

## Erection and Operating Instruction

Dept.

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### 5.      Erection

#### 5.1      Foundations

The loaded machine weight must be taken into account when the foundations Fig. 3 (4) are prepared. The vibration allowances are, in fact, included in the load details shown on the diagrams.

Suitable reinforcements should be provided on the erection site.

Old foundations should be prepared in such a way that they are made 30 to 40 mm lower than their final height. The surface must be rough to ensure satisfactory binding between the new and old concrete.

The foundation bolts should be grouted after alignment of the machine and retightened after the concrete has set.

#### 5.2      Machine and motor

Both the machine and motor should be bolted to foundation rails, foundation blocks or other suitable supports prior to grouting. Foundation rails with set up tightening screws are recommended in particular for the motor so that the belt tension specified by the manufacturers can be set in each case.

Allowance for the height of the foundation rails should be made on the erection site.

The belt pulleys must be lined up accurately.



## 5.3 Adjustment of belt tension specified by the manufacturer.

The slack is taken out of the belt.

Two marks are made on the upper side at a spacing chosen at random. To simplify calculation a spacing of 1000 mm should be preferred.

Tighten the belt by moving the motor until the spacing of the marks has been obtained (at 2.5 % it would be 1025 mm).

Rotate drive several times.

### Important:

As a rule, protect belts from splash water.

Wet belts tend to stretch and slip, and must be re-tightened. A dry belt shrinks and the tension set is no longer correct.

## 5.4 Pipe connections

Piping should be laid according to local conditions. The pipes must, on no account, be supported by the machine. The connection flanges are drilled to DIN ND 10. One each regulating gate valve should be provided on the inlet and outlet in order to ensure a constant throughput in continuous operation.

Diaphragm type pressure gauges, reading up to 4,0 bar, must be fitted without fail at the cleaned stock outlet and at the light rejects outlet. (Proposal of installation, see Fig. 5).

Fitting of a contact type pressure gauge or of a pressure transmitter at the inlet is required which would switch off the dump pump of the pulper when a pressure of about 3,5 bar has been recorded. This is required in particular, when the Q - H curve of the pulper dump pump shows a rather decreasing value and at zero throughput an inlet pressure of 5 bar and more can be expected.

This condition can arise when the outlet or perforated plate are clogged.



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## 5.5 Additional connections

The Fiberizer has a sealing water connection R 1/4" for the shaft seal, which should be connected to the mains. The sealing water pressure is about 0,5 bar above the cleaned stock outlet pressure.

During operation the sealing water should only be opened sufficiently to allow water to issue slightly at the drip water outlet. This allows lubrication and cooling of the shaft and of the shaft seal, and wear of the shaft protection sleeve and of the packings is reduced to a minimum.

A connection R 3/8" is provided on the housing for removal of the drip water and a pipe can be attached to this connection if required.



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6. Before Start-up

## 6.1 Lubrication

Fill up with bearing oil (see list of lubricants).  
For this purpose remove screw plug 105 marked red.

The oil filling should be  $\frac{3}{4}$  way up the oil level sight glass 103 and never drop below the halfway mark of the oil level sight glass when the machine is running so that an efficient splash lubrication is ensured.

## 6.2 Sealing water

Open sealing water supply. Set pressure to 3,0 bar

### 6.3 Light rejects trap

Roughly set interval and opening time of the light rejects trap. Light rejects gate valve is closed. Do not put control system in operation at this stage.

Standard values: Opening time = 2 seconds  
Interval time = 10 seconds (15 seconds)  
(unsorted mixed waste paper)  
Interval time = 20 seconds (30 seconds)  
(sorted waste paper)

#### 6.4 Heavy rejects trap

Bottom gate valve NW 150 closed.  
Top gate valve NW 150 open.  
In the first place, set sealing water pressure  
to 3.0 bar

Interval time = approx. 1 hour  
 Dumping time = approx. 20 seconds  
 Charging time = approx. 1 minute  
 (3 minutes)



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6.5 Flushing

Flush out stock pipes to the Fiberizer. Drain flushing water by way of the heavy rejects trap. Open up Fiberizer so that any larger size foreign matter lodged inside can be removed. At the same time free movement of the rotor should be checked by rotation of the drive.

