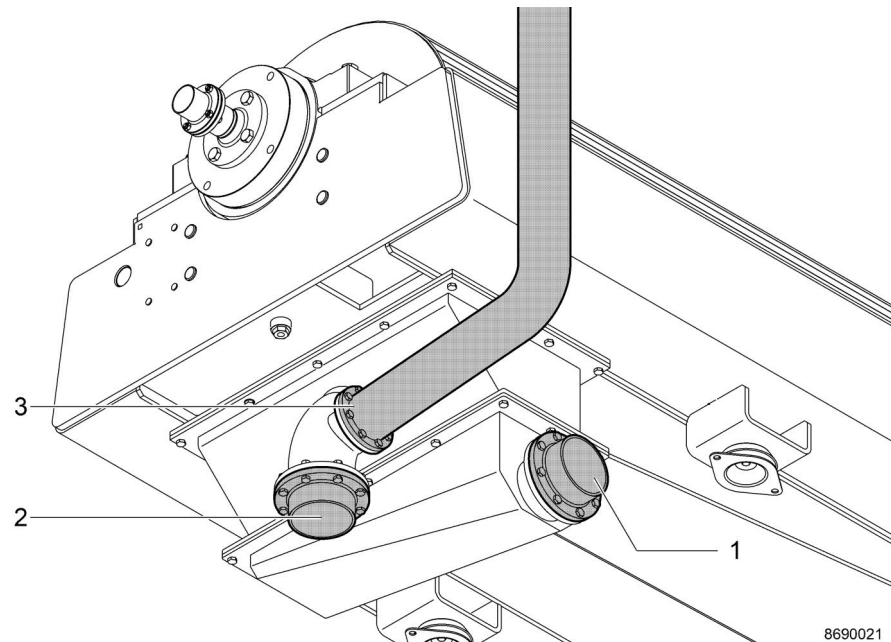


Fig. 30

- Tube phase (1): no venting
- Regulating disc phase (2): venting required
- Vent pipe (3): not included in scope of delivery

6.12 Overflow on the liquid side

(does not apply to designs with a rotating feed tube)

After the decanter shuts down, liquid escapes via the feed tube overflow on the liquid side. Up to 20 litres of liquid can escape, depending on the application and the size of the machine. This liquid must be collected and discharged.

In the case of open designs, the overflow can be connected to the chute on the liquid side via a flexible hose.

6.13 Flush connections

Flush connections must be taken into consideration in accordance with the order-specific dimensioned drawing.

The required water pressures and water volumes are specified in the P&ID.

Use only clean flush liquid for the hood flushing. Flush liquid already contaminated (e.g. from the centripetal pump discharge) soils the flush nozzles.

6.14 Hydrohermetic system

The feed pressure as specified in the decanter instruction manual must be adhered to according to the decanter instruction manual (see Settings chapter).

The required pressure range and the required water volumes are specified in the P&ID.

In addition, free draining of the hydrohermetic system water must be ensured so that the water can drain without pressure. For versions with blanketed inert gas, the draining medium (connection F2) must also be immersed.

If the hydrohermetic system is not used, the hydrohermetic system disc has to be removed and replaced with a different disc. This ensures that this space can be flushed properly.

6.15 Mechanical seal

Outer cooling: Ensure that cooling water is available, even in case of a power cut. The permitted max. pressure (see machine documentation) must not be exceeded, excessive pressure can lead to damage to the gaskets.

Inner cooling: If a medium is fed via the connection of the outer cooling (flushing liquid, flocculant, washing water for solids washing), the max. pressure (see machine documentation) must not be exceeded. Excessive pressure can lead to damage to the gaskets.

6.16 Compressed air connection

For models in the size range 1000 to 5000 an optional oil-air lubrication is available. The oil-air lubrication is included in the standard scope of delivery for the seize 6000 and larger.

The required air volumes and pressures are specified in the supplementary manual.

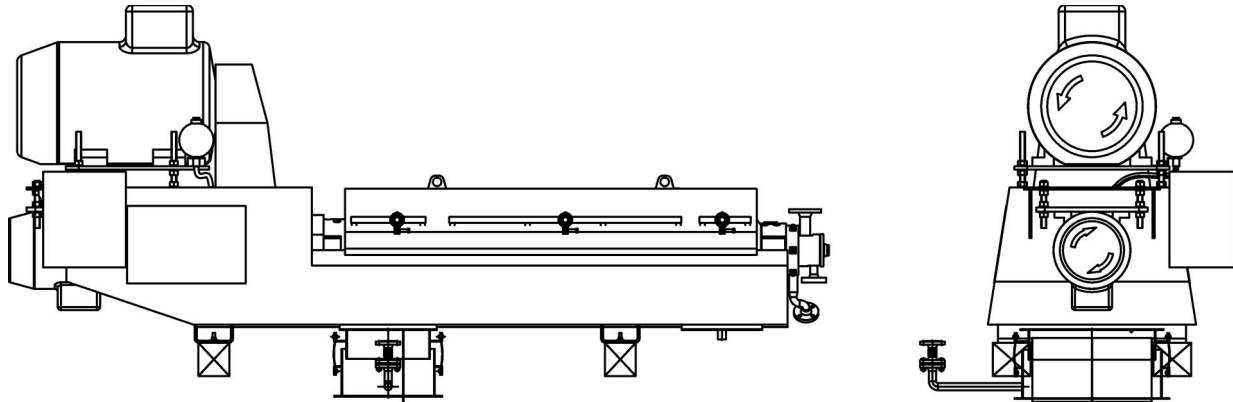
6.17 Inert gas connections

In the case of a decanter with inert gas blanketing, there is no venting of the discharge chutes on the liquid or solid side.

To displace air from the decanter, the latter is purged with inert gas (e.g. nitrogen).

A connection to the ventilation system must be created on the solid chute, or alternatively on the solid tank, for the discharge of the displaced air.

A piping configuration is shown below by way of example. Concrete dimensions are given in the order-specific dimensioned drawing.



8416056

Fig. 31

If an inert gas supply unit is included in the scope of delivery, refer to the corresponding user documentation.

6.18 Special aspects when operating in hot conditions

Steam must not pass through the decanter when it is at standstill. The steam would endanger the maintenance personnel and be an influential factor regarding corrosion in the decanter.

- Shut-off devices in the feed and discharge lines must be installed such that the shut-down decanters can be isolated.
- Vent lines must be planned and installed in such a way that the shut-off devices cannot be bypassed.
- The decanter may only be started when the shut-off devices are open.

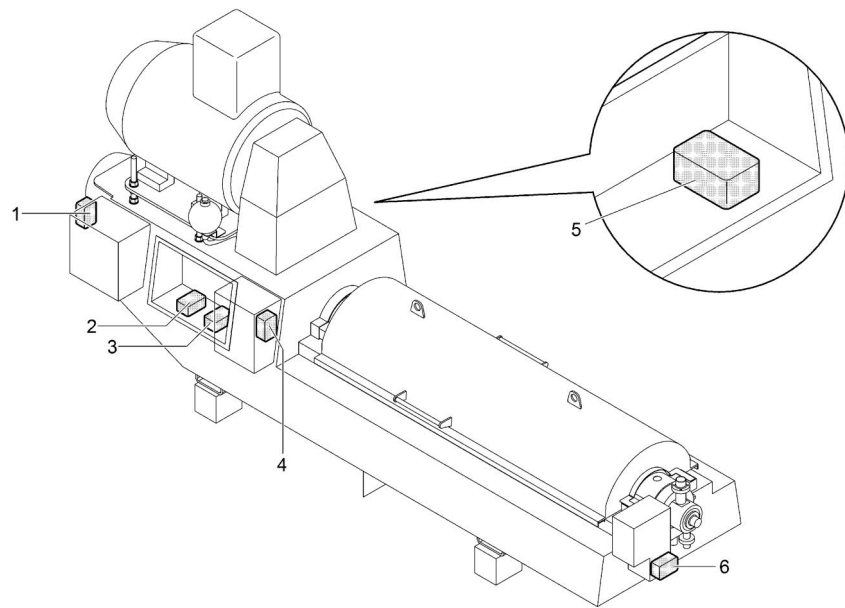
6.19 Terminal box positions of the electrical components

The following illustrations show the places on the decanter where auxiliary electrical components (e.g. A vibration absorber) can be wired into the terminal box. The illustrations are a guide for planning the subsequent cable runs from the separate terminal boxes to the control cabinet.

NOTE: Depending on the design and configuration, not all terminal boxes are actually present on the decanter.

Decanter sizes 3000 to 6000

The following table shows examples of the terminal box positions on decanter sizes 3000 to 6000. Actual dimensions can be found on the order-specific dimension sheet.



8690015

Fig. 32

Decanter sizes 7000 to 8000

The following table shows examples of the terminal box positions on decanter sizes 7000 to 8000. Actual dimensions can be found on the order-specific dimension sheet.

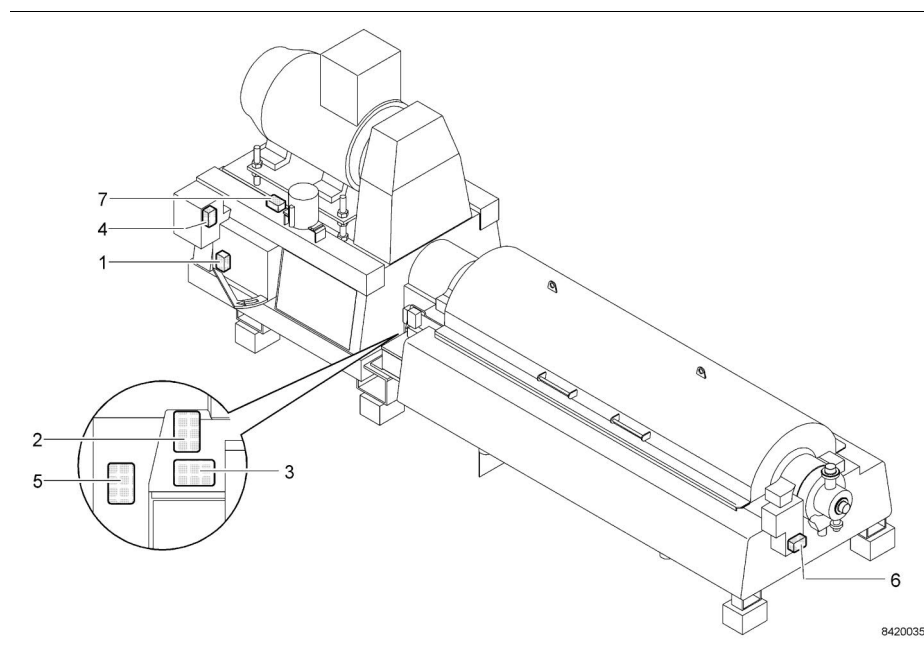


Fig. 33

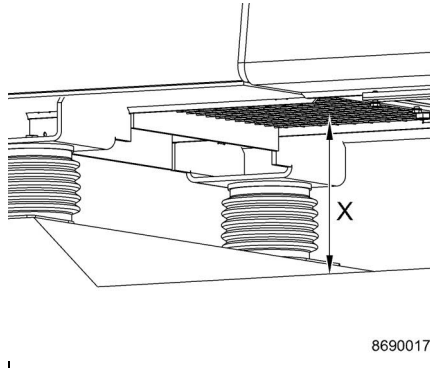
6.19.1 Terminal box designations and their functions

Item	Terminal box designation	Terminal box function
1	X9 (X48)	Terminal box – Oil/air unit complete
2	X7 (X47)	Terminal box – Speed sensor complete
3	X11	Terminal box – Vibration absorber complete
4	X42	Terminal box – Control unit (Varipond P)
5	X41	Terminal box temperature sensor complete (measurement of gearbox temperature), oil, air unit complete and set of retrofitting parts (stick slip measurement)
6	X44	Terminal box – Water pressure reducing valve complete (hydrohermetic system)
	X40	Terminal box – Cooling water supply (mechanical seal), Alternative
	X23	Actuator complete (Varipond E) alternative
7	X53	Terminal box oil circulation lubrication system gearbox (optional)

6.20 Maintain sufficient space for ventilating the drive chamber

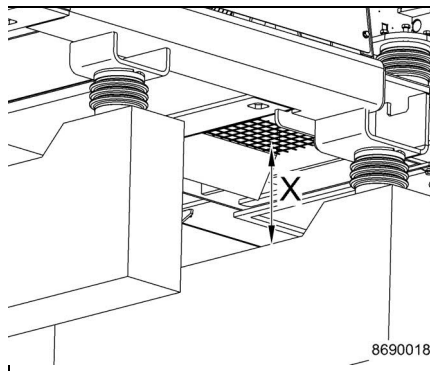
The following points should be considered when designing the foundation for the decanter and before assembly:

Space must be provided below the decanter in the foundation on the drive side next to the solids chute, so that air can circulate for cooling the gearbox. A minimum clearance of 250 mm (X) must be maintained below the machine in the area of the protective grille.



View of sizes 1000 to 6000

Fig. 34



View of sizes 7000 to 8000

Fig. 35

6.21 Space requirements for draining the bowl bearing oil

To drain the spent oil from the bowl bearing, a minimum headroom of 250 mm must be kept free in the area underneath the oil drain plug (1) next to the solids and liquid discharge. This space is required for an oil collecting container and to provide access to the oil drain plug.

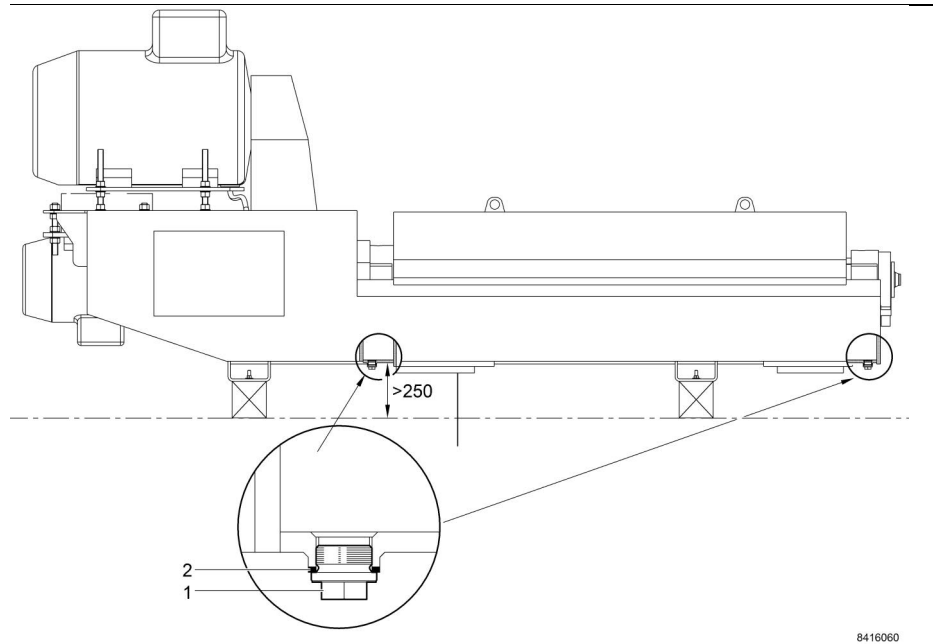


Fig. 36

IMPORTANT: Inspect gasket (2) for damage and replace if necessary.

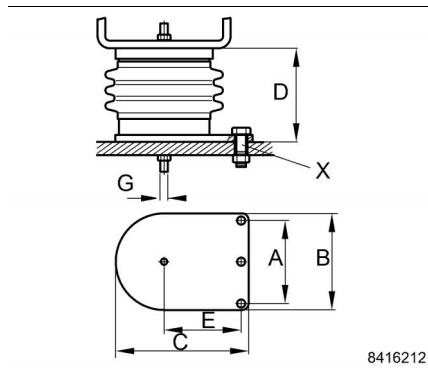
Alternatively, the two drain plugs in the frame can be removed and a hose pipe can be connected to discharge the used oil directly into a canister (hose pipe is not included in the scope of delivery of the centrifuge). The connection thread of the sleeve in the frame has a G1" female thread.

6.22 Viscosity damper

The viscosity damper can be fastened on the foundation or frame in two different ways.

- Via a centric screw.
This variant is suitable for steel frames.
- Via screws that are located at the side of the damper.
This variant is suitable for concrete foundations.

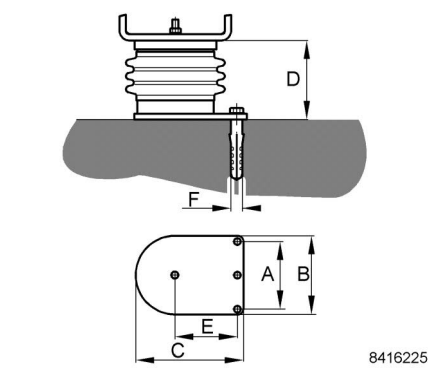
Connecting elements are not included in the supply schedule!



Fastening arrangement on a steel frame.

The lateral holes X can optionally be used.

Fig. 37



Fastening arrangement on a concrete foundation

Fig. 38

Main motor	A	B	C	E	F
depending on the design	The dimensions are given in the separate dimensioned drawing.				

6.23 Planning the frame/foundation

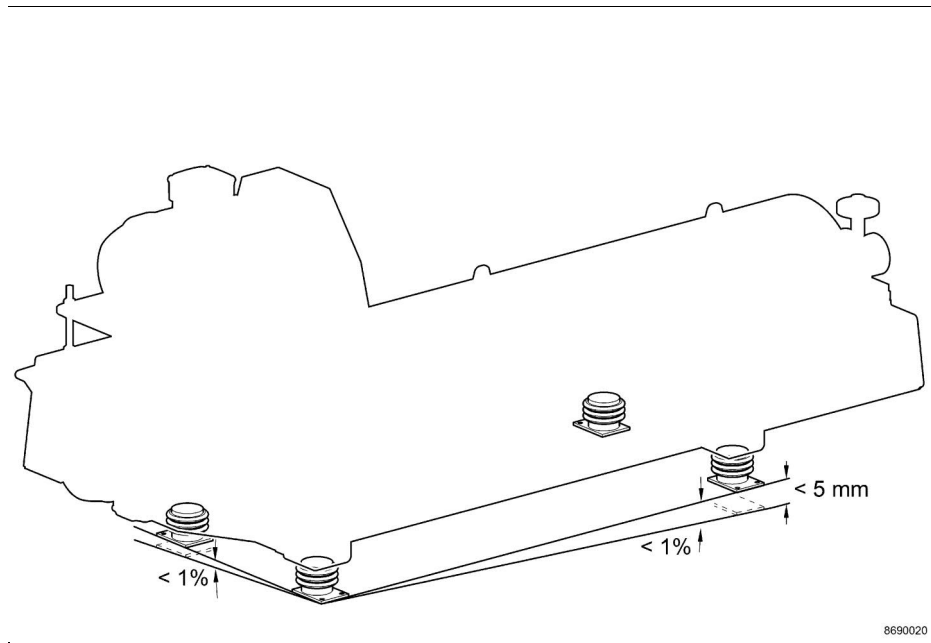


Fig. 39

- Comply with the building regulations of the country of operation.
- The foundation must correspond to the specifications. See load specifications and dimensions on the order-specific dimensional dimension sheet.
- The foundation must be designed so that no vibrations are transferred from the environment to the centrifuge.
- The supporting points must be of rigid, solid design in the form of a concrete structure or steel structure. Individual points of support must not give way under load.
- In order to minimise the introduction of vibrations of the centrifuge into the environment, the natural frequency of the frame must be outside the installation frequencies (details can be seen in the order-related dimension sheet) of the centrifuge and the operating speed range of the centrifuge. The margin from the first resonant frequency of the supporting frame to the maximum operating speed must be at least 30 %.
- A centrifuge must be installed as level as possible. The difference in height between the supporting points must be maximum 5 mm. Differences in height must be offset with shims at the supporting points.

6.24 Transporting the decanter

The decanter is checked in its completely assembled state. Depending on its size, the decanter is packed for shipping in one or several crates.

That notwithstanding, sets of tools or replacement and maintenance parts may be delivered in additional crates.

Decanter sizes 1000 to 4000 are delivered in one crate. For size 1000, the hydro pump unit as well as the oil-air cooler for the hydro pump unit are delivered in a separate crate.

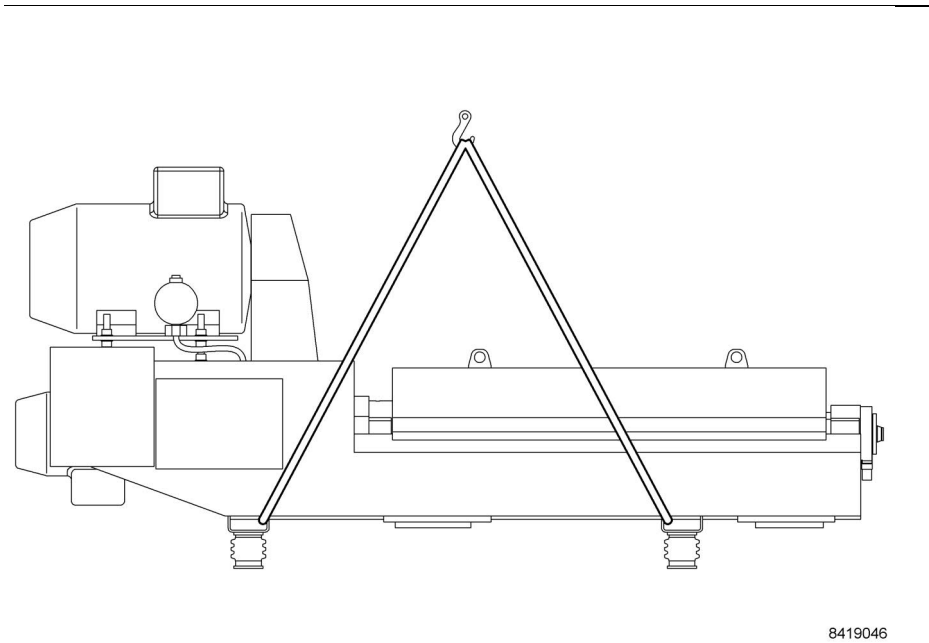
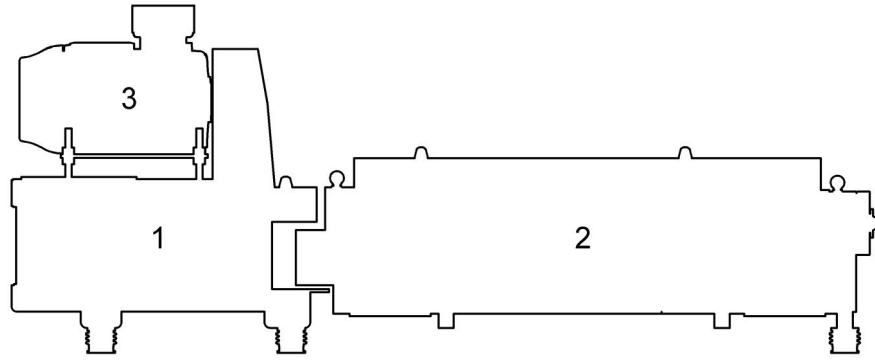


Fig. 40

Decanter sizes 5000 and 6000 are delivered in two crates. Note that the main motor is usually packed separately.

Decanter sizes 7000 and 8000 are packed and delivered in three crates.

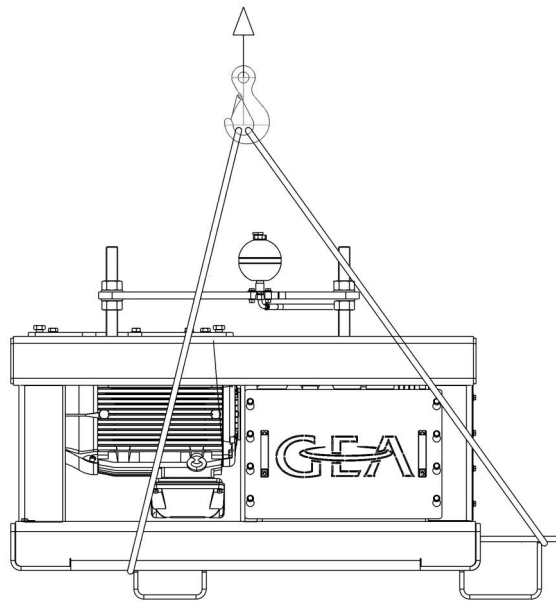
- Drive frame with back drive motor (1)
 - The decanter frame with the top part of the catcher and installed bowl including the gearbox (2)
 - Main motor (3)
- Unpack the components in the given order.



8419005

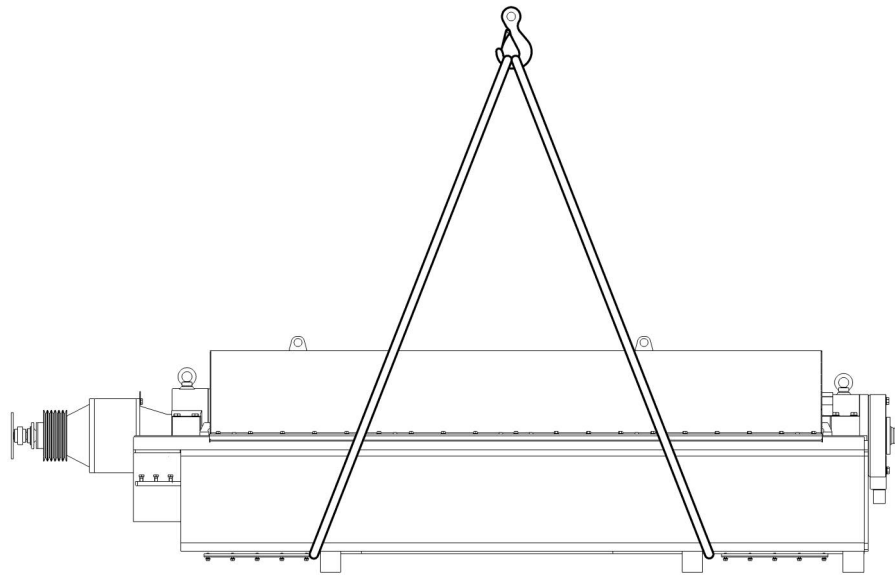
Fig. 41

Attaching hoists for decanters sizes 7000 and 8000



8419007

Fig. 42



8419006

Fig. 43

6.25 Decanter installation and alignment

6.25.1 Installation and alignment of series CF 7000 to CF 8000 decanters



- The film for the erection of decanters CF 7000 to CF 8000 can be found by following the QR Code.

<http://video.gea.com/installation-guide-for-2-part-decanter-frames>

Fig. 44

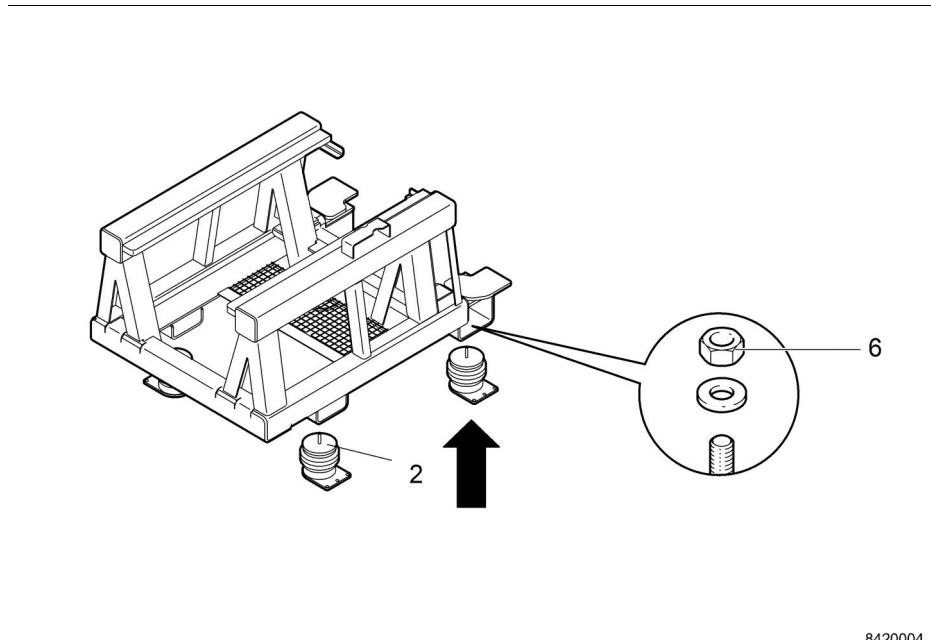
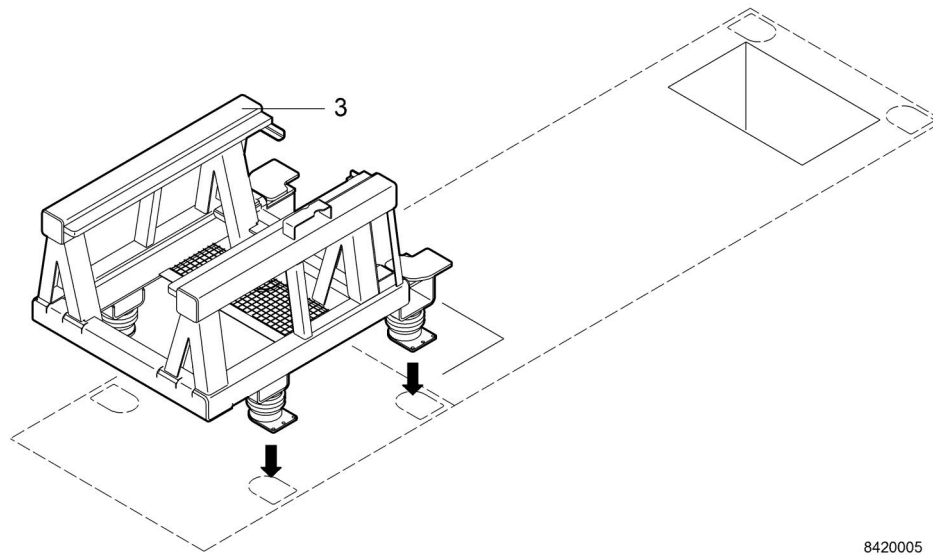


Fig. 45

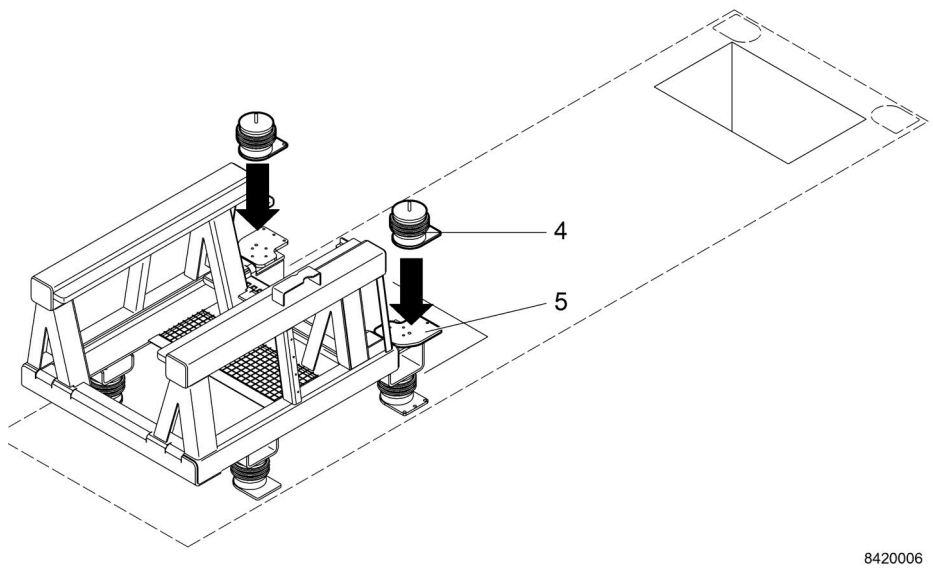
- Fasten viscosity dampers (2) to the drive frame.



8420005

Fig. 46

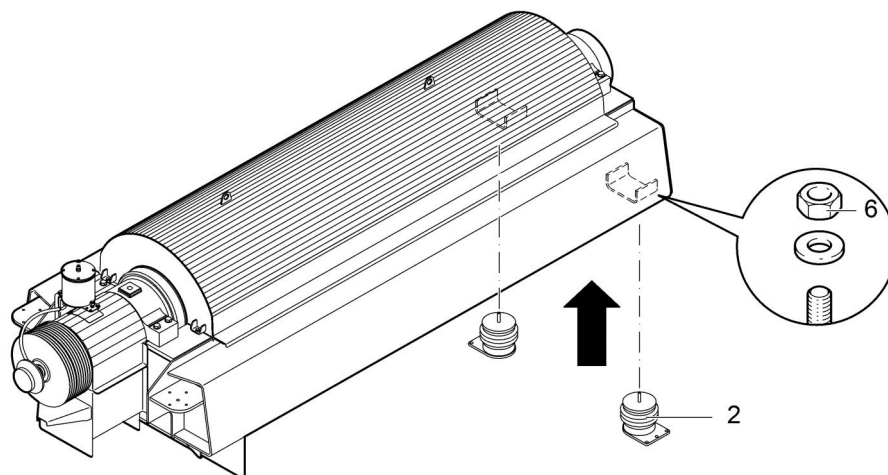
- Sketch the erection points on the foundation.
 - Refer to the order-specific dimension sheet.
 - Pay attention to cut-outs for solid and liquid discharge.
- Erect the drive frame but do not yet fasten it.



8420006

Fig. 47

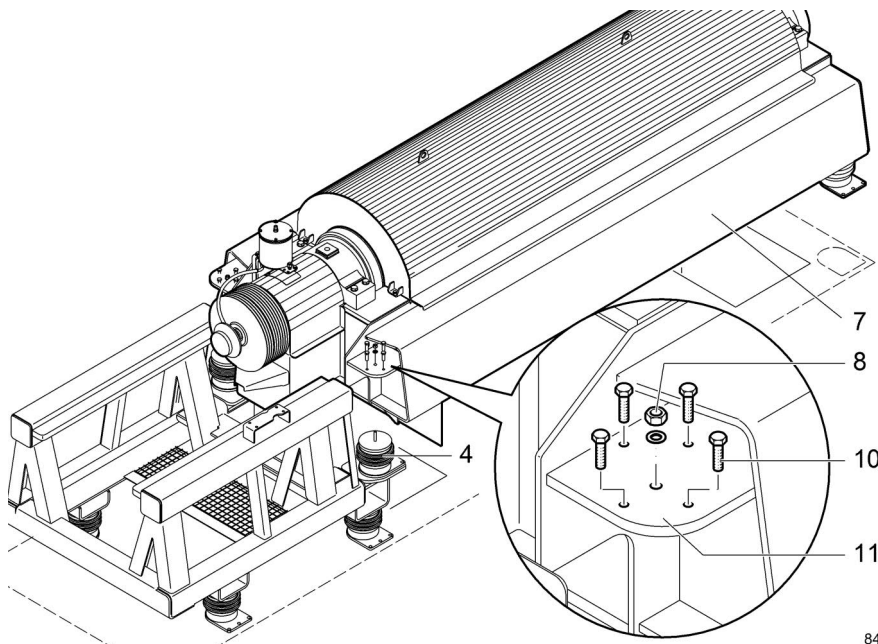
- Fasten viscosity dampers (4) to drive frame (5).



8420011

Fig. 48

- Fasten viscosity dampers (2) to the decanter frame.



8420007

Fig. 49

- Screw screws (10) into the plates (11) of the decanter frame (7).
- Place decanter frame (7) on the viscosity dampers (4).
- Fit washers and nuts (8). Do not tighten the nuts yet (8).

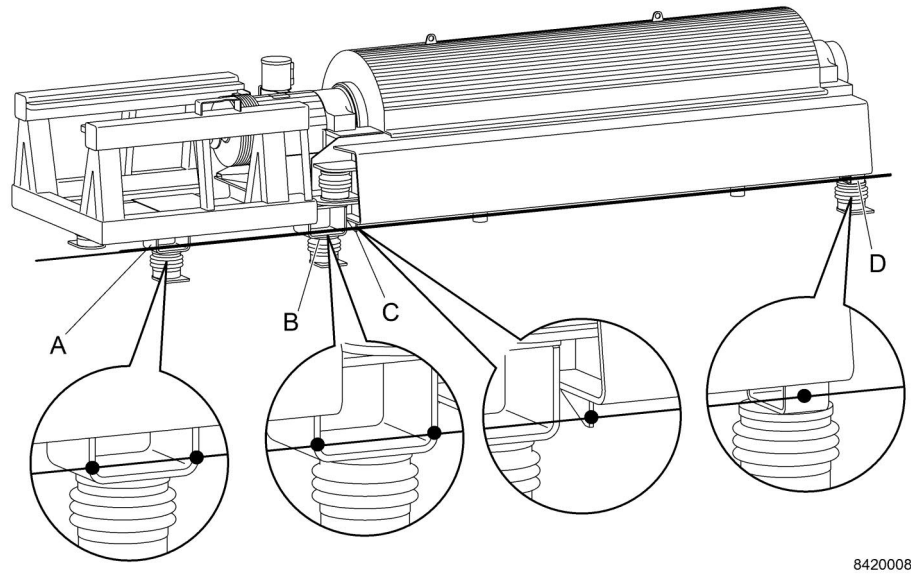


Fig. 50

Align the drive and decanter frame in the longitudinal axis.

- Align the drive and decanter frame so that both frames are in line with each other.
 - Attach a suitable cord at (A) and (D).
 - Align the frames until the points (A), (B), (C) and (D) rest against the taught cord.
- Screw the viscosity dampers to the base.

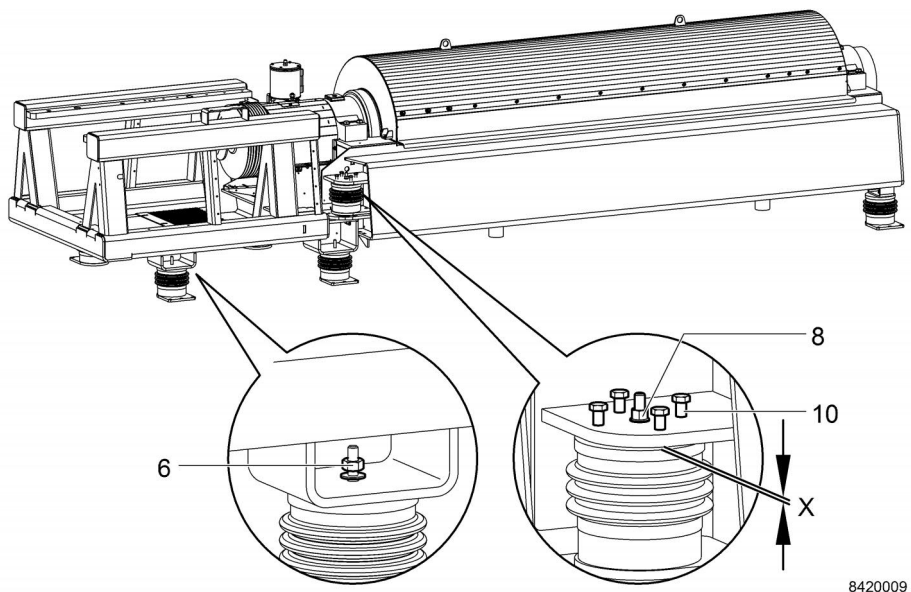


Fig. 51

Aligning the drive and decanter frame horizontally

- Use a suitable spirit level.
- The height of the decanter frame can be adjusted with the aid of screws (10).
 - The distance (X) must be identical on both sides.
- Tighten all nuts (6) and (8).

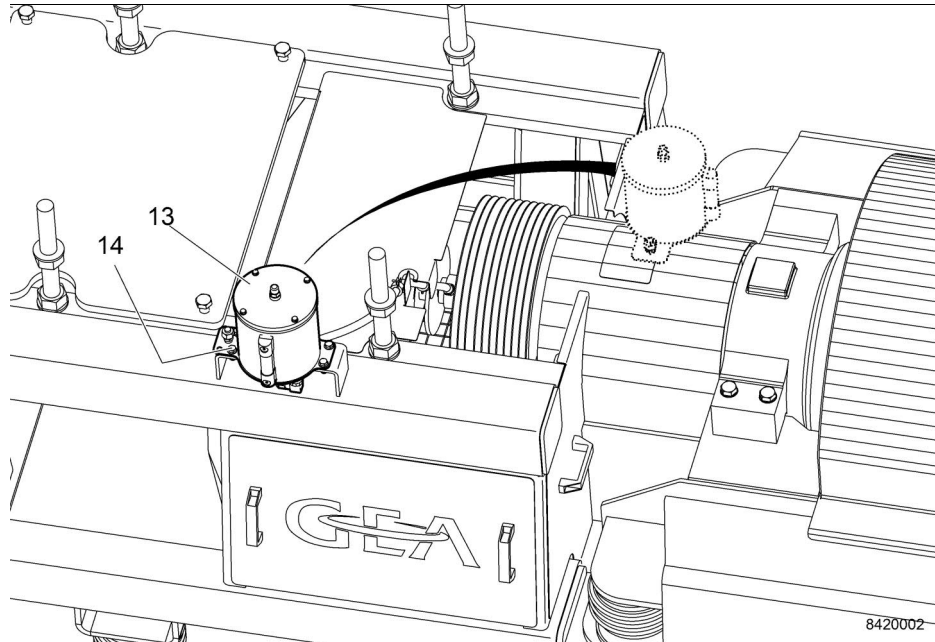


Fig. 52

- Move the oil vessel (13) from the decanter frame to the drive frame and fasten it. Remove the empty holder from the decanter frame.

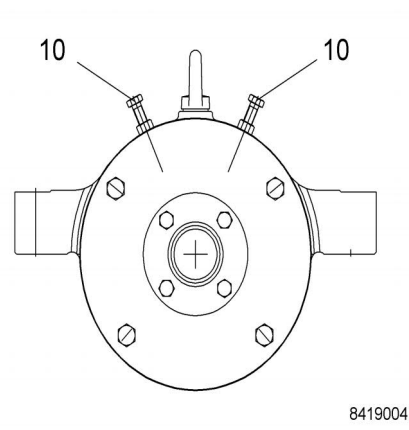


Fig. 53

- Undo all four bowl lock screws (10) and secure (solid side and liquid side).

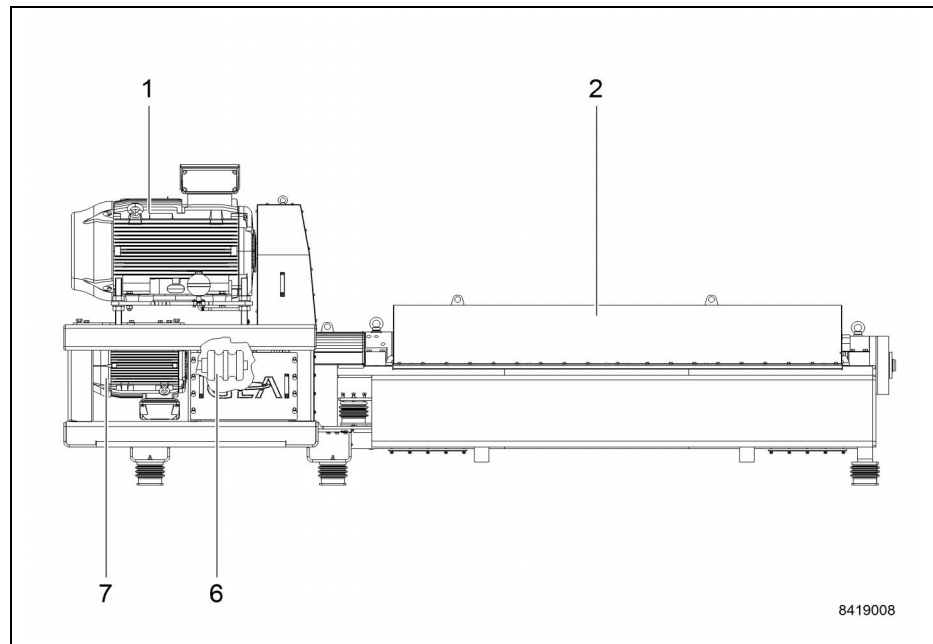
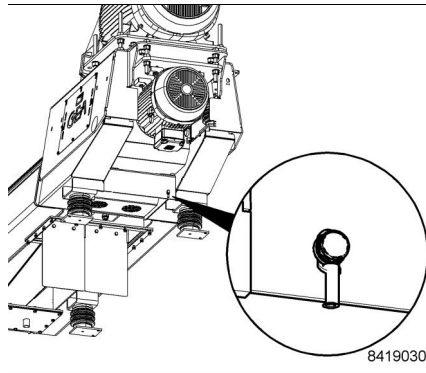


Fig. 54

- Fit main motor (1), see chapter "Servicing / fitting the main motor" in the decanter instruction manual.

6.26 Carry out voltage equalization



- To ensure safe operation of the decanter, voltage equalisation **MUST** be carried out according to EN 60204-1.

Fig. 55

Omitting voltage equalisation will have the following consequences:



DANGER

Danger to life through electric voltage!

As soon as a live power line gets into contact with the machine housing, electric shock may occur.

- Measuring signals of monitoring devices can be distorted (e.g.: vibration monitoring, bearing temperature monitoring).
- Magnetism can give rise to bearing failure.

6.27 Decanter with supply cabinet

An optional supply cabinet is available for every decanter. It contains additional components such as the oil+air unit, or the control unit for Varipond P. The supply cabinet is used e.g. for sanitary applications or under extreme conditions.

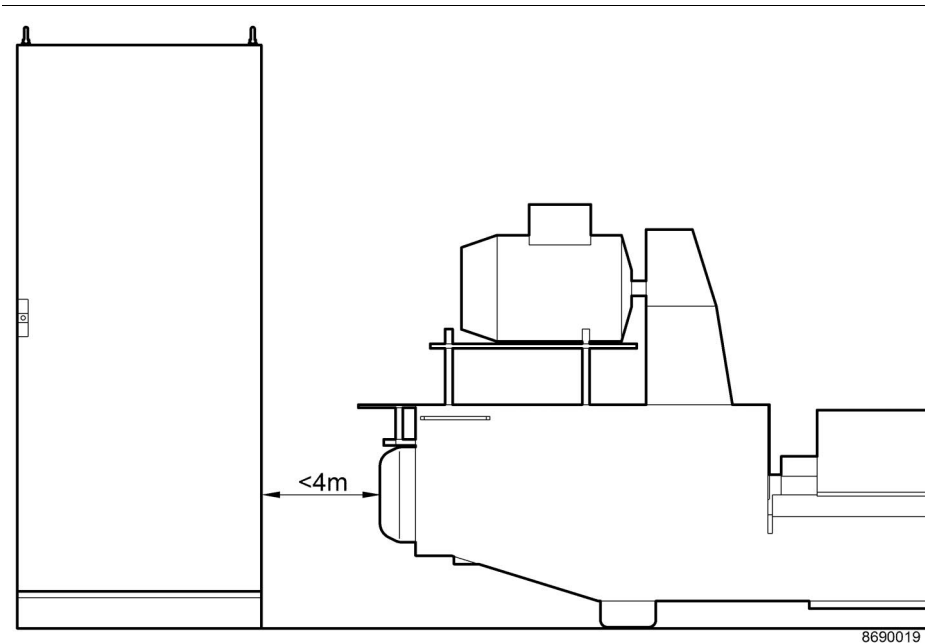


Fig. 56

The optional supply cabinet should be installed at a maximum distance of 4 m from the decanter.

NOTE: Larger distances would result in inadmissibly high pressure losses in the hoses of the oil-air lubrication.

6.28 Connecting three-phase AC motors

**DANGER**

Danger to life through electric voltage

Danger to life and limb through electric shock!

- The electrical connection of the three-phase a.c. motor may only be carried out by authorised specialists (e.g. electricians and high voltage electricians).
- The connections must be deenergised and secured against being energised again unintentionally.

Operation with frequency converter

- Never manipulate the frequency converter to exceed the permissible bowl speed (see nameplate).
- The machine may only be operated with an independent device for speed limitation.

Ceiling speed

- The ceiling speed is set to 5% above nominal speed.

Starting current

The required starting current with frequency converter corresponds roughly to the rated current.

In the case of controlled torque starting, 2 - 3 times the rated current is required as starting current.

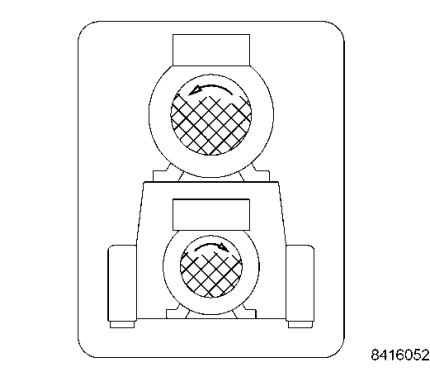
Motor protection

If the motor is equipped with a PTC thermistor, it must be connected to the corresponding tripping device.

The measuring circuit line (between tripping device and motor) has to be laid separate from other lines.

6.29 Checking the direction of rotation of the motors

IMPORTANT! The direction of rotation must be checked without V-belts.



- When looking at the fan, the primary motor must rotate counterclockwise.
- When looking at the fan, the secondary motor must rotate clockwise.

Fig. 57

- The direction of rotation can be reversed by interchanging two lead-in wires in the motor control. Be sure to take into account the direction of rotation of auxiliary units.



DANGER

Danger to life through electric voltage!

Danger to life and limb through electric shock.

- The electrical connection of the three-phase AC motor may only be performed by authorized specialists, e.g. electricians and high voltage electricians.
- Power must be shut off to the connections and it must be ensured that it cannot be switched back on.

6.30 Connecting the control unit

Connecting the electrical system

- Comply with the local regulations for electrical systems and equipment.
- The frequency and voltage of the power supply must correspond to the circuit diagram.
- Install equipotential bonding.
- Observe statutory regulations, e.g. EC Directives in the EU.

Main switch on the control cabinet

Precise information on the position of the main switch on the control cabinet can be found on the circuit diagram.

The control cabinet is installed according to the specifications of the plant operator. The position of the control cabinet with the main switch must therefore be taken from the operating manual of the operating company.

Positioning the EMERGENCY STOP button

EMERGENCY STOP buttons are located on the control cabinet.

Precise information on the position of the EMERGENCY STOP buttons can be found on the circuit diagram.

The control cabinet is installed according to the specifications of the plant operator. The position of the EMERGENCY STOP switches must therefore be taken from the instruction manual of the plant operator.

Additional EMERGENCY STOP switches must be installed on site if the control cabinet is not installed in the direct machine environment.

Additional EMERGENCY STOP switches may be required in the plant in which the centrifuge is integrated. They must be installed based on the risk assessment of the plant operator. The EMERGENCY STOP function of the centrifuge must, if necessary, be integrated in a shut-down concept of the plant or of plant components.

6.31 Connecting the feed and discharge line assemblies

Checking the feed line installation

When product feed pipes have been installed by welding, it must be ensured that the inside of the pipes have been deburred and cleaned at the welds.

This work must be carried out by the executing persons or the assigned company after completion of the installation work and must also be documented.

NOTICE

Foreign bodies in the feed installation, e.g. metal fines from welding

If the above is not observed, metal fines can enter the bowl and damage gaskets and other bowl parts.

Downtime of the centrifuge and high repair costs would be the result. GEA Westfalia Separator accepts no liability for damage caused in this way.

➤ Check that all feed lines are clean and deburred.

If the pipes have already been installed and bolted tight, request an acceptance report from the equipment manufacturer confirming that the pipes were deburred, cleaned and tested upon completion of the installation work.

Feed and discharge line assemblies

- Install the feed and discharge lines flexibly to avoid the transfer of vibrations, e.g. by means of U-shaped conduits.
- Close the feed and discharge lines to reduce noise development.
- Valves and pumps must be adapted to the product.
- Install feed and discharge assemblies separately from the centrifuge.
- The feed line must be provided with a shut-off device so as to be able to interrupt the product supply in case of operating malfunctions.
- The feed line should enable uniform product supply with a constant solids content

7 Settings

7.1	Changing speeds.....	90
7.2	Altering the bowl speed (frequency converter).....	90
7.3	Altering the differential speed (frequency converter).....	90
7.4	Mounting and adjusting the speed sensors.....	91
7.5	Adjust/check the gearbox temperature monitoring device.	92
7.6	Regulating ring.....	92
7.6.1	Removing the regulating ring.....	92
7.6.2	Fitting the regulating ring	94

7.1 Changing speeds

The choice of belt pulleys depends on the product. If a change in speed is desired, please contact GEA Westfalia Separator.

7.2 Altering the bowl speed (frequency converter)

The main motor can also be fitted with an optional frequency converter. The bowl speed can then be infinitely adjusted within certain ranges via the frequency converter.



DANGER

Danger to life due to excessively high bowl speeds



- Never manipulate the frequency converter to exceed the permissible bowl speed (see nameplate).
- The machine may only be operated with an independent device for speed limitation.

Fig. 58

The maximum frequency represents the maximum bowl speed attainable with the fitted pair of belt pulleys.

The bowl speed is proportional to the frequency of the primary motor.

Important: The differential speed also changes even though the frequency on the secondary frequency converter has not been changed.

7.3 Altering the differential speed (frequency converter)

The differential speed can be altered by reducing/increasing the frequency at the secondary frequency converter.

The maximum frequency represents the maximum differential speed attainable with the fitted pair of belt pulleys.

Four differential speed ranges are available.

- In the lowest differential speed range, the gear shaft is arrested with a torque arm.
- In the other differential speed ranges, the shaft of the gear is connected to the main motor via a V-belt drive.

7.4 Mounting and adjusting the speed sensors

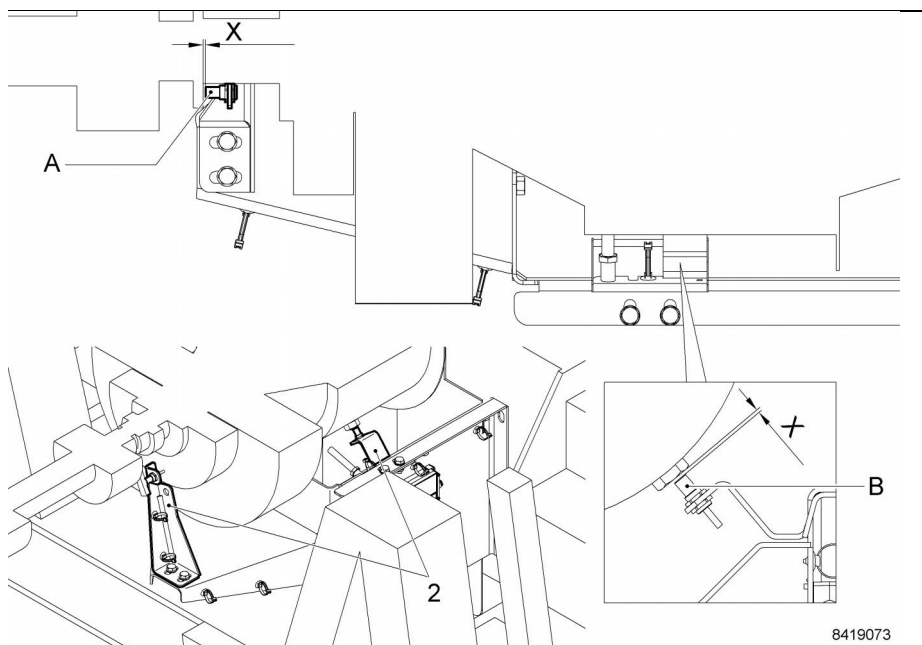


Fig. 59

- Fit holders (2) on the frame and in the lower part of the air chute.
 - Pulse **gear input (A)**
 - **Pulse** Exchangeable pulley **(B)**.
 - Pulse bowl (C)
- Align the holders for the speed sensors.
 - Required clearance $X = 2.5 - 3.5\text{mm}$ If the distance is too large, it could cause incorrect speed evaluations.

7.5 Adjust/check the gearbox temperature monitoring device.

Optionally, the gear temperature can be monitored by means of infrared measurement.

No adjustment work is required.

The protective tube (1) must be checked regularly for soiling.

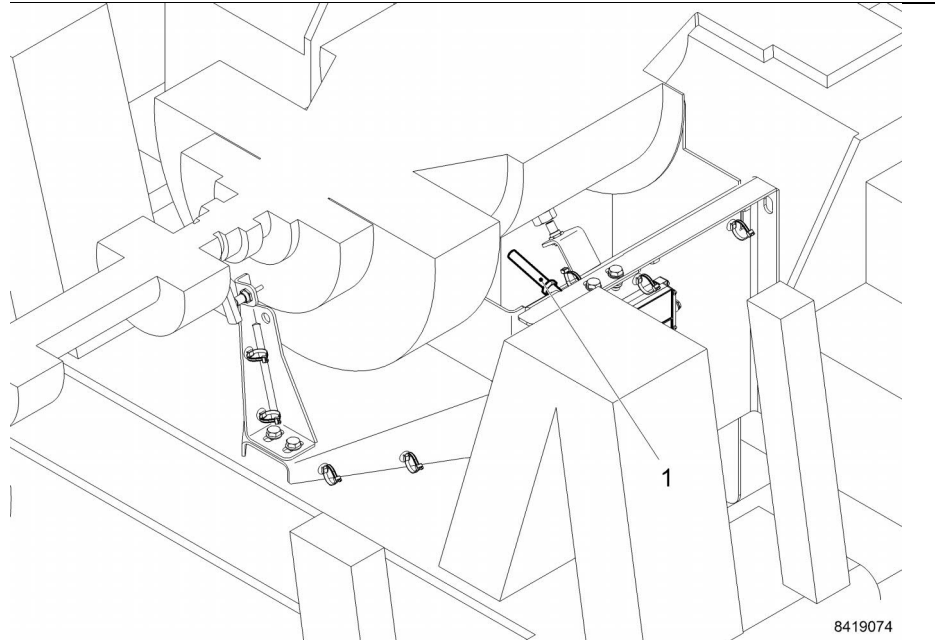


Fig. 60

7.6 Regulating ring

The regulating ring determines the overflow diameter of the bowl.

The overflow diameter can be altered by exchanging the regulating ring to adapt the machine to the respective process by varying the clarifying and drying efficiency.

7.6.1 Removing the regulating ring



DANGER

Danger to life through high-speed rotating machine parts !

- Do not loosen any part of the machine before the decanter bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional switching-on.
- Do not start maintenance work until the components have cooled down to room temperature. Depending on the application and product temperature, the cooling phase can take up to 2 hours.

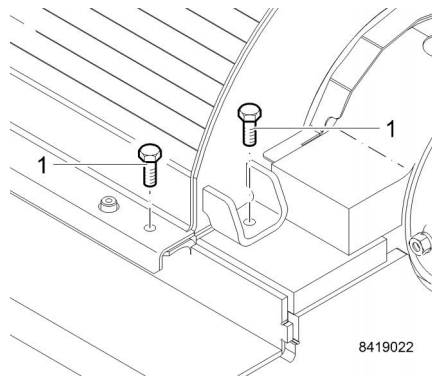


Fig. 61

- Unscrew screws 1. Remove protective hood.

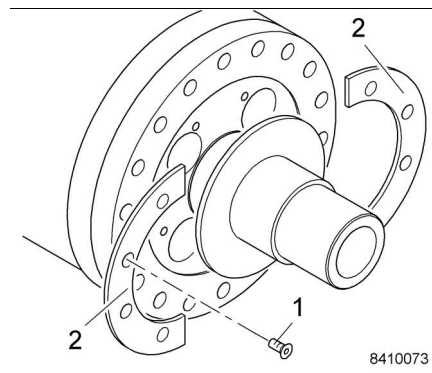
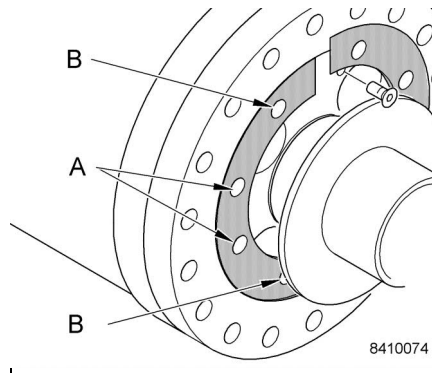


Fig. 62

- Unscrew screws 1.
- Remove regulating ring segments 2.

7.6.2 Fitting the regulating ring

- Clean all parts carefully. Replace worn or damaged parts immediately.



- Mount the ring halves so that the joints are not located over an ejection port.
- Tighten first screws (A), then screws (B).

Fig. 63

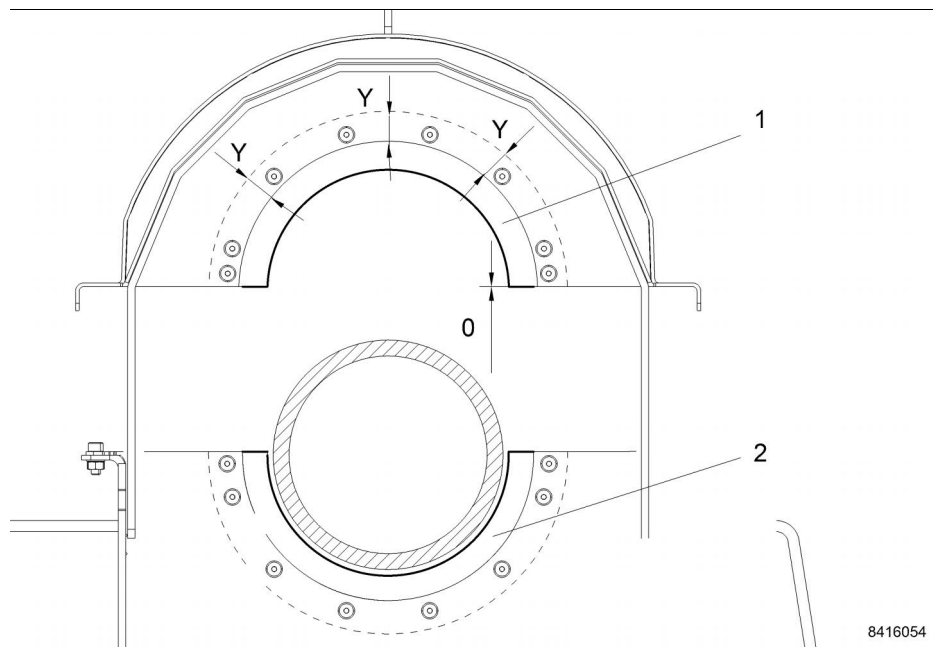


Fig. 64

- Check the seat and condition of the ring halves (1) and (2). Refer to chapter "Maintenance / Aligning ring halves".
- Mount the protective hood.

8 Commissioning

8.1	Safety during commissioning.....	96
8.2	Checking the starting time of the bowl	96
8.3	Checking the run-down time of the bowl	96
8.4	Checking the direction of rotation of the bowl	97
8.5	Commissioning check list	98
8.6	Carry out test run	100
8.7	Preparing for re-starting.....	100
8.8	Start the centrifuge at operating state temperature	101

8.1 Safety during commissioning

Initial commissioning

Commissioning of the centrifuge after erection and installation may only be carried out by specialists from GEA Westfalia Separator or authorized service partners.

Non-professional execution of commissioning by unsuitable personnel can lead to accidents with personal injury and property damage.

When commissioning, observe the following points:

- Assign only trained and authorized specialist with the task of commissioning.
- Only use water instead of the product during commissioning.
- Eliminate faults during commissioning immediately, e.g. leaky pipe joints.
- Check the function of all safety and protective devices, identify faults and eliminate them immediately.

Before every start-up

Operate the centrifuge after maintenance or repair work only when no defects are present which could endanger safe operation.

The plant operator is responsible for ensuring that necessary tests are carried out properly.

take care of the following points before starting the centrifuge:

- Check that all screwed connections are tight.
- Check the "0"-marks on the bowl parts.
 - The "0" marks must be aligned.
- Check oil filling of the gearbox, see chapter "venting the gearbox (without circulation lubrication) or filling in gear oil (with circulation lubrication).
- Check the direction of rotation of the centrifuge.
 - The direction of rotation must correspond to the direction of rotation arrow on the frame.
- Check connections, pressures and temperatures of the product, the operating materials and utilities.
- Eliminate all faults detected prior to starting.

8.2 Checking the starting time of the bowl

- The target values for starting time and operating speed are specified in the order-specific datasheet.
- Make sure that the bowl reaches the specified operating speed within the starting time.

8.3 Checking the run-down time of the bowl

The run-down time of the bowl is the maximum time span required from switching off the centrifuge to standstill of the bowl. It can be found in the datasheet.

The run-down time specified in the datasheet refers to the operating speed with free run-down and at atmospheric pressure. The operating speed is specified on the nameplate of the centrifuge

The filling level of the bowl and various process factors can influence the run-down time of the bowl.

8.4 Checking the direction of rotation of the bowl

The bowl must rotate clockwise when looked at from the feed side.

- Pay attention to the direction of rotation arrows on the drive motors.

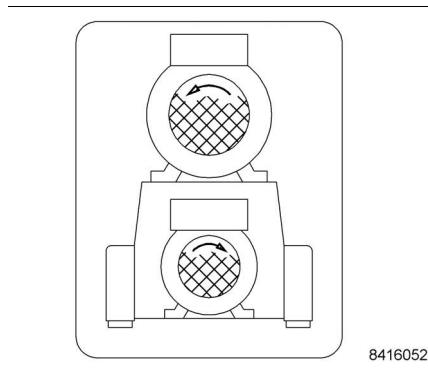


Fig. 65

- The motor fans must run in the direction of the arrows.
- If this is not the case, the electrical connection must be checked.



DANGER

Danger to life through electric voltage!

Danger to life and limb through electric shock.

- The electrical connection of the three-phase AC motor may only be performed by authorized specialists, e.g. electricians and high voltage electricians.
- Power must be shut off to the connections and it must be ensured that it cannot be switched back on.

