

INSTRUCTION MANUAL

FOR INSTALLATION,
OPERATING,
AND MAINTENANCE.



HELISEM[®] AGITATORS **VRG RANGE**

This manual is intended to the staff responsible for installation,
operating and maintenance of the equipment.





FRF



VRG



VDA

HELISEM RANGE®



VRP



VLA



VRT

FOREWORD



People who are in charge of installation, operation and maintenance mixer must consider manual's recommendations in order to prevent some hazards to the person and environmental degradations while assuring a better use of mixer. A particular interest in suggestions and rules of this manual is required. Finally, any mixing of chemicals requires to follow safety data sheet.

Terminology for safety recommendations

Please spend few minutes to read the following table regarding safety terminology used throughout this manual.

SAFETY TERMS	Risk in case of recommendations not followed
ATTENTION	Risk of serious injury or mortal in case of non respect for danger.
<i>Warning</i>	Risk incurred (minor injury) in case of not respect for danger.
<i>Caution</i>	Material risk of damage in case of not respect for danger.
Nota	Necessary remarks for a better use of the mixer.
	Risk for environment.
LOTO	“Lockout – Tagout” is a safety procedure to ensure that dangerous machines are properly shut off and not started up again prior to the completion of maintenance or servicing work.

Regulations ATEX

If the supplied mixer is in agreement with ATEX (utilization in explosive zone), the maintenance must be executed according to the legislation in force by the competent staff (approved) for this type of intervention. Contact your field service. Any interventions on the mixer by an uncertified organism will involve cancellation of ATEX certification.

Dear Customer,

Thank for choosing a Milton Roy Mixing Mixer.

- **Any information?**

Tel: 33(0)1 60 74 95 20

E-mail: contact@miltonroymixing.com

- **A doubt at start up?**

Tel: 33(0)1 60 74 95 25

- **Any spare part?**

Tel: 33(0)1 60 74 95 25

TO READ BEFORE STARTING!

MILTON ROY MIXING mixers are designed and manufactured for the full satisfaction of the user in terms of mixing efficiency as for the reliability of mechanical parts.

A mixer is subject to relatively high stress, for which it is designed, and generates big efforts on its support as on the tank.

It runs one hundred tons of liquids in motion, in a 100 m3 tank, for instance, then it is important to take account the mixer effort at the support and tank conception and to take care of the correct mixer mounting and its maintenance, to get an exceptional life duration.

1. Do not use the agitator in other conditions than it has been designed.
2. Never try to repair or change position or remove any part when the agitator is running on.
3. Do not handle the mixer from the shaft tip or the impeller.
4. Do not use other bolting than which is specified in the maintenance handbook.
5. It is highly recommended to put the mixer shaft in the tank axis and to fit the vessel with baffles in order to stop the rotation of the liquid around the shaft which could generate excessive bending on the shaft.
6. Please follow all recommendations on mounting the agitator on its support and on the torque to apply on bolting.
7. Do not connect a frequency inverter without our prior agreement (some checking have to be considered on power, torque and motor cooling....).
8. Take care on mixer support that must resist to the static and dynamic loads (please see the mixer data), the mixer must be placed in an acceptable vertical position (see relevant tolerances in the handbook), on a perfectly horizontal support, to avoid any additional stress on the shaft that could decrease the agitator life.
9. After dismounting, use a new bolting set, the old one could reach the acceptable elastic limit of material.
10. Do not remove any guard around rotating parts if they are in place and depending on tank configuration, add any device to avoid contact on rotating pieces.
11. Do not try to modify the bulk flowing when the mixer is going on or to decrease the rotation of the impeller with any device.
12. Do not change the physical or chemical bulk data that will be mixed without MILTON ROY MIXING agreement in order to check the change is compatible with the mixer (power increase, additional effort that could cause damage on the mixer).
13. Do not change operating conditions such as temperature or pressure without checking of the capability of the mixer to resist to the new conditions.
14. Do not put the mixer in an other tank than the original one.
15. Do not run a direct motor drive mixer in air (type VDA and VLA), during filling or discharging or with a variable speed device.
16. Stop the agitator if any abnormal vibration occurs, higher electrical intensity than the motor rating, an excessive level of noise or a too much temperature observed on motor or gear reducer boxes.
17. Please regularly check the good order of the equipment (rust mark, bad tightened parts....) and stop the mixer if any abnormal condition is observed.
18. Do not substitute genuine parts by others that are not supplied by MILTON ROY MIXING, in order to be sure of the right compatibility of parts.
19. Do not change the impeller position on shaft that could add more load on the mixer.
20. Do not modify the impeller diameter or shape and do not fit the mixer with an additional impeller on shaft.
21. Do not use the shaft or impeller on an other mixer.
22. Do not rotate at an higher rotation speed than the nominal one, the power or strength is drastically changing.

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Check List

Please fill this check list prior starting up for a better installation of the mixer.

- Instructions of the manual have been read and followed..... ☐
- Verify the good state of the parcel at the reception..... ☐
- Checking of the right horizontality of the support..... ☐
- Check the impeller direction of blowing (down or up)..... ☐
- Verify the impeller's position on the shaft..... ☐
- Verify the locknut are mounted on place..... ☐
- Check the right fixations of following parts :
 - mixer on the support ☐
 - shaft with the coupling..... ☐
 - impeller on the shaft..... ☐
- Check the right tightening torques..... ☐
- Verify the voltage compatibility..... ☐
- Check all holes on terminal box are blind..... ☐
- Check electrical amperage..... ☐
- Check the correct oil in the gear reducer..... ☐
- Check the vent valve is mounted on place..... ☐
- Check all electrical connection..... ☐
- Verify the right rotation of the mixer..... ☐
- Check that the mixer does not have any noise and abnormal heating..... ☐

Made by :	Checked by :	Date :
Authorization of starting up of the mixer :		
☐ YES ☐ NO		

PART I – GENERAL DESCRIPTION

I -1. UNPACKING AND STORAGE

The packaging must be carefully examined on receipt of the parcel in order to ensure that the package has not suffered any obvious damage. Check that all parts cope with the delivery note. Check the conformity of the manufacturer plates compared to the order.

If the parcel is in bad condition, a declaration of damage must be written in the presence of the carrier, then warn MILTON ROY Unit. In addition, in the event of missing parts, please warn MILTON ROY Unit as soon as possible **(within 7 days)**.

The VRG range consists of two types:

- With a cast solid shaft + impeller in one part + MAC coupling (delivered on one small package).
- With tubular shaft on wood frame + impeller with 2 blades + MAB coupling (delivered on two packages).

In this parcel you will find:

Nota: Before unpacking, check that the parcel was not damaged. Also, before beginning the mounting, check that any part is missing.

Mixer with a MAC cylindrical coupling:

For a mixer with cylindrical coupling, the equipment is delivered in only one part (see the picture). In some cases, the shaft is too much long, it could be in two parts. All parcels are numbered and wrapped with a plastic film for a better storing condition.



This parcel contains:

- The drive head (x1)*

*Cf. glossary page 50



- The impeller (x1)



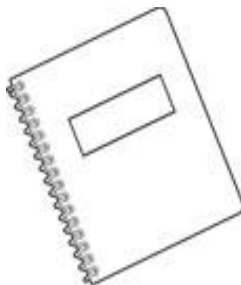
- The shaft (x1)



With marks (Rep 1, Rep 2) in each end on the shaft:

- One end, for the coupling fixation. **Rep 1**
 - One end, for the impeller fixation. **Rep 2**
- (See page 20 → [Part II – 2 paragraph « C\) Mounting of the shaft »](#)).

- The instruction manual (x1)



The bolting is pre-assembled, however, the bolting for the mixer fixation on the tank is not supplied. A set of Allen key is necessary to mount this mixer.

Mixer with flange coupling (MAB):



1/1



2/2

With this agitator, the parcel is bigger than the MAC Mixer, with two parts (1 for the impeller, the other one for the shaft). They are still marked (1/2 and 2/2) as the serial or order id. number.

The first parcel is the (numbered ½):

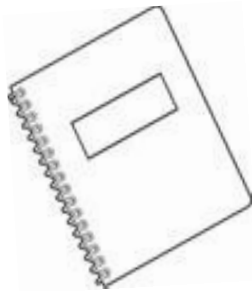
- The drive head (x1)



- The Blades (x4)



- The instruction manual (x1)



- The bolting

For the impeller mounting (x1)



For the MAB assembling (x1) and the **vent valve*** for the gear reducer (exception for mixers fitted with a ZF/DF 38 reducer).

***cf. glossary page 50**



The second parcel is the (numbered 2/2):

- The tubular shaft on wood frame (x1)



One set of tubular wrenches and one set of open-end wrenches are necessary for the assembling of the flange coupling.

STORAGE PRECAUTIONS:

➤ **Storage for less than six months**

Equipment shall preferably be stored in its original packaging, protected from bad weather conditions (rain, snow, direct sunlight...) and impacts, and not too close to vibrating devices as the resulting vibrations may cause wear on the bearings and mechanical mating faces.

➤ **Storage for more than six months**

Consult us.

Nota:

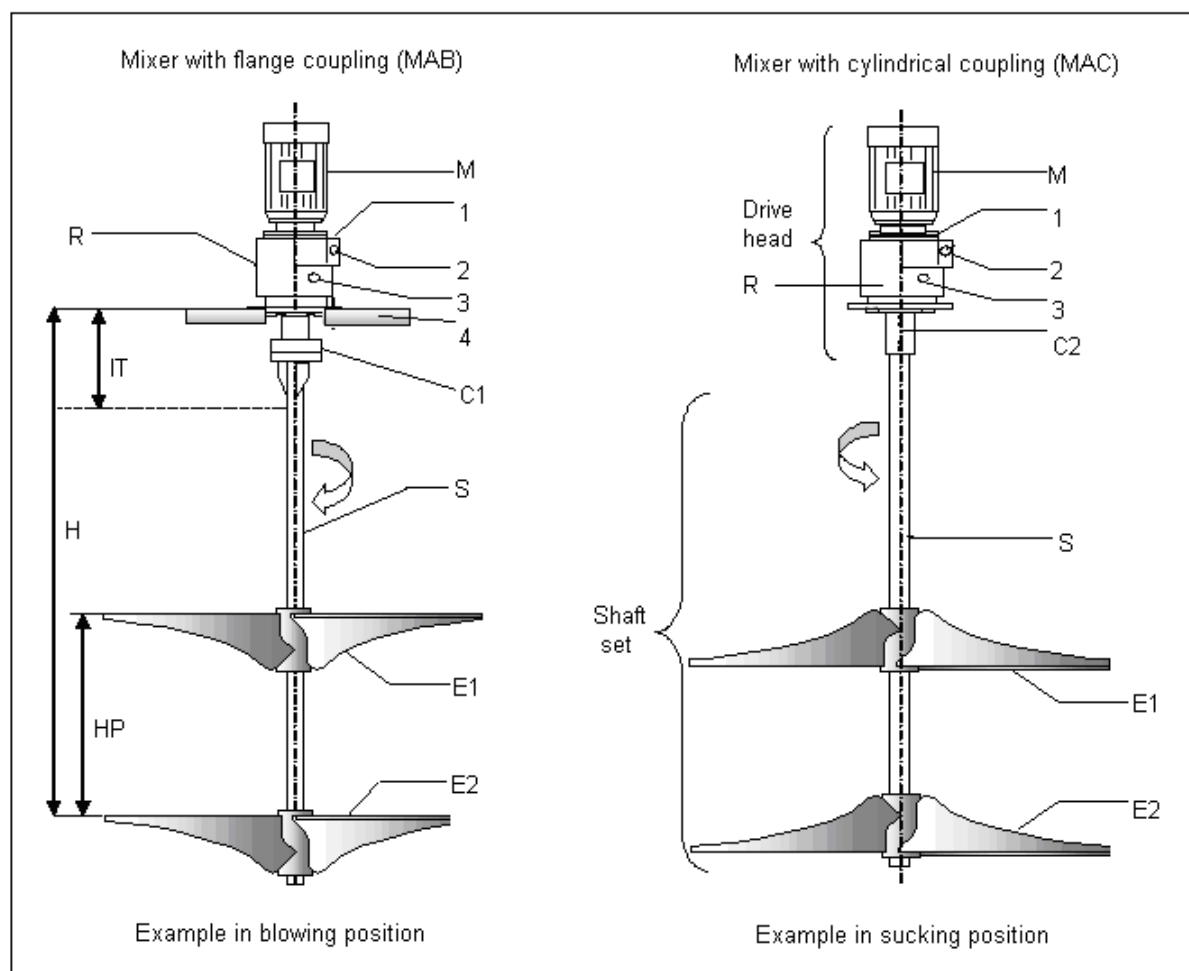
- The shaft should be stored in horizontal position. Any longtime storage before or after use, in particular environmental conditions (humidity, salinity, vibrations or corrosion) shortens the guarantee application.

I - 2. DESCRIPTION

See [figure 16 "Overall drawing and technical characteristics"](#) page 47 to 49.

This is made up of the following items:

- a driving device consisting of a motor [M],
- a reduction gear [R] which reduces the speed between the motor and the agitator shaft. It is splash-lubricated by an oil bath.
- an agitating device, including a shaft [S] and a mixing element [E]. It is connected to the output shaft of the drive via a coupling sleeve [C].

Figure 1: Assembly drawing


M	Motor or speed variator	**C2	Cylindrical coupling
1	Oil filling and vent valve	*IT	Max liquid level
R	Gear reducer	S	Shaft
2	Level nut	*H	Impeller position
3	Drain nut	**HP	Distance between 2 impellers (if any)
4	Support	**E1	Upper impeller
**C1	Flange coupling	**E2	Lower impeller

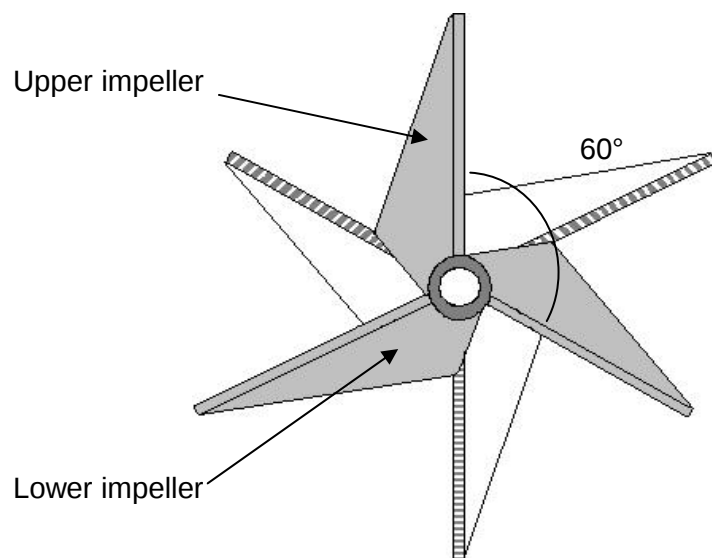
*Please see the drawing given at the order.

**Depending of the model (the impeller is not necessarily double; the coupling depends on mounting).

For the VRG mixer the impeller used is a **HELICE 10SG**.

In case of 2 impellers put it in crossed position, depending of option:

Underside:



The angle between 2 blades is 60°.

1 - 3. SAFETY AND HEALTH INSTRUCTIONS

The staff responsible for installation, operation and maintenance of this equipment must follow and assimilate this manual in order to:

- avoid any possible risk to themselves or to third parties,
- ensure the reliability of the equipment,
- avoid any error or pollution due to incorrect operation.



ATTENTION: Any servicing on this equipment must be carried out when it is stopped. Any accidental start-up must be prevented (either by locking the switch or removing the fuse on the power supply line).

