



Biotech

Instructions for Use

USD3294

Allegro™ Magnetic Mixer Drive Unit

MMG403



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1. Explanation of Symbols



WEEE
Waste of Electrical and Electronic Equipment



CAUTION



HIGH VOLTAGE



PROTECTIVE EARTH
Ground



MAIN POWER SWITCH



CE CERTIFIED



STRONG MAGNETIC FIELD
May affect pacemakers



PACEMAKER OR OTHER MEDICAL DEVICE
Stay 33 cm (13 in) away until consulting with a physician

2. Safeguards & Precautions



1. Read and follow all instructions in this manual carefully, and retain this manual for future reference.
2. Do not use this instrument in any manner inconsistent with these operating instructions or under any conditions that exceed the environmental specifications stated.
3. Be sure the power supplied to this instrument matches the specifications indicated on the control box.
4. This instrument should not be lifted. If it is required to be moved, the device should be rolled on a flat surface.
5. If the drive unit is transported or stored in temperatures colder than the operating environment, it is necessary to wait 1-2 hours to equalize the internal temperatures of the drive unit before powering on.
6. Rotation at mixing action being interrupted because of mains fault or alarm generated will not restart upon restoring of working condition. Return to mixing action available only through intentional operator actions.
7. Prior to servicing the drive unit, always turn the power off using the ON/OFF switch on the front panel of the unit. Unplug and remove power cord to avoid tangling or breaking.
8. For full compliance with CE specifications, be sure the appropriate ground connection is made.
9. For technical assistance contact the sales organization from which you purchased the product or Pall Biotech directly.
10. Each magnetic mixer biocontainer contains a magnetic impeller, which is a source of strong magnetic field within close proximity (305 mm/12 in.) of the impeller. **PEOPLE USING ANY ELECTRONIC MEDICAL DEVICES, SUCH AS PACEMAKERS, SHOULD NOT BE INVOLVED IN THE CLOSE HANDLING OF MAGNETIC MIXER BIOCONTAINERS, IMPELLERS OR TEST IMPELLERS.**
11. Keep the supplied magnetic shields on biocontainers and impellers when not in use.
12. This instrument is not intended to be used with flammable liquids/substances or in hazardous atmosphere. Use of the magnetic mixer with flammable liquids/substances could lead to a fire, injury, or loss of life.
13. The machine is intended for indoor use in atmosphere not containing corrosive substances.
14. The frame and body of the machine consists of 304 stainless steel and may be cleaned with water and isopropyl alcohol.

NOTE: It is important to ensure the system is turned off before cleaning the device.



- DO NOT** open the machine or control box while the drive unit is plugged in.
- DO NOT** submerge the drive in water. The unit outer surfaces may be cleaned and sanitized by wiping with a mild detergent solution.
- DO NOT** position the machine in the way that power switch on face panel is difficult to operate.
- DO NOT** obstruct access to outlet where machine is plugged to power line. Keep point of connection visually and physically easy accessible.
- DO NOT** cut the ground plug.
- CAUTION** disconnect all power before servicing.
- WARNING** risk of electric shock.
- CAUTION** disconnection of the protective earth connector may impair the protection provided by the system.
- ATTENTION** mains outlet used to power the equipment must be within 3 meters of the device and easily accessible.

3. Introduction

The magnetic mixer single-use system contains a bottom mounted disposable magnetic impeller on a disposable bearing. The single-use magnetic impeller includes a proprietary bearing assembly designed to minimize particulate generation.

The complete magnetic mixer system consists of an interchangeable magnetic drive unit and proprietary magnetic impeller based biocontainers. The single-use Allegro mixing biocontainers are placed in either round plastic tanks (on a supporting dolly) or cubical or round stainless steel tanks. The drive unit docks with the dolly or stainless steel tank. The magnetic mixer drive unit is coupled with the Allegro mixing biocontainer through connection interface. The activation of the motor induces rotation of the in-biocontainer impeller resulting in the mixing action inside a closed biocontainer.

The coupling of the in-biocontainer impeller with the drive unit is accomplished by magnetic forces only, therefore no dynamic seals or shaft penetration inside the biocontainer is required. The drive unit is mounted on a portable cart that can be easily disconnected from the biocontainer and reconnected to another Allegro mixing biocontainer thereby allowing mixing in multiple biocontainers of various sizes with a single drive unit.

The magnetic mixer MMG403 can be linked directly to Pall technology (such as the Pall MVP single-use system or Pall SUTFF {single-use tangential flow filtration}) to allow those systems to control the mixer as part of an automated, integrated solution. This control capability can also be customized accordingly to link with other DCS or SCADA systems.

Optional additional functionality is provided through one of 2 automation controllers (advanced and basic) which facilitate local integration of load cells and probes for use in the mixing applications.

The mixing system hardware has three major components:

1. Magnetic mixer drive unit
2. Elevated retaining tank (either on dolly, for use with plastic tanks or with integrated legs on stainless steel tanks)
3. Optional control box

The magnetic mixer reusable system can accommodate a variety of standard and custom-designed disposable biocontainers and tanks available from Pall Biotech with a capacity range from 30 L to 3000 L.

These 'instructions for use' cover the drive unit and docking the drive unit to the plastic or stainless steel tanks. For more details on stainless steel tanks and optional control box, please refer to the following instructions respectively:

- USD 3193: Allegro™ Cubical LevMixer® and Magnetic Mixer Tanks
- USD 3194: Stainless Steel ROUND Mix Tanks: For use with the LevMixer® and Magnetic Mixer Single-Use Mixing Systems
- USD 3197: Allegro™ 2000 L Cubical Magnetic Mixer Tanks
- USD 3280: Allegro 3000 L Cubical Magnetic Mixer 3000 Tank
- USD 3295: Basic/Advanced Control Box for LMG403 and MMG403

4. Specifications

Table 1: Specifications

| | |
|--|--|
| Footprint WxLxH: | 40 x 114 x 89 cm (15.75 x 45 x 35 in.) - compact configuration 40 x 135 x 89 cm (15.75 x 53 x 35 in.) - extended configuration |
| Control box, cart, & mixer enclosure material: | 304 L stainless steel |
| Control box, Frame, Drive Box surface finish | At least 1.2 µm Ra/ 47 µin Ra |
| Control box ingress rating: | IP 65 |
| Drive Unit enclosure ingress rating: | IP 23 |
| Voltage: | 100 – 230 VAC, 50/60 Hz, |
| Voltage fluctuation: | +/- 10% |
| Overvoltage Category: | II |
| Input Wattage: | Less than 250 W |
| Amperage: | 100 V 2.2 A; 110 V 2.0 A; 230 V 1.0 A |
| Altitude rating: | 1000 m |
| Operating environment: | Temperature 4-40°C, Max humidity 85%, avoid condensation |
| Pollution degree: | 2 or better |
| Motor horsepower: | ¼ hp |
| Power cord length: | 600 cm (20 ft) |
| Power cord plug options: | US, Continental Europe, Swiss, Australia, Japan, UK |
| E-stop (present, yes/no, location): | Yes, face of control box |
| Minimum & maximum speed: | 20 to 300 RPM |
| Connectors for remote control: | TURCK RSFPV61; RSFPV579; HUMMEL M23 male thread, 12-pin. Cord sets for remote control are not supplied |
| Functions available from remote control panel: | Motor – start, stop Speed – adjustment, indication Alarm – indication Mode of control (remote/local) – indication |
| Signal type(s) for remote output/control: | Rotation speed out 4-20 mA, motor control in 0-10 V, discrete I/O signals relay contact type |
| Alarms generated: | Motor failure, speed off-range failure, E-stop activation |
| Operator interface type: | Touchscreen PLC |
| Noise level at operator position: | 63 dB |
| Casters: | 2x swivel (front), 2X stationary (rear) |
| Wheel material: | Polyurethane |
| Recipe storage: | Yes. Up to ten can be stored. Up to ten instructions in each recipe are executed sequentially. Each instruction contains individual programmable parameters: mixing time, pause time, and speed. |
| Password protection: | <u>Operator</u> level: access to protected function - start recipe run. <u>Supervisor</u> level: access to protected functions - Recipe Editor, Pause or Abort Recipe run, Switch of Control between Local to Remote, adjustment of set up for reduced set of parameters. <u>Maintenance</u> level: access to protected functions – Program Setup parameters, System parameters and includes Supervisor level of access. |

5. Mixing System Components and Accessories

5.1. Component Overview

Below pictures show an overview of the key components of the Allegro magnetic mixer system.

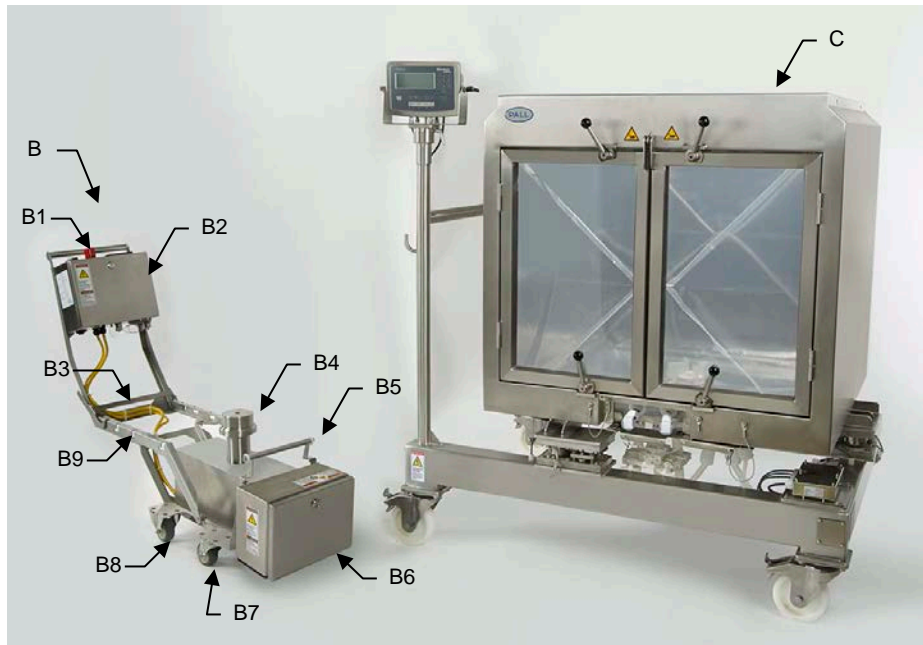


Figure 1: Magnetic mixer drive unit MMG403 with 650 L cubical tank

Table 2: Overview of main components magnetic mixer system

| | |
|----|---------------------------|
| B | Magnetic mixer drive unit |
| B1 | Drive unit handle |
| B2 | Drive unit control box |
| B3 | Latch |
| B4 | Drive head |
| B5 | Guide bearings |
| B6 | Driver box |
| B7 | Front wheels |
| B8 | Rear wheels |
| B9 | Frame |
| C | Tank |

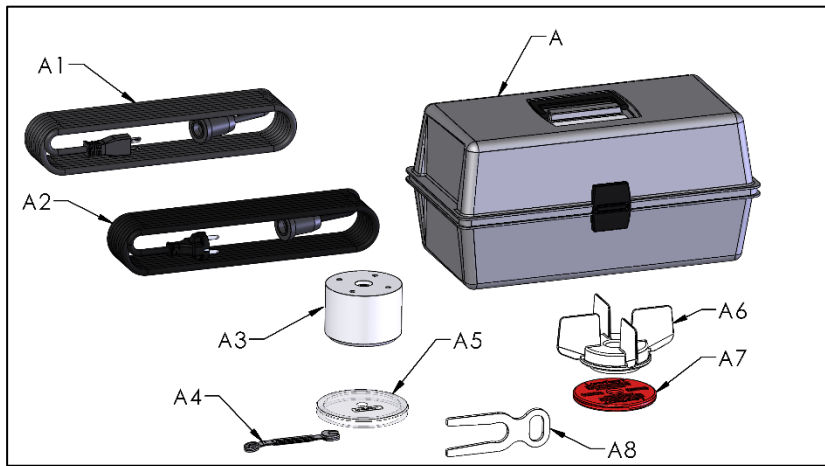


Figure 2: Accessory toolbox and content

Table 3: Overview of components in accessory toolbox

| | |
|----|--------------------------------------|
| A | Accessory Toolbox |
| A1 | US power cord |
| A2 | EU power cord |
| A3 | Magnetic clamp |
| A4 | Combination wrench |
| A5 | Centering aligner |
| A6 | Test impeller |
| A7 | Magnetic shield |
| A8 | Clip for 25.4 mm (1 in.) drain valve |



Figure 3: Round plastic tank

The drive-biocontainer interface and o-ring are delivered as part of the tank (Figure 4). They provide a centered position of the drive head in the tank during drive docking and mixing. For installation see instructions for use of the tank (provided with the tank).



Figure 4: Drive-biocontainer interface and o-ring

The magnetic clamp and centering aligner can be found in the tool box delivered with the drive unit. They are used during installation of the Allegro mixing biocontainer to assure correct positioning of the impeller in respect to the opening in the tank.



Figure 5: Centering aligner (left) and magnetic clamp (right)

5.2. Drive Unit Control Overview

Note: The drive unit enclosure is sealed for water/spray resistance (IP23). The control panel is splash resistant (IP65).

External electrical connections are done with cables running along the frame.

The controls are located on the face panel of the control box (Figure 6). They are: Operator Touchscreen Interface, Quick Adjustment Keys, Power Button, and Emergency Stop push button. Other options including those for remote control through connectors are available on the bottom panel of the control box as shown in Figure 7.

Most control functionality is provided to the user through the touchscreen interface including activation of functions, display of process information and alarm status. The magnetic mixer can be operated in one of three modes selected by the operator locally from the main menu screen:

- Manual mode of operation
- Automatic mode of operation
- Remote mode of operation

Each mode includes a specific set of functions to support processing requirements.

