

***Fusion Fluid
Equipment_{LLC}***

O&M

**Operation and Maintenance Manual for Fusion
PURE series mixers
(PC-F, PC-FL, PHD-FL, PHD-FM, PHG-FL, & PHG-FM)**

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Section 1 – Safety

Safety should be one's main priority when working with industrial mixing equipment. There are many potential hazards associated with rotating equipment. The precautions mentioned in this manual are not intended to cover all hazards in a plant or on this equipment. Using safety mechanisms requires the constant attention of anyone in the vicinity of this or any other equipment. Please use common sense and caution. DO NOT attempt to operate this or any equipment if it does not appear safe. In addition, please use all necessary personal safety devices as well as mechanical safety devices when operating and or maintaining this or any equipment.



PLEASE READ BEFORE INSTALLATION / OPERATION



- Read this manual completely before operating the mixer.
- Installation, operation, and maintenance should only be performed by qualified personnel.
- Check all safety devices prior to starting the equipment. Do not operate the mixer if those devices are not present. Do not operate the mixer if the devices are not functional.
- BEFORE doing any maintenance on the mixer, disconnect all power and air supply. Be sure to follow correct lock out – tag out procedure before proceeding.
- DO NOT touch any rotating parts under any circumstances. Keep all guards and safety devices installed.
- Maintain the equipment on a regular basis. Unmaintained equipment can become unsafe.
- Develop a safety checklist to ensure that proper caution is used during operation and maintenance
- Do not modify your equipment without consulting the factory. Modification of the equipment may cause the equipment to become unstable. In addition, it may decrease the performance or mechanical stability.

Section 2 - Inspection

Inspection should be done upon receipt of the mixer as well as before installation and during maintenance.

1. Check to make sure that all components were received. Fusion mixers may be shipped in multiple packages. Typically your shipment should contain:
 - Mixer drive
 - Shaft
 - Impeller(s)
 - Mounting hardware
2. Check to see if the equipment is damaged. Check the shaft to see if it appears bent. Check the impellers to see if the blades appear bent. All of the blades should be symmetrical. BEFORE connecting any power to the mixer, spin the output side of the drive (mixer shaft end). There may be resistance (especially on gear drives), but the shaft should not be locked.
3. Inspect the bores on the mixer shaft couplings and impellers. They all should be free of dings, galling, or burs. If you proceed to install the mixer components with these defects, the shaft will bind and cause further damage, which may not be covered under warranty.

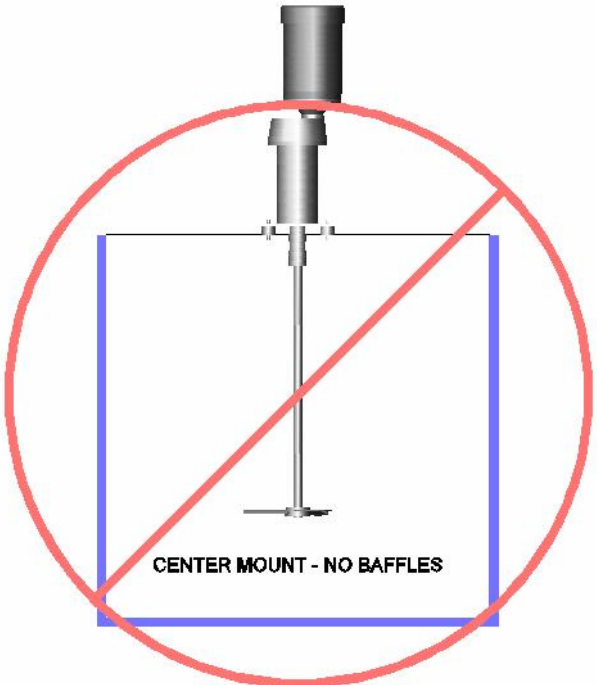
Section 3 – Storage

Mixer should be stored into a cool, dry environment. Humid conditions can damage the motor windings, output bearings, and lubrication. All of these factors may deteriorate your mixer. Do not store the mixer near vibrating machinery. For long storage periods, rotate the mixer shaft once a month and change gearbox lubricant before installation.