8.5 Commissioning check list

Operator: Trained specialist

When must the check list be worked off:

- Before commissioning the centrifuge
- When re-starting after repairs and a long standstill period

Documents

Decanter instruction manual is available.	
Data sheet according to EN 12547 is available.	
Lubrication and maintenance schedule is available.	
Spare parts list is available.	
Instruction manuals for optional auxiliary equipment are available, e.g:	
- Decanter control / decanter monitoring	
- Automatic lubrication system	
P&ID is available.	
Order-specific dimensioned drawing is available.	

Centrifuge

Centrifuge has been installed and assembled to the specifications.	
Bowl is fitted and can be rotated by hand.	
Safety stickers are complete, attached properly, are clean and legible.	
Feed and discharge connections are fitted correctly and the screwed connections are tight.	
Frame drains are free.	
Lubricating oil is filled in as per lubrication schedule and oil level is correct.	
For circulation lubrication for the gearbox: The gearbox itself was filled with oil and is completely filled.	
Monitoring equipment is mounted connected electrically to the control system.	
Limit values for pressurized hoods, concentrate catchers and vessels are set correctly.	
Bowl locking screws are loosened and secured.	
Transport lock of the drive loosened and secured.	

Product paths

Feed lines are deburred and cleaned or acceptance report of the plumber.	
The product feed does not leak.	
The product corresponds to the specifications on the nameplate.	
Operating pressures prevail.	
Temperature is correct.	

Supply lines

Electrical connections for fittings are properly connected.	
Option: Air supply for oil+air lubrication is connected.	

Cooling and purging water

The purging water lines are connected and operational (special request).	
Option: The cooling water pipe to the mechanical seal is connected and operational.	
Option: The water pipe for the hydrohermetic seal is connected and operational.	
Option: The cooling water pipe to the oil circulation lubrication system is connected and operational.	

Control unit

Electrical connections have been executed professionally.	
Protective devices function, e. g. light barriers or switches on protective covers.	
EMERGENCY STOP and EMERGENCY OFF buttons are in the intended places and are functioning.	
Optional monitoring equipment is connected and functioning, e.g. <ul style="list-style-type: none"> - speed monitoring, - vibration monitoring, - temperature monitoring, - flow rate meter, - oil flow monitoring, - temperature displays - pressure displays. 	
The bowl speed is correctly set.	
Torque factor (decanter factor) is correctly set.	
Safety switching circuits and alarms have been tested and are functional.	

Electric motor

Transportation locking device has been removed (if fitted).	
Connection values on the motor nameplate match the specifications on the centrifuge nameplate and the connection values of the local power supply.	
Electrical connection has been executed professionally.	
Directions of rotation motors/bowl are correct.	

8.6 Carry out test run

IMPORTANT: Commissioning entails risks since hidden faults may not emerge until the decanter is started.

If the product is problematic, it is recommended to carry out the commissioning test run with water or an inert medium.

- Check that all speeds and limit values are adjusted correctly on the decanter control. Refer to the control unit instruction manual.
- Start the decanter, see chapter "Operation / Switching on the decanter".
- Feed water to the decanter.
- Check the installation for leaks.
- If unusual noises occur, shut down the decanter immediately.
- Let the decanter run for 30 minutes.
- Shut down the decanter.
- Option: Check tightness of oil circulation lubrication system of gearbox.

8.7 Preparing for re-starting

Before a prolonged shut-down of the centrifuge, various storage measures have been carried out. Machine parts have been dismantled and stored separately, e.g. the bowl.

Permanent corrosion protection for drive parts with the specified slushing oil can be guaranteed for a maximum of 1 year.

When the centrifuge is put back into operation after a long standstill period, the following operations and tests must be performed:

- remove packaging and covers.
- Strip down the bowl and check the bowl parts for corrosion damage. In case of doubt, have the bowl parts checked by service personnel from GEA Westfalia Separator.
- If the centrifuge has been in storage for longer than one year, carry out the steps specified in the maintenance schedule (machine out of operation for prolonged period).
- Check the shut-off devices for functionality and leakage.
- Re-connect the feed lines if they were disconnected before decommissioning.
- Open valves for product feed line and discharge lines.
- If appropriate, carry out a test run with water as described in the section "Performing a test run".
- Only in case of grease-lubricated bowl bearings:
 - Displace surplus grease out of the bearings with the aid of compressed air.
 - Perform this action when the machine is rotating slowly.
 - Too much grease in the bearings can lead to inadmissibly high bearing temperatures.

8.8 Start the centrifuge at operating state temperature

Centrifuges with three-phase AC motors which are controlled by a frequency converter can be re-started at all times. This does **not** apply for motors featuring controlled torque starting.

NOTICE

Heating on centrifuges with motors for controlled torque starting

A centrifuge with motor for controlled torque starting is started with a high current consumption. This can result in overheating of the coupling and the three-phase AC motor.

- Do not re-start centrifuges with motors for controlled torque starting at operating state temperature until after a cooling off time of 60 minutes.

9	Operation
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9.1	Safety during operation	104
9.2	What must be kept in mind when using third-party controls?.....	106
9.3	Immediate action in case of power outage.....	106
9.4	Pre-lubricating bowl bearings	107
9.5	Switching on the decanter	107
9.6	Operation	108
9.6.1	Operation with vibration monitoring equipment	109
9.7	Recommendations for cleaning after production	110
9.7.1	Shut-down program – P&ID flow chart	111
9.7.2	Throughput	112
9.7.3	Recommended standard procedure	113
9.7.4	Valve positions.....	115
9.7.5	Optional Varipond S - Flushing/Centripetal Pump Flushing	116
9.8	Thorough cleaning	117
9.9	Flush connections.....	117
9.10	Temporary decommissioning	118
9.11	Restarting	118

9.1 Safety during operation

Operating a centrifuge can involve risks when the operator does not operate the centrifuge correctly in accordance with its intended use.

The plant operator is responsible for ensuring that necessary checks are done carefully and suitable personnel are deployed.

- Follow the operating instructions.
- Operate centrifuges only when no defects are present which could endanger safe operation.
- Operate the centrifuge only for the intended purpose and in accordance with the agreed process conditions.
- Operate the centrifuge only at the bowl speed specified on the nameplate and in the datasheet.
- Use only qualified personnel, see chapter "Safety precautions / Qualification of the personnel".



Fig. 66

- Wear ear protection.

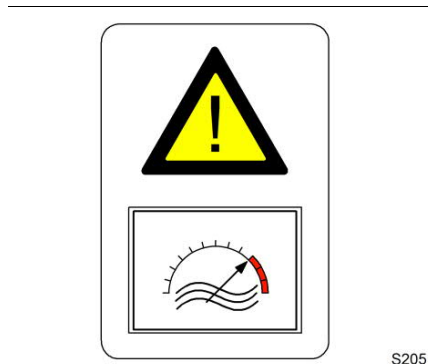


Fig. 67

In case of frequency converter operation:

- Never manipulate the frequency converter to exceed the permissible bowl speed (see nameplate).
- The machine may only be operated with an independent device for speed limitation.



Fig. 68

- Some plant components can get very hot.
 - In normal operating conditions, this applies, for example, to the bearing housing.
 - In hot operating conditions, this particularly applies to parts coming in contact with product (e.g. pipes and hoses, catchers).

If the hot surfaces are readily accessible, warning signs must be attached for the protection of personnel.

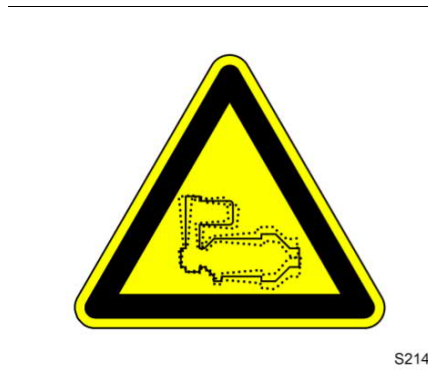


Fig. 69

- Shut down the centrifuge immediately when unusual noises, vibrations or overheating occur.
- Evacuate the room.

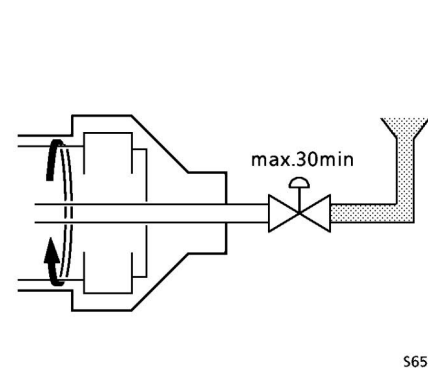


Fig. 70

- The bowl is not allowed to run without liquid supply for more than 30 minutes, as otherwise it would result in overheating of the bowl material.

9.2 What must be kept in mind when using third-party controls?

The decanter is normally operated with controls from Westfalia Separator. these control systems ensure safe operation and protect the decanter from damage due to overload.

This instruction manual assumes in the sections “Machine description” and “Operation” that the decanter control has been delivered by Westfalia Separator.

If the decanter control has not been delivered by GEA Westfalia Separator, a number of requirements must be met by the control system to guarantee at least an adequate standard of safety.

The following list is **not complete** since the complete working process including all relevant parameters and limits must be taken into account to ensure safe and optimum operation of the decanter.



DANGER

The maximum bowl speed must not be exceeded under any circumstances (see nameplate).

In the case of non-compliance, there is a risk of damage to persons and property.

NOTICE

The variable speed motor may only transfer the maximum admissible torque for the scroll drive.

This can in individual cases mean that the torque is significantly below the possible torque of the variable-speed motor.

- The control system must limit the effective torque of the variable-speed motor (secondary drive) as otherwise the scroll drive will get damaged.
- The admissible speed ranges must be observed.
- The admissible torque is project-specific and can be inquired from the responsible business line.

9.3 Immediate action in case of power outage

If the voltage is interrupted for more than one second during operation, “Emergency Stop” is activated:

All drives (such as the main motor) are switched off directly. Flush valves or valves of the oil-air lubrication remain active and can be controlled by the programme.

If the installation is not shut down automatically by the control, the operator must do the following:

- Close valve at product feed.
- Open the discharge to the sewer and all other discharge valves.
- Secure the plant against unintended restarting with locking devices.

9.4 Pre-lubricating bowl bearings

Only required in the case of decanters with oil+air lubrication of the bowl bearings.

- Whenever the bowl bearings or lubricating lines have been replaced, pre-lubrication of the bowl bearings must be triggered manually on the decanter control unit.
- Pre-lubrication is started via the corresponding menu item on the decanter control unit.
- The factory setting for pre-lubrication is 60 minutes.
- Pre-lubrication can be terminated at any time.
- The decanter doesn't start automatically after the pre-lubrication time has elapsed.

9.5 Switching on the decanter

- Switch on main switch of main control. Push the button "Decanter Start".
- Switch on auxiliary equipment, e.g.
 - metering pump for flocculent,
 - conveying equipment for liquid and solids (screw conveyors, conveyor belts etc.)

The auxiliary equipment must be electrically interlocked with the decanter so that these units are running when the decanter starts. The product feed must be cut off when one of these units fails.

- Wait for the starting time to elapse.

Make sure that the speed stated on the nameplate is reached within the specified start-up time and maintained during operation.



DANGER

Overspeed poses a high safety risk

- Shut down the decanter immediately when the max. admissible rated bowl speed is exceeded by more than 5 %.
 - The max. admissible bowl speed is specified on the decanter nameplate or the technical datasheet.
- Set control settings on the decanter monitoring unit
 - Basic differential speed
 - Control gradient
 - Control begin
- Open the product feed and adjust the desired throughput capacity.

9.6 Operation

The machine is monitored to a large extent by the decanter control unit.

The only parameter that can be changed during normal operation is the control begin.

- In the case of poor clarification results: Adjust the control begin downwards.
- In the case of poor solids drying results: Adjust the control begin upwards.

When faults occur (power failure, gear overload etc.), the product feed must be automatically cut off and the flush water line opened.

Operations to be carried out regularly:

- Keep to the "Lubrication and maintenance schedule". The "Lubrication and maintenance schedule", though a separate document, is part of the machine documentation.
- Repairing the scroll: If the wear is extensive, the scroll must be reconditioned or replaced. Excessive wear to the scroll is indicated by, for example:
 - frequent speed increases of the secondary drive
 - increased residual moisture in the discharged solids
- Check for wear. If the erosive effect of the product is unknown, we recommend checking for wear every 500 operating hours. Concentrate especially on:
 - Conveyor screw
 - Components in the solids discharge
 - Catch chamber.
- Inspection: We recommend having your decanter inspected by our specialists at regular intervals. These services help
 - to maintain the operating reliability and safety of your decanter and
 - undesirable production stoppages are avoided.

IMPORTANT! A deterioration in the processing efficiency of the decanter can also be caused by changes in the product.

9.6.1 Operation with vibration monitoring equipment

Vibration monitoring is a central component of the protection concept for the decanter.

This device determines the effective vibration speed (RMS in accordance with ISO 2372) and therefore enables an objective monitoring of the decanter vibration behaviour.

The vibration monitoring devices must be set in accordance with the data sheet. The data sheet is an integral part of the machine documentation.

9.7 Recommendations for cleaning after production

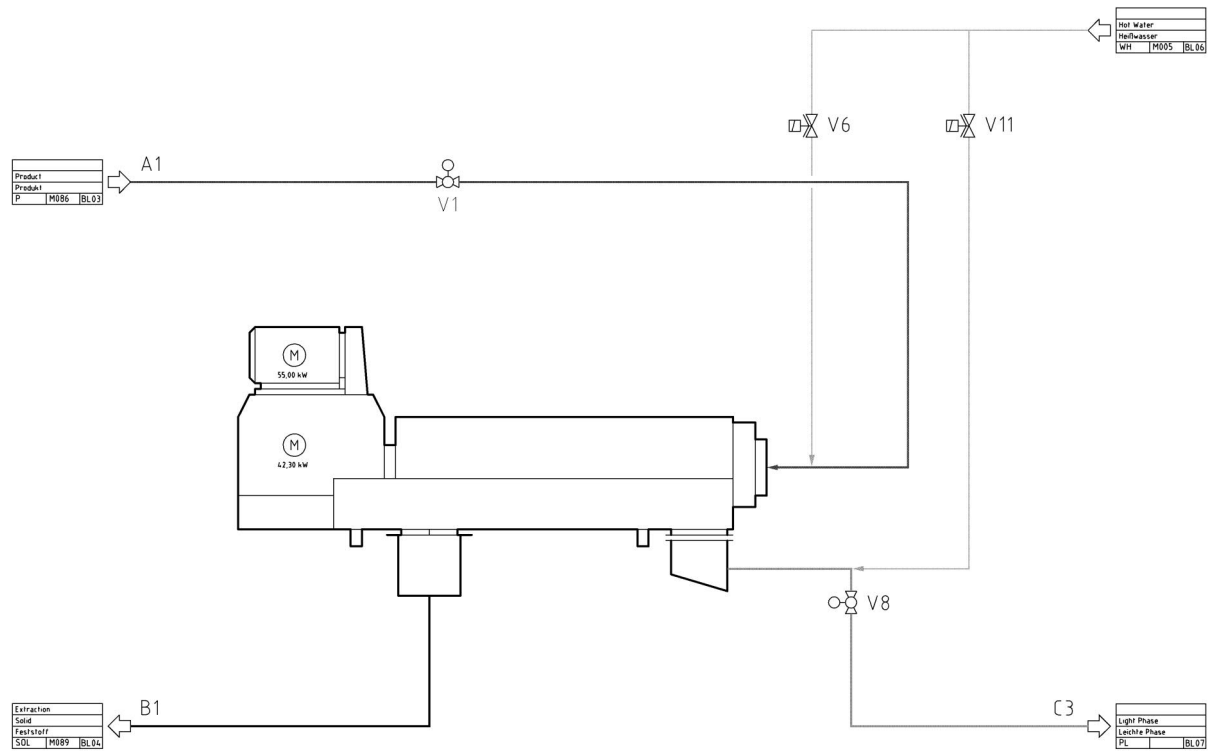
After production, product residues must be removed from the bowl with water. For this purpose, before each stop of the machine, it is advisable not only to flush to displace the product at bowl speed, but to perform a flush cycle at a lower bowl speed.

Purpose of the cleaning:

- Reduction of product residues in the bowl
- Reduction of vibrations due to dried product residues

9.7.1 Shut-down program – P&ID flow chart

P&ID shut-down program



8416506

Fig. 71

V1	Inlet valve
V6	Water inlet valve
V8	Product discharge valve
V11	CIP valve outlet

9.7.2 Throughput

The feed capacity of the centrifuge during production must be below the maximum permissible feed capacity of the centrifuge.

During the shut-down process, the cleaning solution drains through the liquid side and solid side.

The discharged amount of the solid side depends on the throughput, bowl speed and weir diameter.

- High throughput results in more discharge from the solid side.
- Low bowl speed results in more discharge from the solid side.
- Small weir diameter results in more discharge from the solid side.

The inlet flow rate at the upper flushing speed must be reduced for backflushing by centripetal pump or Varipond S.

Decanter size	Max.inlet flow rate at upper flushing speed for back-flushing	
1000	1.5 m ³ /h	7 gpm
3000	2.5 m ³ /h	11 gpm
4000	3.5 m ³ /h	15 gpm
5000	4.5 m ³ /h	20 gpm
6000	7 m ³ /h	31 gpm
7000	10 m ³ /h	44 gpm
8000	14 m ³ /h	62 gpm

9.7.3 Recommended standard procedure

Important information

- The cleaning process can be adapted to the production process, for example:
 - Changing the cleaning period
 - Change the number of flush intervals
- Make sure there is a sufficient amount of flushing medium to guarantee that flushing functions properly.

The entire cleaning (1) after production consists of flushing and shutdown program (A). The times and speeds are to be taken from the decanter settings (decanter setting values).

Flushing:

Flushing serves to displace residual product from the bowl at operating speed (n4).

- The inlet is closed (V1).
- The outlets are opened (V8).
- The flushing inlet valve is opened (V6).
- The time "flush feed" is serviced.
- After this, the flushing inlet valve is closed.

Shut-down program:

The shutdown program is used to flush the decanter bowl via a flush feed with liquid. This takes place at low speeds to achieve a more effective flushing effect.

- The flush liquid (V6) supply is opened. The drive is switched off, the speed drops.
- When the speed of the flushing inlet valve (n2) is reached the supply of flushing liquid (V6) is closed.
- The bowl drive stops.
- After this, the decanter is run again at the upper flushing speed (n3).
- Here, the supply of flushing liquid (V6) is opened.
(The amount of fluid supplied should be at least equal to the bowl volume.)
- After expiration of the upper flushing duration, the bowl drive stops.
- When the speed of the flushing inlet valve (n2) is reached the supply of flushing liquid (V6) is closed.
- The lower flushing speed (n1) is kept to improve the cleaning result for a lower flushing duration.
- The bowl drive stops.
- The cycle (Ax) is repeated depending on the product.

Standard procedure in graphical form

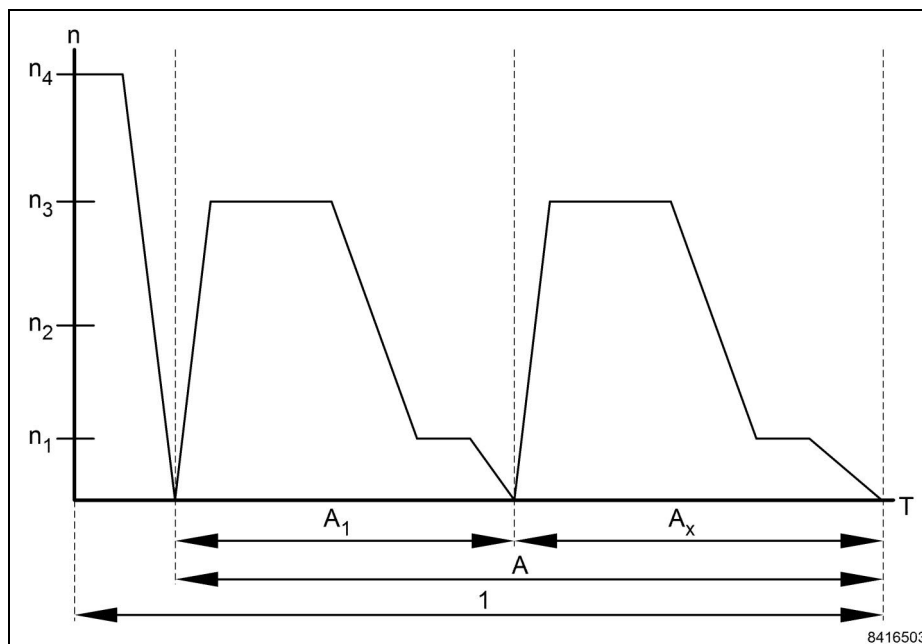


Fig. 72

Speed ranges

Speed range	Designation
n_4	Operating speed
n_3	Bowl drive with FC: Upper flushing speed
n_2	Speed at which the flush liquid supply is closed.
n_1	Bowl drive with FC: Lower flushing speed

Programs

Shutdown program	
1	Water 20 °C

9.7.4 Valve positions

In the various states of "flush", "high speed", and "low speed", the valves in the piping around the decanter are switched as follows to obtain the desired flow directions.

P & ID flow chart

State: Flush water after end of production "high speed"

Valve	Position
V1	closed
V6	open
V8	open
V11	closed

State: closed

"high speed"

Valve	Position
V1	closed
V6	open
V8	open
V11	closed

State: closed

"low speed"

Valve	Position
V1	closed
V6	closed
V8	closed
V11	closed

State: Backflushing

"high speed"

Valve	Position
V1	closed
V6	closed
V8	closed
V11	open

"low speed"

Valve	Position
V1	closed
V6	closed
V8	closed
V11	closed

9.7.5 Optional Varipond S - Flushing/Centripetal Pump Flushing

Graphically represented procedure of the

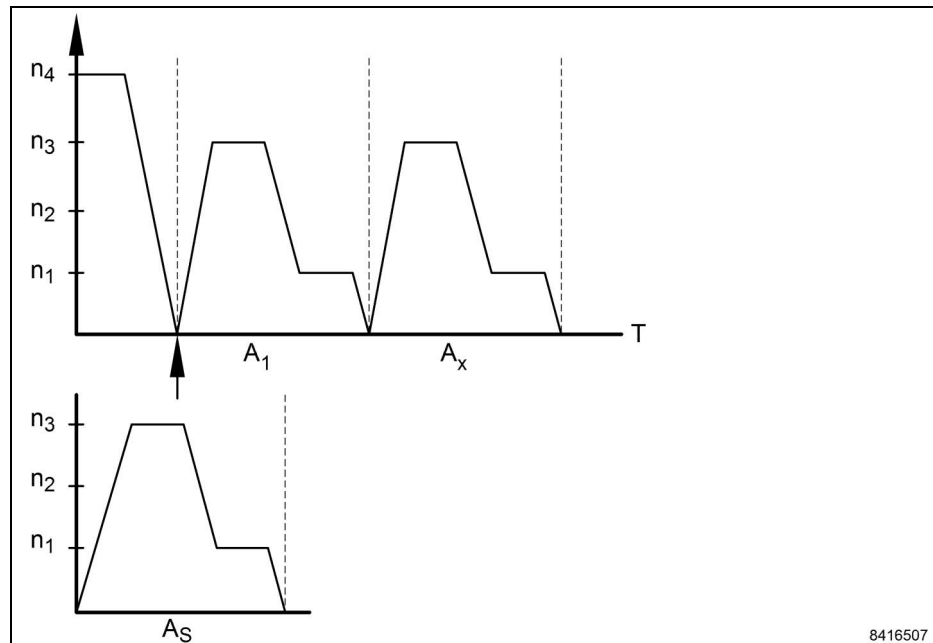


Fig. 73

Varipond S - Flushing/Centripetal Pump Flushing:

If Varipond S – flushing is present, it is not possible to flush a cycle (A_s) as part of the shutdown program via the inlet pipe, but via the Varipond S.

- The flush liquid (V6) supply is opened. The drive is switched off, the speed drops.
- When the speed of the flushing inlet valve (n_2) is reached, the supply of flushing liquid (V6) is closed.
- The bowl drive stops.
- After this, the decanter is run again at the upper flushing speed (n_3).
- Here, the supply of flushing liquid (V11) is opened.
(The amount of fluid supplied should be at least equal to the bowl volume.)
- After expiration of the upper flushing duration, the bowl drive stops.
- When the speed of the flushing inlet valve (n_2) is reached, the supply of flushing liquid (V11) is closed.
- The lower flushing speed (n_1) is kept to improve the cleaning result for a lower flushing duration.
- The bowl drive stops.
- The cycle (A_x) is repeated depending on the product.

9.8 Thorough cleaning

Thorough cleaning should be carried out to avoid infection as well as prior to long-term shut-downs.

- Clean the upper and lower parts of the catcher.
- Remove the scroll , see chapter “Removing the scroll”.
- Thoroughly clean the bowl and scroll with brushes using water or a suitable caustic solution.

NOTICE

Risk of corrosion: Make sure that no cleaning liquid enters the area of the drive shaft of the gear (toothing). The result would be rough running with high vibration values. The bowl would then have to be rebalanced.

When using a high-pressure cleaner:

- Remove the bowl and clean separately.
- Seal tapholes at the cylindrical end of the bowl with screws. This is necessary as otherwise the balancing weights will be flushed out through the holes.

9.9 Flush connections

A complete flushing device is optionally available. The version depends on the application.

If the flushing device is provided by the customer, pay attention to the following:

- Order-specific dimensioned drawing
- P&ID
- Flush liquid volume, pressure and flushing time are product-dependent.
- Adequate flushing is only possible when all flush connections are operational (depending on the application).

9.10 Temporary decommissioning

The decanter will get damaged if it is not operated for a prolonged period and inadequate preserving measures are taken.

When the machine is shut down for longer than 14 days, special measures are required to prevent the machine from getting damaged during standstill.

If this action is not taken, the roller bearings of the machine in particular will be damaged by corrosion and one-sided load. This bearing damage results in high consequential costs.

GEA Westfalia Separator urgently recommends accelerating the decanter to operating speed for 30 minutes every 14 days. Note:

- Chapter "Commissioning / Commissioning check list".
- If the decanter is operated for maximum 30 minutes, the addition of water or other flushing media is not required (for particular explosion concepts max. 15 minutes).
- Only for grease-lubricated bowl bearings: re-lubricate bowl bearings.
 - If the decanter is equipped with the optional "automatic grease lubrication", re-lubrication is carried out automatically.

If the decanter is shut down for a very long period, refer to the chapter "Decommissioning/Long-term storage".

9.11 Restarting

Whenever machine parts have been dismantled during maintenance or repair work, special care must be taken when re-starting the machine.

Skilled personnel must ensure the following:

- All parts are fitted correctly.
- The bowl lock screws have been removed and replaced by short screws.
- Transportation locking device of the drive has been released and secured.
- Sparking due to grinding of components is excluded.
- To check this, the bowl is rotated several times by hand. When even the slightest grinding noises occur, the cause must be investigated and eliminated.

10 Trouble shooting

10.1	Safety when eliminating operating malfunctions	120
10.2	Trouble shooting	121

10.1 Safety when eliminating operating malfunctions

Faults during troubleshooting can endanger the operating safety of the centrifuge. This can lead to accidents with damage to persons and property.

- When troubleshooting, pay attention to and comply with the instructions in the chapter "Servicing / Safety during servicing".
- Determine the source of the fault and inform the responsible departments in the company if necessary. Carry out troubleshooting and fault elimination with care.
- When safety devices on the centrifuge/installation respond, stop operating the centrifuge/installation until the cause has been identified and remedied.
- Ensure that persons are not put at risk through the troubleshooting.
- Observe the local standard operating procedures (SOPs) at the workplace and wear the specified protective gear.
- Cordon off the working area and hang up a warning sign.
- Remove unauthorized persons from the cordoned-off working area.
- Before troubleshooting, all rotating parts of the centrifuge (drive, bowl) must be at a standstill.
- Prior to troubleshooting, switch off the main switches and secure against re-activation.
- Set down dismantled centrifuge parts only on level, anti-slip surfaces, e.g. rubber mat or wooden pallet.
- Secure dismantled centrifuge parts by suitable means to prevent them from overturning or rolling away, e.g. with wooden wedges or square timbers.
- Never weld the bowl, hood or solids catcher.
- Do not machine the bowl, hood and solid catcher.
- Do not climb onto or sit on the centrifuge or parts of the centrifuge.
- Before re-starting, ensure that there is no unbalance due to fouling. Open and clean the bowl prior to start-up.
- Bowls may be balanced only by authorized specialists and authorized workshops.
- After carrying out maintenance and repair work on centrifuges, reattach all protective devices and check the safety devices.

10.2 Trouble shooting

Fault	Possible cause	Measure	Operator
Start-up problems	Gap constriction due to deposits between bowl and catcher	<ul style="list-style-type: none"> ➤ Clean gaps. ➤ Only in the case of a one-piece catcher: Align the ring halves of plastic in the frame or replace them. 	Skilled
	Speed indicator faulty	<ul style="list-style-type: none"> ➤ Check speed sensor 	Skilled
	Only in case of grease-lubricated bowl bearings Bowl bearings overpacked with grease	<ul style="list-style-type: none"> ➤ Remove surplus grease 	Skilled
Bearing temperature too high	Insufficient lubricant	<ul style="list-style-type: none"> ➤ Check lubrication system 	Skilled
	Onsetting bearing damage	<ul style="list-style-type: none"> ➤ Replace roller bearings 	Tspec
	Only in case of grease-lubricated bowl bearings Bowl bearings overpacked with grease.	<ul style="list-style-type: none"> ➤ Use only the quantity of lubricant specified in the lubrication and maintenance schedule. <p>Excessive lubrication will bring about an unnecessary increase in bearing temperature.</p>	Skilled
Vibrations too high	One-sided product deposits	<ul style="list-style-type: none"> ➤ Carry out flushing program. ➤ Check scroll and clean if necessary. 	Skilled
	Bearing damage	<ul style="list-style-type: none"> ➤ Replace roller bearings 	Tspec
	Loose fits	<ul style="list-style-type: none"> ➤ Contact Westfalia Separator 	Tspec
	Product deposits that are grinding against rotating parts	<ul style="list-style-type: none"> ➤ Remove hood; check deposits in housing ➤ Only in the case of a one-piece catcher: Check the ring halves of plastic in the frame. 	Skilled

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

11 Maintenance

11.1	Safety during maintenance	124
11.2	Regular checks	125
11.2.1	Recurring checks on load suspension devices	125
11.3	Instructions on handling roller bearings	126
11.4	Maintenance schedule.....	127
11.5	Scroll	127
11.5.1	Admissible wear to scroll	127
11.6	Scroll bearings	128
11.6.1	Oil change (scroll bearing liquid side).....	129
11.7	Bowl	132
11.8	Bowl bearings	132
11.8.1	Emptying the oil collecting chambers	133
11.9	Tensioning the drive belt	134
11.10	Gearbox	136
11.10.1	Drain the gear oil.	137
11.10.2	Filling the gear oil.....	140
11.10.3	Vent gearbox (without circulation lubrication).....	142
11.11	Motor bearings	143

11.1 Safety during maintenance

Before all maintenance and servicing:

- Observe the safety precautions in chapter 2.
- Perform a controlled shut-down of the decanter via “decanter off”.



Fig. 74

- Disconnect all electrically supplied equipment from the power supply using the main switch.
- Secure the plant against unintended restarting with locking devices.



Fig. 75

- Wait for the bowl to come to a standstill.
 - Wait for the run-down time of the decanter bowl to elapse, approx. 30 minutes.
- Do not loosen any part of the machine before the decanter bowl has come to a standstill.



Fig. 76

- Do not start maintenance work until all machine parts have adequately cooled down.
 - The cooling time depends on the product processed and the machine size and can last several hours.
 - Check the surface temperature before starting work.

11.2 Regular checks

The centrifuge must be checked regularly to ensure operating safety.

The inspection intervals depend on the field of application and the level of stress and are documented in the instruction manual, see chapter "Maintenance / maintenance Schedule".

In addition, the centrifuge and its supervisory equipment must be checked on the following occasions:

- before initial start-up
- before start-up after a prolonged standstill

The following points should be particularly kept in mind.

- The scope and result of each check must be documented.
- Have the centrifuge assessed at least once a year by a qualified person.
- Have the centrifuge assessed in a dismantled state at least every three years by a qualified person.
- When processing corrosive or erosive products, implement shorter inspection intervals.
- Following unusual events which may have a negative impact on safety, have the centrifuge checked immediately. Unusual events are:
 - Modifications to the centrifuge
 - Accidents
 - Natural events, e.g. earth quakes, sand storm, flooding

11.2.1 Recurring checks on load suspension devices

Load suspension devices must be checked at regular intervals. The recurring check would be limited to a visual check after cleaning.

IMPORTANT: Cleaning agents may not attack the base material or conceal cracks or surface damage.

Pay special attention to the following points:

- Visible deformation of parts, e.g. chain links, threads, carrier bolts, eye bolts etc.
- Cuts, notches, cracks, upsetting deformation of contact surfaces.
- Wear in contact areas.
- Jamming of elements that normally move together.
- Excessive corrosion or discolouration through heat.
- Missing or illegible markings.

Every check or test must be documented and the document must be archived.

NOTE: Damaged or incomplete load suspension devices included in the set of tools must be sent to GEA Westfalia Separator for checking and repair.

11.3 Instructions on handling roller bearings

Roller bearings must be kept in their original packing; the packing may only be opened at the workplace and directly prior to fitting. Otherwise there is a risk that the bearings will become soiled and rust.

Cleanness during assembly

- Roller bearings must under all circumstances be protected from dirt and moisture as even the finest particles which enter the bearing will damage the bearing surfaces.
- The assembly site must therefore be free from dust and dry. It may not, for example, be in the vicinity of grinding machines. The use of compressed air must be avoided.
- Also pay attention to the cleanness of the shaft and the housing as well as all other parts.

Premature wear to bearings

If a roller bearing fails prematurely, this can have the following reasons:

- Local damage to the races; e.g., score marks, scratches or dents. Such damage occurs, for example, when the outer ring of a cylindrical roller bearing is mounted twisted with the roll barrels over the inner ring or when the pressing force is guided via the roll barrels.
- Insufficient lubricant
- Incorrect lubricant
- Lubricant change intervals too long

Damage becomes evident in the short-term by an increased running noise level. In the long-term it results in premature fatigue of the bearing surfaces.

11.4 Maintenance schedule

Refer to the order-specific "Lubrication and maintenance schedule" in the machine documentation.

11.5 Scroll

The scroll must be checked for wear at regular intervals.

In case of extensive wear to the scroll flights, the operating efficiency of the decanter is impaired. This can have the following impact:

- Only in the case of automatically adjustable differential speed: The differential speed is constantly increased.
- The discharged solids has a higher residual moisture.
- The vibration values of the decanter are increased.

11.5.1 Admissible wear to scroll

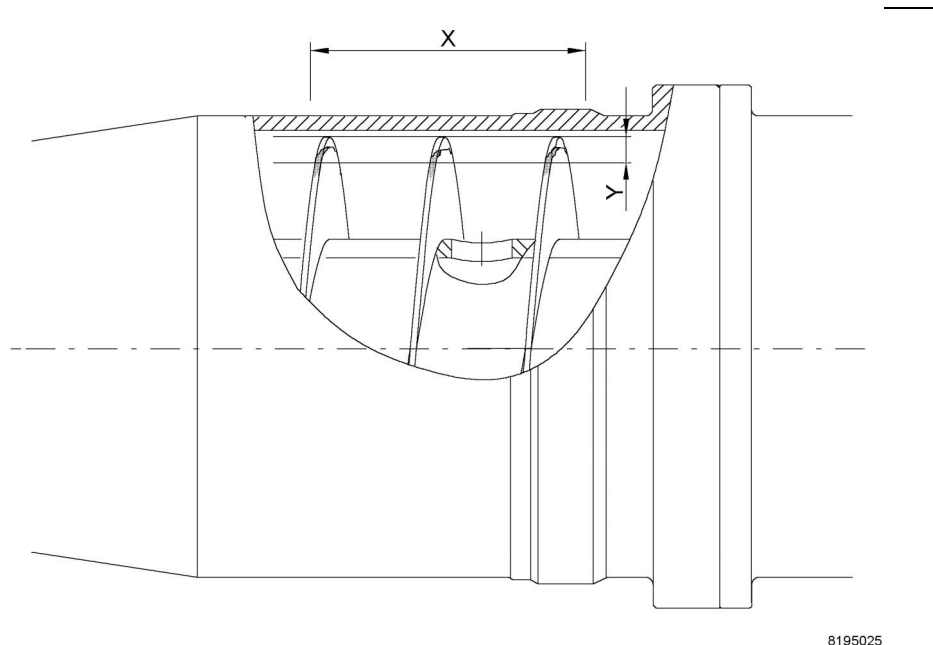


Fig. 77

As a rule, 2-3 flights in the product inlet zone are particularly prone to wear («X»).

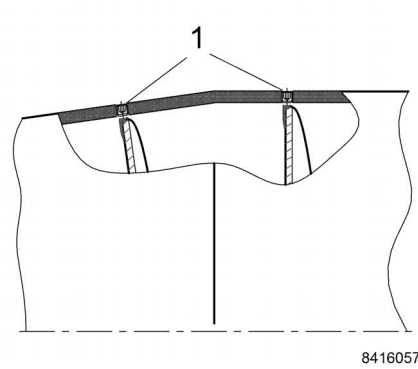
As much wear as possible must be allowed for this small area («Y»).

The wear to the distributors should also be observed.

Inspection holes

Inspection holes enable checking of the scroll wear on most bowls.

The following wear check may only be carried out by service personnel of Westfalia Separator:



- Unscrew threaded pins 1.
- Rotate the gear input shaft by hand until the scroll flight is in the area of the hole.
- Determine the wear with the aid of a depth gauge.

Fig. 78

- Refit the threaded pins.
 - Screw in the threaded pins with Loctite type 245.

NOTICE

The thread has no collar

The threaded pins must be flush with the bowl outer diameter.

Threaded pins that are screwed in too far collide with the scroll and result in damage.

11.6 Scroll bearings

Pay attention to the following during maintenance work:

- Keep to the "Lubrication and maintenance schedule". The "Lubrication and maintenance schedule" is part of the machine documentation.
- Roller bearings with special tolerances are required for all bearing points. Use only those roller bearings specified in the parts list.
- Always use complete tools for the job they were designed for, see "Set of tools".
- Use only suitable hoists and load suspension devices.

11.6.1 Oil change (scroll bearing liquid side)

Optionally, the decanter is equipped with oil-filled scroll bearings. The oil filling of the liquid-side scroll bearings can be renewed with fitted bowl.



DANGER

Risk to life through high-speed rotating machine parts

There is a risk of serious injury from being pulled into the machine and from machine parts or product residues being ejected.

- Do not loosen any part of the machine before the bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional restart.
- Do not start maintenance work until the components have cooled down to room temperature. Depending on the application and product temperature, the cooling phase can take up to 2 hours.



CAUTION

There is a risk of injury through burning or scalding.

Hot machine parts and hot oil can cause burns.

- Carry out the oil change at operating state temperature; 40 – 50 °C are optimal. Check temperature. Do not start assembly too soon.
- Provide a suitable collecting receptacle. Refer to the maintenance schedule.

IMPORTANT:

- Use only suitable hoists and load suspension devices.
- Always use complete tools and use them only for the intended application, see separate spare parts catalog "Set of tools".

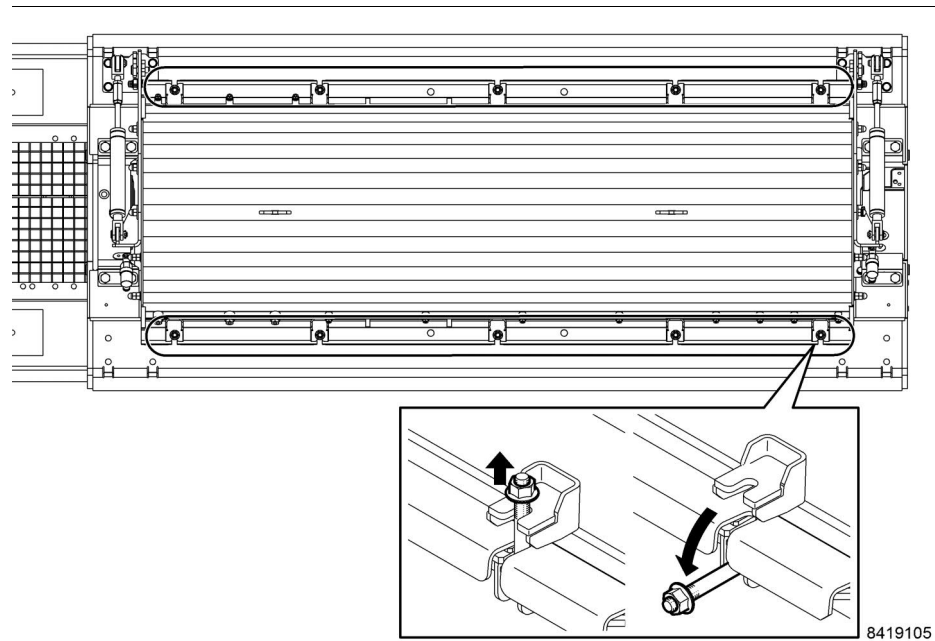


Fig. 79

- Undo the nuts.
- Pull down the bolts.
- Remove protective hood / open the hinged cover
- Rotate the bowl by hand until the screw plug becomes visible.

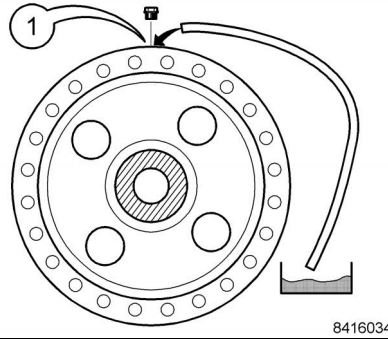


Fig. 80

- Unscrew plug (1) and connect the hose taken from the “set of tools”.
- Place a suitable collecting receptacle underneath to collect the oil. Rotate the bowl until the oil discharge opening (1) is at the bottom.

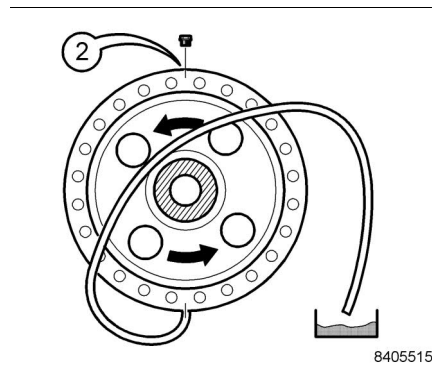


Fig. 81

- Remove plug (2). Drain the oil completely.
- Force any remaining oil residue out of the bearing using compressed air
 - Wear protective clothing and protective goggles.
 - The compressed air must be **free from dust and water**.

- Examine the discharged oil for impurities.
 - Product residues or water indicate defective sealing.
 - Metal shavings indicate a worn roller bearing.

Do not re-start the decanter until the cause of the impurities has been eliminated.

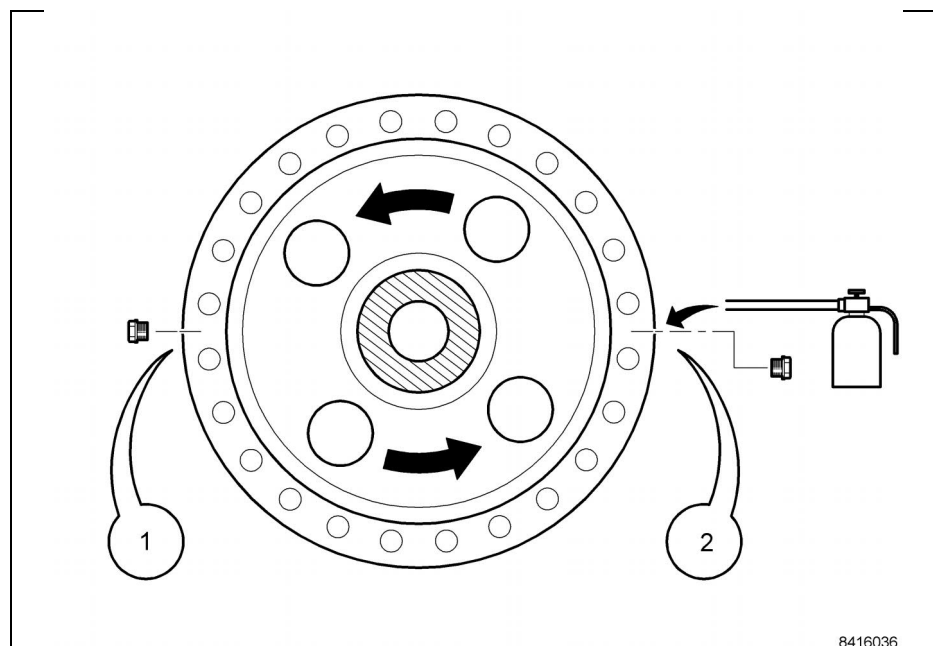


Fig. 82

- Rotate the bowl until the bores (1) and (2) are horizontal.
- Connect the filling tool.

- Heat the new oil to approx. 35 – 40 °C to facilitate filling.
- Fill in oil until oil discharges at the opposite opening.

Oil quantity and oil quality are specified in the "Lubrication and maintenance schedule".

- Seal both holes. Note:
 - Renew the gaskets during each assembly. Damaged gaskets can lead to oil leakage.
 - Grease the threads of the screw plugs with WS M- paste.
- For WS M paste, see "Lubrication and maintenance schedule - chapter lubricant table".

11.7 Bowl

Check the bowl for signs of wear at regular intervals. The inspection intervals are given in the "Lubrication and maintenance schedule". Pay special attention to the following:

- The longitudinal grooves or ribs must be visible in the conical area on the inside.
- Mechanical damage, e.g.:
 - grinding marks in the area near the catchers
 - cavitation in the area of the solids discharge ports
- Wearing bushes in the solids discharge ports

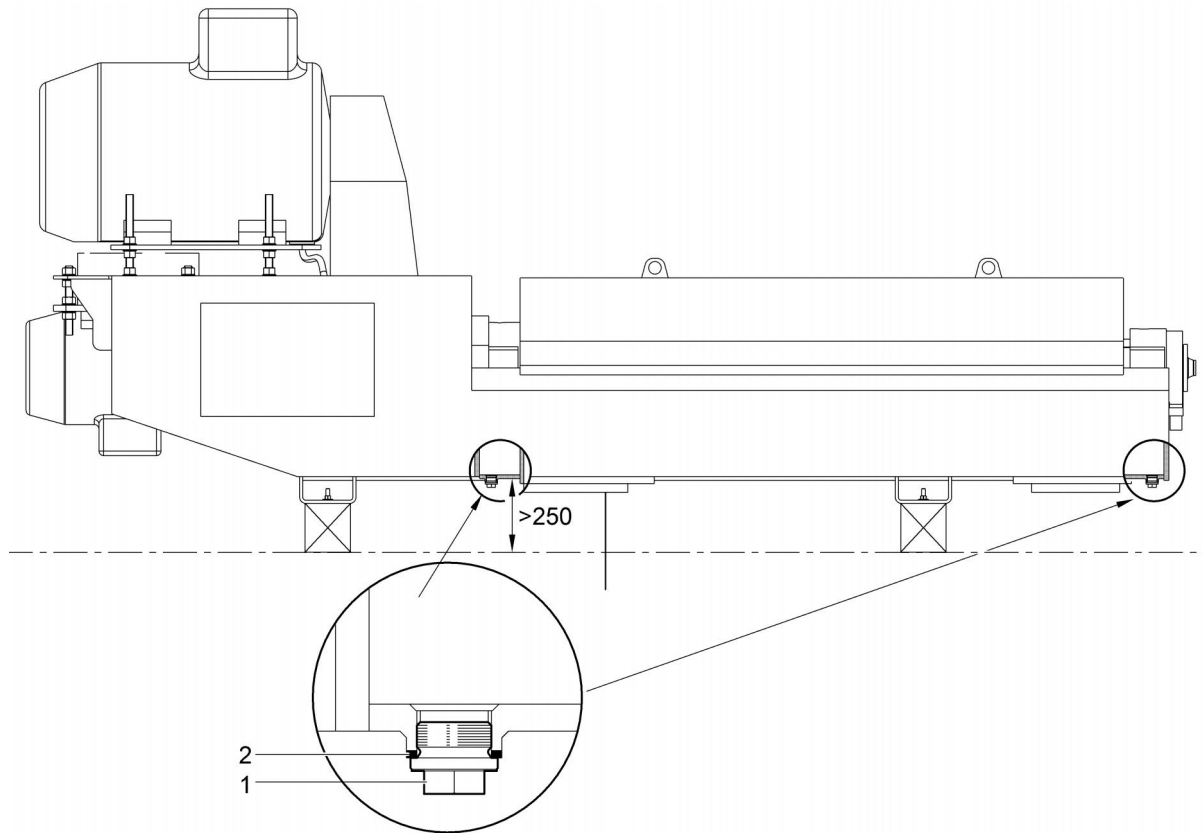
Replace damaged or worn parts immediately or inform GEA Westfalia Separator.

11.8 Bowl bearings

The bowl bearings are supplied with lubricant through an automatic oil-air lubrication system. Pay attention to the following during maintenance work:

- Separate manual on the oil-air lubrication unit.
- Keep to the "Lubrication and maintenance schedule". The "Lubrication and maintenance schedule" is part of the machine documentation.
- Used grease discharges downwards out of the bowl bearings. The grease is collected in catch chambers.
- Drain the spent oil regularly into a collecting vessel (when servicing the decanter at the latest).
- Clean the catch chambers regularly (when servicing the bearings at the latest).
- Roller bearings with special tolerances are required for all bearing points. Use only those roller bearings specified in the parts list.

11.8.1 Emptying the oil collecting chambers



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Fig. 83



CAUTION

There is a risk of injury through burning or scalding.

Hot machine parts and hot oil can cause burns.

- Carry out the oil change at operating state temperature; 40 – 55 °C are optimal. Check temperature. Do not start assembly too soon.
- Provide a suitable collecting vessel. Keep to the lubrication and maintenance schedule. More than 2 litres of waste oil can discharge depending on the adjustments of the oil-air lubrication.
- Alternatively, the two drain plugs in the frame can be removed and a hose pipe can be connected to discharge the used oil directly into a canister (hose pipe is not included in the scope of delivery of the machine). The connection thread of the sleeve in the frame has a G1" female thread.
- Unscrew screw (1). Drain the oil.
- Inspect gasket (2) for damage and replace if necessary.
- Fit screw (1) with gasket (2) again.

11.9 Tensioning the drive belt

The drive belts must be checked regularly for location and condition.

The checking and changing intervals can be found in the lubrication and maintenance schedule.

Signs of inadequate belt tension or worn belts can be:

- increased noise from flapping belts.
- Major drop in speed under load (bowl or differential speed).

When replacing and tensioning the drive belts, bear in mind the following:

- Always replace the complete sets (bowl and scroll drive). This is the only way to ensure that the belts are identical in length. Identical length is a prerequisite for even tension and quiet running.
- Use only belts specified in the parts list. This is the only way to ensure that the belts meet the stringent requirements.
- Belt tension should also be checked on decanters which are supplied ready-assembled.
- Check belt tension after 0.5 - 1 operating hours. Use measuring device 0003-0534-000 for this purpose.

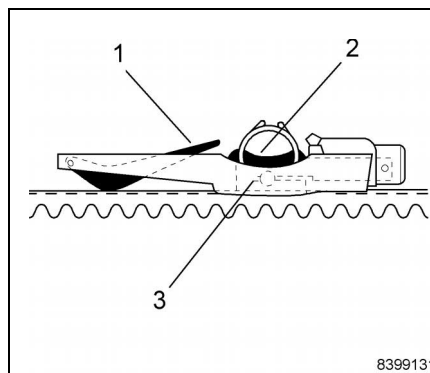


Fig. 84

The measuring device consists of:

- Display arm (1)
- Compression surface (2)
- Pressure spring (3)

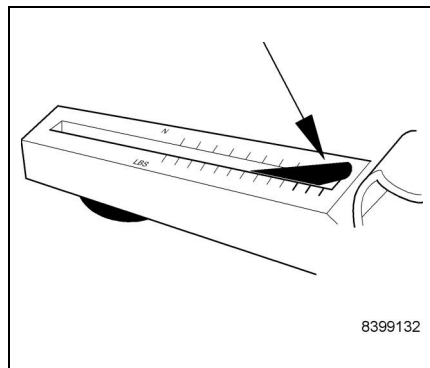


Fig. 85

- Push the display arm of the measuring device to the end of the scale.

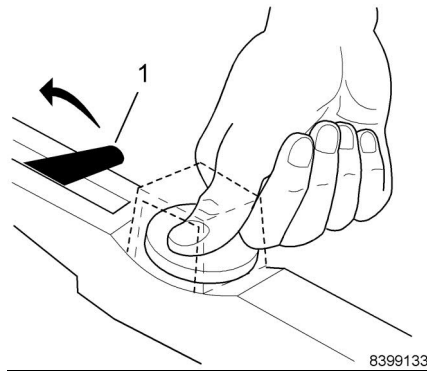


Fig. 86

- Put the measuring device centrally on one of the belts between the two belt pulleys.
- Slowly press a finger onto the compression surface. This will make the display arm move into the scale.
- As soon as a clear click is heard or felt, stop pressing.
- Carefully lift off the device without moving the display arm.

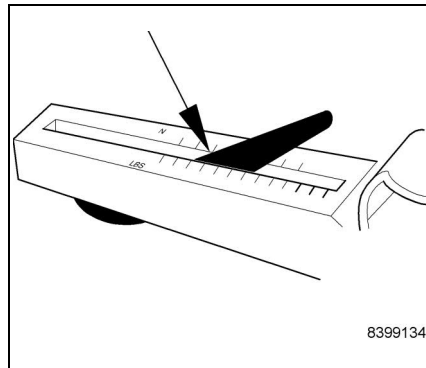


Fig. 87

- Read off the measured value at the intersection between the top edge of the display arm and the scale.
- The specified value for ideally-tensioned belts is
 - for new belts: 1000^{+100} N
 - for run-in belts: 800^{+100} N
- Depending on the measuring result, reduce or increase belt tension until it is within the desired range.

IMPORTANT:

Aligning the secondary motor - checking the gear

- After tensioning the belts, check the alignment of the back drive motor- gearbox, see chapter "installing the coupling".
- If necessary, re-align the secondary motor, see chapter "Fitting the secondary motor".
- Check the position of the speed initiators and realign if necessary, see chapter "setting and realigning speed initiators".

11.10 Gearbox

The gearbox is filled with oil. Oil quantity, oil quality and oil change intervals are specified in the "Lubrication and maintenance schedule".

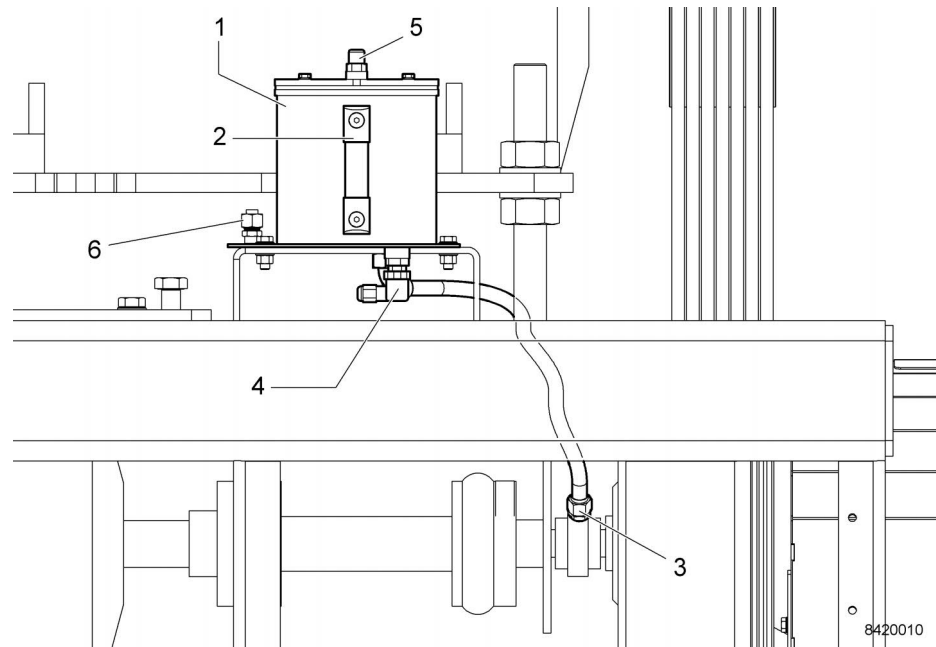


Fig. 88

- 1 Oil surge vessel
- 2 Sight glass
- 3 Rotary transmission leadthrough
- 4 Switch (switches the decanter off when oil drops below minimum)
- 5 Vent
- 6
 - Screw plug (for sealing the rotary leadthrough at (3)).
 - Fastening point for the oil line.

Switch (4) monitors the oil level in oil surge vessel (1). The decanter is shut down when the oil level falls below the minimum.

IMPORTANT:

- Before restarting the decanter, the cause of the oil loss must be eliminated.
- Check radial packing rings and O-ring seals and replace if necessary.

11.10.1 Drain the gear oil.



DANGER!

Risk of death from machine parts rotating at high speed

There is a risk of serious injury due to being pulled into the machine and through ejection of machine parts or product residues.

- Do not loosen any part of the machine before the bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional switching-on.
- Do not start maintenance work until the components have cooled down. Depending on the application and product temperature, the cooling phase can take up to 2 hours.



CAUTION!

There is a risk of injury through burning or scalding.

Hot machine parts and hot oil can cause burns.

- Carry out the oil change at operating temperature; 40 –50° is optimal.
 - Check the temperature.
 - Do not start assembly too soon.
- Provide an appropriate oil collecting receptacle.
 - Keep to the lubrication and maintenance schedule.
- Open the protective hood, see chapter “Servicing / Removing the bowl”. Dismantle guards and covers as required.

NOTE: The hood does not have to be open to drain the gear oil.

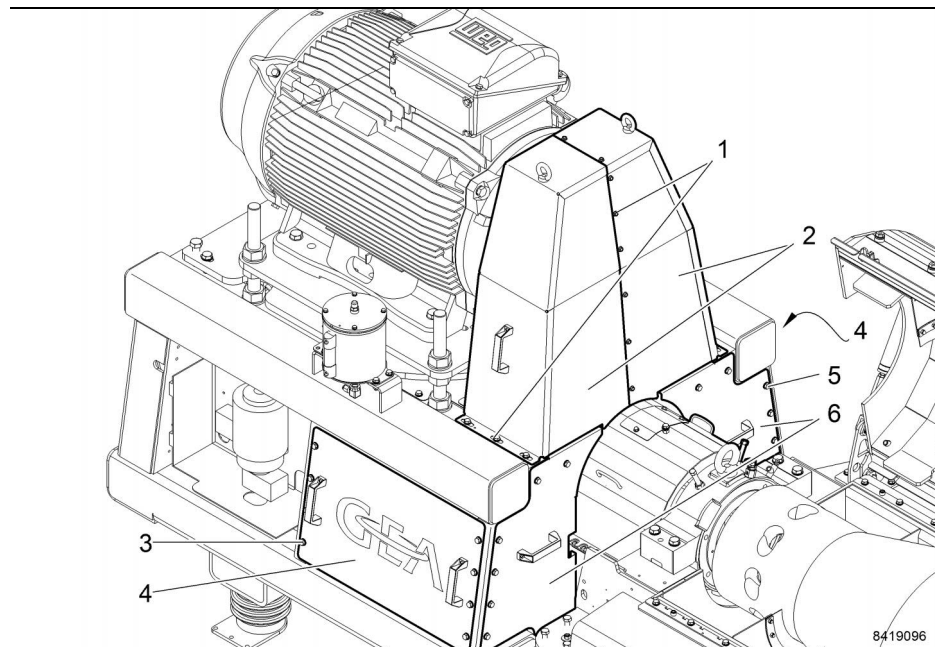


Fig. 89

- Undo the screws (1) and remove the protective hood (2).
- Undo the screws (3) and remove the large side cover (4).
- Undo the screws (5) and remove the guards (6).

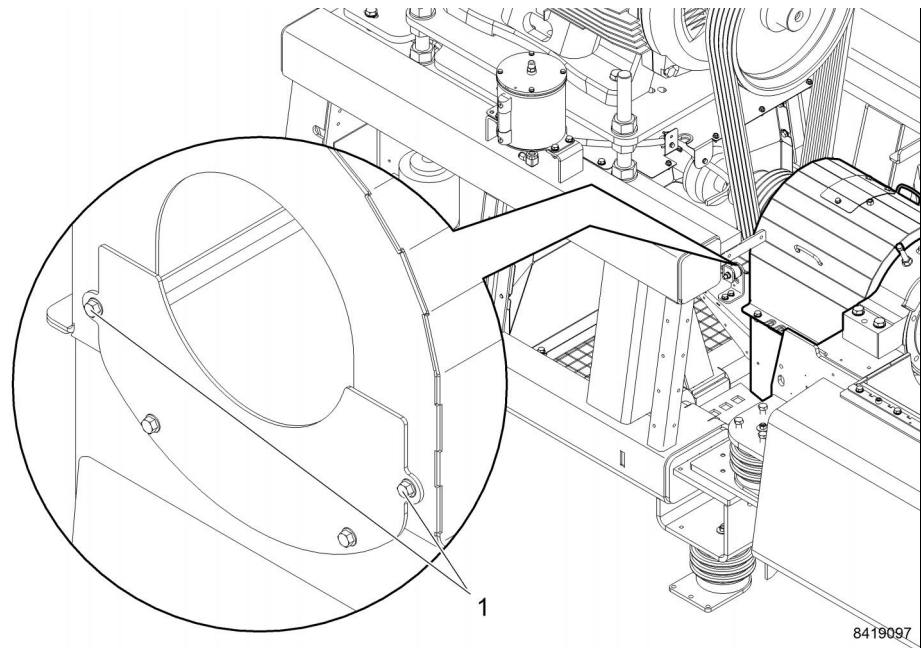


Fig. 90

➤ Undo the screws (1).

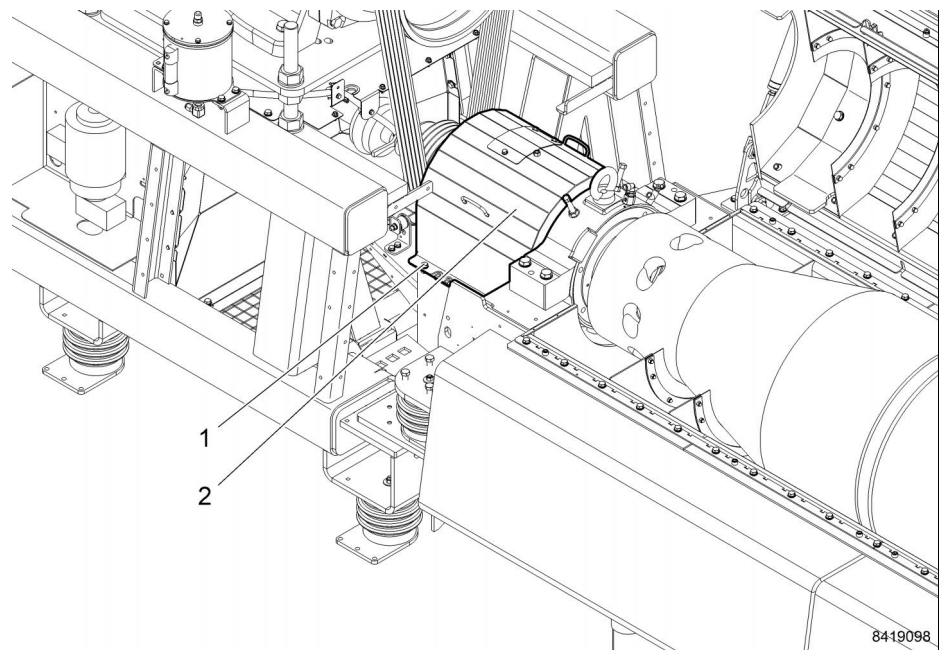


Fig. 91

➤ Undo the screws (1) and remove the top of the air vent (2).

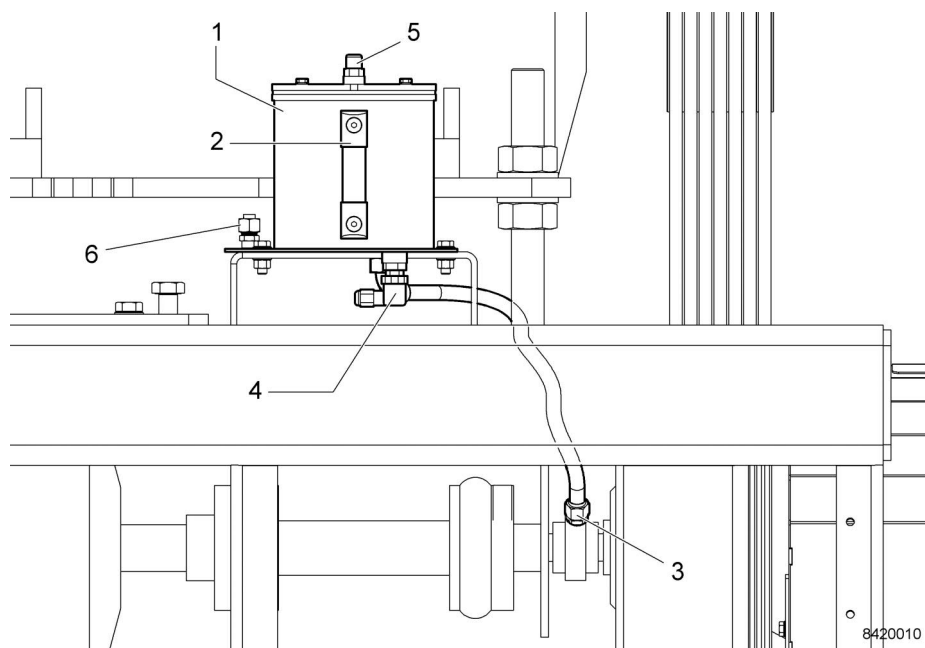


Fig. 92

- **Unscrew the oil line from the rotary leadthrough (3).**
 - Collect the oil.
 - Seal gearbox. Use the nuts (6) provided.
- If the oil in the vessel is not changed, fasten the oil line at (6).
- Remove the bowl if necessary and place it in a suitable device, see chapter "Servicing / Removing the bowl".

