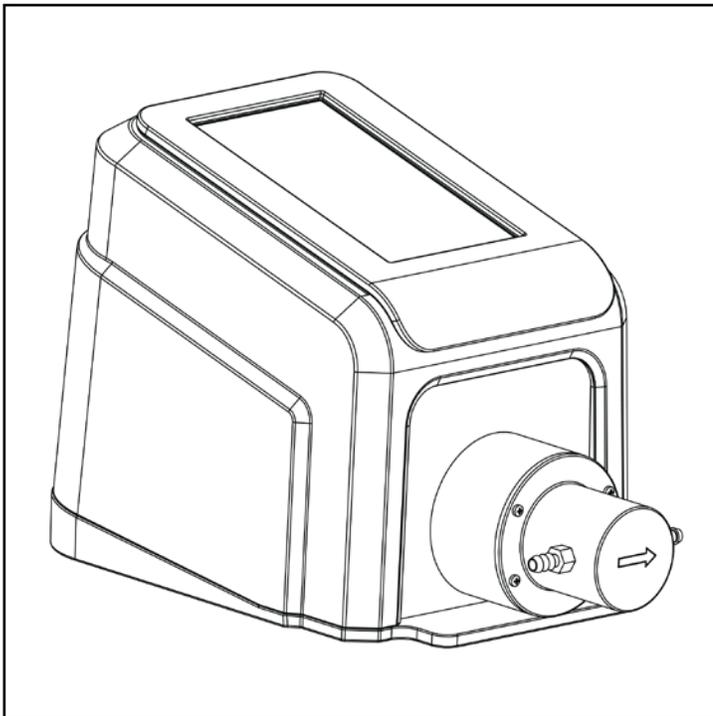


MASTERFLEX® REGLO 78018-60



MASTERFLEX® REGLO 78018-50

OPERATING MANUAL:

REGLO DIGITAL PUMP DRIVES WITH ADVANCED CONNECTIVITY

Model Nos.

78018-50

78018-60

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PUMP FOR LIQUIDS ORIGINAL INSTRUCTIONS

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SECTION 1: INTRODUCTION

SAFE OPERATION

The REGLO Digital Pump Drive with Advanced Connectivity is designed for pumping and dispensing applications in laboratory and process environments. Confirm that the pump drive is operated only in the manner specified in this operating manual and that safe work practices and Good Laboratory Practice (GLP) are followed. Misuse of the pump drive may compromise built-in safety protections and result in injury and/or damage to equipment. Do not operate the pump drive with water on the surface of the touchscreen.

The following Safety Symbols are used in this documentation:

	CAUTION: Risk of danger. Consult operating manual for nature of hazard and corrective actions.
	CAUTION: Risk of crushing. Keep fingers away from the rotor while the pump is in operation. Stop pump before loading or unloading tubing.
	CAUTION: Hot Surface. Do not touch.
	CAUTION: Risk of electric shock. Consult operating manual for nature of hazard and corrective actions.

Please observe the following cautions and recommendations:

	CAUTION: Do not operate the pump in a way that exceeds the designed operating and environmental conditions outlined in this operating manual.
	CAUTION: Do not exceed the specified maximum differential pressure for the pump head.
	CAUTION: The pump must not be used: <ul style="list-style-type: none"> • As a medical device. • In explosion proof chambers or in the presence of flammable gases or fumes.
	CAUTION: The circuit between the mains power supply and the pump must be connected to earth ground.
	CAUTION: Do not handle the pump head before the pump is switched off and disconnected from the mains power supply.
	CAUTION: The pump must be switched off before removing the pump head.

	CAUTION: Do not open or remove the housing while the pump is operating.
	CAUTION: Tubing can tear and burst during operation. It is the responsibility of the customer to take the necessary precautions to avoid injury or damage to equipment.
	CAUTION: It is recommended that any repairs be performed only by an authorized technician. NOTE: If service and repairs are performed by the customer or by any third party company, Masterflex denies all responsibility.

Media Containing Particles

Piston Pumps:

- It is recommended that the pump head be rinsed after every pumping process to prevent the piston from seizing due to remaining particles (especially after pumping media containing salt and protein).
- Do not pump media containing particles that exceed a diameter of 0.8 mm.
- Piston fractures are not covered by your warranty.

Gear Pumps:

	CAUTION: Do not use gear pumps to pump liquids containing particles. Even the smallest particles can have an abrasive effect that can damage or destroy a gear pump within a few seconds.
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Corrosive Liquids

Corrosive liquids may eventually produce leak paths around the sealing surfaces of the pump head. It is recommended that the pump be regularly inspected for leaks.

Dry Running

- It is recommended that the pump head is filled with the liquid to be pumped prior to operation.
- While priming, ensure the pump does not run dry for more than 15 seconds.

Pump Against Pressure

The REGLO piston pump system can be used for continuous operation at a maximum differential pressure of 6.9 bar.

	CAUTION: Please consult factory for maximum pressure capabilities.
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ABOUT THE REGLO

The REGLO Digital Pump Drive with Advanced Connectivity offers precise flow control and highly accurate fluid dispensing ideal for laboratory, process, and field use. All REGLO precision drives include a highly accurate, maintenance-free motor and an easy to navigate touchscreen that makes setup and operation easier than ever. The REGLO range features Ethernet and Wi-Fi connections for web-based control and monitoring using the MasterflexLive™ website (see www.masterflex.com), and remote analog input control and monitoring through the pump drive's DB-25 female connection port.

Package Contents

NOTE: Please check the package and its contents for any visible signs of damage. If any damage is found please contact Technical Assistance immediately (see "[Technical Assistance](#)" on page 3-55).

REGLO Gear Pump

- REGLO Digital Drive Magnet
- 36 VDC Desktop Power Supply Set
- Quick Start Guide
- Flash Drive Containing the Operating Manual

REGLO Piston Pump

- Pump Drive
- 24 VDC Desktop Power Supply Set
- Quick Start Guide
- Flash Drive Containing the Operating Manual
- Pump Head as Ordered

REGLO Drive Features

Features:

- A 5-inch multi-language touchscreen display providing easy access to user-defined operation parameters and direct readouts of pump operation data, including pump speed, flow rates, flow direction, and batch totals.
- Volume, Time, Continuous, and Analog Input modes for quick and easy operation.
- User selectable dispense volumes, pump head sizes, pump speed, and run times.
- Easy user management with three levels of access: ADMIN, SUPER USER and USER.
- Wi-Fi and Ethernet connectivity.
- Brushless, maintenance-free motor offering $\pm 0.1\%$ speed control accuracy with a turndown ratio greater than 100:1.
- Easy pump priming and pump head calibration.

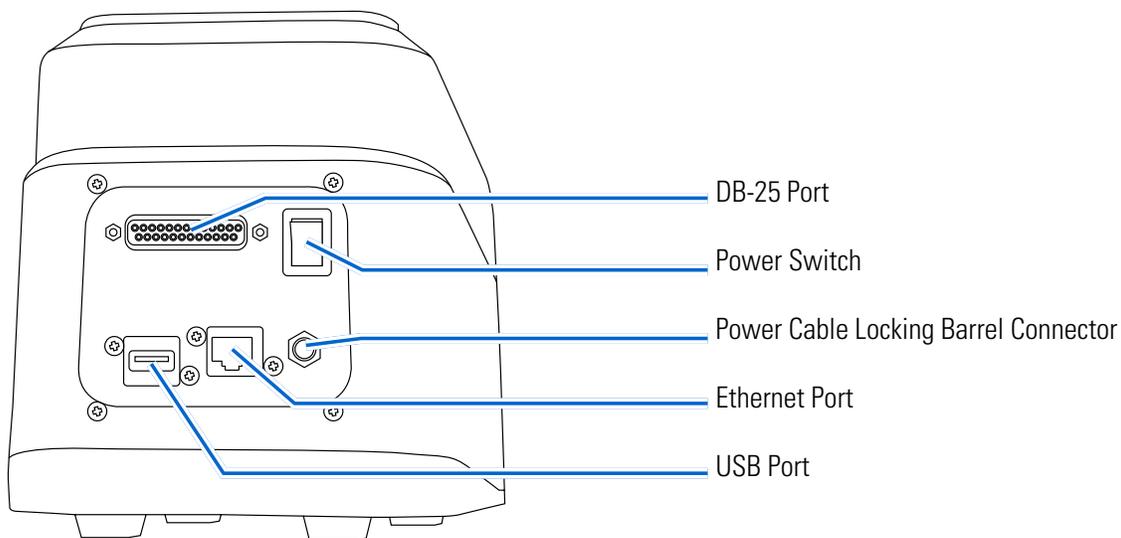
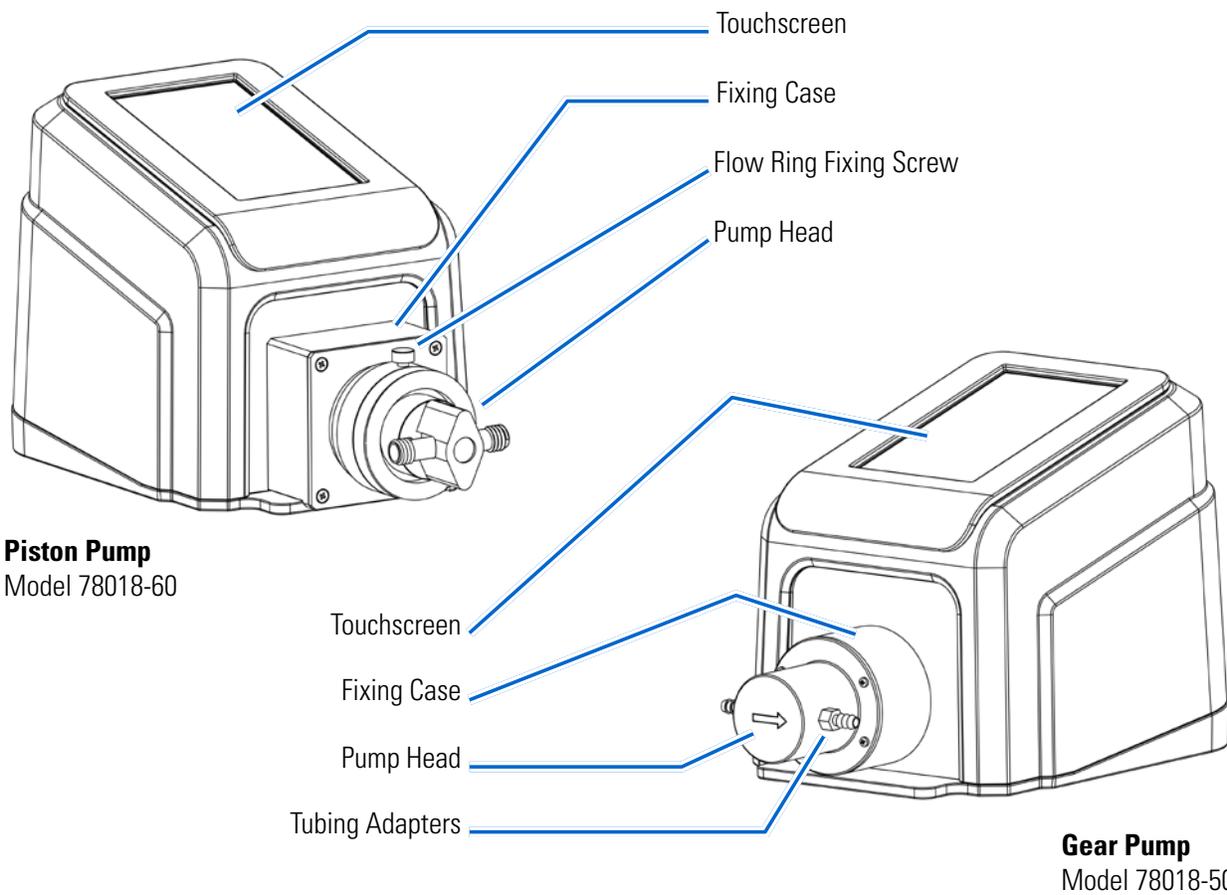
Peristaltic Cassette Models

The REGLO series digital pump drives are also available in one, two, and four channel peristaltic pump models, including a range of both cassette and non-cassette models. Visit www.masterflex.com for further information.

Available REGLO Models

Model	Description	Pump Type	RPM (MAX)	Channels	Rollers	Cartridge/Heads
78018-50	Gear Pump	Gear	5000	1	-	A-mount Gear Pump
78018-60	Piston Pump	Piston	1800	1	-	Piston Head
78018-10	2CH6RLR	Peristaltic	160	2	6	Click'n'go
78018-12	2CH8RLR	Peristaltic	160	2	8	Click'n'go
78018-14	2CH12RLR	Peristaltic	160	2	12	Click'n'go
78018-20	4CH6RLR	Peristaltic	160	4	6	Click'n'go
78018-22	4CH8RLR	Peristaltic	160	4	8	Click'n'go
78018-24	4CH12RLR	Peristaltic	160	4	12	Click'n'go
78018-40	Miniflex	Peristaltic	350	1	3	Miniflex Pump (Single Channel)
78018-42	Miniflex	Peristaltic	350	2	3	Miniflex Pump (Dual Channel)

SECTION 2: BASIC SETUP & SETTINGS



TOUCHSCREEN ICONS

	Analog Input Mode		New User
	Calibrate		Pause
	Calibration Complete		Prime
	Clockwise		Program
	Close/Cancel		Ramp Down
	Confirm		Ramp Up
	Connectivity Status		Record Volume
	Continuous Mode		Reset
	Counterclockwise		Screen Lock
	Delete		Settings
	Display Brightness		Start
	Edit		Stop
	Language		Time Mode
	Logout		Update Available
	New Program		Volume Mode

BEFORE USING THE DRIVE

	CAUTION: Do not block the rear panel of the pump drive. The power switch must always be easy to access and the power cord must always be easy to disconnect.
	CAUTION: Turn the drive off before removing or installing pump heads. Fingers or loose clothing could get caught in the drive mechanism.
	CAUTION: The power cord set supplied with your pump drive meets the requirements of the country where you purchased the pump drive. If you use the pump drive in another country, you must use a power cord set that meets the requirements of that country.
	CAUTION: If the product is not used in the manner specified in the instructions, the protection provided by the equipment may be impaired.
	CAUTION: The circuit between the mains power supply and the pump must be connected to earth ground.
	CAUTION: Do not handle the pump head before the pump is switched off and disconnected from the mains power supply.
	CAUTION: Only use the supplied desktop power supply.
	CAUTION: Do not run pump head dry.
	CAUTION: Do not use the gear pump to pump liquids that contain particles. If necessary, filter the liquid before use.

