

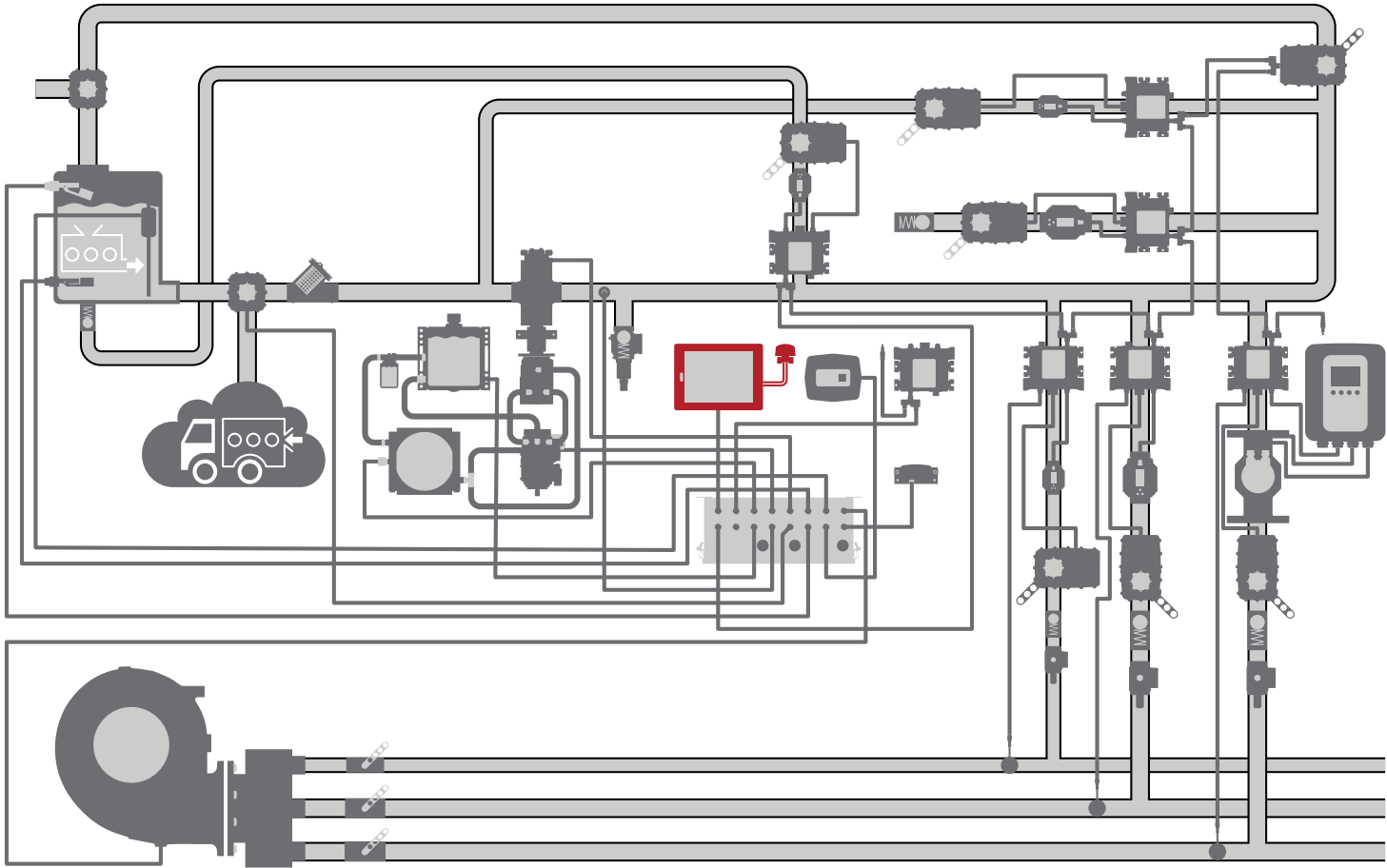


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AQUIS ULTRAFLOW—Tellurus HMI

Installation and Operation



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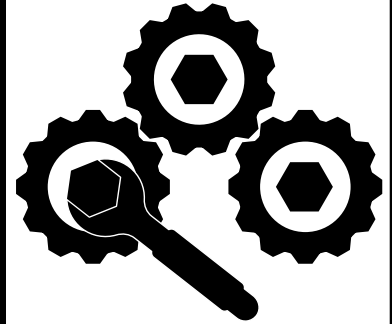
Safety Precautions

- Read and understand all the associated documentation before you begin the installation.
- Read and understand all the notices and safety precautions.
- Be aware that these instructions are only guidelines and are not meant to be definitive. Contact Waterous when you have questions about installing, operating, or maintaining the equipment.
- Do not install the equipment if you are not familiar with the tools and skills needed to safely perform the required procedures—proper installation is the responsibility of the purchaser.
- Do not operate the equipment when safety guards are removed.
- Do not modify the equipment.
- Regularly check for leaks and worn or deteriorated parts.

NOTICE

Modification

- **Modifying the equipment can damage components and void your warranty.**
- **Do not modify the system or any of its components.**



NOTICE

Before Operation

- **Read and understand all the instructions provided.**
- **Check all fluid levels and replenish if necessary.**
- **Remove all shipping plugs and install the operation plugs or caps.**



Use this document to install and operate your Waterous equipment. Understand the following conditions before continuing with the document:

- The instructions may refer to options or equipment that you may not have purchased with your system.
- The illustrations in this document are intended to convey concepts. Do not use the illustrations to determine physical attributes, placement, or proportion.
- Understand that your application may require additional steps, that are not described in the illustrations or instructions, to perform the installation.
- The equipment described in this document is intended to be installed by a person or persons with the necessary skills and knowledge to perform the installation.
- The equipment described in this document is intended to be operated by a person or persons with the basic knowledge of operating similar equipment.
- The information in this document is subject to change without notice.

This document is divided into the following sections:

SAFETY

This section describes general precautions and alert symbols that are in this document.

INTRODUCTION

This section is an overview of the document.

PRODUCT OVERVIEW

This section describes the components that make-up the system.

INSTALLATION

This section describes the installation and initial setup procedures.

OPERATION

This section describes the equipment operation.

MAINTENANCE

This section describes any required maintenance.

Using this Document

Use the guidelines below when viewing this document.

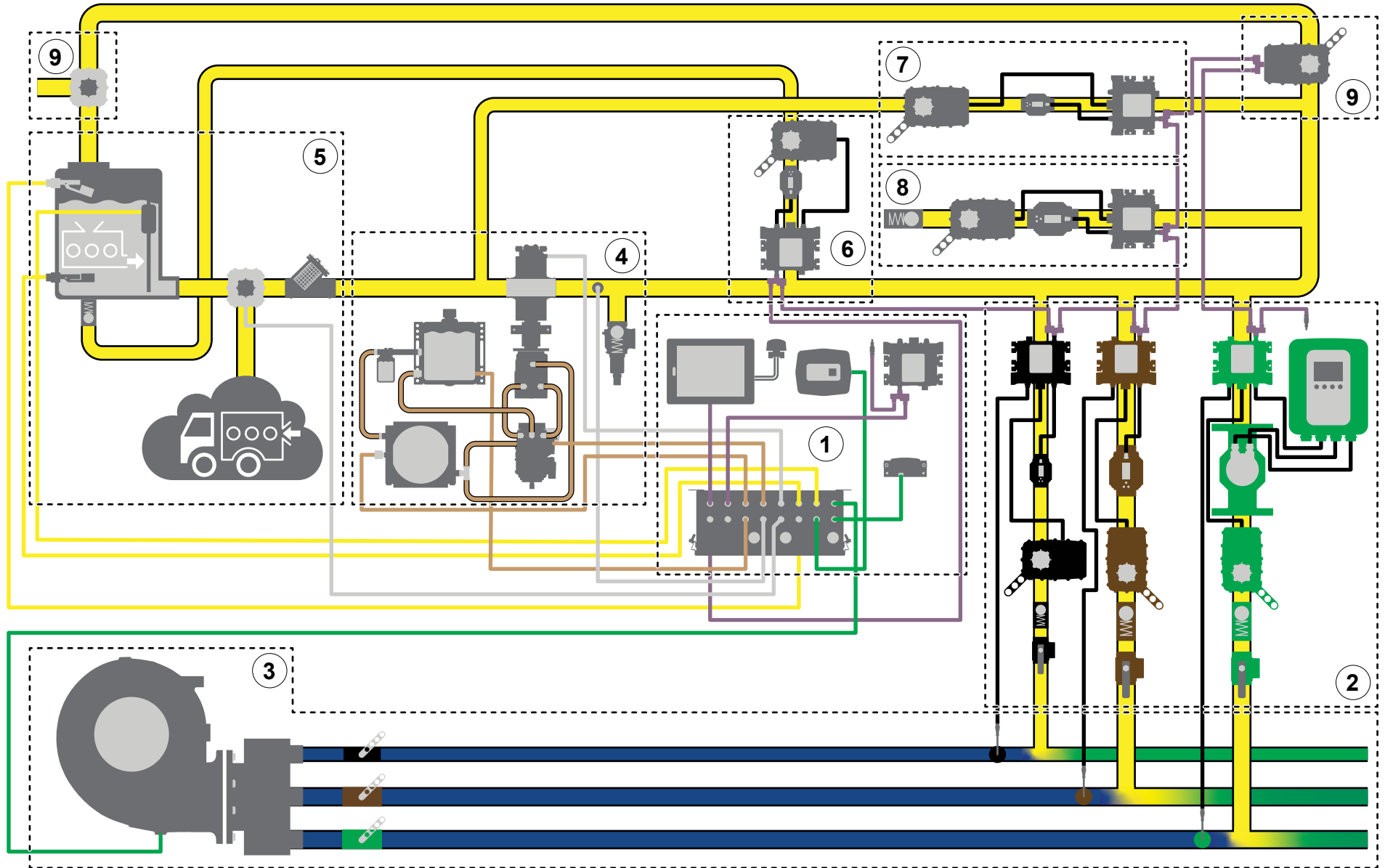
Viewing the Document Electronically

- View this document in landscape orientation.
- Use the table of contents to navigate directly to that section.
- Text **with this appearance** is linked to a reference.

Printing the Document

- The document is viewed the best when printed in color.
- The *print on both sides* and *flip on long edge* features can provide the best results.
- Use a 3-ring binder to store the document.

AQUIS ULTRAFLOW Industrial Foam Proportioner System



AQUIS ULTRAFLOW Industrial Foam Proportioner System

The AQUIS ULTRAFLOW industrial foam proportioner system supplies concentrate into a solution-capable discharge line. A Tellurus™ touchscreen display, or human machine interface (HMI), shows system activity, and provides control over the system using a CANbus protocol. Foam concentrate is sourced from an on-board supply tank or an auxiliary source. The concentrate pump distributes concentrate through the discharge line assembly (DLA) using hydraulic components, where it is measured, controlled, and introduced into the solution-capable discharge line to produce foam solution. Understand that your application will include all or portions of the components described.

Subsystem	Description
1 Control system	<p>This monitors and controls the foam proportioning system. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Tellurus display (HMI)—this displays system operation and provides control of the system. • Control box—this connects to various components in the system and contains the programmable logic controllers (PLC). • Manual override switch—this disables the automatic control of the concentrate control valves. • Power disconnect relay—this power relay enables and disables power to the DLA. • Remote I/O—this adds a node controller to the system for additional options required in your application. • Various cables—these provide communication and power to system components.
2 Discharge line assembly	<p>This manages the concentrate injected into the solution-capable discharge. The system can control up to 19 DLAs. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Node controller—this connects to, and controls, the concentrate control valve, reads the flowmeters and the discharge pressure transducer. • Split CANbus cable—this connects the node controllers to one another and the control box. • DLA terminating resistor—this terminates the CANbus connection on the last node controller or valve in the CANbus chain. • Concentrate control valve—this controls the concentrate flow. • Magnetic flowmeter—this measures the concentrate flow. • Check valve—this prevents contamination of concentrate by preventing reverse fluid flow in the line. • Cal/Inject valve—this allows you to divert and collect water or concentrate when calibrating the your system.
3 Solution-capable discharge	<p>This includes the installer-supplied water pump, distribution manifold, plumbing, and additional components that produce water flow. Additional components in this subsystem include:</p> <ul style="list-style-type: none"> • Paddlewheel flowmeter—this measures the amount of water flowing in the discharge. Note: <i>You can install the paddlewheel flowmeter upstream or downstream of where the concentrate is injected into the waterway.</i> • Water pump pressure transducer—this measures the pressure at the pump discharge. Note: <i>Some applications prohibit measuring discharge pressure at the pump, in those applications alternative measurement methods are used.</i> • Solution discharge pressure transducer—this measures the pressure at the solution capable discharge.

AQUIS ULTRAFLOW Industrial Foam Proportioner System

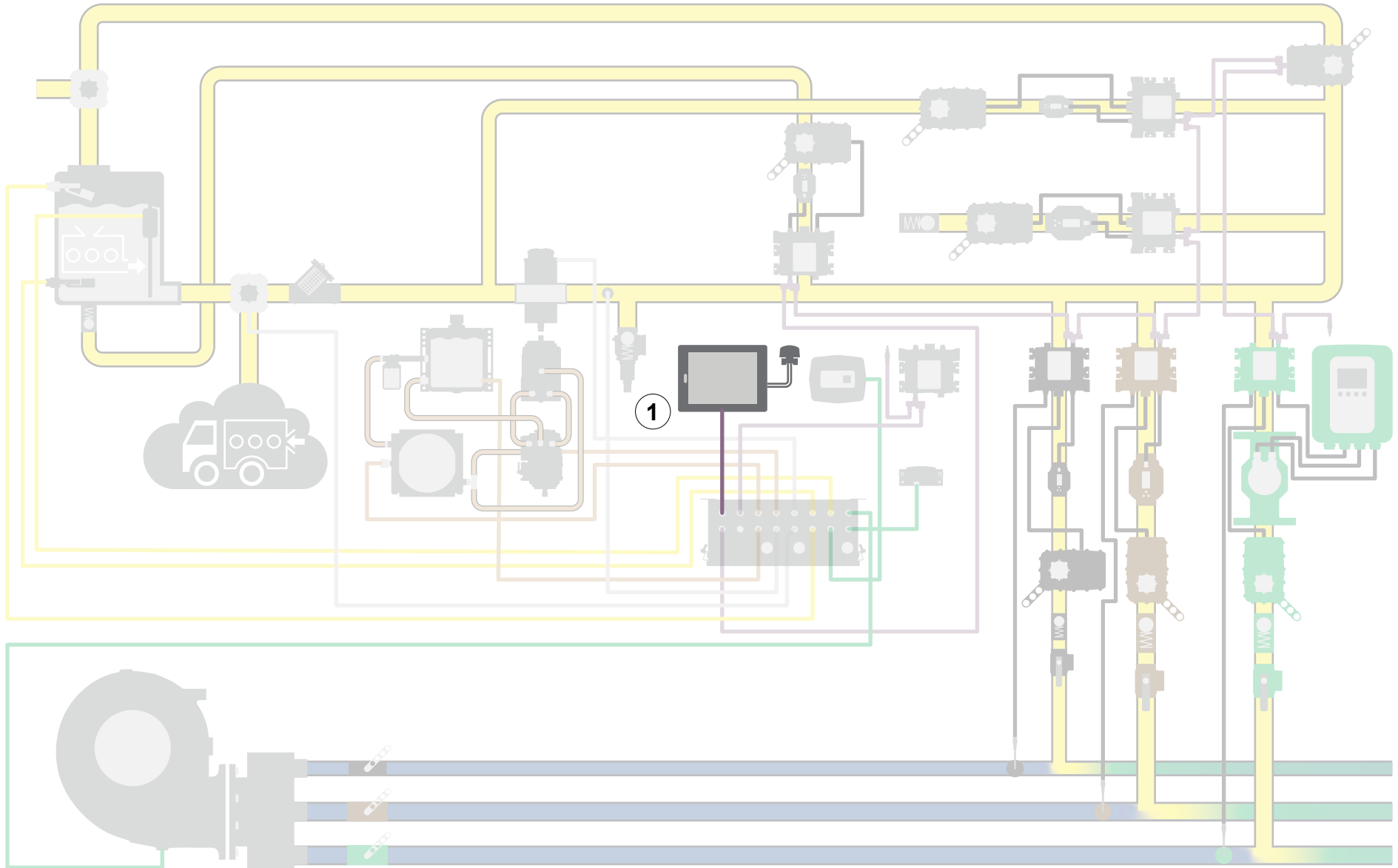
Subsystem	Description
4 Concentrate pump	<p>These components support, control, and power the concentrate pump. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Concentrate pump—this circulates the foam concentrate through the system. • Hydraulic motor—this drives the concentrate pump. • Hydraulic pump—this drives the hydraulic motor. • Hydraulic fluid reservoir—this contains the hydraulic fluid supply. • Hydraulic fluid filter—this filters the hydraulic fluid. • Hydraulic fluid heat exchanger—this cools the hydraulic fluid. • Hydraulic fluid temperature sensor—this measures the hydraulic fluid temperature. • Hydraulic fluid level sensor—this monitors the hydraulic fluid level in the reservoir. • Pressure transducer—this measures the pressure in the concentrate discharge line. • Pressure relief valve—this limits the pressure in the concentrate discharge manifold by opening when the pressure reaches a predetermined level.
5 Concentrate supply	<p>This contains components that contain or supply foam concentrate for the system. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Concentrate supply tank—this contains the on-board foam concentrate supply. • Tank-full sensor—this indicates a tank full condition to the system. • Tank-low sensor—this indicates a tank low condition to the system. • Tank level sensor—this is an installer supplied sensor and display that indicates the supply level in the tank. • Concentrate pump intake select valve—this is an installer supplied, 2 position valve, and additional components that sources concentrate from an on-board tank or an auxiliary supply. A signal is provided to the system to ignore the on-board tank sensors when sourcing concentrate from an auxiliary supply. • Concentrate strainer—this collects debris that would otherwise flow through the system and could damage the concentrate pump.
6 Concentrate supply refill line	<p>This allows you to fill the on-board tank from an external source. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Node controller—this connects to the fill valve and flowmeters. • Fill line control valve—this controls the flow of concentrate. • Magnetic flowmeter—this measures the flow of concentrate. • Split CANbus cable—this connects the node controllers to one another and the control box. • Check valve—this prevents reverse fluid flow in the line.

AQUIS ULTRAFLOW Industrial Foam Proportioner System

Subsystem	Description
7 Low-flow bypass line	<p>This returns a portion of the pumped concentrate in the supply line back to the pump inlet when the desired concentrate output requires the pump to operate at an RPM that is lower than possible by the pump. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Node controller—this connects to the low-flow control valve, flowmeters. • Low-flow valve—this controls the concentrate return flow. • Magnetic flowmeter—this measures the flow of concentrate. • Split CANbus cable—this connects the node controllers to one another.
8 Transfer line	<p>This allows you to transfer or relay concentrate from the apparatus to another location. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Node controller—this connects to and controls the concentrate control valve, flowmeters. • Split CANbus cable—this connects the node controllers to one another and the control box. • Concentrate control valve—this controls the concentrate flow. • Magnetic flowmeter—this measures the concentrate flow. • Check valve—this prevents reverse fluid flow in the line.
9 Priming line	<p>This evacuates air from the concentrate pump inlet as the system primes before operation. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Priming valve—this opens to allow air to evacuate the line before operation. • Split CANbus cable—this connects the node controllers to one another and the control box. • Prime bypass line—this is an installer-supplied valve that prevents contaminating the concentrate during training. When water is substituted for concentrate during training or testing, and you have concentrate in the supply tank, this bypass valve prevents water from contaminating the concentrate supply. Note: <i>You must drain any remaining water in the line before priming the system with concentrate to prevent contamination.</i>

HMI and Components

A comprehensive application of the AQUIS ULTRAFLOW system consists of multiple subsystems that include up to 19 DLAs to perform various functions, an on-board and auxiliary concentrate supply, equipment to circulate water and concentrate, and components to monitor and control the system.