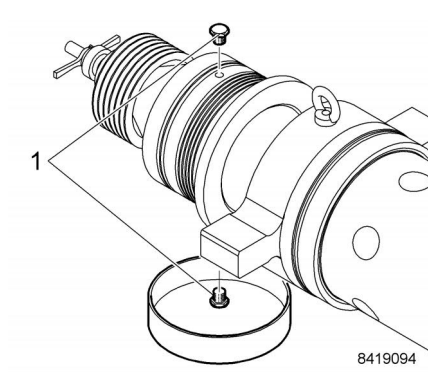


Fig. 93

- Ensure the oil discharge openings are in a vertical position

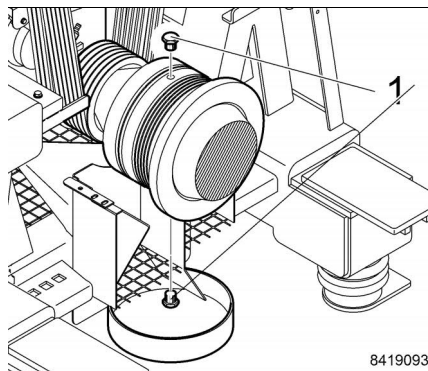


Fig. 94

- Place a suitable collecting receptacle underneath and unscrew the oil drain screws (1).
- Drain the oil from the gearbox.

11.10.2 Filling the gear oil

- If already dismantled: Fit the bowl, see chapter "Servicing / Fitting the bowl".
- Screw in the bottom oil drain screw.
 - Always use a new gasket.
 - The required torque is marked on the screw, e. g. 30 or 50 Nm.
- Fasten the oil line to the rotary leadthrough.
- Heat the new oil to approx. 35 – 40 °C to facilitate filling. The oil quality is specified in the "Lubrication and maintenance schedule".
- Fill the gearbox completely with oil.
 - Do not use a pump to speed up the filling procedure.
 - Do not use compressed air to speed up the filling procedure.
- Screw in the upper oil drain screw.
 - Always use a new gasket.
 - The required torque is marked on the screw, e. g. 30 or 50 Nm.
- Fill oil into the surge reservoir.
 - Option 1 (standard oil vessel) Fill in oil up to the middle of the surge reservoir.
 - Option 2 (integrated oil vessel) Fill in oil up to the middle of the sight glass.
 - Do not use compressed air to speed up the filling procedure.

IMPORTANT

Damage to the centrifuge

If too much oil is filled, the oil surge reservoir may overflow during operation.

- Bleed the oil line between the surge reservoir and the rotary leadthrough.
 - To do this, undo the oil line at the rotary leadthrough again and wait until oil discharges from the rotary leadthrough and the hose.
 - Then re-connect the oil line.
- Mount the guard and protective hood.

IMPORTANT:

Check that the gearbox does not leak by carrying out a test run lasting at least 30 minutes.

- Depending on how hot the oil is, the oil level visible in the tank will rise due to expansion of the lubricant. If the oil level drops noticeably at a constant temperature, it is an indication of oil loss.
 - If the oil level drops below the minimum, the warning device of the float switch is activated and the decanter is shut down.
 - After the test run the gearbox must be vented again.
- For venting the gearbox see chapter: "Maintenance / Venting the gearbox".

11.10.3 Vent gearbox (without circulation lubrication)

The gearbox must be deaerated after the test run to ensure that the gearbox is completely filled with oil.



DANGER

Life threatening danger because of quickly rotating machine parts

Danger of severe injuries caused by body parts being pulled into the machine or by the ejection of machine parts or product remnants.

- Do not remove any parts of the machine until the bowl is at a stand-still.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the unit against unintentional activation.
- Do not start maintenance work until the components have cooled down. Depending on the use and product temperature, the cooling time may last up to 2 hours.

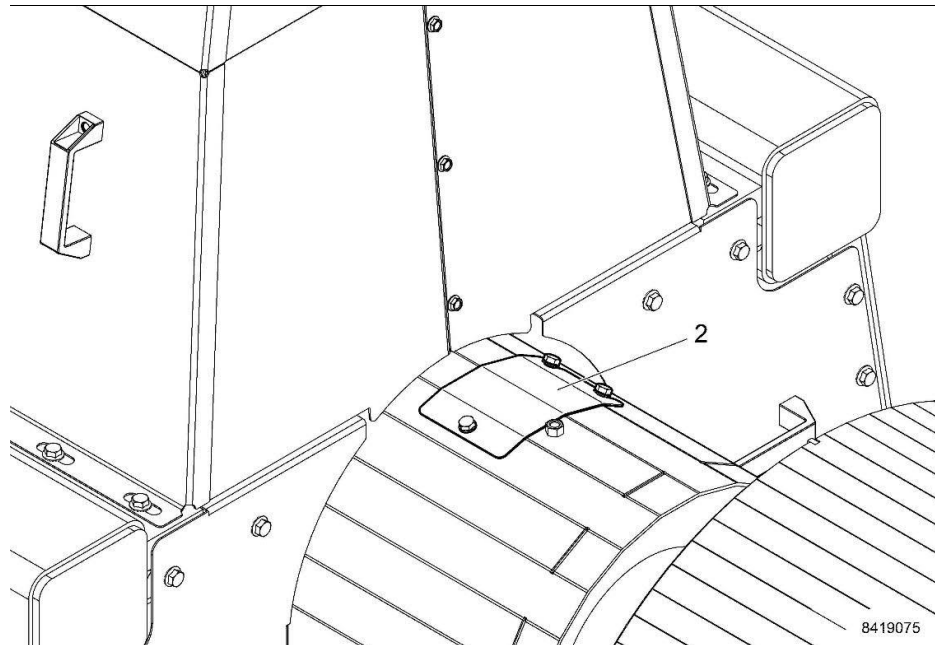


Fig. 95

Venting

- Remove cover (2).
- Rotate the gearbox so that one drain screw points upwards.
- Unscrew the oil drain screw at the top.
 - Oil then flows out of the oil surge reservoir into the gearbox.
 - **IMPORTANT:** This takes a few minutes. Wait until the oil level in the gearbox has risen to the taphole for the drain screw.
- Screw the oil drain screw back in.
 - Use a new gasket.
 - The required torque is marked on the screw, e. g. 30 or 50 Nm.
- Check the oil level in the oil surge reservoir.
 - If too much oil is filled in, the oil surge reservoir can overflow during operation.
- Mount cover (2).

11.11 Motor bearings

For lubricating the motor bearings, refer to the instructions of the motor manufacturer.

The following applies in the case of motors supplied by GEA Westfalia Separator:

- Deviations from the instruction manual of the motor manufacturer are specified on a motor rating plate.
- Lubricate preferably when the machine is running.

12 Repair

12.1	Avoiding damage during maintenance	146
12.1.1	Special tools	146
12.1.2	Standard tools.....	146
12.2	Screw torques.....	147
12.2.1	Screw torques in Newton meters (Nm)	147
12.2.2	Screw tightening torques in inch-pound (inlb)	148
12.3	Removing the bowl.....	149
12.4	Installing the bowl	156
12.5	Aligning the ring halves (option)	162
12.6	Removing the scroll.....	163
12.7	Fitting the scroll.....	165
12.8	Gearbox service.....	166
12.9	Dismantling the gear.....	166
12.10	Fitting the gearbox.....	167
12.11	Gaskets.....	168
12.11.1	Radial packing rings	168
12.12	Removing the main motor	169
12.13	Removing the secondary motor.....	170
12.14	Fitting the secondary motor	171
12.15	Fitting the main motor.....	172
12.16	Removing the coupling	174
12.17	Fitting the coupling	175
12.17.1	Fitting the coupling (type A)	175
12.17.2	Fitting the coupling (type B).....	177
12.18	Replacing belt pulleys.....	180
12.19	Replacing the motor belt pulley (taper lock bush)	182

12.1 Avoiding damage during maintenance

Safety and operating reliability of the centrifuge depend on maintenance work being carried out properly.

Maintenance work carried out incorrectly can result in damage to the centrifuge parts. This can result in personal injury and material damage when operating the centrifuge.

- Centrifuges may only be operated by persons who are qualified to carry out these tasks. These persons include, for example, trained experts from GEA Westfalia Separator and specialist personnel trained and authorised (certified) by GEA Westfalia Separator.
- Dismantled centrifuge parts must only be placed on an even, non-slip surface (e.g. a rubber mat or wooden pallet).
- Dismantled centrifuge parts must be secured by suitable means to prevent them from falling over or rolling away (e.g. with wooden wedges or squared timber).
- Never weld the bowl, hood or solids catcher.
- Do not machine the bowl, hood and solid catcher.
- Do not stand or sit on the centrifuge or attachments.
- Following maintenance and repair work on centrifuges, mount all protective devices again and check the safety equipment.

12.1.1 Special tools

The scope, type and number of the special tools are specified in the order-specific parts list. Commercially available tools are not supplied.

12.1.2 Standard tools

Commercially available standard tools are not included in the supply schedule. These include, for example, open-ended wrenches, ring spanners and screwdrivers. These must be provided by the customer.

12.2 Screw torques

The torques apply for the following conditions:

- Metric screws with coarse-pitch threads
 - Hex head screws as per DIN EN ISO 4014 / 4017
 - Hex socket screws to DIN EN ISO 4762
- Clearance holes to DIN EN 20273 (average)
- "Greased" state (total minimum coefficient of friction = 0.10)
- Torque wrench with scatter of $\pm 10\%$
- Material combinations:
 - Steel-steel
 - Stainless steel - stainless steel

IMPORTANT: Screws/bolts whose torque deviates from this table are marked with the relevant torque in the instruction manual.

12.2.1 Screw torques in Newton meters (Nm)

Strength class	8.8	10.9	12.9	A2-70 A4-70	A2-80 A4-80	Super Duplex 1.4501	Hastelloy 2.4819
Yield stress/yield strength in N/mm ²	640 660	940	1100	450 250	600	550	360
Parameter	Torque in Nm						
M 4	2.6	3.9	4.5	1.9	2.5	1.9	1.5
M 5	5.2	7.6	8.9	3.6	4.8	3.6	2.9
M 6	9.0	13.2	15.4	6.3	8.4	6.3	5.0
M 8	21.6	31.8	37.2	15.2	20.2	15.2	12.1
M 10	43.0	63.0	73.0	30.0	40.0	30.0	24.0
M 12	73.0	108.0	126.0	52.0	69.0	52.0	42.0
M 14	117.0	172.0	201.0	82.0	109.0	82.0	65.0
M 16	180.0	264.0	309.0	126.0	168.0	126.0	100.0
M 18	259.0	369.0	432.0	177.0			
M 20	363.0	517.0	605.0	248.0			
M 22	495.0	704.0	824.0	187.0			
M 24	625.0	890.0	1041.0	237.0			
M 30	1246.0	1795.0	2077.0	472.0			
M 36	2164.0	3082.0	3607.0				

Screws made of Super Duplex 1.4501 are treated like A4-70 screws while neglecting the higher yield stress.

In the case of screws larger than M 16, an individual drop in strength due to the degree of deformation of the screw raw material and the thread rolling procedure must be taken into account.

12.2.2 Screw tightening torques in inch-pound (inlb)

The following formula is used to convert the torques (M_a) from "Nm" to "inlb":

$$M_{\text{inlb}} = M_{\text{Nm}} \times 8.85$$

Example:

M_{inlb} = Wanted (screw tightening torques in "inch-pound")

M_{Nm} = 50 (screw tightening torques in "Newtonmeter")

M_{inlb} = 50 Nm x 8.85

M_{inlb} = 442.5 inlb

12.3 Removing the bowl



DANGER

Life threatening danger because of quickly rotating machine parts.

- Do not loosen any part of the machine before the decanter bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Start maintenance work 2 hours at the earliest after shutting down the decanter. Only then will all machine parts have cooled down so that there is no longer a danger of injury due to hot surfaces.
- Only use the intended hoists and load handling means.
- Use only complete tools for their intended use.

- Disconnect the feed lines.

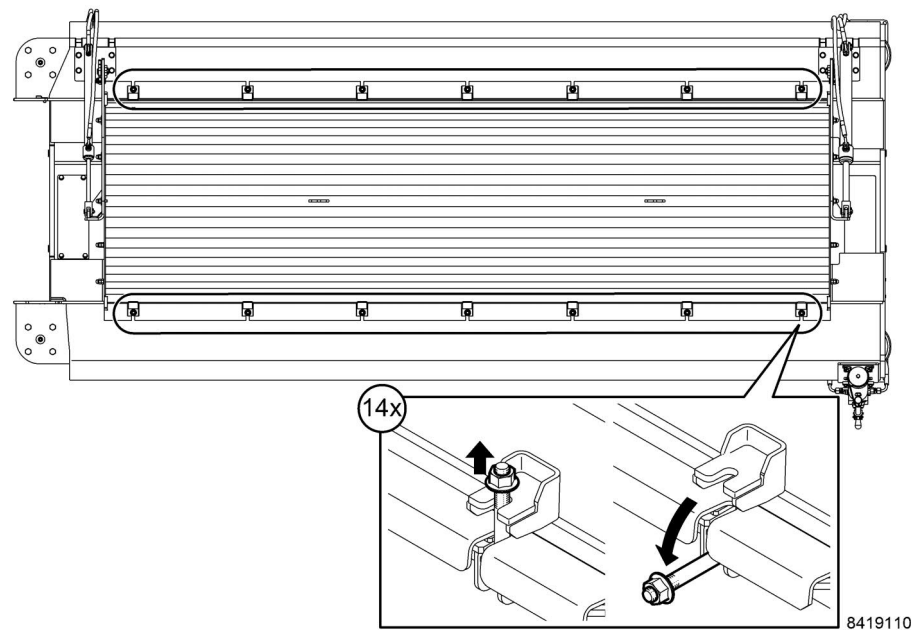


Fig. 96

- Undo the nuts.
- Pull down the bolts.

IMPORTANT: Do not completely unscrew the nuts, they should remain on the thread.

▼ Begin option

Option hinged cover

If hydraulic application is installed

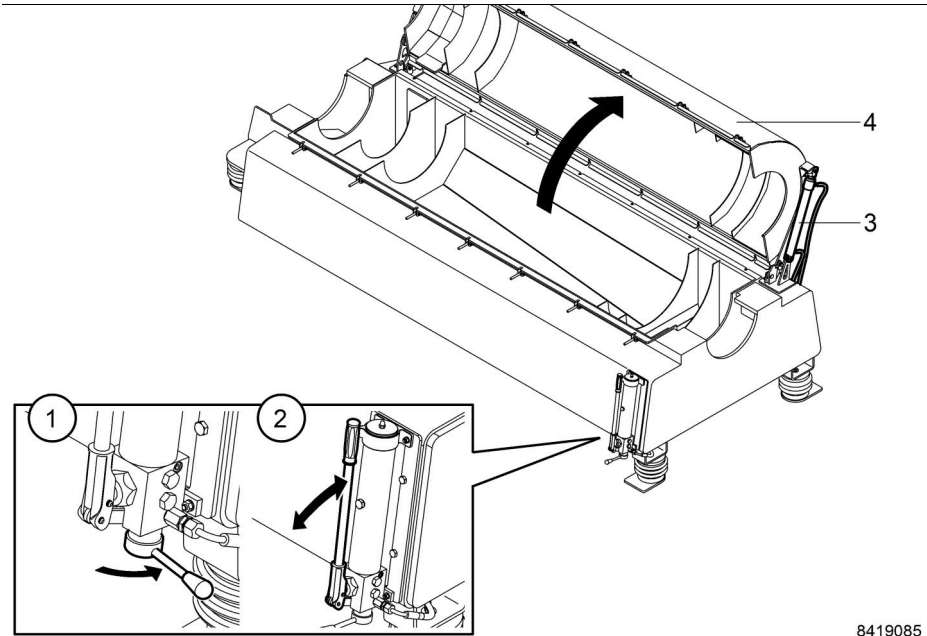


Fig. 97

- Place the lever (1) in the position as shown.
- The cylinder (3) is activated and the hood (4) is raised by pumping the handle (2).

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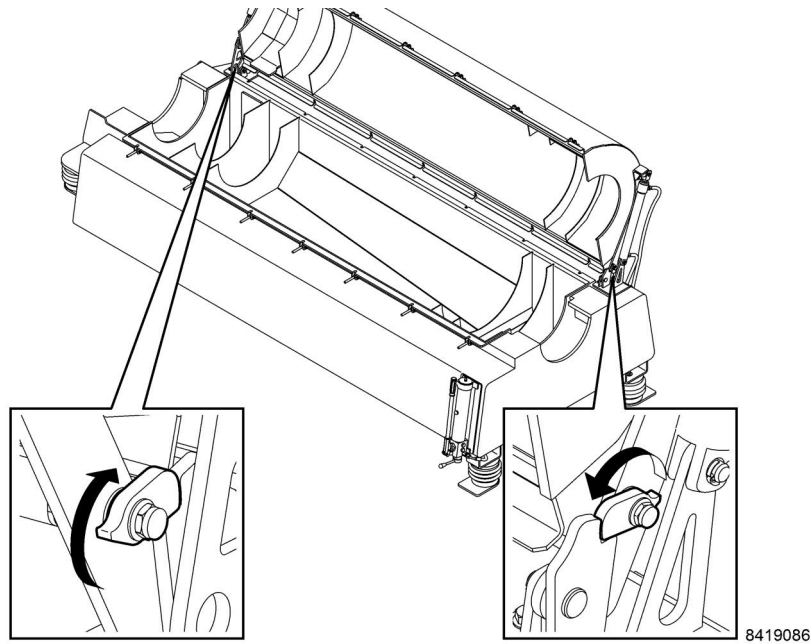


Fig. 98

- Continue pumping until the safety latch engages.

IMPORTANT: Check that the latches on both sides are engaged as shown. If necessary, adjust manually. This prevents the hood accidentally slamming shut.

▲ End option

Without installed hydraulic application



WARNING

Risk of injury from falling components

If a hydraulic application is not fitted or connected, there is a risk of serious injury from the hood accidentally falling shut.

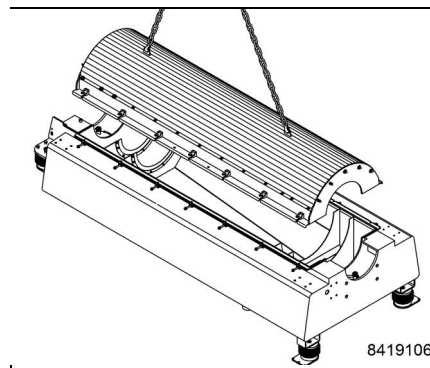


Fig. 99

- Remove the hood with a hoist.
- Only attach the lifting gear to the lugs provided

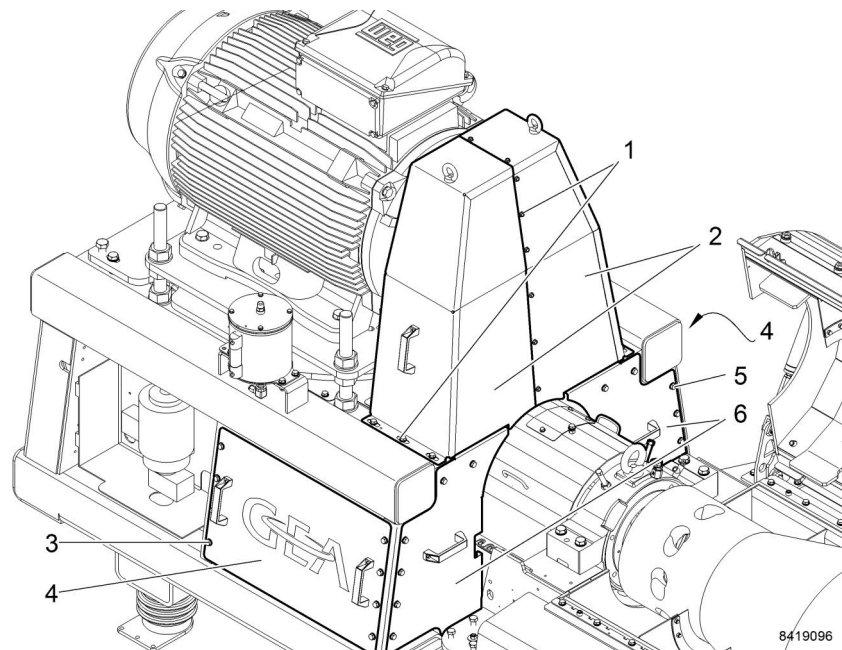


Fig. 100

- Undo the screws (1) and remove the protective hood (2).
- Undo the screws (3) and remove the large side cover (4).
- Undo the screws (5) and remove the guards (6).

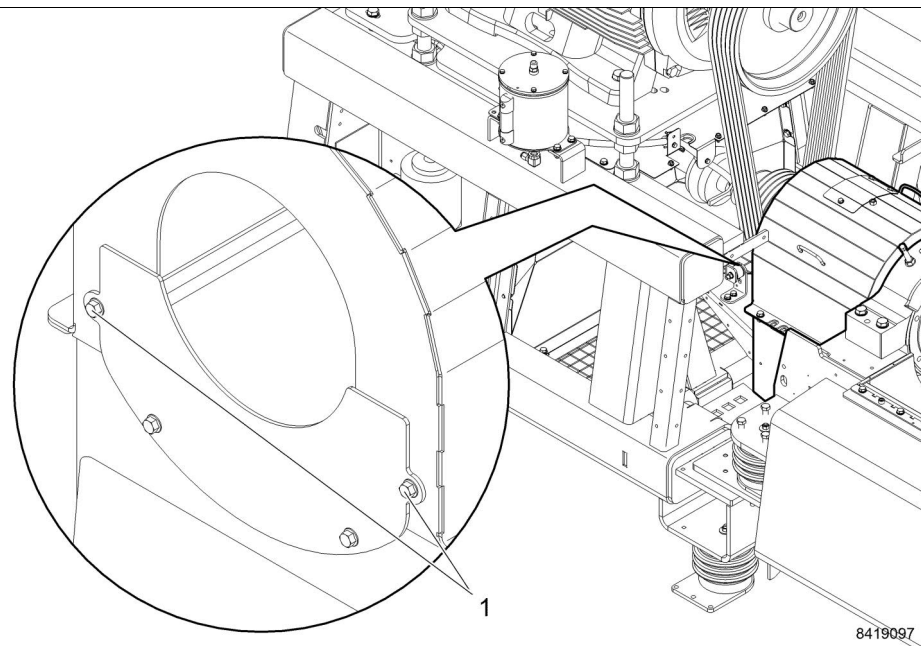


Fig. 101

- Unscrew the screws (1).

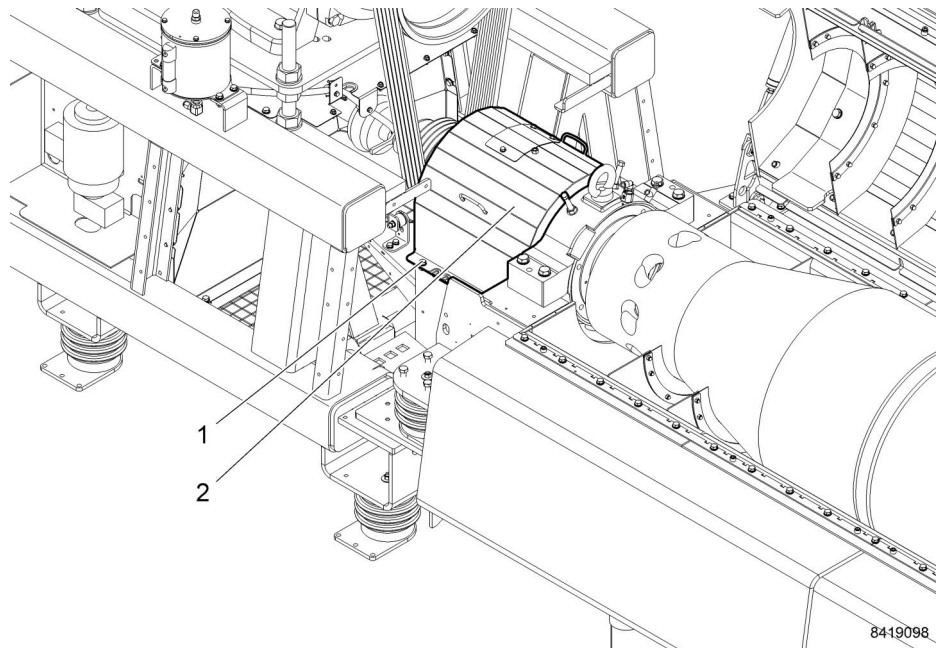


Fig. 102

- Undo the screws (1) and remove the top of the air vent (2).

Not fitted on every version.

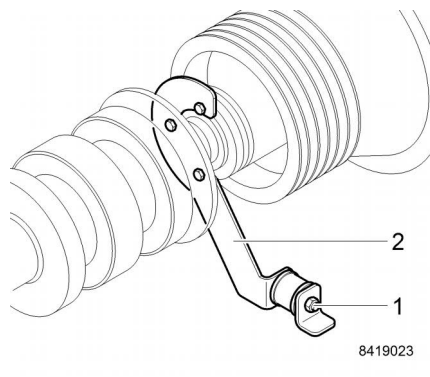


Fig. 103

- Loosen the torque arm (2); to do this, unscrew screw (1).

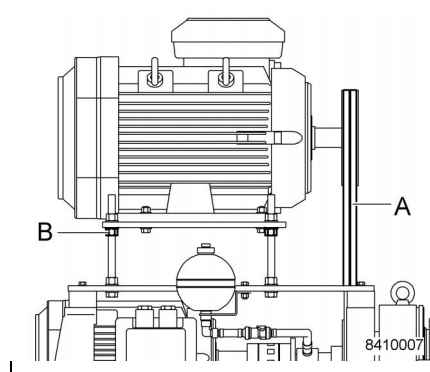


Fig. 104

- Remove the coupling, see chapter "Servicing/Removing the coupling".
- Slacken drive belt (A).
 - To do this, lower the motor by evenly adjusting nuts (B).
- Remove the drive belt.

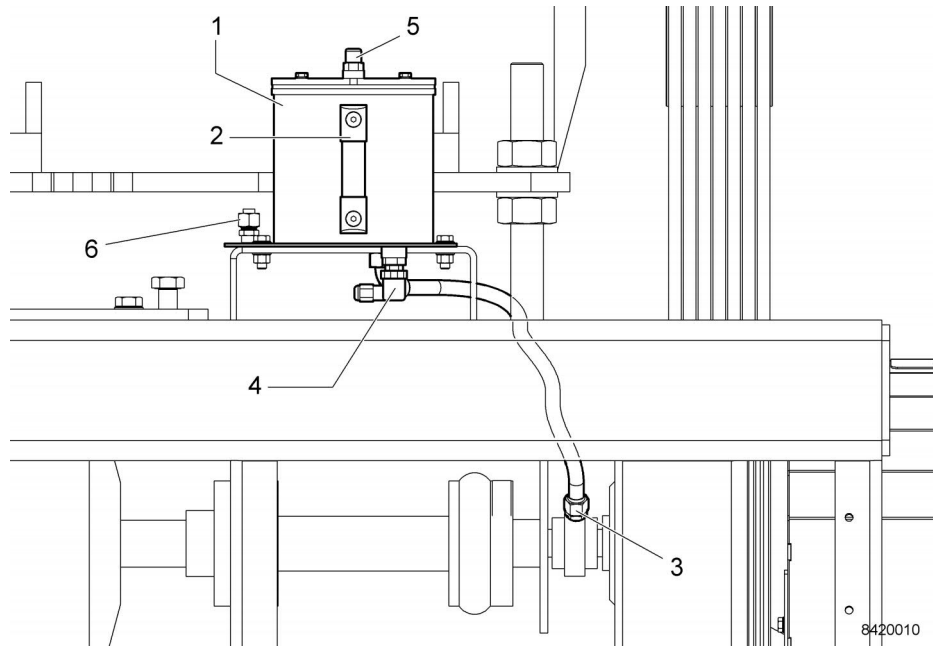


Fig. 105

- Unscrew the oil line from the rotary leadthrough (3).
 - Collect the oil.
 - Seal gearbox. Use the screw (6) provided.
- If the oil in the vessel is not changed, fasten the oil line at (6).
- Take out the bearing temperature feelers.
- Disconnect oil + air lubrication and pull the connector off the pressure switch.
- Remove the vibration pickup.
- Remove the hood flushing.

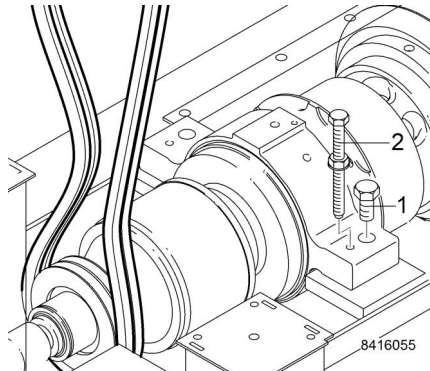


Fig. 106

- Remove the speed sensors with holder.
- Undo the fastening screws (1) on both bearing housings.
- Force off the bearing housing with the aid of screws (2).

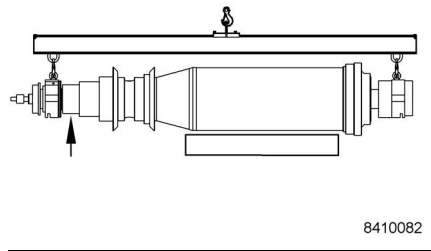


Fig. 107

- Carefully take the bowl out of the frame and place it on a suitable surface.

IMPORTANT: If the gear is exposed to large temperature fluctuations, the gaskets can get destroyed.

As the gear is completely filled with oil, overpressure may occur in the gear.

- **Countermeasure:** Fill the oil and add preservative oil, see also notes on long-term storage in the chapter "Long-term storage".

12.4 Installing the bowl

- Clean all parts carefully. Replace worn or damaged parts immediately.
- Lightly oil contact surfaces.
- To ensure perfect running of the bowl, all plane surfaces and centering rims must be smooth and clean.

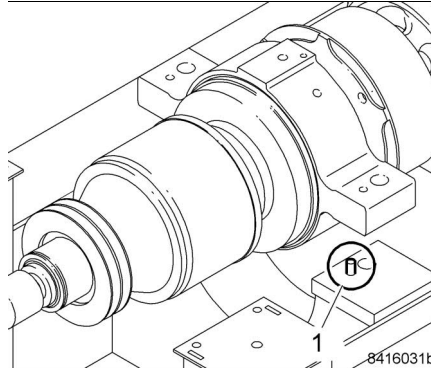


Fig. 108

- Place the complete bowl on the frame. Make sure that the arresting pins 1 are correctly registered in the two bearing housings.
- Mount the drive belt.

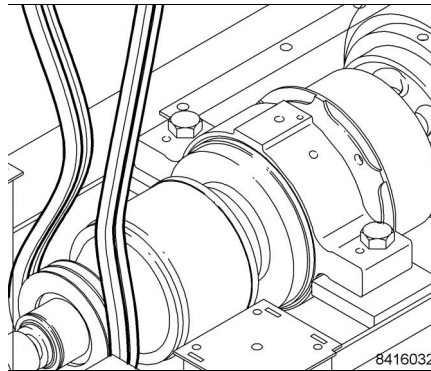


Fig. 109

- Secure both bearing housings.
- Fit and adjust the speed sensors, see section "Fitting the speed sensors".

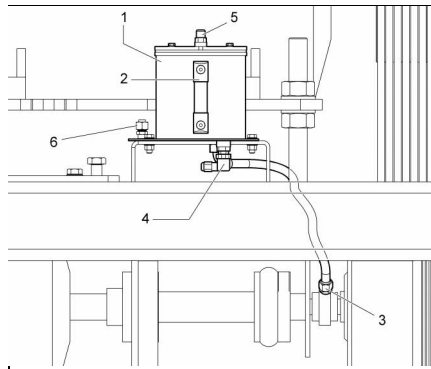


Fig. 110

- Unscrew the M16x1.5 plug from the rotary leadthrough (3).
- Connect the oil line to the rotary leadthrough (3).

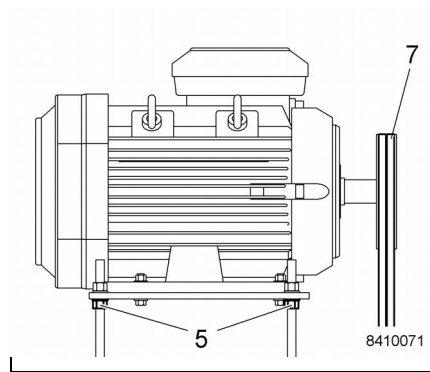


Fig. 111

- Mount drive belt (7).
- Tension the drive belt; to do this, adjust nuts (5) uniformly.
 - Check the belt tension, see section "Tensioning the drive belt".
- To install coupling, see chapter "Maintenance / Installing coupling"

Not installed on every version

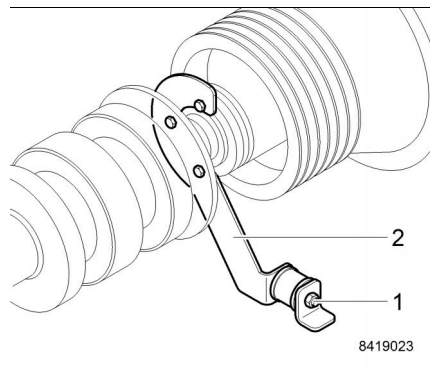


Fig. 112

- Fit torque arm (2).

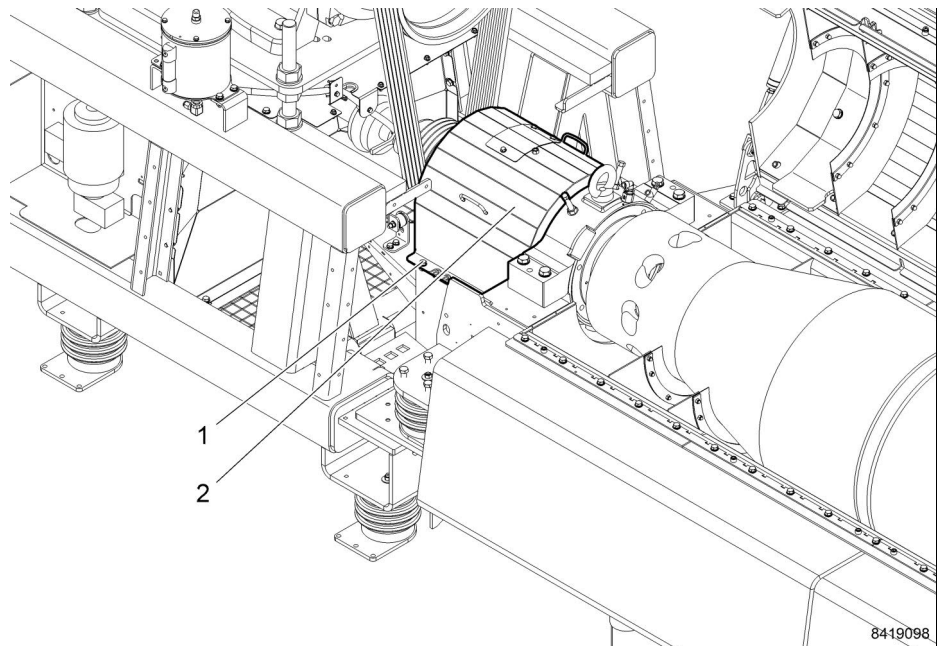


Fig. 113

- Fit the upper parts of the air vent (2) and tighten the screws (1).

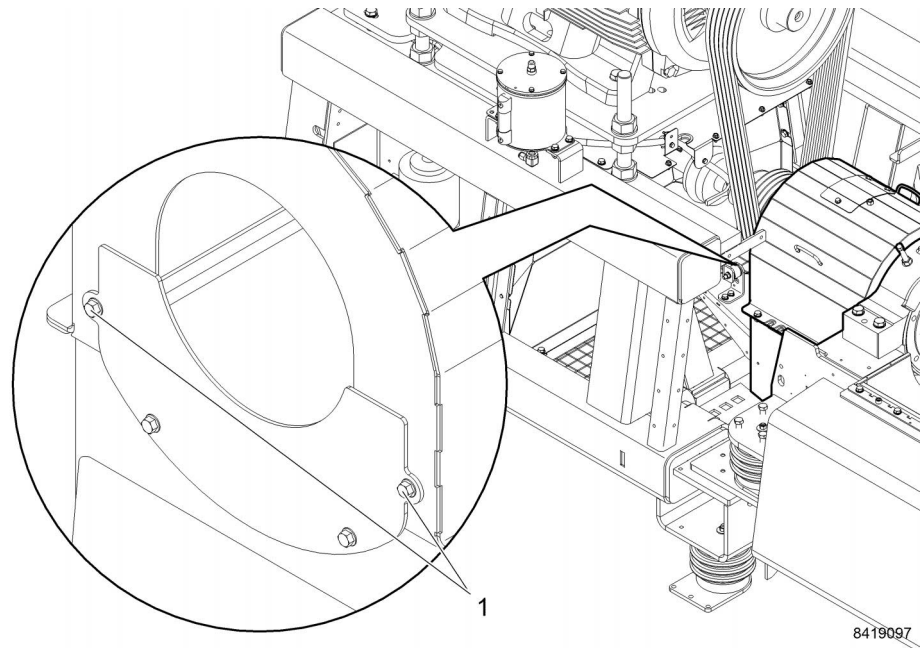


Fig. 114

- Tighten screws (1).

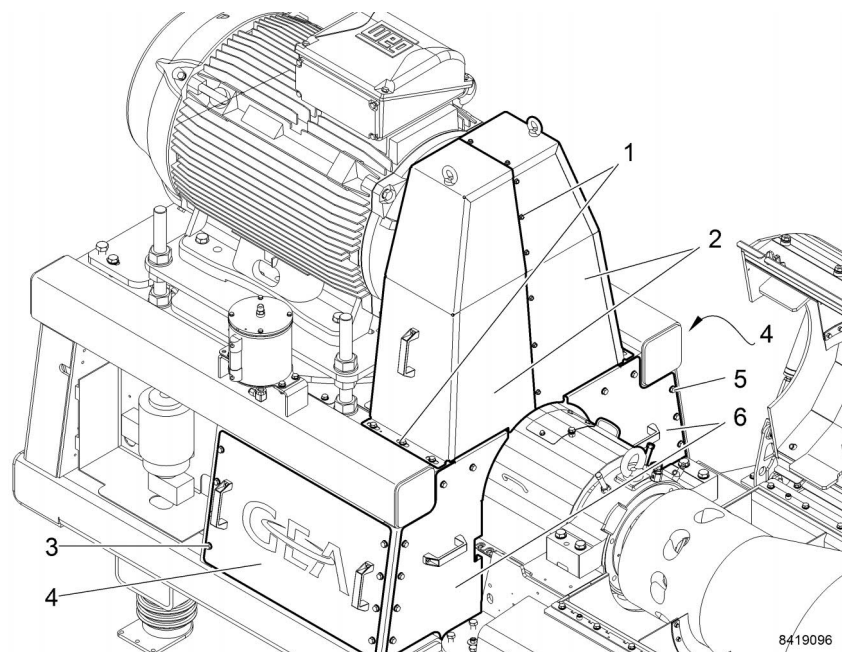
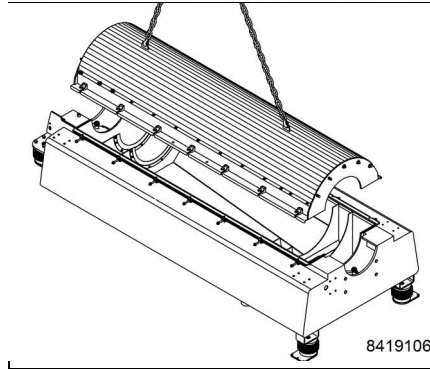


Fig. 115

- Fit the guards (6) and tighten the screws (5).
- Fit the large side cover (4) and tighten the screws (3).
- Attach the protective hoods (2) and tighten screws (1).

Without installed hydraulic application**WARNING****Risk of injury from falling components**

If a hydraulic application is not fitted or connected, there is a risk of serious injury from the hood accidentally falling shut.



- Attach the hood with a hoist.
- Only attach the lifting gear to the lugs provided

Fig. 116

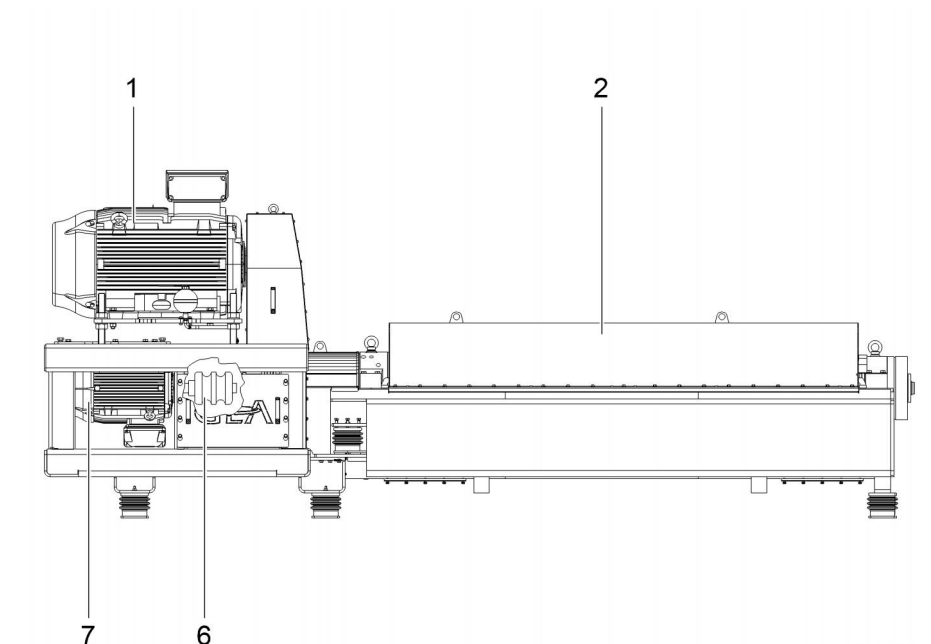
**Begin option****Option hinged cover****If hydraulic application is installed**

Fig. 117

- Undo the safety latches on both sides by turning in the direction of the arrow.

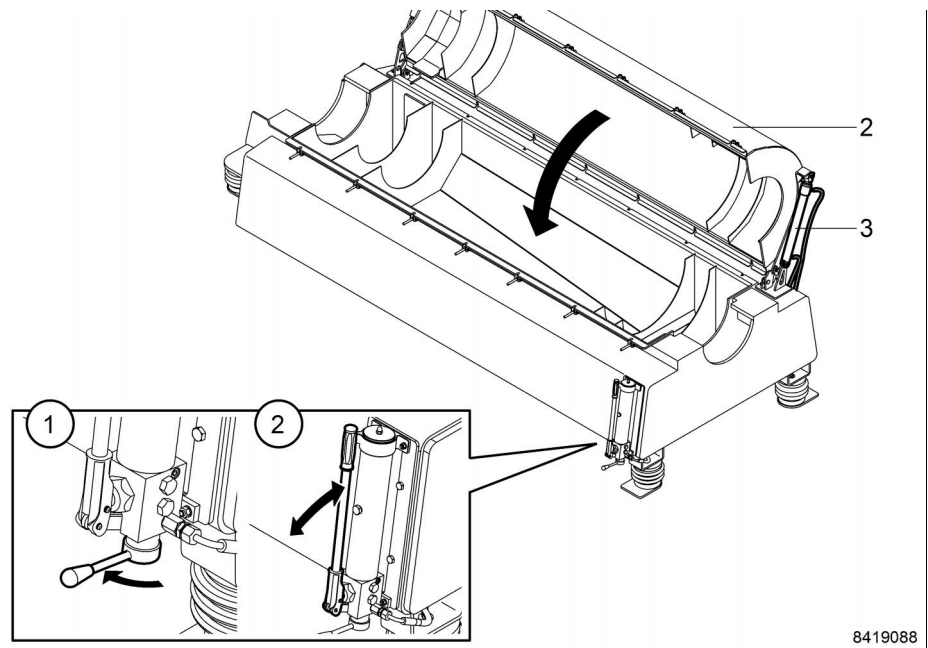


Fig. 118

- Place the lever (1) in the position as shown.
- The cylinder (3) is activated and the hood (4) is closed by pumping the handle (2).

▲ End option

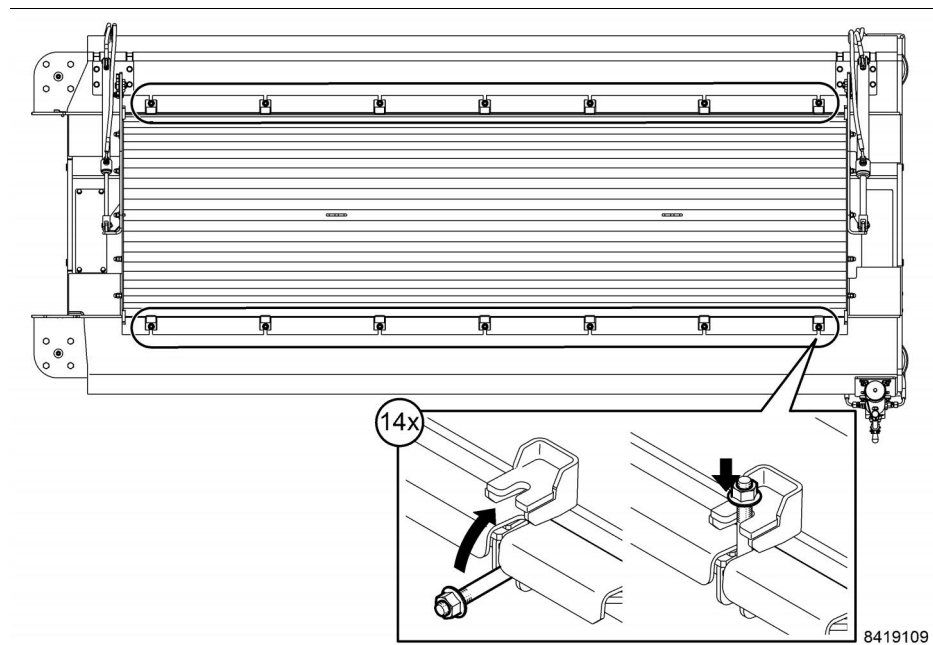


Fig. 119

- Pull down the bolts
- Tighten the nuts.
- Fasten the hood flushing.
- Mount the vibration pickup.
- Fasten the oil + air lubrication.
- Fit the bearing temperature feelers.

12.5 Aligning the ring halves (option)

Only on version with one-piece catcher.

The ring halves consist of plastic. The seat and condition must be checked regularly.

The ring halves can run in a little. Adjust the clearances rather too small than too large.

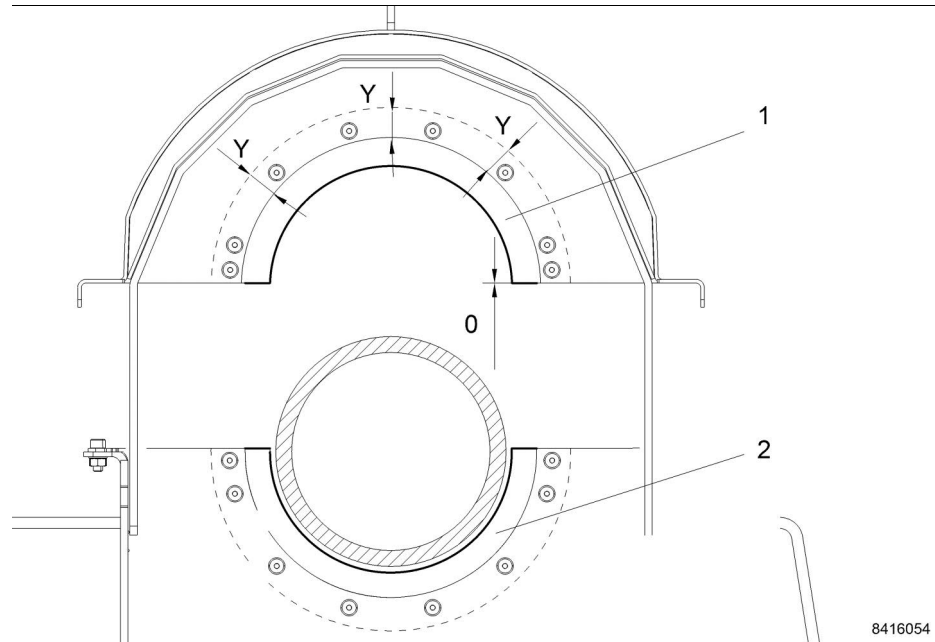


Fig. 120

- Slide the lower ring halves (2) to the bowl shell until the cams touch the bowl.
- Align the upper ring halves (1) with the wall of the catcher upper part.
 - Align dimension (Y) uniformly.
 - Tighten the screws loosely.
 - The ring halves can still be moved under pressure.
- Mount the hood and fasten to the housing with four screws.
- Check to see if the bowl can be turned by hand. If the bowl can be rotated by hand:
 - Remove the hood.
 - Move ring halves (1) slightly further outwards.
- As soon as the optimum fitting position has been found, raise the hood and tighten all screws firmly.
- Check again to see if the bowl can be turned by hand.
 - If the ring halves have too strong contact with the bowl, increased vibrations may occur during operation.
 - Re-align the ring halves if necessary.

12.6 Removing the scroll



DANGER

Danger to life through high-speed rotating machine parts !

There is a risk of serious injury due to being pulled into the machine and through ejection of machine parts or product residues.

- Do not loosen any part of the machine before the bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional switching-on.
- Do not start maintenance work until the components have cooled down to room temperature. Depending on the application and product temperature, the cooling phase can take up to 2 hours.

IMPORTANT:

- Use only suitable hoists and load suspension devices.
- Always use complete tools and use them only for the intended application, see separate spare parts catalog "Set of tools".

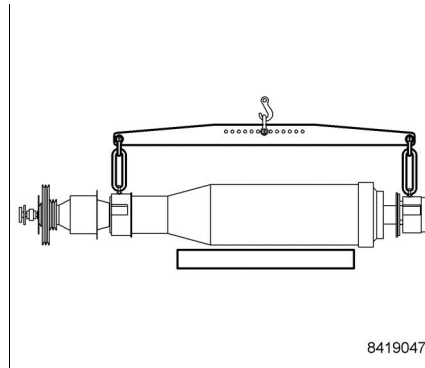


Fig. 121

- Remove the bowl, see chapter "Servicing / Removing the bowl".
- Set the bowl down and support it so that the bowl is stable with and without scroll.

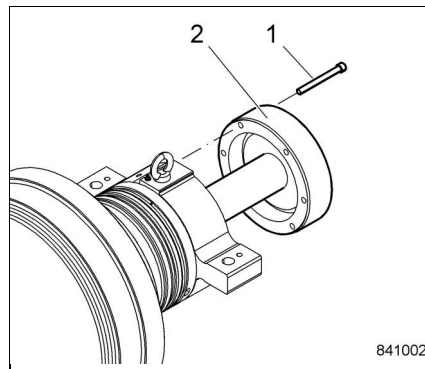


Fig. 122

- Unscrew screws (1).
- Force off and dismantle feed tube (2).

**WARNING****Danger of tipping when pulling the scroll out of the bowl**

When pulling the scroll out of the bowl, there is a danger that the scroll will topple over in the hoist.

- If the scroll cannot be pulled horizontally out of the bowl, alter load fastening point (C).
- **Remove** solids sticking to the scroll flights immediately when pulling out the scroll. **The hoist could otherwise be overloaded.**

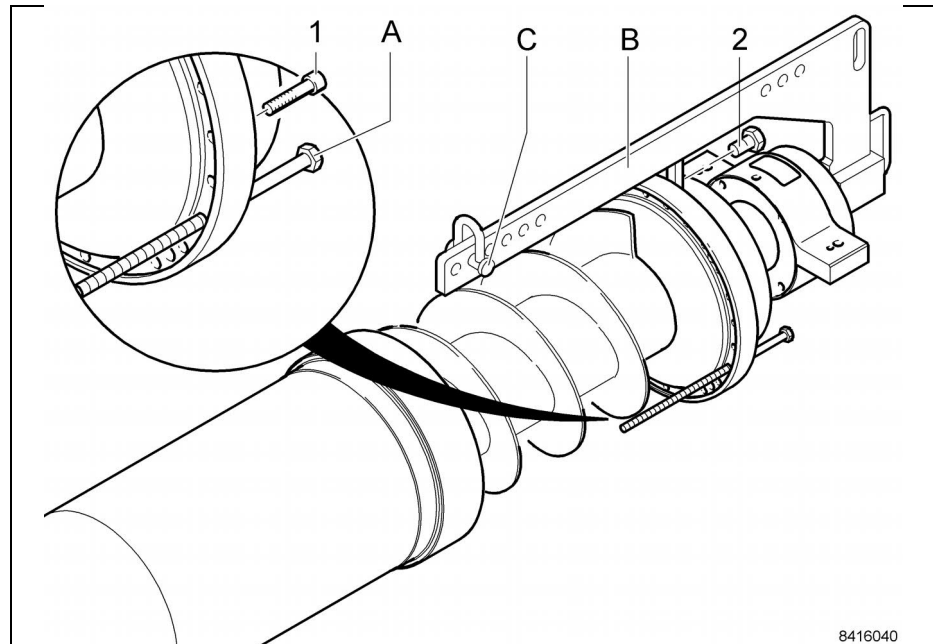


Fig. 123

- Mount hoist (B) and fasten to the bearing hub with screw (2). Tighten screw hand-tight.
- Unscrew screws (1).

NOTICE

Incorrect forcing off will damage the tool or other components.

Uneven forcing off can lead to a situation where individual puller screws are inadmissibly elongated due to overload or dismantling of the scroll is not possible.

- **Evenly force off scroll and bearing hub with 4 screws (A)** and carefully withdraw it from the bowl shell.
- Place the scroll on a suitable surface.
- Support the scroll and secure it from rolling away.
- Seal the tapholes in the bowl shell with screws. The balancing weights in the bowl could otherwise fall out.

12.7 Fitting the scroll

- Clean all parts carefully. Replace worn or damaged parts immediately.
- To ensure perfect running of the bowl, all plane surfaces and centering rims must be smooth and clean.
- Solid residuals in the bowl, flush liquid etc. may under no circumstances be allowed to get into the tothing (B) of the gear shaft.
- Grease drive shaft (A) and tothing (B) to avoid fretting corrosion.
 - Use WS M paste 104 (WS Part-No. 0015-0104-080).

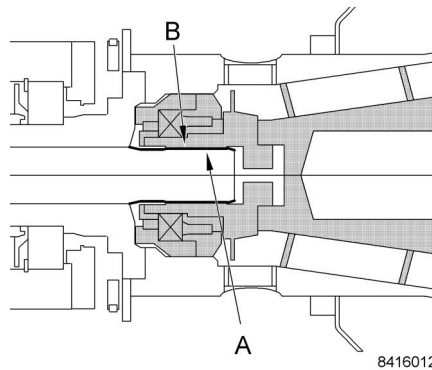


Fig. 124

- Introduce the scroll into the bowl and use slight pressure to slide the scroll in front of the drive shaft (A).
 - Pay attention to correct positioning of the tothing.
- Correct positioning of the tothing can be attained by rotating the scroll or gear input shaft so that the drive shaft (A) slides into the spline profile (B) of the gear.

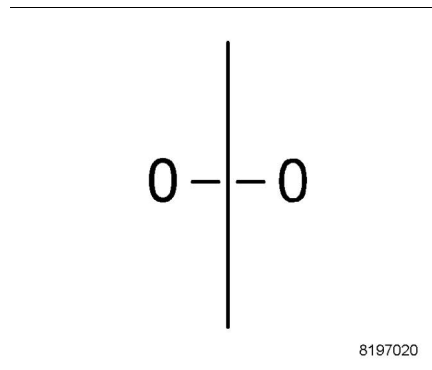


Fig. 125

- Align the "O" marks on the bowl shell and perforated disk by turning the perforated disk.

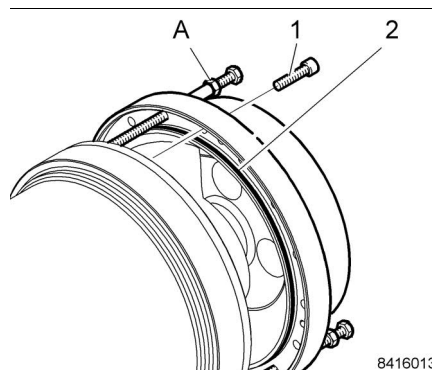


Fig. 126

- Check the position of gasket (2) in the perforated disk.
- Screw 4 hex head screws with distance tubes and nuts (A) into the bowl.
 - By turning nuts (A), force the scroll all the way into the bowl until the bearing hub is seated in the centering of the bowl shell.
- Tighten screws (1) evenly and cross-wise.

➤ Fit the feed tube.

➤ Fit the bowl, see chapter "Servicing / Fitting the bowl".

12.8 Gearbox service

- The gearboxes are maintained at the manufacturer's plant.
- Replacement gearboxes are supplied without an oil filling.

12.9 Dismantling the gear



DANGER

Danger to life through high-speed rotating machine parts !

There is a risk of serious injury due to being pulled into the machine and through ejection of machine parts or product residues.

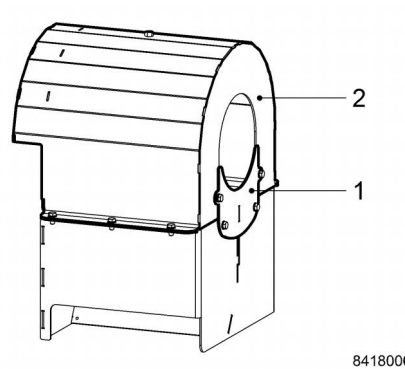
- Do not loosen any part of the machine before the bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional switching-on.
- Do not start maintenance work until the components have cooled down to room temperature. Depending on the application and product temperature, the cooling phase can take up to 2 hours.

IMPORTANT:

- Use only suitable hoists and load suspension devices.
- Always use complete tools and use them only for the intended application, see separate spare parts catalog "Set of tools".

Option:

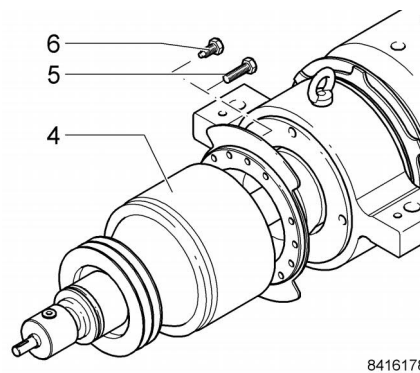
Only on version with gear cooling:



- Remove cover plate (1).
- Remove upper part of air duct (2).

Fig. 127

- Remove the coupling and torque arm / exchangeable pulley, see chapter "Servicing / Removing the bowl".



- **Undo hex head screws (5).**
- Force gear (4) off the gear hub with screws (6).

Fig. 128

12.10 Fitting the gearbox

- Clean all parts carefully. Replace worn or damaged parts immediately. Pay special attention to the condition of the gaskets.
- Use only complete tools for their intended use.
- Fill the gear with oil, see chapter "Filling in gear oil".

12.11 Gaskets

During all maintenance on the decanter:

- Use only gaskets that are in perfect condition!
- Replace worn or damaged gaskets immediately.
- Use only those sealing elements specified in the order-specific parts list.
- Use only genuine spare parts from GEA Westfalia Separator.

12.11.1 Radial packing rings

When fitting radial packing rings, pay attention to the following:

- Unsuitable radial packing rings cause damage to bearings.
- The radial packing rings for the scroll bearing assembly must be glued in.
 - Remove the grease from the seat for the radial packing ring using a suitable fluid.
 - Apply Loctite adhesive type 245 to the entire circumference of the shaft sealing ring.
- Do not use prohibited lubricants such as mounting paste or grease. These lubricants result in the formation of oil carbon which damages the radial packing rings within a very short space of time!

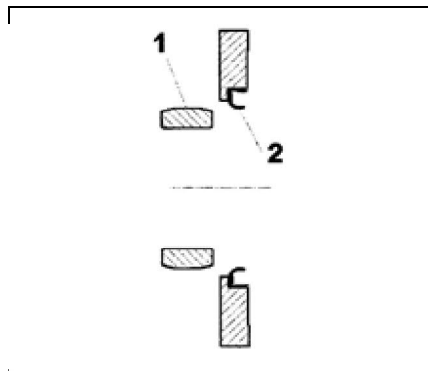


Fig. 129

- Apply a thin coat of lubricant only to the bearing surfaces (1) prior to assembly.
- Use the lubricant sparingly.
- Be sure to use the same lubricant that is used for roller bearing lubrication.
- Do not apply lubricant to the sealing lips of the radial packing rings.

12.12 Removing the main motor



DANGER

Danger to life through high-speed rotating machine parts !

- Do not loosen any part of the machine before the decanter bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional switching-on.
- Do not start maintenance work until the components have cooled down to room temperature. Depending on the application and product temperature, the cooling phase can take up to 2 hours.
- Use only complete tools for their intended use.

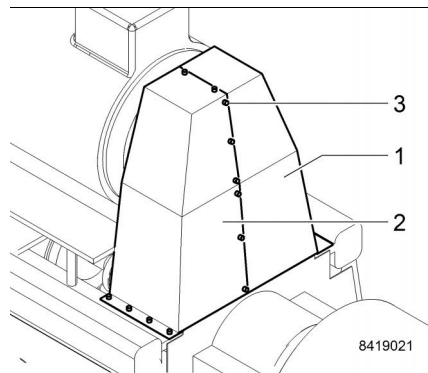


Fig. 130

- Unscrew screws 3.
- Remove guards 1 and 2.

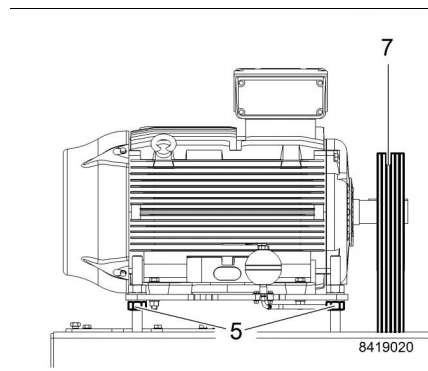


Fig. 131

- Lower the motor by evenly turning nuts 5.
- Remove drive belt 7.
- Unscrew the nuts.
- Remove the motor and motor bracket 8. Use eye bolts.
- Place the motor on a suitable base.

12.13 Removing the secondary motor



DANGER

Risk of death from machine parts rotating at high-speed

- Do not loosen any part of the machine before the decanter bowl has come to a standstill.
- Wait for the run-down time to elapse, approx. 30 minutes.
- Secure the machine against unintentional switching-on.
- Do not start maintenance work until the components have cooled down to room temperature. Depending on the application and product temperature, the cooling phase can take up to 2 hours.
- Remove the main motor, see chapter "Servicing/Removing the main motor".
- Remove the coupling, see chapter "Servicing / Removing the coupling".

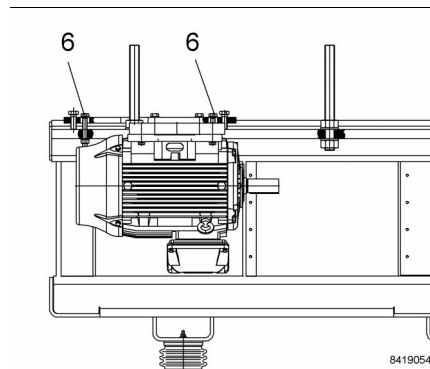


Fig. 132

- Unscrew screws 6.

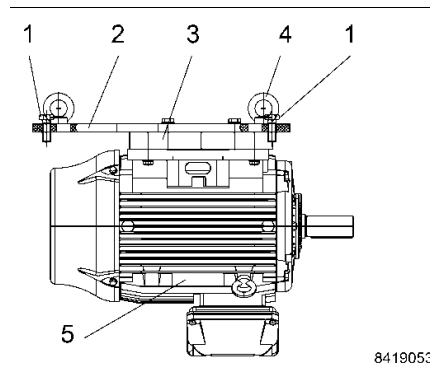


Fig. 133

- Fit eye bolts 4 (M24) to the motor bracket.
- Raise secondary motor (5) slightly and pull it out to the fan side.
- Place the secondary motor on a suitable surface.

12.14 Fitting the secondary motor

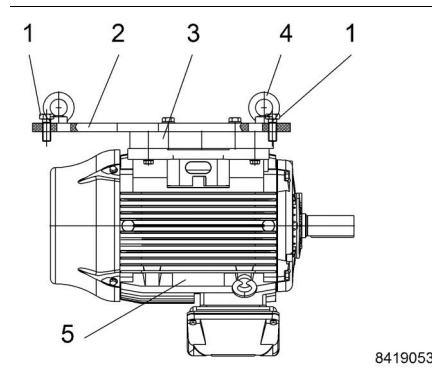


Fig. 134

- Place the secondary motor 5 on a suitable surface.
- Bolt motor bracket 2 to the spacers 3.
- Bolt the secondary motor to the spacers 3.
- Screw screws 1 loosely into the motor bracket. The screws serve later to align the motor.
- Fit eye bolts 4 (M24) to the motor bracket.

