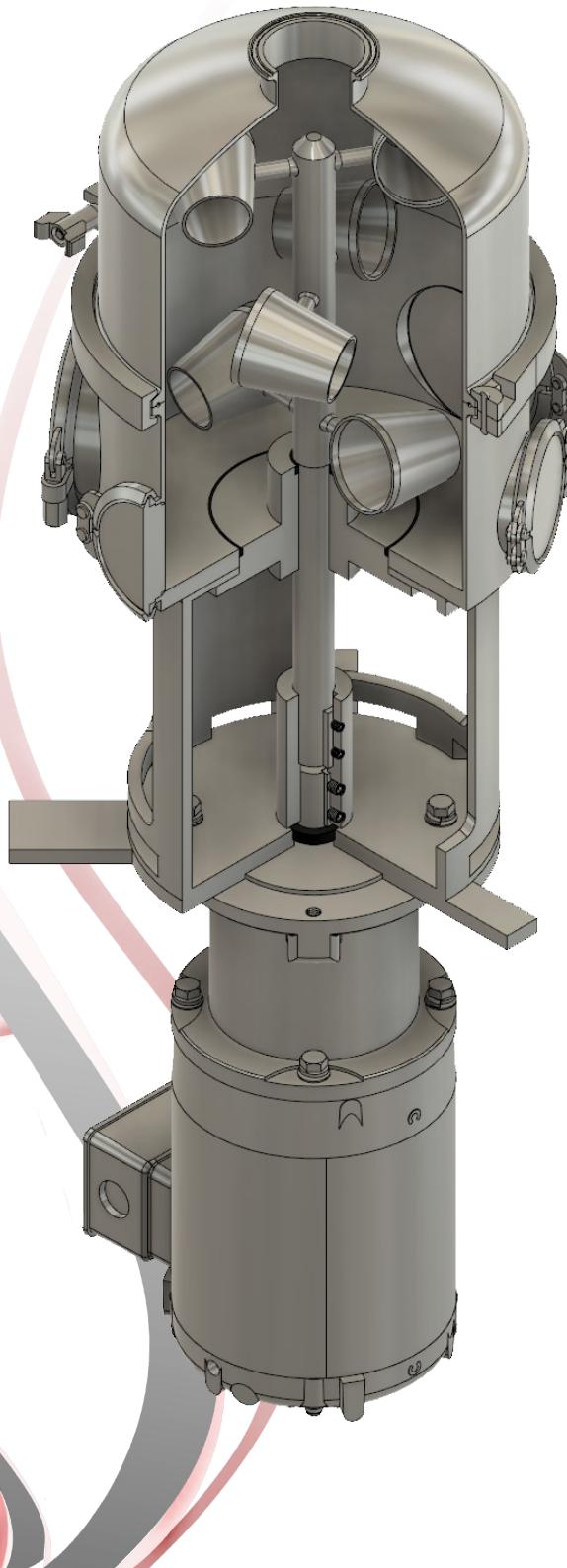


ViscoTec

ViscoMix VM5 Dynamic Inline Mixer

Operating Manual

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ViscoTec

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CONTENTS

1 Intended Use of Dynamic Inline Mixer	
1.1 ViscoMix VM5-3A25200	3
2 Safety Notes	4
3 Technical Specifications	6
4 Description of System Components	
4.1 ViscoMix VM5-3A25200	7
4.2 Serial Number Label	8
5 Delivery	
5.1 Scope of Delivery	9
5.1.2 Condition on Delivery and Transport	9
5.1.3 Reporting Damages	9
6 Installation Assembly and Disassembly	
6.1 Setup and Installing Your ViscoMix VM5-3A25200	10
6.2 Electrical Connections	11
6.3 Programming	11
6.4 Visual Assembly Guide	12
6.5 Visual Disassembly Guide	16
7 Start-up	
7.1 Start-up	21
Direction of Rotation	
7.2 Storage	22
8 Operation	
8.1 Switching On Your ViscoMix VM5-3A25200	23
8.1.2 Switching Off Your ViscoMix VM5-3A25200	23
8.2 Mechanical Seal	24
8.3 Lantern Operation for CIP	25
9 Cleaning	
9.1 CIP Cleaning	26
9.2 Visual Inspection	26
10 Maintenance	
10.1 Inspection	27
10.2 Maintenance and Scheduling	27
10.3 Bill of Materials (BOM)	28
10.4 Torques	30
10.5 Operating Log	31
11 Errors and Assistance	
11.1 Service Assistance and Contact Information	32
Correcting Errors	
12 Full Product Image	33
Appendix	
- Mechanical Seal Documents	
- Inline Mixer Motor Documents (Baldor)	
- Planetary Gearbox Documents (Boston Gear)	

1 INTENDED USE OF DYNAMIC INLINE MIXER

1.1 ViscoMix VM5-3A25200

The ViscoMix VM5-3A25200 is designed to homogenize or mix up to 6 ingredient streams at a time. The dynamic inline mixer can handle flows at a max discharge rate of 40 GPM and a range of viscosities up to 10,000 cps per ingredient. The inline mixer uses Varivent connections to ensure a low profile interior to minimize dead zones in the mixing chamber. Another key feature is the low mechanical input to achieve the high mixing output.



WARNING!

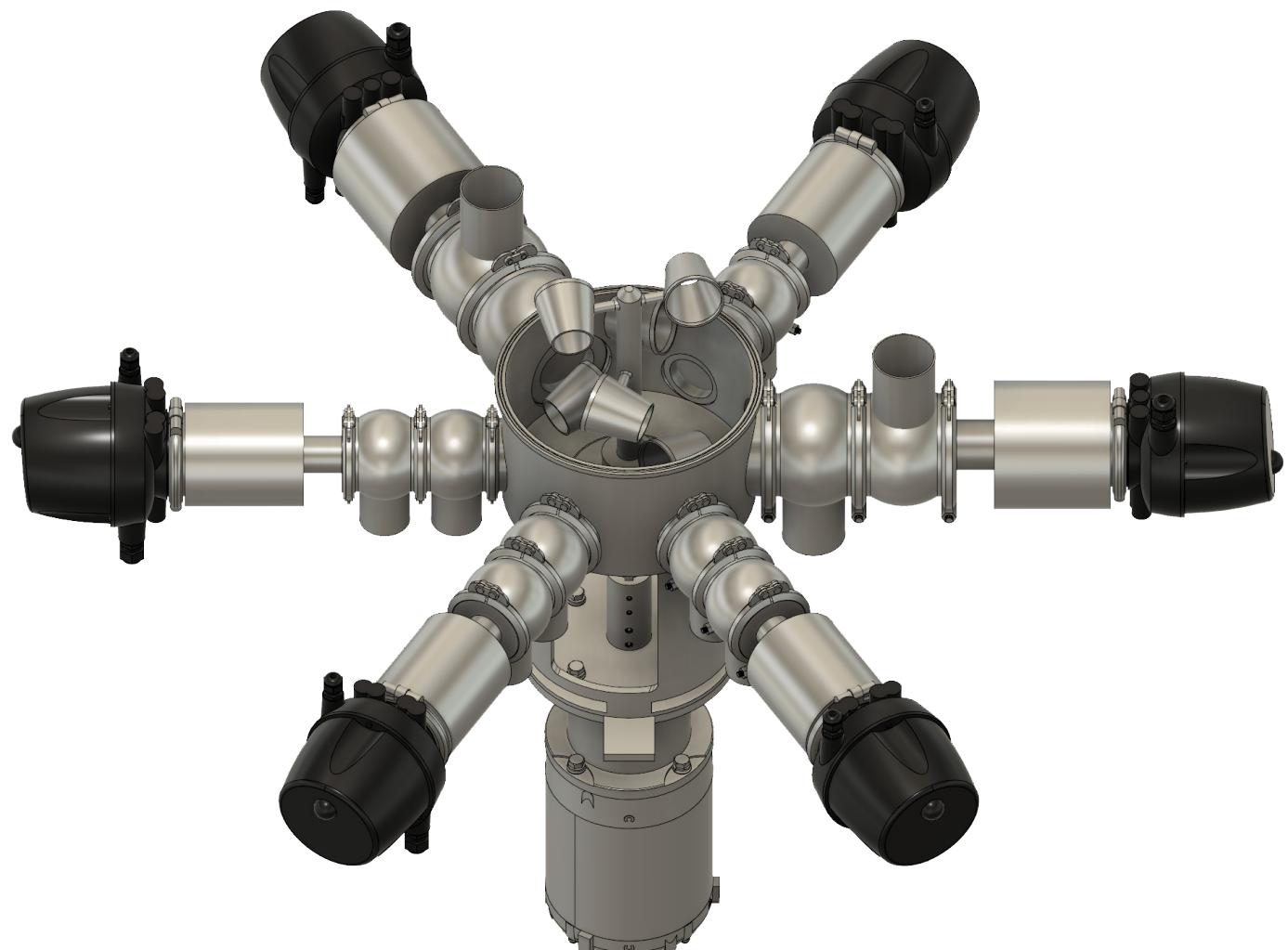
Under no circumstances should ingredients be mixed when the risk of an explosive atmosphere exists. Death, severe personal injury or substantial damage to property will occur if the appropriate precautions are not taken.

The ViscoMix VM5-3A25200 is a special assembly used for inline dynamic blending and mixing of up to 6 ingredient streams at viscosities up to 10,000 cps.



NOTE

Intended use of the ViscoMix VM5-3A25200 includes compliance with the manufacturer's instructions for operation, maintenance and repairs. See 11.1 "Service Assistance and Contact Information" on page 32 for further details.



2 SAFETY NOTES

Scope and purpose of this manual

This operating manual is valid for the ViscoMix VM5-3A25200. This manual is intended to support qualified personnel in becoming familiar with safety, assembly, operating and maintaining the ViscoMix.

This manual contains instructions which you should heed to ensure personal safety and prevent damage to property. These instructions are highlighted by a warning triangle and are marked according to degree of hazard as follows:



WARNING!

Indicates that death, severe personal injury or substantial damage to property will occur if the appropriate precautions are not taken.



CAUTION!

Indicates that minor personal injury or damage to property may occur if the appropriate precautions are not taken.



HAZARD!

Indicates that forklifts are in operation or in use. Failure to comply could result in minor personal injury, back injury or damage to property if the appropriate precautions are not taken.



WARNING!

Indicates there is a suspended overhaul and parts can fall, slip or tip over. Severe personal injury or substantial damage to property can occur if the appropriate precautions are not taken.



HAZARD!

Indicates moving parts can crush and cut. Keep hands clear of moving parts while operating so to prevent minor personal injury or damage to property.



CAUTION!

Indicates heavy objects that can cause muscle strain or back injury. Use lifting aids and proper lifting techniques when moving to prevent minor personal injury or damage to property.



HAZARD!

Indicates rotating shaft can cause injury. Keep arms, legs, hair and loose clothing away to prevent minor personal injury or damage to property.



WARNING!

Indicates high voltage and risk to shock or severe burns. Disconnect electricity source prior to servicing. Death, severe personal injury or substantial damage to property will occur if the appropriate precautions are not taken.



CAUTION!

When operating the ViscoMix VM5-3A25200, it is essential to wear appropriate protective equipment.

2 SAFETY NOTES

READ THE OPERATING MANUAL

Commissioning and operating the ViscoMix VM5-3A25200 may only be performed by qualified personnel. Qualified personnel in terms of the safety instructions in this operating and safety manual are persons trained in the use of and familiar with this system.



NOTE

The manufacturer cannot be held responsible for any accidents or damage caused by failure to follow the safety instructions.



NOTE

This entails important information about the machine, the handling of the machine and sections of the manual should be paid close attention too.



WARNING!

The ViscoMix VM5-3A25200 may be used only for the applications described in the technical specifications and in the technical description, and only in connection with the use of spare parts recommended by ViscoTec Inc.

Safe operation of the machine requires careful transportation, storage, installation and assembly, operation and maintenance.

Audience

This manual is aimed at the assembly personnel and the users of the inline mixer.

The operating manual, work instructions and other applicable provisions relevant to safe installation, start-up and operation must be kept at a location accessible to affected personnel always.



NOTE

Changes or alterations to the ViscoMix inline mixer series will void liability and warranty claims.



NOTE

In addition to this operating manual, general and other regulations applicable to accident prevention must be made available and followed.

Responsibilities of the Operator

The operator undertakes to operate the ViscoMix VM5-3A25200 only in perfect working condition. Hazard areas between the agitator and on-site customer equipment must be secured by the operator. This operating and safety manual must be read carefully to the end. If there are any ambiguities, please get in touch with ViscoTec without delay. Do not start operation until all uncertainties have been clarified.

By starting the system for the first time, you confirm that you have read and understood the operating and safety manual.



WARNING!

Operating the ViscoMix VM5-3A25200 improperly or when not in good condition can lead to accidents.

