



**Bulk Solids Handling Equipment**

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# **INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS TYPES EHD AND EBS ROTARY VALVES**

Rota Val Ltd EHD and EBS rotary valves are designed to control flow in dry solids metering and pneumatic conveying systems operating under negative or positive pressure differentials. Close manufacturing tolerances and a wide range of interchangeable components and design features allow each valve to be supplied to match a particular application: the valve should not be used for any other duty WITHOUT CONSULTING OUR TECHNICAL DEPARTMENT.

## **HEALTH AND SAFETY**

The valve contains moving parts that can be injurious: it is the responsibility of the system installer/user to ensure the safe installation and operation of the valve. In particular it must be adequately protected and guarded, in compliance with the Health and Safety Act. The motor must be isolated before any maintenance or adjustment is carried out, do not operate the valve with the drive guard, or any other part of the valve, removed. Only competent persons must be used to maintain the valve.

**IMPORTANT: ALWAYS QUOTE VALVE SERIAL No. IF FURTHER INFORMATION  
OR SPARE PARTS ARE REQUIRED.**

**IT IS THE RESPONSIBILITY OF THE PURCHASER/USER OF THIS EQUIPMENT TO  
ENSURE THAT THESE HEALTH AND SAFETY INSTRUCTIONS ARE PASSED ON TO  
THOSE PERSONS LIKELY TO BE AT RISK.**

# INSTALLATION

- 1.1 Check the valve externally for damage and internally for foreign objects. Install the valve using compressible gaskets on both flanges; the valve body must not be stressed or used to support ancillary equipment. EHD valves must be installed the correct way up, i.e., the nameplate will be the right way up and the gearbox will be on the left, viewed from the drive end. EBS valves may be installed in the conveying line with the flow in either direction. Air purge shaft seals (if fitted) must be connected to a regulated clean dry air supply at a pressure of 0.13 to 0.33 bar (2 to 5 p.s.i.) above the maximum static pressure in the valve. Side vent ports (optional) must be connected in accordance with our engineer's instructions, or plugged.
- 1.2 The motor must be connected to a suitable electrical supply in accordance with the manufacturers nameplate/operation and maintenance instructions. Check that the Geared Motor Unit is filled with lubricant, in accordance with the manufacturer's instructions. Top up or fill as necessary. Check that the valve rotates in the correct direction, i.e., anticlockwise, viewed from the drive end. The valve is now correctly installed and ready to operate.

## OPERATION AND COMMISSIONING

- 2.1 The speed has been set at our factory for the duty and throughput required: some small variation in speed may be necessary and this can be accomplished by changing the sprocket ratio.
- 2.2 The valve performance is related to that of the system and any major departure from the specified throughput will require investigation.
- 2.3 Failure of the valve to maintain its performance may indicate excessive wear and the valve clearances should be checked.
- 2.4 Run the valve empty for one hour, to run in the gland packing: tighten the gland followers.

## MAINTENANCE

- 3.1 EHD and EBS rotary valves are designed to require minimum maintenance: however, regular attention in accordance with the following instructions will prolong valve life.

### BEARINGS

- 3.2 Std bearings are grease packed and sealed for life, no maintenance being necessary. Bearings should be checked for wear and damage every 3 months or 2,500 hours and replace if necessary. Replace every 24 months. (See DISMANTLING and RE-ASSEMBLY).
- 3.3 High temperature bearings consist of a bush and thrust washer: these must be checked for wear and excessive rotor end float every 3 months or 2,500 hours and replaced if necessary. Replace every 12 months. (See DISMANTLING and RE-ASSEMBLY).

### SHAFT SEALS

- 3.4 Std. sealing comprises 3-4 rings of polyacrylic fibre gland packing. Check seal tightness weekly, it is important that the followers are not overtightened, as this will give rise to excessive torque loads on the rotor shaft. Leakage through this type of seal can only be cured by repacking with new material. Prolonged leakage may lead to premature bearing failure.

### AIR PURGE

- 3.5 Ensure that the air passages to the lantern ring do not become blocked.

## CHAIN DRIVE

- 3.6 Chain tension should be checked and adjusted at monthly intervals. The drive guard cover will have to be removed, adjustment is by nuts and studs under the G.M.U. The tension is correct when up and down movement is equal to the pitch. Lubricate with suitable chain grease.

## GEARED MOTOR UNITS

- 3.7 All gear units are proprietary and are to be maintained in accordance with the manufacturer's instructions attached.

# DISMANTLING, REFURBISHING AND REASSEMBLING INSTRUCTIONS EHD AND EBS SERIES ROTARY VALVES

Figures in brackets refer to item numbers as shown on General Arrangement drawing 66103-0001.