- Ensure the pump drive is mounted on a flat surface.
- Ensure adequate air flow around the pump drive and ensure that the ambient air temperature does not exceed 104° F (40° C).
- Extension tubing should be clean and routed so that bend radii are at a minimum of four (4) times the outside tube diameter and are as short as possible.
- Use the appropriate pump head for the required flow rate and viscosity.
- Recalibrate the pump head regularly to maintain the best flow rate accuracy (for further information see "[Pump Head Calibration](#)" on page 3-12).
- For tubing selection and compatibility go to www.masterflex.com.
- Remove the pump drive's power cord from the mains power outlet when cleaning or performing maintenance on the drive.

Pump Preparation

1. Mount the pump head to the drive (for further information see "[Pump Head Replacement](#)" on page 3-45).
2. Attach the tubing adapters to the pump head. **NOTE:** To help protect the thread and ensure optimum sealing it is recommended that PTFE tape be wrapped around the adaptor threads.
3. Connect the tubing to your system.
4. Fasten the tubing to the tubing adapters using the supplied tubing clamps.
5. Plug in and securely fasten the supplied desktop power supply to the power cable barrel connector located at the rear of the drive.
6. Switch on the drive.
7. Navigate to the Continuous, Time or Volume Mode screens.
8. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
9. Prime the new pump head (for further information see "[Priming the Pump](#)" on page 3-11).
10. Calibrate the new pump head (for further information see "[Pump Head Calibration](#)" on page 3-12).

The pump is now ready for operation.

SWITCHING ON THE DRIVE

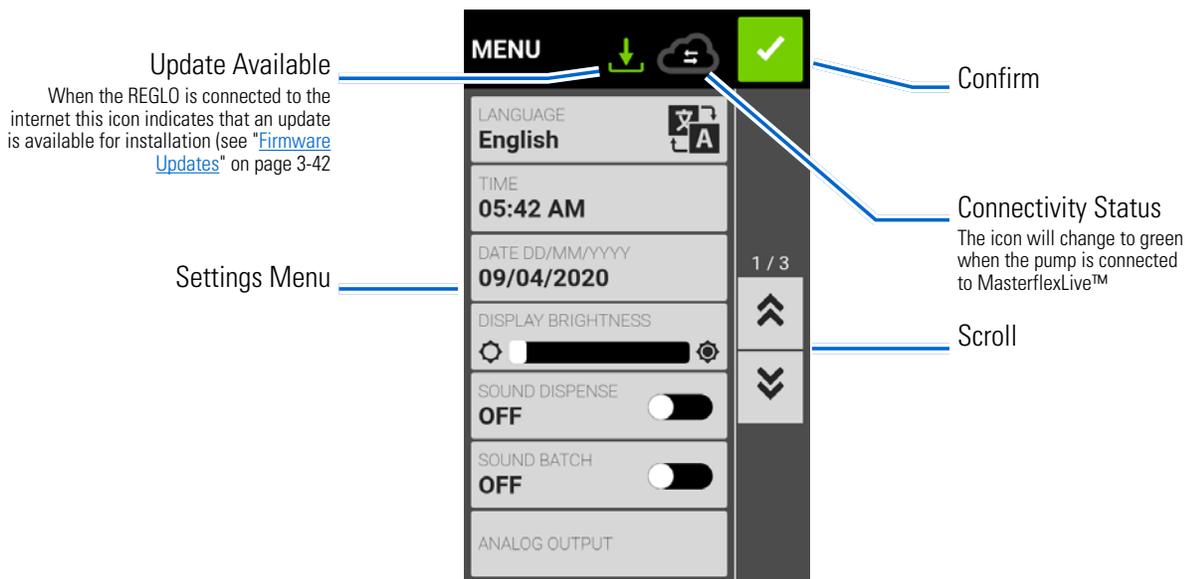
1. Plug in and securely fasten the supplied desktop power supply to the power cable barrel connector located at the rear of the drive.
2. Plug the opposite end of the power cable into a mains power outlet.
3. Switch the drive on using the power switch located at the rear of the drive. **NOTE:** The drive takes approximately two minutes to complete start-up.

NOTE:

- On the initial start-up the Language Settings Screen will be displayed. A language must be selected before pump operation (for further information see "[Language Settings](#)" on page 3-5).
- If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9).
- Following the initial start-up all subsequent start-ups will revert to the mode of operation screen previously in use.
- After 30 minutes of inactivity the REGLO will enter sleep mode and the display will turn off. Tapping the touchscreen will reactivate the drive. To enable (default) or disable the screen saver see "[Auto Start](#)" on page 3-10.

SETTINGS

The Settings Screen allows access to basic configuration settings. The Settings Screen is accessed by tapping **SETTINGS**  from any of the mode screens. **NOTE:** If Manage User is enabled only users with authorization can access the Settings Screen (for further information see "[User Management](#)" on page 3-9).



Language Settings

The REGLO Digital Pump Drive can display Chinese, English, French, German, Italian, Japanese, and Spanish languages. The default display language is English.

To change the display language:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. Tap **LANGUAGE**.
3. Select the desired language from the available list.
4. Tap **CONFIRM**  to save the new language selection.

Setting the Time

To change the time:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. Tap **TIME**.
3. Select either 12-HOUR or 24-HOUR time.
4. Tap **HH** to select hours and enter the desired time using the onscreen keypad.
5. Tap **MM** to select minutes and enter the desired time using the onscreen keypad.
6. If using 12-HOUR time, tap **AM/PM** to select either AM or PM.
7. Tap **CONFIRM**  to save or **CANCEL**  to discard changes.

Setting the Date

To change the date:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. Tap DATE.
3. Select the desired date format (either month/day/year or day/month/year).
4. Tap the desired MONTH, DAY or YEAR field to select and then enter the date using the onscreen keypad.
5. Tap CONFIRM  to save or CANCEL  to discard changes.

Display Brightness

To adjust the display brightness:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. Use the slider to adjust the touchscreen brightness to the desired level.

Dispense Completion Alert

When Sound Dispense is enabled a short beep will sound at the completion of each pump dispense.

To enable or disable the dispense completion alert:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. Tap the SOUND DISPENSE toggle to select either ON or OFF.

Batch Completion Alert

When Sound Batch is enabled a single long beep will sound at the completion of each batch cycle.

To enable or disable the batch cycle completion alert:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. Tap the SOUND BATCH toggle to select either ON or OFF.

Analog Output

The REGLO supports and controls analog output through the pump drive's 25-pin connection (for further information see "[DB-25 Electrical Connections](#)" on page 3-44).

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. Tap ANALOG OUTPUT. The Analog Output Screen will be displayed.
3. Tap the desired analog output type from the available list.
4. If using either ANALOG: VOLTAGE or ANALOG: CURRENT:
 - a. Tap EDIT . The Analog: Voltage or Analog: Current Edit Screen will be displayed.
 - b. Select the desired current or voltage operating range from the available list.
 - c. Tap CONFIRM  to save or CANCEL  to discard changes. The Analog Output Screen will be displayed.
5. Tap CONFIRM .

Device Information

The Device Information Screen provides pump drive details such as MAC address, IP address, build date, and firmware version. Factory reset and updates are also accessed from the Device Information Screen.

To access the Device Information Screen:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **DEVICE INFORMATION**.
3. Tap **DEVICE INFORMATION**. The Device Information Screen will be displayed.

See also "[Firmware Updates](#)" on page 3-42, and "[Restore Factory Settings](#)" on page 3-42.

Screen Saver

The REGLO has a screen saver to help extend the display life of the touchscreen. After 30 minutes of inactivity the REGLO will enter sleep mode and the display will turn off. Tapping the touchscreen will reactivate the drive.

To enable or disable the screen saver:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **SCREEN SAVER**.
3. Tap the **SCREEN SAVER** toggle to select either **ON** or **OFF**.

Device Name

Individual names can be assigned to each REGLO Digital Pump Drive to make identification easier when using more than one pump.

To assign a pump drive name:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **DEVICE NAME**.
3. Tap **DEVICE NAME**. The Device Name Screen will be displayed.
4. Enter the desired pump name using the onscreen keypad (up to 8 characters).
5. Tap **CONFIRM**  to save or **CANCEL**  to discard changes.

Wi-Fi Settings

The REGLO can connect to a network using Wi-Fi and Ethernet connections.

NOTE:

- The Ethernet connection will take priority if both Wi-Fi and Ethernet are used simultaneously.
- The REGLO supports WEP, WPA, WPA2, and None (open) Wi-Fi security protocols.

To select a Wi-Fi network:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **WIFI SETTINGS**.
3. Tap **WIFI SETTINGS**. The Wi-Fi Settings Screen will be displayed.
4. If required, tap the **WIFI** toggle to select either **ON** or **OFF**.
5. Tap the desired Wi-Fi network from the available list.
6. If required, enter the network password using the onscreen keypad.
7. Tap **CONNECT** to join the network or **CANCEL** to cancel.
8. Tap **CONFIRM**  to return to the Settings Screen.

To remove a Wi-Fi network:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **WIFI SETTINGS**.
3. Tap **WIFI SETTINGS**. The **WIFI** Settings Screen will be displayed.
4. Locate the desired Wi-Fi network and tap **REMOVE WIFI** .
5. Tap **REMOVE** to remove the network or **CANCEL** to discard changes.
6. Tap **CONFIRM**  to return to the Settings Screen.

Ethernet Settings

The REGLO can connect to a network using Wi-Fi and Ethernet connections.

NOTE:

- Confirm that the Ethernet cable is securely attached to the Ethernet port at the rear of the pump drive.
- The Ethernet connection will take priority if both Wi-Fi and Ethernet are used simultaneously.

To configure Ethernet settings:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **ETHERNET SETTINGS**.
3. Tap **ETHERNET SETTINGS**. The Ethernet Settings Screen will be displayed.
4. Tap **DHCP** to automatically configure IP settings or **STATIC** to manually edit settings using the onscreen keypad.
5. Tap **CONFIRM**  to save or **CANCEL**  to discard changes.

User Management

The REGLO allows user access to be controlled with configurable permission levels.

Default Permissions:

- USER: Able to use basic machine functions and run programs.
- SUPER USER: Same level of access as USER but with the ability to create and modify programs.
- ADMIN: Full administrative access to the drive.

User and Super User permission levels can be configured to allow access to different Settings Menu items.

Configuring user level permissions:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. SCROLL  through the Settings Screen pages to locate MANAGE USERS.
3. If required, tap the MANAGE USERS toggle to select ON.
4. Tap MODIFY.
5. Tap ACCESS LEVELS.
6. Tap USER or SUPERUSER.
7. Select the desired settings menu items to be included in the user level.
8. Tap CONFIRM  to save or CANCEL  to discard any changes.

Adding a new user:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. SCROLL  through the Settings Screen pages to locate MANAGE USERS.
3. If required, tap the MANAGE USERS toggle to select ON.
4. Tap MODIFY.
5. Tap NEW USER .
6. Tap USERNAME and enter the new username using the onscreen keypad.
7. Tap PASSWORD and enter the desired password using the onscreen keypad. **NOTE:** The password must be at least six characters long.
8. Tap the required PERMISSION LEVEL. **NOTE:** There must always be at least one ADMIN user.
9. Tap CONFIRM  to save or CANCEL  to discard any changes.

Deleting a user:

NOTE: There must always be at least one ADMIN user. ADMIN users cannot delete their own user profile.

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. SCROLL  through the Settings Screen pages to locate MANAGE USERS.
3. Tap MODIFY.
4. Locate the desired username from the available list and then tap the DELETE USER  icon located next to the username.
5. Tap DELETE to delete user or CANCEL to cancel.

Editing an existing user:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. SCROLL  through the Settings Screen pages to locate Manage Users.
3. Tap MODIFY.
4. Select the desired username.
5. Edit as required.
6. Tap CONFIRM  to save or CANCEL  to discard any changes.

Auto Start

The REGLO has an auto start that will resume pump operation when power is restored after a power outage.

To enable auto start:

1. Tap SETTINGS  from any of the mode screens. The Settings Screen will be displayed.
2. SCROLL  through the Settings Screen pages to locate AUTO START.
3. Tap the AUTO START toggle to select either ON or OFF.

PRIMING THE PUMP

Priming the Gear Pump

NOTE: Avoid allowing the gear pump to dry lift. It is recommended that the pump inlet tube is flooded before use. To flood the inlet tube, raise and pre-fill the inlet tubing with the liquid to be pumped.

To prime the gear pump:

1. If required, attach the desired tubing adapters to the pump head. **NOTE:** To help protect the thread and ensure optimum sealing it is recommended that PTFE tape be wrapped around the adaptor threads.
2. Attach the appropriate tubes to the tubing adapters and fasten the tubing to the adapters using the supplied tubing clamps.
3. If necessary, prime the inlet tubing by raising and pre-filling the tubing with the liquid to be pumped.
4. Insert the tube inlet into the supply fluid.
5. Insert the tube outlet into an appropriate container.
6. Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9).
7. Navigate to the Continuous, Time or Volume Mode screens.
8. Press and hold PRIME  until no bubbles are visible in the tubing. Priming will stop when PRIME  is released.