Additionally, there is locked mode of operation which represents variation of remote control from an external system and is intended to support control of the mixer using other equipment such as Pall MVP system.

In manual or automatic mode the drive unit is fully controlled from the local screen. Transfer to locked mode of operation happens upon detaching of the plug from connector ALLEGRO I/O. After detaching the plug from the control panel, the appropriate cable and plug (for example, from the Pall MVP system) should be connected to allow for locked/remote operation. For modes of operation other than locked mode, keep the plug inserted and tightened.

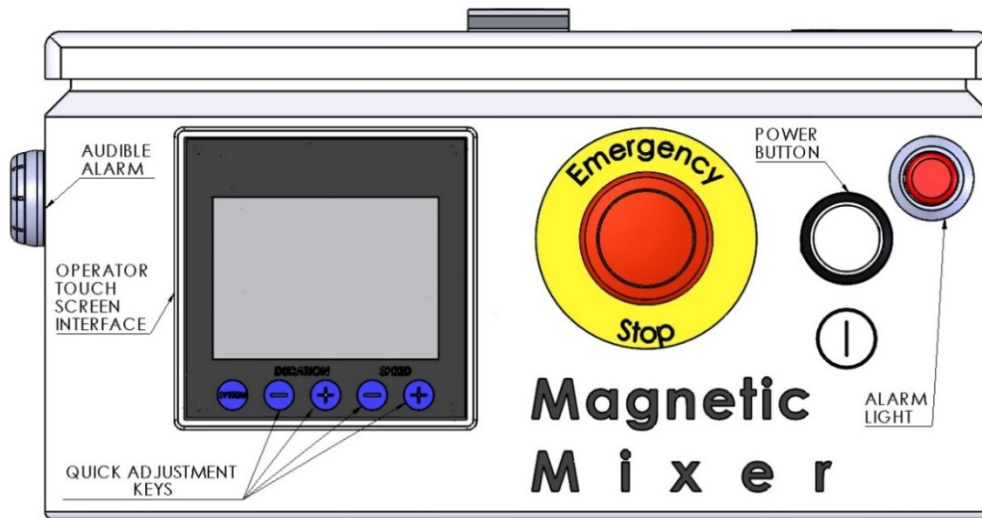


Figure 6: Control panel top

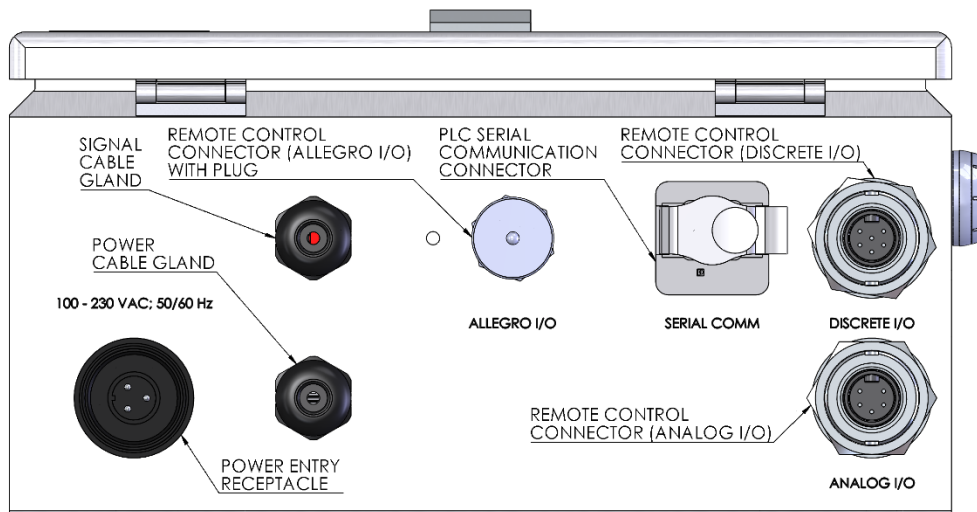


Figure 7: Control panel bottom

When the drive unit is powered on, it is immediately ready for mixing.

IMPORTANT! In case of emergency the operator can stop rotation of the motor by pressing the emergency stop (e-stop) button on the control panel. This can be done during any mode of operation. Doing so halts the rotation of the motor and activates the system failure mode while leaving other functions of the drive unit in operation. To reset alarm, release the e-stop button by pulling it up until it clicks, and then acknowledge the alarm on the touch screen.

For details of operation, see Section 9 Operator Control Interface guide.

5.3. Unpacking

The magnetic mixer is shipped in a wooden crate with foam insets to protect the unit during transport. Make sure to store the tool box in the vicinity of the drive unit. The crate should be retained in the event that the parts have to be shipped in the future. Remove any foam and protective packaging from the drive unit before first use.

6. Dolly – Tank Assembly

In case the drive unit is used in combination with a plastic tank on dolly, the following procedure(s) should be used for installation of the tank on the dolly. If using a stainless steel tank, go to section 7.

6.1. Installation of Tank on Dolly

1. Both the dolly and tank have holes for drive unit coupling. Insert the drive/biocontainer interface into this hole from below and apply the o-ring to secure as shown in Figure 8. It is not necessary to remove or replace the interface after installation (i.e. after mixing or between batches).



Figure 8: Installation of the drive-biocontainer interface on tank dolly with o-ring

2. Position the plastic tank on the dolly. The bottom of the tank has two holes: a small hole for the biocontainer drain and a larger hole for the drive head. Line up the larger hole with the drive port on the dolly. The tank hole should locate around the interface.
3. Tanks up to and including 350 L use a centrally located impeller and therefore use the central port dolly configuration. The 500 L tanks use single-use systems with an off-center impeller and therefore use the off-center port dolly configuration. *See procedure below for changing the dolly port configuration.*

6.2. Changing Dolly Configuration Between Center and Off-Center Impeller Port

Determine which port configuration is required: central port (tanks sizes: 30 – 350 L tanks) or off-center port (500 L tanks). Each rail of the dual port has an adjuster attached to the rail with two screws. The right adjuster is marked with two dots and the left adjuster is marked with one dot. The right and left rails of the port are also marked with two and one dot respectively, see *images below*. Right adjuster should always be used with the right rail and the left adjuster with the left rail.

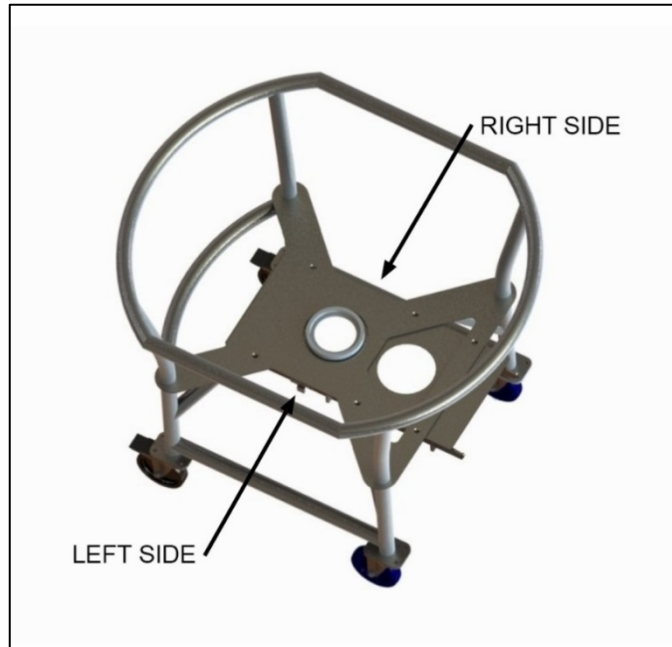


Figure 9: Rail port orientation – showing left side vs. right

To set the rails for the central port position, set the right and left adjusters so that the side with word 'CENTER' is visible on both; see Figure 10. Ensure that the two dot marks on the right adjuster are located next to the two dot marks on the rail and single dot mark of the left adjuster is located next to the single dot mark on the left rail. Secure the adjusters with the screws provided.

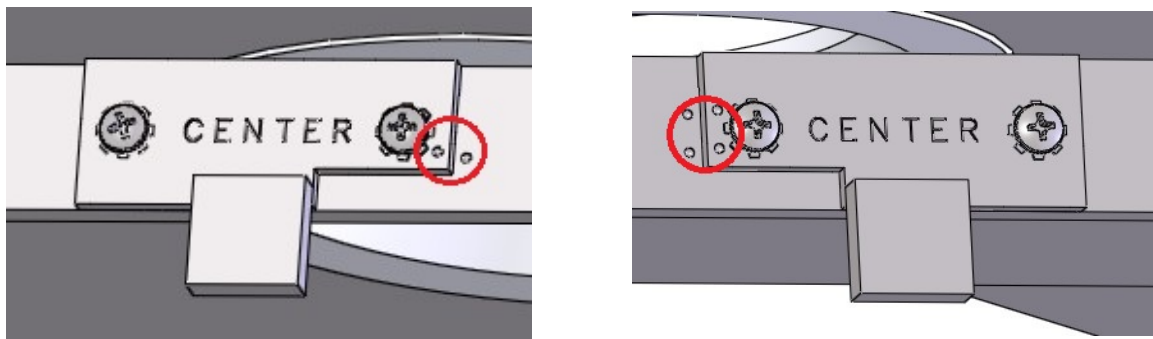


Figure 10: Rail adjustments for central position (left and right side)

To set the rails for the off center port position set the right and left adjusters so that the side with words 'OFF-CENTER' is visible on both; see Figure 11. Ensure that the two dot marks on the right adjuster are located next to the two dot marks on the rail and single dot mark of the left adjuster is located next to the single dot mark on the left rail. Secure the adjusters with the screws provided.

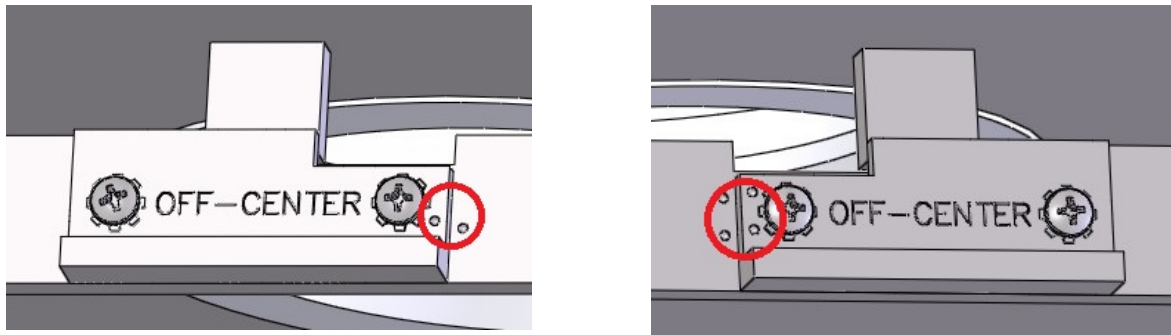


Figure 11: Rail adjustments for off-center position (left and right)

7. Allegro Mixing Biocontainer Installation

The below procedure describes the basics of installing an Allegro mixing biocontainer in a tank. For more detailed instructions, please refer to the instructions delivered with the stainless steel tanks.

1. Locate the magnetic clamp and centering aligner (Figure 12). These parts are required for proper Allegro mixing biocontainer installation and alignment. Inspect the centering aligner for damage; if the center hole is deformed, torn or not concentric, discard and replace with an undamaged centering aligner. Assemble the clamp and aligner as shown in Figure 13.



Figure 12 & 13: Centering aligner (left) and magnetic clamp (right) so they look like the picture on the right

2. Verify the correct article code and expiration date. Remove the outer and inner packaging bag by tearing open at the easy tear notch (Figure 14) - **DO NOT USE SCISSORS OR OTHER CUTTING IMPLEMENTS**. Retain the label from the inner packaging according to the quality policies of your organization.



Figure 13: Opening packaging bags via the easy tear notch

3. Visually inspect the Allegro mixing biocontainer for shipping damage or imperfections; cuts, tears or punctures; film cracks that are externally rough/sharp to the touch (note: white creases that are not sharp to the touch are typically not a cause for concern); impeller detached from impeller seat/post; kinked tubing that cannot be unkinked; damaged, missing or detached subcomponents. If any such imperfections are discovered, contact Pall or the user organization's quality group for advice on whether the Allegro mixing biocontainer should be used.
4. A blue shipping disc is magnetically attached to the outside of the Allegro mixing biocontainer, over the impeller seat. Reverse the Allegro mixing biocontainer to have access to the magnetic impeller with the blue disc. Next, remove the blue shipping disc (Figure 15) (retain this item; this will be used to secure the impeller during subsequent Allegro mixing biocontainer disposal).

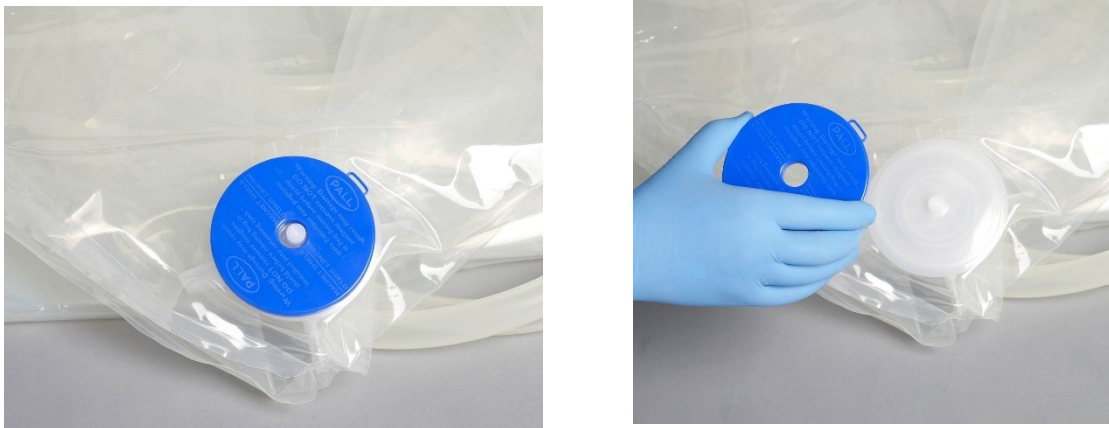


Figure 14: Removing blue shipping disc from Allegro mixing biocontainer

5. Assemble the centering aligner and magnetic clamp on the impeller on the Allegro mixing biocontainer as shown in Figure 16.



