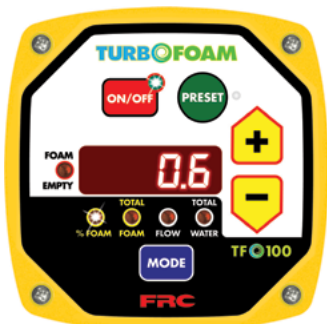


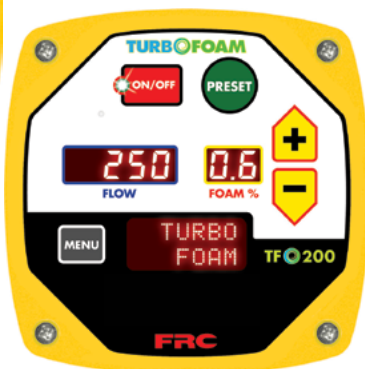
# TURBOFOAM

## DIRECT INJECTION FOAM PROPORTIONING SYSTEM WITH ELECTRIC FOAM CONCENTRATE PUMP

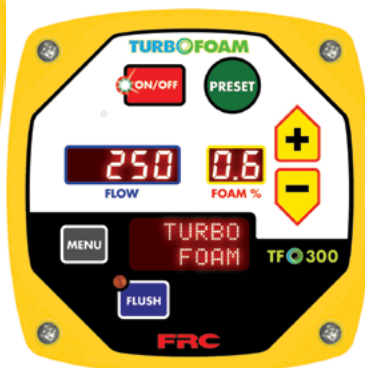
### MODELS: TFC100, TFC200, TFC300, TFC400



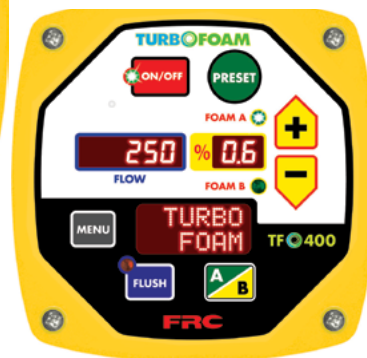
TFC100



TFC200



TFC300



TFC400

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# INTRODUCTION

## Overview

The TurboFoam is an automatic regulating, direct inject foam proportioning system. It performs at most discharge flow rates and pressures with a wide range of foam concentrates. There are multiple models available that offer a variety of foam proportioning capabilities through, system flexibility, custom programming, control and hardware options.

All TurboFoam system models feature an electric pump that injects foam concentrate directly into the discharge water stream, a programmable control module, and a paddlewheel flow sensor. Some models include a manual or electric ABF selector valve (**A** foam, **B** foam, **Flush**).

The **TFC100** models are for use with a single foam tank.

The **TFC200** models are for use with a single foam tank or two foam tanks when the manual ABF selector option is installed.

The **TFC300** models are for use with a single foam tank and include an electric valve to provide electronic flush control. A flush button with LED indicator on the control module operates the valve.

The **TFC400** models are for use with two foam tanks and include the 3-valve electric ABF selector to provide automatic electronic flush control. A flush button with LED indicator and an A/B button with foam A and foam B indicator LEDs on the control module operate the ABF selector.

The TurboFoam system is designed around the foam concentrate pump. FRC offers different size pumps that can be paired with any one of the four control modules. The maximum injection rate ranges from the smallest pump at 1.6 GPM to the largest pump at 6.5 GPM.

The pumps are triplex plunger types that have die-cast bodies, forged brass heads, solid ceramic plungers, and use Viton seals. Each pump is powered by an electric motor that is designed for use in wet environments. The motors range in size from 1/3 to 1 horsepower. The foam pump and motor, along with a pressure relief valve, calibration bypass valve, and the foam pump control are all part of the foam pump assembly.

A panel mounted control module provides the operator interface with the TurboFoam system. There are four different models available. Each control module has **PRESET**, **+** (increase), and **-** (decrease) buttons to input the desired percent of foam solution. All models have the program capability to regulate class A and B foam concentrates. Single tank systems are set for A or B foam at installation, dual tank systems use a select A/B input to change between the two.

A paddlewheel flow sensor monitors the water flow in the discharge and provides data to the control module. The program calculates the correct amount of concentrate and adjusts the foam concentrate pump RPM based on the proportioning percent set by the operator. The system provides a consistent foam solution at the discharge regardless of water flow fluctuations.

Tank empty information is provided to the control module from a TankVision Pro display via the FRC datalink or from a tank float switch wired to the control module. With a TankVision Pro connected the programming can be set so the message display provides information on the time remaining for operation at current concentrate usage.

# Features

Automatic Foam Proportioning

Class A and Class B Foam

Push Button Control

Preset Foam Percent Button

Single and Dual Foam Tank Systems

Foam Tank Low and Empty Warnings

Time Left to Tank Empty (w/TankVision Pro Only)

Pump Pressure Relief Valve

Flow Totaling for Foam Concentrate and Water

Pre-Programmed Values for Power-Up

Manual Mode

USB Port Interface

Over 30 Programmable Codes

Service Reminders

CAFS Valve Control Signal

Flush Button (TFC300/400 Only)

A/B Selector Button (TFC400 Only)

Remote ON/OFF Switch (Option)

Electric Flush Valve and Panel Button (Option)

Multiple Discharge Sensors w/Summing Box (Option)

Remote Control Head (Optional)

**Table 1. TurboFoam Standard Components and Options**

MODEL	TFC116	TFC121	TFC126	TFC135	TFC150	TFC162	TFC165	TFC216	TFC221	TFC226	TFC235	TFC250	TFC262	TFC265	TFC316	TFC321	TFC326	TFC335	TFC350	TFC362	TFC365	TFC416	TFC426	TFC435	TFC450	TFC462	TFC465
Manual ABF Selector	-	-	-	-	-	-	-	o	o	o	o	o	o	o	-	-	-	-	-	-	-	-	-	-	-	-	-
Electric ABF Selector	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	s	s	s	s	s	s
Flow Sensor with Mount	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
Foam Tank Check Valve 3/4"	s	s	s	-	-	-	-	s	s	s	-	-	-	-	-	s	-	-	-	-	-	-	-	-	-	-	-
Foam Tank Check Valves 1"	o	o	o	s	s	s	s	o	o	o	s	s	s	s	s	o	s	s	s	s	s	s	s	s	s	s	s
Foam Pump Input Strainer 3/4"	s	s	s	-	-	-	-	s	s	s	-	-	-	-	-	s	-	-	-	-	-	-	-	-	-	-	-
Foam Pump Input Strainer 1"	o	o	o	s	s	s	s	o	o	o	s	s	s	s	s	o	s	s	s	s	s	s	s	s	s	s	s
Check Valve Injector 1/2"	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s	s
Flush Line Strainer 1/2"	o	o	o	o	o	o	o	o	o	o	o	o	o	o	s	s	s	s	s	s	s	s	s	s	s	s	s
Flush Line Check Valve 1/2"	o	o	o	o	o	o	o	o	o	o	o	o	o	o	s	s	s	s	s	s	s	s	s	s	s	s	s
Electric Flush Valve	o	o	o	o	o	o	o	o	o	o	o	o	o	o	s	s	s	s	s	s	s	-	-	-	-	-	-
Summing Box	-	-	-	-	-	-	-	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Discharge Check Valve Assy	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Discharge Check Valve Assy with Flow Sensor Mount	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Remote ON/OFF Switch	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Tank Float Switch	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
BSP Fittings	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
B Foam Program Active	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o

**Notes:**

- 1 The manual ABF selector option includes two 3/4" foam tank check valves.
- 2 The standard control module is factory set with the A foam program active.

## Specifications

The foam system is available in various system models.

### Control Module

Supply Power:	12/24 VDC
Supply Current:	0.3 Amps (1 Amp Maximum)
Dimensions:	4 7/8" by 4 7/8" (TFC100 is 4 1/4" by 4 1/4")

### Foam Pump Assembly

Supply Power:	12/24 VDC
Pump Motor:	Power from Foam Pump Control Box High Current Terminals
Electronics:	Power from Control Module
Dimensions:	Refer to Table 2. Foam Pump Assembly Dimensions
Pump Motor Power:	Refer to Table 3 Specification
Pressure Relief Valve:	400 PSI (2758 kPa) Factory Set (600 PSI for TFC _2.1)
Pump Oil:	Triplex Plunger Pump Crankcase Oil - # AR64516 14.5 oz for 1.6, 2.1 and 2.6 GPM pump; 15 oz for 3.5, 5.0, 6.2, 6.5 GPM pump

### Electric Flush Valve (TFC100/200/300 Only)

Supply Power:	12/24 VDC from Foam Pump Control Box
Supply Current:	3.5 Amps at 12 VDC Maximum (1.75 at 24 Volts)

### Electric ABF Selector Valve (TFC400 Only)

Supply Power:	12/24 VDC
Supply Current:	3.5 Amps at 12 VDC Maximum (1.75 at 24 Volts)

### Flow Sensors

Type:	Paddlewheel
Sensor Material:	Acetal (Delrin) with Stainless Steel (316) Shaft
Excitation Voltage:	5 VDC

### Summing Box

Supply Power:	12/24 VDC from Control Module
Dimensions:	5.8" by 3.7" by 1.9"

**Table 2. Foam Pump Assembly Dimensions**


Pump GPM	Length	Width	Height	Notes
1.6, 2.6	19 1/2"	10"	8 7/8"	Clearance may be required for calibration handle to open. Larger motors need some fan intake clearance 1/2".
2.1	22 1/2"	10"	8 7/8"	
3.5, 5.0, 6.2, 6.5	23 1/2"	10 1/4"	8 7/8"	

**System**

The TurboFoam Proportioning System has been tested and is certified to be accurate throughout the specifications provided in Table 3.

This foam proportioning system is compatible with any foam concentrate within the limits determined by performing the Calibrate Foam Concentrate Pump procedures found in this manual.

**Table 3. Direct Injection Foam Proportioning System Specifications**

 <b>FOAM CONCENTRATE PUMP</b>							
	<b>1.6 GPM</b>	<b>2.1 GPM</b>	<b>2.6 GPM</b>	<b>3.5 GPM</b>	<b>5.0 GPM</b>	<b>6.2 GPM</b>	<b>6.5 GPM</b>
<b>SYSTEM MODELS</b>	TFC116 TFC216 TFC316 TFC416	TFC121 TFC221 TFC321 —	TFC126 TFC226 TFC326 TFC426	TFC135 TFC235 TFC335 TFC435	TFC150 TFC250 TFC350 TFC450	TFC162 TFC262 TFC362 TFC462	TFC165 TFC265 TFC365 TFC465
<b>SPECIFICATION</b>							
<b>PUMP SIZE</b> GPM (LPM)	1.6 (6.06)	2.1 (7.95)	2.6 (9.84)	3.5 (13.25)	5.0 (18.93)	6.2 (23.47)	6.5 (24.61)
<b>MOTOR SIZE</b> (HORSE POWER)	1/3	1	1/2	3/4	1	1	1
<b>DC VOLTAGE</b>	12 or 24	12 or 24	12 or 24	12 or 24	12 or 24	12	24
<b>MAX CURRENT</b> (AMPS)	36 or 18	90 or 45	50 or 25	68 or 34	78 or 39	90	45
<b>CLASS A FOAM</b> RANGE: 0.1 to 1.0%							
@ 0.1%	1600 (6057)	2100 (7950)	2600 (9842)	3500 (13249)	5000 (18927)	6200 (23470)	6500 (24605)
@ 0.3%	533 (2019)	700 (2650)	867 (3282)	1167 (4416)	1667 (6309)	2067 (7824)	2167 (8202)
@ 0.5%	320 (1211)	420 (1590)	520 (1968)	700 (2650)	1000 (3785)	1240 (4694)	1300 (4921)
@ 1.0%	160 (606)	260 (984)	260 (984)	350 (1325)	500 (1893)	620 (2347)	650 (2461)
<b>CLASS B FOAM</b> RANGE: 0.5 to 10%							
@ 0.5%	320 (1211)	N/A	520 (1968)	700 (2650)	1000 (3785)	1240 (4694)	1300 (4921)
@ 3.0%	53 (202)	N/A	87 (328)	117 (442)	167 (631)	207 (782)	217 (820)
@ 6.0%	27 (101)	N/A	43 (164)	58 (221)	83 (315)	103 (391)	108 (410)
@ 10%	16 (61)	N/A	26 (98)	35 (133)	50 (189)	62 (235)	65 (246)



## GENERAL DESCRIPTION

The TurboFoam system has easy to use push button controls and highly visible displays.

### Components

The system consist of the following components (Refer to Figure 1):

Control Module

Foam Pump Assembly

Manual ABF Selector (Option with TFC200 Only)

Electric ABF Selector (TFC400 Only)

Electric Flush Valve (TFC300, Option with TFC100/200)

Miscellaneous Plumbing Components

Discharge Check Valve Assembly (Option)

Discharge Flow Sensor(s) and Sensor Housing(s)

Summing Box (Required with two or more discharge flow sensors.)

TankVision Pro or Tank Float Switch (Option)

Flush Switch or Remote ON/OFF Switch and Indicator (Option)

Cables

#### Control Module

The control module is waterproof. All operational controls and indicators are located on the front of the control module. (Refer to Controls and Indicators.) A USB port is accessible from the rear of the module.

#### Foam Pump Assembly

The foam pump assembly provides the correct amount of foam concentrate into the discharge water flow to make a foam solution. The components of the assembly are attached to the mounting base include an electric motor and pump, a pump control, a relief valve, and a calibration bypass valve.

#### Manual ABF Selector (Option)

The manual ABF selector is an option with the TFC200 models. It allows the operator to select Class **A** foam, Class **B** foam, or Flushing operations by rotating the ABF selector handle. The selector is connected between the foam tanks and the foam pump assembly intake and has an input for flush water. Two check valves are included with this option that must be installed between the foam tanks and the selector.

#### Electric ABF Selector

The electric ABF selector is standard on the TFC400 models. It allows the operator to select Class **A** foam, Class **B** foam, or Flushing operations from the push buttons on the control module. The selector is installed between the foam tanks and the foam pump assembly intake and has an input for flush water. The electric model is made up of three electric valves mounted on a manifold that controls the flow of foam concentrate or flush water into the system.

On each of the valve covers there is a dial indicator to show the valve position and an Allen head screw that allows for manual adjustment of the valve position.

The control box has two status LEDs: A - Not active; B - Blinks one time when a limit switch changes status.

## Electric Flush Valve

The electric valve is standard on the TFC300 models and an option with the TFC100/200 single tank systems. It is used to provide flush or prime capabilities for the foam concentrate pump.

## Miscellaneous Plumbing Components

A check valve is provided for installation on each foam tank line. A strainer is provided for installation on the input of the foam concentrate pump. A 1/2" water flush line strainer and check valve are provided standard with systems that include a flush valve.

A tee fitting is required to install the electric flush valve, the tee fitting is not provided.

A discharge flow sensor with mount and a check valve injector is provided standard with every system. The optional discharge check valve assembly can be installed that includes the flow sensor, a water way check valve, and check valve injector.

## Discharge Check Valve Assembly (Option)

Two discharge check valve assemblies are available. One includes the flow sensor, water way check valve, check valve injector, and a drain assembled as a single unit to install. The other includes the water way check valve, check valve injector, with a drain. These components are all available to be installed separately. (Refer to Installation Section for plumbing details.)

## Discharge Flow Sensor(s)

The standard system has one discharge flow sensor, options with multiple discharge flow sensors are available. When a single sensor is installed it is usually mounted in the pump discharge manifold to monitor total water flow. It provides an input signal directly to the control module.

When multiple sensors are installed they are mounted in each discharge. Systems with multiple discharge flow sensors require a summing box. Each discharge flow sensor is connected to the summing box which in turn is connected with the FRC datalink to the control module. Multiple mounting options are available for the flow sensor(s).

## Summing Box

**Note:** The summing box is required when there is two or more foam discharge flow sensors.

The summing box is connected between the control module and multiple discharge flow sensors. It provides discharge flow information to the control module via the FRC datalink. Each summing box has inputs for six (6) flow sensors.

## Remote Control Head (Optional)

This additional control head allows for remote operation of the system, and can be placed in another panel on the truck (away from the primary control head). **However, the remote unit cannot be used to change system parameters, calibrate the system, or view the error/fault history.** This can only be done through the primary control head.

## TankVision Pro or Tank Float Switch

A TankVision Pro sensor or tank float switch is required to be installed in the foam tank to provide the tank empty signal to the control module. The TankVision Pro is connected to the control module on the FRC datalink and provides tank level data. If tank float switches are installed, they are connected to the tank empty inputs on the control module.

## Flush Switch and Indicator (Option)

The flush switch is provided with the electric flush valve option for TFC100/200 models. The flush switch also provides prime capabilities if needed for the concentrate pump.

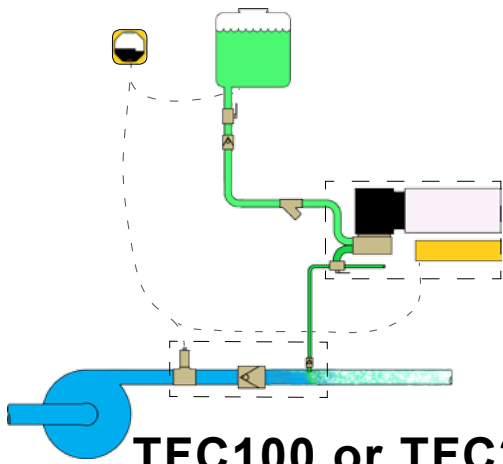
## Remote ON/OFF Switch and Indicator (Option)

The remote switch and indicator mirrors the control module ON/OFF button and LED on the control module.

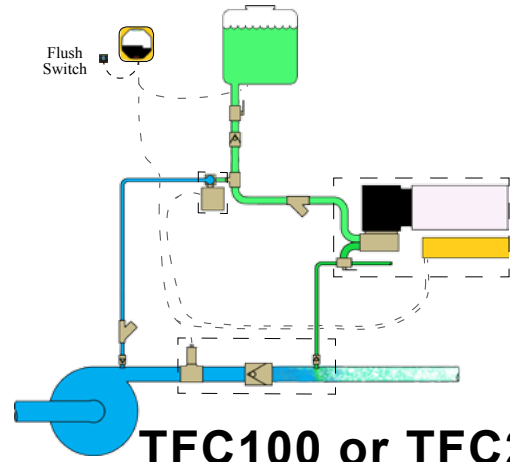
## Cables

Interconnecting cables are provided. (Refer to Wiring Section.)

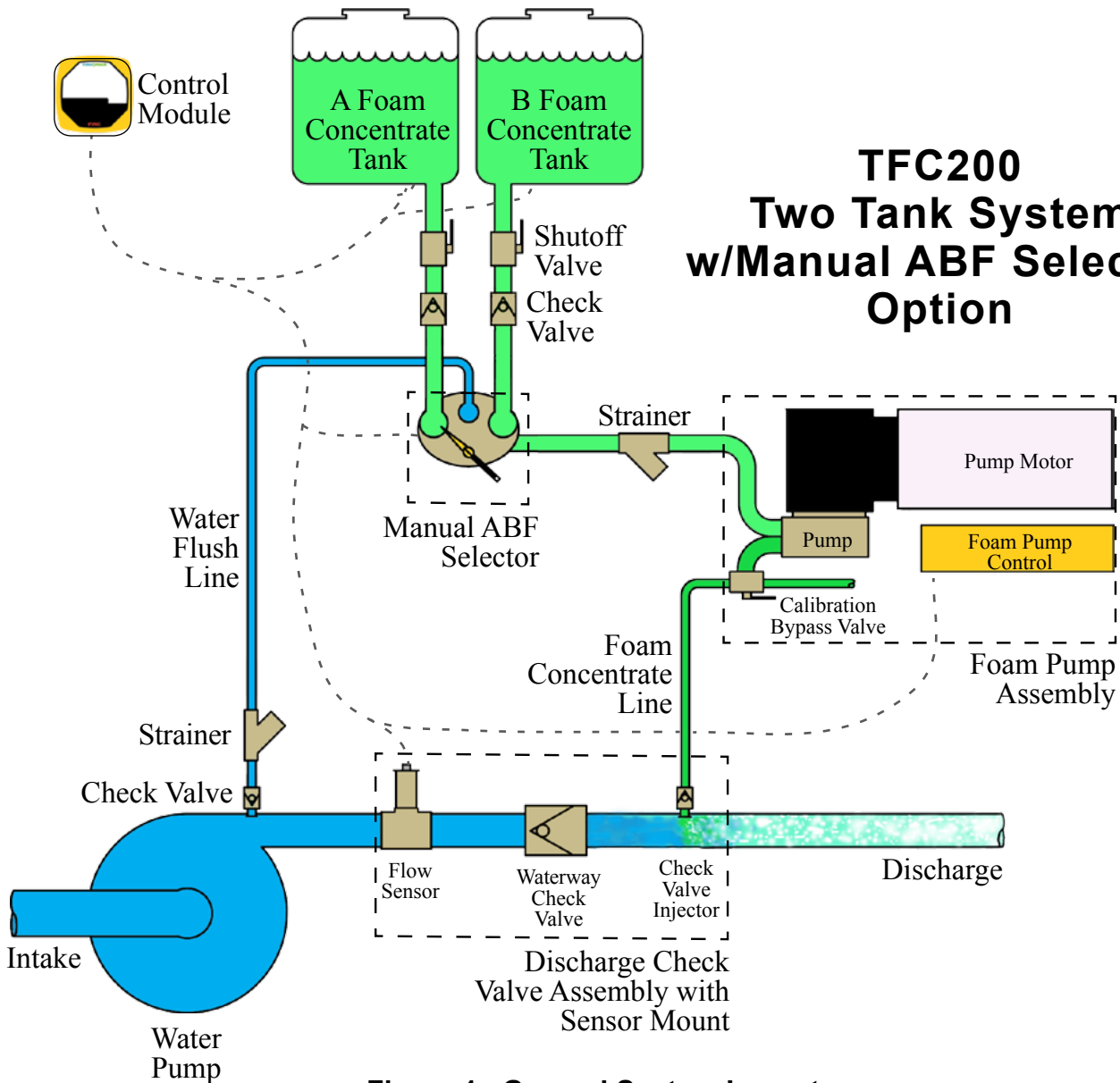
# General System Layout



**TFC100 or TFC200  
Single Tank System**



**TFC100 or TFC200  
Single Tank System  
w/Electric Flush  
Option**



**TFC200  
Two Tank System  
w/Manual ABF Selector  
Option**

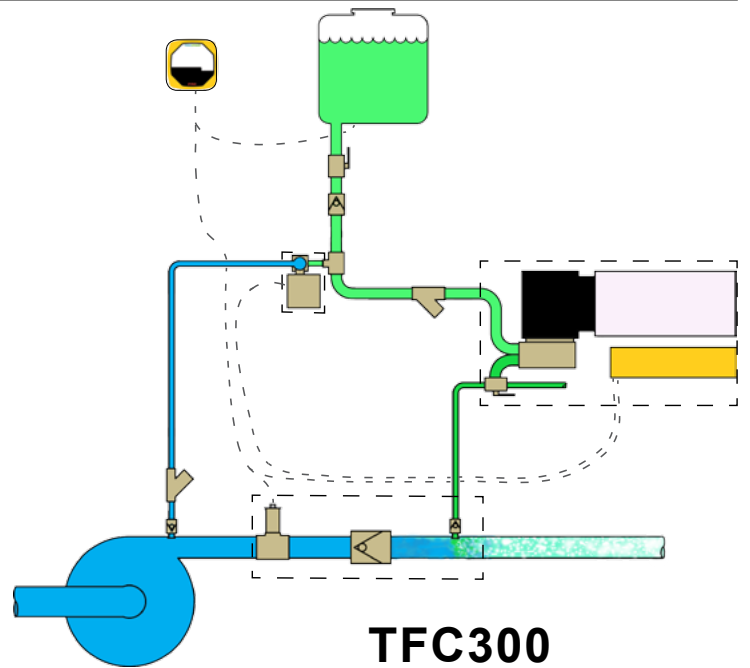
**Figure 1. General System Layout**

Notes:

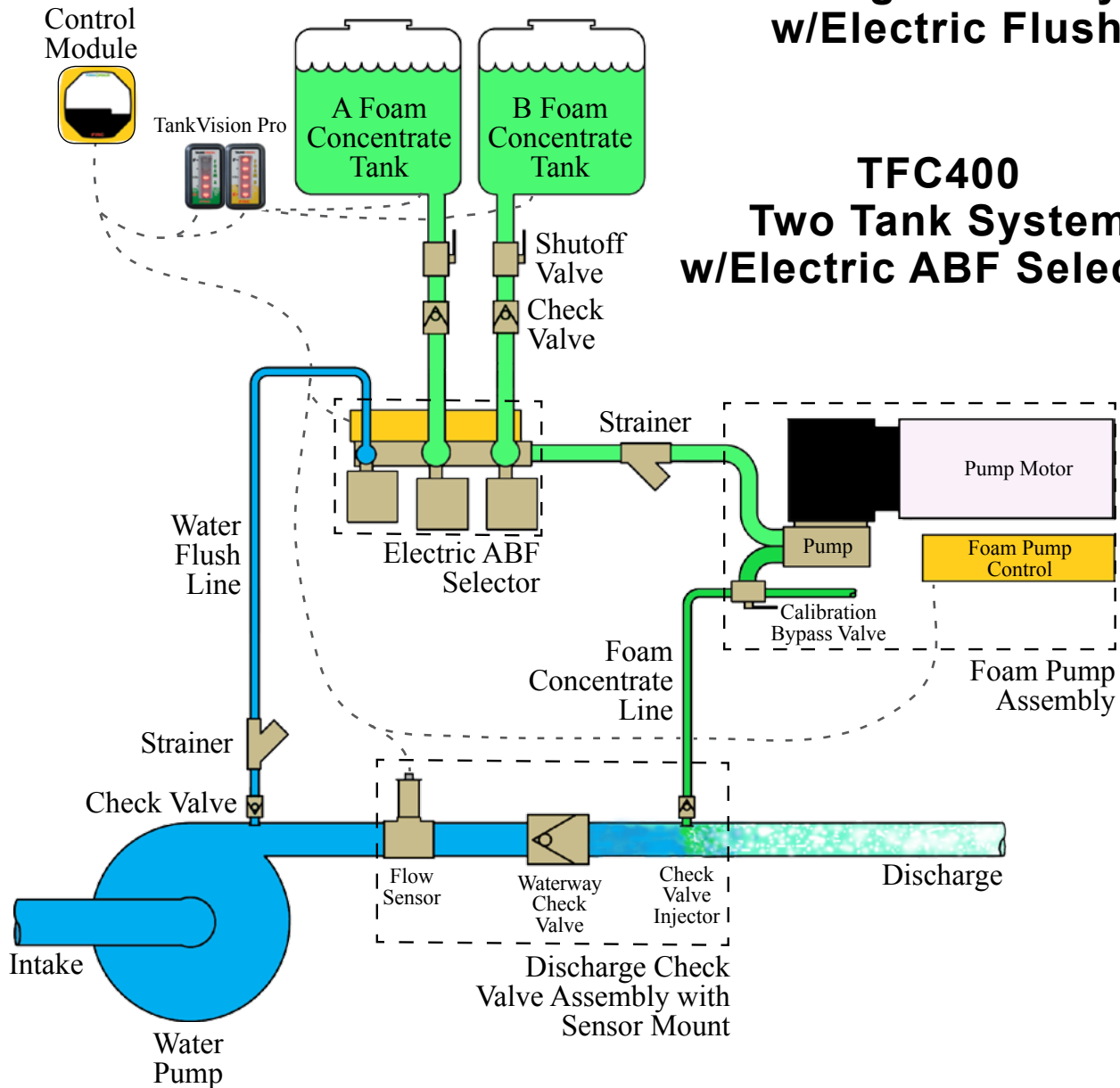
The water flush line may not be necessary for all single tank systems.

The water flush line can be used for priming the foam concentrate pump if needed.

It is important that the required check valves and strainers are installed for all systems.



**TFC300**  
**Single Tank System**  
**w/Electric Flush Valve**



**TFC400**  
**Two Tank System**  
**w/Electric ABF Selector**

**Figure 1. General System Layout**

## Controls and Indicators

All controls and indicators are located on the front of the control module. It contains the push button electronic controls, LEDs, and digital displays. (Refer to figure.) The buttons are used for operations, reviewing stored data, and during programming. See Operation and Programming Sections for more information.

### ON/OFF Button

Press and hold this button for three seconds to turn the system on. LED goes on. The WATER FLOW display shows discharge flow rate. A remote ON/OFF switch is available as an option.

### PRESET Button

Press this button to set the % foam to a pre-programmed value.

### + / – Buttons

Press the + increase or – decrease buttons to raise or lower the amount of foam concentrate (% foam) that is mixed into solution. The % display shows the selected percent.

### MODE Button (TFC100 Only)

Used to toggle the display mode. A mode LED goes on to indicate the selected display mode. Sets totals to 0.

### Mode LEDs (TFC100 Only)

The four LEDs indicate the display mode for the 4-segment display; %FOAM, TOTAL FOAM, FLOW, and TOTAL WATER.

### FOAM EMPTY LED (TFC100 Only)

The input from a TankVision Pro or foam tank level indicator drives this LED.

### FOAM % Display

The display shows the selected percent of foam concentrate in the discharge foam solution.

### A/B Button (TFC400 Only)

Used to select the A foam or B foam tank. The FOAM A or FOAM B LED goes on for tank selected. When this button is pressed (with the system is on) a flush cycle automatically occurs before the electric valve switches the tank (there must be water flow through the discharge).

### FLUSH Button (TFC300/400 Only)

Used to operate the flush (or prime) mode. The LED blinks when flush mode is active (there must be water flow through the discharge).

### MENU Button (TFC200/300/400)

Used to access system detailed information, stored data, and program features. Sets totals to 0.

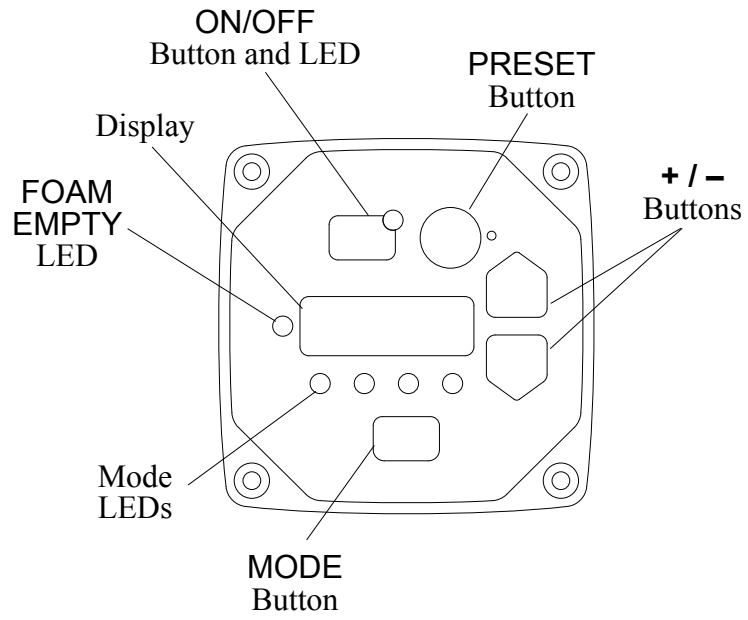
### Message Display (TFC200/300/400)

The two line multifunction display shows system information.

When the MENU button is pressed, during calibration, or during programming the display shows codes, stored data, and program functions.

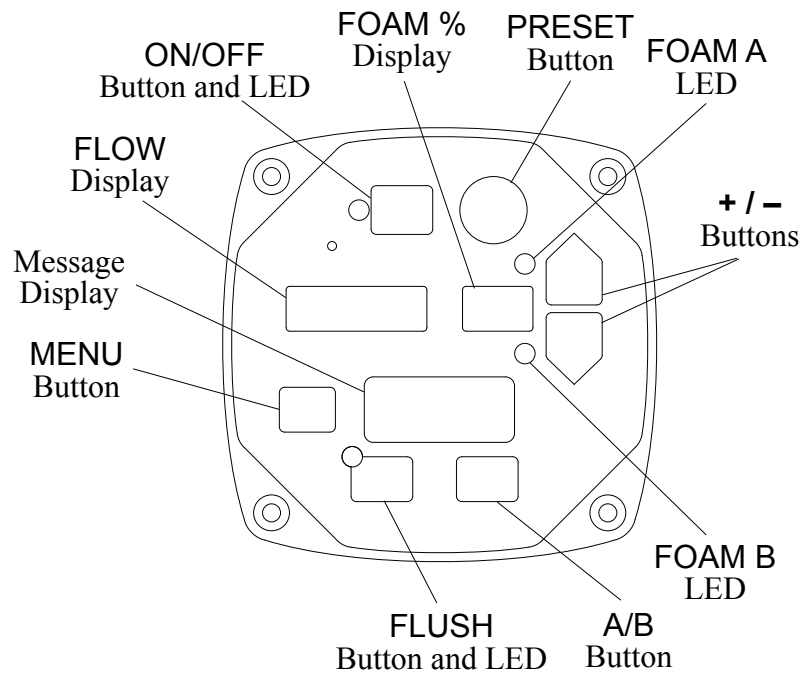
### FLOW Display

The display shows discharge water flow rate through the discharges. In manual mode it shows operator entered flow rate.

