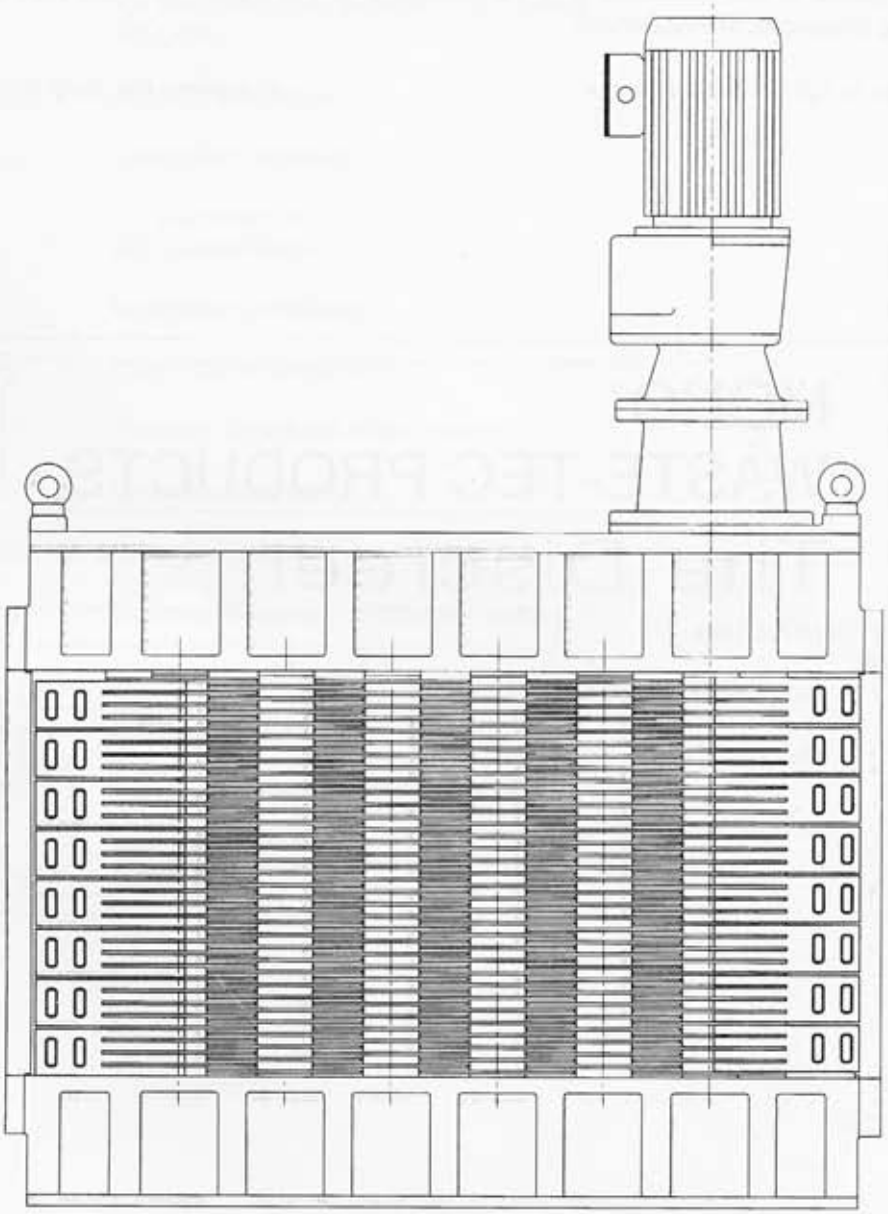
Mono®

WASTE-TEC PRODUCTS

DISCREEN®

INSTALLATION, OPERATION AND MAINTENANCE MANUAL



Mono Pumps DRESSER

DISCREEN®

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This manual gives a guide to the operation and maintenance of the Discreen given that all Health and Safety and good engineering practices are observed.

The information below is for contract No. and gives the duty for which the equipment is supplied.

MONO®
WASTE-TEC PRODUCTS

The Discreen

MODEL No

CONTRACT No/DATE

DUTY/LIQUID

Martin Street Audenshaw Manchester M34 5DQ
Tel: 0161 339 9000 Fax: 0161 344 0727

MADE IN GREAT BRITIAN

Mono Pumps

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1.0 CONTROL PANELS: (Optional)

Conventional stop/start equipment – can be supplied with level control and remote telemetry contacts.
The control logic in the panel is programmed to give a periodic shaft reversal of the disc stacks (typically 10 seconds each hour) which is essential for the self cleaning process on discharge comb bars.
Panels can be supplied for any electrical supply requirements and to meet all national and international design codes.

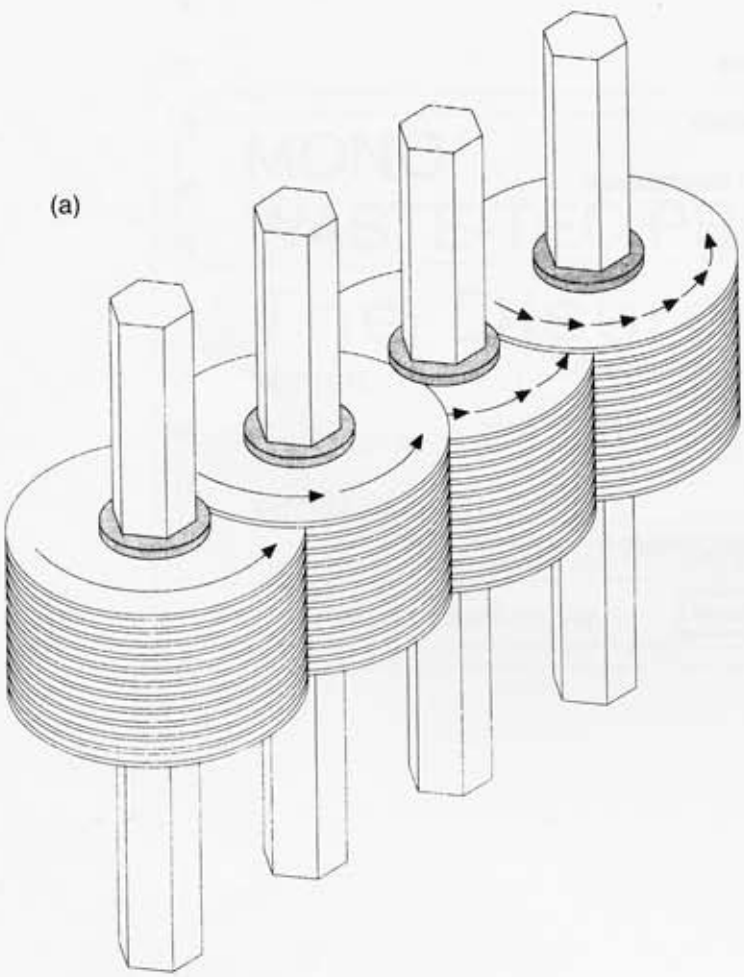
1.1 NOISE LEVEL:

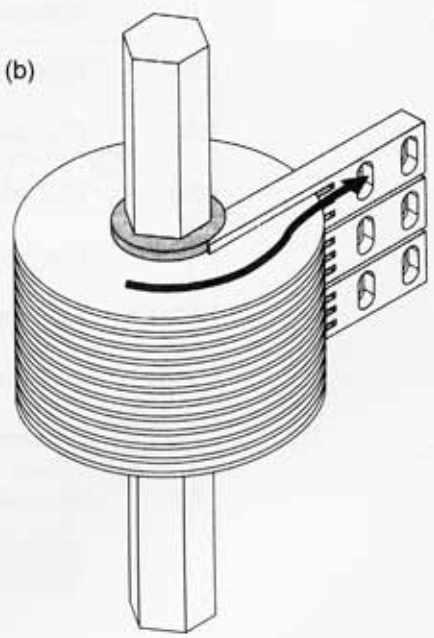
The airborne noise emission of the Discreen does not exceed 70dB(A).

2.0 OPERATING PRINCIPLE

Designed to operate in the water and waste water industry, the Discreen consists of a number of shafts each fitted with overlapping and intermeshing discs with an aperture distance to suit the fineness of screening required.

Each shaft rotates slightly faster than its upstream neighbour forming a gentle conveying action of solids across the face, diagram (a), to the discharge point at the comb bars, diagram (b).





3.0 STORAGE AND PROTECTION RECOMMENDATIONS

The Discreen units are despatched from our factory ready for immediate installation and operation. Should the machines be stored or left stationary for any length of time it is recommended that the disc shafts are rotated weekly. This can be most easily done by removing the motor fan cowl and turning by hand.

NOTE: Extreme care should be observed when handling either the panel or the machine to prevent damage to paintwork etc. The units should be lifted in accordance with the recommendations given in this manual.

4.0 INSTALLATION

4.1 CHANNEL INSTALLATION

The Discreen does not require fixing to the ground, in general the units can be supported either by the concrete channel or by steel supports bolted to the channel walls.

4.2 FOR INSTALLATION GUIDELINES SEE PAGE 4

4.3 LIFTING:

Machines should be lifted by the designated lifting points only using certified equipment. Minimum requirements are given in the table (below).

Machine Code	Dim 'A' (mm)	Max Weight (kg)
CD2106	1024	1200
CD2105	886	1060
CD2104	750	920
CD2103	612	780
CD2086	1024	1070
CD2085	886	960
CD2084	750	850
CD2083	612	740
CD2066	1024	890
CD2065	886	820
CD2064	750	750
CD2063	612	680
CD2036	1024	750
CD2035	886	710
CD2034	750	680
CD2033	612	640

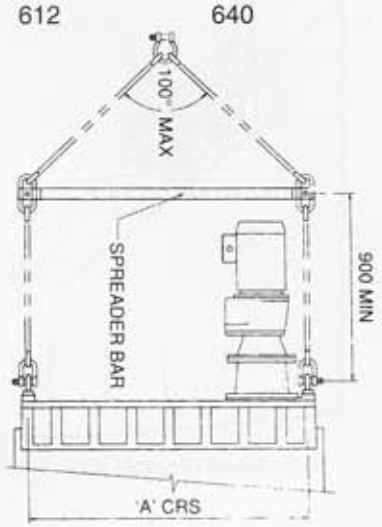


FIG 1.

TYPICAL SPREADER BAR ASSEMBLY FOR 6 SHAFT DISCREEN

5.0 START-UP PROCEDURE

(1) Once the machine is installed in its correct operating position the gearbox should be checked for the correct amount of oil.

(2) By the nature of the equipment and its operating environment the Discreen can be an extremely dangerous item. **Always ensure that the machine is guarded to the Health and Safety and Factories Act requirements before any attempt is made to operate.**

(3) On start-up check the direction of rotation of the discs. **The discs should rotate towards the discharge (motor end)** when viewed from the inlet side (comb bar). If rotation is wrong ensure main line breaker is open and tagged and then reverse any two of the motor input leads. **This work should only be carried out by qualified personnel. Always ensure when checking for rotation that any personnel are well clear of discs.**

6.0 LUBRICATION SCHEDULE

6.1 DISCREEN UNIT

Shaft bearings are the sealed for life type and the gear drive is furnished with lithium grease which should not be mixed with other bases. Use only recommended lubricant as shown below for Discreen shaft gears.

RECOMMENDED LUBRICATION:

BP Energrease LC2 (-30°C to 180°C)
Viscosity rating not applicable

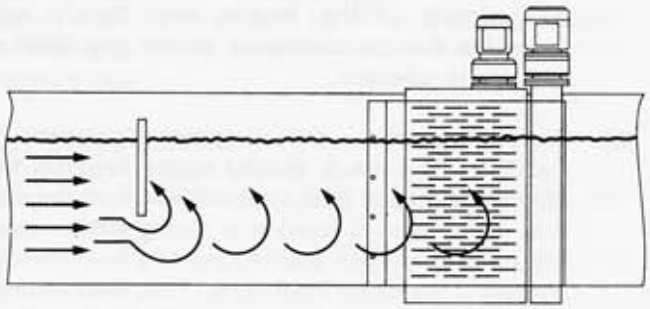
6.2 GEARED MOTOR

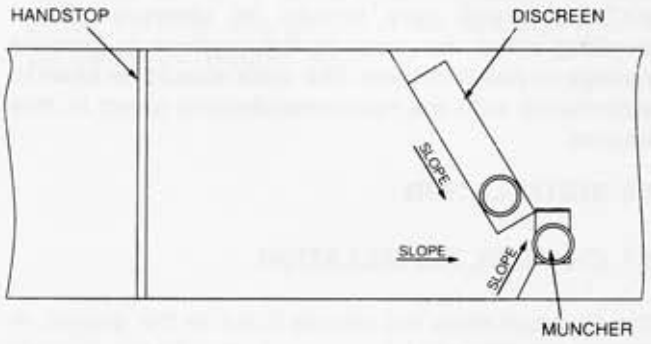
See separate information supplied by gearbox manufacturer.

