

# *Caframo*

## Crossover User Manual





---

## Language Index

English.....	3
--------------	---

---

## Contents

Language Index .....	1
Packing List .....	1
Safety Instructions.....	2
Introduction .....	3
Safety Label Legend .....	3
Safety Features.....	4
Accessories .....	5
Approvals .....	5
Technical Data .....	5
Environmental Operating Conditions.....	6
Installation Instructions.....	6
Features and Operation .....	8
Basic Settings .....	10
Feature Settings .....	10
Data Logging .....	13
Communications .....	14
Software Updates .....	16
Warnings and Notifications .....	17
Warranty and Product Liability .....	19

---

## Packing List

Compare the contents of the shipment to the items on the following list to ensure all parts are received. Do not discard the container and packing materials until all parts are accounted for. It is recommended to keep the original packaging for transportation and storage.

- Caframo Crossover 1540 Mixer
- Chuck with Key
- Chuck Shaft Guard
- Cord Set
- Instruction Manual
- Memory Stick
- Hex Key - 5 mm

Register your product at [CaframoLabSolutions.com/product-registration/](http://CaframoLabSolutions.com/product-registration/) to receive access to software updates.

---

## Safety Instructions

### CAUTION / WARNING

1. All operators must be familiar with the mixer and read this entire manual. If the mixer is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.
2. Ensure that only trained staff operate the mixer.
3. Because the combinations of products, impellers, stirring vessel, and medium are nearly endless, user safety cannot be ensured solely with product design requirements. For this reason, it may become necessary for users to take additional precautionary safety measures.
4. Ensure the Power Switch and Quick Stop switch of the mixer can be accessed immediately, directly and without risk at any time, and above all, in case of fault.
5. The mixer must be securely fixed to a stable support. The high torque produced by the mixer requires particular care in the choice of support for the mixer and vessel. Mixer not intended for hand held operation.
6. All mixing impellers must be in good condition with straight shafts. If the mixer vibrates at high speeds check the shaft for damage and repair or replace it.
7. The mixer must be supplied with the rated voltage (see serial label).
8. Ensure that the mixing impeller does not contact the stirring vessel.
9. Spinning impellers can cause severe personal injuries. Operators must use extreme care and good judgment when mixing at any speed.
10. Always ensure the power switch in the OFF position or disconnect the power before changing the impeller, attaching the shaft guard, and fitting accessories. Do not attempt to service or reposition the mixer while shaft/impeller is rotating.
11. **CAUTION:** This is not an explosion proof mixer. Do not use with highly flammable or explosive materials. Do not operate the mixer in explosive atmospheres, with hazardous substances or under water.
12. Extreme care must be taken when mixing chemicals so that no chemicals are splashed outside the mixing vessel. Care must be taken when changing to faster mixing speeds. On power up, the mixer will display its set speed and will climb to that speed when the PAUSE/PLAY button is pushed. Always start at lowest speed if unsure of maximum safe speed.
13. Do not operate while standing in water. Keep the mixer dry and do not immerse any part, except the impeller into any liquids. Protect from splashing.
14. Ensure that no loose clothing, jewelry, or hair can become entangled in any rotating parts. A fast spinning chuck can cause injury to an operator.
15. Power can be interrupted to the mixer by pressing the power switch or by disconnecting the mains cord. If rotating, this will cause the mixer to stop.
16. Shaft rotation can also be stopped by pressing the PAUSE/PLAY button. This does not disconnect power to the mixers internal drive circuit.
17. Wear safety goggles and suitable clothing when operating the mixer.
18. Repairs must be carried out only by technicians authorized by Caframo.
19. The motor, transmission or housing surface may become hot during operation.
20. Motor fan cover must be secured in place during operation.
21. Always confirm the direction of rotation as noted on the Home Screen dashboard prior to operation.
22. Ensure motor has been stopped by pressing the PAUSE/PLAY button before turning power switch off. Do not use the power switch to stop rotation.
23. A Quick Stop switch has been incorporated for safety. Pressing the Quick Stop will immediately stop operation.
24. Mixer must be used with supplied power cord. The cord and grounded plug type are important safety elements. Do not use an inadequately rated cord or ungrounded plug. Always connect the mixer to a grounded outlet. Do not alter the plug.
25. Following periods of operation, ensure mixer has adequately cooled before handling.
26. Noise levels may exceed 80 decibels under certain operating conditions. Ear protection recommended.
27. Only use guarding provided by the manufacturer (see accessories section).
28. If the reason for loss of power is uncertain, switch off the mixer and check for mechanical hazards prior to resuming operation. When Resume on Power Up feature is set to on, a 5 second delay occurs, 5 short beeps sound and a notification appears on screen prior to start. When audible alarm sounds, please keep clear of moving components. In the absence of audible alarm or on screen notification, switch off the mixer and check for mechanical hazards.

## Introduction


This mixer is specifically designed for professional use in the laboratory and for use in industry to stir liquids with various properties and applications. The mixer rotates at 50-1500 rpm with a peak torque of 3000 Ncm.

This mixer uses a high efficiency brushless DC motor which yields high torque over a very wide speed range. The speed is kept constant with continuous feedback to the motor. The mixer is designed for reliability and durability. There are no wear parts that require user service during the normal life of the mixer. There are no user serviceable parts.


This mixer is designed for safety. It comes on in the 'pause' mode once power is activated. The mixer has integrated overload and overheat protection which ensures no damage can occur to the electronics, motor or transmission when an overload situation occurs, such as too great a torque demand or mixer overheating (see Warnings and Notifications).

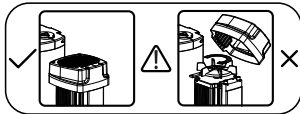
## Safety Label Legend


 **CAUTION:** Refer to Manual

 1. **CAUTION:** Through shaft cover must be securely pressed in place for water protection.




 2. **CAUTION:** Motor fan cover must be secured in place during operation.




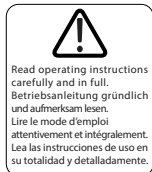
 3. **CAUTION:** Surface may become hot during operation.



