

WATEROUS

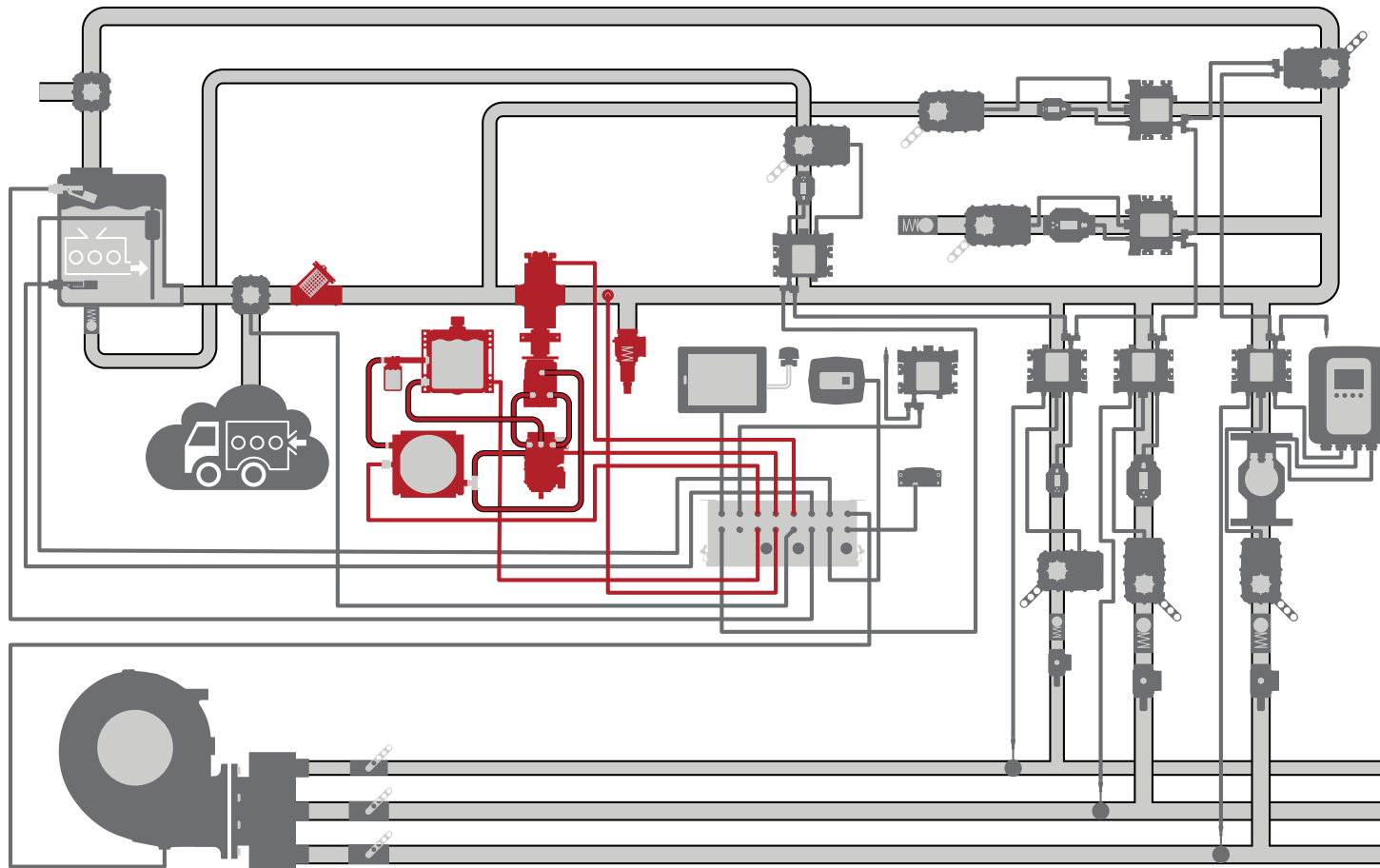
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AQUIS ULTRAFLOW—Hydraulic Components

Installation and Operation



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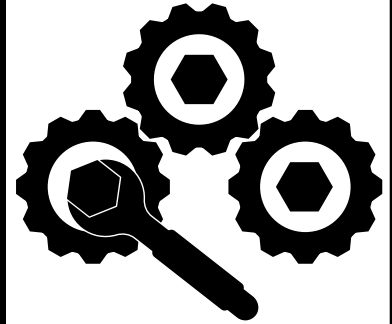
Safety Precautions

- 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.

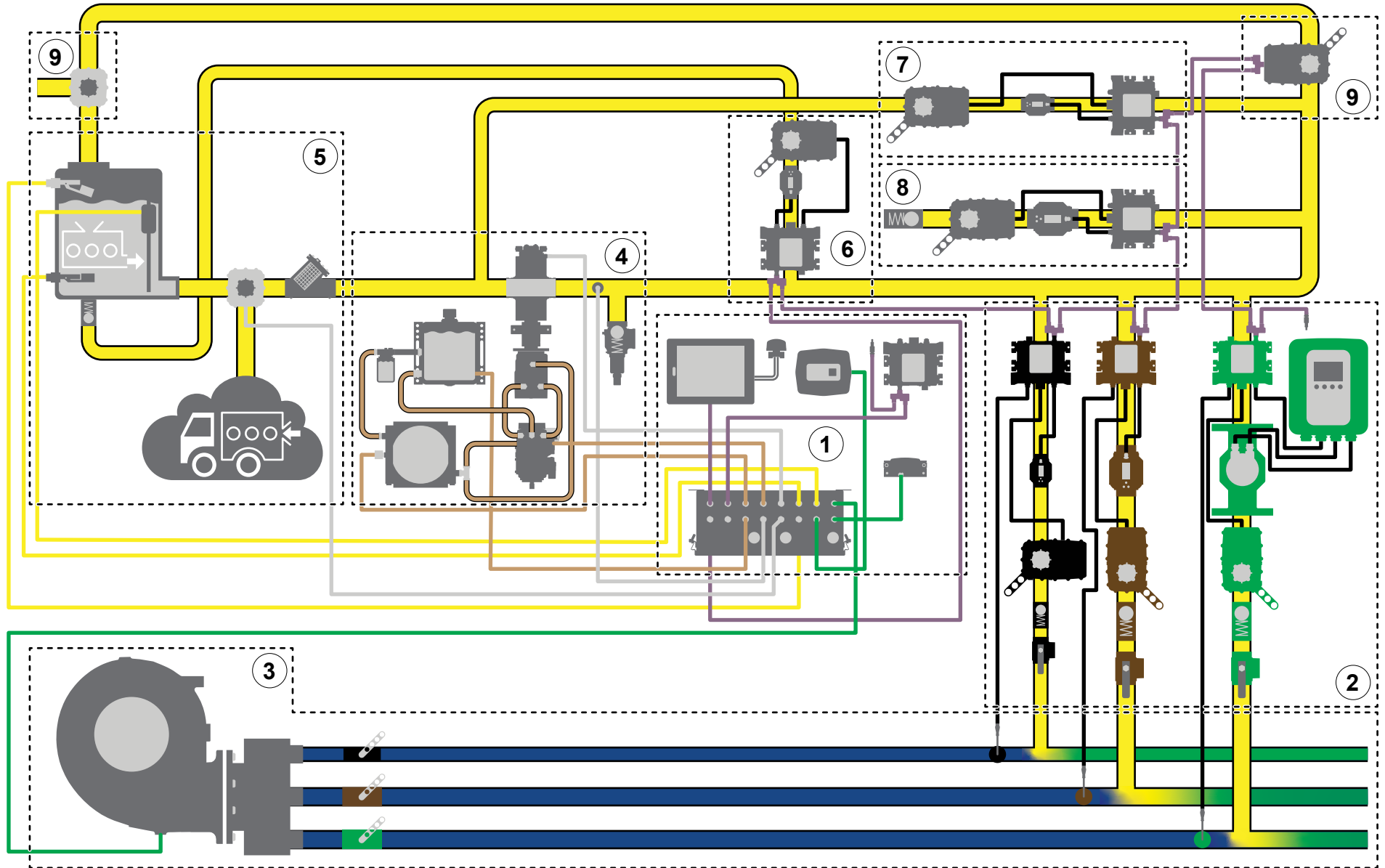
Viewing the Document Electronically

- 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

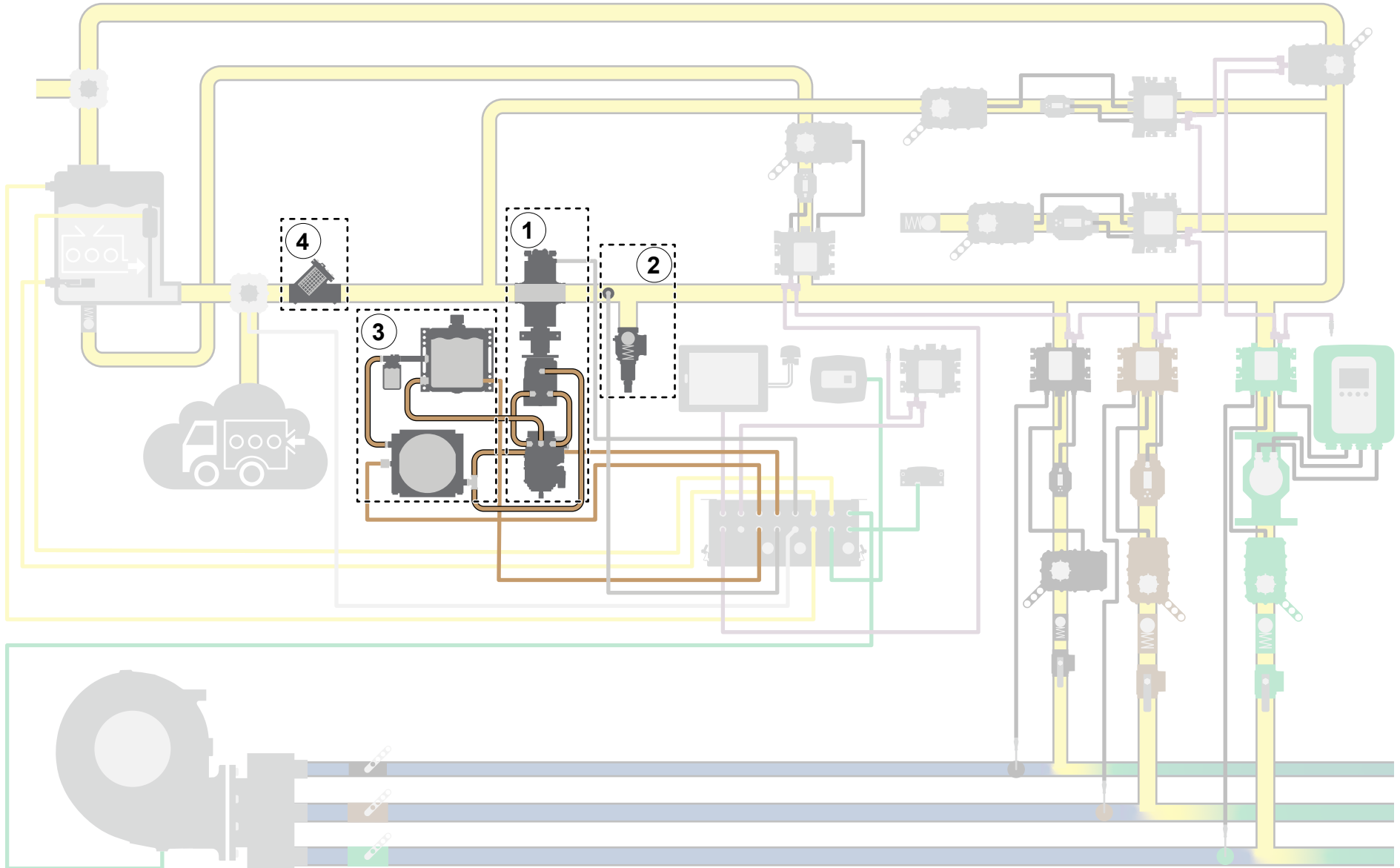
Subsystem	Description
4 Concentrate pump	<p>These components support, control, and power the concentrate pump. The components in this subsystem include:</p> <ul style="list-style-type: none"> • Concentrate pump—this circulates the foam concentrate through the system. • Hydraulic motor—this drives the 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>

Hydraulic Components

The hydraulic system powers the foam concentrate pump. Apparatus power circulates hydraulic fluid from the reservoir, through the hydraulic motor to power the concentrate pump, through the heat exchanger and filter before returning to the reservoir.

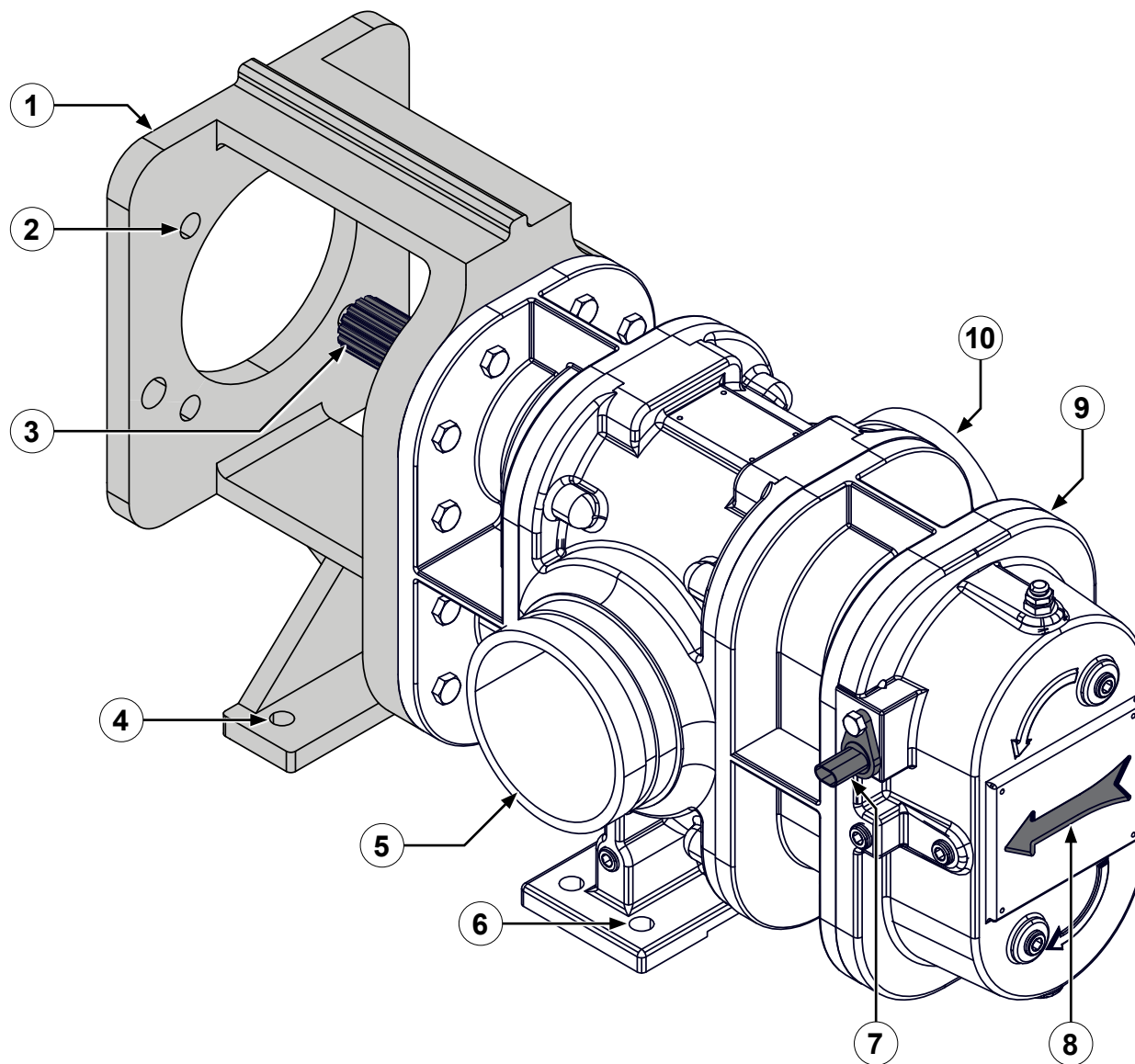


Hydraulic Components

Subsystem	Description
1 Concentrate pump components	This transports the concentrate through the system. It includes the concentrate pump, hydraulic motor, and hydraulic pump.
2 Pressure components	This measures and manages the pressure in the concentrate line. It includes the pressure transducer and pressure relief valve.
3 Hydraulic fluid components	This contains and manages the hydraulic fluid. It includes the hydraulic fluid reservoir, hydraulic filter, and hydraulic fluid heat exchanger.
4 Concentrate strainer	This collects debris that would otherwise flow through the system and could damage the concentrate pump.