**TFC100****TFC200/300/400**

TFC200 does not include the FLUSH button or the A/B button.

TFC300 does not include the A/B button.



**Figure 2. Controls and Indicators**



A Safe Fleet Brand

# TURBOFOAM

## DIRECT INJECTION FOAM PROPORTIONING SYSTEM WITH ELECTRIC FOAM CONCENTRATE PUMP MODELS: TFC100, TFC200, TFC300, TFC400

### OPERATION AND PROGRAMMING

#### Set Time (Code P109)

Enter password code 1221. (Refer to Enter Password for Program Access.)

1. Press the + and – buttons and scroll to code P109.
2. Press the PRESET button.

Result: The message display shows the time with the hours flashing.

3. Press the + and – buttons to change hours.
4. Press the PRESET button.

Result: The message display shows time with the minutes flashing.

5. Press the + and – buttons to change the minutes.
6. Press the PRESET button.

Result: The message display shows time with the AM/PM flashing.

7. Press the + and – buttons to change the AM/PM.
8. Press and hold the MENU button for five (5) seconds to save.

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## OPERATION

The TurboFoam system automatically injects foam concentrate into the water flow to provide a consistent foam solution at the discharge regardless of water flow fluctuations.

When power is supplied to the system, the control module FLOW display shows OFF, the message display shows the date and time or total flow rate for all sensors when a summing box is installed.

When the ON/OFF button is pressed the LED comes on and the control module is active in the auto mode.

The FLOW display shows the water discharge flow rate

The % display shows the last used value or the preset value (based on program code P116).

The message display shows AUTO A(B) and moving arrows to indicate the foam concentrate pump RPM.

With a TankVision Pro connected and program set for tank status (codes P314,P315) the message display shows the foam type and time remaining at current flow rates A XX.Xm.

**Note:** The program allows the end user to set the range and the specific increments that are used to control foam percentage concentration with the + and – buttons.

The PRESET or the + and – buttons are used to adjust the amount of concentrate (changing the percent) injected into the discharge water flow to create the foam solution. Both of these functions are programmable to meet the operators requirements.

If a monitored function is not within normal parameters the FLOW display shows an error or fault warning code and a description shows in the message display. (Refer to Table 5. Error Codes or Table 6. Fault Warning Codes.)

The remote on/off switch and indicator option duplicate the ON/OFF button and LED. The optional flush on/off switch and indicator controls the optional flush valve.

## Detailed Information

### TFC100

The TFC100 does not have a message display. Information is shown in a 4-digit display and on four LEDs. Operations are the same as TFC200/300/400, substitute MODE button for MENU button in procedure steps.

The TFC100 control module four LEDs indicate the display mode for the 4-digit display; %FOAM, TOTAL FOAM, FLOW, and TOTAL WATER. Press and release the MODE button to toggle through the display modes. Foam and water totals are reset to 0 when power goes off. When TOTAL FOAM or TOTAL WATER is shown on the display, press and hold the MODE button to reset total to 0.

### TFC200/300/400

The MENU button allows the operator to gain access to detailed information and some programming features. Press the MENU button to scroll detailed information and return to normal display.

The total water or total foam values can be reset to zero (0) when shown in the display by holding the MENU button until the number 0 flashes in the display.

The message display reverts to normal operation after ten (10) seconds if no button is pressed.

**Table 4. Detailed Information**

Message Display	Description
T WATER	* Shows total amount of water flow (in gallons or liters)
T FOAM	* Shows total amount of foam concentrate flow (in gallons or liters)
WATER FLOW	Shows water flow rate for each discharge; <b>active only with summing box installed</b> , use the + and – buttons to scroll
TANK A	Shows foam concentrate left in tank A; <b>active only with TankVision Pro Foam A installed</b>
TANK B	Shows foam concentrate left in tank B; <b>active only with TankVision Pro Foam B installed</b>
FAULT CODES	Shows stored faults with date and time; use the + and – buttons to scroll
INCIDENT REPORT	Shows stored incidents with date and time; use the + and – buttons to scroll

**\*Note:** The total water and total foam flow amounts are reset to zero when the system is powered down. These can be reset during operations if required.



### Fault/Error Code Reports

The fault/error code reports show a list of the most recent fault/error codes in reverse chronological order, and show a maximum of 20 recorded faults/errors. Once the maximum number of 20 is reached, the system will drop the oldest fault/error in order to make room for a new fault or error.

**S 1**

Flow Display will show "S" and record number

**NOTE:** For each fault/error code, the Fault/Error Code Report will cycle through each screen for approximately 3 seconds.

**E06**

Display shows the descripton for the Fault/Error Code

**RPM  
SEN  
OPEN**

Display shows the descripton for the Fault/Error Code

**NOTE:** Use the INC and DEC to navigate through the fault/error reports.

**04:07 PM  
08JUN'16**

Displays the Time of the incident  
Displays the Date of the incident

### Incident Code Report

The report is displayed in reverse chronological order (works just like the error report). Therefore, the first incident indicates the total number of recorded incidents. In the example below the number "10" would indicate that there 10 recorded incidents. The system will hold a maximum of 20 recorded incidents. Once the maximum number of 20 is reached the system will drop the oldest incident in order to make room for a new incident.

**r 10**

Flow Display will show "r" and current record number

The following lines will cycle (about 3 seconds for each screen) per incident:

**FOAM A  
[blank]**

Line 1 Displays foam type  
Line 2

**NOTE:** Use the INC and DEC to navigate through the error reports.

**5.3 MINS  
3 GALS**

Line 1 Displays the Duration  
Line 2 Displays the Foam Volume Dispensed

**03:11 PM  
23MAY'16**

Displays the Time of the incident  
Displays the Date of the incident

**PCode 324** (Clears the Incident Report). The following depicts screen shots of this process:

**CLEAR  
INCIDENT**

Line 1  
Line 2 Press PRESET.  
Display will change to:

**CLEAR?  
NO**

“NO” will flash. Use INC or DEC to toggle between “NO” and “YES”. Press and Hold MENU to confirm.

**PCode 325** (Sets the minimum number seconds the pump must run before recorded as an incident. This prevents short tests from being recorded.)

**INCIDENT  
SECS 60**

Line 1 Press PRESET. Display will flash the least significant digit and allow the seconds to be edited. Use the PRESET button to move the flashing field from one digit to another and the INC/DEC button to change value. Press and hold MENU to save the setting.  
Line 2

**CLEAR?  
NO**

Line 1 “NO” will flash. Use INC or DEC to change “NO” to “YES”. Press and Hold MENU  
Line 2 to confirm.

## Operation Notes

If a tank empty signal goes active the foam pump stops. The pump can be run in override mode by pressing the ON/OFF button. The warning stays active, the pump should not be run with no foam concentrate flowing.

If the foam pump motor RPM sensor information is lost the system operates using a pre-programmed plot based on the current draw of the motor.

If the flow sensor information is lost the system is operated in the manual mode. Refer to Manual Mode.

To complete flushing the system press the ON/OFF button. (If the FLUSH button is pressed, the system re-starts auto mode.)

## Switching Foam Tanks - Automatic Flush (TFC400 Only)

When the control module is in the auto mode the system performs an automatic flush sequence when switching between the A foam tank and B foam tank. Discharge water must be flowing to cycle through the flush mode.

When switching from A foam tank to B foam tank the A/B button is pressed:

The message display shows A - - - > B and status information, the A tank valve closes then the flush valve opens, the system flushes for the amount of time set in the programming (default is 8 seconds), the flush valve closes then the B tank valve opens.

When switching from B foam tank to A foam tank the A/B button is pressed:

The message display shows B - - - > A and status information, the B tank valve closes then the flush valve opens, the system flushes for the amount of time set in the programming (default is 8 seconds), the flush valve closes then the A tank valve opens.

## Manual Mode

The manual mode is used when flow rate information is not received by the control module. It allows the operator to manually enter a discharge flow rate for system operations. In the manual mode the foam percent value can be changed by pressing the MENU button and using the + and – buttons.

### Ensure water continuously flows through the discharge during Manual Mode operation.

The manual mode is activated when discharge water is flowing but no flow is indicated in the FLOW display.

**Note:** Ensure there is foam concentrate in the tank, in manual mode there is no auto shut down of the foam pump if the tank goes empty.

1. Press both the +/- buttons at the same time for 3 seconds to enter manual mode.

Results: MANUAL MODE flashes in the message display for 3 seconds, the message display changes to show USE +/- FOR FLOW, the FLOW display and red LED flashes. (TFC100 flashes the ON/OFF LED, the FLOW LED is on.)

2. Press the MENU button and then press PRESET or +/- buttons to adjust the FLOW or FOAM rates.

Results: The FLOW display shows the operator entered flow rate, the system responds to this data and injects the correct concentrate into the discharge.

3. Press the MENU button to toggle between setting the flow rate and foam percent value. Press the PRESET button.

Results: The message display changes to show USE +/- FOR %, the FOAM % display flashes. (TFC100 the % FOAM LED is on.)

Press the + and – buttons to set the %.

Press the MENU button to return to flow rate control.

4. Press the ON/OFF button, the LED goes off; this will stop/start the concentrate pump and shuts down the TurboFoam system. Press the ON/OFF button again, the LEDs comes on, the system powers on in the manual mode.
5. Press both the +/- buttons at the same time for 3 seconds to exit manual mode.

**NOTE:** For the TFC100, substitute **MODE** button for **MENU** button in the procedure steps.

## Error Codes and Fault Warnings

Refer to Calibration, Maintenance, and Troubleshooting Section for detailed information.

**Note:** The TFC100 does not have a message display. Information is only shown in the 4-digit display.

**Table 5. Error Codes**

Code	TFC200/300/400 Message Display	Description
E01	PUMP NOT DETECTED	Pump communications failed
E02	MOTOR OVERLOAD	Over current condition sensed
E03	MOTOR DRIVER HI TEMP	Over temperature sensed
E04	MOTOR DRIVER SHUTDOWN	Over temperature shutdown; control module to off mode
E05	TEMP SEN FAILED	No temperature sensor signal
E06	RPM SEN OPEN	RPM sensor failure, circuit open
E07	RPM SEN SHORTED	RPM sensor failure, circuit shorted
E08	MOTOR FAILED	Motor not turning; control module to off mode
E09	DRIVER LIMIT	Hardware power limit, over current protection
E10	POWER LIMITED	Motor does not come up to requested speed, RPM low
E11	NO RPM DETECTED	No RPM detected from the pump motor
E12	NO ABF DETECTED	Auto flush communications failed; no auto flush mode
E13	FOAM A VALVE	Foam A valve failed to open
E14	FOAM B VALVE	Foam B valve failed to open
E15	FLUSH VALVE	Flush valve failed to open
E16	FOAM A VALVE	Foam A valve failed to close
E17	FOAM B VALVE	Foam B valve failed to close
E18	FLUSH VALVE	Flush valve failed to close
E19	FOAM A+B VALVES	Auto Flush Valves A+B Failed to Open
E20	NO MOTOR POWER	Main Motor Power Lost
L01	MANUAL MODE	Logs manual mode operation
L02	SVC OIL FOAMPUMP	Change pump oil at first 50 hours than every 500 hours; use code P122 to clear service oil message
L03	FLUSH SYSTEM	After B foam operation shows as a reminder to flush

**Table 6. Fault Warning Codes**

Code	TFC200/300/400 Message Display	Description
F01	FOAM A LOW	A foam concentrate low
F02	FOAM B LOW	B foam concentrate low
F03	FOAM A EMPTY	A foam concentrate tank empty; control module to off mode
F04	FOAM B EMPTY	B foam concentrate tank empty; control module to off mode
F05	SYSTEM AT MAX	Request exceeds foam concentrate pump capacity

F01-F04: When tank float switches are used the codes P309 and P310 set the time delay between the tank low fault warning (F01, F02) and the tank empty fault warning (F03, F04). When a TankVision Pro is connected the tank low/tank empty information is provided over the datalink. The concentrate pump is switched off when the tank empty goes active.

## Preset Settings

The preset button allows the operator to go to a pre-programmed percent setting during operations. The preset value shows in the % display.

**Note:** The preset setting (selected when the PRESET button is pressed) can only be set to a program enabled value. Refer to Programming Section for information on Set +/- Increment Value, codes P118 and P119.

To access the preset setting program the discharge flow must be 0 (FLOW display shows 000).

1. Select A foam tank or B foam tank.

For dual tank systems. TFC200 set the manual ABF selector; TFC400 press the A/B button.

For single tank systems this is set with program code P312.

2. Press and hold PRESET button. (Continue to hold through step 4.)

Result: % display flashes the programmed setting.

3. Press the + and – buttons to change setting.

4. Release PRESET button.

Result: The new preset value is programmed.

## PROGRAMMING

Programming functions are allowed when the control module is in the off mode. All program functions are password protected.

The P-code program functions are available to view and change after the password code has been entered. Scroll through the P-codes. Use the PRESET button to enter the programming mode and select specific values (number, word, or symbol) to change. The value blinks and the + and – buttons are used to change that value.

**Note:** To exit programming modes, press and hold the MENU button for five (5) seconds.

### Enter Password for Program Access

**Note:** The TFC100 does not have a message display. Information is only shown in the 4-digit display, procedures are the same. (Substitute MODE for MENU button.)

1. Press and hold the + button for 3 seconds. The FLOW display shows four dashes – – – – and the message display shows ENTER CODES. Release the button.
2. Press the + and – buttons to enter a code. Each time a button is pressed the first digit changes by 1. Set the first digit to the desired number.
3. Press the PRESET button to move the cursor to the next digit. Press the + and – buttons to change the digit.
4. Repeat step 3 and enter the password code.

Result: When a correct password code is entered the FLOW display flashes the program (P) code and the message display shows the name of the program or a description of the program code.

5. Press the + and – buttons to scroll through the codes.
6. Use the PRESET button to enter the programming mode and select specific values to change, the + and – are then used to change the value, the MENU button is used to save the changes.
7. Press and hold the MENU button for five (5) seconds to exit.

### Calibration Passwords 1111 and 1112

Provides access to system programming required for calibration procedures.

1111 - Calibrate Discharge Flow Sensor(s)

1112 - Calibrate Foam Pump

Refer to Calibration Section.

### Operator Password 1221

Provides access to system programming P100 codes.

1221 - Operator Programs

Refer to Operator P100 Codes.

### Restore Programmed Functions Passwords 5122 and 5123

Provides access to upload all system programming and calibration information from one component to another.

5121 - Initiates Synchronization Between Control Module and Foam Pump Control Programs

5122 - Set/Clear Control Module Restore Flag

5123 - Set/Clear Foam Pump Control Restore Flag

Refer to Restore Programmed Functions Section.

**OEM/Dealer Password Restricted (Contact FRC)**

Provides access to system programming P300 codes.

Password Restricted - OEM/Dealer Programs

*For more information, refer to the OEM/Dealer P300 Codes listed in the separate OEM programming manual.*

## Operator P100 Codes

The TFC100 does not have a message display. Information is only shown in the 4-digit display, procedures are the same. (Substitute MODE for MENU.)

When scrolling through the P-codes, some may not be displayed. This happens when a specific code is not available for access because of other programming settings. (Example: If a system is set for a single A foam tank, program codes for a B foam tank are not displayed.)

### Notes:

**1 - Codes P108 and P109:** For detailed instructions refer to Set Date and Time.

**2 - Code P110:** This code is only available when a system has multiple discharge flow sensors. If no ID names are programmed, the system assigns FLOW 1, FLOW 2, FLOW 3, etc., based on each flow sensor input connection to the summing box(es). For detailed instructions refer to Set Discharge Flow Sensor ID Names.

**3 - Codes P111 and P115:** These codes are used to access information that is stored in various system devices such as the serial number, manufacture date, or hardware and firmware revisions of that component. They are only available if the device is detected on the FRC datalink.

**4 - Code P116:** This code sets the % value when the system is powered on or when switching between A and B foam tanks (TFC200/400). It can be programmed to PRESET (the programmed preset value) or LAST VAL (the last used value set by the operator).

**5 - Code P117:** With this code is set to AUTO when power is applied the system the control module is active and the system is in auto mode (operational).

**6 - Codes P118 and P119:** These codes are used to set the increment steps when the + and – buttons are pressed. For two tank systems values for both foam A and foam B are set. (TFC200/300/400 shows YES or NO in the message display, the TFC100 uses the % FOAM LED ; on = yes, off = no.) For detailed instructions refer to Set +/- Increment Value.

**7 - Code P120:** This code allows the end user to adjust the elapsed time that passes before the -operate system warning- goes active. It is recommended that the system be operated at least once every 6 weeks (42 days). If the concentrate pump is not operated within the set time frame, a message OPERATE FOAMPUMP shows in the display. The elapsed time clock resets after each pump operation.

**8 - Code P122:** This code is used to clear the L02 service reminder. The concentrate pump oil must be changed after the first 50 hours of operation and then every 500 hours. When these time markers are hit, the L02 code and the message SVC OIL FOAMPUMP shows in the display. When the oil is changed access code P122 and set it to YES, this clears the service needed message.

**Table 7. Program Functions P100 Codes Quick Reference**

<b>CODE</b>	<b>DESCRIPTION</b>	<b>TFC100 DISPLAY</b>	<b>TFC200/300/400 MESSAGE DISPLAY</b>	Press PRESET button to select; change value with + or – button, Press (MODE) MENU to set value
Notes	Password Code: 1221 Enables Access to P100	Factory Default Shown	Factory Default Shown	
P101	System Model	tFC-<> 100	MODEL TFC###	(Read Only)
P102	Software Revision	r#.##	PROG REV ###.##	(Read Only)
P103	Manufacturing Date	MM.YY	MFG DATE DDMMM'YY	(Read Only)
P104	Serial Number	#.### <> ##.#	SER NO #####	(Read Only)
P105	Hardware Version	###	HW REV ###	(Read Only)
P106	UID Number - Upper	##<>##<>##	UIDUPPER ##-##-##	(Read Only)
P107	UID Number - Lower	N/A	UIDLOWER ##-##-##	(Read Only)
P108 <sub>1</sub>	Current Date	DD.MM <> Yr.YY	SET DATE DDMMM'YY	Refer to Set Date
P109 <sub>1</sub>	Current Time	HH N <> NN	SET TIME HH:MM AM/PM	Refer to Set Time
P110 <sub>2</sub>	Assign ID Names for Discharge Flow Sensors w/Summing Box	N/A	SET FLOW	Refer to Set Discharge Flow Sensor ID Names
P111 <sub>3</sub>	Pump Device Data	#### <> ####	PUMP INFO	
P112 <sub>3</sub>	Summing Box 1 Device Data	N/A	SUMBOX 1 INFO	
P113 <sub>3</sub>	Summing Box 2 Device Data	N/A	SUMBOX 2 INFO	
P114 <sub>3</sub>	Summing Box 3 Device Data	N/A	SUMBOX 3 INFO	
P115 <sub>3</sub>	Auto Flush Device Data	N/A	AUTOFLSH INFO	
P116 <sub>4</sub>	Proportioning Rate at Power Up or when Switching Between A and B	PrES	SEL FOAM PRESET	LAST VAL PRESET
P117 <sub>5</sub>	Control Module Mode at Power Up	OFF	POWER UP OFF	AUTO OFF
P118 <sub>6</sub>	Set +/- Percent Increment Value Foam A	0.1 LED On	FOAM A 0.1% YES	0.1 to 0.9 then 1.0 to 10 Increments Select YES or NO for Each
P119 <sub>6</sub>	Set +/- Percent Increment Value Foam B	0.1 LED Off	FOAM B 0.1% NO	0.1 to 0.9 then 1.0 to 10 Increments Select YES or NO for Each
P120 <sub>7</sub>	Days to Exercise Concentrate Pump	N/A	OP PUMP DAYS 42	Set Number; 0 = Disable Function
P121	Display Concentrate Pump Hours	##	PUMP HRS ###	
P122 <sub>8</sub>	Clear Oil Service Reminder (Error Code L02)	no	CLEAR OIL SVC	YES no



## Set Date and Time

**Note:** The TFC100 does not have a message display. Information is only shown in the 4-digit display, procedures are the same. (Substitute **MODE** for **MENU**.)

### Set Date (Code P108)

Enter password code 1221. (Refer to Enter Password for Program Access.)

1. Press the + and – buttons and scroll to code P108.

2. Press the **PRESET** button.

Result: The message display shows the date with the day flashing.

3. Press the + and – buttons to change the day.

4. Press the **PRESET** button.

Result: The month flashes.

5. Press the + and – buttons to change the month.

6. Press the **PRESET** button.

Result: The year flashes.

7. Press the + and – buttons to change the year.

8. Press and hold the **MENU** button for five (5) seconds to save.

Result: The message display shows **DONE**.

### Set Time (Code P109)

Enter password code 1221. (Refer to Enter Password for Program Access.)

1. Press the + and – buttons and scroll to code P109.

2. Press the **PRESET** button.

Result: The message display shows the time with the hours flashing.

3. Press the + and – buttons to change hours.

4. Press the **PRESET** button.

Result: The message display shows time with the minutes flashing.

5. Press the + and – buttons to change the minutes.

6. Press the **PRESET** button.

Result: The message display shows time with the **AM/PM** flashing.

7. Press the + and – buttons to change the **AM/PM**.

8. Press and hold the **MENU** button for five (5) seconds to save.

Result: The message display shows **DONE**.

## Set Discharge Flow Sensor ID Names (TFC200/300/400)

This code applies to systems with multiple foam discharge flow sensors and a summing box installed. There are twelve (12) names along with a two digit number that can be used to identify each foam discharge flow sensor.

If no ID names are programmed for the sensors, the factory defaults are FLOW 1, FLOW 2, FLOW 3, etc., based on the location of each flow sensor input connection to the summing box(es)

The summing boxes are identified, when the code is selected, and shown on the control module display as Sb #.# (#'s refer to box and input). The following example shows two summing boxes with a total of nine inputs:

First box six inputs Sb 1.1, Sb 1.2, Sb 1.3, Sb 1.4, Sb 1.5, Sb 1.6

Second box three inputs Sb 2.1, Sb 2.2, Sb 2.3.

The factory default ID name shown in the message display for the above example is FLOW 1 through FLOW 9.

### Set Flow ID Name (Code P110)

Enter password code 1221. (Refer to Enter Password for Program Access.)

1. Press the + and – buttons and scroll to code P110.
2. Press the PRESET button.

Result: The % display shows Sb 1.1, 1.1 flashes indicating summing box 1, input 1, message display shows the ID name.

3. Press the PRESET button (or press the INC or DEC button to scroll inputs).

Result: The message display flashes the ID name.

4. Press the + and – buttons to scroll the ID names.
5. Press the PRESET button to choose a name.

Result: The message display flashes the ID number. (See Note)

6. Set the number (press the + and – buttons to change the digit, press the SELECT button to move the cursor to the next digit).
7. Press the MENU button to return to step 3.
8. Press and hold the MENU button for five (5) seconds to save.

MESSAGE DISPLAY	DESCRIPTION
DIS. ##	Discharge
F DIS. ##	Front Discharge
REAR DIS ##	Rear Discharge
L/R DIS ##	Left Rear Discharge
R/R DIS. ##	Right Rear Discharge
DECK GUN ##	Deck Gun
ROOF TUR ##	Roof Turret
CROSSLAY ##	Crosslay
PCON ##	Pre-Connect
L/R PCON ##	Left Rear Pre-Connect
R/R PCON ##	Right Rear Pre-Connect
FLOW ##	Factory default ID name

**Note:** If FRC flowmeters (DFA or FPA) are used to retrieve flow rate information, only the FRC Datalink is connected to the foam system. **IMPORTANT** the flowmeter ID numbers must be different than the flow sensor ID numbers used with a summing box.

## Set +/- Increment Value

P118 and P119 codes are available dependent on the setting of code P312. For single tank foam A systems code P118 is programmable, for a single tank foam B code P119 is programmable. For two tank systems both P118 and P119 are programmable.

The following percent values are available:

0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0, 9.0, 10

**Example:** A system is programmed with code P312 to **SINGLE B**. This is a foam B system only where a 1, 3, or 6% mixture is used. Code P119 is set with 1.0, 3.0, and 6.0 YES to enable these three values, all the rest of the values are set to NO. When the operator presses PRESET or the + and – buttons only the 1.0, 3.0, and 6.0 foam percents are available.

### Notes:

These codes allow the end user to set the range and the specific increments that can be used to control foam percentage concentration.

The software requires that at least one value is set to YES.

The preset and last used value can only be one of the set values. (The software checks that the current preset and the last used value matches a set value. If not, the software changes it to the lowest value set at yes.)

The TFC100 does not have a message display. Information is only shown in the 4-digit display, procedures are the same. (Substitute MODE for MENU.)

### Set +/- Increment (Code P118 or P119)

**Note:** TFC200/300/400 shows YES or NO in the message display, the TFC100 uses the % FOAM LED ; on = yes, off = no.

Enter password code 1221. (Refer to Enter Password for Program Access.)

1. Press the + and – buttons and scroll to code P118 or P119.
2. Press the PRESET button.  
Result: The message display shows the % value.
3. Press the PRESET button to select YES or NO.
4. Press the + and – buttons to scroll to the next value. Repeat steps 3 and 4 to set all values.
5. Press and hold the MENU button for five (5) seconds to save.

## Restore Programmed Functions

When a control module and a foam pump control are synchronized all system data, including programming and calibration information, is stored in both the control module and the foam pump control memories. This redundancy allows for either component to be replaced without re-programming or re-calibrating the system.

There are three restore functions:

5121 Synchronization - For components shipped together this is done at the factory. For components shipped separately, this should be done at installation. Initial synchronization is required for restore codes to work.

5122 Control Module - Use this code when replacing the control module, it uploads programming from the foam pump control to the control module.

5123 Foam Pump Control - Use this code when replacing the foam pump control, it uploads programming from the control module to the foam pump control.

**Note:** The TFC100 does not have a message display. Information is only shown in the 4-digit display, procedures are the same. (Substitute **MODE** for **MENU**.)

### Programming Restore

The system restore function is used when the control module or foam pump control module is replaced. Each contains a copy of all program settings and system calibration in memory.

When one of these components are replaced, the program settings and the system calibration is restored from the memory of an original component.

1. Enter password code 5121, 5122, or 5123. (Refer to Enter Password for Program Access.)  
5121 - Initiates Synchronization Between Control Module and Foam Pump Control Programs  
5122 - Set/Clear Control Module Restore Flag  
5123 - Set/Clear Foam Pump Control Restore Flag

Result: The message display shows the component selected and **NO**.

2. Press the + and – buttons to change **NO** to **YES**. (Yes sets the restore flag.)
3. Press and hold the **MENU** button for five (5) seconds to save.

**Note:** The system must powered down and back on for the data to upload.

4. Remove power from the foam system.
5. Restore power to the foam system.

Result: All programming is uploaded to the replaced component.

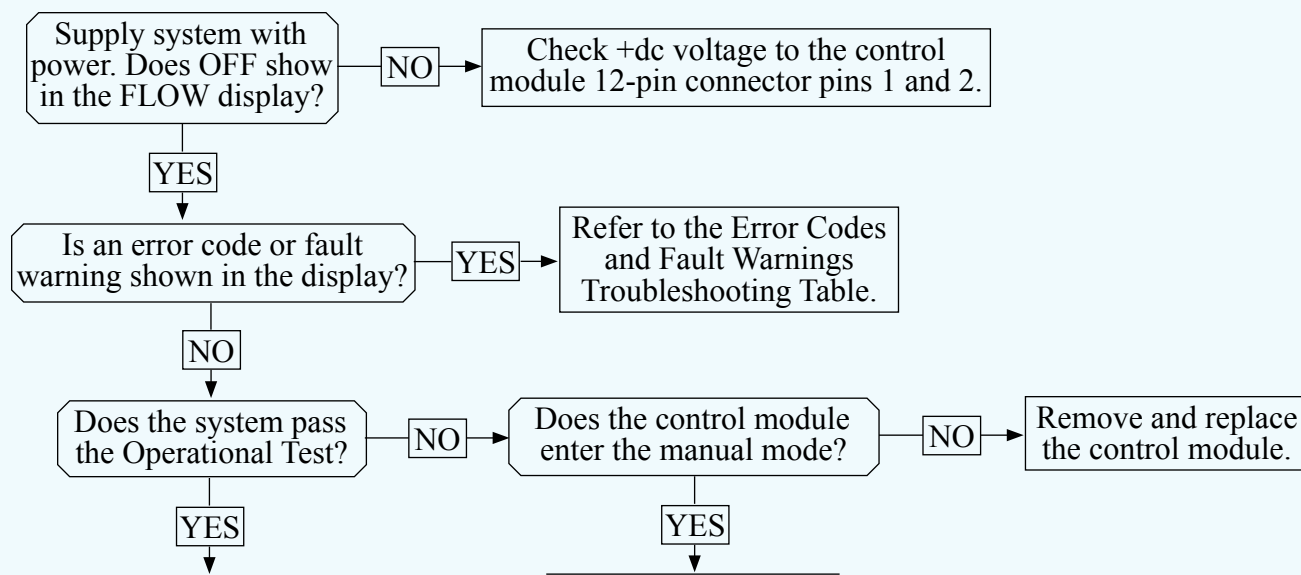


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# TURBOFOAM

## DIRECT INJECTION FOAM PROPORTIONING SYSTEM WITH ELECTRIC FOAM CONCENTRATE PUMP MODELS: TFC100, TFC200, TFC300, TFC400

### CALIBRATION, MAINTENANCE, AND TROUBLESHOOTING



CALIBRATION, MAINTENANCE, AND TROUBLESHOOTING

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## CALIBRATION

The components of the TurboFoam system are calibrated at the factory, but plumbing systems are unique and may cause deviations in the factory calibration. It is recommended that the calibration be checked after system installation.

The foam pump should be calibrated with the type of foam concentrate that is to be used.

When the discharge flow sensor calibration password code is entered the system automatically detects if there is a summing box on the datalink and uses the multi-sensor procedure.

### Replacing Control Module or Foam Pump Control

The control module, foam pump control module have memory that contains a copy of the system calibration. This redundancy allows for either component to be replaced without re-programming or re-calibrating the system. If one is replaced the system calibration can be restored from the memory of the other.

Refer to Programming, Restore Programmed Functions Section.

### TankVision Pro Indicator

TankVision Pro indicators connected to the TurboFoam system are required to be calibrate.

Refer to the TankVision Pro Manual, FRC document number XE-WLA3PM-R0A, Calibration Section.

**Table 8. Calibration Failure Messages**

MESSAGE DISPLAY	DESCRIPTION
NO FLOW DETECTED	No signal from the discharge flow sensor
ZERO CAL ERROR	A flow rate was not entered during the discharge flow sensor calibration procedure

## Calibrate Discharge Flow Sensor (Password Code 1111)

**Note:** Use a calibrated flow meter or Pitot gauge on the discharge under test as a reference.

When flowing water, ensure a constant pressure is maintained to obtain a steady flow rate.

For systems with multiple discharge flow sensors, calibrate each sensor separately.

Select a second reference flow rate and flow water for each discharge to verify the calibration. The flow rate shown on the FLOW display should match the flow rate shown on the reference meter.

Once the system has been calibrated the System Restore function is used when a component is replaced. (Refer to Programming Section.)

### Single Sensor System

1. Enter password code 1111. (Refer to Password Protected Programs Section.)

Result: The message display shows WATER CAL GPM.

2. Press the MENU button.

Result: The FLOW display shows the flow rate with the last digit flashing.

3. Flow water through the discharge.

4. Set the flow rate shown on the FLOW display to match the flow rate shown on the reference meter.

Press the + and – buttons to change the digit.

Press the PRESET button to move the cursor to the next digit.

5. Press and hold the MENU button for five (5) seconds to save and exit.

Result: The message display shows UPDATING SYSTEM. then CAL DONE .

### Multi-Sensor System (w/Summing Box)

1. Enter password code 1111. (Refer to Password Protected Programs Section.)

Result: The message display shows MULTIPLE FLOW CAL.

2. Press the MENU button.

Result: The message display shows the ID name and sensor number.

3. Press the + and – buttons to change the ID name and sensor number.

4. Press the MENU button.

Result: The FLOW display shows the flow rate with the last digit flashing.

5. Flow water through the discharge.

6. Set the flow rate shown on the FLOW display to match the flow rate shown on the reference meter.

Press the + and – buttons to change the digit.

Press the PRESET button to move the cursor to the next digit.

7. Press and hold the MENU button until display shows CAL IN PROGRESS to save new setting.

8. Return and repeat steps 3 through 7 or:

9. Press PRESET button to save and exit.

Result: The message display shows UPDATING SYSTEM then CAL DONE .