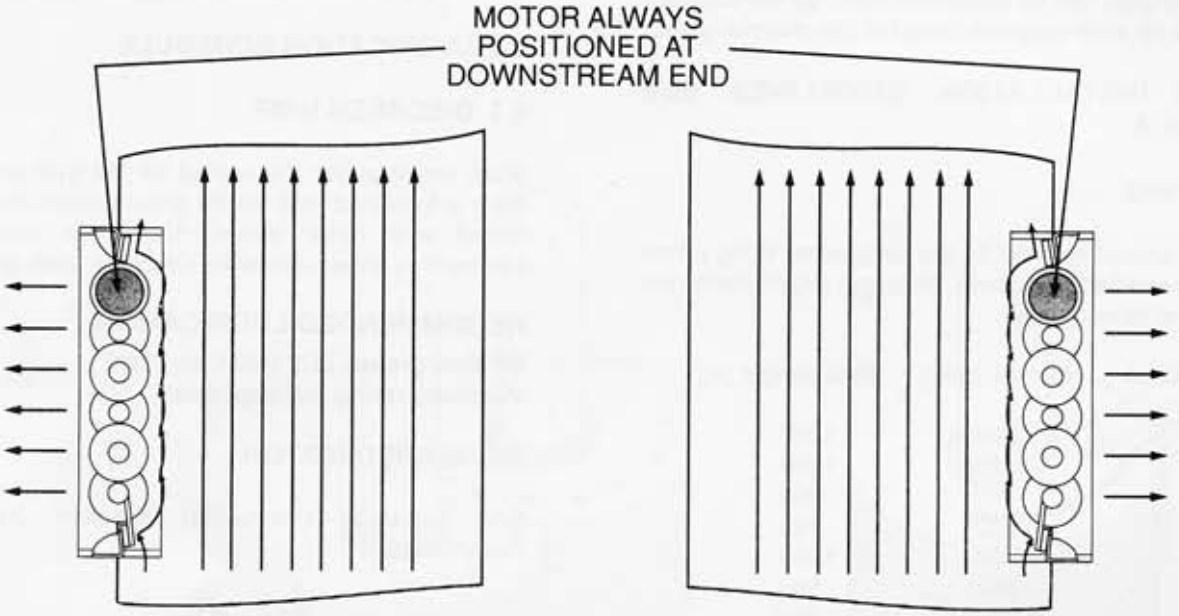
7.0 INSTALLATION GUIDELINES

The Muncher (when used) should be installed at a slightly lower level than the Discreen, with the channel floor benched into the Muncher cutter area.

Whenever possible an adjustable handstop should be located 1-2 metres upstream of the Discreen. In operation this should be lowered until approximately 150mm submerged at duty point. This will promote turbulent flow giving a self cleansing action in the inlet area.