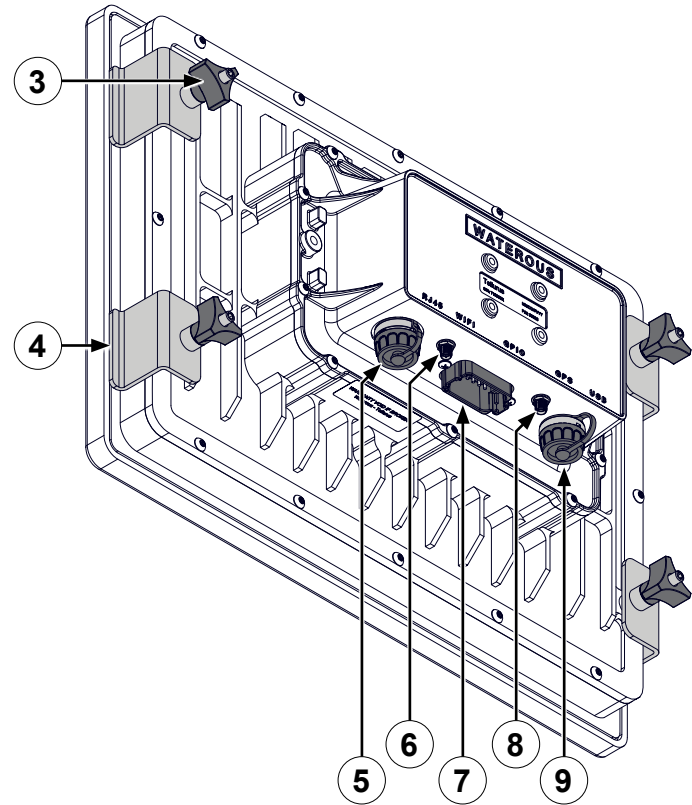
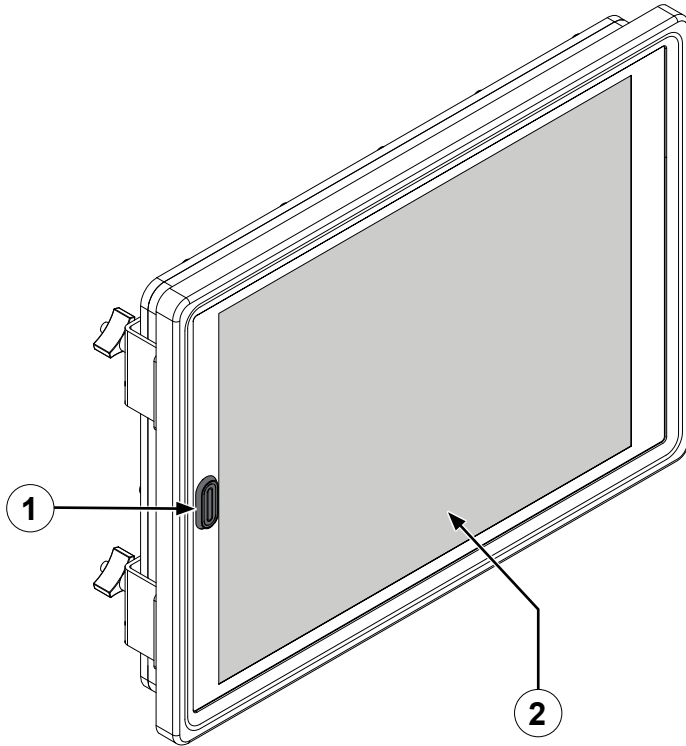


HMI and Components

Subsystem	Description
1 HMI display system	<p>The HMI display interfaces with the control system and provides the operator information and control over system operation.</p> <p>The components in this subsystem include:</p> <ul style="list-style-type: none">• 8-inch or 15-inch Tellurus display or HMI—this displays system operation and provides control of the system.• WiFi and GPS antenna• Various cables—these provide communication and power to the HMI.

15-Inch Tellurus HMI

The Tellurus display, or HMI, displays current operations and provides operator control over the system.

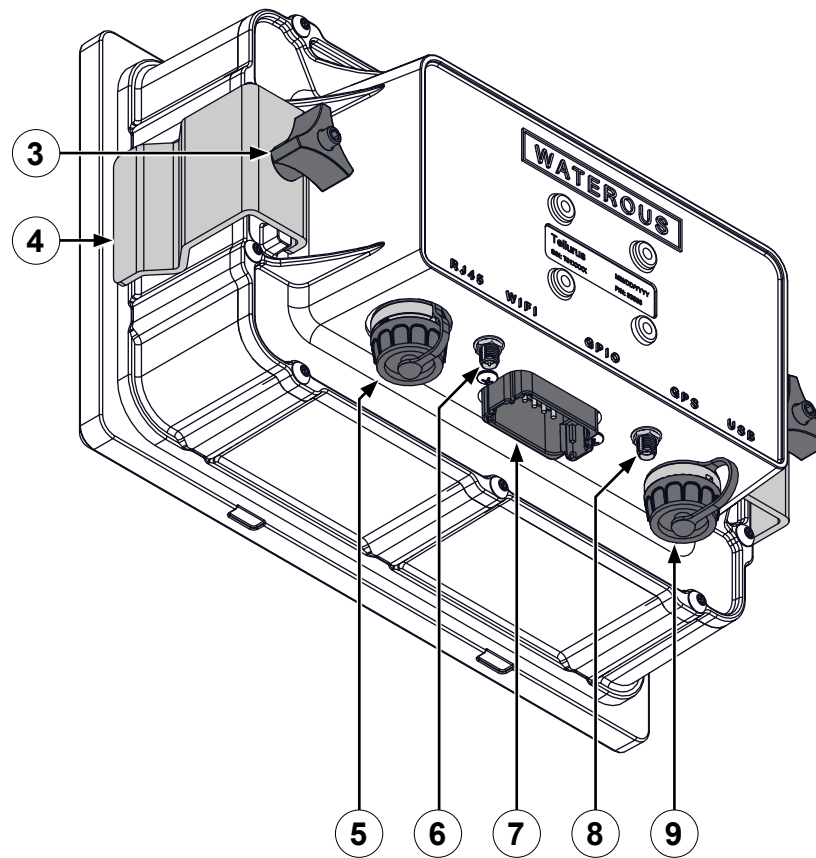
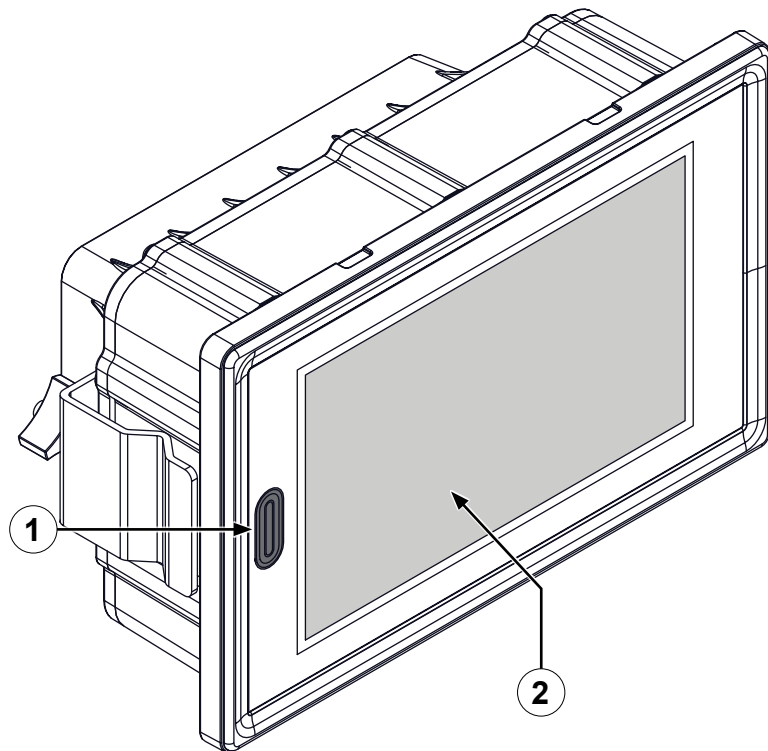


15-Inch Tellurus HMI

Feature	Description
1 Reset button	This indicates system status and allows the operator to reset the HMI.
2 Tellurus display—HMI	This displays operations and system controls.
3 Mounting knob	This secures the HMI to the apparatus.
4 Mounting bracket	This secures the HMI to the apparatus.
5 RJ45 connector	This connects to a secondary HMI or truck Ethernet network.
6 WiFi connector	This connects to a WiFi antenna for wireless access.
7 GPIO connector	This connects external power and the control box.
8 GPS connector	This connects to the GPS antenna for location information.
9 USB connector	This connects a USB keyboard or flash drive for system configuration and updates.

8-Inch Tellurus HMI

The Tellurus display, or HMI, displays current operations and provides operator control over the system.

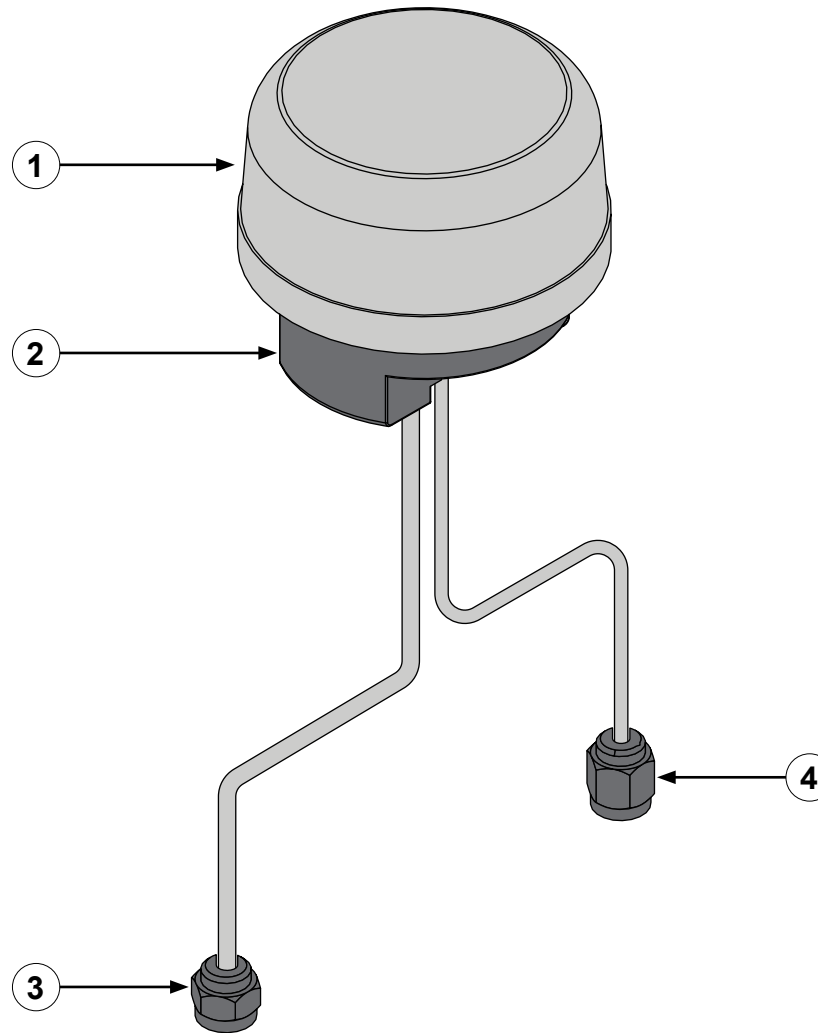


8-Inch Tellurus HMI

Feature	Description
1 Reset button	This indicates system status and allows the operator to reset the HMI.
2 Tellurus display—HMI	This displays operations and system controls.
3 Mounting knob	This secures the HMI to the apparatus.
4 Mounting bracket	This secures the HMI to the apparatus.
5 RJ45 connector	This connects to a secondary HMI or truck Ethernet network.
6 WiFi connector	This connects to a WiFi antenna for wireless access.
7 GPIO connector	This connects external power and the control box.
8 GPS connector	This connects to the GPS antenna for location information.
9 USB connector	This connects a USB keyboard or flash drive for system configuration and updates.

WiFi and GPS Antenna

The antenna receives WiFi and GPS signals.

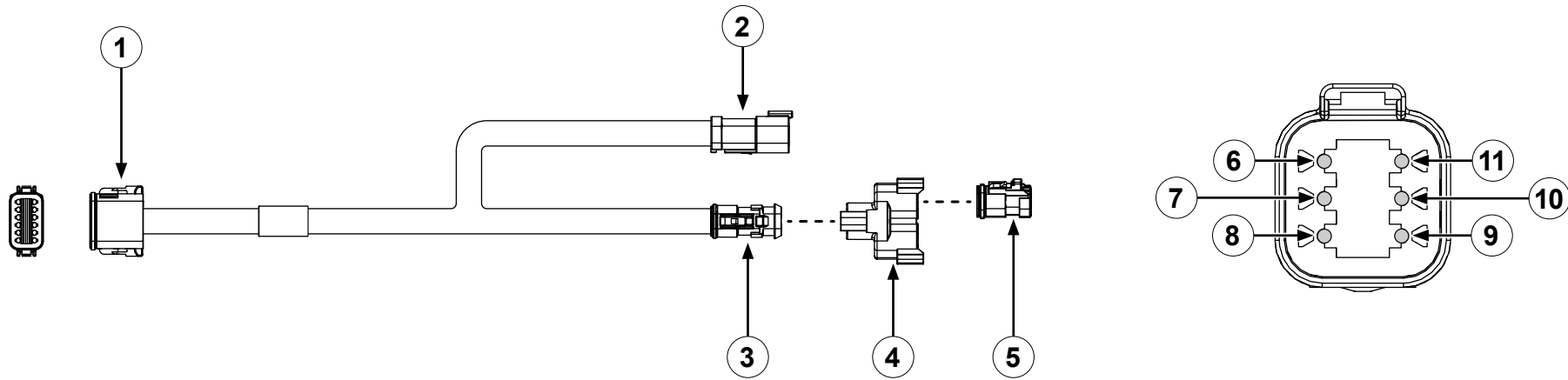


WiFi and GPS Antenna

Feature	Description
1 Antenna	This receives the WiFi and GPS signals.
2 Nut cover	This secures the antenna to the apparatus.
3 GPS connector	This connects the GPS connector to the Tellurus HMI.
4 WiFi Connector	This connects the WiFi connector to the Tellurus HMI.

HMI Cable

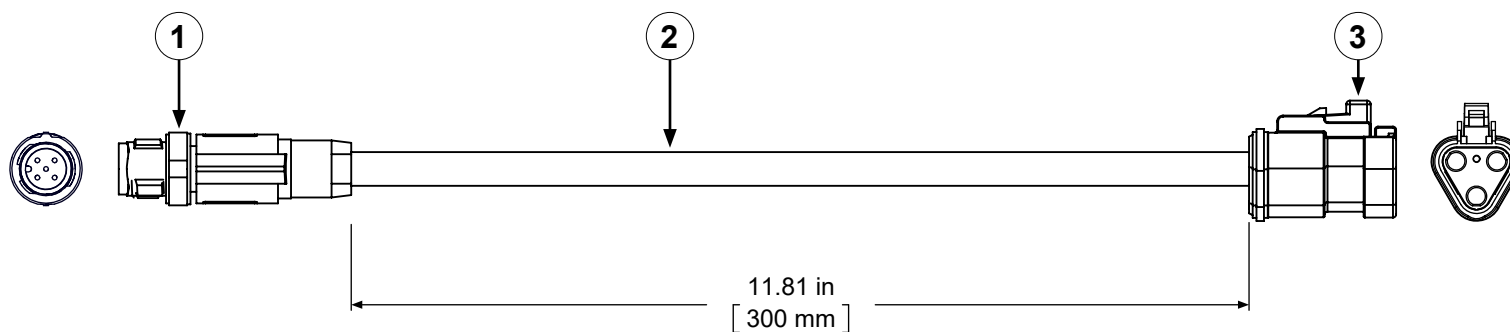
This cable connects the HMI to the control box and to system power. The power connector, associated connector components, and wiring are installer provided. Use the table to determine pin location.



Feature	Description
1 Deutsch connector	This connects to the Tellurus display—Deutsch DT06-12SB.
2 Deutsch connector	This connects to apparatus power—DT04-6P-E003.
3 Deutsch connector	This connects to the Y-splitter receptacle.
4 Y-splitter receptacle	This connects to the display extension cable.
5 Terminating resistor	This is installed into the receptacle.
6 Pin 6	CAN 2 high, yellow—optional CANbus
7 Pin 5	Term 15, white +12V—back light power
8 Pin 4	+12V, red—power
9 Pin 3	CAN 2 low, green—optional CANbus
10 Pin 2	Ground 2, black
11 Pin 1	Ground, black

Note: Pin 3 and pin 6 are only connected when the second CANbus option is used.

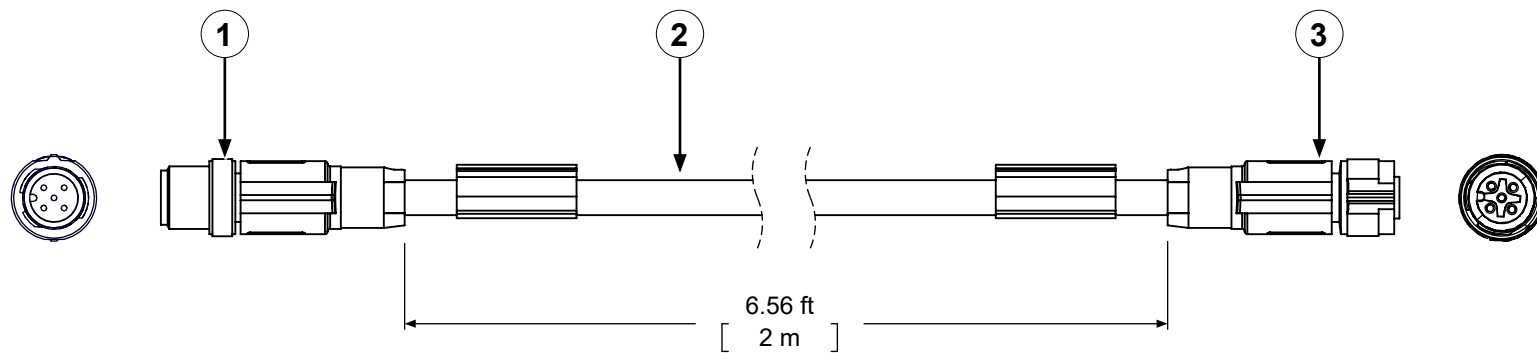
HMI M12 Cable



Feature	Description
1 M12 connector	This connects to the Tellurus HMI CANbus connector on the control box, or an extension cable connected to the control box.
2 Cable	This is a violet cable jacket.
3 Deutsch connector	This connects to the receptacle on the Tellurus HMI cable assembly.