## Calibrate Foam Concentrate Pump (Password Code 1112)

This foam proportioning system is compatible with any foam concentrate within the limits determined by performing this calibration procedure.

To accurately calibrate the foam concentrate pump and control module for specific types of foam concentrate this calibration procedure must be performed. The concentrate foam pump should be re-calibrated if the foam concentrate is changed to a different type.

The system is tested and calibrated to factory standard settings. If necessary the factory standard calibration settings can be restored with program codes P301 foam A and P302 foam B. (Refer to Restore Factory Foam Concentrate Pump Flow Calibration.)

### Overview

No water is used to perform this procedure and the foam concentrate that is pumped is collected, accurately measured, and returned to the tank.

A simulated discharge water flow rate is entered by the operator along with the desired foam percent. The system pumps foam concentrate at the correct rate based on the simulated water flow and percent selected.

The system simulates water flow (flow rate is selected by the operator) and pumps foam concentrate.

The concentrate is routed through the calibration bypass valve where it is collected to be measured. The control module message display shows the calculated foam concentrate the system has pumped.

The amount collected is measured and compared with amount shown in the display. Adjustments to the values shown are made if necessary.

**Note:** Dual foam systems have two calibration programs for A foam and B foam. This allows the two different concentrates to be calibrated accurately. Single foam systems must have the control module programmed for the correct type of foam A or B (program code P312). This is verified in step 1.

### Set-up

Supply power to the system, OFF is shown in the FLOW display.

For systems with multiple foam tanks select the A or B tank.

#### **TFC400 Only:**

1. Press the ON/OFF and PRESET buttons at the same time and hold.  
Results: MANUAL MODE flashes in the message display for 3 seconds.
2. Press the A/B button to select the A or B tank.
3. Remove power from the system for 5 seconds to exit manual mode.
4. Supply power to the system, OFF is shown in the FLOW display.

Place a calibrated collection bucket under the calibration bypass valve hose. (The bypass valve is part of the foam pump assembly.)

Set the calibration bypass valve to bypass.

**Note:** When calibration is complete, set the calibration bypass valve control back to the operate position



## Procedure

**Note:** For systems with multiple foam tanks, the A or B foam tank must be selected before the password code is entered. Ensure that the display in step 1 matches the concentrate type.

1. Enter password code 1112. (Refer to Password Protected Programs Section.)

Result: The message display shows FOAM CAL GPM.

2. Press the MENU button.

Result: The FLOW display shows a water flow rate with the last digit flashing (This is the simulated water flow rate.). The message display shows WATER SIM GPM.

3. Set the FLOW display to show the desired simulated discharge water flow rate for calibration.

Press the + and – buttons to change the digit.

Press the PRESET button to move the cursor to the next digit.

4. Press the MENU button.

Result: The % display shows a percent of concentrate to be pumped. The message display shows FOAM PERCENT.

5. Set the foam percent to be used for calibration. (This % along with the water flow setting determines the amount of concentrate to be pumped.)

Press the + and – buttons to change the digit.

Press the PRESET button to move the cursor to the next digit.

6. Press the MENU button.

Result: The foam pump start to pump concentrate. The message display shows SECS and elapsed pumping time.

7. Press the MENU button to stop pumping.

Result: The foam pump stops. The message display shows FOAM GAL and the amount pumped with the last digit flashing.

8. Measure the concentrate collected in the bucket. Compare this amount to the amount shown in the display.

9. Set the amount shown on the message display to match the measured amount.

Press the + and – buttons to change the digit.

Press the PRESET button to move the cursor to the next digit.

10. Press the MENU button to save and exit.

Result: The message display shows FOAM CAL DONE.

11. Set the calibration bypass valve back to the operational position.

For best accuracy repeat the procedure 2 to 3 times. Ensure there is consistency in the result. (Do not average results that vary greatly from one another.)

---

# MAINTENANCE RECOMMENDATIONS

## After Operations

### Flush the System

Flush the foam system after each operation. Particularly for systems that use B type concentrate. Make sure that the valve to the foam tank is closed when flushing the system so that no water gets into the foam tank.

### Check Position of Manually Operated Valves

Ensure all manually operated valves are in the correct post operation position.

## Routine Checks

These checks should be done every four to six weeks, dependent on system use. High use systems should be checked every two weeks.

### Check Foam Pump Oil

Ensure the oil level is even with the line in the site glass and the oil does not show signs of contamination. The site glass can be found on the side of the pump near the vented dip stick.

Manufacturer recommended oil: Triplex Plunger Pump Crankcase Oil - # AR64516

### Check System Components

Inspect components, wire harnesses, plumbing, and all connections. Look for looseness, wear or deterioration of materials, corrosion, and damage.

### Clean the Paddlewheel Flow Sensor

Use plain water to clean the paddlewheel sensor. Do not use solvents.

### Clean the Strainers

Clean the foam concentrate and flush water strainers.

## Required Periodic Maintenance

### Change Foam Pump Oil

Change the foam pump oil after first 50 hours of use, then every 500 hours. The program shows a L02 error code and flashes a SVC OIL FOAMPUMP message when the hour milestones are hit. (To show foam pump hours use program code P121.) (Reset code P122 after oil is changed.)

Manufacturer recommended oil: Triplex Plunger Pump Crankcase Oil - # AR64516

### Operate System

It is recommended that the TurboFoam system be operated at least once every six weeks. The program flashes a OPERATE FOAMPUMP message when the system has not been operated within the time set. (Program code P120 sets the time.)

### Calibrate System

It is recommended that the TurboFoam system concentrate foam pump and flow sensor calibration be checked yearly. The concentrate foam pump should be re-calibrated if the foam concentrate is changed to a different type.

## Flush the System

It is recommended that the system is flushed after each use to remove the foam concentrate from the ABF selector valves, foam pump, strainer, and plumbing components. Ensure that the valve to the foam tank is closed when flushing the system so that no water gets into the foam tank.

The TFC300/400 electric valves to the tank are automatically closed before the flush valve is opened. The TFC400 automatically goes through a flush cycle when switching between A and B foam tanks except at start-up.

**Note:** If system is in flush mode and no water flows, after 2 minutes the pump shuts down.

1. Ensure that the foam tank shutoff valve(s) are closed and open the manual flush valve (if installed).
2. TFC200 dual tank set manual ABF selector lever to FLUSH position.
3. Press ON/OFF button. The LED is on. (% display must show a value, use PRESET or + and – buttons.)
4. Open discharge and flow water.
5. Press FLUSH button if installed. The LED (or light on remote button) flashes.
6. Flush system until water runs clear.
7. Press ON/OFF button. The LED goes off. System closes flush valve and is in off mode.  
(If the FLUSH button is pressed, the system re-starts auto mode.)
8. Close the manual flush valve (if installed).
9. Close discharge.
10. Reset all valves as required.

## Clean Paddlewheel Flow Sensors

The paddlewheel type flow sensors need to spin freely to generate flow rate data. Should the sensor get clogged and stuck, it can be removed for cleaning.

Remove the retainer cap which holds the paddlewheel sensor in the housing and slide the sensor out.

**Use plain water to clean the paddlewheel sensors. Do not use solvents.**

Be careful when reinstalling the paddlewheel sensor. The paddlewheel only seats properly when in the correct orientation. (Refer to Install Flow Sensor Section.)

## Clean Strainer

The strainers are cleaned by removing the cap and pulling the screen out.

Clean the screen by rinsing it with water or brushing it gently.

## Check/Change Foam Pump Oil

The foam pump oil should be checked regularly. Ensure the oil level is even with the line in the site glass and the oil does not show signs of contamination. The site glass can be found on the side of the pump near the vented dip stick.

Change the foam pump oil after first 50 hours of use, then every 500 hours. (Reset code P122 after oil is changed.)

Manufacturer recommended oil: Triplex Plunger Pump Crankcase Oil - # **AR64516**

14.5 oz for 1.6, 2.1 and 2.6 GPM pump; 15 oz for 3.5, 5.0, and 6.0 GPM pump.

The oil plug is located directly below the sight glass on the pump.

## OPERATIONAL TEST

This procedure is to be performed after installation or maintenance when components have been disconnected. The water pump is not operated during the Operational Test.

### Pre-Operation Checks

Do the following checks before the operation test.

#### Programming Checks

Verify that the required program functions (P100 and P300 codes) have been set.

#### Electrical Checks

Control module connectors are tight and cables secure.

TankVison or float switch connections are tight, waterproofed, and cables secure.

Foam pump control connectors are tight, cables secure, and RPM sensor is connected.

Foam pump control, pump motor, and input power cable connections are tight, rubber terminal covers installed, and wire size is correct for motor maximum current rating.

Electric ABF selector valve connectors are tight and cables secure. (If installed.)

Manual ABF selector or flush valve connections are tight, waterproofed, and cables secure. (If installed.)

Flow sensor connector is tight and cable secure.

Routing of all cables and wires is free from rubbing, pinching, or damage from heat and other equipment.

#### Plumbing Checks

Foam tank check valves are secure and installed for correct direction of flow.

Electric ABF selector hose and fittings are tight, input and output hoses are correct. (If installed.)

Manual ABF selector hose and fittings are tight, input and output hoses are correct. (If installed.)

Flush valve hose connections and fittings are tight, input and output hoses are correct. (If installed.)

Foam pump assembly hose connections and fittings are tight, input and output hoses are correct.

Check valve injector installed for correct direction of flow, hose and fittings are tight, and is located to supply concentrate into the water flow.

Flow sensor is aligned correctly, seated, and retainer cap is tight.

Ensure check valves and strainers are installed for correct direction of flow and strainer caps are tight

#### Mechanical Checks

Foam concentrate pump oil level is even with the line in the site glass. Use manufacturer recommended oil: Triplex Plunger Pump Crankcase Oil - # AR64516 to fill.

Foam concentrate pump red shipping plug removed and replaced with the yellow vented cap/dip stick.

Calibration bypass valve position.

Foam tank shutoff valve position.

Manual ABF selector valve position.

## Operation Test

The manual mode of operation is used to perform the operation test and can be used to prime the foam pump if it is required. **The water pump is not operated during this procedure.**

If a monitored function is not within normal parameters the FLOW display shows an error or fault warning code and a description shows in the message display. (Refer to Error Codes or Fault Warning Codes .)

**TFC100 Operation Note:** The TFC100 does not have a message display. Information is only shown in the 4-digit display, procedures are the same. (Substitute MODE for MENU button.)

### Set-up

Do the Pre-Operation Checks.

Fill the tank (water can be used for this test).

Open the foam tank shutoff valve.

Set manual selector valve to the foam tank with fluid. Close flush valves.

Place a calibrated collection bucket under the calibration bypass valve hose.

Set the calibration bypass valve to bypass.

Supply power to the system, OFF is shown in the FLOW display.

Ensure no error or fault warning codes show in the display.

### Test

1. Press the ON/OFF and PRESET buttons at the same time and hold.

Results: MANUAL MODE flashes in the message display for 3 seconds, the message display changes to show USE +/- FOR FLOW, the FLOW display flashes. (TFC100 flashes the ON/OFF LED, the FLOW LED is on.)

#### TFC400 only:

Press the A/B button to select the tank with fluid.

2. Press the + and – buttons to set the flow rate.

Results: The FLOW display shows the operator entered flow rate, the message display shows moving arrows to indicate the foam concentrate pump RPM, and the foam pump pumps fluid into the bucket.

3. Pump until a steady stream flows.

Do not operate the pump dry for more than 30 seconds. If no fluid flows shut down the pump check for air leaks, closed valve, reversed check valve, clogged strainer screen etc. in all lines between the tank and foam pump input.

4. Press the ON/OFF button to shut down the TurboFoam system, the LED goes off. Press the ON/OFF button again, the LEDs comes on, the system powers on in the manual mode.
5. To exit the manual mode, cut power to the control module.
6. Set the calibration bypass valve control back to the operate position.

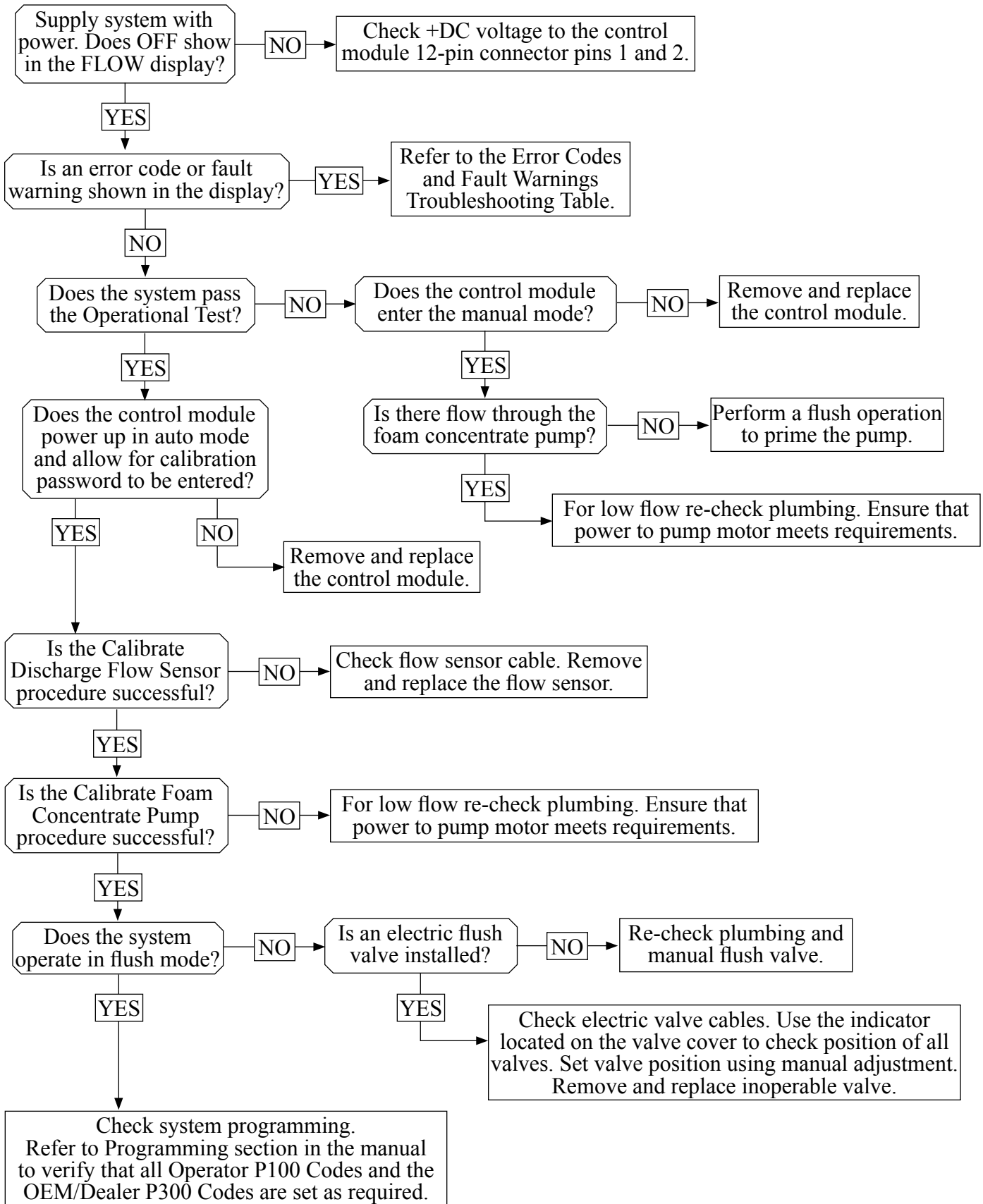
### Follow-up Calibrations

The flow sensor and concentrate pump must be calibrated before normal system operations. Refer to Calibration, Maintenance, and Troubleshooting; Calibration Section and perform the Calibrate Discharge Flow Sensor and Calibrate Foam Concentrate Pump procedures.

If the TankVision Pro is installed, ensure program codes P314 and P315 are set and the TankVision Pro is calibrated.

# TROUBLESHOOTING

## Flow Chart



## Error Codes and Fault Warnings Troubleshooting Table

The table is provided to assist in tracking down system problems, it is not meant to take the place of good troubleshooting practices.

**Table 9. Error Codes and Fault Warnings Troubleshooting**

Code	Description	Probable Cause
E01	Pump communications failed	Datalink cable between Control Module and Foam Pump Control
E02	Over current condition sensed	Foam Pump Motor; Foam Pump Control
E03	Over temperature sensed	Foam Pump Motor; Foam Pump Control
E04	Over temperature shutdown	Foam Pump Motor; Foam Pump Control
E05	No temperature sensor signal	Foam Pump Control
E06	RPM sensor failure, circuit open	Cable between RPM Sensor and Foam Pump Control; Bad RPM Sensor
E07	RPM sensor failure, circuit shorted	Cable between RPM Sensor and Foam Pump Control; Bad RPM Sensor
E08	Motor not turning	Supply power to motor; Foam Pump Motor; Foam Pump Control
E09	Hardware power limit, over current protection	Foam Pump Control
E10	Motor does not come up to requested speed, RPM low	Foam Pump; Foam Pump Motor; Foam Pump Control
E11	No RPM detected from the pump motor	RPM Sensor; Foam Pump Motor; Foam Pump Control
E12	Auto flush communications failed; no auto flush mode	Datalink cable between Control Module and Electric ABF Selector Control; Control Module; Electric ABF Selector Control
E13	A valve failed to open	Electric ABF Selector Control; A Foam Valve
E14	B valve failed to open	Electric ABF Selector Control; B Foam Valve
E15	Flush valve failed to open	Electric ABF Selector Control; Flush Valve
E16	A valve failed to close	Electric ABF Selector Control; A Foam Valve
E17	B valve failed to close	Electric ABF Selector Control; B Foam Valve
E18	Flush valve failed to close	Electric ABF Selector Control; Flush Valve
E19	A and B valves failed to open	Electric ABF Selector Control;
E20	No Motor Power	Main Motor Power Lost
F03	A foam concentrate tank empty	Tank Float Switch; TankVision Pro Control; TankVision Pro Pressure Sensor
F04	B foam concentrate tank empty	Tank Float Switch; TankVision Pro Control; TankVision Pro Pressure Sensor
F05	Request exceeds foam concentrate pump capacity	Foam % setting to high

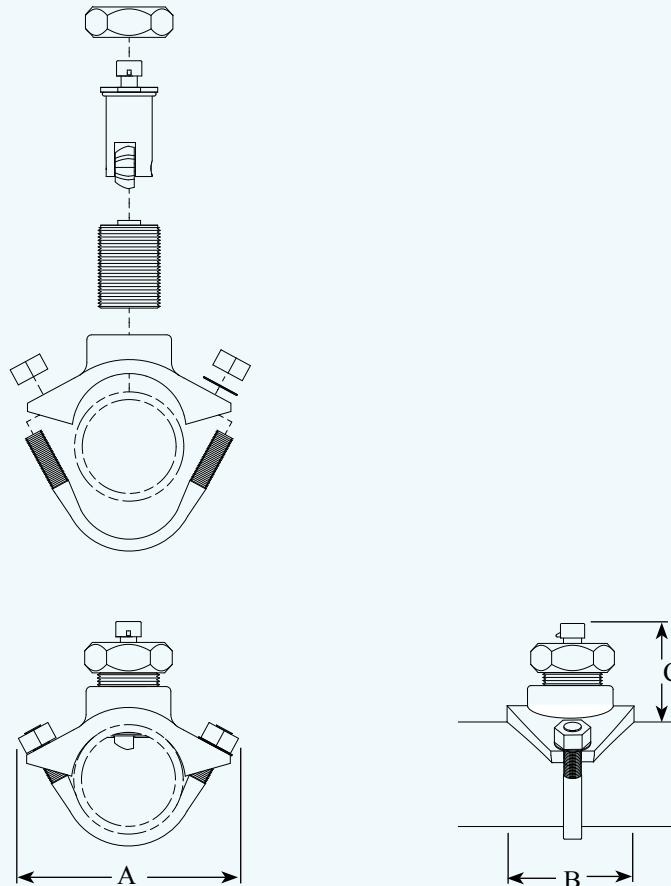


A Safe Fleet Brand

# TURBOFOAM

## DIRECT INJECTION FOAM PROPORTIONING SYSTEM WITH ELECTRIC FOAM CONCENTRATE PUMP MODELS: TFC100, TFC200, TFC300, TFC400

### INSTALLATION



INSTALLATION

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# INSTALLATION

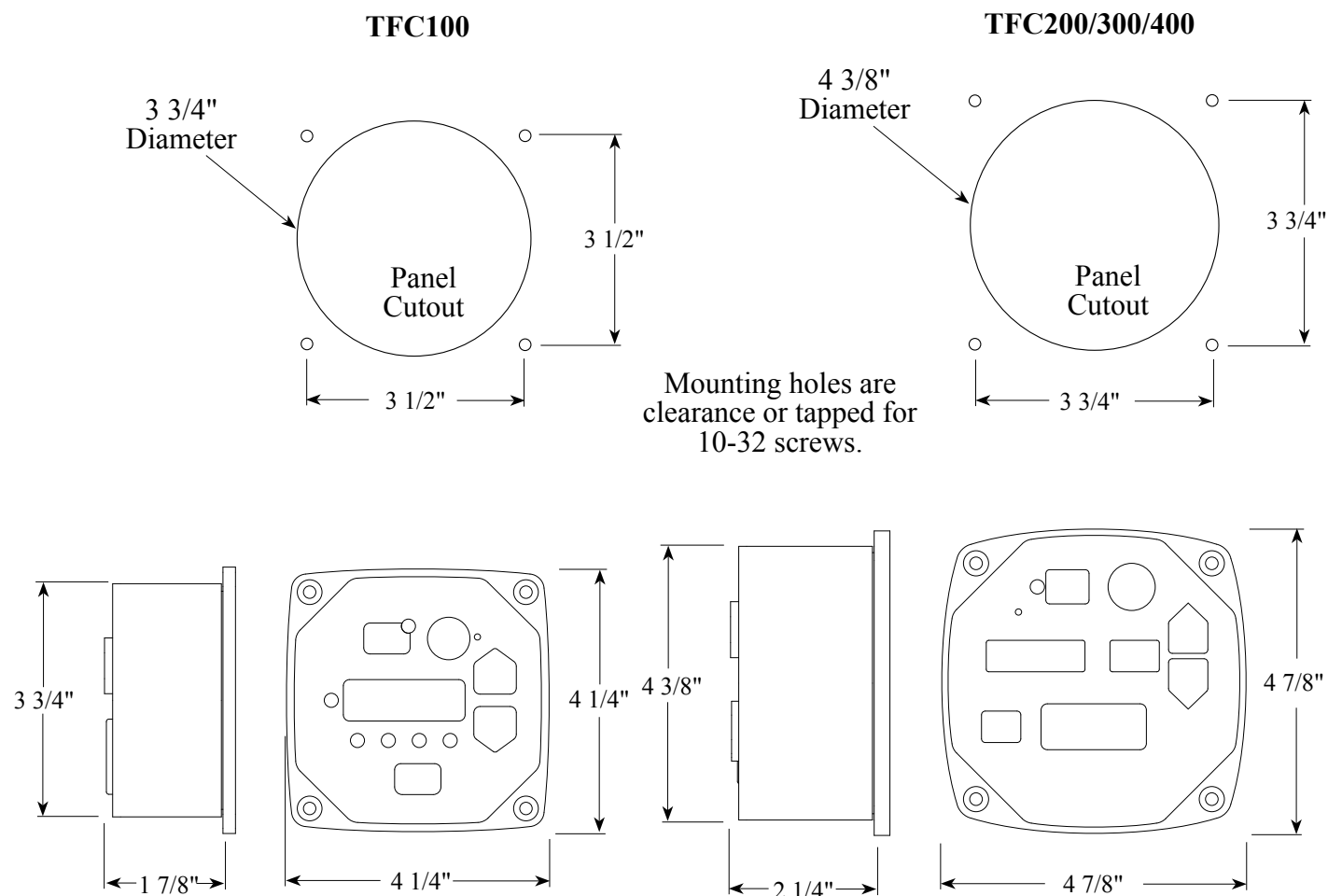
After the system components are installed perform the Operational Test. (Refer to Calibration, Maintenance, and Troubleshooting Section, Operational Test.) The flow sensor and concentrate pump must be calibrated after the Operational Test and before normal system operations.

## Install Control Module

**Note:** The TFC100 model requires a 3 3/4" diameter panel cutout, the TFC200/300/400 models require a 4 3/8" diameter panel cutout.

1. Measure and mark mounting location for control module panel cutout and mounting screw holes. Make sure there is clearance behind the panel before cutting holes. Refer to figure for layout and dimensions.
2. Cut a hole in the panel (check model and dimension) and drill four holes for 10-32 mounting screws.
3. Place the control module in position and secure with four screws.
4. Connect the cable(s) to the module. (Refer to Wiring Section.)

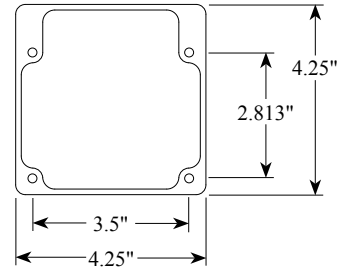
**Note:** The standard single tank control module is factory programmed for class A foam and must be reprogrammed if used for class B foam (refer to program code P312).



**Figure L1. TFC Control Module Mounting Dimensions**

## Install System Placards

Three placards are provided for mounting on the pump panel. They are made of a plate with a decal label. One shows the system basic plumbing diagram, one outlines the basic operating instructions, and one lists the system specifications. The three mounting plates are the same size (4 1/4" by 4 1/4") and use the same mounting hole pattern. The mounting holes are clearance or tapped for 10-32 screws. It is easy to use one of the plates as a template.



## Install TankVision Pro Datalink

The FRC TankVision Pro is used to provide the tank empty signal and the time remaining for operation information via the 2-wire FRC datalink. The signal is available on the TankVision Pro display pins 7(+) and 8(-). Refer to Wiring Section.

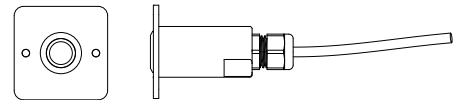
Refer to the TankVision Pro technical manual document number XE-WLA3PM-R0A, file reference number WLA300 for more information.

## Install Tank Float Switch for Tank Empty Input

A float switch can be installed to provide the tank empty signal when a TankVision Pro is not installed. The TurboFoam requires a signal to ground when the tank is empty. (Refer to Wiring Section.)

## Install Remote ON/OFF Switch or Flush Switch

The remote on/off switch and flush switch are wired to the control module. Two connections are available, one for each switch and one for each indicator light. The switch mounting hole diameter is 1 3/8" and it uses two 10-32 screws to secure the 2 1/2" by 2 1/2" label plate to the panel. (Refer to Wiring Section.)



## Install Foam Strainer and Foam Check Valves

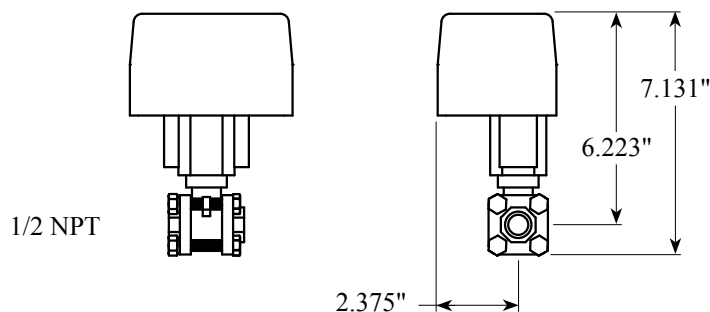
The provided strainer must be installed on the input to the foam pump assembly. A foam tank check valve must be installed to prevent flush water from getting into the foam tank. Refer to Install Plumbing.

## Install Miscellaneous Plumbing

All system components are shipped with the plumbing fittings installed. Hose and hose fittings are not supplied in the kits. Refer to Install Plumbing.

## Install Electric Flush Valve

This valve is standard on TFC300 models and is available as an option for the TFC100/200 single tank systems, refer to Install Plumbing. The valve is controlled by a pushbutton on the TFC300 control module and a separate mounted switch and indicator for the TFC100/200 option. The valve cable is connected to the foam pump control, refer to Wiring Section.



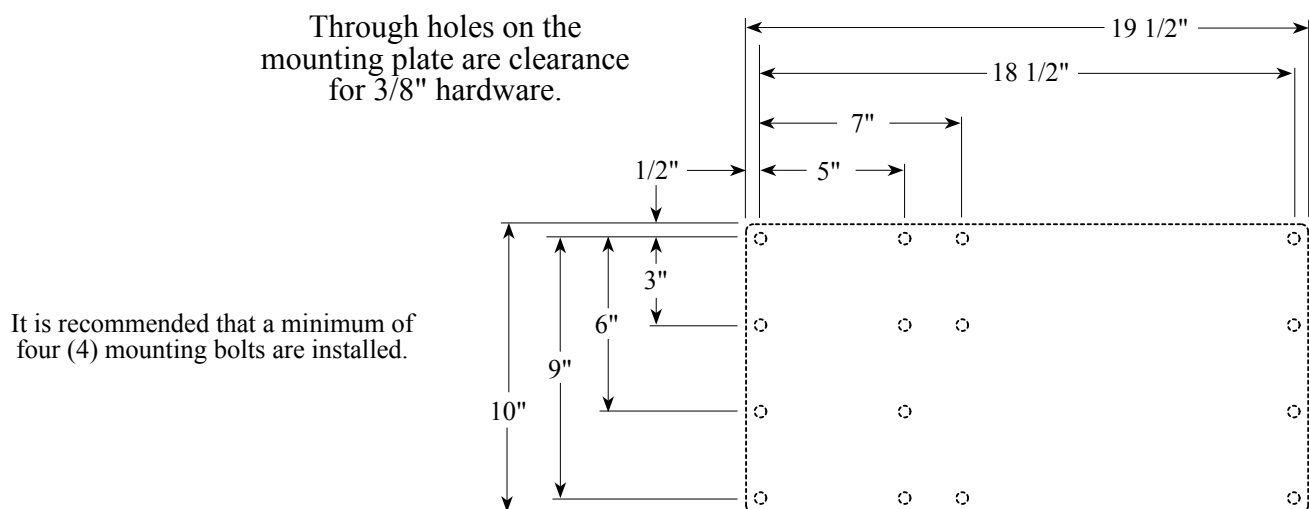
## Install Foam Pump Assembly

Remove and replace the pump oil reservoir red shipping plug with the yellow vented cap/dip stick. Ensure the oil level is even with the line in the site glass. (The red shipping plug should be saved.)

It is recommended that a minimum of four (4) mounting bolts are installed.

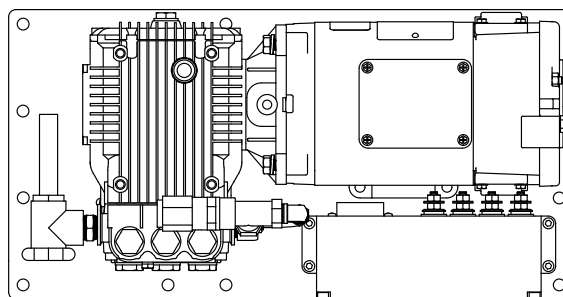
**Note:** Not all mounting holes are easily accessible on every foam pump assembly. Check specific model for details.

1. Measure and mark mounting location. Make sure there is clearance for plumbing connections and to open the calibration valve before drilling holes. (The larger electric motors require 1/2" clearance at the rear for fan intake.) Refer to figure for dimensions.
2. Mount with 3/8" hardware.
3. Connect the cables to the pump control module. Rout the wiring under the motor to provide a drip loop to help prevent water from getting to the terminals. (Refer to Wiring Section.)