## DISMANTLING

- 4.1 Remove chain drive cover (29), taper lock bushes (37) and (40), sprockets (36) and (39) with chain (41).
- 4.2 At the non-drive end remove bearing cover (18), fold back the tab washer (16) and remove locknut (17).
- 4.3 Slacken off gland follower stud nuts (14) at both ends to relieve compression on the packing. Undo the end cover securing bolts (7) and use the jacking screws (9) inserted in the tapped holes in the end covers to jack-off the non-drive end cover. Take care to retain any shims fitted between bearing (15) and sleeve (45).
- 4.4 Examine end disc (46) for wear and if necessary remove from end cover for replacement.
- 4.5 Examine journal sleeve (45) and slotted collar (44) for wear and remove for renewal if necessary.
- 4.6 Withdraw rotor assembly from valve body again preserving the shims, if any, fitted between the drive-end sleeve (45) and bearing (15).
- 4.7 Examine hardened steel blades (3) for wear and remove from rotor if replacement is required.
- 4.8 Examine bore liner (42) for wear and if replacement required extract from valve body making sure that liner securing dowel/key is retained.

Note Under operating conditions liner may have become tight in the bore and should preferably be pressed out or lightly tapped out.

- 4.9 Examine bearings (15) and shaft seals (11) and extract from end cover if replacement required. The lantern ring (48), if fitted, may require renewal or at least clearing of air passages.
- 4.10 The hardened sleeves (45) and slotted collars (44) are provided to protect the rotor shaft. It is important to verify that the integrity of the shaft diameters remains such that the sleeves and collars are correctly supported. In the event of damage to the rotor shaft (2) the basic rotor will have to be replaced.

## REFURBISHING AND RE-ASSEMBLY

- 5.1 Ensure all working surfaces, including bore of valve, are clean and free from rust or dust particles.
- 5.2 Lightly oil all surfaces.
- 5.3 Slide new liner into bore of valve and locate in position with dowel/key (43).
- 5.4 Assemble new end discs (46) to end cover (6) leave end disc screws (47) loose or finger tight only.
- 5.5 Assemble new slotted collar (44), sleeves (45) and hardened steel blades (3) on to rotor (2). Blades should

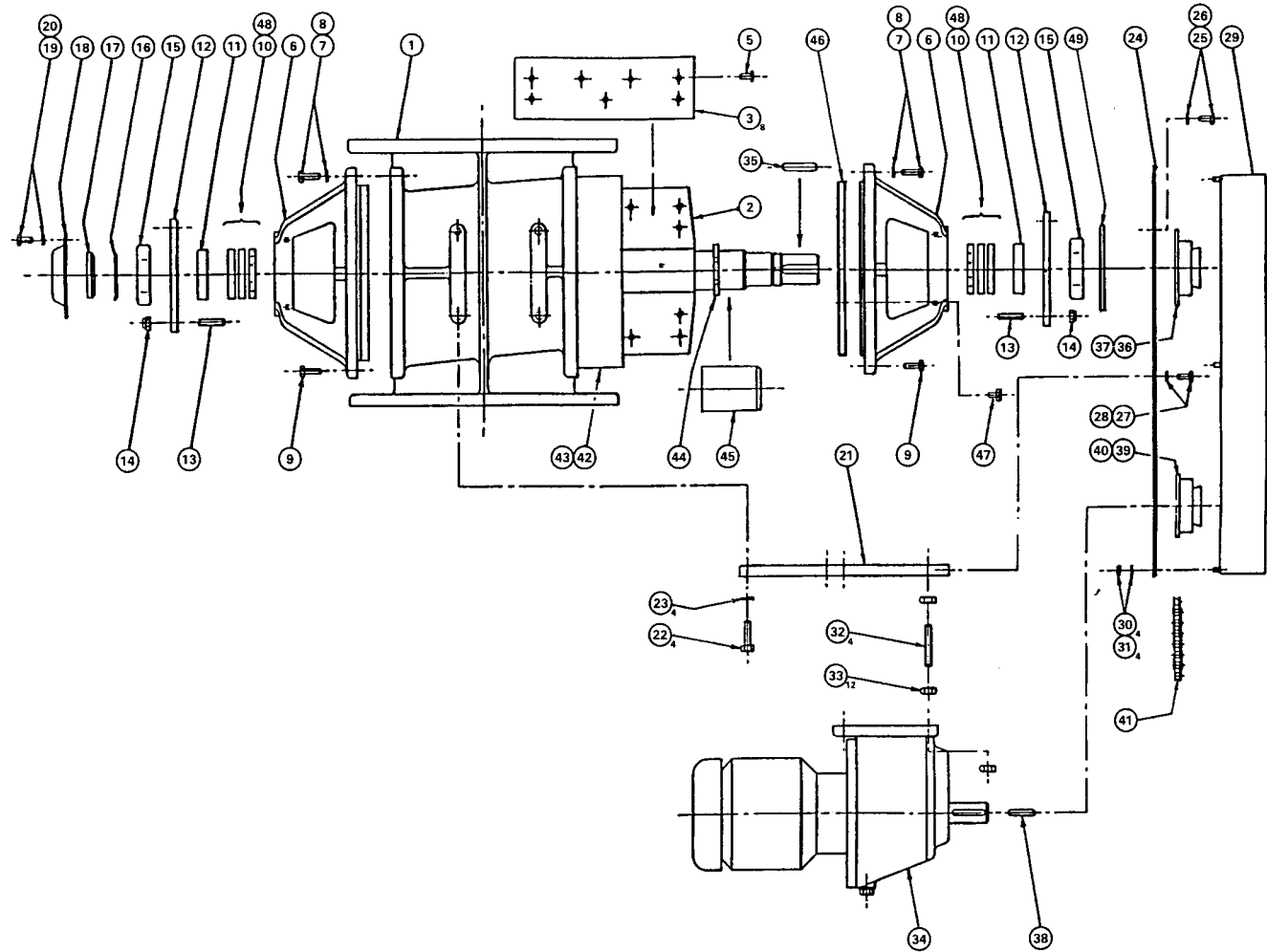
not be tightened but held lightly using two external countersunk securing screws (5) only.