Close up the Fiberizer after completion of these checks and switch on motor for a short time.



## 7. Start-up

- Start up motor.
- Open outlet gate valve.
- Switch on pulper dump pump.
- Open inlet gate valve.
- Put in operation control system of light rejects trap.
- Set pressure on the light rejects trap by opening and closing the inlet and outlet gate valve respectively.  
Pressure has been set correctly when the vibrating screen installed after the Fiberizer is charged with the removed flow volume.
- Start-up vibrating screen.
- Open spray water for the vibrating screen.
- Put in operation control system of heavy rejects trap.
- Correct sealing water pressure for shaft seal.
- Loosen or re-tighten stuffing box for shaft seal.
- Increase interval time of the light rejects trap after about one hour of operation.

The rejects accumulating at the vibrating screen are an indicator whether the interval time has been set correctly.

If the rejects have a very large flake content - stock losses - the interval time set is too short. If the rejects consist almost entirely of light components, then the interval time set is too high. (Concentration of plastics is too high in the rotor housing).

Temporary variations in the rejected stock composition, despite best possible prior setting of the interval time, can be attributable to changed waste paper furnish.



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- Setting of the interval time for the heavy rejects trap, depends on the amount of heavy rejects. The time has been set correctly when the trap is filled with heavy rejects roughly half-way up the sight glass, shortly before dumping.

Stop dumping and charging time and correct setting accordingly.

Important: Only fill up trap with water up to the top edge of the sight glass.

This action should ensure that the heavy rejects accumulated in the meantime, while the top gate valve was closed, are forced into the trap.



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### 8. Stopping

- Switch off pulper dump pump
- Flush out Fiberizer thoroughly
- Switch off heavy rejects trap control system
- Switch off light rejects trap control system
- Close inlet gate valve
- Switch off motor
- Close sealing water for shaft seal
- Close sealing water for heavy rejects trap
- Switch off vibrating screen
- Shut off spray water for vibrating screen



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<p>9.        <u>Operating hints</u></p> <p>9.1       Reduced throughput at the same gate valve position indicates a reduced open area on the perforated plate. The pressure differential between inlet and outlet must have increased in this case.</p> <p>          The following reasons can be involved:-</p> <ul style="list-style-type: none"> <li>a)       the motor has failed or the belt came off and the cleaning effect of the rotor blades in connection with the defibering bars is non-operational.</li> <li>b)       Concentration of light rejects (especially plastics) has increased to a serious level within the rotor housing i.e. the interval time on the light rejects trap has been set too high.</li> </ul> <p>          The following applies as a rule:- -----</p> <p>          The interval and opening time of the gate valve depends on the proportion of the contraries with a lower specific gravity in the waste paper used and on the throughput.</p> <ul style="list-style-type: none"> <li>c)       The Fiberizer has not been flushed out adequately after stopping the motor; paper stock residues have dried up in the holes of the perforated plate.</li> <li>d)       The working edges of the rotor and of the defibering bars have worn excessively, i.e. increased spacing between working edges of rotor and perforated plate and rotor and defibering bars.</li> <li>e)       The spacings mentioned under "d" have been set too wide.</li> </ul>	



9.2 Any vibrations which may build up on the Fiberizer higher noise level - are caused by air bubbles. The air leaves the Fiberizer by way of the light rejects trap. Action is unnecessary.

9.3 If the flow volume supplied to the vibrating screen appears either too high or too low, the pressure on the light rejects trap should be corrected by opening and closing the inlet and outlet gate valve respectively.

9.4 The sealing water supply should only be opened sufficiently during operation, so that a slight amount of water can issue from the stuffing box. If stock is emerging at the stuffing box of the shaft seal the reasons can be as follows:-

- a) sealing water pipe clogged;
- b) sealing water pressure too low or it has dropped or failed periodically;
- c) worn packings;

For this reason only water free from sand and fibres should be used.

No further supply point should be connected to the sealing water pipe.



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### 10. Maintenance

The Escher Wyss Fiberizer calls for a minimum of maintenance because of its robust construction.