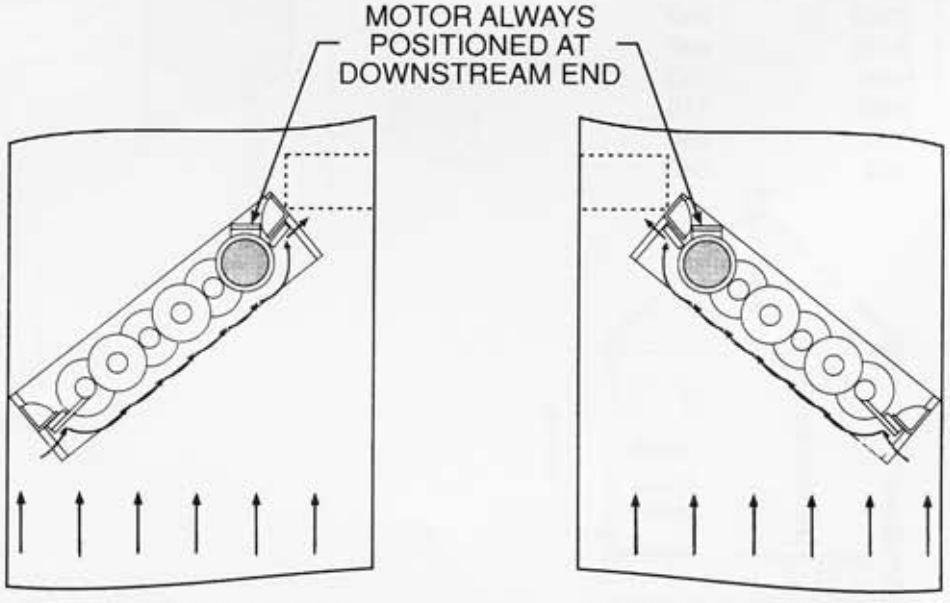






Left Hand storm overflow installation

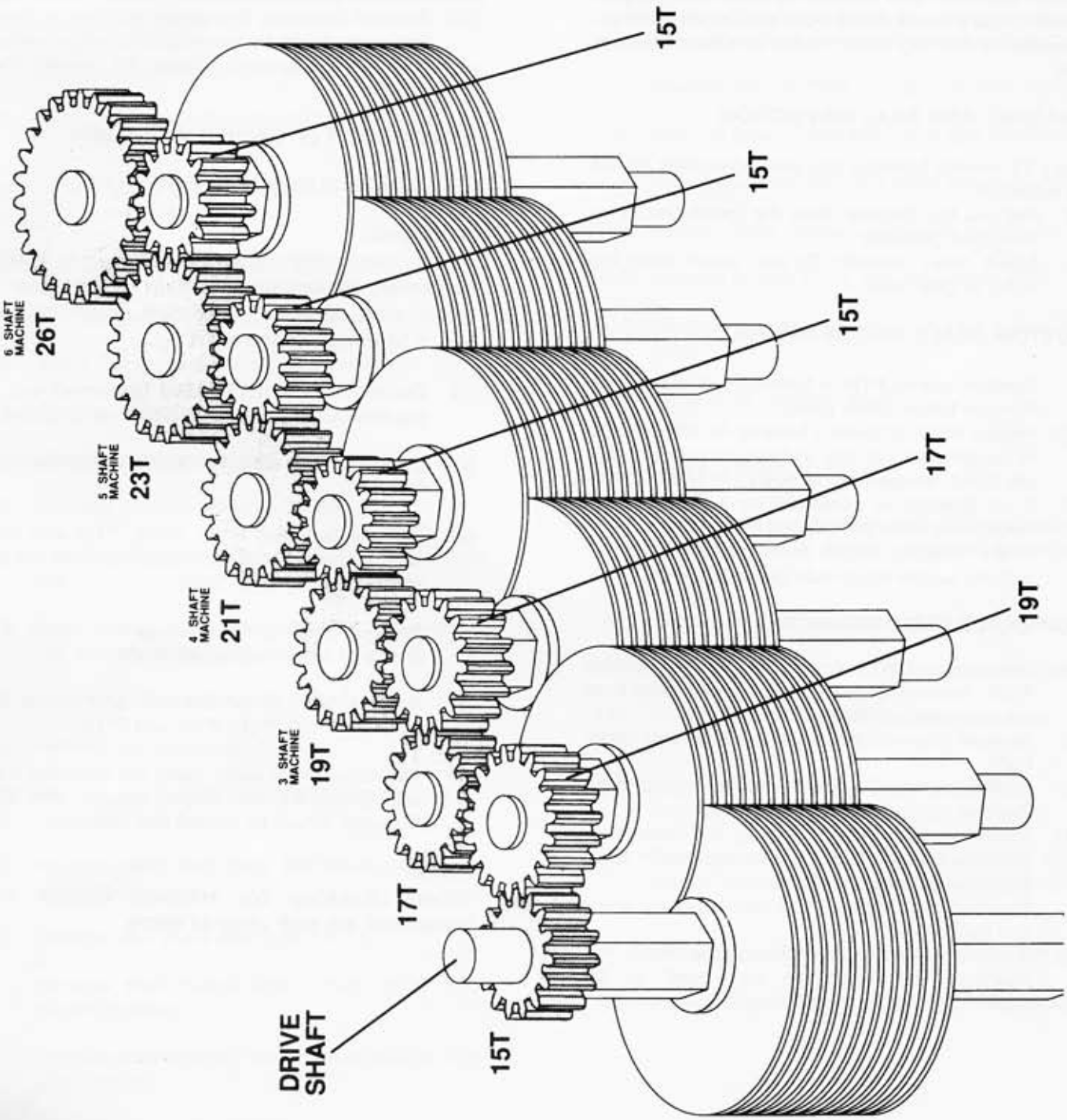
Right Hand storm overflow installation



Left Hand channel installation

Right Hand channel installation

8.0 GEAR TRAIN ARRANGEMENT



9.0 DISCREEN: SCHEDULED MAINTENANCE

REFERENCE DRAWING NUMBERS
D0009820 & D0009821

Caution:

When servicing the Discreen or motor controller, be certain the main line breaker is open and tagged. Serious injury could result from accidental start up. Disconnect and tag motor leads in motor terminal box.

BEARING AND SEAL INSPECTION

Every 12 months bearings and seal assemblies should be inspected.

(1) Remove the Discreen from the installation using lifting gear provided.
(2) Steam clean Discreen. Do not steam clean the motor or gear drive.

BOTTOM SEALS AND BEARINGS

(1) Remove screws P115 in bottom cover plate 1100. Remove bottom cover plate.
(2) Inspect inside of bearing housing for any leakage or contaminants. If any leakage or contaminants are found, the mechanical seal must be replaced.
(3) If no leakage or contaminates are found, the mechanical seals do not need to be replaced.
(4) When replacing bottom cover plate, clean faces and use Loctite liquid multi gasket grade 573.

TOP SEALS AND BEARINGS

(1) Remove adaptor stool screws P107 and washers P108. Remove gear unit and adaptor stool from top cover plate 1150.
(2) Remove Discreen half coupling 2600 and circlip P307.
(3) Remove screws P105 from top cover plate 1150. Remove top cover plate.
(4) Inspect inside of gear housing for leakage or contaminants, if any found, bearings and/or seals are worn and must be replaced.
Disassemble Discreen and replace faulty seals and bearings.
(5) If no leakage or contaminants are found, the bearings and seals do not need to be replaced. Proceed as follows.
(6) Clean joint faces, use loctite liquid gasket and refit top cover plate 1150 and secure with P105.
NOTE:
If lipseal P101 is damaged when removing top cover this should be replaced after top cover is refitted.
(7) Remove circlip P307.
(8) Replace Discreen half coupling 2600.
(9) Replace gear unit and adaptor stool on Discreen and secure with screws P107 and washers P108.
(10) Reinstall Discreen. Reconnect motor leads. Verify that motor leads are connected for proper voltage and start Discreen. Check for correct disc rotation.

REPLACEMENT OF GEARED MOTOR UNIT

REFERENCE DRAWING NUMBER D 0009820

WARNING:
When servicing the Discreen or motor controller, be certain the main line breaker is open and tagged. Serious injury could result from accidental start up.

(1) Discreen may be left installed. Disconnect and tag main lines in breaker upstream of controller.

(2) Disconnect and tag motor leads in motor terminal box.

(3) Remove fasteners P109, P110, P111 and P112 and lift geared motor off Discreen. Drive will split at dog coupling 2600, 2626.

(4) Remove coupling half from geared motor drive shaft and refit on replacement unit.

(5) Replace new unit on Discreen and secure with fasteners P109, P110, P111 and P112.

(6) Reconnect motor leads. Verify that the motor leads are connected for proper voltage and start Discreen. Check for correct disc rotation.

NOTE:
When checking for rotation ensure that personnel are well clear of discs.

10.0 DISCREEN DISASSEMBLY

REFERENCE DRAWING NUMBERS
D0009820 & D0009821

CAUTION:
When servicing the Discreen or motor controller, be certain the main line breaker is open and tagged. Serious injury could result from accidental start up.

(1) Disconnect wiring at motor junction box and leads.

(2) Remove Discreen from installation using lifting box provided.

(3) Steam clean Discreen. Do not steam clean motor or gear drive.

DISASSEMBLY OF STANDARD DISCREEN

(1) Remove geared motor unit and adaptor stool.

(2) Stand Discreen upright on level ground.

(3) Remove comb bars 2200.

(4) Remove comb bar carriers 2300.

(5) Remove side rails 2100 and 2150.

(6) Remove Discreen halfcoupling 2600 and circlip P307.

(7) Lay Discreen horizontally with side fixing socket cap screws facing upwards.

(8) Remove bottom cover plate 1100.

(9) Remove top cover plate 1150.

(10) Remove rotary shaft lipseal P101 from top cover plate.

(11) Remove gears from drive and driven shafts and circlip P307.

(12) Remove idler gears and circlips P118.

(13) Remove shaft fixings 4750, P122, P121 from bearing housing.

