

BINKS[®]

Instruction Manual

Electric Drive Rotary Agitators

Vertical Mounted

10 69 46 Inverter Model EU

10 69 48 Variator Model EU

10 69 73 Inverter Model USA

10 69 75 Variator Model USA

10 69 74 Inverter Model Japan

10 69 76 Variator Model Japan



CARLISLE[®]
FLUID TECHNOLOGIES



Product Description

Agitator - 106946, 106973, 106974
106948, 106975, 106976,

This Product is designed for use with: Solvent and Water based Materials

Suitable for use in hazardous area: Zone 0, 1 & 2

Protection Level: II 1/2 G X T4
II 2 G Exd/Exde IIB T4 IP55 (Motor) CE0722
II 2 GD ck T4 (Gearbox)

Manufacturer: Binks,
Justus-von-Liebig - Strasse,
63128 Dietzenbach. DE

EU Declaration of Conformity

We: Binks declare that the above product conforms with the Provisions of:

Machinery Directive 2006/42/EC

ATEX Directive 94/9/EC

EMC Directive 2004/108/CE

by complying with the following statutory documents and harmonized standards:

EN ISO 12100: Safety of Machinery - General Principles for Design

EN ISO 4413: Hydraulic Fluid Power - General Rules and safety requirements

EN 12621: Machinery for the supply and circulation of coating materials under pressure - Safety requirements

EN1127-1: Explosive atmospheres - Explosion prevention - Basic concepts

EN 13463-1: Non electrical equipment for use in potentially explosive atmospheres - Basic methods and requirements

EN 13463-5: Non electrical equipment for use in potentially explosive atmospheres - Protection by constructional safety

EN 13463-8: Non-electrical equipment for potentially explosive atmospheres. Protection by liquid immersion 'k'

EN 60079-0: Explosive atmospheres - Equipment. General requirements

EN 60079-1: Explosive atmospheres - Equipment protection by flameproof enclosures "d"

EN 60079-7:2007 - Explosive atmospheres. Equipment protection by increased safety "e"

IEC 60072: Rotating electrical machine FT flange class

IEC 60034-1,5,6,7,8,9,12,14: Rotating electrical machines

Providing all conditions of safe use stated within the product manuals have been complied with and that the final equipment into which this product is installed has been re-assessed as required, in accordance with essential health and safety requirements of the above standards, directives and statutory instruments and also installed in accordance with any applicable local codes of practice.

D Smith (General Manager)
12 February 2013

Instruction Manual

General Description

The electric driven agitators are designed to drive paddle assemblies primarily for the agitation of Solventborne and Waterborne paint.

Two types of Agitator mounting are available Inverter or Manual Variator control to suit customer preferences for speed change.

The Agitator complies with current EU CE and ATEX legislation.

Operating Principle

An AC induction electric motor drives an in-line gearbox which in turn drives a shaft and stainless steel three bladed paddle assembly.

A robust coupling connects the gearbox shaft to the paddle shaft.
A PTFE lip seal ensures sealing of the paddle shaft through the lid of the tank.

The assembly is mounted Vertically and 'off set' from the centre of the tank, the paddle design moves the fluid in a downward offset centrifugal direction.

The correct positioning of the agitator on the tank lid is important to create the optimum agitation and perform correct mixing without the use of baffles mounted inside the tank. (See Installation Section)

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Electrical Drives

Inverter Controlled - The rotational speed of the paddle assembly is controlled by adjusting the motor frequency range between 20 and 80 Hz by connecting the electric motor to a suitable AC frequency Inverter Drive.

The speed adjustment is made by control of the Inverter Frequency Output through manual operation or from a PLC analogue output.

The motor frequency is directly proportional to the agitator rotational speed and provides an output speed control factor of 4, the gearbox ratio determining the final output speed. (See specifications section)

If required the speed of rotation can be reduced in proportion to the fluid level in the tank. It is good practice however, particularly with waterborne paint to maintain a high fluid level in the mix tank.

Mechanical Variator Controlled – The rotational speed of the paddle assembly is controlled by adjustment of the hand wheel incorporated on the variator/gearbox unit. The speed control is over a factor of 5, the gearbox ratio determining the final output speed. (See specifications section)

An optional gravitational indicator can be fitted to the standard handwheel.