Priming the Piston Pump

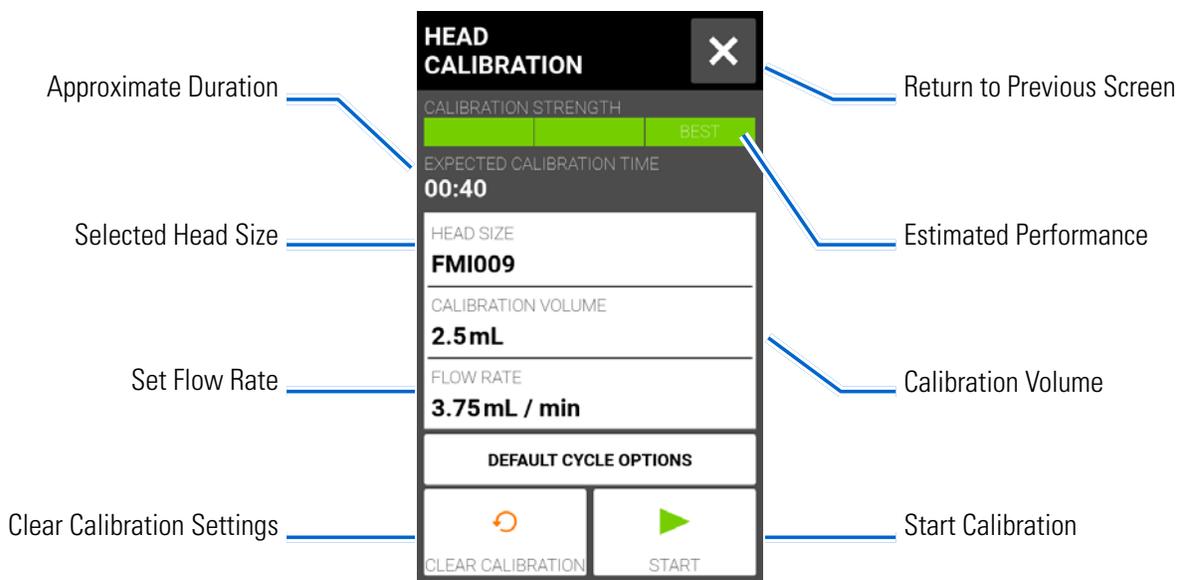
To prime the piston pump:

1. If required, attach the desired tubing adapters to the pump head. **NOTE:** To help protect the thread and ensure optimum sealing it is recommended that PTFE tape be wrapped around the adaptor threads.
2. Attach the appropriate tubes to the tubing adapters and fasten the tubing to the adapters using the supplied tubing clamps.
3. Insert the tube inlet into the supply fluid.
4. Insert the tube outlet into an appropriate container.
5. Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9).
6. Navigate to the Continuous, Time or Volume Mode screens.
7. Press and hold PRIME  until no bubbles are visible in the tubing. Priming will stop when PRIME  is released.

PUMP HEAD CALIBRATION

To ensure accurate dispensing of fluids it is recommended that the pump head be calibrated whenever the fluid, flow rate, tubing or pump head is changed. Pump head calibration can be accessed from the Continuous Mode Screen or from either of the Time and Volume mode edit screens.

Pump Head Calibration Screen



Gear Pump Calibration

General Preparation:

- Confirm the pump head is correctly mounted to the pump drive (for further information see "[Mounting a Gear Pump](#)" on page 3-49).
- Confirm the tubing adapters are attached to the pump head.
- Confirm the appropriate transfer tubing has been attached to the tubing adapters and fastened using the tubing clamps.
- Confirm all fluids and containers are ready.

To calibrate the pump head:

1. Insert the tube inlet into the supply fluid.
2. Insert the tube outlet into a suitable container. **NOTE:** The container should be graduated or placed on a scale for increased accuracy. If using a scale, an acceptable weight to volume conversion for water is: 1 gram = 1 mL.
3. Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9).

4. Navigate to the Continuous, Time or Volume Mode screens.
5. Press and hold PRIME  to prime the pump. Priming will stop when PRIME  is released.
6. Tap CALIBRATE  from the Continuous Mode Screen or tap EDIT  and then CALIBRATE  from either the Volume Mode Screen or the Time Mode Screen. The Pump Head Calibration Screen will be displayed.
7. Tap HEAD SIZE. The Head Size Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
8. Tap CALIBRATION VOLUME. The Calibration Volume Screen will be displayed.
 - a. Enter the desired calibration volume using the onscreen keypad. **NOTE:** The default volume or greater will ensure the best calibration.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
9. Tap FLOW RATE. The Calibration Flow Rate Screen will be displayed.
 - a. Enter the desired flow rate using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen. **NOTE:** The drive will adjust the displayed flow rate after calibration is complete.
10. Tap START  to begin calibration. **NOTE:** Calibration progress will be displayed on the touchscreen.
11. When calibration is complete use the onscreen keypad to enter the measured volume of fluid from the tube outlet container.
12. Tap CONFIRM  to complete calibration and return to the previous mode screen. Calibration Complete  should now be displayed to indicate that calibration has been completed for the current pump head size, tube volume, and flow rate.

NOTE:

- The estimated accuracy for the selected calibration settings is shown in the Calibration Strength bar on the Pump Head Calibration Screen. Calibration accuracy can be improved by using a larger calibration volume and/or altering the flow rate.
- For the best accuracy, calibration should be performed at the anticipated flow rate.
- Calibration settings are retained and transferred to other mode screens when entering or leaving the Pump Head Calibration Screen.
- If the drive is stopped during calibration the calibration will be discarded and the previous mode screen will be displayed. Empty the container before restarting the procedure.
- Calibration time at the maximum allowable flow rate (default max flow rate) is approximately 10 seconds. Calibration time at the minimum allowable flow rate (approximately 4% of the maximum flow rate) is 4 minutes.
- Minimum and maximum flow rates will change after calibration due to a recalculation of the volume of fluid per pump revolution.
- Steps 6–12 can be repeated as necessary to optimize the accuracy of the pump head calibration.

Piston Pump Calibration

General Preparation:

- Confirm the pump head is correctly mounted to the pump drive (for further information see "[Pump Head Replacement](#)" on page 3-45).
- Confirm the appropriate transfer tubing has been attached to the pump head.
- Confirm all fluids and containers are ready.

To calibrate the pump head:

1. Insert the tube inlet into the supply fluid.
2. Insert the tube outlet into a suitable container. **NOTE:** The container should be graduated or placed on a scale for increased accuracy. If using a scale, an acceptable weight to volume conversion for water is: 1 gram = 1 mL.
3. Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9).
4. Navigate to the Continuous, Time or Volume Mode screens.
5. Tap DIRECTION to select either clockwise  or counterclockwise  flow direction.
6. Press and hold PRIME  to prime the pump. Priming will stop when PRIME  is released.
7. Adjust the pump head zero point (For further information consult the pump head user manual).
8. Tap CALIBRATE  from the Continuous Mode Screen or tap EDIT  and then CALIBRATE  from either the Volume Mode Screen or the Time Mode Screen. The Pump Head Calibration Screen will be displayed.
9. Tap HEAD SIZE. The Head Size Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
10. Tap CALIBRATION VOLUME. The Calibration Volume Screen will be displayed.
 - a. Enter the desired calibration volume using the onscreen keypad. **NOTE:** The default calibration volume settings or greater will ensure the best calibration.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
11. Tap FLOW RATE. The Calibration Flow Rate Screen will be displayed.
 - a. Enter the desired flow rate using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen. **NOTE:** The drive will adjust the displayed flow rate after calibration is complete.
12. Tap START  to begin calibration. **NOTE:** Calibration progress will be displayed on the touchscreen.
13. When calibration is complete use the onscreen keypad to enter the measured volume of fluid from the tube outlet container.
14. Tap CONFIRM  to complete calibration and return to the previous mode screen. Calibration Complete  should now be displayed to indicate that calibration has been completed for the current pump head size, tube volume, and flow rate.

NOTE:

- The estimated accuracy for the selected calibration settings is shown in the Calibration Strength bar on the Pump Head Calibration Screen. Calibration accuracy can be improved by using a larger calibration volume and/or altering the flow rate.
- For the best accuracy, calibration should be performed at the anticipated flow rate.
- Calibration settings are retained and transferred to other mode screens when entering or leaving the Pump Head Calibration Screen.
- If the drive is stopped during calibration the calibration will be discarded and the previous mode screen will be displayed. Empty the container before restarting the procedure.
- Calibration time at the maximum allowable flow rate (default max flow rate) is approximately 10 seconds. Calibration time at the minimum allowable flow rate (approximately 4% of the maximum flow rate) is 4 minutes.
- Minimum and maximum flow rates will change after calibration due to a recalculation of the volume of fluid per pump revolution.
- Steps 8–14 can be repeated as necessary to optimize the accuracy of the pump head calibration.

SECTION 3: OPERATION

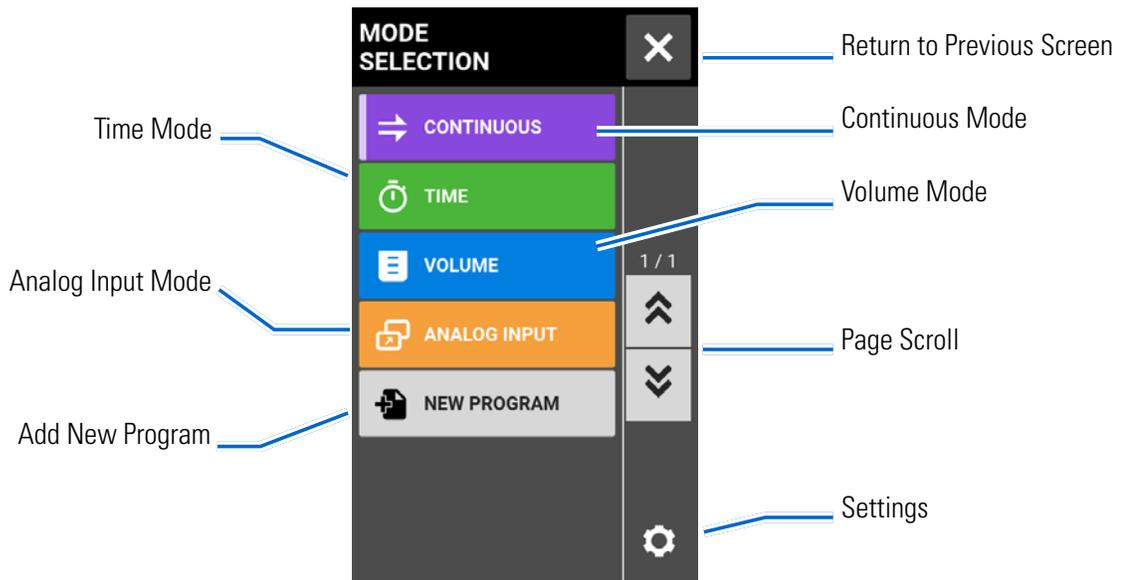
	WARNING: Tube breakage may result in fluid being sprayed from the pump. Use appropriate measures to protect operator and equipment.
	CAUTION: Hot Surface. Do not touch.
	CAUTION: To avoid electrical shock, the power cord protective grounding conductor must be connected to ground. Not for operation in wet locations as defined by EN61010-1.

NOTE:

- It is recommended that the pump head be rinsed after every pumping process to prevent the piston from seizing due to remaining particles (especially after pumping media containing salt and protein).
- Do not pump media containing particles that exceed a diameter of 0.8 mm.
- Piston fractures are not covered by your warranty.
- Do not use gear pumps to pump liquids containing particles. Even the smallest particles can have an abrasive effect that can damage or destroy a gear pump within a few seconds.
- Corrosive liquids may eventually produce leak paths around the sealing surfaces of the pump head. The pump should be regularly inspected for leaks.
- Before operating the pump it is recommended that the pump head be filled with liquid.
- While priming, ensure the pump does not run dry for more than 15 seconds.

MODE SELECTION SCREEN

The Mode Selection Screen allows access to the drive's four basic operation modes (CONTINUOUS, TIME, VOLUME, and ANALOG INPUT) as well as the New Program Screen and user defined programs. The Mode Selection Screen can be accessed from any of the mode screens by tapping the MODE NAME BANNER.



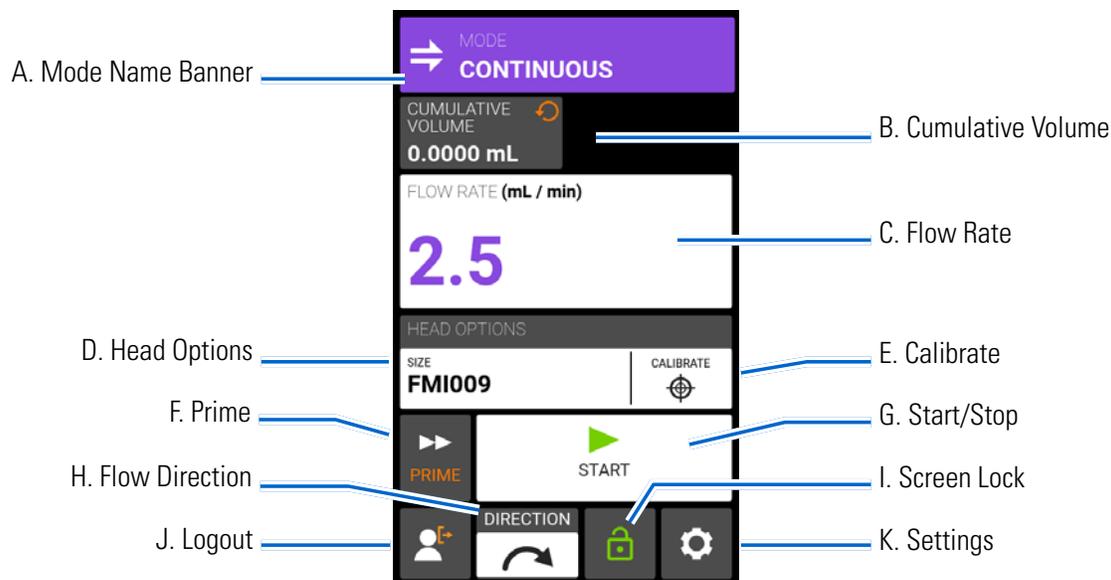
Tap the desired mode or program to access individual mode or program screens.

CONTINUOUS MODE

In Continuous Mode the pump will operate at a selected rpm and/or flow rate until stopped by the user.

Continuous Mode Run Screen

The Continuous Mode Run Screen is accessed by selecting CONTINUOUS from the Mode Selection Screen.