A notice must be attached to the location of the switch to warn that servicing is being carried out on the equipment. Switch off the power supply as soon as any fault is detected during operation: abnormal heating or unusual noise.

In all events, refer to the legislation in force, to safety's regulations and good practice for manipulation of load and for electrical and mechanical works in the country as well as on the site where the agitator is installed.

It is necessary that you respect the safety's procedures of your company during maintenance or repair of equipment. Make sure that you understood all procedures and instructions before you begin working in the whole.

Check that the place where the mixer will be installed is not subject to any specific regulation. If yes, please adapt these specific regulations to this instruction manual in order to have a full compliance of the local regulation, safety and health.



During oil changing operations, the waste oil must be collected in a suitable bin. Any overflow of oil which may result must be removed using a degreasing agent suitable for the operating conditions.



Soiled cleaning cloths must be stored in suitable receptacles. The oil, degreasing agent and cleaning cloths must be stored in line with the rules on pollution. In the same way, packing used to protect the agitator (cardboard, stuffing, wood...) must be eliminated by relevant selective sorting in force in your region.

Sum up part I

► Unpacking and storage

1. Checking of good condition of the equipment.
2. Checking of the packaging since receipt with the delivery note.
3. Checking of the conformity of the manufacturer id. plates.
4. Checking of the parcel's content MAC (1 parcel) :
 - the drive head,
 - the impeller,
 - the shaft,
 - the instruction manual.
5. Checking of the parcel's content MAB (2 parcels):
 - the drive head,
 - the impeller,
 - the shaft,
 - the instruction manual,
 - the bolting.
6. Storage precaution :
 - storage in the original packaging,
 - storage sheltered from adverse weather conditions and impacts,
 - storage far away from vibrating devices,
 - storage for more than 6 months, consult Milton Roy Mixing.

► Description

1. Composition of agitator :
 - a driving device consisting of a motor,
 - a reduction gear,
 - an agitating device consisting of a shaft and an impeller.
2. Position of 3 blades:
 - depending of option: fixation position is 60° between 2 blades.

► Safety and health instructions

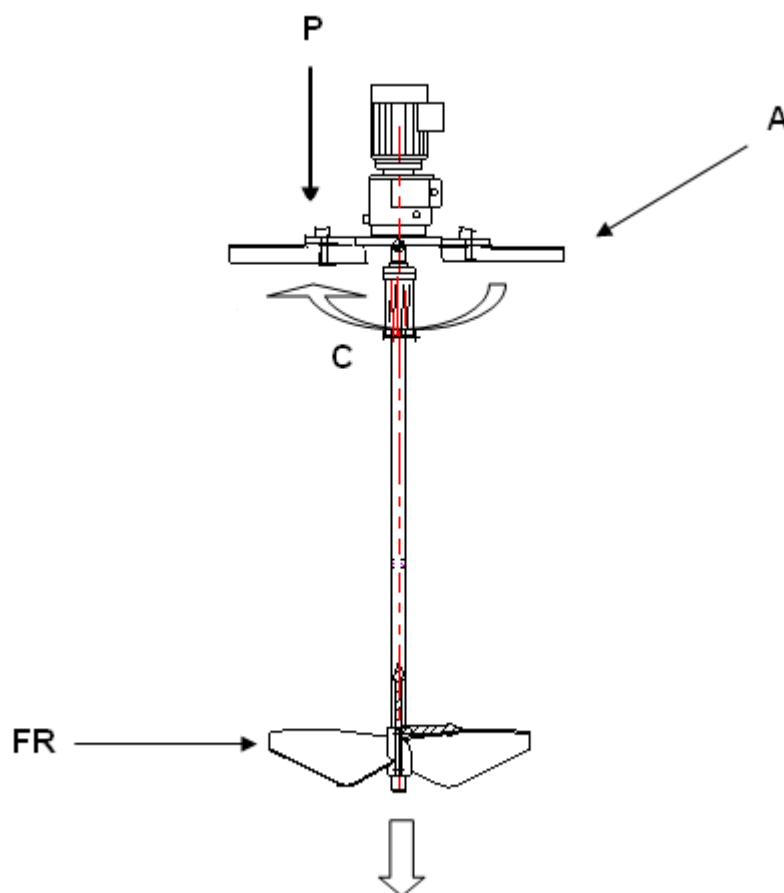
1. Knowing of procedures and instruction manual.
2. Turn off the agitator before any intervention.
3. Put a notice of caution when an intervention takes place on the agitator.
4. Switch off all power supply when an intervention takes place on the agitator.
5. Verification of good respect of safety and health instructions.

PART II - INSTALLATION

II - 1. HANDLING

Choose lifting equipment that is compatible with the weight of the part to handle (see part V [figure 16 "Overall drawing and technical characteristics"](#) page 47 to 49).

Nota: Please see that the support can bear the static load and the efforts generated by the agitator. (Please see [figure 16](#) on page 47 to 49 "[column Load](#), [FR](#) and [C](#)").



P	Load (weight + axial load).
A	Support of the mixer (not supplied).
C	Maximum torque that has tendency to shear the bolt.
FR	Radial load.



Caution: Please watch not to damage the paint! Mechanical damage (stripes), chemical (acids, detergent), or thermal (sparks, particles of welding, heat) generate a phenomenon of corrosion and prevent the protection from playing its role. Any degradation can involve the cancellation of guarantee.

Nota: The weight of parts to handle doesn't require particular precaution. However, will bring the greatest care during the handling to not to damage the shaft, particularly not to bend it.

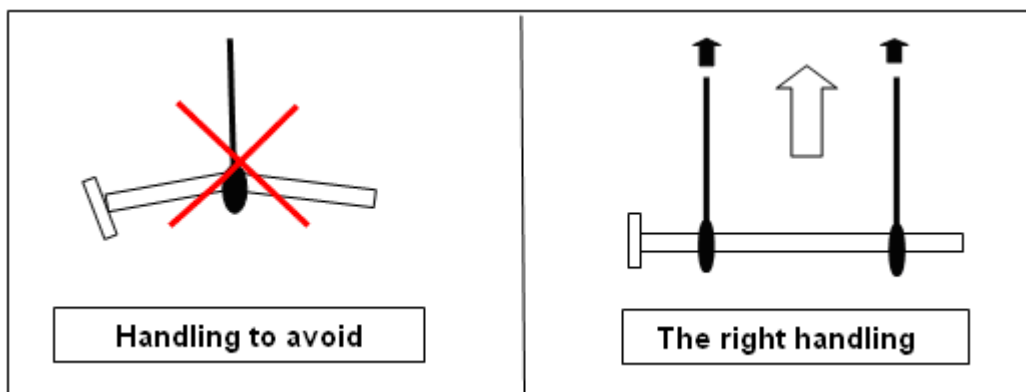
Check that the assembly is correctly balanced before starting to move it.

Warning: the slings must necessarily bear the weight of the equipment.

SHAFT

See [figure 2 "Handling the shaft"](#) next page.

- Fit the sling around the shaft, taking care not to damage the machined and/or painted surfaces.



GEAR REDUCER

See [figure 2 "Handling the drive head reducer"](#) next page.

- Fit the sling around the motor reducer, taking care not to damage the terminal box and machined and/or painted surfaces.
- Check that the assembly is correctly balanced before starting to move it.
- Proceed with mounting as soon as it is set up on site (see Part II - 2.)

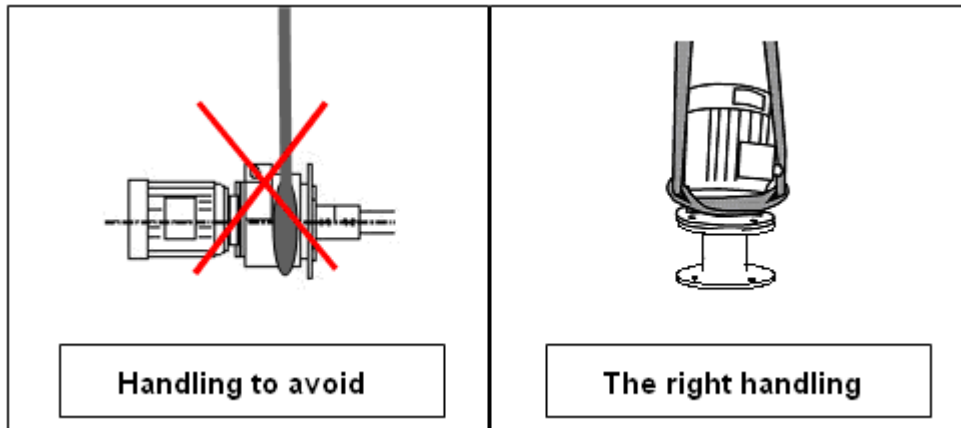
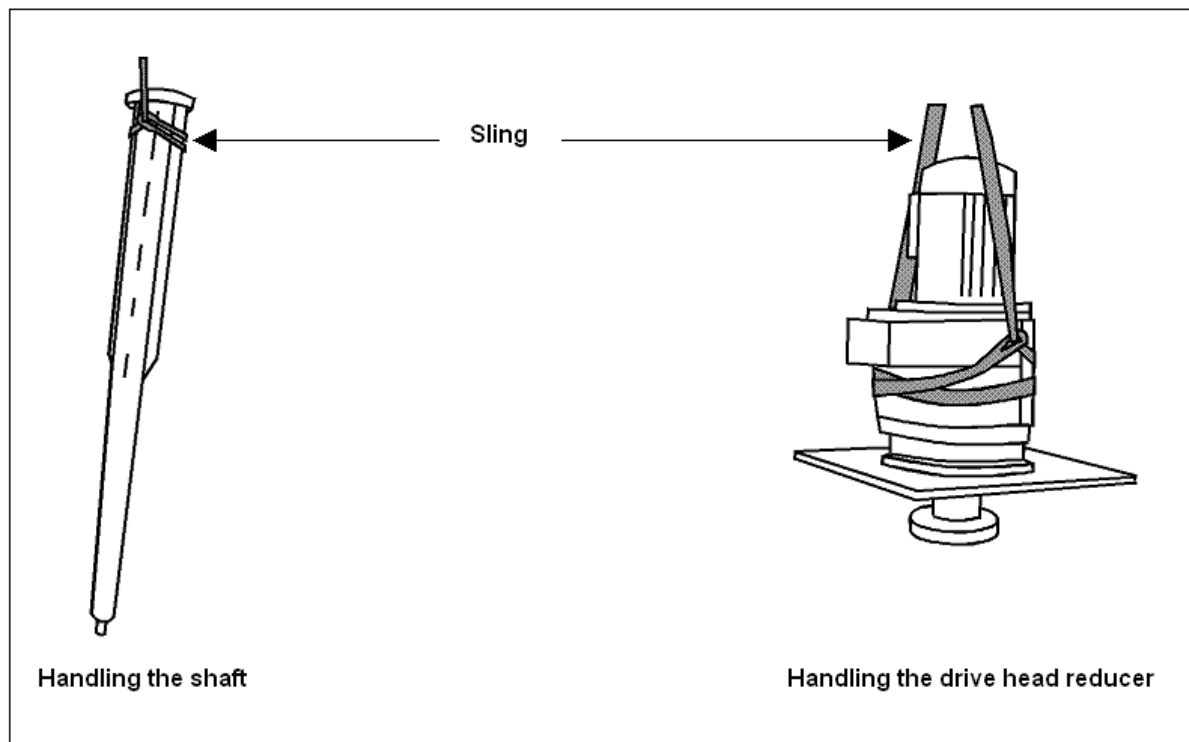


Figure 2: Lifting



II - 2 SETTING UP

Clean all machined parts that will be in contact after assembling (centering faces of flange...). Make sure the flange face are in good order and assemble parts that must be, check with a part list if any piece of equipment is missing.

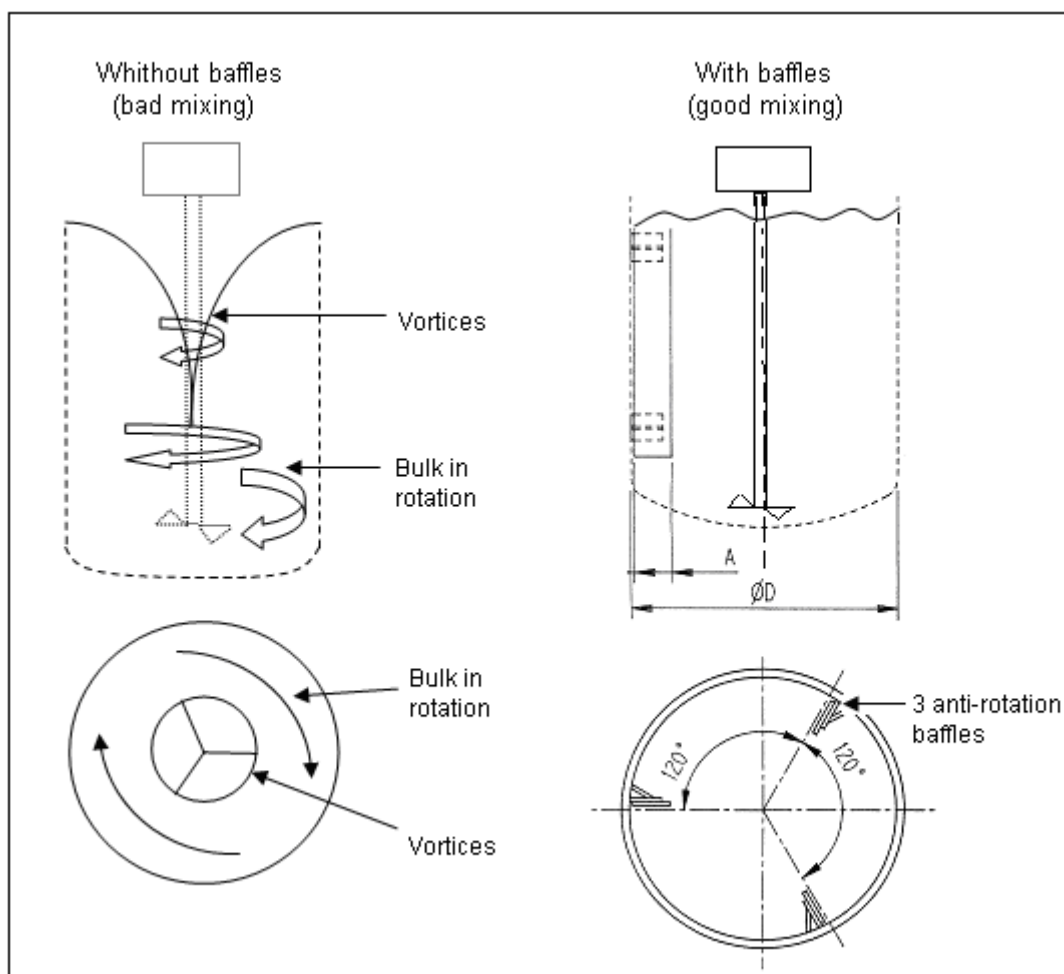
A) BAFFLES NECESSITY

As any agitator must be imperatively installed at the center of a cylindrical tank, it is strongly advised to add of anti-rotation in accordance with the schematic diagram in the figure below. The anti-rotation blades will:

- avoid block rotation of the fluid,
- avoid the formation of **vortices*** which are dangerous for the shaft and which further the introduction of air,
- obtain a satisfactory quality of mixing.

* Cf. glossary page 50

Figure 3 : Anti-rotation baffles



ØD	A	ØD	A	ØD	A
100	8	1000	80	4500	360
200	16	1200	96	5000	400
300	24	1600	128	6000	480
400	32	2000	160	7500	600
500	40	2500	200	10000	800
600	48	3000	240	12000	960
800	64	4000	320		

Dimension in mm.