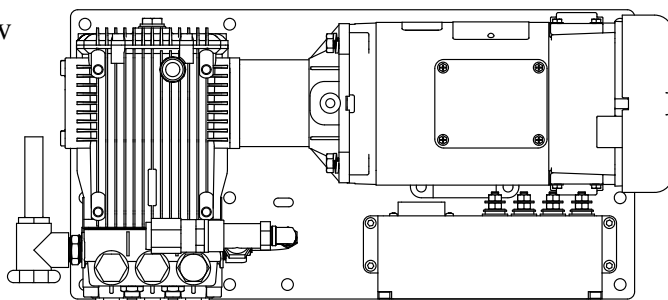
### Typical 1.6, 2.1 and 2.6 GPM Foam Pump Assembly

Top View



### Typical 3.5, 5.0, 6.2, 6.5 GPM Foam Pump Assembly

Top View

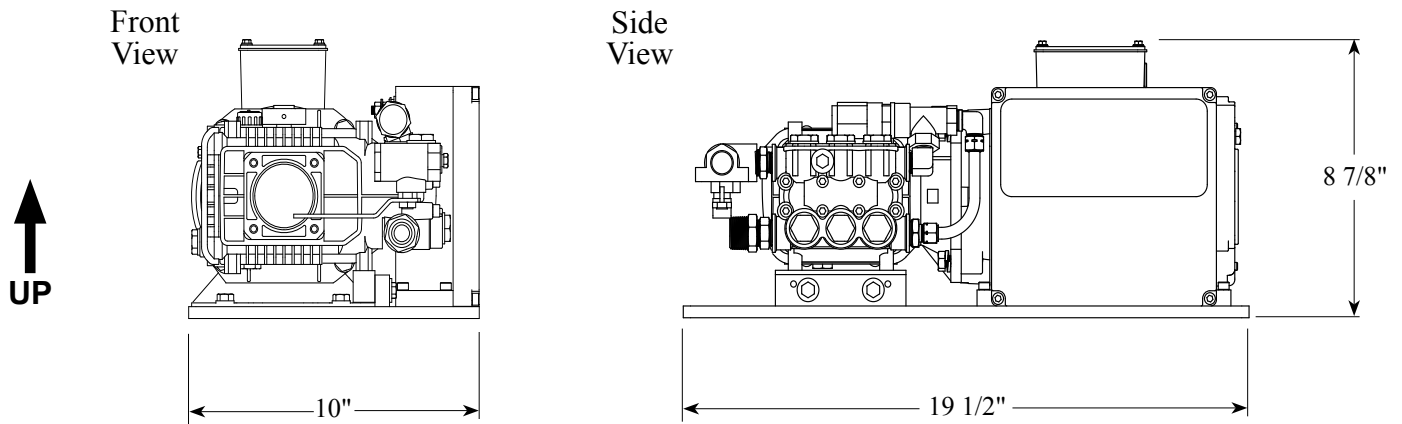


**Figure L2. Foam Pump Assembly Mounting Dimensions**

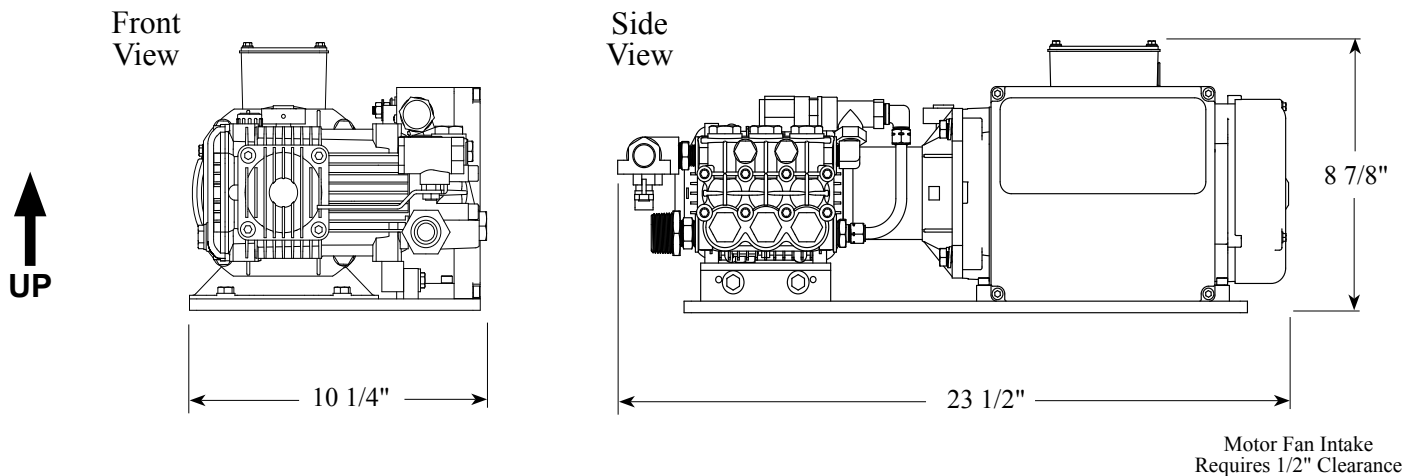
**Installation Notes:**

- Foam Pump Assembly must be mounted in an upright position.
- Not all mounting holes are easily accessible on every foam pump assembly.
- Remove and replace the pump oil reservoir red shipping plug with the yellow vented cap/dip stick.
- Check the oil level (use the sight glass or dip stick).
- A strainer must be installed along the pump input line (refer to Plumbing).
- The calibration bypass valve needs to be accessible.
- Larger motors (2.1, 3.5, 5.0, 6.2, 6.5 GPM ) have a fan at the rear and require 1/2" fan intake clearance.

**Typical 1.6, 2.1 and 2.6 GPM  
Foam Pump Assembly**



**Typical 3.5, 5.0, 6.2, 6.5 GPM  
Foam Pump Assembly**



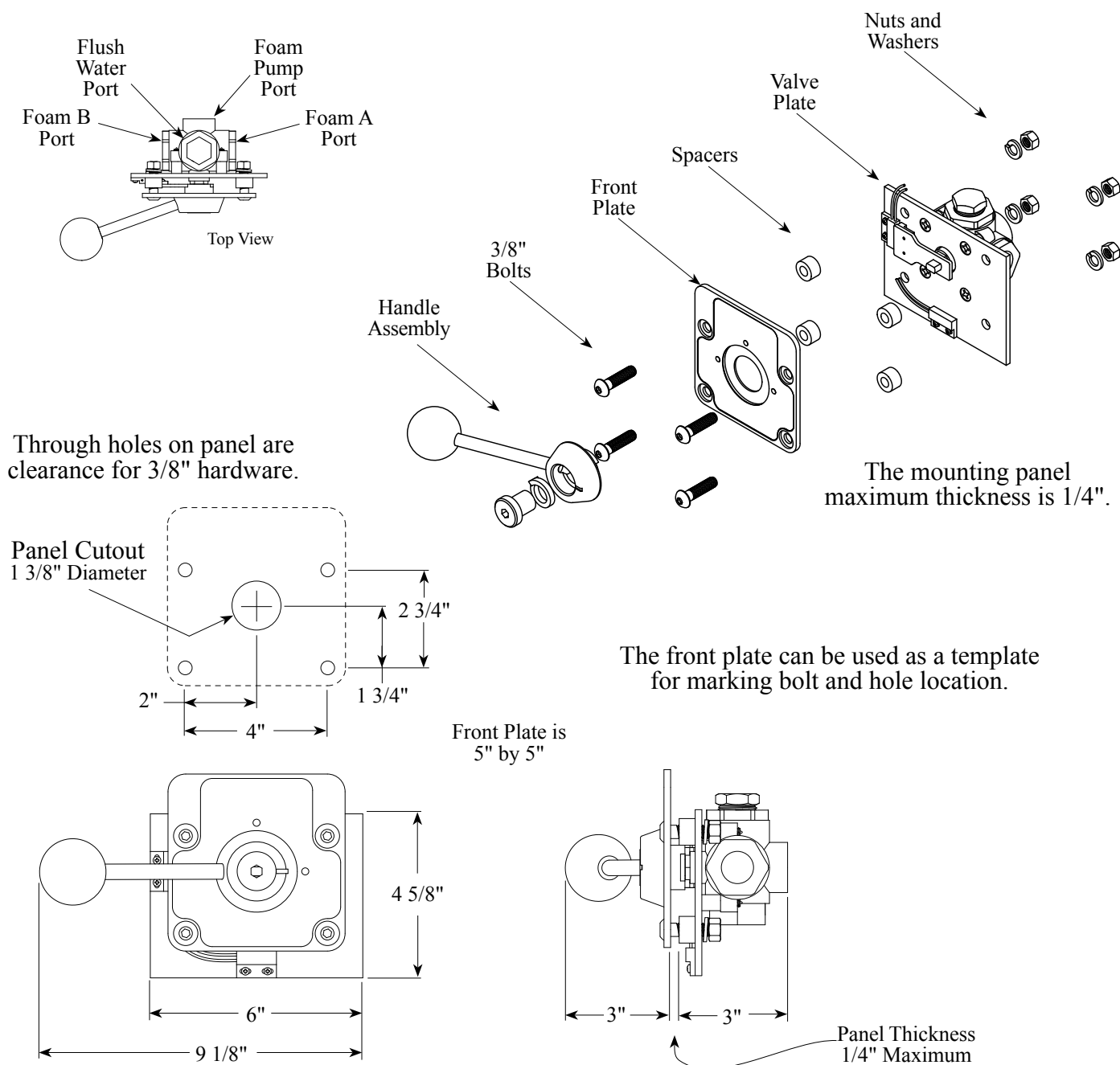
**Figure L3. Foam Pump Assembly Dimensions**

## Install Manual ABF Selector Assembly (TFC200 Option)

The Manual ABF Selector is for use with the TFC200 on two tank systems.

**Note:** The maximum thickness for the mounting panel is 1/4".

1. Measure and mark location for the center hole and four mounting bolts. Make sure there is clearance for plumbing connections before drilling holes. Refer to figure for layout and dimensions.
2. Drill one 1 3/8" center hole and four through holes for the 3/8" bolts.
3. Place the front plate in position, run bolts through front plate, panel, spacers, and valve plate. Secure with nuts.
4. Connect the handle assembly.
5. Connect the foam tanks, flush water, and foam pump plumbing. (Refer to Plumbing Connections.)
6. Connect the cable to the module. (Refer to Wiring Section.)

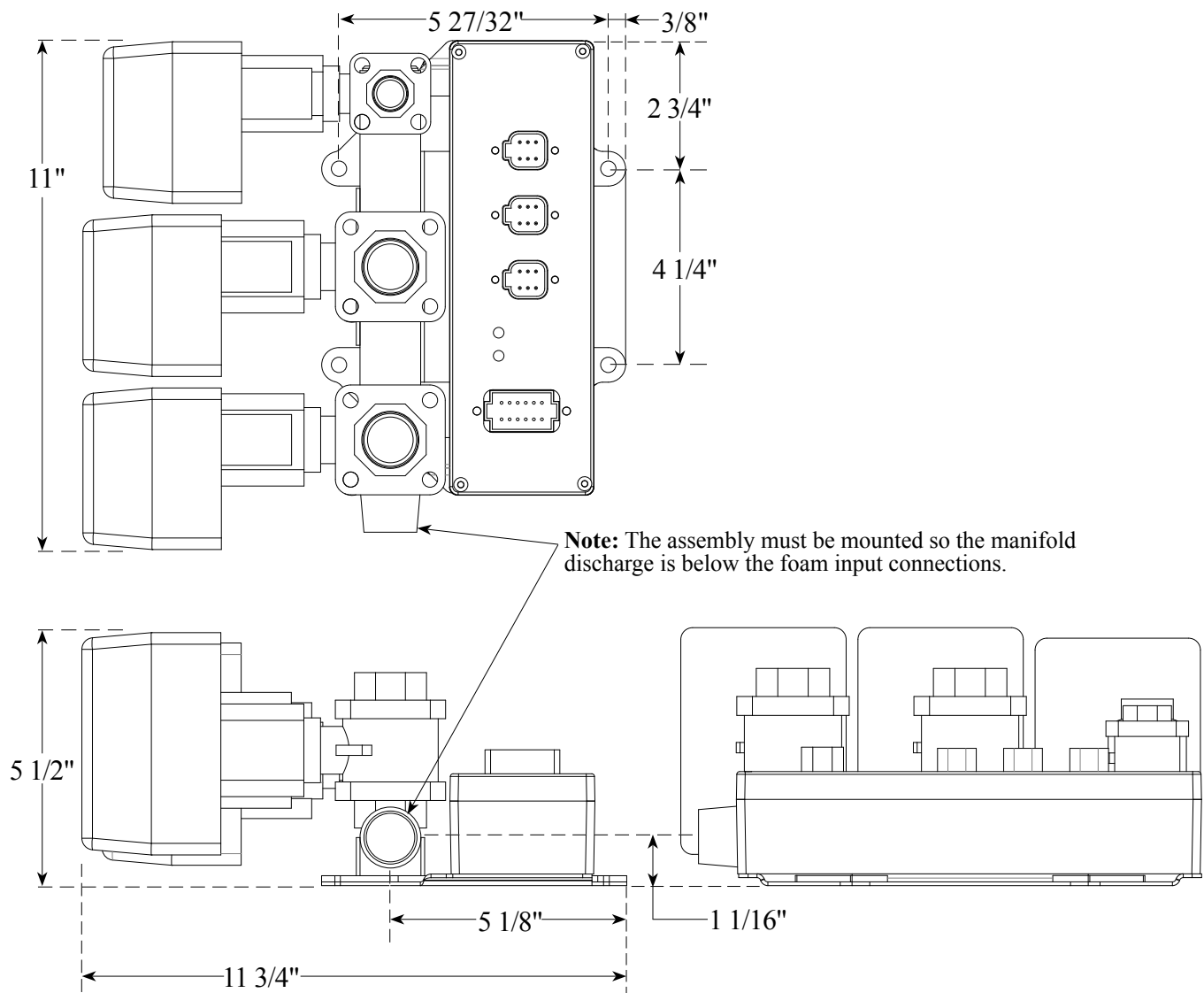


**Figure L4. Manual ABF Selector Mounting Dimensions**

## Install Electric ABF Selector Assembly (TFC400 Only)

**Note:** The assembly must be mounted lower than the foam tank and higher than the concentrate pump (the manifold discharge must not be above the foam input connection).

1. Measure and mark location for four (4) mounting holes. Make sure there is clearance for plumbing connections before drilling holes. Refer to figure for layout and dimensions.
2. Mount with 5/16" hardware.
3. Connect the foam tanks, flush water, and foam pump plumbing. (Refer to Plumbing Connections.)
4. Connect the valve cables and system cable. (Refer to Wiring Section.)



**Figure L5. Electric ABF Selector Mounting Dimensions**

## Install Plumbing

All TurboFoam system components are shipped with the plumbing fittings installed. The standard kit fittings are in American National Pipe thread (an option is available for kit fittings to be British Standard Pipe thread). Hose and hose fittings are not supplied in the kits. It is recommended that the installer use fittings with NPT (National Pipe Taper) (or BSPT (British Standard Pipe Taper)) threads to make all pressure line connections to the system components.

A waterway check valve is required to prevent foam from entering the water pump. The waterway check valve is available as an option in multiple sizes and with various configurations that include the flow sensor mount.

The flow sensor is mounted in the discharge line. Refer to Install Flow Sensor(s) for flow sensor location and mounting information. The check valve injector is installed down stream.

There are four typical plumbing configurations for the TurboFoam system. Depended on the specific model and optional equipment these may vary.

### **TFC100/200 Single Tank**

### **TFC100/200/300 Single Tank with Electric Flush Valve**

### **TFC200 Two Tank with Manual ABF Selector Valve**

### **TFC400 Two Tank with Electric ABF Selector Valve**

Refer to the plumbing diagrams for detailed information.

## **Foam Tank and Concentrate Pump Intake Low Pressure Lines**

Clear Suction Hose, 23" (584mm) Hg Vacuum, 50 PSI (3 bar)

Connect the tanks to the selector valves and/or the concentrate pump input. Check valves need to be installed to protect the tanks from water infiltration. A strainer is required to protect the input to the concentrate pump.

## **Concentrate Pump Intake High Pressure Lines**

Clear Suction/Pressure Hose, 23" (584mm) Hg Vacuum, 500 PSI (34 bar)

Except 2.1 GPM requires 650 PSI (45 bar)

Connect the selector or flush valves to the concentrate pump input. All lines and fittings down stream of the flush valve are required to be for high pressure.

## **Water Flush and Foam Concentrate Injection High Pressure Lines**

Pressure Hose, 23" (584mm) Hg Vacuum, 500 PSI (34 bar)

Except 2.1 GPM requires 650 PSI (45 bar)

Connect the water flush line to the selector valve and/or tank line tee. The water flush line requires a check valve and strainer. Connect the concentrate pump pressure output to the check valve injector.

## **Plumbing Notes:**

Remove the red shipping plug in the foam concentrate pump and replace it with the yellow vented cap/dip stick. Check the oil level in the pump.

Locating the flow sensor in the plumbing system is critical. Guidelines for selecting flow sensor locations are outlined in Install Flow Sensor(s).

All components on the suction side of the concentrate pump should be as close as possible. The one exception: There needs to be a 10" minimum section of hose on the concentrate pump input for vibration absorption.

Mount foam tank check valves directly on the ABF selector if possible or mount as close to the valve as possible. All concentrate hose runs should be as short as possible.

All lines and fittings down stream of the flush valve are required to be for high pressure. This would include the hose between the tank check valve and the tank line tee fitting.

Pay attention to flow direction of check valves and strainers.

The tank to valve to foam pump lines should be plumbed as if they were gravity feed lines. ie. The tank needs to be higher than the valve and both higher than the foam pump - hoses should be continuously declining. Do not leave loops or traps in the hose lines.

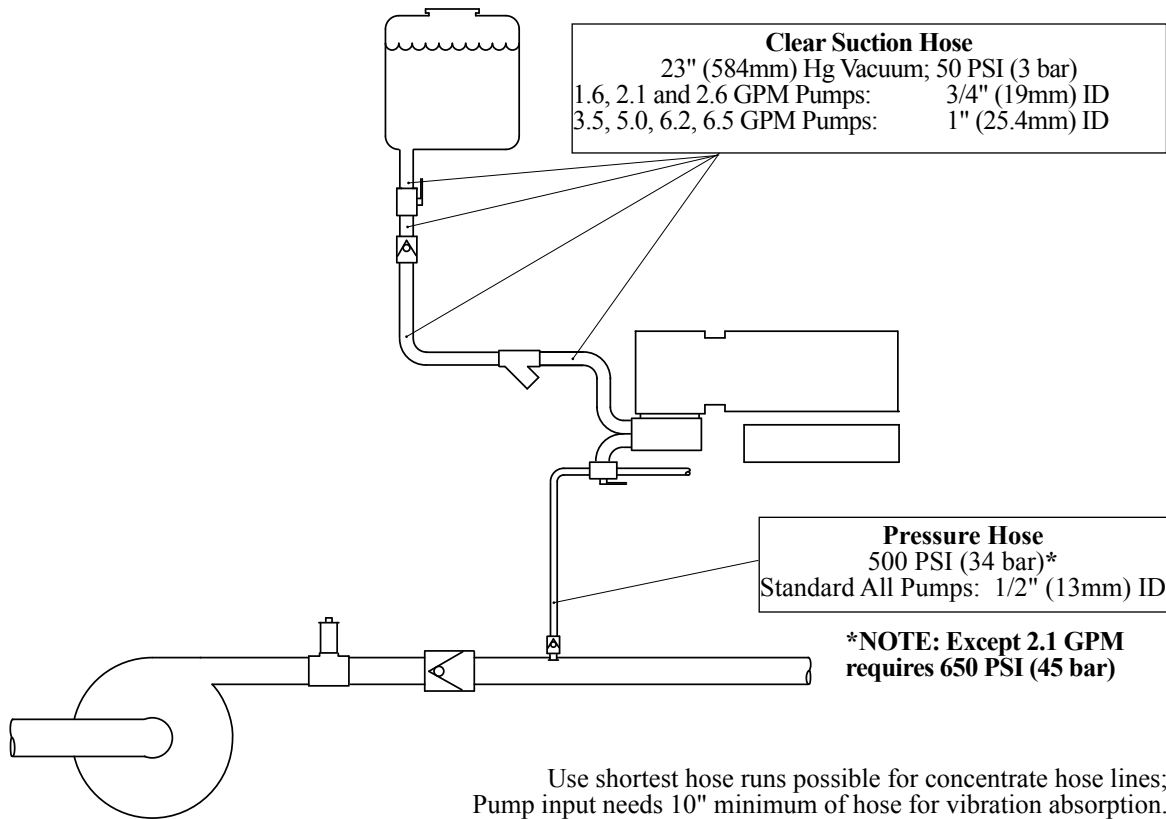
Recommended hose sizes are minimum sizes, the larger the diameter for B foam supply line, the better. The inside of suction hoses need to be smooth. Clear hose is recommended on suction lines.

The calibration hose can be permanently installed or connected as needed.

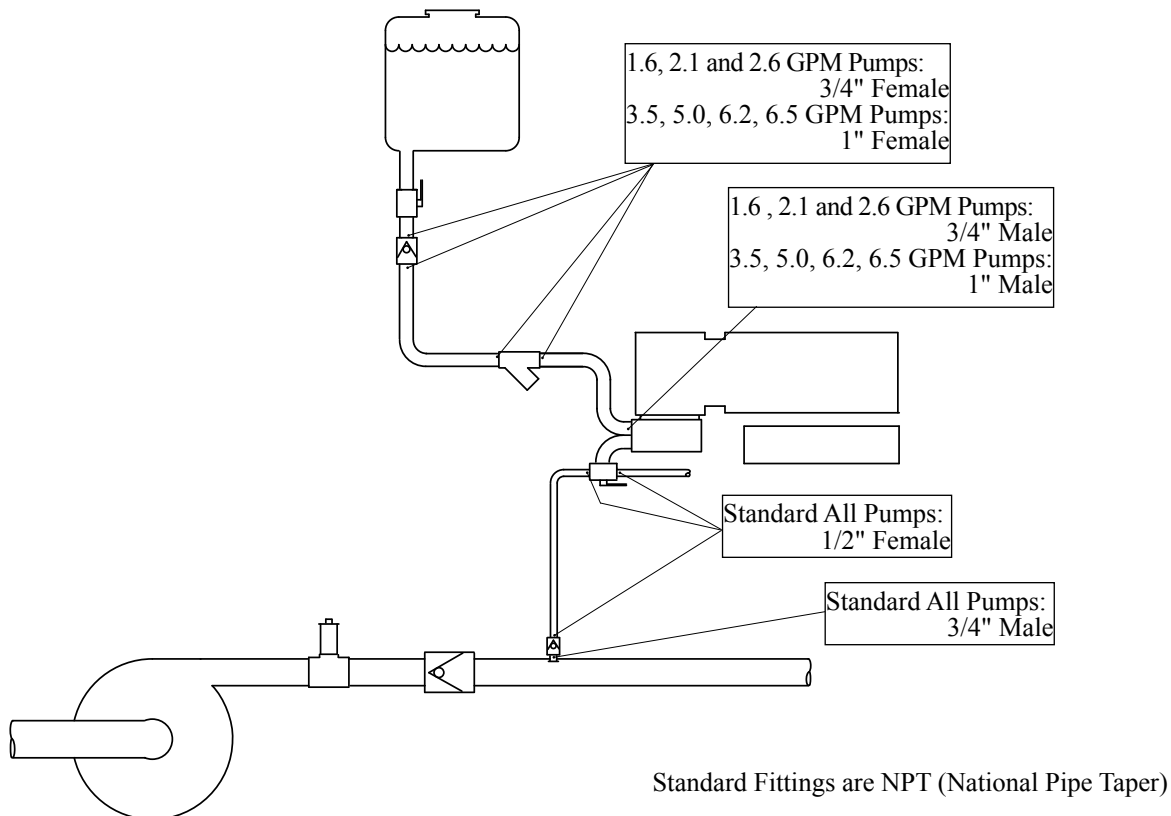
The tank fill line needs to be connected up-stream of the flow sensor.