- A. **MODE NAME BANNER:** Tap the Mode Name Banner to return to the Mode Selection Screen.
- B. **CUMULATIVE VOLUME:** Displays the current cumulative volume of fluid that has been pumped. **To reset the cumulative volume:** Press and hold CUMULATIVE VOLUME RESET  until the display changes to zero.
- C. **FLOW RATE:** Displays the current flow rate in the unit of measurement selected by the user. Tap to access the Flow Rate Screen.
- D. **HEAD OPTIONS:** Tap to access the Head Options Screen.
- E. **CALIBRATE:** Tap to access the Calibration Screen (for further information see "[Pump Head Calibration](#)" on page 3-12). Once calibration has been completed for the current pump head size Calibration Complete  will be displayed.
- F. **PRIME:** Press and hold to prime the pump drive (for further information see "[Priming the Pump](#)" on page 3-11).
- G. **START/STOP:** Tap START to begin operation. Once operation has commenced STOP  will be displayed.
- H. **FLOW DIRECTION:** Tap DIRECTION to select either clockwise  or counterclockwise . **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.

- I. SCREEN LOCK: Locking the screen disables all touchscreen functions. **To lock the screen:** Press and hold UNLOCKED  until the icon changes to LOCKED  and a red border appears around the screen. **To unlock the screen:** Press and hold LOCKED  until the icon changes to UNLOCKED .
- J. LOGOUT: Tap to log out a user. **NOTE:** This option is only available if Manage User is enabled in Settings (for further information see "[User Management](#)" on page 3-9).
- K. SETTINGS: Tap to access the Settings Screen (for further information see "[Settings](#)" on page 3-5).

Continuous Mode Operation

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.
- Confirm that the pump head has been calibrated by checking that Calibration Complete  is displayed on the Continuous Mode Run Screen (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump (for further information see "[Priming the Pump](#)" on page 3-11).

To operate the pump in Continuous Mode:

1. Tap CONTINUOUS from the Mode Selection Screen. The Continuous Mode Run Screen will be displayed.
2. If required, Press and hold CUMULATIVE VOLUME RESET  to reset the display to zero.
3. Select the desired flow rate and flow units:
 - a. Tap FLOW RATE to access the Flow Rate Screen.
 - b. Tap UNITS to access the Flow Units Screen and select the desired flow unit from the available list.
 - c. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Flow Rate Screen.
 - d. Tap FLOW and enter the desired flow rate using the onscreen keypad.
 - e. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Continuous Mode Screen.
4. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Continuous Mode Run Screen.
5. If required, tap CALIBRATE to calibrate the pump for the selected pump head and flow rate (for further information see "[Pump Head Calibration](#)" on page 3-12).
6. Tap DIRECTION to select either clockwise  or counterclockwise  flow direction. **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.
7. Tap START . The drive will commence operation at the flow rate and direction shown.
8. Tap STOP  when the drive operation is no longer required. **NOTE:** In Continuous Mode the drive will continue to operate at the displayed flow rate and direction until stopped.

Saving Continuous Mode Settings as a New Program

Changes made to mode parameters can be saved as a new program for easier access to frequently used settings. **NOTE:** If Manage User is enabled only users with authorization can create and modify programs (for further information see "[User Management](#)" on page 3-9).

To save mode parameters to a new program:

1. If required, edit the Continuous Mode settings as desired.
2. Tap MODE NAME BANNER to return to the Mode Selection Screen.
3. Tap NEW PROGRAM. **NOTE:** If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL ▼ to view additional pages.
4. Tap CONTINUOUS. The Continuous New Program Screen will be displayed with the last settings used in the Continuous Mode.
5. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
6. Tap CONFIRM to save or DELETE to cancel.

NOTE:

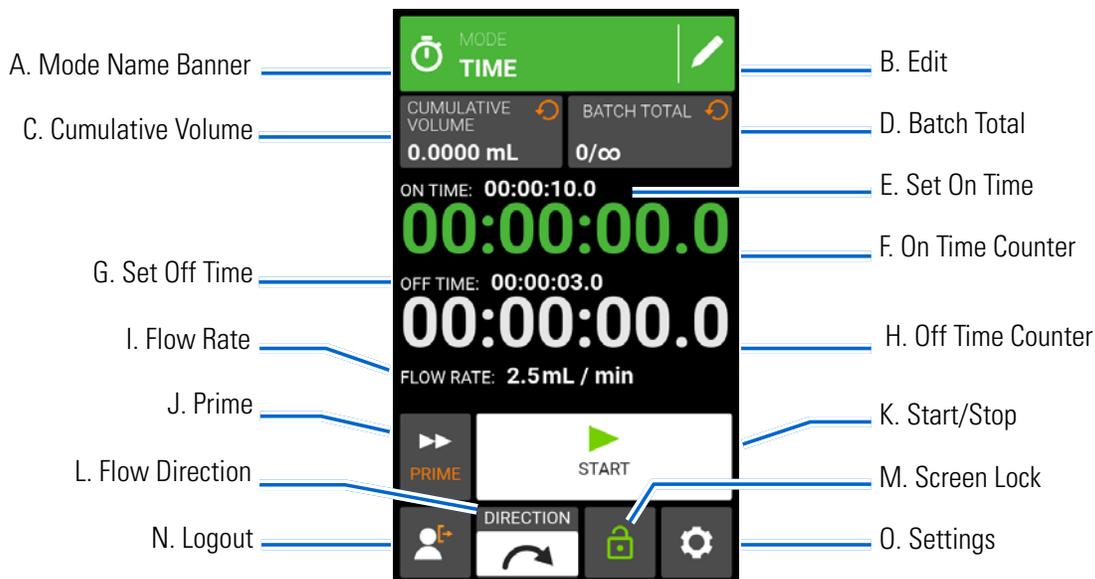
- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL ▼ will display additional pages.

TIME MODE

In Time Mode the pump will operate at a selected rpm and/or flow rate for a selected time and/or batch total. At the completion of the selected time or batch total the pump will automatically stop.

Time Mode Run Screen

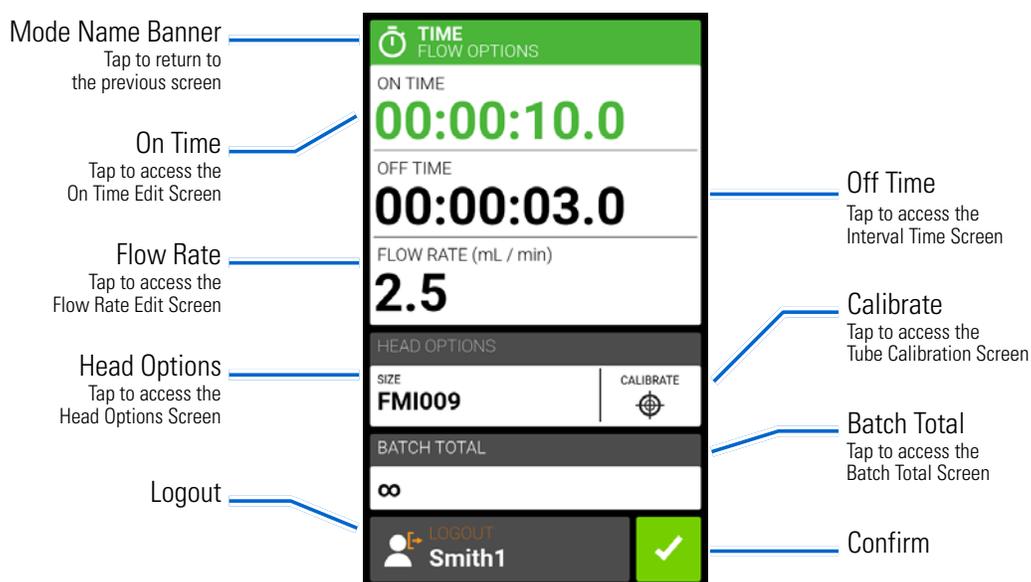
The Time Mode Run Screen is accessed by selecting TIME from the Mode Selection Screen.



- A. **MODE NAME BANNER:** Tap the Mode Name Banner to return to the Mode Selection Screen.
- B. **EDIT:** Tap to access the Time Mode Edit Screen. From the Time Mode Edit Screen changes can be made to flow rate, flow units, pump head size, calibration, on time, off time, and batch total.
- C. **CUMULATIVE VOLUME:** Displays the current Cumulative Volume of fluid that has been pumped. **To reset the cumulative volume:** Press and hold CUMULATIVE VOLUME RESET  until the display changes to zero.
- D. **BATCH TOTAL:** Displays the number of dispenses that have been completed in the current batch. **To reset the batch total:** Press and hold BATCH RESET  until the display changes to zero.
- E. **SET ON TIME:** Displays the set dispense operation time.
- F. **ON TIME COUNTER:** Displays a countdown of the set dispense time during operation.
- G. **SET OFF TIME:** Displays the set duration of time the pump pauses between each dispense operation.
- H. **OFF TIME COUNTER:** Displays a countdown of the set off time during operation.
- I. **FLOW RATE:** Displays the current flow rate in the unit of measurement selected by the user.
- J. **PRIME:** Press and hold to prime the pump drive (for further information see "[Priming the Pump](#)" on page 3-11).

- K. **START/STOP/PAUSE:** During operation, the display will change from START ► to PAUSE || STOP/RESET ■.
- L. **FLOW DIRECTION:** Tap DIRECTION to select either clockwise ↻ or counterclockwise ↺ flow direction. **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.
- M. **SCREEN LOCK:** Locking the screen disables all touchscreen functions. **To lock the screen:** Press and hold UNLOCKED 🗝 until the icon changes to LOCKED 🔒 and a red border appears around the screen. **To unlock the screen:** Press and hold LOCKED 🔒 until the icon changes to UNLOCKED 🗝.
- N. **LOGOUT:** Tap to log out a user. **NOTE:** This option is only available if Manage User is enabled in Settings (for further information see "[User Management](#)" on page 3-9).
- O. **SETTINGS:** Tap to access the Settings Screen (for further information see "[Settings](#)" on page 3-5).

Time Mode Edit Screen



Time Mode Operation

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.
- Confirm that the pump head has been calibrated by checking that Calibration Complete 🌀 is displayed on the Time Mode Edit Screen (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump before operation (for further information see "[Priming the Pump](#)" on page 3-11).

To operate the pump in Time Mode:

1. Tap TIME from the Mode Selection Screen. The Time Mode Run Screen will be displayed.
2. Tap EDIT  to access the Time Mode Edit Screen.
3. Tap ON TIME to set the amount of time for each pump operation. The On Time Edit Screen will be displayed.
 - a. Tap HR, MIN, SEC or TENTHS and enter the desired time using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time Mode Edit Screen.
4. Tap OFF TIME to set the amount of time the pump will pause between each operation. The Off Time Edit Screen will be displayed. **NOTE:** If the off time is set to 0 (zero) the pump drive will require a start input (from either the touchscreen or a wired input) to start the next dispense.
 - a. Tap HR, MIN, SEC or TENTHS and enter the desired time using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time Mode Edit Screen.
5. Tap FLOW RATE. The Flow Rate Edit Screen will be displayed.
 - a. Tap UNITS to access the Flow Units Screen and select the desired flow unit from the available list.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
 - c. Tap FLOW and enter the desired flow rate using the onscreen keypad.
 - d. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time Mode Edit Screen.
6. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time Mode Edit Screen.
7. Tap BATCH TOTAL to adjust the number of dispenses in each batch cycle. The Batch Total Screen will be displayed.
 - a. Enter the desired number of dispenses in a batch using the onscreen keypad. **NOTE:** If required, tap INFINITE  to select an infinite number of dispense cycles. If infinite is selected, the pump will run continuously.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time Mode Edit Screen.
8. Tap CONFIRM  to return to the Time Dispense Mode Run Screen.
9. Tap DIRECTION to select either clockwise  or counterclockwise  flow direction. **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.
10. Tap START . The pump will now operate until the batch total is completed or until PAUSE  or STOP  is tapped.
11. If required, adjustments can be made to any of the Time Mode settings during operation. To make any adjustments:
 - a. Tap PAUSE  and then repeat steps 2–9 above.
 - b. Tap CONTINUE  to complete the pump operation once the desired changes have been made.

Saving Time Mode Settings as a New Program

Changes made to mode parameters can be saved as a new program for easier access to frequently used settings. **NOTE:** If Manage User is enabled only users with authorization can create and modify programs (for further information see "[User Management](#)" on page 3-9).

To save mode parameters to a new program:

1. If required, edit the Time Mode settings as desired.
2. Tap MODE NAME BANNER to return to the Mode Selection Screen.
3. Tap NEW PROGRAM. **NOTE:** If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL ▼ to view additional pages.
4. Tap TIME. The Time New Program Screen will be displayed with the last settings used in the Time Mode.
5. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
6. Tap CONFIRM to save or DELETE to cancel.

NOTE:

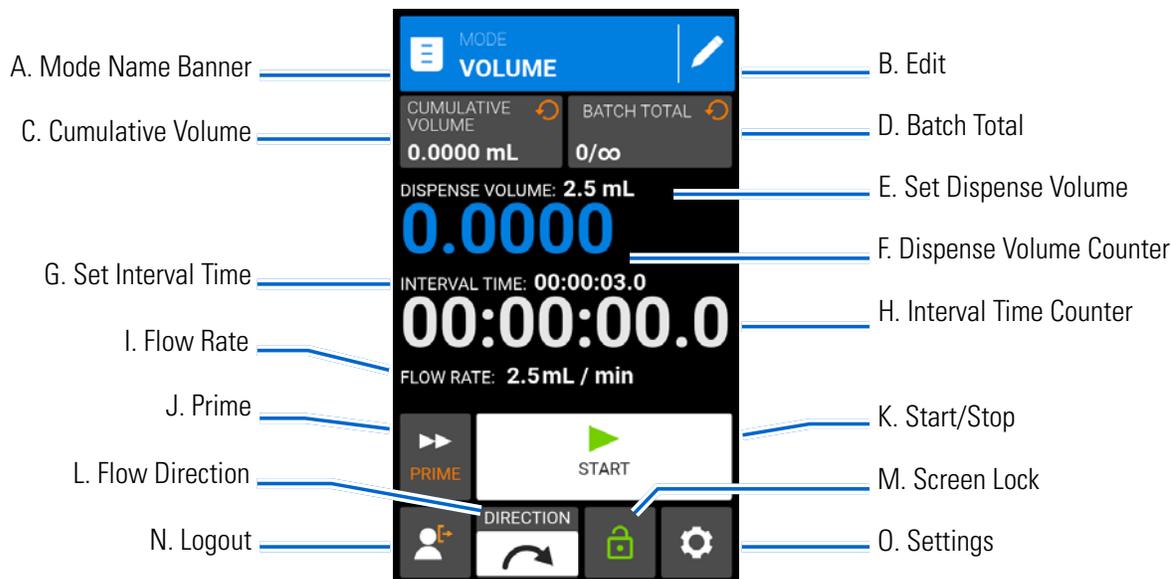
- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL ▼ will display additional pages.