- 10.1 The bearing oil should be changed for the first time after about 100 hours of running-in time. Then top up with small quantities of oil after every 300 hours of operation, in order to maintain the correct oil level. The oil level must not drop below the half-way mark of the oil level sight glass when the machine is running, in order to ensure an efficient splash lubrication of the bearing assemblies. The oil level sight glass must always be clear. Remove old oil residues so that the oil level can be checked accurately.

- 10.2 Flush out the Fiberizer thoroughly on every shut down extending over a long period. Then it is recommended to fill the Fiberizer with water to prevent drying up of any remaining stock residues in the holes of the perforated plate.



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11. List of Lubricants  
used for the Bearing Assembly

<u>Manufacturer</u>	<u>Grade</u>	<u>Viscosity</u>
Shell	Vitrea 27	3 <sup>0</sup> E (50 <sup>0</sup> C)
Esso	Esstic 45	3 <sup>0</sup> E (50 <sup>0</sup> C)
Texaco DEA	Rando Oil A	3 <sup>0</sup> E (50 <sup>0</sup> C)
Chearon	OC Turbine Oil 9	3 <sup>0</sup> E (50 <sup>0</sup> C)



### 12. Spare parts

- 12.1 Replacement of spare parts, except for the obvious parts subject to wear, should hardly be necessary within the first few years when the Fiberizer is operated carefully.

However, we recommend that the parts shown in the spare parts list should be kept in stock.

Their part numbers are identical with the item numbers in Fig. 1 (2)

However, we consider it mandatory that the following spare part items should be kept in stock:-

F1 unit: 220, 341, 343 and 344  
 (F2 unit: 214, 341, 343 and 344

Selective stocking of spare parts is an advantage.





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## 12.2. Spare parts list, F1 unit

Part No.	Qty.	Description	Material	Pattern or Bin No.	Type
107	2	Cord packings Ø 230 x 3	Guttasyn	4 420 107	glued
115	2	Roller bearings Ø 215/100 x 47	St.	4 420 115	NU 320/C3/NA
116	1	Special ball bearing Ø 215/100 x 47	St.	4 420 116	QJ 320 M
202	1	Shaft protection sleeve Ø 94/80 x 140	1.4059	4 420 202	Ceramic coated
204	1	Cord packing Ø 90 x 3	Guttasyn	4 420 203	glued
212	1	Rotor cap Ø 125 x 55	1.4059	4 610 212	
215	1	Hub Ø 215 x 110	1.4312	4 610 215	
216	1	Cover disc Ø 240/130 x 4	1.4541	4 610 216	
220	1	Blade ring Ø 610 x 69			
304	1	Stuffing box complete Ø 215 x 80	GG 25	4 420 304	
307	1	Silver hose NW 6 x 400		4 610 307	
313	1	Stuffing box gland compl. Ø 96 ins. dia.	GG 20	4 420 313	
316	1	Closing ring Ø 170/96 x 18	1.4059	4 610 316	
319	1	Cord packing Ø 115 x 3	Guttasyn	4 420 319	glued

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Ravensburg,  
March 25, 1974

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Part No.	Qty.	Description	Material	Pattern or Bin No.	Type
320	5	Packing cords 12 x 12 x 360	Pamilon	910 512	
321	1	Lantern ring Ø 117/96 x 12	Gz Sn Bz 12	4 420 321	
341	1	Perforated plate Ø 705/170 x 12	1.4571		
342	12	Stainl. cyl. screws M12 x 16, DIN 6912 A2		4 610 342	
343	10	Defibering bars 90 x 50 x 32	165 MCU	4 610 343	
344	10	Retaining parts 68 x 50 x 40	165 MCU	4 610 344	
345	20	Stainl. cyl. screws M12x50 DIN 912	A2	286 147	
346	20	Stainl. spring washers 12, DIN 7980	1.4541	344 712	
508	2	Luminous discs Ø 98 x 8	hard glass	4 910 434	

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## 12.3 Spare parts list F2 unit