Figure 15 : Assembly of Allegro mixing biocontainer with magnetic clamp/aligner assembly

6. Place the Allegro mixing biocontainer in the tank by aligning the magnetic clamp with the large port on the bottom.

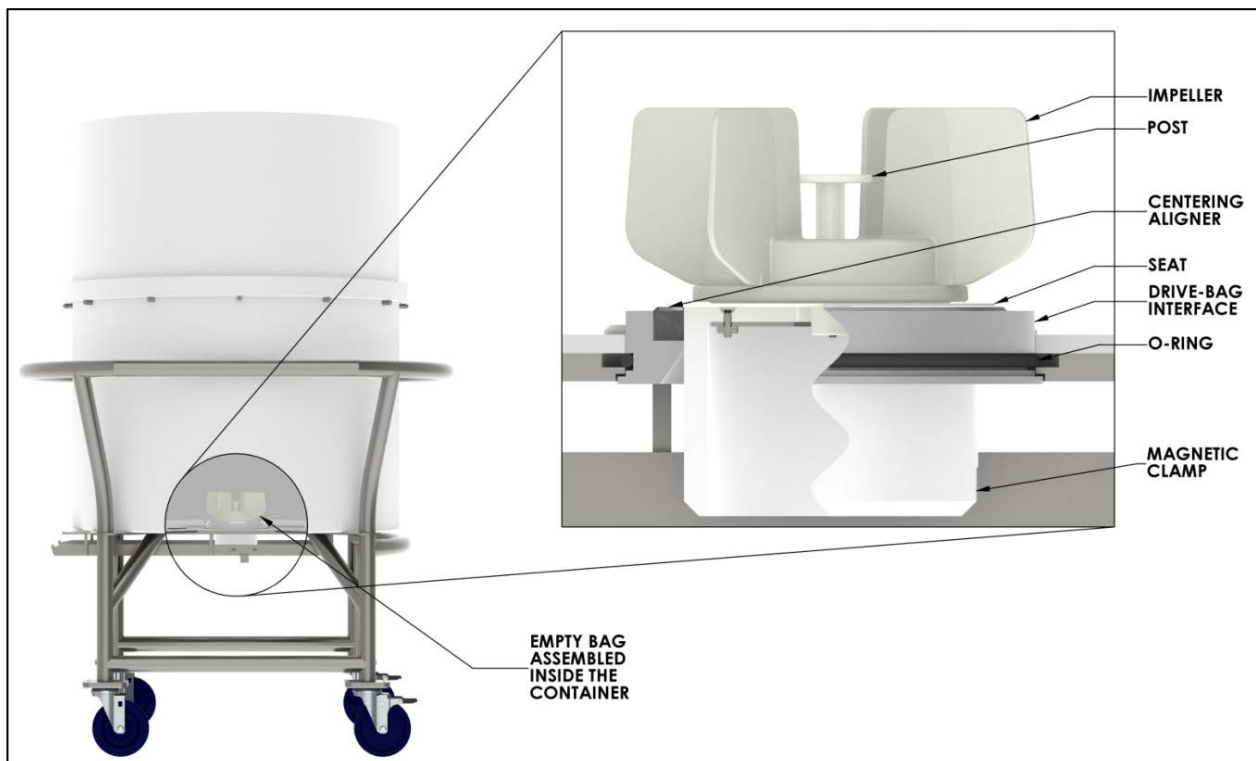


Figure 16: Biocontainer tank assembly with round plastic tank

7. For round plastic tanks, gently pull the bottom drain tube through the drain port opening. For other tanks, please refer to the specific instructions delivered with the tank.
8. Before filling the biocontainer, ensure that the bottom drain tube is clamped. If the biocontainer contains an EZ-Drain, ensure the drain is fully closed and clamp the drain in place using the provided plastic drain clip.
9. As the biocontainer starts to fill, gently pull the bottom surface of the biocontainer to remove any wrinkles, especially near the impeller.

DO NOT exceed recommended biocontainer capacity.
DO NOT alter the tube and/or impeller configuration.

8. Docking of the Drive Unit to the Tank and Biocontainer

8.1. Drive configuration

The drive unit can be used in one of two configurations: standard or extended. The configurations can be switched following the procedure described in Section 11.3.1.

Each configuration allows connection of the unit to different tank sizes using a universal latch as shown in Figure 18. Positions 1 and 2 are in standard configuration; positions 3 and 4 are in extended configuration.

The table below shows the different latch positions for each tank size.

Marks on the frame at each latch show proper positioning of the latch in combination with the round plastic tanks

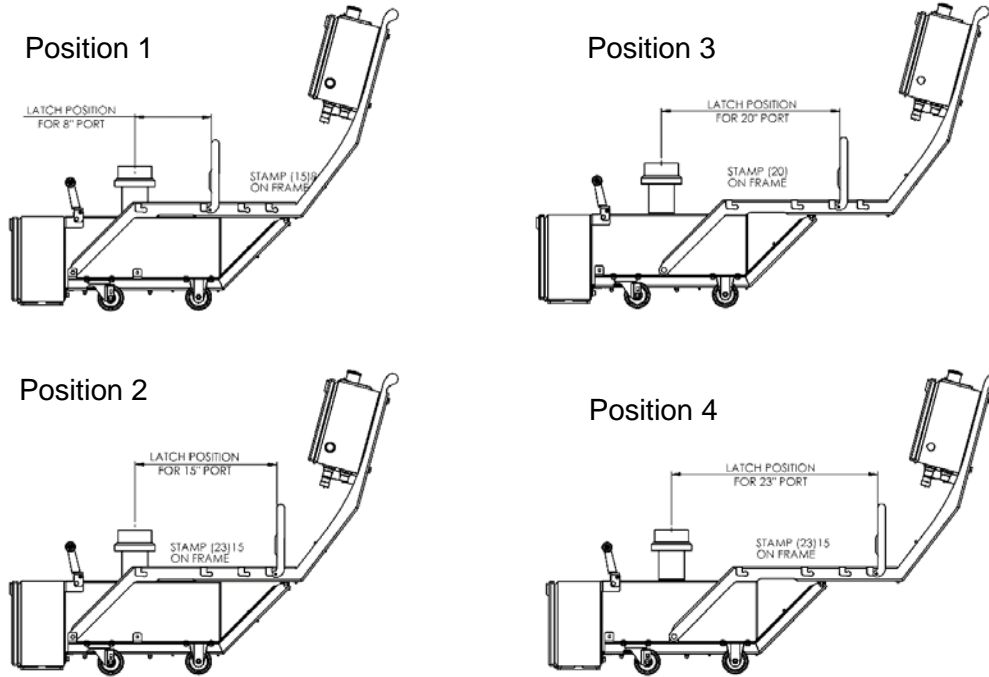


Figure 17: Different latch positions for drive unit

Table 4: Latch positions/configuration cubical tanks

| Cubical Tank Latch Positions | | | |
|------------------------------|----------|----------------|---------------|
| Volume | Position | Stamp on frame | Configuration |
| 50 L | 2 | (23) 15 | standard |
| 100 L | 2 | (23) 15 | standard |
| 200 L | 2 | (23) 15 | standard |
| 400 L | 2 | (23) 15 | standard |
| 650 L | 4 | (23) 15 | extended |
| 1000 L | 4 | (23) 15 | extended |
| 1500 L | 4 | (23) 15 | extended |
| 2000 L | 4 | (23) 15 | extended |
| 3000 L | 4 | (23) 15 | extended |

Table 5: Latch positions/configuration round tanks

| Round Tank Latch Positions | | | |
|----------------------------|----------|----------------|---------------|
| Volume | Position | Stamp on frame | Configuration |
| 30 L | 2 | (23) 15 | standard |
| 50 L | 2 | (23) 15 | standard |
| 100 L | 2 | (23) 15 | standard |
| 200 L | 2 | (23) 15 | standard |
| 350 L | 2 | (23) 15 | standard |
| 500 L | 2 | (23) 15 | standard |
| 1000 L | 2 | (23) 15 | standard |
| 2000 L | 3 | (20) | extended |
| 2500 L | 3 | (20) | extended |

Adjust the universal latch by following the steps shown in Figure 19.



1. Initial latch position before removal



2. Rotate the latch clockwise until the axle flats are aligned with the horizontal slots.



3. Slide the latch toward the drive head.



4. Pull up to remove the latch.

Figure 18: Procedure to change position of latch

8.2. Docking of Drive Unit to Biocontainer

1. Remove the magnetic clamp from the biocontainer container assembly before coupling. To remove the magnetic clamp, reach underneath the drive port and carefully pull the magnetic clamp downwards until it is free from the biocontainer-tank assembly. Return the magnetic clamp to the supplied accessories box for future use.

IMPORTANT NOTE: Do not remove the magnetic clamp before filling the biocontainer with the minimum required volume!



Figure 19: Removal of magnetic clamp

2. Make sure that the universal latch is installed in the correct position to match the rail port intended for connection. See Table 4 and Figure 18 for corresponding latch and port positions. Pull the latch back towards the handle as shown in Figure 19 step 1.
3. Position the drive unit in front of the rails of the tank.
4. Push down on the drive handle and raise the front wheels off the ground. Align the guide bearings on the drive with the tank guide rails.



Figure 20: Aligning drive unit on tank rails

5. Roll the drive unit along the rails all the way until the bearings come to a stop and rest in the notch located at the end of the rails.



Figure 21: Drive unit pushed until stop on tank rails

6. Using the drive unit handle, lift the drive unit to a horizontal position. While holding the drive unit in this position, pivot the latch toward the tank so that the cross bar rests on the hooks in the guide rails.



Figure 22: Lift drive unit and latch to tank

7. Once completely docked, the drive unit can be powered on by plugging the power cord in an appropriate power socket.

Note: Tanks may not look exactly as shown, but the drive installation procedure is the same, regardless of the tank design.




CAUTION: Be careful to not trap fingers under the latch when locking the drive unit onto the tank.

CAUTION: In case of tanks on wheels, DO NOT attempt to move the tank with the drive unit handle while it is docked. Doing so might damage the drive unit. Always use the tank push bar to move the tank.

9. Operator Control Interface Guide

9.1. Navigating the Magnetic Mixer Control Screen

Each screen in the magnetic mixer control software has a number of common elements.

1. The window bar shows the name and/or status of each screen.
2. To return to the previous screen, press the back button  in the upper right corner of the screen.
3. Screen buttons corresponding to critical commands like START, STOP, PAUSE, etc... are protected from inadvertent activation by a delay function. To activate these commands, operator should press and hold the button until the indicating bar in the top of window completely fills (2-3 sec). A request to hold the command button is shown also indicated as text above the indicating bar.
4. Time is indicated on the operator interface in hh:mm format unless otherwise specified.
5. Each operation mode has its own interactive screen, which display initiated automatically (alarm), externally (locked mode of operation) or by operator choice from the main menu.

9.2. User Access Levels

Login function is available through the **PW** button in the left upper corner of each screen (except informational screens and entry screens). All passwords are group passwords, with a minimum of six uppercase, lower case or numeric characters. In total three group logins are available: operator, supervisor, and maintenance. Maintenance login is only available while the system is in power up mode. The login time period is controlled via a program setup parameter. Access is automatically set to the default (common) level upon expiration of a prescribed time period since login.

Access to magnetic mixer control software functions is supported using the following levels:

Common: (default) functions

- Use of power up and manual mode for full access (Sections 9.3 and 9.5).
- Use of failure mode interactive screens for full access
- Use of auto mode and remote mode for view only access (Sections 9.4 and 9.6).
- No password protection

Operator: Includes all common functions, plus...

- Use of recipe start access (Section 9.4).

Supervisor: Includes all common and operator functions, plus...

- Use of auto mode and remote mode for full access (Sections 9.4 and 9.6).
- Access to a limited set of parameters (Sections 9.8).
- Ability to change the password for the supervisor and operator groups.
- Ability to change the automatic logout time.

Maintenance: Includes all supervisor functions, plus full access to system and program parameters.