Note: The unit must be running to be able to adjust the speed

General - To eliminate the possibility of any oil contamination into the paint tank from a failed or leaking gearbox seal a Flinger Plate is incorporated onto the shaft to direct any oil escape into the support housing. Drainage is through the 1/8 connection, a Ø6 mm hose fitting or similar can be connected to allow any drainage to be piped away from the tank lid.

In addition a PTFE shaft seal is incorporated in the support housing to prevent any unintentional ingress from entering from the tank lid.

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Specification

Electrical Motor Driven Rotary Agitator		
Specification		
Paddle Shaft Speed Range	Inverter Control	47 to 190 RPM
	Manual Variator	40 to 212 RPM
Paddle Diameter Paddle shaft Paddle shaft seal		Ø300 (3 Blades) Stainless Steel PTFE Lip Seal
Rotation looking on top of unit		Clockwise
Shaft Connection		Ø20 (female)
Speed control	Inverter Control	Inverter Output 20 – 80 Hz
	Manual Variator	Manual Hand wheel Adjustment
Supply Connection	Inverter Control Manual Variator	400v – 3ph – 50 Hz 0.37 kW Motor Eexd II 2 G T4 IP66 ATEX (inc thermistors when inverter controlled)
Ambient Operating Temperature		-20°C to + 40°C
Gearbox oil (Mineral)	Inverter Control Manual Variator	Shell Omala – 320 or equivalent
Gearbox oil volume	Inverter Control Manual Variator	1.45 Litres
Variator Unit (with 4 pole Motor)	Output Speed	190 – 1000 Rpm
Weight of Unit	Inverter Control	23 Kg
	Manual Variator	28 Kg

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ATEX Conditions for Use - Section 2.2

ATEX Certification: Agitator Shaft and Mounting Assembly. (Cat. 1)

Model 106946; 106948, 502805, 502806,



Certificate number TRL04ATEX91055X
Ta = -20°C to +40 °



II 1/2 G c T3

Special Conditions for Safe use.

The ancillary Electric motor plus the connecting Gearbox used to power the agitator shaft must be adequately rated for the intended use and be declared conformant for the category of the equipment and potentially explosive atmosphere.

Installer shall ensure that the mixing vessel the agitator is attached to does not contain by mass greater than 7.5% in total of magnesium, titanium or zirconium.

Operator shall ensure that there is less than 1 Ohm resistance between metallic parts of the mounting assembly and agitator shaft to the mixing vessel.

Operator shall ensure the mixing vessel is adequately bonded to the main protective earth.

Operator shall ensure greater than 50 mm clearance exists between the tip of the paddle and the side wall of the mixing vessel.

Operator shall ensure greater than 50 mm clearance between the bottom of the tank and lowest part of the agitator paddle or shaft.

Operator shall ensure greater than 50 mm clearance between the underside of the tank lid/cover and the top of the upper paddle (dual paddle units only).

Operator shall visually inspect the shaft for signs of damage or distortion that may reduce the clearance requirement.

ATEX Certification: Motor (Cat. 2)

Model



II 2 G c T3 Ta = -20°C to +40 °

Technical File Reference 600028

Instruction Manual



Directions for Working Safety

This Product has been constructed according to advanced technological standards and is operationally reliable. Damage may, however, result if it is used incorrectly by untrained persons or used for purposes other than those for which it was constructed.

The locally current regulations for safety and prevention of accidents are valid for the operation of this product under all circumstances.

International, national and company safety regulations are to be observed for the installation and operation of this product, as well as the procedures involved in maintenance, repairs and cleaning.

These instructions are intended to be read, understood and observed in all points by those responsible for this product. These operating and maintenance instructions are intended to ensure trouble free operation. Therefore, it is recommended to read these instructions carefully before start-up. Binks PCE cannot be held responsible for damage or malfunctions resulting from the non-observance of the operating instructions. These instructions including regulations and technical drawings may not be copied, distributed, used for commercial purposes or given to others either in full or in part without the consent of Binks PCE.