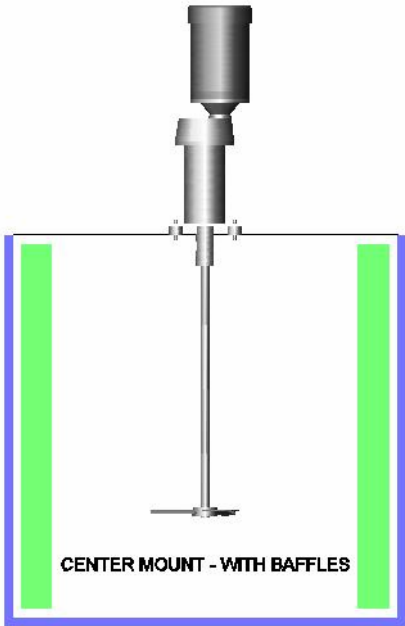
Section 4 – Installation

1. Before any actual installation, develop a plan for the mounting location. Mounting the mixer in a baffled tank will provide the best mixing performance. There is no equivalent substitute that will provide the level of performance of mixing in a baffled tank. If the installation of baffles in your tank is not a possibility, then angle-offset your mixer. Correct angle-offset mounting will provide acceptable mixing performance where baffles are not an option. If none of these options are a possibility, then contact the factory for a suggested mounting location. Center mounting your mixer in the middle of the tank will cause vortexing, thus resulting in the WORST mixing performance. Center mounting without baffles will also reduce the lifetime and mechanical integrity of the mixer. DO NOT center mount the mixer vertically unless authorized by the factory. **See the figures on the next 2 pages for more information.**

