GENERAL INSTRUCTIONS FOR MAGMIX MAGNETIC MIXER RANGE

The MagMix is supplied in a range of sizes with alternative electric or air driven Drive units depending on the size

The MagMix can be used in both atmospheric and pressure vessels, operating from full vacuum to 10 Barg ranging in capacity from 10 litres to 25000 litres.

Table 1 shows the range of vessel capacities for each mixer model.

MODEL	VIGOROUS MIXING	GENTLE MIXING
MM4	10 Litres	30 Litres
MM6	50 Litres	150 Litres
MM8	150 Litres	500 Litres
MM12	300 Litres	2000 Litres
MM20	1000 Litres	3000 Litres
MM32	2000 Litres	6000 Litres
MM64D	3000 Litres	10000+ Litres

TABLE 1

This table is for guidance only and depends on the specific duty which the MagMix is to be operated under.

All mixers are designed to operate from 0 to 500 RPM. For viscous products the higher speed range may not be achievable because of the magnetic slip of the coupling.

THE BASIC UNIT
The MagMix is made up of 4 basic components:

1. The drive unit, consisting of geared motor, magnetic drive head and mounting stool.

2. Vessel mixer pad, welded into the vessel onto which is screwed the male half of the bearing.

3. Magnetic rotor head fitted with the female half of the bearing and one of the various mixing heads.

4. Control panel, either in a stainless steel or polycarbonate enclosure, or as a basic unit.

Welding the Vessel Mixer pad into Vessels
Instructions for welding the vessel mixer pad are given in Appendix A.

MIXER BEARINGS
The bearing and materials used are the result of extensive research and testing of different materials. The bearings are of a grade of Tungsten carbide or Silicon Carbide selected to give minimum wearing with maximum toughness. The bearing surfaces have a highly polished lapped finish to minimise particle generation. As a result no running-in period is required, but it is strongly recommended that they are checked after the first hour of operation.

IMPORTANT! THE LIFE OF THE BEARINGS WILL BE GREATLY REDUCED IF THE MIXER IS ALLOWED TO RUN DRY. THIS SHOULD THEREFORE BE AVOIDED.

The rate of bearing wear will depend on the duty the MagMix is operating under. A mixer used continuously at high speed for vigorous mixing will wear quicker than one used for gentle agitation. It is therefore difficult to give precise periods for inspection, but the following are for guidance.

Times in brackets () are for light duty

Every 200 (500)Hours: Inspection of the bearings should be carried out.
Where it is impractical to get a good view of the mixer pad bearing, inspection of the Rotor head bearing may suffice.

Every 1000 (2000) Hours: Replacement of the bearings are recommended.

REPLACEMENT OF BEARINGS
The shouldered bearing, located on the Vessel mixer pad is removed by placing a suitable spanner on the flats of the bearing retaining nut and unscrewing it anticlockwise. Remove the bearing together with the two PTFE washers. These PTFE washers should be replaced. Once replaced, the bearing nut should be nipped down and not over-tightened , so as to not extrude the PTFE washers or using a torque wrench set at the right setting below tighten the Bearing Nut down.

20 Nm MAX for MM4 & 6 Mixer ,
25 Nm MAX for MM8 & 12 Mixer
30 Nm MAX for MM20, MM32 & MM64 Mixer

The bearing in the Rotor Head is pressed into place within a tight machined tolerance which range dependant on the Rotor Head size and to enable to carry out this process does require a special tool to correctly extract the worn bearing. There is a correct procedure required to do this to prevent any damage being made to the Rotor Head which if attempted by other parties will in effect void any previous warranty issued at manufacture for the Rotor Head. If this procedure is not carried out to the correct tolerances the rotor head could run untrue if fitted incorrectly and cause unforeseen problems in the future and cause damage to the Magmix unit or the Vessel itself.

It is advised that the Rotor Head be returned to Magmix Engineering for the replacement of the bearing in the Rotor Head so that the old bearing can be extracted correctly and the correct procedure followed when pressing in the new bearing to allow correct tolerances and the standards required for each specific rotor head to be adhered too.

NOTE! WHEN REQUESTING SPARES PLEASE QUOTE MIXER SERIAL NUMBER i.e. ME***or W****. The serial number is located inside the control panel if purchased or on the drive unit and also on the top of the rotor head or inside if fully welded option.

CLEANING

There is no exact cleaning procedure, since this will depend largely on the users specific cleaning requirements. However the following information may be helpful in formulating either a new procedure or modifying an existing one.

The Rotor head has holes through which the product fluid flows for lubricating the bearings and to help with cleaning in place (CIP) or steam sterilisation (SIP). It is important that these holes remain clear and are not partially blocked.

Since the Rotor head contains magnets these will attract and collect magnetic particles on its inner surfaces. To clean the Rotor head, it should be removed from the vessel after dismounting the drive unit.

An ultrasonic bath can be used to clean the rotor head but will not remove any magnetic particles. This is best achieved by using a high pressure water jet, if available or the particles can usually be removed with a cloth or a non-metallic stiff wire brush.

STERILISATION

The MagMix can be sterilised by Steam in place (SIP), Steam Autoclaving, or by Dry Heat. We recommended that SIP or Steam Autoclaving are preferred over, dry heat sterilisation, since the higher temperatures involved (typical 180°C) will cause demagnetisation of the head over a period of time.