3 TECHNICAL SPECIFICATION - ViscoMix Dynamic Inline Mixer

General

Year	2017
Description	ViscoMix Inline
Mixing Task	Dynamic inline mixing and homogenizing
Serial No.	VM30.31-IN-F1702141668-322
Overall Height	930 mm [36.5"]
Overall Diameter	254 mm [10"]
Mixer Fixation	3 welding pads
General Orientation	Centered, bottom-up installation
FDA Approved Materials	yes

Product and CIP Data

Density max. in lbs./gal	n/a	
Viscosity max.	10,000 cps	[0.75 hp motor]
Max Particulate Size	1½ in.	
Flowrate depending on Viscosity	8.5 m³/hr	[38 gpm at 10,000 cps]
CIP	14 m³/hr	[76.0 gpm]
	(The impeller must be immersed in CIP while the motor is run at low speed)	

Mixing Chamber with Mechanical Seal

Inside Height	300 mm	[~12 in.]
Inside Diameter	250 mm	[~10 in.]
Nominal volume	~15 liters	[3.8 Gal]
Max Operating Pressure	10 bar	[145 psi]
Max Operating Temperature	130 °C	[266°F]
Material	316L	
Elastomer	FKM	
Mixer Seal Type	Single acting mechanical seal (can be run dry)	

Coupling

Material	304
Connection Side 1	25 mm with Keyway
Connection Side 2	0.875 in. with Keyway

Mixing Element with Shaft

Quantity Impeller	1	
Quantity of Impeller Cups	6	
Diameter	200 mm	[7.87 in.]
Finish	Ra 0.8um	
Connection	Coupling with Keyway	
Shaft Diameter	25 mm	[1 in.]
Shaft Material	316L	

Drive

Design	Inline, washdown, solid shaft
Material	316L
Speed at 60 Hz	345 rpm
Allowable Max Output Speed (nmax)	400 rpm
Frequency	60 Hz
Motor Type	3514M
Frame	56L
Bearing Grease	Polyrex EM, food grade
Painting	n/a
Power	0.75 hp
Enclosure Type	TENV
Voltage	460/ 480V
Ambient Temperature Max.	40 °C [104°F]
Amps	3 A
Gearbox Material	316
Gearbox Grease	lubricated-for-life grease, food grade

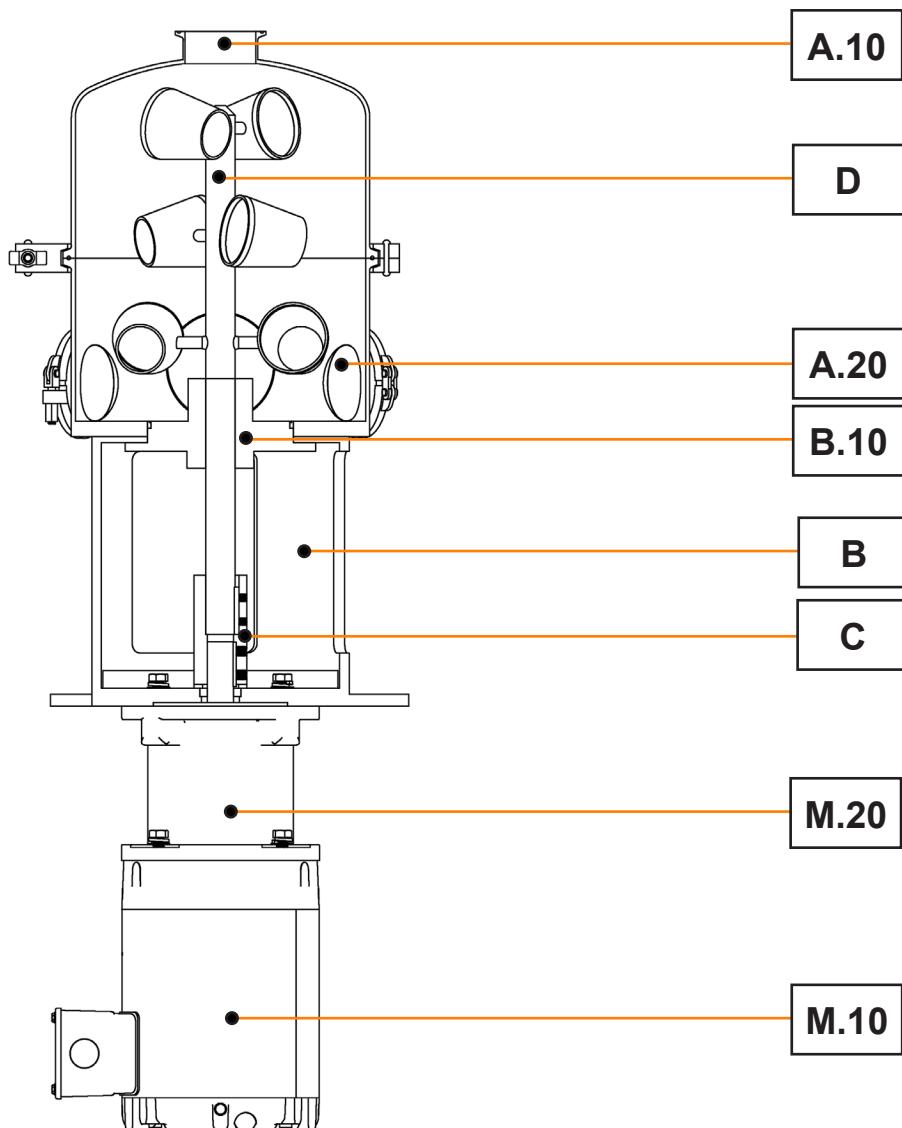
4 DESCRIPTION OF SYSTEM COMPONENTS

4.1 ViscoMix VM5-3A25200

The following illustration gives the operator an overview of the systems main components.

Configuration Key

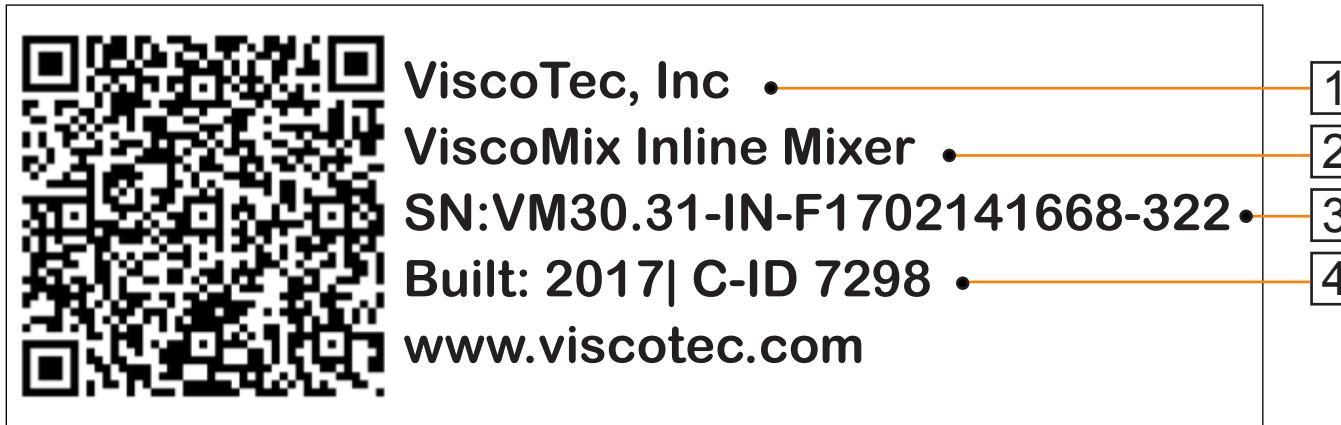
M	Drive	M.10	Electrical, AC-2 NEMA motor 56C
		M.20	Inline Gearbox
B	Mixer Lantern & Seal	B	Latern Assembly, 3ABS1-MF6.6875-ESV025
		B.10	Single Acting Mechanical Seal
C	Coupling	C	Shaft Coupling 25mm/ 0.875 in. Coupling
		A.10	Mixing Chamber Top with Discharge Port 2.5 in. OD Tri-Clamp
A	Mixing Chamber (Vertical, round, 14.5 liters 10x12R6V1T14.5)	A.20	Mixing Chamber Bottom with 6 Inlet Ports 4 x Varivent N, 2 x Varivent 65/80
		D	Mixing Element with Shaft M-25S3OC20031608



4 DESCRIPTION OF SYSTEM COMPONENTS

4.2 Serial Number Label

The information on the serial number label should not be overwritten under any circumstances. The serial number label contains the following information:



Serial Number Label Key

1	Company/ Manufacturer
2	Mixer Type
3	Serial Number
4	Year Manufactured

5 DELIVERY

5.1 Scope of Delivery

Before installing and starting up your new ViscoMix VM5-3A25200 please ensure that your delivery is complete and matches the information on the delivery packing slip.

Delivery Includes:

- ViscoMix VM5-3A25200, integrated into blend skid.
- ViscoTec manual including documentation from third party suppliers, operating manuals, data sheets, wiring diagrams (see Appendix material)

5.1.2 Condition on Delivery and Transport

ViscoMix VM5-3A25200 with a weight of approximately 50 kg (approx. 120 lbs) is packed in a cardboard box.

Note the label for the load pick-up point and the weight information listed on the crate.

5.1.3 Reporting Damages

On receipt of the equipment, please inspect for damaged packaging caused by inadequate transportation. Damages to the equipment must be reported immediately to the shipping agent, the insurance company and ViscoTec (see section 11.1 "Service Assistance and Contact Information", on page 32 for the contact address).



CAUTION!

Heavy load: improper removal from the packaging increases the risk of muscle or bone injury.

Use a suitable lifting device to move the equipment.

6 INSTALLATION, ASSEMBLY, AND DISASSEMBLY

6.1 Setup and Installing Your ViscoMix VM5-3A25200

When transporting the assembled ViscoMix VM5-3A25200, do so with consideration for the shafts on the drive, gearbox, and impeller. Improper transportation could cause severe damage to the ViscoMix.

**NOTE**

Do not lift the inline mixer with both the shaft extension and drive in place. This can bend or damage the shaft.

**WARNING!**

Use a suitable device to remove the individual components from the crate and transport them to the installation site to prevent the risk of muscle or bone injury.



Never stand or work under a suspended load. Parts can fall, slip or tip over.



Risk of a crush injury during assembly of the individual components of the agitator.



No changes, additions or conversions may be made which may effect the safety or function of the machine. Doing so will void CE conformity.



Failing to properly inspect the machine and mounted components, safety equipment, etc. can seriously impact their function and lead to serious injury to personnel and damage to the machine.

Installation

The ViscoMix VM5-3A25200 may only be installed by suitable, trained personnel using the drawings provided for the inline mixer (see section 6.4 "Visual Assembly Guide" on page 12).

1. The order of assembly depends on the on-site conditions. To assemble the ViscoMix VM5-3A25200 refer to the Assembly Guide provided in section 6.4 "Visual Assembly Guide" on page 12.
2. When seal elements are deployed, please refer to the instructions (see section 6.4 "Visual Assembly Guide" on page 12).
3. Fix the ViscoMix VM5-3A25200 securely to the attachment provided on the mixing chamber, as shown in the drawings provided (see section 6.4 "Visual Assembly Guide" on page 12).
4. Tighten all screw connections as described in section 10.4 "Torques", on page 30. Use Loctite and screw locks to secure them to prevent loosening.
5. Install the ViscoMix VM5-3A25200 so that the larger displacer diameter is facing in the direction of rotation. (see Direction of Rotation in section 7.1 "Start-up" on page 21).
6. Check that the mixing element is fitted securely.
7. For larger shafts, use a suitable eye-bolt when fastening to the lifting gear.
8. Fasten the agitator securely by screwing the mounting flange to a stable surface.
9. Check the screw connections again before starting up the machine.
10. Install the ViscoMix VM5-3A25200 so that the larger displacer diameter is facing in a clockwise direction as seen from above.
11. The dimensions between the mixing element and container must meet the specifications in the BOM (see section 10.3 "Bill of Materials" on page 28).
12. For further assistance, a visual assembly guide is included (see section 6.4 "Visual Assembly Guide" on page 12).

If any errors occur, please contact ViscoTec (see section 11.1 "Service Assistance and Contact Information" on page 32 for the contact address).

6 INSTALLATION, ASSEMBLY, AND DISASSEMBLY



NOTE

Appropriate measures should be taken to ensure no personnel has direct contact with the shaft, mechanical seals and/ or other moving parts of the inline mixer while it is in operation.

It is advised that the customer supply a mesh screen or type of protective barrier to surround the lantern.



WARNING!

Failure to properly safe guard rotating parts of the inline mixer may result in serious injury.

6.2 Electrical Connections

Check the voltage specified on the type plate for the drive against the supply voltage. The electrical connection may only be performed by a licensed electrician. Appropriate safety equipment for the monitoring of short circuits and overloads must be installed by the operator.



HAZARD!

Defective electrical components may be live and can therefore be life-threatening.

- Do not drive over, crush or tear cables.

Before working on electrical equipment, the device must be disconnected from the mains. To do this, turn off the main switch or the safety switch. Secure against unintentional switch-on. Any defects detected in electrical components/ modules must be corrected immediately. If there is an acute danger, the equipment must never be used in a defective condition.

6.3 Programming

No programming of ViscoTec supplied VFD is required for this installation.

6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Warning!

Under no circumstances should any extra force be applied on the Mixing Element.

6.4 Visual Assembly Guide

Image 1

Set the bottom of the mixing chamber on top of the lantern. Align the inlet ports and bolt holes in the desired position

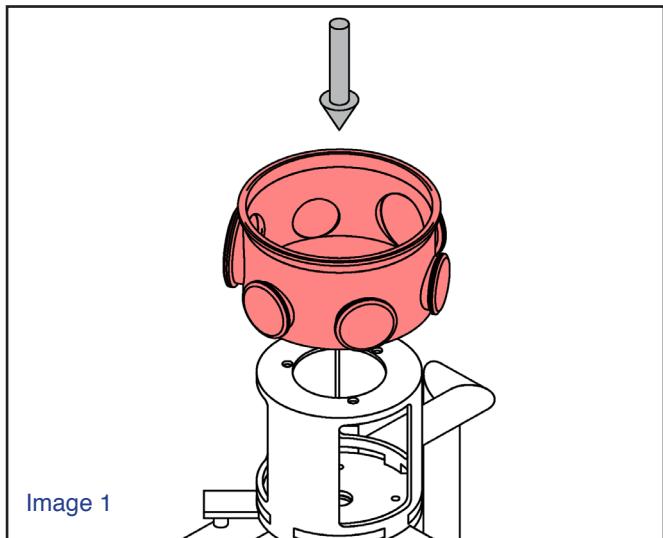


Image 1

Image 2

Check the Lip O-rings for wear and tear and place them on the ESU-025 single acting mechanical seal. Slide the mechanical seal through one of the lantern windows, being careful to not hit the sides of the window.