VOLUME MODE

In Volume Mode the pump will operate at a selected rpm and/or flow rate until a selected volume of fluid has been pumped. When the selected volume has been pumped the drive will automatically stop.

Volume Mode Run Screen

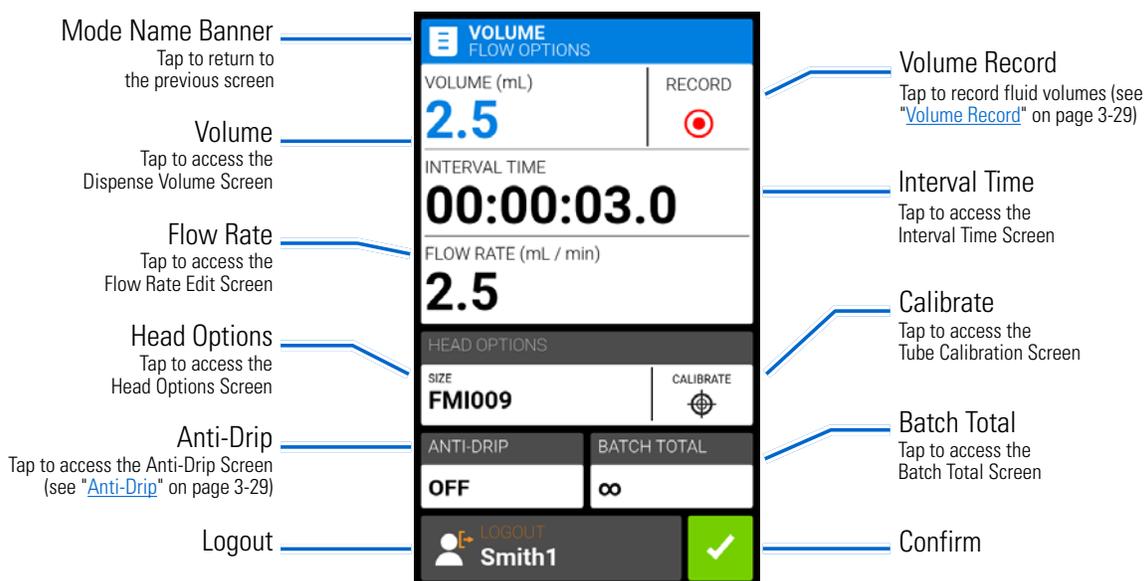
The Volume Mode Run Screen is accessed by selecting VOLUME from the Mode Selection Screen.



- A. **MODE NAME BANNER:** Tap the Mode Name Banner to return to the Mode Selection Screen.
- B. **EDIT:** Tap to access the Volume Mode Edit Screen. From the Volume Mode Edit Screen adjustments can be made to dispense volume, interval time, flow rate, pump head size, anti-drip functions, calibration and batch total. **NOTE:** Edit is inactive during operation.
- C. **CUMULATIVE VOLUME:** Displays the current Cumulative Volume of fluid that has been pumped. **To reset the cumulative volume:** Press and hold CUMULATIVE VOLUME RESET  until the display changes to zero.
- D. **BATCH TOTAL:** Displays the number of dispenses that have been completed in the current batch. **To reset the batch total:** Press and hold BATCH RESET  until the display changes to zero.
- E. **SET DISPENSE VOLUME:** Displays the selected volume of fluid for dispensing.
- F. **DISPENSE VOLUME COUNTER:** Displays a countdown of the fluid volume during operation.
- G. **SET INTERVAL TIME:** Displays the set time the pump pauses between dispenses.
- H. **INTERVAL TIME COUNTER:** Displays a countdown of the set interval time during operation.
- I. **FLOW RATE:** Displays the current flow rate in the unit of measurement selected by the user.
- J. **PRIME:** Press and hold to prime the pump drive (for further information see "[Priming the Pump](#)" on page 3-11).

- K. START/STOP/PAUSE: During operation, the display will change from START ► to PAUSE || STOP/ RESET ■.
- L. FLOW DIRECTION: Tap DIRECTION to select either clockwise ↻ or counterclockwise ↺ flow direction. **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.
- M. SCREEN LOCK: Locking the screen disables all touchscreen functions. **To lock the screen:** Press and hold UNLOCKED 🔓 until the icon changes to LOCKED 🔒 and a red border appears around the screen. **To unlock the screen:** Press and hold LOCKED 🔒 until the icon changes to UNLOCKED 🔓.
- N. LOGOUT: Tap to log out a user. **NOTE:** This option is only available if Manage User is enabled in Settings (for further information see "[User Management](#)" on page 3-9).
- O. SETTINGS: Tap to access the Settings Screen (for further information see "[Settings](#)" on page 3-5).

Volume Mode Edit Screen



Volume Dispense Mode Operation

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.
- Confirm that the pump head has been calibrated by checking that Calibration Complete 🌀 is displayed on the Volume Mode Edit Screen (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump before operation (for further information see "[Priming the Pump](#)" on page 3-11).

To operate the pump in Volume Mode:

1. Tap VOLUME from the Mode Selection Screen. The Volume Mode Run Screen will be displayed.
2. Tap EDIT  to access the Volume Mode Edit Screen.
3. Tap VOLUME. The Dispense Volume Screen will be displayed.
 - a. Tap VOLUME and enter the desired volume using the onscreen keypad. **NOTE:** If the volume of fluid is unknown the pump drive can record fluid dispense volumes (for further information see "[Volume Record](#)" on page 3-29).
 - b. Tap RAMP UP  to set the time the pump takes to reach full flow rate (between 0 and 60 seconds) using the onscreen keypad.
 - c. Tap RAMP DOWN  to set the time the pump takes to stop at the end of each dispense operation (between 0 and 60 seconds) using the onscreen keypad.
 - d. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Edit Screen.
4. Tap INTERVAL TIME to set the amount of time the pump will pause between each operation. The Interval Time Screen will be displayed. **NOTE:** If the interval time is set to 0 (zero) the pump drive will require a start input (from either the touchscreen or a wired input) to start the next dispense.
 - a. Tap HR, MIN, SEC or TENTHS and enter the desired time using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Edit Screen.
5. Tap FLOW RATE. The Flow Rate Edit Screen will be displayed.
 - a. Tap UNITS to access the Flow Units Screen and select the desired flow unit from the available list.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
 - c. Tap FLOW and enter the desired flow rate using the onscreen keypad.
 - d. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Edit Screen.
6. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Edit Screen.
7. Tap BATCH TOTAL to adjust the number of dispenses in each batch cycle. The Batch Total Screen will be displayed.
 - a. Enter the desired number of dispenses in a batch using the onscreen keypad. **NOTE:** If required, tap INFINITE  to select an infinite number of dispense cycles. If infinite is selected, the pump will run continuously.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Edit Screen.
8. If required, tap ANTI-DRIP. The Anti-Drip Screen will be displayed (for further information see "[Anti-Drip](#)" on page 3-29). **NOTE:** Anti-Drip is unavailable on gear pumps.
 - a. Tap ON or OFF to enable or disable the Anti-Drip feature.

- b. If enabled, enter the desired degrees of reverse rotation using the onscreen keypad. **NOTE:** Typical values range from 5 to 45 degrees.
 - c. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Edit Screen.
9. Tap CONFIRM  to return to the Volume Mode Run Screen.
 10. Tap DIRECTION to select either clockwise  or counterclockwise  flow direction. **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.
 11. Tap START . The pump will now operate until the batch total is completed or until PAUSE  or STOP  is tapped.
 12. If required, adjustments can be made to any of the Volume Mode settings during operation. To make any adjustments:
 - a. Tap PAUSE  and then repeat steps 2–10 above.
 - b. Tap CONTINUE  to complete the pump operation once the desired changes have been made.

Saving Volume Mode Settings as a New Program

Changes made to mode parameters can be saved as a new program for easier access to frequently used settings. **NOTE:** If Manage User is enabled only users with authorization can create and modify programs (for further information see "[User Management](#)" on page 3-9).

To save mode parameters to a new program:

1. If required, edit the Volume Mode settings as desired.
2. Tap MODE NAME BANNER to return to the Mode Selection Screen.
3. Tap NEW PROGRAM. **NOTE:** If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL  to view additional pages.
4. Tap VOLUME. The Volume New Program Screen will be displayed with the last settings used in the Volume Mode.
5. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
6. Tap CONFIRM to save or DELETE to cancel.

NOTE:

- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL  will display additional pages.

Anti-Drip

The Anti-Drip feature minimizes drips after fluid has been dispensed by reversing the pump direction to draw fluid back from the end of the tubing. Fluid drip can be caused by numerous factors, including tube size, tube orientation, and the viscosity of the fluid. **NOTE:** Anti-Drip is unavailable on gear pumps.

To enable or disable the Anti-Drip feature:

1. Tap VOLUME from the Mode Selection Screen. The Volume Mode Screen will be displayed.
2. Tap EDIT .
3. Tap ANTI-DRIP. The Anti-Drip Screen will be displayed.
4. Tap ON or OFF to enable or disable ANTI-DRIP.
5. If enabled, enter the desired degrees of reverse rotation using the onscreen keypad. **NOTE:** Typical values range from 5 to 45 degrees.
6. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume Mode Screen.

Volume Record

The Volume Record feature can be used to record unknown fluid volumes.

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.
- Confirm that the pump head has been calibrated by checking that Calibration Complete  is displayed on the Volume Mode Edit Screen (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump (for further information see "[Priming the Pump](#)" on page 3-11).

To record a fluid volume:

1. Tap VOLUME from the Mode Selection Screen. The Volume Mode Run Screen will be displayed.
2. Tap EDIT .
3. Tap RECORD .
4. Tap FLOW RATE to make adjustments to the flow rate. The Flow Rate Screen will be displayed.
 - a. Tap FLOW to enter the desired flow rate using the onscreen keypad.
 - b. Tap UNITS to enter the desired flow rate units using the onscreen keypad.
 - c. Tap CONFIRM  to save changes and return to the Record Dispense Screen.
5. Tap START .
6. If required, adjustments can be made to flow rate during operation. To make adjustments:
 - a. Tap STOP  and then repeat steps 4–5 above.
 - b. Tap START  to complete the pump operation once the desired changes have been made. **NOTE:** If required, tap STOP  and then CANCEL  to discard recording and return to the Volume Mode Edit Screen.

7. Tap STOP  when the desired volume of fluid has been pumped. The recorded dispense volume will now be displayed under VOLUME.
8. Tap CONFIRM  to save or CANCEL  to discard recording and return to the Volume Mode Edit Screen. If saved, the recorded dispense volume will now be displayed under VOLUME.
9. Tap CONFIRM  . The Volume Mode Run Screen will be displayed.

ANALOG INPUT MODE

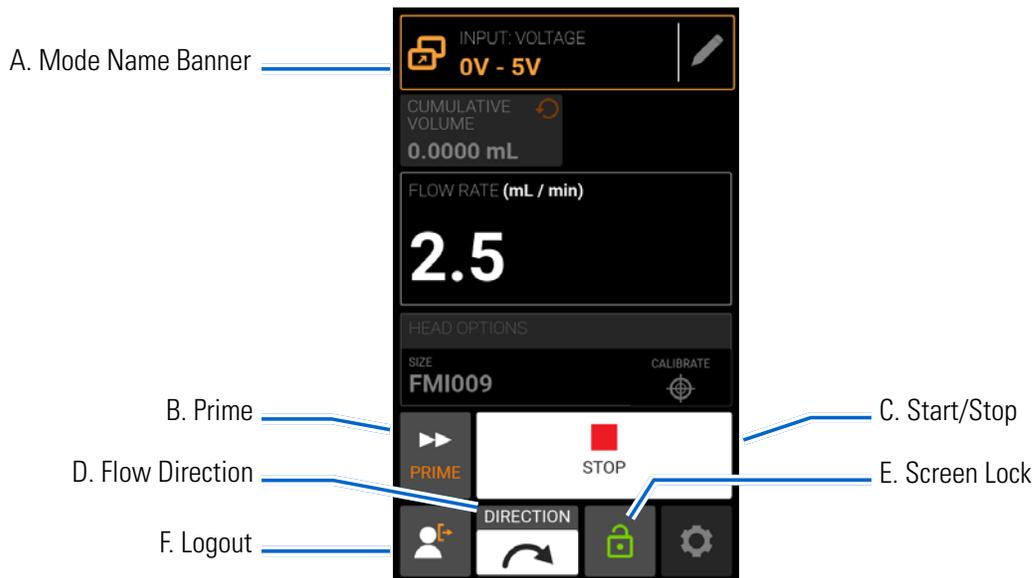


CAUTION: Power must be turned off before connecting the external analog control cable to prevent damage to the drive.

The REGLO Digital Pump Drive can be controlled and monitored through the pump drive's DB-25 female connection port. See www.masterflex.com for more information.

Analog Input Mode Run Screen

The Analog Input Mode Run Screen will be displayed on the pump drive's touchscreen during analog input operation. The screen displays the currently selected operation dispense settings from an external remote control device. The Analog Input Mode Run Screen is accessed by selecting ANALOG INPUT from the Mode Selection Screen.