Concentrate Pump Assembly

The concentrate pump assembly contains the concentrate pump and an assembly frame to mount the hydraulic motor.

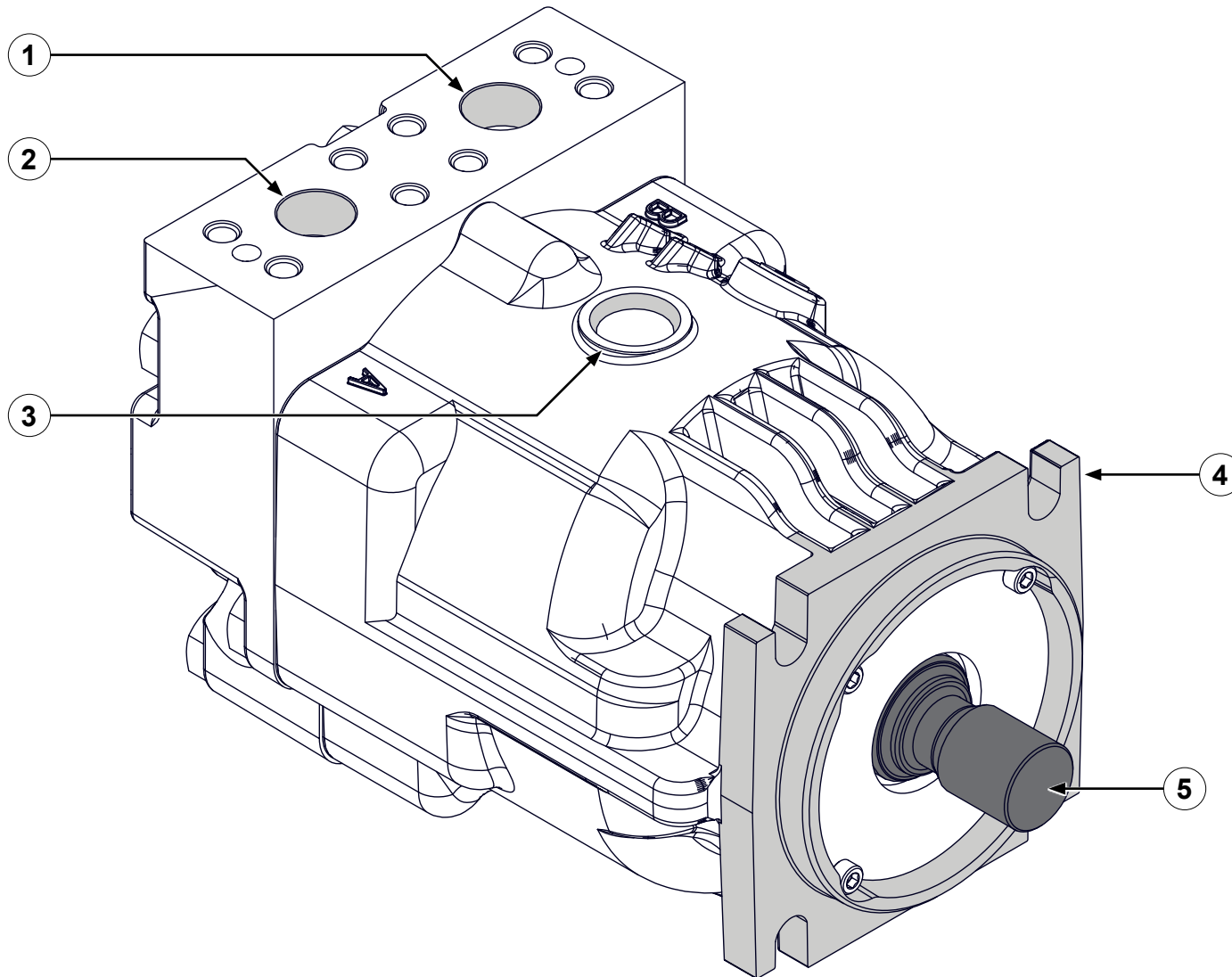


Concentrate Pump Assembly

Feature	Description
1 Assembly frame	This mounts between the hydraulic motor and the concentrate pump.
2 Hydraulic motor mounting holes	This mounts the pump to the apparatus.
3 Concentrate pump drive shaft	This drives the concentrate pump.
4 Assembly frame mounting hole	This mounts the assembly mount to the apparatus.
5 Concentrate outlet	This is where the concentrate exits the pump—victaulic.
6 Concentrate pump mounting hole	This mounts the pump to the apparatus.
7 Pump speed connector	This connects to the cable from the control box.
8 Flow direction indicator	This shows the flow direction.
9 Concentrate pump	This pressurizes the concentrate in the concentrate discharge manifold.
10 Concentrate inlet	This is where the concentrate enters the pump—victaulic.

Hydraulic Motor

The hydraulic motor drives the concentrate pump. The hydraulic motor is controlled by the hydraulic pump.

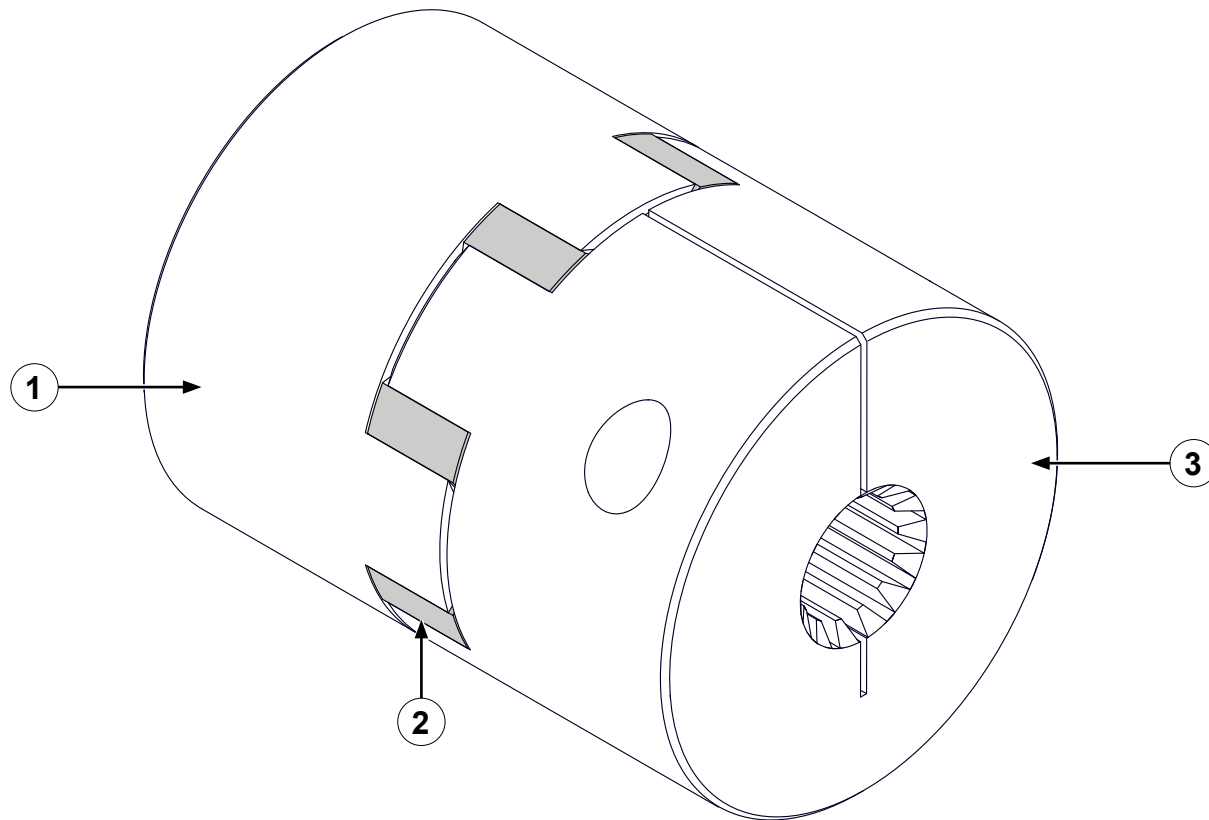


Hydraulic Motor

Feature	Description
1 B-port	This connects to the B-port on the hydraulic pump to drive the motor—1-inch, split flange, SAE J518, code 62.
2 A-port	This connects to the A-port on the hydraulic pump to drive the motor—1-inch, split flange, SAE J518, code 62.
3 Hydraulic output port	This connects to the hydraulic heat exchanger—1-1/16–12 UN-2B-inch, O-ring boss, SAE J514, code 62.
4 Mounting face	This mounts the motor to the concentrate pump assembly frame.
5 Hydraulic motor shaft	This connects to the concentrate pump shaft to drive the pump.

Spider Coupler

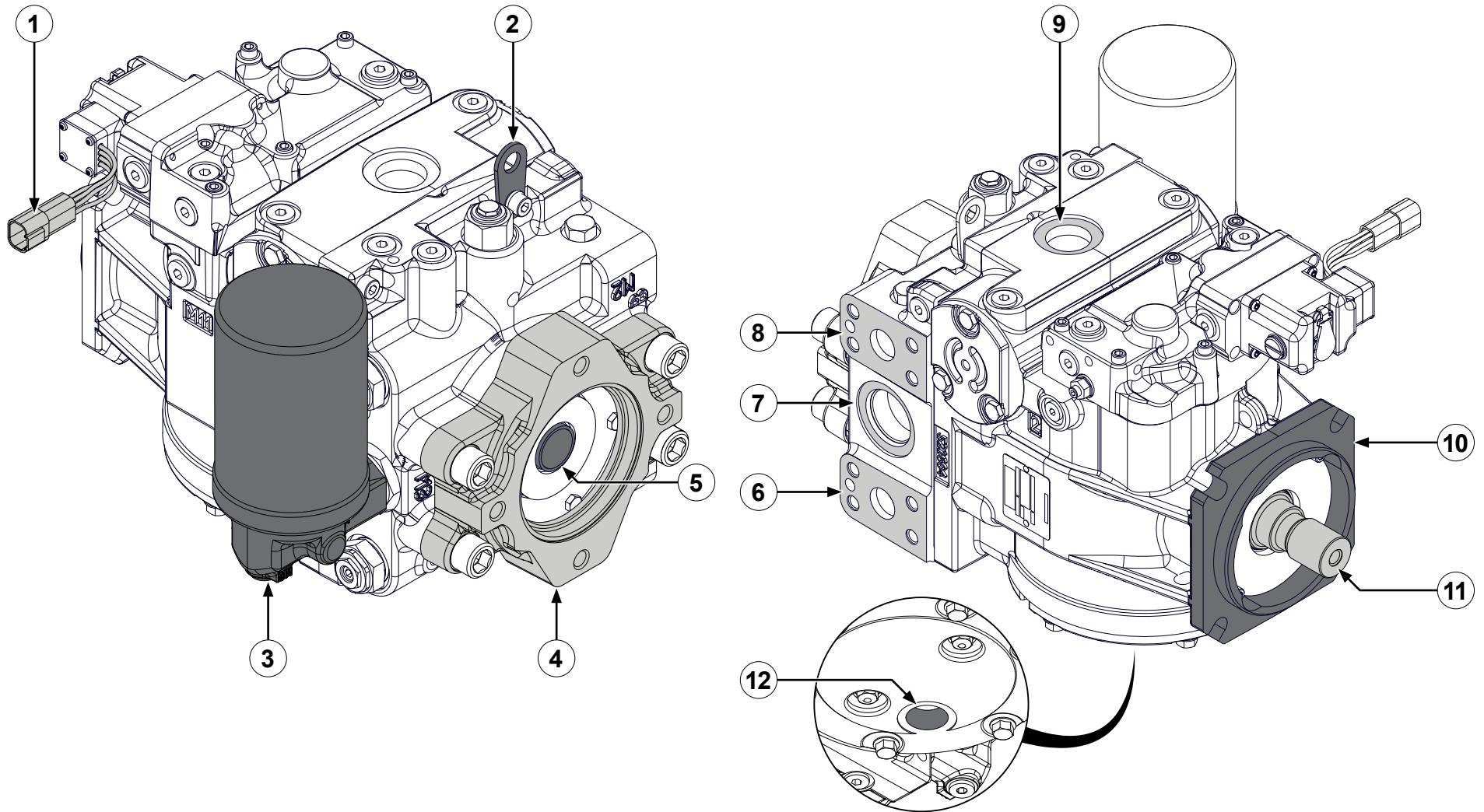
The coupler connects the hydraulic motor shaft to the concentrate pump shaft.



Spider Coupler

Feature	Description
1 Motor hub	This connects to the hydraulic motor. Note: <i>The motor hub and pump hub are interchangeable.</i>
2 Elastomer spider	This transfers torque between the hubs.
3 Pump hub	This connects to the concentrate pump. Note: <i>The pump hub and motor hub are interchangeable.</i>

Hydraulic Pump

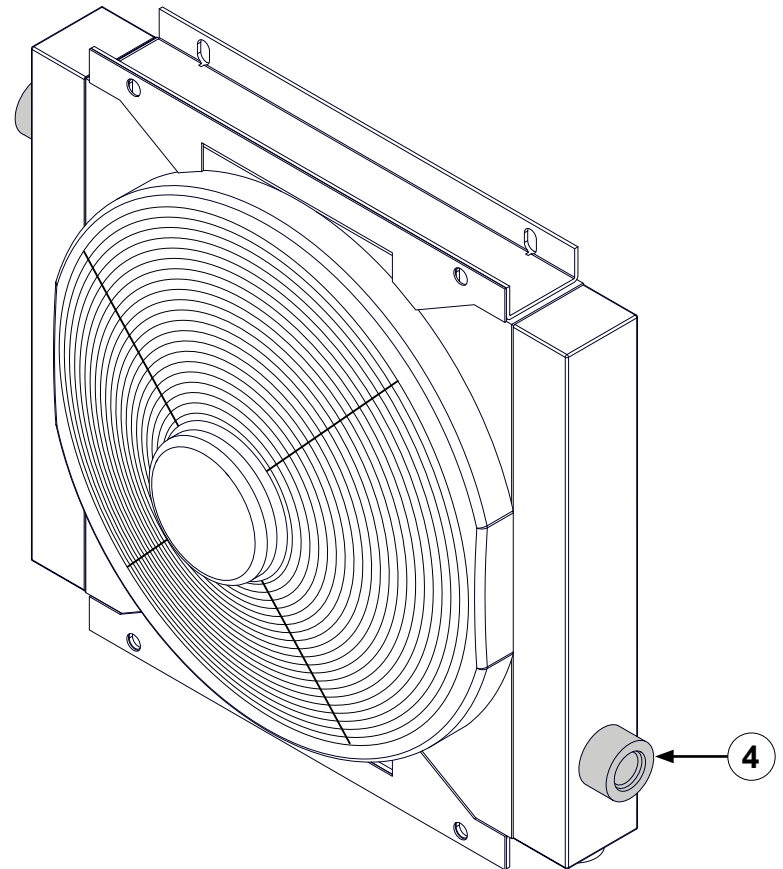
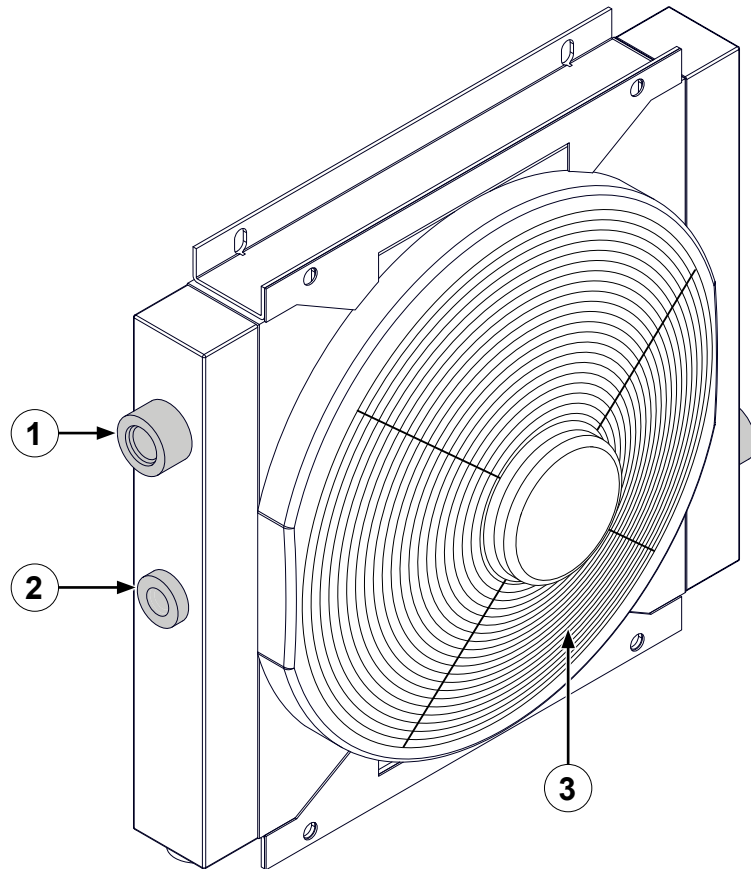


Hydraulic Pump

Feature	Description
1 Cable connector	This connects to the control box.
2 Lift point	This assists lifting the pump.
3 Hydraulic fluid filter	This filters the hydraulic fluid.
4 Auxiliary mounting pad	This allows you to mount additional drive components to the pump.
5 Auxiliary coupling shaft	This allows you to drive additional components—SEA B-B, 2-bolt, 15T, 16/32, internal spline.
6 A-Port output	This connects to the A-port on the hydraulic motor—1-inch, split flange, SAE J518, code 62.
7 S-Port input	This is the hydraulic fluid supply port—1-5/8–12UN-2B.
8 B-Port output	This connects to the B-port on the hydraulic motor—1-inch, split flange, SAE J518, code 62.
9 L1 case drain port	This returns internally leaked hydraulic fluid to the reservoir—1-1/16–12 UN-2B-inch, O-ring boss, SAE J514, code 62.
10 Pump mount	This mounts the hydraulic pump to the apparatus.
11 Input shaft	This connects to the apparatus and drives the hydraulic pump.
12 L2 case drain port	This returns internally leaked hydraulic fluid to the reservoir—1-1/16–12 UN-2B-inch, O-ring boss, SAE J514, code 62.