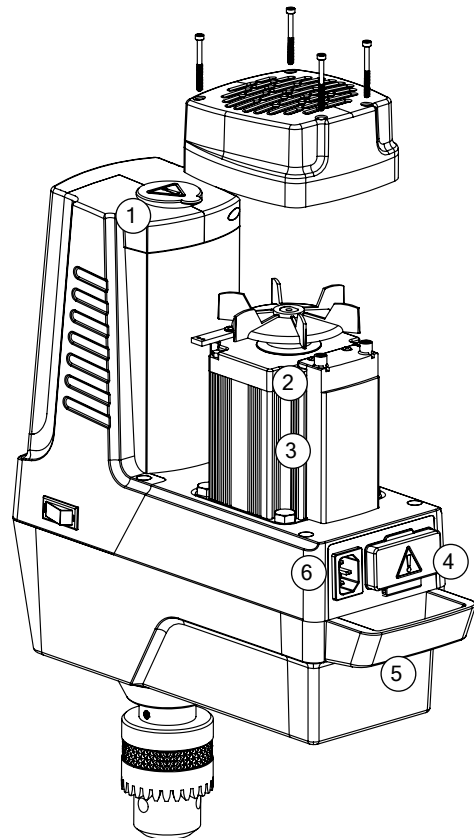
 4. **CAUTION:** Communication port cover must be securely pressed in place for water protection.



 5. **CAUTION:** Read operating instructions carefully and in full.



 6. AC Label



---

## Safety Features

This mixer includes the following safety features. Please reference Features and Operation section and Warnings and Notifications section for further details.

### Quick Stop

Press to immediately stop operation in the event of an unforeseen safety risk to the operator or environment.

### Remote Control Enabled Notification

When remote control is enabled, notification appears on screen when attempting local operation.

### Resume on Power Up Notification

When mixer is programmed to Resume on Power Up, a visual and audible warning occurs during a 5 second start up delay. See Feature Settings for additional information.

### Overheat Warning

Operation stops when control board temperature reaches 70 degrees C. Notification and instructions appear on screen.

### Overheat Motor Warning

Operation stops when motor temperature reaches 105 degrees C. Notification and instructions appear on screen.

### Overload Warning

Operation stops when torque requirements exceed capabilities or output shaft is locked. Notification and instructions appears on screen.

### Chuck Shaft Guard

Provides guarding of rotating chuck and mixing shaft.

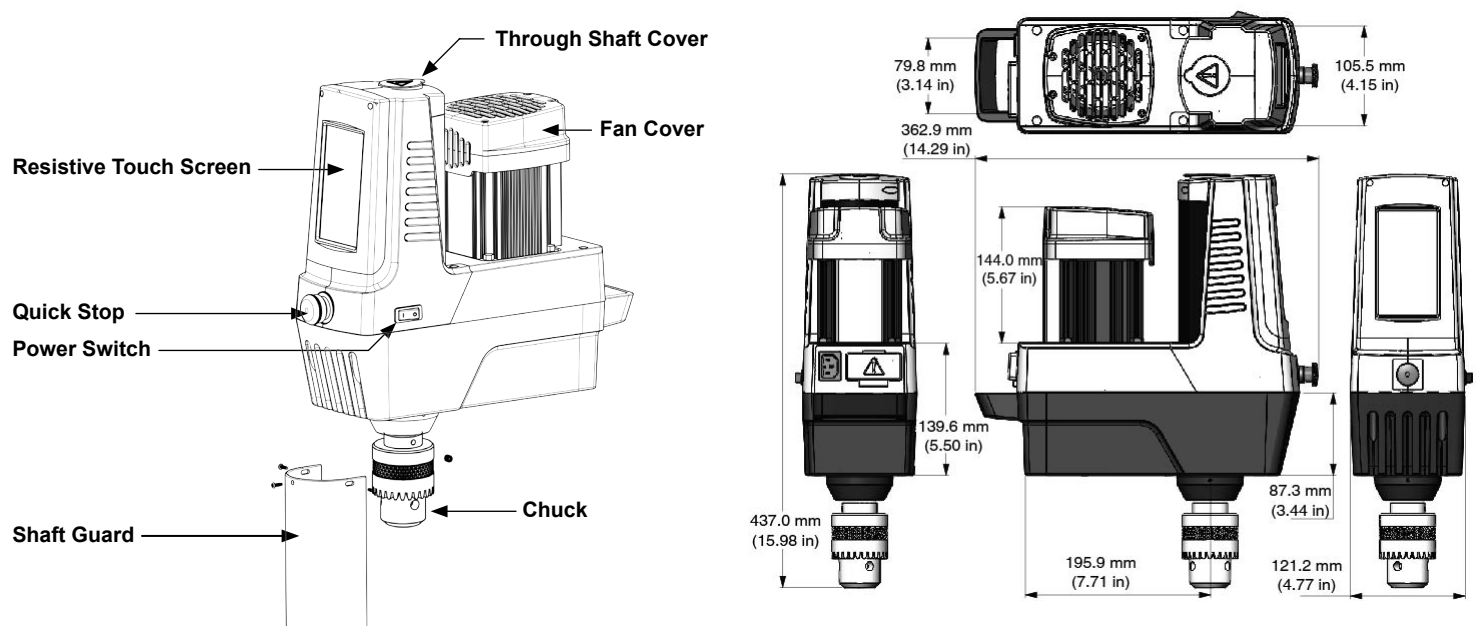
### Thermal Cut Off Switch

If the mixer temperature (at base of motor) exceeds 60 degrees C, an internal thermal cutoff is activated eliminating all power to the mixer and display will be blank. Once mixer cools to below 40 degrees C, power is automatically reinstated with mixer in the paused state. Use keypad to continue operation.

