



**Bulk Solids Handling Equipment**  
Reg. No. 993360 England  
VAT Reg. No. GB 2580681 45

**Rota Val Ltd**  
Bumpers Way  
Bumpers Farm Industrial Estate  
Chippenham Wiltshire  
England SN14 6LH

Tel: + 44(0) 1249 651138  
Fax: + 44(0) 1249 657898  
Fax (Sales): + 44(0) 1249 462054  
E-mail: sales@rotaval.co.uk  
Web site: www.rotaval.co.uk

# **INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS TYPE BSV 12x14 & 13x16 BLOWING SEALS**

Rota Val Ltd types 12 x 14 and 13 x 16 Blowing Seals are designed to meter the flow of dry solid solids into pneumatic conveying systems operating under negative or positive pressure differentials. They are characterised by suitability for vehicle mounting as well as fixed installation, and by the absence of a conveying line trough into the valve body, which reduces overall height. Each valve is supplied to match a particular application; the valve should not be used for any other duty **WITHOUT CONSULTING OUR TECHNICAL SALES DEPARTMENT.**

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

## **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 local health and safety regulations. The motor must be isolated before any cleaning, maintenance or adjustment is carried out; do not operate the valve under power with the drive guard, or any other part of the valve, removed.

Only competent persons must be used to maintain the valve.

**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.**

# INDEX

1. INSTALLATIONS
2. OPERATION AND COMMISSIONING
3. MAINTENANCE
4. REFURBISHING
5. DISMANTLING
6. INSPECTION
7. RE-ASSEMBLY
8. GENERAL ASSEMBLY DRAWING 65105-33001
9. GENERAL ASSEMBLY DRAWING 65105-33002
10. GENERAL ASSEMBLY DRAWING 65105-33003

## 1. INSTALLATION

- 1.1. Check the valve externally for damage and internally for foreign bodies. Install the valve using compressible gaskets on all flanges; the valve body must not be stressed or used to support ancillary equipment. BS valves may be installed in the conveying line with the flow in either direction.
- 1.2. If driven electrically, the motor must be connected to a suitable electrical supply in accordance with the manufacturer's nameplate / operating 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. Whether the drive is electrical or hydraulic, the valve should rotate anticlockwise when viewed from the drive end.

## 2. OPERATION AND COMMISSIONING

- 2.1. Valves driven by electric geared motors are supplied with the valve speed set at our factory. Small variations required to adjust the throughput can be achieved by a change of sprocket ratio. Hydraulic drives are inherently variable speed.
- 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: if replaceable blades are fitted re-adjust (see re-assembly paragraph 7.10)

## 3. MAINTENANCE

- 3.1. BS 12x14 and 13x16 rotary valves are designed for minimum maintenance: however, regular examination in accordance with the following instructions will prolong valve life.

### **BEARINGS.**

- 3.2. Standard bearings inboard or outboard 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 replaced if necessary. Replace every 12 months or 10,000 hours. (See dismantling and re-assembly).

### **SHAFT SEALS - Where INBOARD bearings are fitted.**

- 3.3. Standard seals are nitrile lip seals, 2 at each end: no maintenance is possible. Seals should be replaced at the same time as the bearings.

### **SHAFT SEALS - Where OUTBOARD bearings are fitted.**

- 3.4. Standard sealing arrangement is woven acrylic 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 failure.

### **CHAIN DRIVE.**

- 3.5. 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 Geared Motor Unit. The tension is correct when the up and down movement is equal to the pitch. Lubricate with suitable chain grease.

## GEARED MOTOR UNITS AND HYDRAULIC MOTORS.

3.6. All units are proprietary and are to be maintained in accordance with the manufacturers instructions attached.

### 4. REFURBISHING

4.1. Wear and tear within the rotary valve is always uneven. However, if valves are fitted with replaceable adjustable blades, some temporary improvement may be achieved by re-adjustment (see paragraph 7.10).