- A. **MODE NAME BANNER:** Displays the Mode Name as well as the currently selected input type (ANALOG CURRENT or ANALOG VOLTAGE). Tap the Mode Name Banner to return to the Mode Selection Screen.
- B. **PRIME:** Press and hold to prime the pump drive (for further information see "[Priming the Pump](#)" on page 3-11).
- C. **START/STOP:** During operation, the display will change from START ► to STOP ■.
- D. **FLOW DIRECTION:** Tap DIRECTION to select either clockwise ↻ or counterclockwise ↻ flow direction. **NOTE:** Flow Direction is unavailable on single direction gear pumps and will be grayed out.
- E. **SCREEN LOCK:** Locking the screen disables all touchscreen functions. **To lock the screen:** Press and hold UNLOCKED 🗝 until the icon changes to LOCKED 🔒 and a red border appears around the screen. **To unlock the screen:** Press and hold LOCKED 🔒 until the icon changes to UNLOCKED 🗝.

- F. LOGOUT: Tap to log out a user. **NOTE:** This option is only available if Manage User is enabled in Settings (for further information see "[User Management](#)" on page 3-9).

Analog Input



CAUTION: Power must be turned off before connecting the external analog control cable to prevent damage to the drive.

The REGLO supports and controls analog input using suitable equipment through the pump drive's DB-25 female connection port. Analog input can be used in place of, or in addition to, MasterflexLive™.

See also "[DB-25 Electrical Connections](#)" on page 3-44.

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.
- Confirm that the pump head has been calibrated (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump before operation (for further information see "[Priming the Pump](#)" on page 3-11).
- Confirm that the pump drive is connected to the appropriate equipment through the drive's DB-25 female connection port (for further information see "[DB-25 Electrical Connections](#)" on page 3-44).

To operate analog input control and monitoring:

1. Tap ANALOG INPUT from the Mode Selection Screen. The Analog Input Mode Run Screen will be displayed.
2. Tap EDIT . The Analog Input Mode Edit Screen will be displayed.
3. Tap the desired analog input type from the available list.
4. If using either ANALOG: VOLTAGE or ANALOG: CURRENT:
 - a. Select the desired current or voltage operating range from the available list.
 - b. Tap CONFIRM to save or CANCEL to cancel and return to the previous screen.

NOTE:

- Tap STOP on the pump drive touchscreen to override the remote control device and immediately stop the pump operation. **NOTE:** If locked, the screen will need to be unlocked before the pump operation can be stopped.
- See www.masterflex.com for further information on using analog input remote control and monitoring.

Saving Analog Input Mode Settings as a New Program

Changes made to mode parameters can be saved as a new program for easier access to frequently used mode settings. **NOTE:** If Manage User is enabled only users with authorization can create and modify programs (for further information see "[User Management](#)" on page 3-9).

To save mode parameters to a new program:

1. If required, edit the Analog Input Mode settings as desired.
2. Tap MODE NAME BANNER to return to the Mode Selection Screen.
3. Tap NEW PROGRAM. **NOTE:** If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL ⌵ to view additional pages.
4. Tap ANALOG INPUT. The Analog Input New Program Screen will be displayed with the last settings used in the Analog Input Mode.
5. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
6. Tap CONFIRM to save or DELETE to cancel.

NOTE:

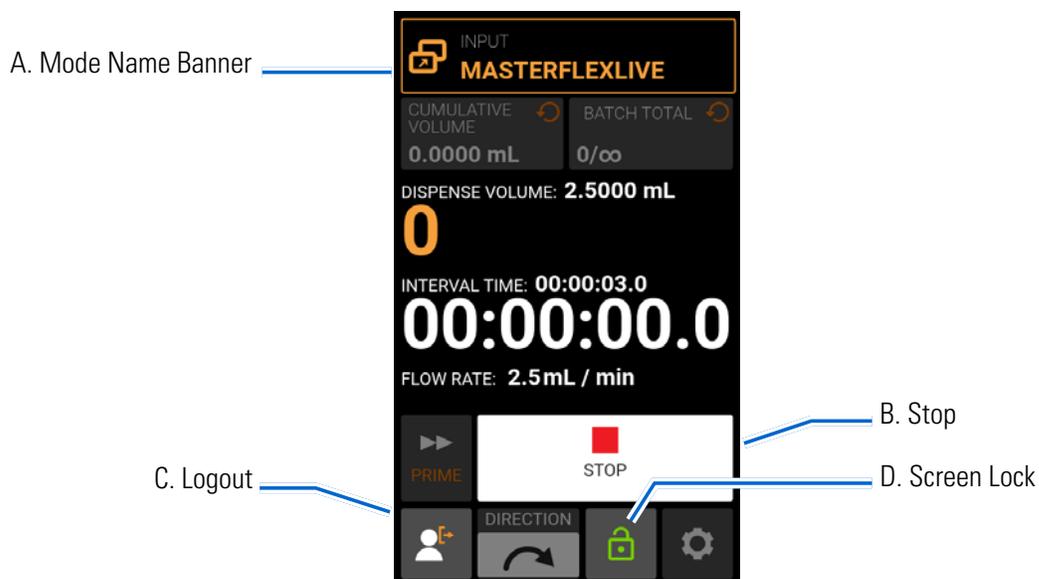
- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL ⌵ will display additional pages.

MASTERFLEXLIVE™

The REGLO Digital Pump Drive can be controlled and monitored through the MasterflexLive™ website using an Ethernet or Wi-Fi connection. MasterflexLive™ can be accessed from any suitable digital device connected to the internet, such as a laptop, tablet, smartphone or desktop computer. See www.masterflex.com for more information.

MasterflexLive™ Run Screen

The MasterflexLive™ Run Screen is only displayed on the pump drive touchscreen while the pump drive is being operated through the MasterflexLive™ website. The screen displays the currently selected operation dispense settings (Continuous, Time or Volume).



- MODE NAME BANNER:** Displays the Mode Name as well as the currently selected input type. Tap the Mode Name Banner to return to the Mode Selection Screen.
- START/STOP:** During operation, the display will change from START ► to STOP ■.
- LOGOUT:** Tap to log out a user. **NOTE:** This option is only available if Manage User is enabled in Settings (for further information see "[User Management](#)" on page 3-9).
- SCREEN LOCK:** Locking the screen disables all touchscreen functions. **To lock the screen:** Press and hold UNLOCKED 🗝 until the icon changes to LOCKED 🔒 and a red border appears around the screen. **To unlock the screen:** Press and hold LOCKED 🔒 until the icon changes to UNLOCKED 🗝.

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User

is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.

- Confirm that the pump head has been calibrated (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump (for further information see "[Priming the Pump](#)" on page 3-11).
- Confirm that the pump drive is connected to the internet via an active Wi-Fi or Ethernet connection (for further information see "[Wi-Fi Settings](#)" on page 3-8 or "[Ethernet Settings](#)" on page 3-8).
- Confirm the digital device you are using is connected to the internet.

To connect to MasterflexLive™:

1. Go to www.masterflex.com and type **masterflexlive** into the search bar.
2. Follow the onscreen prompts to log in or create a new account.
3. Follow the onscreen prompts to add your REGLO pump drive. **NOTE:** The Device ID (listed as the MAC Address) and Device Model Number are listed under "[Device Information](#)" on page 3-7. The MAC Address is also located on a label on the pump drive.
4. Select the desired pump drive from the list of available devices. The MasterflexLive™ Web App Run Screen will be displayed.

NOTE:

- Once the pump drive is connected to MasterflexLive™ the pump drive can be operated and monitored from the MasterflexLive™ Web App Run Screen and adjustments can be made to any of the pump settings.
- Tap STOP  on the pump drive touchscreen to stop the pump operation. **NOTE:** If locked, the screen will need to be unlocked before the pump operation can be stopped.

CUSTOM PROGRAM MODES

Custom programs allow users to create easily accessible programs for frequently used pump mode settings.

NOTE: If Manage User is enabled only users with authorization can create and modify programs (for further information see "[User Management](#)" on page 3-9).

Adding a New Program: Continuous Mode

To add a new Continuous Mode program:

1. Tap NEW PROGRAM from the Mode Selection Screen. The New Program Screen will be displayed.
NOTE: If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL  to view additional pages.
2. Tap CONTINUOUS. The Continuous New Program Screen will be displayed.
3. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
4. Select the desired flow rate and flow units:
 - a. Tap FLOW RATE to access the Flow Rate Screen.
 - b. Tap UNITS to access the Flow Units Screen and select the desired flow unit from the available list.
 - c. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Flow Rate Screen.
 - d. Tap FLOW and enter the desired flow rate using the onscreen keypad.
 - e. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Continuous New Program Screen.
5. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Continuous New Program Screen.
6. Tap CONFIRM to save or DELETE to discard changes.

NOTE:

- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL  will display additional pages.

Adding a New Program: Time Mode

To add a new Time Mode program:

1. Tap NEW PROGRAM from the Mode Selection Screen. The New Program Screen will be displayed.
NOTE: If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL  to view additional pages.
2. Tap TIME. The Time New Program Screen will be displayed.
3. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).

4. Tap ON TIME to set the amount of time for each pump operation. The On Time Edit Screen will be displayed.
 - a. Tap HR, MIN, SEC or TENTHS and enter the desired time using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time New Program Screen.
5. Tap OFF TIME to set the amount of time the pump will pause between each operation. The Off Time Edit Screen will be displayed. **NOTE:** If the off time is set to 0 (zero) the pump drive will require a start input (from either the touchscreen or a wired input) to start the next dispense.
 - a. Tap HR, MIN, SEC or TENTHS and enter the desired time using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time New Program Screen.
6. Tap FLOW RATE. The Flow Rate Edit Screen will be displayed.
 - a. Tap UNITS to access the Flow Units Screen and select the desired flow unit from the available list.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
 - c. Tap FLOW and enter the desired flow rate using the onscreen keypad.
 - d. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time New Program Screen.
7. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to Time New Program Screen.
8. Tap BATCH TOTAL to adjust the number of dispenses in each batch cycle. The Batch Total Screen will be displayed.
 - a. Enter the desired number of dispenses in a batch using the onscreen keypad. **NOTE:** If required, tap INFINITE  to select an infinite number of dispense cycles. If infinite is selected, the pump will run continuously.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Time New Program Screen.
9. Tap CONFIRM to save or DELETE to discard changes.

NOTE:

- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL  will display additional pages.

Adding a New Program: Volume Mode

To add a new Volume Mode program:

1. Tap NEW PROGRAM from the Mode Selection Screen. The New Program Screen will be displayed. **NOTE:** If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL  to view additional pages.
2. Tap VOLUME. The Volume New Program Screen will be displayed.

3. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
4. Tap VOLUME. The Dispense Volume Screen will be displayed.
 - a. Tap VOLUME and enter the desired volume using the onscreen keypad. **NOTE:** If the volume of fluid is unknown the pump drive can record fluid dispense volumes (for further information see "[Volume Record](#)" on page 3-29).
 - b. Tap RAMP UP  to set the time the pump takes to reach full flow rate (between 0 and 60 seconds) using the onscreen keypad.
 - c. Tap RAMP DOWN  to set the time the pump takes to stop at the end of each dispense operation (between 0 and 60 seconds) using the onscreen keypad.
 - d. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume New Program Screen.
5. Tap INTERVAL TIME to set the amount of time the pump will pause between each operation. The Interval Time Screen will be displayed. **NOTE:** If the interval time is set to 0 (zero) the pump drive will require a start input (from either the touchscreen or a wired input) to start the next dispense.
 - a. Tap HR, MIN, SEC or TENTHS and enter the desired time using the onscreen keypad.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume New Program Screen.
6. Tap FLOW RATE. The Flow Rate Edit Screen will be displayed.
 - a. Tap UNITS to access the Flow Units Screen and select the desired flow unit from the available list.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the previous screen.
 - c. Tap FLOW and enter the desired flow rate using the onscreen keypad.
 - d. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume New Program Screen.
7. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume New Program Screen.
8. Tap BATCH TOTAL to adjust the number of dispenses in each batch cycle. The Batch Total Screen will be displayed.
 - a. Enter the desired number of dispenses in a batch using the onscreen keypad. **NOTE:** If required, tap INFINITE  to select an infinite number of dispense cycles. If infinite is selected, the pump will run continuously.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume New Program Screen.
9. If required, tap ANTI-DRIP. The Anti-Drip Screen will be displayed (for further information see "[Anti-Drip](#)" on page 3-29). **NOTE:** Anti-Drip is unavailable on gear pumps.
 - a. Tap ON or OFF to enable or disable the Anti-Drip feature.
 - b. If enabled, enter the desired degrees of reverse rotation using the onscreen keypad. **NOTE:** Typical values range from 5 to 45 degrees.

- c. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Volume New Program Screen.

10. Tap CONFIRM to save or DELETE to discard changes.

NOTE:

- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL  will display additional pages.

Adding a New Program: Analog Input Mode

To add a new Analog Input Mode program:

1. Tap NEW PROGRAM from the Mode Selection Screen. The New Program Screen will be displayed.
NOTE: If NEW PROGRAM is not displayed on the Mode Selection Screen tap SCROLL  to view additional pages.
2. Tap ANALOG INPUT. The Analog Input New Program Screen will be displayed.
3. Tap PROGRAM1. If required, delete the characters using the back arrow on the onscreen keypad and then enter the desired program name (up to 8 characters).
4. Tap INPUT. The Analog Type Screen will be displayed.
5. Tap the desired analog type from the available list.
6. If using either ANALOG: VOLTAGE or ANALOG: CURRENT:
 - a. Select the desired current or voltage operating range from the available list.
 - b. Tap CONFIRM  to save or CANCEL  to cancel and return to the Analog Input New Program Screen.
7. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Analog Input New Program Screen.
8. Tap CONFIRM to save or DELETE to discard changes.

NOTE:

- Once saved, new programs are added in alphabetical order to the bottom of the Mode Selection Screen.
- If there are multiple programs tapping SCROLL  will display additional pages.

Using Program Modes

Custom programs will appear in alphabetical order at the bottom of the Mode Selection Screen. If there are multiple programs tapping SCROLL  will display additional pages.