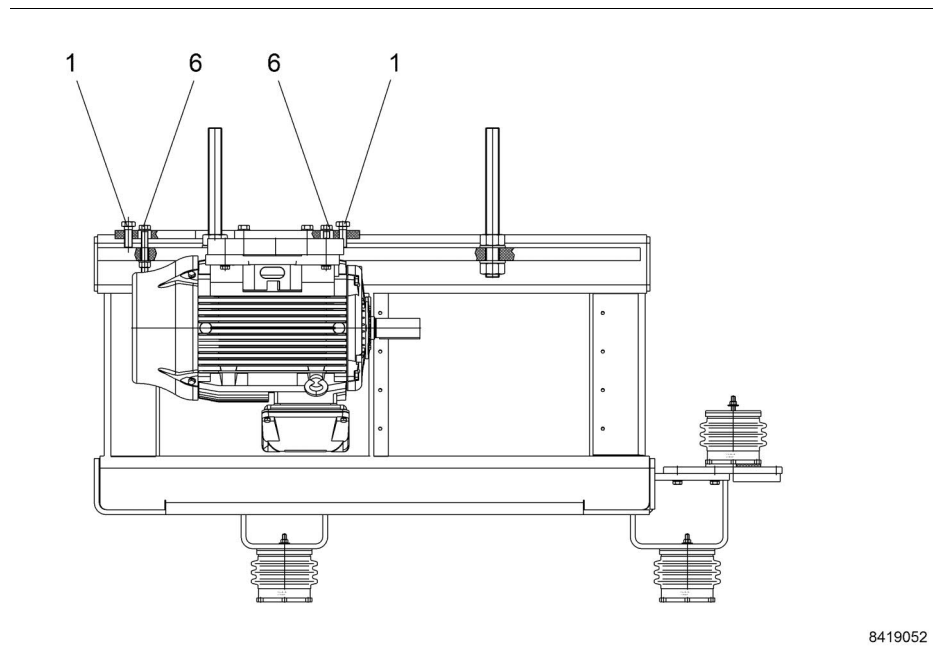
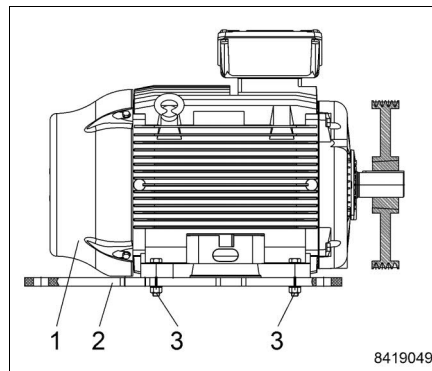


Fig. 135

- Hang the pre-assembled unit into a hoist and position in the drive frame.
- Fasten the secondary motor loosely in the drive frame with fastening screws 6. The motor must be aligned later.
- Remove the eye bolts.
- Fit the main motor, see chapter "Fitting the main motor".
- Tension the drive belt, see chapter "Re-tensioning drive belt".
- Fit and align the coupling, see chapter "Fitting the coupling". Align the secondary motor at the same time:
 - The height is altered with the aid of screws 1.
 - Fastening screws 6 allow lateral adjustment via slots.

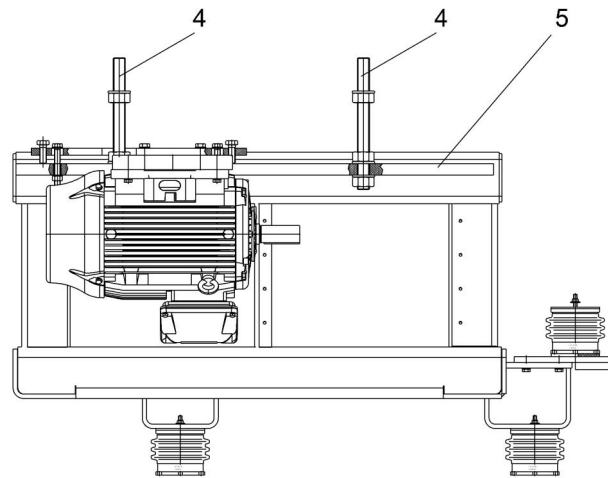
12.15 Fitting the main motor



- Fasten the motor 1 on the motor bracket with the aid of the screws 3.

8419049

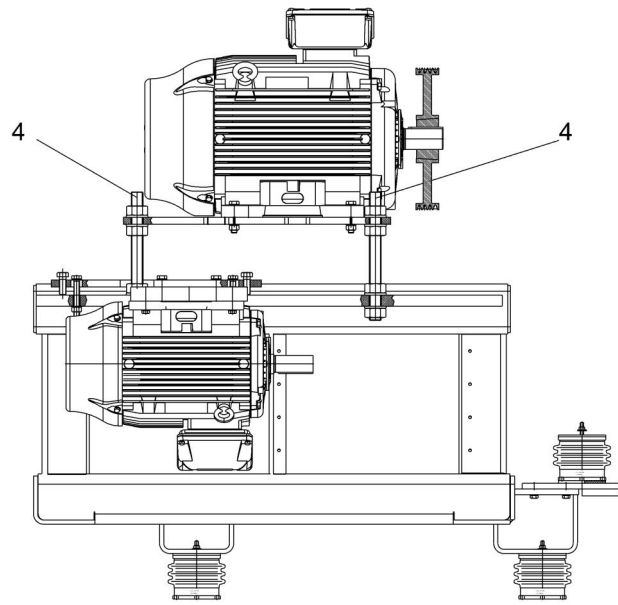
Fig. 1



8419050

Fig. 2

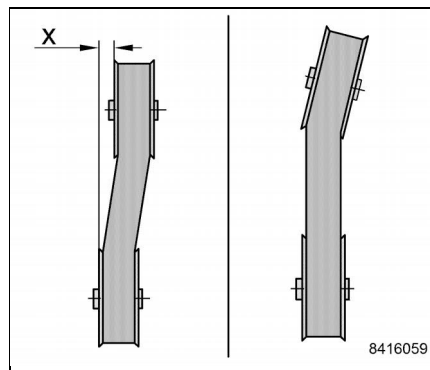
- Fasten threaded rods 4 in the drive frame 5.



8419051

Fig. 3

- Position and fasten the main motor and motor bracket on the threaded rods.
- Align the belt pulleys.



8416059

Fig. 4

- Check the belt pulleys for correct alignment.
 - Avoid the errors illustrated.
 - The deviation of the pulley alignment should not exceed $x = 3$ mm.
 - The larger the off-track running of the belts, the higher the wear.

- Mount and tension the drive belt, see chapter "Re-tensioning drive belt".
- Fit the coupling and align the secondary motor. See chapter "Fitting the coupling and secondary motor".

12.16 Removing the coupling.

Different couplings are used depending on the application.

Coupling type A

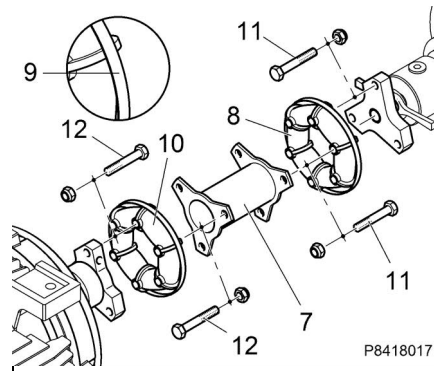


Fig. 5

- Pre-tension the coupling ring (10) with clip (9).
- Unscrew screws (12).
- Remove coupling ring (10).
- Pre-tension the coupling ring (8) with clip (9).
- Unscrew screws (11).
- Remove pipe (7) and coupling ring (8).

Coupling type B

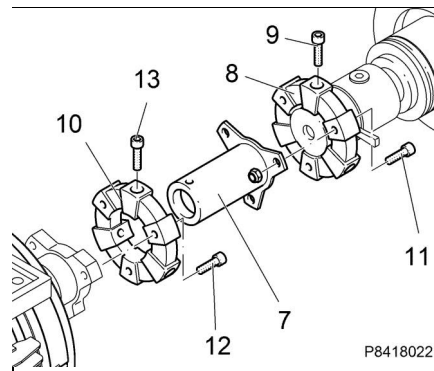


Fig. 6

- Unscrew screws (9) and (13).
- Unscrew screws (11) and (12).
- Remove coupling ring (10) and pipe (7).
- Remove coupling ring (8).

12.17 Fitting the coupling

Different couplings are used depending on the application.

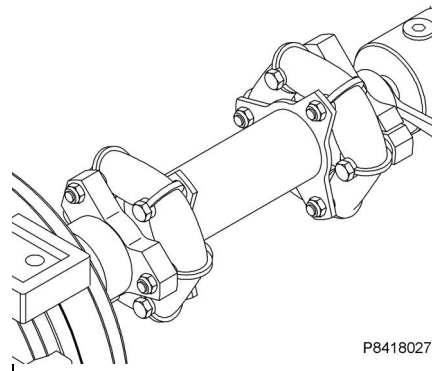


Fig. 7

Coupling type A

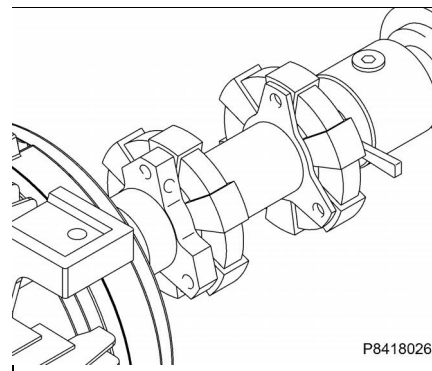


Fig. 8

Coupling type B

12.17.1 Fitting the coupling (type A)

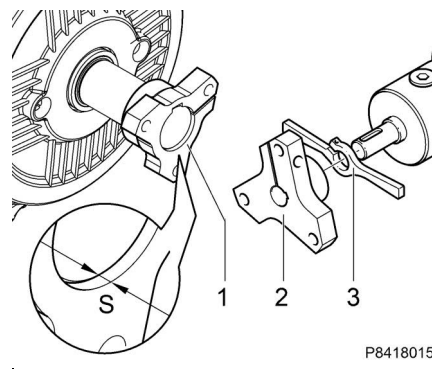


Fig. 9

- Slide disk (3) onto the gear shaft and arrest it.
- Slide gear-side coupling hub (2) onto the gear shaft as far as it will go and arrest it.
- Fasten the motor-side coupling hub (1) on the motor shaft.
 - The coupling half must be at least 2 mm (S) in front of the motor shaft.

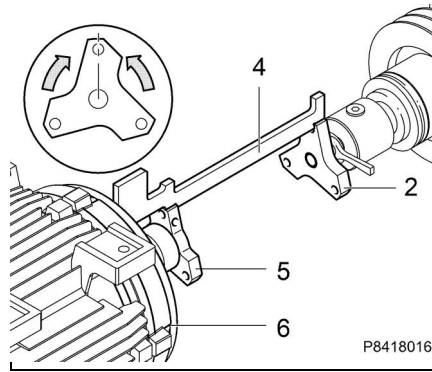


Fig. 10

- Turn the coupling hubs so that one of the tips respectively points upwards.
- Check the distance of the coupling hubs with the centering aid (4) and correct if necessary.
 - The centering aid must fit exactly between the coupling hubs.
 - Correct small deviations up to 0.5 mm by displacing the motor-side coupling hub (5).
 - Correct bigger deviations by displacing the secondary motor (6).
 - **IMPORTANT!** Do not displace the gear-side coupling hub (2).

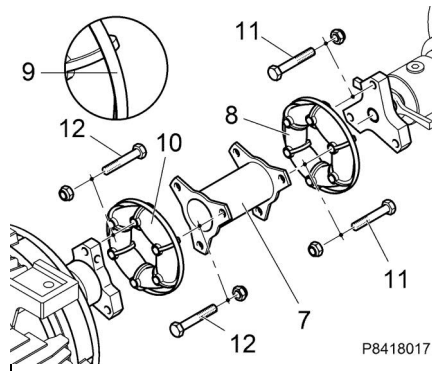


Fig. 11

- Remove the centering aid.
- Fit pipe (7), coupling ring (8) and clip (9).
- Pre-tension coupling ring (8) with clip (1) until screws (11) can be screwed in.
- Tighten screws (1) firmly.
- Remove the clamp (9).
- Pre-tension coupling ring (10) with clip (9) until screws (12) can be screwed in.
- Tighten screws (12) firmly.
- Remove the clamp (9).

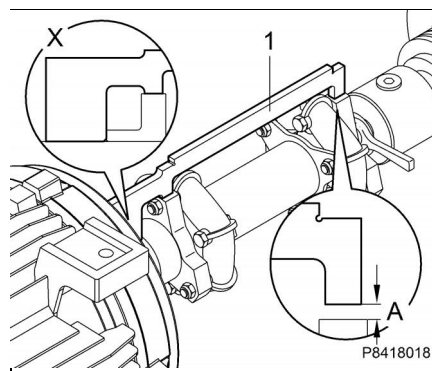


Fig. 12

- Mount the centering aid (1) on the motor shaft as shown in detail X.
- Align the motor so that the centering aid (1) is seated on both coupling hubs.
 - Adjust the height of the motor bracket if necessary.
 - The offset (A) must be smaller than 1 mm.

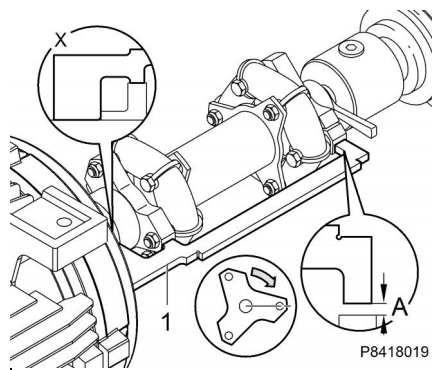


Fig. 13

- Turn the coupling through 90° so that one of the tips faces the side.
- Mount the centering aid (1) on the motor shaft as shown in detail X.
- Align the motor so that the centering aid (1) is seated on both coupling hubs.
 - The offset (A) must be smaller than 1 mm.
 - Displace the motor laterally if necessary.
- Tighten the screws of the motor and motor bracket.

12.17.2 Fitting the coupling (type B)

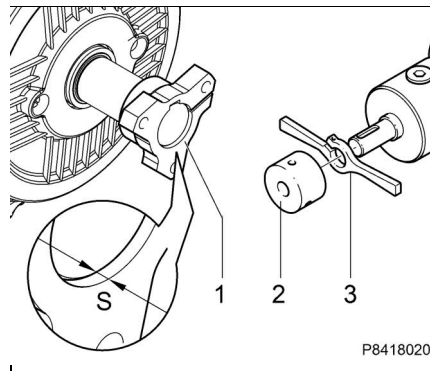


Fig. 14

- Slide pulse transmitter (3) onto the gear shaft as far as it will go and arrest it.
- Slide gear-side coupling hub (2) onto the gear shaft as far as it will go and arrest it.
- Fasten the motor-side coupling hub (4) on the motor shaft.
 - The coupling hub must be approx 2 mm (S) in front of the motor shaft.

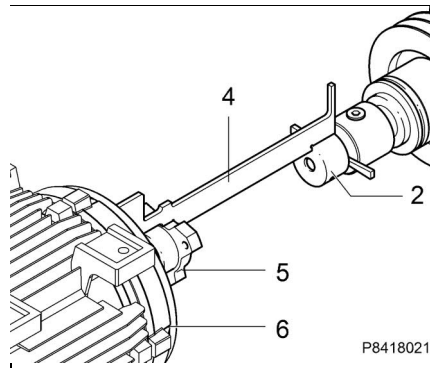


Fig. 15

- Check the distance of the coupling hubs with the centering aid (4) and correct if necessary.
 - The centering aid must fit exactly between the coupling hubs.
 - Correct small deviations up to 0.5 mm by displacing the motor-side coupling hub (5).
 - Correct bigger deviations by displacing the secondary motor (6).
 - **IMPORTANT:** Do not displace the gear-side coupling hub (2).

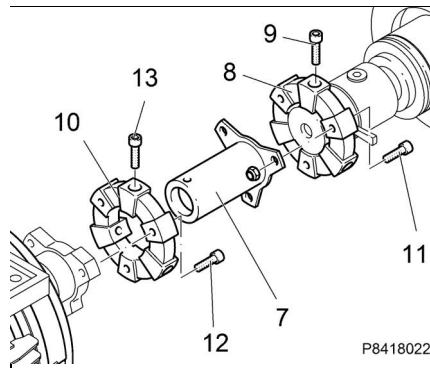


Fig. 16

- Remove the centering aid.
- Mount coupling ring (8) on the gear-side coupling hub. Screw in screws (9) loosely.
- Slip coupling ring (10) on pipe (7) and tighten screws (13) loosely.
- Fasten the pipe (7) with screws (11).
- Fasten coupling ring (10) to the motor-side coupling hub with screws (12).
- Tighten screws (9) and (13).

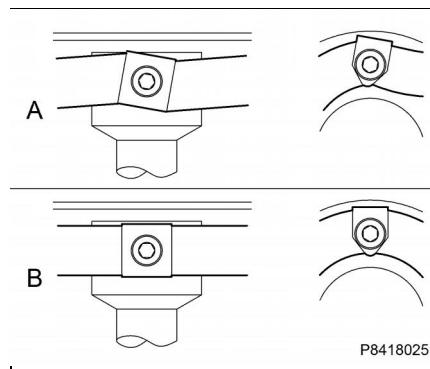


Fig. 17

IMPORTANT!

- The coupling rings must not be deformed through the screwing (example A).
- The rubber elements must retain their original form (example B).

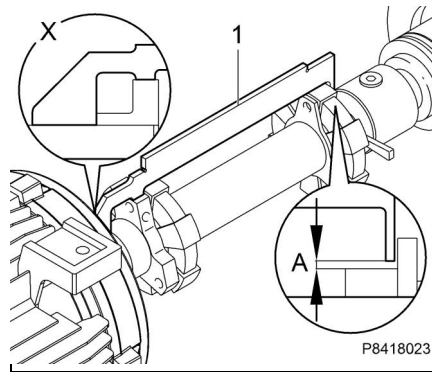


Fig. 18

- Mount the centering aid (1) on the motor shaft as shown in detail X.
- Align the motor so that the centering aid (1) is seated on both coupling hubs.
 - To do this, adjust the height of the motor bracket.
 - The height offset (A) must be smaller than 1 mm.

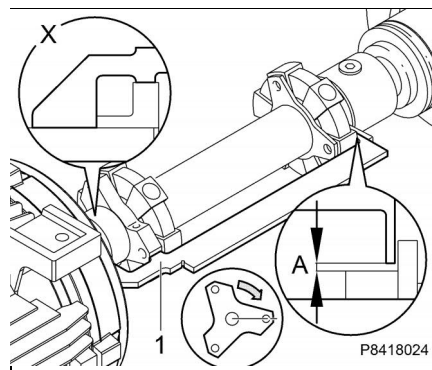


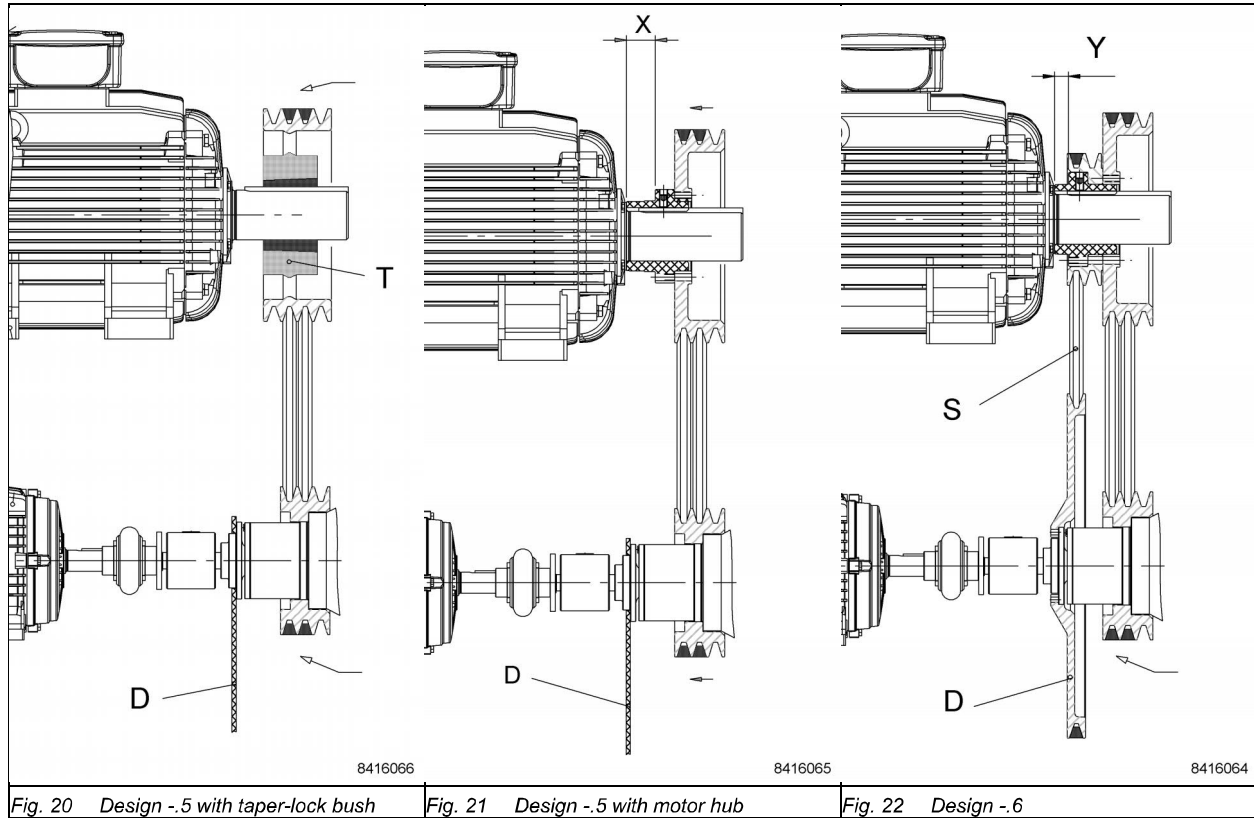
Fig. 19

- Turn the coupling hubs through 90° so that one of the tips respectively faces the side.
- Mount the centering aid (1) on the motor shaft as shown in detail X.
- Align the motor so that the centering aid (1) is seated on both coupling hubs.
 - To do this, displace the motor laterally.
 - The side offset (A) must be smaller than 1 mm.
- Tighten the screws of the motor and motor bracket.

12.18 Replacing belt pulleys

The design of the belt pulleys and drive belts depends on the motor power set and the drive concept.

The following variants can be installed:



<p>Characteristics:</p> <ul style="list-style-type: none"> • 1 pair of belt pulleys • No belt drive for the worm • D = torque support • T = belt pulley with taper lock bush <p>Note:</p> <ul style="list-style-type: none"> • There may be more grooves present than belts. <ul style="list-style-type: none"> - Motor belt pulley: Arrange the belt in the middle - Decanter belt pulley: Arrange the belt on the motor side • Chapter "Replacing motor belt pulley (taper lock bush)" 	<p>Characteristics:</p> <ul style="list-style-type: none"> • 1 pair of belt pulleys • No belt drive for the worm • D = torque support • X = long offset of motor hub in the direction of the motor <p>Note:</p> <ul style="list-style-type: none"> • There may be more grooves present than belts. <ul style="list-style-type: none"> - Arrange the belt on the motor side 	<p>Characteristics:</p> <ul style="list-style-type: none"> • 2 pair of belt pulleys • S = worm drive • No torque support • X = short offset of motor hub in the direction of the motor <p>Note:</p> <ul style="list-style-type: none"> • There may be more grooves present than belts. <ul style="list-style-type: none"> - Arrange the belt on the motor side
---	---	---

NOTICE**Incorrect belts, incorrect belt numbers and incorrect belt positions can lead to damage on the gear.**

For standardisation reasons, some grooves in the belt pulleys may remain free.

- The free grooves must not be fitted with extra belts!
- The number of belts per belt pulley and the position must be taken from the speed table (the speed table is not part of the standard customer documentation).
- Reset the original state following maintenance work.
 - The grooves used can be recognised through traces of use.
 - Unused grooves are painted completely.

12.19 Replacing the motor belt pulley (taper lock bush)

The following work may be performed only by a trained specialist (Tspec).

The size "3525" illustrated has 3 fastening holes (A) and 2 puller holes (B).

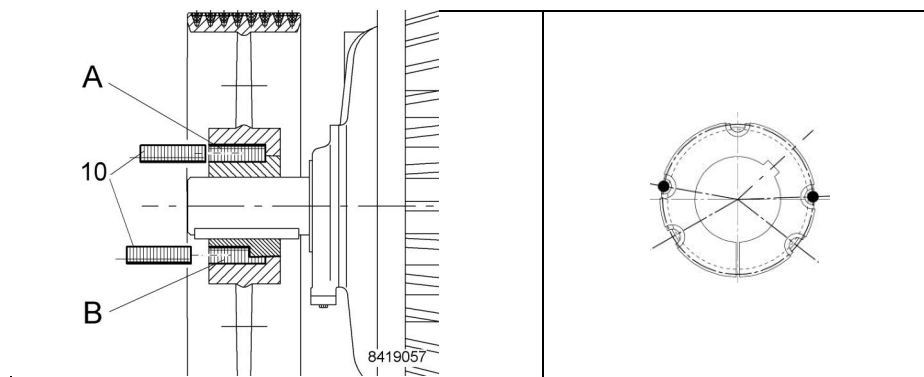


Fig. 23

Dismantling

- Hang the V-belt pulley into a hoist with the aid of a suitable rope.
 - **Attention:** Tension the rope only slightly to avoid damage to the motor bearing.
- Undo all three screws (A).
 - Remove two of the screws. Oil the screws liberally and screw into the puller holes (B).
- Tighten the screws alternately until the bush becomes dislodged from the hub and the pulley moves freely on the shaft.

Assembly

- Clean all unvarnished surfaces of the bush and pulley.
 - Ensure that the conical contact surfaces are clean and free from oil and dust.
 - Fit the pulley and bush into each other and align the holes.
- Apply a thin coat of oil to the screw thread. Screw the screws into the fastening holes (A).
- Clean the shaft. Slide the belt pulley onto the motor shaft and carefully align relative to the decanter belt pulley.
 - **IMPORTANT!** If the two belt pulleys are not exactly aligned, the machine will not run smoothly and the V-belts will wear prematurely.
- Tighten screws (10) alternately and evenly.
 - Required torque for screws $\frac{1}{2} \times 1\frac{1}{2}$ " = 115 Nm
 - Check the torque after 0.5 - 1 operating hours.
- Fill the puller holes with grease to prevent penetration of foreign bodies.

13 Decommissioning

13.1	Notes on long-time storage of the centrifuge and individual rotors	184
13.1.1	Decommissioning the decanter	184
13.1.2	Painted parts.....	184
13.1.3	Unpainted areas and galvanised parts	185
13.1.4	Gearbox / spare gearbox.....	185
13.1.5	Drive motors	185
13.2	Maintenance schedule (machine shut-down for a prolonged period) ...	186
13.2.1	Maintenance work once a month.....	187
13.2.2	Maintenance work once a year.....	187
13.2.3	Maintenance work before resuming operation	187
13.3	Disposing of the centrifuge	188
13.3.1	Disposing of utilities	188
13.3.2	Disposing of cleaning fluids	189

13.1 Notes on long-time storage of the centrifuge and individual rotors

The centrifuge/rotor will get damaged if it is not operated for a prolonged period and inadequate preserving measures are taken. This also applies for the time before commissioning.

When the machine is shut down for longer than 12 months, special measures are required to avoid the machine getting damaged during standstill.

If this action is not taken, the roller bearings of the machine in particular will be damaged by corrosion and one-sided load. This bearing damage results in high consequential costs.

The required preserving measures should be monitored by GEA Westfalia Separator Service.

13.1.1 Decommissioning the decanter

For a prolonged period of storage (standstill longer than one year), the decanter must be prepared as follows:

- Clean hood and catcher.
- Dismantle all feed and discharge lines on the machine and close the openings.
 - Product feed
 - Solids discharge
 - Fluid discharge
 - Flocculating agent feed
- Remove the coupling. Relax the drive belts and remove.
- Drain the gear oil from the gearbox and the surge reservoir. Fill in preserving oil.
- Option oil circulation lubrication system gearbox: Beforehand, drain gear oil from oil lubrication unit.
- Only in case of grease-lubricated bowl bearings
 - Fill the bowl completely with grease.
- Only in case of oil-lubricated bowl bearings:
 - Fill 0.05 litres of preserving oil into the bowl bearings (WS Part-No. 6969-0005-010).
 - In the case of individual rotors, additionally seal all holes.
- Tighten the bowl lock screws and lock with nuts.

13.1.2 Painted parts

An intact paint coating provides adequate corrosion protection. For this reason, painted parts must be examined for damage or changes once a month.

Touch up the damage in accordance with the instructions of the paint manufacturer.

13.1.3 Unpainted areas and galvanised parts

Unpainted areas and galvanised parts must be treated as follows:

- Carefully clean the area or part.
- Spray on corrosion protection wax (see Lubrication and maintenance schedule). Note the exception in the following diagram.

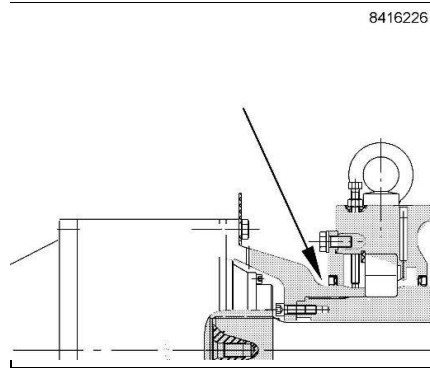


Fig. 24

- Treat this part of the hub with slushing oil (see Lubrication and maintenance schedule).

- Check and, when necessary, touch up the corrosion protection once a month.

13.1.4 Gearbox / spare gearbox

The gearbox and spare gearboxes must be prepared as follows for long-term storage.

- Drain the lubricating oil completely, see chapter "Gear".
- Fill in 0.05 litre preserving oil (WS part no. 6969-0005-010) and close the gearbox.
- Carefully clean the gearboxes. Spray on corrosion protection wax (WS Part-No. 6969-0022-010) Check and, when necessary, touch up the corrosion protection once a month.

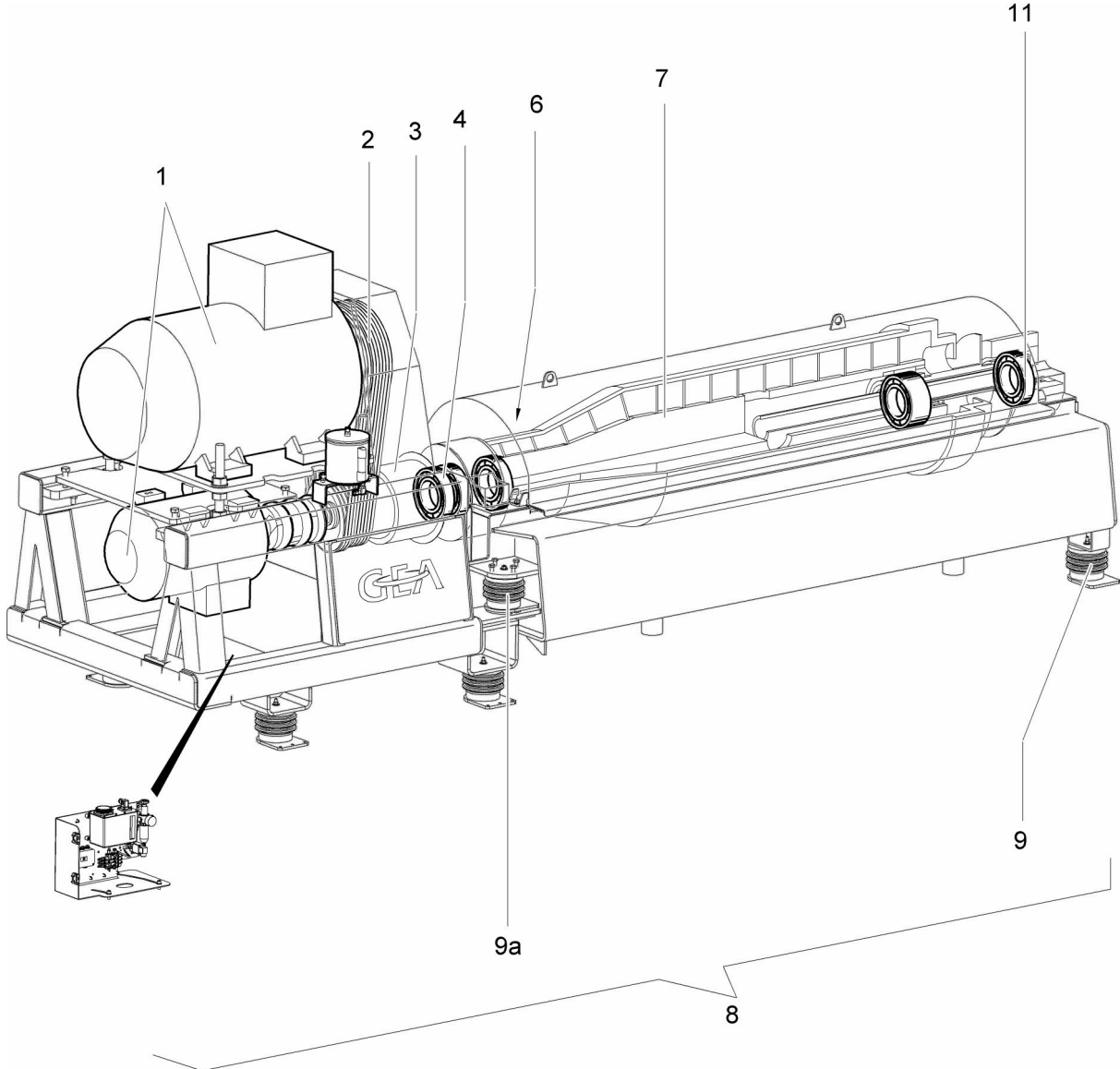
For the purpose of transporting the gearbox for inspection by the manufacturer, the gearbox must likewise be prepared as described above.

13.1.5 Drive motors

The drive motors must be prepared as follows for long-term storage.

- Option: Connect the space heaters for the motor winding. This is especially important in the case of high air humidity in the environment.
- Carefully clean the motor.
- Spray on corrosion protection wax.
- Check and, when necessary, touch up the corrosion protection once a month.

13.2 Maintenance schedule (machine shut-down for a prolonged period)



8420013

Fig. 25

Important: Machines decommissioned for longer than one year require regular maintenance to remain serviceable.

13.2.1 Maintenance work once a month			
Pos:	Machine part	Action	Operator
8	Decanters	<ul style="list-style-type: none"> ➤ Check paint finish. Touch up damage immediately. ➤ Check corrosion protection. If necessary, spray on corrosion protection wax (WS Part-No. 6969-0022-010) 	Tspec
7	Bowl	<ul style="list-style-type: none"> ➤ Rotate the bowl (minimum 10 revolutions) 	Tspec
3	Gearbox, input	<ul style="list-style-type: none"> ➤ Rotate the gearbox (minimum 10 revolutions) 	Tspec
1	Drive motors	<ul style="list-style-type: none"> ➤ Rotate the motor shaft (minimum 10 revolutions) 	Tspec

13.2.2 Maintenance work once a year			
Pos:	Machine part	Action	Operator
8	Decanter housing	<ul style="list-style-type: none"> ➤ Renew corrosion protection. ➤ Spray on corrosion protection wax (WS Part-No. 6969-0022-010) 	Tspec

13.2.3 Maintenance work before resuming operation			
Pos:	Machine part	Action	Operator
2	V-belts	<ul style="list-style-type: none"> ➤ Mount belts. 	Tspec
3	Gearbox	<ul style="list-style-type: none"> ➤ Filling in new oil 	Tspec
4 11	Bowl bearings	<ul style="list-style-type: none"> ➤ Carry out "Pre-lubricate bowl bearings". 	Tspec
6	Protective rings, clearers and bushes/ Solids discharge	<ul style="list-style-type: none"> ➤ Check wear and replace when necessary: 	Tspec
7	Bowl and scroll	<ul style="list-style-type: none"> ➤ Check for wear. ➤ When wear, damage or corrosion is detected on load-bearing bowl parts, contact Westfalia Separator Service. 	Tspec
9	Vibration isolators / frame Vibration isolators / drive	<ul style="list-style-type: none"> ➤ Check the vibration absorbers for any changes. Replace the vibration absorbers in the case of the following abnormal signs: <ul style="list-style-type: none"> • Cracks • Deformations • Discoloration Defective vibration absorbers may cause substantial follow-up damage. 	Tspec

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

13.3 Disposing of the centrifuge

When the centrifuge has reached the end of its useful service life, the plant operator is responsible for proper and correct disposal.

It is recommended to commission a company specialized in the disposal of machines or to obtain information from GEA Westfalia Separator service.

- Observe applicable local disposal regulations.
- Comply with environmental protection legislation.
- Have electrical connections disconnected by qualified personnel, e.g. electricians and high voltage electrician.

IMPORTANT: Residual liquids in feed lines and utility lines can cause injury. Protective clothing must therefore be worn when dismantling lines.



WARNING

Danger of acid and alkali burns

After cleaning, hot caustic and acid residues can still be in the centrifuge and the pipelines. When working on the centrifuge, contact with the caustics and acids can cause burns.

- Wear acid-resistant safety gear, e.g. safety goggles, safety gloves, protective overalls or protective suits.
- Take special care.
- Observe the plant operator's SOPs on handling acids and caustic alkalis as well as local disposal regulations.
- Comply with environmental protection legislation.
- Drain residual liquids in feed lines and utility lines into suitable vessels and dispose of them properly.
- Observe regulations on product contact.

- Dismantle feed lines and utility lines, clean superficial impurities caused by lubricants or product with suitable media and dispose of separately.
- Dismantle all seals and non-metallic materials, clean them to remove lubricants and dispose of them separately or recycle.
- Separate and sort metal parts and recycle them.

13.3.1 Disposing of utilities

When the centrifuge is decommissioned, the gear oil must be drained and disposed of. The plant operator is responsible for the proper disposal of the utilities.

- Observe the local disposal regulations.
- Comply with applicable environmental protection legislation.
- Drain off gear oil into suitable vessels and dispose of it properly. See data sheet for oil quantity.

13.3.2 Disposing of cleaning fluids

Chemicals are used for the chemical cleaning process which are specified in the user information or a datasheet issued with the user information. They are dangerous and can cause injuries and environmental damage.



WARNING

Danger of acid and alkali burns

Danger of chemical burns when handling chemical cleaning fluids and danger of burns by hot water.

- Wear acid-resistant protective gear, e.g. protective goggles, protective gloves, protective overalls or protective suits.
- Take special care.
- Observe the standard operating procedures (SOPs) issued by the operator on handling acids and caustics as well as the local disposal regulations.
- Comply with applicable environmental protection legislation.
- Drain residual liquids in feed lines and utility lines into suitable vessels and dispose of them properly.
- Observe regulations on product contact.

14 Spare parts

14.1	Use only genuine spare parts.....	192
14.2	Notes on ordering spare parts.....	193
14.3	Storing wear parts and operating materials.....	194
14.3.1	Gaskets and drive belts	194
14.3.2	Roller bearings.....	195
14.3.3	Lubricants	195

14.1 Use only genuine spare parts.

All spare parts, wear parts and operating materials are originally packed by GEA Westfalia Separator.



The original packing is provided with the marking shown.

Fig. 26



WARNING

Danger due to defective spare parts

Non-genuine or non-approved spare parts or operating materials reduce the availability of the centrifuge.

Non-genuine or non-approved spare parts or operating materials reduce the availability of the centrifuge.

- Use only genuine spare parts from GEA Westfalia Separator to assure the operating safety and optimum availability of the centrifuge.

14.2 Notes on ordering spare parts

A spare parts catalogue is part of the documentation of the centrifuge. It contains all spare parts, wear parts and operating materials.

Spare part kits are available for many machines which are customized to the maintenance intervals in the maintenance schedule of the centrifuge. E. g.:

- Set of spare parts for an operating time of 4000 hours.
- Set of spare parts for an operating time of 8000 hours.
- Set of spare parts for an operating time of 16000 hours.

Rapid and correct supply of spare parts can only be guaranteed if your order contains the following details:

- Centrifuge type: see nameplate
- Serial number: see nameplate
- Bowl serial number (can differ from the machine serial number, see spare parts catalog).
- Designation: see spare parts catalogue.
- Part number: see spare parts catalogue.

The part number is sometimes engraved on the individual parts.

Information required for ordering third-party components:

All specifications on the nameplate of the subcontractor, e. g. pump type and pump number.

14.3 Storing wear parts and operating materials

Pay attention to the following for storing wear parts and operating materials.

14.3.1 Gaskets and drive belts

Unfavourable storage conditions change the physical properties of rubber.

Possible causes:

- Shortened service life
- Completely unserviceable

If the following instructions are adhered to, it is possible that gaskets and drive belts will retain their properties for several years.

Requirements to be met by the storage room:

- Cool (+15 to max. +25 °C)
- Dry (less than 60 % relative air humidity)
- Dust-free (as possible)
- Dark, no direct solar radiation or bright artificial light (if necessary, paint the windows red or orange).
- Moderately ventilated, draft-free (if necessary wrap up the parts or pack them in antistatic foils or bags made of paper, polyethylene or polyamides).

Environmental requirements:

- Not in the vicinity of heat sources.
- Not together with solvents, fuels, lubricants, acids, disinfectants etc.

Method of storage:

- Stress-free, i.e. without tension, pressure or other deformation.
- Avoid different material compositions from coming in contact with one another.
- Avoid direct contact with metals (copper and manganese in particular have a negative impact on rubber products).

14.3.2 Roller bearings

Roller bearings must be kept in their original packing during storage; the packing may only be opened at the workplace and directly prior to fitting. Otherwise there is a risk that the bearings will become soiled and rust.

Larger bearings whose raceways have a relatively small thickness should be stored horizontally, not vertically and be supported around the entire circumference.

Before packing the roller bearings are immersed in slushing oil. This oil does not resinify or harden and is neutral towards all commercially available roller bearing greases. Roller bearings are reliably protected against external influences in their original packaging.

However, this protection is only effective for a prolonged period when the packed bearings are stored in a dry (relative air humidity 60%) and frost-free room.

No aggressive chemicals such as acids, ammonia or chloride of lime may be stored in the same room.

14.3.3 Lubricants

Always keep lubricant containers tightly closed and store them in closed rooms.

Avoid large temperature fluctuations as they cause respiration of the containers. As a result, moisture penetrates into the containers.

Clean the lubricant containers before opening them to prevent contaminants from getting into the lubricant. Even the smallest foreign matter in the lubricant can drastically reduce the life of the roller bearings.



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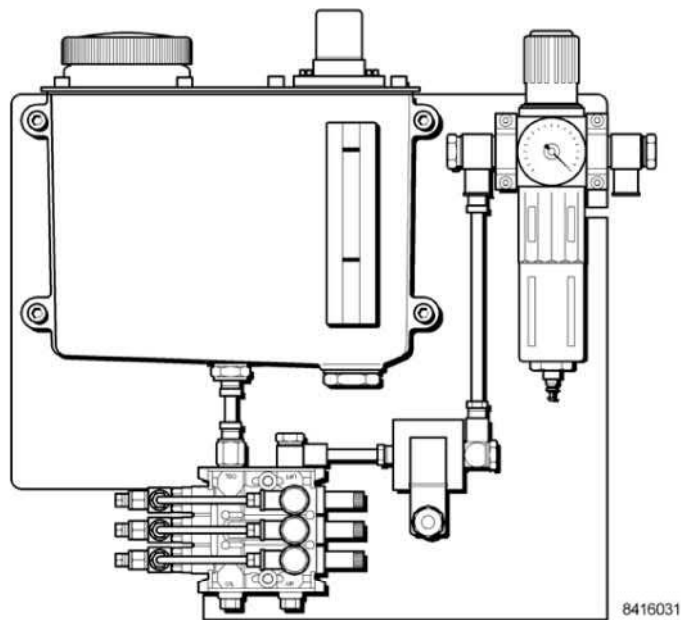
gea.com/contact
gea.com

Instruction manual

Designation: Lubricating device

Model: OLA 1303

No. 8175-9001-032 | Edition 01.03.2015



ORIGINAL INSTRUCTION MANUAL
Subject to modification!

The authors are always grateful for comments and suggestions for improving the documentation. These can be addressed to:



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1	Safety precautions	4
1.1	Intended use	4
1.2	Reasonably foreseeable misuse	4
1.1	Maintenance safety precautions	4
2	Description	6
2.1	Description of unit	6
2.2	Installation	10
2.3	Requirements to be met by the compressed air supply	10
3	Operation	11
3.1	Commissioning	11
3.2	Adjustment	11
3.3	Bearing air cooling (optional)	11
3.4	Adjusting the oil quantity	12
3.5	Adjusting the compressed air	12
3.6	Solenoid valve (oil + air injection lubricator)	12
3.7	Adjusting the pressure switch	12
3.8	Faults	13
3.9	Plant control and monitoring	13
4	Repair	14
4.1	Maintenance schedule	14
4.2	Long-term shut-down	14

1 Safety precautions

1.1 Intended use

The intended use is the lubrication of bowl bearings on centrifuges from GEA Westfalia Separator.

1.2 Reasonably foreseeable misuse

The manual contains instructions for the intended use. Any operation of the lubricating unit that does not fall under the intended use constitutes unintended use and is considered to be misuse.

Reasonably foreseeable misuses include:

- Use of unsuitable spare parts
- Use of impermissible operating materials
- Operation in incomplete assembly state:
 - The required supervisory equipment is not activated.
 - The required protective covers are not installed.
- The unit is operated by persons who have not received adequate training.
- Changing the process conditions, operating conditions and environmental conditions without the consent of the manufacturer.

Any misuse of the lubricating unit can lead to severe damage to persons and property.

1.1 Maintenance safety precautions

Unfavourable operating conditions may require shorter maintenance intervals. The factors listed below are unfavourable because they either attack the material of the unit directly or impair the lubrication system.

Timely maintenance of the unit and replacement of worn or damaged parts are essential for safe operation of the unit.

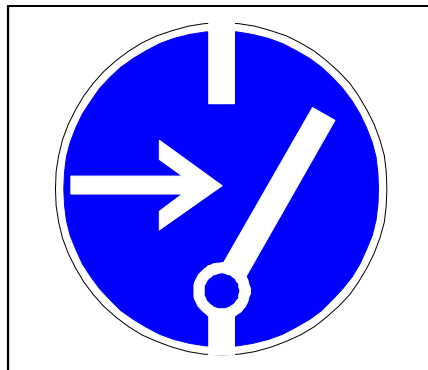


Fig. 1

Before all maintenance and servicing:

- Isolate all electrically supplied equipment from the power supply using the main switch.
- Secure the plant against unintended restarting with locking devices.
- The lubricating unit is pressurised during operation. It must therefore be depressurised before commencing with upgrades, modifications, repairs etc.



Fig. 2

- Collect dripping oil to prevent risk of slipping or infection of the product. Wait until the bowl has come to a standstill.
- When handling waste oils note:
 - Health risks depend on the chemical composition.
 - Dispose of waste oil in accordance with local regulations.

2 Description

2.1 Description of unit

The oil-air unit is a device for centrifuges for lubricating the bowl bearings with minimal quantities.

The finely dosed lubricant is distributed by an air flow in smears on the inner walls of the lubricating line and is transported to the lubricating point.

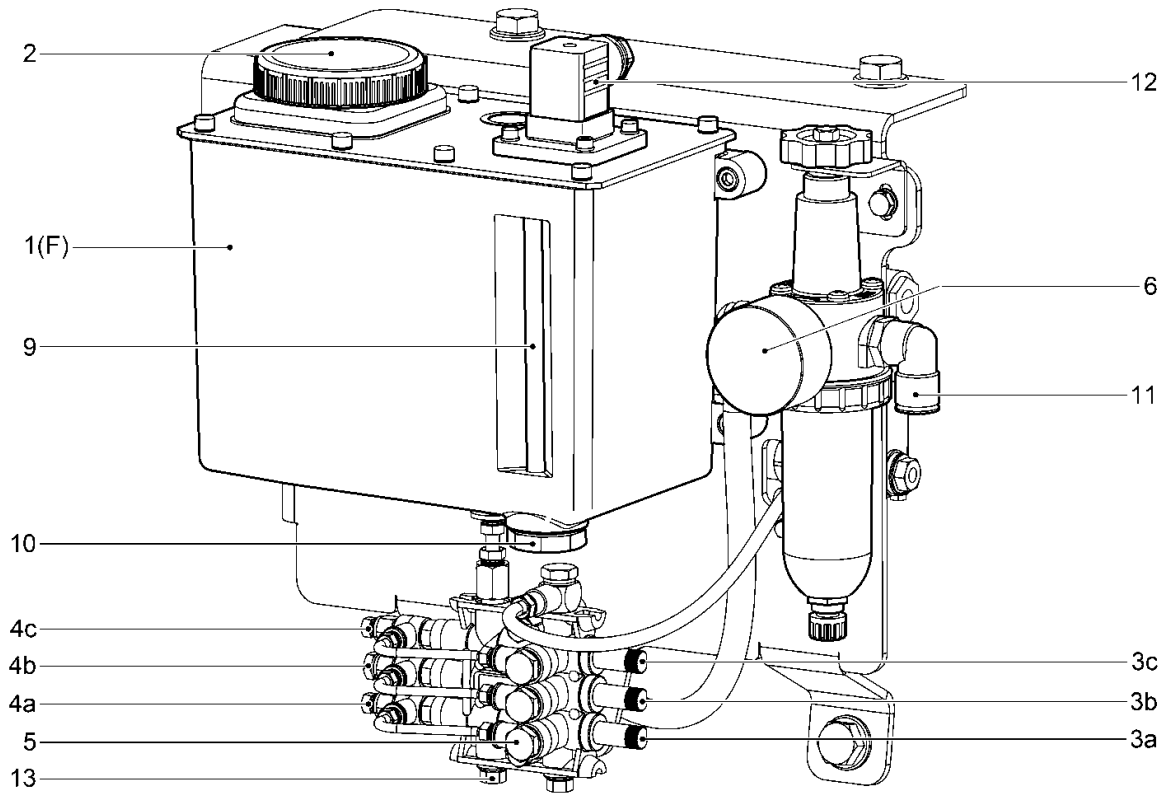
The bowl bearings are discontinuously supplied with lubricant in the form of fine droplets via a discharge nozzle.

The compact unit works in pulses; a lubrication cycle is followed by a pause.

Tasks of the machine control:

- Control of the pause and pulse times
- Monitoring of the filling level in the oil storage vessel
- Monitoring of the air pressure in the individual lubricating lines

The required lubricating quantity can be precisely dosed for each individual lubricating point.

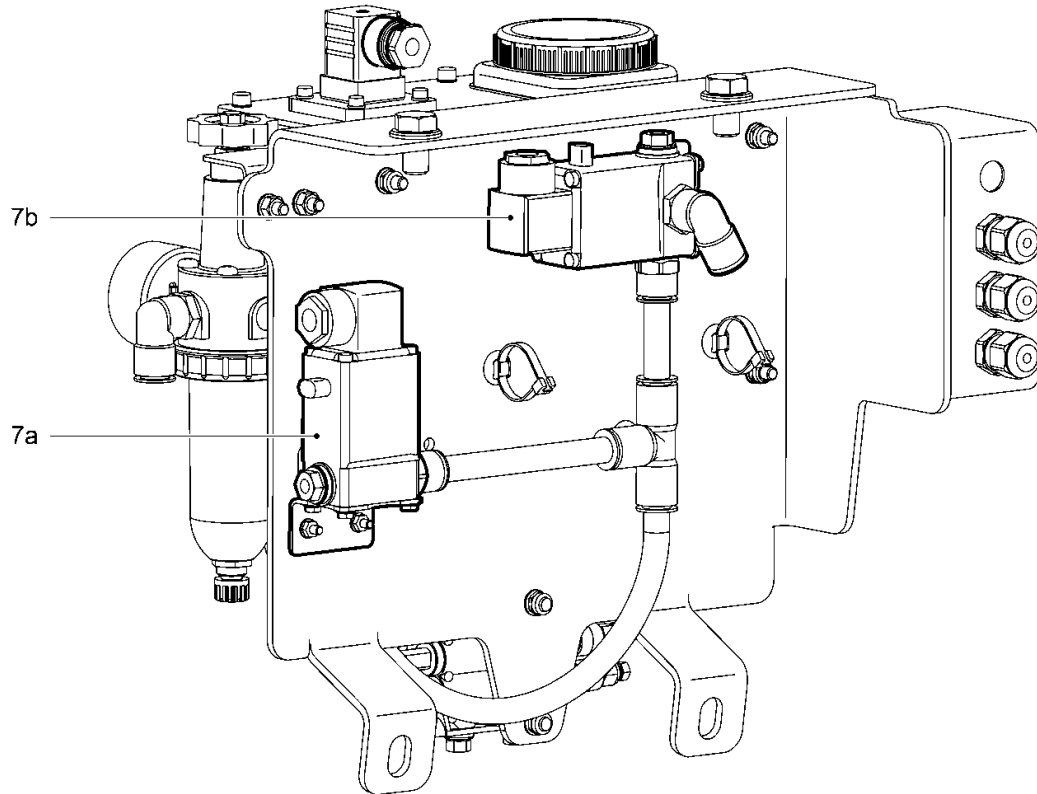


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Fig. 3

The oil + air unit (standard design) consists of the following assemblies:

- 1 Lubrication vessel with float switch (F)
- 2 Filler neck for filling the lubricant vessel
- 3a Adjusting sleeve for the injection oiler, bowl bearing solid side
- 3b Adjusting sleeve for the injection oiler, not used
- 3c Adjusting sleeve for the injection oiler, bowl bearing liquid side
- 4a Lubricating line connection, solid-side outlet
- 4b Connection lubricating line, sealed
- 4c Lubricating line connection, fluid-side outlet
- 5 Oil-air injection oiler
- 6 Compressed air pressure reducer with pressure gauge and automatic water trap
- 9 Sight glass
- 10 Drain screw
- 11 Air supply connection (line diameter: 12 mm, compressed air to be provided by customer)
- 12 Filling level sensor
- 13 Vent screw



8418013

Fig. 4

The oil + air unit with bearing air cooling (optional) consists of the following assemblies:

- 1 Lubrication vessel with float switch (F)
- 2 Filler neck for filling the lubricant vessel
- 3a Adjusting sleeve for the injection oiler, bowl bearing solid side
- 3b Adjusting sleeve for the injection oiler, not used
- 3c Adjusting sleeve for the injection oiler, bowl bearing liquid side
- 4a Lubricating line connection, solid-side outlet
- 4b Connection lubricating line, sealed
- 4c Lubricating line connection, fluid-side outlet
- 7a Solenoid valve, oil + air injection oiler
- 7b Solenoid valve, bearing air cooling
- 5 Oil-air injection oiler
- 6 Compressed air pressure reducer with pressure gauge and automatic water trap
- 9 Sight glass
- 10 Drain screw
- 11 Air supply connection (line diameter: 12 mm, compressed air to be provided by customer)
- 12 Filling level sensor
- 13 Vent screw

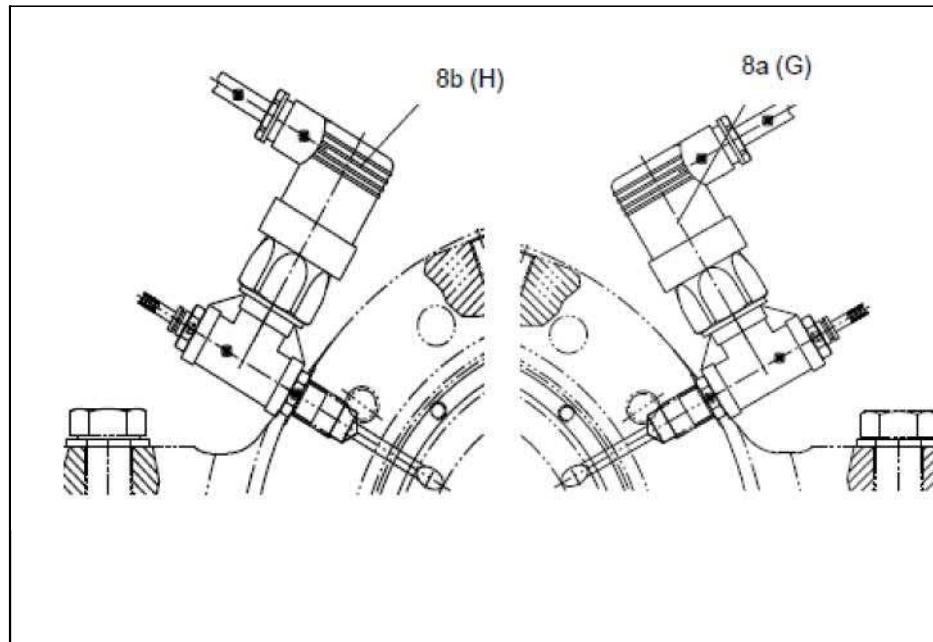


Fig. 5

- 8a** Pressure switch for minimum air pressure, inlet to solid-side lubricating point (H)
- 8b** Pressure switch for minimum air pressure, inlet to fluid-side lubricating point (G)

2.2 Installation

Installation of the electrical components:

- When installing electrical components, local and national guidelines must be complied with. The unit and individual components such as the tank must be taken into consideration when carrying out equipotential bonding.

Installation of the pneumatic components:

- Check use of the correct compressed air (see chapter "Compressed air").
- The lubricant vessel must be mounted horizontally so that the oil level in the tank is uniformly high and can be monitored.
- During installation and operation, refer to the manuals of the centrifuges and the individual components.
- When equipped with bearing air cooling:
 - During commissioning, the lock screw must be replaced with the connection for the bearing air cooling (only on the version with lock screw in bearing housing).

During assembly, there must be no isolated plant components. The oil-air unit may only be connected via electrostatically conductive pipe or hose systems which have been taken into consideration when carrying out equipotential bonding.

This oil-air unit is not suitable for use in explosive zones.

2.3 Requirements to be met by the compressed air supply

Requirement	Values
Inlet pressure	Min. 0.5 MPa (corresponds to 4 bar)
	Max. 0.8 MPa (corresponds to 8 bar)
Based on the compressed air quality grades according to ISO 8573-1	
Particle content	Class 3
Max. particle size	5 µm
Max. particle content	5 mg/m ³
	Class 4
Pressure dew point	max. + 3°C
	Class 3
Oil concentration	max. 1 mg/m ³

3 Operation

3.1 Commissioning

- Fill the lubricant vessel through the filler neck (2) up to the maximum mark. Make sure that no dirt enters the oil storage vessel during filling. The oil quality is specified in the "Lubrication and maintenance schedule".
- Deaerate pump:
 - Open vent screw (13) by approx. 3 turns.
 - Actuate the pump via a maintenance switch in the control cabinet until the oil discharges from the vent screw free of bubbles.
 - Close the vent screw again.
 - After approx. 30 minutes, check the entire system again for trapped air and repeat the venting procedure if necessary.
 - Dispose of the collected oil in a proper manner. Do not recycle it into the system under any circumstances.

For version without oil lances:

- Pull the oil lines out of the connector of the pressure switch.

For version with oil lances:

- Pull the oil lances out of the bearing housing. In this way, the nozzle bore at the end of the oil lance can be checked.
- The oil-air unit is switched on during start-up of the centrifuge.
 - During start-up of the centrifuge, using a sheet of paper, check several times whether the oil is conveyed to the lubricating points.
 - After 10 faulty pulses, the centrifuge is shut down and the control starts the post-lubrication time. The oil-air unit remains switched on until the post-lubrication time has expired.
- Connect the oil lines or oil lances.

3.2 Adjustment

The oil-air unit runs when the centrifuge is started.

Factory setting

- The oil-air lubrication is adjusted by GEA Westfalia Separator before shipping the centrifuge.
- The oil quantity is set.
- the cycle is set in the control system.

3.3 Bearing air cooling (optional)

Function "Activate liquid-side bearing cooling":

- Activation takes place when switching to the status "ready for operation".

Purpose: the solenoid valve of the bearing cooling is opened.

Function "Deactivate liquid-side bearing cooling".

- The deactivation takes place when switching to the statuses "Shut-down program" and "Run-down".

Purpose: the function "Activate liquid-side bearing cooling is terminated. The solenoid valve of the bearing cooling closes.

No alarms and messages are triggered.

3.4 Adjusting the oil quantity

The delivery volume per pulse is adjusted by means of the transparent adjusting sleeves of the injection oiler.

- Pull back the black locking ring.
- The delivery volume is reduced stepwise by turning the adjusting sleeve counterclockwise (-).
 - It engages 4x per revolution (audibly and tangibly) so that intermediate settings are also possible.
- The maximum delivery volume is attained again by turning the adjusting sleeve clockwise (+) until it hits stop.
- Let the black locking ring click into place again.

Max. delivery volume / stroke	30 mm ³
1 full left revolution	25 mm ³
2 full left revolutions	20 mm ³ factory setting
3 full left revolutions	15 mm ³
4 full left revolutions	10 mm ³
5 full left revolutions	5 mm ³
Over 6 full left revolutions	3 mm ³

3.5 Adjusting the compressed air

At the factory, the air pressure at the compressed air pressure reducer (6) is set to 5 bar.

- The air pressure can be altered by turning the handwheel.

The system functions correctly with an air pressure of 5 – 8 bar.

3.6 Solenoid valve (oil + air injection lubricator)

The solenoid valve (7a) for the air supply is controlled via the machine control.

There are different settings between start phase and operation.

3.7 Adjusting the pressure switch

The pressure switches for minimum air pressure 8a and 8b for lubricating pulse monitoring on the bearing housings have been set at the factory to 0.5 bar minimum switching value.

After adjustment, the adjusting screw was secured and sealed against twisting with lacquer.

3.8 Faults

Note:

- The system is insensitive if too much oil is lubricated in the bearing.
- The bearing temperatures normally rise by only 3° - 5°C.
- If the air pressure is too low, the machine is shut down since the lubricating points are then no longer adequately supplied with lubricant.
 - The switching signal comes directly from the pressure switches on the bearing housings.
- The setting for monitoring the pressure pulses/lubrication pulses is pre-set in the control at the factory:
 - Oil level in lubricant vessel below minimum
 - Mechanical damage to a component

3.9 Plant control and monitoring

If a machine control is delivered by GEA Westfalia Separator, control and monitoring of the operation of the oil-air unit is included in the scope of delivery. Corresponding notes and instructions are given in the manual for the machine control.

Plants without control:

In the case of machine controls ordered by the plant operator, the following must be taken into account for the control of the oil-air unit:

- The pulse and pause time is controlled:

The following is monitored:

- The lubrication pulse
 - The pressure switches (8) check at both bearing points whether the minimum air pressure is achieved during the lubrication pulse and whether it subsequently decreases.
 - Faulty lubrication pulses are counted up.
 - Completed pulses are counted down but not below 0.
 - In the case of 5 faulty pulses, a warning and collective alarm are output as a message.
 - In the case of 10 faulty pulses, the machine is shut down.
- The filling level in the lubricant vessel
 - A warning signal is given first. If no oil has been topped up after 25000 seconds, the centrifuge is switched off.

4 Repair

4.1 Maintenance schedule

Oil-air lubricating units need little maintenance.



CAUTION

Repair work may only be carried out on a unit which has been de-energised beforehand by trained personnel.

Work on energised units can lead to personal injury.

The lubricating unit is pressurised during operation. It must therefore be de-pressurised before commencing with repairs.

Check regularly:		
Machine component	Action	Operator
Check entire lubricating unit	➤ for leakage	Operator
Oil lines	<ul style="list-style-type: none"> ➤ Carry out a visual inspection for leakage, paying particular attention to the connecting parts at the bearing points. The latter are exposed to the machine vibrations. ➤ Re-seal untight connections. 	Operator
Lubricant vessel	<ul style="list-style-type: none"> ➤ Fill in oil up to the maximum mark on the filling level indicator. • The required oil is specified in the order-specific "Lubrication and maintenance schedule" in the machine documentation. • To avoid mistakes, it is recommended to attach a label specifying the lubricant used to the lubricant vessel. • Holding capacity: max. 3 litres oil. 	Operator
Manual water separators, filters	<ul style="list-style-type: none"> • Check the manual water separators on the compressed air pressure reducer for water residue and contamination, <ul style="list-style-type: none"> ➤ and empty if necessary ➤ Clean filter. • Removing the filter: <ul style="list-style-type: none"> ➤ Loosen the screwed connections and remove the vessel. ➤ Loosen the fastening nut from the filter. ➤ Take out the filter, clean it and fit it again. ➤ Make sure that the gaskets are in perfect condition. 	Operator

Cleaning:

- As required, the compact unit can be cleaned with mild, material-compatible detergents (non-alkaline, no soap).
- Cables and hoses should remain connected if possible. Openings must be closed to prevent detergents from entering the inside.
- Given a normal operating mode and the use of the lubricants listed in the "Lubrication and maintenance schedule", cleaning of the interior is not necessary.
- If an incorrect or contaminated lubricant has been filled in by mistake, the inside of the lubricant vessel must be cleaned. For this purpose, consult GEA Westfalia Separator.

4.2 Long-term shut-down

- Disconnect the power from the oil-air unit.

- Fill the lubricant vessel with oil to avoid corrosion.
- Store in a dry and dust-free environment.
 - The ambient temperatures must be between 10 – 60°C.