**Note:** If Resume on Power Up feature is active, operation will resume immediately when power is restored.

---

## Diagrams




## Accessories

The following accessories can be purchased from any authorized Caframo distributor:

- A016SET Chuck with Key, SS, Accepts up to 16mm shafts
- A016KEY Chuck Key Only, for A016SET
- A118 Stand – Manual Lift with Casters
- A128SET C-Clamp Set multi-position includes hardware - SS
- A129 Plate Mount 100 x 260 mm includes hardware - SS
- S200 Accessory Set Screen Protector 62 x 101 mm
- A354 Impeller - Propeller 102 mm dia welded to 914 x 13 mm shaft - 316 SS polished
- A356 Impeller - Propeller 152 mm dia welded to 914 x 13 mm shaft - 316 SS polished

## Approvals

### Mixer Approvals

Model	Standards
1540	 CAN / CSA 61010-1 & 61010-2-51 3rd edition UL61010-1 3rd edition.

## Technical Data

Rating	120 volts +/- 10 % at 60 Hz 6.25A	
Installation category (in accordance with IEC664)	II	
Maximum output power (mechanical)	½ hp, 300 Watts	
Speed range	50-1500 rpm	
Graphic User Interface	Resistive touch control	
Speed readout accuracy	+/- 1 rpm or +/- 1% of reading	
Torque maximum at stirring shaft	low speed (50-299 rpm)	2500 Ncm (continuous) 3000 Ncm (peak)
	high speed (300-1500 rpm)	500 Ncm (continuous) 600 Ncm (peak)
Torque readout accuracy	low speed (50-299 rpm)	+/-150 Ncm or +/- 5% of reading; whichever is greater
	high speed (300-1500 rpm)	+/-20 Ncm or +/- 5% of reading; whichever is greater
Maximum stirring volume	200 litres (55 US gal)	
Motor Type	Brushless DC	
Weight (without chuck)	12 kg (26.45 lbs)	
Drive	2 stage transmission, lubricated	
Through shaft diameter	15.9 mm (5/8 in)	
Chuck	304 SS; Accepts shafts up to 15.9 mm (5/8 in) dia; keyed	
Mounting Bolt Pattern	87.6 mm (3.45 in) square with M6 threaded holes	

---

## Environmental Operating Conditions

The mixer must operate in the following conditions:

### Indoors

- Altitudes up to 2000 m (6500 ft.).
- Temperatures from 5 degrees C to 40 degrees C (41 degrees F to 104 degrees F).
- Maximum relative humidity 80% for temperatures up to 31 degrees C (88 degrees F) decreasing linearly to 50% relative humidity at 40 degrees C (104 degrees F).
- Pollution degree 2.

---

## Installation Instructions

### Unpacking and Assembly

1. Always use the designed hand grips to lift the mixer.
2. Slide fingers of one hand into the front hand grip pocket.
3. Wrap the fingers of other hand around the rear hand grip.
4. Carefully lift with the mixer weight equally balanced between both hands.

The packaging can be re-used for mixer and accessory storage.

### CAUTION / WARNING

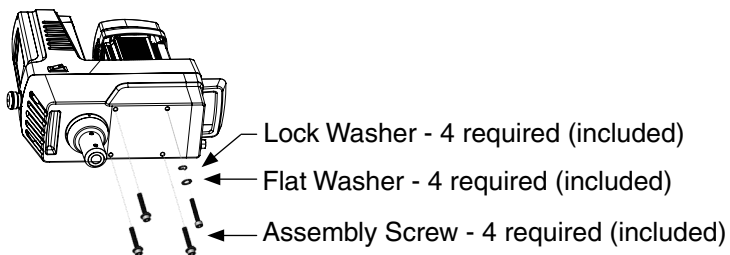
Always hold by the two hand grips, supporting the mixer until securely mounted on an appropriate fixture. Mixer not intended for hand held operation.

### CAUTION / WARNING

Mixer has a maximum recommended tilt and angle (forwards and backwards) of +/- 25 degrees and a maximum recommended rotation angle (side to side) of +/- 15 degrees. The mixer can be used outside of the recommended limits for short periods of time. Prolonged use beyond the recommended angle reduces the lubrication of internal transmission components and could result in permanent damage.

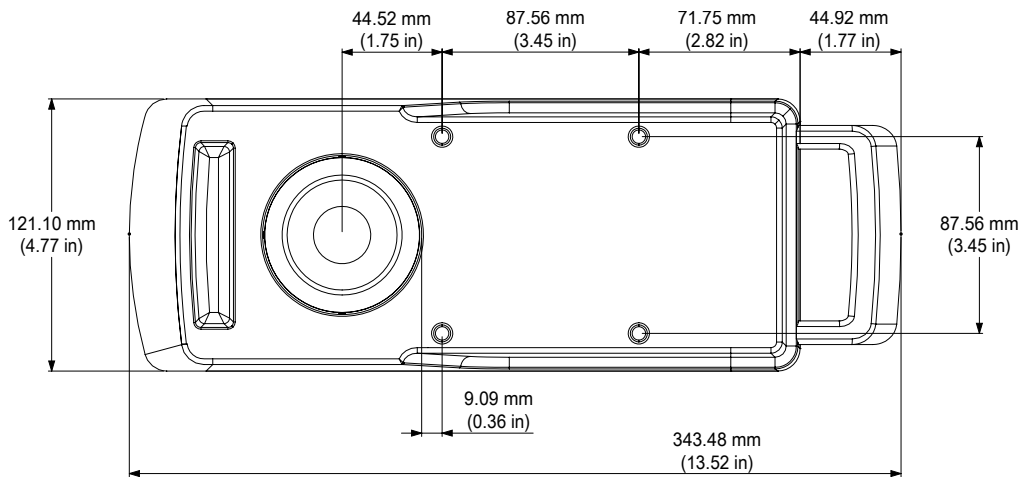
### Mounting the Mixer

Four mounting bolts located on the bottom of the mixer allow for secure attachment to an appropriate stand or fixture. The holes are arranged in an 87.6 mm (3.45 in) square pattern with M6 threaded holes. Use the provided hardware and 5 mm hex key to tighten or loosen bolts.