We reserve the right to alter drawings and specifications necessary for the technical improvement of this product without notice.



Equipment Misuse Hazard

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose.
- Do not alter or modify this equipment. Use only genuine Binks PCE parts and accessories.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure stated on the equipment or in the Technical Data for your equipment. Do not exceed the maximum working pressure of the lowest rated component in your system.
- Use fluids and solvents which are compatible with the equipment wetted parts. Refer to the Technical Data section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose hoses to temperatures above 82°C (180°F) or below -40°C (-40°F).
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.



Fire, Explosion and Electric Shock Hazard

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire, explosion, or electric shock.

When installed and operated in accordance with its instructions, the pump is approved for operation in Zone 1 (Europe) & Division 1 (North America), hazardous locations. (ATEX Cat 2)

- Electrical equipment must be installed, operated, and serviced only by trained, qualified personnel who fully understand the requirements stated in this instruction manual.
- Ground the equipment and all other electrically conductive objects in the spray area. After grounding test with ohmmeter to ensure earth continuity is 1 ohm or less.
- Keep all covers tight while the motor is energized.
- If there is any static sparking or you feel an electric shock while using this equipment, stop spraying/dispensing immediately. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the build up of flammable fumes from solvents or the fluid being pumped.
- Keep the pumping area free of debris, including solvent, rags, and gasoline.
- Electrically disconnect all equipment in the pumping area.
- Extinguish all open flames or pilot lights in the spray/dispense area.
- Do not smoke in the spray/dispense area.
- Do not turn on or off any light switch in the spray/dispense area while operating or if fumes are present.

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WARNING



READ THE MANUAL

Before operating equipment, read and understand all safety, operation and maintenance information provided in the operation manual.



DE-ENERGIZE, DEPRESSURIZE, DISCONNECT AND LOCK OUT ALL POWER SOURCES DURING MAINTENANCE

Failure to De-energize, disconnect and lock out all power supplies before performing equipment maintenance could cause serious injury or death.



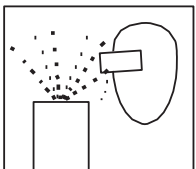
OPERATOR TRAINING

All personnel must be trained before operating equipment.



KEEP EQUIPMENT GUARDS IN PLACE

Do not operate the equipment if the safety devices have been removed.



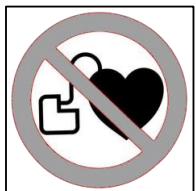
PROJECTILE HAZARD

You may be injured by venting liquids or gases that are released under pressure, or flying debris.



PINCH POINT HAZARD

Moving parts can crush and cut. Pinch points are basically any areas where there are moving parts.



MAGNETIC FIELD PRESENT

You may be subjected to magnetic fields which may interfere with the operation of certain pacemakers.



WEAR SAFETY GLASSES

Failure to wear safety glasses with side shields could result in serious eye injury or blindness.



NOISE HAZARD

You may be injured by loud noise. Hearing protection may be required when using this equipment.



KNOW WHERE AND HOW TO SHUT OFF THE EQUIPMENT IN CASE OF AN EMERGENCY



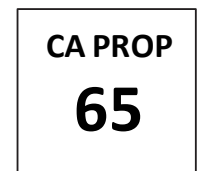
HIGH PRESSURE CONSIDERATION

High pressure can cause serious injury. Relieve all pressure before servicing. Hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury.



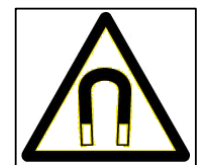
AUTOMATIC EQUIPMENT

Automatic equipment may start suddenly without warning.