In some particular case, the mixer can be off centered from the tank axis; this generates additional mechanical efforts on the shaft, please contact **Milton Roy Mixing**.

B) TOOLS AND MATERIALS REQUIRED

You need all the following tools for a better assembling:

- Lifting equipment able to lift the total weight of the mixer.
- Slings, hooks, shackles, ropes.
- Standard tool kit up to wrench N°24.
- A level adjuster.
- **Torque meter wrench***.
- PTFE in spray or mob sulfide grease, if compatible with the mixed products.
- **Wood beam***.

* cf. glossary page 50

C) MOUNTING OF THE SHAFT

Caution: The mixer must be always mounted in vertical position.

Please see [figure 16 "Overall drawing and technical characteristics"](#) page 47 to 49.

The agitation shaft [S] is connected to the output shaft of the reducer according to two types of coupling [C]:

➤ **With the cylindrical coupling (MAC) :**

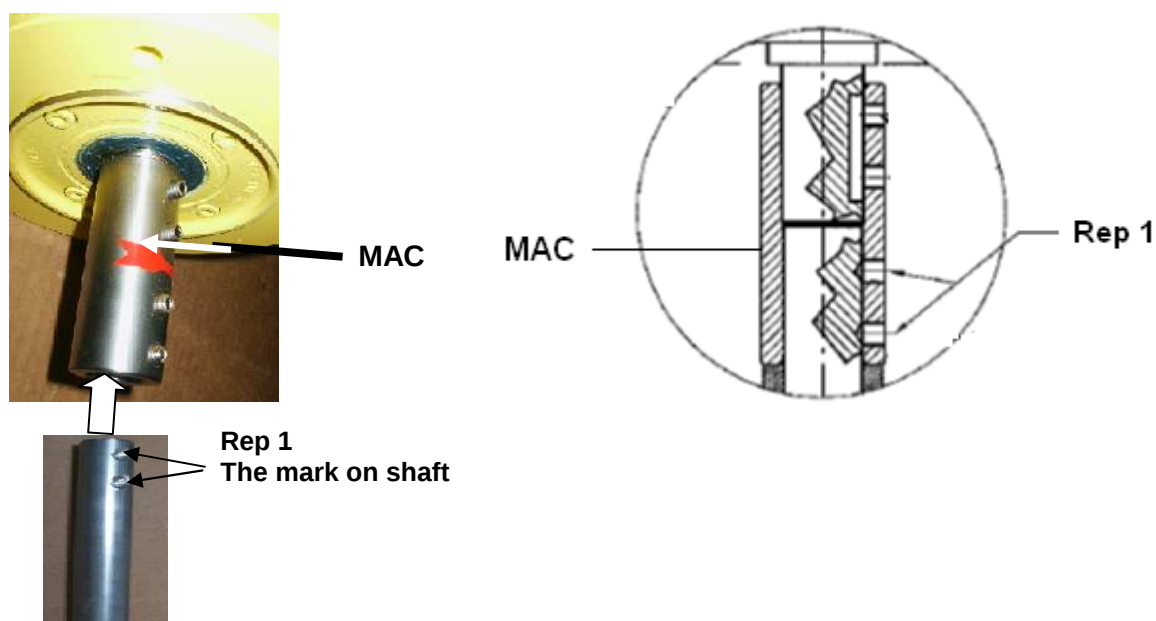
The cylindrical coupling is mounted beforehand in the assembly shop on the drive.

Caution: The mixer must be always mounted in vertical position.

To conclude the assembly on the shaft with the cylindrical coupling it is necessary to:

- **Step 1**, keep in the force the shaft and introduce it into the coupling (MAC).
- **Step 2**, make it so that the screws cope with the marks (**Rep1**) existing on the shaft ([for mounting of the impeller on the shaft](#) see page 26).
- **Step 3**, assemble and screw set screws by applying the tightening torques indicated on the chart ([figure 7: Table of tightening torques](#) on page 28).

Figure 4: Cylindrical coupling

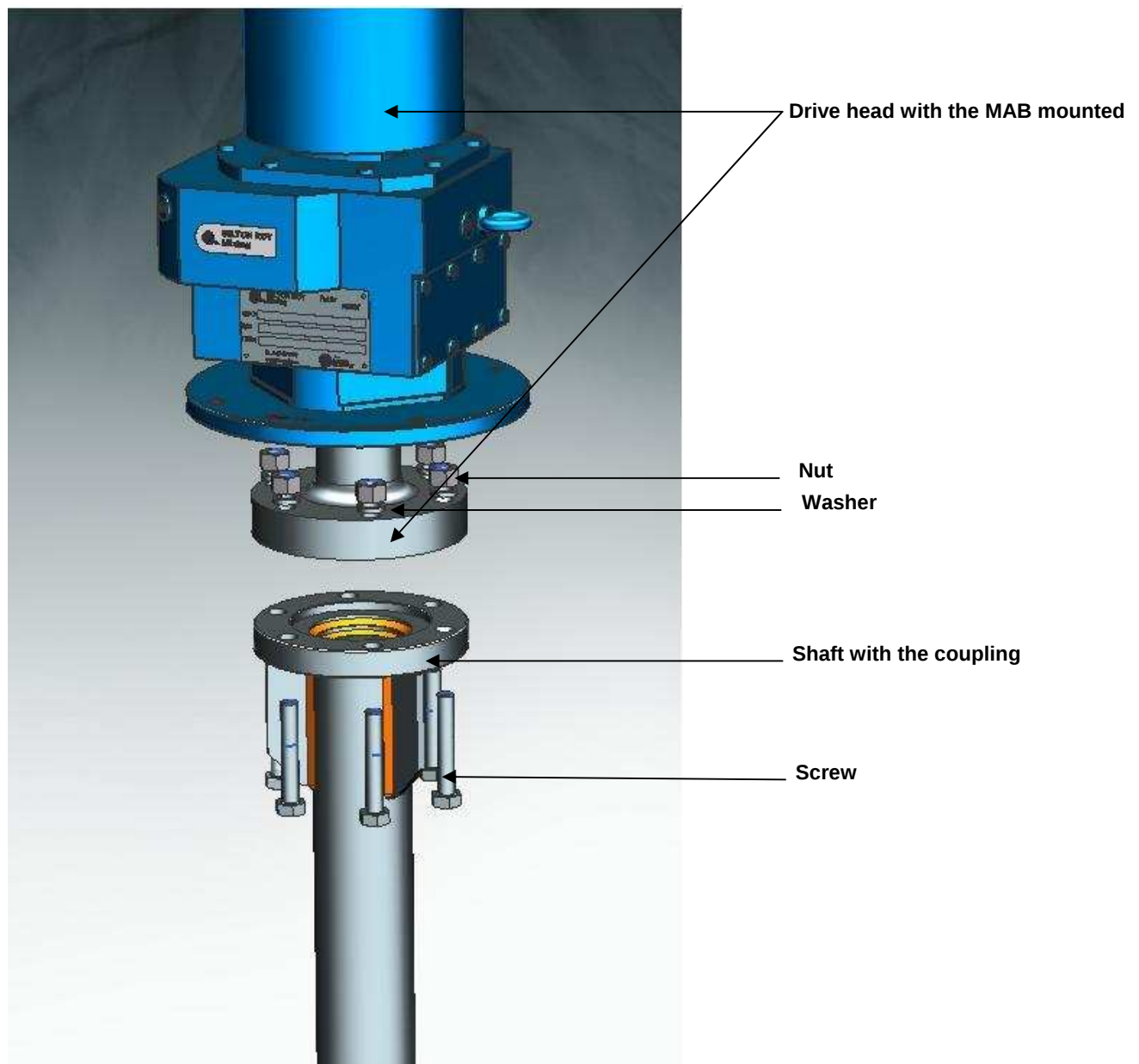


➤ **With the flange coupling (MAB):**

For this configuration, the shaft is equipped with a welded flange at one of its tips. The gear reducer is equipped meanwhile with a flange welded mounted on reducer shaft. This flange coupling (MAB) is, itself, already mounted on the drive head with the screw H.

To conclude the assembly on the shaft with the flange coupling it is necessary to:

- **Step 1.** approach the shaft at the drive head, taking care to respect the holes in the plate shaft with the flange coupling located on the drive head.
- **Step 2.** assembly the screws. Introduce the screws in the coupling of the shaft then in the flange coupling mounted in the drive head. Then, place a washer on each screw.
- **Step 3.** screw everything with bolting provided by Milton Roy Mixing.



Nota: In the case of covered agitator, the plate of the agitation shaft is equipped of bored holes: the assembly is carried out with **stud*** are fixed before hand on the plate of the shaft of agitation.

* Cf. glossary page 50

Then, proceed to setting the shaft using sling and mounting the U beam or wood beam required to maintain the shaft on the tank.

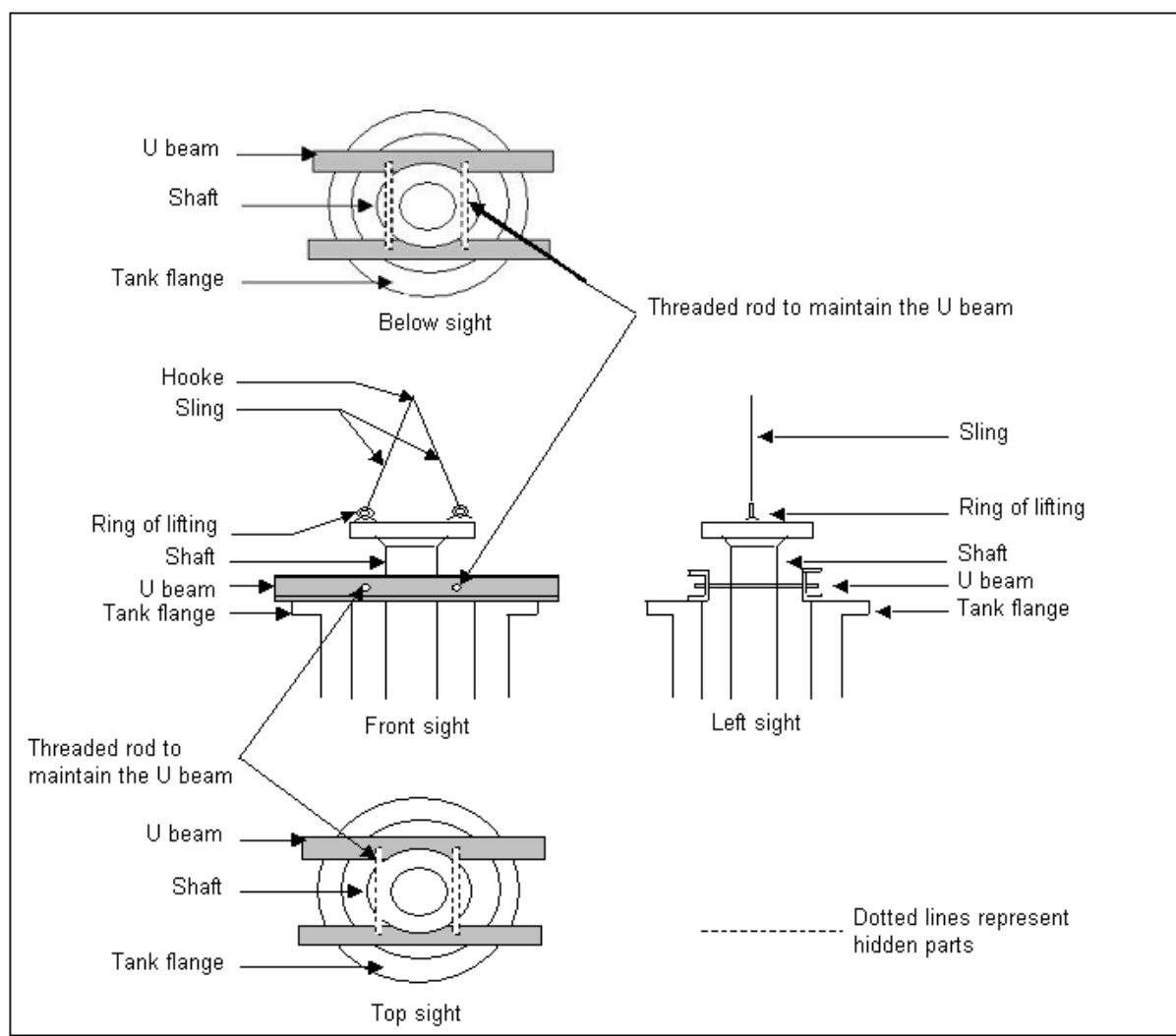
Put the tank gasket if needed before connecting the drive head and the shaft (out of supply of MILTON ROY MIXING).

D) FIXING THE SHAFT ON THE TANK FOR MOUNTING

Caution: Put a protection between the tank flange and the U beam in order to not to damage the flange.

Fix rings on the shaft flange.

Figure 5: Overall sight



E) MOUNTING OF THE MIXER ON THE TANK SUPPORT.

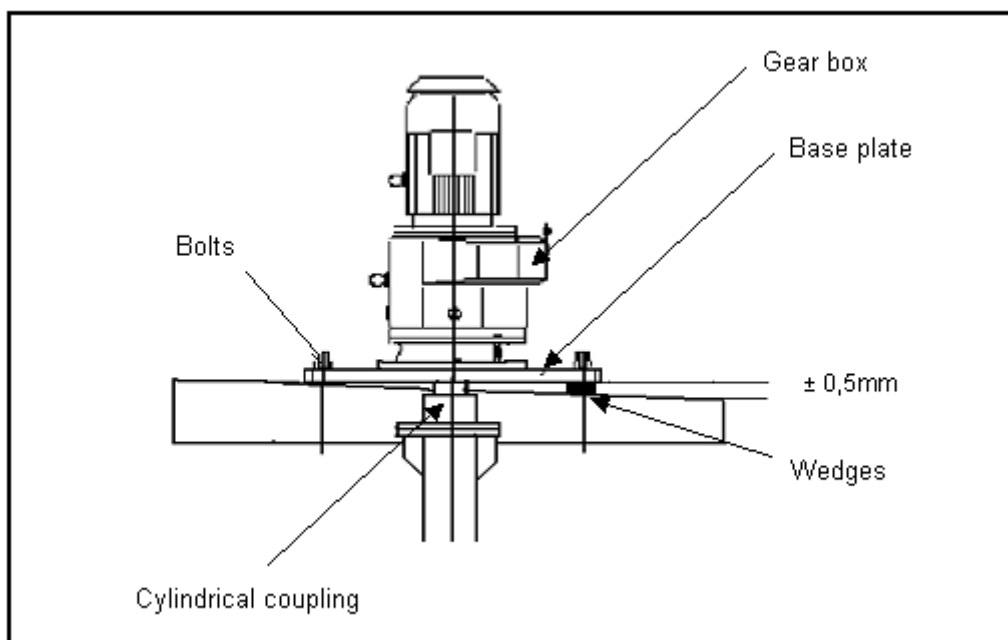
a) Assembling principle

Check the horizontality of the tank support, as following:

- Put the mixer on the support.
- Make a perfect horizontality with the help of wedge, for not putting out of shape the flange (see [figure 6](#)). The wedge set will be adjusted to get a horizontality $\pm 0.5\text{mm}$.
- The total horizontality default must be less than 2mm/m
- Check the horizontality in two directions.
- Use a level gauge suitable for the tolerance.

Assemble and screws the bolting in accordance with chart page 28.