(14) Remove shaft fixings P106, P116 and 4702 from gear housing.

(14.1) Remove grease guard 0050.

(15) Remove front top half of gear housing 0200.

(16) Remove front half of bearing housing 0100.

(17) Remove stacked shafts from housings for disassembly.

(18) It is good practice to observe the stacking procedure at this time.

NOTE:
Stack ratio of discs to spacers and spacer shims as applicable. Close attention to stacking during assembly will ease the restacking of the shafts.

(19) Remove bearing P302, circlip P306 from shaft.

(20) Remove lipseal P303 from stack lock collar 3600.

(21) Remove locknut 3651 and stack lock collar 3600.

(22) Remove discs, spacers and shims from shafts.

(23) Remove locknut P304, and lockwasher 4701.

(24) Carefully remove mechanical seal P301 from shaft.

(25) Remove 'O' ring from shaft.

CLEAN AND INSPECT

(1) Steam clean and disinfect all parts of the Discreen except the motor, geared unit, seal assemblies and bearings.

(2) Remove any gasket material from joint faces.

(3) End housing bores must be thoroughly cleaned.

(4) Inspect all parts for damage, excessive wear, etc. and replace if necessary.

(5) Inspect mechanical seal assemblies P301. Replace if necessary.

(6) Clean bearings P302 and inspect for wear. Sealed bearings cannot be regreased. Replace if necessary.

(7) Inspect lipseal P303 and replace if necessary.

(8) Inspect all gears for wear. Replace if necessary.

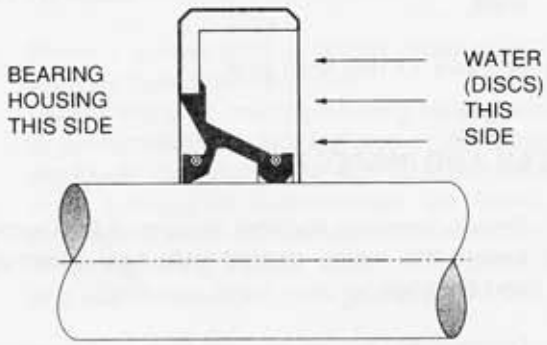
11.0 DISCREEN ASSEMBLY

REFERENCE DRAWING NUMBERS
D0009820 & D0009821

DRIVE SHAFT AND DRIVEN SHAFT ASSEMBLIES

(1) Fit mechanical seal 'O' ring carefully into groove on drive shaft 3200 and driven shafts 3250.
(2) Carefully slide mechanical seal P301 over 'O' ring onto shaft.
(3) Secure mechanical seal onto shaft by means of locknut P304 and lockwasher 4701.
(4) Stack shafts using discs 2500, spacers 3500 and spacer shims as applicable.
(5) Fit stack lock collar 3600 onto shaft, using anti-sieze compound on threads and face.
(6) Slip lipseal P303 over stack lock collar and place in position as shown.
(7) Fit locknut 3650 and tighten against stack lock collar.

P303-DOUBLE LIP SEAL (Top Bearing Housing)

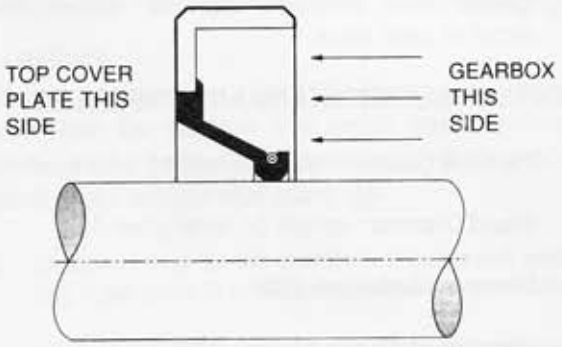


(8) Press bearing P302 onto shaft and secure in position with circlip P306.

HOUSINGS

(1) Lay bearing housing back half 0100 horizontally with tapped holes facing upwards.
(2) Lay gear housing back half 0200 horizontally with tapped holes facing upwards.
(3) Lay stacked shafts in housings (mechanical seal end in bearing housing half).
(4) Secure mechanical seals in position using anti-rotation washer 4750 M8 HEX. HD. Screw P121 and M8 spring washer P122.
(5) Secure ball bearings in position using M8 HEX. HD. screw P106, M8 spring washer P116 and washer 4702.
(6) Cover joint face of bearing housing back with Loctite liquid gasket and place front half of bearing housing 0100 in position ensuring mechanical seal is correctly located.
(7) Repeat above with front of gear housing 0200 ensuring ball bearing and lip seal are correctly located.
(8) Secure housing halves together using M12 socket screw P103.
(9) Fit grease guard 0050 and secure ball bearings in position at each end using M8 Hexhd screw P115, M8 spring washer P116 and washer 4702.
(10) Loctite idler gear carrier shaft 3300 into position housing.
(11) Fit idler shafts using circlip P118. (See gear train arrangement for idler gear details on page 5).
(12) Fit gears to drive and driven shafts using key P308 and circlip P307. (See gear train arrangement for gear details on page 5).
(13) Lubricate gear train with BP Energrease LC2 (-30°C to 180°C).
(14) Fit top cover plate 1150 to gear housing loctite liquid gasket and M8 HEX. Socket capscrew P105. Dowel in position using dowel P104.
(15) Fit rotary shaft lipseal P101 over drive shaft into recess in top cover plate, with lip facing outward as shown.

P101-SINGLE LIP SEAL (Top Cover Plate)



(16) Fit eyebolts P102 into top cover plate.
(17) Fit bottom cover plate 1100 to bearing housing loctite liquid gasket and M HEX. socket capscrews P105.
(18) Fit half coupling 2600 to drive shaft 3200 using circlip P307 and key P309.
(19) Stand the Discreen upright on level ground.

SIDERAILS

(1) Fit siderails upstream 2100 and downstream 2150 using M12 socket capscrew P201.
(2) Fit comb bar carrier blocks upstream 2350 and downstream 2300 using M10 HEX. HD. screw P203 and washers P204 and P205, approx 2mm away from the disc stack.
(3) Fit comb bars 2200 using M8 socket capscrew P202.