PROP 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

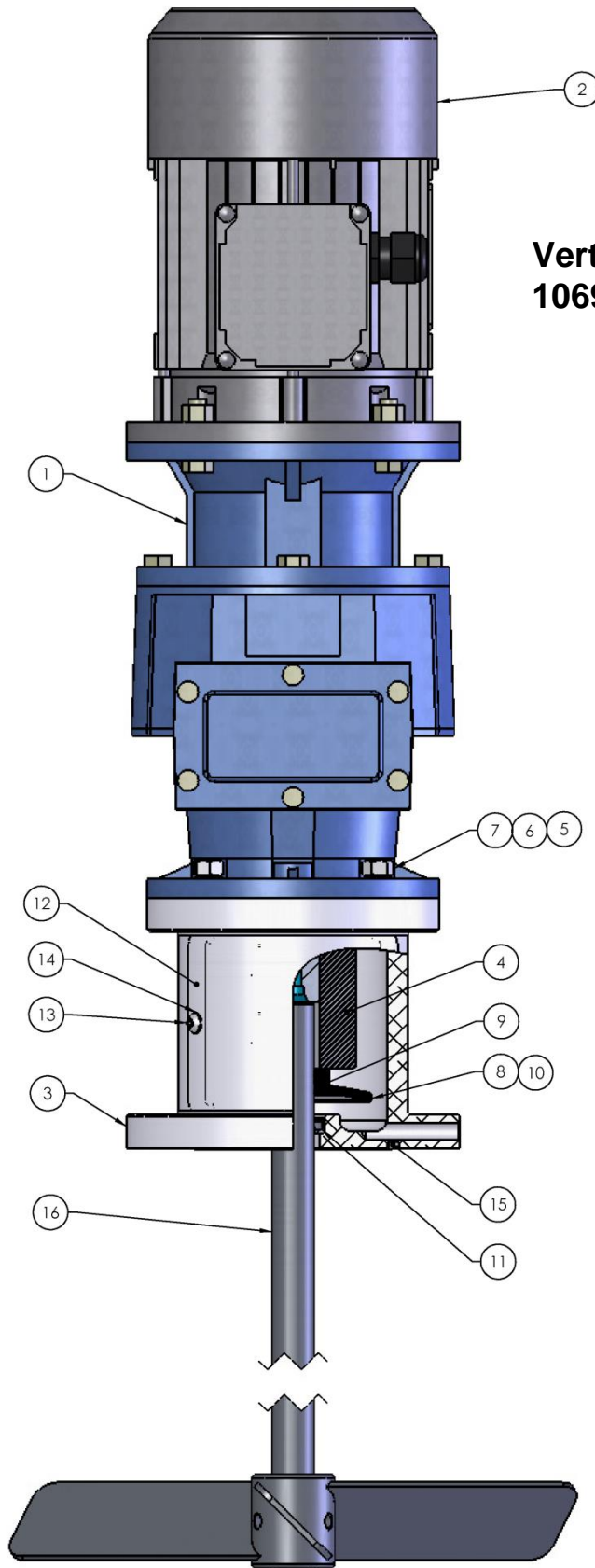


MAGNET HAZARD

Take care when handling magnets. Avoid getting magnets in close proximity of each other. Injury or damage to magnets may result.