2.0 Meter CANbus Extension Cable

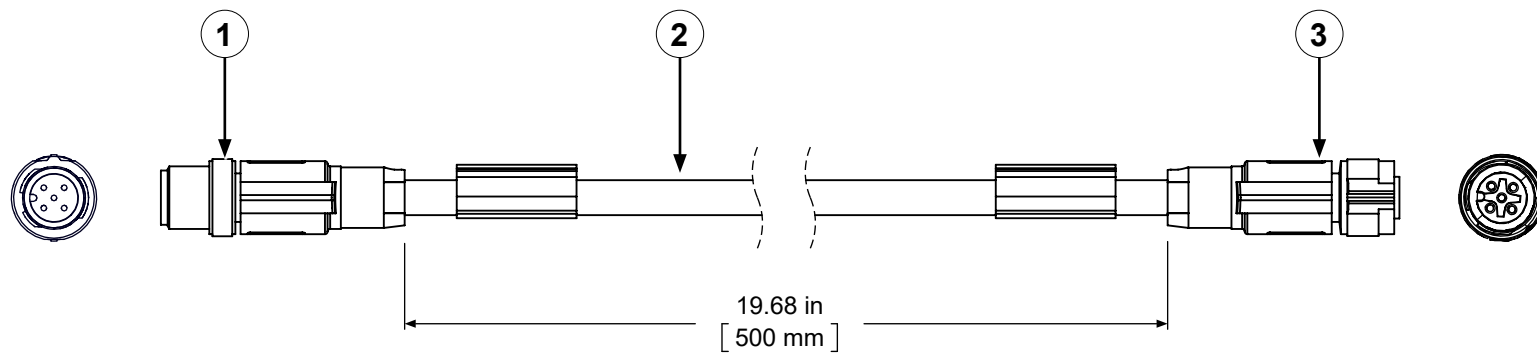
The CANbus extension cable communicates data between the CANbus connections. It is typically a violet color. The CANbus extension cable is not interchangeable with the sensor extension cable. **Note:** You can connect 2 or more cables together to achieve a desired length.



Feature	Description
1 M12 connector	This is a male connector.
2 Cable	This is typically a violet cable jacket.
3 M12 connector	This is a female connector.

0.5 Meter CANbus Extension Cable

The CANbus extension cable communicates data between the CANbus connections. It is typically a violet color. The CANbus extension cable is not interchangeable with the sensor extension cable. **Note:** You can connect 2 or more cables together to achieve a desired length.



Feature	Description
1 M12 connector	This is a male connector.
2 Cable	This is typically a violet cable jacket.
3 M12 connector	This is a female connector.

Installation Overview

This equipment is intended to be installed by a person or persons with the basic knowledge of installing similar equipment. Contact Waterous with questions about installing the equipment. The installation may require the following tasks and abilities:

- Locating, drilling, and cutting features into the apparatus.
- Welding
- Installing the hoses and fittings.
- Routing and securing the hoses.
- Routing and securing the wiring.
- Calibrating the output.
- Calibration and final testing.

Preparing for the Installation

Use the following guidelines before, during, and after the installation.

- Read and understand all the installation instructions before installing the equipment.
- Prepare a suitable, well-lit area, and gather all the necessary tools before you begin the installation.
- Make sure that you remove any shipping plugs or caps before installing the component.

Make sure that you bring all fluids to operating levels before using the equipment.

NOTICE

Before Operation

- Read and understand all the instructions provided.
- Check all fluid levels and replenish if necessary.
- Remove all shipping plugs and install the operation plugs or caps.



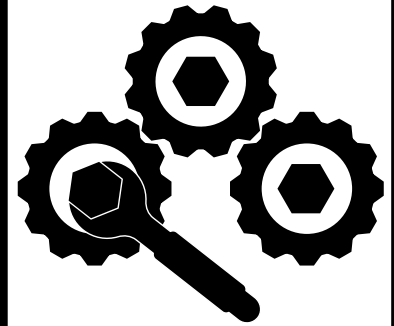
Modifying the Equipment

This equipment is intended to operate as designed. Do not remove, modify, or change the components in the system. Doing so will void the warranty. Contact Waterous for more information.

NOTICE

Modification

- Modifying the equipment can damage components and void your warranty.
- Do not modify the system or any of its components.



Do not modify the system or any components. Doing so will void your warranty.

Additional Documentation

Additional documentation is available through the MyWaterous login at Waterousco.com. Use your serial number to gain access to the service parts list associated with your system. Dimensional drawings are available through the Waterous Service department.

Optional Equipment

Be aware that the installation instruction may include optional equipment not included in your application.

Determining Panel and Plate Locations

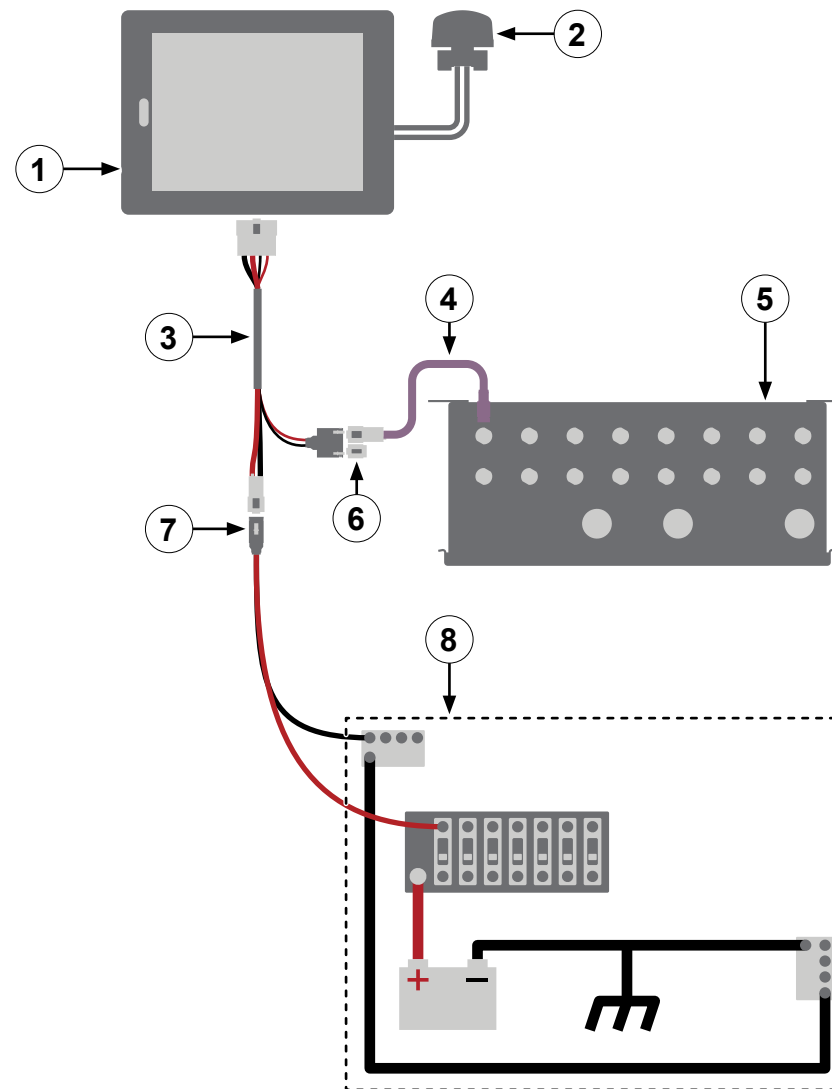
Use the following guidelines to determine a location to mount the control panel and instruction plate:

- Consider the cable and hose routing.
- Consider accessibility during operation and maintenance.
- Install instruction plates near their applicable operator panels.
- Refer to the dimensional drawings for cutout and mounting hole locations for your application.

Determining Cable and Wire Routing

Use the *Wiring Best Practices* document, available at www.waterousco.com, as a guide to select and route wiring for your application.

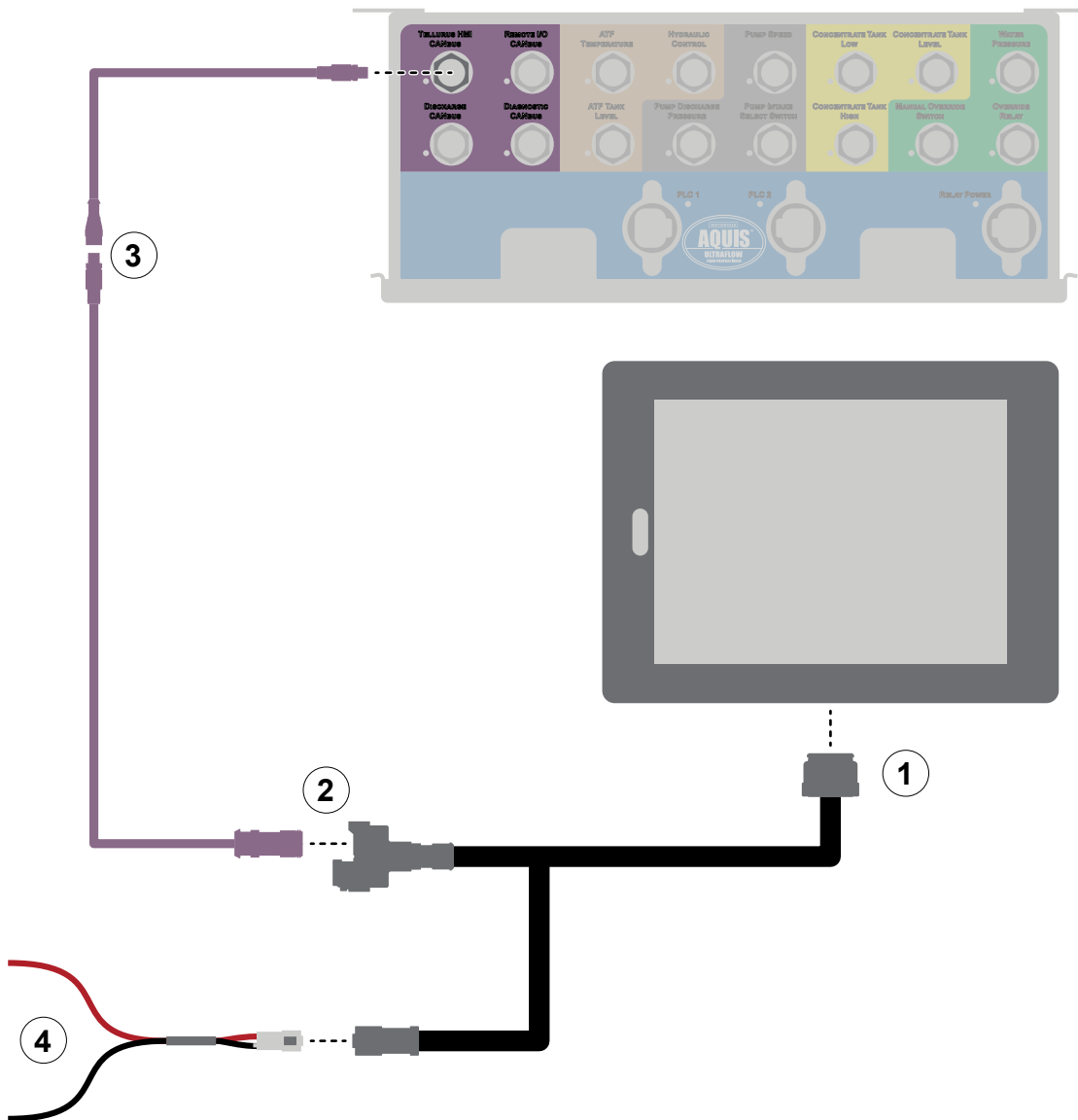
HMI Cables and Connections



HMI Cables and Connections

Feature	Description
1 Tellurus HMI display	This displays system operation and provides operator control of the system.
2 Antenna	This transmits and/or receives WiFi and GPS signals.
3 HMI cable	This connect the HMI to power and to the HMI M12 cable.
4 HMI M12 cable	This connect the HMI cable to the control box.
5 Control box	This connects to various components in the system and contains the programmable logic controllers (PLC).
6 Terminating resistor	This terminates the CANbus signal.
7 HMI power cable	This is the installer-supplied power cable. Refer to "HMI Cable" on page 18 for pin-out configuration.
8 System power	This is the system power.

Connecting the Tellurus Display



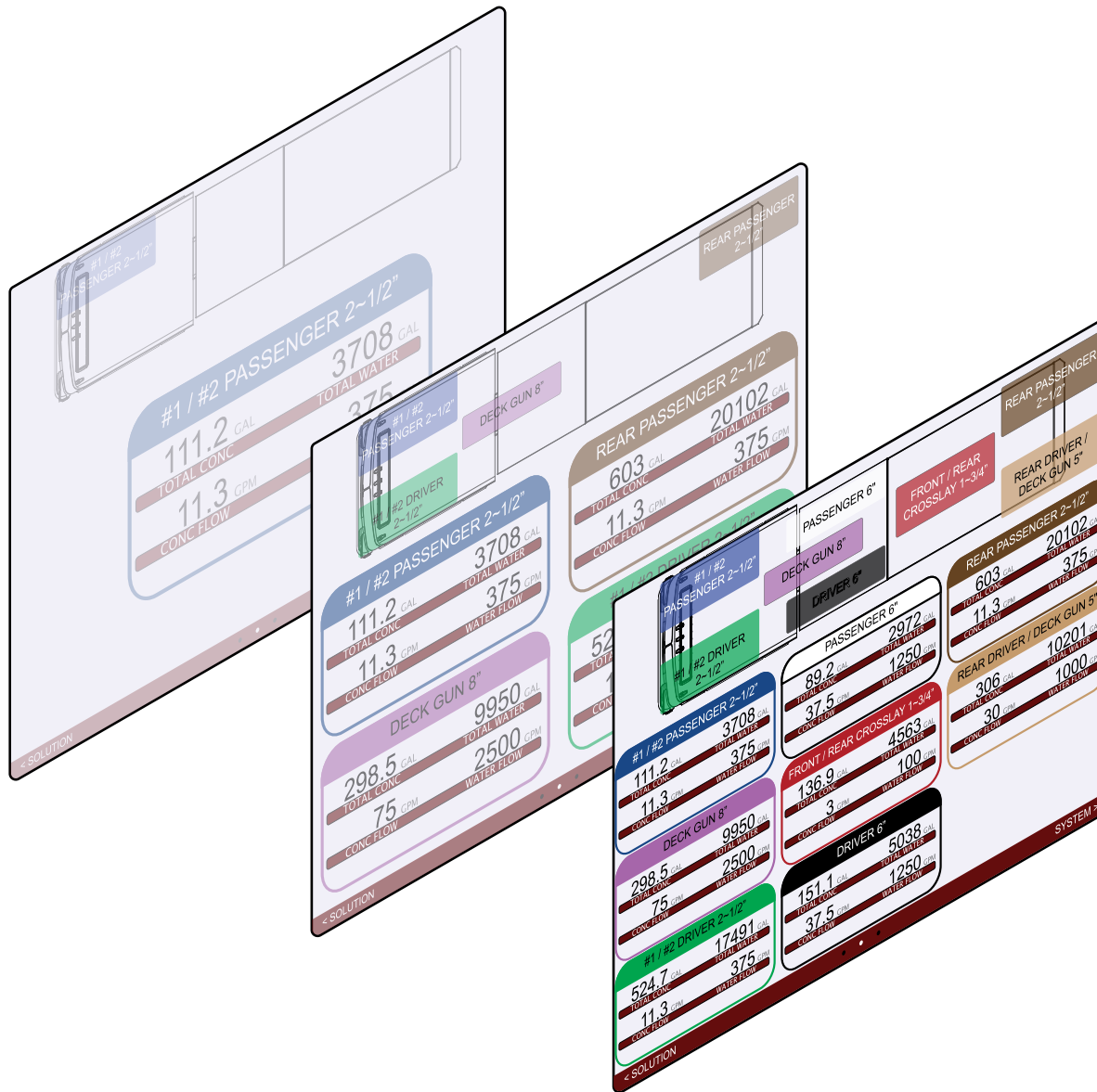
Use the illustration and instructions to connect the Tellurus display.

- 1 Connect the compatible connector on the HMI cable assembly to the Tellurus display connector.
- 2 Connect the compatible connector on the HMI cable assembly to the display extension cable connector.
- 3 Connect compatible connector on the display extension cable to the control box—the HMI CANbus connection.

Note: Use a CANbus extension cable if necessary.

- 4 Locally source a Deutsch DT06-3S connector and an appropriate cable to connect system power to the receptacle on the HMI cable assembly. Power the node controller through a 10 A circuit breaker. Refer to "**HMI Cable**" on page 18.

Configuring the System



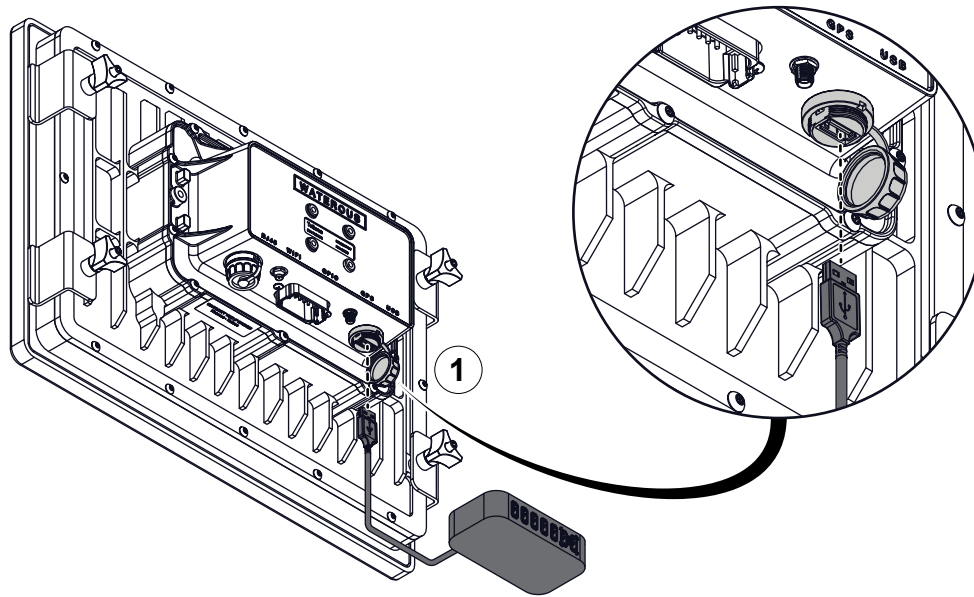
Each ULTRAFLOW system is composed of a few basic elements and is configured to your specific application. Common elements include components such as DLAs, flowmeters, valves, switches, sensors, as well as mechanical and plumbing components.

The system is configured using the Tellurus. The configuration can be divided into 2 levels. One level is the installer-level configuration and the other is the user-level configuration. The installer level configuration defines permanent aspects of the system—number of DLAs, flowmeter calibration, units of measure, along with other system-level behaviors. The user-level configuration defines items such as discharge names, colors, button location, among other user-level concerns.

Any configuration settings can be updated, and the entire system configuration can be saved to a removable drive, to restore or troubleshoot the system.

Use the following section to configure the system during installation, or to configure it to your specific application. Contact Waterous for more information.