Hydraulic Fluid Heat Exchanger

The hydraulic fluid heat exchanger manages the hydraulic fluid temperature.

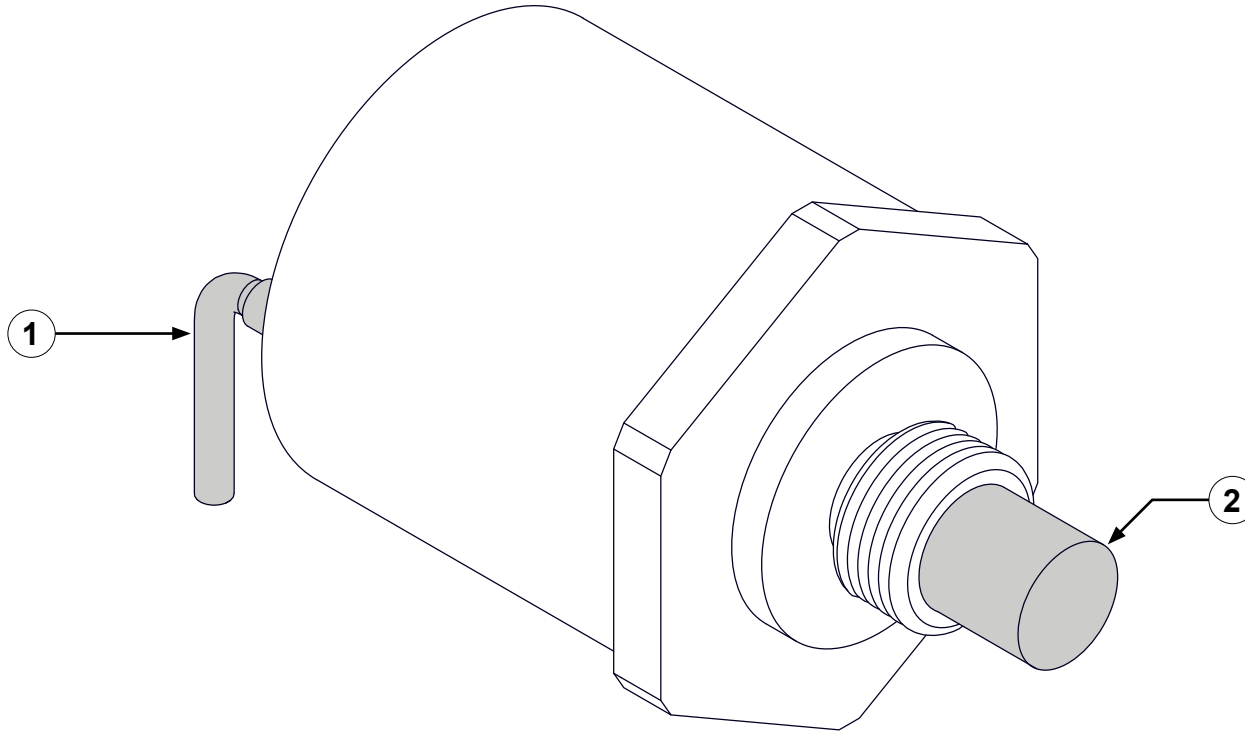


Hydraulic Fluid Heat Exchanger

Feature	Description
1 Hydraulic fluid input	This is where the hydraulic fluid enters the heat exchanger—#16 SAE.
2 Fan controller port	This is the port for the fan controller—#8 SAE.
3 Fan and motor	This cools the hydraulic fluid.
4 Hydraulic fluid output	This is where the hydraulic fluid exits the heat exchanger—#16 SAE.

Fan Controller

This measures the hydraulic fluid temperature and manages the heat exchanger fan.

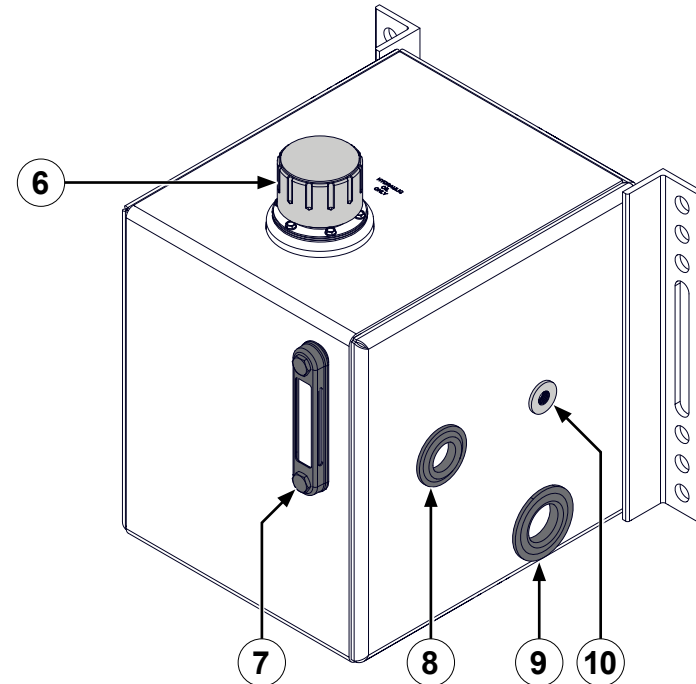
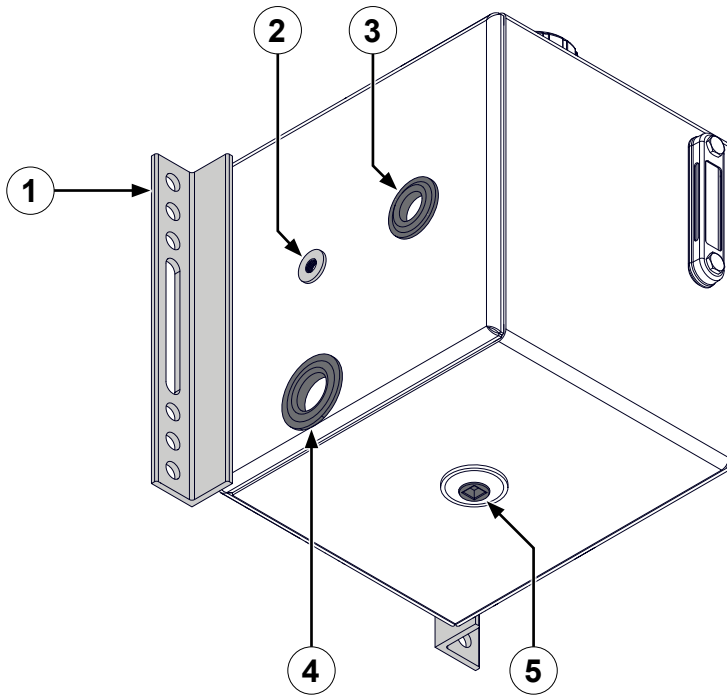


Fan Controller

Feature	Description
1 Wire leads	This connects to apparatus power.
2 Temperature sensor	This measures hydraulic fluid temperature in the heat exchanger—#8 SAE.

Hydraulic Fluid Reservoir

The hydraulic fluid reservoir contains the hydraulic fluid supply. The ports on the reservoir are mirrored and interchangeable to best suit your application.

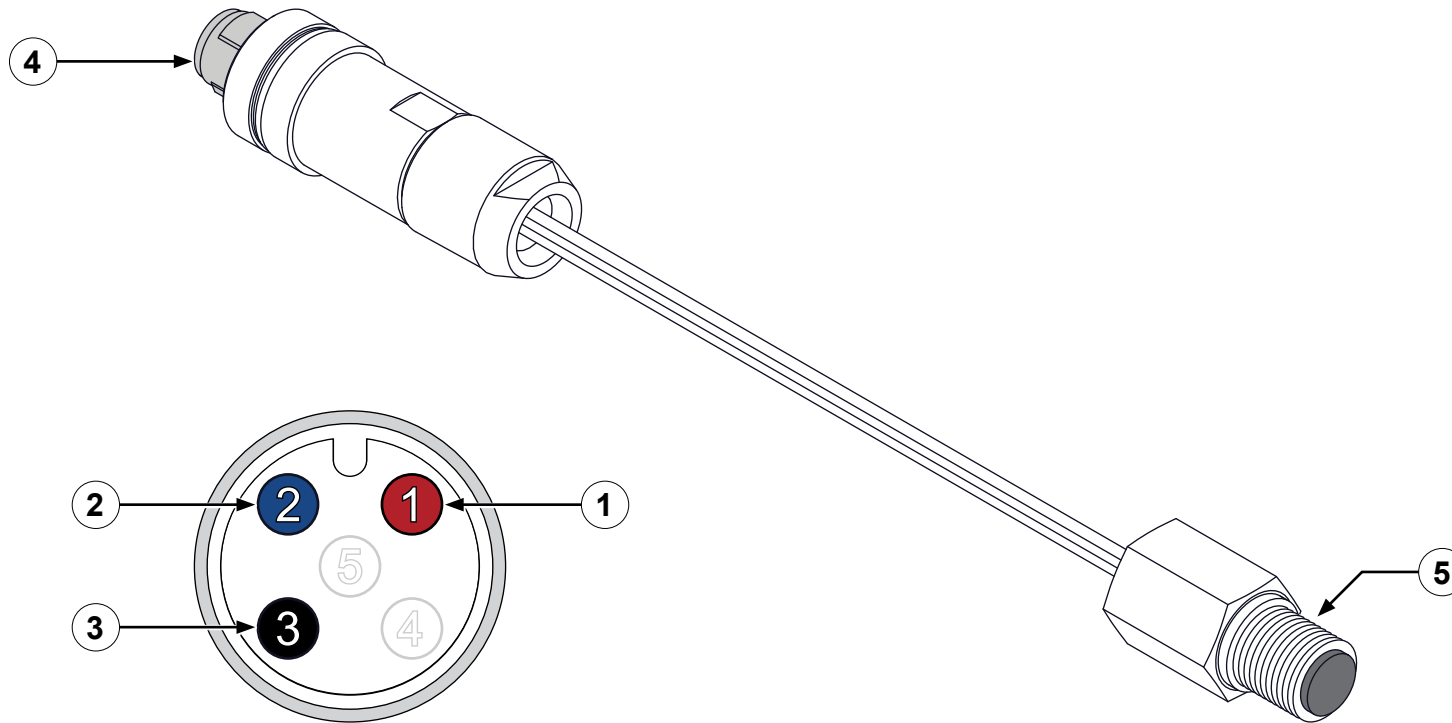


Hydraulic Fluid Reservoir

Feature	Description
1 Mounting bracket	This mounts the hydraulic reservoir to the apparatus.
2 Left accessory port	This is where the level or temperature sensor is installed to the reservoir—1/4-inch NPT.
3 Left side upper port	This port connects to the hydraulic fluid filter in typical applications—1-inch NPT.
4 Left side lower port	This connects to the hydraulic pump inlet in typical applications—1-1/4-inch NPT.
5 Magnetic drain port	This is where hydraulic fluid is drained from the reservoir and contains a magnet to collect metal partials.
6 Fill port	This is where hydraulic fluid is added to the reservoir.
7 Sight gauge	This shows the hydraulic fluid level in the reservoir.
8 Right side upper port	This port connects to the hydraulic pump in typical applications—1-inch NPT.
9 Right side lower port	This port is plugged in typical applications—1-1/4-inch NPT.
10 Right accessory port	This is where the level or temperature sensor is installed to the reservoir—1/4-inch NPT.

Hydraulic Reservoir Level Sensor

The level sensor monitors the hydraulic fluid level in the reservoir.

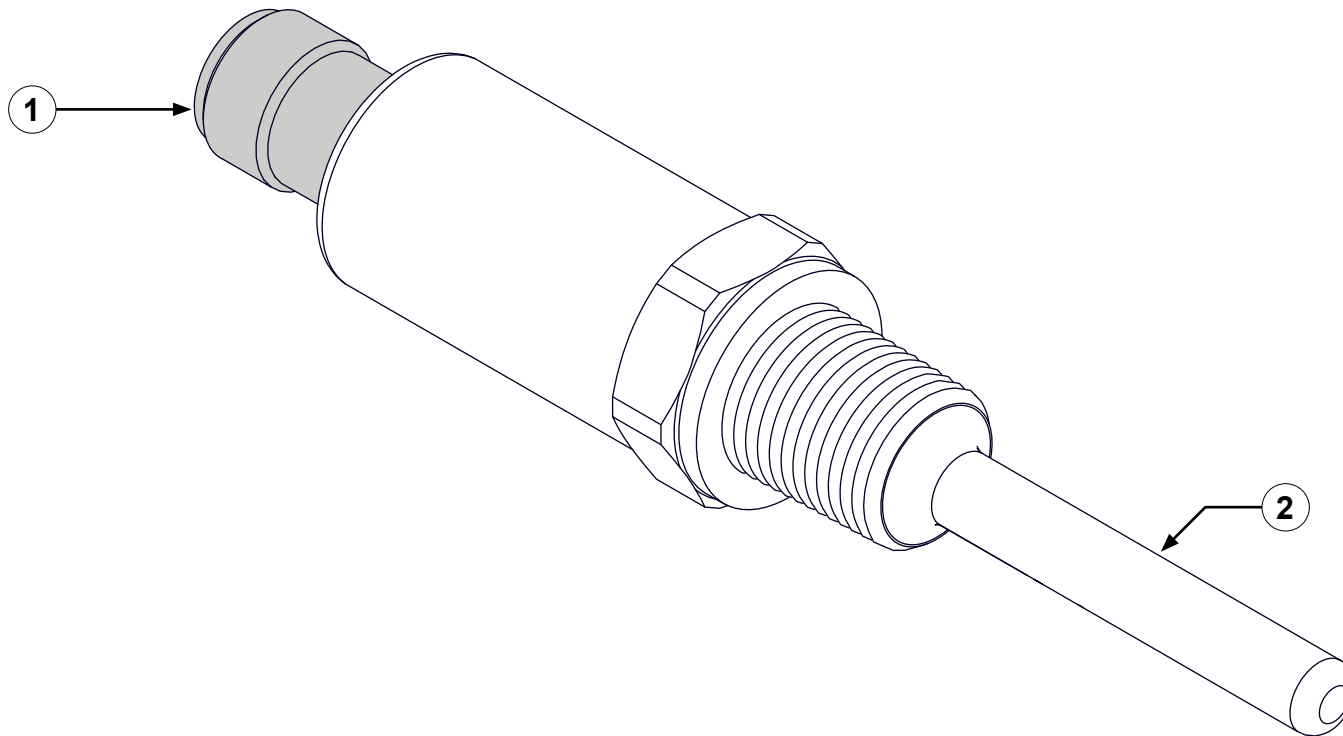


Hydraulic Reservoir Level Sensor

Feature	Description
1 Red wire	Vcc, +12 V
2 Blue wire	Signal
3 Black wire	Ground
4 Connector	This connects to the cable from the control box—M12.
5 Optical sensor	This monitors the hydraulic fluid level—1/4-inch NPT.