General Preparation:

- Confirm the correct transfer tubing is securely attached to the pump head.
- Confirm all fluids and containers are ready.
- Switch the drive on using the power switch located at the rear of the drive. **NOTE:** If Manage User is enabled you may be prompted for a Username and Password (for further information see "[User Management](#)" on page 3-9). The touchscreen display will revert to the previously used operation mode.
- Confirm that the pump head has been calibrated by checking that Calibration Complete  is displayed on the Program Information  Screen (for further information see "[Pump Head Calibration](#)" on page 3-12).
- If required, prime the pump (for further information see "[Priming the Pump](#)" on page 3-11).

To use a program:

1. Select the desired program from the Mode Selection Screen. The Program Run Screen will be displayed.
2. Tap START  to begin the pump drive operation using the displayed program settings.
3. If required, Tap PAUSE  or STOP  during operation. **NOTE:** The pump cannot be paused during Continuous Mode operation.

NOTE:

- Tap INFORMATION  to view the selected program's settings.
- Individual settings cannot be edited from the Program Run Screen.

Editing a Program

NOTE: If Manage User is enabled only users with authorization can create and modify programs (for further information see "[User Management](#)" on page 3-9).

To edit a program:

1. Tap EDIT  located next to the desired program name on the Mode Selection Screen (**NOTE:** If there are multiple programs, tap SCROLL  to display additional pages). The Program Edit Screen will be displayed.
2. Edit the settings for the selected mode as desired. For instructions on editing individual mode settings see:
 - "[Adding a New Program: Continuous Mode](#)" on page 3-36.
 - "[Adding a New Program: Time Mode](#)" on page 3-36.
 - "[Adding a New Program: Volume Mode](#)" on page 3-37.
 - "[Adding a New Program: Analog Input Mode](#)" on page 3-39.
 - **NOTE:** Once the individual mode settings have been edited and saved the Program Edit Screen will be displayed.
3. Tap CONFIRM  to save or CANCEL  to discard changes and return to the Mode Selection Screen.

Deleting a Program

NOTE: If Manage User is enabled only users with authorization can delete a program (for further information see "[User Management](#)" on page 3-9).

To delete a program:

1. Tap EDIT  located next to the desired program name on the Mode Selection Screen (**NOTE:** if there are multiple programs tap SCROLL  to display additional pages). The Program Edit Screen will be displayed.
2. Tap DELETE PROGRAM .
3. Tap DELETE to delete the program and return to the Mode Selection Screen or CANCEL to return to the previous screen.

SECTION 4: SERVICE & MAINTENANCE



CAUTION: Replace the power cord only with one of the same type and rating.

FIRMWARE UPDATES

If the REGLO is connected to the internet, updates can be downloaded directly onto the pump drive.

NOTE: When new updates are available for your device, the update available  icon will be displayed at the top of the Settings Menu Screen.

To update REGLO:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **DEVICE INFORMATION**.
3. Tap **DEVICE INFORMATION**. The Device Information Screen will be displayed.
4. Tap **CHECK FOR UPDATES** and follow the onscreen prompts.

If the REGLO is not connected to the internet, updates must be downloaded onto a USB drive before installing onto the pump drive. Visit www.masterflex.com to download the latest updates for your device.

To install updates from a USB drive:

1. Insert the USB drive containing the updates into the pump drive's USB port.
2. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
3. **SCROLL**  through the Settings Screen pages to locate **DEVICE INFORMATION**.
4. Tap **DEVICE INFORMATION**.
5. Tap **CHECK FOR UPDATES** and follow the onscreen prompts.

RESTORE FACTORY SETTINGS

NOTE: Factory reset will erase all settings, including custom programs.

To restore the pump to the original factory defaults:

1. Tap **SETTINGS**  from any of the mode screens. The Settings Screen will be displayed.
2. **SCROLL**  through the Settings Screen pages to locate **DEVICE INFORMATION**.
3. Tap **DEVICE INFORMATION**.
4. Tap **FACTORY RESET** and follow the onscreen prompts.

FLUSHING THE PUMP HEAD

It is recommended that the pump head be flushed thoroughly after pumping in order to prevent the piston from seizing due to remaining particles. Avoid pumping liquids containing abrasive solids.

CLEANING THE PUMP DRIVE

If required, the pump drive may be wiped clean using a soft cloth lightly moistened with either isopropyl or ethyl alcohol.

NOTE:

- Do not use water, chlorine or any perfumed or aromatic cleaning agents on the pump drive.
- Care should be taken with the pump drive's touchscreen to avoid scratching or otherwise damaging the surface. Do not wipe with dry or abrasive material.
- Do not operate the pump drive with water on the surface of the touchscreen.
- Any damage caused by improper cleaning will be the sole responsibility of the customer.

ACCESSORIES

To purchase accessories or for further information visit www.masterflex.com. The following accessories are available for the REGLO Digital Pump Drive:

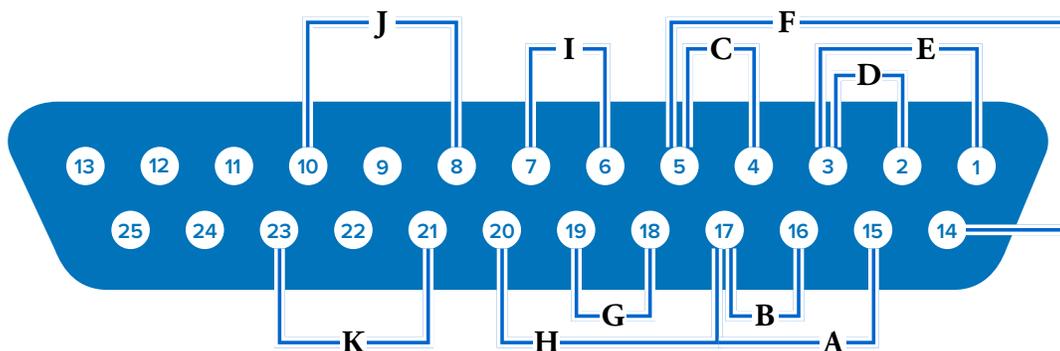
Description	Part Number
Footswitch with 6 ft (1.8 m) cable and DB-25 male connector	07523-92
DB-25 male connector (no cable, connector only)	07523-94
Cable assembly (DB-25 male connector and 25 ft (7.9 m) cable with stripped wire ends	07523-95
Dispensing Wand with 6 ft (1.8 m) cable and DB-25 male connector	07523-97
Power Supply	116065

Visit www.masterflex.com for a full list of available fittings and accessories.

DB-25 ELECTRICAL CONNECTIONS



CAUTION: Power must be turned off before connecting the external analog control cable to prevent damage to the drive.



Contact Arrangements:

Pin No. DB-25	Description	Pin No. DB-25	Description
1	Speed Control Voltage Input (0–10 V)	14	Speed Signal Voltage Output (0–10 V)
2	Speed Control Current Input (0–20 mA)	15	Start/Stop Input
3	Speed Control Input Reference	16	CW/CCW Input
4	Speed Signal Current Output (0–20 mA)	17	Start/Stop, CW/CCW, Prime Reference
5	Speed Signal Output Reference	18	Tach Output Reference
6	Motor Running Relay Output (N.O.)	19	Tach Output (Open Collector)
7	Motor Running Relay Output Common	20	Prime Input
8	Open Head Sensor Relay Output (N.O.)	21	General Alarm Relay Output Common
9	Not Used	22	Not Used
10	Open Head Sensor Relay Output Common	23	General Alarm Relay Output (N.O.)
11–13	Not Used	24–25	Not Used

Wiring Scheme:

A	Start/Stop	G	Tach Output
B	CW/CCW	H	Prime
C	Output (0–20 mA, 4–20 mA)	I	Motor Running (N.O.)
D	Input (0–20 mA, 4–20 mA)	J	Open Head Sensor (N.O.)
E	Input (0–10 V)	K	General Alarm
F	Output (0–10 V)		

PUMP HEAD REPLACEMENT

Available A-Mount Gear Pump Heads

Suction Shoe Pump Heads:

Part Number	Flow Rate (ml/rev)	Body	Gears	Seals
07002-14	0.092	316 SS	PPS	PTFE
07002-25	0.017	316 SS	Graphite	PTFE
07002-26	0.042	316 SS	Graphite	PTFE
07002-27	0.084	316 SS	Graphite	PTFE
07003-02	0.58	316 SS	PPS	Viton® with internal bypass
07003-04	1.17	316 SS	PPS	Viton® with internal bypass
73003-14	0.092	316 SS	PEEK	PTFE
73004-00	0.261	316 SS	PEEK	Viton® with internal bypass
73004-02	0.58	316 SS	PEEK	Viton® with internal bypass
73004-04	1.17	316 SS	PEEK	Viton® with internal bypass
73004-19	0.58	316 SS	PPS	Viton®
73004-21	1.17	316 SS	PPS	Viton®
73004-77	0.58	316 SS	PEEK	Viton®

Cavity-Style Pump Heads:

Model Number	Flow Rate (ml/rev)	Body	Gears	Seals
07001-40	0.91	316 SS	PTFE	PTFE with internal bypass
07001-80	0.64	316 SS	PPS	PTFE with internal bypass
07002-17	0.32	316 SS	PTFE	PTFE with internal bypass
07002-23	0.64	316 SS	PTFE	PTFE with internal bypass
73011-00	0.32	316 SS	PEEK	PTFE
73011-02	0.32	316 SS	PEEK	PTFE with internal bypass
73011-08	0.64	316 SS	PEEK	PTFE
73011-16	0.91	316 SS	PEEK	PTFE
73011-18	0.91	316 SS	PEEK	PTFE with internal bypass

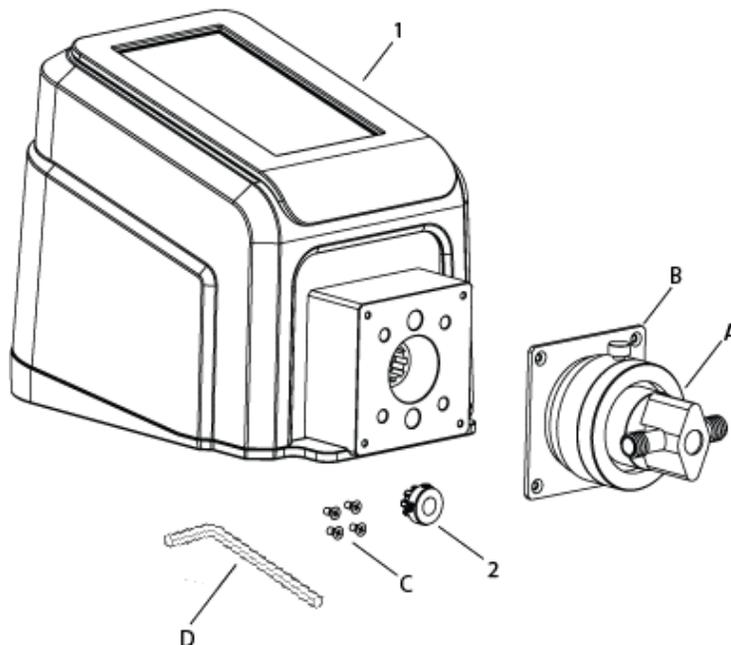
Available Piston Pump Heads

Part Number	Inlet Connection	Maximum Flow Rate (ml/min)	Wetted Materials
07117-33	1/4" OD Tubing	18.75	316 SS, PVDF, Carbon
07117-35	1/4" OD Tubing	18.75	316 SS, ETFE, Carbon
07117-41	1/4 -28 Female	18.75	316 SS, ETFE, Carbon
07117-53	1/4" OD Tubing	37.5	Ceramic, ETFE
07117-55	1/4" OD Tubing	37.5	Ceramic, PVDF
07117-59	1/4 -28 Female	37.5	Ceramic, PVDF
07117-61	1/4 -28 Female	37.5	Ceramic, ETFE
07117-63	1/4" OD Tubing	75	Ceramic, ETFE
07117-65	1/4" OD Tubing	75	Ceramic, PVDF
07117-69	1/4 -28 Female	75	Ceramic, PVDF
07117-71	1/4 -28 Female	75	Ceramic, ETFE

Mounting a Ceramic Piston Pump

General preparation and required equipment:

- Confirm you have the correct replacement pump head
- Remove the pump head from its packaging and inspect for any obvious signs of damage
- Phillips screwdriver size 0



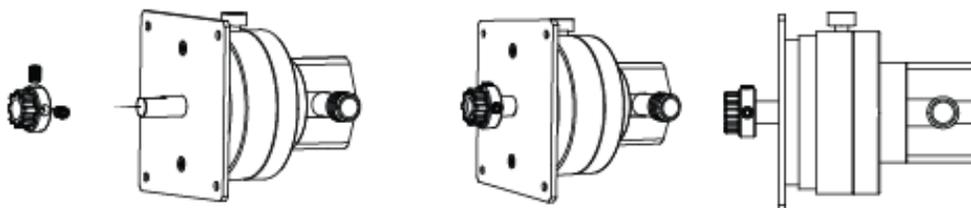
Pump Head Parts

- A. Pump Head (RH00, RH0, RH1)
- B. Mounting Plate
- C. Phillips Flat Head Machine Screws (4 pieces)
- D. Allen Key 2.5 mm (3/32")

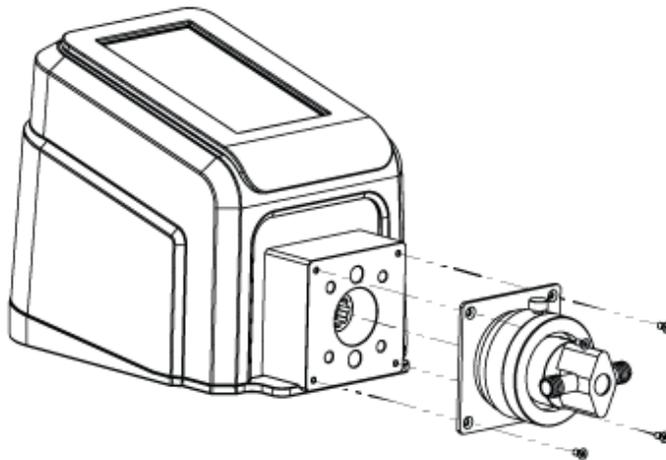
Pump Drive

- 1. REGLO Pump Drive
- 2. Coupling

1. Attach the coupling:
 - a. Place the coupling onto the pump-head shaft and push it on as far as it will go. **NOTE:** The Allen screw must be centered on the flat of the pump-head shaft.
 - b. Tighten the coupling (2) with the 2.5 mm size Allen key (D).