Connecting to the Tellurus HMI—External Keyboard and USB Drive



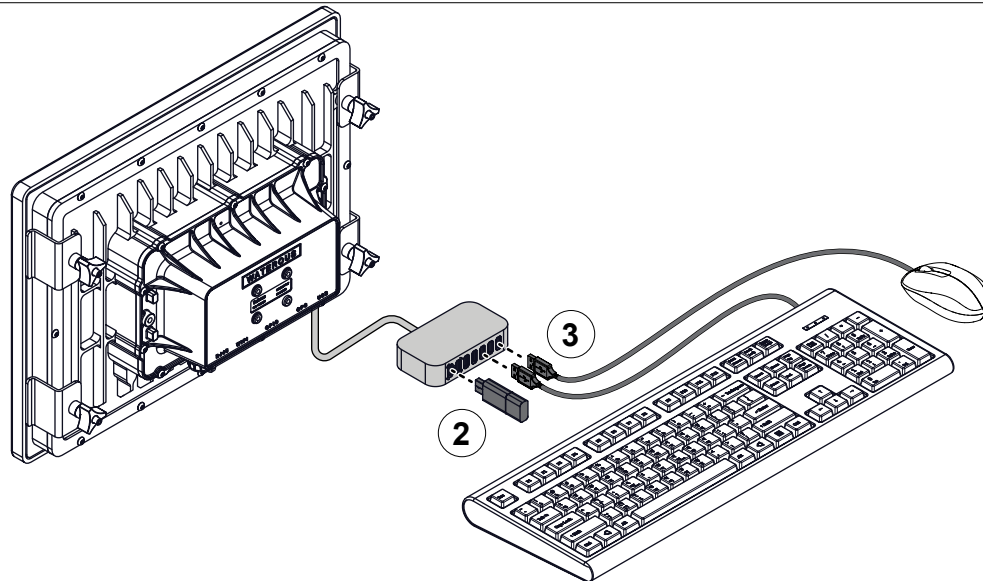
Use the illustration and instructions to connect to the Tellurus HMI with a keyboard and USB drive. Use the USB drive to download and save the current configuration file or to upload a new or restore to a previous configuration.

To transfer configuration files, you will need the following:

- A USB hub to connect the HMI to the keyboard and USB drive.
- A USB keyboard to navigate through the menu.
- A USB drive to store and retrieve configuration files.








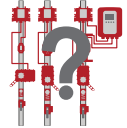

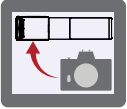
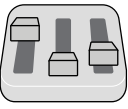
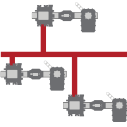






Note: Only use components with a USB standard of 2.0 or higher.

- 1 Plug in the USB hub to the USB connection on the HMI.
- 2 Plug-in the USB drive to the USB hub if you are transferring files.
- 3 Plug-in the USB keyboard and mouse to the USB hub.



Desktop Icons

The desktop icons provide direct access to common configuration settings.

Operations										
	AQUIS ULTRAFLOW	Power Cycles	Report All	Run Time	Total Con Used	Total Water				
	Customer Service									
		Remote Connection	System Info	System Help	Control System Instructions	HMI System Instructions	Hydraulic System Instructions	DLA System Instructions	Screen Capture	
		Configurations								
			Calibrate Touch	DLA Colors	DLA Names	Set Background	Settings	Set Units		
Maintenance										
			Commission DLA	Diagnostics	Flowmeter Calibration	Log Files	Security Scan	System Updates	Terminal	Status Alarm

Desktop Icons—Operation Menu



Press this icon to return to the ULTRAFLOW operation screens.



Press this icon to display the number of power cycles.



Press this icon to navigate to the totals menu. From there, you can review and reset the values for the total run time, total concentrate used, and total water used.



Press this icon to display the total system run time.



Press this icon to display the total concentrate used since the last reset.



Press this icon to display the total water used since the last reset.

Desktop Icons—Customer Service Menu



Press the icon to open a live troubleshooting session. Refer to: **"Using the Live Troubleshooting App" on page 34.**



Press the icon to display system information.



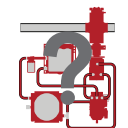
Press this icon to display a QR code that navigates to the system-help documentation.



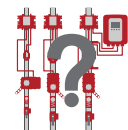
Press the icon to navigate to the Controls instructions.



Press the icon to navigate to the HMI instructions.



Press the icon to navigate to the Hydraulics instructions.



Press the icon to navigate to the DLA instructions.



Press the icon to capture the current screen.

Desktop Icons—Configuration Menu



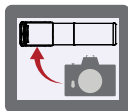
Pressing this icon initiates the touch screen calibration procedure. Refer to: **"Calibrating the Touch Screen" on page 37.**



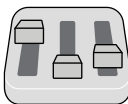
Press this icon to change discharge colors.



Press this icon to change discharge names.



Press this icon and follow the instructions to install, or change, the apparatus graphic.

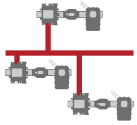


Press this icon to navigate to the setting menu.



Press this icon and follow the instructions to select the units used to measure the amount of water discharged.

Desktop Icons—Maintenance Menu



Press this icon to commission a DLA.



Press this icon to display the diagnostic report. Use the diagnostic report to verify various aspects of the operation and to troubleshoot various system components.



Press this icon to navigate to the flowmeter calibration. Use the available options to calibrate the desired flowmeter.



Press this icon to prepare a summary system log report.



Press this icon to initiate a security scan.



Press to apply previously downloaded software updates.



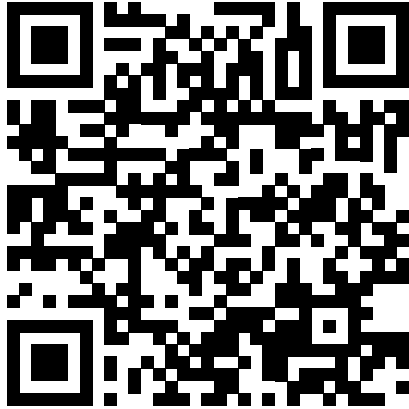
Press this icon to navigate to the command interface to apply terminal commands.



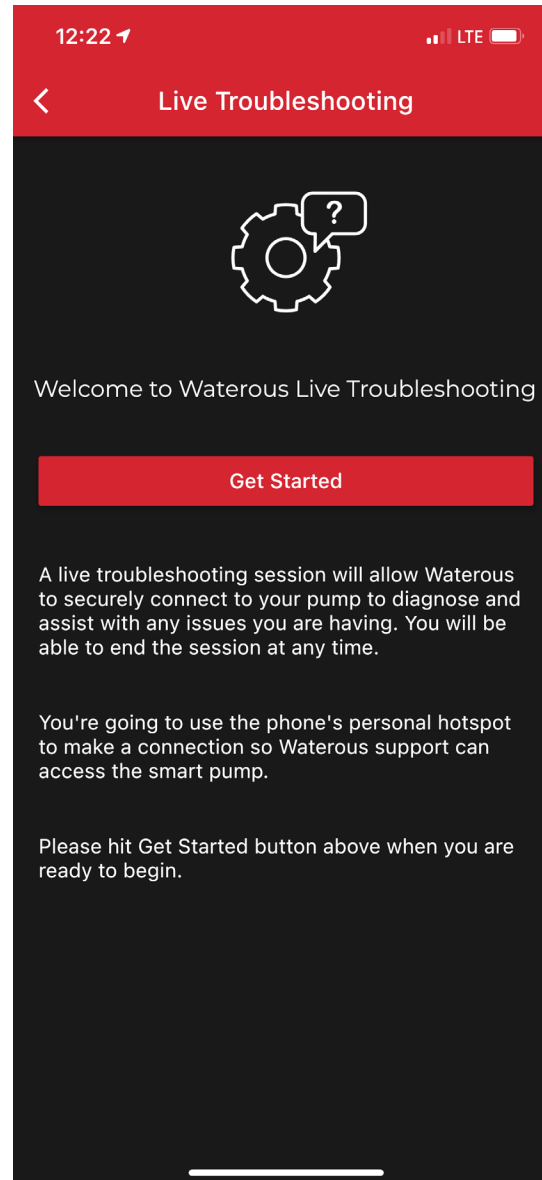
Press this icon to display alarm conditions that do not require immediate attention by the operator.

Using the Live Troubleshooting App

Download for Apple



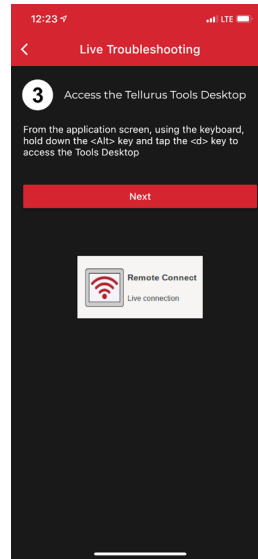
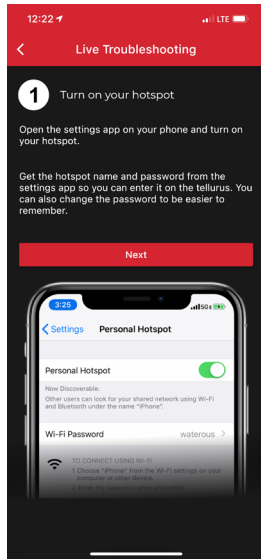
Download for Android



The remote connect feature allows you to open a secure, live, troubleshooting session by using your phone as a WiFi hotspot. Once connected, information about your system is available to the Support Department to assist you in troubleshooting your system.

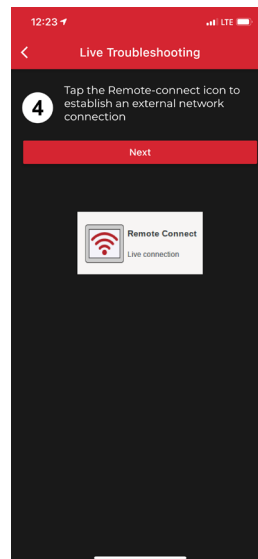
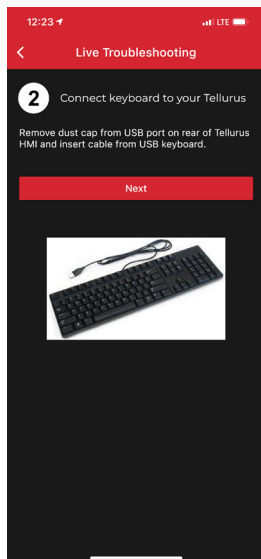
Note: If your QR-Code reader is not available, go to apps.apple.com to download the app to your Apple device, and play.google.com to download the app to your Android device. Search for the Waterous Connect app.

Using the Live Troubleshooting App

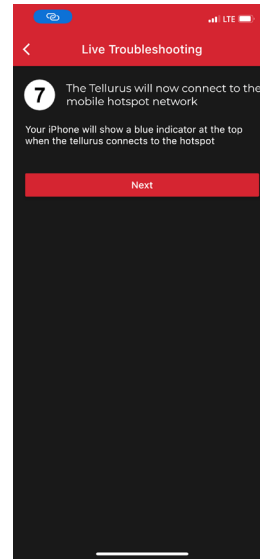
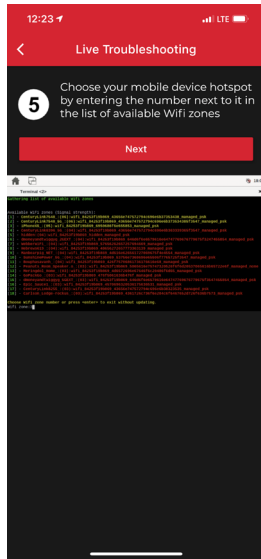


Use the illustrations and instructions to open a live troubleshooting session, or to access additional system documentation.

- 1 To initiate a remote session, do the following.
 - Activate the hotspot feature on your mobile phone.
 - Go to the setting menu to capture the hotspot name and password, you will use this information later.
- 2 Connect a keyboard to the Tellurus. Refer to: **"Connecting the Tellurus Display" on page 26.**
- 3 To access the tools desktop, hold down the *ALT* key and press the *D* key.
- 4 Press the remote-connect icon to establish an external network connection.



Using the Live Troubleshooting App

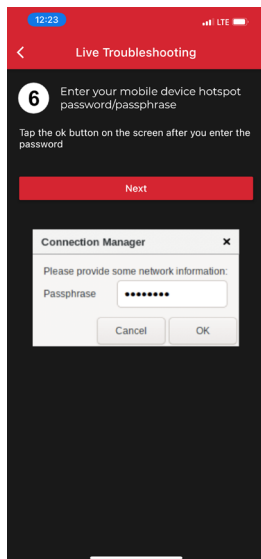


Remote Connection Icon

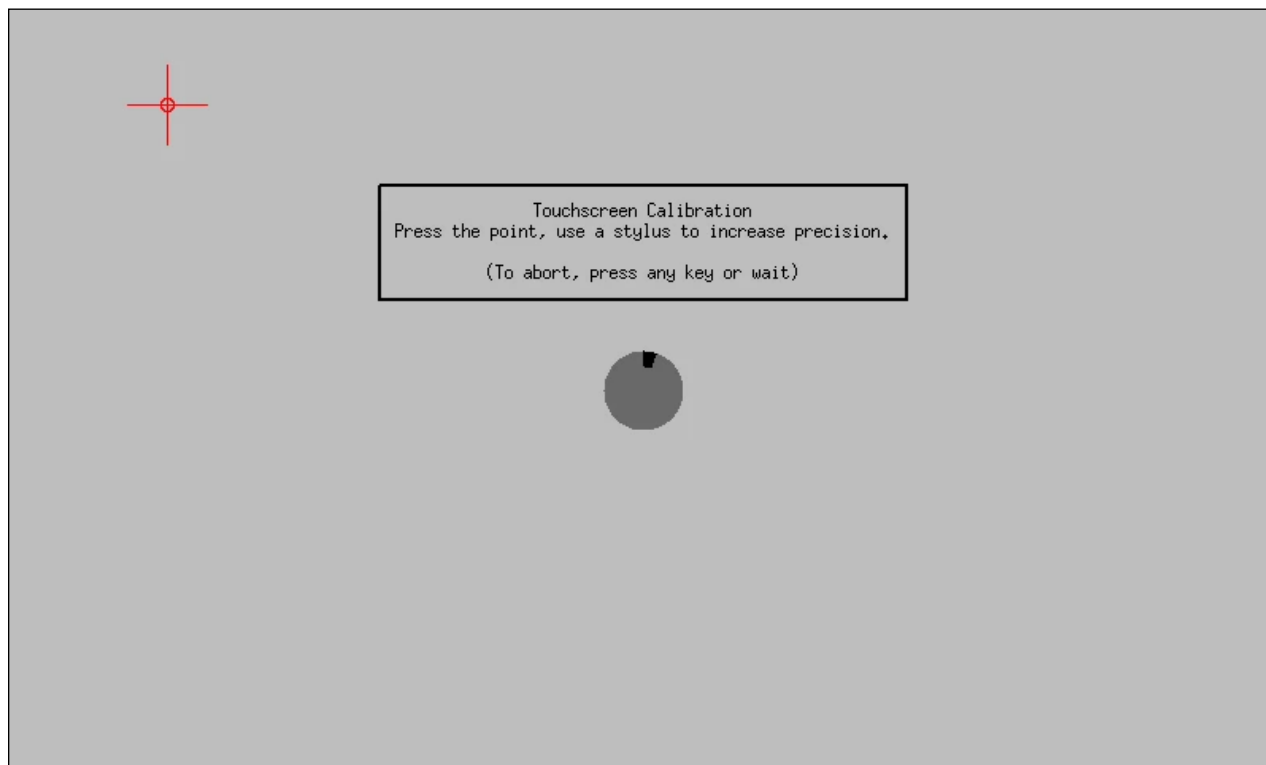


Use the illustrations and instructions to open a live troubleshooting session, or to access additional system documentation.

- 5 Locate your hotspot in the list of available hotspots.
- 6 Enter the hotspot passphrase into the connection manager, then press the OK button.
- 7 Once connected, a blue connection icon appears to indicate that the Tellurus is connected to the mobile hotspot.



Calibrating the Touch Screen



Calibrate Touch Icon



Pressing this icon initiates the touch screen calibration procedure. Calibrate the touchscreen any time the finger press activation is misaligned, or after any operating system firmware update. To calibrate the touchscreen, do the following:

- From the configuration desktop, choose the calibrate touchscreen option.
- Follow the instructions on the touchscreen.

Command Interface Menu

Most commonly used configuration commands are available through the shortcuts on the desktop. Additional commands are available through the command interface. Use the command interface to access the additional command functions when necessary. Review the menu description to navigate to the desired function. Continue following the menu descriptions as you navigate to the desired setting or adjustment.

**** **Tellurus Command Interface** ****

Enter any of the following commands at the prompt to perform HMI functions:

- [help]** - Show command interface help
- [exit]** - Exit command interface and restart application
- [operate]** - Operating status menu
- [report]** - Reporting functions menu
- [service]** - Customer service menu
- [config]** - Tellurus configuration menu
- [maint]** - System maintenance and diagnostics menu
- [cal]** - System calibration menu
- [net]** - Network settings menu
- [term]** - Open terminal command shell
- [patch]** - Apply incremental system patch files
- [restart]** - Shutdown and restart

command:

Powering Up the Display

1



2



Use the illustrations and instructions to monitor the start-up as the system comes online. The display powers-up automatically with the pump panel.

1 This is the first start-up screen. This screen indicates that the display is receiving power and the boot sequence has initiated.

2 This screen displays as the Tellurus begins to communicate with the PLC.

Note: The operating system and the software versions are displayed in the lower corners.

3 A pulsating ring animates as the Tellurus and PLC communicate.

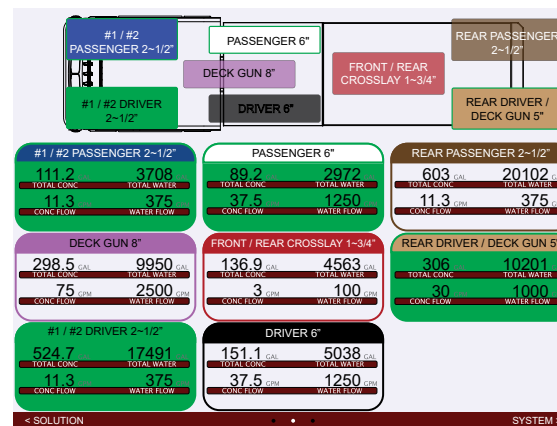
4 Once the start-up sequence is complete the system displays the gauge screen.

Note: All the screens described in this section are configurable to your specific application. The appearance of your screen may differ than what is illustrated. The illustrations in this section are based on the 15-inch HMI. The 8-inch HMI displays the lower 2/3 of the 15-inch HMI—omitting the apparatus graphic and discharge locations. Apply the concepts described in the instruction to your application. Contact Waterous for more information.