**Hose Sizes:** Hoses Provided by Installer

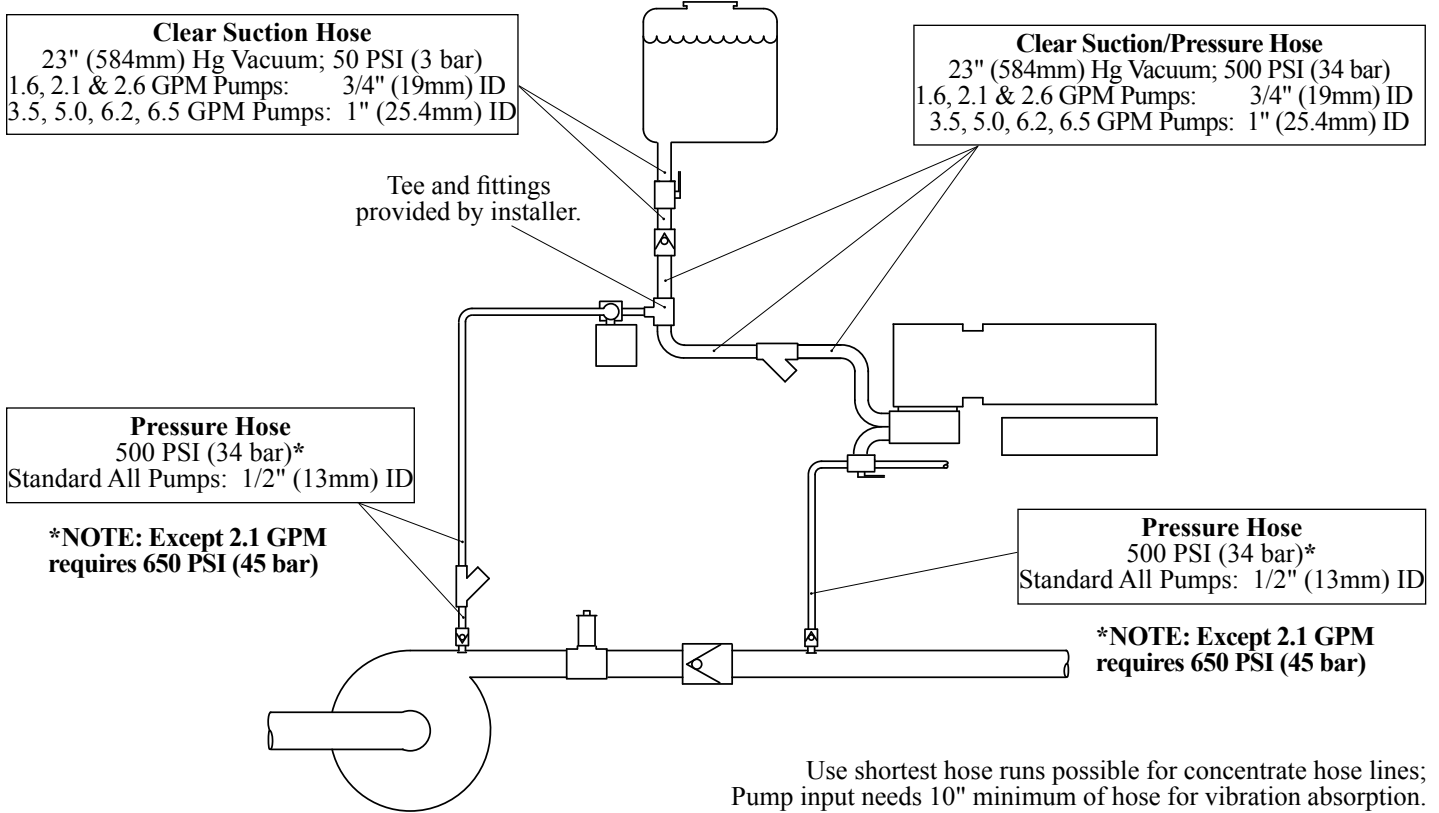


**Fitting Sizes:** Fittings Provided with System Kit

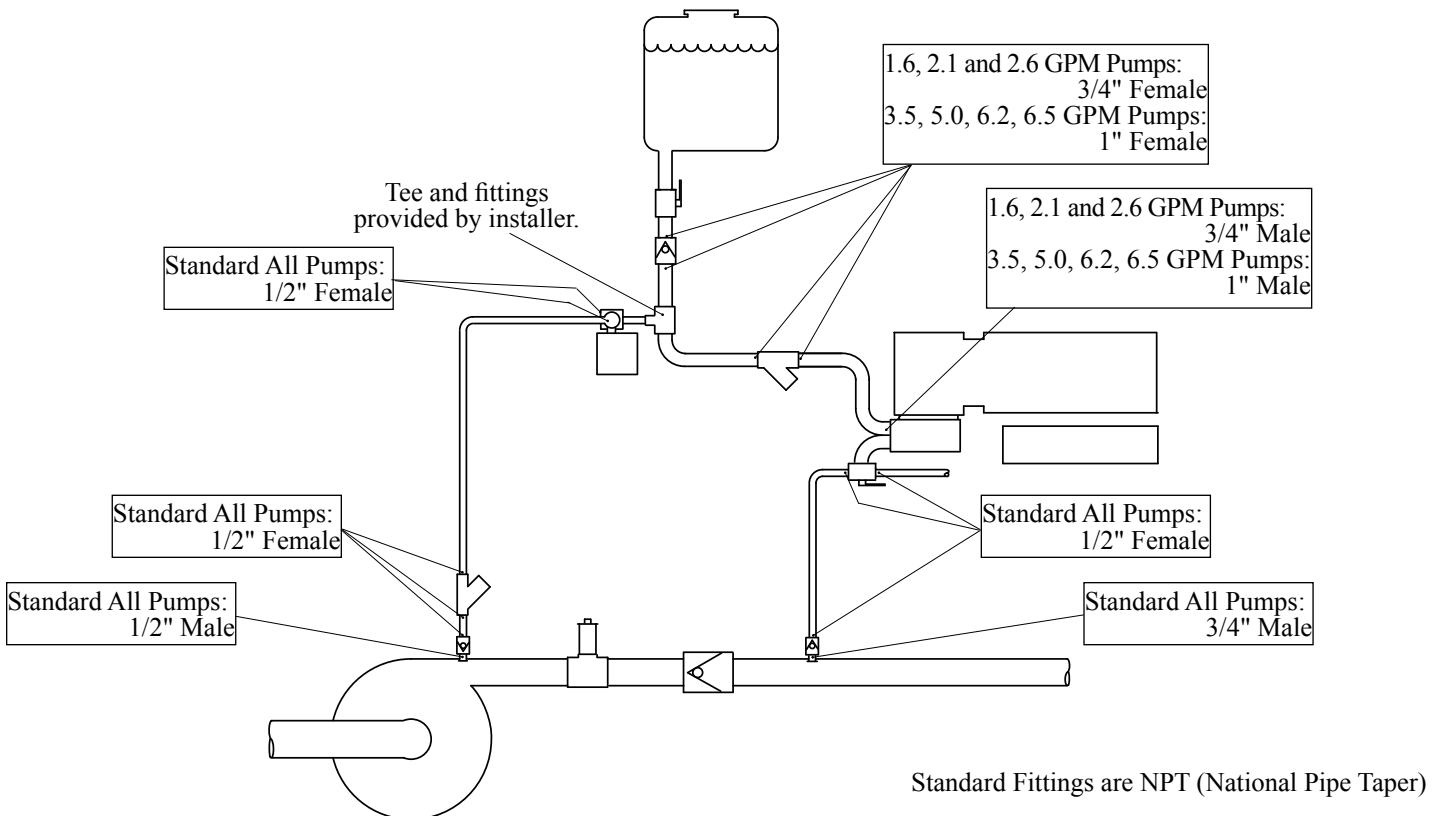


**Figure L6. TFC100/200 Plumbing Single Tank System**

**Hose Sizes:** Hoses Provided by Installer

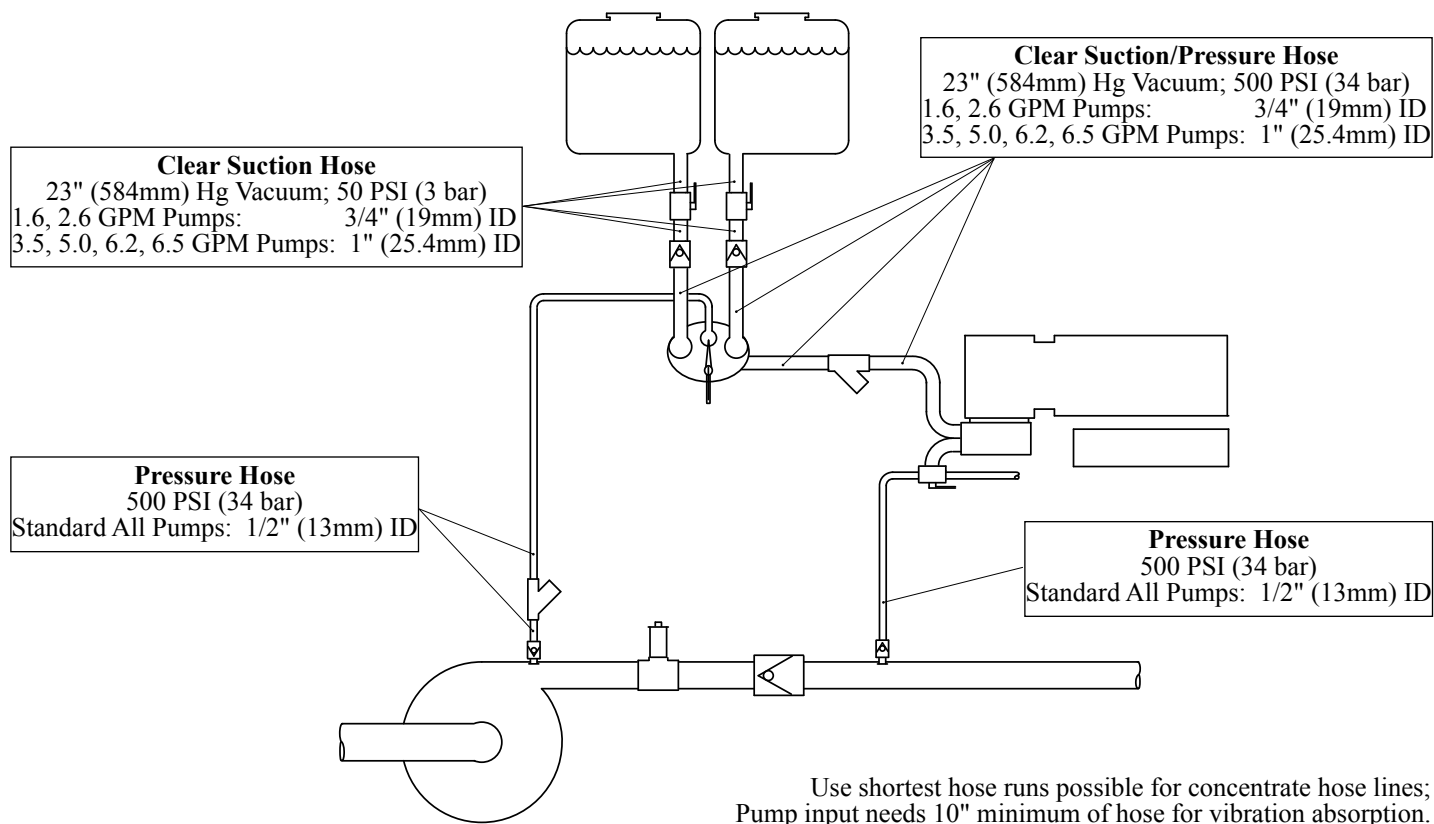


**Fitting Sizes:** Fittings Provided with System Kit

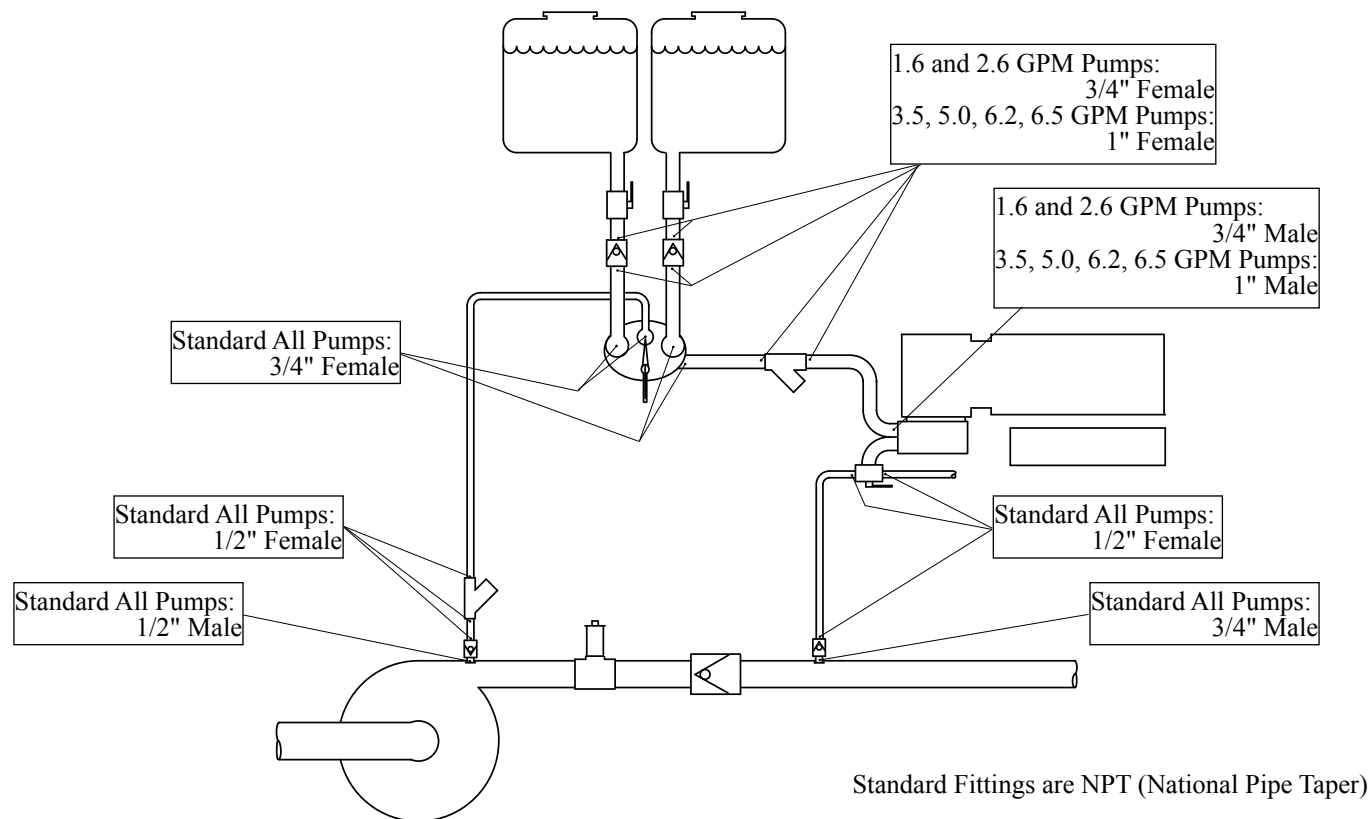


**Figure L7. TFC100/200/300 Plumbing Single Tank System w/Electric Flush Valve**

**Hose Sizes:** Hoses Provided by Installer

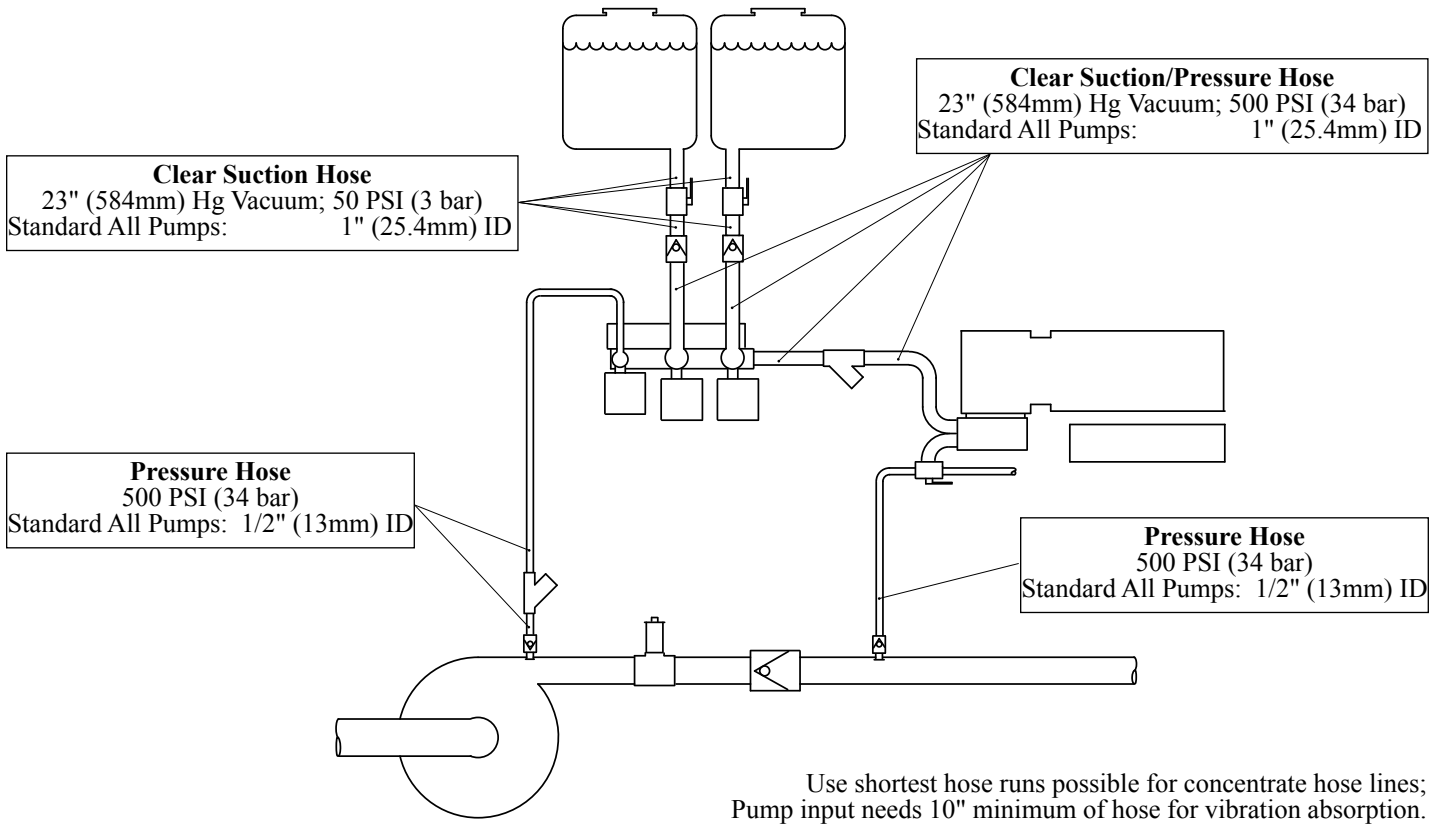


**Fitting Sizes:** Fittings Provided with System Kit

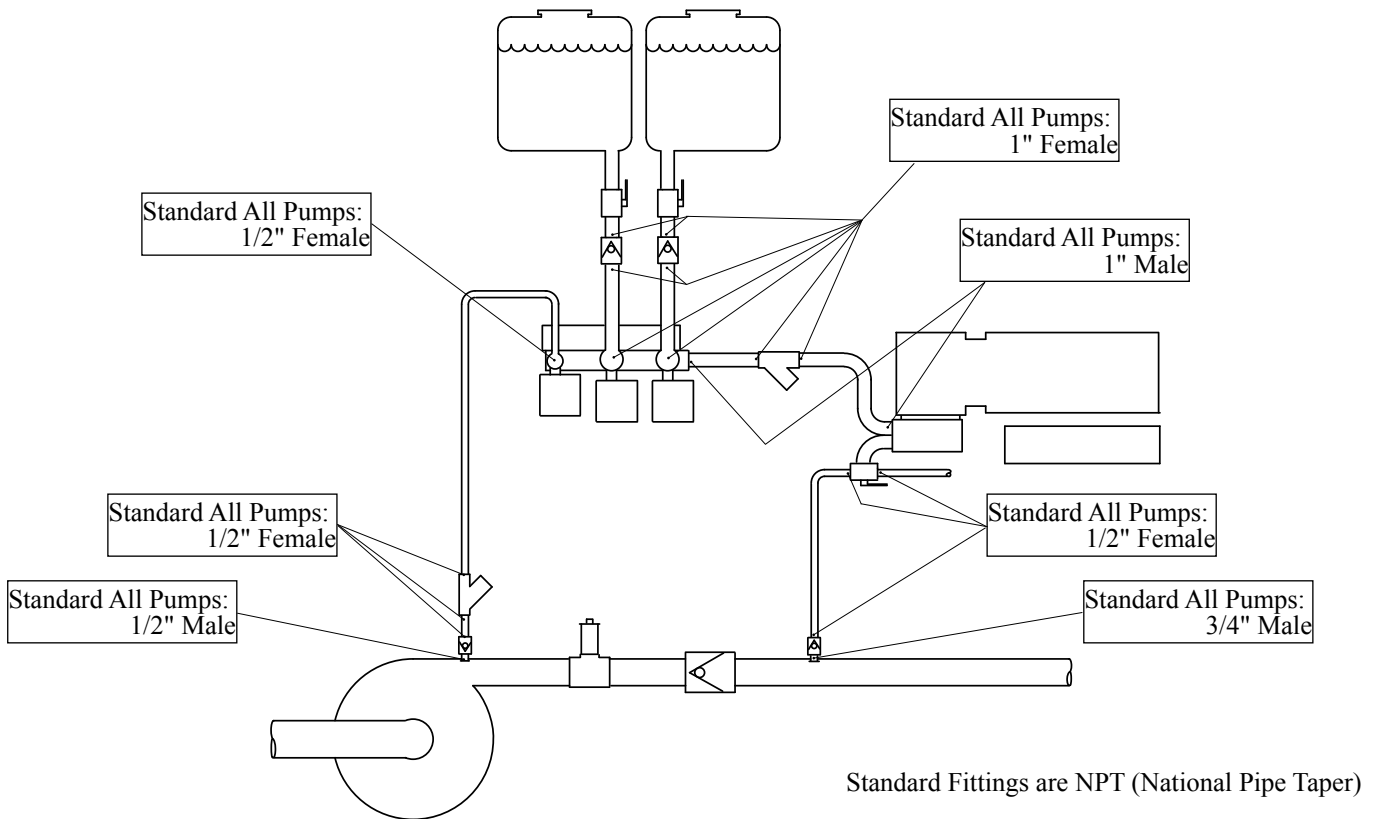


**Figure L8. TFC200 Plumbing Two Tank System w/Manual ABF Selector**

**Hose Sizes:** Hoses Provided by Installer



**Fitting Sizes:** Fittings Provided with System Kit

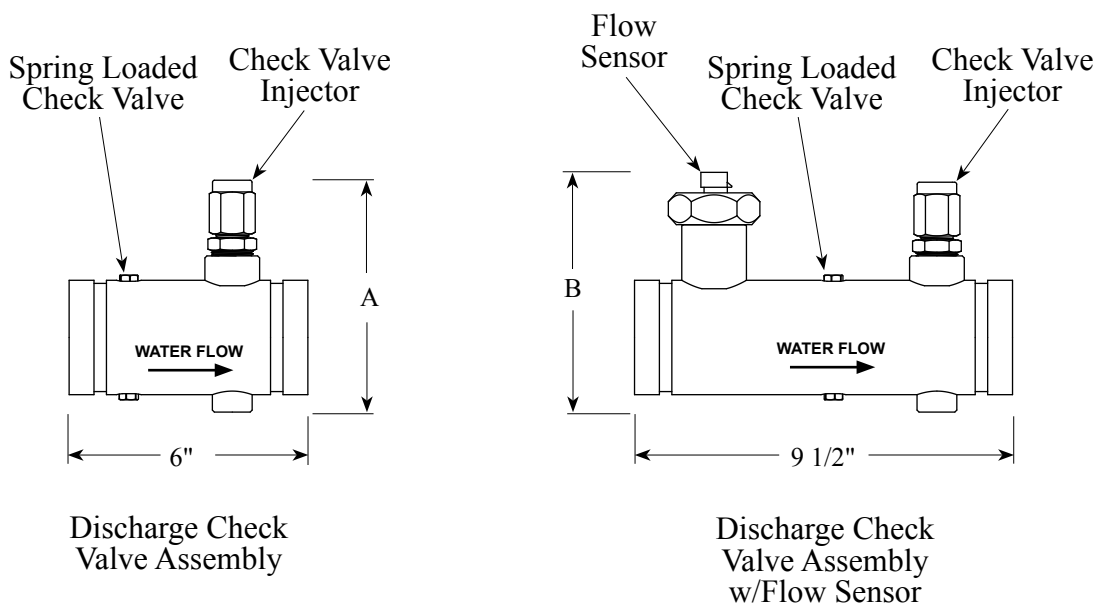


**Figure L9. TFC400 Plumbing Two Tank System w/Electric ABF Selector**

## Install Discharge Check Valve Assembly Option

The discharge check valve assembly includes a waterway check valve and a check valve injector. A second option is available that includes the flow sensor mount.

**Note:** Allow a minimum of 3 inches clearance above the flow sensor for removal/installation.



Spring Loaded Check Valve	1.5"	2.0"	2.5"	3.0"	4.0"
Victaulic Coupling	1.5"	2.0"	2.5"	3.0"	4.0"
Height A	4 13/16	5 5/16	5 13/16	6 7/16	7 7/16
Height B	5 1/16	5 9/16	6 1/16	6 11/16	7 11/16

**Figure L10. Discharge Check Valve Assembly Dimensions**

## Install Flow Sensor(s)

There are several ways to install paddlewheel type flow sensors. Mounting options include saddle clamps, weldments, pipe tees, and special adapters. Each mount meets a particular plumbing requirement.

Flow sensors are interchangeable. It is recommended to check display accuracy if sensors are swapped and calibrated when necessary.

The maximum flow sensor pressure is 700 PSI (48 bar).

### Flow Sensor Location

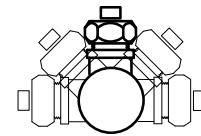
Locating the flow sensor in the plumbing system is critical. The flow of water at and around the sensor must be laminar, or smooth, to ensure accurate flow rate measurement. There must be enough straight pipe before the flow sensor for the water stream to stabilize into a uniform flow. Guidelines for selecting flow sensor locations are outlined in the following figures.

### Turbulent Water

When the flow sensor is mounted after an area in the plumbing that tends to increase water stream turbulence (a valve, increase in pipe diameter, etc.), it is critical that steps are taken to stabilize the flow. When a pipe is reduced in diameter, the water stream tends to be squeezed into a more uniform flow. This can help stabilize flow when there is not sufficient straight pipe up stream.

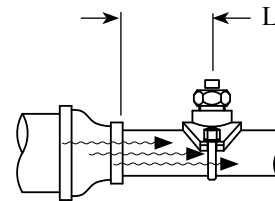
The preferred location for mounting a flow sensor is on the top half of the pipe. The best orientation is vertical.

Best Flow Sensor Orientation is Vertical



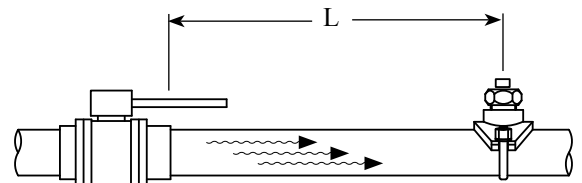
When mounting a sensor after the pipe diameter is reduced, length L must be at least 2 times the pipe diameter.

After Reduction  
 $L > 2 \times \text{PIPE DIA.}$



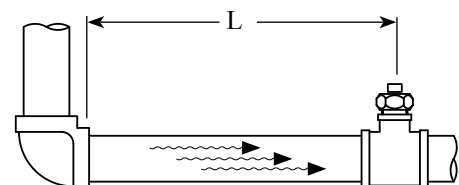
When mounting a sensor after a valve, length L must be at least 14 times the pipe diameter.

After Valve  
 $L > 14 \times \text{PIPE DIA.}$



When mounting a sensor after an elbow, length L must be at least 6 times the pipe diameter.

After Elbow  
 $L > 6 \times \text{PIPE DIA.}$



When mounting a sensor before a valve or an elbow, length L must be at least equal to the pipe diameter.

Before Valve or Elbow  
 $L > 1 \times \text{PIPE DIA.}$

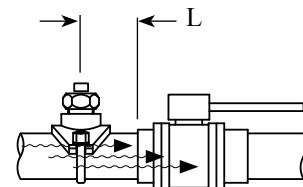


Figure L11. Flow Sensor Location Guidelines

## Saddle Clamp Installation

**Note:** Ensure that the mounting location meets the requirements for uniform water flow and that there is enough room for the saddle clamp, sensor, and connector to fit.

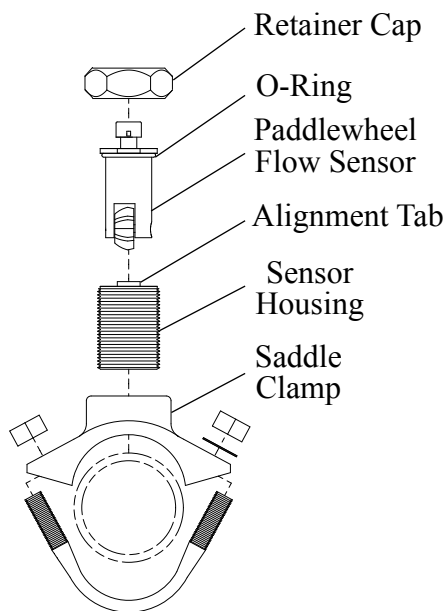
1. Drill and deburr a 1-11/16" to 1-3/4" diameter hole at mounting location.
2. Clean pipe surface in area where saddle clamp gasket seal.

**Note:** The sensor housing is epoxied in the saddle clamp with the alignment tab in the correct position and is not meant to be removed.

3. Place saddle clamp over hole with sensor housing centered.
4. Tighten saddle clamp nuts until the gasket makes a good tight seal.
5. Insert flow sensor into sensor housing. Align flat spot on sensor rim with alignment tab and make sure O-ring is in groove.

**Note:** The retainer cap is hand-tightened. There is an inside lip that stops the cap from turning when it makes contact with the alignment tab. This provides the correct pressure to make the seal at the O-ring. Make sure the flow sensor engages the alignment tab and does not rotate.

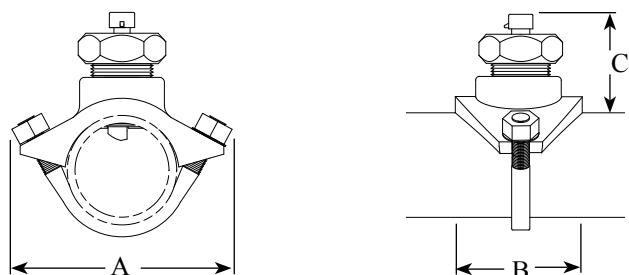
6. Install retainer cap and hand tighten.
7. Connect flow sensor cable. (Refer to Wiring Section.)



**Note:** Allow a minimum of 3 inches clearance above the sensor for removal/installation.

**Note:** When the retainer cap is tightened make sure the flow sensor engages the alignment tab and does not rotate.

**Note:** Dimensions are typical and are an aid to determine flow sensor mounting locations.



Pipe Size (Sch 40)	Dimensions		
	A	B	C
2	5.5	3.9	2.9
2.5	5.5	3.9	2.8
3	5.9	3.9	2.8
3.5	6.8	4.3	2.8
4	6.8	4.3	2.8
5	8	4.3	2.8

Measurements are in inches.

**Figure L12. Saddle Clamp Installation**

**Weldment Installation**

**Note:** Ensure that the mounting location meets the requirements for uniform water flow and that there is enough room for the weldment, sensor, and connector to fit.

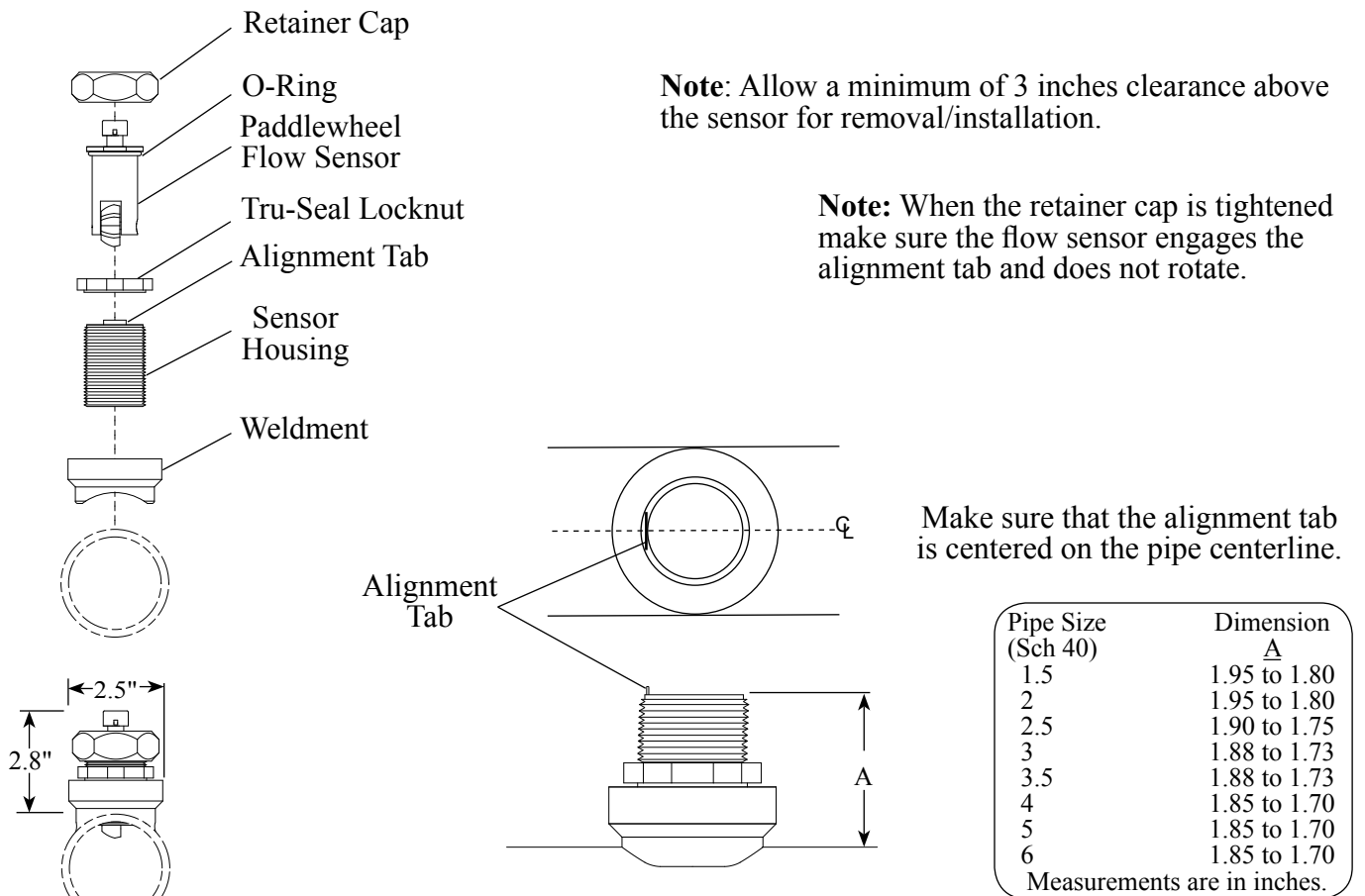
1. Drill and deburr a 1-11/16" to 1-3/4" diameter hole at mounting location.
2. Center weldment mount over hole and weld it to pipe. The weld must be continuous around the fitting with no gaps or voids.
3. Screw sensor housing into weldment far enough to make sure it goes through the pipe freely, then back it out.

**Note:** The paddlewheel sensor must be correctly aligned in the water stream. The alignment tab is used to set the position of the sensor on the pipe centerline.

4. Set sensor housing to dimension A (refer to figure). Make sure the alignment tab is centered on the pipe as shown (it can be on upstream or downstream side).
5. Install tru-seal locknut and tighten with 2" wrench using light to medium torque. Make sure the sensor housing alignment tab remains centered and the sensor housing does not rotate causing dimension A to change.
6. Insert flow sensor into sensor housing. Align flat spot on sensor rim with alignment tab and make sure O-ring is in groove.

**Note:** The retainer cap is hand-tightened. There is an inside lip that stops the cap from turning when it makes contact with the alignment tab. This provides the correct pressure to make the seal at the O-ring. Make sure the flow sensor engages the alignment tab and does not rotate.

7. Install retainer cap and hand tighten.
8. Connect flow sensor cable. (Refer to Wiring Section.)



**Figure L13. Weldment Installation**



## Install Summing Box (Multiple Flow Sensors Only)

The summing box mounts with four screws. Make sure there is room to connect the cables. The summing box is required when there is more than one discharge flow sensor.

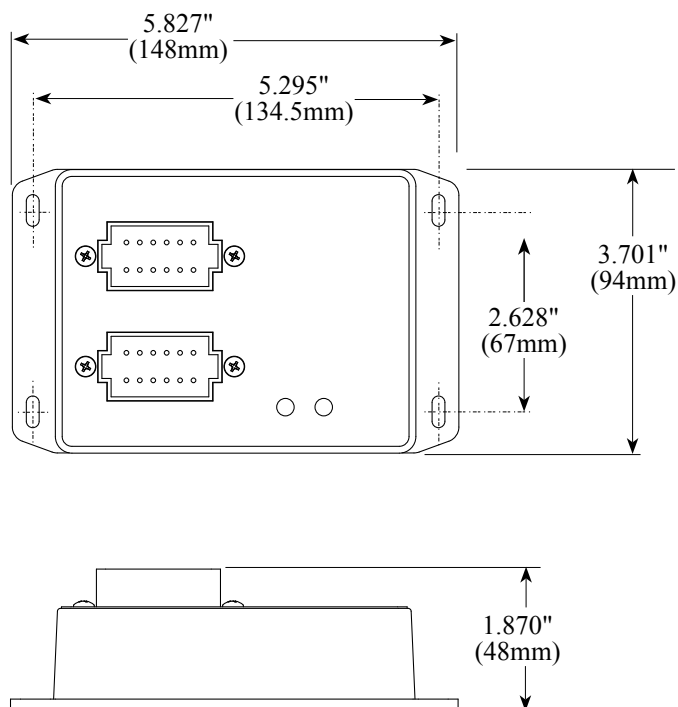
1. Measure and mark mounting location for summing box mounting screw holes. Make sure there is clearance for the module and cables before drilling holes. Refer to the Figure 4 for layout and dimensions.
2. Drill four holes, clearance or tapped, for #8 mounting screws.
3. Place box in position and secure with four screws.
4. Connect the cable(s) to the module. (Refer to Wiring Section.)

### LED Indicators

Green LED: Flashing when there is no flow input; Steady on when flow input is detected.

Red LED: Flashing indicates that there is a datalink problem; Steady on when there is a conflict with the box address setting.

Mounting holes are clearance or tapped for #8 screws.



Switch Address	1	2
Box 1	ON	OFF
Box 2	OFF	ON
Box 3	ON	ON

When more than one summing box is installed, the addresses need to set. Remove the four screws on the bottom and open the box to access the dip switch to change the address setting.