2. Mount the pump head (**NOTE:** The scale of the red flow control ring must be pointing upwards):
 - a. Hold the mounting plate (B) so that the screws are at the top and at the bottom.
 - b. Line up the couplings and insert the pump-head assembly. Push it on as far as it will go.
 - c. Drive in the flat head screws (4).
 - d. Tighten the Allen screw using the 2.5 mm size Allen key (D).



3. Plug in the supplied desktop power supply.
4. Switch on the drive.
5. Navigate to the Continuous, Time or Volume Mode screens.
6. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM to save or CANCEL to discard changes and return to the previous screen.
7. Adjust the pump head zero point (For further information consult the pump head user manual).
8. Prime the new pump head (for further information see "[Priming the Piston Pump](#)" on page 3-11).
9. Calibrate the new pump head (for further information see "[Piston Pump Calibration](#)" on page 3-14).

The new pump head is now ready for operation.

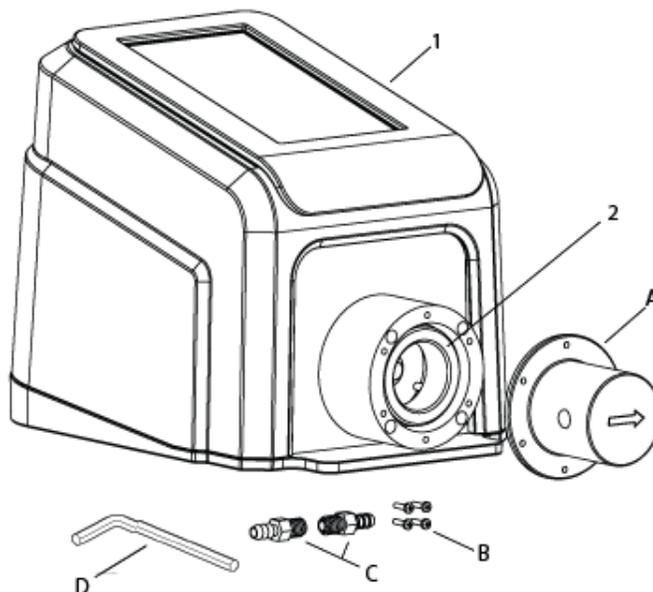
Mounting a Gear Pump



CAUTION: Before mounting a new pump head ensure that the magnet is securely fitted to the drive.

General preparation and required equipment:

- Confirm you have the correct replacement pump head
- Remove the pump head from its packaging and inspect for any obvious signs of damage
- Phillips screwdriver size 0



Pump Head Parts

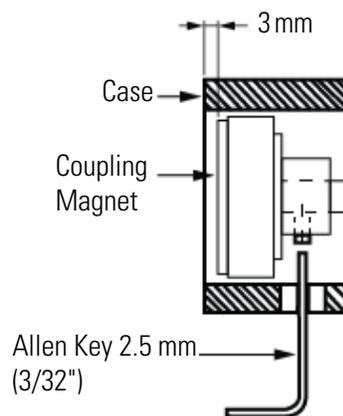
- A. Pump Head
- B. Phillips Flat Head Machine Screws (4 pieces)
- C. Barb Tubing Adaptor (2 pieces)
- D. Allen Key 2.5 mm (3/32")

Pump Drive

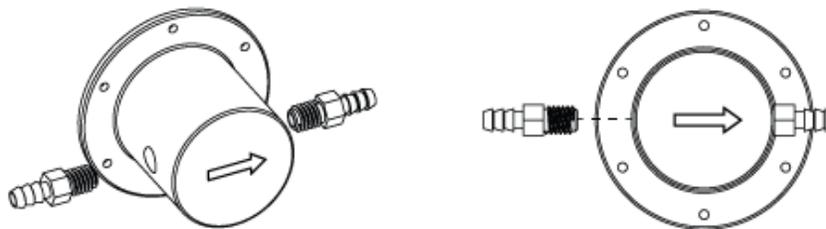
- 1. REGLO Pump Drive
- 2. Coupling Magnet

NOTE:

- Ensure there is a gap of approximately 3 mm between the magnet and the brim of the fixing case.
- During operation the back of the coupling magnet must not touch the housing of the pump drive.



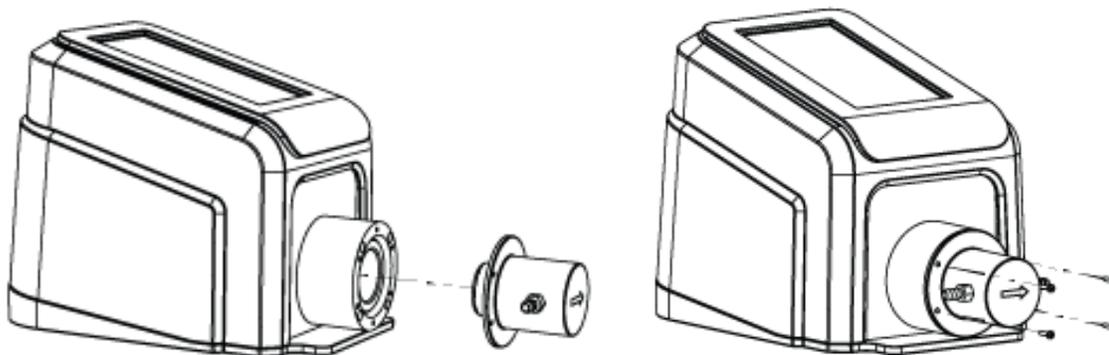
1. Screw the two tubing adapters into the pump head. **NOTE:** Before screwing the two tubing adapters into the pump head it is recommended that PTFE tape be wrapped around the thread of the adapter to help protect the thread and ensure optimum sealing.



2. Screw the pump head to the fixing case of the drive.

NOTE:

- The face of the pump head with the engraved model number must be oriented toward the user. The engraved arrow indicates the flow direction.
- Gear pumps can only pump in one direction. An arrow engraved on the front of the pump head indicates the correct flow direction.



3. Plug in the supplied desktop power supply.
4. Switch on the drive.
5. Navigate to the Continuous, Time or Volume Mode screens.
6. Tap HEAD OPTIONS. The Head Options Screen will be displayed.
 - a. Select the desired pump head size from the list of available options.
 - b. Tap CONFIRM to save or CANCEL to discard changes and return to the previous screen.
7. Prime the new pump head (for further information see "[Priming the Gear Pump](#)" on page 3-11).
8. Calibrate the new pump head (for further information see "[Gear Pump Calibration](#)" on page 3-12).

The new pump head is now ready for operation.



CAUTION: Fill the pump head with liquid before pump operation. Avoid dry running the pump head.

TROUBLESHOOTING

For further assistance, or for issues that cannot be resolved, see "[Technical Assistance](#)" on page 3-55.

Symptom	Cause	Remedy
Motor does not rotate. Display does not light.	No power.	<ol style="list-style-type: none"> 1. Check that the power cord is securely plugged into the drive. 2. Check that the power cord is plugged into the mains power outlet and that the power is switched on. 3. Check the power cord for any visible signs of damage and replace if defective.
Pump does not rotate during analog operation. The display does not light up during analog operation.	Defective analog control or setting error.	<ol style="list-style-type: none"> 1. Switch the pump drive off. 2. Check that the DB-25 connection cable is fully inserted into the drive's port. 3. Switch on the pump drive. 4. If the motor still does not rotate, select ANALOG INPUT from the Mode Selection Screen and/or the Settings Screen and verify that the settings are correct. 5. For further information see "Analog Input Mode" on page 3-31.
Weak calibration strength displayed on the calibration strength bar.	Poor calibration volume and/or flow rate.	Calibration accuracy can be improved by using a larger calibration volume and/or altering the flow rate.
Touchscreen unresponsive.	Wearing thick latex gloves can make the screen less responsive.	Remove gloves before using the touchscreen. NOTE: Consult your company or laboratory safety guidelines before removing any personal protective equipment.

ERROR DEFINITIONS

Error #2: No Encoder Pulses

Description:	The drive's processor has not received expected encoder feedback.
Actions:	Drive will stop immediately. Verify load is correct and power cycle drive. If error persists see "Technical Assistance" on page 3-55.

Error #3: Exceeded Average Motor Current Limit

Description:	Motor is drawing too much current on average for a period of time.
Actions:	Drive will stop immediately. Verify that pump head is not binding and that the load is not above recommended maximum load. If error persists see "Technical Assistance" on page 3-55.

Error #4: Exceeded Peak Motor Current

Description:	Motor is drawing too much current for a short duration of time.
Actions:	Drive will stop immediately. Verify that pump head is not binding and that the load is not above recommended maximum load. If error persists see "Technical Assistance" on page 3-55.

Error #5: Communication Watchdog Timeout

Description:	Internal communications have exceeded allowable time limit.
Actions:	Drive will stop immediately. Power cycle the pump drive. If error persists see "Technical Assistance" on page 3-55.

Error #6: Pump Head Opened During Cal

Description:	The occlusion bed of the pump is no longer in its closed position, or an internal connection is loose or broken.
Actions:	Drive will stop immediately. Close pump head. If necessary power cycle the pump drive. If error persists see "Technical Assistance" on page 3-55.

Error #7: Motor Over Temperature

Description:	The pump's temperature sensor has failed or internal temperatures have exceeded limits.
Actions:	Drive will stop immediately. If necessary remove drive from high ambient temperature, decrease load, and verify that there is free airflow around the drive. If error persists see "Technical Assistance" on page 3-55.

Error #8: Motor Direction – Leads Incorrect

Description:	The motor wires are reversed.
Actions:	Drive will stop immediately. Power cycle the pump drive. If error persists see "Technical Assistance" on page 3-55.

Error #9: Over Speed

Description:	The drive has exceeded commanded speed value.
Actions:	Drive will stop immediately. Verify load is correct and power cycle the pump drive. If error persists see "Technical Assistance" on page 3-55.

Error #10: Encoder Commutation

Description:	The drive's internal speed sensor is not providing a consistent output.
Actions:	Drive will stop immediately. Verify load is correct and power cycle the pump drive. If error persists see "Technical Assistance" on page 3-55.

Error #11: Cal: Bad Checksum in EEPROM

Description:	Bad EEPROM checksum for Factory Cal.
Actions:	Error will be cleared after 10 seconds and parameters will be reset to default values. If error persists see "Technical Assistance" on page 3-55.

SPECIFICATIONS

OUTPUT

Speed:	Gear Pump Models	100 to 5000 RPM
	Piston Pump Models	1 to 1800 RPM
Torque Output, Max Continuous:	Gear Pump Models	14 oz-in
	Piston Pump Models	17 oz-in
Speed Regulation:	All Models	Line $\pm 0.1\%$ F.S.
		Load $\pm 0.1\%$ F.S.
		Drift $\pm 0.1\%$ F.S.
Display:	All Models	800 x 480 LCD w/ LED Backlight
Outputs:	All Models	Voltage speed output (0-10VDC @ 1 k Ω min)
		Current speed output (4-20 mA @ 0-600 Ω)
		Motor running relay (Closed when running, 1 A max @ 24VDC)
		General alarm relay (Closed when error is displayed, 1 A @ 24VDC)
		Gear Pump Models
Piston Pump Models	Tach output (10 – 18000 Hz, 50% Duty Cycle, 10 Hz per RPM)	

INPUT

Supply Voltage Limits:	All Models	90 to 260 Vrms @ 50/60 Hz (Universal Input)
Max Current:	All Models	1.3 A @ 115 VAC; 0.6 A @ 230 VAC
Inputs:	All Models	Start/Stop, Prime, CW/CCW (Contact closure)
		Current input (0-20 mA @ 249 Ω ; ± 50 V common mode range)
		Voltage input (0-10 VDC @ 10 k Ω ; ± 50 V common mode range)
		RJ45 Ethernet
		USB, Type A (5VDC @ 0.5 A)

CONSTRUCTION

Dimensions (L x W x H):	Drive Only	7.62" x 5.75" x 6.31" (194 mm x 146 mm x 160 mm)
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Section 4: Service & Maintenance

Weight:	Drive Only	5.74 lbs. (2.60 kg)
Enclosure Rating:	All Models	IP31 per IEC 60529

ENVIRONMENT

Operating Temperature:	All Models	0 °C to 40 °C (32 °F to 104 °F)
Storage Temperature:	All Models	-25 °C to 65 °C (-13 °F to 149 °F)
Humidity (Non-Condensing):	All models	10% to 90%
Altitude:	All Models	Less than 2000 m
Pollution Degree:	All models	Pollution Degree 2 (Indoor use, lab, office)
Chemical Resistance:	All Models	Exposed material is painted aluminum and ABS plastic

COMPLIANCE

	All Models	UL 61010-1 US/CAN For CE mark: EN61010-1, Low Voltage Directive EN61326-1, EMC Directive EN50581, RoHS Directive
	Pump Head Models	EN809, Machinery Directive

TECHNICAL ASSISTANCE

If you have any questions about the use of this product contact the manufacturer or authorized seller.

PRODUCT RETURN

Like all pumps, the REGLO pump drive contains components that will wear over a period of time. To limit charges and delays contact the seller or manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product please state the reason for the return. For your protection, pack the product carefully and insure it against possible damage or loss. Any damages resulting from improper packaging are your responsibility.

WARRANTY

Visit www.masterflex.com for warranty information.

DISPOSAL

Please retain packaging materials until the product warranty ends. Afterwards please discard of any packaging materials in an environmentally friendly manner and according to local regulations.

Once the useful life of the product has ended, please ensure proper disposal according to local laws. Plastic and electronic components should be disposed of at a recycling facility. Please refer to local regulations regarding proper disposal.



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US & Canada only

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