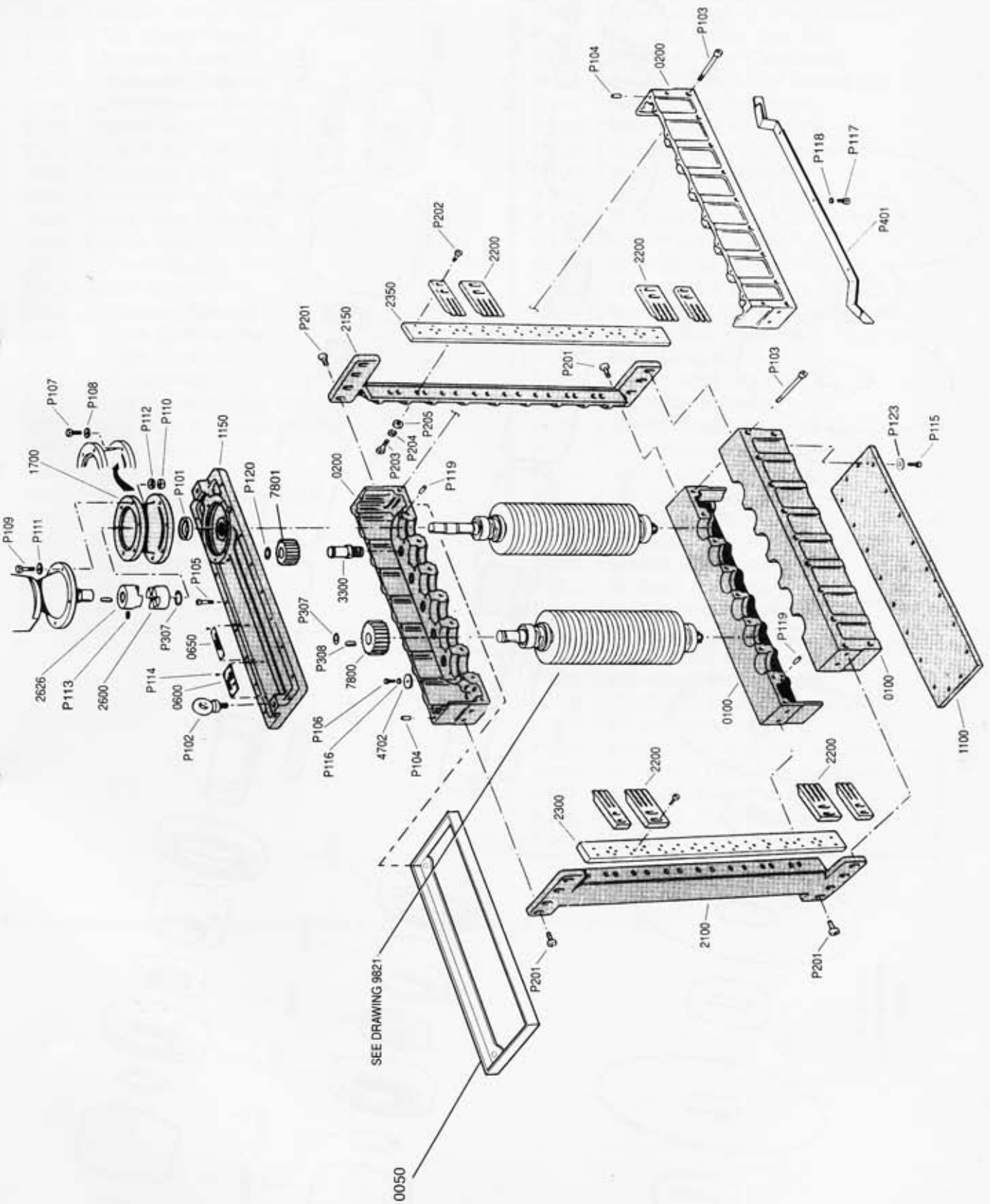
GEARBOX

(1) Fit half coupling 2626 to gearbox shaft (using key supplied with gearbox) and secure with socket set screw (supplied with coupling).
(2) Fit motor stool 1700 to top cover 1150 using M10 HEX. HD. screw P107 and washer P108. Loctite liquid gasket to be used between joint faces.
(3) Fit geared motor stool 1700 using HEX. HD bolts P109 and washers P111, P112 and nuts P110.

NOTE:
When fitting geared motor ensure that the shaft alignment is correct.