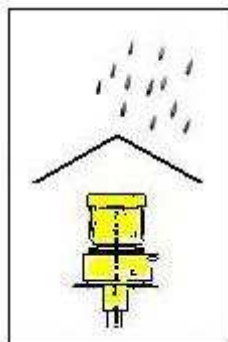
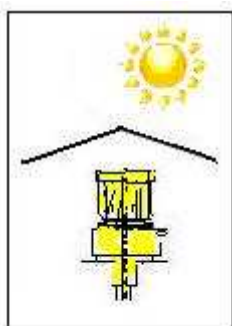
Figure 6: Fitting the base flange on the support



The torque bolting is depending of the bolting material (recommended material: steel cl. 8.8), or a fixation with a chemical plug capable to resist to the force due to the torque bolting of a material cl. 8.8.

For the attachment of the agitator on a concrete slab, thought bolts should be used, as far as possible.

Caution: It is advisable to fit a rain cover on equipment installed outdoors.



b) Steps of assembling.

This is to follow up after proceeding on mounting of [figure 6](#) (page 23):

STEP 1

Introduce the lower shaft into the tank, and put it on two U beams or wood beams, according to the weight to support.

The two parallel beams must be maintain with a set of threaded rob.



Make sure the equipment can't fall down.

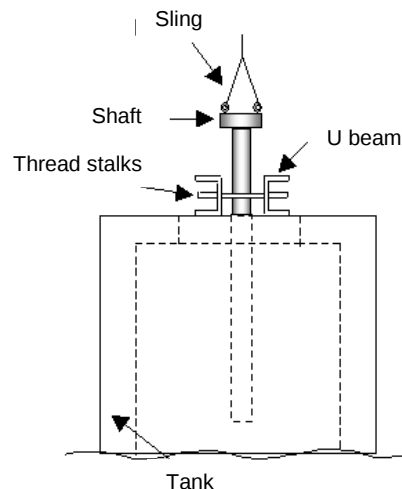


Figure 6.a

STEP 2

Take out the slings and lifting rings.

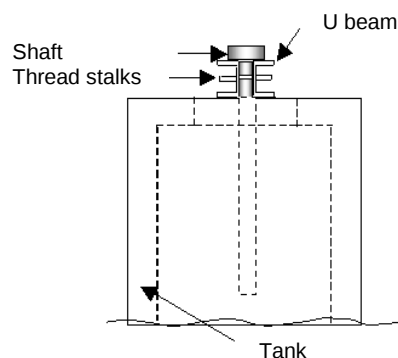


Figure 6.b

STEP 3

Pull up near the drive head on top of the tank, keep the slings carefully to maintain the drive in a vertical position

Clean all faces that will be in contact.

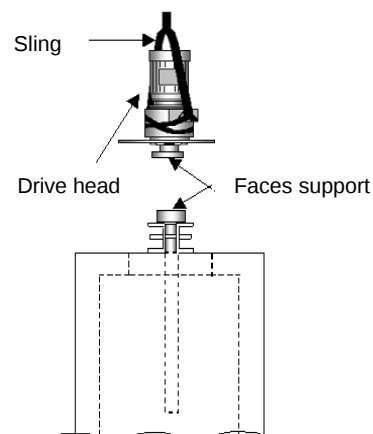


Figure 6.c

STEP 4

Assemble the 2 flanges with 2 bolts minimum, or 2 screws with counter bolt or with tole retention.
The 2 bolts must be at 180° of each other.

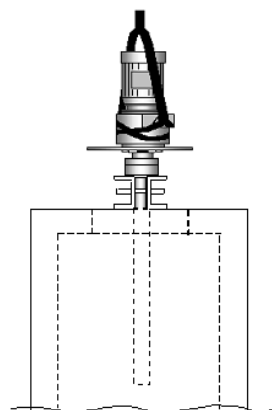


Figure 6.d

STEP 5

Lift up slightly the whole mixer.
Take out the beams.

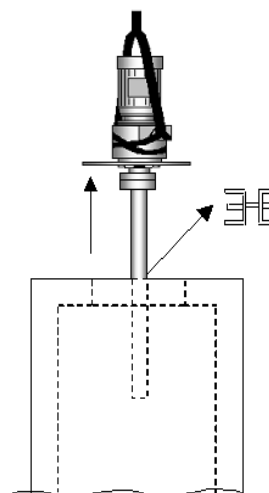


Figure 6.e

STEP 6

Come down carefully and let the mixer flange holes in front of the tank support holes.

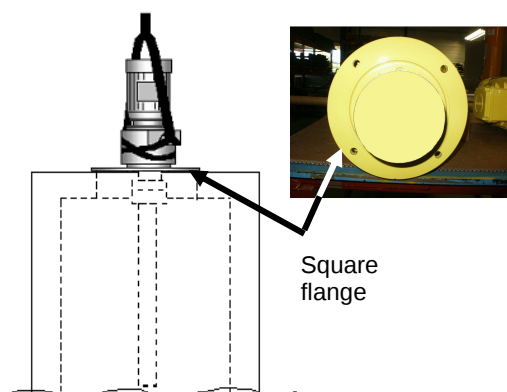


Figure 6.f

F) MOUNTING OF THE IMPELLER ON THE SHAFT

Fitting impeller on the agitator shaft can be facilitated by assembling them at the bottom of the tank (depending on the dimensions of the elements and/or the installation).

When the impeller is located at too great distance from the bottom, use a scaffold.

Please see the [figure 1](#) (page 12) and the [figure 16](#) (page 47 to 49) to locate the impeller [E] on the shaft[S] at the right position. Check the impeller direction of blowing (down or up).

Generally, place the impeller a few centimeters from the tip on the shaft.

See the above label roped on the impeller.

Label roped on the impeller blade for the indication of the rotation direction.

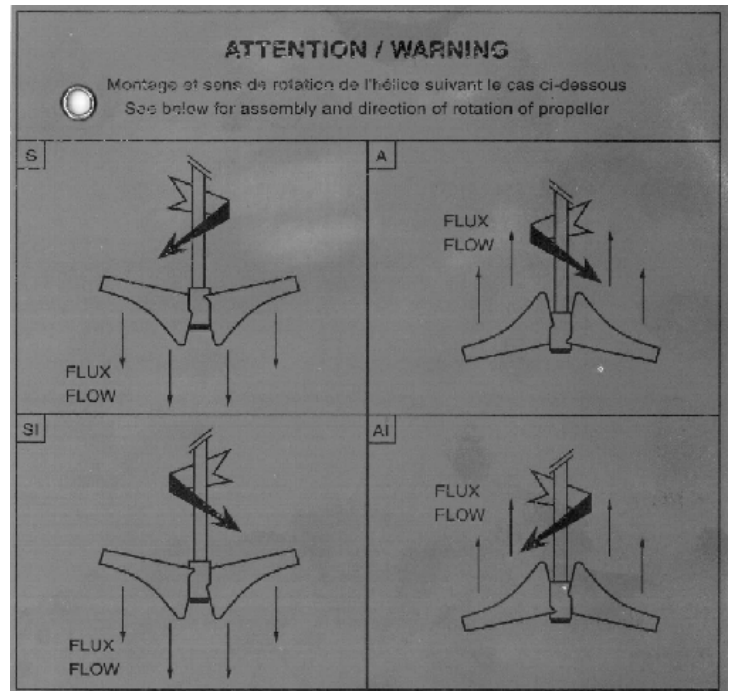
Code is:

S → blowing down, with CW rotation

A → blowing up (sucking), with CCW rotation

SI → blowing down, with CCW rotation

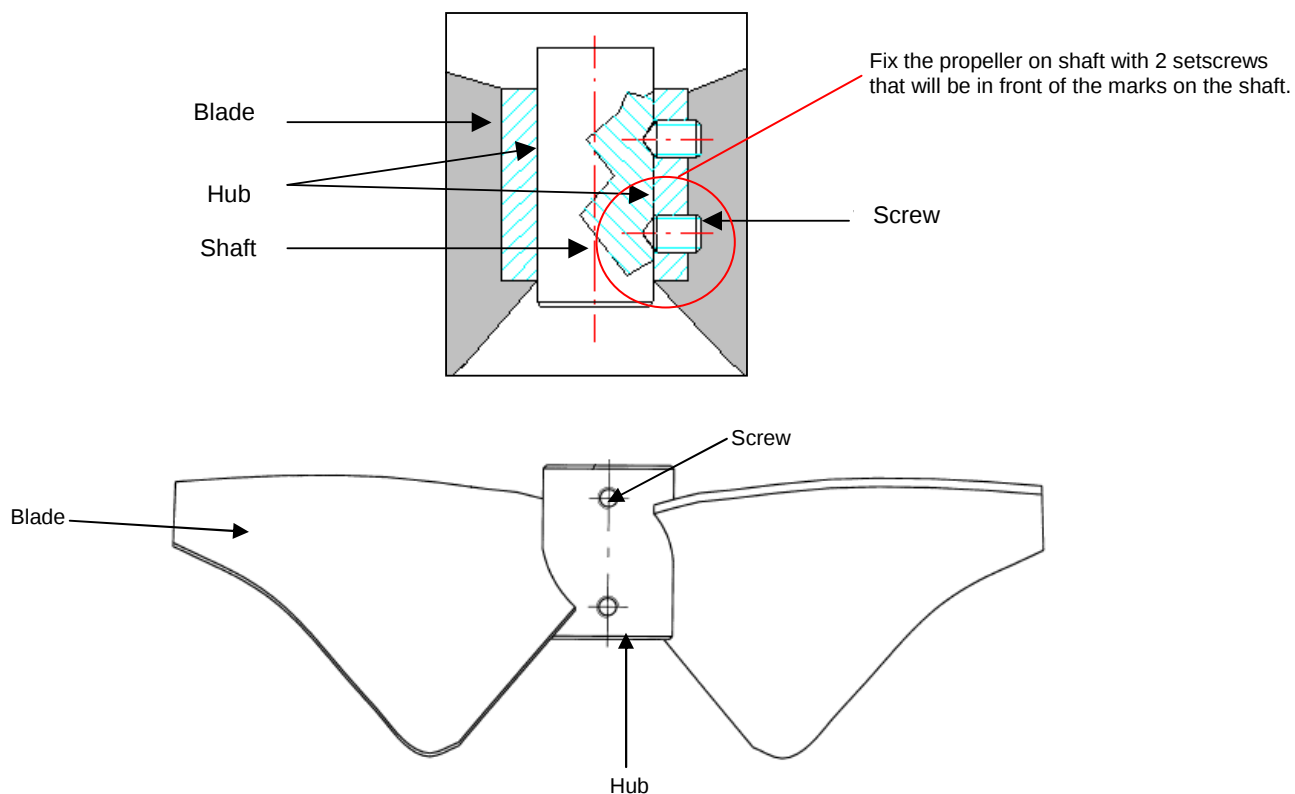
AI → blowing up, with CW rotation.



Check the impeller position from the tank bottom and the tank wall.

Impeller could be welded on hub (in one part) or in 2 or 3 parts. Indeed, the number of hub part varies according to the number of baffles on the impeller.

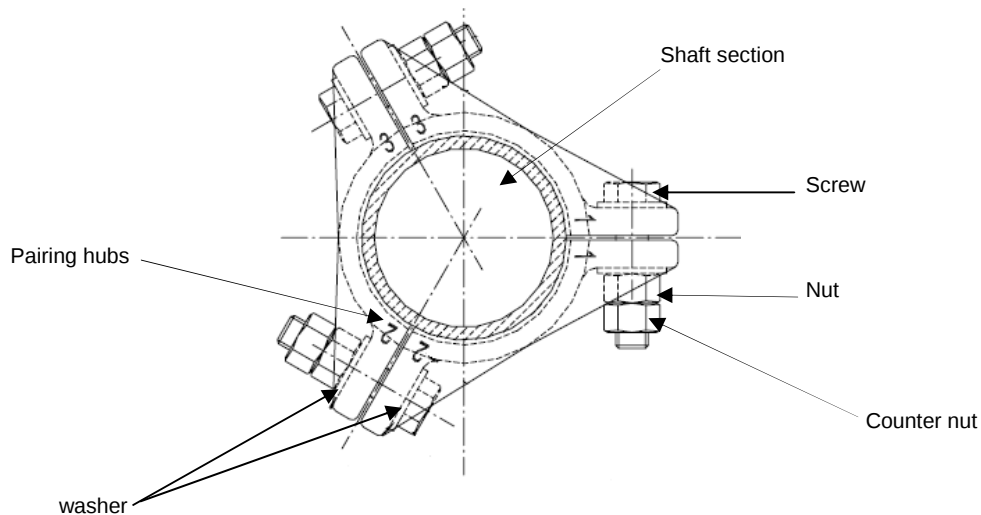
➤ **Impeller welded on a hub (Mixer with cylindrical coupling)**



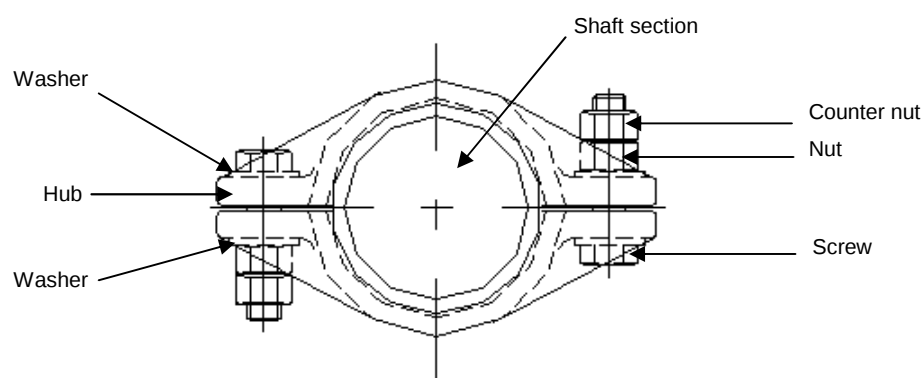
➤ **Impellers mounted on hub into two or three parts:**

They are fixed on the shaft by assembling the parts of hubs together thanks to bolts (screw, nut and counter-nut). Not to forget in this case the counter-nuts.

Example with hub in three parts



Example with hub in two parts



Block by applying the tightening torque indicated to the table hereafter to the nut and the counter nut.

Nota: in the case of coated agitator, the impellers are welded onto the shaft in a final way.

TIGHTENNING TORQUES

The values indicated in the table below are defined for screws or bolts in a new and lubricated condition.

Figure 7: Table of the tightening torques

Dimensions	Tightening torque		
	Fixing bolts in stainless steel A4-70	Fixing bolts in steel type 8.8	Fixing screw in steel type 8.8 or in stainless steel A4-70 with yield stress ≥ 210 MPa
M6	7 m.N	10 m.N	3 m.N
M8	16 m.N	23 m.N	7 m.N
M10	33 m.N	47 m.N	15 m.N
M12	57 m.N	81 m.N	26 m.N
M14	91 m.N	130 m.N	42 m.N
M16	137 m.N	195 m.N	64 m.N
M18	186 m.N	265 m.N	87 m.N
M20	267 m.N	380 m.N	124 m.N
M24	470 m.N	650 m.N	200 m.N
M27	686 m.N	950 m.N	300 m.N
M30	866 m.N	1200 m.N	370 m.N

1daN=10N

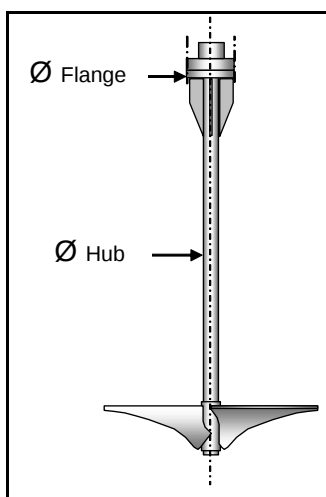
Bolting of coupling and impeller are supplied with the equipment. Please check the following tables to not to reverse the bolting. Moreover, please measure in our agitator the dimension of our flange and our shaft.