Hydraulic Reservoir Temperature Sensor

The temperature sensor measures the hydraulic fluid temperature in the reservoir.

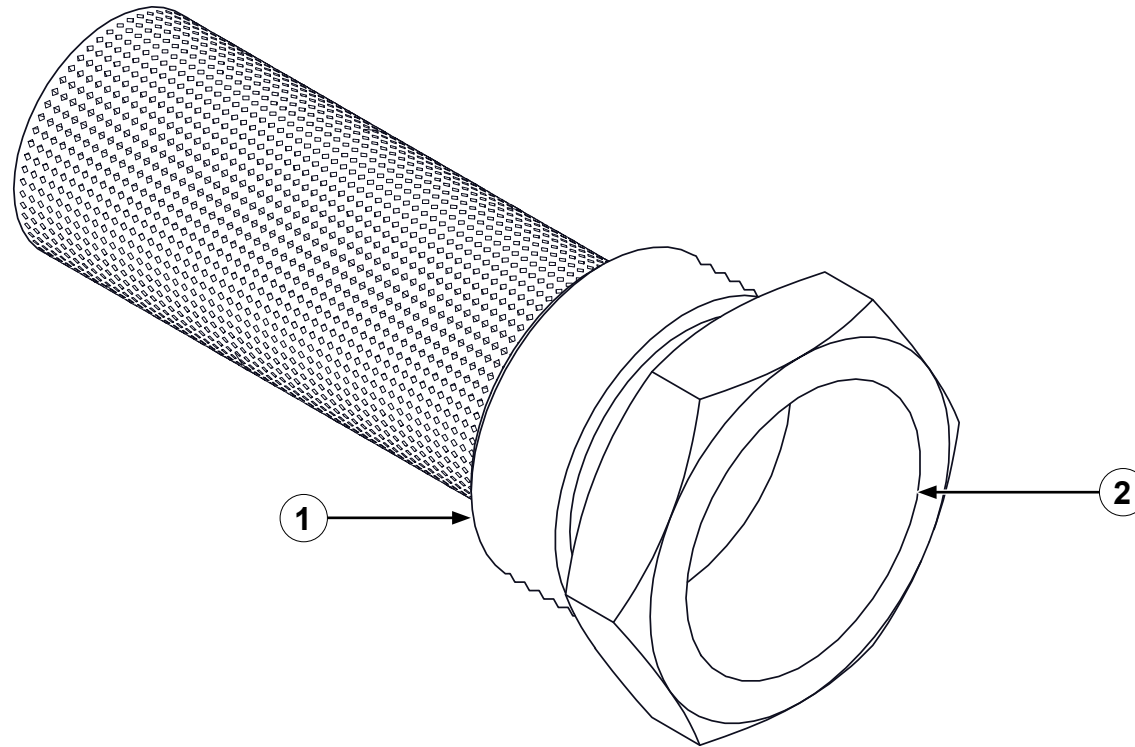


Hydraulic Reservoir Temperature Sensor

Feature	Description
1 Connector	This connects to the cable from the control box—M12.
2 Temperature probe	This measures the hydraulic fluid temperature—1/4-inch NPT.

Hydraulic Reservoir Suction Strainer

The suction strainer filters debris from the hydraulic fluid before it exits the reservoir.

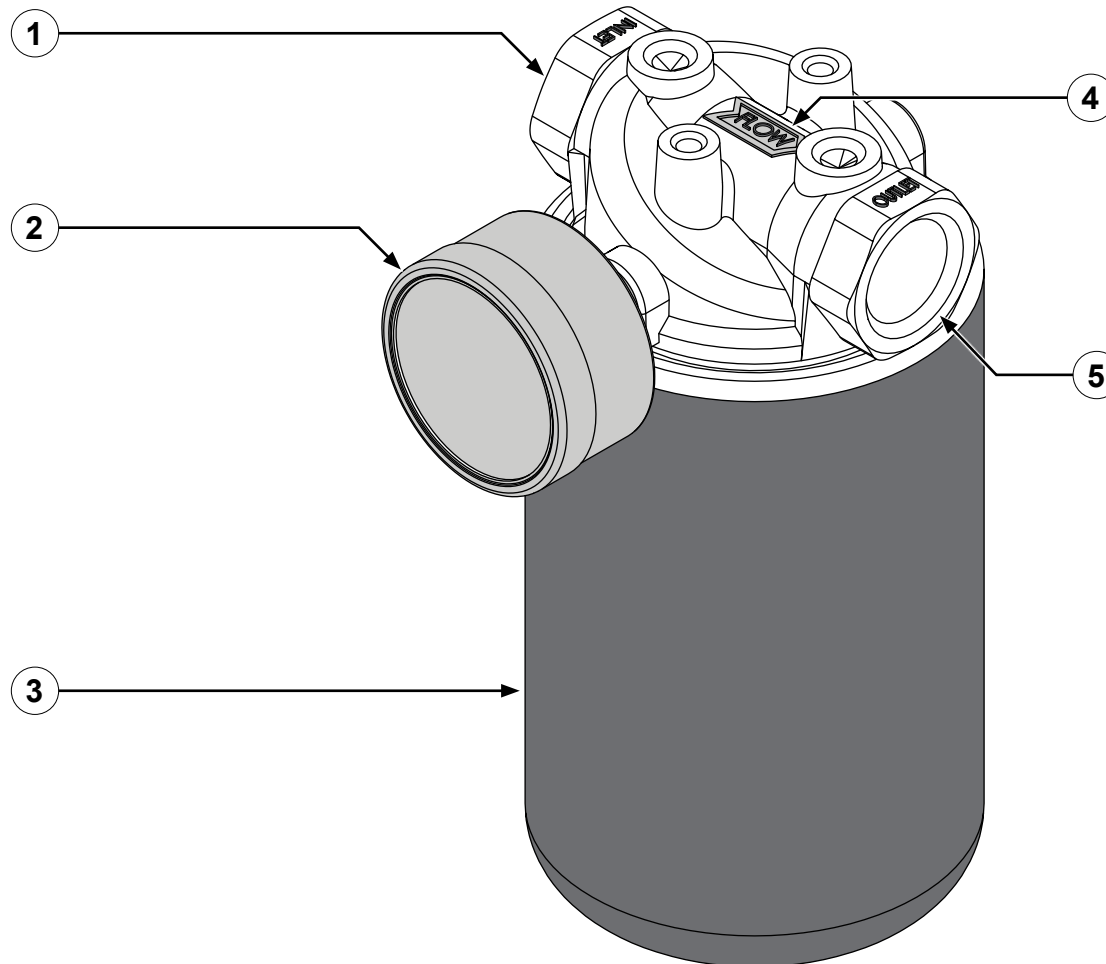


Hydraulic Reservoir Suction Strainer

Feature	Description
1 1-1/4-inch NPT thread	This threads into the reservoir tank.
2 3/4-inch NPT thread	This threads into the output fitting.

Hydraulic Fluid Filter Components

The hydraulic fluid filter assembly filters the hydraulic fluid and contains the filter head, filter, and filter life indicator.

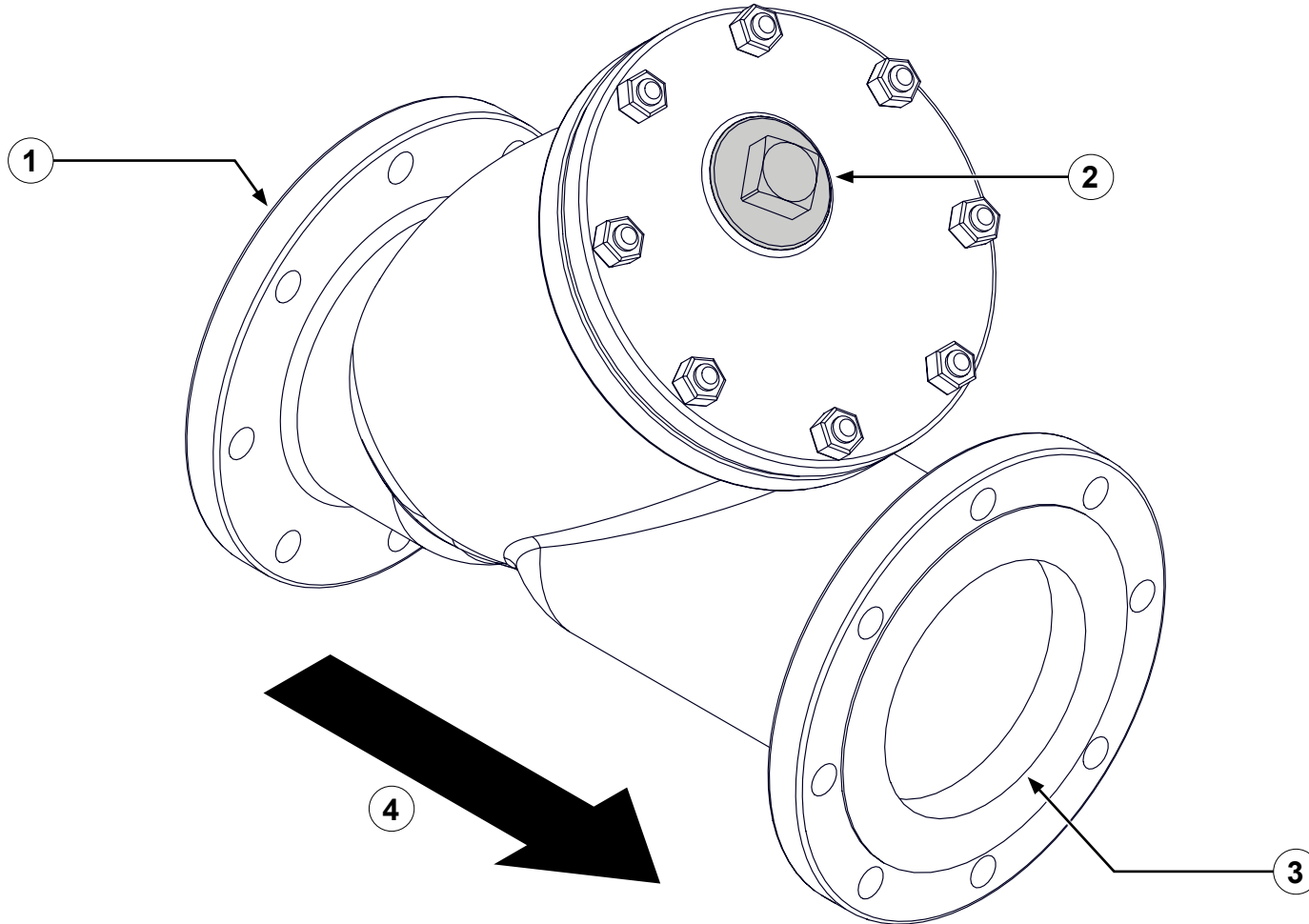


Hydraulic Fluid Filter Components

Feature	Description
1 Filter-head inlet	This is the inlet for the hydraulic fluid—3/4-inch NPT.
2 Filter-life indicator	This indicates the filter condition.
3 Filter	This filters the hydraulic fluid.
4 Flow indicator	This shows the flow direction.
5 Filter-head outlet	This is the outlet for the hydraulic fluid—3/4-inch NPT.

Concentrate strainer

The concentrate strainer collects debris that would otherwise flow into the system and possibly damage the concentrate pump.

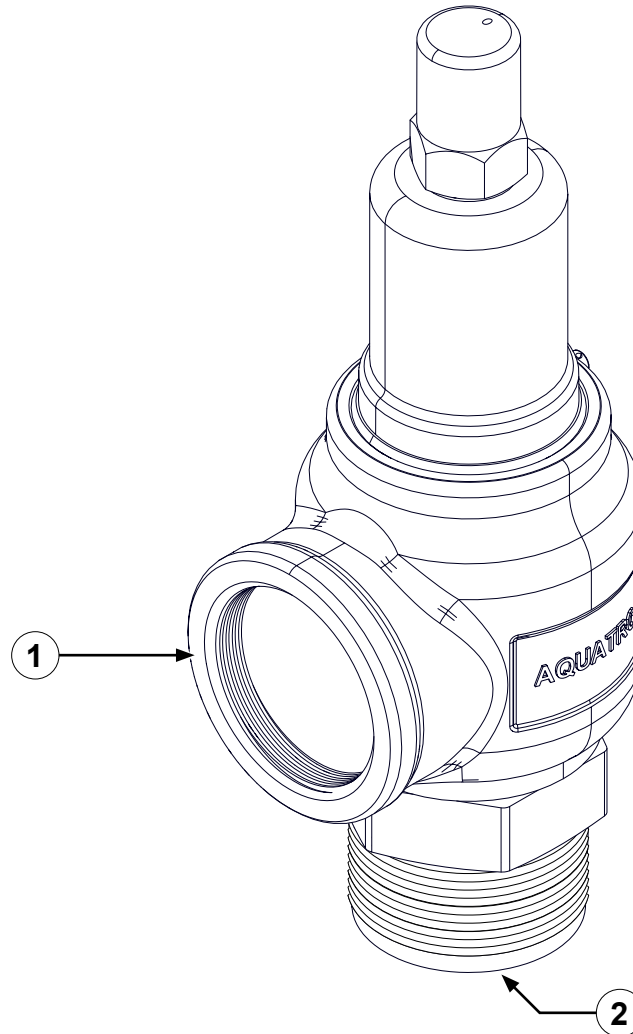


Concentrate strainer

Feature	Description
1 Inlet	This is where the concentrate enters the strainer.
2 Blow-off plug	This enables self-cleaning to reduce maintenance time.
3 Outlet	This is where the concentrate exits the strainer.
4 Flow direction	This is the concentrate direction of flow.

Pressure Relief Valve

The pressure relief valve limits the pressure in the concentrate discharge manifold by opening when the pressure reaches a predetermined level.

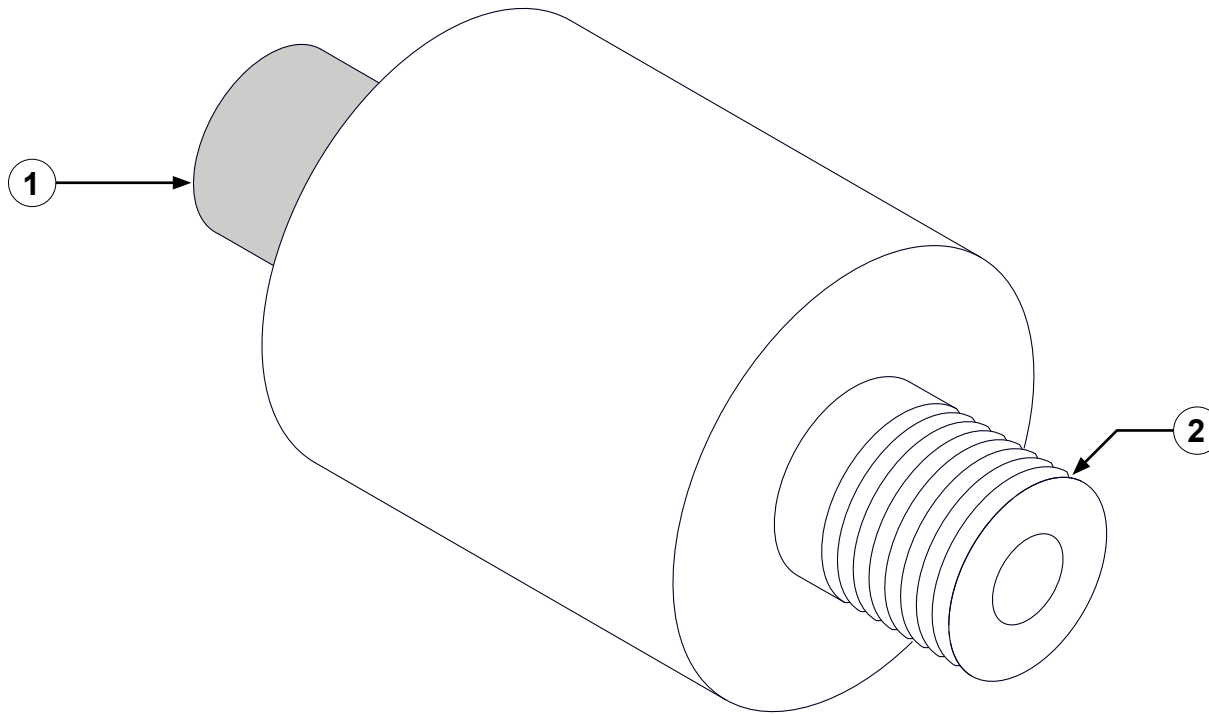


Pressure Relief Valve

Feature	Description
1 Outlet	This is where the concentrate exits the pressure relief valve—2-inch NPT.
2 Inlet	This is where the concentrate enters the pressure relief valve—2-inch NPT.