Instruction Manual

Assembly Drawing



**Vertical Agitator - Inverter
106946 (106973 & 106974)**

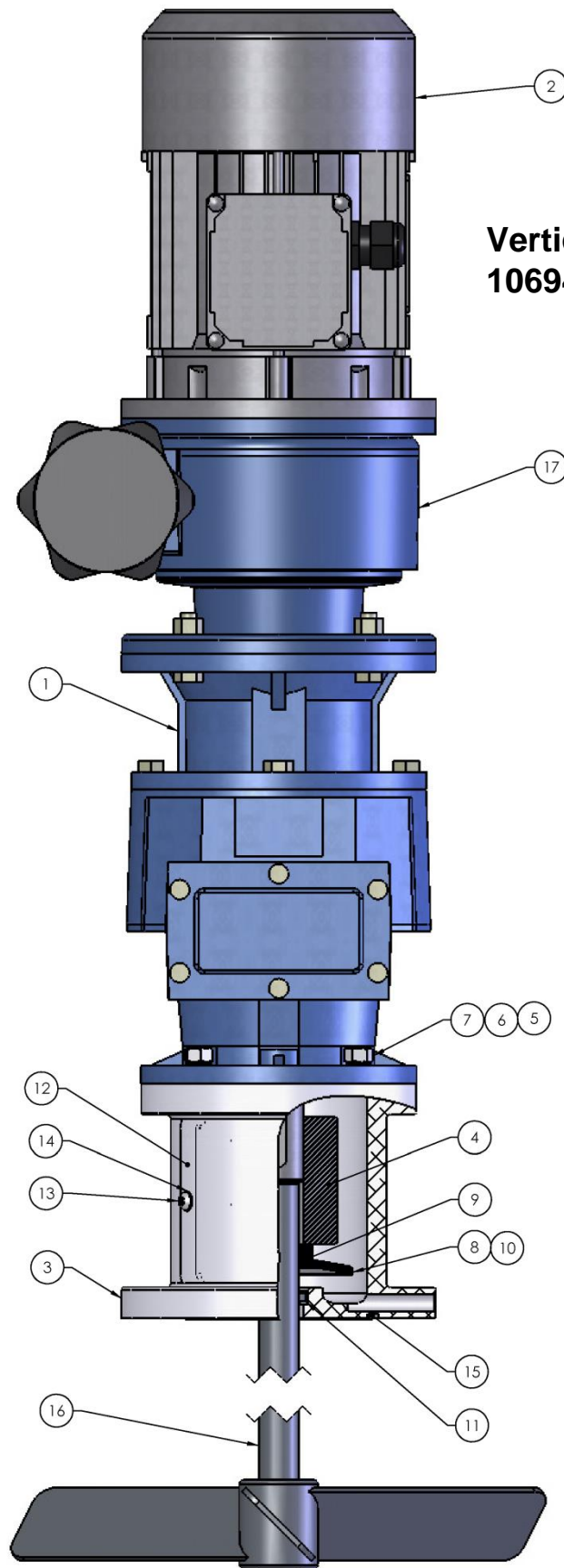
Instruction Manual

Parts List - Vertical Agitator - Inverter 106946 (106973 & 106974)

ITEM	PART No	DESCRIPTION	QTY	REMARKS
1	193610	GEARBOX (RATIO 11.76 USA)	1	106973
1 & 2	194918	MOTOR & GEARBOX – EU VERSION	1	
2	193609	ELECTRIC MOTOR (0.5HP USA)	1	106973
2	193613	ELECTRIC MOTOR (0.4KW JAPAN)	1	106974
3	192744	SUPPORT HOUSING - MACHINING	1	
4	192745	SHAFT CLAMP	1	
5	165664	M8 x 30 GRUBSCREW	4	
6	165108	M8 SPRING WASHER	4	
7	163144	M8 HEXAGON NUT	4	
8	192746	FLINGER PLATE	1	
9	161990	Ø20.29 x 2.62 O-RING (VITON)	1	
10	165635	M4 x 6 GRUBSCREW	2	
11	162705	Ø20 x Ø30 LIP SEAL	1	
12	192748	COVER PLATE	1	
13	165949	M5 x 10 TORX SCREW (ST ST)	2	
14	165141	M5 SHAKEPROOF WASHER (ST ST)	2	
15	161983	Ø91.67 x 3.53 O-RING	1	
16	192747	PADDLE ASSEMBLY	1	SPECIFY SHAFT LENGTH
17	192750	M5 TORX SCREWDRIVER	1	