- 5.6 Load rotor assembly into valve body.
- 5.7 Press new bearings (15) into end cover housing.
- 5.8 Offer up end cover assemblies over the rotor shaft including the lantern ring (48), if fitted, the gland ring (11) and gland follower (12). Fully tighten end disc screws (47). Any shims removed should be back in position at this stage.
- 5.9 Bolt the end covers (6) ensuring that any jacking screws (9) do not impede this operation.
- 5.10 Assemble and tighten up tab washer (16) bearing nut (17). Do not fold down tab washer at this stage.
- 5.11 Secure bearing retainer (49) in position and check to see that rotor turns freely, if not a gentle tap with a soft mallet on the end of the rotor shaft should displace the blades sufficiently to ensure rotation. If rotor remains locked in fixed position then check assembly for causes.
- 5.12 Adjust the hardened steel blades (3) using feeler gauges firstly to centralise blades between end covers. Keep these feelers in position and use additional feelers to set the blades radially. Mole grips are effective in gripping and adjusting blades. Lock the blades in position using screws (5) and remove all feeler gauges. Check for freedom of rotation after setting each blade.
- 5.13 Insert split gland packing rings (10) into gland housings. 2-3 rings per end with the lantern ring, otherwise 3-4 rings per end. The gland ring joints should be 'scarfed' and adjacent ring joints staggered at 180°c. The gland ring (11) must enter the cover. Pass gland follower over studs and gently tighten in position.
- 5.14 IF THE ROTOR SHOWS ANY SIGNS OF BODY CONTACT, INDICATED BY A RINGING SOUND OR RESISTANCE WHEN THE ROTOR IS TURNED BY HAND, CHECK FOR FOREIGN BODIES IN THE VALVE AND RE-CHECK ASSEMBLY AS ABOVE.
- 5.15 When satisfied that the rotor is correctly positioned axially, fold over the tab washer (16) to secure the bearing nut (17). Replace the bearing cap (18).
- 5.16 Reassemble chain drive components. The chain tension should be checked and adjusted as necessary using nuts (33) on studs (32). See para 3.6.
- 5.17 Carry out all the procedures indicated under INSTALLATION, OPERATION AND COMMISSIONING (Sections 1 and 2).