**Figure L14. Summing Box Mounting Dimensions**

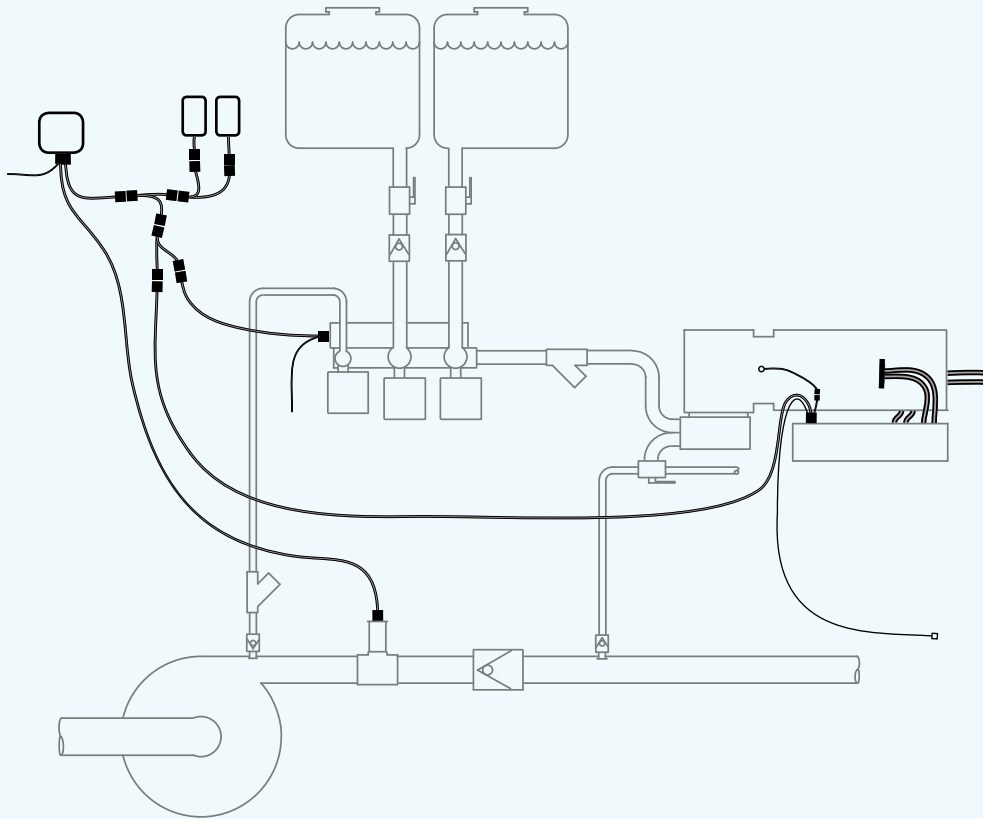


A Safe Fleet Brand

# TURBOFOAM

## DIRECT INJECTION FOAM PROPORTIONING SYSTEM WITH ELECTRIC FOAM CONCENTRATE PUMP MODELS: TFC100, TFC200, TFC300, TFC400

### WIRING



WIRING

**FIRE RESEARCH CORPORATION**

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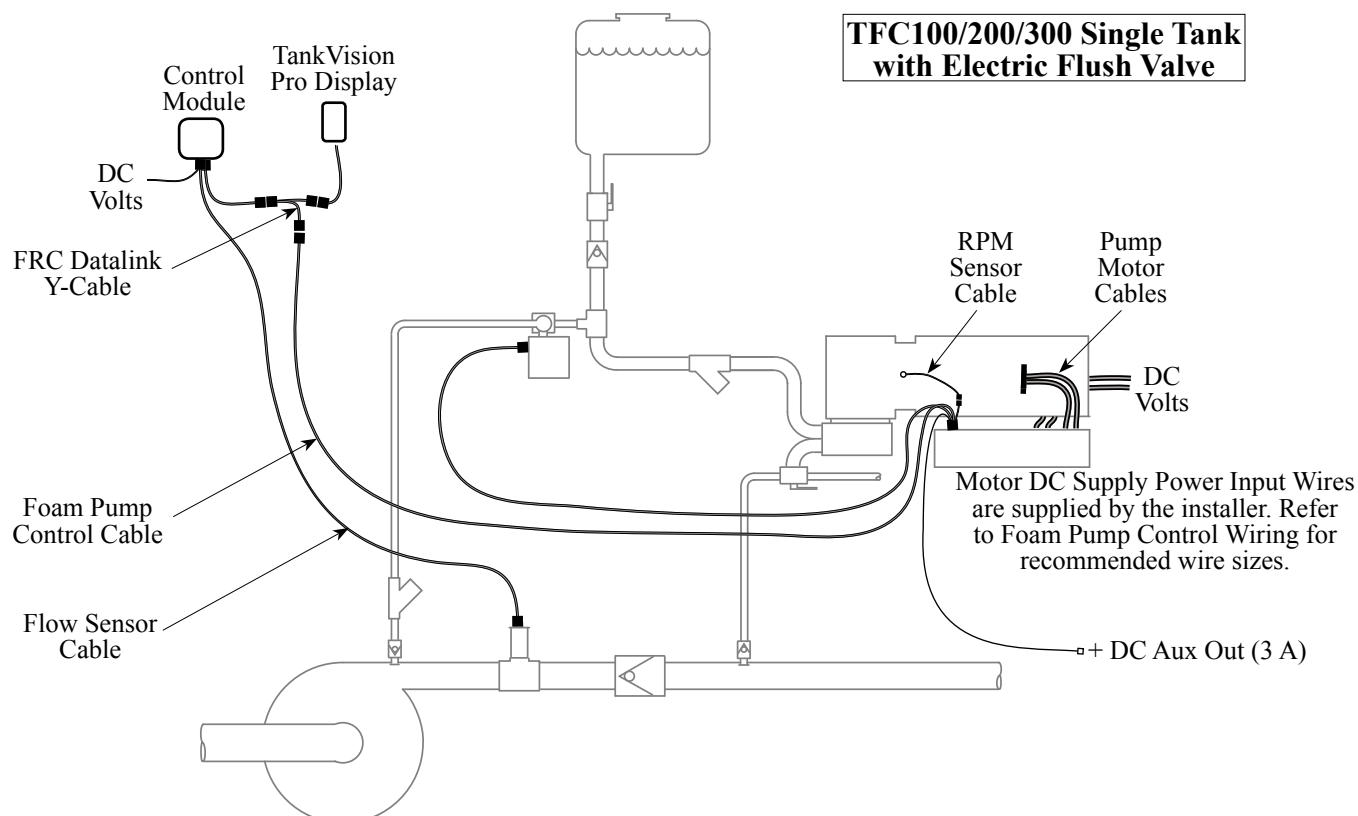
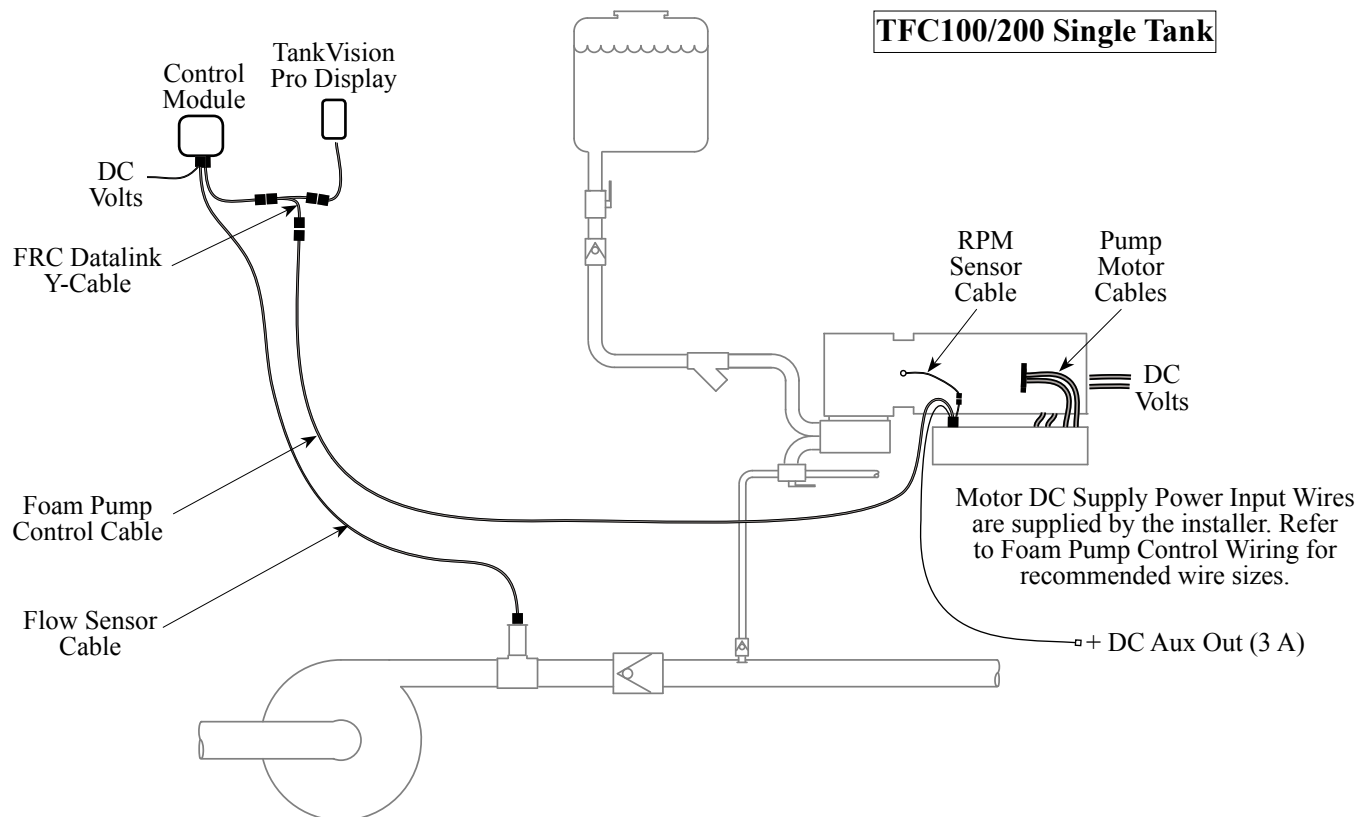
26 Southern Blvd., Nesconset, NY 11767

TEL 631.724.8888 FAX 631.360.9727 TOLL FREE 1.800.645.0074

# WIRING

The following figures include the schematics, wiring diagrams, block diagrams, connectors, and cables for the system.

## Cables

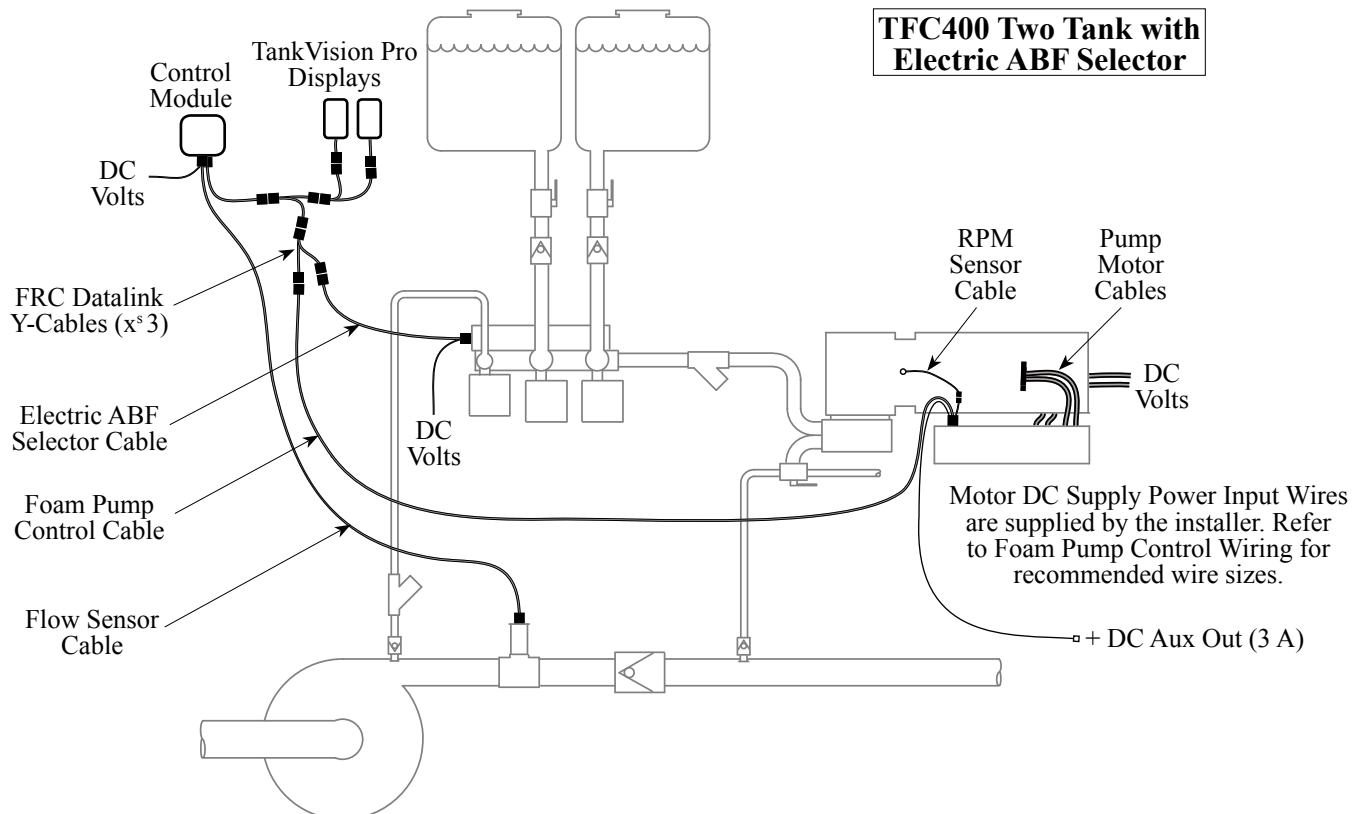
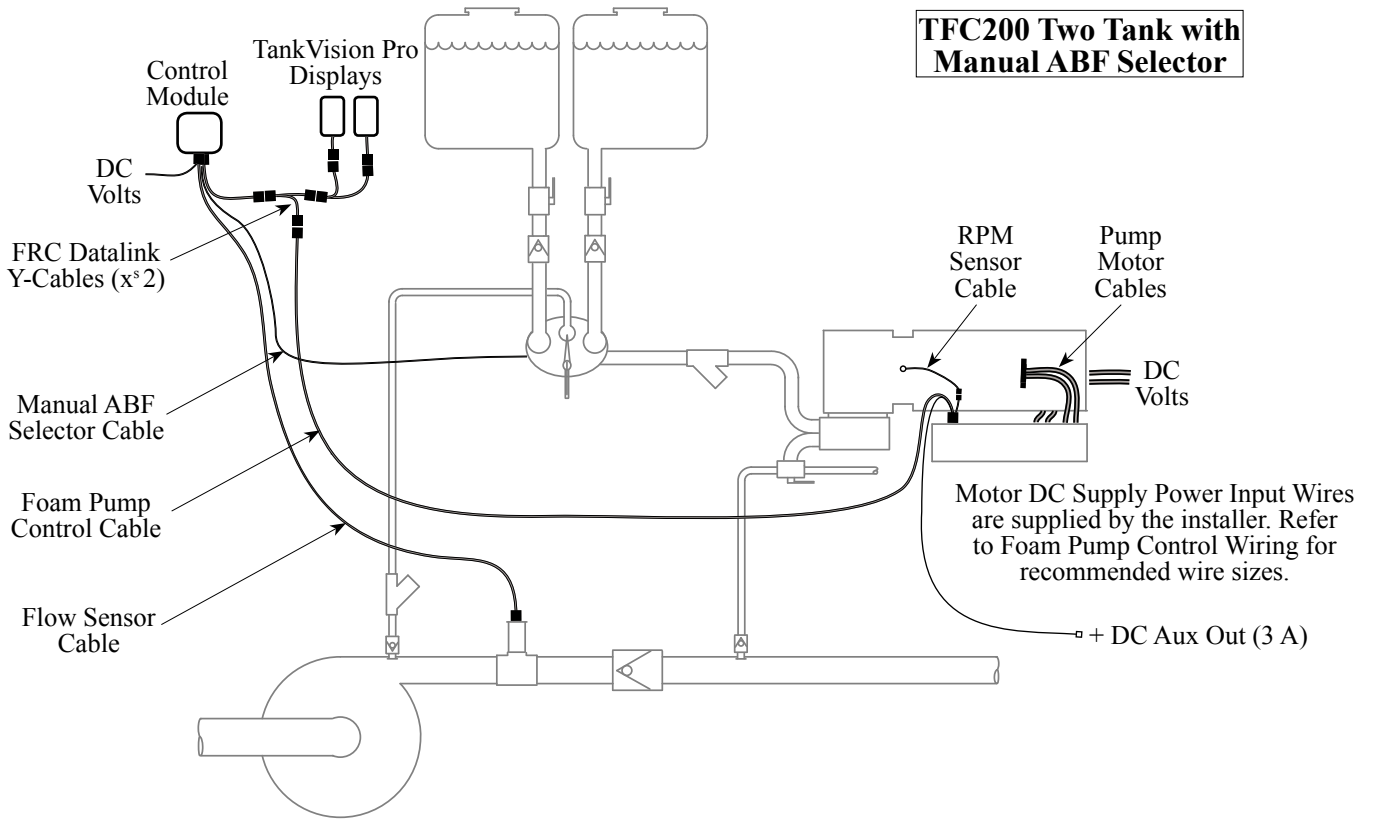


**Figure W1. System Cables**

**Tank Float Switch:** If tank float switches are used the FRC datalink y-cables for the TankVision Pro are not needed. The tank float switches are wired to the control module connector tank empty inputs.

**Remote ON/OFF Switch:** Wire to the control module remote switch inputs.

**Flush/Prime Switch:** Wire to the control module flush/prime switch inputs.



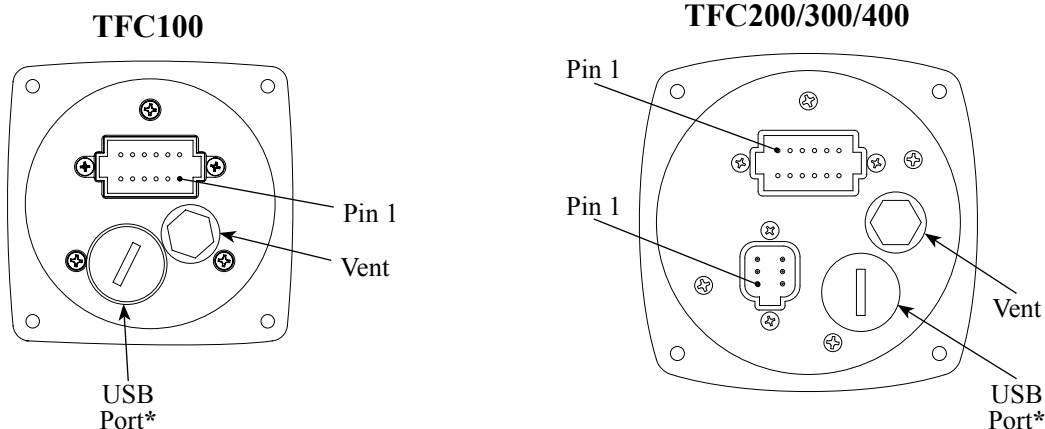
**Figure W1. System Cables**

## Control Module

The control module communicates with other components of the system via the 2-wire FRC datalink. The datalink is also used to communicate with other FRC products such as the TankVision Pro.

12-Pin Connector/Cable	
Pin/Wire	Description
1/Red	Supply Power
2/Black	Ground
3/Red	Sensor 5 Volt
4/White	Sensor Signal
5/Green	Flush Indicator
6/White	Flush Switch
7/White	FRC Datalink (+)
8/Green	FRC Datalink (-)
9/Black	Ground
10	Supply Power (* Tank Empty)
11/Green	Remote ON/OFF Indicator
12/White	Remote ON/OFF Switch

\*Pin 10 is Tank Empty Sensor (active low) for TFC100 Only



**\*NOTE:** If opened, USB access port plug must be tightened to a torque of 8-10 in-lbs. Exceeding this torque value can result in damage to its water seal capability.  
**Warning: Flange may not fully bottom out.**

6-Pin Connector/Cable	
Pin/Wire	Description
1/Green	Tank A Empty Sensor
2/Yellow	Tank B Empty Sensor
3/White	Select A/B Sensor
4	Spare
5	Spare
6	Spare

### 6-Pin Connector Notes:

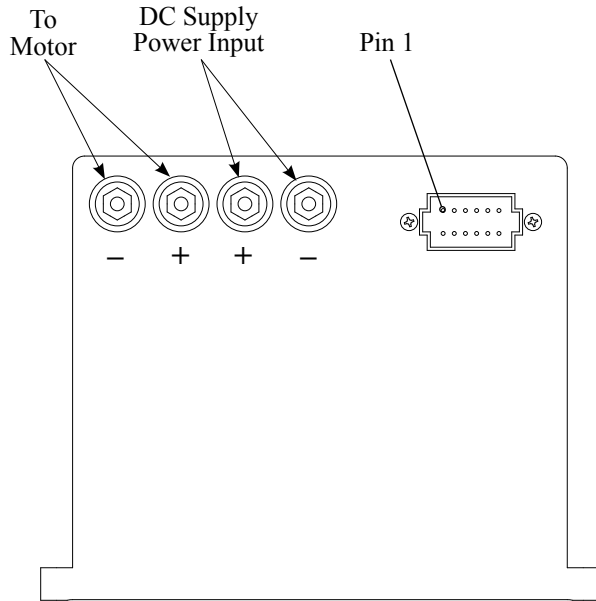
- The Tank Empty inputs are used with tank float switches.
- The Select A/B Sensor input is used when the TFC200 is installed with a manual ABF selector assembly.

Figure W2. Control Module Wiring

# Foam Pump Control

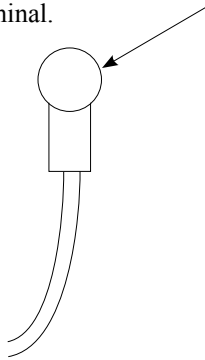
The foam pump control is a part of the foam pump assembly. The box houses the electronics that control the motor. The power for the electronics is provided over the four wire cable from the control module. Motor power is provided over separate DC supply cables. Refer to table for recommended wire size.

The rubber terminal covers for the DC supply power should be installed with the opening down to prevent water from collecting in the cap.



12-Pin Connector/Cable	
Pin/Wire	Description
1/Red	Supply Power
2/Black	Ground
3/White	FRC Datalink (+)
4/Green	FRC Datalink (-)
5/Red	Close Valve (+)
6/Black/Brown	Ground
7/White	Close Limit Switch
8/Blue	Open Limit Switch
9/Green	Open Valve (+)
10	+ DC AUX Out (3 A)
11/Red	RPM Sensor Signal
12/Black	RPM Sensor Ground

**Note:** The rubber terminal covers should be installed with the opening down to prevent water from collecting in the cap. Ensure that the rib on the cap snaps into the groove in the terminal.



**Notes:**

- Supply power for electronics is provided by the control module.
- Pins 5-9 are used when the electric flush valve is installed.
- Pin 10 outputs +DC voltage when the foam concentrate pump is operating. It is capable of driving a 3 amp load. The output from pin 10 is commonly used to open a CAFS valve. (No output during flush operations.)

**Note:** The DC supply cables should be routed down and under the motor.

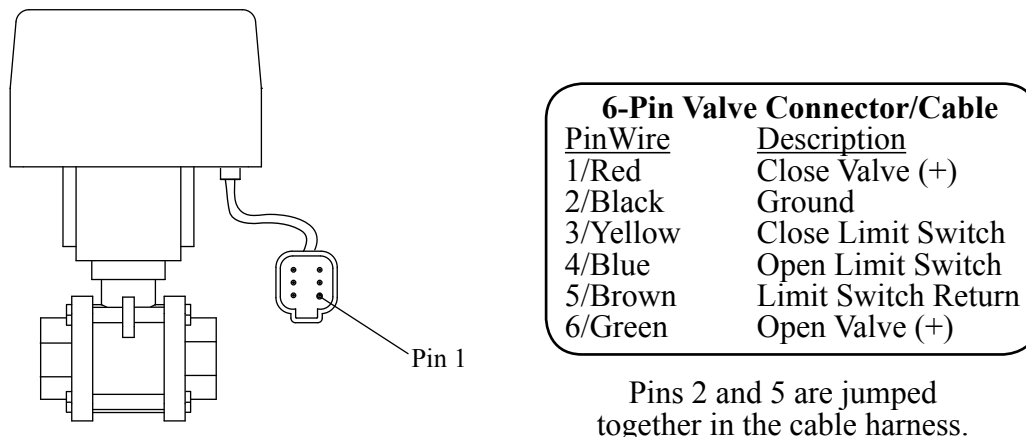
**Table 10. Foam Pump DC Supply Power Input Wire Size**

Pump Size in GPM (LPM)	1.6 (6.06)	2.1 (7.95)	2.6 (9.84)	3.5 (13.25)	5.0 (18.93)	6.2 (23.47)	6.5 (24.61)
Motor Horse Power	1/3	1	1/2	3/4	1	1	1
DC Voltage	12 24	12 24	12 24	12 24	12 24	12	24
Maximum Current (AMPS)	36 18	90 45	50 25	68 34	78 39	90	45
Wire Size (AWG) [Recommended for up to a 10 foot run.]	6 6	2 4	4 6	2 4	2 4	2	4

**Figure W3. Foam Pump Control Wiring**

## Electric Flush Valve TFC300 (TFC100/200 Option)

This valve is standard on TFC300 models and is available as an option for the TFC100/200 single tank systems. The valve is controlled by a pushbutton on the TFC300 control module and a separate mounted switch and indicator for the TFC100/200 option. The valve cable is connected to the foam pump control.



Connect the cable to the foam pump control 12-Pin Connector pins 5-9.

Figure W4. Electric Flush Valve Wiring

## Manual ABF Selector TFC200 Only

The TFC200 system is available with an optional selector to make it a dual tank system. Four wires from the micro-switches located on the manual ABF selector assembly need to be connected.

Two wires are connected to chassis ground, the other two wires are connected to the control module 6-Pin connector, pin 3 - Select A/B Sensor and 12-Pin connector, pin 6 - Flush/Prime Switch.

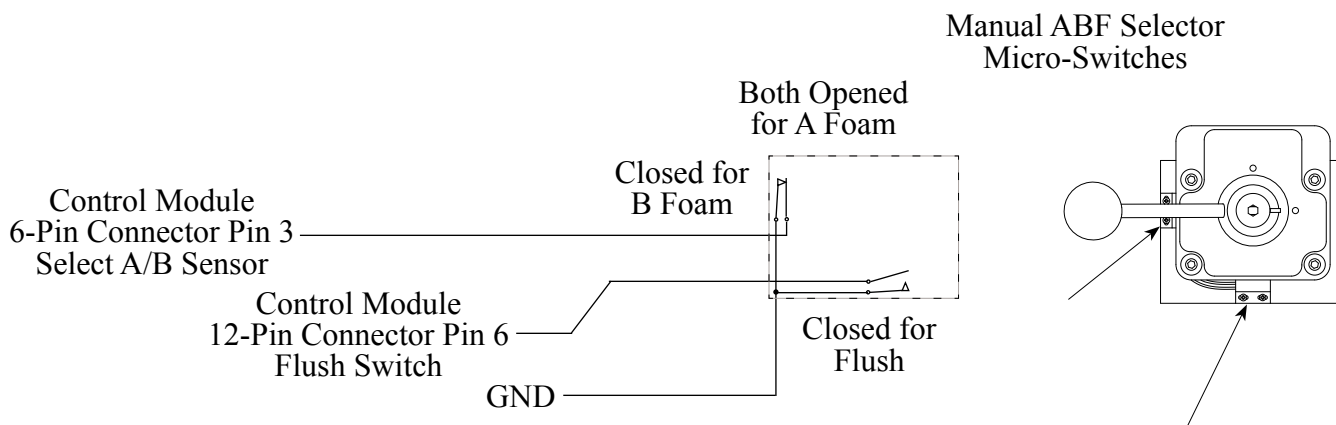
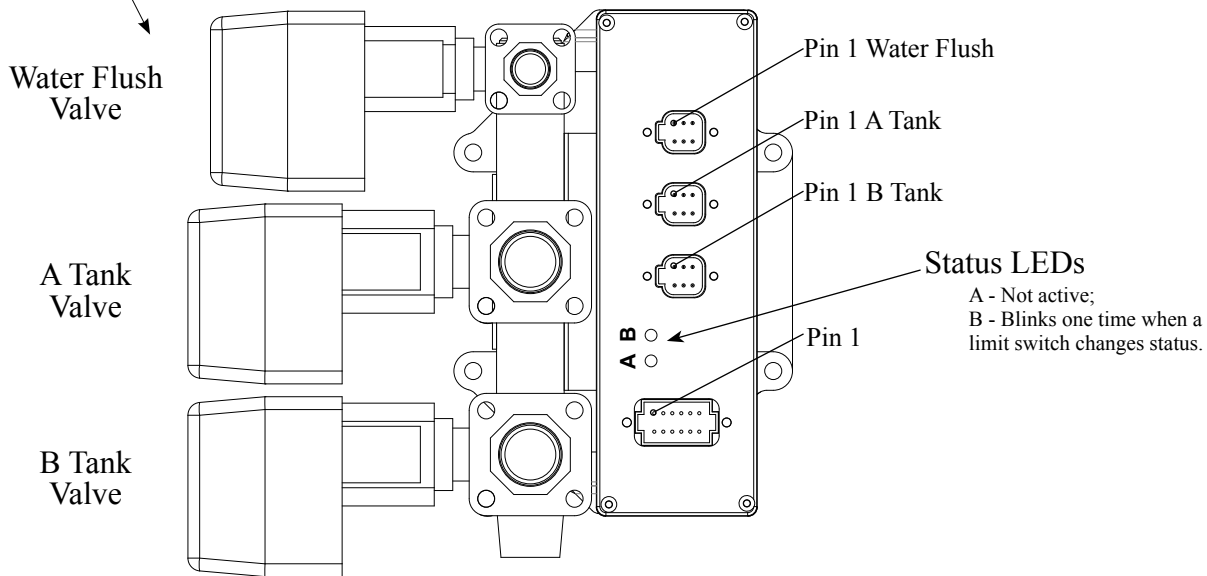


Figure W5. Manual ABF Selector Wiring

# Electric ABF Selector TFC400 Only

TFC400 system requires that the electric ABF selector valve is installed. The TFC400 has a water flush valve and two foam tank valves that are controlled from the control module pushbuttons.

There is a position indicator and manual adjustor located on the side of each valve



6-Pin Valve Connector/Cable	
Pin/Wire	Description
1/Red	Close Valve (+)
2/Black	Ground
3/Yellow	Close Limit Switch
4/Blue	Open Limit Switch
5/Brown	Limit Switch Return
6/Green	Open Valve (+)

**Note:** The assembly must be mounted so the manifold discharge is not above the foam input connections.

12-Pin ABF Connector/Cable	
Pin/Wire	Description
1/Red	Supply Power
2/Black	Ground
3/Black	FRC Datalink (-)
4/Red	FRC Datalink (+)
5	FRC Datalink (-)
6	FRC Datalink (+)
7	Spare
8	Spare
9	Spare
10	Spare
11	Ground
12	Supply Power

**Figure W6. Electric ABF Selector Wiring**



## Flow Sensor

Systems with a single discharge flow sensor: The sensor cable is connected directly to the control module.

Systems with multiple flow sensors: The sensor cables are connected to a summing box. The summing box is connected to the control module via a supply power and FRC datalink cable.

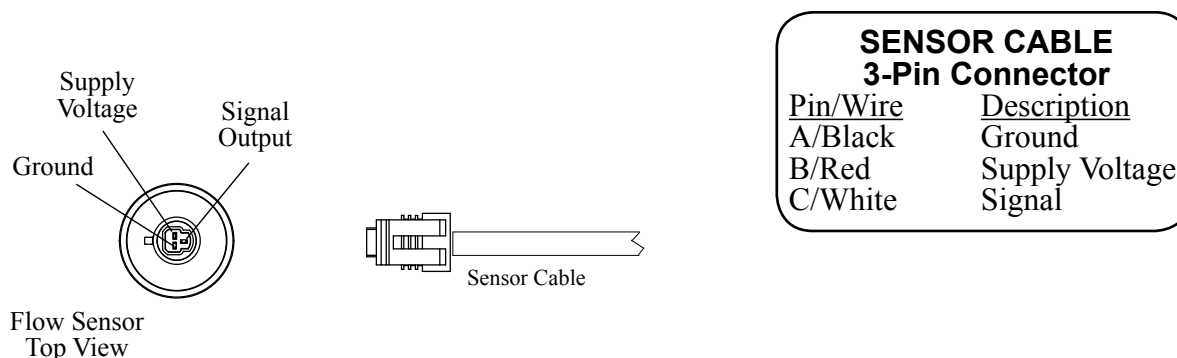
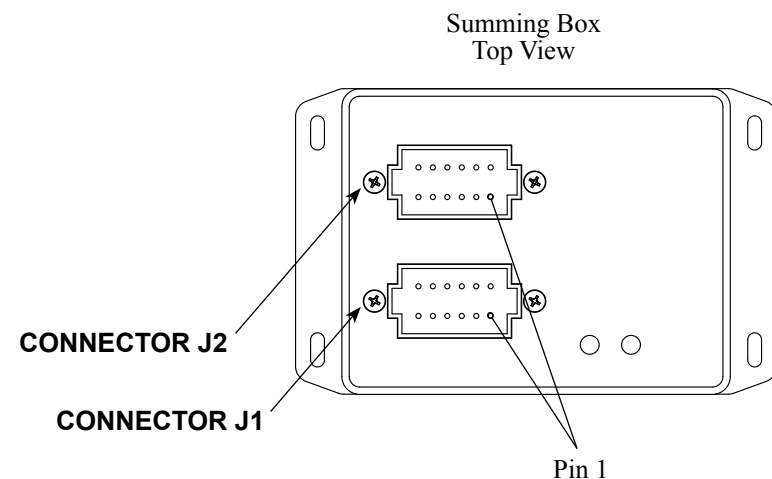


Figure W7. Flow Sensor Wiring

## Summing Box (Multiple Flow Sensors Only)

The summing box has two 12-Pin connectors. Each box has inputs for six (6) discharge flow sensors. Multiple boxes are interconnected using the FRC datalink. Power is provided by the control model.

**Note:** If FRC flowmeters (DFA or FPA) are used to retrieve flow rate information, only the FRC Datalink is connected to the foam system. **IMPORTANT** the flowmeter ID numbers must be different than the flow sensor ID numbers used with a summing box.



**Note:** When more than one box is installed the address of each box must be set. Refer to Installation Section.

### CONNECTOR J2 12-Pin Connector/Cable

Pin/Wire	Description
1/Red	Sensor +5 VDC
2/Black	Sensor Ground
3/White	Sensor 3 Signal
4/Red	Sensor +5 VDC
5/Black	Sensor Ground
6/White	Sensor 4 Signal
7/Red	Sensor +5 VDC
8/Black	Sensor Ground
9/White	Sensor 5 Signal
10/Red	Sensor +5 VDC
11/Black	Sensor Ground
12/White	Sensor 6 Signal

### CONNECTOR J1 12-Pin Connector/Cable

Pin/Wire	Description
1/Red *	Supply Power
2/Black*	Supply Ground
3/Green*	FRC Datalink (-)
4/White*	FRC Datalink (+)
5/Black	FRC Datalink (-)
6/Red	FRC Datalink (+)
7/Red	Sensor +5 VDC
8/Black	Sensor Ground
9/White	Sensor 1 Signal
10/Red	Sensor +5 VDC
11/Black	Sensor Ground
12/White	Sensor 2 Signal

\*Four conductor cable from control module.