Instruction Manual

Assembly Drawing



**Vertical Agitator - Variator
106948 (106975 & 106976)**

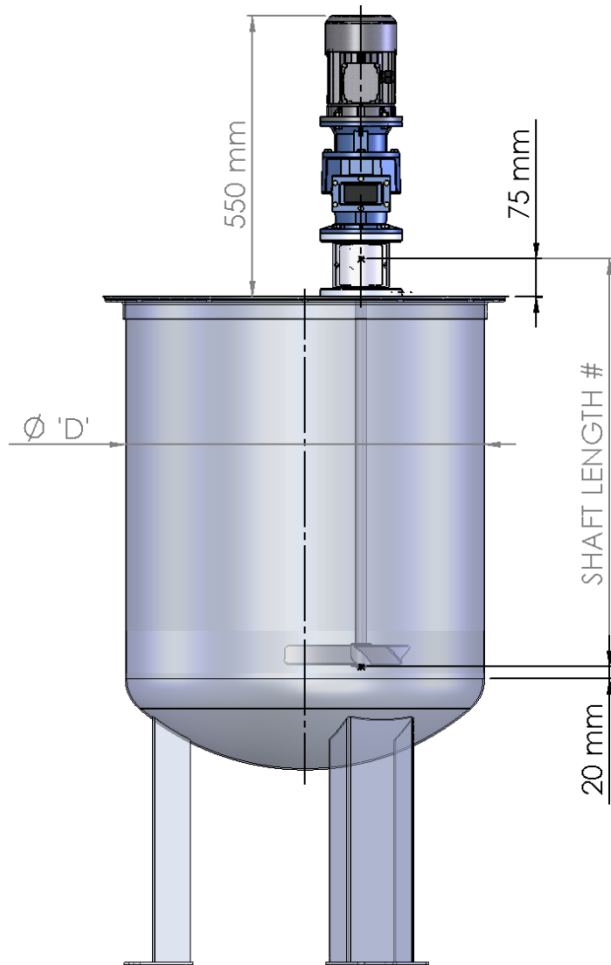
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Parts Lists

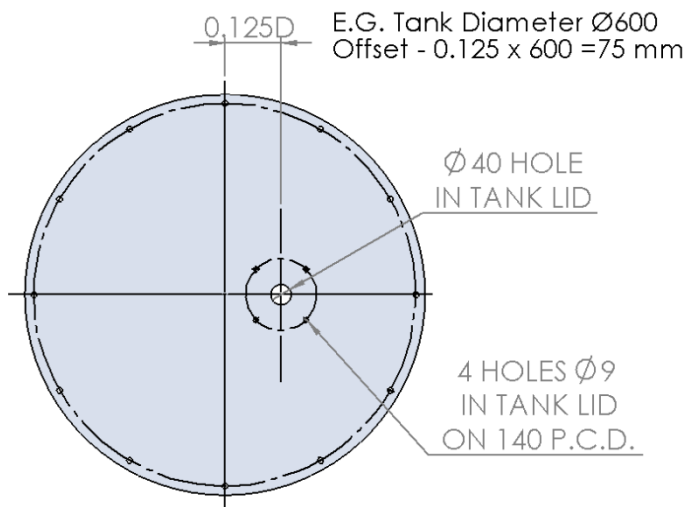
Parts List - Vertical Agitator - Variator 106948 (106975 & 106976)				
ITEM	PART No	DESCRIPTION	QTY	REMARKS
1,2,17	194879	MOTOR, VARIATOR + GEARBOX - EU	1	BLACK
1	193611	GEARBOX (RATIO 4.70 USA)	1	106975
2	193609	ELECTRIC MOTOR (0.5HP USA)	1	106975
2	193613	ELECTRIC MOTOR (0.4KW JAPAN)	1	106976
3	192744	SUPPORT HOUSING - MACHINING	1	
4	192745	SHAFT CLAMP	1	
5	165664	M8 x 35 GRUBSCREW	4	
6	165108	M8 SPRING WASHER	4	
7	163144	M8 HEXAGON NUT	4	
8	192746	FLINGER PLATE	1	
9	161990	Ø20.29 x 2.62 O-RING (VITON)	1	
10	165635	M4 x 6 GRUBSCREW	2	
11	162705	Ø20 x Ø30 LIP SEAL	1	
12	192748	COVER PLATE	1	
13	165949	M5 x 10 TORX SCREW (ST ST)	2	
14	165141	M5 SHAKEPROOF WASHER (ST ST)	2	
15	161983	Ø91.67 x 3.53 O-RING	1	
16	192747	PADDLE ASSEMBLY	1	SPECIFY SHAFT LENGTH
17	192743	VARIATOR UNIT (USA)	1	106975
18	192750	M5 TORX SCREWDRIVER	1	

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Installation Mounting Detail

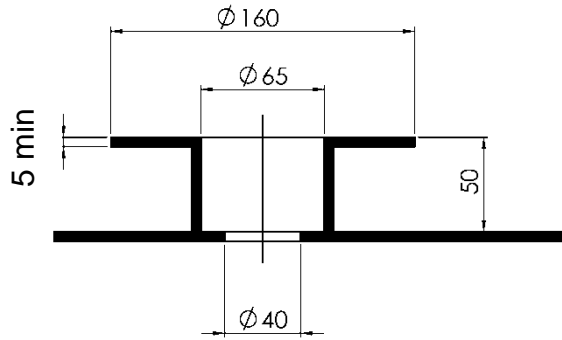


Standard shaft length 1M Reduce shaft length to position paddle as shown for best results [50 mm minimum Tank / Paddle clearance]