### **ROTOR CLEARANCES: REFER TO PLATE ON VALVE HOUSING**

ITEM NO.	DESCRIPTION	MATERIAL	NO OFF
1	BODY	CAST IRON BS1452-220	1
2	ROTOR	CARBON STL BS970	1
3	REPLACEABLE BLADE	HARDENED STEEL	8
4			
5	BLADE SCREW	SKT. BUTTON HD.	VAR
6	END COVER	CAST IRON BS1452-220	2
7	END COVER BOLT	BS3692 Gd 8.8	VAR
8	WASHER SPRING	BS4464	VAR
9	JACK SCREW	BS3692 Gd 8.8	4
10	GLAND PACKING	POLYACRYLIC FIBRE PTFE IMPREGNATED	1 SET
11	GLAND RING	CARBON STL BS970	2
12	GLAND FOLLOWER	CARBON STL BS4360	2
13	FOLLOWER STUD		4
14	FOLLOWER STUD NUT	'NYLOC'	4
15	BEARING	SEALED BALLRACE	2
16	BEARING TAB WASHER		
17	BEARING NUT		
18	BEARING COVER		1
19	COVER SCREW	BS3692	VAR
20	COVER WASHER		VAR
21	MOTOR MTG PLATE	CARBON STL	1
22	MTG PLATE SCREW	BS3692 Gd8.8	4
23	MTG PLATE WASHER	BS4464	4
24	DRIVE PLATE GUARD	CARBON STL	1
25	PLATE-END COV. SCREW	BS3692 Gd8.8	VAR
26	WASHER SPRING	BS4464	VAR
27	PLATE MTG SCREW	BS3692 Gd 8.8	1 OR 2
28	WASHER, SPRING	BS4464	1 OR 2
29	DRIVE GUARD COVER	CARBON STL	1
30	COVER NUT	BS3692	4
31	WASHER	BS4464	4
32	MOTOR MTG STUD		4
33	NUT, THIN	BS3692	12
34	G.M.U.		1
35	ROTOR KEY		1
36	ROTOR SPROCKET		1
37	ROTOR T/L BUSH		1
38	G.M.U. KEY		1
39	G.M.U. SPROCKET		1
40	G.M.U. T/L BUSH		1
41	CHAIN		1
42	LINER	SG IRON	1
43	LINER DOWEL		1
44	SLOTTED COLLAR	HARDENED STEEL	2
45	SLEEVE	HARDENED STEEL	2
46	END DISC	NI HARD	2
47	END DISC SCREW	BS3692 Gd 8.8	6
48	LANTERN RING	PHOS. BRONZE	2
49	BEARING RETAINER	CARBON STL	1

ITEM NO	DESCRIPTION	MATERIAL	NO OFF
1	BODY	CAST IRON BS1452-220	1
2	ROTOR	CARBON STL BS970	1
3	REPLACEABLE BLADE	HARDENED STEEL	8
4			
5	BLADE SCREW	SKT. BUTTON HD.	VAR
6	END COVER	CAST IRON BS1452-220	2
7	END COVER BOLT	BS3692 Gd 8.8	VAR
8	WASHER SPRING	BS4464	VAR
9	JACK SCREW	BS3692 Gd 8.8	4
10	GLAND PACKING	POLYACRYLIC FIBRE PTFE IMPREGNATED	1 SET
11	GLAND RING	CARBON STL BS970	2
12	GLAND FOLLOWER	CARBON STL BS4360	2
13	FOLLOWER STUD		4
14	FOLLOWER STUD NUT	'NYLOC'	4
15	BEARING	SEALED BALLRACE	2
16	BEARING TAB WASHER		
17	BEARING NUT		
18	BEARING COVER		1
19	COVER SCREW	BS3692	VAR
20	COVER WASHER		VAR
21	MOTOR MTG PLATE	CARBON STL	1
22	MTG PLATE SCREW	BS3692 Gd 8.8	4
23	MTG PLATE WASHER	BS4464	4
24	DRIVE PLATE GUARD	CARBON STL	1
25	PLATE-END COV. SCREW	BS3692 Gd 8.8	VAR
26	WASHER SPRING	BS4464	VAR
27	PLATE MTG SCREW	BS3692 Gd 8.8	1 OR 2
28	WASHER, SPRING	BS4464	1 OR 2
29	DRIVE GUARD COVER	CARBON STL	1
30	COVER NUT	BS3692	4
31	WASHER	BS4464	4
32	MOTOR MTG STUD		4
33	NUT, THIN	BS3692	12
34	G.M.U.		1
35	ROTOR KEY		1
36	ROTOR SPROCKET		1
37	ROTOR T/L BUSH		1
38	G.M.U. KEY		1
39	G.M.U. SPROCKET		1
40	G.M.U. T/L BUSH		1
41	CHAIN		1
42	LINER	SG IRON BS2789	1
43	LINER DOWEL		1
44	SLOTTED COLLAR	HARDENED STEEL	2
45	SLEEVE	HARDENED STEEL	2
46	END DISC	NI HARD	2
47	END DISC SCREW	BS3692 Gd 8.8	6
48	LANTERN RING	PHOS. BRONZE	2
49	BEARING RETAINER	CARBON STL	1



PROJECTION	THIRD ANGLE	MATL.			TITLE			
SCALE					TYPE 'EHD' VALVE - EXPLODED G.A. REPLACEABLE BLADE			
TOLS	CAS M/C ANGLE	PATTERN No	DRN	DATE	JOB No	ORG No	Sheet	Issue
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