Follow these steps to enter the passcode for different user access levels and log in using that levels privileges:

1. Press **PW** on the top left corner of the screen
2. Select the access level from the user login screen (see Figure 24) then choose **Password** (see Figure 24) to open the password entry screen
3. When the keypad entry screen appears, enter the passcode for the desired user access level and then press **Enter** (see Figure 25)
4. You will now return to the previous screen (see Figure 25). Press **Login**. You are now logged in under the selected user access level

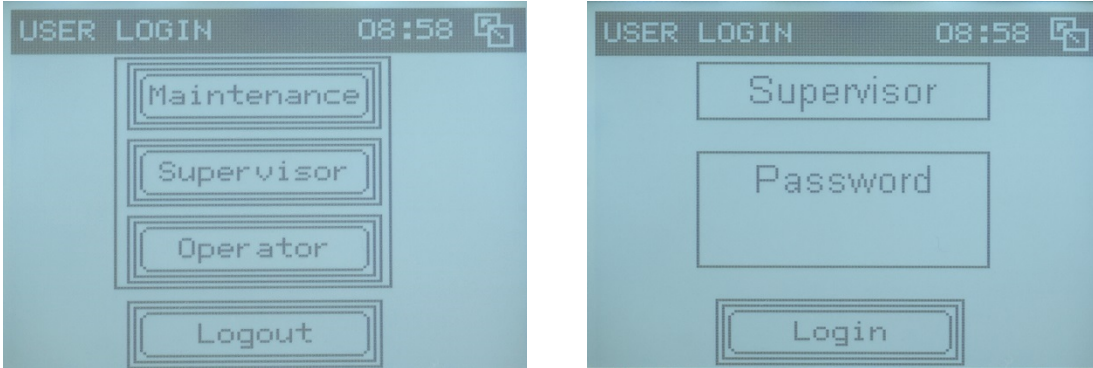


Figure 23: User login screen (left). Supervisor user password screen (right)

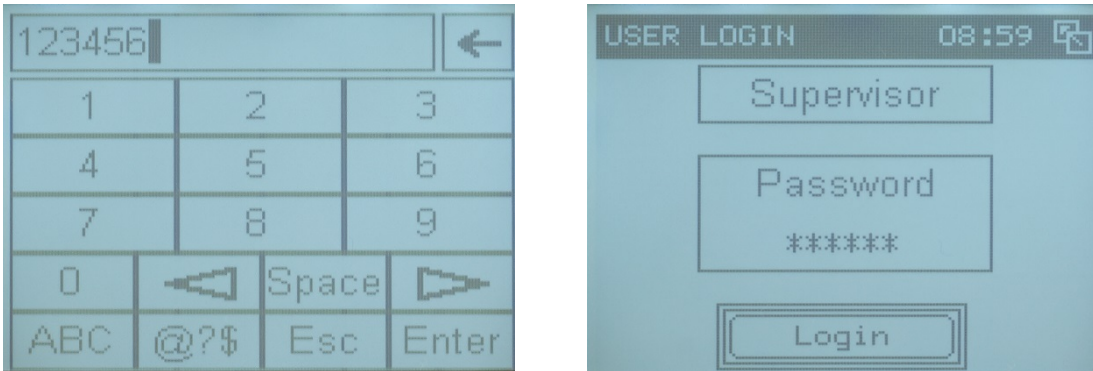


Figure 24: Password entry screen (left). Supervisor login screen (right)

9.3. Operating the Magnetic Mixer

To select the mixers' operation mode, press one of the buttons on the main menu:

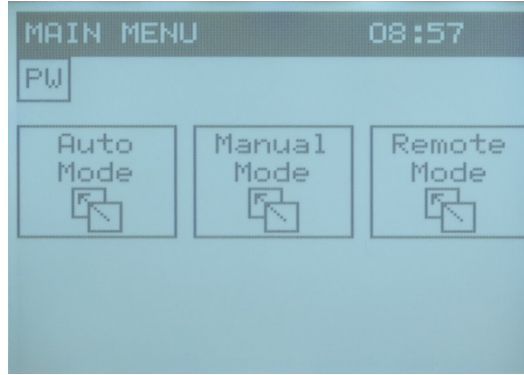


Figure 25: Main menu screen

Select **Auto Mode** for the automatic operation mode.
Select **Manual Mode** for the manual operation mode.
Select **Remote Mode** to control the mixer remotely.

The three mode screens - the automatic mode screen, the manual mode screen, and the remote mode screen are the locations for setting mixing parameters. Activation of these modes is locally controlled. For activation of locked mode of operation see Section 9.7.

9.4. Automatic Mode

Automatic mode is used to run mixing according to recipes; lists of instructions composed by the user to run the mixing process at different speed settings and/or at certain time schedules. The magnetic mixer software includes a library of ten recipes. Each recipe contains up to ten instructions executed consecutively during a run. Each instruction consists of three user defined parameters: duration of mixing phase, duration of pause phase and speed of rotation. All the recipes have duration of mixing and pause factory pre-installed to values of zero, and speed of rotation set to 20 RPM. Any recipe with all mixing phase durations set to zero considered an 'empty' recipe. If the operator tries to run such a recipe a notification is displayed on screen. To simplify exchange of recipes between drive units a migration function is available at the Supervisor level. The feature allows import/export of the entire library from/to a removable memory card (see 0 and 9.9 for details).

Operators can load, start recipe run and view a recipe's instructions. Supervisors and maintenance can pause/resume or abort recipes as well as edit their contents or change the name under which the recipe is stored. To use the automatic mode to run the mixer according to a recipe, press automatic mode on the main menu. The automatic mode screen opens and lists the currently loaded recipe. Status bar indicates 'AUTOMATIC MODE' (Figure 27).

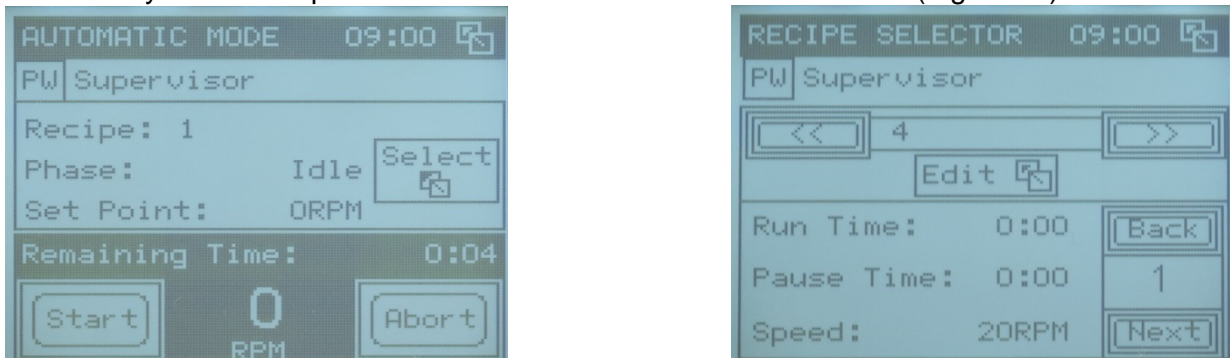



Figure 26: Automatic mode screen (left); recipe selector screen (right)

9.4.1. Loading a Recipe

To load a recipe, follow these steps:

- On the Automatic Mode scene, press **Select**. The Recipe Selector screen will open (Figure 27).
- Use the buttons on the Recipe Selector screen to load recipes and view their contents.
- At the top of the screen, press the arrow buttons to move through the list of recipes.
- In the lower right corner of the screen, press the **Back** and **Next** buttons to move through the individual instructions in the selected recipe.
- On the Recipe Selector screen, press the back button  in the upper right corner of the screen to load the selected recipe and return to the Automatic Mode screen.

9.4.2. Running a Recipe

To run the recipe listed on the Automatic Mode screen, press and hold the **Start** button. The mixer will start according to the recipe's instructions and 'Routine in Progress' will appear in the menu bar. The time remaining in the recipe is listed at the bottom of the screen. The window status bar will show a blinking 'Routine in Progress'.

Upon finishing the recipe run the screen will show 'Successful Finish' with a time stamp, run duration and name of the recipe finished. To resume to the auto mode screen, press the OK button.

When failure mode is activated during a recipe run the job is paused automatically and can be resumed upon failure reset. 'Unscheduled Finish' is displayed with a time stamp, run duration and name of the recipe after finishing the recipe run. To resume to the auto mode screen, press the OK button.

9.4.3. Aborting a Recipe

Supervisors and Maintenance user levels can abort running recipes. To abort a recipe that is currently running, press and hold the **Abort** button. When a routine is aborted the 'Unscheduled Finish' screen with a time stamp, name of the recipe aborted and run duration will open. To resume to the manual mode screen, press the OK button.

9.4.4. Pausing and Resuming a Recipe

Supervisors and Maintenance user levels can pause and resume recipes. To a recipe that is currently running, press and hold the **Pause** button. A blinking 'Routine Paused' status is displayed in the status bar. To resume the recipe from where it was paused, press and hold the **Resume** button.

9.4.5. Editing a Recipe

Supervisors and maintenance user levels can edit a recipes instructions.

To edit a recipe, follow these steps:

1. Press **Select** on the automatic mode screen. The recipe selector screen opens.
2. Use the arrow buttons at the top of the screen to scroll through the list of recipes until you open the one you want to edit.
3. Press **Edit**. The Recipe Editor screen opens (Figure 28).
4. If needed, press the **Back** and **Next** buttons on the right side of the screen to scroll through the list of instructions for that recipe.
5. Each recipe can contain up to 10 instructions
6. Set the parameters to use for a specific instruction.

7. Press **Pause** to set the length of time the magnetic mixer should pause for that instruction. When the keypad opens, type the length of time to pause and then press **Enter**.
8. Press **Run** to set the length of time the magnetic mixer should run for that instruction. When the keypad opens, type the length of time to run the mixer and then press **Enter**.
9. Press **Speed** to set the RPM set point at which the mixer should run for that instruction. When the keypad opens, type the RPM set point and then press **Enter**.
10. Press **Save** to save your changes to the recipe. To return to the automatic mode screen without saving your changes to the recipe, press **Cancel**.

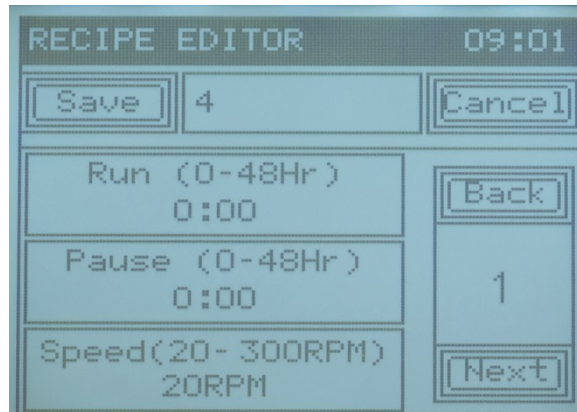


Figure 27: Recipe editor screen

To edit the name under which a recipe is stored, follow these steps:

11. Press **Select** on the automatic mode screen. The recipe selector screen opens.
12. Use the arrow buttons at the top of the screen to scroll through the list of recipes until you find the name you want to edit.
13. Press **Edit**. The Recipe Editor screen opens.
14. If needed, press the **Back** and **Next** buttons on the right side of the screen to scroll through the list of instructions for that recipe.
15. Press the button with the recipe name in it. An entry screen opens.
16. Use the onscreen keyboard and arrows to change the name of the recipe then press enter.
17. Press **Save** to save your changes. To return to the automatic mode screen without saving your changes to the recipe, press **Cancel**

9.5. Manual Mode

Use the manual mode to run the mixer either continuously or for a specific amount of time at a given RPM. The manual mode is ideal for mixing jobs that have no additional parameters. If the job requires mixing at different speeds use automatic mode instead.

To use the manual mode press **Manual Mode** on the main menu. The manual mode screen will open. The status bar will display 'MANUAL MODE' (See Figure 29).

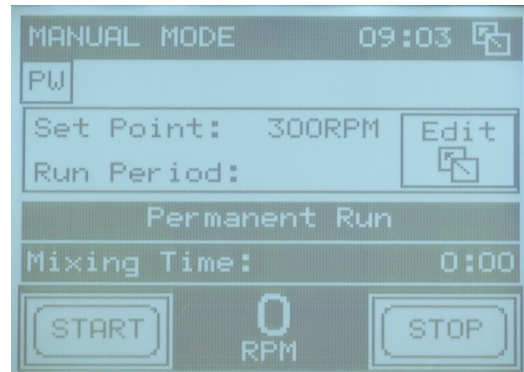
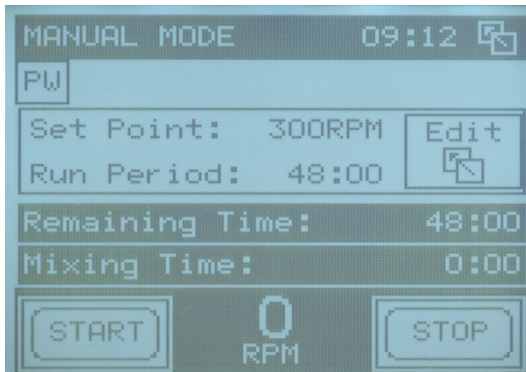


Figure 28: Manual mode parameters screen (left). Manual mode permanent screen (right)

9.5.1. Setting Up a Manual Job

Parameters available for a manual job are speed of rotation of impeller (RPM) and duration of run (hh:mm). Previous settings are remembered until they are changed manually. Quick adjustment of manual job parameters is possible from the PLC face panel with dedicated keys (Figure 6) regardless of run status.

To select the parameters to use for the manual job run, follow these steps:

- On the manual mode screen, press edit. The manual setup screen opens (see Figure 30).
- Press the **Set Point** box to set the RPM set point.
- In the entry screen, enter the RPM set point and then press **enter**.
- Set the time period for prospective run.
- The status **permanent** indicated on a switch means it will run indefinitely until manually stopped.
- To have manual run stopped automatically, specify the length of run. Press the switch to toggle it to **timed** status to allow time period setting for run.
- To set the length of time the mixer should run, press the **run period** box. When the keypad opens, enter the amount of time and then press **enter**.
- Return to the manual mode screen. All parameters are indicated in screen areas with white backgrounds (Figure 29).