3

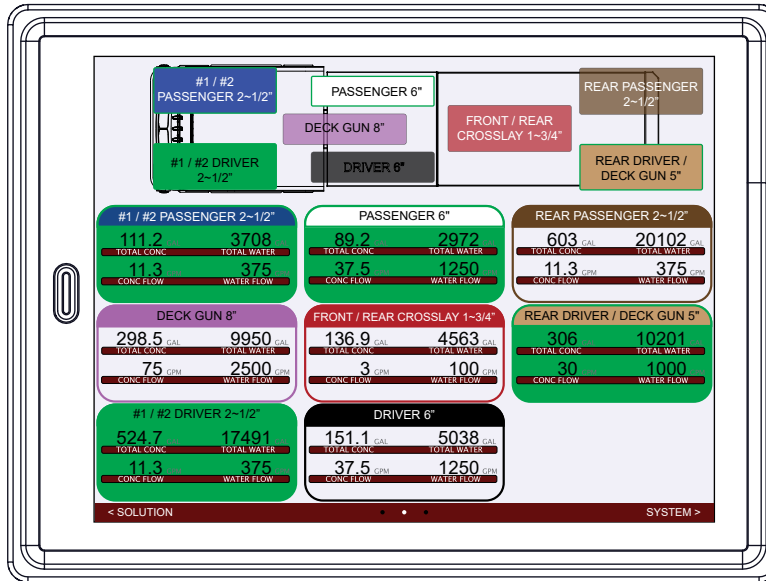


4



HMI Display—Screen Size

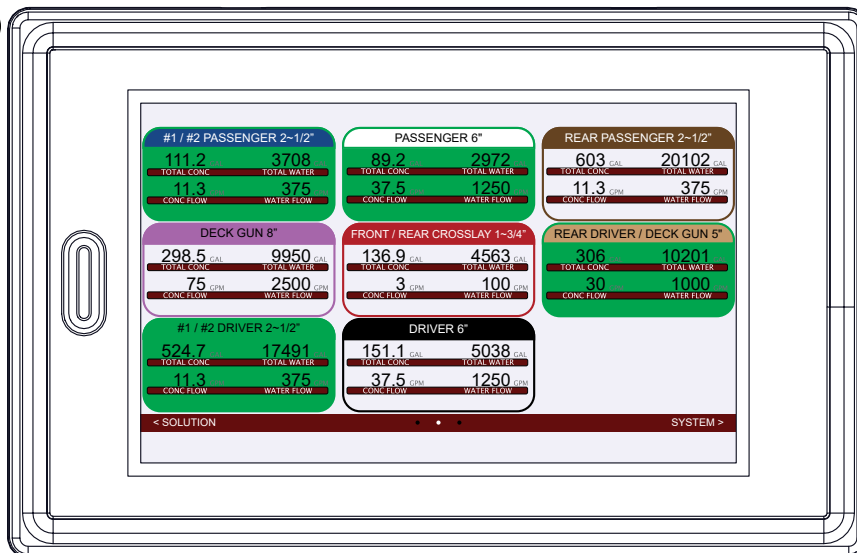
1



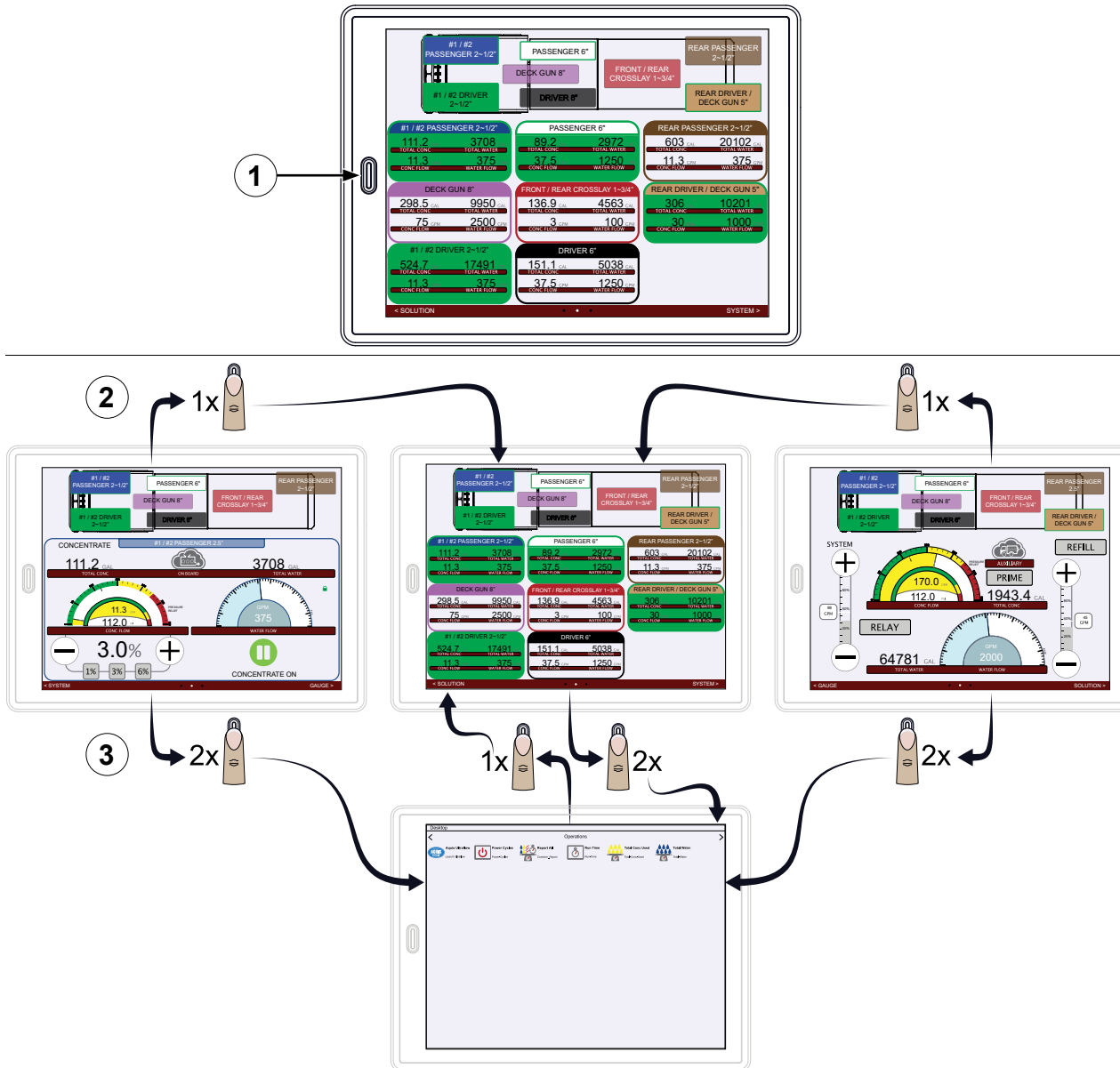
Use the illustrations and instructions understand the display differences between the 15-inch HMI and that 8-inch HMI.

- 1 The 15-inch HMI displays the configured DLAs in addition to an apparatus graphic with approximate discharge location.
- 2 The 8-inch HMI displays the lower 2/3 of the 15-inch HMI. The apparatus graphic and approximate discharge locations are not illustrated.

2



HMI Display—Orb Button



Use the illustrations and instructions understand the ORB button and its function.

1 The Orb button illuminates white when the HMI is powered up. Additionally, the ORB button provides quick navigation to commonly accessed screens.

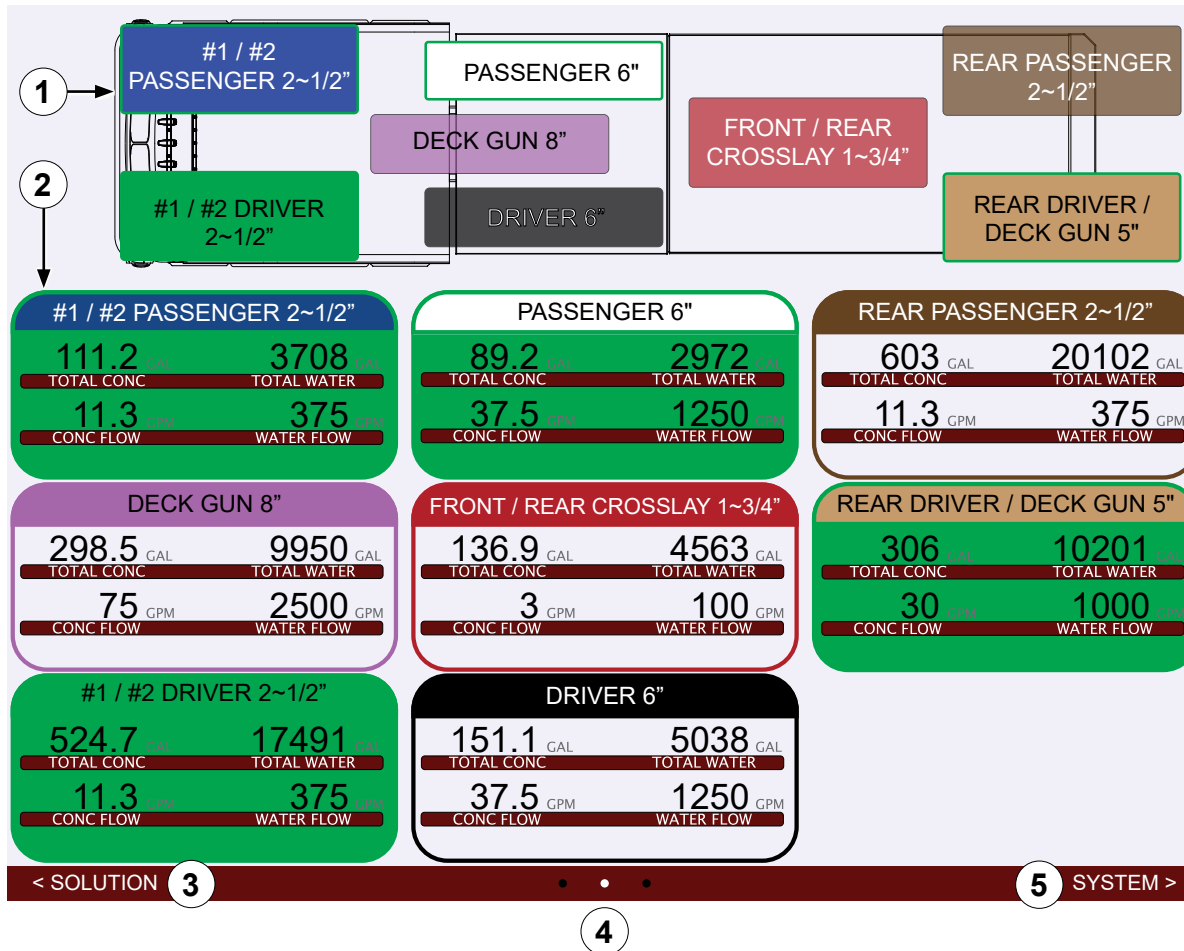
2 From any screen, tap the ORB button to navigate to the gauge screen.

Note: Make sure that you release the ORB button once it turns blue.

3 From any screen, tap the ORB button twice within 2 seconds to navigate to the desktop application screen. Press the ORB button once to return to the gauge screen.

Note: Release the ORB button once it turns blue.

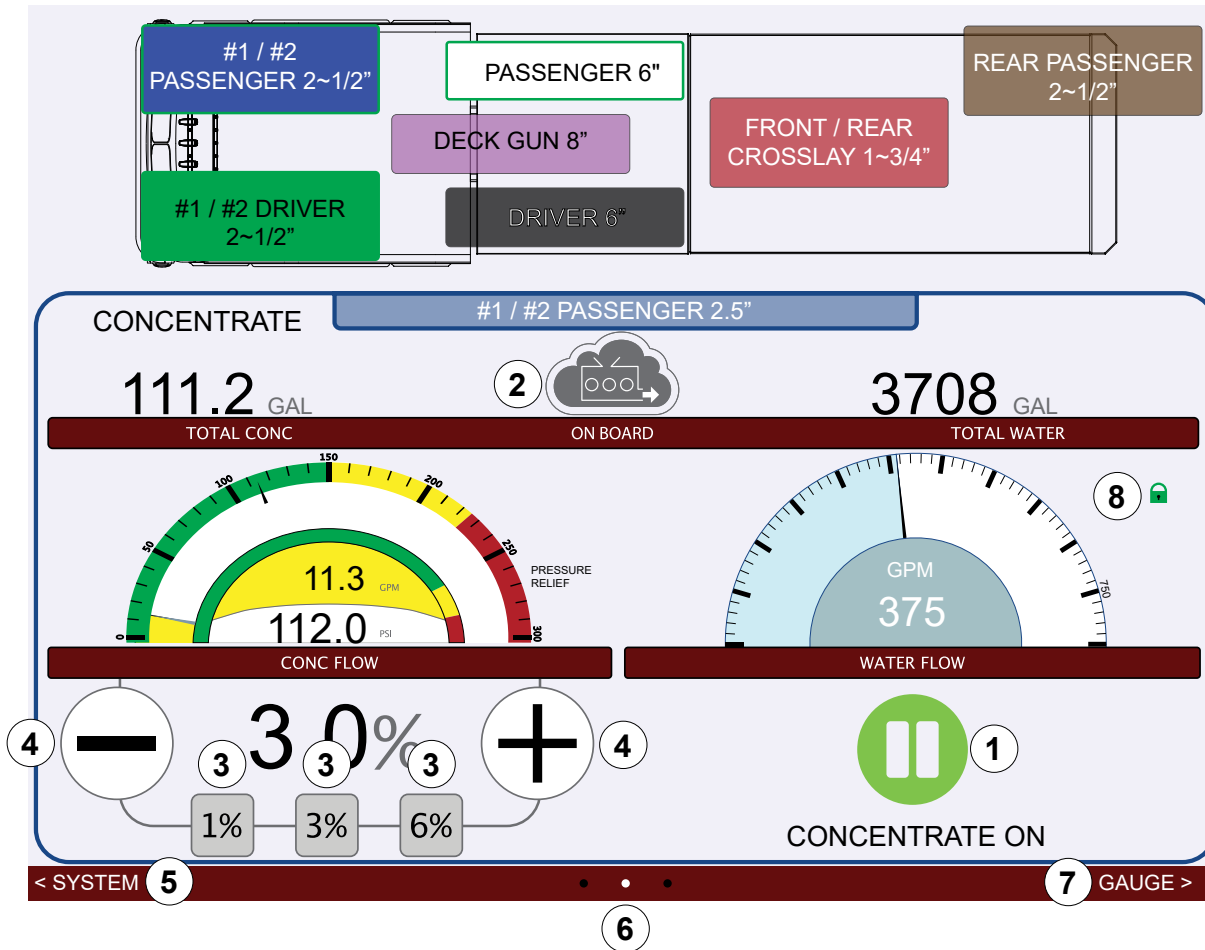
DLA Gauge Screen



Use the illustration and definitions to understand the various elements in the DLA gauge screen. The system opens in the DLA gauge screen after start-up. This screen displays the available DLAs, their status, and basic statistics. Keep in mind, the appearance of the DLA gauge screen, the number of DLAs, their names, location, and colors, are determined by your specific application.

- 1 This is the apparatus graphic. It is overlaid with the DLA name and relative location. Long-press the DLA button to enable or disable that DLA. The apparatus with DLA graphic is displayed across all screens.
- 2 This is the DLA gauge. It displays the discharge name, status, and operating statistics since the activation. The statistics include current and total concentrate flow, current and total water flow, and the DLA state.
Note: The *TOTAL CONC* and *TOTAL WATER* values are persistent. Long-press the value to reset it to zero.
- 3 This button navigates you to the solution screen.
- 4 This is the screen indicator.
- 5 This button navigates you to the system screen.

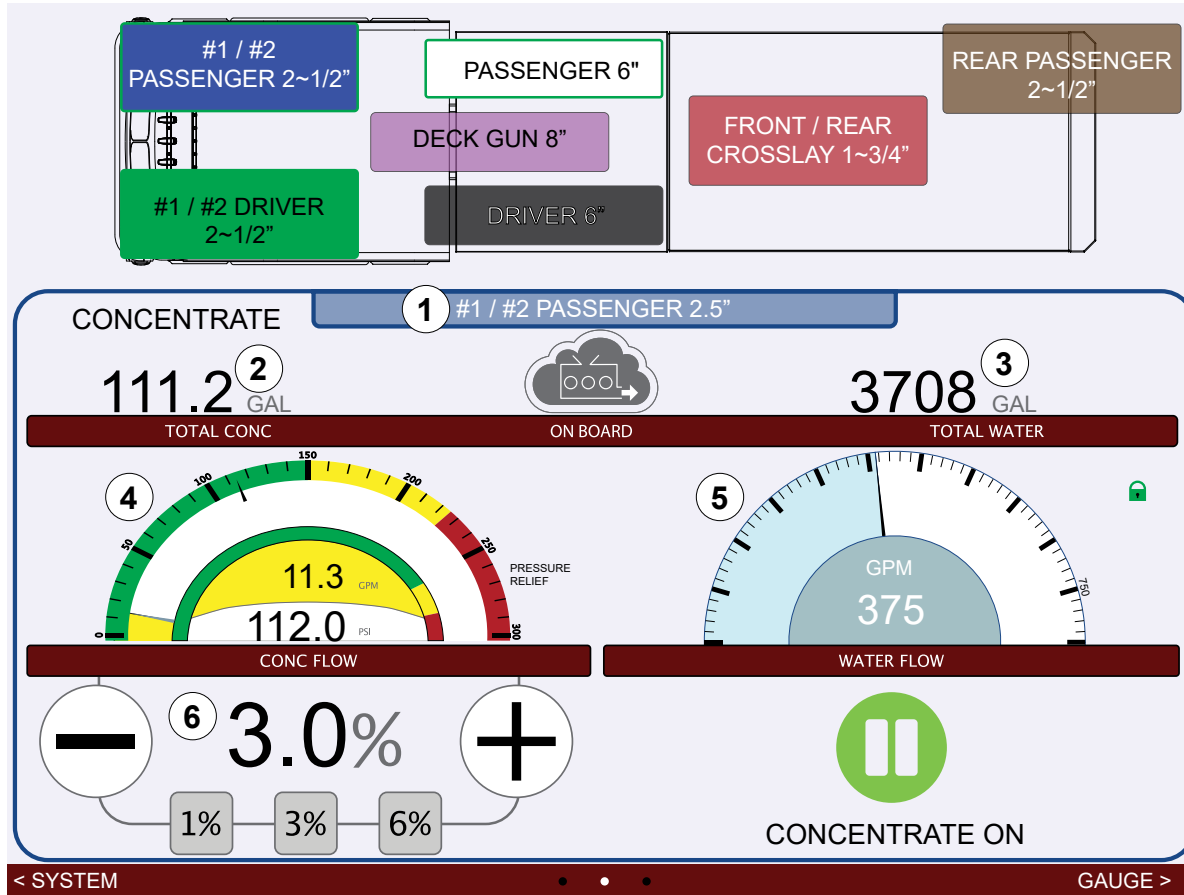
Solution Screen—Buttons



Use the illustration and definitions to understand the information displayed. Short-press a DLA button to open the DLA solution screen. From this screen you can enable and disable concentrate flow to the discharge, adjust the percent, and view the current and total flow values.

- 1 This button displays the DLA state, enabled or disabled. Long-press this button to change the DLA state.
- 2 This is the selected concentrate source, and is determined by a signal provided to the system.
- 3 These buttons directly adjust the concentrate set-point. You can configure each button to values appropriate for your application.
- 4 This adjust the concentrate percent set-point at 0.1 increments.
- 5 This button navigates you to the system screen.
- 6 This is the screen indicator.
- 7 This button navigates you to the DLA gauge screen.
- 8 This button enables simulation flow mode. This simulates discharge water flow.

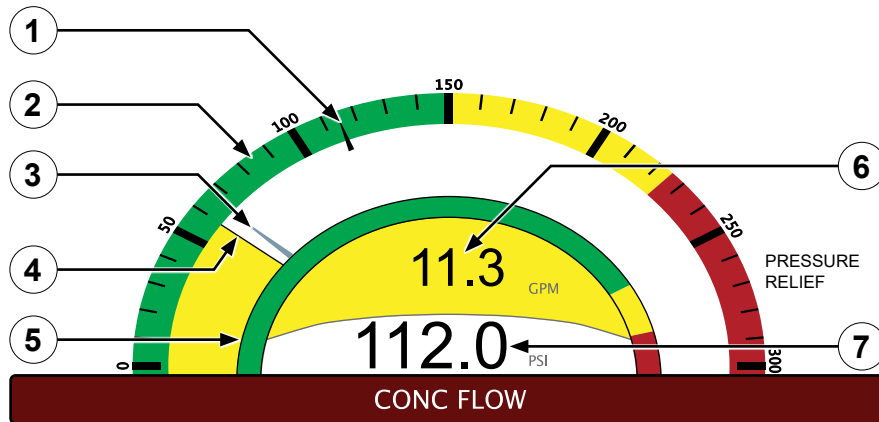
Solution Screen—Telemetry



Use the illustration and definitions to understand the information displayed. Short-press a DLA button to open the DLA solution screen. From this screen you can enable and disable concentrate flow to the discharge, adjust the concentrate percent, and view the current and total flow values.