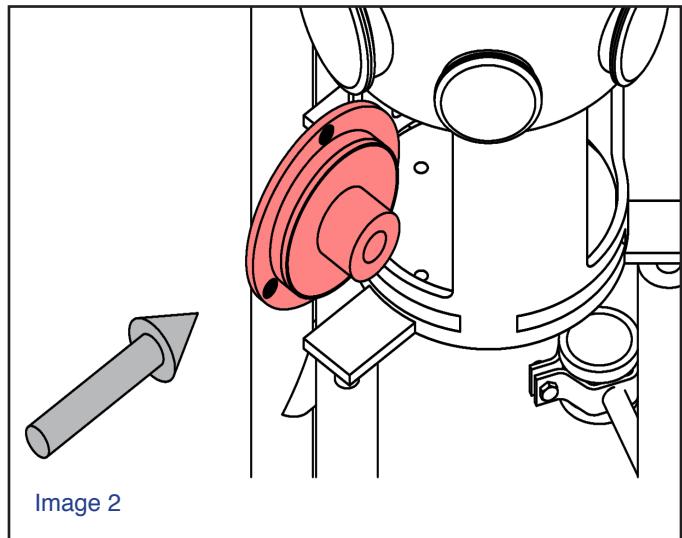


Image 2

Image 3

Insert the mechanical seal up through the lantern and the bottom of the ViscoMix until it is flush with the interior of the bottom of the ViscoMix.

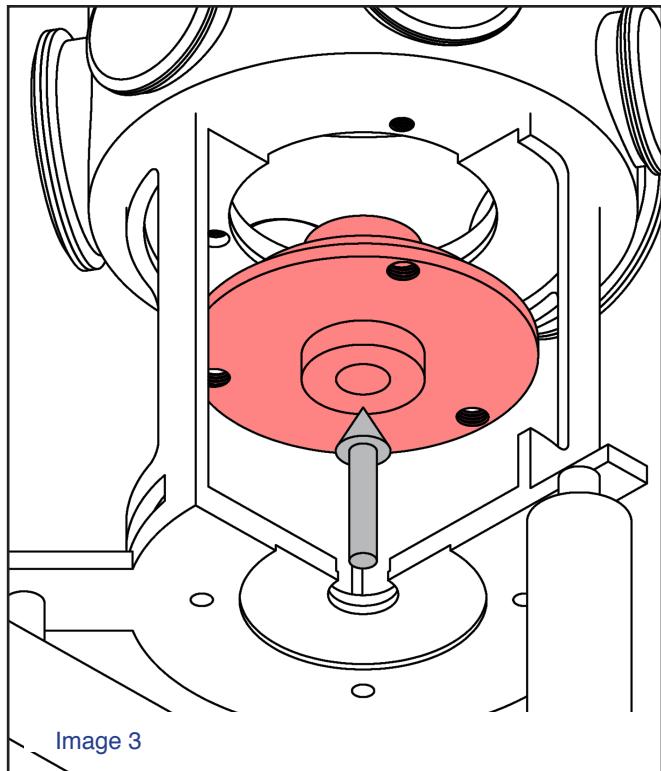


Image 3

Image 4

Coat M12 male threads in locktite. Insert M12 bolts, washers, and lock washers through the bolt holes. Tighten the bolts once they engage the bottom of the ViscoMix. Tighten the bolts as described in section 10.4 "Torques" on page 30. Wipe away all visible residue.

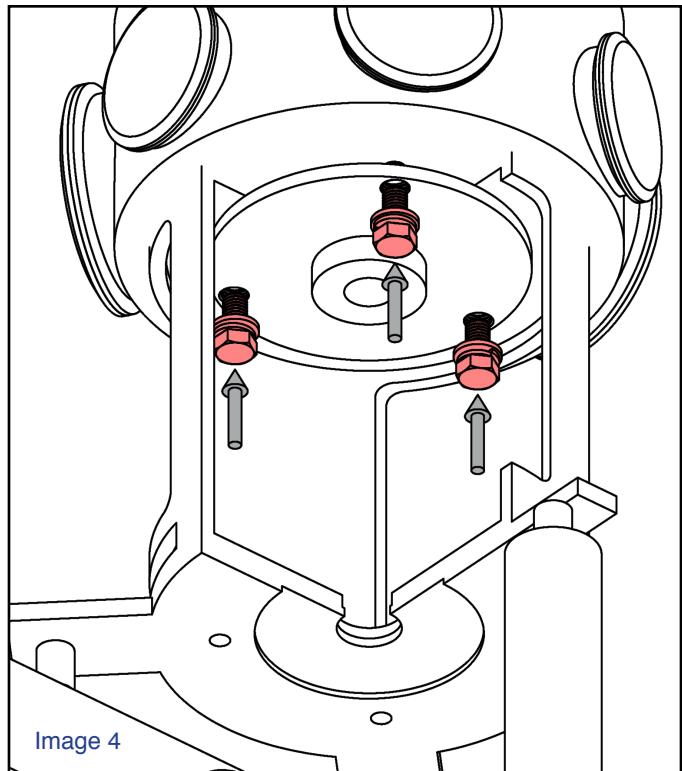


Image 4

6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Image 5

Insert the gearbox up through the bottom of the lantern. Be sure to insert the gearbox straight to avoid bending the gearbox shaft.

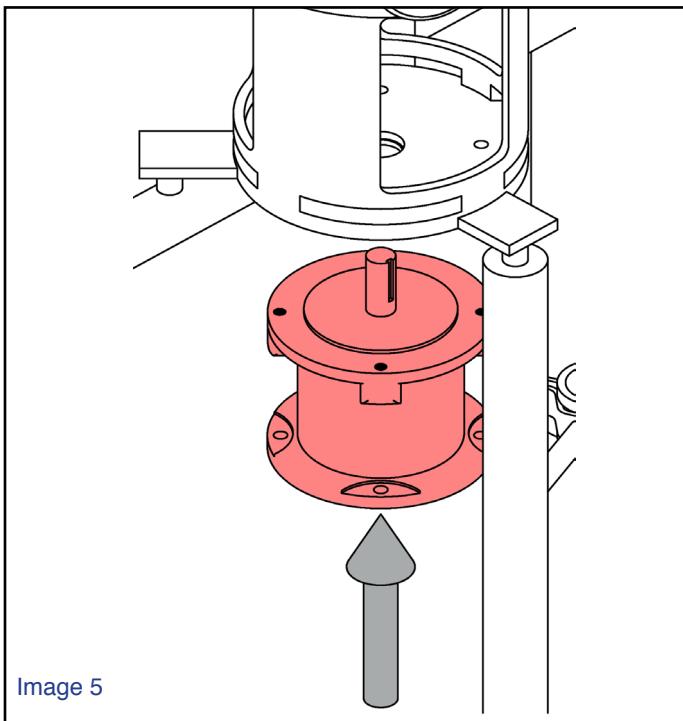


Image 5

Image 6

Coat the 3/8-16 UNC x 1.5" bolts in locktite. Insert the 3/8" bolts, washers, and lock washers through the bolt holes. Tighten the bolts once they engage the gearbox. Tighten the bolts as described in section 10.4 "Torques" on page 30. Wipe away all visible residue.

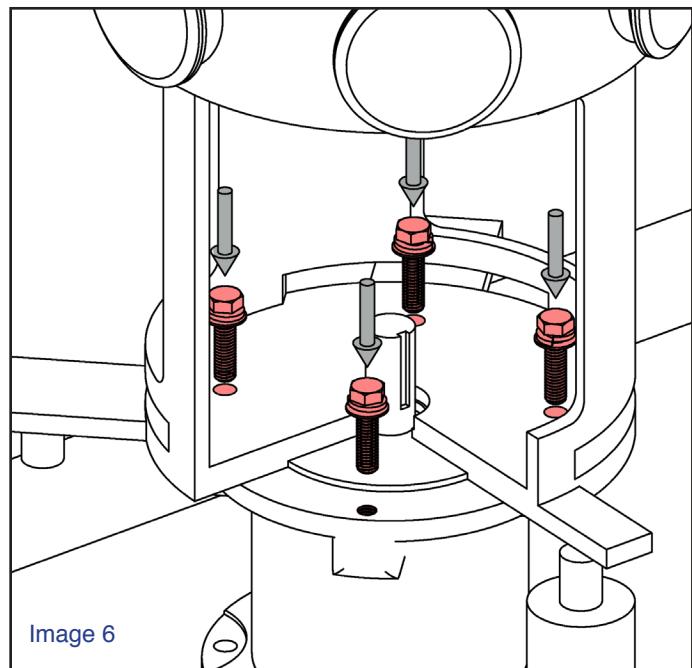


Image 6

Image 7

Insert the motor into the bottom of the gearbox. Be sure to insert the motor straight to avoid bending the motor shaft.

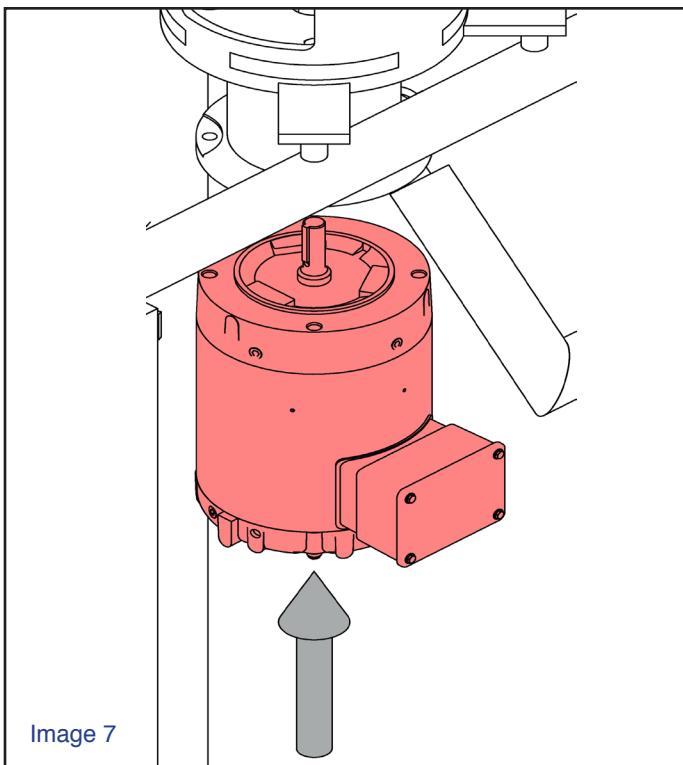


Image 7

Image 8

Coat the 3/8-16 UNC x 1" bolts in locktite. Insert the 3/8" bolts, washers, and lock washer through the bolt holes. Tighten the bolts once they engage the motor. Tighten the bolts as described in section 10.4 "Torques" on page 30. Wipe away all visible residue.

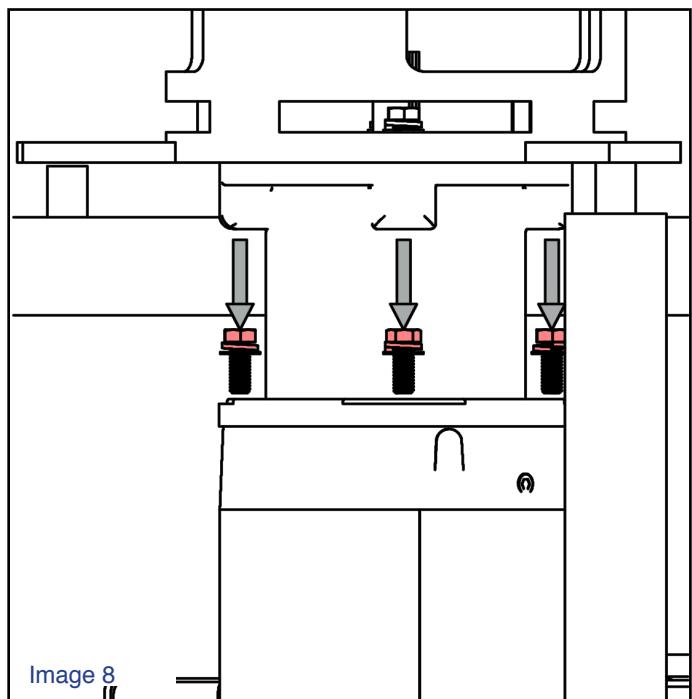


Image 8

6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Image 9

Insert the seal ring over the gearbox shaft into the lip on the bottom of the lantern. Be sure the seal ring sits flush with the bottom of the lantern.

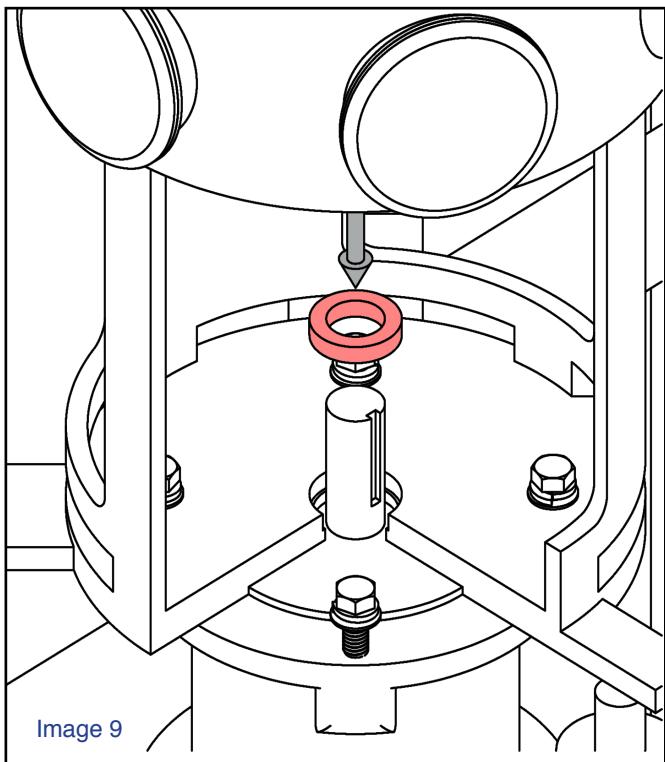


Image 9

Image 11

Lubricate the shaft and lip O-rings in product and elastomer friendly grease. Lower the shaft through the mechanical seal. Once the bottom of the shaft is completely through the mechanical seal, insert the keyway into the shaft and continue lowering into the coupling until the shaft stops sliding through the mechanical seal. Once the shaft is fully inserted, tighten the set screws on the mechanical seal. Refer to the mechanical seal technical documentation for further instructions.