Pressure Transducer

The pressure transducer measures the concentrate and discharge line pressure, respectively.

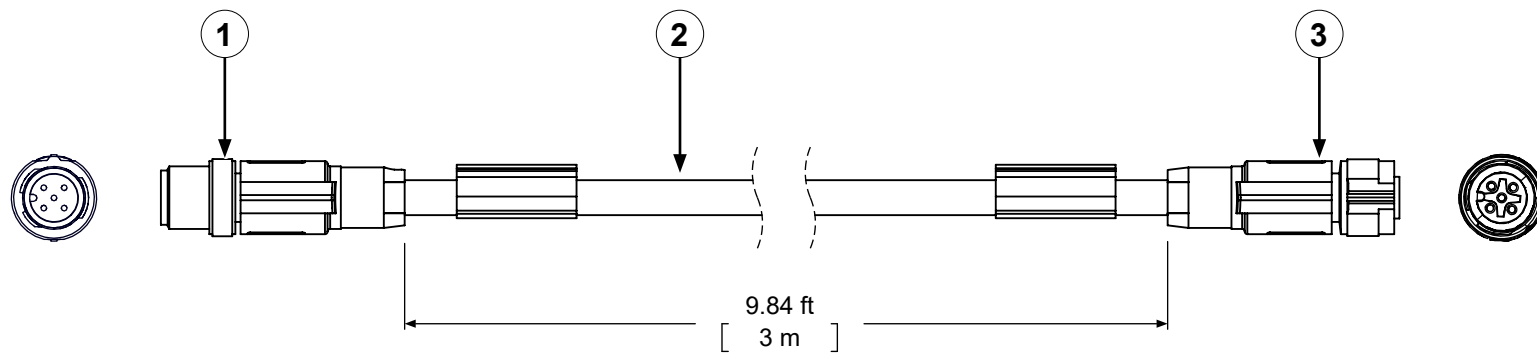


Pressure Transducer

Feature	Description
1 Connector—M12	This connects to the cable from the PDM control box and power.
2 Pressure transducer	This measures the pressure in the line—1/4-inch NPT.

3.0 Meter Sensor Cable

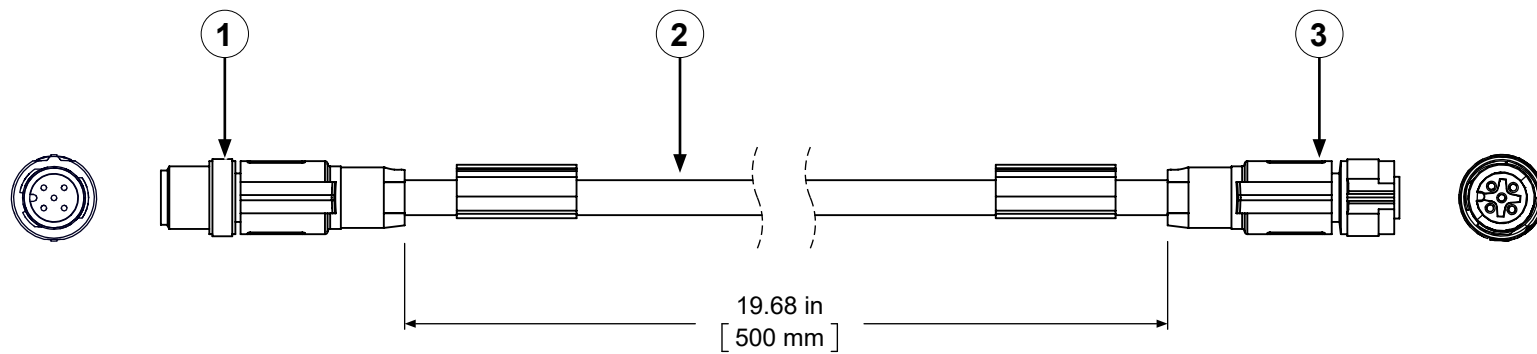
The sensor cable communicates data between the various connections. It is typically a yellow, gray, or black color. The sensor cable is not interchangeable with the CANbus extension cable. **Note:** You can connect 2 or more cables together to achieve a desired length.



Feature	Description
1 M12 connector	This is a male connector.
2 Cable	This is typically a yellow, gray, or black cable jacket.
3 M12 connector	This is a female connector.

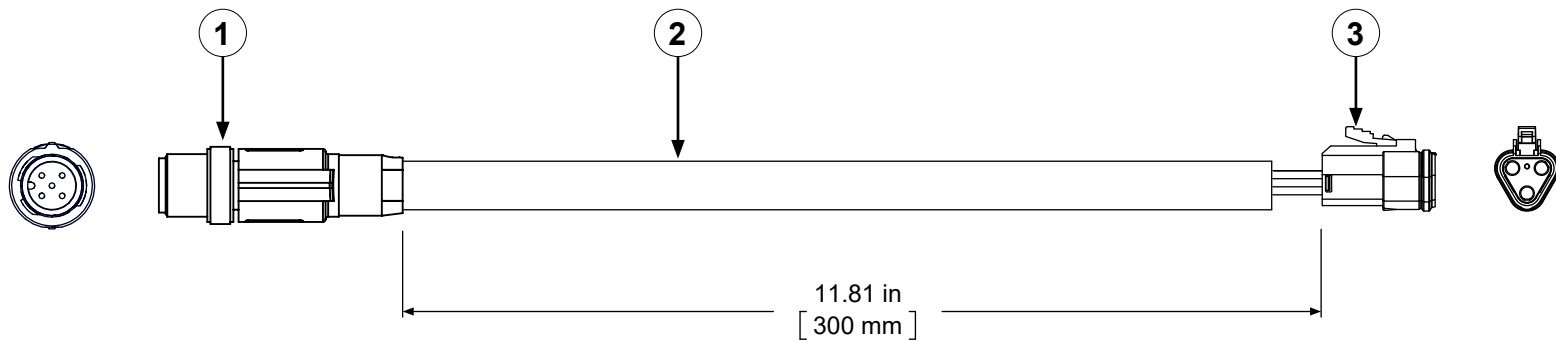
0.5 Meter Sensor Cable

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



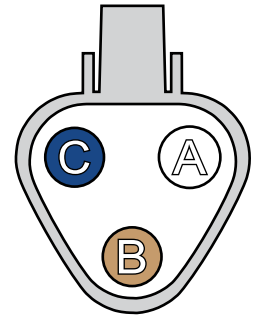
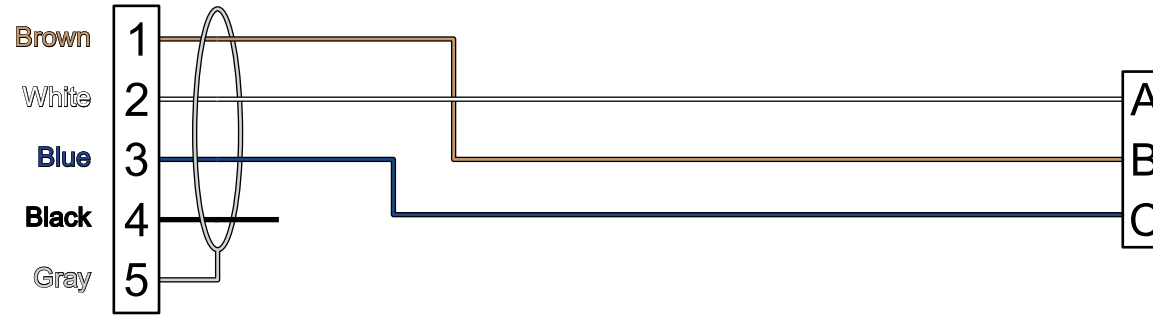
Feature	Description
1 M12 connector	This is a male connector.
2 Cable	This is typically a yellow, gray, or black cable jacket.
3 M12 connector	This is a female connector.

Concentrate Pump Speed Sensor Cable



Feature	Description
1 M12 connector	This connects to the concentrate pump connector on the control box, or an extension cable connected to the control box.
2 Cable	This is a yellow cable jacket.
3 Deutsch connector	This connects to the concentrate pump speed sensor connector.

Concentrate Pump Speed Sensor Cable—Schematic



M12 Connector

- | | |
|---|------------|
| 1 | Vcc, +24 V |
| 2 | Signal |
| 3 | Ground |
| 4 | N/C |
| 5 | Shield |

Phoenix Contact—1405879
or equivalent

Deutsch Connector

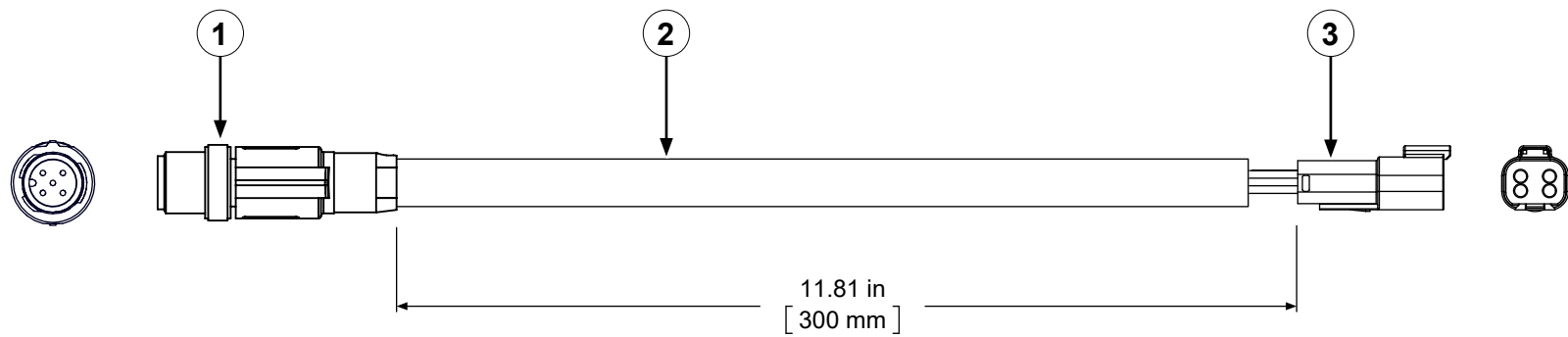
- | | |
|---|------------|
| A | Signal |
| B | Vcc, +24 V |
| C | Ground |

Shell—934452102 (1)

Wedge—934482003 (1)

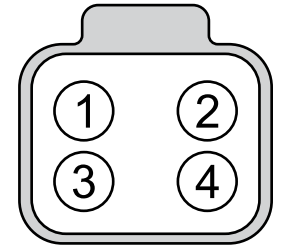
Sockets—match to counterpart
or equivalents

Hydraulic Pump Swashplate Control Cable



Feature	Description
1 M12 connector	This connects to the hydraulic pump connector on the control box, or an extension cable connected to the control box.
2 Cable	This is a yellow cable jacket.
3 Deutsch connector	This connects to the hydraulic pump swashplate connector.

Hydraulic Pump Swashplate Control Cable—Schematic



M12 Connector

- | | |
|---|---------------|
| 1 | PWM out—AB |
| 2 | PWM out—CD |
| 3 | PWM return—AB |
| 4 | PWM return—CD |
| 5 | Shield |

Phoenix Contact—1405879
or equivalent

Deutsch Connector

- | | |
|---|---------------|
| 1 | PWM out—AB |
| 2 | PWM out—CD |
| 3 | PWM return—AB |
| 4 | PWM return—CD |

Shell—934453102 (1)

Wedge—934483003 (1)

Sockets—match to counterpart
or equivalents

Notes

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.
- Routing and securing the wiring.
- 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.**



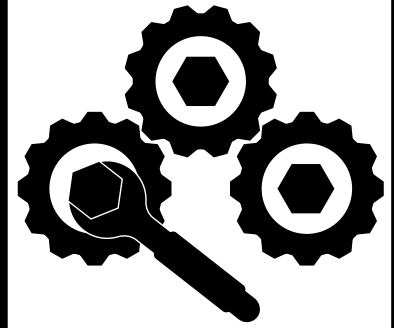
Modifying the Equipment

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

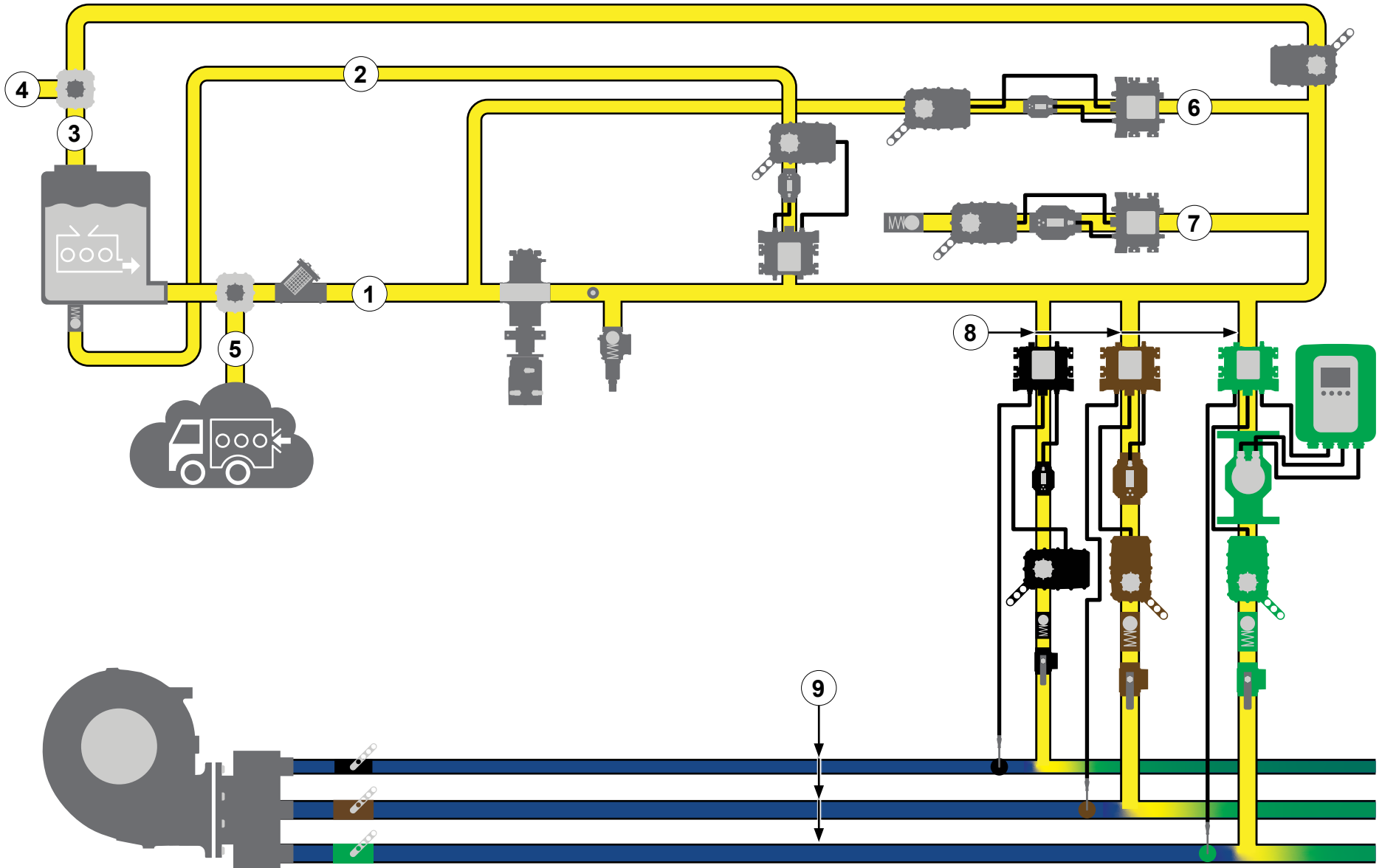
Be aware that the installation instruction may include optional equipment not included in your application.