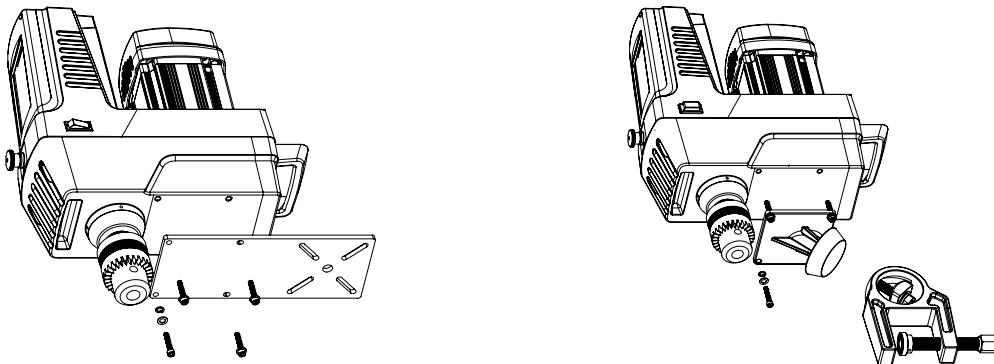


## Mounting Bolt Pattern



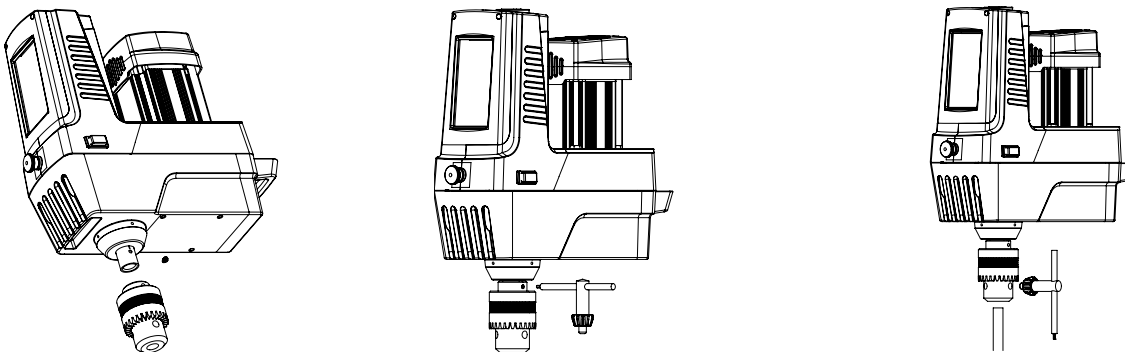
## Mounting Accessories (optional)

- Mounting Plate - Stainless steel plate (100 x 260 mm) allows mixer to be securely mounted to an existing horizontal surface.
- Clamp Set - Stainless steel adapter and c-clamp allows the mixer to be securely mounted to the side of a vessel, drum or vertical surface. Use the C-Clamp Set to achieve any desired mixing angle.



## Chuck and Chuck Shaft Guard Installation

1. Align the chuck set screw hole with the alignment mark on the collar.
2. Slide the chuck onto the motor output shaft until holes are aligned.
3. Tighten the set screw using the tool end of the chuck key (provided) or 3 mm hex key. The mounting screws will be flush when properly installed.
4. Open chuck and insert the impeller shaft into the chuck to the desired length and secure with chuck key.
5. If desired, install the chuck/shaft guard with provided set screws using the chuck key tool or 3 mm hex Key.



## Power On

1. When the mixer is securely mounted, plug mains cord into appropriate power source.
2. Move power switch to the on position.

## CAUTION / WARNING

- Ensure all rotating parts are guarded and protected from potential interference prior to engaging the power switch.
- Ensure Quick Stop is not engaged.

Mixer is shipped in the paused state with the following default values:

Data Logging Interval	1 Second
Language	ENGLISH
Date / Time of Day	Eastern Standard Time
Resume on Power Up	Off
Rotation Direction	Clockwise
Torque Min	0 Ncm
Torque Max	2500 Ncm
Torque Alarms	Off
Continue After Alarm	Off
Timer	Off
Timer Alarm	Off
Continue After Timer	Off
Speed	50 rpm

---

## Features and Operation

### Graphic User Interface

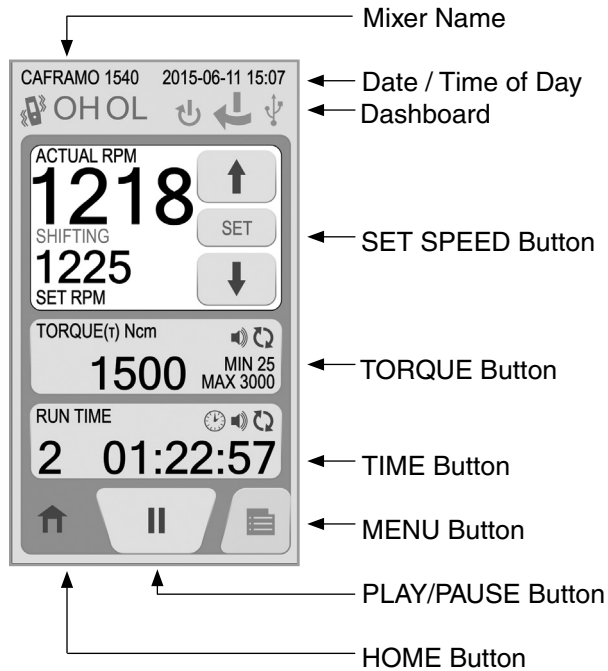
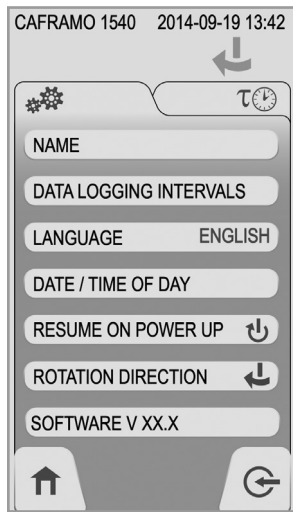
The 1540 Crossover is designed with a durable resistive touch screen. It can be operated by a gloved or ungloved hand, stylus, pen, etc.