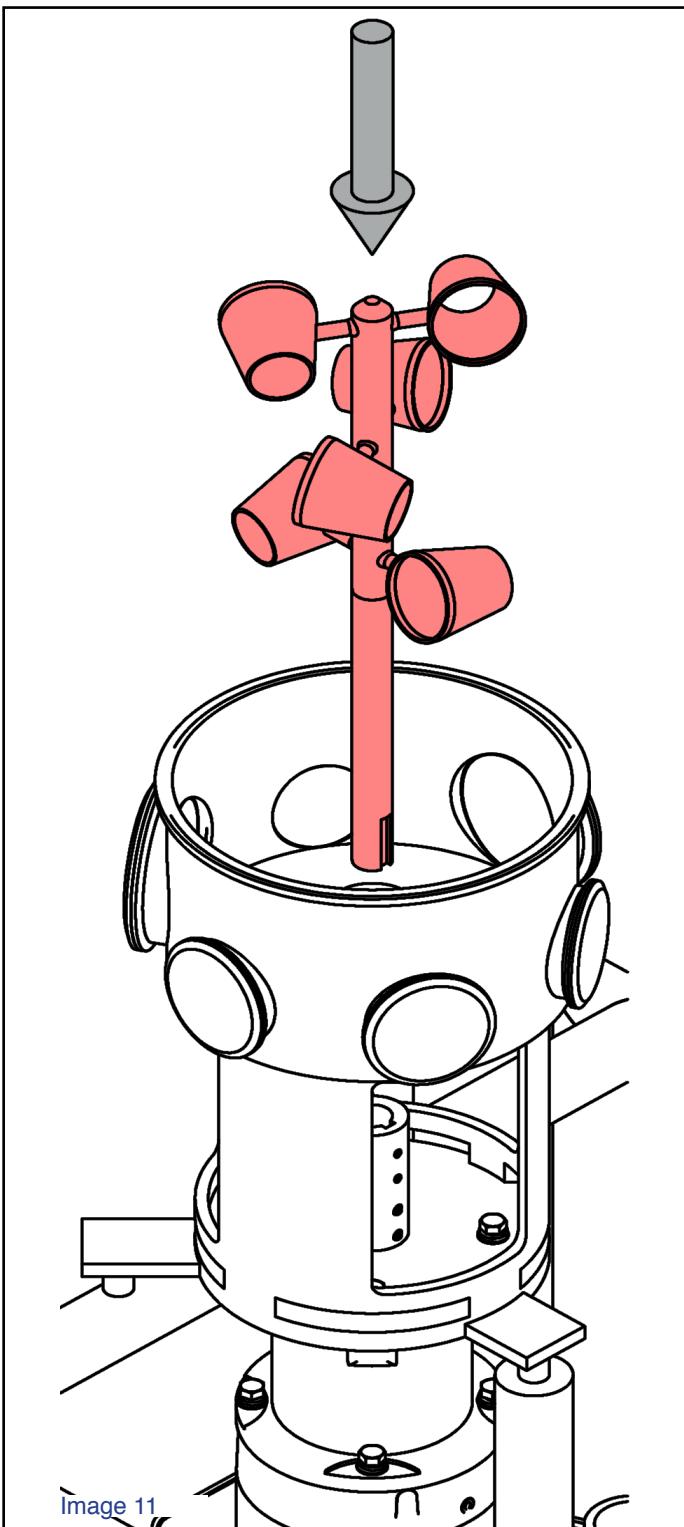


Image 11

Image 10

Insert the keyway into the gearbox shaft. Slide the coupling onto the gearbox shaft.

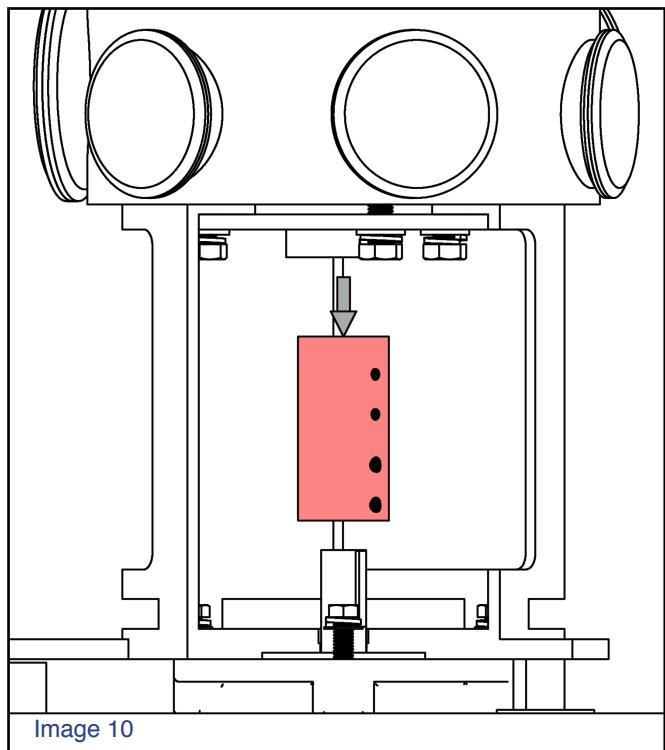


Image 10

6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Image 12

Lift the coupling slightly so it is not resting on the bottom of the lantern. Insert the M6 and M8 set screws into the coupling. Hand tighten the set screws until they firmly engage both shafts.

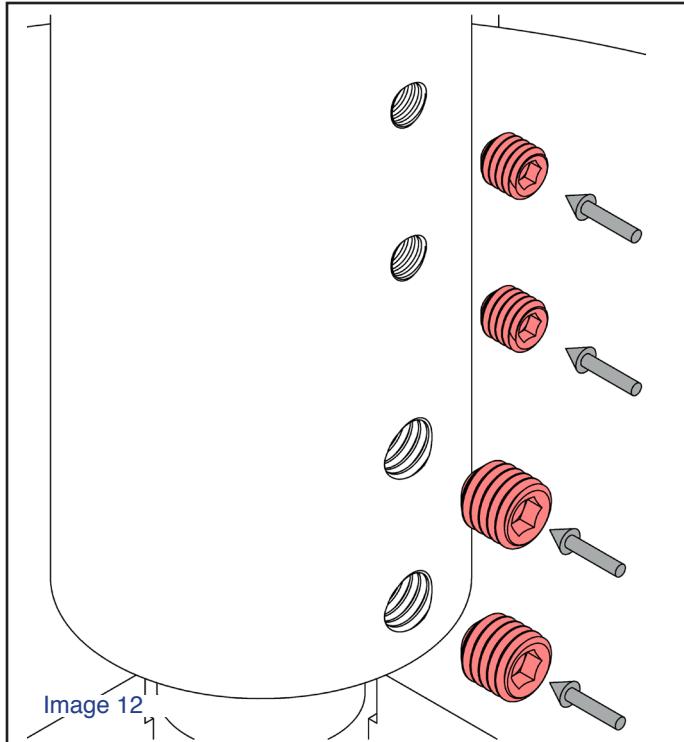
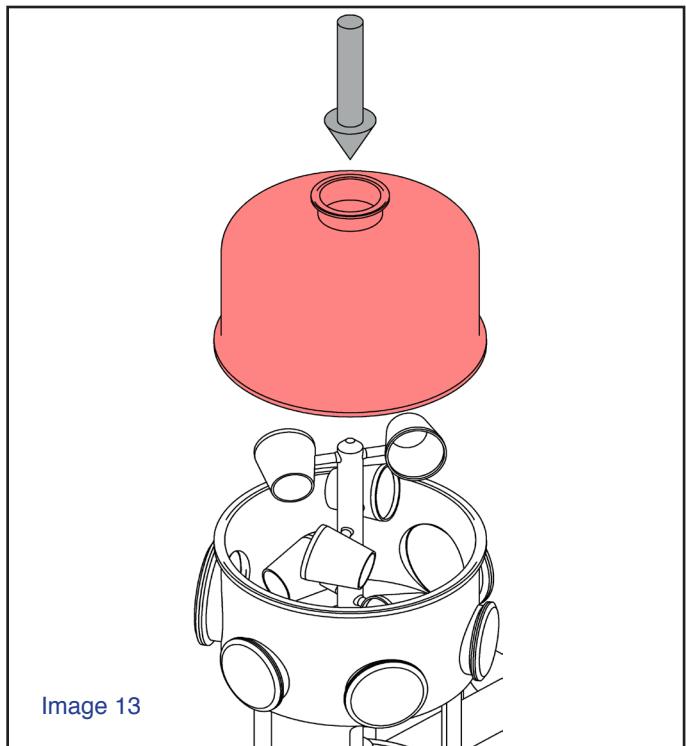


Image 13

Lower the Lid and gasket of the top of the mixing chamber over the impellers until it rests on the bottom of the mixing chamber. Clamp the assembly together.



6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Warning!

Under no circumstances should any extra force be applied on the Mixing Element.

6.5 Visual Disassembly Guide

Image 1

Disconnect the valve assemblies and sensors attached to the ViscoMix Inline.

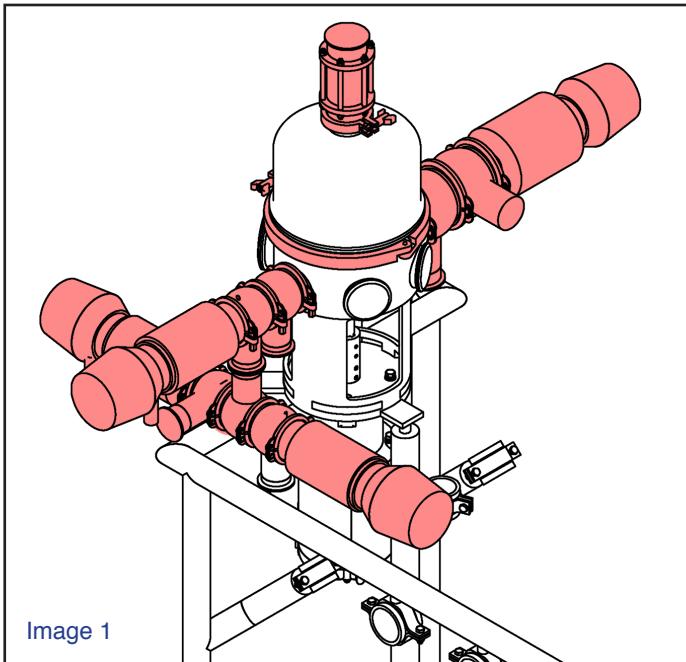


Image 1

Image 2

Replace all open ports on the ViscoMix Inline with blind caps. Be sure the blind caps are clean to avoid introducing dirt to the interior of the ViscoMix Inline.

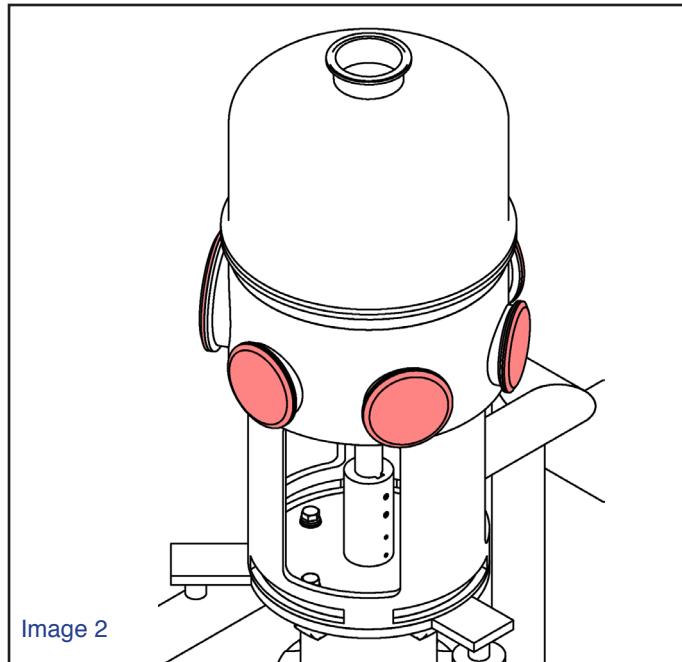


Image 2

Image 3

Undo the clamp on the top of the ViscoMix Inline. Remove the lid and the gasket. Be sure to lift straight up to avoid hitting the impeller and possibly damaging the unit.

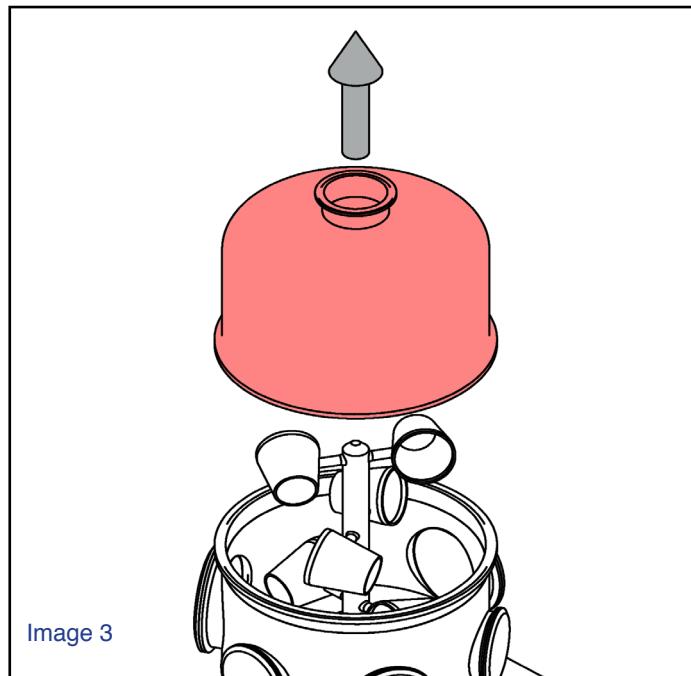


Image 3

Image 4

Remove the M8 and M6 set screws from the coupling.