Mounting Guidelines for Fusion "Custom Solutions" Series Mixers
CENTER MOUNTING

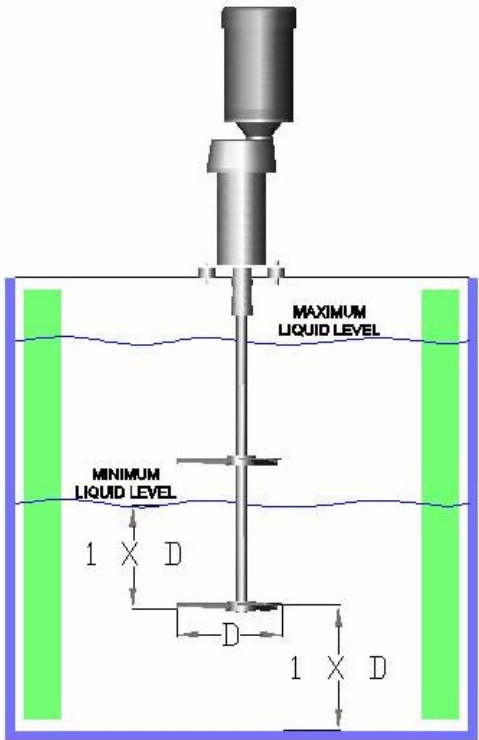


NO

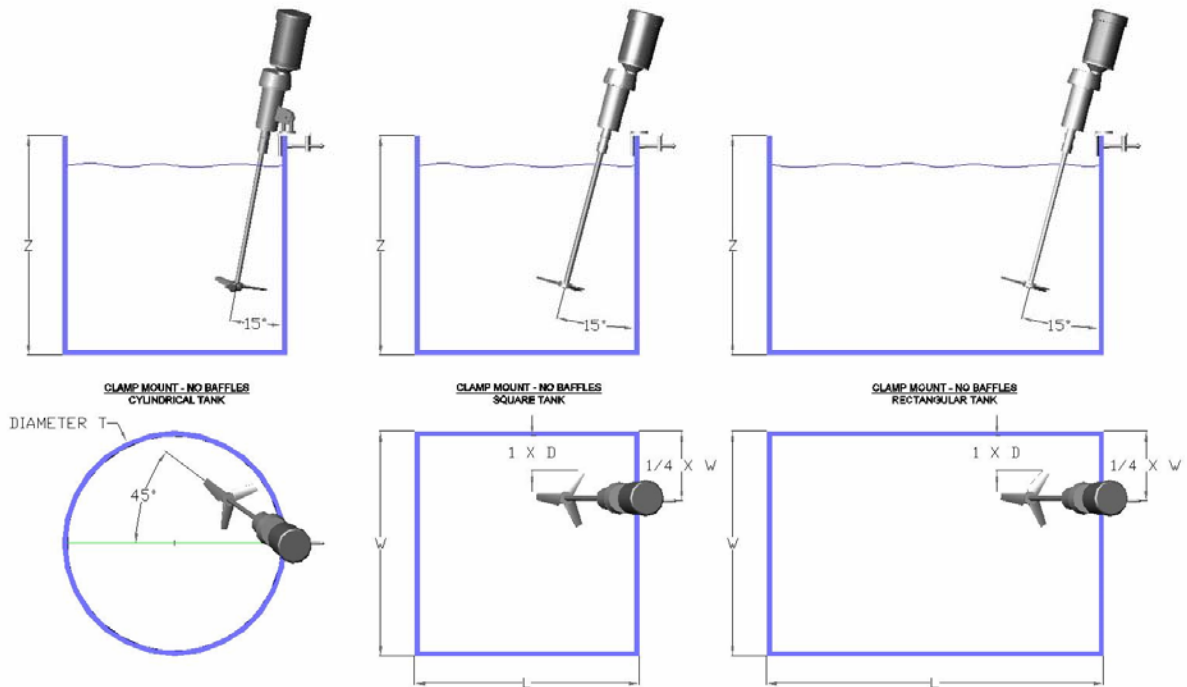


BAFFLE DIMENSIONS:
WIDTH: 1/12 TANK DIAMETER
NUMBER: 3 @ 120° OR 4 @ 90°
OFF SIDEWALL: 1/72 TANK DIAMETER

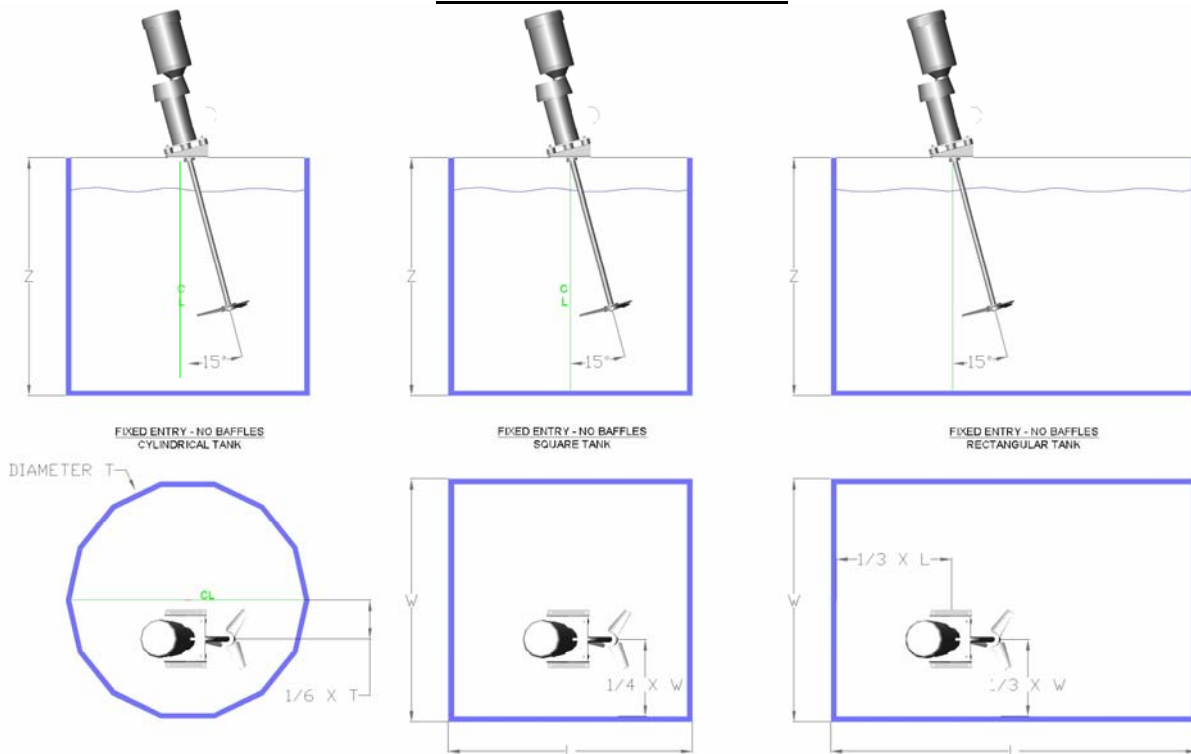
YES



IMPELLER SPACING – ALL MOUNTING STYLES
Mounting Guidelines for Fusion “Custom Solutions” Series Mixers
CLAMP MOUNT MIXERS



FIXED MOUNT MIXERS





Caution: There are several pinch points on the mixers



2. Mount the mixer to the desired location. Be careful, as there are several pinch points in the mounting hardware as well as in the shaft couplings. Once the desired position and mounting angles are achieved, tighten all of the hardware to the torque specifications in the table below:

Hardware Size	Grade 2 and 300 series stainless hardware	High strength grades 5 & 8
1/4"	5 ft*lbs	7 ft*lbs
5/16"	9 ft*lbs	14 ft*lbs
3/8"	15 ft*lbs	25 ft*lbs
1/2"	37 ft*lbs	60 ft*lbs
5/8"	74 ft*lbs	120 ft*lbs

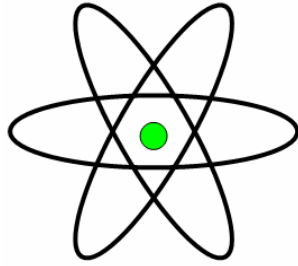
3. Mixer shaft installation: To avoid binding in the future and ease of installation, apply process compatible grease or anti-seize compound on the threads. Too much grease will create resistance from air pressure. Be sure to slide the shaft into the coupling on the drive slowly and gently. The tolerances are very tight to keep concentricity and limit vibration. If the shaft is forced, it will gall and the mixer will be damaged.
4. Impeller installation: Set the location of the impellers on the shaft and tighten the set screws. The bottom impeller should be 0.5 x impeller diameter to 1.5 x impeller diameter off the bottom of the tank. For dual impellers, refer back to the quote for spacing. In general, the second impeller should be about 2 x impeller diameters from the lower impeller in gear drive models and about 5 x impeller diameters on direct drive models.