Figure W8. Summing Box Wiring

## Remote ON/OFF Switch or Flush Switch (Option)

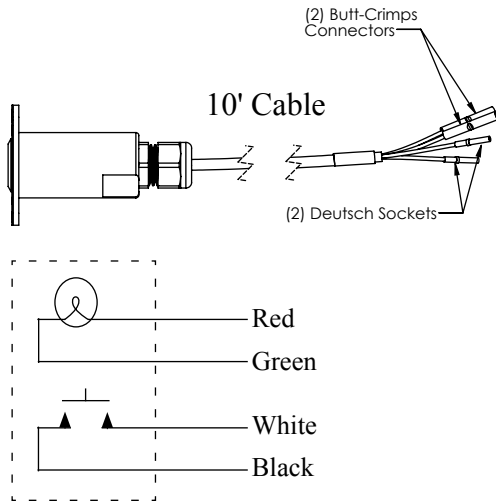
The remote on/off switch and flush switch are wired to the control module. Two connections are available, one for each switch and one for each indicator light.

### Remote ON/OFF Switch and Indicator (Option)

The remote switch and indicator mirrors the control module ON/OFF button and LED on the control module.

### Flush Switch and Indicator (Option)

The flush switch is provided with the electric flush valve option for TFC100/200 models. The flush switch also provides prime capabilities if needed for the concentrate pump. (Code P313 set to yes.)



#### REMOTE SWITCH CABLE 4-Wires

Wire	Description
Red	Supply Voltage
* Green	Indicator
* White	Switch
Black	Ground

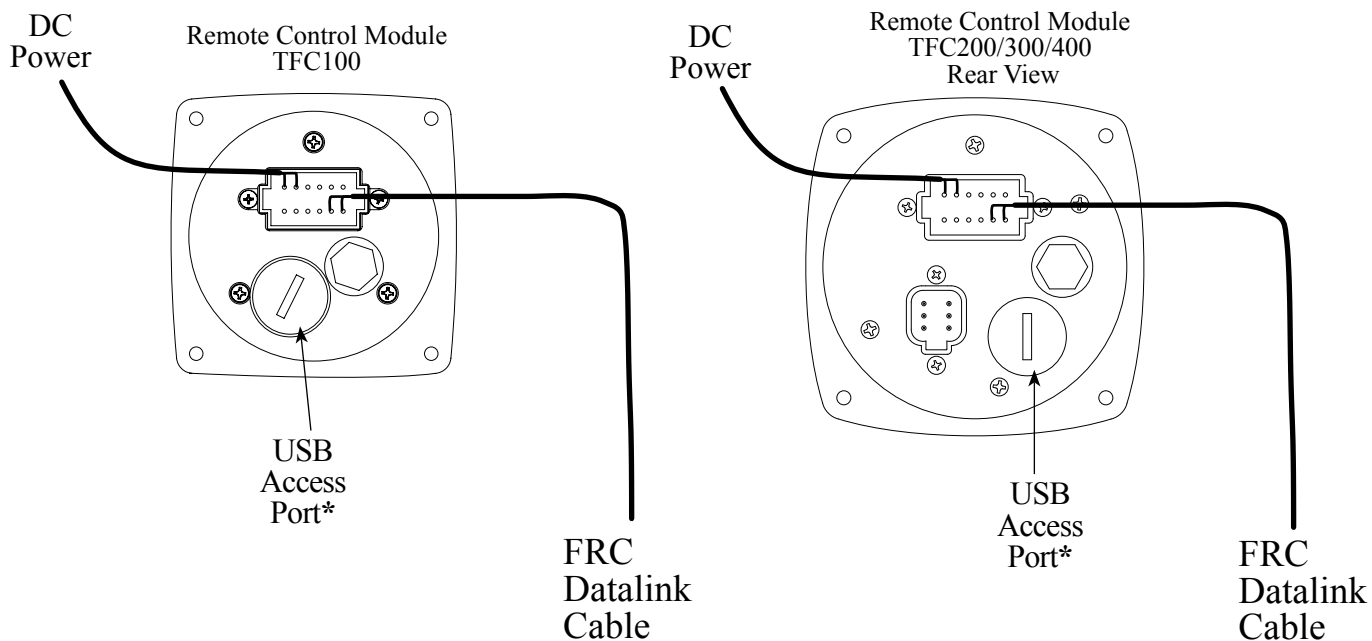
- \* To Control Module 12-Pin Connector
  - Pin 5 - Flush Indicator
  - Pin 6 - Flush Switch
  - Pin 11 - Remote ON/OFF Indicator
  - Pin 12 - Remote ON/OFF Switch

**Figure W9. Remote Switch Wiring**

## Optional Remote Control Module

### 12-Pin Connector/Cable

<u>Pin/Wire</u>	<u>Description</u>
1/Red	Supply Power 12/24 VDC
2/Black	Supply Ground
3/Red	N/A
4/White	N/A
5/Black	N/A
6/Red	N/A
7/White	FRC Datalink (+)
8/Green	FRC Datalink (-)
9/Black	N/A
10/Red	N/A
11	N/A
12	N/A



**\*NOTE:** If opened, USB access port plug must be tightened to a torque of 8-10 in-lbs. Exceeding this torque value can result in damage to its water seal capability.

**Warning:** Flange may not fully bottom out.

**NOTE:** For either the TFC100 or TFC200/300/400—  
Connect pin 7 and pin 8 to the primary control module

Figure W10. Optional Remote Control Module Wiring

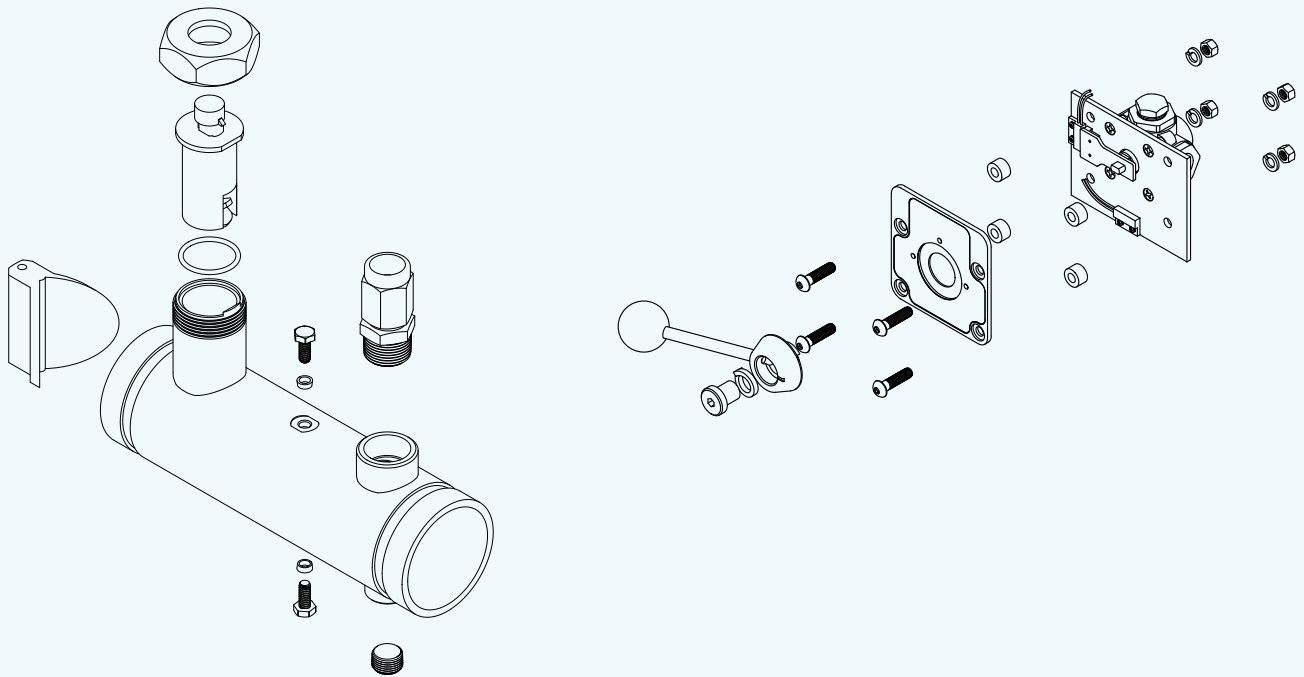


A Safe Fleet Brand

# TURBOFOAM

## DIRECT INJECTION FOAM PROPORTIONING SYSTEM WITH ELECTRIC FOAM CONCENTRATE PUMP MODELS: TFC100, TFC200, TFC300, TFC400

### ILLUSTRATED PARTS BREAKDOWN



ILLUSTRATED PARTS BREAKDOWN

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# CONTROL MODULES

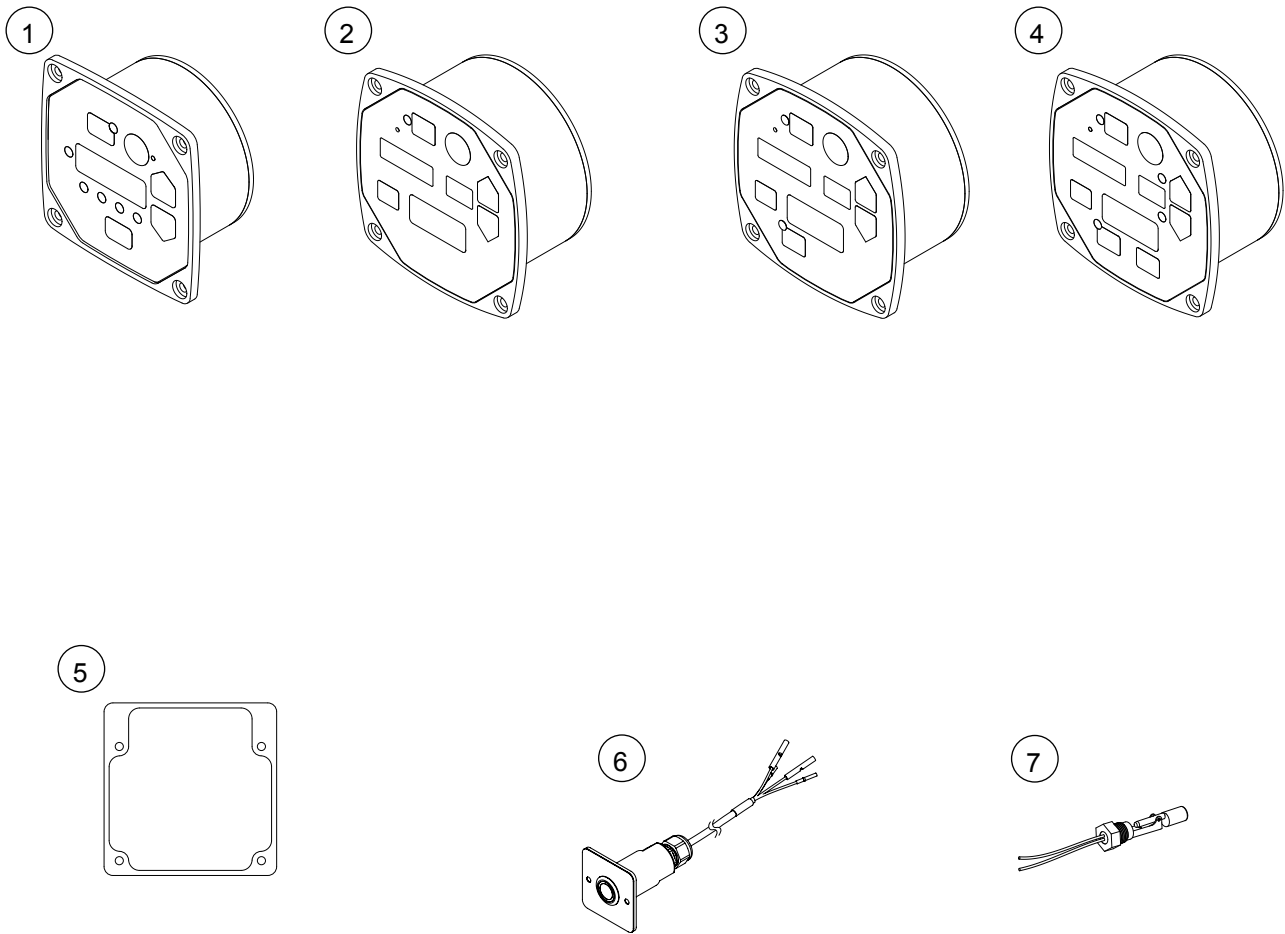
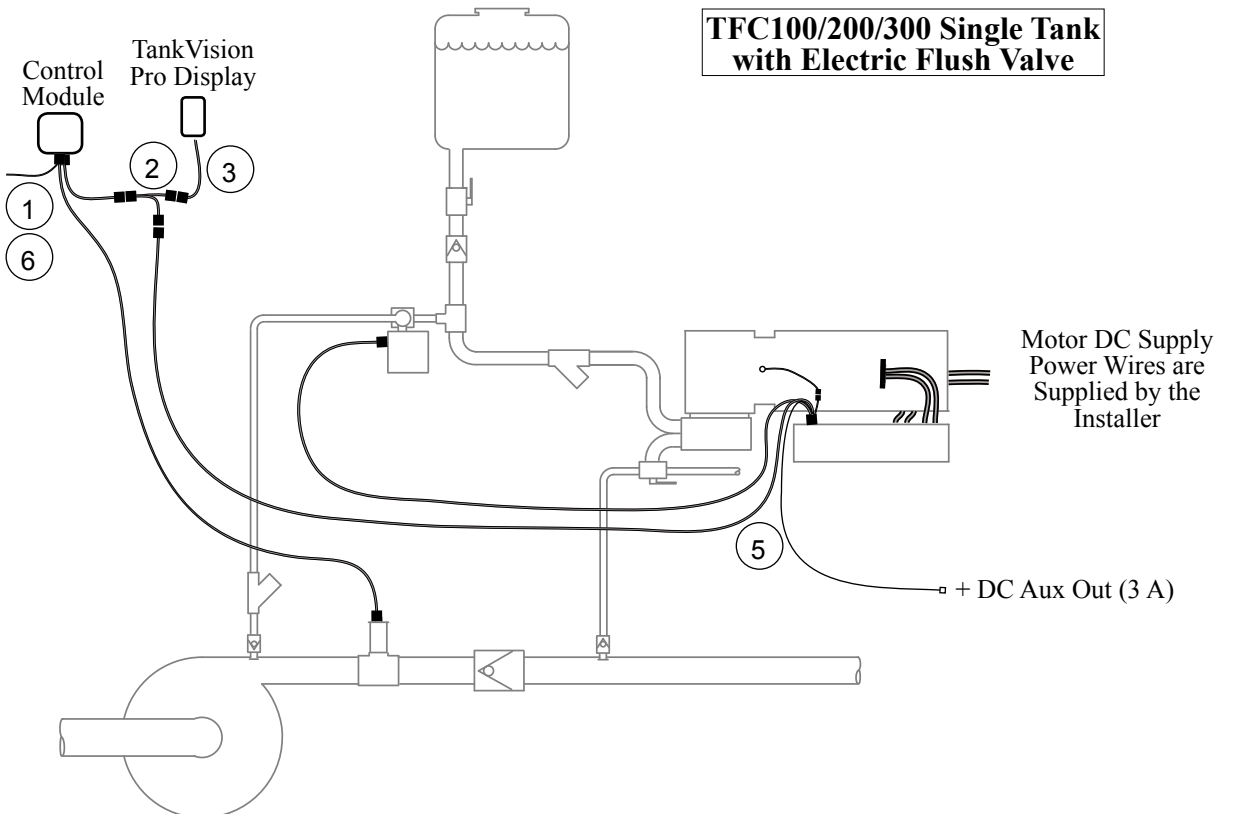
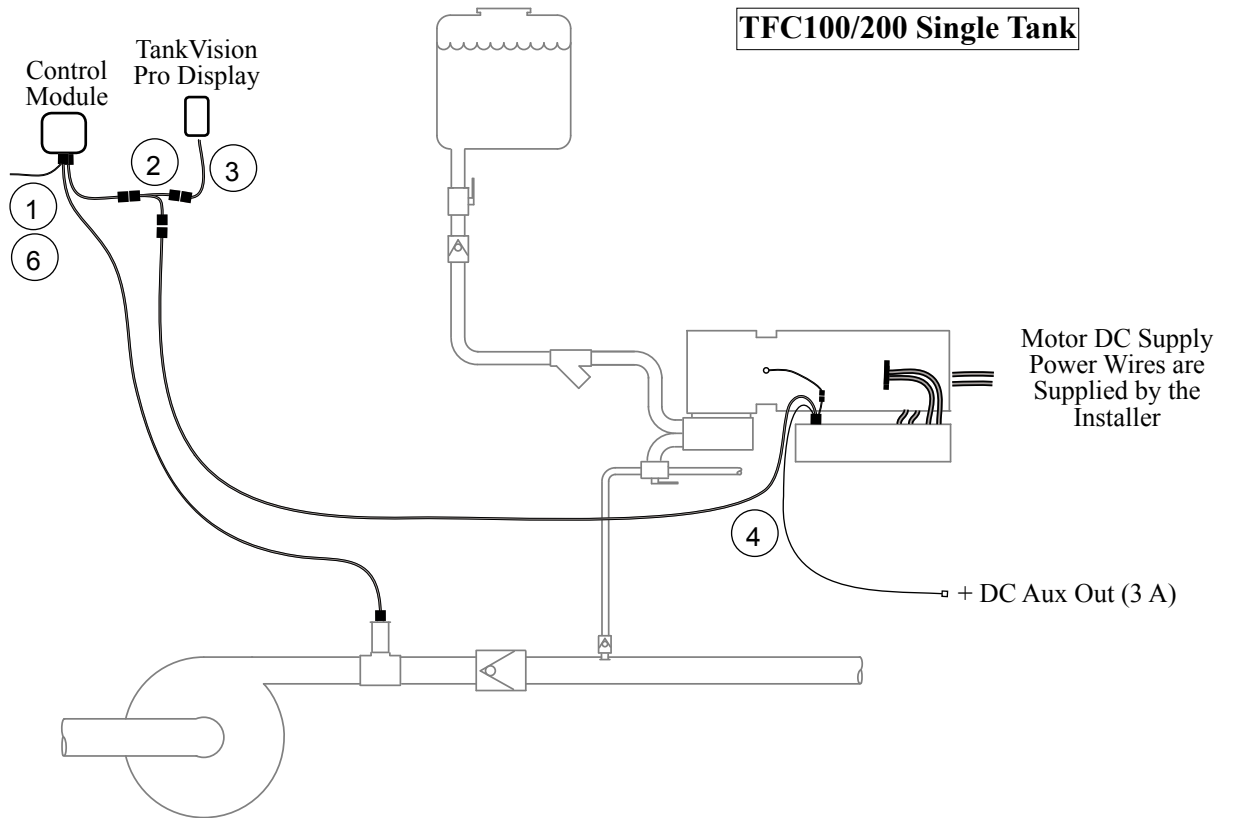


Figure P1. TurboFoam Control Modules

**Control Modules**

<b>INDEX</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
1	XE-TF100-D0A	DM TURBOFOAM TF100 CNTL MODULE	1
2	XE-TF200-D0A	DM TURBOFOAM TF200 CNTL MODULE	1
3	XE-TF300-D0A	DM TURBOFOAM TF300 CNTL MOD F/FLUSH	1
4	XE-TF400-D0A	DM TURBOFOAM TF400 CNTL MOD A/B/FLUSH	1
5	XE-TFC1PLINST-A0A	ACCY TFC PLACARD INSTRUCTIONS 100	1
	XE-TFC2PLINST-A0A	ACCY TFC PLACARD INSTRUCTIONS 200	
	XE-TFC2PLPLB-A1A	ACCY TFC PLACARD PLUMB 1-FOAM	1
	XE-TFC2PLPLB-A2A	ACCY TFC PLACARD PLUMB 2-FOAM	
	XE-TFC2PLSPC-A16A	ACCY TFC PLACARD SPECS 1.6-GPM	1
	XE-TFC2PLSPC-A21A	ACCY TFC PLACARD SPECS 2.1-GPM	
	XE-TFC2PLSPC-A26A	ACCY TFC PLACARD SPECS 2.6-GPM	
	XE-TFC2PLSPC-A35A	ACCY TFC PLACARD SPECS 3.5-GPM	
	XE-TFC2PLSPC-A50A	ACCY TFC PLACARD SPECS 5.0-GPM	
	XE-TFC2PLSPC-A62A	ACCY TFC PLACARD SPECS 6.2-GPM	
	XE-TFC2PLSPC-A65A	ACCY TFC PLACARD SPECS 6.5-GPM	
6	XE-TF100RSW-A0A	ACCY TURBOFOAM REM ON-OFF SW/IND 12V	-
	XE-TF100RSW-A1A	ACCY TURBOFOAM REM ON-OFF SW/IND 24V	
	XE-TF100FLSW-A0A	ACCY TURBOFOAM FLUSH BT/IND 12V	
	XE-TF100FLSW-A1A	ACCY TURBOFOAM FLUSH BT/IND 24V	
7	XE-FLSW1H-S0A	SENSOR FLUID LEVEL SWITCH HORIZONT MNT	-

**TurboFoam Single Tank System Cables**



**Figure P2. TurboFoam Single Tank System Cables**

**TurboFoam Single Tank System Cables**

INDEX	PART NUMBER	DESCRIPTION	QTY
1	XE-TF2SENS-C15A XE-TF2SENS-C20A XE-TF2SENS-C30A	CABLE TURBOFOAM PWR SENSOR DATA 15-FT CABLE TURBOFOAM PWR SENSOR DATA 20-FT CABLE TURBOFOAM PWR SENSOR DATA 30-FT 12-Pin Deutsch Plug - 3-Pin Flow Sensor Plug - 4-Pin Deutsch Plug - 2-Wires wButt Crimps	1
2*	XE-XXDLY4-C1A	CABLE DATALINK WYE 4P CONN 4-Pin Deutsch Receptacle - 4-Pin Deutsch Plug - 4-Pin Deutsch Plug	-
3*	XE-XXDLWLEXT-C10A	CABLE DLINK TankVision Pro 4PDR BLK-PIN 10FT 4-Pin Deutsch Receptacle - 2 Socket Pins, Deutsh, for 12-Pin TankVision Pro Connector	-
4*	XE-TF10EEXT-C15A	CABLE TFC PUMP PWR DATA 15-FT 12-Pin Deutsch Plug - 4-Pin Deutsch Receptacle - 2-Pin Deutsch Receptacle - 1 Wire wButt Crimp	1
5*	XE-TF10EEXTF-C30A	CABLE TFC PUMP PWR DATA FLSH 30-FT 12-Pin Deutsch Plug - 4-Pin Deutsch Receptacle - 2-Pin Deutsch Receptacle - 6-Pin Deutsch Receptacle w/10-ft cable - 1 Wire wButt Crimp	1
6* 6A*	XE-XX6PDP-A0A XE-TF2TNKEXT-C0A	ACCY 6-PIN DEUTSCH SEALING PLUG CABLE TURBOFOAM TANK-EMP SENS 8-IN 6-Pin Deutsch Plug - 3-Wires wButt Crimps	1

## \* Notes:

Cables 2 and 3 are only required with a TankVision Pro installed.

Wire with cables 4 and 5 from pin 10 provides a +DC voltage (3 amps) when foam tank is empty and pump stops.

Item 6 is a protective plug for the control module 6-Pin connector.

Cable 6A is required if tank float switches are installed. The tank float switches are wired to the control module connector tank empty inputs and the FRC datalink y-cables for the TankVision Pro are not needed.

Cables required can vary with options included with the system.



# TurboFoam Two Tank System Cables

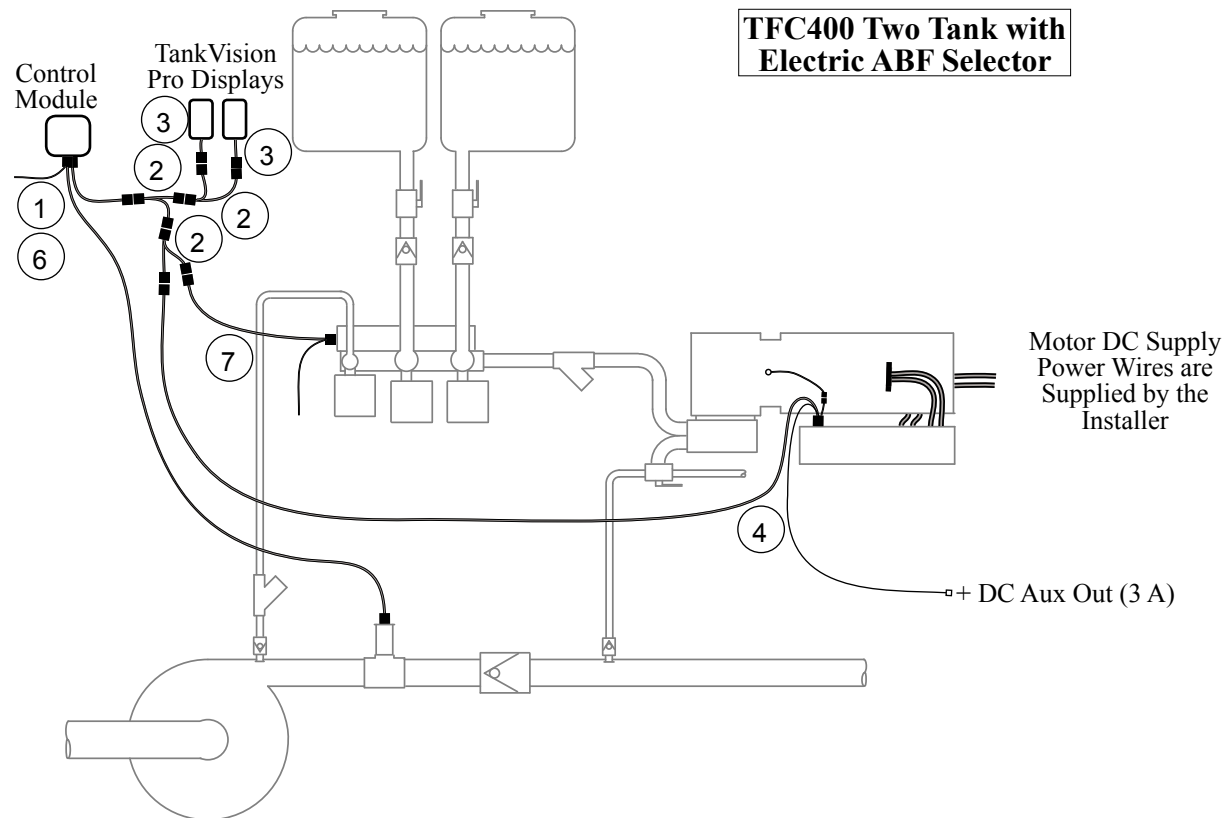
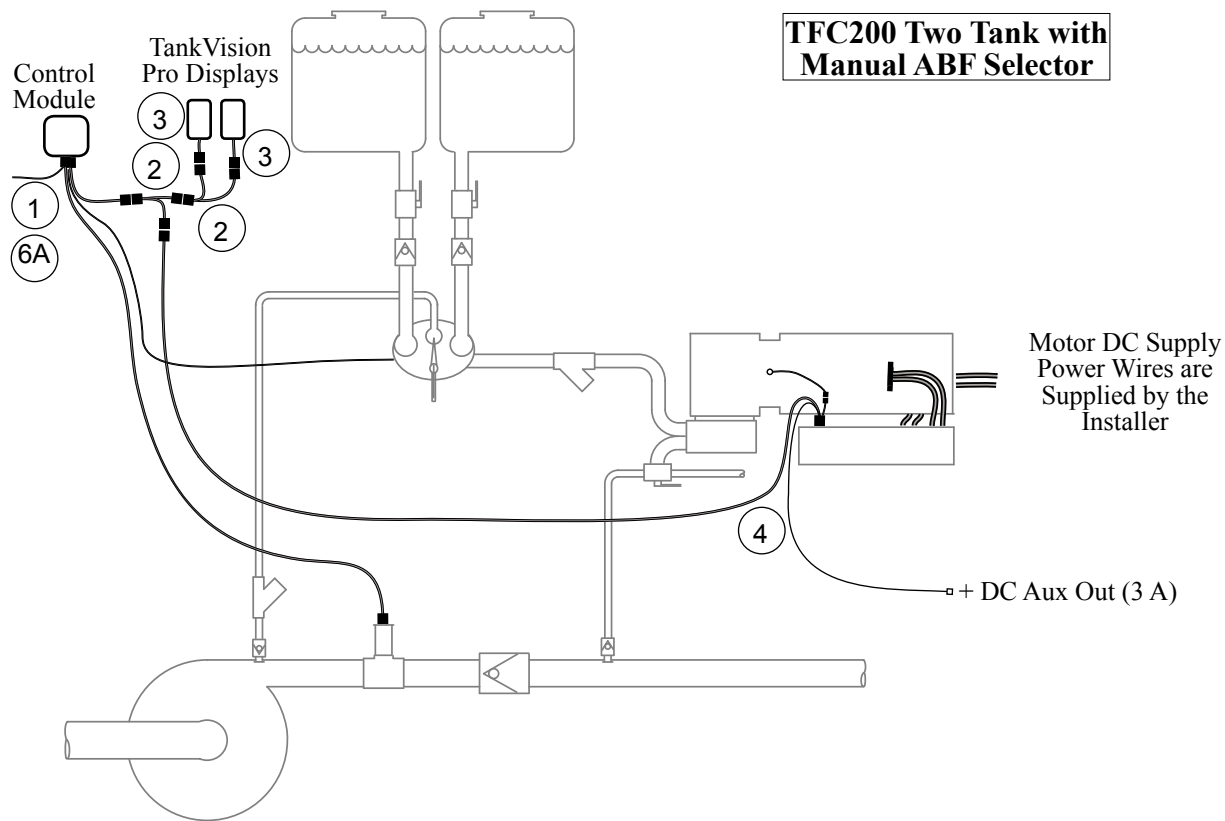


Figure P3. TurboFoam Two Tank System Cables

**TurboFoam Two Tank System Cables**

INDEX	PART NUMBER	DESCRIPTION	QTY
1	XE-TF2SENS-C15A XE-TF2SENS-C20A XE-TF2SENS-C30A	CABLE TURBOFOAM PWR SENSOR DATA 15-FT CABLE TURBOFOAM PWR SENSOR DATA 20-FT CABLE TURBOFOAM PWR SENSOR DATA 30-FT 12-Pin Deutsch Plug - 3-Pin Flow Sensor Plug - 4-Pin Deutsch Plug - 2-Wires wButt Crimps	1
2	XE-XXDLY4-C1A	CABLE DATALINK WYE 4P CONN 4-Pin Deutsch Receptacle - 4-Pin Deutsch Plug - 4-Pin Deutsch Plug	-
3*	XE-XXDLWLEXT-C10A	CABLE DLINK TankVision Pro 4PDR BLK-PIN 10FT 4-Pin Deutsch Receptacle - 2 Socket Pins, Deutsh, for 12-Pin TankVision Pro Connector	-
4*	XE-TF10EEXT-C15A	CABLE TFC PUMP PWR DATA 15-FT 12-Pin Deutsch Plug - 4-Pin Deutsch Receptacle - 2-Pin Deutsch Receptacle - 1 Wire wButt Crimp	1
5	N/A		
6* 6A*	XE-XX6PDP-A0A XE-TF2TNKEXT-C0A	ACCY 6-PIN DEUTSCH SEALING PLUG CABLE TURBOFOAM TANK-EMP SENS 8-IN 6-Pin Deutsch Plug - 3-Wires wButt Crimps	1
7	XE-TF101EXT-C15A	CABLE TFC ABF SELECTOR PWR/DATA 15-FT 12-Pin Deutsch Plug - 4-Pin Deutsch Receptacle - 2-Wires wButt Crimps	1

**\* Notes:**

Cables 3 are only required with a TankVision Pro installed.

Wire with cable 4 from pin 10 provides a +DC voltage (3 amps) when foam tank is empty and pump stops.

Item 6 is a protective plug for the control module 6-Pin connector.

Cable 6A is required if tank float switches or the manual ABF selector are installed. The tank float switches are wired to the control module connector tank empty inputs and the FRC datalink y-cables for the TankVision Pro are not needed.

Cables required can vary with options included with the system.