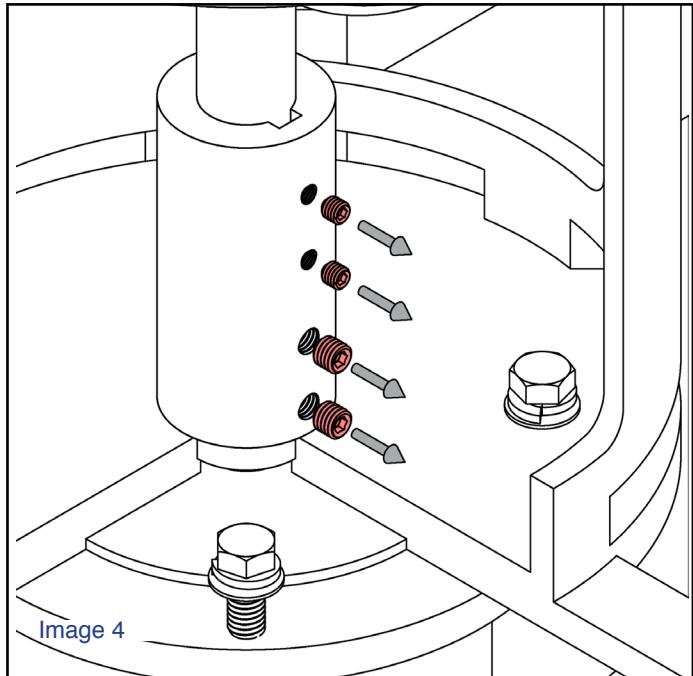


Image 4

6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Image 5

Loosen all the set screws on the mechanical seal. Remove the impeller/shaft up through the mechanical seal. Remove the keyway from the impeller shaft once it becomes accessible. Be sure to lift the shaft straight up to avoid damaging the shaft or the mechanical seal.

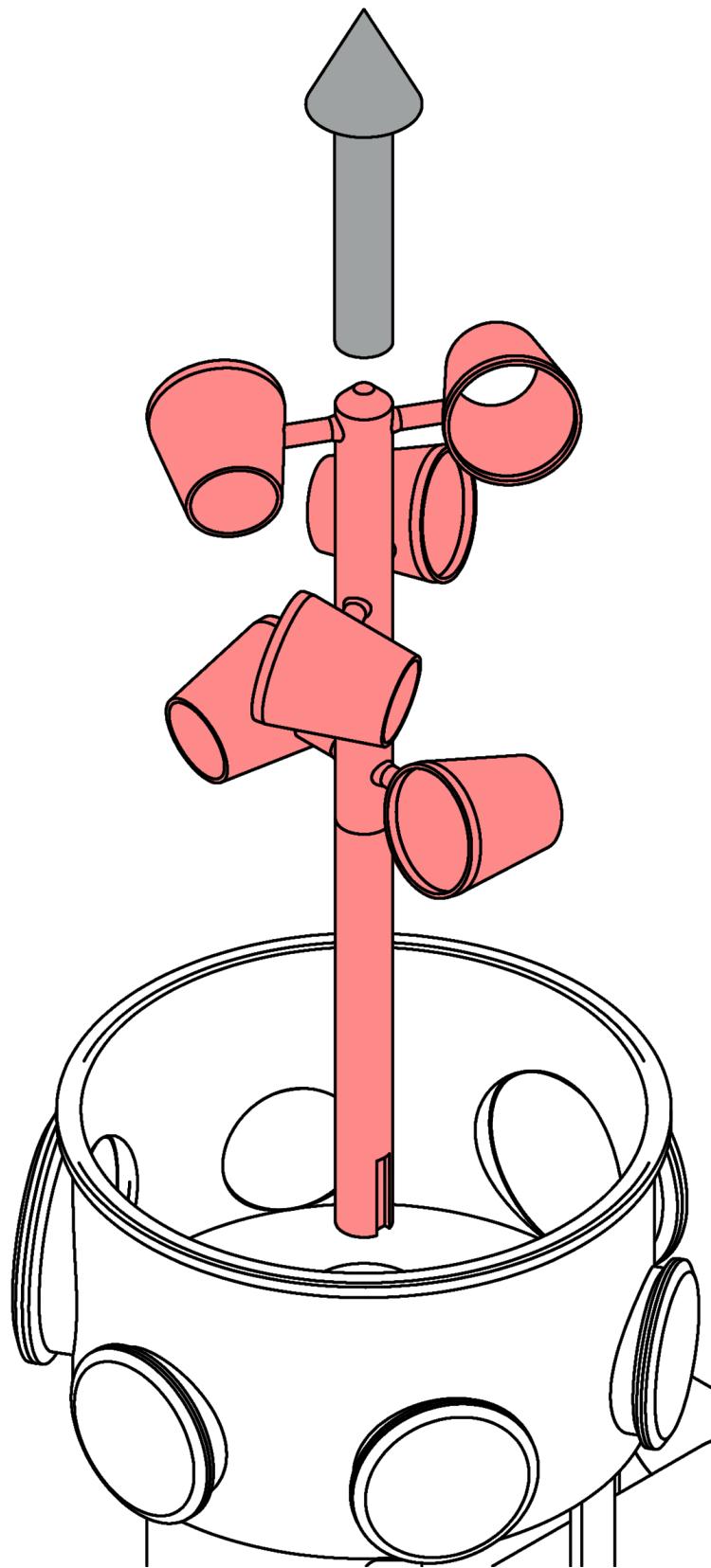


Image 5

6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Removing the Gearbox and Motor

Image 6

Remove the coupling from the gearbox shaft. Remove the keyway from the gearbox shaft.

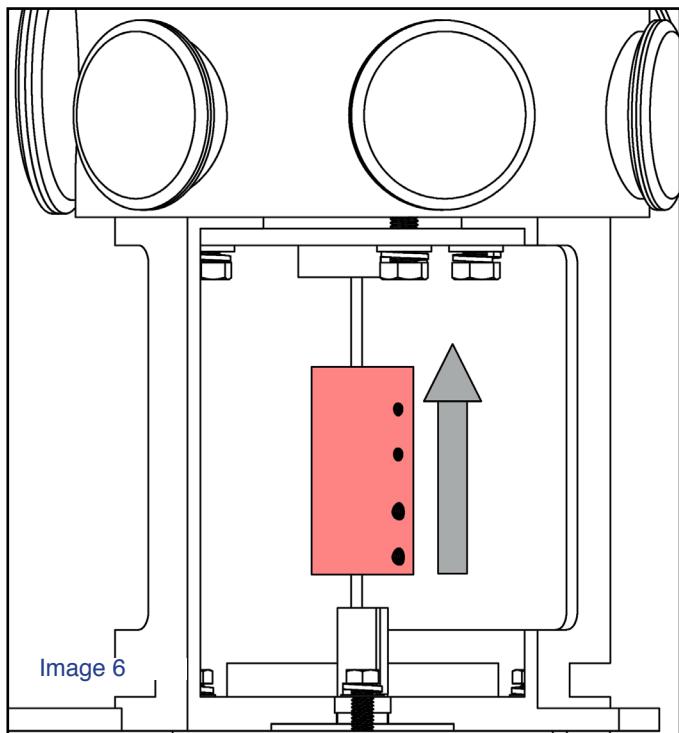


Image 8

Remove the motor from the gearbox, being sure to lower the motor straight down to avoid bending the motor shaft.

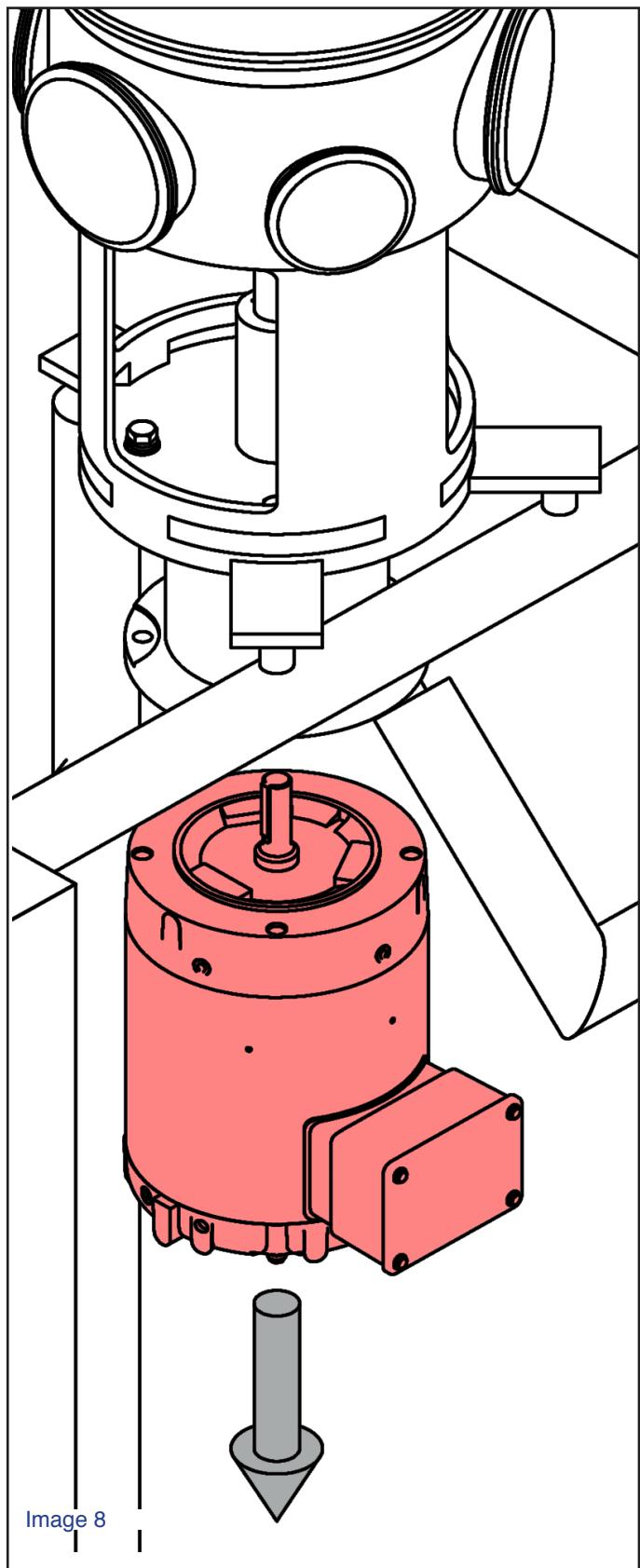
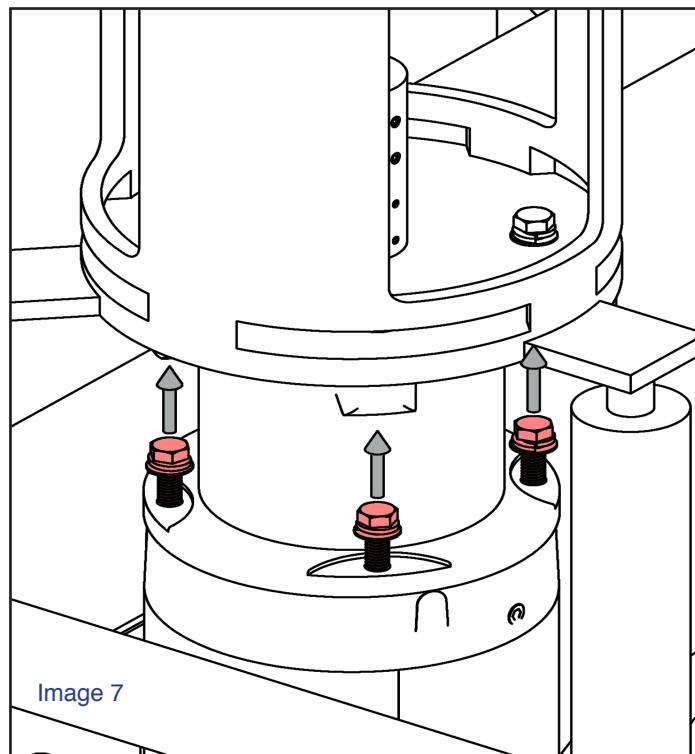


Image 7

Support the motor from falling. Once the motor is secured, remove the 3/8-16 UNC bolts, washers, and lock washers securing the motor to the gearbox.



6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Image 9

Remove the seal ring from the gearbox shaft.

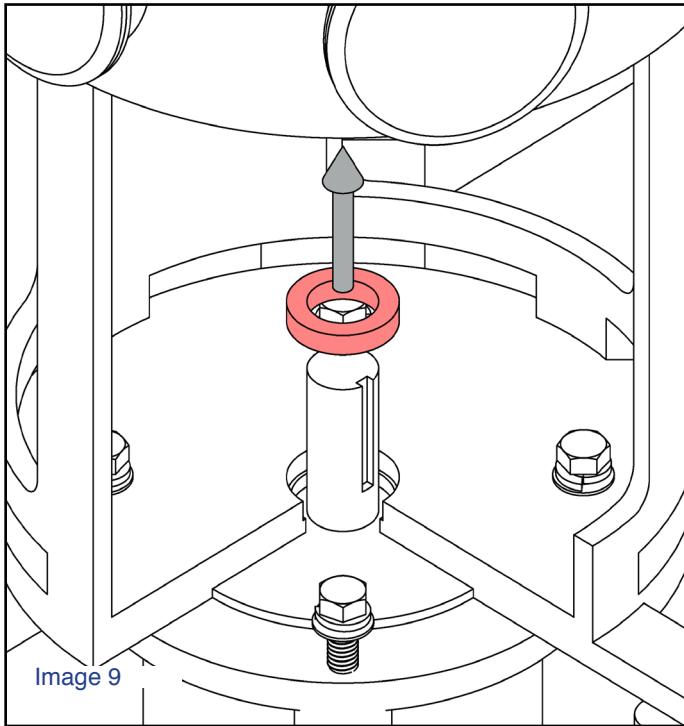


Image 10

Support the gearbox from falling. Once the gearbox is secured, remove the 3/8-16 UNC bolts, washers, and lock washers securing the gearbox to the lantern assembly.