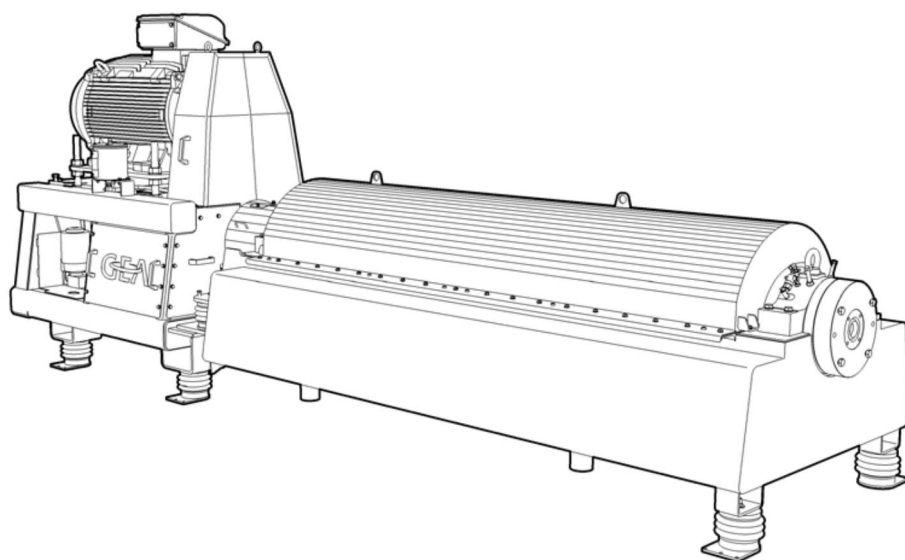
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GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

GEA Mechanical Equipment

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www.gea.com



Lubrication and maintenance schedule

Decanter
CF 7000

No. 8419-3010-041
Edition 22.03.2018

Max. product temperature (°C) **95**
Lubricant gear **WS-0038**
Lubricant bowl bearing **WS-0036**
Lubricant scroll bearing (liquid side) **WS-0129**
Lubricant scroll bearing (solid) **WS-0129**
Other lubricants

1	Safety precautions	4
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1.1	Important notes on maintenance	4
1.2	Application	5
1.3	Requirements to be met by spare parts and consumables	5
1.4	Target groups	5
1.4.1	Operator	5
1.4.2	Skilled worker	6
1.4.3	Trained specialist.....	6
1.5	Service offers.....	6
1.5.1	Training.....	6
1.5.2	Service.....	7
1.6	Additional documentation	7

2	Maintenance schedule	8
----------	-----------------------------	----------

2.1	After/during 1st Commissioning.....	9
2.2	After the first 500 operating hours	10
2.3	Daily.....	10
2.4	Monthly	11
2.5	Every 2000 operating hours, after 6 months at the latest	11
2.6	Every 4000 operating hours, after 12 months at the latest	12
2.7	Every 8000 operating hours, after 3 years at the latest.....	13
2.8	Every 16000 operating hours, after 3 years at the latest	14
2.9	Pay attention to the specifications of the manufacturer!.....	15
2.10	Product-dependent intervals.....	15
2.11	Lubricants	16
2.11.1	Table of Lubricants	16
2.12	Preservatives	16

1 Safety precautions

1.1 Important notes on maintenance

Regular maintenance of the centrifuge is crucial in terms of service life, safety and operating readiness.

Failure to carry out regular maintenance will result in increased wear, poorer product quality and higher energy consumption.

Increased wear reduces the stability of the components and can lead to severe damage to bowl and drive. This damage can in turn result in high risks for life and limb of the personnel as well as damage to property.

Observe the following points to avoid hazards:

- Observe the specified maintenance intervals.
When a service and maintenance contract is concluded with GEA Westfalia Separator Group, the maintenance work is optimally adapted to the production process. This can substantially lower maintenance costs.
- The maintenance intervals apply for standard applications. In the case of increased stress caused by special operating conditions, special products or hot operating conditions, shorten the service intervals in consultation with GEA Westfalia Separator Group service.
- If damage is detected during an inspection, replace the damaged elements immediately by original spare parts from GEA Westfalia Separator Group.
- If problems arise during maintenance work, consult GEA Westfalia Separator Group or take advantage of the training opportunities. See "Qualification of the personnel" and "Service and training".
- Following unusual events which may have a negative impact on safety, check the centrifuge immediately. Unusual events can be, for example, accidents or natural phenomena such as earthquakes, sand storms and flooding.

Use in explosion-hazarded zones

When operating the decanter in an explosion-hazarded zone, additional service and maintenance work is required which exceeds the scope described in this document.

The required operations are described in the corresponding manual for the ATEX decanter. For example, additional maintenance is required on the gear.

1.2 Application

This document applies for all persons who work with or on the centrifuge.

It is applicable for the plant operator as a basis for creating standard operating procedures for conduct at the workplace at the centrifuge.

1.3 Requirements to be met by spare parts and consumables

Spare parts, wear parts and consumables can cause damage to persons and property if they do not meet the requirements.

Original spare parts and consumables from GEA Westfalia Separator Group satisfy all pre-conditions for the operating safety of the centrifuge.

- Use only original spare parts.
- Use only original operating materials.
- Use the order-specific spare parts catalog supplied.
- See the chapter "Spare parts" for ordering spare parts and consumables.
- Keep to the limit values.

1.4 Target groups

The target groups for this documentation are all persons involved in installing, assembling, operating, maintaining and repairing the centrifuge.

What work may be carried out by what target group depends on the qualification of the personnel and on the type of work.

In the tables in the chapters **Troubleshooting** and **Maintenance** the responsible target group as well as the operation is specified.

1.4.1 Operator

Abbreviation: Op

The operator is employed by the customer and has been briefed in the following operations:

- Starting and shutting down the machine.
- Monitoring the machine and process (e.g. by means of indicators).
- Execution of easy re-lubrication and cleaning operations.

When given specific directions, the operator is able to carry out simple modifications to the process, e.g.:

- Adjusting temperatures, pressures and throughput capacities.
- Dosing additives.

1.4.2 Skilled worker

Abbreviation: Skilled

The skilled worker is normally employed by the customer and has been briefed in the following areas:

- Performing easy assembly work
- Performing routine maintenance work or servicing
- Limited settings and parametrization on the components and control system

The skilled worker has basic technical knowledge. The basic knowledge corresponds to a technical apprenticeship (mechanical or electrical).

The skilled worker is selected and deployed by the employer (plant operator).

GEA Westfalia Separator will carry out the briefing only in specific technical features that are part of the supply schedule and will indicate potential hazards.

This briefing is no substitute for an apprenticeship.

1.4.3 Trained specialist

Abbreviation: Tspec

The trained specialist normally belongs to the service team of GEA Westfalia Separator Group.

In exceptional cases, skilled workers employed by the customer can obtain a corresponding qualification by attending training courses held by GEA Westfalia Separator Group.

1.5 Service offers

1.5.1 Training

GEA Westfalia Separator regularly holds training courses for customer employees.

The training content is aimed at the operating and service personnel of the customer who work with the centrifuge. The operator must know how the centrifuge functions.

Trained operators assure the operating safety of the centrifuge.

Many different applications require competent process engineering know-how. Only adequately trained employees in service ensure a high quality standard. This requires ongoing further training.

The demands on the qualification of the service staff are growing increasingly. GEA Westfalia Separator consequently offers a qualification model and training concept.

Contact the following addresses for training courses for operating and service staff.

- GEA Westfalia Separator Group GmbH • Werner Habig Straße 1 • 59302 Oelde (Germany) • Tel. +49 (0)2522 77-1469 • Fax +49 (0)2522 77-31469 • info.learningcenter@gea.com • www.gea.com
- GEA Westfalia Separator Systems GmbH • Am Neuländer Gewerbepark 6 • 21079 Hamburg (Germany) • Phone +49 40 589650-0 • Fax +49 40 7380585 • info.learningcenter@gea.com • www.westfalia-separator.com

1.5.2 Service

GEA Westfalia Separator offers comprehensive service for the following areas:

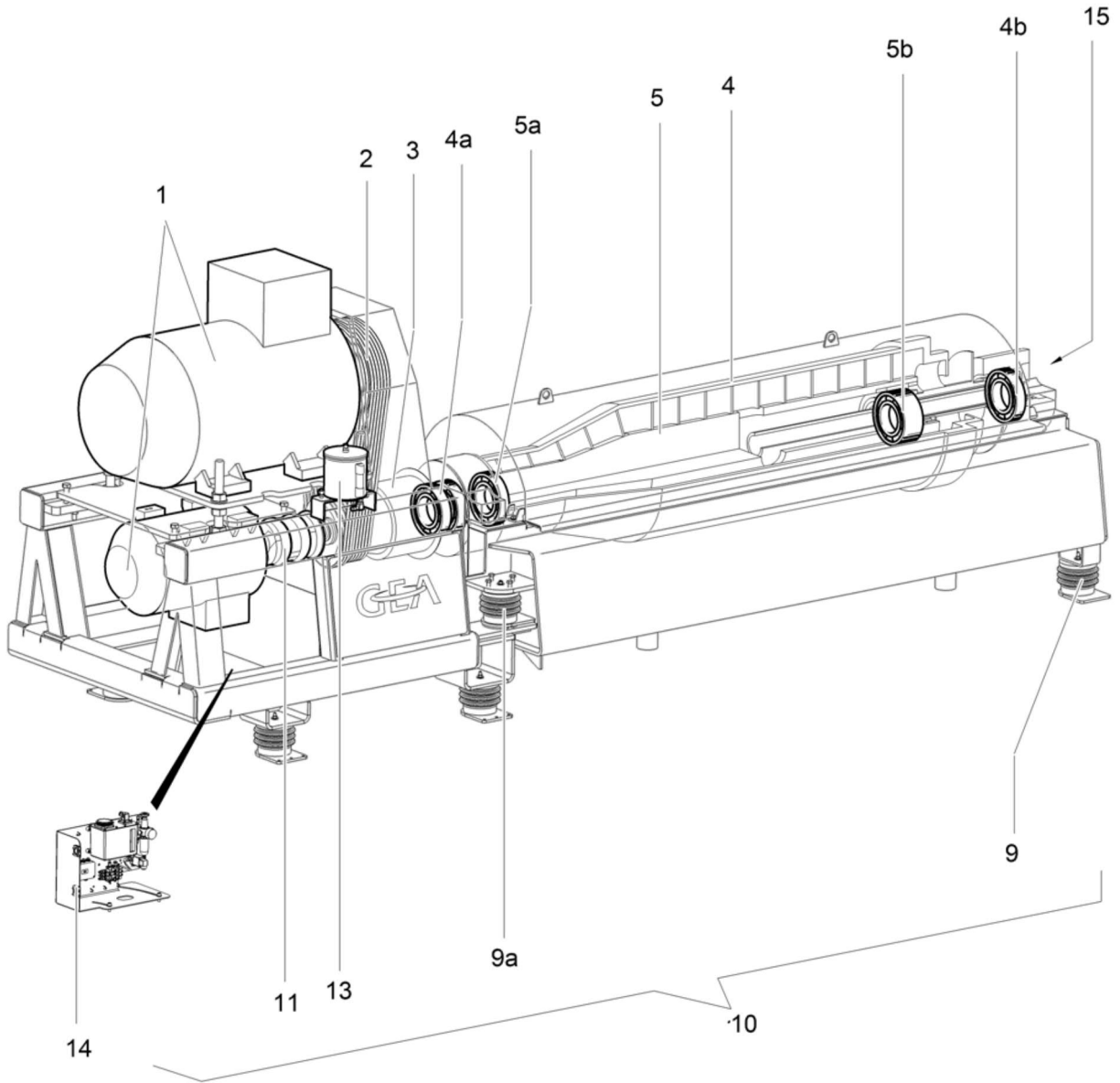
- Assembly
- Commissioning
- Regular maintenance
- Repairs
- Checking the operating state
- Checking in dismantled state
- Decommissioning for a long-term shut-down
- Storage and conservation during long-term standstill
- Restarting
- Decommissioning and disposal
- Training

1.6 Additional documentation

Request further information and technical documentation from the following places:

- Directly from GEA Westfalia Separator in Oelde.
- From the nearest representative of GEA Westfalia Separator.
- Per Internet under: gea.com
- Via e-mail at: info@gea.com

2 Maintenance schedule



8420012

Fig. 1

2.1 After/during 1st Commissioning			
	Machine part	Action	Operator
2	Drive belt	<ul style="list-style-type: none"> ➤ The 1 time, check the belt tension after 0.5 - 1 operating hours. ➤ The 2 time, check the belt tension after 8 - 24 operating hours. Refer to the manual.	Skilled
10	Complete decanter	<ul style="list-style-type: none"> ➤ Check the installation for leakage. 	Skilled
13	Surge reservoir / gear lubrication	<ul style="list-style-type: none"> ➤ Check the oil level in the surge vessel. Lubricant: WS-0038	Op
14	Oil-air unit / bowl bearing lubrication	Lubricant: WS-0036 <ul style="list-style-type: none"> ➤ Check the oil level in the storage vessel. Oil consumption per 1000 operating hours with factory setting: - approx. 2.5 litres (sum for both bearing points)	Op
		<ul style="list-style-type: none"> ➤ Refer to the oil-air unit manual. ➤ Check air pressure. Setpoint at pressure reducer = 5 bar ➤ Check the lubrication pulse. <ul style="list-style-type: none"> - Settings in the decanter control - Oil flow 	Skilled

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.2 After the first 500 operating hours			
	Machine part	Action	Operator
3	Gearbox	<ul style="list-style-type: none"> ➤ Fill in new oil. Lubricant: WS-0038 The gear type is engraved on the gearbox casing. 	Skilled
	PGA 411	Lubricant quantity: 7,5 litres	
	PGA 417	Lubricant quantity: 10 litres	

2.3 Daily			
	Machine part	Action	Operator
10	Complete decanter	<ul style="list-style-type: none"> ➤ Check running characteristics. ➤ Shut down the decanter when unusual noises or vibrations occur. 	Op
13	Surge reservoir / gear lubrication	<ul style="list-style-type: none"> ➤ Check the oil level in the surge vessel. Lubricant: WS-0038 	Op
14	Oil-air unit / bowl bearing lubrication	<ul style="list-style-type: none"> ➤ Check the oil level in the storage vessel. Lubricant: WS-0036 Refer to the oil-air unit manual. 	Op

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.4 Monthly			
	Machine part	Action	Operator
4a	Bowl bearings / solids side	<ul style="list-style-type: none"> ➤ Empty the oil collecting vessel in the frame below the bowl bearing. Oil quantity per 1000 operating hours with factory setting: approx. 1.25 litres	Skilled
4b	Bowl bearings / liquid side	<ul style="list-style-type: none"> ➤ Empty the oil collecting vessel in the frame below the bowl bearing. Oil quantity per 1000 operating hours with factory setting: approx. 1.25 litres	Skilled
14	Oil-air unit / bowl bearing lubrication	<ul style="list-style-type: none"> ➤ Check the oil level in the storage vessel. ➤ Actuate the water trap at the compressed air pressure reducer. Clean the filter element when soiled. ➤ Check air pressure. ➤ Check lubrication pulse (audible). Lubricant: WS-0036 Refer to the oil-air unit manual.	Op
		<ul style="list-style-type: none"> ➤ Check the oil-air hoses for signs of change. 	Op
		<ul style="list-style-type: none"> ➤ Replace the oil-air hoses in the case of the following abnormal signs: <ul style="list-style-type: none"> - Cracks - Leaks - Discoloration 	Skilled

2.5 Every 2000 operating hours, after 6 months at the latest			
	Machine part	Action	Operator
2	Drive belt	<ul style="list-style-type: none"> ➤ Check condition and belt tension. Refer to the decanter manual (chapter "Tensioning drive belts").	Skilled
3	Drive shafts / gear-box	<ul style="list-style-type: none"> ➤ Check for leakage. 	Skilled

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.6 Every 4000 operating hours, after 12 months at the latest			
	Machine part	Action	Operator
3	Gearbox	➤ Fill in new oil. Lubricant: WS-0038 The gear type is engraved on the gearbox casing.	Skilled
	PGA 411	Lubricant quantity: 7,5 litres	
	PGA 417	Lubricant quantity: 10 litres	
3	Drive shafts / gearbox	When using the decanter in explosion-hazarded areas : ➤ Replace the service kit "Drive shaft, complete".	Tspec
9	Vibration isolators / frame	➤ Check the vibration absorbers for any changes. Replace the vibration absorbers in the case of the following abnormal signs: <ul style="list-style-type: none"> • Cracks • Deformations • Discoloration Defective vibration absorbers may cause substantial follow-up damage.	Skilled
9a	Vibration isolators / drive		
11	Coupling / drive	➤ Check the rubber elements for changes. Replace the rubber elements in the case of the following abnormal signs: <ul style="list-style-type: none"> • Cracks • Deformations • Discoloration 	Skilled
	Optional: Lifting devices / set of tools	➤ Carry out visual check for damage. ➤ Replace damaged tools immediately.	Skilled
	Optional: Vibration pickup	➤ Check vibration guard for proper functionality. The functional check is done by lowering the limit value temporarily while the machine is running.	Skilled

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.7 Every 8000 operating hours, after 3 years at the latest			
	Machine part	Action	Operator
2	Drive belt	➤ Replace the drive belt. Refer to the operating instructions for the decanter.	Skilled
3	Driven shaft / gear-box	➤ Renew gaskets.	Tspec
3	Drive shafts / gear	When using the decanter in non-explosion-hazarded areas : ➤ Replace the service kit "Drive shaft, complete".	Tspec
4	Bowl	➤ Replace both bowl bearings and all gaskets.	Tspec
	Bowl bearings / solids side	➤ Apply a liberal amount of oil to the roller bearings before fitting.	
	Bowl bearings / liquid side	Lubricant: WS-0036	
5	Conveyor screw	➤ Replace both scroll bearings and all gaskets.	Tspec
	Scroll bearing / liquid side	➤ Pack the roller bearings with grease. Lubricant: WS-0129 Lubricant quantity: 910g	
	Scroll bearing / solids side	➤ Pack the roller bearings with grease. Lubricant: WS-0129 Lubricant quantity: 290g	
14	Oil-air unit / bowl bearing lubrication	➤ Replace the oil-air hoses.	Skilled

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.8 Every 16000 operating hours, after 3 years at the latest			
	Machine part	Action	Operator
3	Gearbox	<p>When using the decanter in explosion-hazarded areas:</p> <ul style="list-style-type: none"> ➤ Have the gearbox inspected by GEA Westfalia Separator. Consulting is done by GEA WS service or GEA WS branches. <p>Other intervals may be necessary in the case of long standstill times or very tough operating or ambient conditions.</p> <ul style="list-style-type: none"> • Long standstill times are: longer than 6 months • Very tough operating or ambient conditions are, e.g. Hot operation, frequent torque peaks, frequent overload of the decanter. 	Skilled
9	Vibration isolators / frame	<ul style="list-style-type: none"> ➤ Replace vibration isolators. <p>Does not apply for versions with viscosity dampers. The viscosity dampers are recognisable by the bellows.</p>	Skilled
9a	Vibration isolators / drive		Skilled
11	Coupling / drive	<ul style="list-style-type: none"> ➤ Replace the rubber elements. 	Skilled

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.9 Pay attention to the specifications of the manufacturer!			
	Machine part	Action	Operator
1	Drive motor	<ul style="list-style-type: none"> ➤ Re-lubricate / replace motor bearings. ➤ Information on this is given in the manual for the motor. ➤ Deviations, if any, are specified on a rating plate on the motor. ➤ Carry out re-lubrication preferably when the motor is rotating. 	Skilled

2.10 Product-dependent intervals			
	Machine part	Action	Operator
4	Bowl	<ul style="list-style-type: none"> ➤ Check bowl shell for wear. ➤ Check protective ring for wear. ➤ Check solids clearers and wearing bushes in the area of the discharge ports for wear. <p>When wear, damage or corrosion is detected on load-bearing bowl parts, contact the factory.</p>	Tspec
5	Conveyor screw	<ul style="list-style-type: none"> ➤ Check the wear to the scroll and wear liners. 	Tspec
10	Complete decanter	<ul style="list-style-type: none"> ➤ Check the decanter and the electrical components. ➤ Check the frame, catcher and product discharge for deposits. ➤ Eliminate caking. 	Tspec

Op = Operator

| Skilled = Skilled worker

| Tspec = Trained specialist

2.11 Lubricants

Selection of a suitable lubricant is essential for correct functioning of the decanter. Wear is minimised. The service life and operating safety of the decanter is increased.

For this reason, we recommend the lubricant be filled in at the factory. GEA Westfalia Separator Group carries out continuous quality checks only for this product.

Notes on storage: The possible storage time when stored carefully in dry rooms and with closed original containers is at least 24 months.

2.11.1 Table of Lubricants

	Designation	WS - Part-No /drum.	Manufacturer
WS-0036	High-performance lubricating oil with NSF-H1 approval	0015-0036-000 / 2.5 litres	GEA Westfalia Separator genuineparts
WS-0038	High-performance lubricating oil with NSF-H1 approval	0015-0038-000 / 2.5 litres	GEA Westfalia Separator genuineparts
WS-0129	High-pressure grease	0015-0129-010 / 0.4 kg Cartridge according to DIN 1284	GEA Westfalia Separator genuineparts
Assembly paste	Use for <ul style="list-style-type: none"> • Screwed connections • Toothing on the drive and driven shaft • All metallic joints 	0015-0104-080 / 500 g	GEA Westfalia Separator genuineparts

2.12 Preservatives

The centrifuge/bowl will get damaged if it is not operated for a prolonged period and inadequate preservation measures are taken. This also applies for the time before commissioning.

Refer to the instruction manual.

Designation	WS Part-No.	For the following parts use
Slushing oil	6969-0015-050	<ul style="list-style-type: none"> • Gear hub
Anti-corrosion wax	6969-0022-010	<ul style="list-style-type: none"> • Non-lacquered parts of the frame • Gear (outside) • Motors (outside)
Preserving oil	6969-0005-010	<ul style="list-style-type: none"> • Gear (inside) • Oil-lubricated bowl bearings



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The following are factory work instructions and paint material information used on all GEA Westfalia Separator Decanter Centrifuges.

The following documents are included:

- WSN 66 – 1000 – 25 Corrosion Protection
- WSN 66 – 0031 – 00 Coatings
- WSN 66 – 0002 – 00 SEEVENAX Primer
- WSN 66 – 0004 – 00 SEEVENAX Finish Coating



Corrosion protection

Decanters
Textured paint (DIN EN ISO 12944- 5: 2020-03/ C3)

WSN
66-1000-25
6 Sheets | Sheet 1

EN+DE

Standard paint:**Production plant Europe:**

No.	Decanter	Separator	Field of application	Category acc. ISO 12944-5	Coating system	WS- Norm
1	x		Indoor, solvent resistance	C3	Mank.Seevenax: Textured paint (Optional: Smooth paint)	WSN 66-1000-25
2	x		Outdoor, UV resistance	C3	Mank.Alexit: Textured paint	WSN 66-1000-26
3	x		Heavy Duty	C5	Hempel: Smooth paint	WSN 66-1000-30
4		x	Indoor, solvent resistance	C3	Mank.Seevenax: Textured paint	WSN 66-1200-00/-01; WSN 66-1300-05
5		x	Heavy Duty	C5	Hempel: Smooth paint	WSN 66-1200-00/-03; WSN 66-1300-07

Production plant India/China:

No.	Decanter	Separator	Field of application	Category acc. ISO 12944-5	Coating system	WS- Norm
6	x	x	Indoor, solvent resistance	C3	Akzo-Nobel: Textured paint	WSN 66-1000-35
7	x	x	Heavy Duty	C5	Akzo-Nobel: Smooth paint	WSN 66-1000-36

Paint variant 1. C3 textured paint (Mank.Seevenax) is described in this standard.

Application Area:

All project parts which require painting are painted in accordance with individual part drawings and the coating materials section. Specific drawing information or order text information may supplement the standard (e.g. surface)

Comparative paint system: DIN EN ISO 12944- 5/C3.05-EP (corrosivity category: C3; duration of protection: medium)

Observe general specifications in line with WSN66-1100-00.

Procedure:**- Machine whole part:**

- Depending on the storage, parts are machined before or after the application of the first layer.
 - ⇒ Apply temporary protection to machined surfaces if necessary
- Storage: must be protected from weather influences

Specialist Department Product Development - Customized Decanters

Worked:
19.10.20 C.Mumm

Checked:
19.10.20 V.Knospe

Standard Checked:
B.Wingefeld

GEA Westfalia Separator Group GmbH
Data Management
59302 Oelde, Germany

- Pre-treatment painting:

- Preparation of surface irregularities
 - Surface preparation according to DIN EN ISO 12944
 - Degree of preparation P1 (ISO 8501-3)
- Blast-clean of individual parts (not applicable for parts machined on all sides)
 - Degree of preparation SA 2 ½ (ISO 8501-1)
 - max. roughness depth approx.60µm (ISO surface roughness comparison pattern "G" segment 2, according to ISO 8503-1)
- Clean, degrease, apply phosphate conversion coating (phosphate conversion coating ISO 9717-Fe/Feph 0,2-0,6/T1)
- Apply filler and sand smooth, if necessary
 - Polyester filler Finalin/22 grey (WS mat. no. 6966-0292-040)
 - For castings, only fill coarse surface defects (bubbles, larger pores)
 - For welded parts, only fill coarse surface defects (very poor transitions between materials)
- Mask (cover and tape)
- Storage: must be protected from weather influences

- Painting:

Variant A:

Layer 1 is applied in one work step, followed by the machining and subsequent application of layers 2 and 3 in one work step.

Variant B:

First machining is completed, followed by the application of all layers in a one work step.

- **1 layer:**
 - Seevenax protective paint 112 (epoxy resin-based 2-component, WSN66-0033-00)
 - Thickness 80 µm dry layer
 - Variant A: colour RAL7037
 - Variant B: colour - suit to top coat
 - Treat small pores and small bubbles
- **2 layer:**
 - Seevenax protective paint 112 (epoxy resin-based 2-component, WSN66-0033-00)
 - Thickness 40 µm dry layer
 - Colour and RAL no. as per order
 - Treat small pores and small bubbles with paint roller
 - For metallic colours: use Seevenax top coat 110 (WSN66-00033-00) as mat finish instead
- **3 layer: (not applicable for smooth layer finish)**
 - Seevenax protective paint 112 (epoxy resin-based 2-component, WSN66-0033-00)
 - Coarse effect
 - Nozzle: 1,5 mm,
 - Air pressure 2,5-3 bar/material pressure 5bar
 - Necessary thickness to apply texture
 - Colour and RAL no. as per order
- **Requirements at special customer request:**

If stainless steel components are to be coated, they must be specified separately. The surfaces are lightly roughened and cleaned using ferrite-free abrasive by means of fine blasting. Dry film thickness DFT and total nominal film thickness NDFT are reduced by 50%.
- **Drying:**

After applying the final coat, the components are dried according to paint specifications.

- Post-processing:

- Remove masking
- Clean
- Preserve
- Storage: must be from protected weather influences

Final state:

- Total nominal dry film thickness NDFT with pre-treatment
 - **Nominal dry film thickness NDFT > 120 µm**

Documentation:

Depending on customer requirements, the tests and checks are recorded in a daily log as per WSN 66-1100-02.

6966-0295-000

SEEVENAX universal primer 7:1 (hazardous material)

1 Material description

SEEVENAX universal primer is a chromate-free two-component primer on an epoxy resin base. Through using selected corrosion inhibitors and the specially adapted epoxy resin - binding agent combination excellent anticorrosive and adhesive film properties are obtained on all types of metal including nonferrous heavy metals: aluminium, magnesium, sendzmir galvanised sheet metal and many plastics. Seevenax universal primer hardens to a firmly structured coating with excellent chemical and mechanical resistance. The surface is abrasion proof, elastic and resistant to knocks, impacts, chemicals and solvents.

SEEVENAX universal primer reliably and economically solves particularly difficult priming programs.

2 Fields of application

For all air- and -oven-drying paint systems that are exposed to extreme conditions.

For work pieces considered to be very difficult in terms of adhesion.

For objects exposed to water and steam for improved resistance, especially corrosion protection, tropicalisation as well as insensitivity to mechanical and chemical impact.

For objects which become very greasy and soiled during mechanical production. Since the firm structure prevents extreme oil fouling and soiling of the work pieces, cleaning is made much easier.

Separator frames

3 Colour

- green

4 Tinctorial power

- approx. 8 sq. meters(kg given a layer thickness of 30 im

5 Materials

Mother material	: SEEVENAX universal primer 7:1	6966-0295-000
Reaction component	: SEEVENAX hardner 125 oder 137	6966-0169-000
Thinner	: SEEVENAX thinner 71 oder 72	6966-0331-000

6 Preparation

SEEVENAX-universal primer is mixed with Seevenax hardener at a weight ratio of 7:1:

- 7 parts SEEVENAX universal primer
- 1 part SEEVENAX hardener

- Painting : 5-10% SEEVENAX thinner
- Compressed air spraying : 20-30% SEEVENAX thinner
- Spraying viscosity : approx 20 seconds
- Airless spraying : max. 20% SEEVENAX thinner
- Spraying viscosity : approx 30 minutes
- Pre-reaction time : approx 20 minutes

7 Potlife

- approx. 2 days

To adjust longer pottimes and for special applications additional hardener types are available (on special order)

8 Drying

During the drying phase, a room and object temperature of at least 15 - 20 °C is required.

- Air drying : fast to handling : approx. 2 hours
paintable : approx. 12 - 24 hours

- Heat and oven drying

after short heating,
e.g. 20 minutes at 30°C
or 10 minutes at 120°C.

9 Safety specifications

- SEEVENAX-universal primer
- SEEVENAX-hardener : flash point over 21°C
- SEEVENAX-thinner : hazard class A 11

10 Drum sizes

- SEEVENAX-universal primer: 10,5 kg, 21 kg net



A EXIT Top Coat

Fa. Mankiewicz

WSN
66-0031-00

8 Blätter Blatt 7

1 Introduction an Characteristics

ALEXIT-Strukturlack Z420 is an special two-component polyurethane based finish. To suit individual requirements, ALEXIT-Strukturlack Z420 can be sprayed from very fine to coarse finish, thus reducing surface preparation to a minimum.

EN

The curing process, which can be accelerated by increased temperatures, forms a coating with excellent properties. The coating is flexible and resistant to rubbing, scratching and also resistant to solvents, chemicals, water, refrigerants, hydraulic oils and cleaners.

ALEXIT-Strukturlack Z420 offers fast and economic coating. especially for large areas.

2 Range of Application

ALEXIT-Strukturlack Z420 is used as decorative coat for filling- and packing machines, textile machines, machine tools, instruments, electrical appliances and measuring instruments.

3 Colours

ALEXIT-Strukturlack Z420 is available in all colour shades for industrial series production.

4 Pre-treatment of ground material

Perfect adhesion can be obtained on almost all metals and many plastic materials when applying ALEXIT Z420 structured paint only. In case of especially severe adhesion requirements, it is recommended to begin with an extra adhesive, anti-corrosion ground paint, e.g. CELEROL reactive ground, SEEVENAX ground paints or ALEXIT grounding compounds.

5 Coverage

4 to 6 qm/kg dependent on the desired structural effect.

6 Sicherheitstechnische Daten

ALEXIT-Strukturlack Z420) Flammpunkt über 21°C
VbF "nicht unterstellt"

ALEXIT-Zusatz 459) VbF A II

ALEXIT-Verdünner 62) VbF A II

7 Trade-Name

Basic Material:

ALEXIT-Strukturlack Z420

Hardener:

ALEXIT-Zusatz 459

Thinner:

ALEXIT-Verdünner 62

8 Mixing-Ratio

4 parts by weight of:

ALEXIT-Strukturlack Z420

1 part by weight of:

ALEXIT-Zusatz 459

9 Application

One layer coating
(coarse finish)

Compressed air spraying:

without thinner

Two layer Coating
(fine structure)

1. Application:

as primer, colour-giving intermediate coat or smooth texture

Compressed air spraying:

approx. 20-30% thinner

Efflux time (DIN 53 211):

not measurable

Intermediate drying:

approx. 15 minutes

2. Application:

effect-giving final coat

Compressed air spraying:

without thinner



A EXIT Top Coat

Fa. Mankiewicz

WSN

66-0031-00

8 Blätter Blatt 8

Statusschlüssel (STS):
 1 = Gültiges Teil
 2 = Ersatzteil
 3 = Sonderteil
 4 = Ungültiges Teil

Effect variations:	fine texture	coarse texture
Nozzle Size:	1,2-1,5 mm	1,5--2,0 mm
Pressure:	3,5-4,5 bar	1,0-3,0 bar
Distance:	up to 25 cm (if necessary add approx. 5% Thinner)	up to 50 cm
10 Pot Life	Room temperature:	approx. 5 hours/hardener 459
11 Drying	Room temperature:	dust free : 20 to 30 minutes handable : 4 to 5 hours hard dry : 12 to 18 hours
	Oven drying:	After approx. 30 minutes for solvent evaporation time, 30 minutes - 80°C or 10 minutes - 100°C
12 Packages	ALEXIT-Strukturlack Z 420:	12kgs, 24 kgs net
	ALEXIT-Zusatz 459:	3 kgs, 6kgs net
	ALEXIT-Verdünner 62:	5kgs, 25kgs net

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Westfalia Separator AG Techn. Datenmanagement D-59302 Oelde	Bearbeitet: Ric 04.06.04	Geprüft: Schl 04.06.04	Genehmigt: Po	
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GEA		Seevenax-Coating lacquer		WSN	
		Make Mankiewicz		66-0004-00	
				4	Sheets Sheet 3
Line	Designation, size, perform	Material	QTY	Part number	
1	Coating lacquer-Seevenax green beige (hazardous material)	RAL 1000	1	6966-0585-000	
2	Coating lacquer-Seevenax sand yellow (hazardous material)	RAL 1002	1	6966-0585-010	
3	Coating lacquer-Seevenax signal yellow (hazardous material)	RAL 1003	3	6966-0585-520	
4	Coating lacquer-Seevenax golden yellow (hazardous material)	RAL 1004	1	6966-0585-020	
5	Coating lacquer-Seevenax maize-yellow (hazardous material)	RAL 1006	1	6966-0585-030	
6	Coating lacquer-Seevenax citron yellow (hazardous material)	RAL 1012	1	6966-0585-040	
7	Coating lacquer-Seevenax pearl white (hazardous material)	RAL 1013	1	6966-0017-000	
8	Coating lacquer-Seevenax ivory (hazardous material)	RAL 1014	1	6966-0585-050	
9	Coating lacquer-Seevenax light ivory (hazardous material)	RAL 1015	1	6966-0585-060	
10	Coating lacquer-Seevenax cadmium yellow (hazardous material)	RAL 1021	1	6966-0585-070	
11	Coating lacquer-Seevenax yellow ochre (hazardous material)	RAL 1024	1	6966-0585-080	
12	Coating lacquer-Seevenax melon yellow (hazardous material)	RAL 1028	1	6966-0585-480	
13	Coating lacquer-Seevenax yellow orange (hazardous material)	RAL 2000	1	6966-0585-090	
14	Coating lacquer-Seevenax light red orange (hazardous material)	RAL 2008	1	6966-0585-110	
15	Coating lacquer-Seevenax flame red (hazardous material)	RAL 3000	1	6966-0585-120	
16	Coating lacquer-Seevenax crimson (hazardous material)	RAL 3002	1	6966-0585-130	
17	Coating lacquer-Seevenax oxide red (hazardous material)	RAL 3009	1	6966-0585-140	
18	Coating lacquer-Seevenax reddish brown (hazardous material)	RAL 3016	3	6966-0016-000	
19	Coating lacquer-Seevenax blue violet (hazardous material)	RAL 5000	3	6966-0585-530	
20	Coating lacquer-Seevenax ultra marine blue (hazardous material)	RAL 5002	1	6966-0585-540	
21	Coating lacquer-Seevenax brilliant blue (hazardous material)	RAL 5007	1	6966-0585-150	
22	Coating lacquer-Seevenax azure (hazardous material)	RAL 5009	3	6966-0585-490	
23	Coating lacquer-Seevenax enzian blue (hazardous material)	RAL 5010	1	6966-0585-160	
24	Coating lacquer-Seevenax light blue (hazardous material)	RAL 5012	1	6966-0585-170	
25	Coating lacquer-Seevenax sky blue (hazardous material)	RAL 5015	1	6966-0585-180	
26	Coating lacquer-Seevenax traffic blue (hazardous material)	RAL 5017	3	6966-0585-510	
27	Coating lacquer-Seevenax turquoise blue (hazardous material)	RAL 5018	1	6966-0585-190	
28	Coating lacquer-Seevenax Capri blue (hazardous material)	RAL 5019	3	6966-0585-500	
29	Coating lacquer-Seevenax patina green (hazardous material)	RAL 6000	1	6966-0585-220	
30	Coating lacquer-Seevenax emerald green (hazardous material)	RAL 6001	1	6966-0585-230	
31	Coating lacquer-Seevenax leaf green (hazardous material)	RAL 6002	1	6966-0585-240	
32	Coating lacquer-Seevenax moss green (hazardous material)	RAL 6005	1	6966-0585-250	
33	Coating lacquer-Seevenax grass green (hazardous material)	RAL 6010	1	6966-0585-260	
34	Coating lacquer-Seevenax reseda (hazardous material)	RAL 6011	1	6966-0007-100	
35	Coating lacquer-Seevenax reed green (hazardous material)	RAL 6013	1	6966-0585-100	
36	Coating lacquer-Seevenax olive yellow (hazardous material)			6966-0585-270	
37	Coating lacquer-Seevenax May green (hazardous material)			6966-0585-280	
38	Coating lacquer-Seevenax yellow-green (hazardous material)			6966-0585-210	
39	Coating lacquer-Seevenax pastel green (hazardous material)	RAL 6019	1	6966-0585-200	
40	Coating lacquer-Seevenax pale green (hazardous material)	RAL 6021	1	6966-0585-290	
41	Coating lacquer-Seevenax opal green (hazardous material)	RAL 6026	1	6966-0585-550	
42	Decklack-Seevenax light green (Gefahrgut)	RAL 6027	1	6966-0585-310	

DECANTER COLOR



Seevenax-Decklacke

Fabr. Mankiewicz

WSN

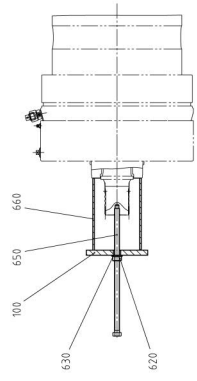
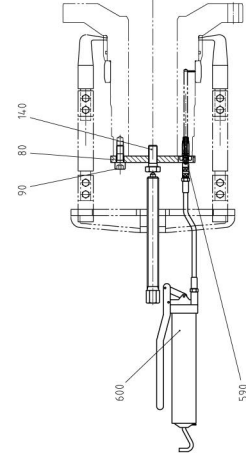
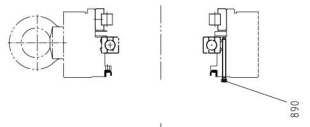
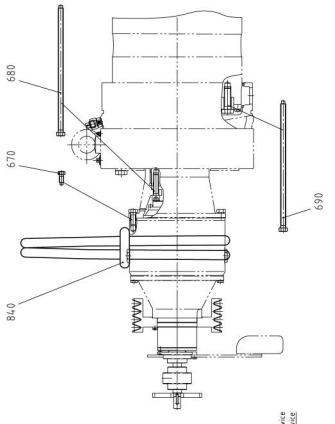
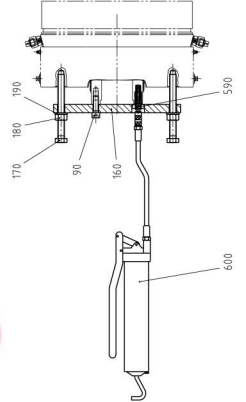
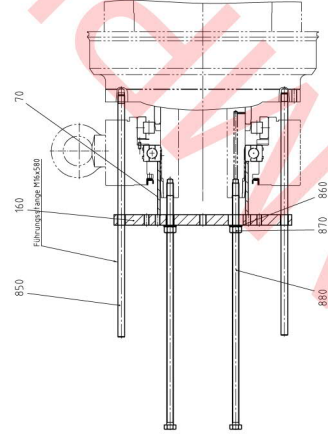
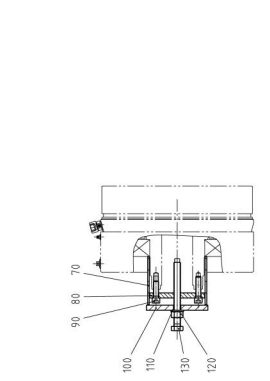
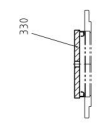
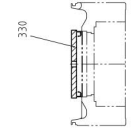
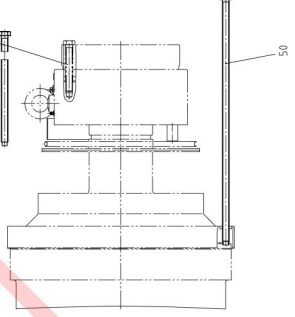
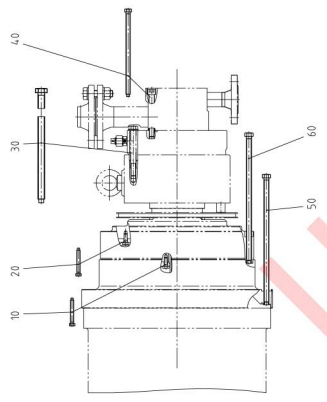
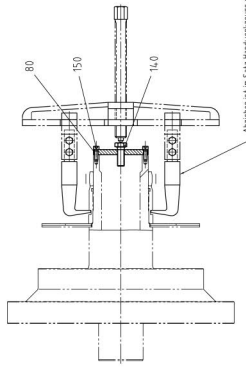
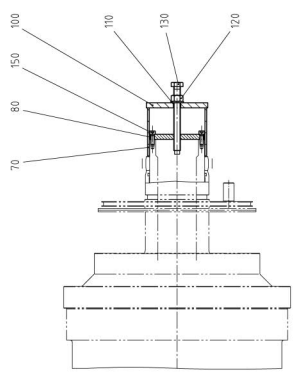
66-0004-00

4 Sheets | Sheet 4

Zelle	Designation, size, perform	Material	Stk	Part number
1	Coating lacquer-Seevenax squirrel grey (hazardous material)	RAL 7000	1	6966-0585-320
2	Coating lacquer-Seevenax silver grey (hazardous material)	RAL 7001	1	6966-0585-330
3	Coating lacquer-Seevenax olive green (hazardous material)	RAL 7002	1	6966-0585-340
4	Coating lacquer-Seevenax moss green (hazardous material)	RAL 7003	1	6966-0585-350
5	Coating lacquer-Seevenax mouse grey (hazardous material)	RAL 7005	1	6966-0585-360
6	Coating lacquer-Seevenax reseda green (hazardous material)	RAL 6011	1	6966-0007-110
7	Coating lacquer-Seevenax iron grey (hazardous material)	RAL 7011	1	6966-0176-040
8	Coating lacquer-Seevenax stone grey (hazardous material)	RAL 7030	1	6966-0585-370
9	Coating lacquer-Seevenax bluish grey (hazardous material)	RAL 7031	1	6966-0585-380
10	Coating lacquer-Seevenax pebble grey (hazardous material)	RAL 7032	1	6966-0585-300
11	Coating lacquer-Seevenax cement grey (hazardous material)	RAL 7033	1	6966-0585-390
12	Coating lacquer-Seevenax light grey (hazardous material)	RAL 7035	1	6966-0585-400
13	Coating lacquer-Seevenax platinum grey (hazardous material)	RAL 7036	1	6966-0585-410
14	Coating lacquer-Seevenax agate grey (hazardous material)	RAL 7038	1	6966-0585-420
15	Coating lacquer-Seevenax ochre brown (hazardous material)	RAL 8001	1	6966-0585-430
16	Coating lacquer-Seevenax clay brown (hazardous material)		1	6966-0585-440
17	Coating lacquer-Seevenax fawn brown (hazardous material)		1	6966-0585-450
18	Coating lacquer-Seevenax nut brown (hazardous material)	RAL 8011	1	6966-0585-460
19	Coating lacquer-Seevenax orange brown (hazardous material)	RAL 8023	1	6966-0585-470
20	Coating lacquer-Seevenax black (hazardous material)	RAL 9005	1	6965-0249-010
21	Coating lacquer-Seevenax white (hazardous material)	RAL 9010	1	6966-0292-010
22				
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MOTOR COLOR

Westfalia Separator AG Standardization D-59302 Oelde	Worked: 07.01.2002 Mu	Checked: 07.01.2002 Schl	Standard Checked: Po
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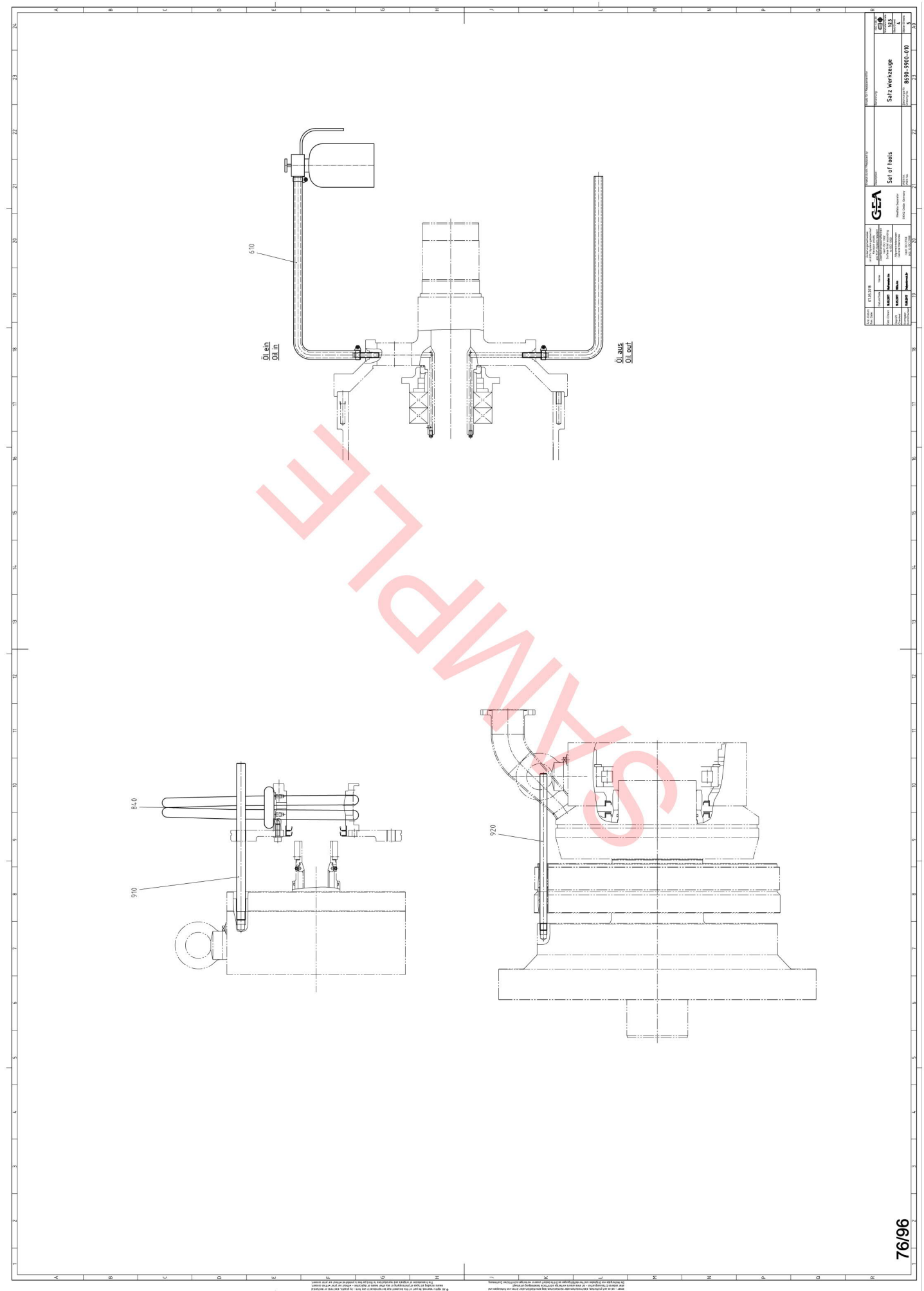


10: Transport
für Filterelement

710
720
730
Für Service
des Service

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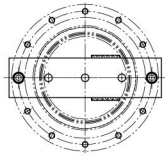
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Produktfamilie	Handwerkzeuge
Produktlinie	Handwerkzeuge
Produktversion	Handwerkzeuge
Produktzustand	Handwerkzeuge
Produktmaterial	Handwerkzeuge
Produktfarbe	Handwerkzeuge
Produktgröße	Handwerkzeuge
Produktgewicht	Handwerkzeuge
Produktlänge	Handwerkzeuge
Produktbreite	Handwerkzeuge
Produkthöhe	Handwerkzeuge
Produktvolumen	Handwerkzeuge
Produktfläche	Handwerkzeuge
Produktumfang	Handwerkzeuge
Produktbeschreibung	Handwerkzeuge
Produktanwendung	Handwerkzeuge
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Produktanmerkungen	Handwerkzeuge



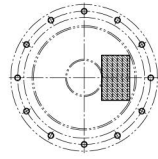
SKIDMOUNTED

GEA		GEA	
Product Name	Oil Separator	Product Name	Oil Separator
Part Number	610-9900-310	Part Number	610-9900-310
Revision	1.0	Revision	1.0
Author	...	Author	...
Checker	...	Checker	...
Approver	...	Approver	...
Customer	...	Customer	...
Material	...	Material	...
Quantity	...	Quantity	...
Unit	...	Unit	...
Weight	...	Weight	...
Volume	...	Volume	...
Notes	...	Notes	...

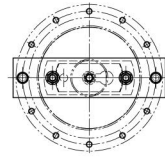
Montage Verteiler
Assembly distributor



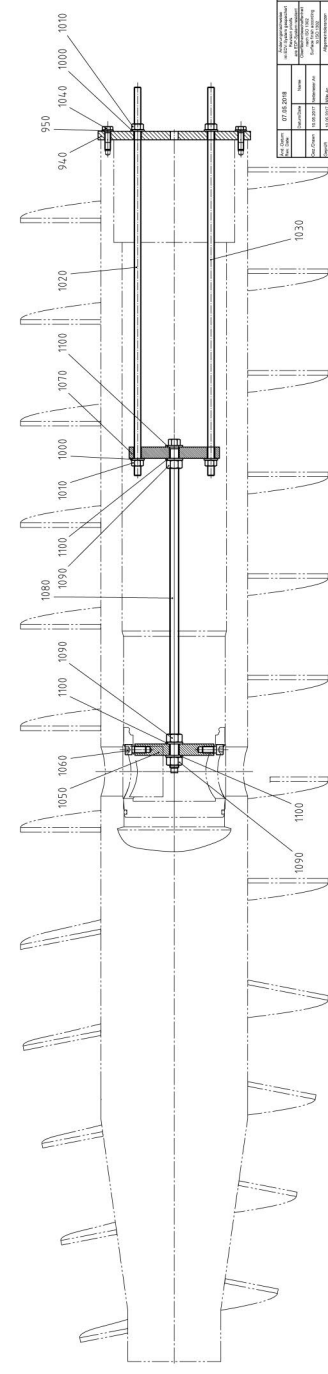
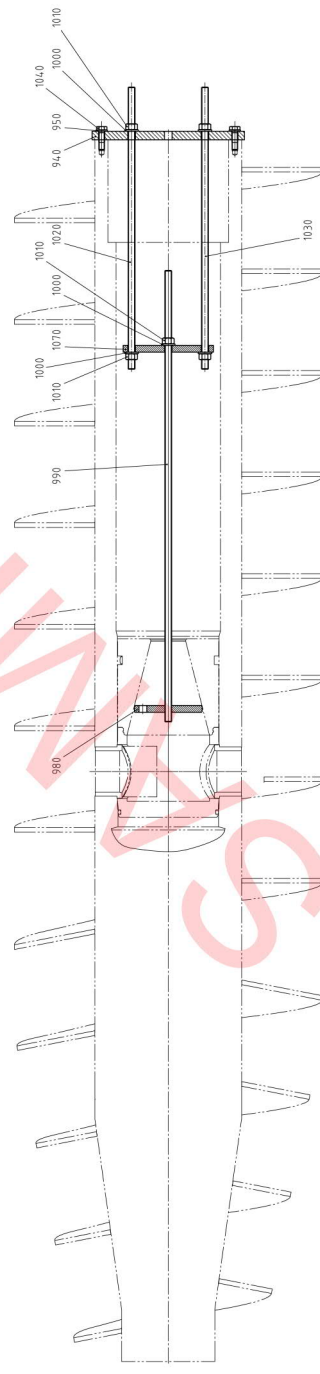
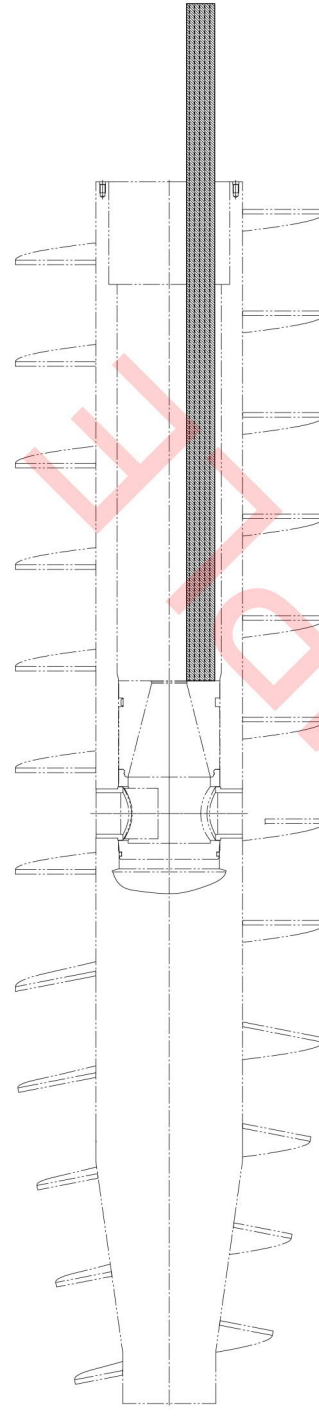
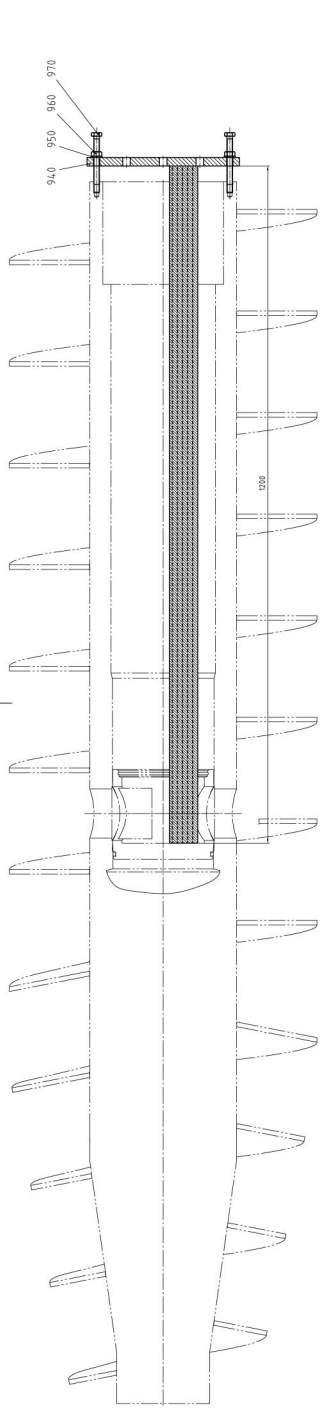
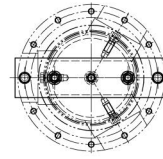
Montage Verteilerdeckel
Assembly distributor cover



Demontage Verteilerdeckel
Disassembly distributor cover



Demontage Verteiler
Disassembly distributor



Produktname Satz Verteilung	Teilnummer 9900-900-010
Zeichnung Satz Verteilung	Blattnummer 1
Datum 07.05.2018	Zeichnungsart 3D
Gezeichnet ...	Geprüft ...
Freigegeben ...	Freigegeben ...

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0019-5199-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
20	0019-5190-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
30	0019-5238-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
40	0019-5238-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
50	0019-0365-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
60	0019-5238-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
70	8419-9868-040	1		HUELSE SLEEVE DOUILLE	✓	
80	8419-9939-120	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
90	0019-6206-150	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
100	8420-9939-100	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
110	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
120	0013-0005-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
130	0019-1237-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
140	0019-7105-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

78/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
150	0019-6145-400	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
160	8419-9939-110	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
170	0019-6238-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
180	0013-0282-400	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
190	0026-1335-400	4		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
200	8419-9868-050	1		HUELSE SLEEVE DOUILLE	✓	
210	0019-8118-178	1	m	GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
220	0019-7041-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
230	0019-8118-178	1	m	GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
240	8420-9939-140	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
250	0019-7106-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
260	8419-9910-010	1		AUSHEBEVORRICHTUNG VOLLST. LIFTING DEVICE CPL. DISPOSITIF A ENLEVER, COMPLET	✓	
270	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
280	0026-2781-030	2		SCHAEKEL SHACKLE MANILLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

79/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
290	6968-0950-380	2		RUNDSCHLINGE ROUND SLING LACET ROND	✓	
300	8419-9910-000	1		AUSHEBEVORRICHTUNG VOLLST. LIFTING DEVICE CPL. DISPOSITIF A ENLEVER, COMPLET	✓	
310	0019-0365-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
320	0013-0005-400	1		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
330	8419-9939-160	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
340	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
350	8419-9939-150	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
360	8419-9868-060	1		HUELSE SLEEVE DOUILLE	✓	
370	0013-0279-400	6		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
380	0019-5180-150	6		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
390	0026-1348-400	6		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
400	0019-7105-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
410	0019-0365-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
420	8419-9939-080	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

80/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
430	0019-5190-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
440	0019-5211-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
450	0013-0280-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
460	0026-1371-400	3		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
470	8419-9939-170	1		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
480	0019-5238-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
490	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
500	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
510	0013-0278-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
520	0026-1345-400	2		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
530	0019-8144-300	2		GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
540	8419-9868-020	3		HUELSE SLEEVE DOUILLE	✓	
550	0026-1371-400	3		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
560	0013-0280-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

81/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
570	0019-0428-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
580	0019-5224-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
590	8419-9912-000	1		ADAPTER VOLLST. ADAPTOR, COMPLETE ADAPTATEUR, COMPLETE	✓	
600	0003-0429-000	1		HOCHDRUCK-HANDHEBELPRESSE HIGH-PRESSURE HAND-LEVER PRESS POMPE MANUELLE HAUTE PRESSION	✓	
	0003-0429-010	1		HOECHSTDRUCKSCHLAUCH MAXIMUM PRESSURE HOSE TUYAU SOUPLE TRES HAUTE PRESSION	✓	
610	8410-9979-000	1		FUELVORRICHTUNG VOLLST. FILLING DEVICE, COMPL. DISPOSITIF DE REMPLISSAGE, COMPL.	✓	85
620	0013-0005-400	1		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
630	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
640	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
650	0019-0365-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
660	8419-9868-000	1		HUEELSE SLEEVE DOUILLE	✓	
670	0019-5219-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
680	0019-5219-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
690	0019-5220-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

82/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
700	0019-8920-030	1		VERSCHLUSSSCHRAUBE SCREW PLUG	✓	
710	0018-8636-030	1		BOUCHON DE FERMETURE VERSCHLUSSSTUTZEN CLOSING CONNECTING PIECE RACCORD DE FERMETURE	✓	
720	0018-3200-400	1		VERSCHLUSSKEGEL MALE CONNECTING NIPPLE CONE D'OBTURATION	✓	
730	0013-2001-400	1		UEBERWURFMUTTER COUPLING NUT	✓	
740	0019-7039-150	3		ECROU DE RACCORD SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
750	0019-5250-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
760	0013-0280-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
770	0026-1371-400	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
780	8419-9939-100	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
790	8419-9939-130	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
800	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
810	0013-0005-400	1		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
820	0019-1237-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
830	8419-9939-140	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

83/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
850	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
860	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
870	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
880	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
890	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
900	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
910	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
920	8174-9965-010	2		GEWINDESPINDEL THREADED SPINDLE TIGE FILETEE	✓	
930	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

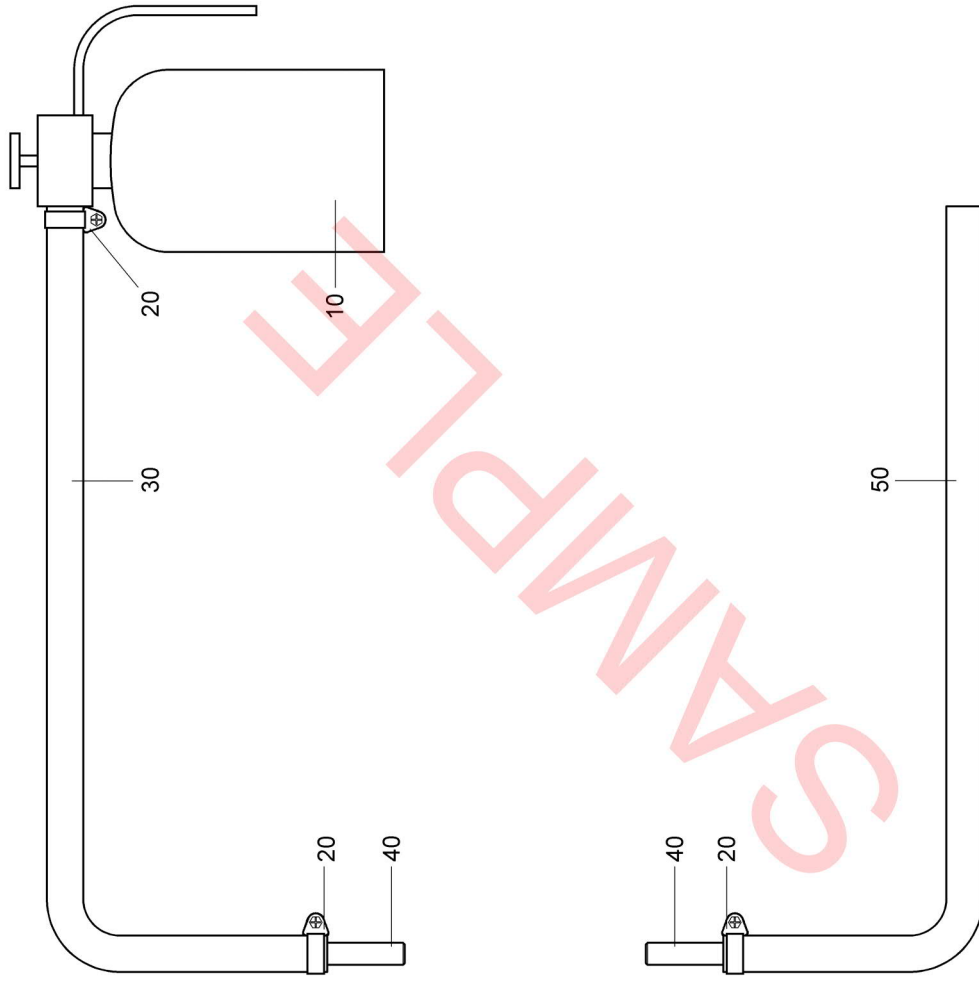
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

84/96



Rev. : *

Datum: 14.10.2020

Zeichnungs-Nr.: 8410-4759-091

Blatt 1

1 Blätter

Baugruppe / Component group

8410-9979-000

FUELLVORRICHTUNG VOLLST.
FILLING DEVICE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0003-0635-800	1		DRUCKSPRUEHGERAET PRESSURE SPRAY DEVICE	✓	
20	0018-3668-310	3		DISPOSITIF D'ARROSAGE SOUS PRESSION SCHLAUCHSCHELLE HOSE CLIP COLLIER A FLEXIBLE	✓	
30	0018-4861-828	1,2	m	SCHLAUCH HOSE TUYAU SOUPLE	✓	
40	8410-9916-000	2		GEWINDESTUECK THREADED PIECE PIECE FILETEE	✓	
50	0018-4861-828	1,2	m	SCHLAUCH HOSE TUYAU SOUPLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

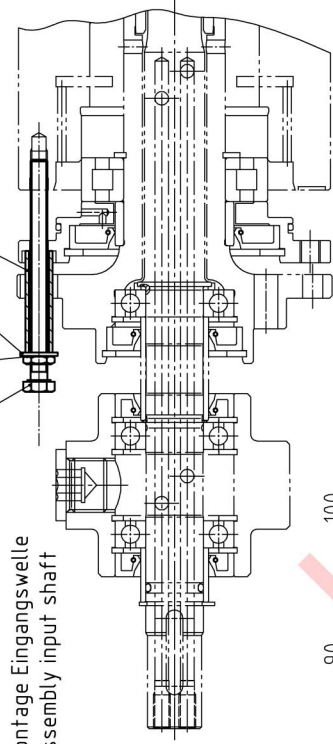
Ausgabe / Edition

15.06.2021

Seite/Page

86/96

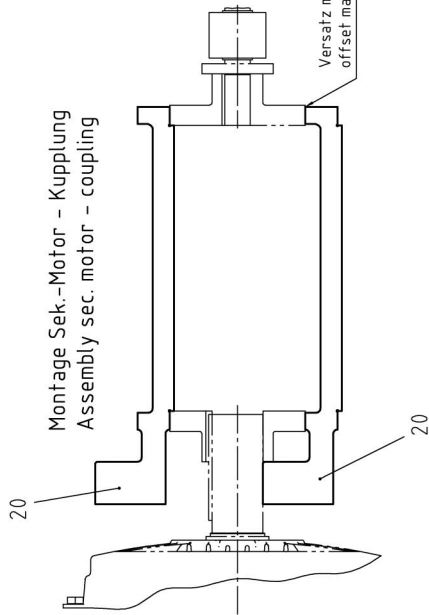
Montage Eingangswelle
Assembly input shaft