5. Electric Components: All wiring of motors, VFD's, panels, and controls should be done according to local code. If any wiring was provided by Fusion, please have your electrical inspector inspect all connections, conductors, etc. to verify that the installation is acceptable. Unless specifically requested, pre wiring of components may not be UL approved. Call your local inspector!
Electric motors: Motors provided are specific to each application. You will be able to locate the motor model number and MFG on the tag. You can find performance data and operating limitations online. Otherwise, contact Fusion, and we will provide this information to you.



NOTE: Wire so that impeller rotates clockwise when viewed from top



Mixer shaft rotation is typically indicated with a yellow arrow sticker on the mixer



***Fusion Fluid
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PC-FL, PHD-FL, & PHG-FL Installation and Maintenance Check List

Fusion PURE series mixers with LIP SEALS

Installation Guide:

1. Install the lip seal in the seal gland and place the stainless snap ring to retain it. It is a one-way seal, so the lips of the seal should point towards the side of higher pressure, as is standard with all lip seals.
2. Verify that all components are included.
3. CLEAN the shaft thoroughly! The shaft must be cleaned SEVERAL times to avoid particulate build up. If the shaft is not cleaned, the seal will shed a dark particulate.
4. Install shaft through the bottom of the mixer to avoid damage of the lip seal.
5. Install stainless drive coupling on top of mixer shaft. Align set screws with flats on mixer shaft to avoid galling.
6. Wire motor according to diagram.