Determining 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.

Plumbing Layout

Use the illustration as a guide to layout the plumbing connections for your application.

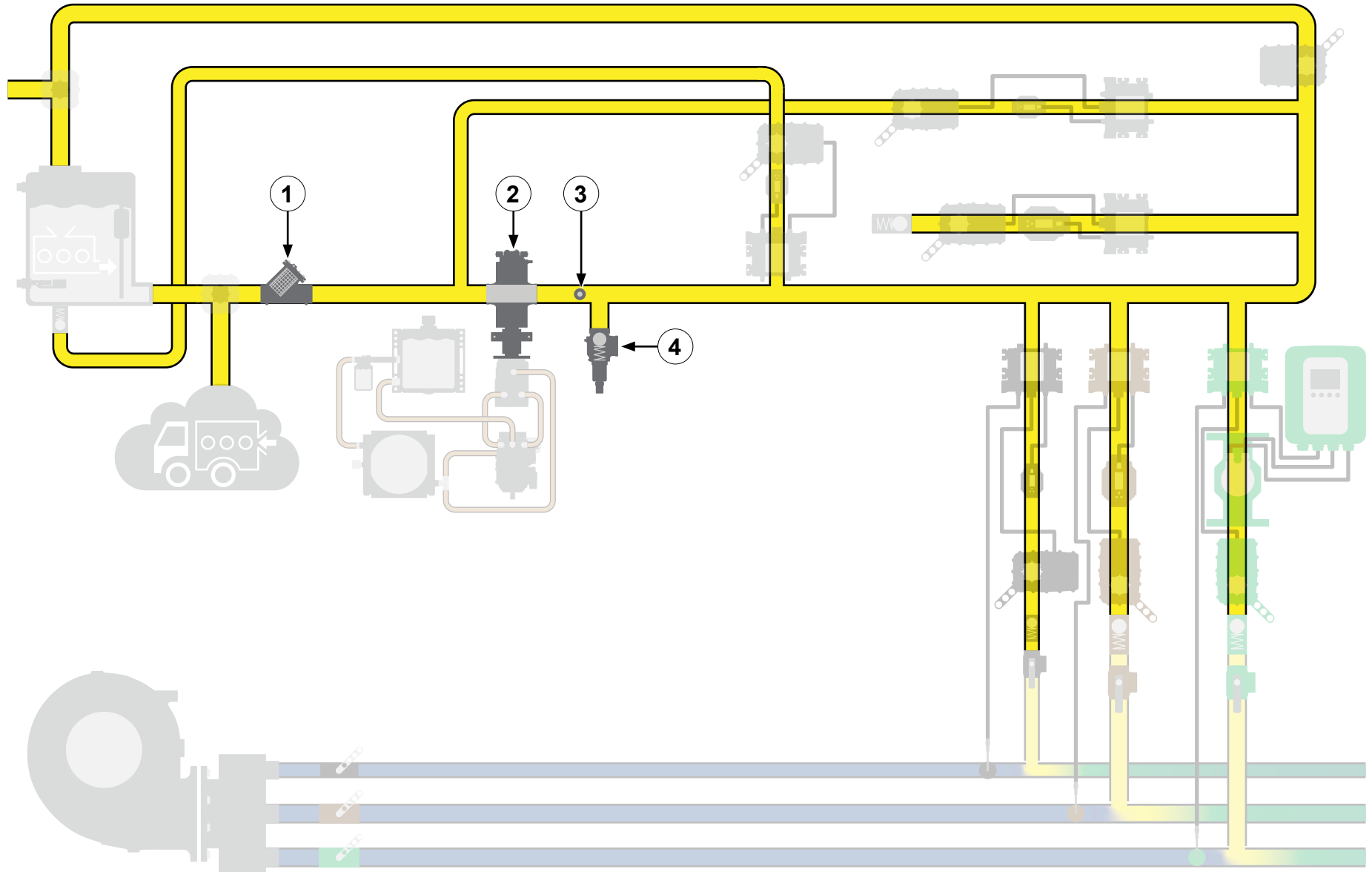


Plumbing Layout

Feature	Description
1 Concentrate supply line	This transports concentrate around the system. This is a low-pressure line.
2 Concentrate supply refill line	This allows you to fill the on-board tank from an auxiliary source. This is a low-pressure line.
3 Priming line	This evacuates air from the concentrate pump inlet as the system primes before operation. This is a low-pressure line.
4 Priming bypass line	This prevents contaminating the concentrate during testing and training. When water is substituted for concentrate during training or testing, and you have concentrate in the supply tank, this bypass valve diverts water from the supply tank to prevent concentrate contamination. It is also very important to make sure that you drain any remaining water in the line before priming the system with concentrate. This is a low-pressure line.
5 Auxiliary concentrate supply line	This allows you to source concentrate from an external source. This is a low-pressure line.
6 Low-flow bypass line	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. This is a low-pressure line.
7 Transfer line	This line allows you to transfer or relay concentrate to another location. This is a high-pressure line.
8 Discharge line assembly	This manages the concentrate injected into the solution-capable discharge. This is a high-pressure line.
9 Solution-capable discharge	This transports clear water and is capable of creating a foam solution. This is a high-pressure line.

Concentrate Supply Component Location

Use the illustration and table to understand the hydraulic component location in the plumbing layout.

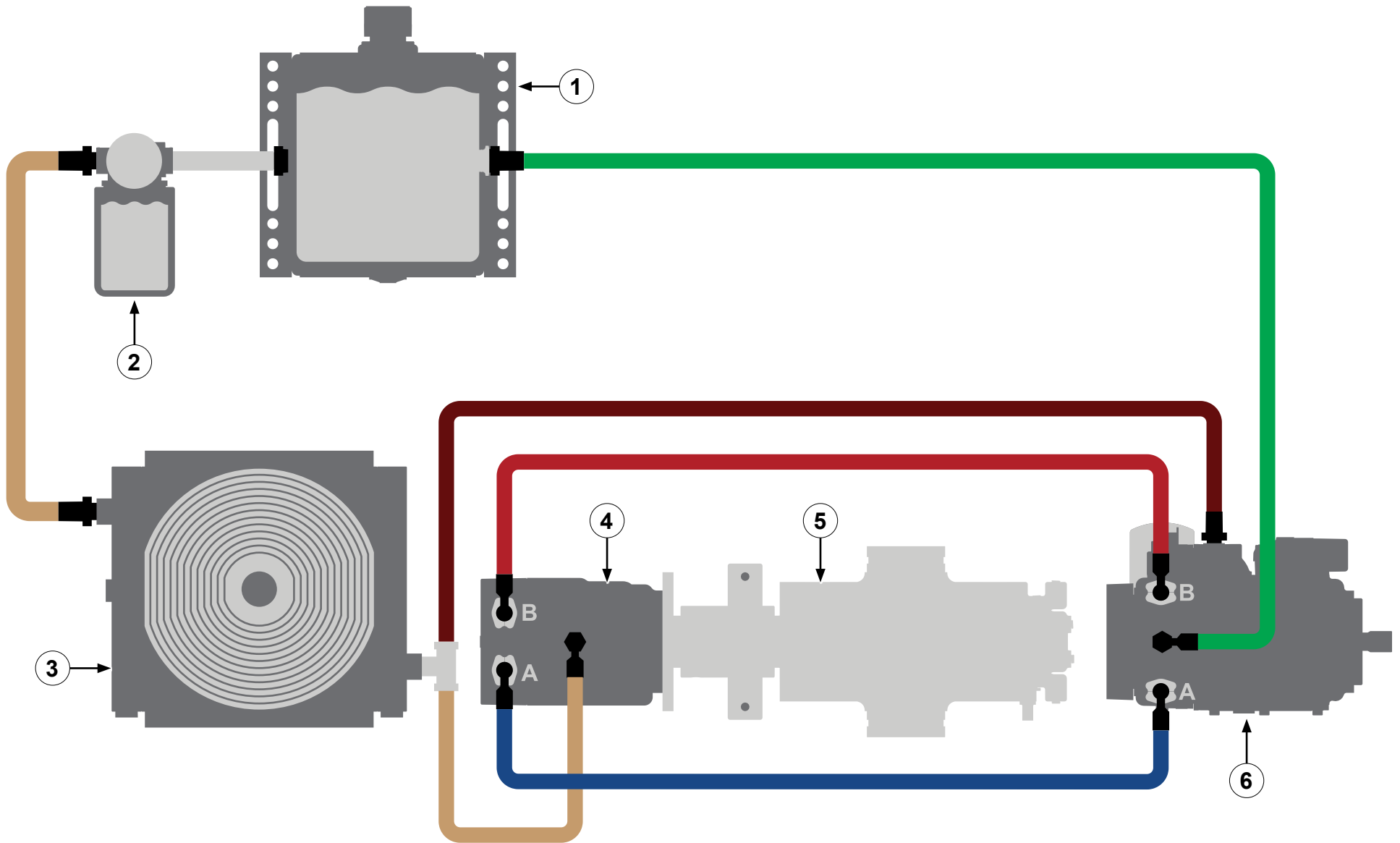


Concentrate Supply Component Location

Feature	Description
1 Concentrate strainer	This collects debris that would otherwise flow through the system and could damage the concentrate pump.
2 Concentrate pump	This circulates the foam concentrate through the system.
3 Pressure transducer	This measures the pressure in the concentrate discharge line.
4 Pressure relief valve	This limits the pressure in the concentrate discharge manifold by opening when the pressure reaches a predetermined level.

Hydraulic Component Layout

Use the illustration and table to understand the relationship between the hydraulic component locations and hose connections.

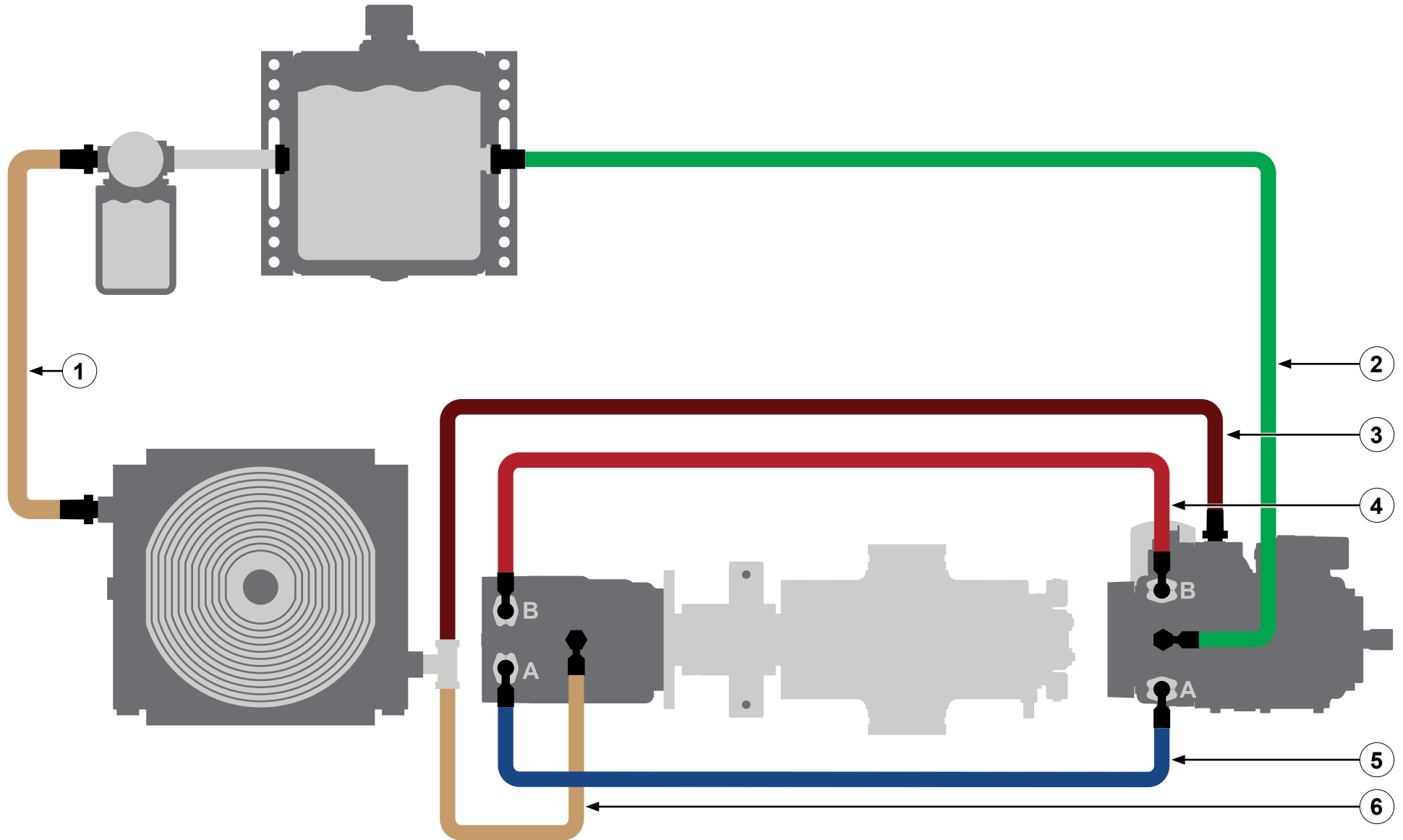


Hydraulic Component Layout

Feature	Description
1 Hydraulic fluid reservoir	This contains hydraulic fluid.
2 Hydraulic fluid filter	This filters the hydraulic fluid.
3 Hydraulic fluid heat exchanger	This cools the hydraulic fluid.
4 Hydraulic motor	This drives the concentrate pump.
5 Concentrate pump	This transports the concentrate through the system.
6 Hydraulic pump	This drives the hydraulic motor.

Installing the Hydraulic Hoses

Use the illustration and table to install the hydraulic hoses. **Note:** All hose, connectors, and fittings are installer supplied.



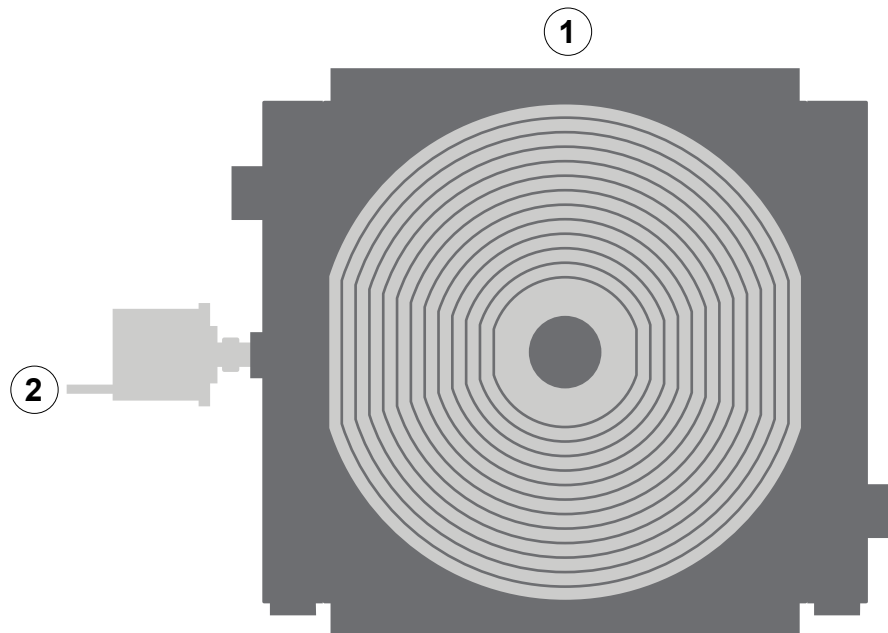
Hydraulic Hoses—Overview

Hose	First Connector	Second Connector
1 Hydraulic filter to heat exchanger hose—3/4-inch, 250 psi	Filter end—3/4 NPT, female	Heat exchanger end—#16 SAE, male
2 Hydraulic reservoir to hydraulic motor—3/4-inch, 250 psi	Reservoir end—3/4-inch NPT, male	Pump end—1-5/8–12-inch, ORB, male
3 Hydraulic pump to heat exchanger—3/4-inch, 250 psi.	Pump end—1-1/16–12-inch, ORB, male	Heat exchanger end—#16 SAE, male
4 Hydraulic pump B-port to hydraulic motor B-port—1-inch, 6000 psi	Pump end—1-inch, C62 split flange boss	Motor end—1-inch, C62 split flange boss
5 Hydraulic pump A-port to hydraulic motor A-port—1-inch, 6000 psi	Pump end—1-inch, C62 split flange boss	Motor end—1-inch, C62 split flange boss
6 Hydraulic pump to heat exchanger—3/4-inch, 250 psi	Pump end—1-1/16–12-inch, ORB, male	Motor end—1-1/16–12-inch, ORB, male

Installing the Hydraulic Fluid Heat Exchanger and Controller

Use the illustration and instructions to install the heat exchanger and controller.