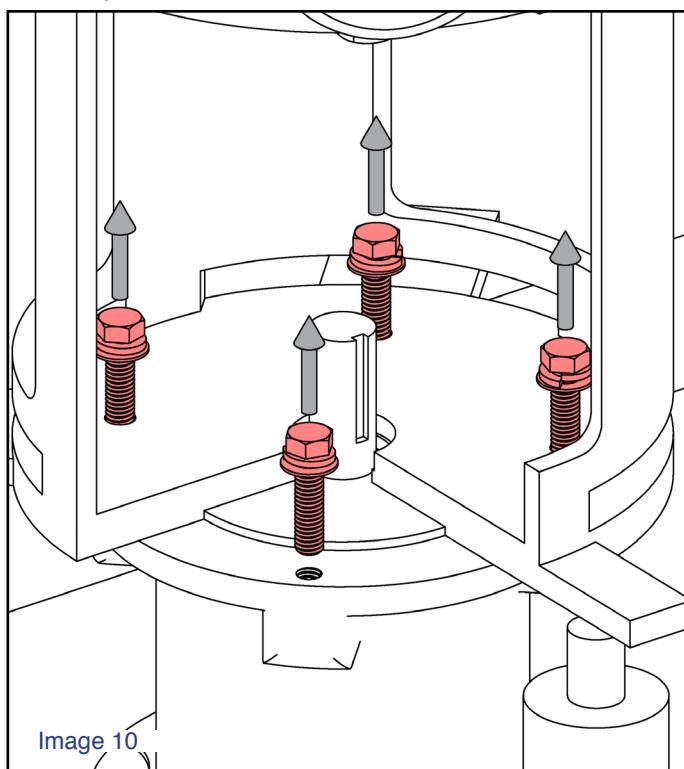
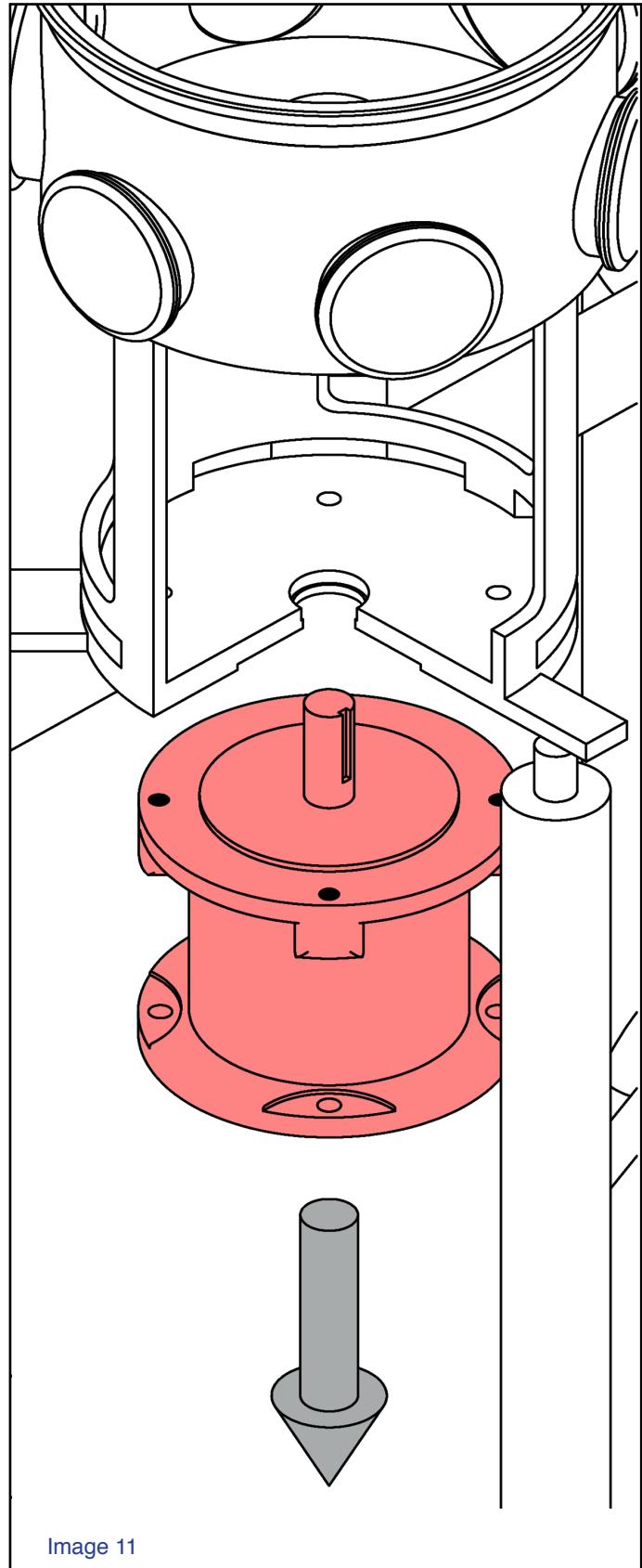


Image 11

Remove the gearbox from the lantern assembly, being sure to lower the gearbox straight down to avoid bending the gearbox shaft.



6 INSTALLATION ASSEMBLY AND DISASSEMBLY

Removing the Mechanical Seal

Image 12

For simplicity, the following disassembly is shown with the gearbox removed. Remove the M12 bolts, washers, and lock washers from the bottom of the ViscoMix Inline

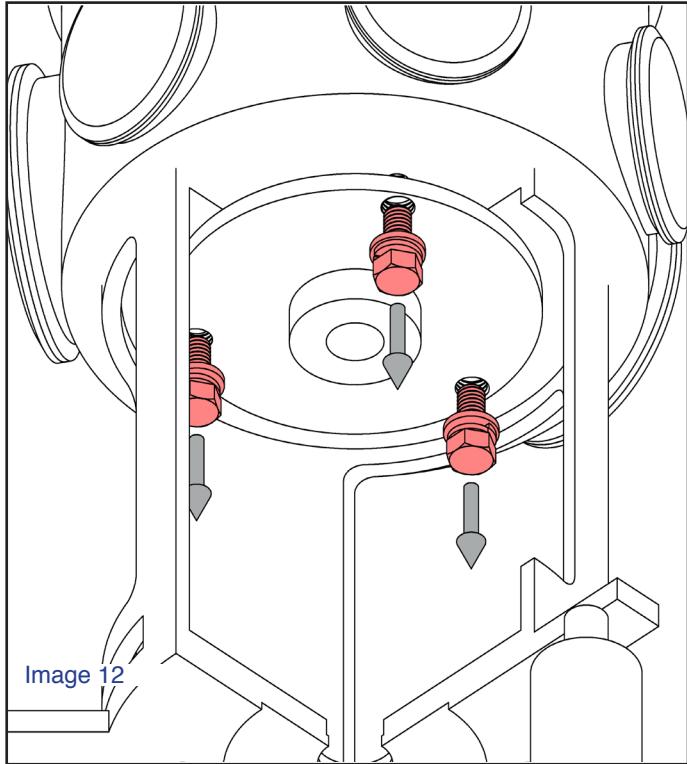


Image 13

Remove the mechanical seal from the bottom of the ViscoMix Inline and the lantern assembly. Slide the mechanical seal out through one of the lantern windows.

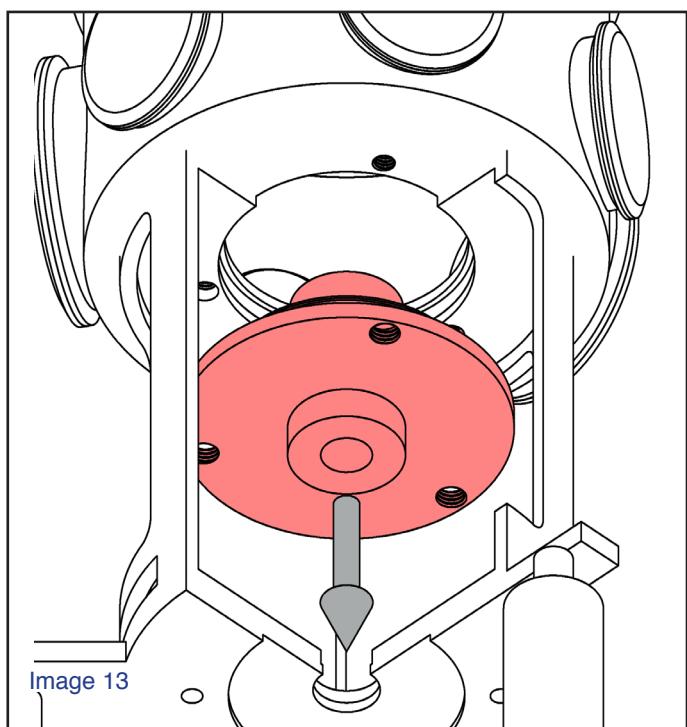
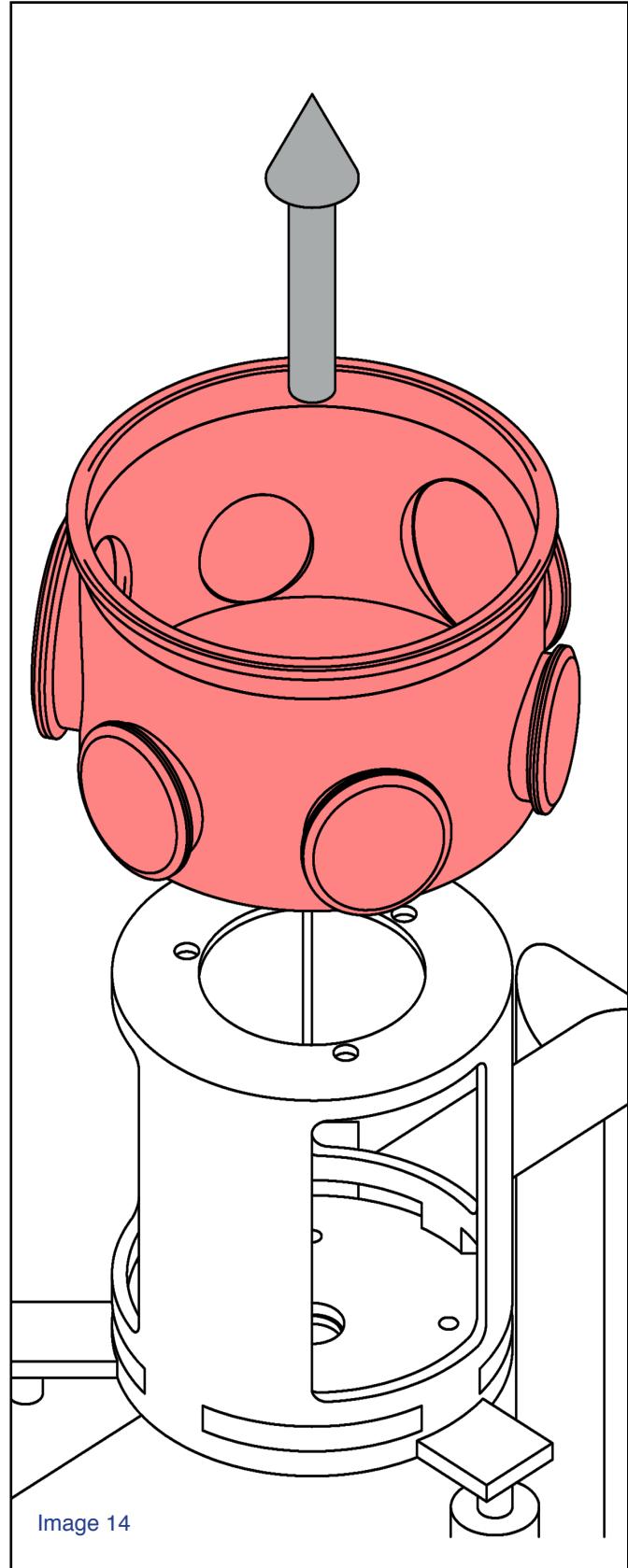


Image 14

The bottom of the ViscoMix Inline is now unsupported on the lantern. For safety reasons, remove the bottom of the ViscoMix Inline from the lantern.



7 START-UP

7.1 Start-up

Please note the following points during first start-up or during the first test run of the ViscoMix VM5-3A25200. The user must ensure that:

- The operators are familiar with the operating manual, the system and system controls.
- The safety and monitoring equipment has been checked.
- The safety officer has checked for the presence of safety equipment.
- The mounting spacer Pos. 180 on the mechanical seal has been removed.
- Ensure coupling set screws are tightened and secure.
- The main power supply matches the voltage specified on the type plate for each of the electrical components.
- The inline mixer should not be run at full speed in air or during flow-through.
- The inline mixer must be brought up to operating speed with a start-up ramp.



NOTE

If you experience unexpected difficulties during a test run, contact ViscoTec without delay (see section 11.1 "Service Assistance and Contact Information", on page 32 for the contact address).



WARNING!

Before turning on the inline mixer, make sure that all set screws are tightened to the correct torques and that there are no personnel or objects in the vicinity of any rotating parts.

Switching on

1. Remove the padlock from the safety switch.

Direction of Rotation

2. When making the electrical connections, note the direction of rotation of the inline mixer. Direction of rotation of the inline mixer shaft seen from above the mixing element is **clockwise**, or as shown by the direction arrow shown on the drive.