Steaming in place

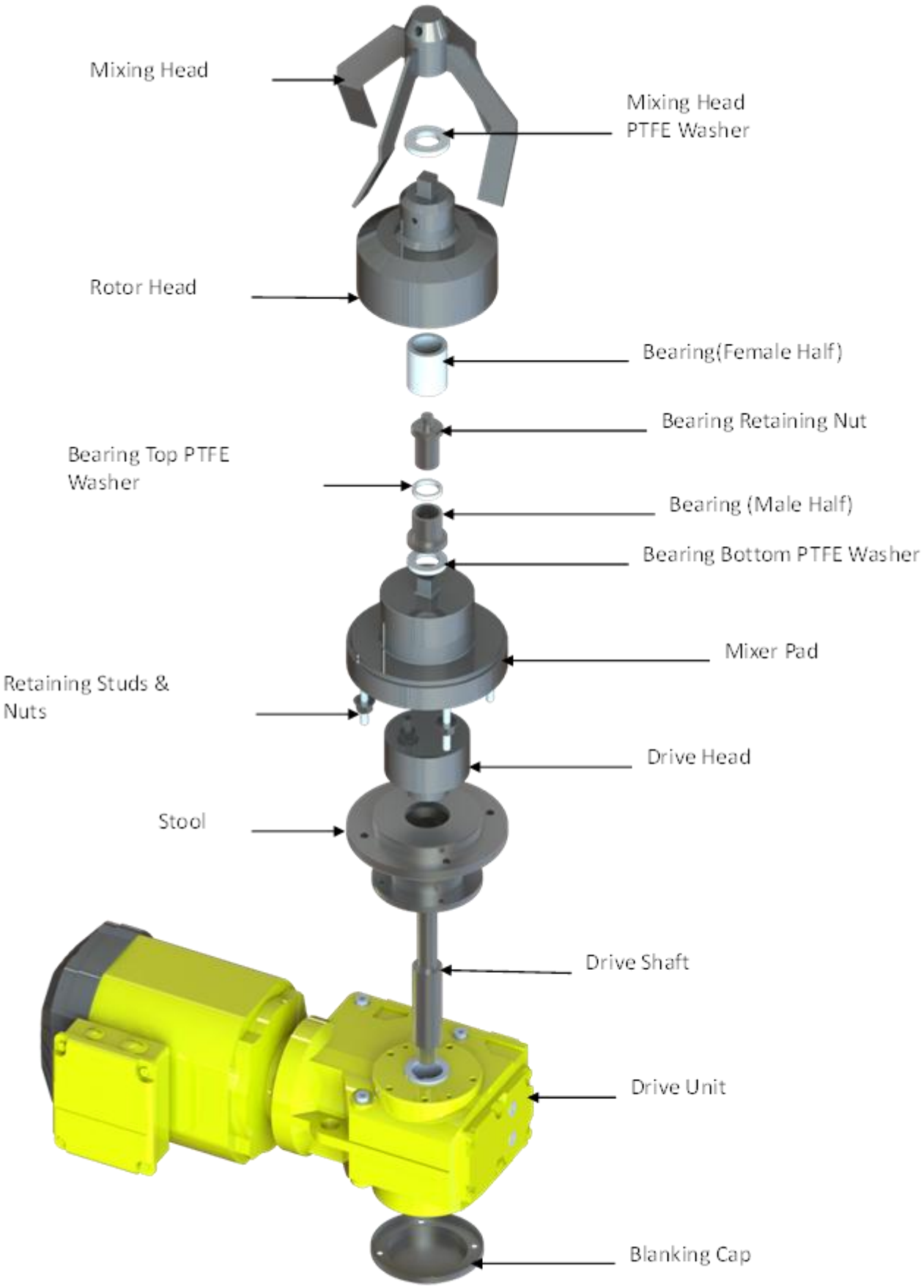
SIP can be carried out with the drive unit in place, if the maximum temperature is less than 125°C. Above this the drive unit must be removed. In order to eliminate any air pockets in the head, the vessel should be subject to vacuum prior to the steam cycle. With SIP, cold spots are unlikely to occur on/or around the Rotor head.

Steam Autoclaving

Steam autoclaving must be carried out with the Drive unit removed. An initial vacuum cycle should be applied to eliminate any air pockets in the Rotor head. The maximum sterilisation temperature by this method is 140°C. To overcome any possible cold spots on/or around the Rotor head, approximately 5 minutes should be added to the cycle time.

Dry Heat Sterilisation

This must be carried out with the Drive unit removed and is limited to a maximum temperature of 180°C, if the head remains in the vessel. It will probably be necessary to increase the sterilisation cycle time in order to eliminate any cold spots on/or around the Rotor head. This additional time is dependant on the particular equipment used and should be determined during validation trials. If you require higher sterilisation temperature contact Magmix Engineering for advice.



Basic MagMix Components

ALL MAGMIX RANGE

The Mixing head (Low volume type or other) screws onto the top of the Rotor head in a ANTICLOCKWISE direction. A PTFE washer seals the Mixing head onto the Rotor head.

The Rotor head slides onto the bearing on the Vessel Mixer pad.

IMPORTANT: Due to the nature of the Bearing material great care should be taken during fitting of the head to avoid any shock loads. The Rotor Head should thus be fitted before the drive unit.

The Drive unit is mounted externally on to the Vessel Mixer pad by a Tri-clover connection or Bolted connection. Once located, the Tri-clover Clamp or Bolted Spool should be tightened up and the unit checked to ensure that it is mounted squarely.

When starting up, check the Mixing head is rotating in a clockwise direction, when viewed from the top.

Maintenance
The standard motor is a TEFV type rated IP55 and requires no maintenance. However, any accumulation of dirt and dust should be removed.

The gearbox is a worm unit and is sealed for life with synthetic grease. It should therefore not require any maintenance.

See section on Bearings for maintenance requirements

Spares
See Appendix B for spare parts.