Part No.	Qty.	Description	Material	Pattern or Bin No.	Type
107	2	Cord packings Ø 230 x 3	Guttasyn	4 420 107	glued
115	2	Roller bearings Ø 215/100 x 47	St.	4 420 115	NU 320/C3/NA
116	1	Special ball bearing Ø 215/100 x 47	St.	4 420 116	QJ 320 M
202	1	Shaft protection sleeve Ø 94/80 x 140	1.4059	4 420 202	ceramic coated
204	1	Cord packing Ø 90 x 3	Guttasyn	4 420 203	glued
206	1	Hub Ø 250/78x172	1.4312	4 620 206	
207	1	Cap nut Ø130x70	1.4541	4 620 207	
208	1	Cord packing Ø 95 x 4	Neoprene	540 104	
212	1	Cover disc Ø 280/150 x 4	1.4541	4 620 212	
214	1	Blade ring Ø 860 x 73			
304	1	Stuffing box compl. Ø 215 x 80	GG 25	4 420 304	
307	1	Silver hose NW 6 x 400		4 610 307	
313	1	Stuffing box gland compl. Ø 96	GG 20	4 420 313	
319	1	Cord packing Ø 115 x 3	Guttasyn	4 420 319	glued
320	5	Packing cords 12 x 12 x 360	Ramilon	910 512	

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Part No.	Qty.	Description	Material	Pattern or Bin No.	Type
321	1	Lantern ring Ø 117/96x12	Gz.Sn Bz 12	4 420 321	
341	1	Perforated plate Ø 920/170 x 12	1.4571		
342	12	Stainl. cyl. screws M12x16, DIN 6912	A2	4 610 342	
343	10	Defibering bars 90 x 50 x 32	165 MCU	4 610 343	
344	10	Retaining parts 68 x 50 x 40	165 MCU	4 610 344	
345	20	Stainl. cyl. screws M12x50, DIN 912	A2	286 147	
346	20	Stainl. spring washers 12, DIN 7980	1.4541	344 712	
347	1	Closing ring Ø 170/96 x 18	1.4059	4 610 316	
429	1	Flat sealing Ø 1300/1110 x 2	rubber w. insert	4 620 429	
445	1	Cord packing Ø1670xØ10	Neoprene	540 110	
508	2	Luminous discs Ø 98 x 8	hard glass	4 910 434	

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13. Installation of spare parts

Important: Isolate main motor switch before any part is replaced.

13.1 Opening up the Fiberizer

- Close inlet gate valve
- Close sealing water for heavy rejects trap.
- Drain rotor housing
- Remove screws between cover and rotor housing.
- Remove screws between gate valve for light rejects trap and vibrating screen piping.
- Move aside cover by hand.

13.2 Replacement of the rotor

- Open up Fiberizer
- Unscrew rotor cap 212 (cap nut 207 )
- Remove retaining plate 206
- Withdraw rotor from shaft by means of an extractor
- Clean shaft seat and apply light coat of Molykote
- Exchange cord packing 204, 214, (204, 208) if necessary
- Assembly is effected in reverse order to dismantling.
- Provide leakproof material between rotor cap and rotor boss
- Measure gap width between working edge rotor and perforated plate.

If the gap width differs from the indicated figure, the spacer thickness 205 must be increased by means of additional washers or reduced by removal.

The spacer is located between rotor boss and shaft protection sleeve.



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13.3 Replacement of the defibering bars

- Open up Fiberizer
- Loosen retaining parts 344 and exchange defibering bars 343
- Measure gap width between working edges rotor blade ends and defibering bars and set it according to the indicated figure.
- Retighten screws for retaining parts.

13.4 Replacement of the perforated plate

- Open up Fiberizer
- Remove rotor, retaining parts and defibering bars
- Exchange perforated plate 341



### 13.5 Replacement of packings

Important: do not use hard or sharp edged tools because ceramic coated shaft protection sleeve is involved.

- Shut off sealing water
- Remove split gland 313, 314
- Withdraw the old packings with a packing extractor
- Clean packing space carefully
- Introduce packings in the following order:-

one packing cord	320
one lantern ring	321
three packing cords	320

(Stagger joints by  $120^{\circ}$  when the packing rings are inserted).