*	HYDRAULIC MOTOR DRIVEN
**	CHAIN DRIVEN ONLY
#	VALVES WITH INBOARD BEARINGS ONLY
##	VALVES WITH OUTBOARD BEARINGS ONLY

### 5. DISMANTLING

- 5.1. ROTA VAL LTD valves require normal fitting skills and no special tools. All parts of the valve must be handled with extreme care to prevent accidental damage, which could render the valve unserviceable.
- 5.2. Item numbers refer to drawing number 65105-33002 and 65105-33003 for valves with OUTBOARD bearings and 65105-33001 for valves with INBOARD bearings.
- 5.3. \* Remove the hydraulic motor assembly by slackening grub screws (32) and remove fixings (31). Pull assembly away from valve.
- 5.4. \*\* Remove chain guard cover (34) and fixings (35). Disconnect the conveying line from the non-drive whilst leaving the valve in-situ if partial dismantling for inspection only is required. Alternatively and essentially for complete dismantling remove the valve totally from the system.
- 5.5. \*\* Remove chain, sprockets and rotor key (36 to 42). Sprockets are normally fitted with taperlock bushes. Pilot bore sprockets are secured by a grub screw (it will assist chain removal if the geared Motor Unit adjusting studs (28) are slackened).
- 5.6. \*\* Remove drive guard plate (31 & 32), Geared Motor Unit and mounting plate (27 to 30).
- 5.7. # Remove end cover fixings (3).
- 5.8. Screw two end cover bolts into the two tapped holes in each end cover (2); tighten evenly to jack the end covers off the body.
- 5.9. # Pull the end covers off the rotor and remove the rotor from the body. Take note of any shims on the rotor behind the bearings. In principle this type of valve is constructed with the bearing inner race located against a shoulder on the rotor shaft. The bearing retainer abuts the outer race and when pulled up tight onto the face of the end cover, removes end float from the bearing without applying excessive end load. At the same time the rotor is held central in the body with the correct end clearances. Tolerance variations may necessitate the use of shims between the inner race and the rotor on some valves.
- 5.10.# The bearings and shaft seals (17 & 22) can now be removed from the end covers.
- 5.11.## Remove the bearing cover from the non-drive end (25 & 26).
- 5.12.## Remove bearing nuts and washers (23 & 24).
- 5.13.Remove gland follower nuts (21) and end cover fixings (3).
- 5.14. Screw two end cover bolts into the two tapped holes in each end cover (2); tighten evenly to jack the end covers off the body.
- 5.15. Pull the end covers off the rotor and remove the rotor from the body.

5.16. The bearings and gland packing can now be removed from the end covers.

## 6. INSPECTION

- 6.1. Check the body, rotor and end cover faces for scoring; ease any high spots or rough patches with emery cloth or a smooth file.
- 6.2. Some replaceable blade rotors may be fitted with chamfered blades, or serrated scraper blades: note the positions of these BEFORE removal from the rotor.
- 6.3. Depending on the amount of wear the blades can be adjusted or new ones fitted.
- 6.4. Check the rotor seal area for wear.
- 6.5. Any serious damage in the above areas will impair valve efficiency; if in doubt consult our technical department.
- 6.6. Renew bearings and seals.

## 7. RE-ASSEMBLY

- 7.1. Ensure all surfaces are clean, free from burrs and accidental damage.
- 7.2. # Press the lip seals into the end cover recesses, lips facing inwards.
- 7.3. Press the bearings into the end cover recesses, flush with the outside face: taking care not to damage the bearing seals.
- 7.4. # Assemble blades or tips to the rotor, if a replaceable blade rotor is used. Note they must be fitted to the leading edge of the vane.
- 7.5. # Refit any shims to the shaft.
- 7.6. Slide the rotor into the body, being careful not to allow the vanes to score the bore. Check also that the rotor is the right way round, i.e. motor mounting lugs on the left looking from the drive end.
- 7.7. # Slide the end covers onto the rotor. Tighten the end cover fixings evenly until both end covers are fully home.
- 7.8. # Refit the bearing retainers (temporarily secure the drive end with the drive guard fixings).
- 7.9. # The rotor should be central in the body; if not check the clearances and reshim to centralise.

*	HYDRAULIC MOTOR DRIVEN
**	CHAIN DRIVEN ONLY
#	VALVES WITH INBOARD BEARINGS ONLY
##	VALVES WITH OUTBOARD BEARINGS ONLY

### 7.10.# Replaceable Blade Rotor:

Fit the rotor as above, then set the blades central and clear of the body radially: nip up the end fixings, check that the rotor turns freely. Put a feeler equal to the clearances at each end of one blade, pull the blade up to contact the body, nip up the fixings. Tap the blade down until the required clearance is achieved, tighten all fixings. Remove the feelers, recheck the clearances and check the rotor rotates freely. Repeat for the remaining blades.