### Screen Navigation

- MENU Button - press to display the Menu Screens
- MENU Tab - press to toggle between Settings Menu and Torque / Timer Menu
- ACCEPT Button - press to accept the displayed settings and return one screen level
- HOME Button - press to discard any changes and return to the Home Screen
- PAUSE / PLAY Button - can only be accessed from the Home Screen

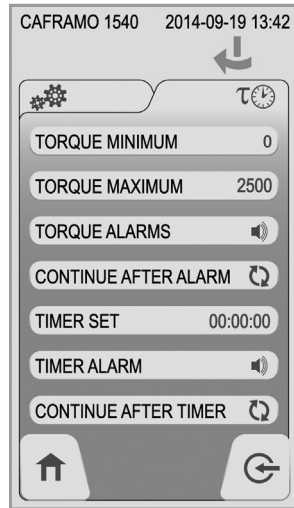
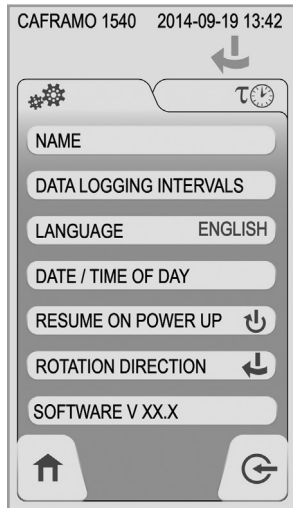
## Home Screen

Upon start up and while in operation

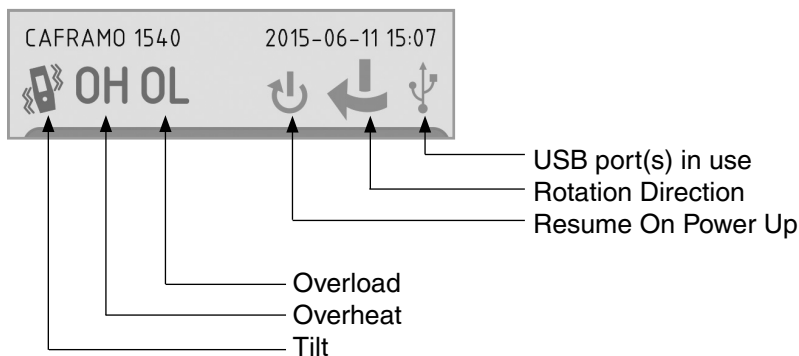


## Menu Screens

Settings Menu and Torque Timer Menu



## Dashboard Icons



---

## Basic Settings

### Name and Date/Time of Day

Customize the mixer name or date/time of day displayed.

From the Settings Menu tab:

1. Press the NAME or DATE / TIME OF DAY button to open the alpha numeric Keypad Screen.
2. Enter parameter. Time of day will be displayed in the 24 hour format.

### Language

View the Home and Menu Screens in English or French.

From the Settings Menu tab:

1. Press the LANGUAGE button to toggle between the available options.
2. Chosen language will be displayed on the LANGUAGE button and the screen will update.

### Rotation Direction

Adjust mixer to turn clockwise or counterclockwise.

From the Settings Menu Screen:

1. Press the ROTATION DIRECTION button to toggle between clockwise and counter clockwise shaft rotation.
2. Chosen setting will be displayed on the ROTATION DIRECTION button and on the dashboard.

### Speed

There are two ways to adjust mixer speed:

From the Home Screen:

1. Press the UP and DOWN arrow to change the SET RPM as shown in the Speed Display.

From the Home Screen:

1. Press the SET button to open the Keypad Screen.
2. Enter desired parameter. SET SPEED will appear on the Home Screen as entered.

If a speed is set outside of the possible range, the default max/min speed is displayed.

If the set speed requires a gear shift, SHIFTING will appear on the Speed Display until gear shift is complete. Mixer will pause rotation while shifting.

---

## Feature Settings

### Resume on Power Up

This mixer has an optional Resume on Power Up feature. When set, the mixer resumes mixing with the same settings after a power failure, when power has been removed by control equipment (i.e., PLC) or when the AC power has been cut (i.e., mixer unplugged). When power is restored, the mixer automatically ramps up to the last set speed following a 5 second delay during which the Resume on Power Up notification appears on screen. The mixer ships from the factory with Resume On Power Up disabled. This feature must be set locally on screen.

From the Settings Menu Screen:

1. Press the RESUME ON POWER UP button to toggle between on and off.
2. RESUME ON POWER UP button will display the corresponding icon.
3. Resume On Power Up icon will appear on the dashboard when feature is set to on.

When this feature is active and the mixer is powered on, the start is delayed for a five second period. During this period an audible alarm will sound five short beeps and a

notification screen will be immediately visible.

**Note:** If Resume on Power Up is used with a Timer setting, the Set Time will restart each time the mixer resumes operation. Resume on Power Up will not occur when Quick Stop has been activated.

**Note:** If reason for power loss is uncertain, switch mixer off and check for mechanical hazards.

### Timer Settings

This mixer features a timer, optional alarm and continue operation function.

This section describes how to set and view:

- Timer - total mixing time
- Timer Alarm - optional audible alarm
- Continue After Timer - stop / resume mixing at the end of the set time

## Timer - Set

Set the total mixing time.

From the Torque / Timer Menu Screen:

1. Press TIMER SET button to open Keypad Screen.
2. Enter desired run time in hours:minutes:seconds. HH:MM:SS to a maximum of 23:59:59
3. Set value will appear on the TIMER SET button and Home Screen, TIME button.

When set time is reached:

- Remaining set time in the display will flash 00:00:00,
- Alarm will/will not sound (per setting) and
- Mixer will stop/continue mixing (per setting - see Timer Alarm and Continue After Timer sections).

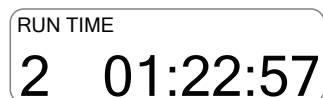
## Timer - View Settings

View the set or run time on the home screen.