Maintenance:

1. Review the condition of the motor. If it is running poorly, contact Fusion for a replacement.
2. Check the condition of the lip seal. Make sure it is not torn or worn out. It is a barrier to the process fluid, so it must be intact.
3. Replace the tri-clamp gaskets regularly. They must be in good condition to properly maintain a seal.
4. For additional information regarding your mixer, please see the manual for Custom Solutions mixers. Contact Fusion if you need additional documentation or safety/maintenance guidance.
5. Please consult Fusion regarding which components are safe to put in an Autoclave.

Should there be any additional problems or concerns, feel free to contact Fusion Fluid Equipment – info@fusionfluid.com

Section 5 – Maintenance



Warning: Turn off power to the mixer before any maintenance



1. Lubrication is the most important key to prolonging the life of your mixer. Be sure to regularly grease all fittings on the mixer. Gearboxes on geardrive units come pre-lubricated with AGMA #7C synthetic or food grade oil (all stainless models). Periodically remove the vent plug to check for water contamination in the oil. Change the oil if there is water contamination. Periodically remove the gearbox from the drive to check for leakage. If oil is found in the bearing housing, it will work its way down the mixer shaft into the tank. Be sure to clean all oil out of the housing. Air motors should have lubrication and dry, filtered air.
2. For harsh, washdown, or wet environments, special attention is required. These units are provided with additional o-rings and lip seals to prevent contamination from entering or leaving the drive. High pressure washing can allow water to enter through the seals. Check for water contamination as described in step 1 and also regularly remove motor drain plugs to remove any water. Water contamination will greatly reduce the life of your mixer.
3. Disassembly: The Custom series fusion mixers have various designs. Here are some hints on how to remove each components:
 - Motor: Remove all FOUR motor bolts. Apply anti-seize to the motor output shaft before re-installing in geardrive units only.
 - Gearbox (on geardrive units): Remove the FOUR gearbox bolts.
 - Shafts: Loosen coupling set screws and pull shaft straight down. If shaft is galled, it will not be easily removed. Galled shafts required skilled personnel to repair.
 - For replacement parts, please contact Fusion. CUSTOM SOLUTIONS MIXERS ARE ALL-CUSTOM. Each mixer is designed with the customer's specific budget and process in mind. We will have records of all the parts required for your custom mixer.

Section 6 – Warranty and Contact

Warranty:

All equipment or parts covered by this manual are guaranteed free from defective material and workmanship for a period of twelve (12) months from date of shipment, under normal use and service. This warranty does not cover failure of normal wear parts unless the failure of such part has resulted from defective material and workmanship. Fusion Fluid Equipment LLC will repair or replace, at its option, any equipment which has been found to be defective and is within the warranty period, provided that the equipment is shipped, with previous factory authorization, freight prepaid, to Fusion's plant in Whitehall, Michigan, USA. All return shipments are made FOB Fusion's factory. Fusion Fluid Equipment LLC is not responsible for removal, installation, or any other incidental expenses incurred in shipping the equipment to or from Fusion Fluid Equipment LLC. In the case of components purchased by Fusion Fluid Equipment LLC, and incorporated in the equipment, the component manufacturer's guarantee shall apply. NOTE: Any modifications or corrective work done to the equipment which were not specifically authorized in writing by Fusion Fluid Equipment LLC shall void this limited warranty, and Fusion Fluid Equipment LLC shall accept no liability for any of the corrective work or expenditures which were conducted without their prior, written authorization. Fusion Fluid Equipment LLC shall not be held liable for any further cost, expense, or labor to replace equipment or replaceable parts, or indirect or consequential damages.

With the exceptions of the limited warranty set out above, there are no other understandings, agreements, representatives, or warranties implied (including any regarding the merchant-ability or fitness for a particular purpose), not specified herein, respecting this agreement or equipment, hereunder. This contract states the entire obligation of Fusion Fluid Equipment LLC in connection with this transaction.

Contact:

For questions, concerns, or comments, we strongly recommend contacting the sales representative that supplied your equipment. Otherwise you may email us or visit our website. We typically respond same day.

Website:

www.fusionfluid.com

Email:

info@fusionfluid.com

Thank you for choosing Fusion. We look forward to a long standing relationship with you, providing high quality custom equipment!