7.11.## Slide the end covers onto the rotor, noting that the gland ring and follower must also be assembled at this stage. Tighten the end cover fixings evenly until both covers are fully home.

**7.12.## Fixed Vane Rotor:**

Assemble the tab washers and bearing nuts to the rotor, (also thrust bearing and thrust washer for plain bearings), tighten by hand at the non-drive end until the rotor vanes lightly contact the end cover. Measure clearance at drive end with feeler gauges, slacken the non-drive end nut and use the drive end nut to divide the clearance equally between ends. Both nuts should be pulled up to the bearing with equal feelers between the rotor and end cover at both ends. Back off both nuts by one notch until the rotor turns freely without axial movement and finally check clearances. Lock both the tab washers.

**7.13.## Replaceable Rigid Blade Rotor:**

Assemble the tab washers and bearing nuts to the rotor, tighten by hand at the non-drive end until the rotor hub lightly contacts the end cover. Push the blades towards the non-drive end cover and downwards. Nip up the blade end fixings. Centralise the rotor as above (7.12) measuring clearance at the hub only. Place a feeler equal to the clearance at each end of one blade; pull the blade to contact the body and nip up remaining fixings on that blade. Tap the blade down until the required radial clearance is achieved, tighten all fixings. Remove the feelers, recheck clearances and check that the rotor rotates freely, Repeat for the remaining blades.

**7.14.## Flexible Blade Rotor:**

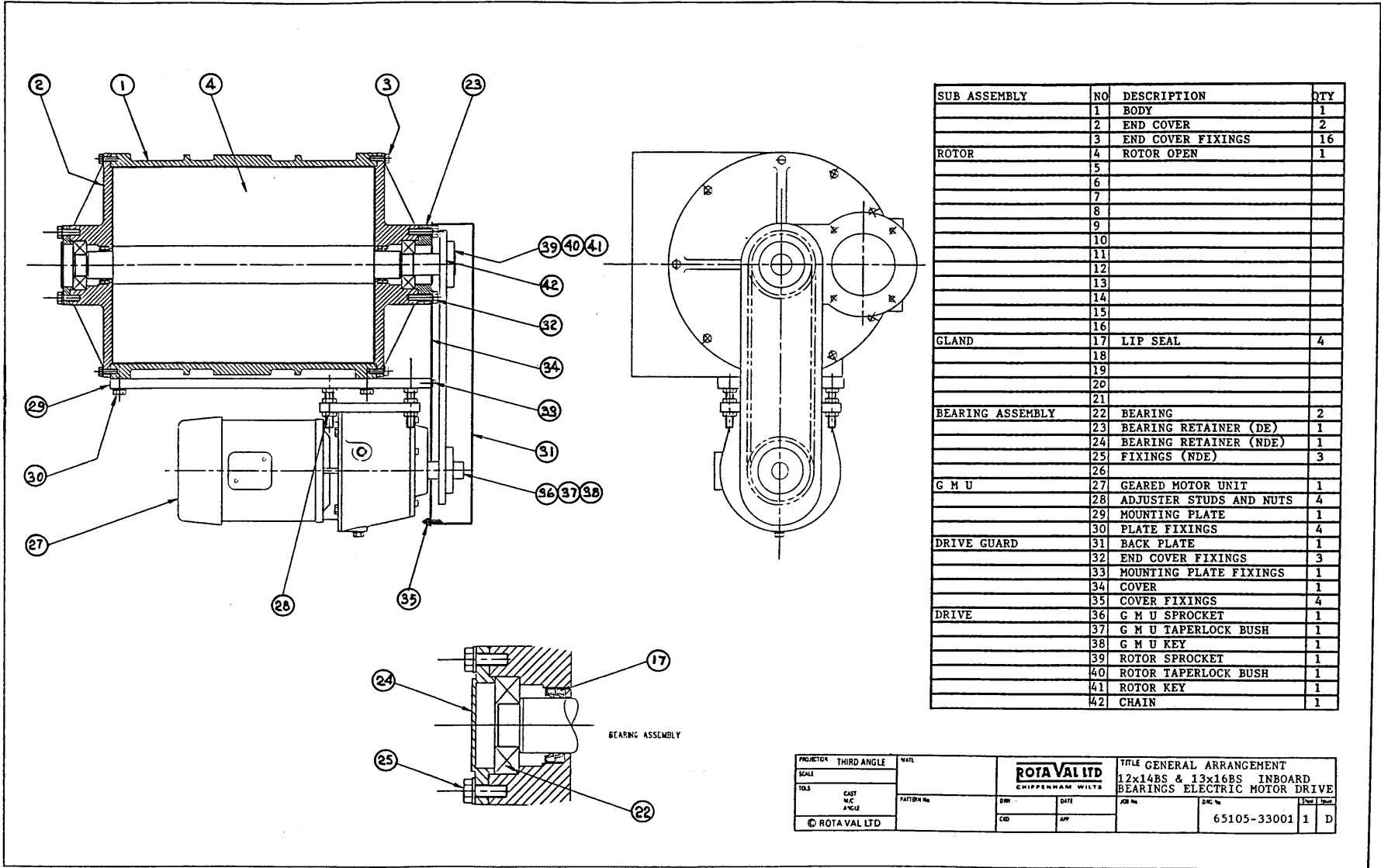
Assemble and centralise as (7.13), clamp plates are fitted to apply uniform pressure to the blades; tighten to give a light interference between the blades and the internal surfaces of the valve.