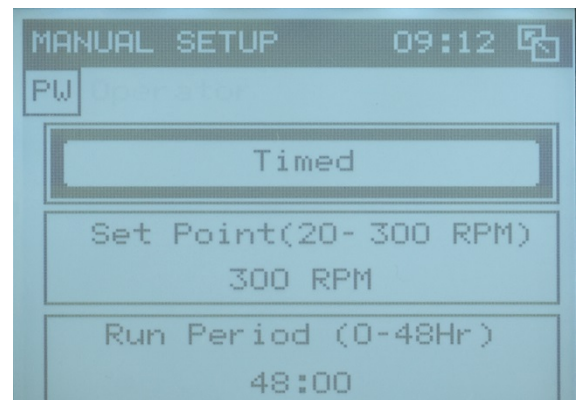
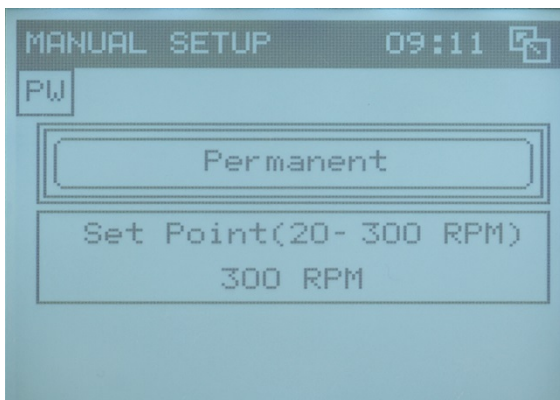


Figure 29: Manual setup permanent screen (left). Manual setup timed screen (right)

9.5.2. Starting a Manual Job

To a manual job, press and hold the **start** button on the manual mode screen. The mixer will start and the current status will show in areas with dark backgrounds: the remaining time (for timed jobs) or the 'Permanent Run' (for continuous runs) and net mixing time (Figures 38 and 39). The window status bar will have a blinking 'Run in Progress'.

9.5.3. Stopping a Manual Mode Job (Permanent Run)

To stop a manual job that is currently running, press and hold the **Stop** button. When a job is stopped the screen will display 'Successful Finish' with a time stamp and run duration. To resume to the manual mode screen press the OK button.

When failure mode is activated during run the job is paused automatically and can be resumed upon failure reset. 'Unscheduled Finish' is displayed with the time stamp and net mixing time after stopping the run. To resume to the manual mode screen press the OK button.

9.5.4. Stopping a Manual Mode Job (Timed Run)

Timed runs will automatically stop when the scheduled run time is complete. The screen will display 'Successful Finish' with a time stamp and run duration. To resume to the manual mode screen, press the OK button.

To stop a timed job that is currently running, press and hold the **stop** button. When the job stops the screen will display 'Unscheduled Finish' with a time stamp and run duration. To resume to the manual mode screen, press the OK button.

When failure mode is activated during a run, the job is paused automatically and can be resumed upon failure reset. 'Unscheduled finish' is displayed with a time stamp and net mixing time after manually stopping or automatic finishing of the run. To resume to the manual mode screen, press the OK button.

9.5.5. Pausing and Resuming a Manual Job

To pause the current job, press and hold the **pause** button. To resume the job from where it was paused, press and hold the **resume** button.

9.6. Remote Mode

The remote mode allows operator to control the magnetic mixer from external equipment to which the mixer is connected. Supervisor and maintenance user levels can switch the mixer between remote and local control.

Signal circuits for remote control pass through the control box via two connectors located on the back of the control box. With a remote control panel, the operator is able to:

- Start/stop the motor
- Change the speed of rotation
- Read the speed of rotation
- Read alarm status
- Read the control circuit status

While the magnetic mixer is in remote mode the impeller rotation control is available only via the remote control unit. The magnetic mixer screen indicates speed of impeller for local monitoring only. When the control is switched back to local (magnetic mixer) the remote control unit can only monitor the speed of rotation and alarm status.

When in remote mode the mixer automatically switches to manual mode stop status if any alarm is activated.

To use the remote mode:

- Press **remote mode** on the main menu. The remote mode screen opens in 'local control' status indicated in status bar (Figure 31).

- To switch control to any remote equipment connected to the mixer, first make sure that the equipment is correctly connected to the Magnetic Mixer and powered up. Then press and hold the **switch control to remote** button on the remote node screen.

When the control is switched to a remote panel, the 'remote control' status is indicated in the window status bar.

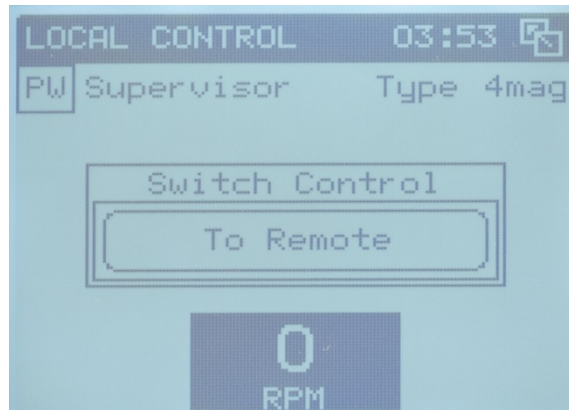


Figure 30: Remote mode screen

To switch control back to the magnetic mixer, press and hold the **switch control back to local** button on the remote mode screen. The system will switch to manual mode stop status. For details of remote control I/O signals see section 15.

9.7. Locked Mode

The locked mode allows operator to control the magnetic mixer from external equipment to which the mixer is connected through ALLEGRO I/O connector on back of control box. In that mode operator of remote panel has an opportunity to switch mixer control temporary between remote and local panels. Switching between locked mode and normal operation is controlled by plug connected to ALLEGRO I/O connector.

To go to locked mode of operation follow steps:

- Having the drive unit powered off, pull the plug out of ALLEGRO I/O connector
- Connect remote panel and drive unit with control cable (not supplied)
- Turn drive unit ON and follow information on the screen (see also 9.7.1)

Locked mode screen opens with 'LOCKED MODE' indicated in status bar and shows 'Speed Command from Allegro' (Figure 32) or the window for local speed adjustments (Figure 33) depending on settings on remote panel. Speed of rotation is indicated on screen.



Figure 31: Locked mode screen

In locked mode of operation operator of remote control panel is able to:

- Start/Stop the motor
- Change the speed of rotation
- Read the speed of rotation
- Switch full control to local panel and back
- Transfer speed adjustment function to local panel and back
- Read remote cable connection status

9.7.1. Local Operator Involvement

There are exceptions when local operator is involved in interaction with system running in locked mode of operation.

1. Per command from remote panel function of speed of rotation adjustment can be transferred to local operator. In this case the window for local speed setup appears on locked mode screen (See Figure 33). To adjust the speed of rotation, go to speed editor by pressing the speed setup window on screen or use quick adjustment keys on PLC front panel. Speed control can be taken back by operator of remote panel at any moment.
2. Full control of drive unit can be transferred to local panel and be taken back to remote panel per command of operator of remote panel.
3. Upon generation of alarm in unit running in locked mode all controls as well as motor rotation are blocked. Standard alarm indication is present locally (see 9.8) while remote control panel doesn't receive alarm signal. Resolution of accident is available only from local panel as described in 9.8.
4. Another exception is 'entry point' to locked mode – the condition when drive unit being set to locked mode of operation experienced significant event which is power ON or returning to operation after alarm reset.



Figure 32: Local speed control in locked mode

At the entry point dedicated screen is exposed while all controls (local and remote) as well as motor rotation are blocked until local operator have 'Reset to Remote' button pressed (Figure 34). That brings system to locked mode of operation functioning according to current settings on remote panel.



Figure 33: Entry point reset

For details of remote control I/O signals, see section 15.

9.8. Alarms

Failure detected by the system will activate Failure mode while in any mode of operation. Failure mode halts motor rotation, displays an alarm notification on screen (Figure 35 left) and generates an alarm output signal for remote control. Alarm light changes the color from green to red and audible signal comes to beeping.

The equipment in the drive unit will stay powered up but cannot be operated until failure reset is complete. Failure resolution is available only locally from the magnetic mixer face panel. External control equipment will only receive an alarm signal with no ability to feedback control.

Note: in locked mode remote panel will not receive alarm notification.

IMPORTANT: If failure happens while any of editor screen is open the alarm is generated and indicated via alarm light and sounder but notification will not appear on screen until escape from editor to any of mode screens.

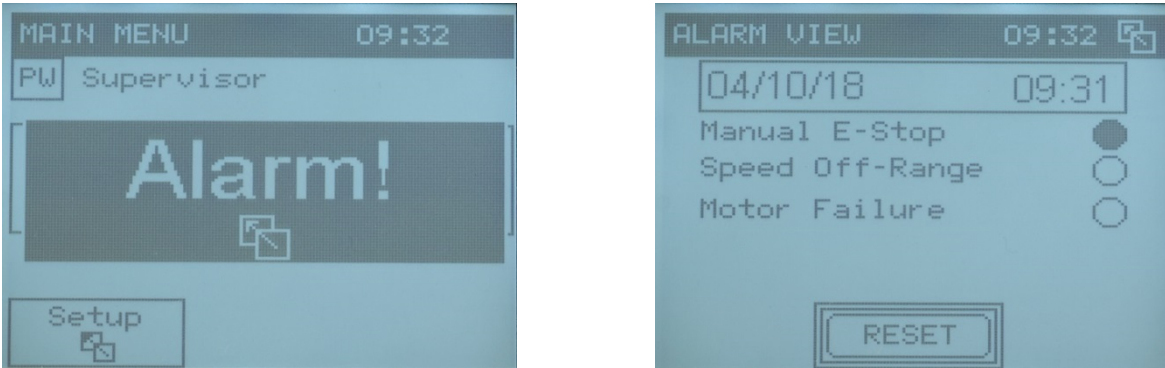


Figure 34: Alarm screen (left); Failure detection screen (right)

Reset of the failure mode is available from the failure detection screen (Figure 35 right) which is opened after pressing the alarm button.

Upon alarm reset the system will return to one of the following:

- a) Manual mode idle condition: if at the moment of alarm, the mixer is in remote mode or idled in manual mode.

- b) Manual mode pause condition: if at the moment of alarm, the mixer is in manual mode.
- c) Automatic mode idle condition: if at the moment of alarm, the mixer is idled in automatic mode.
- d) Recipe run pause condition: if at the moment of alarm, the mixer is in automatic mode.
- e) Locked mode or local main menu screen (depending on settings on remote panel): if at the moment of alarm generating the mixer is in locked mode.

Three types of failure can stop the current job.

9.8.1. Manual E-Stop

When an operator presses the E-Stop button on the control panel, the motor rotation immediately stops and the alarm appears on the screen. To reset the unit, follow the following steps:

1. Release the E-stop button by pulling it until it clicks.
2. Press the ALARM button. The failure detection screen will then open.
3. On the failure detection screen identify the E-stop failure in the blinking bullet.
Note: the date and time of the failure event is indicated on this screen.
4. Press the RESET button to return the unit to operation.

9.8.2. Speed Off-Range

If the measured RPM deviates from speed set point outside the +/-5 RPM limits for more than 60 sec. the speed control may be functioning improperly. When this occurs, rotation is stopped and the ALARM appears on the screen. The red alarm light and the alarm sound is on as well. The operator should do the following steps:

1. Press the ALARM button. The failure detection screen will then open.
2. On the failure detection screen identify the speed off-range failure in the blinking bullet.
Note: the date and time of the failure event is indicated on this screen.
3. Press the RESET button to return the unit to operation.

IMPORTANT: The speed off-range alarm is not generated in remote mode or in locked mode of operation. In this case current speed and set point are controlled externally.

9.8.3. Motor Failure

If the mixer's drive unit experiences an error, it signals the PLC. The mixer then stops rotation and indicates ALARM through the screen, alarm light and sound. The operator should do the following steps:

1. Press the ALARM button. The failure detection screen will then open.
2. On the failure detection screen identify the motor failure in the blinking bullet. Note: the date and time of the failure event is indicated on this screen.
3. Press the RESET button to return the unit to operation. The screen will open with a request to turn off power to reset the failure signal.
4. Turn the unit off and then turn it back on.

9.9. Auxiliary Functions

System functionality is controlled with parameters accessible through the setup editor which is available through the main menu screen. A setup button will appear on the screen after a user has logged in at the supervisor or maintenance level (Figure 36 left). The selection of parameters available for adjustment depends on the level of access and is listed in the settings editor for the supervisor level (Figure 36 right), which opens after pressing setup set up.

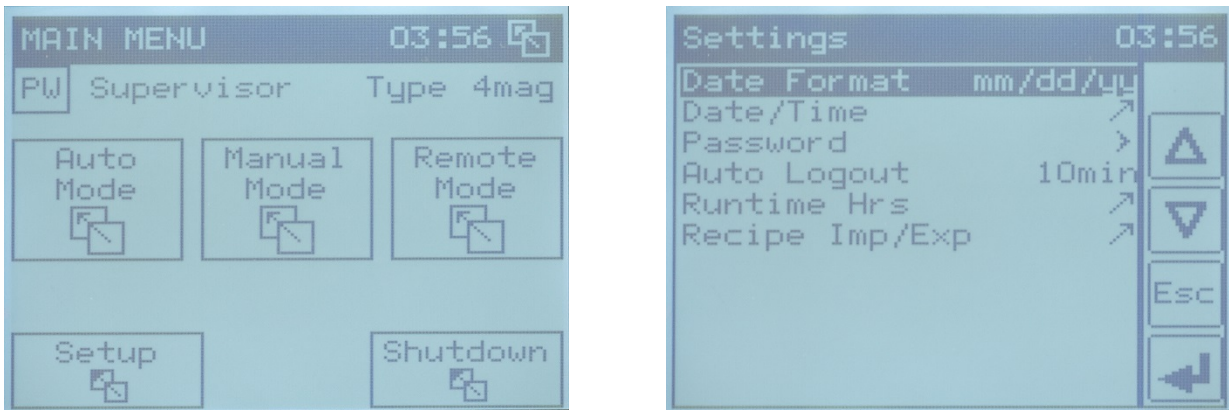






Figure 35: Supervisor main menu screen (left). Supervisor settings screen (right)

Supervisor settings editor allows:

1. Select the date format for indication on screens: mm:dd:yy or dd:mm:yy
 - Login to system as supervisor
 - Press the setup button on the main menu screen
 - Select the date format function using the up and down arrows
 - Press the curved arrow to go to the selection screen
 - Select the appropriate format using the arrows provided on screen and then press enter
2. Adjust the calendar date and clock time
 - Login to system as supervisor
 - Press the setup button on the main menu screen
 - Select the 'date/time' function using the up and down arrows
 - Press the curved arrow to go to the next screen
 - Press the button with the date, adjust the date to current, then press enter
 - Press button with the time, adjust time to current, then press enter
 - Press  to return to the settings list
3. Change password for supervisor and operator levels
 - Login to the system as supervisor
 - Press the setup button on the main menu screen
 - Select the 'password' function using the up and down arrows
 - Choose the level of access to which the change of password is required
 - Press the curved arrow to go to the next screen
 - Press the curved arrow to go to the entry screen
 - Enter the new password twice as prompted and press change
 - Press  to return to the settings list

4. Adjust auto logout time
 - Login to the system as supervisor
 - Press the setup button on the main menu screen
 - Select the 'auto logout' function using the up and down arrows
 - Press the curved arrow to go to the entry screen
 - Enter the time for auto logout then press enter

5. View runtime counter indicators for system runtime and motor runtime
 - Login to the system as supervisor
 - Press the setup button on the main menu screen
 - Select the 'runtime hrs' function using the up and down arrows
 - Press the curved arrow to go to the view screen
 - The screen will indicate accumulated runtime separately for both system and motor rotation
 - Press  to return to the settings list magnetic mixer

6. Export of Recipe library to memory card
 - Insert a micro SD card into the memory slot (See section 0)
 - Login to the system as supervisor
 - Press the setup button on the main menu screen
 - Select the 'recipe imp/exp' function using the up and down arrows
 - Press the curved arrow to open the next screen (Figure 36)
 - Press the file number button to go to the entry screen
 - On the entry screen input the file number (0-9) you wish to export and press enter
 - Press the export recipes button and confirm when prompted (Figure 37).
 - The entire library will be exported to the micro SD card under filename LIBRARYX.BAK, where X is the file number entered on the previous step.
 - A confirmation notice will appear after the file writing is finished (this may take several minutes)
 - Acknowledge the notice and press  to return to the settings list

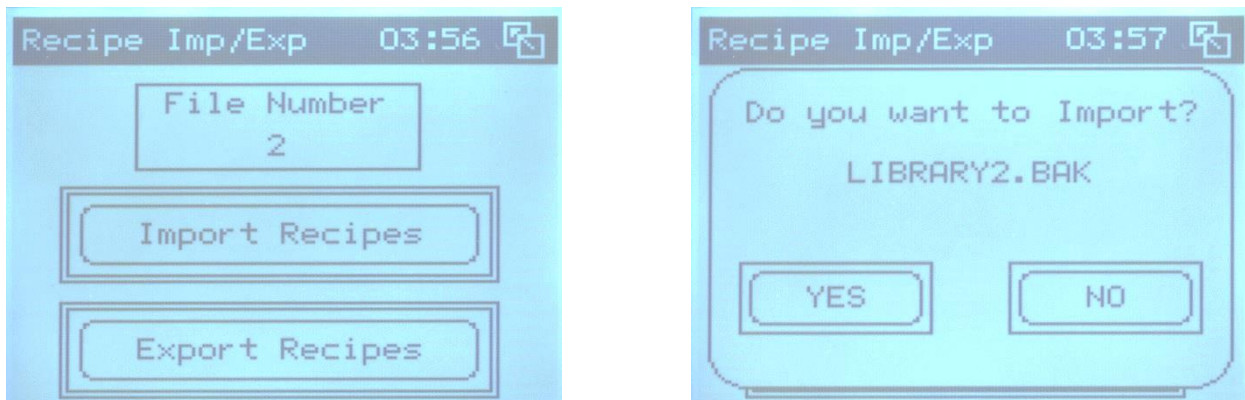



Figure 36: Import/Export screen (left). Confirmation screen (right)

7. Import of recipe library from memory card
 - Insert a micro SD card into the memory slot (See section 0)
 - Login to the system as supervisor
 - Press the setup button on the main menu screen
 - Select the 'recipe imp/exp' function using the up and down arrows
 - Press the curved arrow to open the next screen (Figure 49)
 - Press the file number button to go to the entry screen
 - On the entry screen input the file number (0-9) you wish to import and press enter
 - Press the import recipes button and confirm when prompted (Figures 50 and 51)
 - The whole library will be imported from the file on the micro SD card named LIBRARYX.BAK, where X is the file number entered on the previous step.
 - A confirmation notice will appear after the file writing is finished (this may take several minutes)
 - Acknowledge the notice and press  to return to the Settings list

9.10. Finishing Mixing Run

Upon finishing a run the notification to the operator is shown on the screen. Details of the notification depend on events during the process. Possible scenarios are provided in Table 6.

Table 6: Finish notification details

| Process Condition | | Finish Notice Content | |
|--------------------------------|--------------------------|-----------------------|--|
| Started | During Run | Finish Status | Duration Shown |
| Manual permanent or timed run. | Normal process | Successful | Neat mixing time (pause time is not included) |
| | Paused-resumed | | |
| | Failure-alarm | Unscheduled | |
| | Stopped (timed run only) | | |
| Recipe run | Normal process | Successful | Actual duration of recipe run time (includes pauses) |
| | Pause-resumed | Unscheduled | |
| | Failure-alarm | | |
| | Aborted | | |

9.11. Initial Settings

Default settings are the factory preinstalled parameters as listed in the Table 7. The parameters can be adjusted through the corresponding editor screens.

Table 7: Initial settings of user interface parameters

| Description of Parameter | Units | Factory Setting |
|--|-------|-----------------|
| Manual mode speed of rotation | RPM | 20 |
| Manual mode run duration | Min | 0 |
| Recipe mixing phase time duration (in all instructions) | Min | 0 |
| Recipe pause phase time duration (in all instructions) | Min | 0 |
| Recipe speed of rotation (for all instructions in recipes) | RPM | 20 |
| Auto logout time | Min | 10 |
| Operator password | | 123456 |
| Supervisor password | | 123456 |
| Date format | | MM:DD:YY |
| Calendar date | | |
| Clock time | | |

10. Disconnecting Drive Unit from Tank

1. When mixing is complete, press and hold the STOP button until top bar of the window filled (2-3 sec); unless the run finished and rotation stopped automatically.
2. Firmly hold the drive unit handle and raise the drive unit slightly to release the latch. Release the latch by pulling it toward the control box.
3. Carefully lower the rear wheels of the drive unit to the floor. Roll the drive unit on its rear wheels away from the dolly.
4. Press down on the drive unit handle until the guide bearings are free from the guide rails.
5. Pull the drive unit away from the dolly until the guide bears are free from the rails. Carefully lower the front wheel to the ground.
6. The magnetic mixer drive unit can now be wheeled to another station for use.
7. When mixing is completed and the biocontainer is completely drained, remove the biocontainer by carefully pulling the impeller seat and the drain tube out of their respective ports.
8. Remove the centering aligner and return to the supplied accessories box for future use. The interface should remain in its locked position for future use.
9. Dispose of plastic biocontainer.



Always put the protective shield back on the biocontainer impeller before disposal.

11. Maintenance and Care

The magnetic mixer drive unit is designed to operate with minimal maintenance. It has been tested to run continuously for up to 7 days. Longer operation may be possible but further user validation would be required.

To clean, wipe down the drive unit surfaces using water and a mild detergent solution. Standard drives are constructed from 304-alloy stainless steel, which may be vulnerable to corrosion if exposed to corrosive chemicals or if left in persistent contact with moisture. Appropriate precautions should be taken to prevent such corrosion.

Only use the original packaging for shipment of the drive unit.

Recipes can be transferred between magnetic mixer units, including the whole recipe library, using external media (micro SD card).

If user defined library content needs to be transferred back in the unit after service is done it is recommended to save the recipe library on a micro SD card prior to conducting software service.



Always unplug the unit from power line when performing maintenance procedures. When finished, make sure all the electrical cases are properly locked and all open/detached components placed back and secured in their normal position. Update/restore of software resets the runtime counters to zero.

Update/restore of software results in changes in recipes content which is set to factory installed values (run time and pause time are zero, speed = 20 RPM).



The presence of this WEEE label on a product means that the product contains electrical or electronic materials and therefore must not be disposed of as unsorted waste but instead is treated separately. The presence of these materials may, if not disposed of properly, have potential adverse effects on the environment and human health. Within the European Union, operators are urged to recycle such products when being replaced with a newer version or when they have outlived their useful lives.

Under the Waste Electrical and Electronic Equipment (WEEE) directive and implementing regulations, when customers buy new electrical and electronic equipment from Pall they are entitled to:

- Send old items put on the market in Europe before August 13th 2005 equipment for recycling on a one-for-one, like-for-like basis (this varies depending on the country)
- Send the new equipment back for recycling when this ultimately becomes waste.

Country specific instructions to both customers, and recyclers/treatment facilities wishing to obtain disassembly information, are provided by following the link below.

<https://www.pall.com/en/about-pall/corporate-sustainability/weee-compliance.html>

11.1. Preventive Maintenance

Periodical maintenance is recommended to keep the drive unit in reliable working condition. Wearing of moving parts can be monitored through the elapsed run time counter in the PLC. Run time information is accessible for viewing on the touch screen through the setup menu.

Recommended preventive maintenance procedures are listed in Table 8.

Table 8: Preventive maintenance procedures

| Description | Frequency | Spare Parts Involved | Who Performs |
|--|-----------------------------|--------------------------------------|---|
| Filter inspection. Replace if deposits on the filter media are noticeable. | Every 1000 system run hours | Replacement filter tissue LT-SVSP327 | User. Follow procedure description in this manual |
| Battery replacement | 6 years | Li battery CR2477 | Service |

11.2. Troubleshooting

Table 9 lists ways for resolving possible problems. Contact technical service if problem persists.

Table 9: Troubleshooting

| Problem Description | Possible Reason | Corrective Action |
|---|--|--|
| Unit does not start when power button is pressed. | Main power fuse is burned out | Replace the fuse. Follow procedure description in this manual. |
| No white light when power is on while unit started | Power button LED is burned out | Replace the bulb. Follow procedure description in this manual. |
| Impeller has unsmooth rotation with jumps or jerks with irregular rattling sound. | Impeller is overloaded with torque | Inspect impeller load in application, reduce load if possible |
| | Weak coupling | Check if connection to tank made correctly without tilt and/or air gap between drive head and biocontainer. |
| Low battery notification onscreen | Battery is low | Elevated risk of memory corruption and unreliable operation. Call for technical service. |
| Motor failure alarm | Overheating of the controller by frequent starting-stopping of the motor | Reset the motor controller alarm. Pause about 3 min before starting up motor. Avoid frequent starting-stopping of the motor. |
| | Wiring or Internal damage of motor or controller | Contact service personnel |
| Cannot read/write to micro SD card. | Micro card improperly formatted | Format micro SD card. |
| E-stop ALARM persists after reset | E-stop button is activated | Deactivate E-stop button by pulling it up until it clicks, then reset the alarm. |

11.3. Procedures

11.3.1. Change the Frame Configuration

To change frame configuration, follow steps below and Figure 38 and Figure 39.

1. Release cables from the two cable clips on the angled cross bar on the frame.
2. At the four frame connection points loosen and remove the two nuts on the side connections and the two nuts on the top connections.
3. Pull out the carriage screws at the four frame connection points and remove the two bushings installed in the side tabs. Hold the frame at the heavier control box side to prevent it from tipping.
4. Move the frame to align it with the other set of connection points corresponding to the new frame configuration.
5. Insert the four carriage screws into four frame connection points. The two side bolts should go through bushings as shown in Figure 38.
6. Secure the frame with the four nuts at the connection points; tighten the nuts. Make sure the square portion of screw heads are fitted into the square holes in frame.
7. Adjust and clip the cables to the frame to fit the frame configuration.

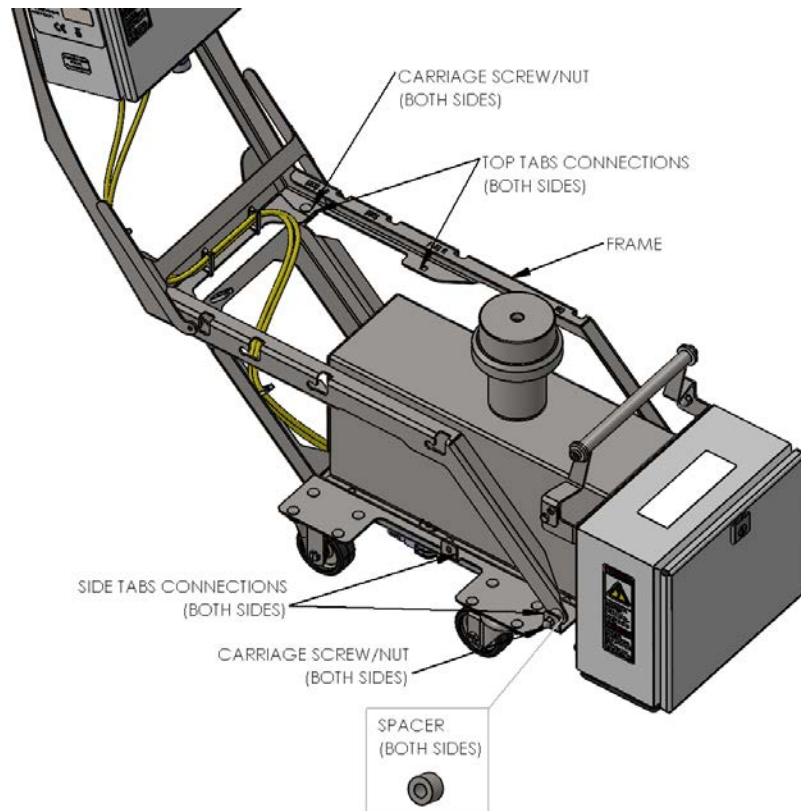


Figure 37: Frame adjustments elements

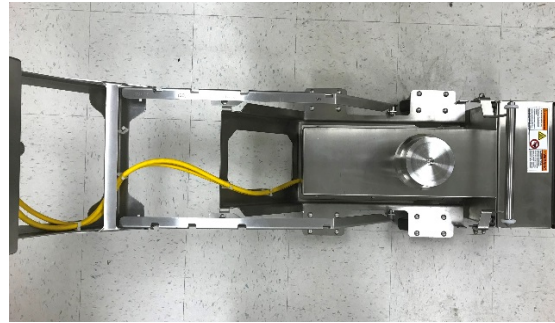
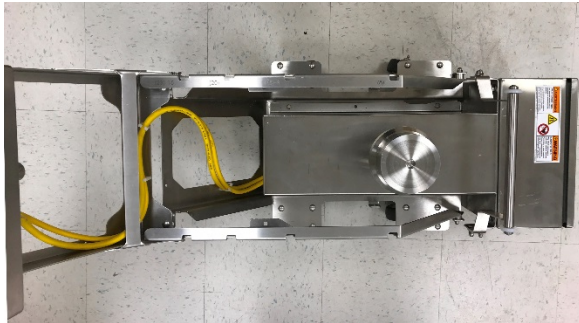


Figure 38: Left: Standard configuration. Right: Extended configuration

11.3.2. Power Cord Replacement

Should you need to replace the power cord with an alternative one, follow the procedure as described below. Only use power cords provided by Pall for replacement.