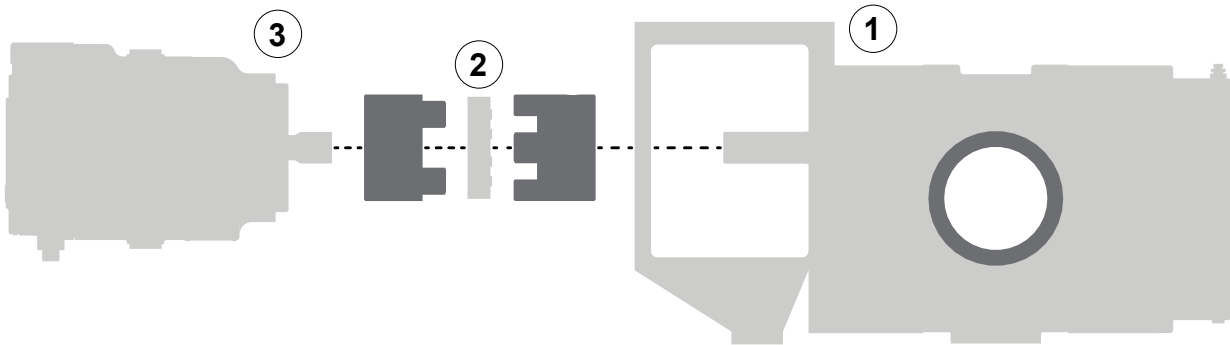
- 1 Install the heat exchanger into the apparatus.
- 2 Install the controller by doing the following:
 - Install the controller into the heat exchanger.
 - Use the instructions from the controller manufacturer to connect it to apparatus power.
 - Use the instructions from the controller manufacturer to set the operation of the heat exchanger fan.



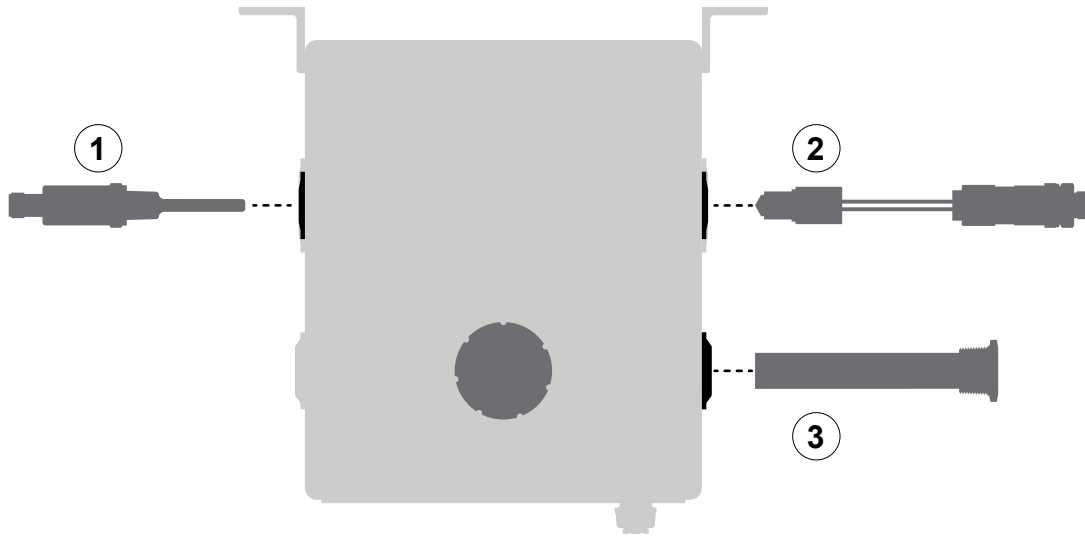
Installing the Hydraulic Motor and Concentrate Pump

Use the illustration and instructions to connect the hydraulic motor to the concentrate pump.

- 1 Install the concentrate pump into the apparatus and connect it to the concentrate plumbing.
Refer to: "**Plumbing Layout**" on page 48.
- 2 To install the couplers, do the following:
 - Loosely install motor hub to the hydraulic motor.
 - Loosely install the pump hub to the concentrate pump.
- 3 To complete the install, do the following:
 - Place the elastomer spider between the hubs.
 - Loosely mount the hydraulic motor to the mount assembly on the concentrate pump.
 - Make any adjustments to the spider coupler and securely tighten each hub.



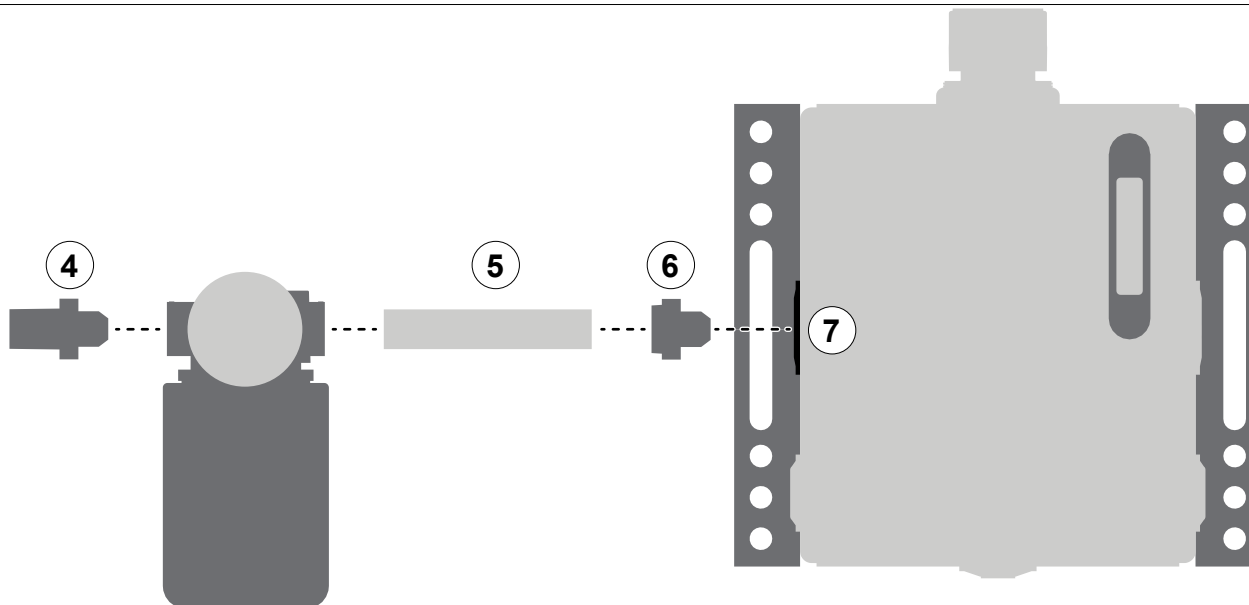
Assembling the Hydraulic Fluid Reservoir



Use the illustrations and instructions to assemble the hydraulic fluid reservoir.

Note: The illustrated component locations are not definitive. The ports on the reservoir are mirrored and interchangeable to best suit your application.

- 1 Install the hydraulic reservoir temperature sensor into one of the 1/4-inch NPT ports.
- 2 Install hydraulic reservoir level sensor into the remaining 1/4-inch NPT port.
- 3 Install the hydraulic reservoir section strainer into the appropriate 3/4-inch NPT port.
- 4 Locally source and install a 3/4-inch female NPT x 3/4-inch male NPT fitting to the filter-head inlet.
- 5 Locally source and install a 3/4-inch NPT x 3/4-inch male NPT pipe of an appropriate length to the filter-head outlet.
- 6 Locally source and install a 3/4-inch female NPT x 1-inch male NPT fitting to the pipe.
- 7 Install the hydraulic fluid filter assembly into the appropriate 1-inch female NPT port.

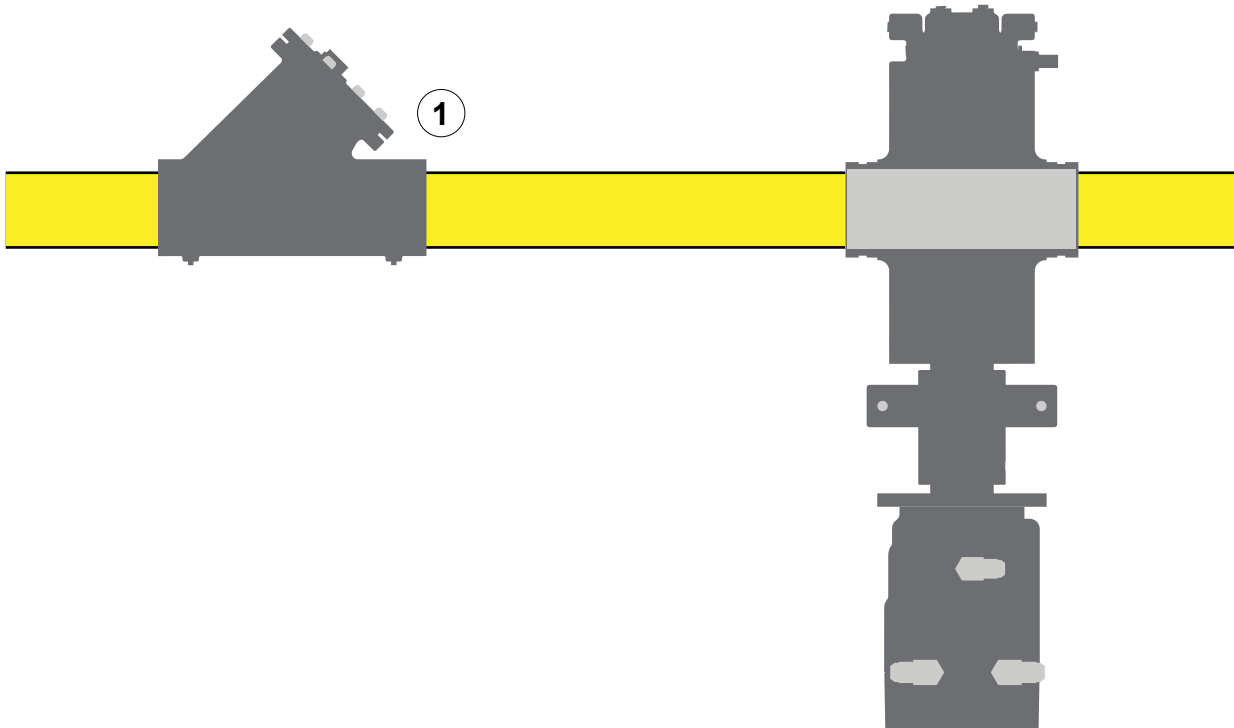


Installing the Concentrate strainer

Use the illustration and instructions to install the concentrate strainer.

- 1 Install the concentrate strainer downstream of the concentrate source, and upstream of the concentrate pump, in the concentrate line. Refer to: **"Plumbing Layout" on page 48.**

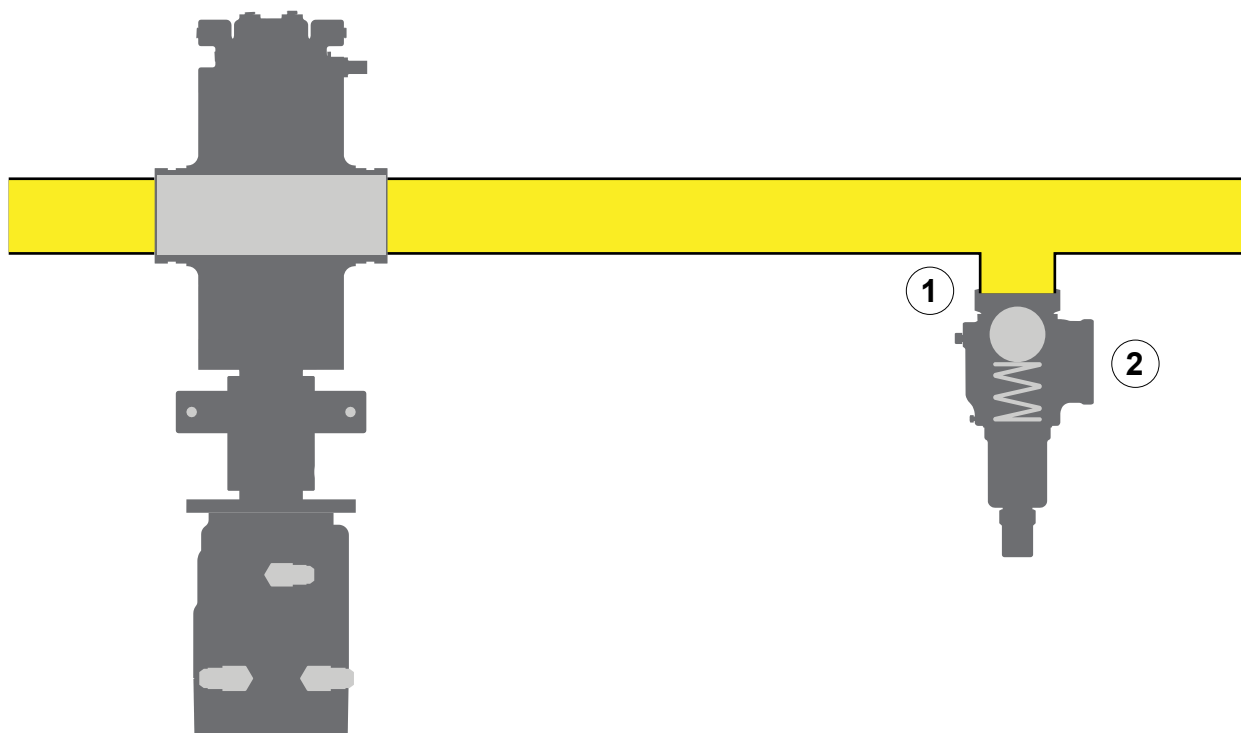
Note: Make sure that you orient the strainer to follow the correct direction-of-flow. Refer to: **"Concentrate strainer" on page 34.**



Installing the Pressure Relief Valve

Use the illustration and instructions to install the pressure relief valve.

- 1 Install the pressure relief valve downstream of the concentrate pump in the concentrate line. Refer to: "**Plumbing Layout**" on page 48.
- 2 Connect the pressure relief valve discharge to an appropriate container or back into the low pressure side of the system to contain any relieved concentrate.