Figure 7.a

Flange coupling		
Ø flange	Number of screw	Nuts
125	4	H-M12x065/30
140	4	H-M12x065/30
175	6	H-M16x090/38
215	6	H-M16x090/38
225	6	H-M16x090/38
310	6	H-M24x120/54
425	8	H-M30x190/72

Figure 7.b

Hub			
Ø shaft	Number of screw		Nuts
	Hub 2 pieces	Hub 3 pieces	
Ø 60.3	4	6	H - M12x55/55
Ø 88.9	4	6	H - M14x60/60
Ø 114.3	4	6	H-M16x70/70
Ø 141.3	4	6	H-M18x80/80
Ø 168.3	4	6	H-M20x90/46

Figure 7.c


II - 3. ELECTRICAL INSTALLATION

 **Warning:** Electrical wiring must be proceeded by a professional according to the safety regulation.

Read the name plate data.

Check the right accordance of the supplying (frequency, amps, voltage) with the motor data.

The electrical protection (fuse...) must be in accordance with the nominal amperage of the motor.

Connect the motor wiring according to the indication located into the terminal box (figure 8), without forgetting the ground connection (PE).

For a 230 / 400 V motor, the 230 V connection is with a delta connection Δ (figure 9) and for the 400V use the star connection Y (figure 10).

For a 400 / 690 V motor, the 400 V connection is with a delta connection Δ , (figure 9) and for the 630V use the star connection Y (figure 10).

Fill up in tightening conditions any connection hole not in use to avoid the moisture introduction.

Nota: After a long storage or stop, check the right resistance between the wiring coil, each phase to phase resistance and phase to ground resistance.

Figure 8 : Motor terminal box

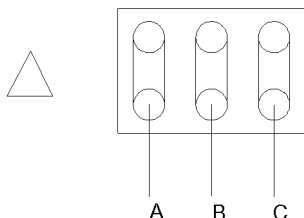
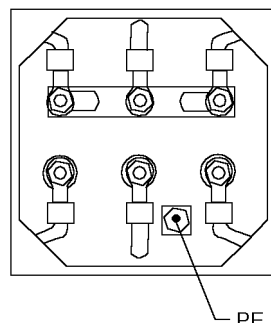
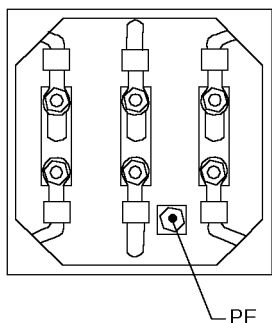


Figure 9 : 230 V delta connection

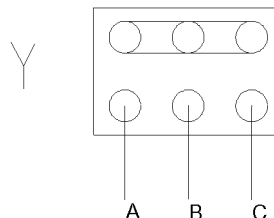


Figure 10 : 400 V star connection

Sum up part II

► Handling

1. Any damage of the paint may involve the cancellation of guarantee.
2. The handling of the shaft must be on vertical position.
3. Checking the right balancing of weight prior lifting.
4. The handling of the shaft and the motor is done a sling.

► Setting up

1. Checking the cleanliness of the agitator.
2. Checking of right condition of parts.
3. The agitator must be on center of the tank.
4. Recommendation of baffles in the tank.
5. Bring the right tools.
6. Setting up of the cylindrical coupling :
 - D) the shaft is introduced on the cylindrical coupling,
 - E) checking of the screws position with marks on the shaft,
 - F) checking of the tightening torques.
7. Setting up of the flange coupling:
 - G) approach the shaft at the drive head,
 - H) introduce the screws then the washers,
 - I) screws everything with nuts.
8. Use of U beams for immobilization of the shaft on the tank.
9. Verification of the right horizontality of the tank support.
10. Checking of fixing of the tank support.
11. Verification of the fitting mixer.
12. Verify the impeller direction of blowing (down or up).
13. Place the impeller preferably a few centimeters from the tip of the shaft.
14. Verification of the impellers fixation on shaft.
15. Checking of all dimensions of the mixer.

► Electrical installation

1. Verification of the conformity of the manufacturer plates.
2. Verification of electrical intensity.
3. Verification of electrical connections.
4. Checking that the connection hole not in use are plugging.

PART III – START UP

III - 1. PROCEDURES BEFORE START UP

Caution: Use the safety rules on electrical connection, add on the electrical cabinet and start button a label indicating for example “an operator is proceeding to a maintenance on the mixer, do not plug in, do not touch”; “LOTO”.

Check the various attachment fittings and check that the screws are locked (see Part II - 2. “Fitting”)

- Check that no any obstacle is in the way of the rotation of the mixer.
- Check indication on the name plate.
- Check the good accordance between motor voltage, frequency and the supply.
- Check the right rotation direction (depending on option).
- In case of a frequency variator, check the maximal rotation speed indicated on the drawing cannot be over passed (depending on option).
- Check all electrical connection that must be strongly fixed and that all safety checking measurement devices are correctly connected.
- Check that all additional devices on the mixer and around it are correctly fixed.
- Check that all cooling exhaust opening are cleaned.
- Check that the motor is well fixed.
- Check that protection devices (ground connection on the mixer) are well adapted
- Check that the terminal box is closed and that stuffing box around wiring are in good conditions.

Nota: All HELISEM® agitators are delivered full of oil.

- Put in place the **vent valve*** on the gear reducer, in place of the seal cap (**Exception of gear reducer ZF38/DF38, please see p 45**). The vent valve is provided in the box “bolting for the MAB assembling”, see page 10.

**Cf. glossary page 50*

Nota: If the agitator is used in a dusty area or where there is a risk of wind-blown sand, a special filter is required. Please consult us for this purpose.

- Check the oil level in the reduction gear [R]. for this you need to do:
 - **Step 1.** Unscrew the oil level plug [2] and check that the oil reaches the level of the bore in the plug.
 - **Step 2.** Top up via the filler plug [3], if necessary, in order to obtain the volume recommended (for know the oil level recommended see the manufacturer id. plates).
 - **Step 3,** Screw plugs [2] and [3] back into place.

Caution: Remove any overflowed oil immediately with a suitable degreasing agent for the operating conditions.

Nota: for gear reducer ZF38 and DF38, there is not drain plug. The lubrication is adapted to the life of the gear box. No oil change is necessary, just check the right oil level and add some oil if any. The oil, in case of any maintenance, can be extracted by sucking it under vacuum.

- Fill the tank until the impeller part is submerged.

ATTENTION: Do not run the agitator device continuously if the mobile part is partially submerged.

CHECK THE ELECTRICAL CONNECTION OF THE MOTOR

Start up the agitator in order to check the direction of rotation of the motor. The direction of rotation of the propeller must comply with the direction indicated by the arrow marked on the housing. To reverse the motor's direction of rotation, stop the agitator and invert A and B or A and C ([figure 9 or 10 page 30](#)).

III - 2. First start up

- Once all the checks and procedures described in the previous chapter have been carried out, start up the agitator.
- For the agitators used for the treatment of waste water in the presence of sludge threads it is regularly necessary to put on the agitator the other way around during some times.
- Check visually and by hearing (in particular, check that there is no suspicious noise).
- Stop the mixer.
- Fill the tank up at its operating level and check that there is no any obstacle in the tank
- Start up the mixer.

CHECK ON AMPERAGE

Check the current on the three phases with a clamp-on amps tester when the liquid is in motion and compare the reading with the voltage indicated on the motor identification plate.

III - 3. FAILURES ON START UP**PROBLEMS WITH MOTOR**

- **The motor runs with difficulty and heats up**
 - One phase is incorrectly connected.
 - The characteristics of the electrical power supply do not match the specifications of the motor.
 - The electrical connection used is not suitable (type Star – Delta).
- **The gear box overheats**
 - There is an insufficient quantity of lubricating oil (see [Part III - 1. Procedures before start up](#) on page 32).

III - 4. OPERATION

During operation, the following should be checked:

- Normal operating temperature,
- Modification of noise.
- Any oil leakage.

These checks are described in [Part III – 5 “Checks and maintenance operations schedule”](#) next page.

If a default is detected during operation, the motor must be stopped.

To determine the cause of the dysfunction, see the [Part IV 1-5 “Tracing causes of failure”](#) on page 39.

If there is any problem to identify the cause of the dysfunction or in repairing it, contact your usual technical support service (see details at the end of this manual).

III - 5. CHECKS AND MAINTENANCE OPERATIONS SCHEDULE

The programme of checks and maintenance operations depends on the conditions in which the equipment is used. For this reason, the following frequencies of maintenance are given as an example only. Individual users should adapt these frequencies to their own specific operating conditions.

Figure 11: Table of maintenance program

When	Check	Servicing action	See
Every month	Check by ear (for worn bearings opinions) If unsatisfactory ->	Remove the motor reducer for overhauling	Part IV -2 Page 42
	Check the extent of soiling of the motor fan If necessary ->	Clean the motor fan	Part IV 1-2 Page 37
Every 3 months	Check the oil temperature (max. as in Chapter V - 3) If incorrect ->	Check - date of last oil change - fouling of the oil - If the motor fan is soiled	Part IV 1-4 Page 38
Every 2,500 hours	Check the oil level in the reduction gear casing - If incorrect ->	Trace the oil leak	Part IV 1-3 Page 37
Every 5,000 hours		Change the oil in the reduction gear	Part IV 1-4 Page 38
At least once a year	Check the relevant locking of all bolting.		Part IV 1-1 Page 37

A model maintenance sheet is shown in Figure 12 to help you with your servicing actions (checking or maintenance operations).

Agitator code :
Contract No :
Date of the first start up :

[illegible]

Sum up part III

► Procedures before Start up

Before starting the agitator:

1. Visual inspection of the agitator:
 - J) the fitting and locking of screws,
 - K) the direction of rotation,
 - L) the electrical connections,
 - M) the additional devices,
 - N) the cooling exhaust opening,
 - O) the fitting of the motor,
 - P) the closure of the terminal box.
2. Check that the vent valve has been put.
3. Checking of the oil level of the gear reducer.
4. Filling the tank.
5. Control of the electrical connections.

► First start up

1. Start up the agitator.
2. Checking visually and by listening.
3. Stop the agitator.
4. Filling the tank
5. Start up the agitator again.
6. Control the electrical intensity.

► Failures at the start up

Problems with the motor:

- Q) Checking of phase connection.
- R) Checking of motor characteristics.
- S) Checking of the electrical connection.
- T) Checking of the oil level in the housing of the reducer.

► Operation

1. Checking of operating temperature.
2. Checking of noise modification.
3. Checking of any oil leakage.

► Checks and maintenance operations schedule

1. every month :
 - check by ear
 - check the extent of soiling of the motor fan
2. Every 3 months:
 - checking of the oil temperature
3. Every 2,500 hours:
 - checking of the oil level in the housing of the reducer
4. Every 5,000 hours:
 - change oil in the reduction gear
5. At least once a year
 - checking of the relevant locking of all bolting

PART IV - MAINTENANCE

Maintenance operations are concerning the Helisem® range of mixer.



Caution: Be careful, if your mixer has some particular option, the maintenance may be changed (special motor, lantern mounting, frequency inverter, good compatible oil...) please check the delivered additional manual or contact Milton Roy Mixing.

I BASIC MAINTENANCE

1-1. CHECKING THE LOCKING OF ALL BOLTINGS



ATTENTION: Switch off the agitator. Check that the equipment cannot be switched on accidentally. Put a notice at the location of the switch. (LOTO)

Check the various attachment fittings on the agitator and check that they are locked.

The locking torque is specified in the table in [Part II - 2 "Setting up"](#) on page 28.

Bad fixing assemblies are to be replaced with assemblies in the same quality.

1-2. CLEANING THE MOTOR FAN

This maintenance operation ensures good heat dissipation.

- **Switch off the agitator. Check that the equipment cannot be switched on accidentally. Put a notice at the location of the switch. (LOTO)**
- Remove all traces of soiling and dust. Do not use a high-pressure cleaning system or sharp tools.

1-3. CHECKING THE OIL LEVEL IN THE HOUSING OF GEAR REDUCER



Caution: Before any maintenance, please take account of the oil temperature. The oil temperature must be lower than 30°C.

Even in a short rotation period, let the oil settle few minutes to allow elimination of any air bubbles.

Caution: Wear protective gloves to avoid any burn during maintenance.



Switch off the agitator. Check that the equipment cannot be switched on accidentally. Position a notice at the location of the switch. (LOTO)

For check the oil level in the housing of the reducer it is necessary to:

- **Step 1**, unscrew the oil level plug and check that the oil reaches the bore of the plug.
- **Step 2**, fill up the housing if necessary (with suitable oil to the conditions of use) until the oil reaches the bore of the plug.

Caution: any overflow of oil must immediately be removed, using a degreasing agent suitable for the operating conditions.

- **Step 3**, check the good condition of the sealing ring, and change if required.
- **Step 4**, screw the plug back into place.

1-4. OIL CHANGE

* Exception of mixer with ZF38/DF38.



Before any maintenance, please take account of the oil temperature. The oil temperature must be lower than 30°C.

Even in a short rotation period, let the oil settle few minutes to allow desaeration of the oil. But for a complete draining of oil, the oil temperature can be around 31°C to make the oil less viscous, before draining operation let the mixer rotate few minutes.

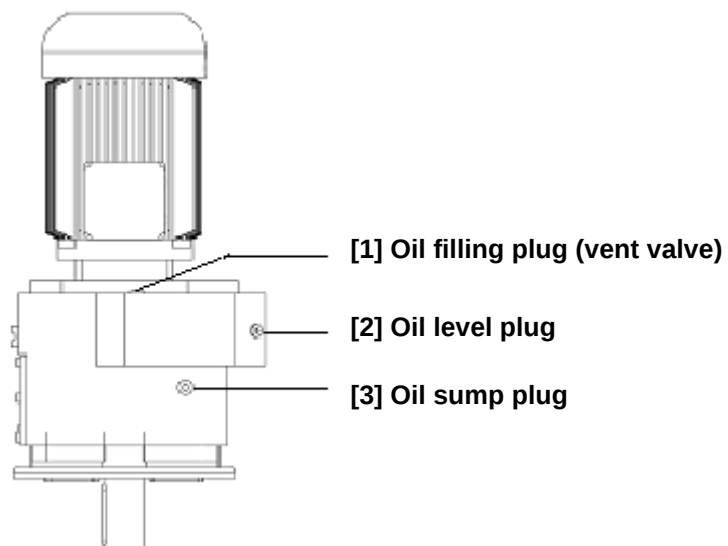
However, it would be better that the oil is warm in order to facilitate its fluidity and its draining off. For this, let the reducer work during 15 in 30 minutes to warm up.

Drain the oil every 5,000 hours. Wear protective gloves to avoid any burn during maintenance.



*the reducer oil degrades our environment, please collect waste oil carefully and send it to a central waste treatment. It is the same for waste dusters of cleaning by oil.

Oil change of the reducer



Before starting this operation switch off the agitator. Check that the equipment cannot be switched on accidentally. Position a notice at the location of the switch. (LOTO)

1) Oil change of the gear reducer

To proceed at the oil change of the gear reducer it is necessary to:

- **Step 1**, put a suitable container under the oil sump plug [3].
- **Step 2**, unscrew the plug [3] and let to run the oil entirely in the container. The housing must be perfectly cleaned of any oil residue or particles.
- **Step 3**, screw the oil sump plug back into place.