Changing the power cord is performed through a power entry connector on the back panel of the control box.

To replace the power cord, follow these steps (see Figure 40):

1. Ensure the unit is turned off.
2. Unplug the unit from the external power supply.
3. Disconnect the power cord from the control box by rotating the power connector holding cap counterclockwise then, holding the connector plug, pull it out of the receptacle.
4. Attach the replacement power cord connector plug to the power receptacle on the control box. Make sure the key on the receptacle and key hole in the plug are aligned and the connector plug is pushed all the way in.
5. Secure the connector holding cap by rotating it clockwise. Tighten the cap firmly to seal the connection.



Figure 39: Power cord replacement

11.3.3. SD Micro Card Replacement:

Micro SD cards are compatible with the memory slot. The PLC uses a FAT 32 file system format. The memory slot is equipped with a 'push-in, push-out' connector for Micro SD cards insertion.

To change the SD card:

- Switch the unit off and unplug it from the external power source
- Unlock control box by rotating the latch counterclockwise using a flat-head screwdriver
- Open the Control Box door and locate the memory slot on the upper side of the PLC (see Figure 41)

To insert the SD card

- Align the card so that the 8-pin gold edge connector is facing upwards on the SD card
- Push the Micro SD card in all the way into the memory slot, ensuring that it clicks into place

To remove the Micro SD card

- Push down on the top of the card gently to release the spring. The card will pop up for removal

Close the control box door and lock it by rotating the latch 90° in a clockwise direction using a flat-head screwdriver.



Figure 40: Micro SD card installation

11.3.4. Fuse Replacement

To change the fuse (see Figure 42):

- Switch the unit off and unplug it from the external power source
- Unlock control box by rotating the latch counterclockwise using a flat-head screwdriver
- Open the control box door and locate the fuse holder
- Grip the fuse holder, pull upwards and rotate it 90°
- Unsnap and open the access door on the side of the fuse holder. The fuse will now be exposed
- Remove and replace the fuse by pulling the old one out and snapping the new one into the slot on the access door surface
- Close the access door and squeeze firmly to snap it back in place
- Rotate the fuse holder back into its original position and close the control box door. Lock it by rotating the latch clockwise using a flat-head screwdriver



Figure 41: Fuse replacement

11.3.5. LED Bulb Replacement

To change the LED bulb (see Figure 43 & Figure 44):

- Switch the unit off and unplug it from the external power source
- Unlock control box by rotating the latch counterclockwise using a flat-head screwdriver
- Open the control box door and locate the contact block attached to the power button.
- Pull the cap up from the lever (pry slightly with slotted blade screw driver)
- Turn the lever to the left position
- Pull the contact block off of the power button. The contact block will release and the LED will be exposed
- Replace the LED by twisting and pulling it out of the contact block. Replace with a new LED
- Place the contact block in its original position on the power button stem and lock it by turning the lever all the way to right
- Check to ensure the contact block is firmly seated on the power button and place cap back on the lever all the way down
- Close the control box door and lock it by rotating the latch clockwise using a flat-head screwdriver

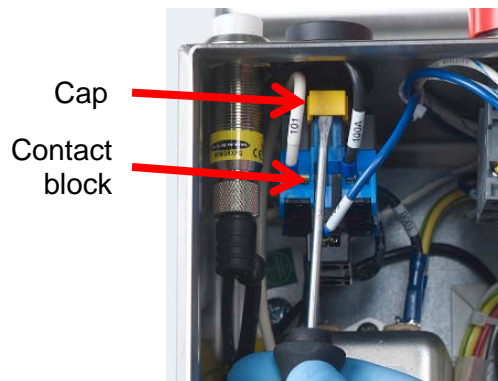


Figure 42: Contact block release

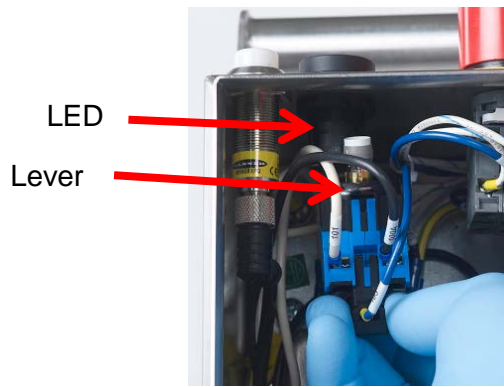


Figure 43: LED bulb replacement

11.3.6. Air Filter Inspection

To inspect air filter, follow steps below:

- Switch the unit off and unplug it from the external power source.
- Lean the entire unit back to expose the bottom of the unit.
- Unsnap all four clips of the filter cover with a flat-head screwdriver and detach it from the filter body.
- Remove the cover by sliding it out. The filter tissue is located between the filter body and filter cover (see Figure 45 & Figure 46).
- Check the filter tissue for deposits on both sides. Replace filter tissue with a new one if noticeable deposits are found.
- Replace the filter tissue and snap the filter cover back onto the filter body.
- Check to ensure the cover is secured using all four clips.



Figure 44: Removing filter cover



Figure 45: Replacing filter membrane

11.3.7. Cleaning and Decontamination

The steel frame of the machine consists of 304 stainless steel and may be cleaned with water and isopropyl alcohol.

NOTE: It is important to ensure the system is turned off before cleaning the device.

11.3.8. Speed Calibration Verification

Equipment recommended:

- Test impeller: Accessory item 4100655 equipped with piece of reflective tape (tachometer accessory) on side surface.
- Optical tachometer: Omega HHT13 or equivalent

The drive unit should be set to manual mode of operation. Use Table 10 to document the calibration.

1. Set the permanent run speed of rotation to 20 RPM.
2. Press and hold the 'start' button, rotation started. Wait until the impeller accelerates to its nominal speed of rotation.
3. Reading from external tachometer, write into the second column of the table.
4. Calculate the difference between set point and the value measured in 3.
5. Compare the reading recorded in column 2 with corresponding allowable range in the third column, and then record the result in column 6.
6. RPM Reading from panel screen record into the fourth column.
7. Compare the reading recorded in column 4 with corresponding allowable range in column 5 of the table, and then record the result in column 7.
8. Repeat steps 3 to 7 for each of the RPM set points in the first column.
9. If unsuccessful, call service.

Table 10: Rotational speed calibration test measurements

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-----------------|-----------------------------------|---|--------------------------------|-------------------------------------|--|---|
| Set Point (RPM) | External Tachometer Reading (RPM) | External Tachometer reading allowable range (RPM) | Panel Tachometer Reading (RPM) | Panel reading allowable range (RPM) | External Tachometer Max Deviation falls within allowable range (Y/N) | Panel Tachometer Max Deviation falls within allowable range (Y/N) |
| 20 | | 19 - 21 | | 19 - 21 | | |
| 60 | | 59 - 61 | | 59 - 61 | | |
| 100 | | 99 - 101 | | 99 - 101 | | |
| 140 | | 138 - 142 | | 138 - 142 | | |
| 180 | | 178 - 182 | | 178 - 182 | | |
| 220 | | 218 - 222 | | 218 - 222 | | |
| 260 | | 258 - 262 | | 258 - 262 | | |
| 300 | | 298 - 302 | | 298 - 302 | | |

12. Spare Parts and Standard Accessories

Table 11 shows a list of recommended accessories and spare parts with their respective part numbers. For reference see also Figure 48 & Figure 47.

Table 11: Spare parts and accessories

| Item | Description | Part Number |
|--|---|-------------|
| Accessories Included in Toolbox | | |
| A1 | US power cord | LT-SVSP365 |
| A2 | EU power cord | LT-SVSP366 |
| A3 | Magnetic clamp type 2 | LT-SVSP309 |
| A4 | 7/16 in. combination wrench | LT-SVSP314 |
| A5 | Centering aligner | LT-SVSP305 |
| A6 | Magnetic mixer test impeller | 4100655 |
| A7 | Soft magnetic shield | LT-SVSP313 |
| A8 | Clip for 1 in. drain valve | LT-SVSP312 |
| Accessories Not Included in Toolbox | | |
| | Power cord AU | LT-SVSP367 |
| | Power cord SW | LT-SVSP368 |
| | Power cord UK | LT-SVSP369 |
| | Power cord CN | LT-SVSP480 |
| Spare Parts | | |
| 1 | Latch | LT-SVSP315 |
| 2 | Guide roller | LT-SVSP320 |
| 3 | Replacement filter tissue | LT-SVSP327 |
| 4 | White illuminated pushbutton switch | LT-SVSP414 |
| 5 | Fuse, 250 VAC x 10 A | LT-SVSP482 |
| 6 | Carriage screw ¼ in. - 20, lg. 1 in., 18-8 SS | LT-SVSP387 |
| 7 | Carriage screw ¼ in. - 20, lg. ½ in., 18-8 SS | LT-SVSP386 |
| 8 | Acorn nut ¼ in.-20, hex 7/16 in. | LT-SVSP388 |
| 9 | Spacer 0.38 ID x 0.75 OD 7/8 in. lg, 18-8SS | LT-SVSP394 |
| 10 | White LED bulb | LT-SVSP415 |
| 14 | Compact touch screen PLC | LT-SVSP348 |
| 15 | Mixer signal connector plug | LT-SVSP483 |

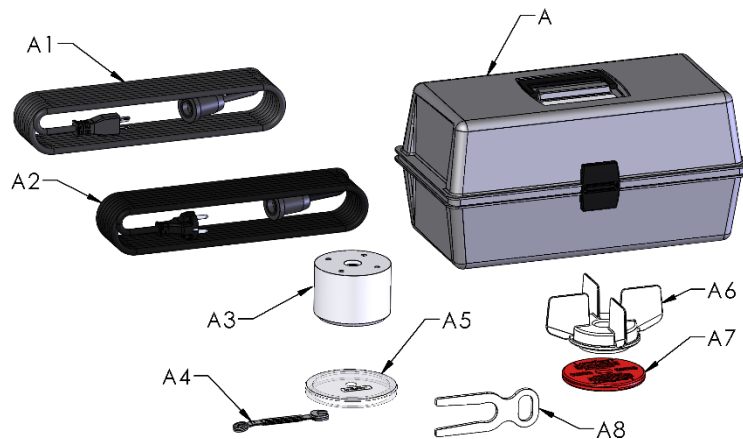


Figure 46: Accessories included in toolbox

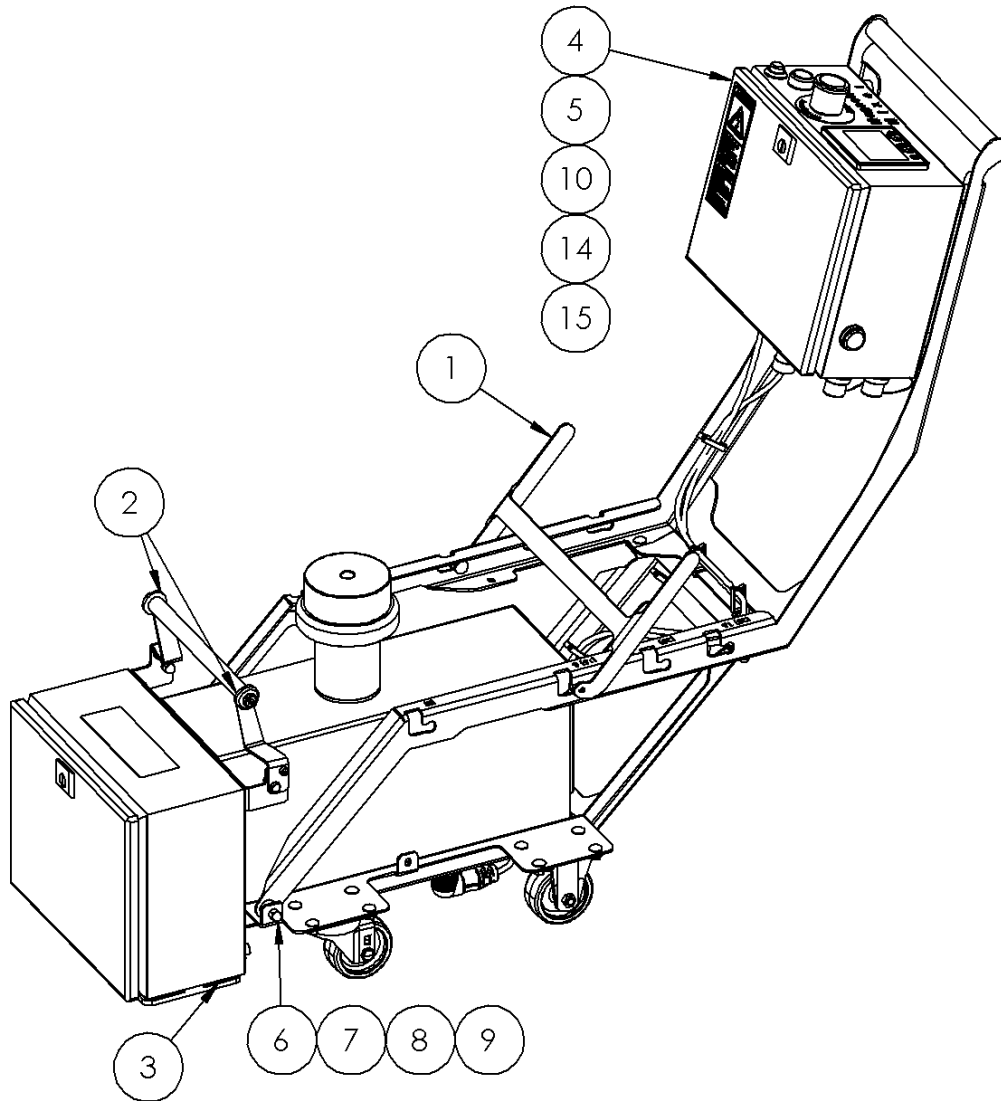


Figure 47: Magnetic mixer components

13. Service

The Allegro mixing tank was developed exclusively for mixing fluids and solids in fluids in specially designed Allegro single-use mixing biocontainers. The tank should only be used for this purpose to ensure a long service life. Should your drive unit require service, please contact your Pall local sales team.