- Tighten gland slightly
- Open sealing water
- Machine can be put into operation
- After a few minutes of operation, when heating of the shaft seal is carefully checked by touching, the gland can be retightened in order to reduce the amount of emerging sealing water.

Experience shows that packings expand due to absorption of water. The sealing pressure on the shaft increases as a result and the initially excessive escape of sealing water is minimized.

If this packing feature is not taken into account and the packing is tightened excessively at the outset, it can burn out on the contact surface within a relatively short time.



### 13.6 Replacement of the shaft protection sleeve

The shaft protection sleeve 202 has a light sliding fit on the shaft and is secured by a retaining pin.

- Open up Fiberizer
- Remove rotor, key and spacer
- Shut off sealing water
- Unscrew split stuffing box and split gland
- Remove packings and split lantern ring 321
- Pull off shaft protection sleeve

(Handle ceramic coated shaft protection sleeve carefully).



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### 14. Summary of operating data

#### 14.1 Fiberizer F1

Machine :

Maximum power input

60 kW

Speed

650 l/min.

Maximum throughput

2000 l/min

4150 kg/hr

100 tons per day  
bone dry related  
to a consistency  
of 3.5 %

Consistency

3 - 4 %

Maximum inlet pressure

3,0 bar

Outlet pressure

2,5 bar

Pressure differential

0,3 - 0,6 bar

maximum, sealing water

Pressure for shaft seal area

3,5 bar

Sealing water consumption approx.

0.5 l/min.

Maximum sealing water pressure

3,5 bar

for heavy rejects trap

Sealing water consumption approx.

≈ 60 l/min

Flywheel inertia without belt  
pulley

5 kg /m<sup>2</sup>

Fiberizer weight (without charge)  
approx.

1440 kg

Gap width between working edges  
rotor and perforated plate

2-3 mm

Gap width between  
working edges defibering  
bars and rotor

2-3 mm



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## Motor

Type of motor	squirrel cage rotor delta connection
Rated power	75 kW
Rated speed	1500 1/min.
Type of construction	B 3
Type of enclosure	IP44
Frequency	50 cycles



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### 14.2 Fiberizer F2

#### Machine:

Maximum power input	120 kW ✓	
Speed	525 l/min. ✓	
Maximum throughput	4400 l/min.	
	8350 kg/h	
	200 tons per day	
	bone dry related to a	
	consistency of 3.5 %	
Consistency	3 - 4 %	
Maximum inlet pressure	3,0 bar	42 psi
Outlet pressure	≤ 2,5 bar	35 psi
Pressure differential approx.	0,6 - 0,8 bar	8,4 - 11,5 psi
Maximum sealing water pressure for shaft seal area	3,5 bar	49 psi
Sealing water consumption approx.	0.5 l/min.	8 Gallons/h
Maximum sealing water pressure for heavy rejects trap	3,5 bar	49 psi
Sealing water consumption approx.	≈ 60 l/min.	16 GPM
Flywheel inertia without belt pulley	10 kg/m <sup>2</sup>	
Fiberizer weight (without charge) approx.	2680 kg	5916 Pound
Gap widths see Fiberizer F1		



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### Motor

Type of motor	squirrel cage rotor delta connection
Rated power	132 kW
Rated speed	1500 1/min.
Type of construction	B3
Type of enclosure	IP44
Frequency	50 cycles



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PT13.7 Replacement of bearings

- Open up Fiberizer
- Withdraw rotor
- Shut off sealing water
- Unscrew split stuffing box and split gland
- Remove packings and split lantern ring
- Remove guard
- Take away belts
- Withdraw Fiberizer belt pulley and take out key
- Separate bearing housing from annular channel 322  
(prior to this provide support for the rotor housing and the annular channel)
- Take away grub screw 123 and remove labyrinth ring 122
- Unscrew bearing cap 108
- Unscrew bearing cap 111 and withdraw the shaft in direction of rotor
- Use suitable hooks and pull out outer races of the roller bearings 115

The bearings should be exchanged carefully while the manufacturer's instructions are followed. Assembly is effected in reverse order to dismantling.