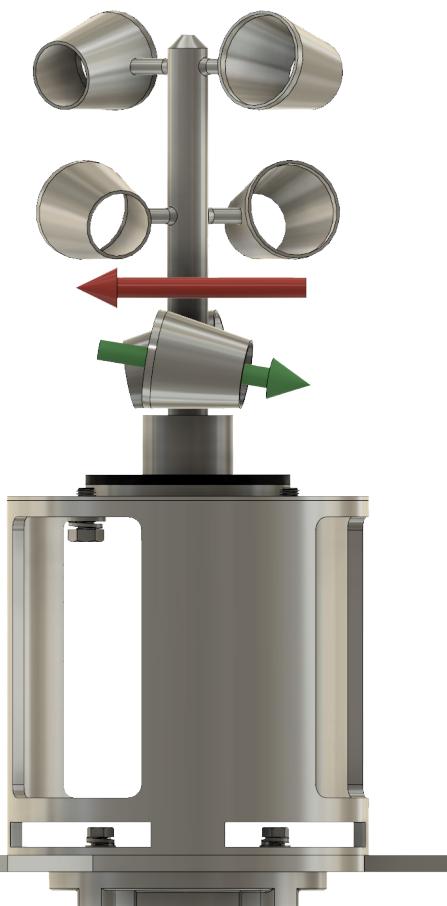


Diagram 1 and 2 show the direction of rotation is going clockwise. Spinning in the opposite direction could damage and/ or break the impeller and shaft.



7 START-UP

Damage to the Inline Mixer

1. To avoid damage to the inline mixer, ensure that no objects can enter the mixing chamber.
2. When working with the inline mixer, for example during cleaning or inspection work, always lock and/ or secure the drive against accidental activation.

Maximum Output Speed (nmax) and Critical Speed (ncrit)

3. The maximum output speed (nmax) is limited because of the potential for motor overload or excessive stress to the shaft. This information is noted in the technical specifications list found on page 6.
4. The critical speed (ncrit) is usually above the maximum speed. If not, this area must always be passed quickly. This information is noted in the "Technical Specifications" list found on page 6.



NOTE

The on-site controller must be set to the values described in the inline mixer specifications.



CAUTION!

Do not operate the ViscoMix VM5-3A25200 with little or no product at nominal rotation speed. This could damage the mixing chamber.



WARNING!

No changes, additions or conversions may be made which may effect the safety or function of the machine. Doing so will void CE conformity.

Failing to properly inspect the machine and mounted components, safety equipment, etc. can seriously impact their function and lead to serious injury to personnel and damage to the machine.



NOTE

Start-up and operation of the machine may only be performed by qualified personnel.

Qualified personnel in terms of the safety instructions in this operating manual are persons trained in the use of and familiar with the system that is being installed.

Before starting work, all personnel must have read and understood the operating manual and applicable regulations regarding safety measures (see "Safety Notes" on page 5).

7.2 Storage

To keep an inline mixer that is not in use over a long period in working order, the following points must be observed and/ or arranged:

- The storage space must be clean and dry.
- The machine must not be exposed to extreme cold (below 40 °F or 5 °C) or heat (105 °F or 40 °C)
- The entire machine must be kept clean to prevent deterioration and corrosion.



NOTE

ViscoTec provides no warranty for corrosion damage caused by improper storage; for example, storing the inline mixer in a damp room.

8 OPERATION

8.1 Switching On Your ViscoMix VM5-3A25200

Please note the following during and after switching on the inline mixer:

- The inline mixer should not be running at max speed in air or during flow-through.
- The inline mixer must be brought up to operating speed with a start-up ramp.



WARNING!

Do not keep tools in or around the mixing container.

- To avoid damage to the inline mixer, ensure that no objects can enter or fall into the vessel.
- During the mixing process ensure that there is nobody in the immediate vicinity of the mixing element.
- Safety equipment used during the assembly must be replaced and in good working order.



WARNING!

Never touch the rotating inline mixer shaft, doing so could cause serious injuries.



CAUTION!

When operating the ViscoMix VM5-3A25200 there is always a risk that the mixture will be ejected from the container. It is essential to wear appropriate protective equipment.



WARNING!

Before turning on the inline mixer, make sure that there are no personnel or objects in the vicinity of any rotating parts.

8.1.2 Switching Off Your ViscoMix VM5-3A25200

Please note the following when switching off the inline mixer:

- Gradually reduce the speed before switching off the inline mixer.



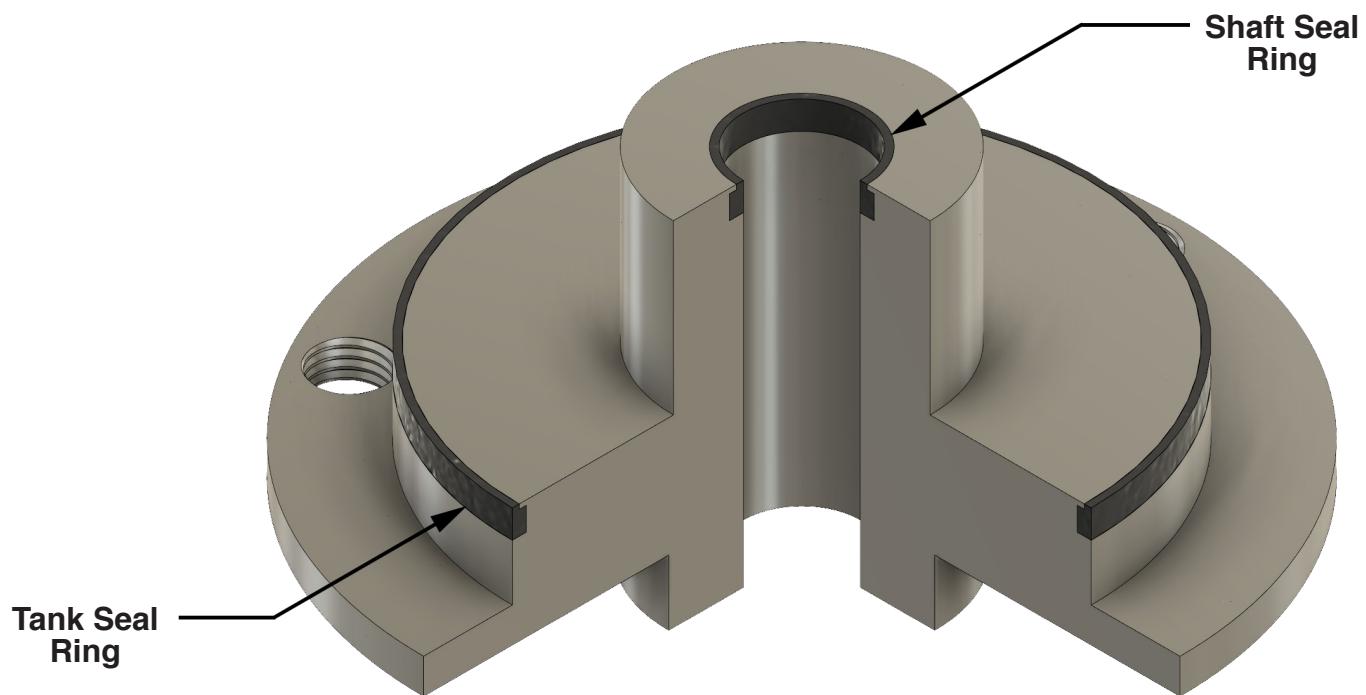
HAZARD!

The requirements of the international installation standard EN IEC 60079-14 must be followed strictly for the electrical installation in potentially explosive atmospheres.

8 OPERATION

8.2 Single Acting Mechanical Seal

The single acting mechanical seal is a single balanced cartridge seal. The seal is allowed to move axially \pm 2mm and also has a large angular tolerance. This seal also contains a robust spring package located away from the product.



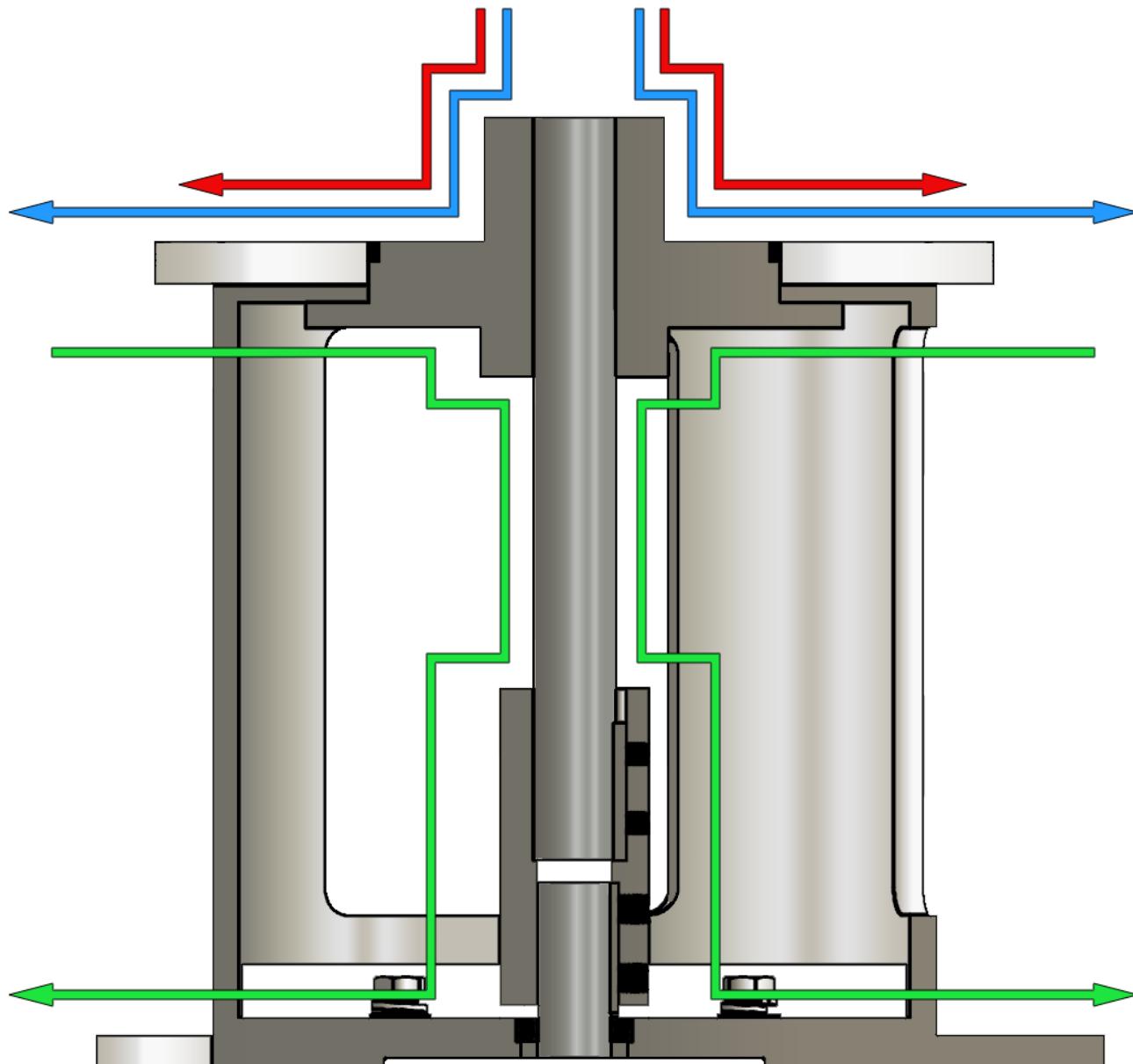
8 OPERATION

8.3 Lantern Operation for CIP

The lantern assembly ensures that outside debris can't enter the gearbox face. The mechanical seal contains the vapors, product, etc. ensuring none will exit the mixing element.

Color Product Key

Blue	Product Overflow
Green	Foreign Debris
Red	CIP Solution



9 CLEANING

9.1 CIP Cleaning

If there is a risk of the product sticking to the mixing element, it must be cleaned as often as necessary.



CAUTION!

Be sure no product remains stuck to the mixing element after the mixer is shut down. The element can be damaged when the inline mixer is restarted at high speeds.

The inline mixer is cleanable with CIP. The mixing chamber must be filled up with CIP solution until it submerges the cones.

9.2 Visual Inspection

After cleaning the ViscoMix, have a weekly inspection for wear and tear on the shaft, seal rings, and mechanical seal. Look thoroughly to make sure there is no dirt, build up, or damage to these parts. This insures that the parts are in working order and allows the operator to determine when it's time to order replacements.



WARNING!

No changes, additions or conversions may be made which may effect the safety or function of the machine. Doing so will void CE conformity.

Failing to properly inspect the machine and mounted components, safety equipment, etc. can seriously impact their function and lead to serious injury to personnel and damage to the machine.

10 MAINTENANCE

10.1 Inspection

Inspection and General Review

ViscoMix VM5-3A25200 w/ Mechanical Seal

Yearly Interval	Hours	Replaceable Spare Part
Monthly	160 hrs	Shaft coupling set screws (check torque values)
1/4 Year	500 hrs	Inline Mixer Drive (see drive manufacturer's documentation)
1/4 Year	500 hrs	Seal Ring (if present, see BOM for item no.)
1/4 Year	500 hrs	Single Acting Mechanical Seal (If present, see BOM for item no.)
Yearly	2000 hrs	Shaft and Mixing Element (check for wear and tear)
Yearly	2000 hrs	Gearbox (check for noise and wear and tear)

10.2 Maintenance and Scheduling

Below are charts specifying hourly/ yearly intervals to check and/ or replace any damaged or worn spare parts.

Replacement of Specified Parts

ViscoMix VM5-3A25200 w/ Mechanical Seal

Yearly Interval	Hours	Replaceable Spare Part
Yearly	2000 hrs	Inline Mixer Drive (see drive manufacturer's documentation)
Yearly	2000 hrs	Single Acting Mechanical Seal (If present, see BOM for item no.)
Yearly	2000 hrs	Seal Ring (if present, see BOM for item no.)