2) Filling up of the reducer

To proceed at the filling up of the reducer it is necessary to:

- **Step 1**, unscrew the oil level plug [2] and the oil filling plug [1].
- **Step 2**, to fill up the housing, it is advisable to pour the new oil through filter (with a suitable oil for the service conditions) until the oil reaches the level of the bore of the plug [2];
- **Step 3**, screw back the oil level plug and the oil filling plug into place.

Caution: Any overflow of oil must immediately be removed, using a degreasing agent suitable for the operating conditions.

Characteristics:

- Quantity: see the technical data sheet at the end of the manual.
- Original oil: mineral oil ISO VG 220 EP
- Room temperature : - 5°C à + 40°C
- Maximum temperature of oil during operation: 90°C
- Waste oil and polluted wipe must be collected into proper bins.

Equivalence table:

ELF	REDUCTELF 220
BP	ENERGOL GR-XP220
ESSO	SPARTAN EP220
SHELL	OMALA 220

1-5. TRACING CAUSES OF FAILURES

PROBLEMS WITH MOTOR

➤ The motor does not run

The thermal relay has been tripped.

- Too much amps due to:
 - Presence of filament,
 - Fibbers mixed bulk with too much viscosity or density.
- The motor is defective.
- Wiring is defective.

➤ The motor is difficult to start up or runs with difficulty

- The oil quality is not correct (viscosity).

➤ The motor heats up abnormally

- The motor fan is soiled.
- There is an insufficient quantity of lubricating oil: trace the leak.
- The quality of the lubricating oil is unsatisfactory. Check the date of the last oil change, the characteristics of the oil used and its degree of contamination.
- The agitator is used in conditions it is not designed for.

PROBLEMS WITH NOISY MECHANICAL ASSEMBLIES

- The clearance on bearings is too great or the bearings are worn (motor or reduction gear).
- The gearings are worn.

If the vent valve is not connected, following trouble can appear :

- Too high oil temperature
- Oil leakage

1-6. ORDERING SPARE PARTS

To make your order easier to register and to ensure that spare parts are delivered in the shortest possible time, please specify:

- The necessary data regarding the agitator: type [1] and contract number [2]. This data is given on the identification plate mounted on the motor casing (see figure below).
- The necessary data regarding the spare part: reference, description and quantity. These details are shown in the spare parts list.

Figure 13: Identification plate



MILTON ROY
Mixing



HELISEM®

TYPE

S/N

ITEM

①

②

③



TEL : 33(0)1 60 74 95 20

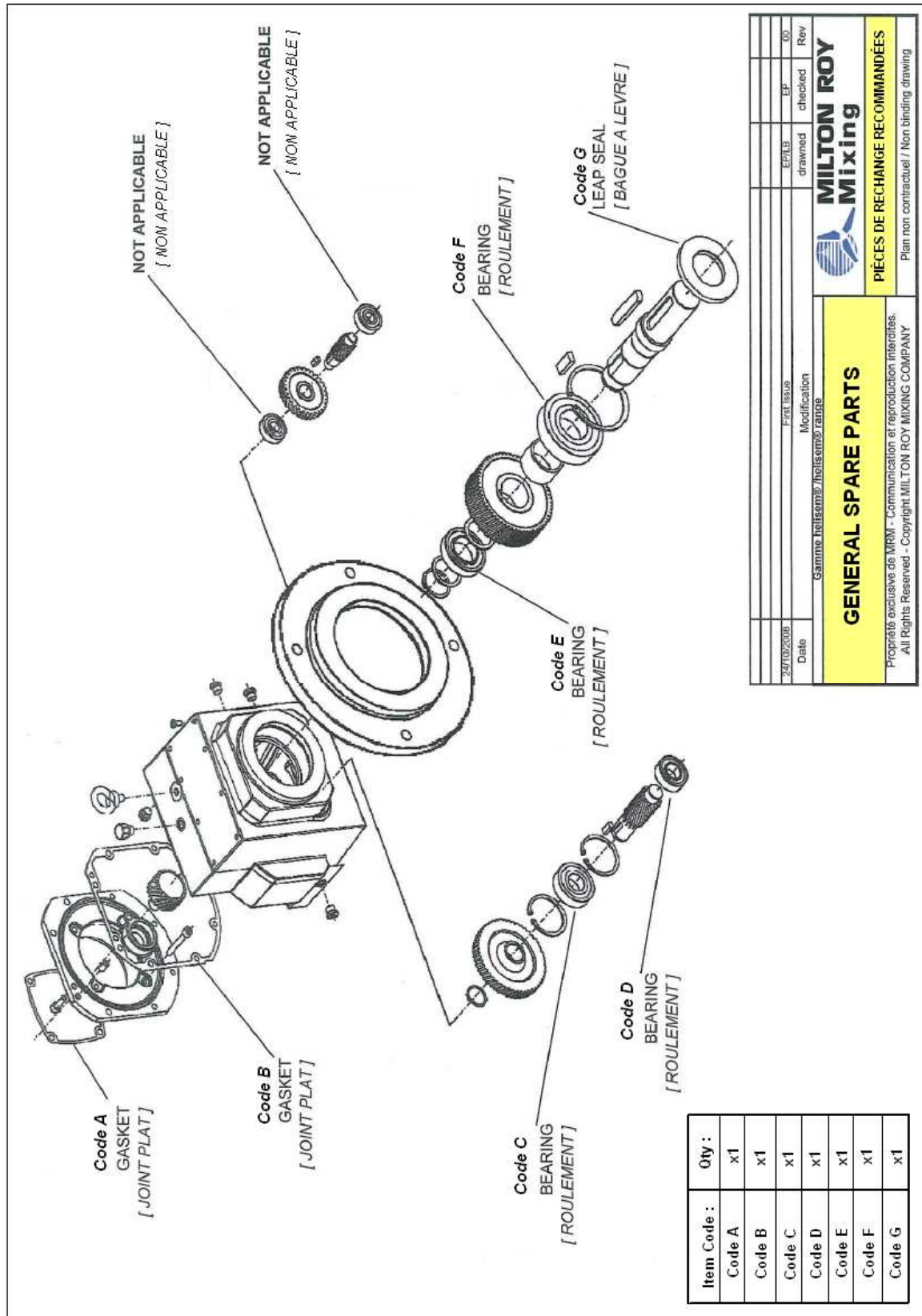
www.miltonroymixing.com

1	TYPE : Agitator Code
2	S/N : Serial or order N°
3	ITEM : your reference

Call the field service:

Tel: +33(0)1 60 74 95 25

1-7. SPARE PARTS RECOMMENDED



II – CORRECTIVE MAINTENANCE

2-1. MOTOR

GENERAL

➤ Precautions

Dry damp motors before starting up and have their insulation value checked by qualified personnel.

➤ Bearings

The motor bearings are life-lubricated and, therefore, require no servicing.

Any unusual bearing noise and high temperature on bearing seats indicates that the relevant bearings are in unsatisfactory condition.

REMOVING THE MOTOR

➤ REMOVAL

- **Switch off the agitator. Check that the equipment cannot be switched on accidentally. Put a notice at the location of the switch (LOTO).**
- Mark the connection of the motor before disconnecting the wires from the terminal box.
- Fit a sling around the motor reducer to handle it (see [Part II – 1. “Handling”](#) page 16).
- Remove the motor.

➤ REMOUNTING

See figure 14.

Tightening torques is indicated in [Part II - 2. “Setting up”](#) page 28.

- Reinstall the motor on the reduction gear unit. Assemble and lock by applying the torque specified in the table below.
- Connect up the motor, complying with the markings made before it was removed.
- Check the connection of the motor which must comply with the indication of the arrow on the casing (see [Part III – 1. “Section on checking the electrical connection”](#)).

2-2. REDUCTION GEAR OR MOTO REDUCER

REMOVING THE REDUCTION GEAR OR THE MOTO REDUCER

➤ REMOVAL

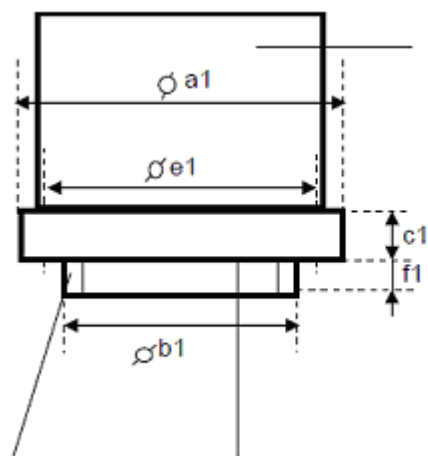
- **Switch off the agitator. Check that the equipment cannot be switched on accidentally. Position a notice at the location of the switch (LOTO).**
- Mark the connection of the motor before disconnecting the wires from the terminal box.
- Fit a sling to handle the agitator (see [Part II - 1. “Handling”](#) on page 16).
- Remove the bolting from agitator and support and install a shaft holding device.
- Lift up the agitator to gain access to the attaching screws and disconnect the agitator shaft (the coupling sleeve remains stays on the motor shaft).
- If applicable, drain the oil from the reduction gear and separate the motor from the reduction gear (fitted with the coupling sleeve).

➤ **REMOUNTING**

The required tightening torques are specified in [Part II - 2. "Setting up"](#) on page 28.

- If applicable, assemble the motor with the reduction gear. Assemble and lock by applying the torque specified in the table below.
- Handle the motor as described in ["Part II - 1.Handing"](#) (on page 16) and position it above its support.
- Secure the agitator shaft in the coupling sleeve.
- Secure the agitator onto its support.
- If applicable, fill the reduction gear casing with oil (see the section on lubrication of the reduction gear).
- Connect up the motor, complying with the markings made before it was removed.
- Check the connection of the motor which must comply with the indication of the arrow on the casing (see [Part III – 1. "section on checking the electrical connection"](#) on page 33).

Helisem® standard flange



Type*	a1	e1	b1	c1	f1
1	160	130	110	10	3.5
2	200	165	130	12	3.5
3	250	215	180	15	4
4	300	265	230	16	4
5	350	300	250	18	5
6	450	400	350	22	5

millimeter

* To know what type of flange you have, please refer part V

Sum up part IV

► **Checking the locking of all bolting**

1. Switch off the agitator and put a notice of caution. (LOTO).
2. Checking of various attachment fittings on the agitator.
3. Check that they are locked.

► **Cleaning the motor fan**

1. Switch off the agitator and put a notice of caution (LOTO).
2. Remove all traces of soiling and dust.

► **Checking the oil level in the housing of reducer**

1. Checking of the oil temperature prior any maintenance (30°).
2. Switch off the agitator and put a notice of caution (LOTO).
3. Recommendation of wear protective gloves.
4. Checking of the oil level in the housing of reducer.
5. Checking of the good condition of the sealing ring.

► **Oil change**

1. Checking of the oil temperature prior any maintenance (30°).
2. Switch off the agitator and put a notice of caution (LOTO).
3. Recommendation of wear protective gloves.
4. Execute the oil change every 5,000 hours.
5. Proceed to the oil change of the reducer.
6. Proceed to the filling up of the reducer.
7. Remove any overflow of oil.
8. Checking of the characteristics recommended.

► **Tracing with motor**

1. Motor problems:
 - checking of amps,
 - checking of density,
 - checking of wiring,
 - checking of the oil quantity in the housing of the reducer,
 - checking of the oil quality in the housing of the reducer,
 - checking the fan cleanliness,
 - checking of the use conditions of the agitator.
2. Mechanical problems:
 - checking of bearings,
 - checking of the gearings,
 - checking of the good utilization of the vent valve.

► **Ordering spare parts**

1. Checking of full information for ordering spare parts:
 - type and contract number,
 - reference, description and quantity.

PART V – TECHNICAL CHARACTERISTICS

V - 1. CODIFICATION

See the identification plate (figure 13) to get the agitator code.

Type of model: VRG.... A... / VRG....B... / VRG....S... / VRG....E... / VRG....H...

V - 2. CHARACTERISTICS OF THE RANGE MOTORIZATION

Figure 14: Characteristics of the range motorization

Power, kW	0.37	0.55	0.75	1.1	1.5	2.2	3	4	5.5	7.5
Speed, rpm	1390	1400	1400	1410	1400	1420	1430	1445	1450	1450
Voltage, V	220/380 ± 5% ; 230/400 ± 10% ; 240/415 ± 5%									
Degree of protection	IP55									
Tropicalization	Yes									
Insulation Class	F									
Heating	B									
Frequency, Hz	50									

V - 3. LUBRICATIONS OF THE RANGE REDUCERS

Figure 15: Volume of oil of the reducers range

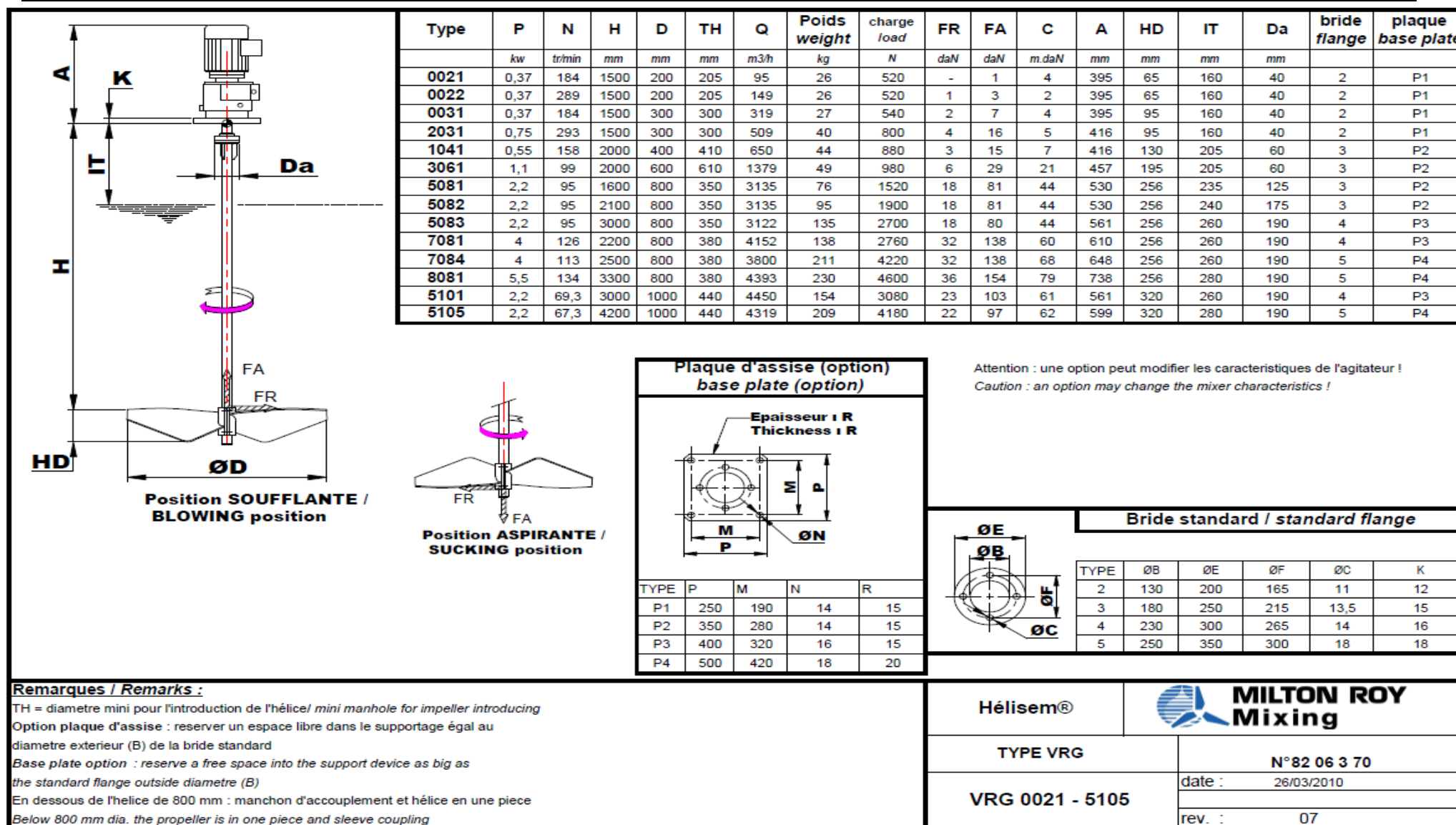
Type VRG....	0021; 0022; 0031 2032; 1041; 3061	5081; 5082	5083; 5084; 7081 7082; 7083; 7084 5101; 5102; 5103; 5104	8081; 5105; 7121; 7122	7123; 7124; 8141 8142; 8143	8144; 8145; 9161 9162; 9163; 9164 9165; 9181; 9182 9183; 9184; 9185
Type of montage	V1					
Volume of oil, l	0.8	1.8	3	6.8	12.8	18.5
Oil Quality	See part IV - 4.					