**7.15. 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 RECHECK ASSEMBLY AS ABOVE (section 6 & 7)**

7.16.## Fit the gland packing, ensure the joints are staggered. Assemble the remaining valve components, except the drive guard cover, check that the sprockets and chain are in line. Carry out all procedures indicated under MAINTENANCE (section 3) including Geared Motor Unit lubrication. Replace the drive guard cover.

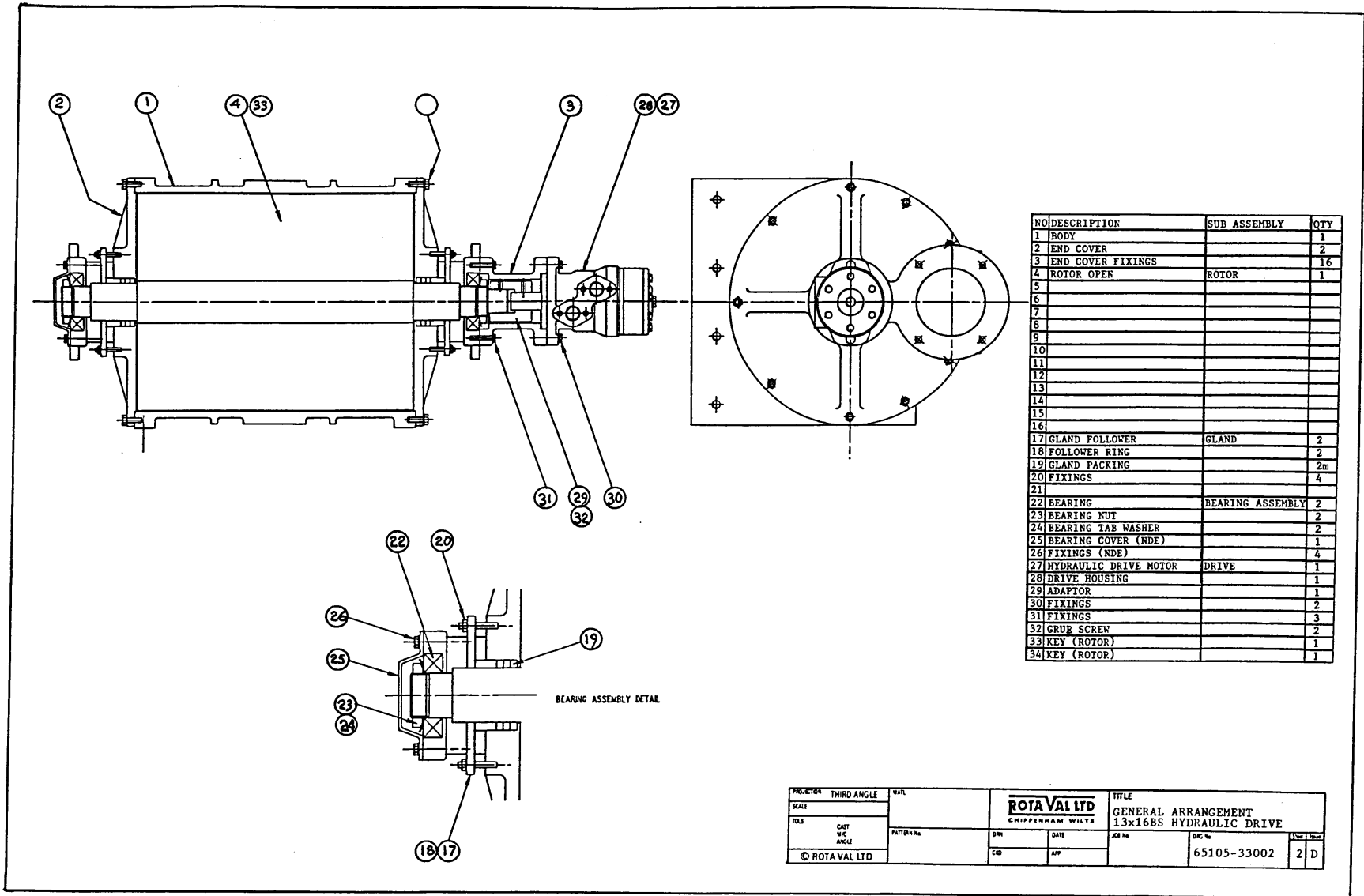
7.17. Carry out all procedures indicated under INSTALLATION, OPERATION AND COMMISSIONING (sections 1 & 2).