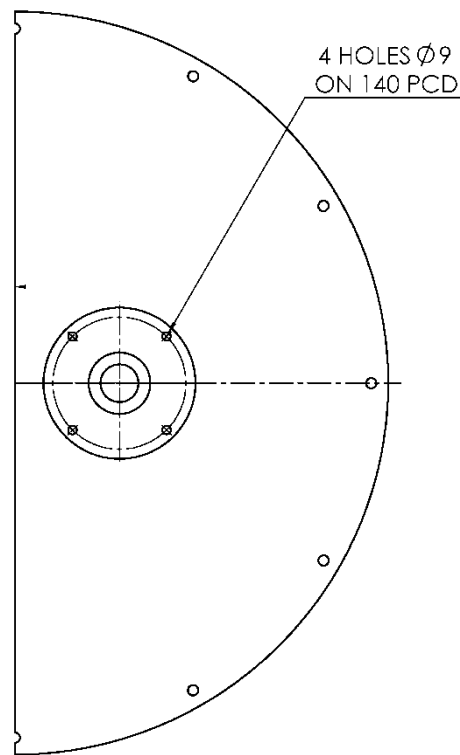


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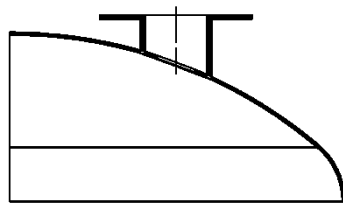
Installation Mounting Detail



Alternate mounting for vertical mounting agitator on flat lid



FLAT LID VERTICAL MOUNTING



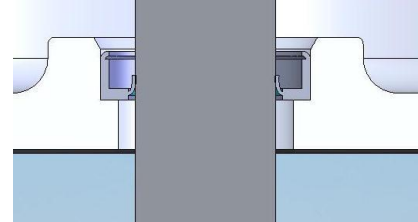
DOMED LID VERTICAL MOUNTING

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Maintenance - Assembly Procedure

Initial Assembly

1. Lubricate Lip seal [11] with suitable grease and press into support housing [3]
2. Insert 4 off M8 grub screws [5] into support housing [3] until the thread 'bottoms out', use loctite 243.
3. Connect shaft clamp [4] to gearbox shaft and tighten the 2 off clamping screws.
4. Assemble motor / gearbox to support housing and fasten with 4 off M8 nuts [7] and spring washers [6]
5. Lubricate o-ring [9] with suitable grease and fit into flinger [8] then loosely insert 2 off M4 grub screws [10]
6. Lubricate o-ring [15] with suitable grease and fit to the bottom of the support housing.



Assembly to Mix Tank

1. Position the Motor/Gearbox housing assembly on the mix tank (ensure o-ring [15] is still in place) and secure using suitable M8 fasteners.
2. Position the flinger assembly into the support housing.
3. Place the agitator shaft into the mix tank then slide the shaft through the support housing and flinger assembly until the shaft locates firmly into the shaft clamp.
4. Tighten the 2 off shaft clamp screws.
5. Slide the flinger against the shaft clamp and tighten the M4 grub screws.
6. Position the cover plate [12] on the support housing and secure using 2 off M5 Torx screws [13] and washers [14]. A special security screwdriver is provided for this purpose.

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Maintenance – Gearbox

Wait until the unit has cooled sufficiently after stopping and isolate from power supply.

Oil Plugs / Ventilator

Remove the ventilator plug prior to removing level and/or drain plug.

The gearbox is supplied factory fitted with EP mineral oil (see section 1.3) only 'top up' with the same type of oil and never overfill as this may cause overheating and leakage. Check the ventilator is clean and fitted correctly.

There is no drain plug fitted to the gearbox or variator unit as the units are 'sealed for life' so top up of oil is only necessary as required.