V - 4. CHARACTERISTICS OF THE AGITATORS OF THE RANGE

Nota: The values below are for standard version, please see tables hereafter.

For the agitators in the table below, the sides of the engine bearings are not removable. You will need to recommend a new engine.

AGITATOR	TYPE
VRG	0021S
VRG	0022S
VRG	0031S
VRG	1041S
VRG	2031S
VRG	3061S
VRG	5081S
VRG	5082S
VRG	5083S
VRG	5084S
VRG	7081S
VRG	7082S
VRG	7083S
VRG	7084S
VRG	7123S
VRG	7124S
VRG	8081S



Remarques / Remarks :

TH = diametre mini pour l'introduction de l'hélice/ mini manhole for impeller introducing

Option plaque d'assise : reserver un espace libre dans le supportage égal au diametre extérieur (B) de la bride standard

Base plate option : reserve a free space into the support device as big as the standard flange outside diameter (B)

En dessous de l'hélice de 800 mm : manchon d'accouplement et hélice en une piece

Below 800 mm dia. the propeller is in one piece and sleeve coupling

Hélisem®

TYPE VRG

VRG 0021 - 5105



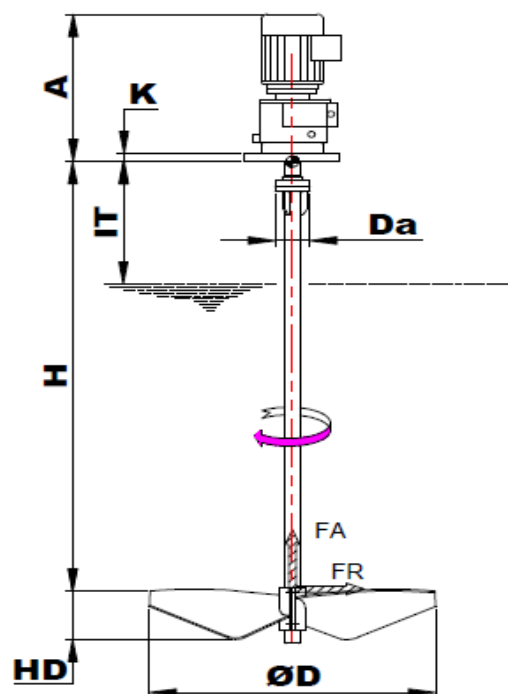
MILTON ROY
Mixing

N°82 06 3 70

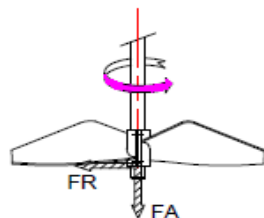
date : 26/03/2010

rev. : 07

Figure 16: Overall drawing and technical characteristics



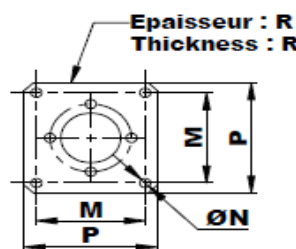
**Position SOUFFLANTE /
BLOWING position**



**Position ASPIRANTE /
SUCKING position**

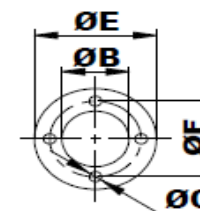
Type	P	N	H	D	TH	Q	Poids weight	charge load	FR	FA	C	A	HD	IT	Da	bride flange	plaque base plate
	kw	tr/min	mm	mm	mm	m ³ /h	kg	N	daN	daN	m.daN	mm	mm	mm	mm		
7121	4	63,7	2300	1200	520	7065	198	3960	39	176	120	648	384	280	190	5	P4
7122	4	63,7	3100	1200	520	7065	215	4300	39	176	120	648	384	280	190	5	P4
7123	4	63	3700	1200	520	6988	307	6140	39	172	121	681	384	300	220	5	P5
7124	4	63	4600	1200	520	6988	336	6720	39	172	121	681	384	300	220	5	P5
8141	5,5	53,3	2700	1400	520	9391	324	6480	51	226	197	771	448	300	220	5	P5
8142	5,5	53,3	3200	1400	520	9391	353	7060	51	226	197	771	448	300	220	5	P5
8143	5,5	53,3	4000	1400	520	9391	380	7600	51	226	197	771	448	300	220	5	P5
8144	5,5	53,4	4700	1400	520	9415	531	10620	52	227	197	823	448	340	300	6	P5
8145	5,5	53,4	5400	1400	520	9415	563	11260	52	227	197	823	448	340	300	6	P5
9161	7,5	47,7	2700	1600	710	12549	465	9300	69	306	300	823	512	340	300	6	P5
9162	7,5	47,7	3400	1600	710	12549	490	9800	69	306	300	823	512	340	300	6	P5
9163	7,5	47,7	4000	1600	710	12549	541	10820	69	306	300	823	512	340	300	6	P5
9164	7,5	47,7	4700	1600	710	12549	575	11500	69	306	300	823	512	340	300	6	P5
9165	7,5	47,7	5700	1600	710	12549	687	13740	69	306	300	823	512	340	300	6	P5
9181	7,5	39,7	3300	1800	820	14868	509	10180	75	338	361	823	576	340	300	6	P5
9182	7,5	39,7	3800	1800	820	14868	556	11120	75	338	361	823	576	340	300	6	P5
9183	7,5	39,7	4500	1800	820	14868	590	11800	75	338	361	823	576	340	300	6	P5
9184	7,5	39,7	5400	1800	820	14868	695	13900	75	338	361	823	576	340	300	6	P5

**Plaque d'assise
base plate (option)**



TYPE	P	M	N	R
P4	500	420	18	20
P5	600	500	18	20

Bride standard / standard flange



TYPE	ØB	ØE	ØF	ØC	K
5	250	350	300	18	18
6	350	450	400	18	22

Remarques / Remarks :

Attention : une option peut modifier les caractéristiques de l'agitateur !

Caution : an option may change the mixer characteristics !

TH = diamètre mini pour l'introduction de l'hélice/ mini manhole for impeller introducing

Option plaque d'assise : réserver un espace libre dans le supportage égal au diamètre extérieur (B) de la bride standard

Base plate option : reserve a free space into the support device as big as the standard flange outside diameter (B)

Hélisem®



MILTON ROY
Mixing

TYPR VRG

N° 82 07 3 70

VRG 7121 - 9185

date : 26/03/2010

rev.: 06

	Français	English	Deutsch	Espagnol
A	Hauteur tête	Drive height	Höhe der Antriebseinheit	Altura de la "cadeza"
ØD	Diamètre hélice	Impeller diameter	Durchmesser der Rührflügel	Diámetro hélice
Da	Diamètre accouplement	Coupling diameter	Durchmesser der Kupplung	Diámetro del acoplamiento
FA	Force axiale	Axial load	Axialkraft	Fuerza axial
FR	Force radiale	Radial load	Radialkraft	fuerza radial
H	Position hélice	impeller position	Lage der Rührflügel	Sitio del hélice
HD	Hauteur hélice	impeller height	Höhe der Rührflügel	Altura del hélice
IM	Immersion minimum	Minimum immersion	Min Eintauchen	Min inmersión
IT	Niveau de liquide max	Max liquid level	Höchststand der Flüssigkeit	Nivel máx del liquido
P	Puissance moteur	Rated power	Motorleistung	Potencia del motor
Q	Débit	Pumping flow rate	Durchfluss	Caudal
TH	Diamètre de passage	Man hole	Durchmesser der Montage	Mín. Paso montaje
	Vitesse	Rotation speed	Drehzahl	Velocidad
	Entraînement	Drive	Antrieb	Arraste
	Poids	Weight	Gewicht	Peso
	Diamètre centrage	Centring diameter	Durchmesser der Zentrierung	Diámetro del centrado
	4 trous sur diamètre	4 holes on diameter	4 Löcher auf dem Durchmesser	4 agujeros
	Diamètre extérieur bride	Outside diam of flange	Außendurchmesser der Flansch	Diámetro exterior de la brida
	Epaisseur bride	Flange thickness	Dicke der Flansch	Grossor de la brida
	Longueur d'arbre max	Maxi shaft length	Max Länge der Welle	Longitud máx del eje
M	Moteur	Motor	Motor	Motor
C	Accouplement	Coupling	Kupplung	Acoplamientos
S	Arbre	Shaft	Welle	Eje
E	Hélice	Impeller	Drehkörper	Roteres

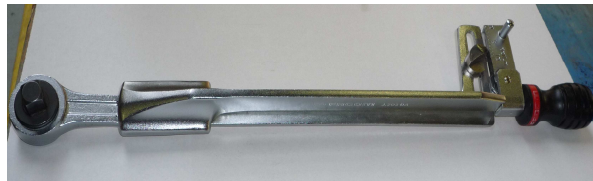
Français	English	Deutsch	Espagnol
Ne pas tourner à vide.	Do not run without liquid.	Ohne flüssigkeit nicht drehen.	No poder en marcha sin liquido.
Ne pas tourner durant la vidange et le remplissage.	Do not rotate during draining and filling.	Wenn entleerung oder füllen nicht drehen.	No poder en marcha durante el llenado o el vaciado.
Pour une réduction de la longueur d'arbre, nous consulter.	For a shorter shaft length, please consult Milton Roy Mixing.	Für eine reduzierung der wellenlänge, Milton Roy Mixing aufsuchen.	Para reducir el longitud del eje, contactar MRM.
Attention: une option peut modifier les caractéristiques de l'agitateur.	Caution: an option may change the mixer characteristics.	Achtung: eine option kann die leistungdaten der rührwerk ändern.	Cuidado: dimensiones, peso y fuerzas válidas que para la ejecución standard (sin opcionales).
TH: diamètre mini pour l'introduction de l'hélice.	TH: mini diameter for impeller introducing.	TH: mini durchmesser für die einföhrung der rührflügel	TH : min diámetro para la introduction de la hélice.
Option plaque d'assise : réserver un espace libre dans le support égal au diam ext. B de la bride.	Base plate option: reserve a free space into the support device as big as the standard flange outside diameter.	Halterung option: ein platz in der halterung aufsparen(gleich der außendurchmeter B der flansch).	Brida opcional: reservar un espacio libre en el soporte igual al diámetro exterior Bde la brida standard.

GLOSSARY

Vent valve: A vent valve is a mechanical devise that allows the balancing of pressure between air and oil during heating of cooling.



Torque wrench: this wrench allows the torque measurement during bolting.



Vortice: an hydraulic phenomenon that appears when the liquid is rotating (swirling) around an axis ,with a central depression due to the centrifugal effect, then the liquid surface becomes conical form.

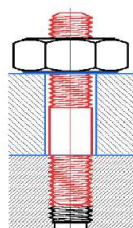
Drive head: a part of mixer out of tank composed of with motor, gear reducer, lantern...)



Filament: An assembling of fibbers, filament around the impeller hub to form a « ball » that increases the absorbed power.

Wood beam: piece of wood used to support the mixers shaft during erection.

Stud: Threaded bar that can be sealed in concrete. Look this picture.



GUARANTEE

The vendor guarantees his products according to the Milton Roy Mixing general conditions of sale.

The guarantee for components and sub-assemblies not fabricated by the vendor is limited to that given by the supplier.

The vendor's guarantee only covers the replacement or the repair, at his cost and in his factory, of all parts acknowledged by his technical services as being defective due to an error in conception, of material or of execution. It is the purchasers responsibility to prove the said defects.

The vendor reserves the right to modify all or part of his products in order to satisfy the guarantee. The guarantee does not cover charges arising from dismantling, assembly, transport and movements.

The replacement of one or several parts, for whatever reason, does not prolong the period of guarantee.

The guarantee is not applicable notably in the following cases:

- installation not in accordance with standard current practice.
- deterioration or accident resulting from negligence.
- lack of surveillance or maintenance.
- modifications to conditions of use.
- chemical corrosive or erosive attack. The proposed materials of construction are recommendations subject in all cases to verification and acceptance by the client. The recommendations, based on the experience of the vendor and the best available information, do not guarantee against wear or chemical action.

The guarantee will cease:

- if the storage of the material, out with the vendors factory, does not conform to his recommendations or to current standard practices.
- in case of work or dismantling of the material by someone who does not respect written recommendations of the instruction manual (when replacing wear parts).
- if parts from another origin are substituted for the original parts supplied by the manufacturer.

The purchaser cannot call on guarantee claims to justify differing payments.

INDUSTRIAL OWNERSHIP

This manual can only be used by the purchaser or the user. It cannot be distributed, published, reproduced (partially or totally) or generally communicated to third parties without the advance, formal written authorisation of the vendor.

Any breach of these rules may result in legal action being taken.