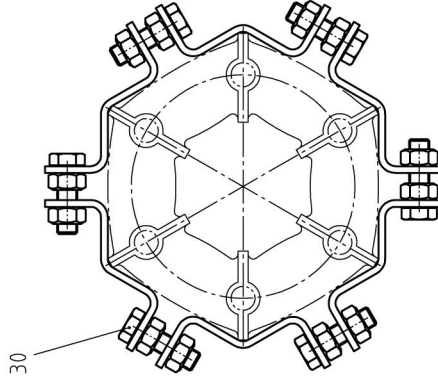
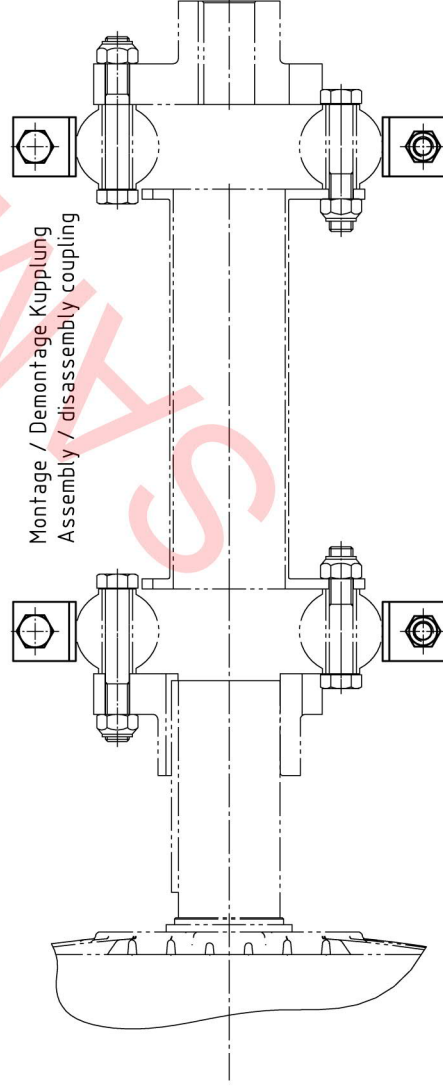
Montage Dichttring
Assembly gasket



Montage Sek.-Motor - Kupplung
Assembly sec. motor - coupling



Montage / Demontage Kupplung
Assembly / disassembly coupling



04.12.2015 Datum/Date		04.12.2015 Datum/Date		04.12.2015 Datum/Date		04.12.2015 Datum/Date		04.12.2015 Datum/Date		04.12.2015 Datum/Date	
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nach ISO 2768 Allgemeine Toleranzen General tolerances		nach ISO 2768 Allgemeine Toleranzen General tolerances		nach ISO 2768 Allgemeine Toleranzen General tolerances		nach ISO 2768 Allgemeine Toleranzen General tolerances		nach ISO 2768 Allgemeine Toleranzen General tolerances		nach ISO 2768 Allgemeine Toleranzen General tolerances	
59302 Oelsb., Germany Werkstück Separator		59302 Oelsb., Germany Werkstück Separator		59302 Oelsb., Germany Werkstück Separator		59302 Oelsb., Germany Werkstück Separator		59302 Oelsb., Germany Werkstück Separator		59302 Oelsb., Germany Werkstück Separator	
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Beschreibung		Beschreibung		Beschreibung		Beschreibung		Beschreibung		Beschreibung	
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8657-9900-030		8657-9900-030		8657-9900-030		8657-9900-030		8657-9900-030		8657-9900-030	
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Baugruppe / Component group

8657-9900-060

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
20	8657-9453-010	1		BLECH SHEET METAL TOLE	✓	
30	8656-9932-000	2		HALTER VOLLST. HOLDER, COMPL. SUPPORT, COMPLETE	✓	89
40	8657-9473-010	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
50	0019-6854-300	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
60	0013-0276-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
70	0026-1382-400	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
80	0018-4787-400	2		ROHR PIPE TUBE	✓	
90	0019-6581-400	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
100	8657-9473-100	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

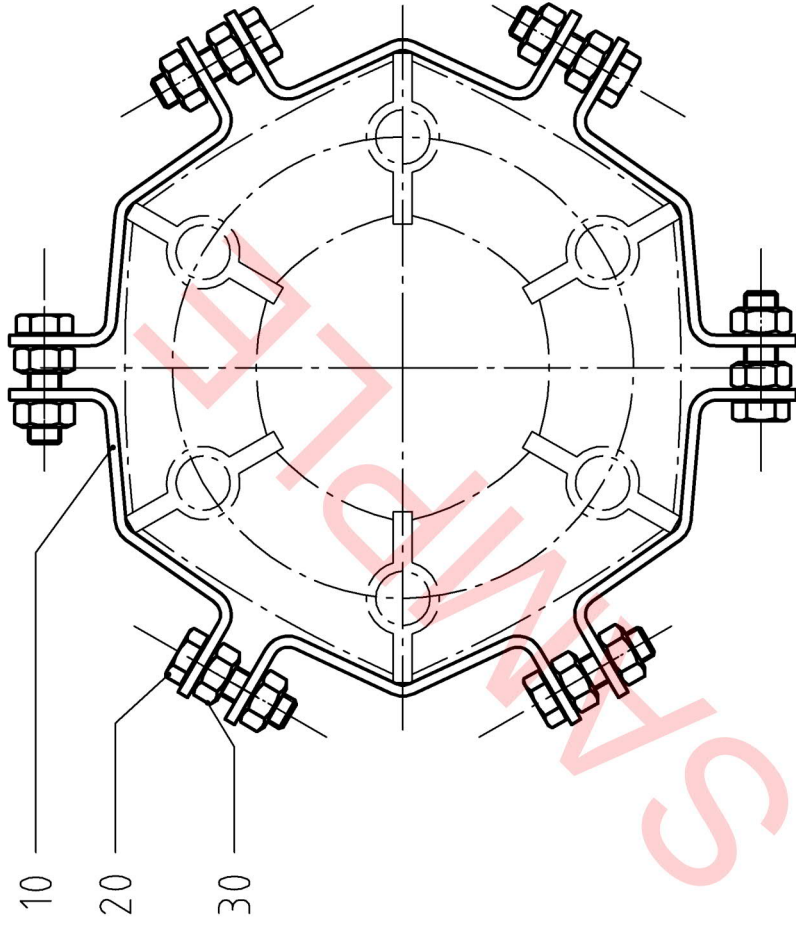
15.06.2021

Seite/Page

88/96

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Änd.-Datum: Rev. Date:			Ersetzt durch:/ Replaced by:		Ersatz für:/ Replacement for:	
	Datum/Date	Name	Description:		Benennung:	
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Geprüft Checked	25.04.2012	Neubauer, Rl	Änderungsnachweise im EDV-System gespeichert Revision proofs are EDP-System resident Oberflächenbeschaffenheit nach ISO 1302 Surface finish according to ISO 1302		ISO 128-30 Maßstab/Scale 1:2.5 Blatt/Sheet	
Normgepr. Normchecked	26.04.2012	Sindermann, Co	Allgemeintoleranzen General tolerances mk nach ISO 2768 acc. to ISO 2768		Zeichnungs-Nr. Drawing No.	
			Westfalia Separator 59302 Oelde, Germany		8657-9932-000	
					Blätter/Sheets 1	

Baugruppe / Component group

8656-9932-000

HALTER VOLLST.
HOLDER, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	8656-9931-000	12		HALTER HOLDER SUPPORT	✓	
20	0019-6972-150	12		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
30	0013-0280-400	24		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

90/96

Für diese Baugruppe gibt es keine Zeichnung

No drawing is available for this assembly

Baugruppe / Component group

8419-9900-020

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0003-0534-000	1		KEILRIEMEN-VORSPANNUNGS-MESSGERAET BELT TENSION METERING DEVICE MESUREUR DE TENSION DES COURROIES	✓	
20	6986-0417-110	1		SATZ SECHSKANTSCHRAUBENDREHER SET OF ALLEN WRENCHES JEU DE TOURNEVIS HEXAGONAUX	✓	
40	6986-0408-000	1		SATZ DOPPELMAULSCHLUESSEL SET OF DOUBLE-ENDED WRENCHES JEU DE CLES DOUBLES	✓	
50	0003-4221-320	1		EINMAULSCHLUESSEL SINGLE-ENDED WRENCH CLE SIMPLE	✓	
60	0003-0085-320	1		EINMAULSCHLUESSEL SINGLE-ENDED WRENCH CLE SIMPLE	✓	
70	0003-4204-320	1		DOPPELMAULSCHLUESSEL DOUBLE-ENDED WRENCH CLE DOUBLE	✓	
80	0003-0485-320	1		SCHLUESSEL WRENCH CLE	✓	
90	0003-0604-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
100	0003-0601-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
110	0003-0602-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
120	0003-0603-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
130	0003-0428-320	1		STECKSCHLUESSELEINSATZ SOCKET FOR WRENCHES ADAPTATEUR POUR CLE A DOUILLE	✓	
140	0003-0784-000	1		SATZ DREHMOMENTSCHLUESSEL SET OF TORQUE WRENCH JEU DE CLÉS DYNAMOMÉTRIQUES	✓	
150	0003-0515-030	1		ABZIEHER PULLER EXTRACTEUR	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

92/96

Baugruppe / Component group

8419-9900-020

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
160	0003-0641-000	1		SICHERUNGSRINGZANGE SECURING RING PLIERS PINCÉ POUR CIRCLIPS	✓	
170	0003-0429-000	1		HOCHDRUCK-HANDHEBELPRESSE HIGH-PRESSURE HAND-LEVER PRESS POMPE MANUELLE HAUTE PRESSION	✓	
180	0003-3845-000	1		GELENKHAKENSCHLUESSEL PIVOTED HOOK WRENCH CLE A CROCHET ARTICULE	✓	
190	0003-3846-000	1		GELENKHAKENSCHLUESSEL PIVOTED HOOK WRENCH CLE A CROCHET ARTICULE	✓	
200	0003-4636-050	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
210	0003-4640-050	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
220	6986-0400-030	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
230	6986-0400-470	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
240	6986-0900-100	1		WERKZEUGKASTEN TOOL BOX COFFRET A OUTILS	✓	
250	6986-0451-910	1		ECKROHRZANGE CORNER WORK PIPE WRENCH TENAILLES A TUYAUX A ENCOIGNURES	✓	
260	0003-0575-000	1		SPLINTTREIBER PIN PUNCH CHASSE-GOUPILLE	✓	
280	6986-0119-120	1		MESSER KNIFE COUTEAU	✓	
290	6986-0390-500	1		SEITENSCHNEIDER SIDE CUTTING PLIERS PINCÉ COUPANTE DIAGONALE	✓	
300	6986-0165-100	1		HAMMER HAMMER MARTEAU	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

93/96

Baugruppe / Component group

8419-9900-020

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer Part-No.	M Qty.	ME Unit	Benennung Designation	ETS	Seite Page
330	0003-4205-320	1		DOPPELMAULSCHLUESSEL DOUBLE-ENDED WRENCH CLE DOUBLE	✓	
340	0003-0482-320	1		SCHLUESSEL WRENCH CLE	✓	

ELBAWAS

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

94/96

Baugruppe / Component group

9390-0014-589

SATZ ERSATZTEILE I
SET OF SPARE PARTS I

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0019-9421-400	12		SENKSCHRAUBE COUNTERSUNK SCREW	✓	
20	0007-2966-750	1		VIS NOYEE DICHTRING GASKET	✓	
30	0007-2924-830	2		DICHTRING GASKET	✓	
40	0007-2926-830	2		DICHTRING GASKET	✓	
50	0007-3619-750	1		DICHTRING GASKET	✓	

Additional Spares:

60	0021-3969-810	1		SET OF NARROW V-BELTS
70	0015-0038-000	1		LUBRICATING OIL FOR GEARBOX (2.5L)
80	0005-0868-050	1		SPEED SENSOR

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

Trommel-Nr. / Bowl s/n

Ausgabe / Edition

15.06.2021

Seite/Page



Ersatzteilkatalog / Spare Parts Catalog

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Serial number of machine

Trommel-Nr. / Serial number of bowl

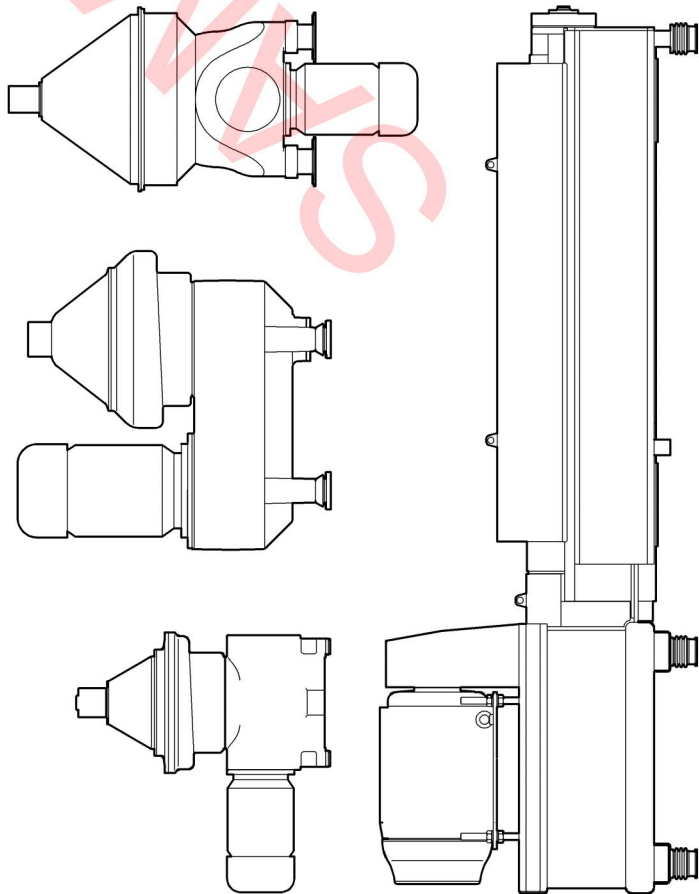
Auftrags-Nr. / Order number




Ausgabe / Edition

15.06.2021

GEA Germany

GEA Westfalia Separator Group GmbH
Werner-Habig-Str. 1, D 59302 Oelde
Phone +49 2522 77-0, Fax +49 2522 77-2488
www.gea.com



ETS	Ersatzteilschlüssel / Spare part code
	Teil oder Baugruppe lieferbar Part or assembly available
	Teil oder Baugruppe bedingt lieferbar. Rücksprache mit dem Herstellerwerk nehmen. Part or assembly available to a limited extent. Contact manufacturer.
	Teil oder Baugruppe in dieser Fertigungsstufe nicht lieferbar. Part or assembly not available in this manufacturing stage.

SAMPLE

Baugruppe / Component group

2451178231_02

KLAER-DEKANTER WATERMASTER CF 7000
CLARIFYING DECANTER

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	2451178231			KLAER-DEKANTER WATERMASTER CF 7000		5
				CLARIFYING DECANTER		
				DECANTEUR CLARIFICATEUR		

ETBWAYS

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

4/96

SAMPLE

Baugruppe / Component group

2451178231

KLAER-DEKANTER WATERMASTER CF 7000
CLARIFYING DECANTER

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	9987-0503-193			KLAER-DEKANTER WATERMASTER CF 7000		
1335	8419-1335-040	1		CLARIFYING DECANTER DECANTEUR CLARIFICATEUR	✓	8
				SCHMIERSTOFFE VOLLST. LUBRICANTS, COMPLETE LUBRIFIANTS, COMPL.		
1100	8419-1100-110	1		GESTELL VOLLST. FRAME, COMPL. BATI, COMPLET	✓	10
6600	8419-6600-110	1		TROMMEL VOLLST. BOWL, COMPL. BOL, COMPLET	?	17
6539	8419-6539-040	1		SCHNECKE VOLLST. SCROLL, COMPL. VIS TRANSPORTEUSE, COMPLETE	✓	34
3351	8419-3351-100	1		RIEMENANTRIEB VOLLST. BELT DRIVE, COMPL. ENTRAINEMENT PAR COURROIES, COMPLET	✓	41
2297	8419-2297-130	1		SCHLEUDERGUTZULEITUNG VOLLST. PRODUCT FEED LINE, COMPL. CONDUITE D'ALIMENTATION PRODUIT,CPL	✓	65
3243	8419-3243-080	1		DREHZAHNINITIATOR VOLLST. SPEED SENSOR, COMPL. DETECTEUR DE PROXIMITE POUR VITESSE	✓	67
3292	8690-3292-000	1		TEMPERATURFUEHLER VOLLST. TEMPERATURE FEELER, CPL. SONDE DE TEMPERATURE, COMPLETE	✓	69
3297	8419-3297-020	1		SCHWINGUNGSANFUEHMER VOLLST. VIBRATION PICK-UP, COMPL. ENREGISTREUR DES VIBRATIONS, CPL.	✓	71
9900	8419-9900-030	1		SATZ WERKZEUGE SET OF TOOLS JEU D'OUTILS	✓	73
9900	8657-9900-060	1		SATZ WERKZEUGE SET OF TOOLS JEU D'OUTILS	✓	87
9900	8419-9900-020	1		SATZ WERKZEUGE SET OF TOOLS JEU D'OUTILS	✓	91
6669	8419-6669-210	3		REGULIERPLATTE REGULATING PLATE PLAQUE DE REGLAGE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

6/96

Baugruppe / Component group

2451178231

KLAER-DEKANTER WATERMASTER CF 7000
CLARIFYING DECANter

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
6669	8419-6669-220	3		REGULIERPLATTE REGULATING PLATE PLAQUE DE REGLAGE	✓	
0038	0015-0038-000	1		SCHMIEROEL LUBRICATING OIL HUILE DE GRAISSAGE	✓	
0014	9390-0014-589	1		SATZ ERSATZTEILE I SET OF SPARE PARTS I JEU DE PIECES DE RECHANGE I	✓	95
9001	8419-9001-300	1		BETRIEBSANLEITUNG INSTRUCTION MANUAL LIVRET D'INSTRUCTIONS	✓	
9001	8175-9001-032	1		BETRIEBSANLEITUNG EN INSTRUCTION MANUAL EN LIVRET D'INSTRUCTIONS EN	✓	
1130	8419-3010-061	1		SCHMIERPLAN LUBRICATION CHART PLAN DE GRAISSAGE		
1150	8419-4100-160	1		MASSBLATT DIMENSIONED DRAWING		
1151	8690-4100-000	1		MASSBLATT DIMENSIONED DRAWING		
	XP316323-9905-PID0 01	1		S1459316323-9905-PID001		
1180	8419-9056-090	1		DREHZAHLTABELLE SPEED TABLE		
	8419-9088-000	1		EINSTELLWERTE DEKANTER SETTINGS DECANter		
1190	8419-9088-000	1		EINSTELLWERTE DEKANTER SETTINGS DECANter		

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

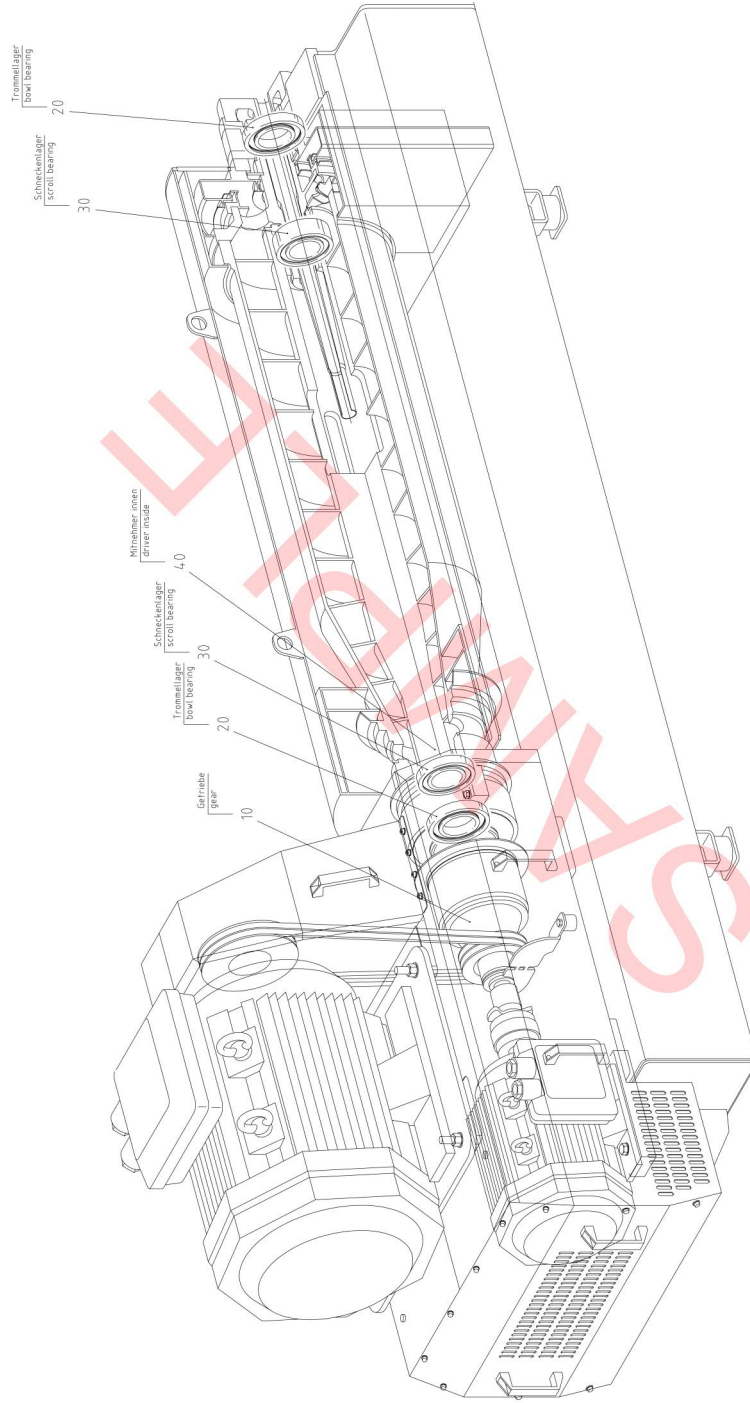
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

7/96



GEA GEORGES BRUNNEN Industriemaschinen 42699 Solingen Telefon: +49 (0) 212 2400-0 Telefax: +49 (0) 212 2400-240 E-Mail: g@gea.de www.gea.de	Schmierstoffe v. Lubricant compl. Schmierstoffe v. Lubricant compl.

Baugruppe / Component group

8419-1335-040

SCHMIERSTOFFE VOLLST.
LUBRICANTS, COMPLETE

Pos.	Teil-Nummer Part-No.	M Qty.	ME Unit	Benennung Designation	ETS	Seite Page
10	0015-0038-000	4		SCHMIEROEL LUBRICATING OIL HUILE DE GRAISSAGE	✓	
20	0015-0036-000	1		SCHMIEROEL LUBRICATING OIL HUILE DE GRAISSAGE	✓	
30	0015-0129-010	3		WELZLAGERFETT ROLLING BEARING GREASE GRAISSE A ROULEMENTS	✓	
40	0015-0104-080	1		SCHMIERFETT LUBRICATING GREASE - TSCA Compliant GRAISSE LUBRIFIANTE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

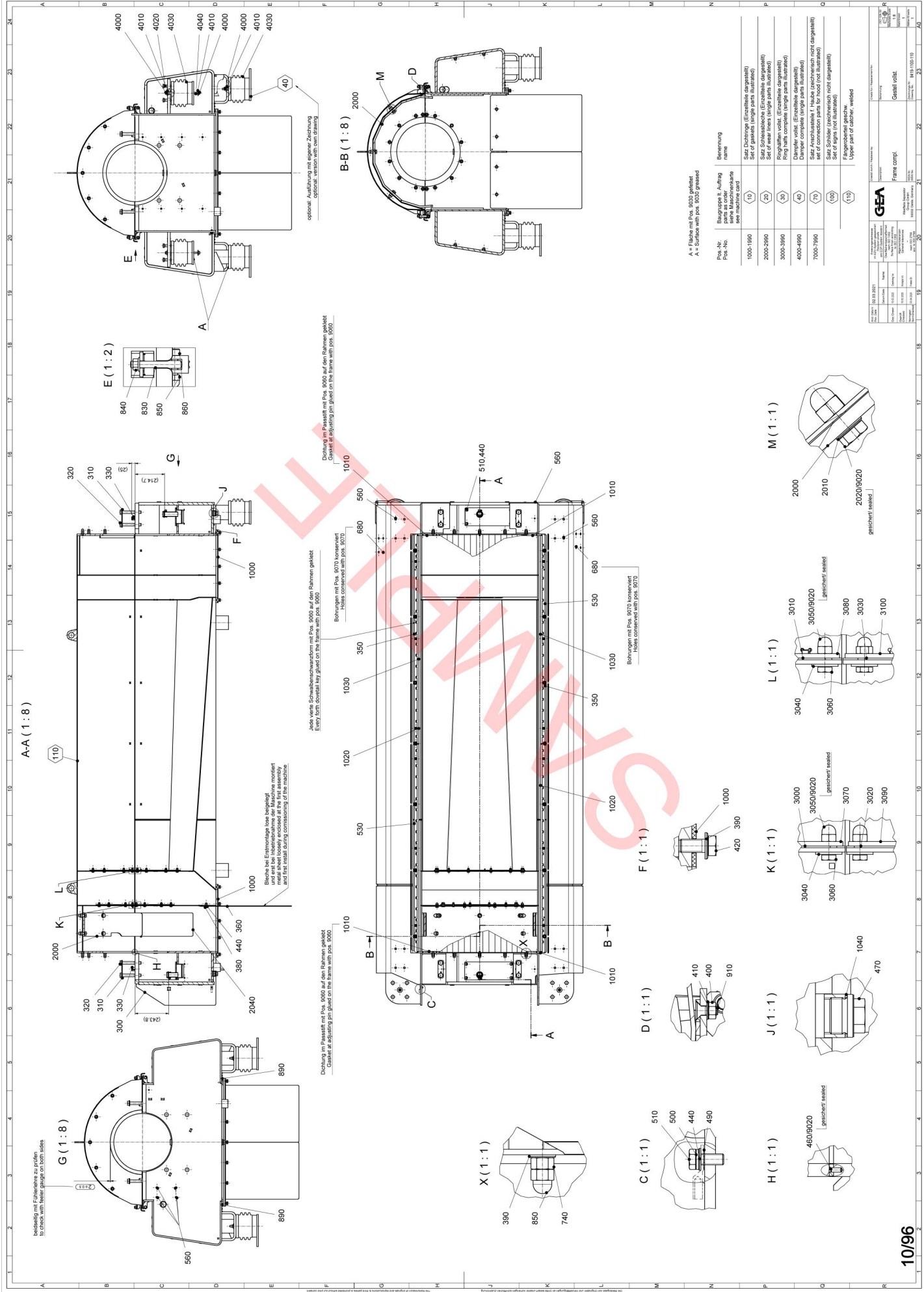
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

9/96



optional: Ausföhrung mit eigener Zeichnung
 optional: construction drawing

Dichtung im Passsift mit Pos. 9060 auf den Rahmen gelasht
 Gasket at adjusting pin glued on the frame with pos. 9060

Jede vertikale Schweissbohrwand mit Pos. 9070 auf den Rahmen gelasht
 Every vert. borewall is glued on the frame with pos. 9070

Dichtung im Passsift mit Pos. 9060 auf den Rahmen gelasht
 Gasket at adjusting pin glued on the frame with pos. 9060

Jede vertikale Schweissbohrwand mit Pos. 9070 auf den Rahmen gelasht
 Every vert. borewall is glued on the frame with pos. 9070

Dichtung im Passsift mit Pos. 9060 auf den Rahmen gelasht
 Gasket at adjusting pin glued on the frame with pos. 9060

A = Flache mit Pos. 9030 gelasht
 A = Surface with pos. 9030 grafted

Pos.-Nr. Pos. No.	Bezeichnung name	Pos.-Nr. Pos. No.	Bezeichnung name
1000-1990	Satz Drahtseile (Einzeltabelle dargestellt) Set of cables (single parts illustrated)	(10)	Satz Drahtseile (Einzeltabelle dargestellt) Set of cables (single parts illustrated)
2000-2990	Satz Schneidbohrer (Einzeltabelle dargestellt) Set of wear liners (single parts illustrated)	(20)	Satz Schneidbohrer (Einzeltabelle dargestellt) Set of wear liners (single parts illustrated)
3000-3990	Ringkugeln vollst. (Einzeltabelle dargestellt) Ring full complete (single parts illustrated)	(30)	Ringkugeln vollst. (Einzeltabelle dargestellt) Ring full complete (single parts illustrated)
4000-4990	Dämpfer komplet (Einzeltabelle dargestellt) Dampers complete (single parts illustrated)	(40)	Dämpfer komplet (Einzeltabelle dargestellt) Dampers complete (single parts illustrated)
7000-7990	Satz Antriebsstange + Halbe (zusammen nicht dargestellt) Set of drive shaft (not illustrated)	(70)	Satz Antriebsstange + Halbe (zusammen nicht dargestellt) Set of drive shaft (not illustrated)
(100)	Satz von Rollen (not illustrated) Set of rollers (not illustrated)	(100)	Satz von Rollen (not illustrated) Set of rollers (not illustrated)
(110)	Obere Teil der Gabel, versch. Upper part of calkey, welded	(110)	Obere Teil der Gabel, versch. Upper part of calkey, welded

GEA		GEA	
Art-Nr. Part No.	Bezeichnung Description	Art-Nr. Part No.	Bezeichnung Description
1000-1990	Satz Drahtseile (Einzeltabelle dargestellt)	1000-1990	Satz Drahtseile (Einzeltabelle dargestellt)
2000-2990	Satz Schneidbohrer (Einzeltabelle dargestellt)	2000-2990	Satz Schneidbohrer (Einzeltabelle dargestellt)
3000-3990	Ringkugeln vollst. (Einzeltabelle dargestellt)	3000-3990	Ringkugeln vollst. (Einzeltabelle dargestellt)
4000-4990	Dämpfer komplet (Einzeltabelle dargestellt)	4000-4990	Dämpfer komplet (Einzeltabelle dargestellt)
7000-7990	Satz Antriebsstange + Halbe (zusammen nicht dargestellt)	7000-7990	Satz Antriebsstange + Halbe (zusammen nicht dargestellt)
(100)	Satz von Rollen (not illustrated)	(100)	Satz von Rollen (not illustrated)
(110)	Obere Teil der Gabel, versch.	(110)	Obere Teil der Gabel, versch.

Baugruppe / Component group

8419-1100-110

GESTELL VOLLST.
FRAME, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	8419-1005-040	1		SATZ DICHTRINGE F.GESTELL SET OF GASKETS FOR FRAME JEU DE JOINTS POUR BATI	✓	
1000	8419-1004-000	2		SATZ DICHTUNGEN SET OF GASKETS JEU DE JOINTS D'ETANCHEITE	✓	
1010	8419-1265-160	4		DICHTUNG GASKET JOINT D'ETANCHEITE	✓	
1020	8419-1265-020	2		DICHTUNG GASKET JOINT D'ETANCHEITE	✓	
1030	8419-1265-010	2		DICHTUNG GASKET JOINT D'ETANCHEITE	✓	
1040	0007-1981-550	2		DICHTRING GASKET JOINT	✓	
20	8419-1063-020	1		SATZ SCHLEISSBLECHE SET OF WEAR LINERS JEU DE TOLES D'USURE	✓	
2000	8419-1062-030	1		SCHLEISSBLECH WEAR LINER TOLE D'USURE	✓	
2010	0026-1335-400	6		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
2020	0019-7034-400	6		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
2040	8419-1062-020	2		SCHLEISSBLECH WEAR LINER TOLE D'USURE	✗	
30	8419-1728-220	1		RINGHAELFTEN VOLLST. RING HALFS COMPL. DEMI-ANNEAU COMPLET	✓	
3000	8419-1728-190	1		RINGHAELFTE RING HALF DEMI-BAGUE	✓	
3010	8419-1728-210	1		RINGHAELFTE RING HALF DEMI-BAGUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

Baugruppe / Component group

8419-1100-110

GESTELL VOLLST.
FRAME, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
3020	8419-1728-180	1		RINGHAELFTE	✓	
				RING HALF		
				DEMI-BAGUE		
3030	8419-1728-200	1		RINGHAELFTE	✓	
				RING HALF		
				DEMI-BAGUE		
3040	0013-0404-400	32		HUTMUTTER	✓	
				CAP NUT		
				ECROU CHAPEAU		
3050	0026-0439-400	32		SCHEIBE	✓	
				WASHER_DISK		
				RONDELLE_DISQUE		
3060	0019-6903-400	32		SECHSKANTSCHRAUBE	✓	
				HEX HEAD SCREW		
				VIS SIX PANS		
3070	8419-1146-070	1		GEGENHALTER	✓	
				HOLDER-UP		
				CONTRE-SUPPORT		
3080	8419-1146-050	1		GEGENHALTER	✓	
				HOLDER-UP		
				CONTRE-SUPPORT		
3090	8419-1146-060	1		GEGENHALTER	✓	
				HOLDER-UP		
				CONTRE-SUPPORT		
3100	8419-1146-040	1		GEGENHALTER	✓	
				HOLDER-UP		
				CONTRE-SUPPORT		
40	8419-1780-040	1		DAEMPFER M.ANSCHLUSSTEILEN V.	✓	
				DAMPER WITH CONNECTING PARTS, CPL.		
	0013-0280-400	4		SECHSKANTMUTTER	✓	
				HEXAGON NUT		
				ECROU SIX PANS		
	0026-2407-300	4		SCHEIBE	✓	
				WASHER_DISK		
				RONDELLE_DISQUE		
	0019-7039-400	8		SECHSKANTSCHRAUBE	✓	
				HEX HEAD SCREW		
				VIS SIX PANS		
	8690-1780-000	2		DAEMPFER VOLLST.	✓	
				DAMPER COMPL.		
				AMORTISSEUR COMPL.		

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

12/96

Baugruppe / Component group

8419-1100-110

GESTELL VOLLST.
FRAME, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	0004-3346-810	2		FALTENBALG BELLOWS ACCORDEON	✓	
	0018-3812-300	4		SCHLAUCHSCHELLE HOSE CLIP COLLIER A FLEXIBLE	✓	
	6985-0605-050	2		KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	
	0019-6330-400	2		GEWINDESTIFT THREADED PIN GOUPILLE FILETEE	✓	
	8690-1780-060	2		DAEMPFER VOLLST. DAMPER COMPL. AMORTISSEUR COMPL.	✓	
	0004-3381-810	2		FALTENBALG BELLOWS ACCORDEON	✓	
	0018-3667-300	4		SCHLAUCHSCHELLE HOSE CLIP COLLIER A FLEXIBLE	✓	
	6985-0605-050	2		KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	
	0013-0282-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
	0026-1335-400	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
70	0000-0006-162	1		ENTFAELT NOT APPLICABLE SUPPRIME	✗	
100	8690-4940-000	1		SATZ SCHILDER SET OF PLATES JEU DE PLAQUES	✓	
	0024-6481-000	1		SCHILD PLATE ENSEIGNE	✓	
	0024-3604-000	1		SCHILD PLATE ENSEIGNE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

13/96

Baugruppe / Component group

8419-1100-110

GESTELL VOLLST.
FRAME, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	x	
	0024-6571-000	1		KLEBESCHILD ADHESIVE PLATE PLAQUE ADHESIVE	✓	
	0024-5380-000	1		SCHILD PLATE ENSEIGNE	✓	
	0026-1571-300	8		KERBNAGEL NOTCHED NAIL CLOU CANNELE	✓	
	0024-6482-000	4		SCHILD PLATE ENSEIGNE	✓	
	0024-6424-000	1		SCHILD PLATE ENSEIGNE	✓	
	0024-6572-000	4		KLEBESCHILD ADHESIVE PLATE PLAQUE ADHESIVE	✓	
	0024-6580-000	7		KLEBESCHILD ADHESIVE PLATE PLAQUE ADHESIVE	✓	
	0024-6423-000	1		SCHILD PLATE ENSEIGNE	✓	
110	8419-1752-100	1		FAENGERBERTEIL GESCHW. UPPER PART OF CATCHER, WELDED PARTIE SUPERIEURE DU CAPTEUR,SOUDEE	✓	
300	8419-3473-160	1		RAHMEN GESCHW. FRAME, WELDED CADRE, SOUDE	✓	
310	8419-6453-520	4		BLECH SHEET METAL TOLE	✓	
320	0019-6675-400	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
330	0026-2779-170	4		SPANNSTIFT SPRING DOWEL SLEEVE GOUILLE DE SERRAGE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

Baugruppe / Component group

8419-1100-110

GESTELL VOLLST.
FRAME, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
360	8419-1453-000	2		BLECH SHEET METAL TOLE	✓	
380	0019-6933-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
390	0026-1371-400	54		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
400	0013-0278-400	12		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
410	0026-1345-400	12		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
420	0019-6968-400	40		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
440	0026-1348-400	13		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
460	0026-1589-400	8		ZYLINDERSTIFT CYLINDRICAL PIN GOUPILLE CYLINDRIQUE	✓	
470	0019-1126-400	2		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	
480	0019-8904-300	13		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	
490	0026-5673-300	1		FAECHERSCHEIBE FAN-TYPE LOCK WASHER RONDELLE A EVENTAIL	✓	
500	0026-1337-300	1		FEDERRING SPRING RING ANNEAU-RESSORT	✓	
510	0019-6935-400	9		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
520	0019-8910-300	3		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

15/96

Baugruppe / Component group

8419-1100-110

GESTELL VOLLST.
FRAME, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
530	8419-1453-255	2		BLECH SHEET METAL TOLE	✓	
560	0003-3870-800	4		STOPFEN PLUG BOUCHON	✓	
680	0003-0780-800	24		STOPFEN PLUG BOUCHON	✓	
740	0013-0280-400	10		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
830	0019-1931-400	14		AUGENSCHRAUBE EYEBOLT BOULON A OEIL	✓	
840	0013-0172-400	14		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
850	0013-0406-400	24		HUTMUTTER CAP NUT ECROU CHAPEAU	✓	
880	0019-6972-400	14		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
890	0003-0586-800	2		STOPFEN PLUG BOUCHON	✓	
910	0019-9391-400	12		SENKSCRAUBE COUNTERSUNK SCREW VIS NOYEE	✓	
9010	6985-0606-500	1		DICHTUNGSMASSE SEALANT MATERIAU D'ETANCHEITE	✓	
9020	6985-0605-050	1		KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	
9030	0015-0104-080	1		SCHMERFETT LUBRICATING GREASE - TSCA Compliant GRAISSE LUBRIFIANTE	✓	
9060	6960-0201-150	1		KLEBER ADHESIVE COLLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

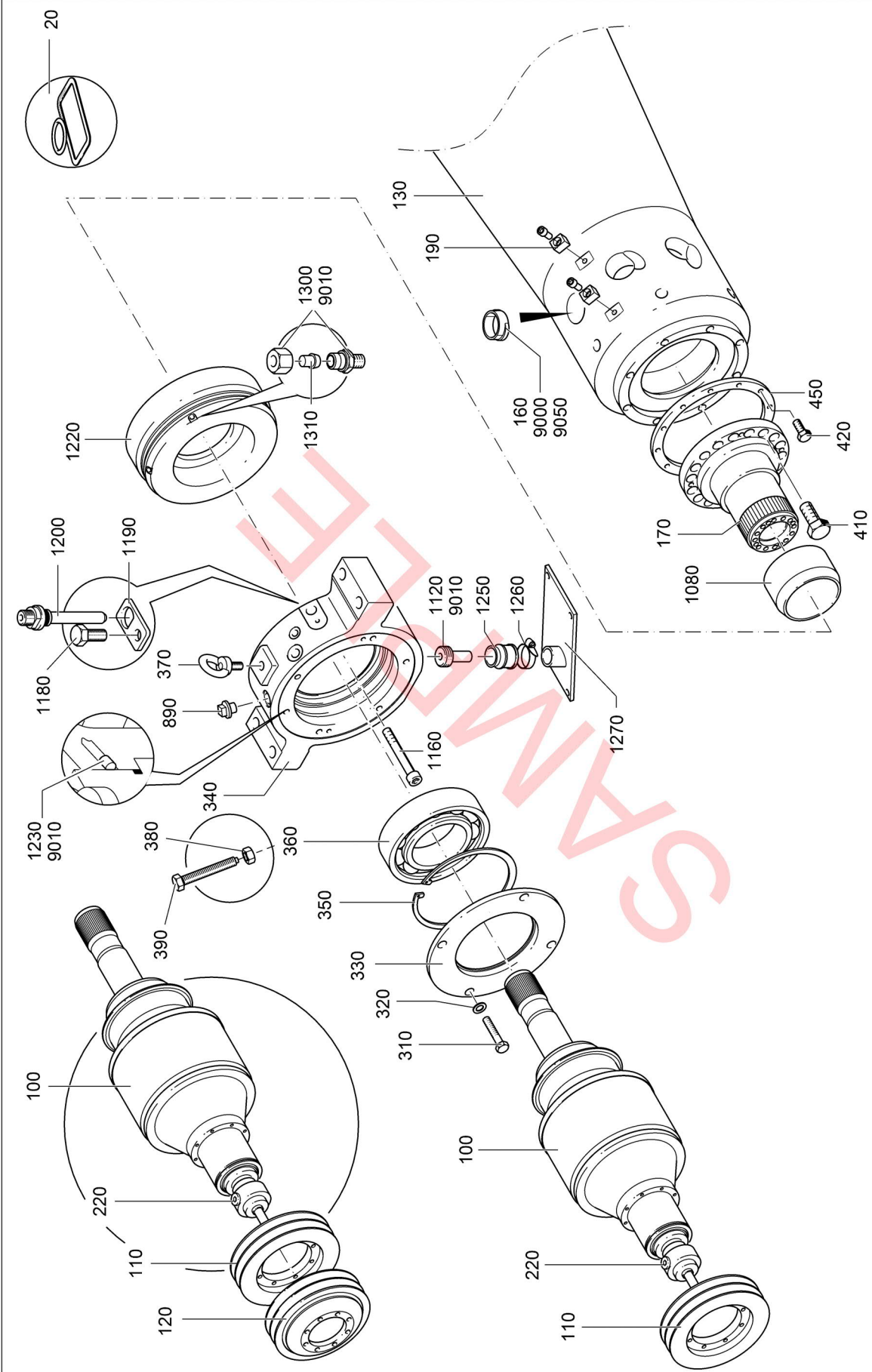
8012-134

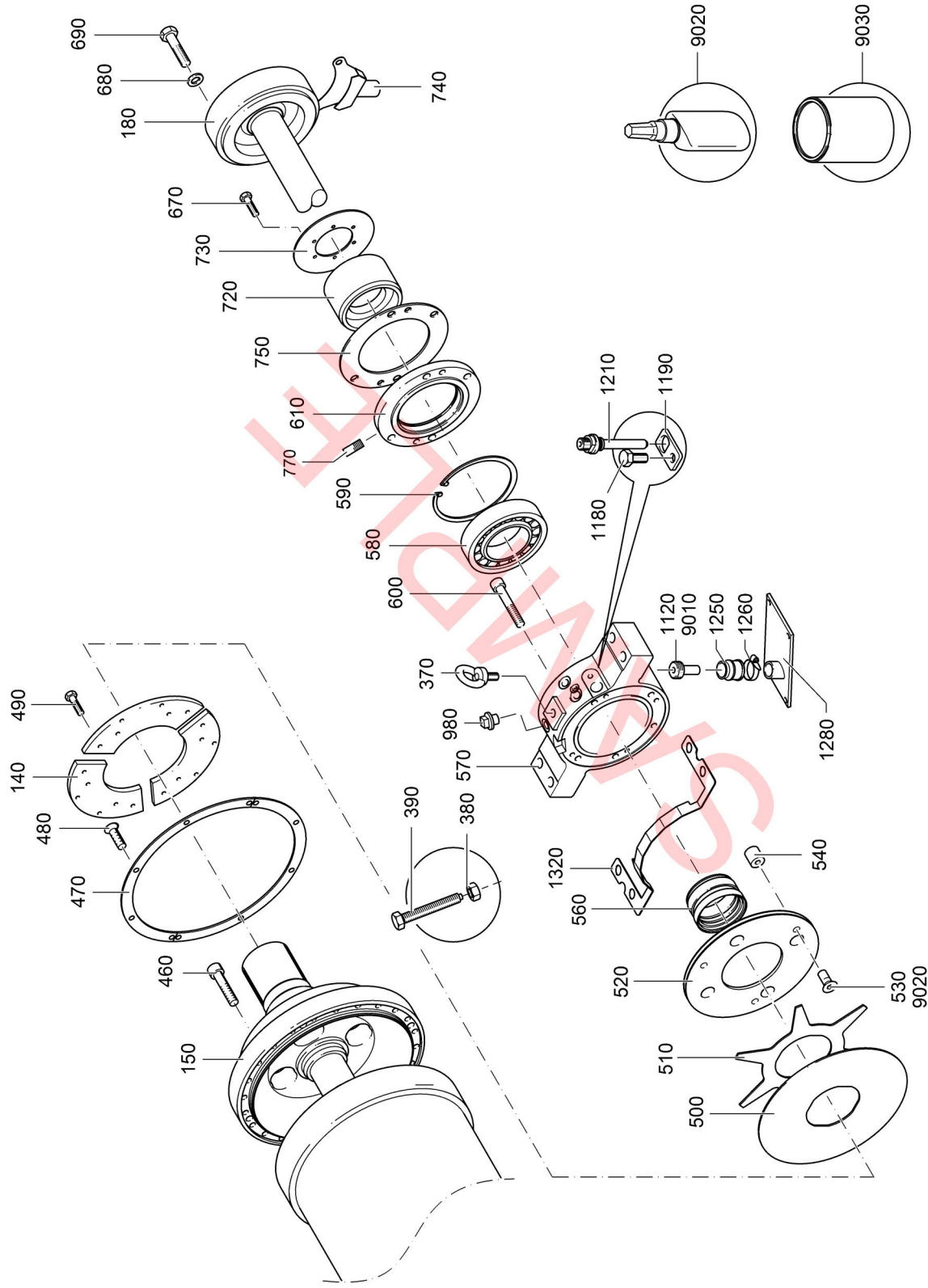
Ausgabe / Edition

15.06.2021

Seite/Page

16/96





Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
20	8419-6007-160	1		SATZ DICHTRINGE F. TROMMEL SET OF GASKETS FOR BOWL JEU DE JOINTS POUR BOL	✓	26
100	8657-3210-060	1		PLANETENGETRIEBE VOLLST. PLANETARY GEAR, COMPLETE MECANISME PLANETAIRE, COMPLET	?	28
110	8657-3352-010	1		KEILRIEMENSCHLEIBE V-BELT PULLEY	✓	
120	0000-0006-162	1		POULIE A GORGES ENTFAELLT NOT APPLICABLE	✗	
130	8419-6601-180	1		SUPPRIME TROMMELMANTEL BOWL SHELL CHEMISE DE BOL	?	
	0019-6326-400	2		GEWINDESTIFT THREADED PIN	✓	
	6985-0605-050	1		GOUVILLE FILETEE KLEBSTOFF LOCTITE LOCTITE GLUE	✓	
140	8419-6669-200	3		COLLE LOCTITE REGULIERPLATTE REGULATING PLATE PLAQUE DE REGLAGE	✓	
150	8419-6520-020	1		LAGERNABE VOLLST. BEARING HUB, COMPL. MOYEU DE PALIER, COMPLET	✓	30
160	8418-6391-000	1		SATZ SCHLEISSBUCHSEN SET OF WEARING BUSHES JEU DE DOUILLES D'USURE	✓	
170	8419-6602-010	1		TROMMELNABE VOLLST. BOWL HUB, COMPL. MOYEU DE BOL, COMPLET	?	
	0026-2778-140	2		ZYLINDERSTIFT CYLINDRICAL PIN	✓	
180	8419-2705-000	1		GOUVILLE CYLINDRIQUE EINLAUFROHR GESCHW. INLET TUBE, WELDED TUBE D'ENTREE, SOUDEE	✓	
190	8419-6686-000	1		SATZ FLUEGEL SET OF SCRAPER BLADES JEU D'AILES	✓	32

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

19/96

Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
220	8419-6269-100	1		SATZ GETRIEBEANSCHLUSSTEILE SET OF GEAR CONNECTION PARTS JEU PIECES DE RACCORD. DU MECANISME	✓	
	0019-6112-400	1		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
	8657-3278-040	1		IMPULSGEBER IMPULSE TRANSMITTER GENERATEUR D'IMPULSIONS	✓	
	0019-6931-400	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
	8657-1145-000	1		HALTER HOLDER SUPPORT	✓	
	0019-6148-300	8		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
	0019-7040-400	24		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
	8419-3358-080	1		GETRIEBENABE GEAR HUB PIÈCE D'INTRAÎNEMENT	✓	
	8419-3400-000	1		ANTRIEBSWELLE DRIVE SHAFT ARBRE DE COMMANDE	✓	
	0019-6206-150	12		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
	8690-6698-020	1		RING RING BAGUE	✓	
	0019-6106-400	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
	0019-6119-400	1		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
	8657-3310-000	1		VENTILATOR GESCHW. VENTILATOR, WELDED VENTILATEUR, SOUDE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

20/96

Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	0019-6973-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
	8657-3338-000	4		DISTANZHUELSE SPACER SLEEVE DOUILLE D'ECARTEMENT	✓	
	8690-6431-030	2		AUSGLEICHSTUECK COMPENSATING PIECE PIECE COMPENSATRICE	✓	
	0019-6318-400	4		GEWINDESTIFT THREADED PIN GOUPILLE FILETEE	✓	
	6985-0605-050	1		KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	
	0015-0104-080	1		SCHMIERFETT LUBRICATING GREASE - TSCA Compliant GRAISSE LUBRIFIANTE	✓	
310	0019-6607-400	6		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
320	0026-1335-400	6		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
330	8419-6375-000	1		LAGERDECKEL BEARING COVER COUVERCLE DE PALIER	✓	
340	8419-6131-020	1		LAGERGEHAEUSE BEARING HOUSING BOITE DE PALIER	✓	
350	0026-2431-170	1		SICHERUNGSRING SECURING RING CIRCLIP	✓	
360	0011-6334-870	1		RILLENKUGELLAGER GROOVED BALL BEARING ROULEMENT RAINURE A BILLES	✓	
370	0019-5387-050	2		RINGSCHRAUBE EYE BOLT BOULON A OEILLET	✓	
380	0013-0282-400	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

21/96

Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
390	0019-5220-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
410	0019-6664-400	22		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
420	0019-6938-400	12		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
450	8419-6592-160	1		RING RING BAGUE	✓	
460	0019-6206-400	44		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
470	8419-6757-020	4		SCHUTZRING GUARD RING ANNEAU DE GARDE	✓	
480	0019-9421-400	12		SENKSCHRAUBE COUNTERSUNK SCREW VIS NOYEE	✓	
490	0019-6933-400	18		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
500	8419-6473-020	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
510	8419-6594-000	1		DRUCKRING PRESSURE RING BAGUE DE PRESSION	✓	
520	8419-6473-250	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
530	0019-9400-400	4		SENKSCHRAUBE COUNTERSUNK SCREW VIS NOYEE	✓	
540	8419-6526-030	4		HUELSE SLEEVE DOUILLE	✓	
560	8419-6526-140	1		HUELSE SLEEVE DOUILLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

22/96

GEA Westfalia Separator Group

Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

23/96

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
570	8419-6131-050	1		LARGERGEAEUSE BEARING HOUSING BOITE DE PALIER	✓	
30	0019-6335-400	1		GEWINDESTIFT THREADED PIN GOUILLE FILETEE	✓	
40	0019-8923-400	1		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	
50	0004-5283-780	1		DICHTUNG GASKET JOINT D'ETANCHEITE	✓	
60	0019-6316-400	2		GEWINDESTIFT THREADED PIN GOUILLE FILETEE	✓	
9010	6985-0606-500	1		DICHTUNGSMASSE SEALANT MATERIAU D'ETANCHEITE	✓	
580	0011-1036-880	1		ZYLINDERROLLENLAGER CYLINDRICAL ROLLER BEARING ROULEMENT A ROULEAUX CYLINDRIQUES	✓	
590	0026-0748-170	1		SICHERUNGSRING SECURING RING CIRCLIP	✓	
600	0019-6216-400	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
610	8419-6375-010	1		LAGERDECKEL BEARING COVER COUVERCLE DE PALIER	✓	
670	0019-6522-300	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
680	0026-1358-300	4		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
690	0019-6677-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
720	8419-6526-020	1		HUELSE SLEEVE DOUILLE	✓	

Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
730	8419-6305-010	1		SCHEIBE WASHER _DISK RONDELLE _DISQUE	✓	
740	8419-6454-000	1		SCHUTZBLECH GESCHW. GUARD, WELDED TOLE DE PROTECTION, SOUDEE	✓	
750	8419-6305-020	1		SCHEIBE WASHER _DISK RONDELLE _DISQUE	✓	
770	0019-6337-400	2		GEWINDESTIFT THREADED PIN GOUPILLE FILETEE	✓	
980	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
1080	8419-6526-000	1		HUELSE SLEEVE DOUILLE	✓	
1120	8418-6707-020	2		STOPFEN PLUG BOUCHON	✓	
1160	0019-6228-400	6		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
1180	0019-6901-400	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1190	8415-6453-100	2		BLECH SHEET METAL TOLE	✓	
1200	8419-6471-010	1		ROHR PIPE TUBE	✓	
1210	8419-6471-020	1		ROHR PIPE TUBE	✓	
1220	8419-6378-000	1		LAGERDECKEL VOLLST. BEARING COVER, COMPL. COUVERCLE DE PALIER, COMPLET	✓	
	8419-6375-100	1		LAGERDECKEL BEARING COVER COUVERCLE DE PALIER	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

24/96

Baugruppe / Component group

8419-6600-110

TROMMEL VOLLST.
BOWL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	0019-6307-400	1		GEWINDESTIFT THREADED PIN	✓	
1230	0019-6307-400	1		GOUPILLE FILETEE GEWINDESTIFT THREADED PIN	✓	
1250	0004-3378-830	2		FALTENBALG BELLOWS	✓	
				ACCORDEON		
1260	0018-5981-300	2		SCHLAUCHSCHELLE HOSE CLIP	✓	
				COLLIER A FLEXIBLE		
1270	8419-1061-010	1		DECKEL GESCHW. COVER, WELDED	✓	
				COUVERCLE, SOUDE		
1280	8418-1061-040	1		DECKEL GESCHW. COVER, WELDED	✓	
				COUVERCLE, SOUDE		
1300	0018-3537-400	1		VERSCHRAUBUNG SCREW COUPLING	✓	
				RACC. A VIS		
1310	0018-3200-400	1		VERSCHLUSSKEGEL MALE CONNECTING NIPPLE	✓	
				CONE D'OBTURATION		
1320	8419-1453-020	1		BLECH SHEET METAL	✓	
				TOLE		
9000	6985-0605-200	1		KLEBSTOFF LOCTITE LOCTITE GLUE	✓	
				COLLE LOCTITE		
9010	6985-0606-500	1		DICHTUNGSMASSE SEALANT	✓	
				MATERIAU D'ETANCHEITE		
9020	6985-0605-050	1		KLEBSTOFF LOCTITE LOCTITE GLUE	✓	
				COLLE LOCTITE		
9030	0015-0104-080	1		SCHMIERFETT LUBRICATING GREASE - TSCA Compliant	✓	
				GRAISSE LUBRIFIANTE		

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

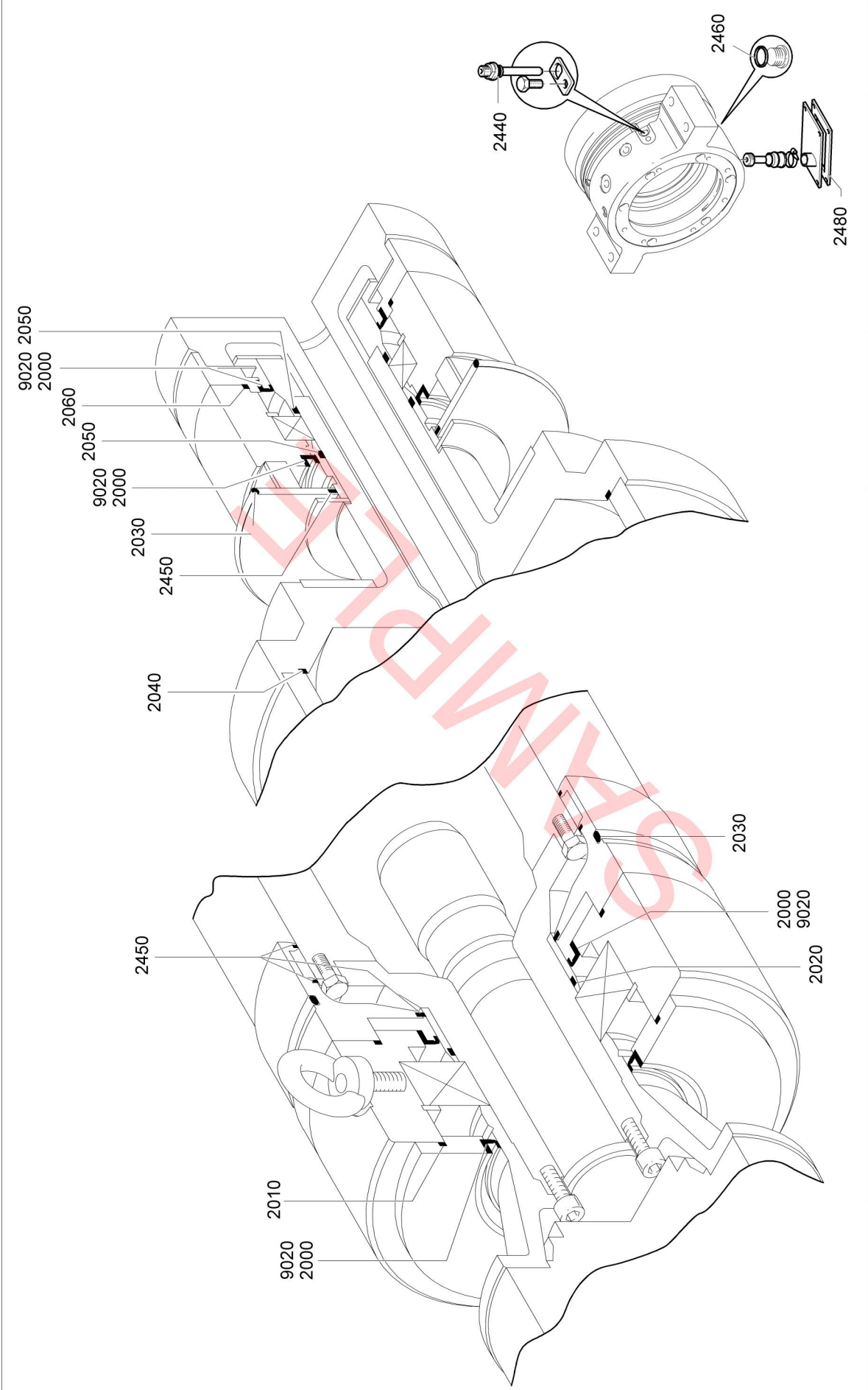
Ausgabe / Edition

15.06.2021

Seite/Page

25/96

GEA Westfalia Separator Group



	Rev. : 23.11.2015	Zeichnungs-Nr.: 8419-4756-031	Blatt 1
	Datum: 19.01.2015		1 Blätter

Baugruppe / Component group

8419-6007-160

SATZ DICHTRINGE F. TROMMEL
SET OF GASKETS FOR BOWL

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
2000	0004-3223-850	4		WELLENDICHTRING SHAFT SEALING RING	✓	
2010	0007-2621-830	1		JOINT TORIQUE A LEVRES DICHTRING GASKET	✓	
2020	0007-1802-830	1		JOINT DICHTRING GASKET	✓	
2030	0007-2260-750	2		JOINT DICHTRING GASKET	✓	
2040	0007-2966-750	1		JOINT DICHTRING GASKET	✓	
2050	0007-2862-830	2		JOINT DICHTRING GASKET	✓	
2060	0007-2571-830	1		JOINT DICHTRING GASKET	✓	
2440	0007-2508-830	2		JOINT DICHTRING GASKET	✓	
2450	0004-1576-328	4.5	m	DICHTUNGSSCHNUR PACKING CORD	✓	
2480	8418-1265-260	2		CORDON D'ETANCHEITE DICHTUNG GASKET	✓	
9020	6985-0605-050	1		JOINT DETANCHEITE KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

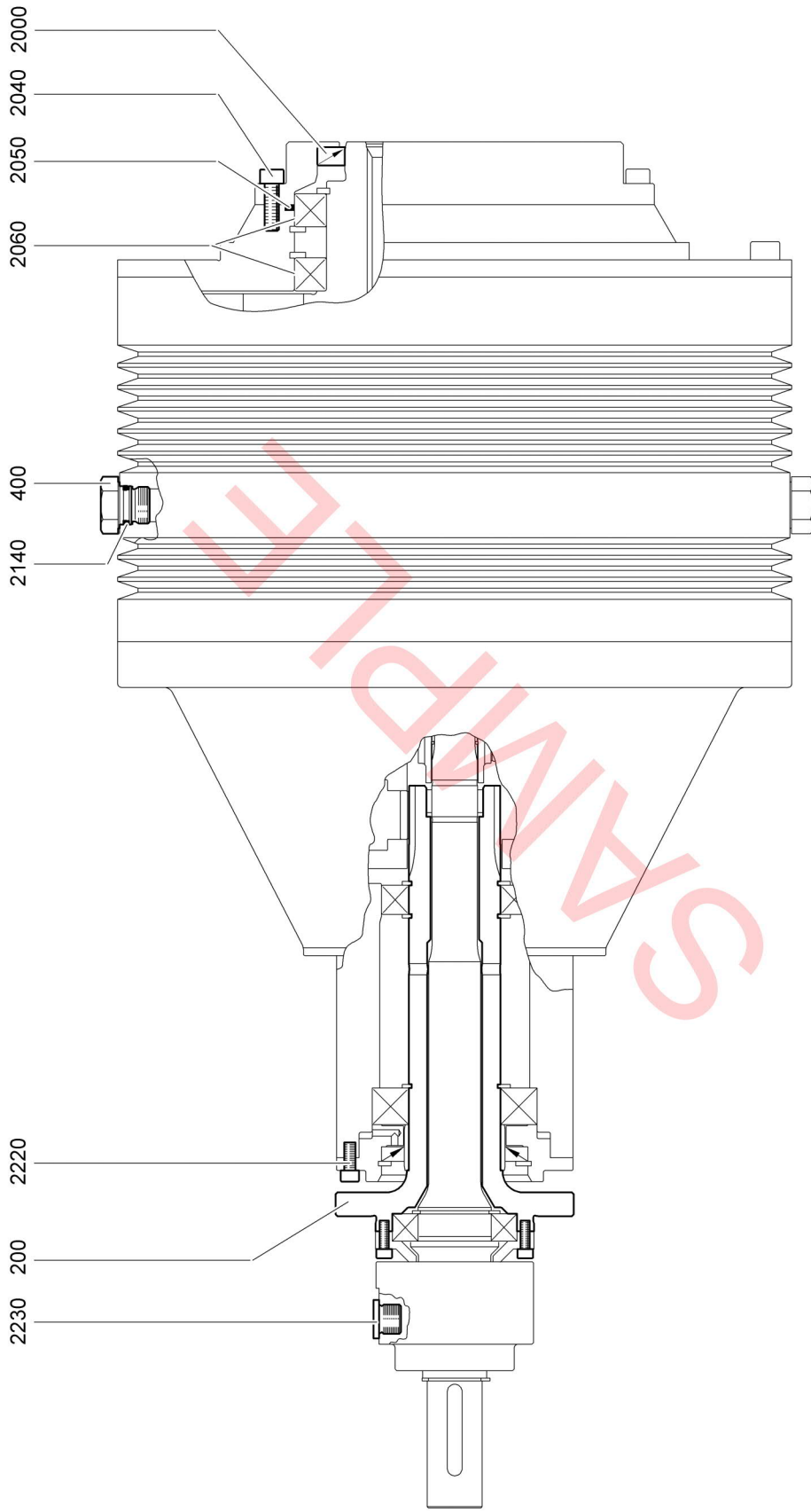
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

27/96



Rev. : *

Zeichnungs-Nr.:
8657-4753-008

Datum: 20.02.2020

Blatt 1

1 Blätter

Baugruppe / Component group

8657-3210-060

PLANETENGETRIEBE VOLLST.
PLANETARY GEAR, COMPLETE

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
200	8657-3415-050	1		WELLE VOLLST. SHAFT, COMPL. ARBRE, COMPLET	?	
370	8657-3515-010	1		SATZ PLANETENBOLZEN SET OF PLANET BOLTS JEU D'AXES PLANETAIRES	?	
390	8657-3513-010	1		PLANETENFLANSCH PLANET FLANGE BRIDE PLANETAIRE	?	
400	8654-3161-010	2		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	
410	8657-3513-000	1		PLANETENFLANSCH PLANET FLANGE BRIDE PLANETAIRE	?	
440	8657-3515-050	1		SATZ PLANETENBOLZEN SET OF PLANET BOLTS JEU D'AXES PLANETAIRES	?	
2000	0004-3332-830	1		WELLECHTRING SHAFT SEALING RING JOINT TORIQUE A LEVRES	✓	
2040	0019-6124-400	8		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
2050	0007-2825-830	1		DICHTRING GASKET JOINT	✓	
2060	0011-6182-020	2		RILLENKUGELLAGER GROOVED BALL BEARING ROULEMENT RAINURE A BILLES	✓	
2140	0007-2924-830	2		DICHTRING GASKET JOINT	✓	
2220	0019-6106-400	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
2230	0019-8920-030	1		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