From the Home Screen:

1. Press the TIME button (display area) to toggle the display between Run Time and Set Time.

Run Time - displays active mixing time since powered on counting up from zero (Day HH:MM:SS) to a maximum of 99 days.



Set Time - displays set mixing time. The smaller number displays the total set time (HH:MM:SS). The larger number displays the remaining set time, counting down while mixing (HH:MM:SS).



## Timer Alarm

Set an audible alarm to sound when Set Time is complete. When set, a short, audible beep will sound at 3, 2, 1 seconds remaining followed by 2 additional beeps.

From the Torque / Timer Menu Screen:

1. Press TIMER ALARM button to toggle between alarm on and alarm off.
2. Audible Alarm icon, indicating on/off setting appears on the Torque/Timer Menu Screen, TIMER ALARM button and Home Screen, TIME button.

## Continue After Timer

Set the mixer to continue mixing when timer expires.

From the Torque / Timer Menu Screen with Timer set:

1. Press the CONTINUE AFTER TIMER button to toggle between on and off.
2. When set to on, the mixer will continue mixing indefinitely at the completion of the set time. The

remaining set time on the display will flash 00:00:00.

3. When set to off, the mixer will stop mixing at the completion of the set time.
4. Continue After Timer icon, indicating on/off setting appears on the Torque / Timer Menu Screen, CONTINUE AFTER TIMER button. If set to on, the icon also appears on the Home Screen, TIME button.

## Torque Settings

This section describes how to:

- Set the Zero Torque feature
- Set a minimum or maximum torque value
- Sound an alarm when the set value is reached
- Stop/continue mixing when the set value is reached

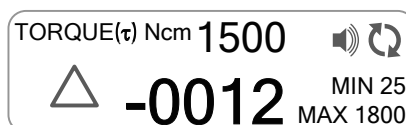
## Zero Torque Feature

Zero the torque reading to track a change in viscosity as it relates to the change in torque.

From the Home Screen, the TORQUE button displays the amount of torque required to maintain the set speed. Similar to the tare feature on a scale, the operator can zero out the torque reading during the mixing process. This Zero Torque feature allows the user to track a change in viscosity as it relates to the change in torque.

From the Home Screen while running:

1. Press the TORQUE button to activate the Zero Torque feature.
2. The TORQUE button now displays the actual torque reading above; the delta symbol and zeroed torque reading below. A negative number indicates a reduction in torque and a positive number indicates an increase in torque.



3. Press the TORQUE button a second time to void the Zero Torque feature and return the display to actual torque only.
4. This action can be repeated throughout the mixing cycle.

**Note:** Run the mixer at low speed for 30 minutes before zeroing torque.

**Note:** If the mixer is powered off, unplugged or power is interrupted, the display returns to actual torque. The Zero Torque feature can only be activated when the mixer is running.

### **Torque Minimum/Maximum**

Set a minimum or maximum torque value.

From the Torque/Timer Menu Screen:

1. Press the TORQUE MINIMUM or TORQUE MAXIMUM button to open the Keypad Screen.
2. Enter desired parameter. The set value is displayed on the Torque/Timer Menu Screen, TORQUE MINIMUM /TORQUE MAXIMUM button and Home Screen, TORQUE button.

**Note:** If attempting to set a value outside of the allowable limit, the default value will display. Minimum and maximum values are always based on the actual torque value. When setting a maximum torque, speed parameter must be set first. Mixer will not operate if max torque is set to zero.

**Note:** When the corresponding min or max value is reached, the mixer will stop or continue operation as set (see Continue After Alarm).

### **Torque Alarms**

Set an audible alarm (5 short beeps) to sound when MIN/MAX Torque is reached.

From the Torque / Timer Menu Screen:

1. Press TORQUE ALARMS button to toggle between alarm on and alarm off.
2. Audible Alarm icon, indicating on/off setting appears on the Torque/Timer Menu Screen, TORQUE ALARMS button and Home Screen, TORQUE button.

### **Continue After Alarm**

Set the mixer to continue/stop mixing when the set Torque Min/Max is reached.

From the Torque / Timer Menu Screen:

1. Press CONTINUE AFTER ALARM button to toggle between on and off.
2. When set to on, the mixer will continue mixing indefinitely after the Torque Min/Max is reached. Set Torque value will flash.
3. When set to off, the mixer will stop mixing when the Torque Min/Max is reached.
4. Continue After Alarm icon, indicating on/off setting appears on the Torque/Timer Menu Screen, CONTINUE AFTER ALARM button and Home Screen, TORQUE button.

---

## Data Logging

Date, time, speed and torque can be logged during operation to a memory stick. The data logging interval defaults to one second, and can be set from 1-999 seconds.

Insert memory stick or computer USB cable to initiate data logging. USB icon is visible on the Dashboard. When using a memory stick, utilize the mixer keypad for operation. The mixer creates a new set of data logging files when powered off and on, or when the memory stick is removed and replaced.

### Set Data Logging Intervals

A memory stick or computer connection must be detected to initiate data logging. Set the data logging interval between 1 and 999 seconds.

From the Settings Menu Screen:

1. Press DATA LOGGING INTERVALS button to open the Keypad Screen.
2. Enter total number of seconds (1-999)

When in operation, the mixer will create the following two files on the memory stick:

Status file labeled Date\_Serial# defining mixer settings.

Serial Number	15401234
Date of Manufacture	2015-10-01
Hours of Operation	HH:MM:SS
Software Version	3.4.5
Speed Setting	100
Maximum Torque	2500
Minimum Torque	0
Resume on Power UP	NO
Timer Continue on Alarm	NO
Torque Continue on Alarm	NO
Data Logging Interval	2

Data logging file labeled Serial#\_MixerName with data.