It is recommended however, to change the oil during a overhaul of the agitator when the unit is removed from the mix tank assembly.

If changing the oil place a suitable container underneath the plug for draining.

Note: It is recommended that the oil should be slightly warm [40-50° C] to facilitate easier draining.

After filling with fresh oil refit the ventilator, level and/or drain plugs and clean up any oil spillage.

Lubrication

Check the oil level every 3,000 hours or 6 months top up as necessary.

Replace the oil every year as per ATEX regulations

Note: Oil replacement not required for units that are 'sealed for life'.

If Synthetic oil is used (USA Gearbox) the recommendation is to replace the oil every 3 years

Never mix different oil types.

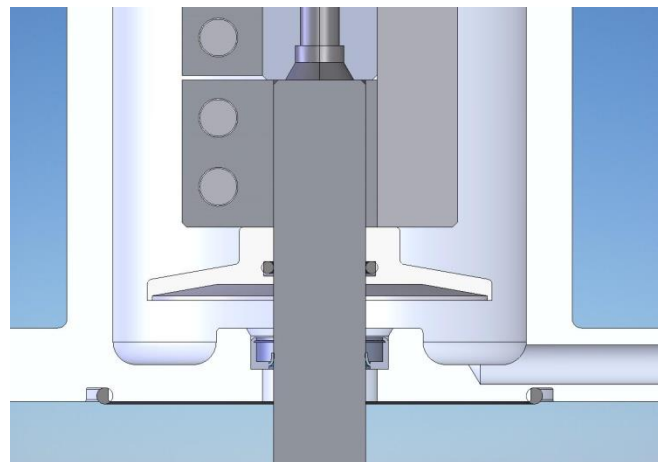
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Preventative Maintenance

Unit	Action	Interval
Agitator	Check for any gearbox oil leaks	1 Week
Gearbox	Replace gearbox Oil	12 Months
Agitator	Replace Shaft Seal162705	12 Months

Shaft Seal Replacement

1. Stop the agitator and isolate the electric motor from the mains supply.
2. Remove the Cover Plate to access the shaft clamp.
3. Loosen Cap screws on the agitator shaft clamp. Ensure the Flinger is still firmly clamped to the shaft before doing this as the shaft will drop slightly until the flinger rests on the bottom of the support housing. (This prevents the agitator shaft from dropping into the tank)
4. Remove 4 off M8 Hexagon nuts and lift off the Motor / Gearbox assembly.
5. Remove the fasteners attaching the support housing to the tank.
6. Lift the support housing to give access to the agitator shaft and temporarily clamp the shaft to prevent it dropping into the tank.
7. Loosen the grub screws clamping the Flinger to the agitator shaft and remove the support housing.
8. Remove the worn shaft lip seal and insert a new seal.
9. Reassemble agitator.



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Fault Finding

Problem	Cause	Action
Oil coming from agitator drain fitting	Gearbox transport plug still fitted	Remove and Fit 'Breather' plug. Check Gearbox seal is still OK
	Gearbox seal failed	Remove unit and replace seal.
	Gearbox over filled with oil	Drain and check oil volume
Excessive movement on shaft & paddle	Shaft coupling loose	Retighten and check movement
	Gearbox bearings worn	Remove unit and replace gearbox bearings and seals
Excessive noise coming from unit	No or low oil in gearbox or variator unit	Check oil volume
	Gearbox bearings or variator discs worn	Remove unit and replace as necessary

Spare Parts List

250616 Spare Parts List - All Agitator Models				
ITEM	PART No	DESCRIPTION	QTY	REMARKS
1	161990	Ø20.29 x 2.62 O-RING (VITON)	1	
2	162705	Ø20 x Ø30 LIP SEAL	1	
3	165949	M5 x 10 TORX SCREW (ST ST)	2	
4	165141	M5 SHAKEPROOF WASHER (ST ST)	2	
5	161983	Ø91.67 x 3.53 O-RING	1	
6	192750	M5 TORX SCREWDRIVER	1	Supplied with New Agitator

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Notes

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China		Tel: +8621-3373 0108 Fax: +8621-3373 0308
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