- 1 This is the name of the selected DLA.
- 2 This is the total amount of concentrate dispensed from the selected DLA since the last reset. Long-press the value to reset it to zero.
- 3 This is the total amount of water dispensed from the selected DLA since the last reset. Long-press the value to reset it to zero.
- 4 This graphically and numerically shows the current concentrate flow rate for the selected DLA, as well as the concentrate-line pressure. Refer to: **"Solution Screen—Concentrate Gauge"** on page 45.
- 5 This graphically and numerically shows total amount of water dispensed from the selected discharge since the last reset. Refer to: **"Solution Screen—Water Gauge"** on page 46.
- 6 This is the concentrate percent set-point.

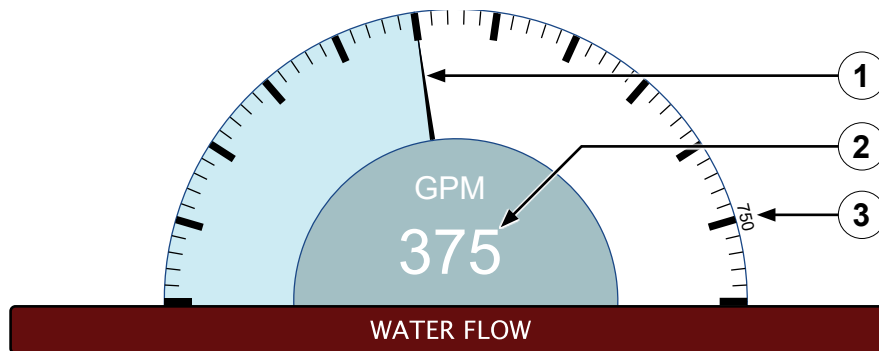
Solution Screen—Concentrate Gauge



Use the illustration and definitions to understand the concentrate gauge features.

- 1 This needle indicates the concentrate line pressure.
- 2 This indexes the concentrate line pressure.
- 3 This needle indicates the expected value of the concentrate output.
- 4 This gauge indicates the actual value of the concentrate output.
- 5 This index represents the amount of concentrate flowing through a DLA with respect to its capacity. By default, the green segment is 0% to approximately 90% of DLA capacity. The yellow segment is approximately 90% to 100% of DLA capacity. The red segment is outside the capacity of the DLA.
Note: You can configure where the yellow and red segments appear in the index to best represent your application.
- 6 This displays the numerical value of the concentrate flowing as read by the DLA flowmeter.
Note: You can configure the units displayed for your application.
- 7 This displays the numerical value of the pressure in the concentrate line as measured by the concentrate line pressure transducer.
Note: You can configure the units displayed for your application.

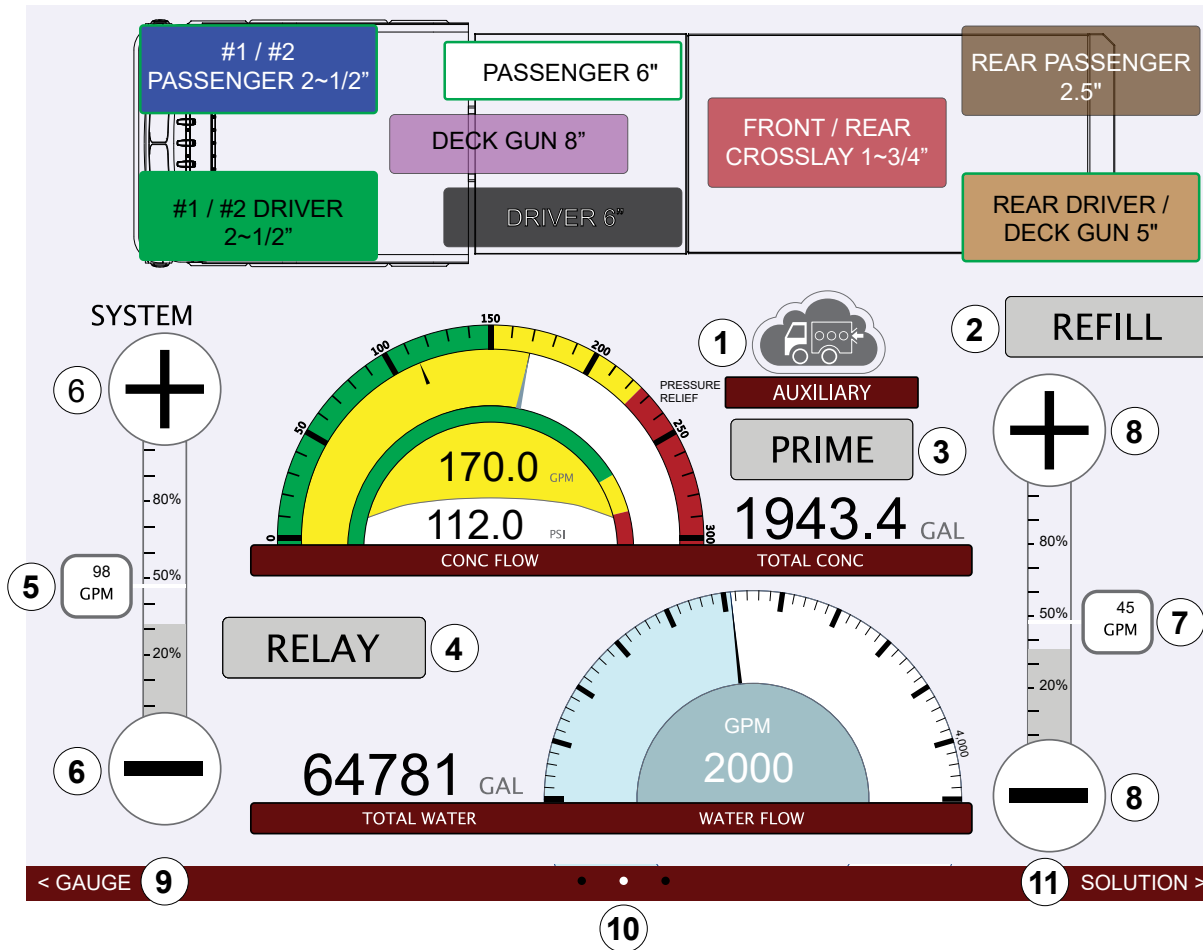
Solution Screen—Water Gauge



Use the illustration and definitions to understand the water gauge features.

- 1 This needle indicates the water flow in the discharge associated with the DLA.
- 2 This displays the numerical value of the water flowing in the solution-capable discharge associated with the DLA.
Note: You can configure the units displayed for your application.
- 3 This value indicates the maximum flow of the solution-capable discharge associated with the DLA.
Note: You can configure this value for each discharge in your application.

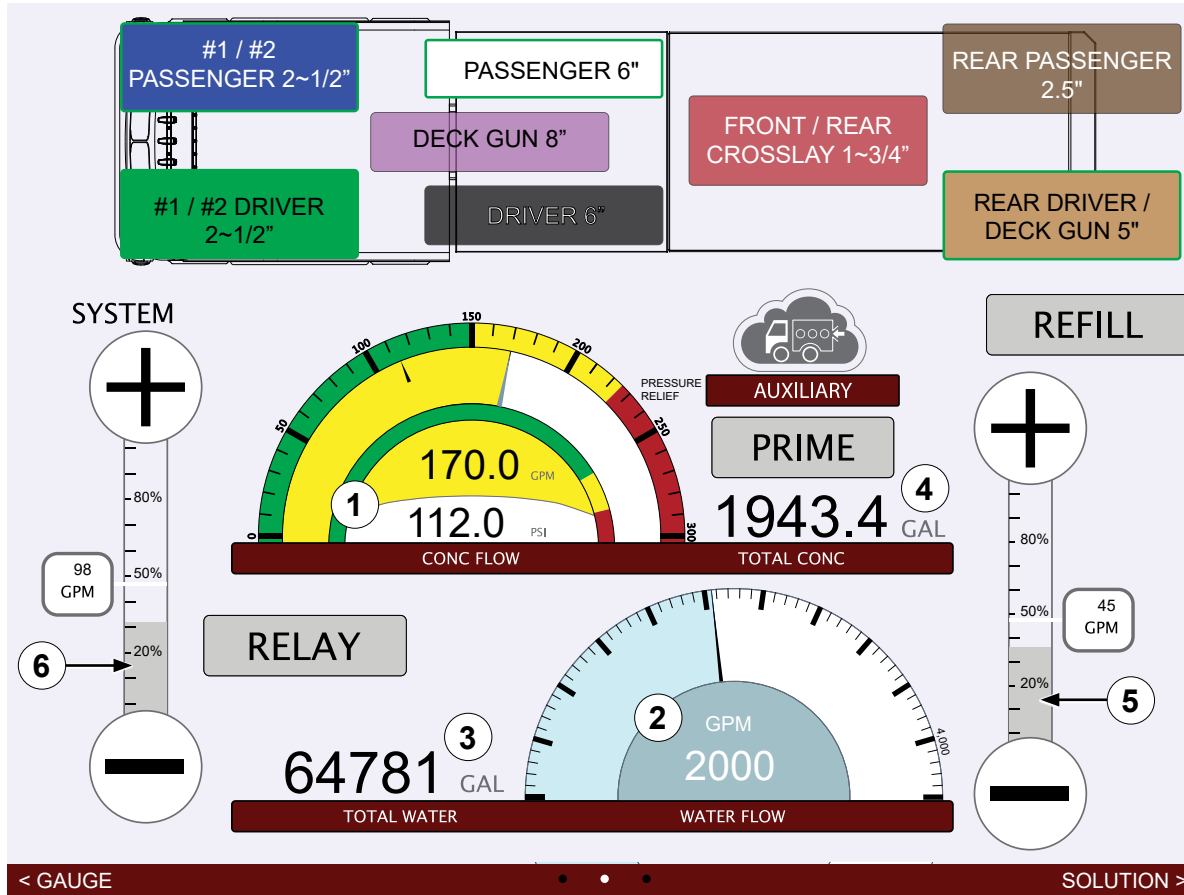
System Screen—Buttons



Use the illustration and definitions to understand the buttons on the system display. The system screen displays the current and total flow of water and concentrate across all DLAs. It also monitors and controls the refill, transfer, and relay processes.

- 1 This is the selected concentrate source, and is determined by a signal provided to the system.
- 2 This enables the refill process when the concentrate source is set to auxiliary.
- 3 Press and hold this button to manually prime the concentrate pump.
- 4 This enables the relay or transfer process and operates as follows:
 - The transfer process is available when the concentrate source is on-board.
 - The relay process is available when the concentrate source is auxiliary.
- 5 This is the relay or transfer rate set-point slider. Adjust this to set a general value.
- 6 This incrementally adjusts the relay or transfer rate set-point. Adjust this to fine-tune the value.
- 7 This is the refill rate set-point slider. Adjust this to set a general value.
- 8 This incrementally adjusts the refill rate set-point. Adjust this to fine-tune the value.
- 9 This button navigates you to the DLA gauge screen.
- 10 This is the screen indicator. It shows you the screen navigation options.
- 11 This button navigates you to the solution screen.

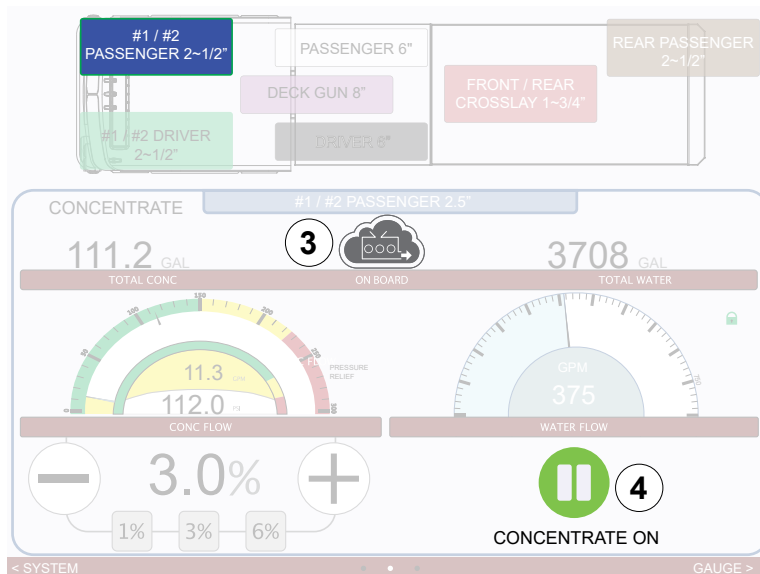
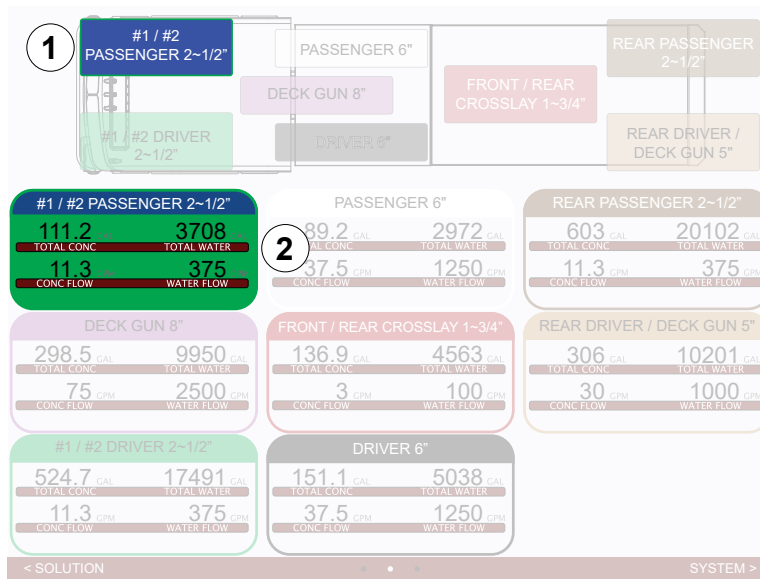
System Screen—Telemetry



Use the illustration and definitions to understand the gauges on the system display. The system screen monitors and displays the total amount of concentrate and water flowed by the system. Your application may not have the transfer and refill options shown in the illustration.

- 1 This graphically and numerically shows the current concentrate flow rate for all active DLAs, as well as the concentrate-line pressure.
- 2 This graphically and numerically shows the current water flow rate for all active DLAs.
- 3 This shows the total amount of water flowed by the system since the last reset. Long-press the number to reset the value to zero.
- 4 This shows the total amount of concentrate flowed by the system since the last reset. Long-press the number to reset the value to zero.
- 5 This graphically shows what percentage of the selected set-point the system is achieving during the refill process.
- 6 This graphically shows what percentage of the selected set-point the system is achieving during the relay or transfer process.

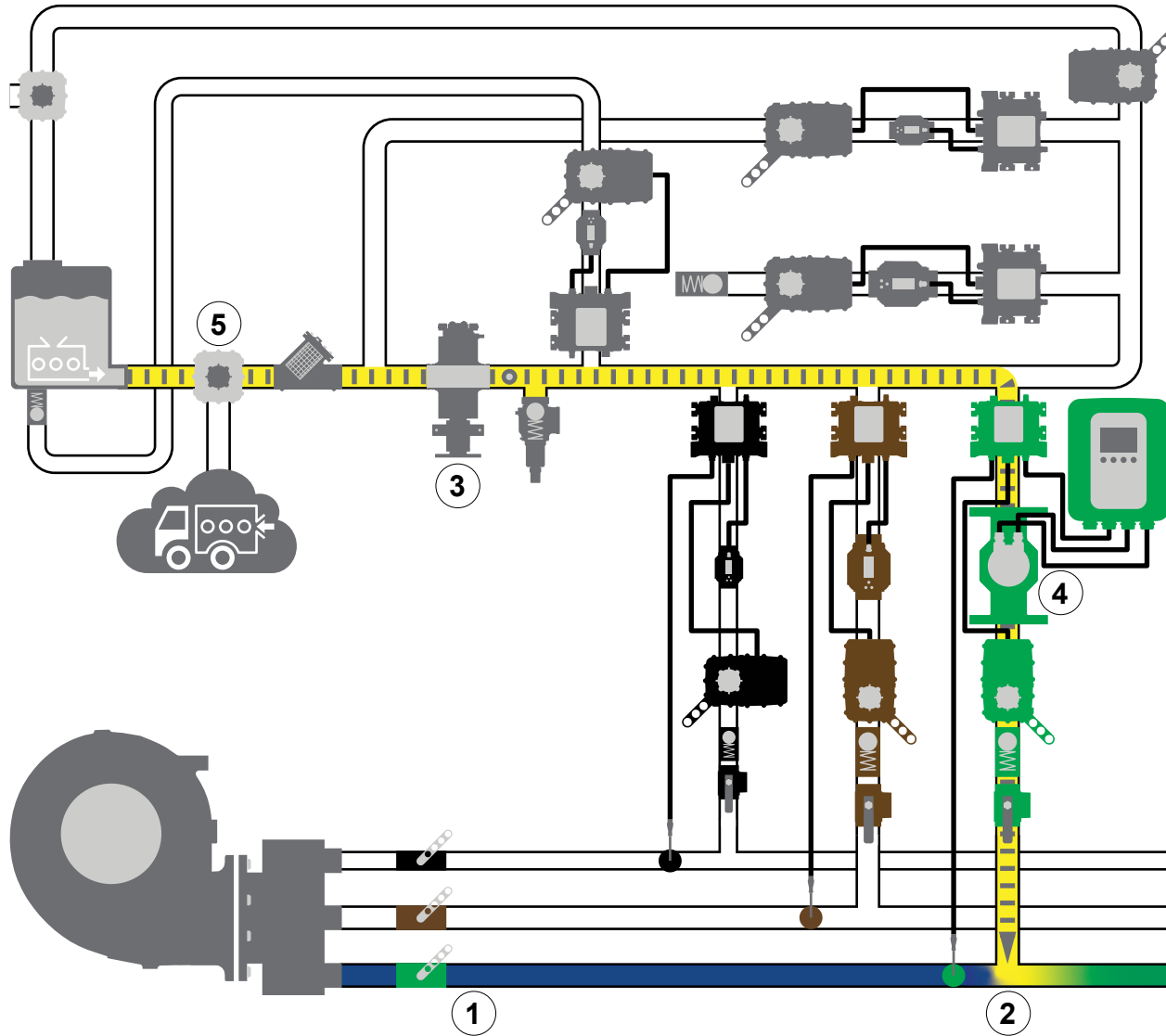
Enabling and Disabling a DLA—Screen Views



Use the illustrations and instructions to enable and disable a discharge. A discharge consists of a DLA and dedicated waterline from the fire pump. Enabling a discharge on the screen enables the associated DLA that is then activated by flowing water through the dedicated waterline. After start-up, the system opens to the DLA Gauge screen.