14. Scientific and Laboratory Services

Pall operates a technical service to assist in the application of all of its products. This service is readily available to you and we welcome your questions so that we can help. In addition, a full network of technical representatives is available throughout the world.

15. Electrical Diagram

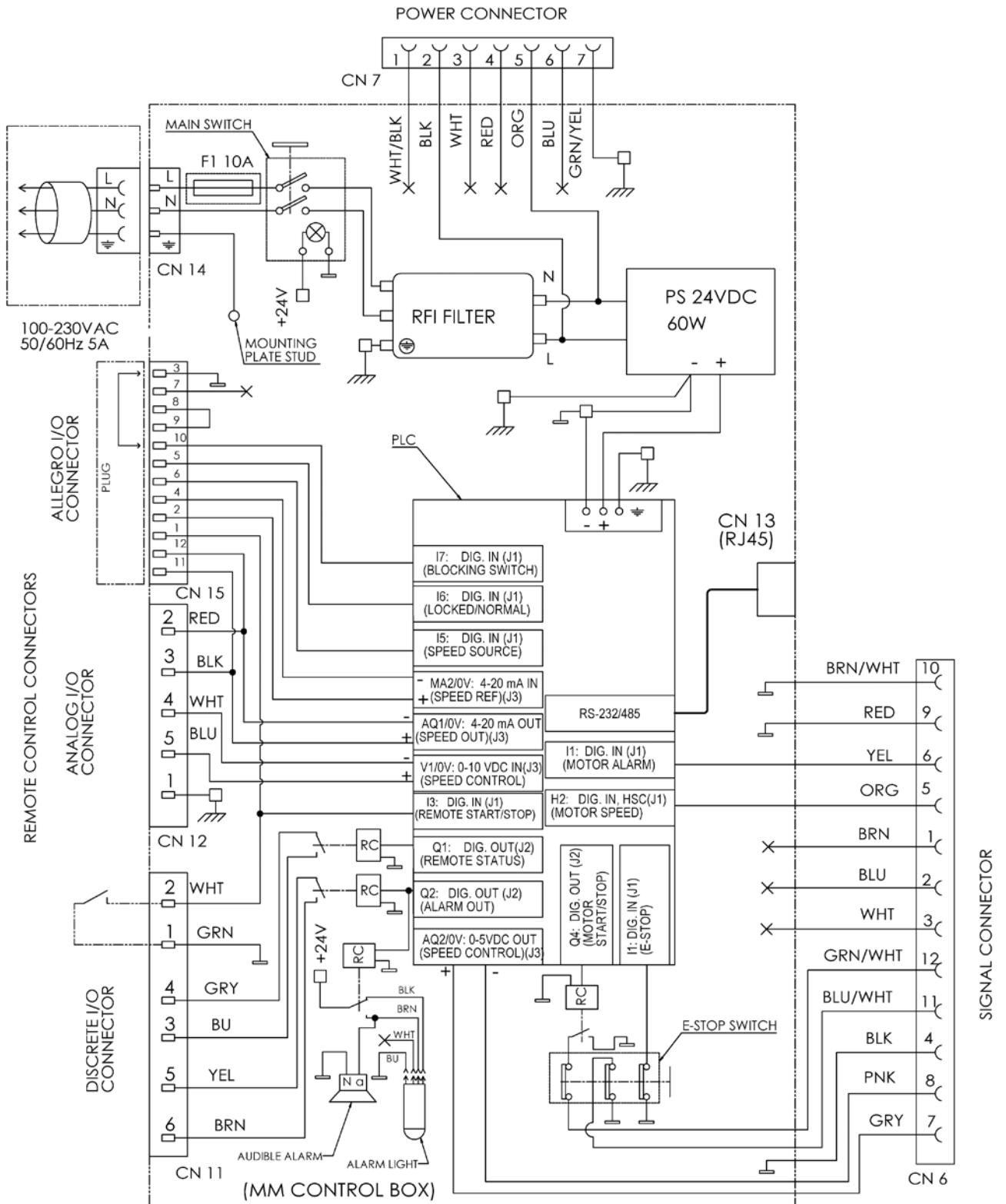


Figure 48: Electrical diagram control box

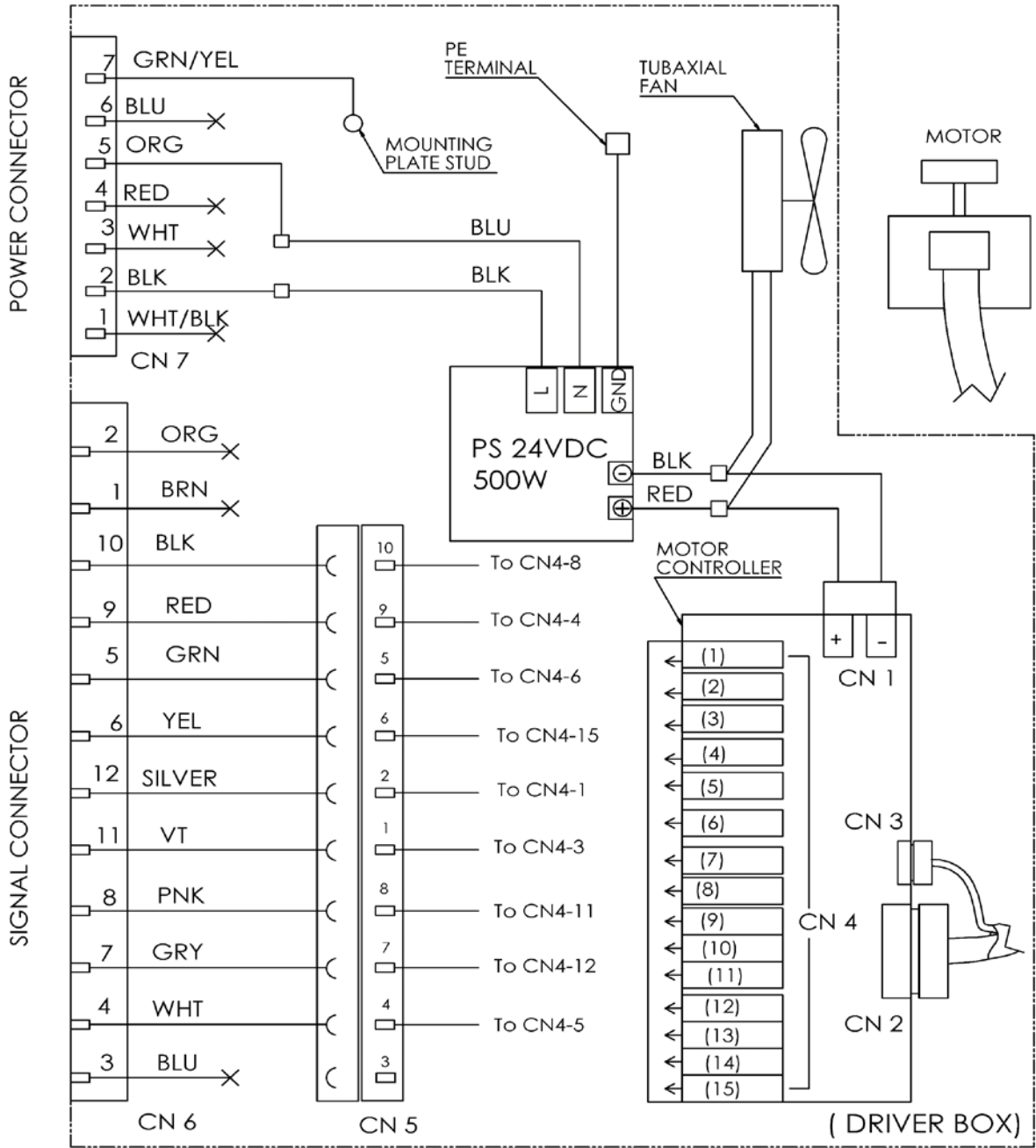


Figure 49: Electrical diagram drive box

Table 12: Remote Control I/O Chart

| Analog I/O Connector Circuits | | | | |
|---------------------------------|----------------------------------|---------------|-----------------------------|-----------------------------|
| Pin # | Circuit Description | Range | Calibration | |
| 2, 3 | Speed output 4-20 mA | 0-300 RPM | 4mA=0% of range | 20mA=100% of range |
| 4, 5 | Speed set point input 0-10VDC | 0-300 RPM | 0V=0% of range | 10V= 100% of range |
| Discrete I/O Connector Circuits | | | | |
| Pin # | Circuit Description | Signal Type | Logic | |
| 1, 2 | Motor Start/Stop input | Relay contact | Open=Stop | Closed=Run |
| 3, 4 | Remote status output | Relay contact | Open=Local Control | Closed=Remote Control |
| 5, 6 | Alarm output | Relay contact | Open=No Alarm | Closed=Alarm |
| Allegro I/O Connector Circuits | | | | |
| Pin # | Circuit Description | Signal Type | Logic | |
| 1, 3 | Motor Start/Stop input | Relay contact | Open=Stop | Closed=Run |
| 5, 3 | Norma/Locked Mode switch input | Relay contact | Open=Locked Mode | Closed=Normal |
| 6, 3 | Speed control switch input | Relay contact | Open=Local speed adjustment | Closed=Remote speed control |
| | | Range | Calibration | |
| 2, 4 | Speed set point input 4-20 mA | 0-300 RPM | 4mA=0% of range | 20 mA=100% of range |
| 11, 12 | Speed output 4-20 mA | 0-300 RPM | 4mA=0% of range | 20 mA=100% of range |

The analog speed control input 0-10 V (pins 4 and 5 of ANALOG I/O connector) has an impedance of 500 kOhm. The safe input voltage range is -0.5 V to +15 V


For the analog output 4-20 mA (pins 2 - 3 of ANALOG I/O connector and pins 11 – 12 of ALLEGRO I/O connector) the MAX load resistance should not exceed 500 Ohm.

For equipment safety and to avoid possible excess noise on the speed control input signal (pins 4, 5 of ANALOG I/O connector) it is recommended to include an Isolation amplifier in the design of the 0-10 VDC remote control external circuitry.

IMPORTANT: Avoid having in use simultaneously remote cable in Allegro connector and standard remote cables (discrete and analog connectors) to prevent potential interference of some of I/O signals.

IMPORTANT: External connectors and cables are rated 300 V to 600 V. For all external communication signals, normally working voltage does not exceed 24 V by design. Per safety requirements external equipment intended for connection to signal inputs, signal outputs or other connectors shall comply with the relevant product standard e.g. IEC 60950-1 or IEC 62368-1 for IT-equipment and the IEC 61010-1-series for laboratory equipment so as to provide proper isolation between high voltage and low voltage circuits.

16. CE Certificate


EC DECLARATION OF CONFORMITY
CE

Product Description: As detailed in Operator Manual (020-17528-00)

Product Part Number: MMG403

The Magnetic Mixer
a product of Pall Corporation, is in conformity with the requirements of the following European Directives
(and their associated amendments):


| | |
|--|------------|
| Electromagnetic Compatibility Directive (EMC) | 2014/30/EU |
| Electrical Safety Low Voltage Directive (LVD) | 2014/35/EU |
| Restrictions on the use of Certain Hazardous Substances (RoHS) | 2011/65/EU |
| Machinery Directive | 2006/42/EC |

This declaration is based upon testing the compliance of the product against the limits of the following harmonised standards:


| | |
|--|-----------------------|
| EN60204-1: 2016 | Machinery Directive |
| EN61010-1: 2012 | Low Voltage Directive |
| EN61000-6-4:2007 (EN55011:2016), EN61000-6-2:2005 | EMC Directive |

Signed:

Massimo Manazza
Director of Quality, Biopharm / CE Representative Europe

 12 Nov. 2018
Date:

Paul Wallace
Quality Manager Westborough / CE Representative US

 13 NOV 2018
Date:

For and on behalf of:
Pall Life Sciences, Reugelstraat 2 3320 Hoegaarden, Belgium, Telephone: 32.16.76.80.70

17. Warranty

Pall warrants that the Allegro systems manufactured by Pall, when properly stored and installed, and operated as per the specifications and design conditions stated in this document will be free from defects in material and workmanship during their shelf life. Pall liability under any warranty is limited solely to replacing, or issuing credit for the Allegro systems that may become defective during the warranty period.



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