1/4 year = quarterly/ hrs = operating hours

The operating hours or the specified intervals are applied, whichever occurs first. The drawings, bill of materials (BOM) can be found in section 10.3 "Bill of Materials", on page 28.

BOM (Bill of Materials can also be referred to as the Master Assembly Drawing)



NOTE

When removing and installing the inline mixer shaft, secure it against falling.

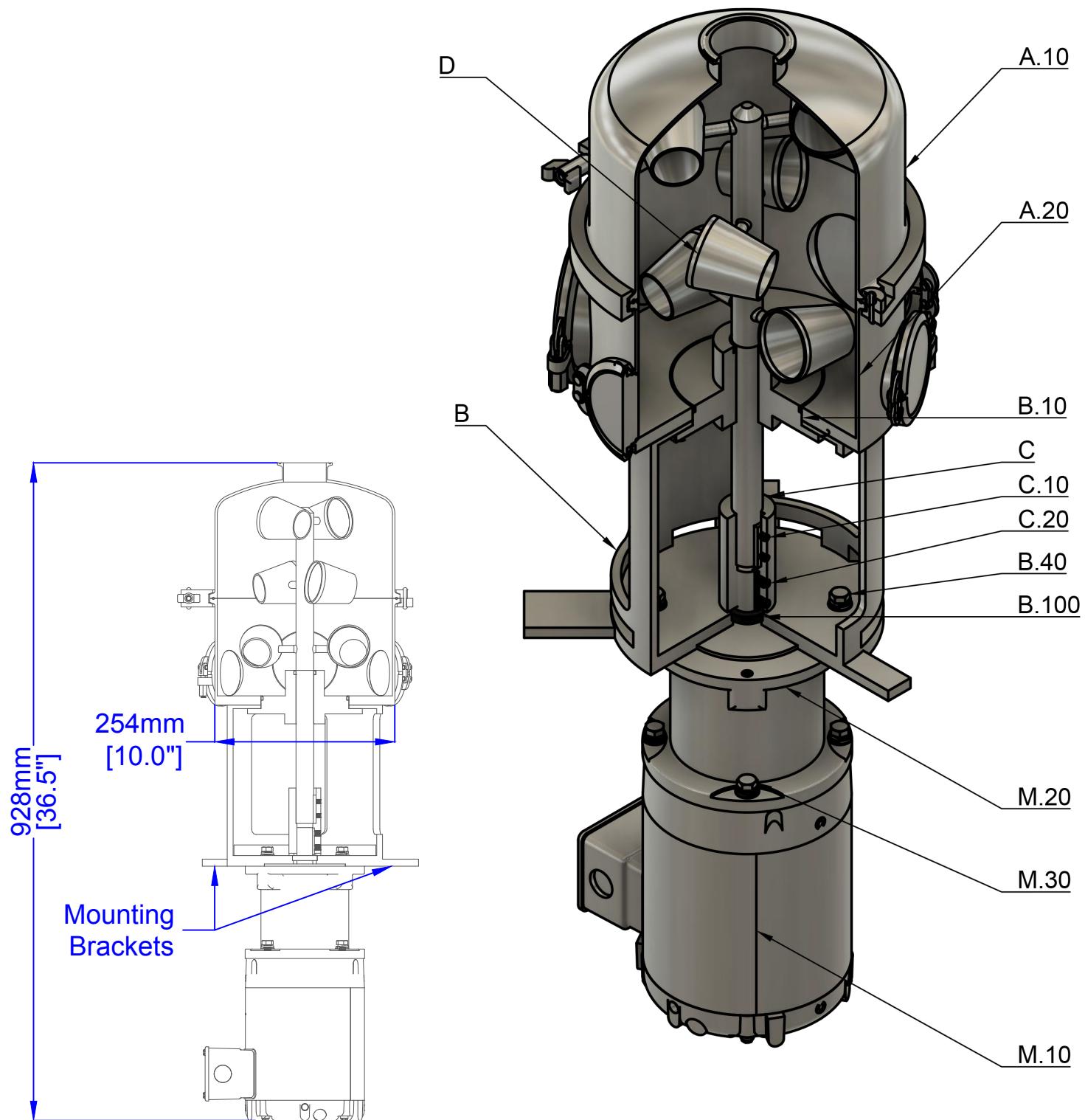
Screw Connections

Check all screw connections during preventative maintenance work for tightness and tighten if necessary. Tighten all screw connections and use screw locks to secure them against loosening. When doing so, please refer to the tightening torque table 10.4 "Torques", on page 30.

10 MAINTENANCE

10.3 Bill of Materials (BOM)

The following image shows and lists all materials used specifically for the construction and assembly for this inline mixer:



10 MAINTENANCE

The following lists all materials used specifically for the construction of this inline mixer:



NOTE

Under the Wear & Tear column SP=Spare Part and RP=Replaceable Part.

ViscoMix VM5-3A25200

Pos.	Description	Brand	Wear & Tear	eData ID
A	Mixing Chamber	ViscoTec	--	19493
A.10	Mixing Chamber Top w/ Discharge Port	ViscoTec	--	--
A.20	Mixing Chamber Bottom w/ 6 Inlet Ports	ViscoTec	--	--
B	Mixer Lantern	ViscoTec	--	19249
B.10	Single Acting Mechanical Seal	ViscoTec	--	11303
B.20	Mechanical Seal Spare Parts Kit (not shown)	ViscoTec	SP	12773
B.30	Mechanical Seal Lip O-Ring Kit (not shown)	ViscoTec	SP	19486
B.40	3/8-16 UNC x 1.5" bolt (x3)	Generic	RP	18300
B.50	3/8 Lock Washer (x3, not shown)	Generic	RP	18303
B.60	3/8 Flat Washer (x3, not shown)	Generic	RP	18302
B.70	M12 x 1.75 x mm bolt (x3, not shown)	Generic	RP	19496
B.80	M12 Lock Washer (x3, not shown)	Generic	RP	19133
B.90	M12 Flat Washer (x3, not shown)	Generic	RP	19132
B.100	Oil Seal Ring	ViscoTec	SP	19505
C	Shaft Coupling	ViscoTec	--	19492
C.10	M6 x 1 x 6mm Cup Point Set Screw (x2)	Generic	RP	19488
C.20	M8 x 1.25 x 8mm Cup Point Set Screw (x2)	Generic	RP	19464
D	Mixing Element w/ Shaft	ViscoTec	--	19490

ViscoMix VM5-3A25200 - Baldor Motor

Pos.	Description	Brand	Wear & Tear	eData ID
M	Drive	ViscoTec	--	--
M.10	CSWDM3542	Baldor	--	19070
M.20	Gearbox (NEMA motor)	Boston Gear	--	19180
M.30	3/8-16 UNC x 1.5" bolt (x4)	Generic	RP	19489
M.40	3/8 Lock Washer (x3, not shown)	Generic	RP	18303
M.50	3/8 Flat Washer (x3, not shown)	Generic	RP	18302

10 MAINTENANCE

10.4 Torques

Tightening Torques Thread with Lubrication

Screw Size	SAE Grade 2-6" (ft.-lbs.)	SAE Grade 5" (ft.-lbs.)	SAE Grade 8" (ft.-lbs.)	18-8 SS (in.-lbs)	316 SS (in.-lbs.)	Brass (in.-lbs.)	Silicon Bronze (in.-lbs.)
1/4-20	4.2	6.3	9	75.2	78.8	61.5	68.6
1/4-28	4.7	7.2	10	94.0	99.0	77.0	87.0
5/16-18	8	13	18	132	138	107	123
5/16-24	9	14	20	142	147	116	131
3/8-16	15	23	35	236	247	192	219
3/8-24	17	25	35	259	271	212	240
7/16-14	24	35	50	376	393	317	349
7/16-20	27	40	60	400	418	327	371
1/2-13	35	55	80	517	542	422	480
1/2-20	40	65	90	541	565	443	502
9/16-12	55	80	110	682	713	558	632
9/16-18	60	90	130	752	787	615	697
5/8-11	75	110	160	1110	1160	907	1030
5/8-18	85	130	180	1244	1301	1016	1154
3/4-10	130	200	280	1530	1582	1249	1416
3/4-16	140	220	310	1490	1558	1220	1382
7/8-9	125	320	450	2328	2430	1905	2140
7/8-14	140	350	500	2318	2420	1895	2130
1-8	190	480	680	3440	3595	2815	3185
1-14	210	540	760	3110	3250	2545	2885

10 MAINTENANCE

Tightening Torques (N·m)

Thread with Lubrication

Material Type	Screw Size	Temperature °C					
		-40	-10	+20	+100	+200	+250
5.6	M 8	13	13	13	12	10	9.4
	M 10	25	25	25	23	20	18
	M 12	44	44	44	40	34	32
	M 16	108	108	108	97	83	78
	M 20	212	212	212	191	163	152
	M 24	365	365	365	330	280	263
	M 30	730	730	730	656	555	522
8.8	M 8	23	23	23	21	20	19
	M 10	49	49	49	45	41	37
	M 12	77	77	77	33	68	64
	M 16	193	193	193	180	163	154
	M 20	378	378	378	350	318	302
	M 24	652	652	652	601	552	520
10.9	M 12	-	-	89	89	-	-
	M 16	-	-	218	218	-	-
	M 20	-	-	395	395	-	-
	M 24	-	-	720	720	-	-
	M 30	-	-	1412	1412	-	-
	M 36	-	-	2460	2460	-	-
A4-70	M 12	-	50	50	42	40	39
							37

10.5 Operating Log

We recommend keeping an operating log for the inline mixer, which may include the following records:

- Inspections carried out in accordance with section 10.1 “Inspection” on page 27.
- Maintenance work carried out in accordance with 10.2 “Maintenance and Scheduling” on page 27.

11 ERRORS AND ASSISTANCE

Below is a list of fixable errors and their possible causes and advice on how to correct the issue at hand:

Correcting Errors

Error	Possible Cause	Solution
Inline mixer not running	Power supply not available	Have inline mixer checked by qualified electrician
Drive is moving, producing vibrations	Screw connection is loose	Tighten the connection
Abnormal noise in the drive	Bearings, motor or gear- box defective	Please contact ViscoTec, Inc.
Abnormal heating of the drive	Motor or gearbox defective	Please contact the motor or gearbox manufacturer
Inline mixer vibrating	Shaft is knocking	Please contact ViscoTec, Inc.
Knocking noises in the mixing container	Foreign body in container	Check the container, remove any foreign bodies.

11.1 Service Assistance and Contact Information

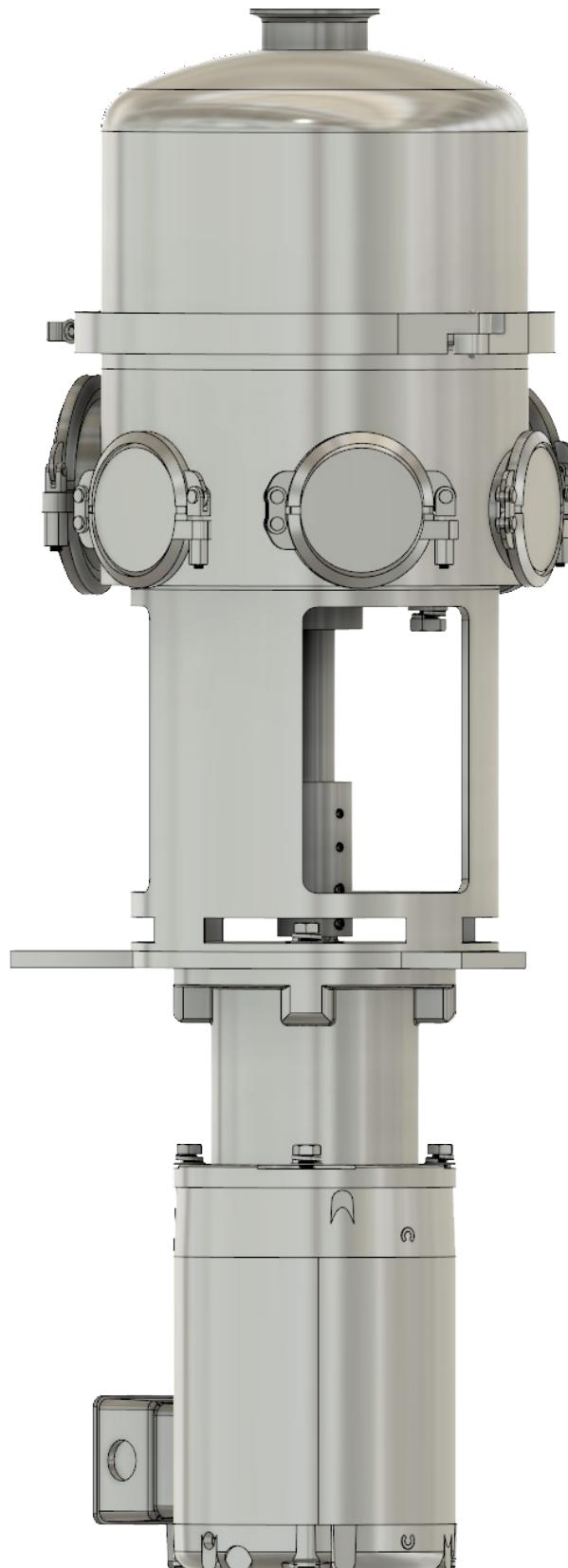
In the event of problems or questions which are not described here or cannot be resolved, please contact the **ViscoTec Inc.** Service department:

Address: **ViscoTec, Inc.**
 932 West Mission Ave.
 Visalia, CA 93277

Email: info@viscotec.com
Phone: +1 (559) 802-3664
Fax: +1 (559) 429-4228
Internet: www.viscotec.com

12 FULL PRODUCT IMAGE

ViscoMix VM5-3A25200 3D Image



ViscoMix
**VM5 Dynamic Inline Mixer integrated
into ViscoBlend with 2 streams**