NOTES

DECLARATION OF INCORPORATION

F DECLARATION D'INCORPORATION D'UN SOUS ENSEMBLE CONFORME A L'ARTICLE 4 - PARAGRAPHE 2 ET A L'ANNEXE II PARTIE B DE LA REGLEMENTATION CI-DESSOUS DIRECTIVE "MACHINES" DIRECTIVE DU CONSEIL DU 14 JUIN 1989 (89/392 CEE) MODIFIEE LE 20 JUIN 1991 (91/368 CEE) MODIFIEE LE 14 JUIN 1993 (93/44 CEE) ET LE 22 JUILLET 1993 (93/68 CEE) CONCERNANT LE RAPPROCHEMENT DES LEGISLATIONS DES ETATS MEMBRES RELATIVES AUX MACHINES. Nous, MILTON ROY Mixing 77210 SAMOREAU FRANCE déclarons que le matériel désigné ci-après : a été conçu et fabriqué pour être incorporé ou assemblé dans une machine soumise à l'application de la directive "machines" désignée ci-dessus. L'installation, l'utilisation et la maintenance de notre matériel doivent être effectués suivant les règles de l'art et en respectant les prescriptions de la notice d'instructions. La contribution de notre matériel à respecter les exigences essentielles de la directive est limitée aux effets normalement attendus de ce type de matériel. Notre matériel ne doit être mis en service avant que la machine dans laquelle il est incorporé ne soit déclarée conforme aux dispositions de la directive.
GB DECLARATION OF INCORPORATION CONFORMS WITH THE ARTICLE 4 - PARAGRAPH 2 AND WITH APPENDIX II, PART B, OF THE REGULATIONS BELOW "MACHINES" DIRECTIVE DIRECTIVE OF THE COUNCIL OF JUNE 14, 1989 (89/392 EEC), MODIFIED ON JUNE 20, 1991 (91/368 EEC), MODIFIED ON JUNE 14, 1993 (93/44EEC) AND JULY 22, 1993 (93/68 EEC) CONCERNING THE APPROXIMATION OF THE LAWS OF MEMBER STATES RELATIVE TO MACHINES. We, MILTON ROY Mixing 77210 SAMOREAU FRANCE hereby declare that the equipment designated below : has been designed and manufactured to be incorporated or assembled in a machine subject to the application of the "machines" directive designated above. The installation, use and maintenance of our equipment must be performed according to recognized workmanship practices and while respecting the specifications in our instruction manual. The contribution of our equipment to the respect of the basic requirements of the directive is limited to the effects normally expected of this type of equipment. Our equipment is not to be put into service before the machine in which it has been incorporated has been declared to be in conformance with the provisions of the directive.
D EINBAUERKLÄRUNG IN KONFORMITÄT MIT ARTIKEL 4 - ABSATZ 2 UND MIT ANHANG II, TEIL B DER NACHSTEHENDEN BESTIMMUNGEN EG-MASCHINENRICHTLINIE RICHTLINIE DES RATS VOM 14.JUNI 1989 (89/392 EWG), ABGEÄNDERT AM 20.JUNI 1991 (91/368 EWG), ABGEÄNDERT AM 14.JUNI 1993 (93/44 EWG) UND AM 22 JULI 1993 (93/68 EWG) BEZÜGLICH DER ANNÄHERUNG DER GESETZGEBUNGEN DER MITGLIEDSSTAATEN AUF DEM GEBIET DES MASCHINENWESENS. Wir, MILTON ROY Mixing 77210 SAMOREAU FRANKREICH erklären, daß die nachstehend bezeichneten Gerätschaften : geplant und gefertigt wurden, um in einer von der oben genannten EG-Maschinenrichtlinie betroffenen Maschine ein- oder angebaut zu werden. Einbau, Verwendung und Wartung unserer Gerätschaften müssen fachgerecht und unter inhaltung der in der Gebrauchsanleitung enthaltenen Vorschriften erfolgen. Der Beitrag unserer Gerätschaften zur Einhaltung der wesentlichen Anforderungen der Richtlinie beschränkt sich auf die normalerweise von dieser Art von Ausstattungen erwarteten Auswirkungen. Unsere Gerätschaften dürfen erst dann in Betrieb genommen werden, wenn die Maschinen, in denen sie eingebaut sind, als konform mit den Anordnungen der Richtlinie erklärt wurden.
NL VERKLARING VAN INBOUW CONFORM ARTIKEL 4 - LID 2 EN BIJLAGE II DEEL B VAN HET HIERONDER VERMELDE REGLEMENT RICHTLIJN « MACHINES » DOOR DE RAAD VAN DE EUROPESE UNIE OP 14 JUNI 1989 UITGEVAARDIGD ALS EEG-RICHTLIJN 89/392, GEWIJZIGD OP 20 JUNI 1991 EN UITGEVAARDIGD ALS EEG RICHTLIJN 91/368, GEWIJZIGD OP 14 JUNI 1993 EN UITGEVAARDIGD ALS EEG RICHTLIJN 93/44 ALSMEDE OP 22 JULI 1993 EN UITGEVAARDIGD ALS EEG RICHTLIJN 93/68 INZAKE DE HARMONISATIE VAN DE WETGEVING DER LIDSTATEN BETREFFENDE MACHINES. De ondergetekenden, MILTON ROY Mixing 77210 SAMOREAU FRANKRIJK verklaren dat het hierna vermelde materiaal : ontworpen en vervaardigd is om te worden ingebouwd of geassembleerd in een aan de bovenvermelde richtlijn onderworpen machine. Installatie, gebruik en onderhoud van ons materiaal dient vakkundig en volgens de handleidingen plaats te vinden. Binnen normale grenzen voldoet dit materiaal aan de vereisten van de richtlijn. Ons materiaal mag niet in dienst worden gesteld voordat de machine waarin het moet worden ingebouwd conform is verklaard aan het in de richtlijn bepaalde.
I DICHIARAZIONE DI INCORPORAZIONE CONFORME ALL'ARTICOLO 4 - PARAGRAFO 2 ED ALL'ALLEGATO II PARTE B DELLA NORMATIVA SOTTO DESCRITTA DIRETTIVA "MACCHINE" DIRETTIVA DEL CONSIGLIO DEL 14 GIUGNO 1989 (89/392 CEE) MODIFICATA IL 20 GIUGNO 1991 (91/368 CEE), MODIFICATA IL 14 GIUGNO 1993 (93/44 CEE) E IL 22 LUGLIO 1993 (93/68 CEE) IN SEGUITO ALL'UNIFORMAZIONE DELLE LEGISLAZIONI DEGLI STATI MEMBRI RELATIVE ALLE MACCHINE. La società MILTON ROY Mixing 77210 SAMOREAU FRANCIA dichiara che l'apparecchiatura descritta di seguito : è stata progettata e fabbricata per essere incorporata o assemblata ad una macchina soggetta all'applicazione della direttiva "macchine" sopra descritta. L'installazione, l'utilizzazione e la manutenzione dell'apparecchiatura devono essere effettuate attenendosi alle regole d'arte e rispettando le procedure riportate nel manuale d'istruzioni. L'apparecchiatura rispetta le esigenze fondamentali della direttiva limitandosi agli effetti normalmente previsti da tale tipo di apparecchiatura. L'apparecchiatura non deve essere messa in funzione prima che la macchina a cui l'apparecchiatura è incorporata venga dichiarata conforme alle disposizioni della direttiva.
E DECLARACION DE INCORPORACION CONFORME AL ARTICULO 4 - APARTADO 2 Y AL ANEXO II PARTE B DE LA REGLAMENTACION SIGUIENTE DIRECTIVAS "MAQUINAS" DIRECTIVA DEL CONSEJO DEL 14 DE JUNIO DE 1989 (89/392 CEE) MODIFICADA EL 20 DE JUNIO DE 1991 (91/368 CEE) MODIFICADA EL 14 DE JUNIO DE 1993 (93/44 CEE) Y EL 22 DE JULIO DE 1993 (93/68 CEE) RELATIVA AL ACERCAMIENTO DE LAS LEGISLACIONES DE LOS ESTADOS MIEMBROS EN LO QUE RESPECTA A LAS MÁQUINAS. Nosotros, MILTON ROY Mixing 77210 SAMOREAU FRANCIA Declaramos que el material que a continuación se designa : fue diseñado y fabricado para ser incorporado o montado en una máquina sometida a la aplicación de la directiva "máquinas" anteriormente mencionada. La instalación, el uso y el mantenimiento de nuestro material deben efectuarse se conformidad con la normativa profesional y cumpliendo las prescripciones del manual de instrucciones. La contribución de nuestro material al cumplimiento de los requisitos esenciales de la directiva está limitada a los efectos que normalmente se esperan de este tipo de material. Nuestro material no debe ser puesto en servicio antes de que la máquina en la que va a montarse sea declarada acorde con las disposiciones de la directiva.

Dise Rev. E du 28/08/02 Responsable B.E. + responsable Qualité
 Dise Rev. F du 01/10/02 Robin Industries ... → MILTON ROY Mixing
 Dise Rev. G du 20/12/03 Document européen

Dise Rev. B du 20/12/96
 Dise Rev. C du 20/01/02 Directeur Industriel J.M. DULEY
 Dise Rev. D du 15/04/02 Directeur Général G. MENY

P	DECLARAÇÃO DE INCORPORAÇÃO CONFORME O ARTIGO 4 - PARÁGRAFO 2 E ANEXO II DA PARTE B DA REGULAMENTAÇÃO ABAIXO - DIRECTIVA "MÁQUINAS" DIRECTIVA DO CONSELHO DO DIA 14 DE JUNHO DE 1989 (89/392 CEE) MODIFICADA NO DIA 20 DE JUNHO DE 1991 (91/368 CEE) MODIFICADA NO DIA 14 DE JUNHO DE 1993 (93/44 CEE) E NO DIA 22 DE JULHO DE 1993 (93/68 CEE) NO QUE SE REFERE À APROXIMAÇÃO DAS LEGISLAÇÕES DOS ESTADOS MEMBROS RELATIVAS ÀS MÁQUINAS. Nós, MILTON ROY Mixing 77210 SAMOREAU FRANCE declaramos que o material designado em seguida : foi construído e fabricado para ser incorporado ou montado numa máquina submissa à aplicação da directiva "máquinas" designada acima. A instalação, utilização e manutenção do nosso material devem ser efectuadas segundo as regras da arte e respeitando as prescrições da nota de instruções. A contribuição do nosso material ao respeito das exigências essenciais da directiva é limitada aos efeitos normalmente esperados deste tipo de material. Nosso material não deve ser ligado antes que a máquina na qual ele é incorporado seja declarada conforme às disposições da directiva.
DK	ERKLÆRING OM INDBYGNING I OVERENSSTEMMELSE MED BILAG II AFSNIT B I NEDENSTÅENDE BESTEMMELSER "MASKIN"DIREKTIV RÅDETS DIREKTIV AF 14. JUNI 1989 OM INDBYRDES TILNÆRMELSE AF MEDLEMSSTATERNES LOVGIVNING OM MASKINER (89/392/EØF) OG ÆNDRET DEN 20. JUNI 1991 (91/368/EØF), DEN 14. JUNI 1993 (93/44/EØF) OG DEN 22. JULI 1993 (93/68/EØF). Underskrevne: MILTON ROY Mixing 77210 SAMOREAU FRANKRIG erklærer hermed, at nedenstående udstyr : er konstrueret og fremstillet med henblik på indbygning i eller sammenbygning med en maskine, for hvilken ovennævnte "maskin"direktiv finder anvendelse. Montering, drift og vedligeholdelse af dette udstyr skal foregå i henhold til god faglig praksis og de i vejledningen angivne forskrifter. Udstyrets medvirken til, at direktivets hovedkrav opfyldes, er begrænset til den indflydelse, der normalt kan forventes af denne type udstyr. Udstyret må ikke tages i brug, før maskinen, som det indbygges i, er erklæret i overensstemmelse med direktivets bestemmelser.
SW	INBYGGNADSINTYG I ENLIGHET MED BILAGA II DEL B I NEDANSTÅENDE BESTÄMMELSE "MASKIN"DIREKTIV DIREKTIV FRÅN RÅDET, DEN 14 JUNI 1989 (89/392 EEC) MODIFIERAT DEN 20 JUNI 1991 (91/368 EEC) MODIFIERAT DEN 14 JUNI 1993 (93/44 EEC) OCH DEN 22 JULI 1993 (93/68 EEC) RÖRANDE NÄRMANDE AV MEDLEMSSTATERNAS LAGSTIFTNINGAR FÖR MASKINER. Vi, MILTON ROY Mixing 77210 SAMOREAU FRANKRIKE intyggar att nedan beskriven utrustning : har konstruerats och tillverkats för att byggas in eller monteras i en maskin underställd tillämpningen av ovan nämnda "maskin"-direktiv. Utrustningen installeras, används och underhålls enligt konstens regler och enligt de beskrivningar som ges i användarinstruktionen. Vår utrustningsdels förmåga att respektera huvudkraven i direktivet är begränsad till det beteende som normalt förväntas av denna typ av utrustning. Vår utrustning får inte tas i drift innan maskinen i vilken den är inbyggd intygats uppfylla bestämmelserna i direktivet.
FIN	RAKENNETODISTUS ALLAOLEVAN MÄÄRÄYKSEN LIITTEEN II OSAN B MUKAISESTI KONEDIREKTIIVI NEUVOSTON DIREKTIIVI, 14. KESÄKUUTA 1989 (89/392 EEC), MUUTETTU 20. KESÄKUUTA 1991 (91/368 EEC), MUUTETTU 14. HEINÄKUUTA 1993 (93/44 EEC) JA 22. HEINÄKUUTA 1993 (93/68 EEC) KOSKIEN JÄSENVALTIOIDEN KONEISIIN LIITTYVIEN LAINSÄÄDÄNTÖJEN LÄHENTYMISTÄ. Me, MILTON ROY Mixing 77210 SAMOREAU RANSKA todistamme, että seuraavassa selostettu varustus : on suunniteltu ja valmistettu rakennettavaksi tai asennettavaksi koneeseen, johon sovelletaan em. konedirektiiviä. Varustus asennetaan, sitä käytetään ja huolletaan sääntöjen ja käyttöohjeissa olevien selostusten mukaisesti. Varustusosamme kykenee ottamaan huomioon direktiivin päävaatimukset siltä osin, mitä tämän tyyppiseltä varustukselta normaalisti odotetaan. Varustustamme ei saa ottaa käyttöön ennen kuin koneen, johon se on yhdistetty, on todistettu täyttävän direktiivin määräykset.
GR	ΔΗΛΩΣΗ ΕΝΣΩΜΑΤΩΣΗΣ ΣΥΜΦΩΝΑ ΜΕ ΤΟ ΠΑΡΑΡΤΗΜΑ II ΜΕΡΟΣ Β ΤΗΣ ΚΑΤΩΤΕΡΩ ΠΥΘΜΙΣΗΣ ΟΔΗΓΙΑ "ΜΗΧΑΝΗΜΑΤΑ" ΟΔΗΓΙΑ ΤΟΥ ΣΥΜΒΟΥΛΙΟΥ ΤΗΣ 14ης ΙΟΥΝΙΟΥ 1989 (89/392 ΕΟΚ) ΠΟΥ ΤΡΟΠΟΠΟΙΗΘΗΚΕ ΤΗΝ 20η ΙΟΥΝΙΟΥ 1991 (91/368 ΕΟΚ), ΤΗΝ 14η ΙΟΥΝΙΟΥ 1993 (93/44 ΕΟΚ) ΚΑΙ ΤΗΝ 22α ΙΟΥΛΙΟΥ 1993 (93/68 ΕΟΚ), ΠΟΥ ΑΦΟΡΑ ΤΗΝ ΠΡΟΣΕΠΙΣΤΗ ΤΩΝ ΝΟΜΟΘΕΣΙΩΝ ΤΩΝ ΚΡΑΤΩΝ ΜΕΛΩΝ ΣΧΕΤΙΚΑ ΜΕ ΤΑ ΜΗΧΑΝΗΜΑΤΑ. Η MILTON ROY Mixing 77210 SAMOREAU FRANCE δηλώνουμε ότι το παρακάτω περιγραφόμενο μηχανήμα : σχεδιάστηκε και κατασκευάστηκε για να ενσωματωθεί σε συναρμολογηθεί σε μηχανήματα που υπόκεινται στην εφαρμογή της οδηγίας "Μηχανήματα" που αναφέρεται ανωτέρω. Η εγκατάσταση, η χρήση και η συντήρηση του μηχανήματός μας πρέπει να πραγματοποιούνται σύμφωνα προς τους κανόνες της τεχνικής και τις οδηγίες χρήσης. Η τήρηση των βασικών απαιτήσεων της οδηγίας σε ό,τι αφορά το μηχανήμα, μας περιορίζεται στα αποτελέσματα που μπορεί να αναμενουμε από έναν τέτοιο τύπο μηχανήματος. Το υλικό μας δεν πρέπει να τεθεί σε λειτουργία πριν το μηχανήμα στο οποίο ενσωματώνεται δηλωθεί σύμφωνο προς τις διατάξεις της οδηγίας.

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 Products Manager
 Produkt Manager
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