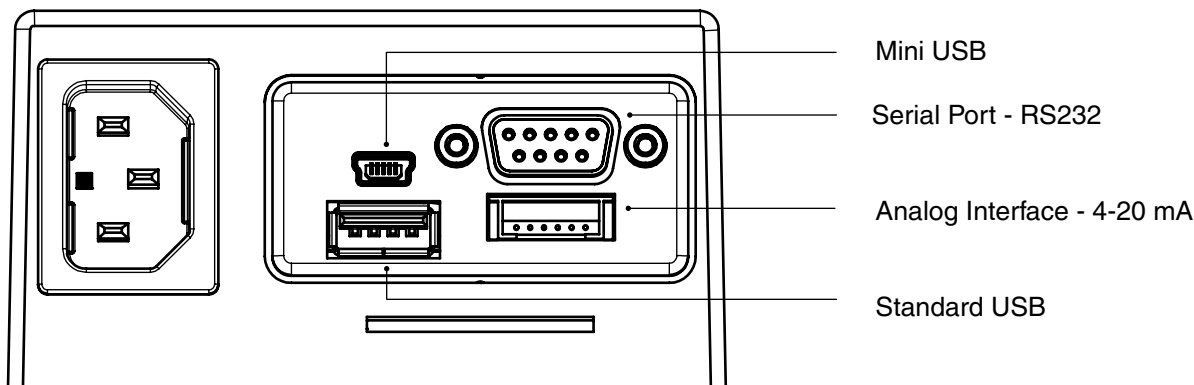
Date	Time	Speed (RPM)	Torque (Ncm)
2016-02-03	14:34:18	0	0
2016-02-03	14:34:20	25	243
2016-02-03	14:34:22	47	290
2016-02-03	14:34:24	73	318
2016-02-03	14:34:26	79	332
2016-02-03	14:34:28	90	346
2016-02-03	14:34:30	97	354
2016-02-03	14:34:32	98	356

Data format: YYYY-MM-DD,HH:MM:SS,RPM,Ncm

## Communications

Connect to external control or data logging sources with the following ports. Only one port may be used at any given time. Terminal is intended to be connected to non-hazardous secondary 35 VDC max, separated from mains with double reinforced insulation.

### Command Set



The following commands serve only as low level commands for the communication between the mixer and PC. Using a suitable terminal or communications program allows the commands to be transmitted directly to the mixer.

	Command	Description	Response
1	IN_NAME	Read device name	Mixer Name, Software Version
2	IN_PV_4	Read current speed integer	Current speed 4
3	IN_PV_5	Read current torque integer	Current torque 5
4	IN_SP_4	Read rated speed value	Rated speed 4
5	IN_SP_5	Read the torque limit value	Torque limit 5
6	START_4	Start the motor	Mixer starts 4
7	STOP_4	Stop the motor	Mixer pauses 4
8	RESET	Switch to local operation	No acknowledgement
9	IN_MODE	Read the direction of rotation	1(cw) or 2(ccw)
10	STATUS_X	Status output	TILT LIMIT STATUS OVERHEAT STATUS OVERLOAD STATUS QUICK STOP STATUS MOTOR OVERHEAT STATUS
11	IN_DATE	Gets the current Date and Time	YYYYMMDD, HH:MM:SS
12	SET_ACK_ON	Turns on Mixer acknowledgment from SET commands	OK
13	SET_ACK_OFF	Turns off command responses or acknowledgments	No acknowledgement
14	IN_HRS	Get total hours of operation of from mixer	HH:MM:SS
15	IN_DATE_S	Used to READ the last date of Service and Calibration	YYYYMMDD HH:MM:SS
16	IN_SERIAL	Used to READ the programmed serial number	Serial Number
17	OUT_SP_4 xxxx	Adjust the speed value (50 to 1500 max)	OK



## Communication Parameters

Parameter	Value
Baud Rate	9600
Parity	None
Data bits	8
Start bits	1
Stop bits	1
Break	500mS
Flow Control	None

## Command Syntax and Format

MIXER NAME represents the unique name of the mixer

COMMAND is any command from the Command Set table (as noted above)

DATA is the associated parameter to accompany a command

The following applies to the command set:

- Commands are generally sent from the computer (Master) to the mixer (Slave).
- The mixer sends only at the computer's request. Even fault indications cannot be sent spontaneously from the mixer to the computer (automation system). Except on power up when the mixer outputs its Model Number, Identifier or NAME and Firmware number during power-up initialization and will remain silent until spoken to over the communications buss.
- Commands are transmitted in capital letters.
- Commands and parameters including successive parameters are separated by at least one space (Code: hex 0x20).
- Each individual command (incl. parameters and data) and each response are terminated with Blank CR Blank LF (Code: hex 0x20 hex 0x0d hex 0x20 hex 0x0A) and have a maximum length of 80 characters.
- The decimal separator in a number is a dot (Code: hex 0x2E).

---

## Software Updates

Register your product at [CaframoLabSolutions.com/product-registration/](http://CaframoLabSolutions.com/product-registration/) to receive access to software updates.

The installed version of software is identified on the Settings Menu Screen. A memory stick ships with the mixer and includes the current software version and manual.

Install updated software from a standard memory stick.

1. Power off the mixer.
2. Insert memory stick containing only one software version into the USB port.
3. Power on the mixer. Notification appears on screen listing the Download File (new software version) and current software version. A 10 second countdown timer is also visible.
4. The software update automatically begins in 10 seconds. Remove memory stick within 10 seconds to cancel the update. Software loads completely in approximately 15 minutes. Percent complete is identified on screen.

**Note:** Do not remove the memory stick while software is loading.

5. Once complete, the on screen notification indicates "Download File Successful / Disconnect USB to Reset".
6. Remove memory stick and continue normal operation.

When installing a software update, the following parameters will remain unchanged. All other settings return to default values (see Installation Instructions for default values).

- Serial number
- Calibration values
- Service and Calibration Date
- Mixer Name
- Mixer Date and Time

## Warnings and Notifications

The following warnings and notifications exist for safety and communication purposes.

Touch the screen to remove the warning or notification and return to the Home Screen. The associated dashboard icon will be visible until a correction is made. When correction is complete, the associated dashboard icon will disappear. Press play to continue operation.

When connected to a PC or PLC, warnings and notifications will be visible on the control equipment screen.