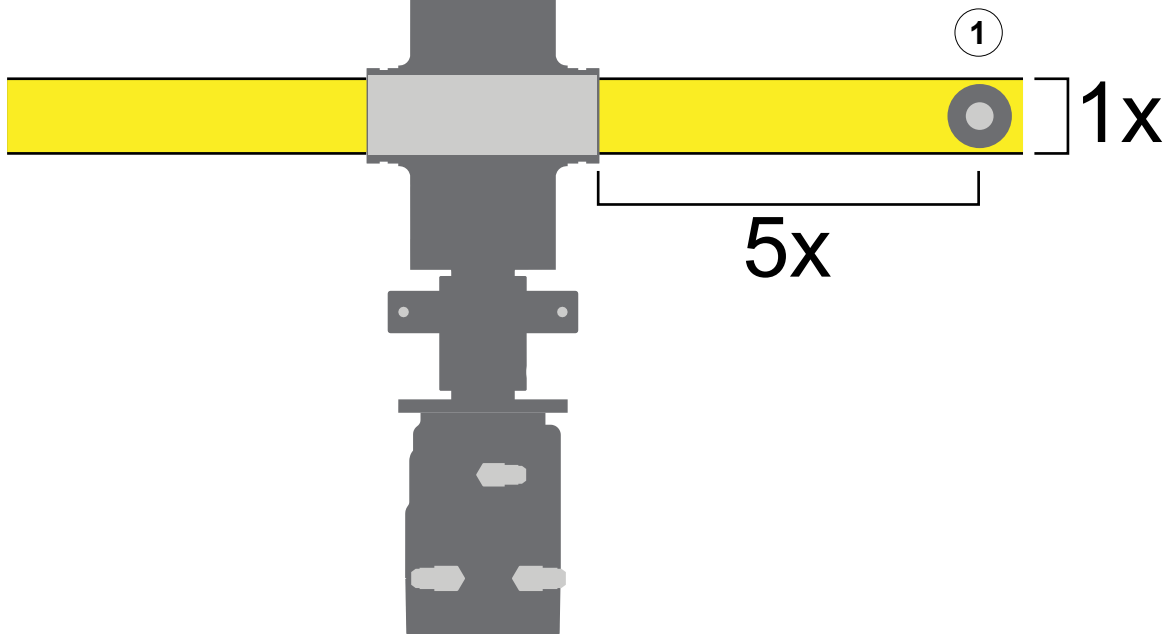


Installing the Pressure Transducer

Use the illustration and instructions to install the pressure transducer.

- 1 Install the pressure transducer downstream of the concentrate pump in the concentrate line. Make sure that you install the pressure transducer a distance of at least 5 times the inner diameter of the concentrate line, downstream of the concentrate pump outlet. Refer to: **"Plumbing Layout" on page 48.**

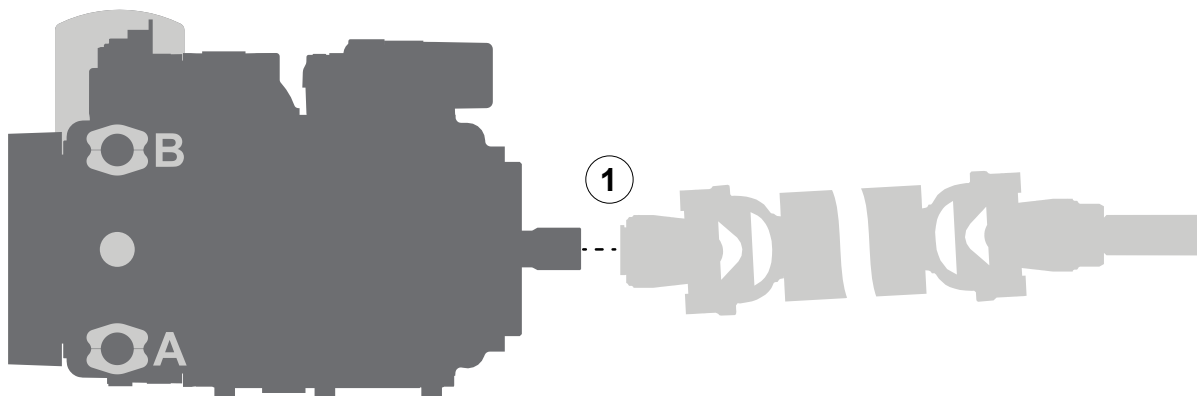
Note: Do not install the pressure transducer in an elbow section of the plumbing.



Connecting the Hydraulic Pump to the Apparatus Drive

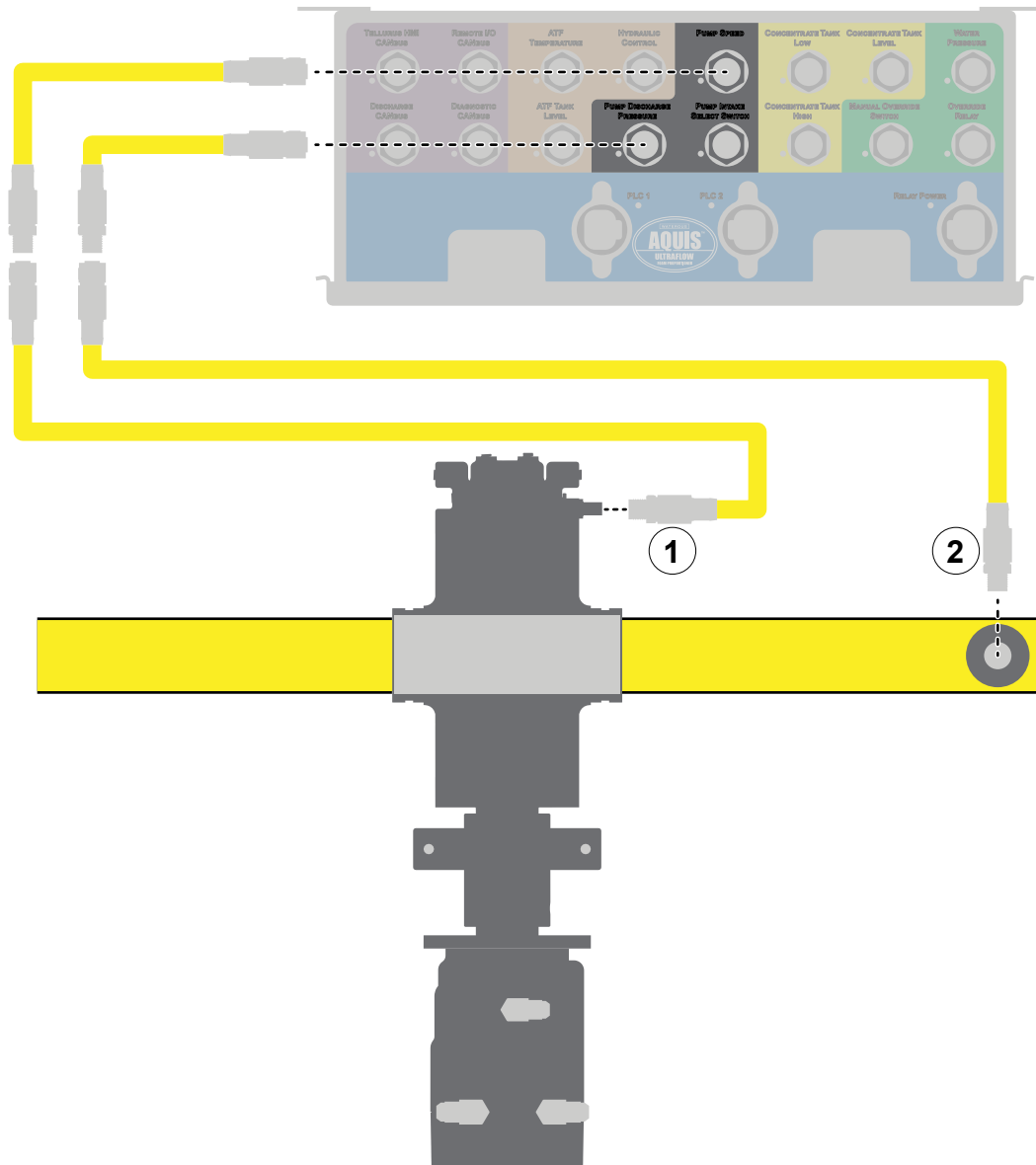
Use the illustration and instructions to connect the hydraulic pump to the apparatus drive line.

- 1 Locally source the appropriate components to connect the hydraulic pump to the apparatus-drive.



Notes

Connecting the Concentrate Pump, Pressure Transducer, and Source Select Valve



Use the illustration and instructions to connect the concentrate pump speed sensor, concentrate line pressure transducer.

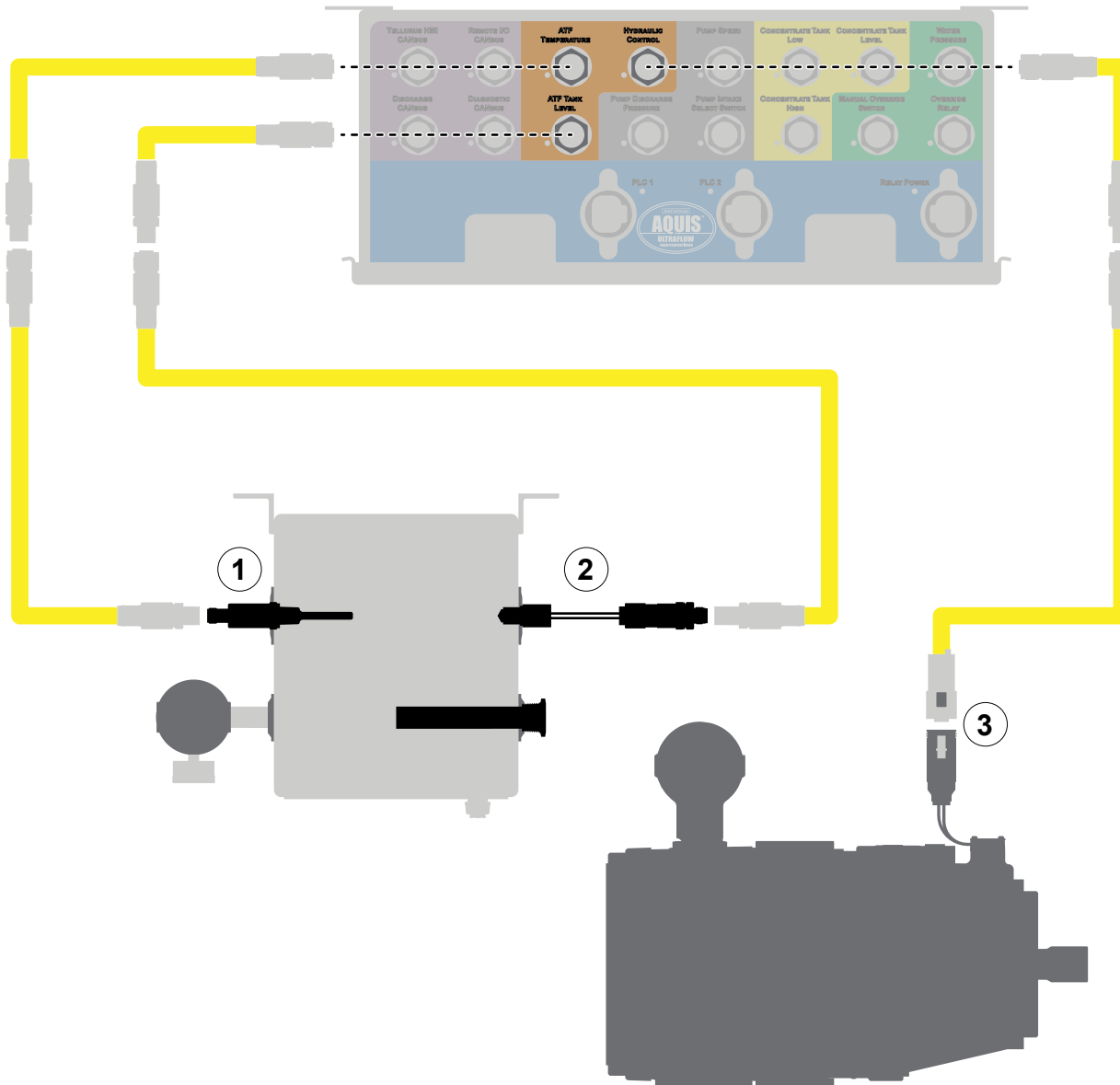
- 1 Use a sensor cable to connect the concentrate pump speed sensor to the control box—the pump speed connection.

Note: Connect 2 or more cables together to achieve a desired length.

- 2 Use an M12 cable to connect the concentrate line pressure transducer to the control box—pump discharge pressure connection.

Note: Connect 2 or more cables together to achieve a desired length.

Connecting the Hydraulic Fluid Reservoir Sensors, Suction Strainer, and Hydraulic Pump



Use the illustration and instructions to connect the hydraulic reservoir sensors, and the hydraulic pump to the control box.

- 1 Use an M12 cable to connect the temperature sensor to the control box—the ATF temperature connection.

Note: Connect 2 or more cables together to achieve a desired length.

- 2 Use an M12 cable to connect the reservoir level sensor to the control box—ATF tank level connection.

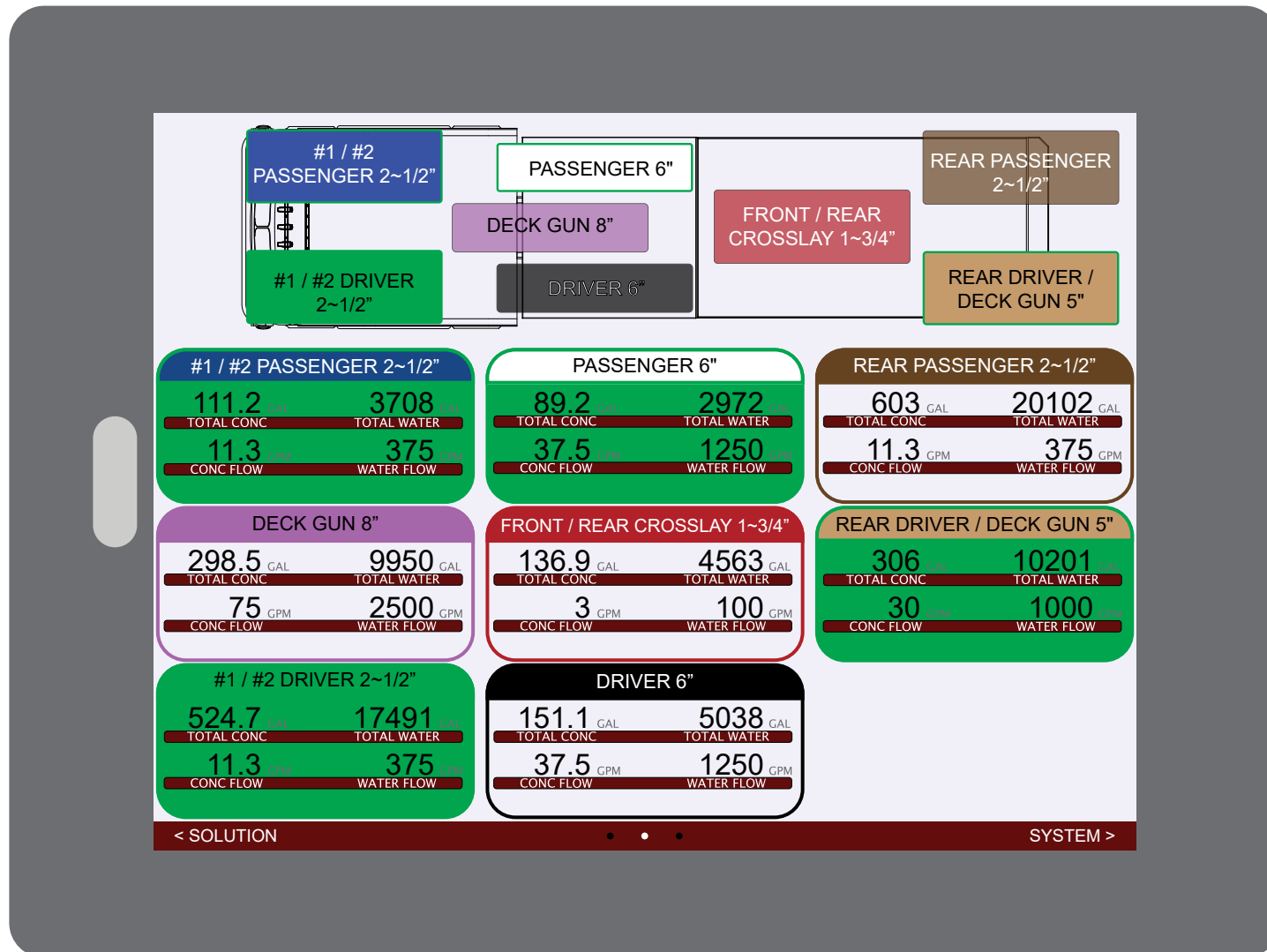
Note: Connect 2 or more cables together to achieve a desired length.

- 3 Use the hydraulic pump swash plate control cable to connect the hydraulic motor to the control box—the hydraulic control connection.

Note: Connect to an M12 cable to achieve a desired length.

Operating the Hydraulic System

The hydraulic system is managed by the AQUIS ULTRAFLOW control system hardware and software. You can operate the system through the 8-inch or 15-inch Tellurus HMI.



Maintenance Schedule

Use the documentation that you received with your system to develop a maintenance schedule for your specific application. Consider environmental conditions, hours of operation, and other factors specific to your application to develop a suitable maintenance schedule.

WATEROUS

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