# FOAM PUMP ASSEMBLY

## 1.6, 2.1 and 2.6 GPM Foam Pump Assembly

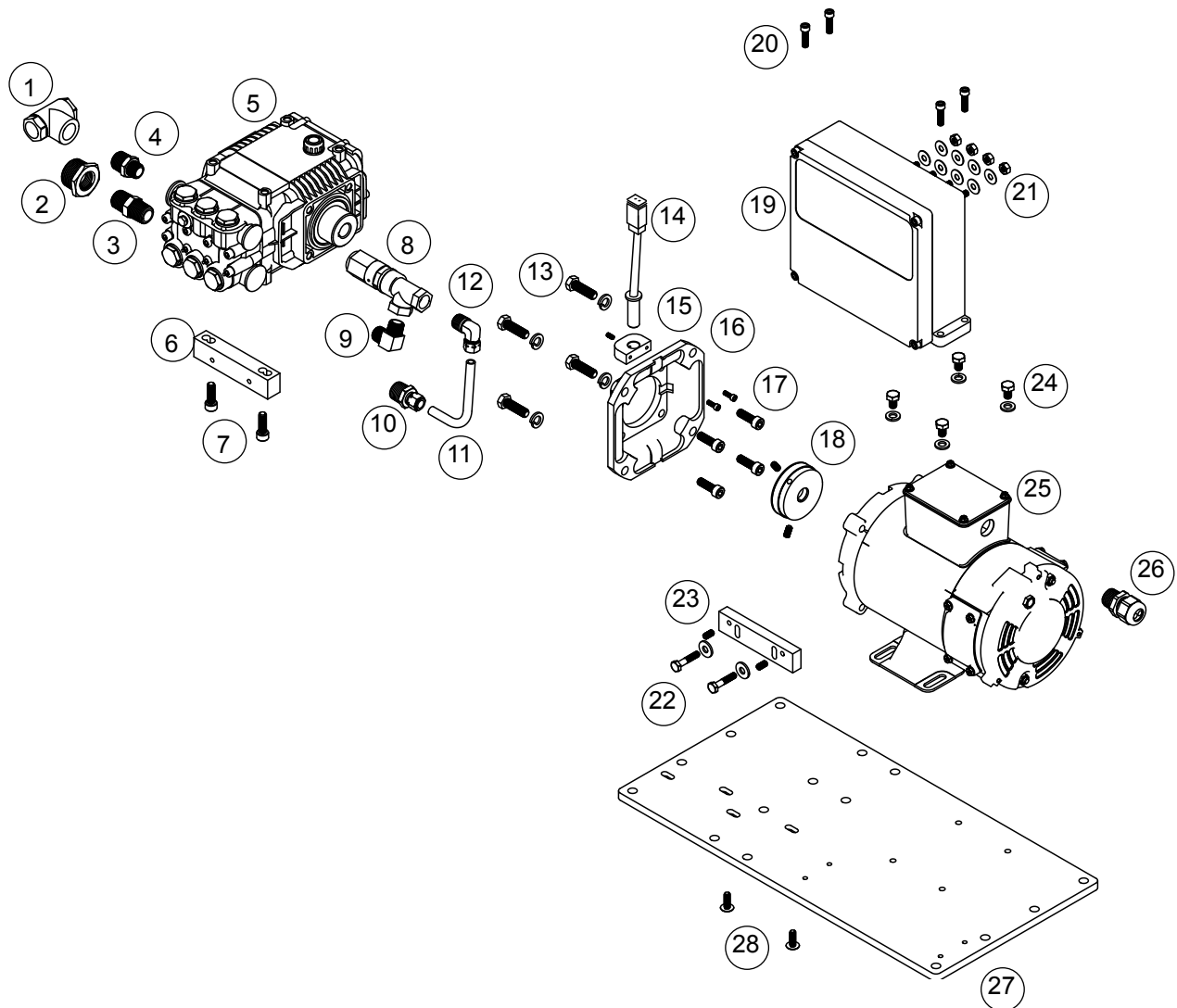


Figure P4. 1.6, 2.1 and 2.6 GPM Foam Pump Assembly

## 1.6, 2.1 and 2.6 GPM Foam Pump Assembly

INDEX	PART NUMBER	DESCRIPTION	QTY
	XE-TF10E16-D0A XE-TF10E16-D1A XE-TF10E21HP-D0A XE-TF10E21HP-D1A XE-TF10E26-D0A XE-TF10E26-D1A	ASSY TFC FOAM PUMP 1.6 GPM 12V ASSY TFC FOAM PUMP 1.6 GPM 24V ASSY TFC FOAM PUMP 2.1 GPM 12V ASSY TFC FOAM PUMP 2.1 GPM 24V ASSY TFC FOAM PUMP 2.6 GPM 12V ASSY TFC FOAM PUMP 2.6 GPM 24V	
1	ZVV-BRS700-8F8F-F	VALVE 3 WAY 1/2" NPT VITON SEAL	1
2	XE-TF10EFIT-A075A XE-TF10EFIT-A100A Z-4429K414 Z-4429K424 Z-4757T84	ACCY TFC KIT FIT 3/4 IN INTAKE FOAM PUMP ACCY TFC KIT FIT 1.0 IN INTAKE FOAM PUMP BUSHING 3/4 X 1/2 BUSHING 1 X 1/2 NIPPLE 1/2	1
3			
4	Z-5485K33	REDUCING NIPPLE 1/2 X 3/8	1
5	XE-TF10EPUMP-A16A XE-TF10EPUMP-A26A	ASSY TF PUMP PLUNGER 1.6 GPM ASSY TF PUMP PLUNGER 2.6 GPM	1
6	XM-TFA824	UPPER PUMP SUPPORT	1
7	ZHM8AT25SS	SCREW METRIC SOCKET CAP M8 X 25MM S/S	2
8	Z-SVL17 XM-TFA844	PUMP REGULATOR VALVE STOP	1
9	Z-50785K124	FITTING PIPE BRASS THREADED 3/8 90 DEG	1
10	Z-5220K75	FITTING COMPRESSION BRASS 3/8 X 1/2	1
11	XM-TFA845	COPPER TUBE BENT	1
12	Z-5220K104	FITTING COMPRESSION BRASS 90 DEG ELBOW	1
13	ZH3816HC114SS ZHW38LSS	SCREW HEX CAP 3/8-16 X 1 1/4" S/S WASHER LOCK 3/8 S/S	4 4
14	XE-TF10ERPM-S0A	SENSOR RPM FOR ELECTRIC FOAM PUMP	1
15	XM-TFA800 ZH832SS38CSS ZH832AT38SS	HALL MOTOR MOUNT SCREW SOCKET SET CUP 8-32 X 3/8 S/S SCREW SOCKET CAP 8-32 X 3/8" S/S 18-8	1 1 2
16	XM-TFA805	BELL HOUSING	1
17	ZHM8AT25SS	SCREW METRIC SOCKET CAP M8 X 25MM S/S	4
18	XE-TF10EMAG-A0A	ASSY HOLDER RING W/MAG RPM	1
19	XE-TF10EMDRV-D0C	ASSY FOAM PUMP CONTROL BOX	1
20	ZH1420AT78SS	SCREW SOCKET CAP 1/4-20 X 7/8 S/S	4
21	ZHN1428HSB ZHW14FSB	NUT WASHER	4 8
22	ZH1420HC114SS ZHW12FL ZH1428C12SS	SCREW HEX CAP 1/4-20 X 1 1/4 S/S WASHER S/S FLAT #12 SIZE SCREW SOCKET SET CUP 1/4-28 X 1/2 S/S	4 4 2
23	XM-TFA825	LOWER PUMP SUPPORT	1
24	ZH51618HC12SS ZHW516F34SS	SCREW HEX CAP 5/16-18 X 1/2 S/S WASHER S/S FLAT 5/16" X 3/4" OD	
25	XE-TFMOTOR12V-A033A XE-TFMOTOR24V-A033A XE-TFMOTOR12V-A050A XE-TFMOTOR24V-A050A XE-TFMOTOR12V-A100A XE-TFMOTOR24V-A100A	ASSY TF ELEC MOTOR 12VDC 1/3 HP ASSY TF ELEC MOTOR 24VDC 1/3 HP ASSY TF ELEC MOTOR 12VDC 1/2 HP ASSY TF ELEC MOTOR 24VDC 1/2 HP ASSY TF ELEC MOTOR 12VDC 1 HP ASSY TF ELEC MOTOR 24VDC 1 HP	1
26	ZK-M3234GAC	STRAIN RELIEF	1
27	XM-TFA830-C13	BASE BLK WRINKLE	1
28	ZH1420PT34SS	SCREW PHIL TRUSS 1/4-20 X 3/4 S/S 18-8	2

## 3.5, 5.0, 6.2, and 6.5 GPM Foam Pump Assembly

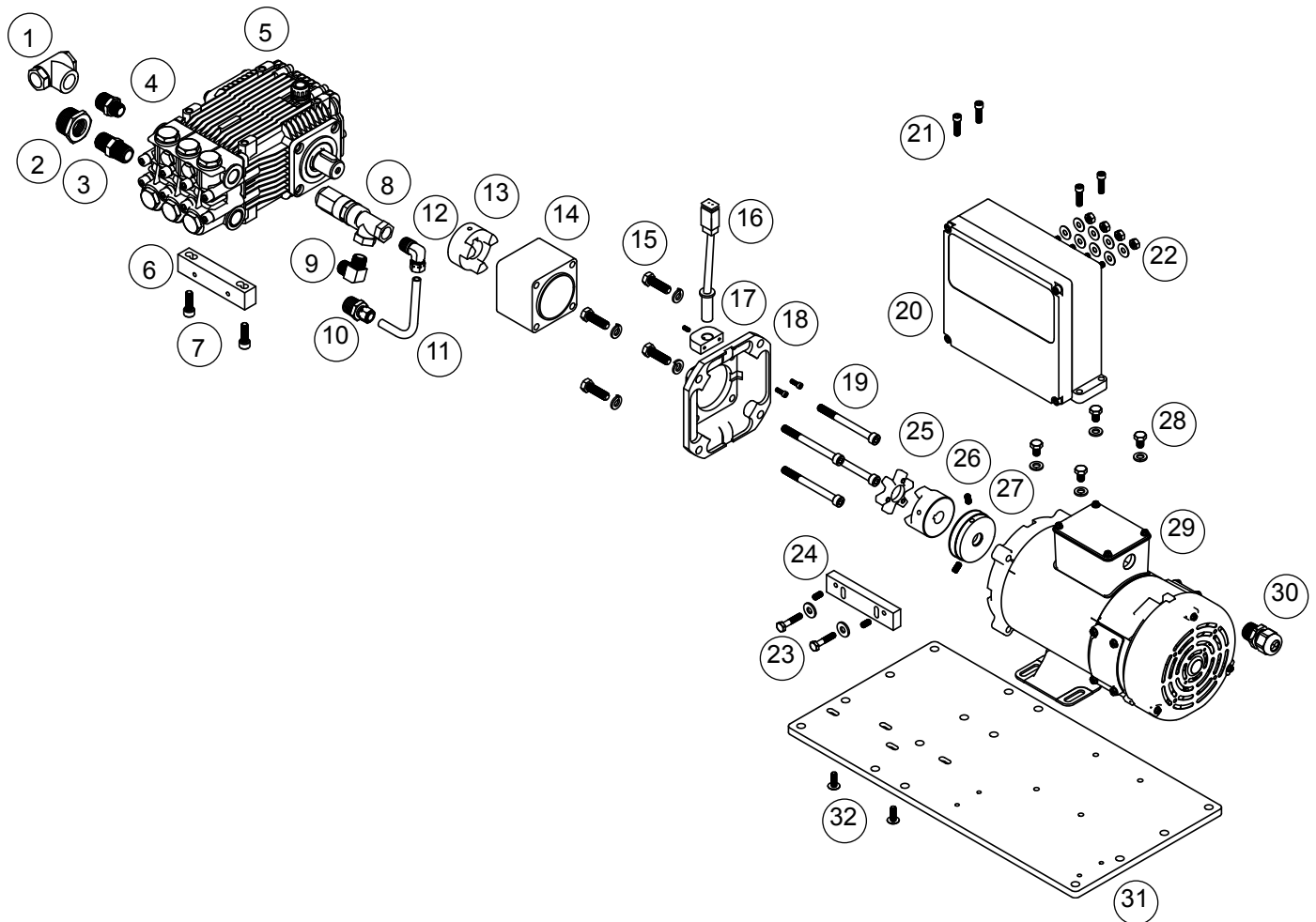


Figure P5. 3.5, 5.0, 6.2, and 6.5 GPM Foam Pump Assembly

### 3.5, 5.0, 6.2, and 6.5 GPM Foam Pump Assembly

INDEX	PART NUMBER	DESCRIPTION	QTY
	XE-TF10E35-D0A XE-TF10E35-D1A XE-TF10E50-D0A XE-TF10E50-D1A XE-TF10E62-D0A XE-TF10E65-D1A	ASSY TFC FOAM PUMP 3.5 GPM 12V ASSY TFC FOAM PUMP 3.5 GPM 24V ASSY TFC FOAM PUMP 5.0 GPM 12V ASSY TFC FOAM PUMP 5.0 GPM 24V ASSY TFC FOAM PUMP 6.2 GPM 12V ASSY TFC FOAM PUMP 6.5 GPM 24V	
1	ZVV-BRS700-8F8F8-F	VALVE 3 WAY 1/2" NPT VITON SEAL	1
2	XE-TF10EFIT-A075A XE-TF10EFIT-A100A Z-4429K414 Z-4429K424 Z-4757T84	ACCY TFC KIT FIT 3/4 IN INTAKE FOAM PUMP ACCY TFC KIT FIT 1.0 IN INTAKE FOAM PUMP BUSHING 3/4 X 1/2 BUSHING 1 X 1/2 NIPPLE 1/2	1
4	Z-5485K33	REDUCING NIPPLE 1/2 X 3/8	1
5	XE-TF10EPUMP-A35A XE-TF10EPUMP-A50A XE-TF10EPUMP-A62A	ASSY TF PUMP PLUNGER 3.5 GPM ASSY TF PUMP PLUNGER 5.0 GPM ASSY TF PUMP PLUNGER 6.X GPM (for 6.2 and 6.5 GPM Systems)	1
6	XM-TFA824	UPPER PUMP SUPPORT	1
7	ZHM8AT25SS	SCREW METRIC SOCKET CAP M8 X 25MM S/S	2
8	Z-SVL17 XM-TFA844	PUMP REGULATOR VALVE STOP	1 1
9	Z-50785K124	FITTING PIPE BRASS THREADED 3/8 90 DEG	1
10	Z-5220K75	FITTING COMPRESSION BRASS 3/8 X 1/2	1
11	XM-TFA845	COPPER TUBE BENT	1
12	Z-5220K104	FITTING COMPRESSION BRASS 90 DEG ELBOW	1
13	ZCPLG-35407402	COUPLING HUB SERIES L090 24MM	1
14	XM-TFA804	PUMP STANDOFF	1
15	ZH3816HC114SS ZHW38LSS	SCREW HEX CAP 3/8-16 X 1 1/4" S/S WASHER LOCK 3/8 S/S	4 4
16	XE-TF10ERPMP-S0A	SENSOR RPM FOR ELECTRIC FOAM PUMP	1
17	XM-TFA800 ZH832SS38CSS ZH832AT38SS	HALL MOTOR MOUNT SCREW SOCKET SET CUP 8-32 X 3/8 S/S SCREW SOCKET CAP 8-32 X 3/8" S/S 18-8	1 1 2
18	XM-TFA805	BELL HOUSING	1
19	ZHM8AT90SS	SCREW METRIC SOCKET CAP M8 X 90MM S/S	4
20	XE-TF10EMDRV-D0C	ASSY FOAM PUMP CONTROL BOX	1
21	ZH1420AT78SS	SCREW SOCKET CAP 1/4-20 X 7/8 S/S	4
22	ZHN1428HSB ZHW14FSB	NUT WASHER	4 8
23	ZH1420HC114SS ZHW12FL ZH1428C12SS	SCREW HEX CAP 1/4-20 X 1 1/4 S/S WASHER S/S FLAT #12 SIZE SCREW SOCKET SET CUP 1/4-28 X 1/2 S/S	4 4 2
24	XM-TFA825	LOWER PUMP SUPPORT	1
25	ZCPLG-35407428	COUPLING THREE PIECE JAW L090/095 SERIES	1
26	ZCPLG-35407345	COUPLING HUB SERIES L090 5/8" BORE DIA	1
27	XE-TF10EMAG-A0A	ASSY HOLDER RING W/MAG RPM	1
28	ZH51618HC12SS ZHW516F34SS	SCREW HEX CAP 5/16-18 X 1/2 S/S WASHER S/S FLAT 5/16" X 3/4" OD	4 4
29	XE-TFMOTOR12V-A075A XE-TFMOTOR24V-A075A XE-TFMOTOR12V-A100A XE-TFMOTOR24V-A100A	ASSY TF ELEC MOTOR 12VDC 3/4 HP ASSY TF ELEC MOTOR 24VDC 3/4 HP ASSY TF ELEC MOTOR 12VDC 1 HP ASSY TF ELEC MOTOR 24VDC 1 HP	1
30	ZK-M3234GAN ZK-M3231GAC	STRAIN RELIEF, 3/4 HP-12 VDC, 1 HP-12/24 VDC STRAIN RELIEF, 3/4 HP-24 VDC	1
31	XM-TFA830-C13	BASE BLK WRINKLE	1
32	ZH1420PT34SS	SCREW PHIL TRUSS 1/4-20 X 3/4 S/S 18-8	2

# ELECTRIC ABF SELECTOR AND ELECTRIC FLUSH VALVE

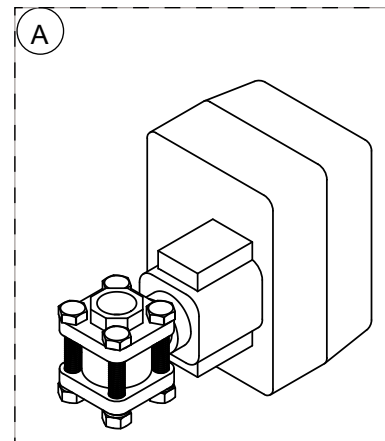
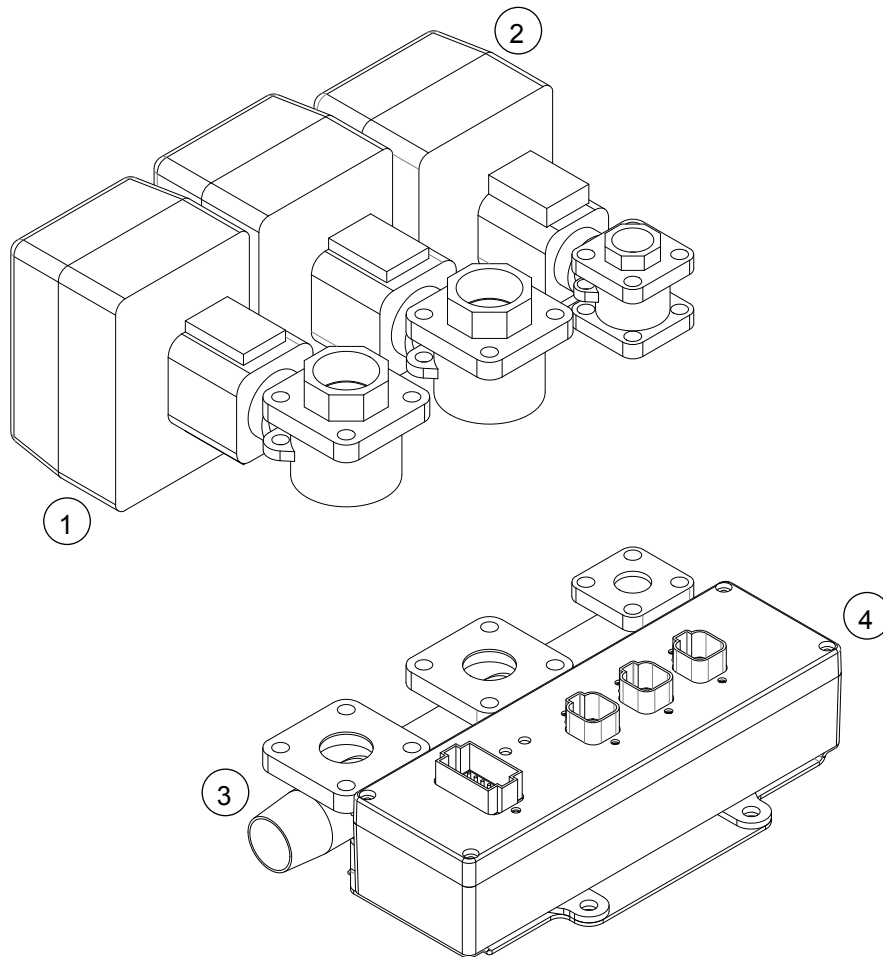


Figure P6. Electric ABF Selector and Electric Flush Valve

**Electric Valves**

<b>INDEX</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
Complete Assembly	XE-TF101-D3A XE-TF101-D31A	ACCY TF ABF SELECTOR CNTL 12V 3-VL ACCY TF ABF SELECTOR CNTL 24V 3-VL	
1	XE-TF101EV10-D0A XE-TF101EV10-D1A	ASSY TURBOFOAM ELEC VALVE 1.0 IN 12V ASSY TURBOFOAM ELEC VALVE 1.0 IN 24V	2
2	XE-TF101EV05-D0A XE-TF101EV05-D1A	ASSY TURBOFOAM ELEC VALVE 0.5 IN 12V ASSY TURBOFOAM ELEC VALVE 0.5 IN 24V	1
3	XM-TF600-S12	MANIFOLD FOR A-B ELEC	1
4	XE-TF101VDRV-A3A XE-TF101VDRV3-A3A	ASSY ABF VALVE CNTL BOX ASSY ABF VALVE CNTL BOX CHINESE	1
A	XE-TF101-D1A XE-TF101-D11A	ACCY TF ELEC FLUSH VALVE 12V ACCY TF ELEC FLUSH VALVE 24V	1



# MANUAL ABF SELECTOR

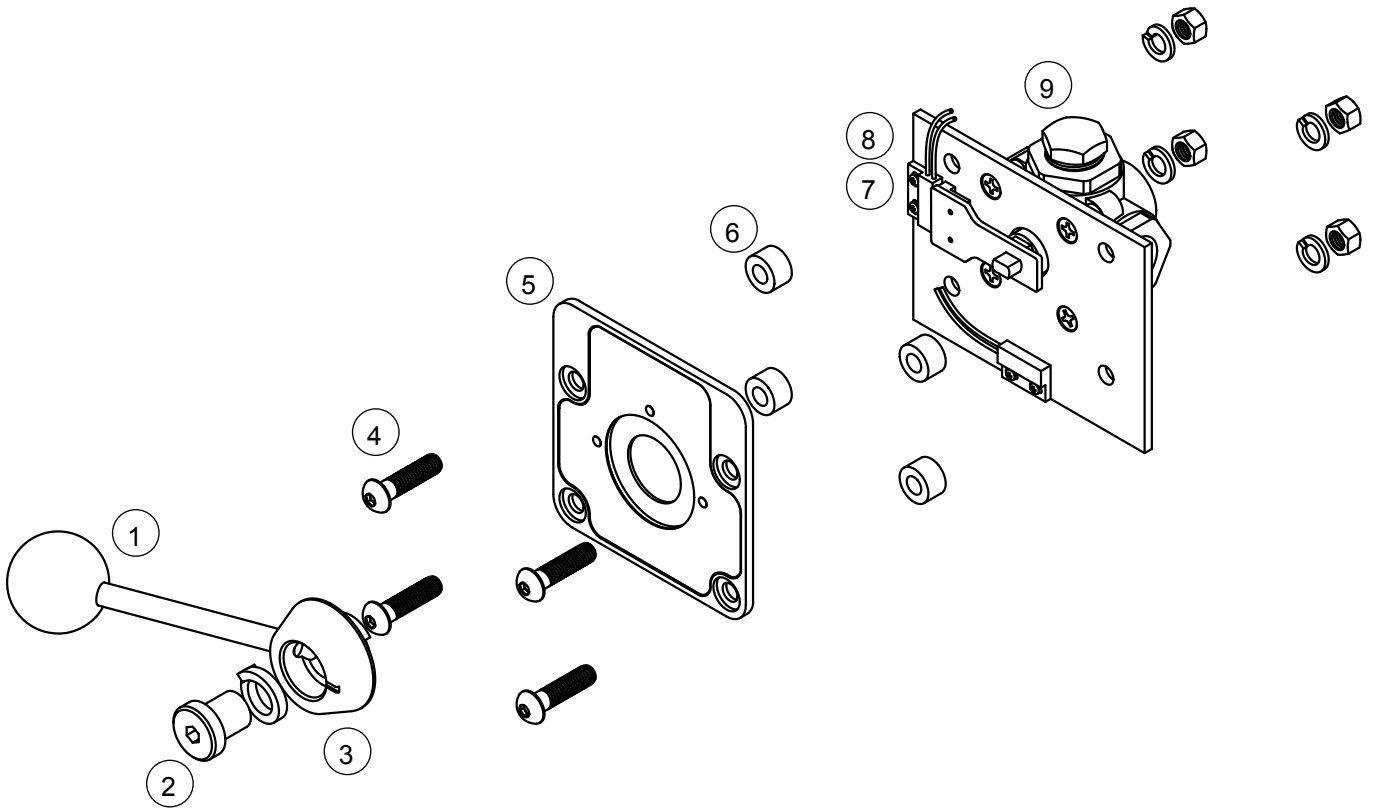


Figure P7. Manual ABF Selector

**Manual Valve**

<b>INDEX</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>QTY</b>
	XE-TF101MAN-A0A	ACCY TF ABF SELECTOR MANUAL VALVE	
1	Z-GLS-105 ZKB-B16	GEAR LEVER SHAFT 4 1/2" LONG S/S KNOB PHENOLIC BLACK ROUND 1 7/8" DIA	1 1
2	XM-TF501 ZHW34LSS	7/16-20 UNF NUT WASHER LOCK 3/4 S/S	1 1
3	XM-TF502	HUB	1
4	ZH3816HPB112SS TFA-0600 TFA-1120	SCREW SOCKET HEX BUTTON 3/8-16 X 1 1/2 WASHER LOCK 3/8 S/S NUT HEX 3/8-16 S/S	4 4 4
5	XM-TF510-02-C4 Z-TF510	MACHPRT PLATE AB MANUAL YELLOW TURBO FOAM A/B NAME PLATE 5" X 5"	1 1
6	XM-TF503	L-STANDOFF	4
7	XM-TF505	MAG-MOUNT	1
8	ZSN-59135-010 ZH440PP14SS	SENSOR MAGNETIC SPST/NO FLANGE SCREW PHIL PAN 4-40 X 1/4 S/S	2 4
9	XM-TF-78-125 ZPG-9171K45	BRONZE 5 PORT VALVE PLUG BRASS HEX 3/4" NPT X NPT	1

# MISCELLANEOUS PLUMBING COMPONENTS

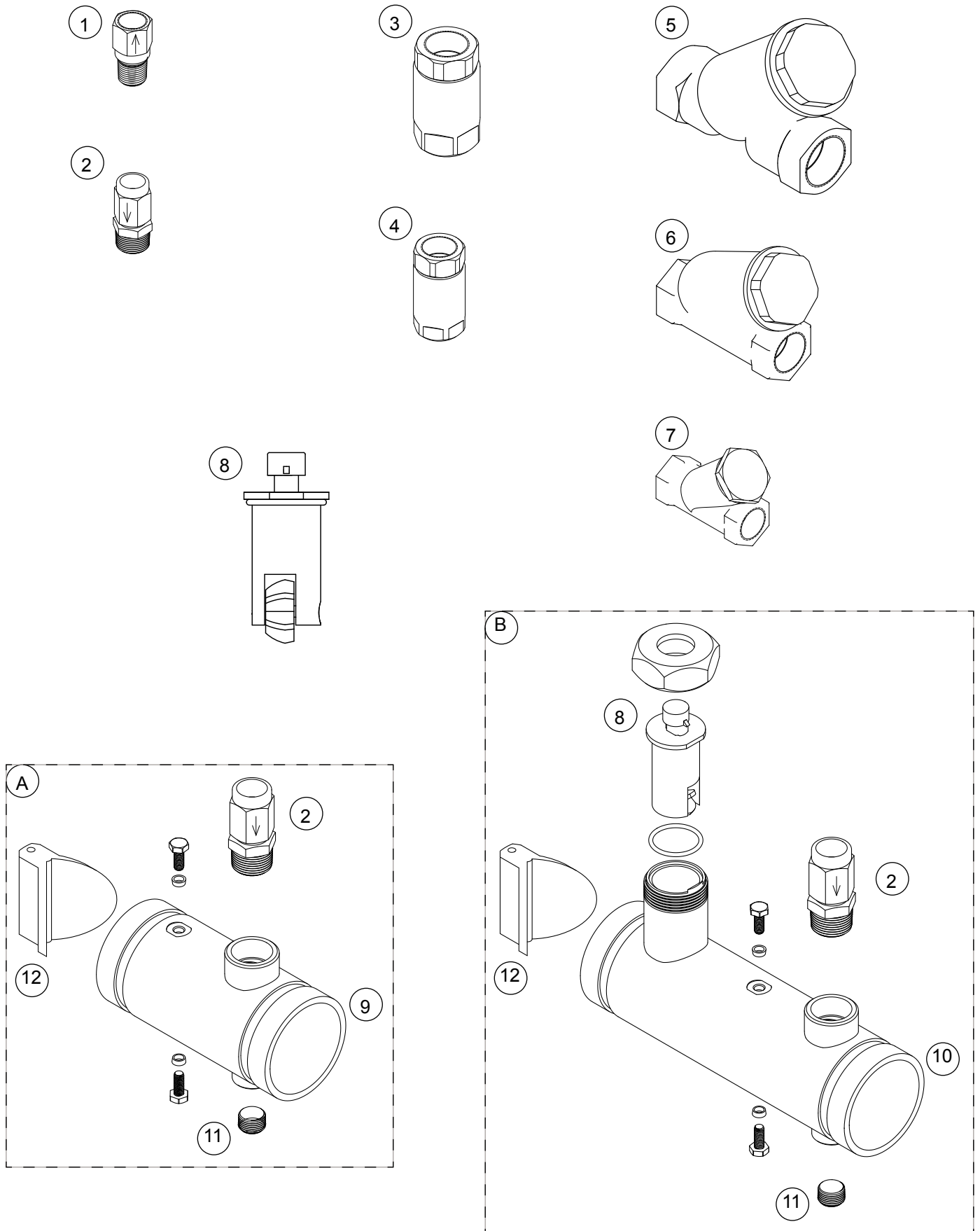


Figure P8. Miscellaneous Plumbing Components

## Plumbing Components

INDEX	PART NUMBER	DESCRIPTION	QTY
1	XE-XXVALVECH-A050A	ACCY PLUMBING VALVE CHECK 1/2 IN	-
2	XE-TF2FIN050-A075A	ASSY VALVE CHECK/ BUSH 3/4-1/2 IN	-
3	XE-XXVALVECH-A100A	ACCY PLUMBING VALVE CHECK 1 IN	-
4	XE-XXVALVECH-A075A	ACCY PLUMBING VALVE CHECK 3/4 IN	-
5	XE-XXSTRAIN-A100A	ACCY PLUMBING STRAINER 1 IN	-
6	XE-XXSTRAIN-A075A	ACCY PLUMBING STRAINER 3/4 IN	-
7	XE-XXSTRAIN-A050A	ACCY PLUMBING STRAINER 1/2 IN	-
8	XE-MF15P-S0C X-MF22N	SENSOR PADDLEWHEEL FLOW NUT BRASS FLOW RETAINING CAP	-
			-
A	XE-TF2FMAN-M15A XE-TF2FMAN-M20A XE-TF2FMAN-M25A XE-TF2FMAN-M30A XE-TF2FMAN-M40A	ASSY TF FOAM MANIFOLD 1.5 IN ASSY TF FOAM MANIFOLD 2.0 IN ASSY TF FOAM MANIFOLD 2.5 IN ASSY TF FOAM MANIFOLD 3.0 IN ASSY TF FOAM MANIFOLD 4.0IN	-
9	XM-TF155-S01 XM-TF205-S01 XM-TF255-S01 XM-TF305-S01 XM-TF405-S01	1 1/2" INJECTOR NO PADDLE 2" INJECTOR NO PADDLE 2 1/2" INJECTOR NO PADDLE 3" INJECTOR NO PADDLE 4" INJECTOR NO PADDLE	1
B	XE-TF2FMANFL-M15A XE-TF2FMANFL-M20A XE-TF2FMANFL-M25A XE-TF2FMANFL-M30A XE-TF2FMANFL-M40A	ASSY TF FOAM MANIFOLD W/FLOW 1.5 IN ASSY TF FOAM MANIFOLD W/FLOW 2.0 IN ASSY TF FOAM MANIFOLD W/FLOW 2.5 IN ASSY TF FOAM MANIFOLD W/FLOW 3.0 IN ASSY TF FOAM MANIFOLD W/FLOW 4.0 IN	-
10	XM-TF150-S01 XM-TF200-S01 XM-TF250-S01 XM-TF300-S01 XM-TF400-S01	1 1/2" INJECTOR 2" INJECTOR 2 1/2" INJECTOR 3" INJECTOR 4" INJECTOR	1
11	ZPG-4464K563	PLUG HEX SOCKET TYPE 302 S/S 3/8 PIPE SZ	1
12	Z-8M717151113602 Z-8M71714693602 Z-8M7171512436 Z-8M7171450836 Z-8M717151853602	VALVE CHECK BUNA 1.5" SPRING LOADED S/S VALVE CHECK BUNA 2.0" SPRING LOADED S/S VALVE CHECK BUNA 2.5" SPRING LOADED S/S VALVE CHECK BUNA 3.0" SPRING LOADED S/S VALVE CHECK BUNA 4.0" SPRING LOADED S/S	1

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**NOTES**

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**NOTES**

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# NOTES



# **DANGER**

## **PERSONAL RESPONSIBILITY CODE**

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and/or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.



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