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



SUB ASSEMBLY	NO	DESCRIPTION	QTY
	1	BODY	1
	2	END COVER	2
	3	END COVER FIXINGS	16
ROTOR	4	ROTOR OPEN	1
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16		
GLAND	17	LIP SEAL	4
	18		
	19		
	20		
	21		
BEARING ASSEMBLY	22	BEARING	2
	23	BEARING RETAINER (DE)	1
	24	BEARING RETAINER (NDE)	1
	25	FIXINGS (NDE)	3
	26		
G M U	27	GEARED MOTOR UNIT	1
	28	ADJUSTER STUDS AND NUTS	4
	29	MOUNTING PLATE	1
	30	PLATE FIXINGS	4
DRIVE GUARD	31	BACK PLATE	1
	32	END COVER FIXINGS	3
	33	MOUNTING PLATE FIXINGS	1
	34	COVER	1
	35	COVER FIXINGS	4
DRIVE	36	G M U SPROCKET	1
	37	G M U TAPERLOCK BUSH	1
	38	G M U KEY	1
	39	ROTOR SPROCKET	1
	40	ROTOR TAPERLOCK BUSH	1
	41	ROTOR KEY	1
	42	CHAIN	1

PROJECTOR	THIRD ANGLE	DATE			TITLE GENERAL ARRANGEMENT 12x14BS & 13x16BS INBOARD BEARINGS ELECTRIC MOTOR DRIVE			
SCALE			DWG	DATE	JOB No	DWG No	Rev	Issue
TOLS	CAST W/C ANGLE	PATTERN No	CD	APP		65105-33001	1	D
© ROTA VAL LTD								



NO	DESCRIPTION	SUB ASSEMBLY	QTY
1	BODY		1
2	END COVER		2
3	END COVER FIXINGS		16
4	ROTOR OPEN	ROTOR	1
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17	GLAND FOLLOWER	GLAND	2
18	FOLLOWER RING		2
19	GLAND PACKING		2m
20	FIXINGS		4
21			
22	BEARING	BEARING ASSEMBLY	2
23	BEARING NUT		2
24	BEARING TAB WASHER		2
25	BEARING COVER (NDE)		1
26	FIXINGS (NDE)		4
27	HYDRAULIC DRIVE MOTOR	DRIVE	1
28	DRIVE HOUSING		1
29	ADAPTOR		1
30	FIXINGS		2
31	FIXINGS		3
32	GRUB SCREW		2
33	KEY (ROTOR)		1
34	KEY (ROTOR)		1

PROJECTION	THIRD ANGLE	MATERIAL			TITLE GENERAL ARRANGEMENT 13x16BS HYDRAULIC DRIVE		
SCALE			DRAWN	DATE	JOB No	DWG No	
TOLS	CUT N/C ANGLE	PATTERN No	CD	APP		65105-33002	
© ROTAVAL LTD						2	D