- 1 The gauge screen displays the available discharges, their status, and their statistics since the last reset. Enable and disable any discharge by doing the following:
 - Long-press any *DLA* button to enable that DLA. The button appearance changes to indicate that the DLA is enabled. A border appears around the button, and the DLA name animates when the DLA is active.
 - Long-pressing an enabled DLA disables that DLA, and reverts the button to its original appearance.
 - Short-press any *DLA* button from any screen to navigate to the solution screen for that DLA.
- 2 The DLA information box updates to show the status, and the associated statistics update when it is active.
- 3 The concentrate source icon animates on the solution screen for any DLA that is enabled.
- 4 Another indication that the DLA is enabled is that the *CONCENTRATE ON/OFF* is in the *ON* state. Press the *CONCENTRATE ON/OFF* button to disable that DLA.

Enabling and Disabling a Discharge—System View

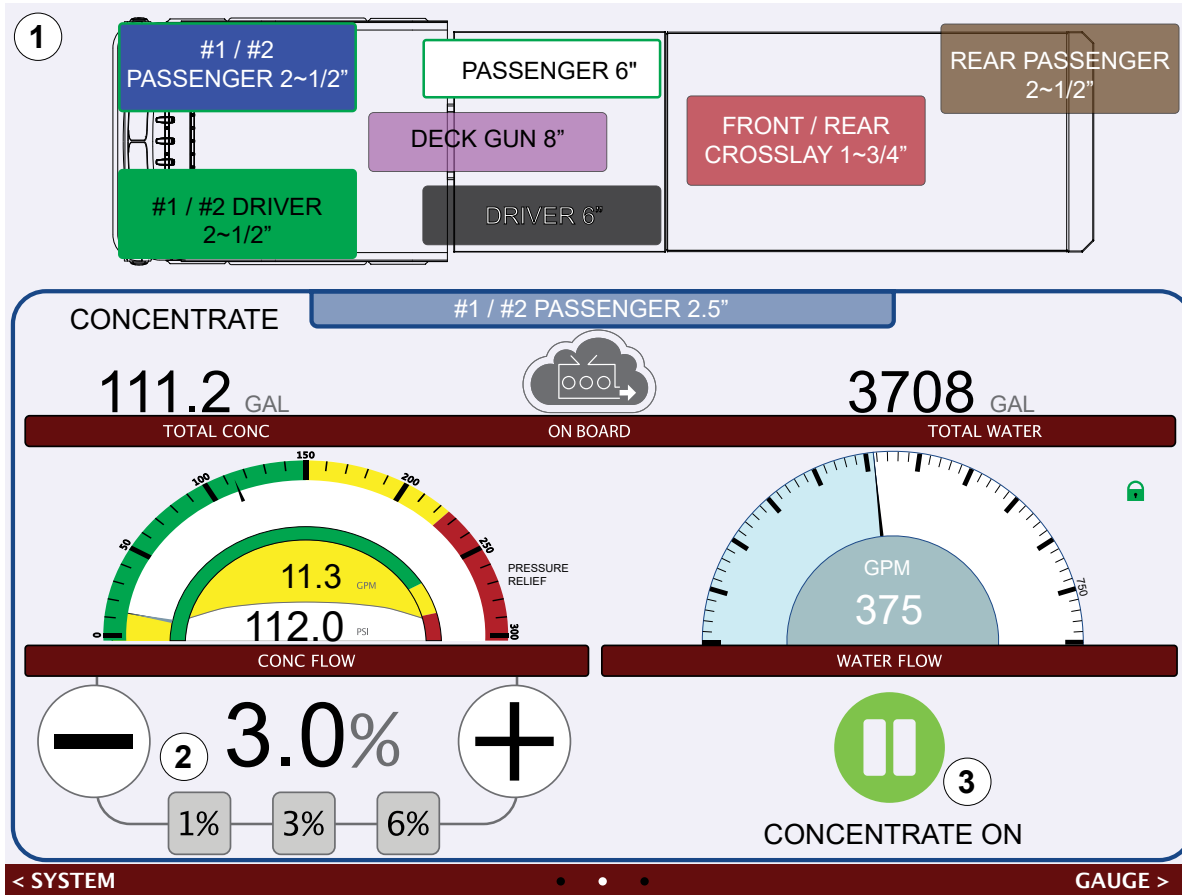


Use the illustration and instructions to understand the system activity when you enable a DLA. Keep in mind that an enabled DLA is only active when the associated line is flowing water.

Note: For instructional purposes, this illustration only focuses on the specific activity in the system that best conveys the topic.

- 1 The fire pump flows water into the discharge.
- 2 The enabled DLA measures the water flow in the discharge.
- 3 The concentrate pump activates.
- 4 The magnetic flowmeter measures the amount concentrate flowing in the DLA, while the valve meters the concentrate proportioned into the discharge to produce the selected solution.
- 5 The concentrate source is selected by the concentrate-source valve. The valve switches between an on-board or auxiliary concentrate source. The valve position signal is provided to the system—which uses this information to determine when to monitor the on-board concentrate level.

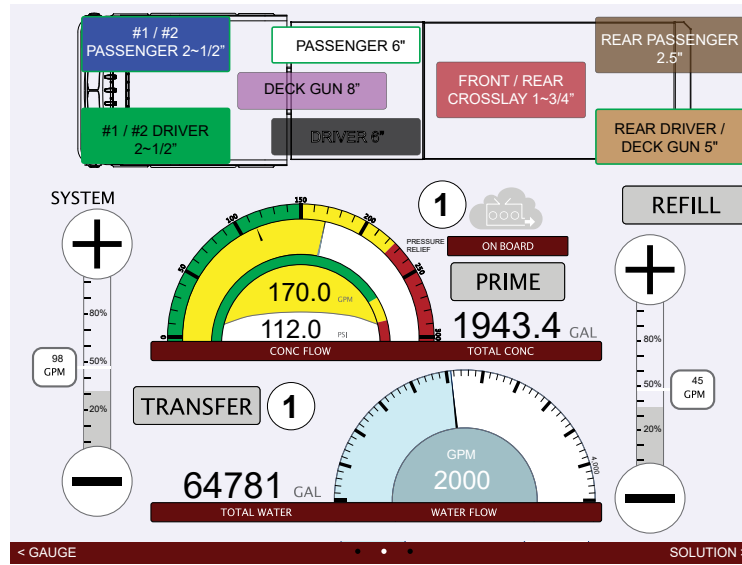
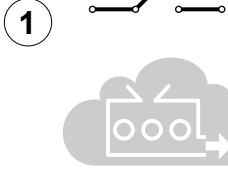
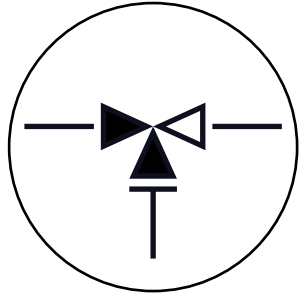
Adjusting the Solution Screen



Use the illustration and instructions to adjust the concentrate percentage for a specific discharge.

- 1 Typically the solution parameters are set during calibration or testing. Use the solution to screen adjust the concentrate percentage during operation.
- 2 Use the *CONCENTRATE-PERCENT* buttons to increase or decrease the concentrate percent in 0.1% increments.
- 3 To disable the DLA, long-press the *DLA* button on the apparatus graphic, or long-press the *CONCENTRATE ON/OFF* button.

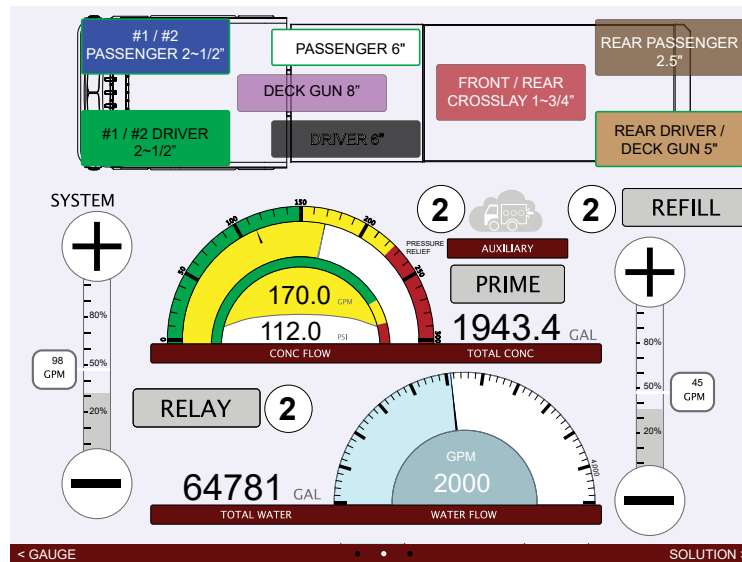
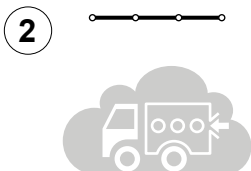
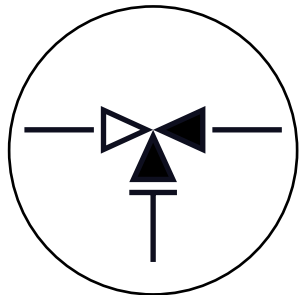
Switching the Concentrate Source—Screen View



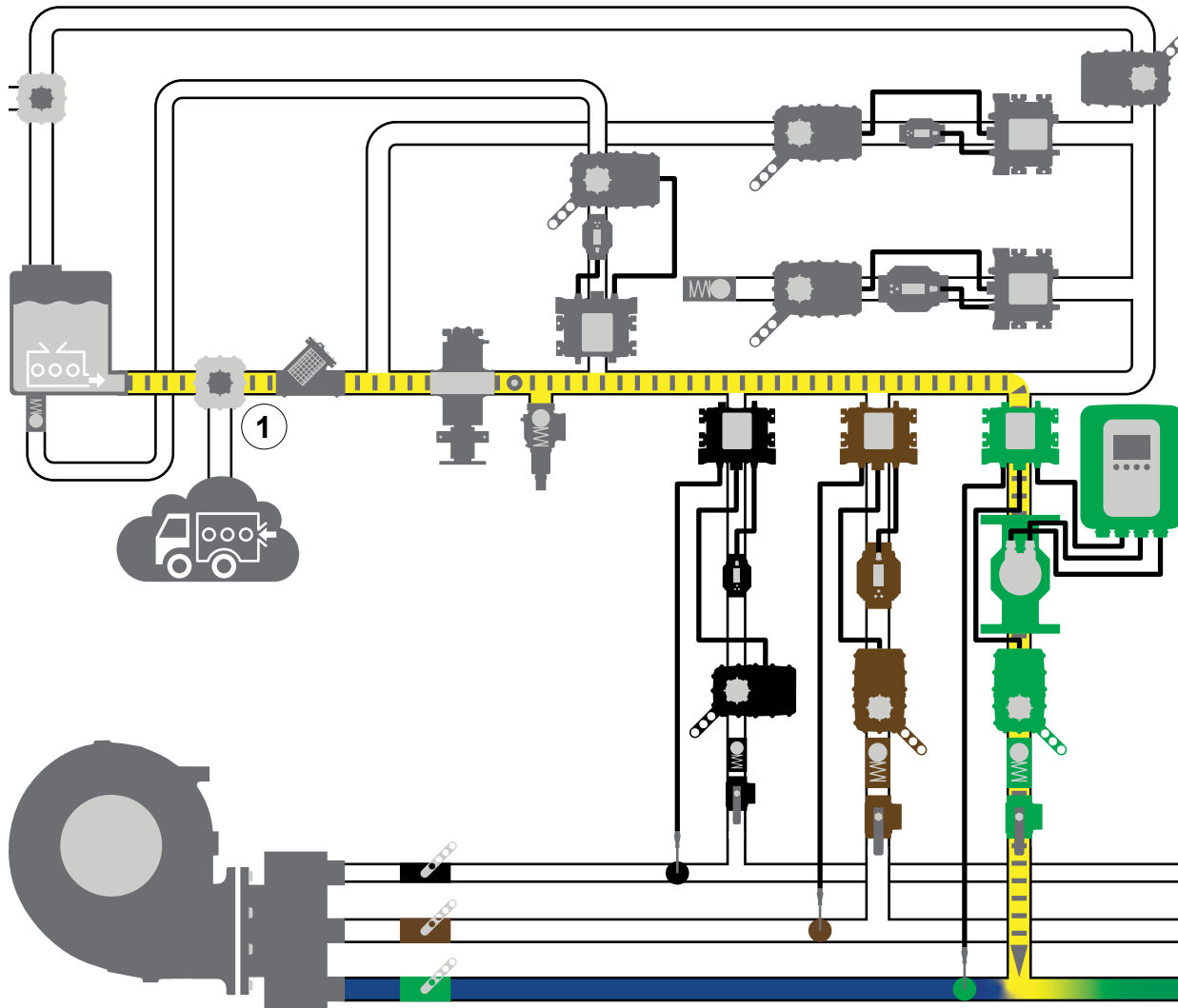
Use the illustrations and instructions to understand how the concentrate source is determined by the system. The system installer provides and defines a signal to the system as well as a method for switching between on-board and auxiliary sources. The concentrate source affects system features and functions.

Note: The illustrations and instructions reflect a typical application.

- With the on-board source selected, the system functions as follows:
 - The concentrate supply icon indicates an on-board source is selected.
 - The system monitors the supply through the tank-level sensors.
 - The transfer function is available.
- With the auxiliary source selected, the system functions as follows:
 - The concentrate supply icon indicates an auxiliary source is selected.
 - The operator monitors the supply levels.
 - The refill and relay function is available.



Switching the Concentrate Source Mode—System View



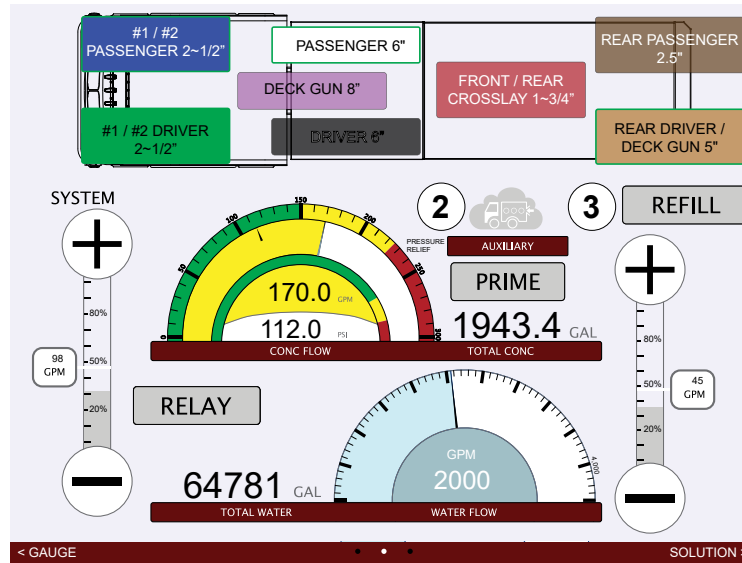
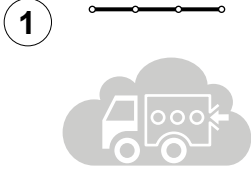
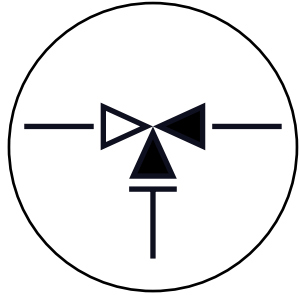
Use the illustrations and instructions to understand the system activity when you set it to an auxiliary concentrate source.

Note: For instructional purposes, this illustration only focuses on the specific activity in the system that best conveys the topic.

- 1 When set to auxiliary supply mode, a valve is used to change the concentrate source from the on-board supply tank to the auxiliary system. When sourcing concentrate from an auxiliary source, the system cannot measure the supply level—the concentrate supply must be managed by the operator.

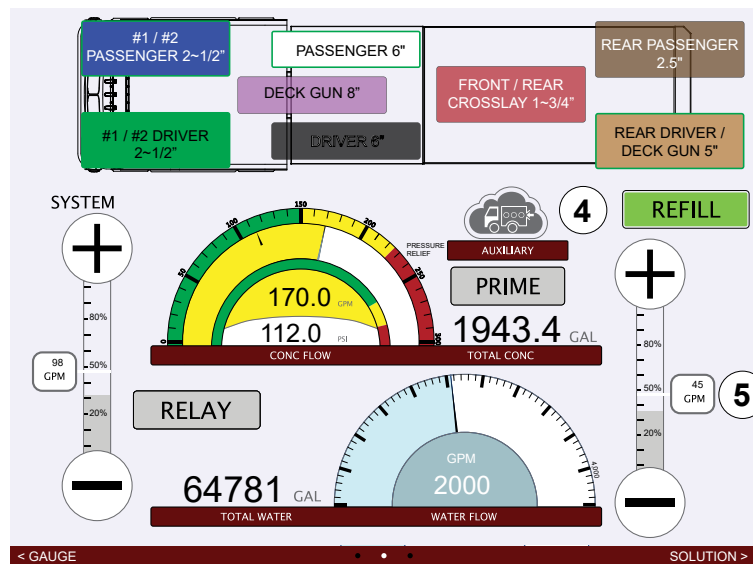
Note: Do not operate the equipment without providing concentrate or water to pump through the system.

Refilling the On-Board Supply Tank—Screen View

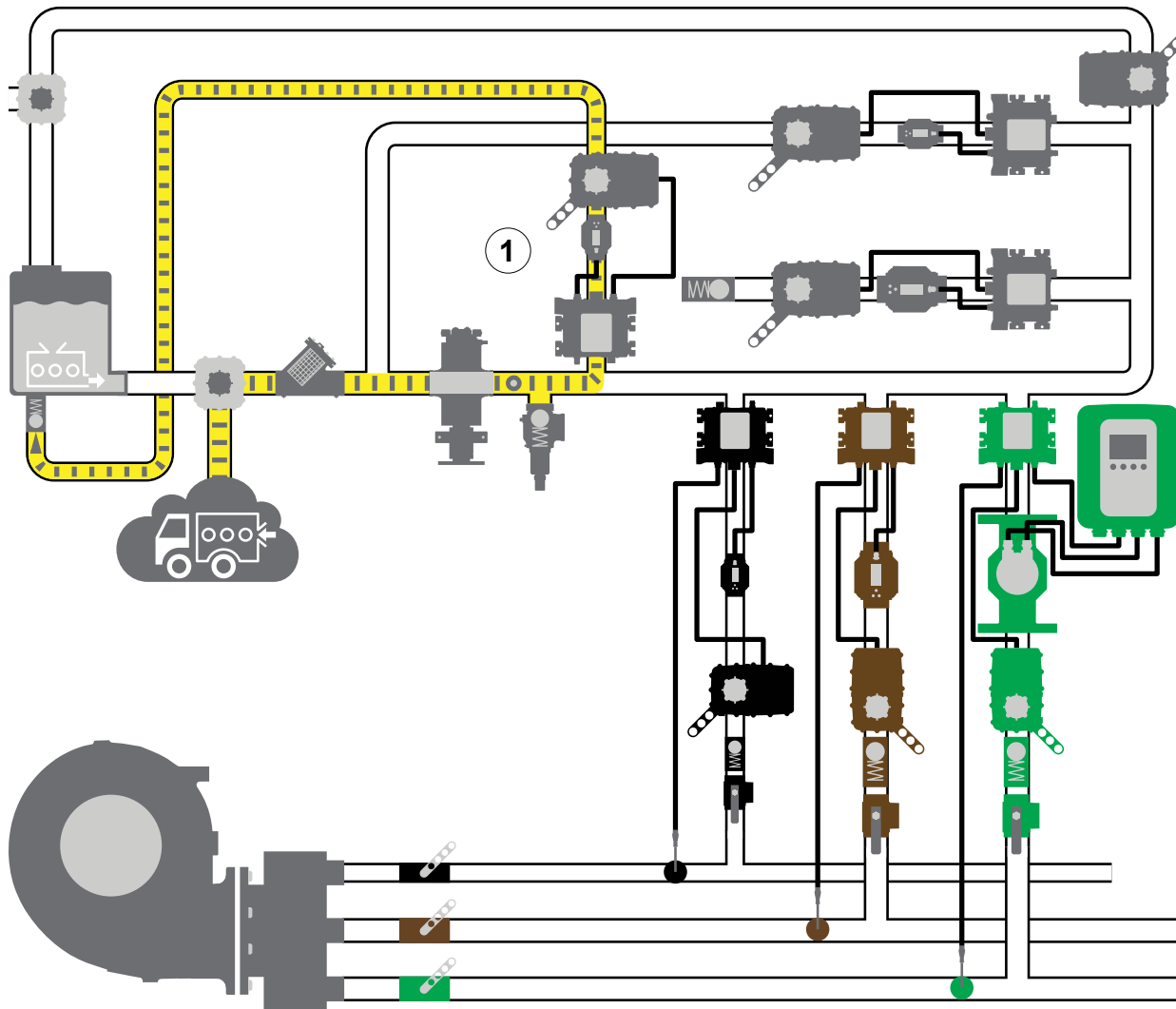


Use the illustrations and instructions to refill the on-board concentrate-supply tank from an external source. This is useful when manually refilling the on-board supply tank is not practical. Refilling the on-board supply tank can take place concurrently with normal discharge operations.