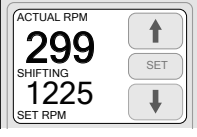

### Warnings

The following warnings indicate a condition requiring corrective action. The mixer ceases operation until the correction is complete and the PLAY button is pressed. Correction should be made locally, using the touch screen.

Warning	Dashboard Icon	Condition	Correction
<b>OVERLOAD WARNING</b> <small>(TOUCH SCREEN &amp; CONSULT MANUAL)</small>	OL	Torque requirements exceed capabilities or output shaft is locked. Mixer stops.	Reduce torque requirements of the application. Touch screen to clear warning and resume operation.
<b>OVERHEAT WARNING</b> <small>(TOUCH SCREEN &amp; CONSULT MANUAL)</small>	OH	Board temperature exceeds allowable limit (80 degrees C). Mixer stops.	Reduce ambient temperature or load and provide an appropriate cooling period. Touch screen to clear warning and resume operation.
<b>OVERHEAT MOTOR WARNING</b> <small>(TOUCH SCREEN &amp; CONSULT MANUAL)</small>	OH	Motor temperature exceeds allowable limit (105 degrees C). Mixer stops.	Reduce ambient temperature or load and provide an appropriate cooling period. Touch screen to clear warning and resume operation.
<b>QUICK-STOP ACTIVATED</b> <small>(RE-SET E-STOP &amp; TOUCH SCREEN)</small>	None	The Quick Stop has been pressed. Mixer stops. Mixer does not power off. User input settings are retained.	Re-set Quick Stop by rotating clockwise until the button pops out. Touch screen to clear warning and resume operation.
<b>CRITICAL ERROR WARNING</b> <small>(CONSULT MANUAL)</small>	None	One of two conditions has occurred: Mixer has failed to shift between the two speed ranges after four repeated attempts. Mixer stops. Mixer has experienced internal error requiring technical assessment. Mixer stops.	Power mixer off; wait 10 seconds and power mixer on. If Error message is not present, continue operation. If Error message persists, contact manufacturer for assessment and repair.

## Notifications

The following notification codes appear during operation. Operation continues without interruption. Touch the screen to remove the notification and return to the home screen.

Notification	Audible Alarm	Dashboard Icon	Condition	Correction
<b>REMOTE CONTROL ENABLED</b>	None		Appears when local operation is attempted while mixer is remotely controlled by a PC or PLC.	Use control equipment to adjust settings, or disengage control equipment to adjust settings locally.
<b>RESUME ON POWER UP ENABLED</b> <small>(TOUCH SCREEN)</small>	5 short beeps		The mixer will resume operation based on the previous settings following a 5 second delay.	No action required under normal operation.
	None	None	Set speed requires mixer to shift gears between 299/300 rpm. Mixing pauses and "SHIFTING" appears on the Home Screen.	No action required.
<b>TILT LIMIT ACTIVATED</b> <small>(TOUCH SCREEN &amp; CONSULT MANUAL)</small>	None		Mixer has exceeded the maximum recommended tilt and angle (forwards and backwards) of +/- 25 degrees or maximum rotation angle (side to side) of +/- 15 degrees.	No action required. For optimal operation, adjust mixer position within recommended limits.

## Cleaning and Service

### Cleaning

Using a mild soap and water solution, wipe the housing and control panel of the mixer with a damp cloth. Do not use chlorine bleach, chlorine-based cleanser, abrasives, ammonia, steel wool, or scouring pads with metal content or similar harsh solvents or abrasives. These may damage the surface of the mixer and touch screen.

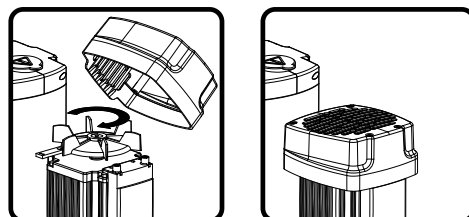
Fan cover may be removed for cleaning. Clear dust or debris with a cloth or soft brush.

### CAUTION / WARNING

Fan cover must be secured in place using the (4) provided M3 cap screws and washers before operating. Tighten screws with 2.5mm hex key.

### CAUTION / WARNING

Power must be disconnected before removing cover.



## Service

### CAUTION / WARNING

Do not attempt to service or repair a Caframo mixer. If the mixer housing is opened, the warranty becomes void. Contact Caframo for return authorization and return instructions.

Clean the mixer so that it is free from any materials which may be harmful. Provide an SDS or other safety data sheets for all chemicals used in conjunction with this mixer where appropriate. Place the mixer and its parts into the original packaging to protect and prevent damage during transport. Follow shipping directions provided by Caframo when return is authorized and RMA issued.

Failure to clean, service, and handle the mixer as outlined above can cause it to fail which could impair the safety of the user.

---

## Warranty and Product Liability

### Warranty

Caframo warrants the herein described product of its manufacture for three years from receipt of the equipment by the purchaser, against defects in material and workmanship. Warranty registration is available on the Service and Support page of our website ([CaframoLabSolutions.com](http://CaframoLabSolutions.com)).

This limited warranty covers parts and labor. In the event of a warranty claim, contact Caframo. If the cause is determined to be a manufacturing fault, Caframo will repair or replace all defective parts to restore the mixer to operation.

This warranty may only be altered by a specifically published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments. Expendable items are not covered by this warranty. Damages due to corrosion, accidental breakage or submersion are not covered.

### Product Liability

Under no circumstances shall Caframo be liable for indirect, consequential or special damages of any kind.

Caframo reserves the right to make technical changes without prior notice.





***Caframo***  
**LabSolutions**

501273 Grey Road 1  
Georgian Bluffs ON N0H 2T0, Canada

Tel: 519-534-1080 Ext 248  
Toll Free: 800-567-3556 (USA and Canada)  
Fax: 800-209-6786  
Web site: [CaframoLabSolutions.com](http://CaframoLabSolutions.com)  
E-mail: [labsales@caframo.com](mailto:labsales@caframo.com)