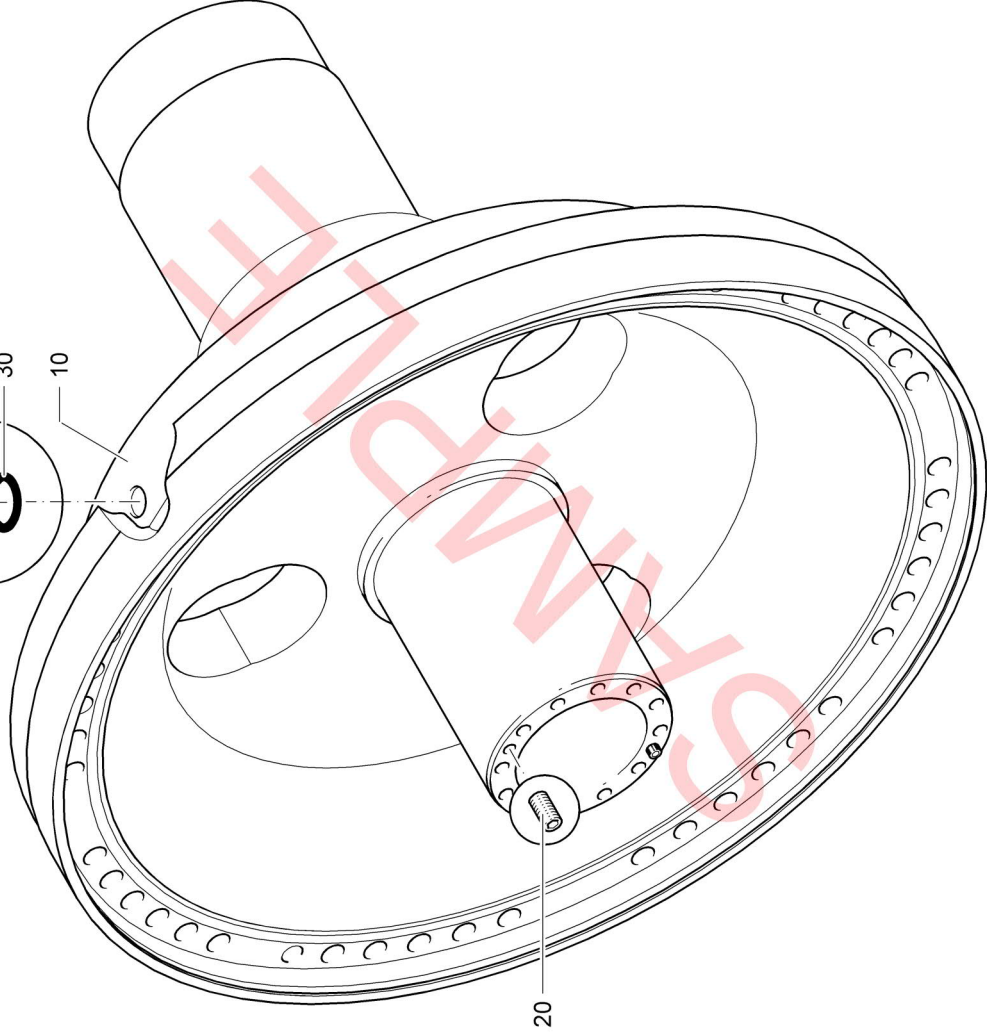
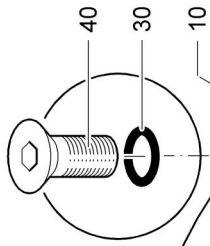
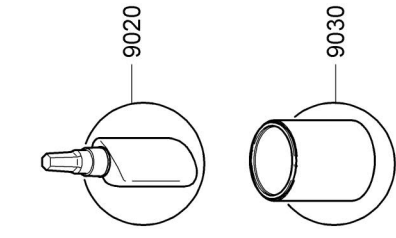
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

29/96



Baugruppe / Component group

8419-6520-020

LAGERNABE VOLLST.
BEARING HUB, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
20	0019-6335-400	2		GEWINDESTIFT THREADED PIN	✓	
30	0007-2926-830	2		GOUPILLE FILETEE DICHTRING GASKET JOINT	✓	
40	0019-9410-400	2		SENKSCRAUBE COUNTERSUNK SCREW VIS NOYEE	✓	
9020	6985-0605-050	1		KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	
9030	0015-0104-080	1		SCHMIERFETT LUBRICATING GREASE - TSCA Compliant GRAISSE LUBRIFIANTE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

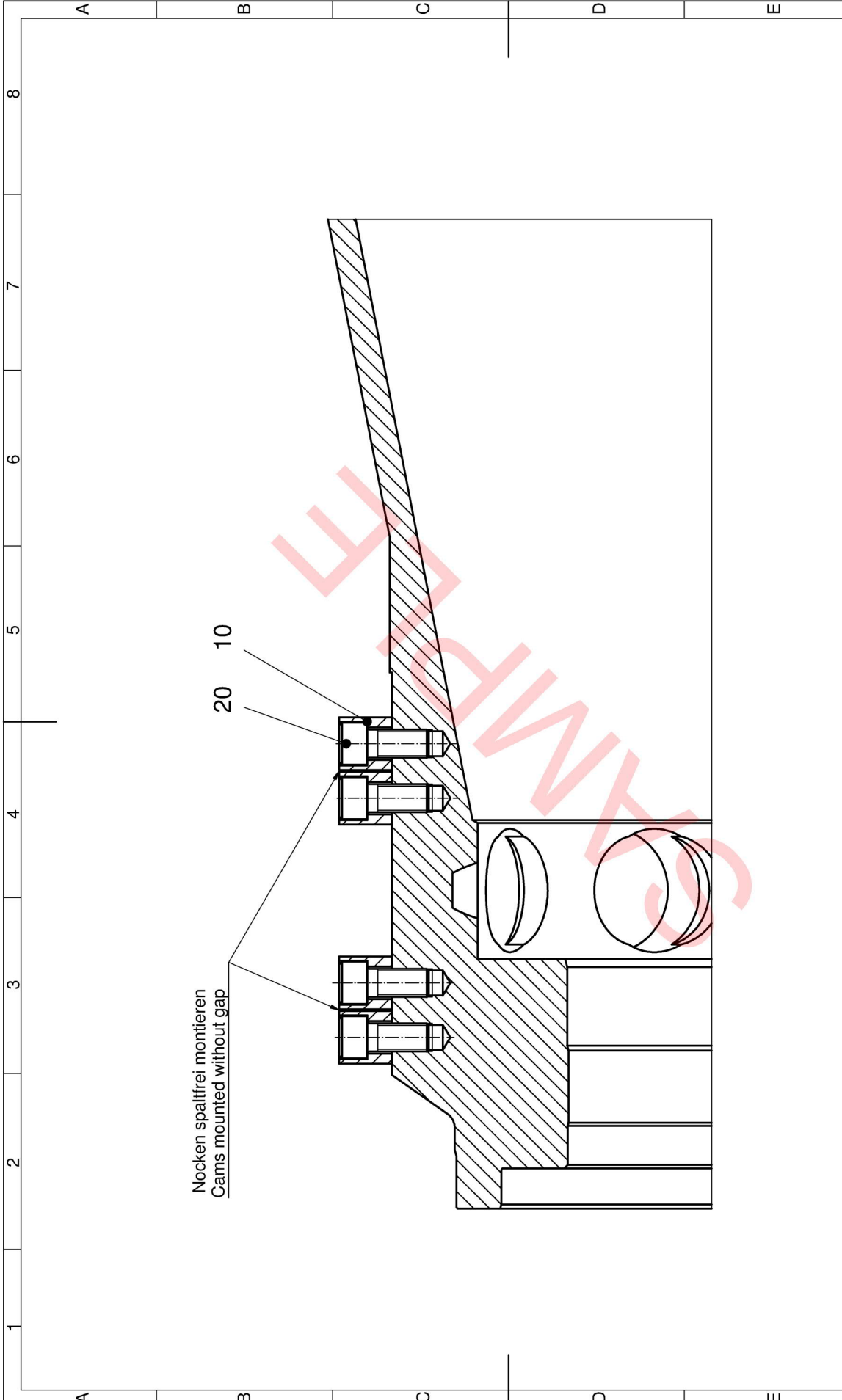
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

31/96



Nocken spaltfrei montieren
Cams mounted without gap

20 10

And.-Datum: Rev. Date:		Änderungsachse im EDV-System gespeichert Revision proofs are EDP-System resident		GEA Westalia Separator Group GmbH 59302 Oelde, Germany		Ersetzt durch/ Replaced by: Description: Set of scraper blades		Ersetzt für/ Replacement for: Benennung: Satz Flügel		ISO 128-30 Maßstab/Scale 1:2 Blatt/Sheet 1 Blätter/Sheets 1	
Datum/Date 29.06.2017		Name Niemann, C1		Westalia Separator Group GmbH 59302 Oelde, Germany		WSN-Nr. 8419-6686-000		Zeichnungs-Nr. 8419-6686-000		Blatt/Sheet 1 Blätter/Sheets 1	
Gez./Drawn 29.06.2017		Zelle/Do Depentoox.Br		Westalia Separator Group GmbH 59302 Oelde, Germany		WSN-Nr. 8419-6686-000		Zeichnungs-Nr. 8419-6686-000		Blatt/Sheet 1 Blätter/Sheets 1	
Geprüft Checked 29.06.2017		Normgepr. Normchecked 03.07.2017		Allgemeine Toleranzen General tolerances mk nach ISO 2768 acc. to ISO 2768		WSN-Nr. 8419-6686-000		Zeichnungs-Nr. 8419-6686-000		Blatt/Sheet 1 Blätter/Sheets 1	
3		4		5		6		7		A3	

Baugruppe / Component group

8419-6686-000

SATZ FLUEGEL
SET OF SCRAPER BLADES

Pos.	Teil-Nummer Part-No.	M Qty.	ME Unit	Benennung Designation	ETS	Seite Page
10	8177-6465-040	8		NOCKEN CAM CAME	✓	
20	0019-6200-400	8		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	

ETBWAYS

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

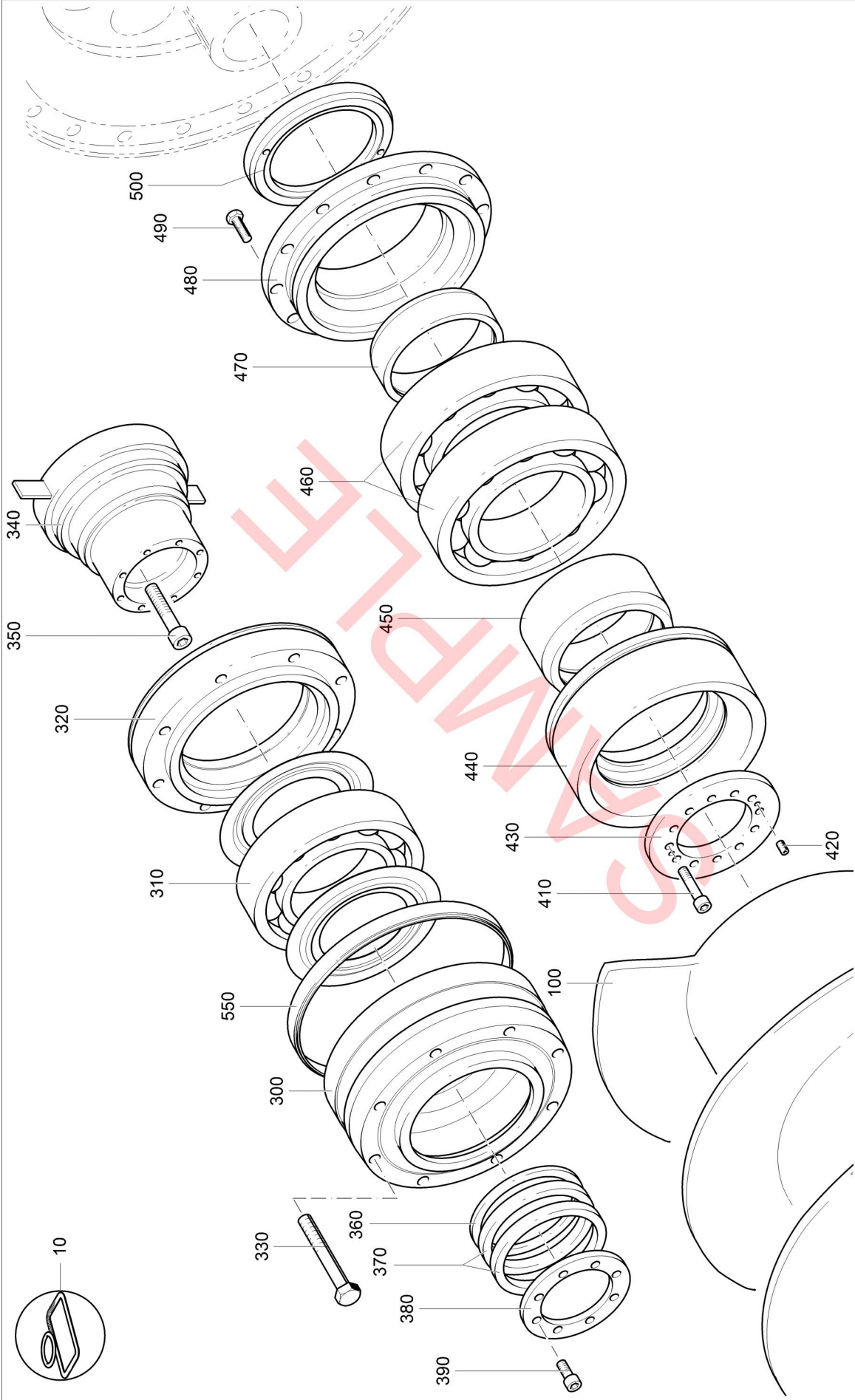
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

33/96



 Westfalia Separator	Rev. : *	Zeichnungs-Nr.: 8419-4756-068	Blatt 1
	Datum: 11.03.2016		1 Blätter

Baugruppe / Component group

8419-6539-040

SCHNECKE VOLLST.
SCROLL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	8419-6006-040	1		SATZ DICHTRINGE F.SCHNECKE SET OF GASKETS FOR SCROLL JEU DE JOINTS P.VIS TRANSPORTEUSE	✓	37
100	8419-6515-010	1		SCHNECKE GESCHW. SCROLL, WELDED VIS TRANSPORTEUSE, SOUDEE	7	39
300	8419-6592-230	1		RING RING BAGUE	✓	
310	0011-6226-950	1		RILLENKUGELLAGER GROOVED BALL BEARING ROULEMENT RAINURE A BILLES	✓	
320	8419-6592-030	1		RING RING BAGUE	✓	
330	0019-6520-300	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
340	8419-6635-000	1		MITNEHMER VOLLST. DRIVER, COMPL. ENTRAINEUR, COMPLET	✓	
350	0019-6247-400	5		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
360	8419-6592-010	1		RING RING BAGUE	✓	
370	8419-6592-000	2		RING RING BAGUE	✓	
380	8419-6473-050	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
390	0019-6144-400	8		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
410	0019-6166-400	12		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
420	0019-6318-400	2		GEWINDESTIFT THREADED PIN GOUPILE FILETEE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

35/96

Baugruppe / Component group

8419-6539-040

SCHNECKE VOLLST.
SCROLL, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
430	8419-6592-020	1		RING	✓	
				RING		
				BAGUE		
440	8419-6592-050	1		RING	✓	
				RING		
				BAGUE		
450	8419-6592-070	1		RING	✓	
				RING		
				BAGUE		
460	0011-7228-970	2		SCHRAEGKUGELLAGER	✓	
				ANGULAR CONTACT BALL BEARING		
				ROUL.A BILLES A CONTACT OBLIQUE		
470	8419-6592-090	1		RING	✓	
				RING		
				BAGUE		
480	8419-6375-020	1		LAGERDECKEL	✓	
				BEARING COVER		
				COUVERCLE DE PALIER		
490	0019-6971-400	12		SECHSKANTSCHRAUBE	✓	
				HEX HEAD SCREW		
				VIS SIX PANS		
500	8419-6592-110	1		RING	✓	
				RING		
				BAGUE		
550	0026-2805-300	1		TOLERANZRING	✓	
				SPACER RING		
				BAGUE DE TOLERANCE		

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

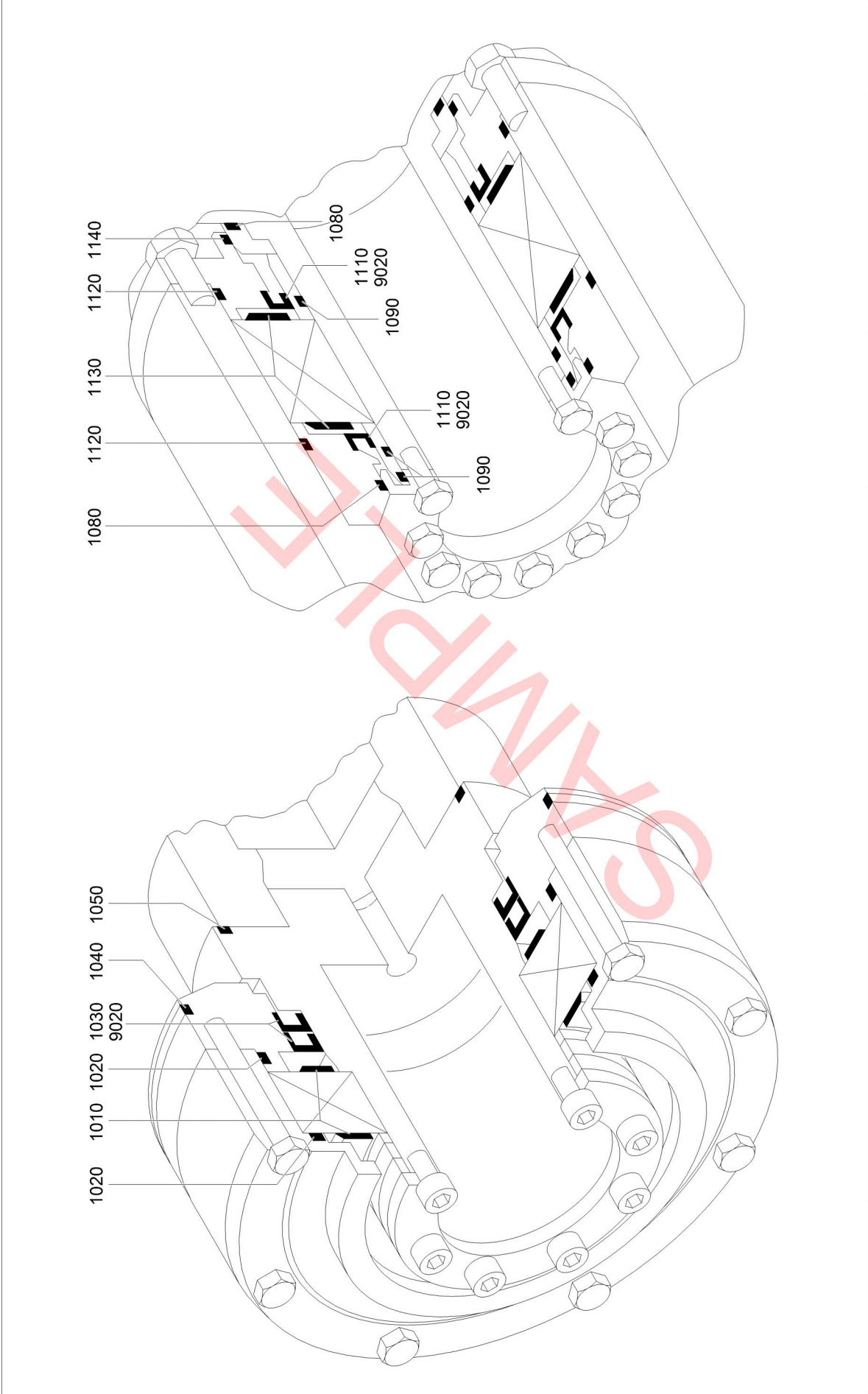
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

36/96



 Westfalla Separator	Rev. : 12.10.2015	Zeichnungs-Nr.: 8419-4756-046	Blatt 1
	Datum: 24.04.2015		1 Blätter

Baugruppe / Component group

8419-6006-040

SATZ DICHTRINGE F.SCHNECKE
SET OF GASKETS FOR SCROLL

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
1010	0004-1586-300	2		NILOS-DICHTRING NILOS GASKET JOINT NILOS	✓	
1020	0007-2706-750	2		DICHTRING GASKET JOINT	✓	
1030	0004-1582-850	2		WELLENDICHTRING SHAFT SEALING RING JOINT TORIQUE A LEVRES	✓	
1040	0007-2577-750	1		DICHTRING GASKET JOINT	✓	
1050	0007-2864-750	1		DICHTRING GASKET JOINT	✓	
1080	0007-2864-750	2		DICHTRING GASKET JOINT	✓	
1090	0007-2940-750	3		DICHTRING GASKET JOINT	✓	
1110	0004-1583-850	2		WELLENDICHTRING SHAFT SEALING RING JOINT TORIQUE A LEVRES	✓	
1120	0007-3733-750	2		DICHTRING GASKET JOINT	✓	
1130	0004-3334-300	2		NILOS-DICHTRING NILOS GASKET JOINT NILOS	✓	
1140	0007-3619-750	1		DICHTRING GASKET JOINT	✓	
9020	6985-0605-050	1		KLEBSTOFF LOCTITE LOCTITE GLUE COLLE LOCTITE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

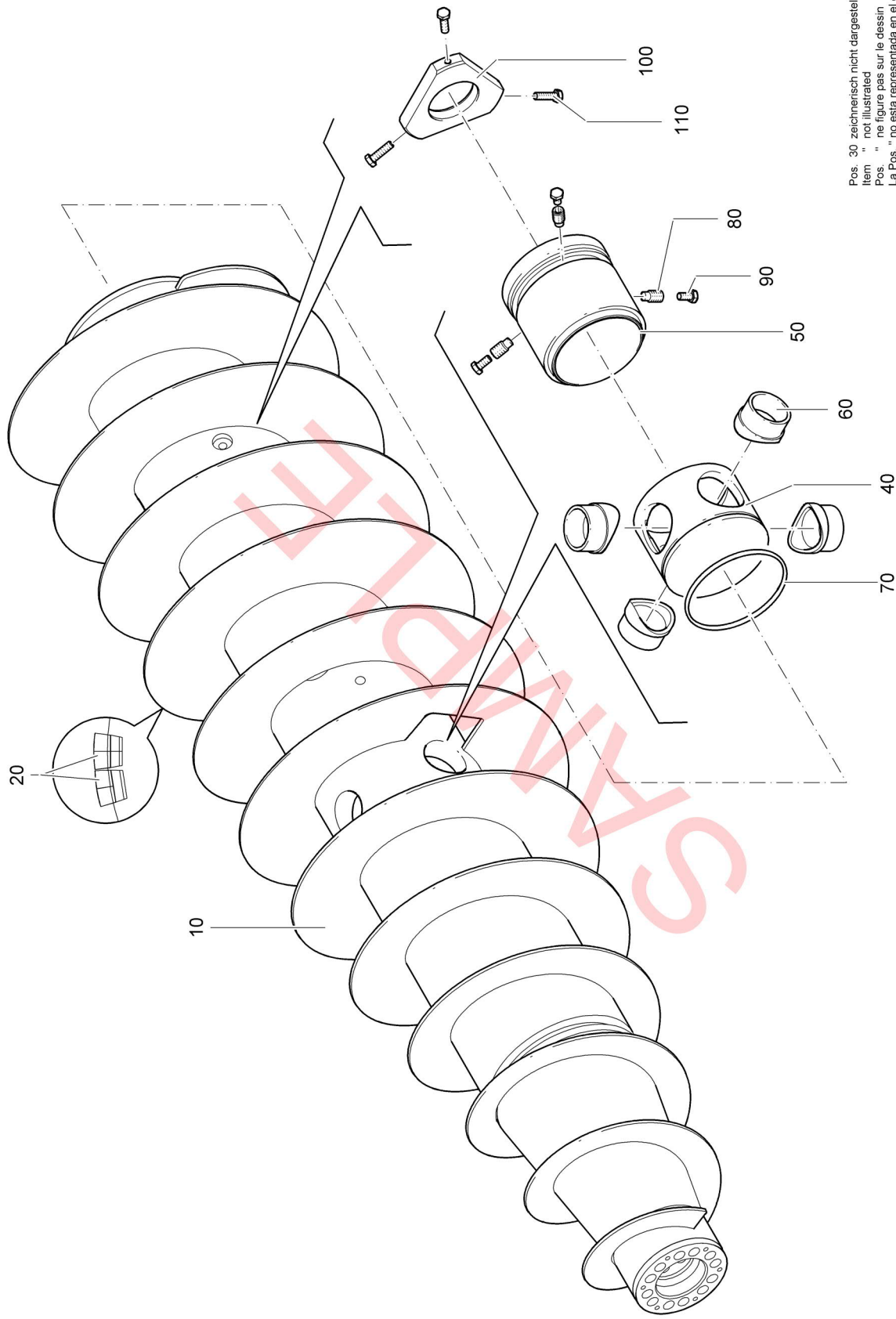
8012-134

Ausgabe / Edition


15.06.2021

Seite/Page

38/96



Pos. 30 zeichnerisch nicht dargestellt
 Item " not illustrated
 Pos. " ne figure pas sur le dessin
 La Pos. " no esta representada en el dibujo

	Rev. : *	Zeichnungs-Nr.:	Blatt
	Datum: 27.06.2019	8419-4756-106	1
			1 Blätter

Baugruppe / Component group

8419-6515-010

SCHNECKE GESCHW.
SCROLL, WELDED

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
20	8175-1079-240	480		PLATTE GELOETET PLATE, SOLDERED PLAQUE, BRASEE	✓	
30	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
40	8419-6621-000	1		VERTEILER DISTRIBUTOR DISTRIBUTEUR	✓	
50	8419-6630-000	1		VERTEILERDECKEL DISTRIBUTOR COVER COUVERCLE DU DISTRIBUTEUR	✓	
60	8418-6493-000	4		BUCHSE BUSHING BOITE	✓	
70	0007-2065-750	1		DICHTRING GASKET JOINT	✓	
80	0019-6396-400	3		GEWINDESTIFT THREADED PIN GOUPILLE FILETEE	✓	
90	0019-7031-400	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
100	8419-6453-000	1		BLECH SHEET METAL TOLE	✓	
110	0019-6536-400	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

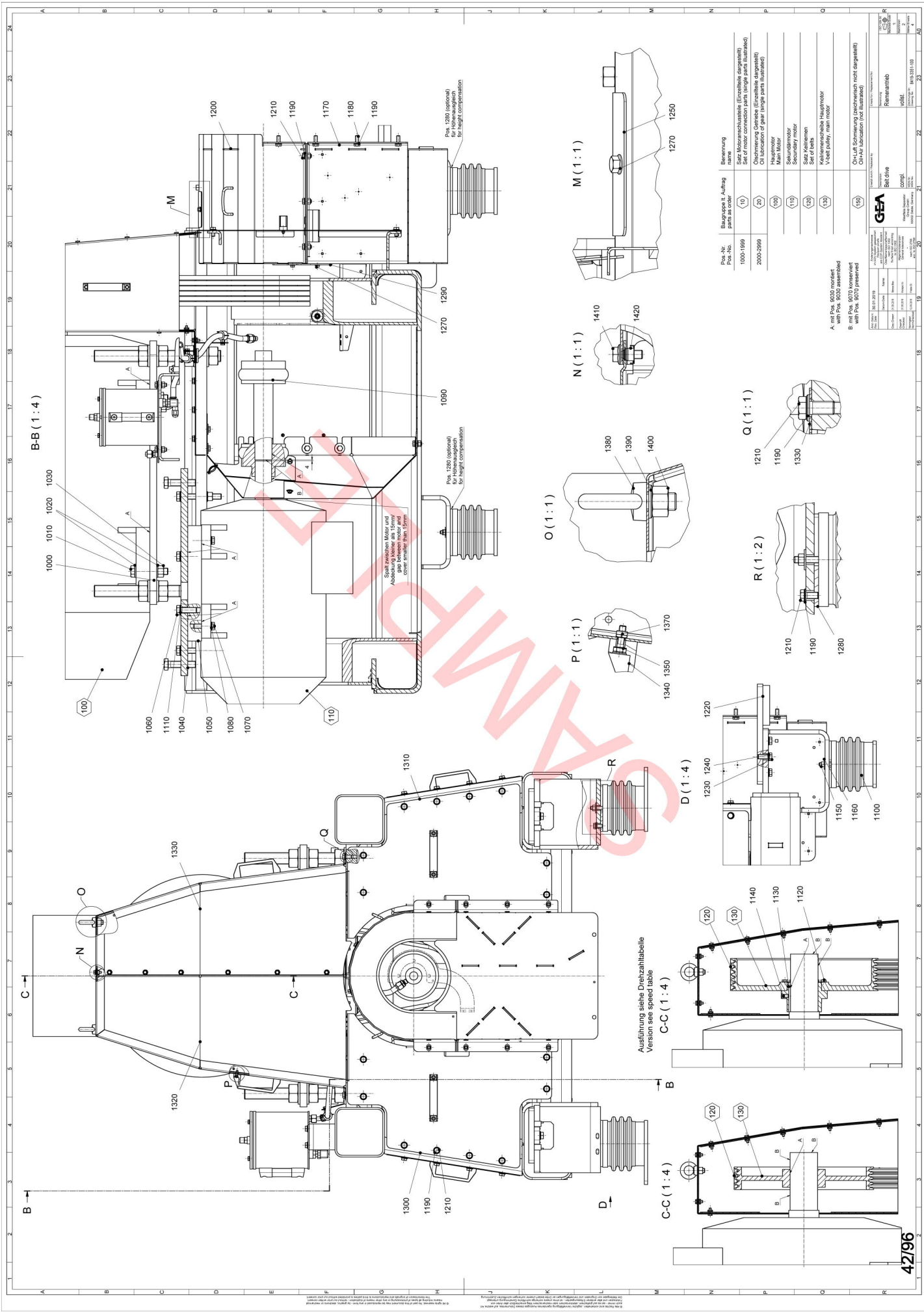
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

40/96

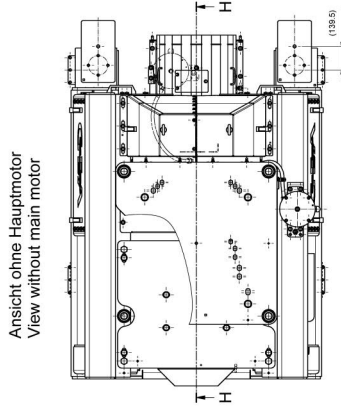


Pos. No.	Bezeichnung	name
1000-1099	Satz Motorschleife (Einzelteile dargestellt)	Set of motor connection parts (single parts illustrated)
1100-1199	Einbauelemente Gehäuse (Einzelteile dargestellt)	On-line housing parts (single parts illustrated)
2000-2999	Hauptmotor	Main Motor
	Sekundärmotor	Secondary motor
	Satz Keilbolzen	Set of bolts
	Keilriemenschleife Hauptmotor	V-belt pulley, main motor
		V-belt pulley, main motor
	Öl-Luft-Schmierung (zusätzlich nicht dargestellt)	Oil-Air lubrication (not illustrated)

A. mit Pos. 6030 montiert
 with Pos. 6030 assembled
 B. mit Pos. 6070 konserviert
 with Pos. 6070 preserved

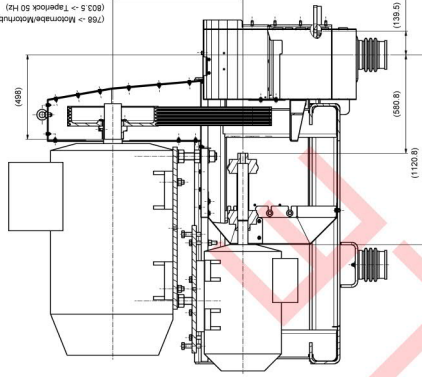
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Getriebe / Gear PG. 417

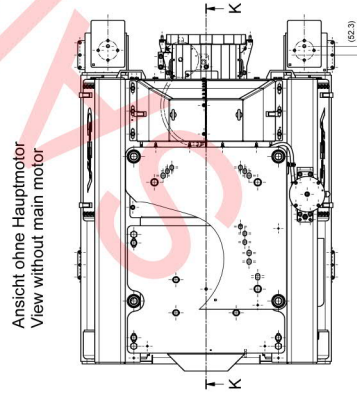


Ansicht ohne Hauptmotor
View without main motor

H-H (1 : 10)

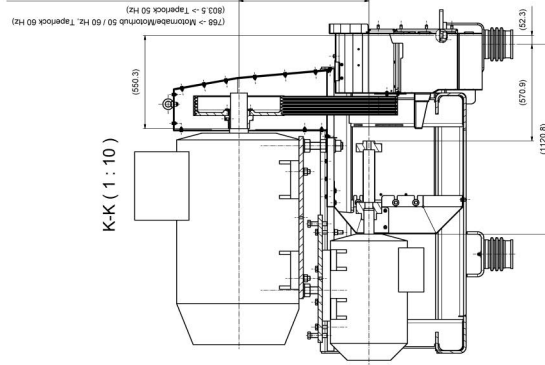


Getriebe / Gear PG. 411



Ansicht ohne Hauptmotor
View without main motor

K-K (1 : 10)



GEA GEORG F. EGGER & SOHN Industriestraße 1 42699 Solingen Tel. +49 (0) 212 241-1 Fax +49 (0) 212 241-2424 E-Mail: gega@gega.de www.gega.de		Produktname Remantrieb	Zeichnungs-Nr. 411/301100
Blatt-Nr. 1	Blatt-Gesamt 1	Blatt-Titel Remantrieb	Blatt-Gruppe 1
Blatt-Gruppe 1	Blatt-Titel Remantrieb	Blatt-Gruppe 1	Blatt-Titel Remantrieb
Blatt-Gruppe 1	Blatt-Titel Remantrieb	Blatt-Gruppe 1	Blatt-Titel Remantrieb

Baugruppe / Component group

8419-3351-100

RIEMENANTRIEB VOLLST.
BELT DRIVE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	8419-3328-350	1		SATZ MOTORANSCHLUSSTEILE SET OF MOTOR CONNECTION PARTS JEU PIECES DE RACCORDEMENT MOTEUR	✓	
1000	8419-3008-040	1		MOTORPLATTE MOTOR PLATE	✓	
1010	0019-7049-300	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1020	0026-1335-400	8		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
1030	0013-0282-400	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
1040	8419-3008-050	1		MOTORPLATTE MOTOR PLATE PLAQUE SUPPORT DU MOTEUR	✓	
1050	8419-3343-000	2		LEISTE METAL STRIP LISTEL	✓	
1060	0019-7108-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1070	0019-7042-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1080	0026-1335-400	4		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
1090	8657-3390-060	1		KUPPLUNG VOLLST. COUPLING, COMPL. ACCOUPLLEMENT, COMPLET	✓	51
1100	8690-1780-060	4		DAEMPFER VOLLST. DAMPER COMPL. AMORTISSEUR COMPL.	✓	
	0026-1358-400	4		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
1120	0000-0006-162	10		ENTFAELT NOT APPLICABLE SUPPRIME	✗	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

Baugruppe / Component group

8419-3351-100

RIEMENANTRIEB VOLLST.
BELT DRIVE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
	0000-0006-162	1		SUPPRIME ENTFAELLT NOT APPLICABLE SUPPRIME	x	
	0013-0280-400	4		SECHSKANTMUTTER HEXAGON NUT	✓	
1160	0026-2407-300	4		ECROU SIX PANS SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
1170	8419-3752-040	1		LUFTSCHACHTUNTERTEIL GESCHW. LOWER PART OF VENTILATION DUCT WELDED	✓	
1180	0019-6970-400	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1190	0026-1371-400	40		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
1200	8419-3752-050	1		LUFTSCHACHTOBERTEIL GESCHW. UPPER PART OF VENTILATION DUCT WELDED	✓	
1210	0019-6968-400	32		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1220	8419-3454-010	2		BLECH GESCHW. SHEET METAL, WELDED TOLE SOUDEE	✓	
1230	0019-7037-400	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1240	0026-1335-400	8		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
1250	8419-3376-100	1		DECKEL COVER COUVERCLE	✓	
1270	0019-1791-300	7		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

46/96

Baugruppe / Component group

8419-3351-100

RIEMENANTRIEB VOLLST.
BELT DRIVE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
1280	8690-1075-020	2		PLATTE PLATE PLAQUE	✓	
1290	8419-3376-090	1		DECKEL COVER COUVERCLE	✓	
1300	8419-3376-060	1		DECKEL COVER COUVERCLE	✓	
1310	8419-3376-070	1		DECKEL COVER COUVERCLE	✓	
1320	8419-3381-040	1		SCHUTZKASTEN GESCHW. PROTECTIVE CASING, WELDED CAGE PROTECTRICE, SOUDEE	✓	
1330	8419-3381-030	1		SCHUTZKASTEN GESCHW. PROTECTIVE CASING, WELDED CAGE PROTECTRICE, SOUDEE	✓	
1340	0026-2678-840	4		GRIFF HANDLEGRIP POIGNEE	✓	
1350	0019-6842-400	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1370	0013-0294-300	8		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
1380	0019-5384-050	2		RINGSCHRAUBE EYE BOLT BOULON A OEILLET	✓	
1390	0026-1335-400	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
1400	0013-0282-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
1410	0019-1754-300	11		SPERRZAHNSECHSKANTSCHRAUBE ELF-LOCKING HEX HEAD SCREW VIS SIX PANS A DENTS DE BLOCAGE	✓	
1420	0013-0185-030	11		KAEIFIGMUTTER CAGE NUT ECROU A CAGE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

47/96

GEA Westfalia Separator Group

Baugruppe / Component group

8419-3351-100

RIEMENANTRIEB VOLLST.
BELT DRIVE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
1430	8419-3205-000	1		STUETZE SUPPORT SOUTIEN	✓	
20	8690-3350-030	1		OELSCHMIERUNG GETRIEBE OIL LUBRICATION SYSTEM, GEAR GRAISSAGE A L'HUILE, MECANISME	✓	53
100	5390-7896-389	1		DREHSTROMMOTOR THREE-PHASE AC MOTOR MOTEUR TRIPHASE	✓	
110	5390-9885-089	1		DREHSTROMMOTOR THREE-PHASE AC MOTOR MOTEUR TRIPHASE	✓	
120	0021-3969-810	1		SATZ SCHMALKEILRIEMEN SET OF NARROW V-BELTS JEU DE COURROIS TRAPEZOID.ETROITES	✓	
130	0021-4128-210	1		RIEMENSCHIBE VOLLST. BELT PULLEY, COMPL. POULIE, COMPLETE	✓	
150	8419-3409-130	1		OEL-LUFT-AGGREGAT VOLLST. OIL-AIR UNIT, COMPL. GROUPE HUILE-AIR COMPL.	✓	59
300	8419-3473-050	1		ANTRIEBSRAHMEN GESCHW. DRIVE FRAME, WELDED	✓	
310	8419-1145-000	1		HALTER HOLDER SUPPORT	✓	
320	0026-1348-400	6		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
330	0019-6931-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
340	0021-3147-750	1		RUNDLAGER RUBBER-METAL CUSHIONS GALET AMORTISSEUR	✓	
350	0013-0279-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
360	0019-6935-400	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

48/96

Baugruppe / Component group

8419-3351-100

RIEMENANTRIEB VOLLST.
BELT DRIVE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
370	0026-1371-400	30		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
380	0013-0280-400	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
390	0026-1348-400	2		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
460	0019-6935-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
480	0019-8133-090	4		GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
490	0013-0191-150	16		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
500	0026-2626-300	16		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
510	0019-7188-300	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
520	0019-7121-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
530	0026-1358-400	8		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
540	0013-0005-400	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
580	8419-3376-200	1		DECKEL COVER COUVERCLE	✓	
590	8419-3117-010	1		SCHUTZBLECH GESCHW. GUARD, WELDED TOLE DE PROTECTION, SOUDEE	✓	
600	8419-3376-030	2		DECKEL COVER COUVERCLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

49/96

Baugruppe / Component group

8419-3351-100

RIEMENANTRIEB VOLLST.
BELT DRIVE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
610	0026-2678-840	4		GRIF HANDLEGRIP	✓	
				POIGNEE		
620	0019-6842-400	8		SECHSKANTSCHRAUBE HEX HEAD SCREW	✓	
				VIS SIX PANS		
640	0013-0294-300	8		SECHSKANTMUTTER HEXAGON NUT	✓	
				ECROU SIX PANS		
660	0019-6968-400	36		SECHSKANTSCHRAUBE HEX HEAD SCREW	✓	
				VIS SIX PANS		
670	8419-3117-000	1		SCHUTZBLECH GESCHW. GUARD, WELDED	✓	
				TOLE DE PROTECTION, SOUDEE		
760	0013-0185-030	8		KAEFIGMUTTER CAGE NUT	✓	
				ECROU A CAGE		
780	0019-1754-300	8		SPERRZAHNSECHSKANTSCHRAUBE ELF-LOCKING HEX HEAD SCREW	✓	
				VIS SIX PANS A DENTS DE BLOCAGE		
850	0026-1337-300	1		FEDERRING SPRING RING	✓	
				ANNEAU-RESSORT		
860	0026-5673-300	1		FAECHERSCHEIBE FAN-TYPE LOCK WASHER	✓	
				RONDELLE A EVENTAIL		
870	0004-2051-768	0.2	m	DICHTUNGSPROFIL MOULDED GASKET	✓	
				PROFIL ETANCHEIFIANT		
880	0026-2407-300	10		SCHEIBE WASHER_ DISK	✓	
				RONDELLE_ DISQUE		
9030	0015-0104-080	1		SCHMIERFETT LUBRICATING GREASE - TSCA Compliant	✓	
				GRAISSE LUBRIFIANTE		

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

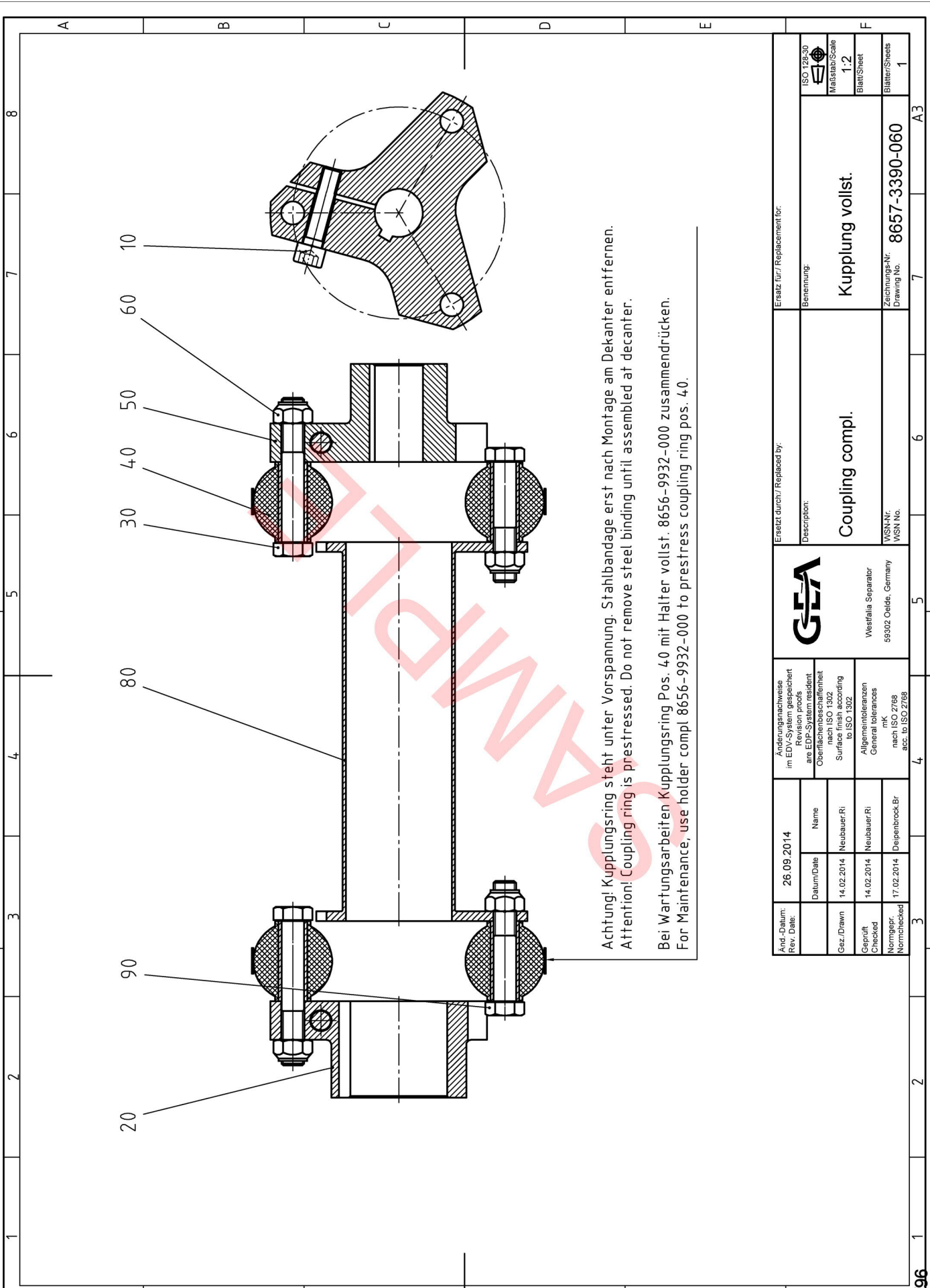
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Seite/Page

50/96


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Achtung! Kupplungsring steht unter Vorspannung. Stahlbandage erst nach Montage am Dekanter entfernen.
 Attention! Coupling ring is prestressed. Do not remove steel binding until assembled at decanter.

Bei Wartungsarbeiten Kupplungsring Pos. 40 mit Halter vollst. 8656-9932-000 zusammendrücken.
 For Maintenance, use holder compl. 8656-9932-000 to prestress coupling ring pos. 40.

Änd.-Datum/ Rev. Date:	26.09.2014		Änderungsnachweise im EDV-System gespeichert Revision proofs are EDP-System resident		 Westfalia Separator 59302 Oelde, Germany		Ersatz durch/ Replaced by:	
	Datum/Date	Name	Oberflächenbeschaffenheit nach ISO 1302 Surface finish according to ISO 1302				Description:	
Gez./Drawn	14.02.2014	Neubauer/RI	Allgemeintoleranzen General tolerances mK nach ISO 2768 acc. to ISO 2768		Kupplung vollst.		ISO 15830 Maßstab/Scale 1:2 Blatt/Sheet	
Gepf./Checked	14.02.2014	Neubauer/RI			Zeichnungs-Nr. Drawing No.		Blätter/Sheets	
Normgepr./Normchecked	17.02.2014	Deipenbrock/Br			8657-3390-060		1	
			4		5		7	
			3		6		A3	

Baugruppe / Component group

8657-3390-060

KUPPLUNG VOLLST.
COUPLING, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0019-6169-400	2		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
20	8656-3388-020	1		KUPPLUNGSNABE CLUTCH HUB MOYEU D'ACCOUPLLEMENT	✓	
30	0019-6586-400	6		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
40	8656-3396-000	2		KUPPLUNGSRING CLUTCH RING BAGUE D'ACCOUPLLEMENT	✓	
50	8657-3388-030	1		KUPPLUNGSNABE CLUTCH HUB MOYEU D'ACCOUPLLEMENT	✓	
60	0013-0309-410	12		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
80	8657-3448-020	1		ROHR GESCHW. PIPE, WELDED TUBE, SOUDE	✓	
90	0019-6583-300	6		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

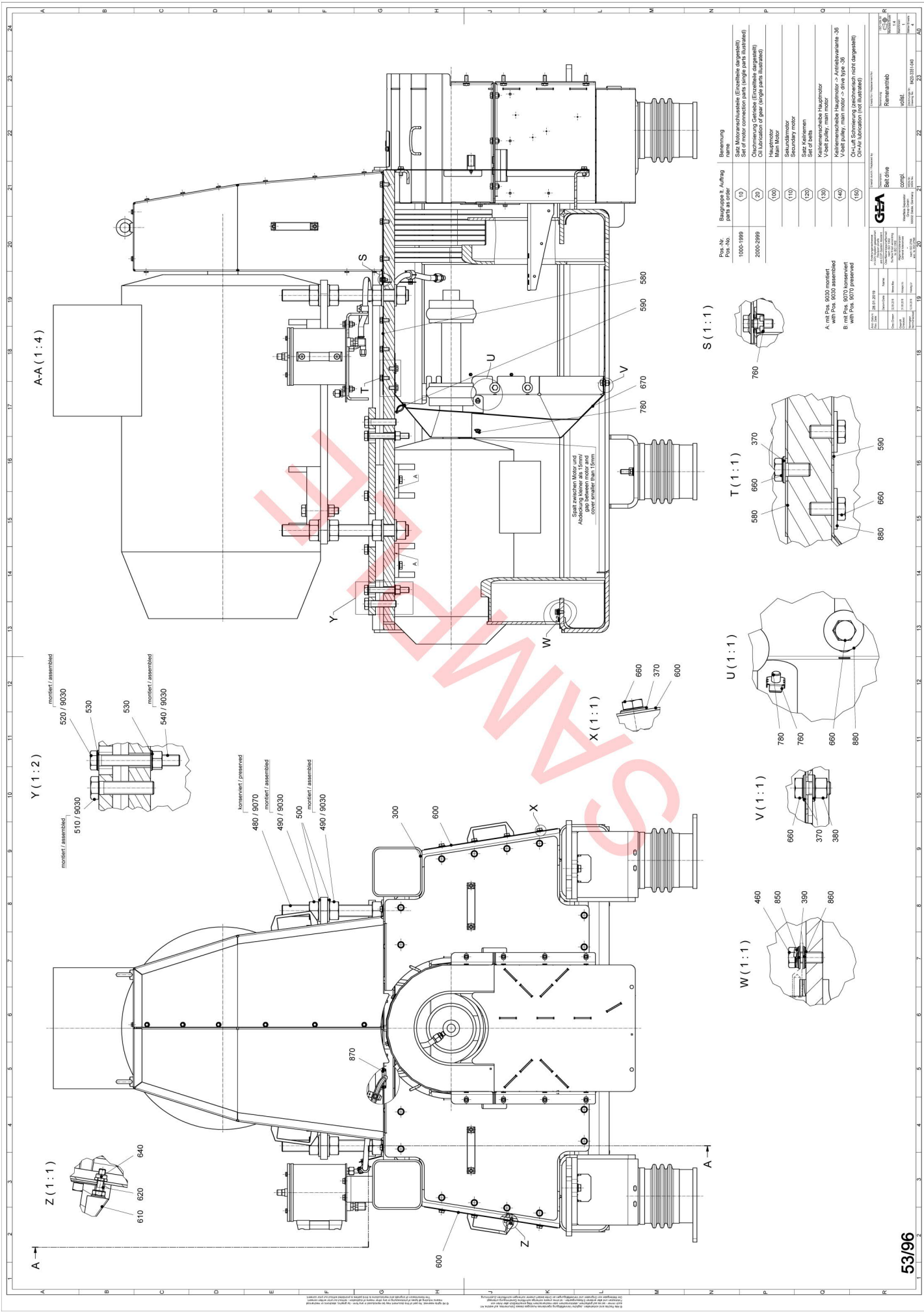
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

52/96



Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

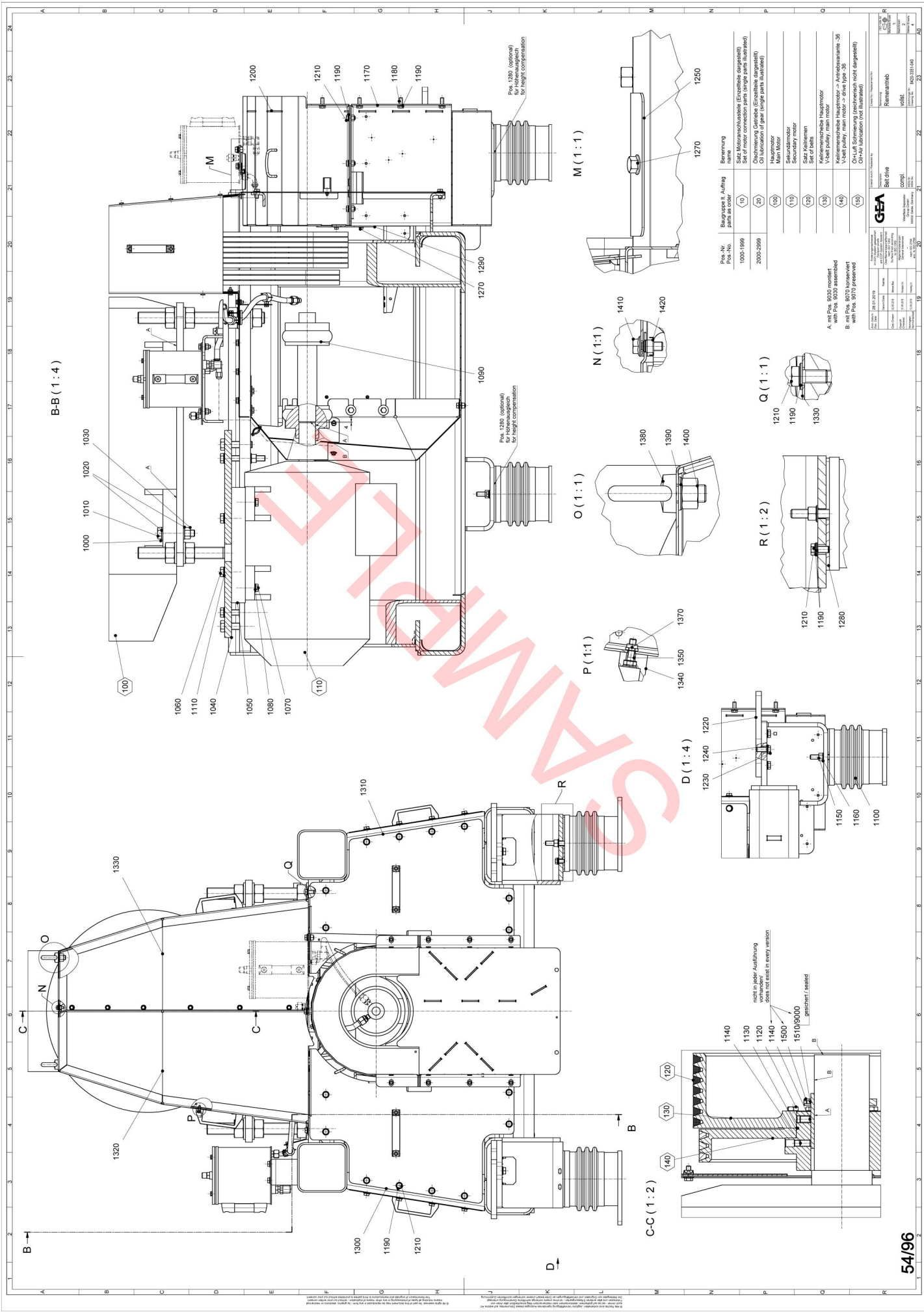
A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled

Pos. Nr.	Bezeichnung & Aufruf parts as order	Bezeichnung name
1000-1999	(10)	Satz Motorschastelle (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	(20)	Öl-Schmierung Oil lubrication of gear (single parts illustrated)
	(10)	Hauptmotor Main Motor
	(10)	Nebentrieb Secondary motor
	(10)	Satz Ketten Set of belts
	(10)	Kettenantriebs-Hauptmotor Chain-drive main motor
	(10)	Kettenantriebs-Hauptmotor - Antriebsart 35 Chain-drive main motor - drive type 35
	(10)	Öl-Luft-Schmierung (nicht dargestellt) Oil-lubrication (not illustrated)

A mit Pos. 8030 montiert
with Pos. 8030 assembled

B mit Pos. 9070 montiert
with Pos. 9070 assembled



B-B (1:4)

M (1:1)

N (1:1)

O (1:1)

P (1:1)

Q (1:1)

R (1:2)

D (1:4)

C-C (1:2)

Pos. No.	Bezeichnung & Auflage name as order	Bezeichnung name
1900-1999	Satz Motorschuttschleife (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)	Satz Motorschuttschleife (Einzelteile dargestellt)
2000-2999	Ölwanne für Motor (Einzelteile dargestellt) Oil lubrication of gear (single parts illustrated)	Ölwanne für Motor (Einzelteile dargestellt)
	Hauptmotor Main Motor	Hauptmotor
	Sekundärmotor Secondary Motor	Sekundärmotor
	Satz Kegelriemen Set of belts	Satz Kegelriemen
	Kettenscheinwerfer Hauptmotor V-belt pulley, main motor	Kettenscheinwerfer Hauptmotor
	Kettenscheinwerfer Sekundärmotor V-belt pulley, main motor	Kettenscheinwerfer Sekundärmotor
	Öl-Luft-Schneidung (Zusätzlich nicht dargestellt) Oil-Air lubrication (not illustrated)	Öl-Luft-Schneidung (Zusätzlich nicht dargestellt)

A mit Pos. 9000 montieren
Mount with Pos. 9000
B mit Pos. 9070 montieren
Mount with Pos. 9070

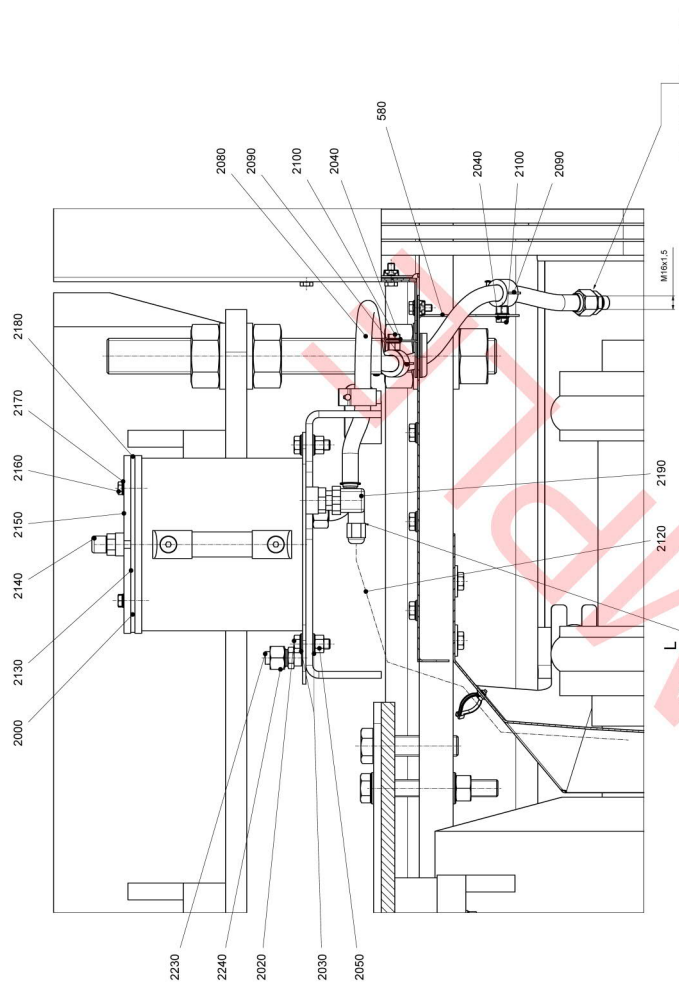
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E-E (1:2)

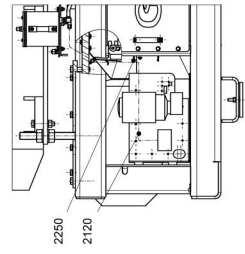
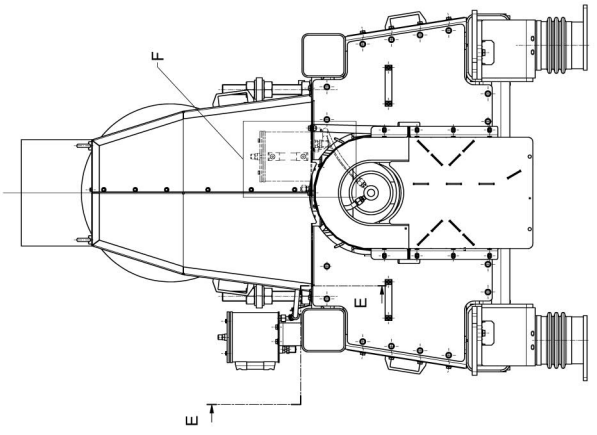


Verstellung gem. Nennmaßstab M16
LS oil - gear
Setting according to nominal diagram M16

Schneidele "Die" - Schneidring "Cutter"
cut surface "inner, freidrehung" gear

F (1:2)

Position des Ölbehälters NUR für den Transport / Versand
Vor Installation muss der Ölbehälter an den Antriebsrahmen montiert werden - siehe Ansicht E-E
Position of the oil tank ONLY for transport / shipping
Position of the oil tank must be mounted on the drive frame - see view E-E
(Pos. 1430 abmontieren)

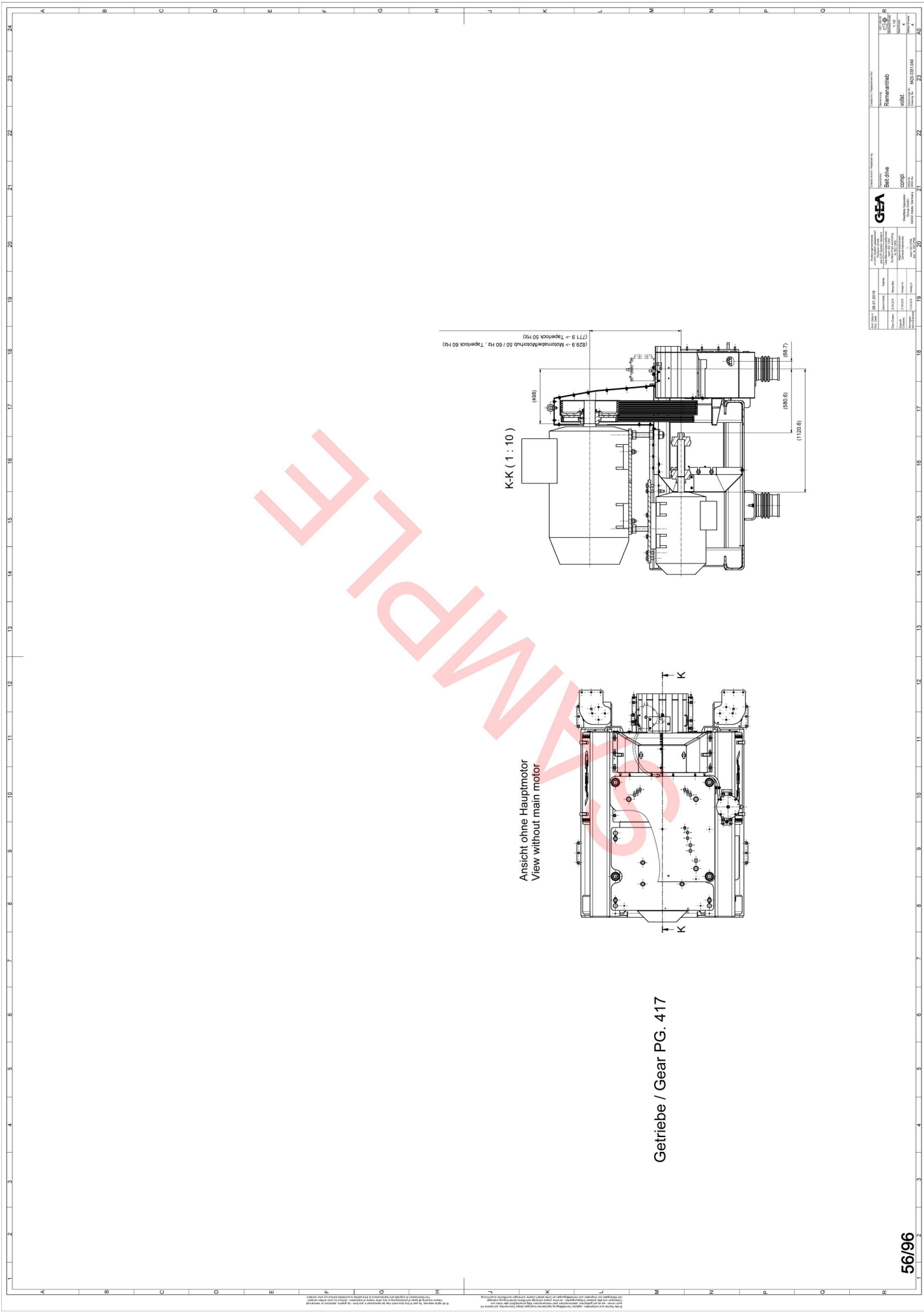


Pos. No.	Bezeichnung / Calling name	Bezeichnung / Calling name
1900-1999	Satz Motorschutzkappe (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)	Satz Motorschutzkappe (Einzelteile dargestellt) Set of motor connection parts (single parts illustrated)
2000-2999	Satz Ölwanne (Einzelteile dargestellt) Oil lubrication of gear (single parts illustrated)	Satz Ölwanne (Einzelteile dargestellt) Oil lubrication of gear (single parts illustrated)
	Hauptmotor Main Motor	Hauptmotor Main Motor
	Sekundärmotor Submotor	Sekundärmotor Submotor
	Satz Kabinen Set of cabin	Satz Kabinen Set of cabin
	Keilriemenkette Hauptmotor V-belt pulley, main motor	Keilriemenkette Hauptmotor V-belt pulley, main motor
	Keilriemenkette Sekundärmotor V-belt pulley, sub motor	Keilriemenkette Sekundärmotor V-belt pulley, sub motor
	Öl-Luft-Schneimeng (zeichnerisch nicht dargestellt) Oil-Air lubrication (not illustrated)	Öl-Luft-Schneimeng (zeichnerisch nicht dargestellt) Oil-Air lubrication (not illustrated)

A mit Pos. 9000 montieren
V-seil motor, main motor
B mit Pos. 9070 montieren
V-seil motor, sub motor
with Pos. 9070 preserved
Oil-Air lubrication (not illustrated)



Produktions-Nr.	1430110000
Zeichnung-Nr.	1430110000
Rev. / Änderung	01 / 01
Gezeichnet	...
Geprüft	...
Freigegeben	...
Produktions-Nr.	1430110000
Rev. / Änderung	01 / 01
Gezeichnet	...
Geprüft	...
Freigegeben	...