- 1 Set the concentrate-supply source to auxiliary.
- 2 Verify that the concentrate-supply icon is showing that auxiliary supply is selected.
- 3 Press the *REFILL* button to start the process. The system stops when the concentrate-supply tank is full.
- 4 The *REFILL* button changes appearance and concentrate-supply icon begins to animate when the refill process is active.
- 5 Adjust the slider to the desired refill rate.



Refilling the On-Board Supply Tank—System View



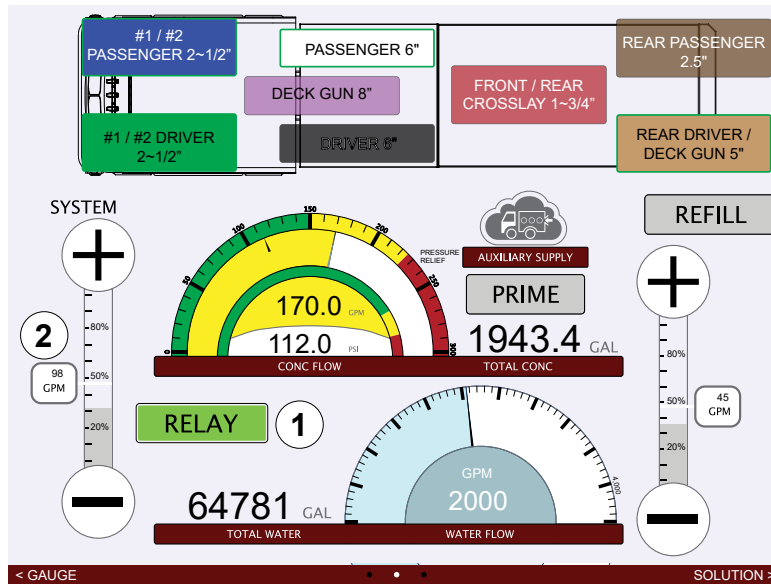
Use the illustrations and instructions to understand the system activity when you refill the on-board concentrate-supply tank. You can operate the discharges while refilling the tank.

Note: For instructional purposes, this illustration only focuses on the specific activity in the system that best conveys the topic.

- 1 The system sources concentrate from the auxiliary source. Concentrate is pumped into the on-board supply tank until the supply-level system determines the tank is full.

Note: Make sure that you provide enough concentrate to fill the on-board supply tank, or manually stop the pump operation before the auxiliary concentrate supply runs out.

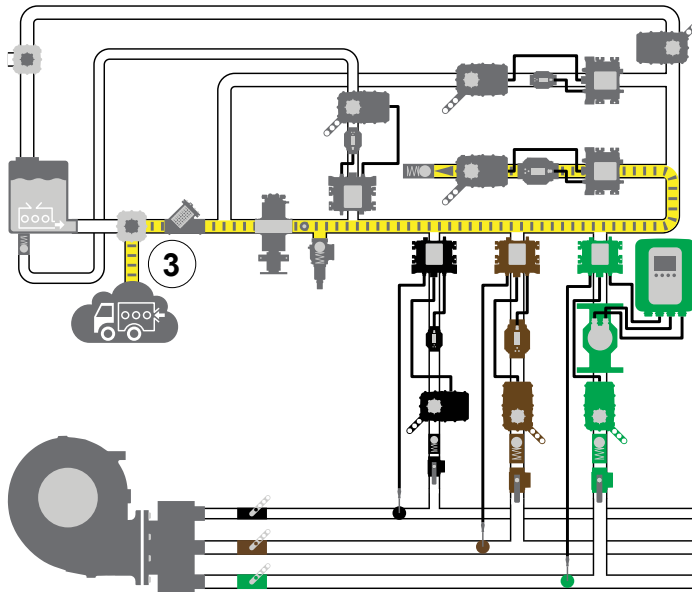
Relaying Concentrate



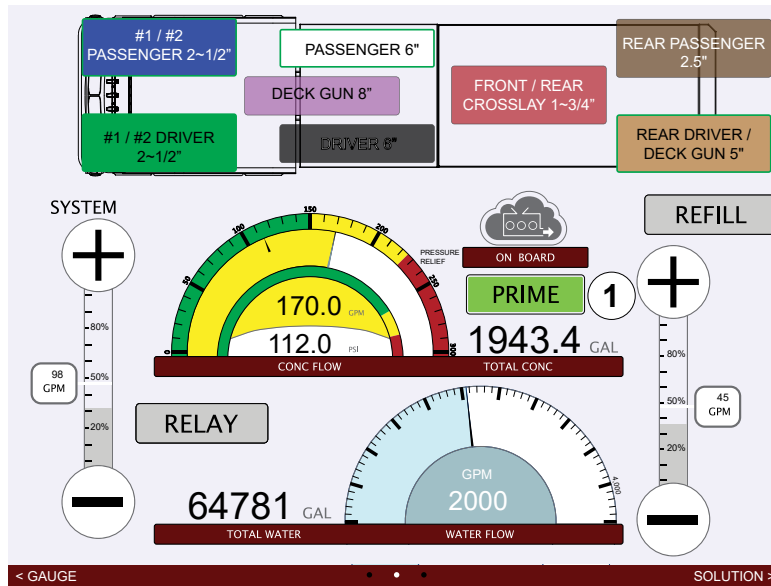
Use the illustrations and instructions to transfer concentrate to another location. If included in your application, you can use the transfer line to move the concentrate from the on-board tank, or external source, to another location. You can operate the discharges while transferring concentrate.

Note: For instructional purposes, the system illustration only focuses on the specific activity in the system that best conveys the topic.

- 1 Press the *RELAY* button to begin the relay process.
- 2 Adjust the slide to the desired relay rate.
- 3 The system relays the concentrate from an auxiliary source to the transfer line.



Manually Priming the Concentrate Line

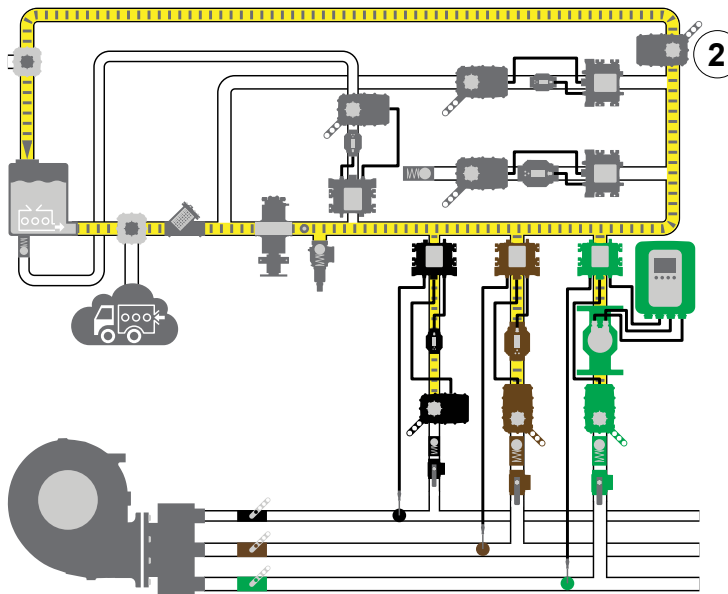


Use the illustrations and instructions to manually prime the concentrate line. The system automatically primes before operation. You can also manually prime the system by pressing the prime button until the system is primed.

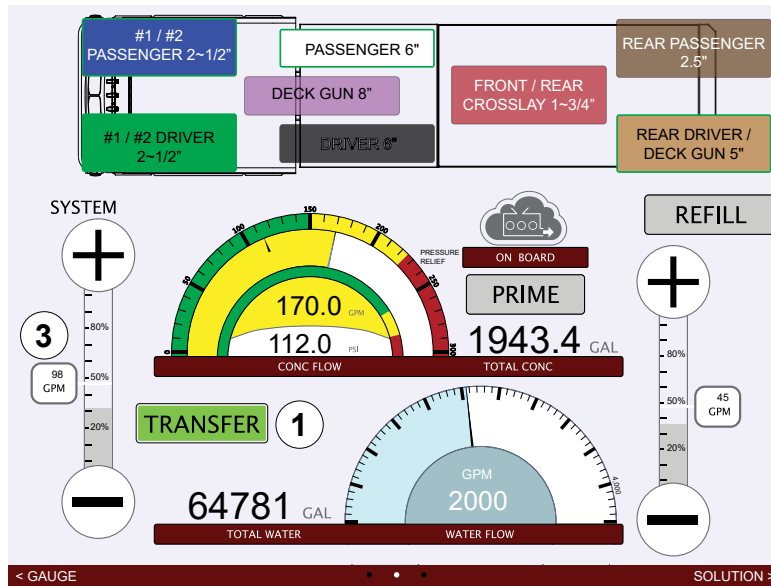
Note: For instructional purposes, the system illustration only focuses on the specific activity in the system that best conveys the topic.

- 1 Press and hold the *PRIME* button until the system is primed.
- 2 The system evacuates the air in the lines to atmosphere as the concentrate fills the lines. During prime operation a small amount of concentrate will return to the on-board tank. Make sure that the tank capacity is sufficient to allow for normal priming operation.

You can also prime the system from an auxiliary concentrate source. However, extended priming from an auxiliary supply is not recommended as this may overflow the on-board tank.



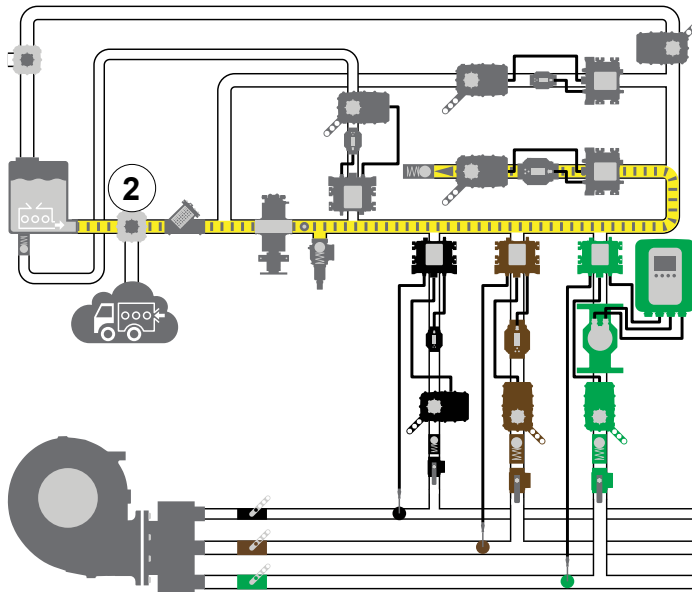
Transferring Concentrate



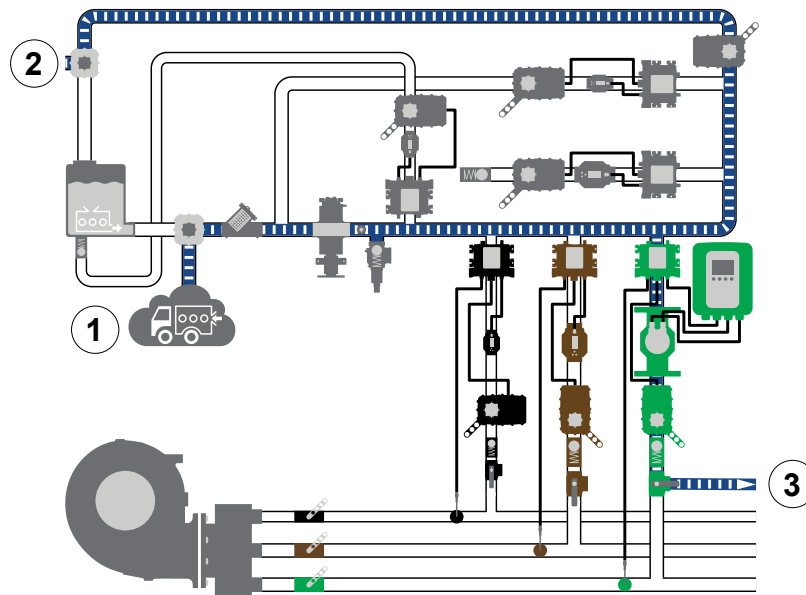
Use the illustrations and instructions to transfer concentrate to another location. If included in your application, you can use the transfer line to move the concentrate from the on-board tank to another location. You can operate the discharges while transferring concentrate.

Note: For instructional purposes, the system illustration only focuses on the specific activity in the system that best conveys the topic.

- 1 Press the *TRANSFER* button to begin the transfer process.
- 2 The system transfers the concentrate from the selected source to the transfer line.
- 3 Adjust the slider to the desired rate.



Verifying Concentrate Output with Water



Preparing for Validation

Use the illustrations and instructions to verify that the DLA injects the expected amount of concentrate into the solution-capable discharge. This can be done without flowing water in the waterway discharge by placing the system into simulated flow mode.

- 1 Connect a clean water source to the auxiliary intake.
- 2 Make sure that you set the prime bypass valve to divert the water away from the concentrate supply tank to avoid contaminating concentrate.

NOTICE

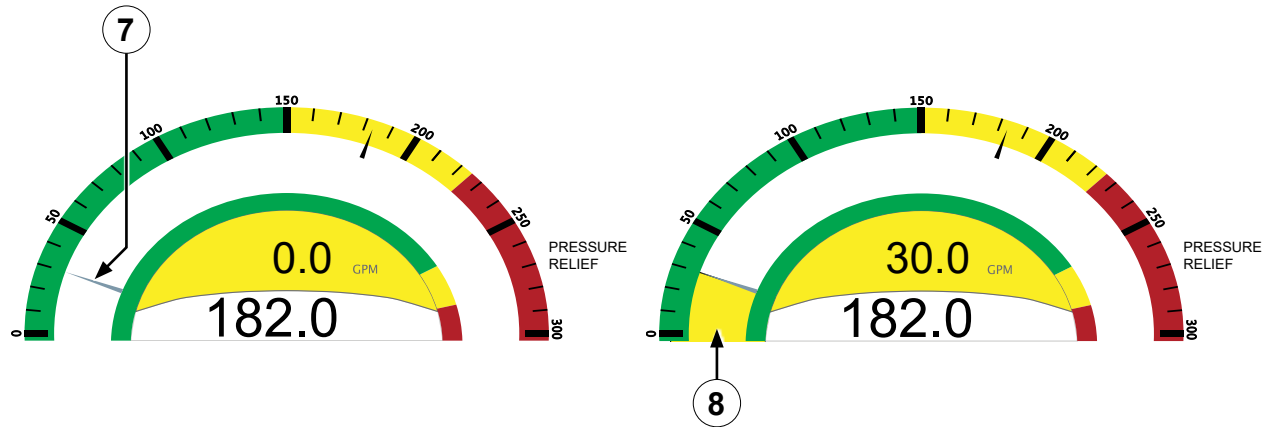
Concentrate Supply Contamination

- Priming with water can contaminate the on-board concentrate supply.
- Divert water to prevent concentrate contamination.



- 3 Prepare the DLA by doing the following:
 - Position a container suitable to collect and measure the concentrate, or used a calibrated, external flowmeter.
 - Set the cal/inject valve to divert concentrate for collection and measurement.
- 4 Long-press the *SIM FLOW* button to enable simulated flow mode.
- 5 Adjust the simulated flow value by sliding your finger along the *WATER FLOW* bar.
- 6 Set the desired concentrate percent.

Verifying Concentrate Output with Water



Operating Simulated Flow Mode

Use the illustrations and instructions to operate the system in simulated flow mode.

7 This needle indicates the expected value for the concentrate output.

8 Begin flowing concentrate by long-pressing the *CONCENTRATE ON/OFF* button. The flow rate displayed when flowing concentrate should match the expected value represented by the needle.

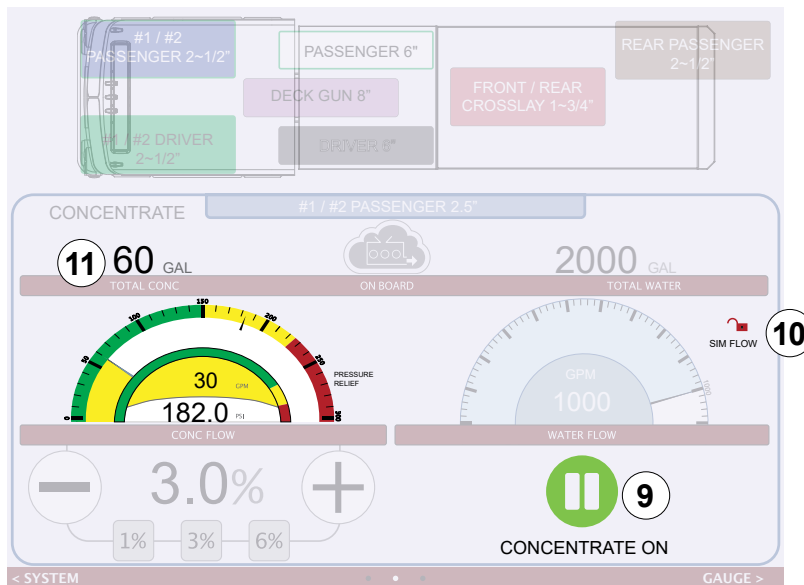
Use the volumetric method or a calibrated, external flowmeter collect concentrate sample during steady-state operation.

9 Long-press the *CONCENTRATE ON/OFF* button to stop flowing concentrate.

10 Long-press the *SIM FLOW* button to disable simulated flow mode.

11 After completing the simulation, compare the values expected by the system with the collected output.

Drain any water remaining in the concentrate line to prevent future concentrate contamination.



Maintenance Schedule

No scheduled maintenance is required for the control system. However, it is recommended that you periodically inspect the system to reveal excessive debris buildup, worn components, or any developing leaks. Consider environmental conditions, hours of operation, and other factors specific to your application to develop a suitable inspection schedule.

WATEROUS

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