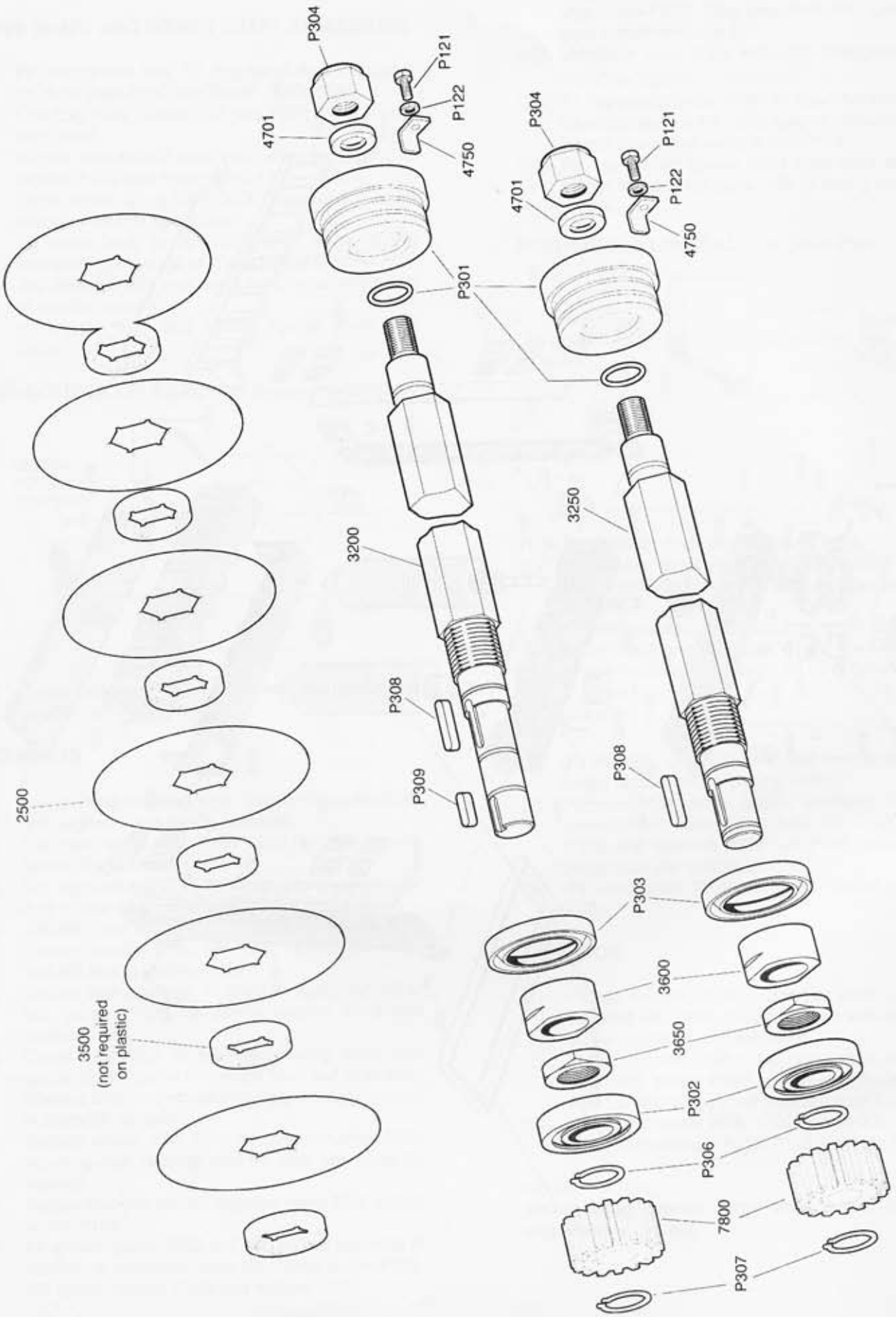
12.0 EXPLODED ASSEMBLY OF DISCREEN UNIT

DRAWING NUMBER D000 9820



12.1 EXPLODED ASSEMBLY OF DISCREEN SHAFT

DRAWING NUMBER D000 9821



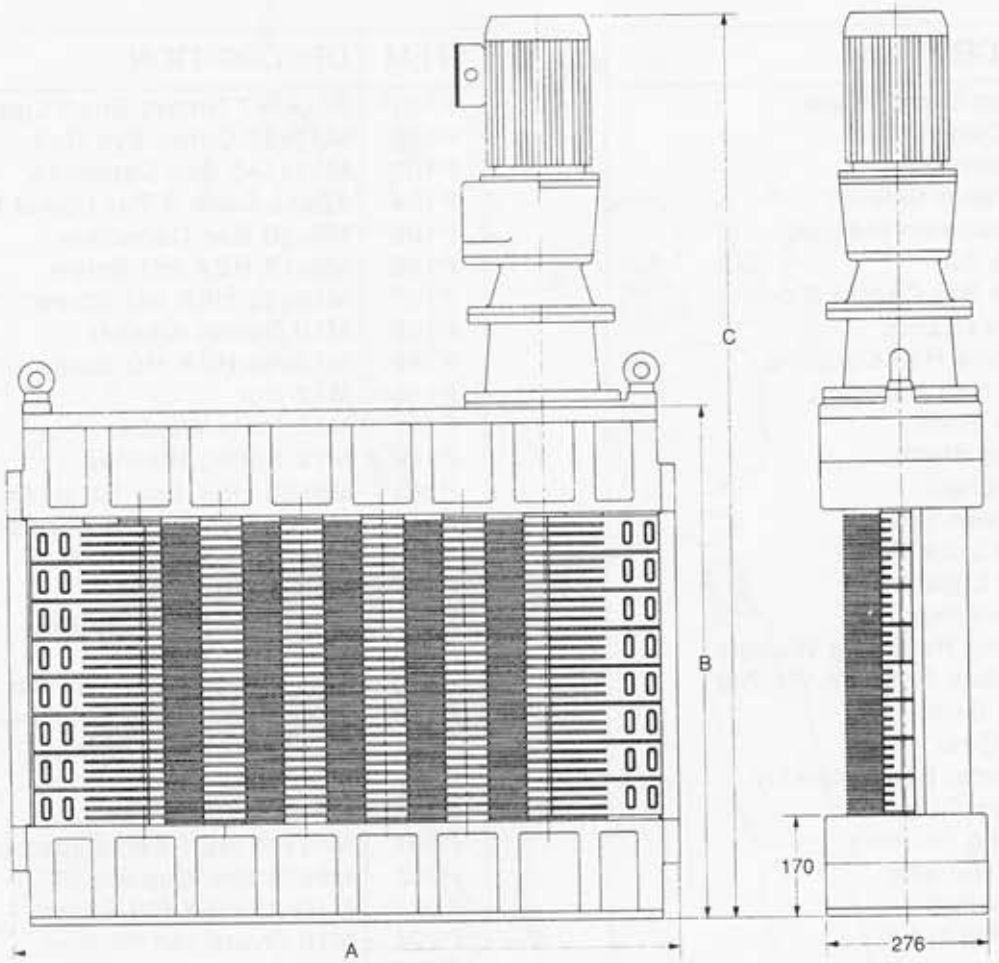
13.0 DISCREEN PARTS LIST

ITEM	DESCRIPTION
1100	Bottom Cover Plate
1150	Top Cover Plate
1700	Adaptor Stool
2100	Upstream Siderail
2150	Downstream Siderail
2200	Comb Bar
2300	Comb Bar Carrier Block
2500	Discreen Disc
2600	Machine Half Coupling
2626	Gear Half Coupling
3200	Drive Shaft
3250	Driven Shaft
3300	Idler Shaft
3500	Discreen Spacer
3600	Stack Lock Collar
3650	Shaft Locknut
4701	Lockwasher
4702	Bearing Retaining Washer
4750	Seal Anti-Rotation Washer
7800	Drive Gear
7801	Idler Gear
9950	Spreader Bar Assembly
0050	Grease Guard
0100	Bearing Housing
0200	Gear Housing
0600	Nameplate
0650	Warning Label

ITEM	DESCRIPTION
P101	35x47x7 Rotary Shaft Lipseal
P102	M20x32 Collar Eye Bolt
P103	M12x145 Soc Capscrew
P104	12x45 Code 3 Par Dowel Pin
P105	M8x30 Soc Capscrew
P106	M8x16 HEX HD Screw
P107	M10x35 HEX HD Screw
P108	M10 Spring Washer
P109	M12x50 HEX HD Screw
P110	M12 Nut
P111	M12 Plain Washer
P112	M12 Spring Washer
P113	M8x20 HEX Soc Setscrew
P114	No. 0x3/16 RD HD Drivescrew
P115	M8x25 Soc Capscrew
P116	M8 Spring Washer
P117	M6x12 HEX HD Screw
P118	M6 Plain Washer
P119	10x25 Grade 1 Dowel Pin
P120	30x2 Heavy Duty Ext Circlip
P121	M8x16 HEX HD Screw
P122	M8 Spring Washer
P123	M8 Spring Washer
P201	M12x25 HEX Soc Capscrew
P202	M8x25 Soc Capscrew
P203	M10x40 HEX HD Screw
P204	M10 Oversized Washer
P205	M10 Spring Washer
P301	Mechanical Seal Assembly
P302	40x90x23 Ball Bearing
P303	70x95x10 Double Lipseal
P304	M24x3 Metal Locknut
P306	40x2.5 Heavy Duty Ext Circlip
P307	35 Heavy Duty Ext Circlip
P308	10x8x55 Rect Par Key
P309	10x8x36 Rect Par Key
P401	Baffle Plate