Getriebe / Gear PG. 417

GEA GEA Antriebstechnik Industriestraße 1 42699 Solingen Tel: +49 (0) 212 2452-0 Fax: +49 (0) 212 2452-200 E-Mail: info@gea.de www.gea.de		Projekt: PG. 417 Blatt: 1 Datum: 11.01.2011 Zeichner: [Name] Geprüft: [Name] Freigegeben: [Name]
Auftraggeber: [Name] [Adresse]	Auftrag: [Beschreibung]	Zeichnungs-Nr.: PG. 417 Blatt-Nr.: 1

Baugruppe / Component group

8690-3350-030

OELSCHMIERUNG GETRIEBE
OIL LUBRICATION SYSTEM, GEAR

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
2000	8419-3311-000	1		AUSGLEICHSBEHAELTER GESCHW. EQUALIZING BASIN, WELDED VASE D'EXPANSION SOUDE	✓	
2020	0019-6971-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
2030	0026-1371-400	14		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
2040	0026-1345-400	6		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
2050	0013-0280-400	6		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
2080	8419-3769-010	1		SCHLAUCH VOLLST. HOSE, COMPL. TUYAU SOUPLE, COMPLET	✓	
10	0018-8474-030	1		VERSCHRAUBUNG SCREW COUPLING RACC. A VIS	✓	
20	0018-8473-030	1		STECKNIPPEL PLUG-IN NIPPLE RACCORD ENFICHABLE	✓	
30	0018-8183-758	0.8	m	SCHLAUCH HOSE TUYAU SOUPLE	✓	
40	0018-8551-030	1		STECKNIPPEL PLUG-IN NIPPLE RACCORD ENFICHABLE	✓	
2090	0018-8349-030	3		ROHRSCHELLE PIPE CLIP COLLIER POUR TUYAU	✓	
2100	0019-6898-300	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
2120	0005-0422-068	3	m	KABEL CABLE CABLE	✓	
2130	0001-0755-040	1		OELSTANDSANZEIGER OIL GAUGE INDICATEUR DE NIVEAU D'HUILE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

57/96

Baugruppe / Component group

8690-3350-030

OELSCHMIERUNG GETRIEBE
OIL LUBRICATION SYSTEM, GEAR

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
2140	0018-6163-000	1		LUFTFILTER AIR FILTER FILTRE A AIR	✓	
2150	8419-3061-000	1		DECKEL COVER COUVERCLE	✓	
2160	0019-6906-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
2170	0026-1345-400	4		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
2180	8419-1265-130	1		DICHTUNG GASKET JOINT D'ETANCHEITE	✓	
2190	0005-1904-400	1		SCHWIMMERSCHALTER FLOAT SWITCH INTERRUPTEUR A FLOTTEUR	✓	
2200	0019-6965-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
2210	0019-6968-400	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
2230	0018-8048-400	1		VERSCHLUSSEGEL MALE CONNECTING NIPPLE CONE D'OBTURATION	✓	
2240	0013-2002-400	1		UEBERWURFMUTTER COUPLING NUT ECROU DE RACCORD	✓	
2250	0005-4770-900	11		KABELBAND CABLE TAPE BANDE A CABLES	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

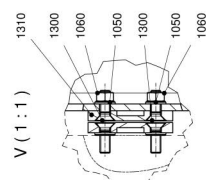
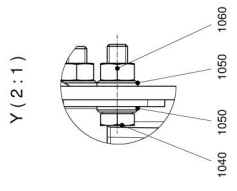
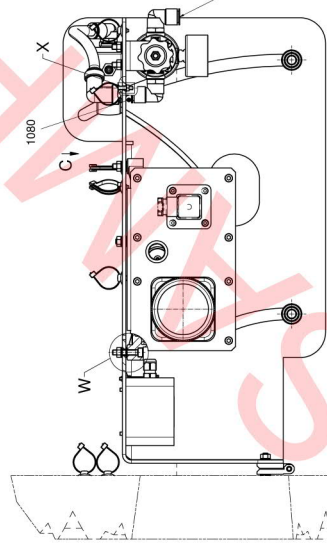
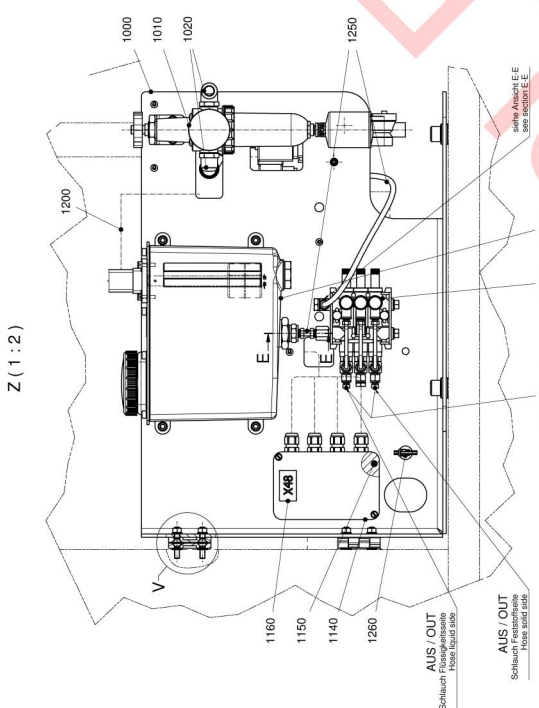
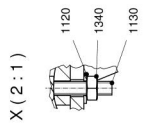
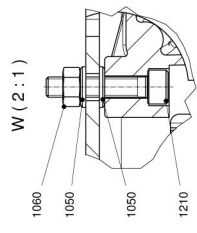
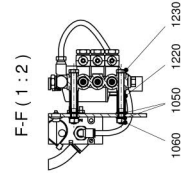
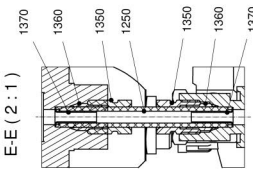
Ausgabe / Edition

15.06.2021

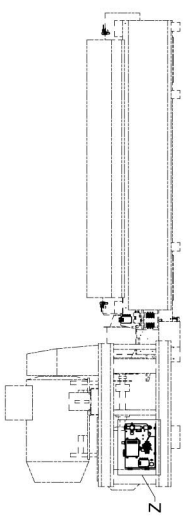
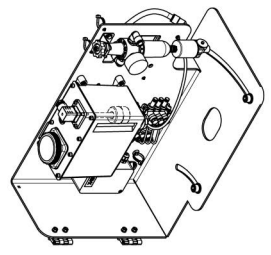
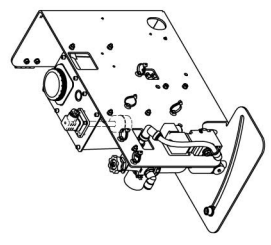
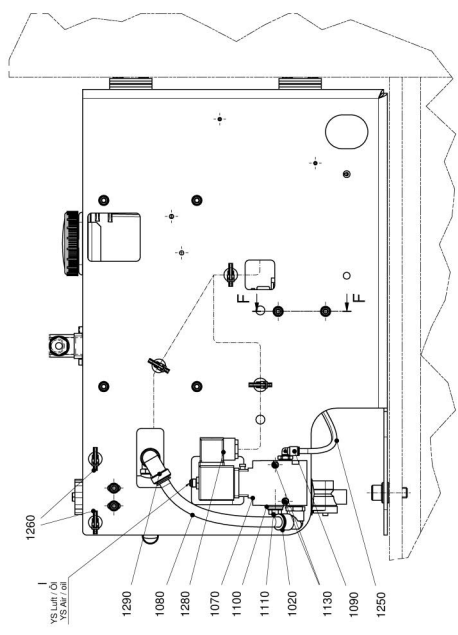
Seite/Page

58/96

GEA Westfalia Separator Group



C (1:2)

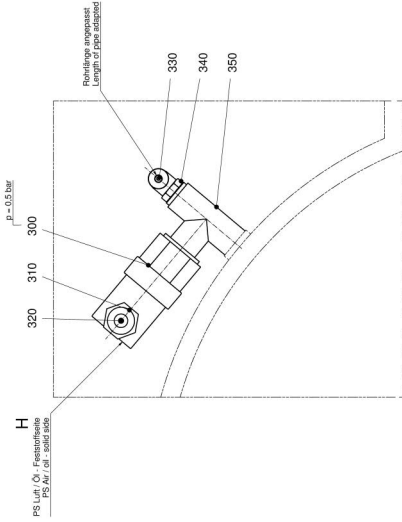


Pos. No. / Bezeichnung
 Pos. No. / name
 1000-1990 / Öl-Luft-Aggregat (montiert) (Einheitlich dargestellt)
 1000-1990 / Oil-air unit (pre-assembled) (uniformly represented)

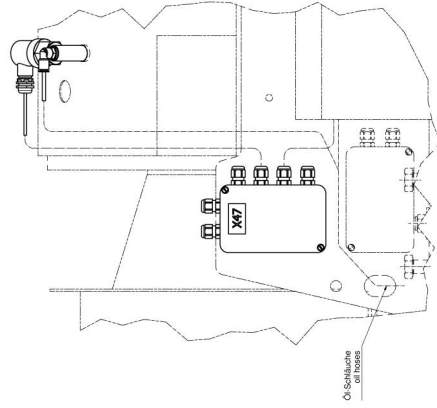
Alle Gewinde der Verbindung im Pos. 400 zu empfindlich.
 Alle in der Zeichnung gezeigten Gewinde sind zu
 Teil-Nr. 400 (Kabelband) nicht dargestellt.
 Pos. 400 (Kabelband) nicht dargestellt.
 Kennzeichnung gem. Kennzeichnungsrichtlinie in Kennzeichnungs-Kat. gezeichnet.
 Terminal diagram in acc. with identification plate in terminal box A48

GEA GEORGES KÄSTNER Industriestraße 1 42699 Solingen Telefon: +49 (0) 212 2400-0 Telefax: +49 (0) 212 2400-200 E-Mail: gka@gea.de Internet: www.gea.de		Pos. No. / Bezeichnung Pos. No. / name 1000-1990 / Öl-Luft-Aggregat 1000-1990 / Oil-air unit
Zeichnung Nr. / Drawing No. 1000-1990	Stück / Pieces 1	Pos. No. / Bezeichnung Pos. No. / name 1000-1990 / Öl-Luft-Aggregat 1000-1990 / Oil-air unit
Pos. No. / Bezeichnung Pos. No. / name 1000-1990 / Öl-Luft-Aggregat 1000-1990 / Oil-air unit	Stück / Pieces 1	Pos. No. / Bezeichnung Pos. No. / name 1000-1990 / Öl-Luft-Aggregat 1000-1990 / Oil-air unit

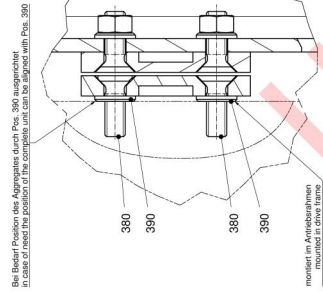
AA (1:1)



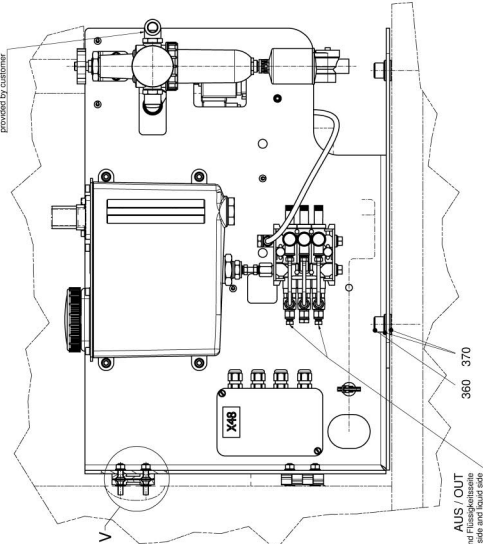
U (1:2)



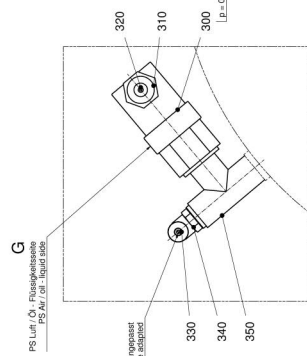
V (2:1)



Z (1:2)



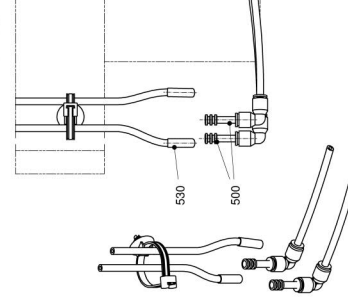
B-B (1:1)



Bei der Installation beachten:

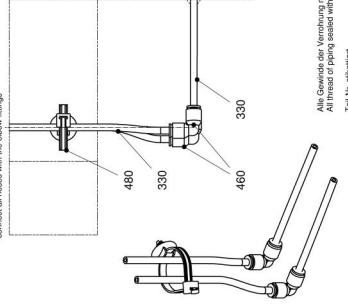
E-E (1:1)

Zur Installation des Druckes:
 alle Klappen bzw. Stopfen sind zu entfernen, anschließend
 alle Schlauchleitungen sind durch
 Aggregat bzw. Stopfen verschließen
 Differenz statisch dezentrieren.
 all hoses are closed with caps and plugs
 remove all caps and plugs, then it
 connect all hoses with the above fittings



E-E (1:1)

Zur Installation des Druckes:
 alle Klappen bzw. Stopfen sind zu entfernen, anschließend
 alle Schlauchleitungen sind durch
 Aggregat bzw. Stopfen verschließen
 Differenz statisch dezentrieren.
 remove all caps and plugs, then it
 connect all hoses with the above fittings



Alle Gewinde der Verbindung mit Pos. 9010 eingesetzt
 All thread of piping sealed with Pos. 9010

alle Nr. orientiert
 all No. oriented

Pos. 400 (Schlechte) nicht dargestellt
 Pos. 400 (badly) not illustrated
Klemmenplan gem. Kennzeichnungsschild in Kennzeichnung X48 belegt
 Terminal diagram in acc. with identification plate part in terminal box X48

Pos.-Nr. / Bezeichnung
 Pos. No. / name
 1000-1990
 Öl-Luft Aggregat montiert (Einzelteile dargestellt)
 Oil-air unit (individual parts illustrated)

GEA GEORGES F. ENGELHARDT AG Industriestraße 1 42699 Solingen Tel. +49 (0) 212 453-1 Fax +49 (0) 212 453-200 E-Mail: gfa@gea.com www.gea.com		Öl-Luft Aggregat Modell 1000-1990 Artikel-Nr. 1000-1990
Blatt 1 von 2	Datum 11.02.2011	Zeichnung 1000-1990

Baugruppe / Component group

8419-3409-130

OEL-LUFT-AGGREGAT VOLLST.
OIL-AIR UNIT, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	8419-3409-138	1		OEL-LUFT-AGGREGAT (MONTIERT)	✓	
				OIL-AIR UNIT (MOUNTED)		
				GROUPE HUILE-AIR (MONTEE)		
1000	8419-3145-040	1		HALTER GESCHW. HOLDER, WELDED SUPPORT, SOUDE	✓	
1010	0018-8290-560	1		DRUCKLUFT-DRUCKMINDERER COMPRESSED-AIR PRESSURE REDUCER DETENDEUR D'AIR COMPRI ME	✓	
1020	0018-6750-860	3		WINKELINSCHRAUBSTECKANSCHLUSS ANGULAR SCREW-IN CONNECTOR RACCORD FILETE COUDE ENFICHABLE	✓	
1030	8690-3144-050	1		HALTER HOLDER SUPPORT	✓	
1040	0019-6842-400	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1050	0026-1382-400	20		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
1060	0013-0276-400	12		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
1070	0018-9503-300	1		DREIWEGE-MAGNETVENTIL THREE-WAY SOLENOID VALVE ELECTROVANNE A TROIS VOIES	✓	
1080	0018-1218-848	0.3 m		ROHR PIPE TUBE	✓	
1090	0018-3227-860	1		WINKELINSCHRAUBSTECKANSCHLUSS ANGULAR SCREW-IN CONNECTOR RACCORD FILETE COUDE ENFICHABLE	✓	
1100	0004-2754-400	1		USITRING USIT RING JOINT USIT	✓	
1110	0019-8904-300	1		VERSCHLUSSSCHRAUBE SCREW PLUG BOUCHON DE FERMETURE	✓	
1120	0026-1362-300	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

61/96

Baugruppe / Component group

8419-3409-130

OEL-LUFT-AGGREGAT VOLLST.
OIL-AIR UNIT, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
1130	0019-2226-300	2		ZYLINDERSCHRAUBE CYLINDRICAL SCREW	✓	
1140	0005-4147-280	1		VIS A TETE CYLINDRIQUE KLEMMENKASTEN TERMINAL BOX	✓	
1150	0019-2222-300	2		ZYLINDERSCHRAUBE CYLINDRICAL SCREW	✓	
1160	0005-3666-510	1		VIS A TETE CYLINDRIQUE KENNZEICHNUNGSSCHILD IDENTIFICATION PLATE	✓	
1170	8690-3171-000	1		BEHALTER CONTAINER RESERVOIR	✓	
1180	8690-3981-000	1		PUMPE PUMP POMPE	✓	
1200	0005-0422-068	1.3	m	KABEL CABLE CABLE	✓	
1210	0019-6111-400	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW	✓	
1220	8416-3344-010	2		VIS A TETE CYLINDRIQUE ROHR PIPE TUBE	✓	
1230	0019-6462-300	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
1250	0018-8795-848	0.4	m	ROHR PIPE TUBE	✓	
1260	0005-4770-900	6		KABELBAND CABLE TAPE BANDE A CABLES	✓	
1270	0018-8797-600	2		DOPPELKEGELRING DOUBLE-TAPERED RING JOINT BICONIQUE	✓	
1280	0018-5118-050	1		GERAETESTECKDOSE APPLIANCE SOCKET CONNECTEUR	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

62/96

Baugruppe / Component group

8419-3409-130

OEL-LUFT-AGGREGAT VOLLST.
OIL-AIR UNIT, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
1290	0018-1215-600	1		WINKELSTECKANSCHLUSS ANGULAR PLUG-TYPE CONNECTOR	✓	
1300	0019-2099-300	4		CONNECTEUR ANGULAIRE SENKSCHRAUBE COUNTERSUNK SCREW VIS NOYEE	✓	
1310	0021-2645-400	2		SCHARNIER HINGE CHARNIERE	✓	
1320	0005-1912-280	1		SCHWIMMERSCHALTER FLOAT SWITCH INTERRUPTEUR A FLOTTEUR	✓	
1340	0013-0274-300	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
1350	0018-8792-300	3		UEBERWURFSCHRAUBE CAP SCREW VIS CHAPEAU	✓	
1360	0018-8796-600	3		DOPPELKEGELRING DOUBLE-TAPERED RING JOINT BICONIQUE	✓	
1370	0018-8794-600	3		HUELSE SLEEVE DOUILLE	✓	
1380	0018-8793-300	2		UEBERWURFSCHRAUBE CAP SCREW VIS CHAPEAU	✓	
300	0005-4111-000	2		DRUCKSCHALTER PRESSURE SWITCH PRESSOSTAT	✓	
310	0005-0202-900	2		VERSCHRAUBUNG SCREW COUPLING RACC. A VIS	✓	
320	0005-0422-068	12	m	KABEL CABLE CABLE	✓	
330	0018-6203-848	15	m	ROHR PIPE TUBE	✓	
340	0018-8980-600	2		WINKELNSCHRAUBSTECKANSCHLUSS ANGULAR SCREW-IN CONNECTOR RACCORD FILETE COUDE ENFICHABLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

63/96

Baugruppe / Component group

8419-3409-130

OEL-LUFT-AGGREGAT VOLLST.
OIL-AIR UNIT, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
350	0018-5039-400	2		T-STUECK T-PIECE	✓	
360	0019-6165-400	2		PIECE ENT ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
370	0026-1371-400	4		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
380	0019-2099-300	4		SENKSCHRAUBE COUNTERSUNK SCREW VIS NOYEE	✓	
390	0026-1382-400	4		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
460	0018-8553-860	2		WINKELSTECKANSCHLUSS ANGULAR PLUG-TYPE CONNECTOR CONNECTEUR ANGULAIRE	✓	
480	0005-4770-900	16		KABELBAND CABLE TAPE BANDE A CABLES	✓	
490	0005-1455-900	15		KABELBINDER CABLE TIE ATTACHE-CÂBLE	✓	
500	0018-8751-860	2		BLINDSTOPFEN BLIND PLUG FAUX BOUCHON	✓	
530	0026-2727-890	2		KAPPE CAP CAPUCHON	✓	
9010	6985-0606-500	1		DICHTUNGSMASSE SEALANT MATERIAU D'ETANCHEITE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

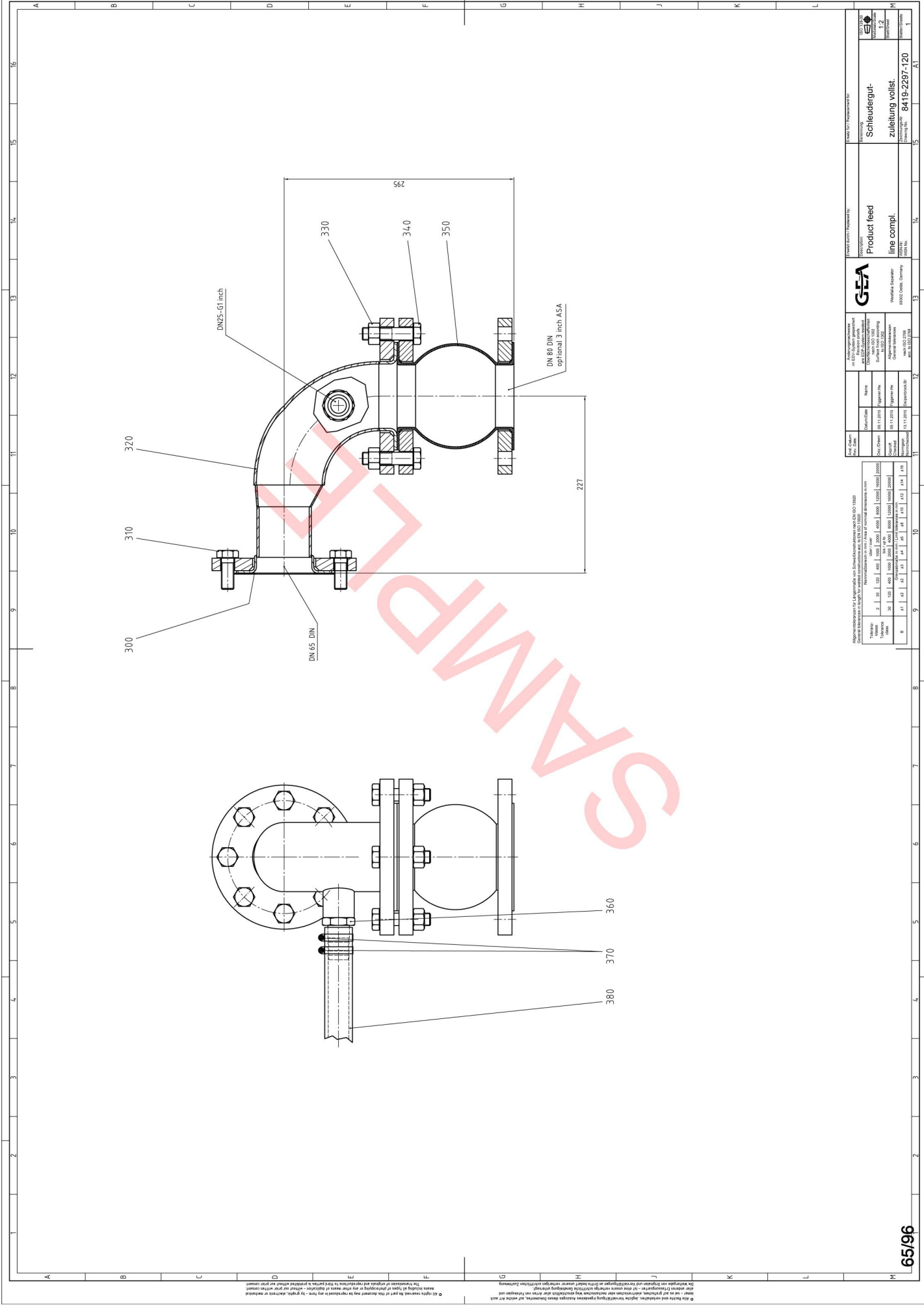
Ausgabe / Edition

15.06.2021

Seite/Page

64/96

GEA Westfalia Separator Group



Approved for use in accordance with the requirements of the EN 10222-2 standard. Geeignet für Einsatz in Anlagen, die nach EN 10222-2 ausgelegt sind. Approved for use in accordance with the requirements of the EN 10222-2 standard. Geeignet für Einsatz in Anlagen, die nach EN 10222-2 ausgelegt sind.		Approved for use in accordance with the requirements of the EN 10222-2 standard. Geeignet für Einsatz in Anlagen, die nach EN 10222-2 ausgelegt sind. Approved for use in accordance with the requirements of the EN 10222-2 standard. Geeignet für Einsatz in Anlagen, die nach EN 10222-2 ausgelegt sind.	
Material Material Material Material	Dimensions Dimensions Dimensions Dimensions	Designation Designation Designation Designation	Drawing No. Drawing No. Drawing No. Drawing No.
Product feed line compl.		Schweißergut zuleitung vollst.	
GEA Werkstoff-Experte 80602 Oetwil, Germany		8419-2297-120	

Baugruppe / Component group

8419-2297-130

SCHLEUDERGUTZULEITUNG VOLLST.
PRODUCT FEED LINE, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
300	0004-2232-780	1		DICHTUNG GASKET	✓	
310	0019-7037-400	8		JOINT D'ETANCHEITE SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
320	8419-2191-030	1		ANSCHLUSSSTUECK GESCHW. CONNECTING PIECE, WELDED PIECE DE RACCORDEMENT, SOUDEE	✓	
330	0013-0282-400	8		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
340	0019-6609-400	8		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
350	0018-6362-030	1		KOMPENSATOR COMPENSATOR COMPENSATEUR	✓	
360	0018-7750-400	1		SCHLAUCHAUSLASS HOSE OUTLET RACCORD DE TUYAU SOUPLE	✓	
370	0018-3814-310	2		SCHLAUCHSCHELLE HOSE CLIP COLLIER A FLEXIBLE	✓	
380	0018-4422-828	2	m	SCHLAUCH HOSE TUYAU SOUPLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

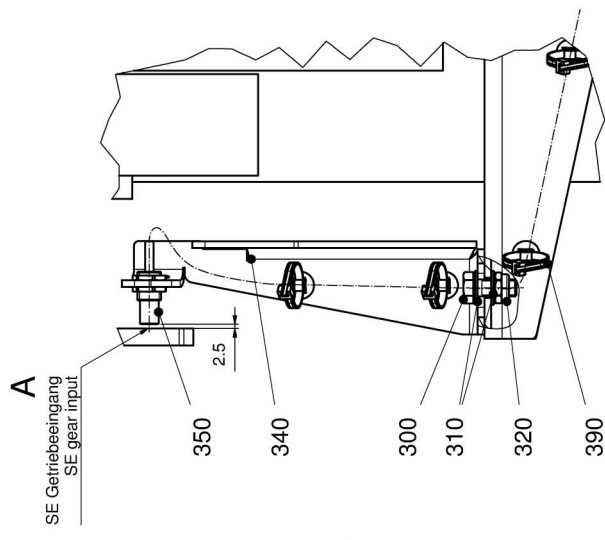
15.06.2021

Seite/Page

66/96

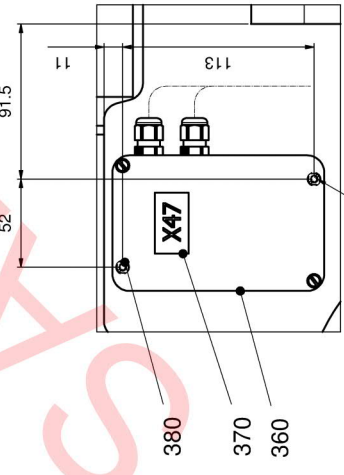
GEA Westfalia Separator Group

Z (1:2)



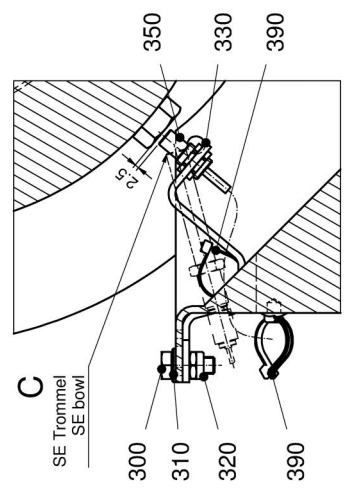
A
SE Getriebeingang
SE gear input

Y (1:2)



M4 bei Montage gebohrt
M4 drilled during assembly

A-A (1:2)



C
SE Trommel
SE bowl

Klemmenplan gemäß Kennzeichnungsschild in Klemmkasten X47 gelegt
Terminal diagram in acc. with identification plate put in the terminal box X47

Änderungsübersicht im EDV-System gespeichert alle Änderungen sind nach ISO 1502 Surfakt bis ISO 1502 Allgemeinbezeichnungen nach ISO 2768 acc. to ISO 2768	Ersetzt durch / Replaced by: Beschreibung: Speed sensor, compl.	Benennung: Drehzahl- initiator vollst.	ISO 128-39 Maßstab/Scale 1:10 Blatt/Sheet 1 Blattanzahl 1
Datum: 30.06.2015 Rev. Date:	Name: Name: VE	Beschreibung: Beschreibung: Speed sensor, compl.	Blatt/Sheet 1 Blattanzahl 1
Gezeichnet: Gezeichnet: 17.06.2015	Geprüft: Geprüft: 28.06.2015	Hersteller: Hersteller: Westfalia Separator 59302 Oelde, Germany	Zeichnungs-Nr.: Drawing No.: 8419-3243-080
Normungs- Normenbezeichnung: nach ISO 2768 acc. to ISO 2768	Freigegeben: Freigegeben: 28.06.2015	Hersteller: Hersteller: Westfalia Separator 59302 Oelde, Germany	Zeichnungs-Nr.: Drawing No.: 8419-3243-080

Baugruppe / Component group

8419-3243-080

DREHZAHLINITIATOR VOLLST.
SPEED SENSOR, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
300	0019-6935-400	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
310	0026-1348-400	4		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
320	0013-0292-300	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
330	8419-3144-060	1		HALTER Prox Switch Holder SUPPORT	✓	
340	8419-3145-030	1		HALTER GESCHW. HOLDER, WELDED SUPPORT, SOUDE	✓	
350	0005-0868-050	2		NAEHERUNGSINITIATOR PROXIMITY SWITCH DETECTEUR DE PROXIMITE	✓	
360	0005-4147-280	1		KLEMMENKASTEN TERMINAL BOX BOITE A BORNES	✓	
370	0005-3666-500	1		KENNEICHNUNGSSCHILD IDENTIFICATION PLATE PLAQUE D'IDENTIFICATION	✓	
380	0019-2222-300	2		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
390	0005-4770-900	10		KABELBAND CABLE TAPE BANDE A CABLES	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

68/96

Für diese Baugruppe gibt es keine Zeichnung

No drawing is available for this assembly

Baugruppe / Component group

8690-3292-000

TEMPERATURFUEHLER VOLLST.
TEMPERATURE FEELER, CPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
320	0005-1226-070	2		WIDERSTANDSFUEHLER RESISTANCE FEELER SONDE DE RESISTANCE		v

FRANZS

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

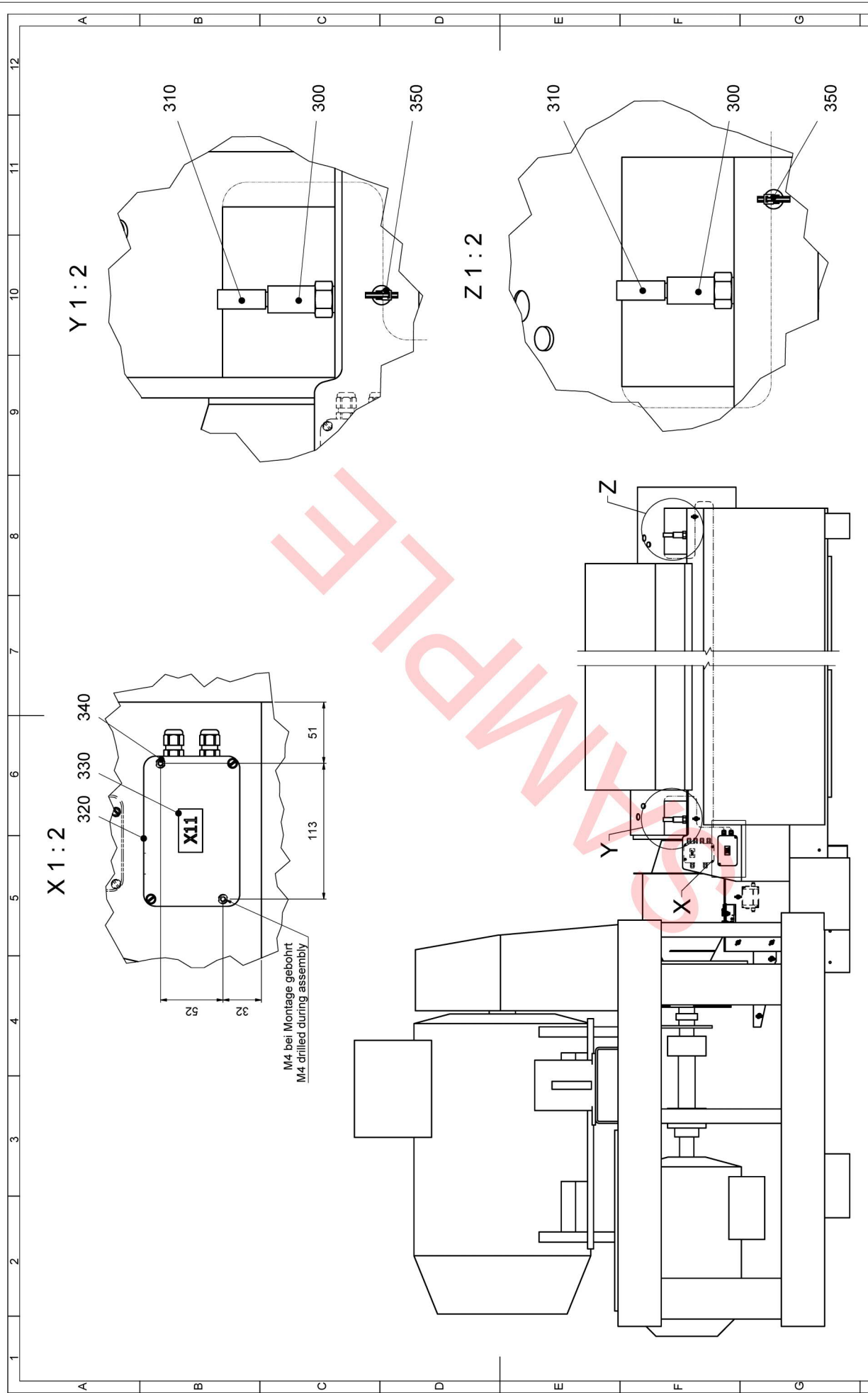
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

70/96



X1:2

Y1:2

Z1:2

M4 bei Montage gebohrt
M4 drilled during assembly

Klemmplan in Klemmkasten X11 gelegt
Terminal diagram in acc. with identification plate put in the terminal box X11

Tech. Drawn: Rev. Date:		Date/Date		Name		Erstellt durch / Prepared by:		ISO 15926-3 Material Scale	
Gezeichnet Checked	17.08.2015	17.08.2015	17.08.2015	Formis Ve	Formis Ve	Schwingungsauf-	Schwingungsauf-	1:10	1
Normgeber Normnummer	30.08.2015	30.08.2015	30.08.2015	Dahler-CH	Frederik SI	nehmer vollst.	nehmer vollst.	1	1
Anforderungsschritte im EDV-System gespeichert and EDV-System released		Oberflächenbeschaffenheit nach ISO 15002 Surface to ISO 15002		Allgemeinmerkmale General characteristics nach ISO 2768 acc. to ISO 2768		Beschreibung: vibration pick-up compl.		Blatt/Sheet Blätter/Sheets	
Ersatz für / Replacement for:		Werkstoffe Separator 59302 Oelde, Germany		MCH No.		8419-2397-020		11	

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Baugruppe / Component group

8419-3297-020

SCHWINGUNGAUFNEHMER VOLLST.
VIBRATION PICK-UP, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
300	0005-1848-020	2		SCHWINGUNGAUFNEHMER VIBRATION PICK-UP	✓	
310	0005-1646-100	2		ENREGISTREUR DES VIBRATIONS ANSCHLUSSKABEL CONNECTION CABLE	✓	
320	0005-4147-280	1		CABLE DE BRANCHEMENT KLEMMENKASTEN TERMINAL BOX	✓	
330	0005-3666-080	1		BOITE A BORNES KENNZEICHNUNGSSCHILD IDENTIFICATION PLATE	✓	
340	0019-2222-300	2		PLAQUE D'IDENTIFICATION ZYLINDERSCHRAUBE CYLINDRICAL SCREW	✓	
350	0005-4770-900	2		VIS A TETE CYLINDRIQUE KABELBAND CABLE TAPE BANDE A CABLES	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

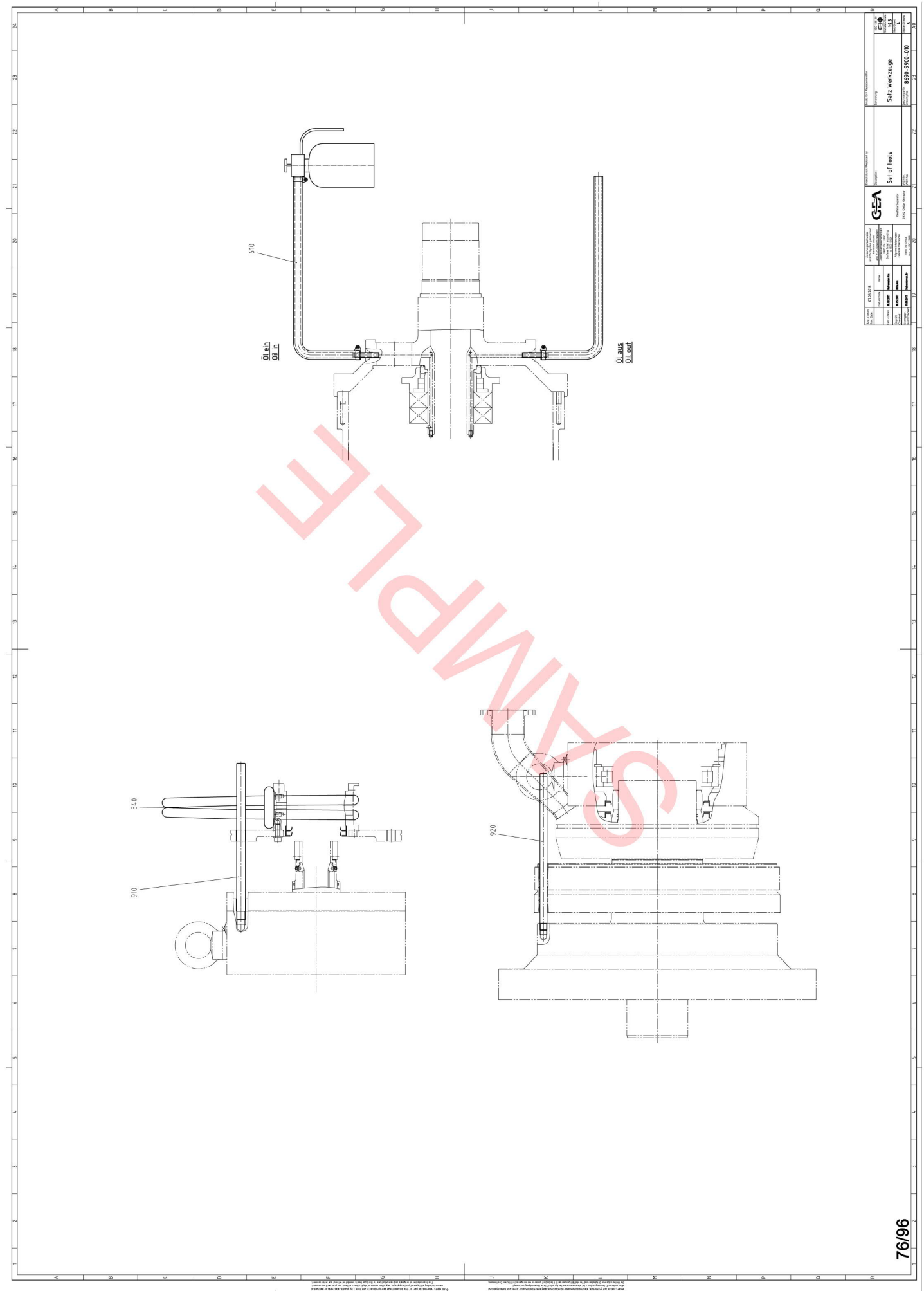
8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

72/96



GEA GEORG F. EGGER & SOHN Industriestraße 1 D-72636 Hechingen Tel. +49 (0) 71 31 30-0 Fax +49 (0) 71 31 30-200 E-Mail: gega@gega.de		PROJECT NO. 9305-9900-310 DRAWING NO. 9305-9900-310 SHEET NO. 1
TITLE Set of tools	PROJECT NAME Set of tools	PROJECT NO. 9305-9900-310
DATE 01/05/2018	DRAWN BY M. K.	CHECKED BY M. K.
APPROVED BY M. K.	PROJECT MANAGER M. K.	PROJECT ENGINEER M. K.

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0019-5199-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
20	0019-5190-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
30	0019-5238-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
40	0019-5238-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
50	0019-0365-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
60	0019-5238-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
70	8419-9868-040	1		HUELSE SLEEVE DOUILLE	✓	
80	8419-9939-120	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
90	0019-6206-150	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
100	8420-9939-100	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
110	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
120	0013-0005-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
130	0019-1237-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
140	0019-7105-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

78/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
150	0019-6145-400	4		ZYLINDERSCHRAUBE CYLINDRICAL SCREW VIS A TETE CYLINDRIQUE	✓	
160	8419-9939-110	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
170	0019-6238-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
180	0013-0282-400	4		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
190	0026-1335-400	4		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
200	8419-9868-050	1		HUELSE SLEEVE DOUILLE	✓	
210	0019-8118-178	1	m	GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
220	0019-7041-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
230	0019-8118-178	1	m	GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
240	8420-9939-140	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
250	0019-7106-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
260	8419-9910-010	1		AUSHEBEVORRICHTUNG VOLLST. LIFTING DEVICE CPL. DISPOSITIF A ENLEVER, COMPLET	✓	
270	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
280	0026-2781-030	2		SCHAEKEL SHACKLE MANILLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

79/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
290	6968-0950-380	2		RUNDSCHLINGE ROUND SLING LACET ROND	✓	
300	8419-9910-000	1		AUSHEBEVORRICHTUNG VOLLST. LIFTING DEVICE CPL. DISPOSITIF A LENLEVER, COMPLET	✓	
310	0019-0365-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
320	0013-0005-400	1		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
330	8419-9939-160	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
340	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
350	8419-9939-150	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
360	8419-9868-060	1		HUELSE SLEEVE DOUILLE	✓	
370	0013-0279-400	6		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
380	0019-5180-150	6		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
390	0026-1348-400	6		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
400	0019-7105-400	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
410	0019-0365-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
420	8419-9939-080	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

80/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
430	0019-5190-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
440	0019-5211-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
450	0013-0280-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
460	0026-1371-400	3		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
470	8419-9939-170	1		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
480	0019-5238-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
490	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
500	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
510	0013-0278-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
520	0026-1345-400	2		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
530	0019-8144-300	2		GEWINDEBOLZEN THREADED BOLT BOULON FILETE	✓	
540	8419-9868-020	3		HUELSE SLEEVE DOUILLE	✓	
550	0026-1371-400	3		SCHEIBE WASHER_DISK RONDELLE_DISQUE	✓	
560	0013-0280-400	3		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

81/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
570	0019-0428-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
580	0019-5224-150	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
590	8419-9912-000	1		ADAPTER VOLLST. ADAPTOR, COMPLETE ADAPTATEUR, COMPLETE	✓	
600	0003-0429-000	1		HOCHDRUCK-HANDHEBELPRESSE HIGH-PRESSURE HAND-LEVER PRESS POMPE MANUELLE HAUTE PRESSION	✓	
	0003-0429-010	1		HOECHSTDRUCKSCHLAUCH MAXIMUM PRESSURE HOSE TUYAU SOUPLE TRES HAUTE PRESSION	✓	
610	8410-9979-000	1		FUELVORRICHTUNG VOLLST. FILLING DEVICE, COMPL. DISPOSITIF DE REMPLISSAGE, COMPL.	✓	85
620	0013-0005-400	1		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
630	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
640	0000-0006-162	1		ENTFAELLT NOT APPLICABLE SUPPRIME	✗	
650	0019-0365-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
660	8419-9868-000	1		HUELSE SLEEVE DOUILLE	✓	
670	0019-5219-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
680	0019-5219-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
690	0019-5220-150	4		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

82/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
700	0019-8920-030	1		VERSCHLUSSSCHRAUBE SCREW PLUG	✓	
710	0018-8636-030	1		BOUCHON DE FERMETURE VERSCHLUSSSTUTZEN CLOSING CONNECTING PIECE RACCORD DE FERMETURE	✓	
720	0018-3200-400	1		VERSCHLUSSKEGEL MALE CONNECTING NIPPLE CONE D'OBTURATION	✓	
730	0013-2001-400	1		UEBERWURFMUTTER COUPLING NUT	✓	
740	0019-7039-150	3		ECROU DE RACCORD SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
750	0019-5250-150	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
760	0013-0280-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
770	0026-1371-400	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
780	8419-9939-100	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
790	8419-9939-130	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
800	0026-1358-400	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
810	0013-0005-400	1		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
820	0019-1237-150	1		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
830	8419-9939-140	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

83/96

Baugruppe / Component group

8419-9900-030

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
850	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
860	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
870	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
880	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
890	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
900	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
910	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		
920	8174-9965-010	2		GEWINDESPINDEL THREADED SPINDLE	✓	
				TIGE FILETEE		
930	0000-0006-162	1		ENTFAELLT NOT APPLICABLE	x	
				SUPPRIME		

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

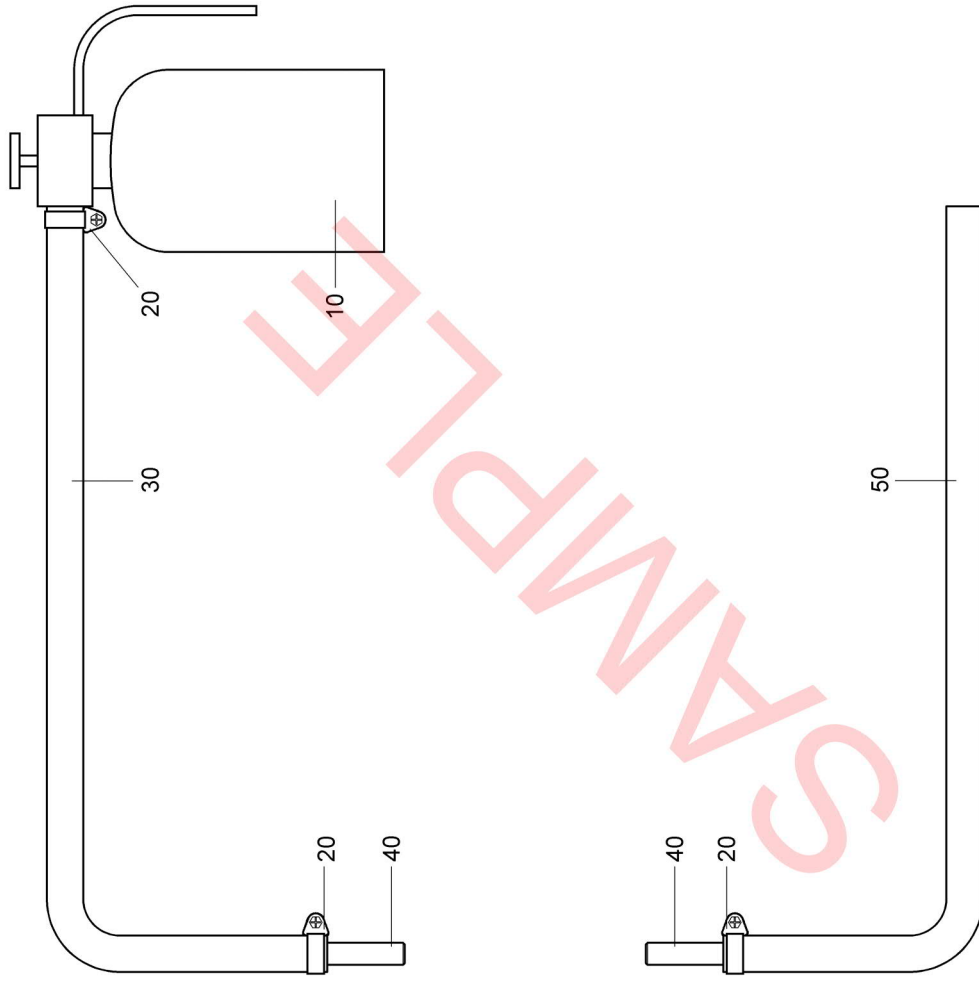
8012-134


Ausgabe / Edition

15.06.2021

Seite/Page

84/96



	Rev. : *	Zeichnungs-Nr.:	Blatt
	Datum: 14.10.2020	8410-4759-091	1
			1 Blätter

Baugruppe / Component group

8410-9979-000

FUELLVORRICHTUNG VOLLST.
FILLING DEVICE, COMPL.

Pos.	Teil-Nummer Part-No.	M Qty.	ME Unit	Benennung Designation	ETS	Seite Page
10	0003-0635-800	1		DRUCKSPRUEHGERAET PRESSURE SPRAY DEVICE	✓	
20	0018-3668-310	3		DISPOSITIF D'ARROSAGE SOUS PRESSION SCHLAUCHSCHELLE HOSE CLIP COLLIER A FLEXIBLE	✓	
30	0018-4861-828	1,2 m		SCHLAUCH HOSE TUYAU SOUPLE	✓	
40	8410-9916-000	2		GEWINDESTUECK THREADED PIECE PIECE FILETEE	✓	
50	0018-4861-828	1,2 m		SCHLAUCH HOSE TUYAU SOUPLE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

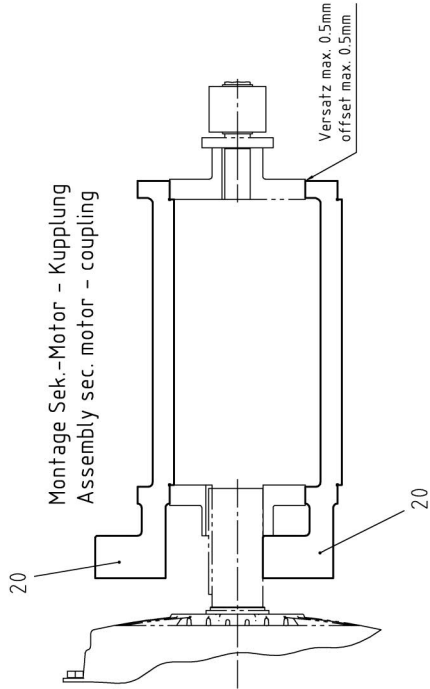
86/96

Montage Eingangsweile
Assembly input shaft

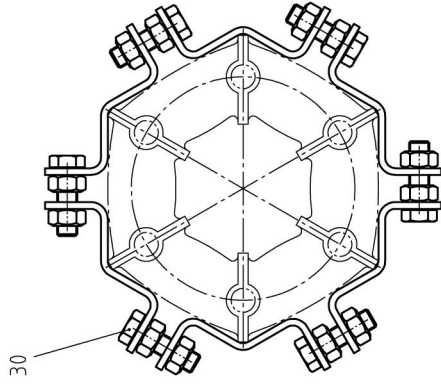
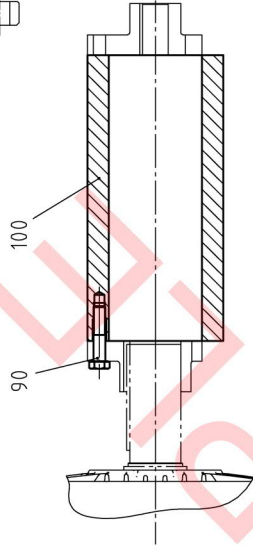
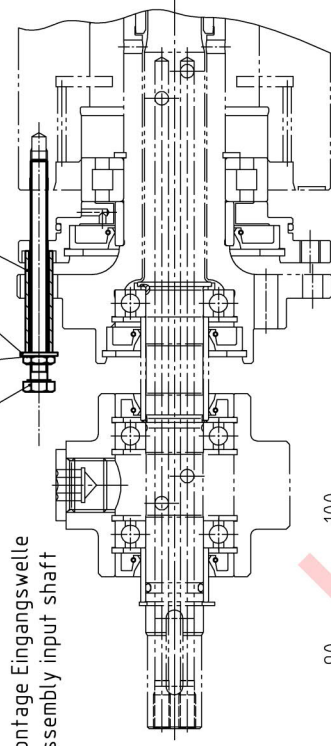
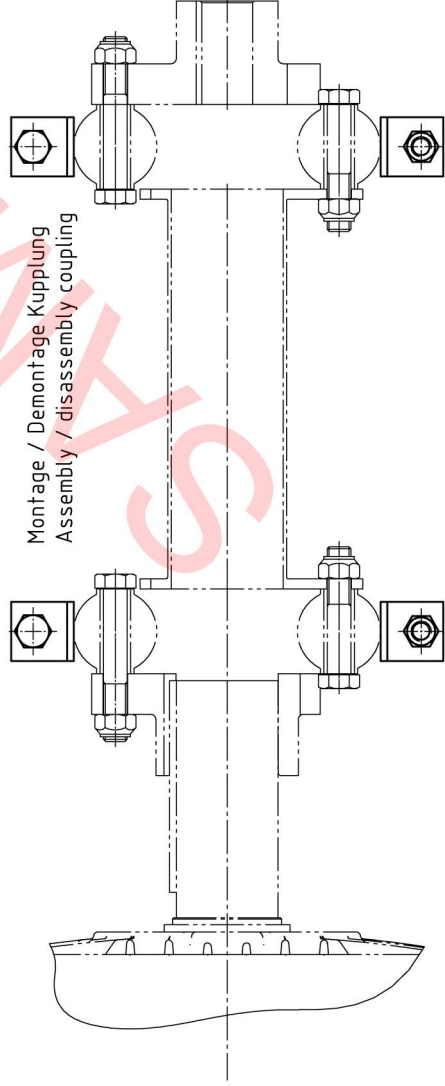


Montage Dichttring
Assembly gasket

Montage Sek.-Motor - Kupplung
Assembly sec. motor - coupling



Montage / Demontage Kupplung
Assembly / disassembly coupling



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04.12.2015 Datum/Date	Name Name: Heidegger R.	Revision Revision: 1502	Zeichnungsart Drawing No.: 8657-9900-030
05.02.2014 Gezeichnet/Checked	Nachbearbeitet/Revised Nachbearbeitet: Heidegger R.	Oberflächenbeschaffenheit Surface finish according to ISO 1302	Blatt/Sheet Blatt/Sheet: 1
19.02.2014 Normgepr. / Normchecked	Freigegeben/Released Freigegeben: Heidegger R.	Allgemeintoleranzen General tolerances according to ISO 2768	Blatt/Sheet Blatt/Sheet: 1
04.12.2015 Freigegeben/Released Freigegeben: Heidegger R.		Werkstück-Signatur 58902 Odeib, Germany	Zeichnungsart Drawing No.: 8657-9900-030
04.12.2015 Datum/Date		Name Name: Heidegger R.	Revision Revision: 1502
05.02.2014 Gezeichnet/Checked		Nachbearbeitet/Revised Nachbearbeitet: Heidegger R.	Zeichnungsart Drawing No.: 8657-9900-030
19.02.2014 Normgepr. / Normchecked		Freigegeben/Released Freigegeben: Heidegger R.	Blatt/Sheet Blatt/Sheet: 1
04.12.2015 Datum/Date		Name Name: Heidegger R.	Revision Revision: 1502
05.02.2014 Gezeichnet/Checked		Nachbearbeitet/Revised Nachbearbeitet: Heidegger R.	Zeichnungsart Drawing No.: 8657-9900-030
19.02.2014 Normgepr. / Normchecked		Freigegeben/Released Freigegeben: Heidegger R.	Blatt/Sheet Blatt/Sheet: 1

Baugruppe / Component group

8657-9900-060

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
20	8657-9453-010	1		BLECH SHEET METAL TOLE	✓	
30	8656-9932-000	2		HALTER VOLLST. HOLDER, COMPL. SUPPORT, COMPLETE	✓	89
40	8657-9473-010	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
50	0019-6854-300	2		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
60	0013-0276-400	2		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	
70	0026-1382-400	2		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	
80	0018-4787-400	2		ROHR PIPE TUBE	✓	
90	0019-6581-400	3		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
100	8657-9473-100	1		SCHEIBE WASHER _ DISK RONDELLE _ DISQUE	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

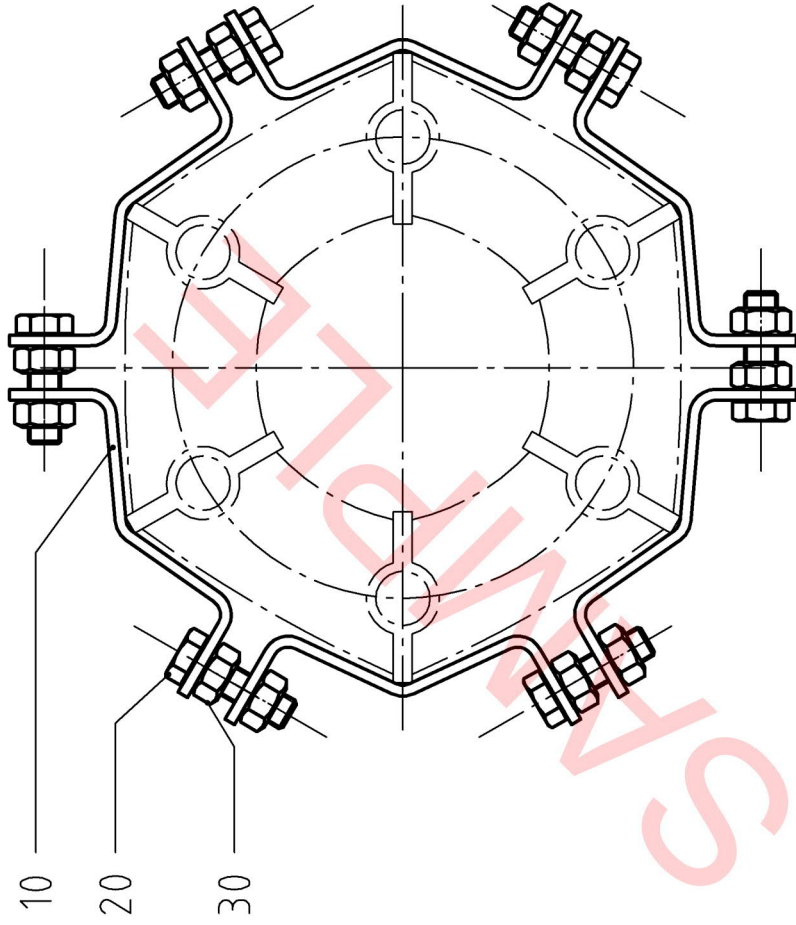
15.06.2021


Seite/Page

88/96

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Änd.-Datum: Rev. Date:			Ersetzt durch:/ Replaced by:		Ersatz für:/ Replacement for:	
	Datum/Date	Name	Description:		Benennung:	
Gez./Drawn	25.04.2012	Neubauer,RI	Holder compl.		Halter vollst.	
Geprüft Checked	25.04.2012	Neubauer,RI	Änderungsnachweise im EDV-System gespeichert Revision proofs are EDP-System resident Oberflächenbeschaffenheit nach ISO 1302 Surface finish according to ISO 1302		ISO 128-30  Maßstab/Scale 1:2.5 Blatt/Sheet	
Normgepr. Normchecked	26.04.2012	Sindermann,Co	Allgemeintoleranzen General tolerances mk nach ISO 2768 acc. to ISO 2768		Zeichnungs-Nr. Drawing No.	
			Westfalia Separator 59302 Oelde, Germany		8657-9932-000	
					Blätter/Sheets 1	

Baugruppe / Component group

8656-9932-000

HALTER VOLLST.
HOLDER, COMPL.

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	8656-9931-000	12		HALTER HOLDER SUPPORT	✓	
20	0019-6972-150	12		SECHSKANTSCHRAUBE HEX HEAD SCREW VIS SIX PANS	✓	
30	0013-0280-400	24		SECHSKANTMUTTER HEXAGON NUT ECROU SIX PANS	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

90/96

Für diese Baugruppe gibt es keine Zeichnung

No drawing is available for this assembly

Baugruppe / Component group

8419-9900-020

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0003-0534-000	1		KEILRIEMEN-VORSPANNUNGS-MESSGERAET BELT TENSION METERING DEVICE MESUREUR DE TENSION DES COURROIES	✓	
20	6986-0417-110	1		SATZ SECHSKANTSCHRAUBENDREHER SET OF ALLEN WRENCHES JEU DE TOURNEVIS HEXAGONAUX	✓	
40	6986-0408-000	1		SATZ DOPPELMAULSCHLUESSEL SET OF DOUBLE-ENDED WRENCHES JEU DE CLES DOUBLES	✓	
50	0003-4221-320	1		EINMAULSCHLUESSEL SINGLE-ENDED WRENCH CLE SIMPLE	✓	
60	0003-0085-320	1		EINMAULSCHLUESSEL SINGLE-ENDED WRENCH CLE SIMPLE	✓	
70	0003-4204-320	1		DOPPELMAULSCHLUESSEL DOUBLE-ENDED WRENCH CLE DOUBLE	✓	
80	0003-0485-320	1		SCHLUESSEL WRENCH CLE	✓	
90	0003-0604-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
100	0003-0601-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
110	0003-0602-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
120	0003-0603-320	1		SECHSKANTSTECKSCHLUESSELEINSATZ HEXAGON SOCKET DOUILLE	✓	
130	0003-0428-320	1		STECKSCHLUESSELEINSATZ SOCKET FOR WRENCHES ADAPTATEUR POUR CLE A DOUILLE	✓	
140	0003-0784-000	1		SATZ DREHMOMENTSCHLUESSEL SET OF TORQUE WRENCH JEU DE CLÉS DYNAMOMÉTRIQUES	✓	
150	0003-0515-030	1		ABZIEHER PULLER EXTRACTEUR	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

92/96

Baugruppe / Component group

8419-9900-020

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
160	0003-0641-000	1		SICHERUNGSRINGZANGE SECURING RING PLIERS PINCÉ POUR CIRCLIPS	✓	
170	0003-0429-000	1		HOCHDRUCK-HANDHEBELPRESSE HIGH-PRESSURE HAND-LEVER PRESS POMPE MANUELLE HAUTE PRESSION	✓	
180	0003-3845-000	1		GELENKHAKENSCHLUESSEL PIVOTED HOOK WRENCH CLE A CROCHET ARTICULE	✓	
190	0003-3846-000	1		GELENKHAKENSCHLUESSEL PIVOTED HOOK WRENCH CLE A CROCHET ARTICULE	✓	
200	0003-4636-050	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
210	0003-4640-050	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
220	6986-0400-030	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
230	6986-0400-470	1		SCHRAUBENDREHER SCREWDRIVER TOURNEVIS	✓	
240	6986-0900-100	1		WERKZEUGKASTEN TOOL BOX COFFRET A OUTILS	✓	
250	6986-0451-910	1		ECKROHRZANGE CORNER WORK PIPE WRENCH TENAILLES A TUYAUX A ENCOIGNURES	✓	
260	0003-0575-000	1		SPLINTTREIBER PIN PUNCH CHASSE-GOUPILLE	✓	
280	6986-0119-120	1		MESSER KNIFE COUTEAU	✓	
290	6986-0390-500	1		SEITENSCHNEIDER SIDE CUTTING PLIERS PINCÉ COUPANTE DIAGONALE	✓	
300	6986-0165-100	1		HAMMER HAMMER MARTEAU	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

93/96

Baugruppe / Component group

8419-9900-020

SATZ WERKZEUGE
SET OF TOOLS

Pos.	Teil-Nummer Part-No.	M Qty.	ME Unit	Benennung Designation	ETS	Seite Page
330	0003-4205-320	1		DOPPELMAULSCHLUESSEL DOUBLE-ENDED WRENCH CLE DOUBLE	✓	
340	0003-0482-320	1		SCHLUESSEL WRENCH CLE	✓	

ELBAWAS

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

94/96

Für diese Baugruppe gibt es keine Zeichnung

No drawing is available for this assembly

Baugruppe / Component group

9390-0014-589

SATZ ERSATZTEILE I
SET OF SPARE PARTS I

Pos.	Teil-Nummer	M	ME	Benennung	ETS	Seite
Pos.	Part-No.	Qty.	Unit	Designation	ETS	Page
10	0019-9421-400	12		SENKSCHRAUBE COUNTERSUNK SCREW	✓	
20	0007-2966-750	1		VIS NOYEE DICHRING GASKET JOINT	✓	
30	0007-2924-830	2		DICHRING GASKET JOINT	✓	
40	0007-2926-830	2		DICHRING GASKET JOINT	✓	
50	0007-3619-750	1		DICHRING GASKET JOINT	✓	

Typ / Model

WATERMASTER CF 7000

Maschinen-Nr. / Machine s/n

8012-134

Trommel-Nr. / Bowl s/n

8012-134

Ausgabe / Edition

15.06.2021

Seite/Page

96/96