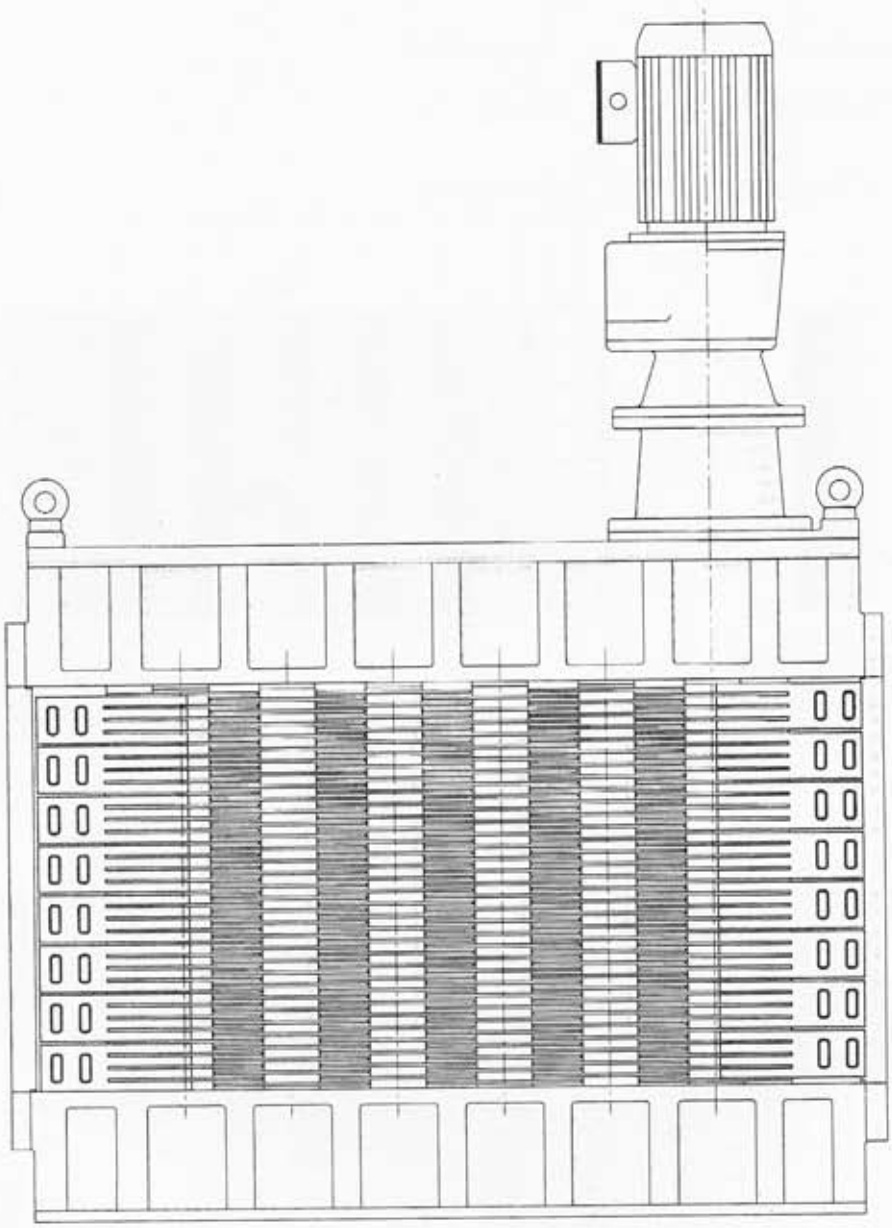
For quantities and part numbers see parts list enclosed with manual.

14.0 GENERAL ARRANGEMENT DRAWING



MODEL	DIMENSION		MAX DIMENSION 'C' FOR DRIVES								MASS (MAX) kg
			IP55		IP67		IP68				
	A	B	0.55kw	0.75, 1.1	0.55 &	1.1 &	0.55kw	0.75kw	1.1kw	1.5kw	
CD2106	1129	1328	1990	2050	1923	2050	1923	1977	2015	2050	1200
CD2105	992	1328	1990	2050	1923	2050	1923	1977	2015	2050	1060
CD2104	855	1328	1990	2050	1923	2050	1923	1977	2015	2050	920
CD2103	718	1328	1990	2050	1923	2050	1923	1977	2015	2050	780
CD2086	1129	1132	1794	1854	1727	1854	1727	1781	1819	1854	1070
CD2085	992	1132	1794	1854	1727	1854	1727	1781	1819	1854	960
CD2084	855	1132	1794	1854	1727	1854	1727	1781	1819	1854	850
CD2083	718	1132	1794	1854	1727	1854	1727	1781	1819	1854	740
CD2066	1129	878	1540	1600	1473	1600	1473	1527	1565	1600	885
CD2065	992	878	1540	1600	1473	1600	1473	1527	1565	1600	815
CD2064	855	878	1540	1600	1473	1600	1473	1527	1565	1600	745
CD2063	718	878	1540	1600	1473	1600	1473	1527	1565	1600	675
CD2036	1129	678	1340	1400	1273	1400	1273	1327	1365	1400	745
CD2035	992	678	1340	1400	1273	1400	1273	1327	1365	1400	710
CD2034	855	678	1340	1400	1273	1400	1273	1327	1365	1400	675
CD2033	718	678	1340	1400	1273	1400	1273	1327	1365	1400	640

THIS DRAWING IS SUITABLE FOR IP55/IP67/IP68 MOTORS ONLY
(220/240V 1ph 50Hz and 380/415V 3Ph 50Hz SUPPLY)
MASSES SHOWN ARE FOR HEAVIEST CONSTRUCTION OPTION ie 2.5mm SCREEN GAP.
DRAWING NUMBERS D0009900 and D0009901



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