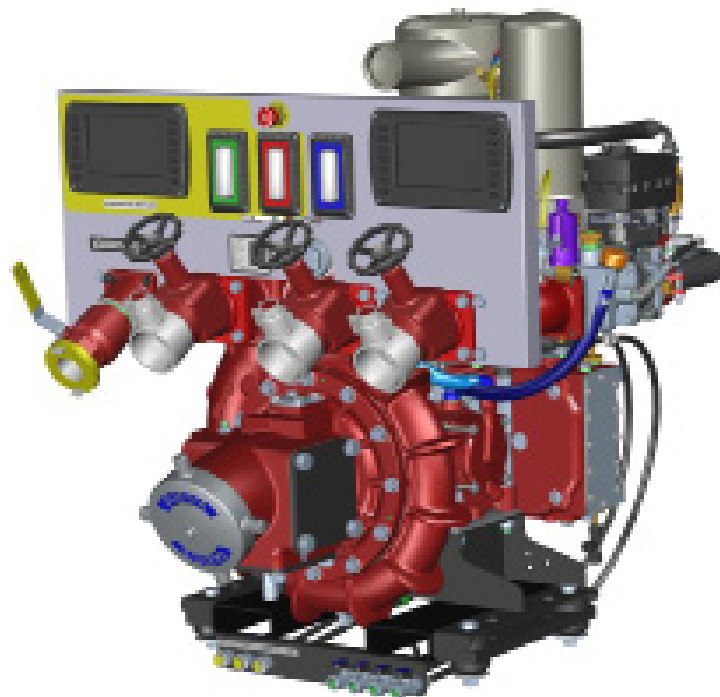




# **PRIMA UV SMARTCAFS 50/100 GEN 2.0 VEHICLE MOUNTED FIRE PUMP WITH COMPRESSED AIR FOAM SYSTEM AND SMARTGOV CONTROL**



## **INSTALLATION AND OPERATION MANUAL**

**AMENDMENT RECORD**

Model: Prima UV SmartCAFS

Modification No.	Date	Page/s	Amendment	New Issue Number
	Feb 2021		First Issue	1
1	Feb 2023	33	Inserted electrical grounding recommendations	2

## CONTENTS

Amendment Record	2
Contents	3
Introduction	4
Safety	5
Technical Data	7
System Overview	20
Installation and Initial Set-up	22
Vehicle Design Consideration	43
SMARTCAFS - Operation	45
Maintenance Schedule PC1/PC2	67
Fault Finding	71
Operator Maintenance Log	79
Customer Support Documents	80
Supplement	
UV SmartGOV - Operation	81

## INTRODUCTION

This publication provides information relating to the installation, commissioning and operation of the Prima UV SmartCAFS GEN 2.0 pumps. This refers to any Godiva Prima pump, single or multi-pressure, when partnered with a Compressed Air Foam System (CAFS). The system can comprise of these main components -

Godiva Prima P1 & P2	Compressor	FoamLogix (foam pump)	UV SmartCAFS	UV SmartGOV
2010	50, 100	2.1A, 3.3	Yes	Yes
3010	50, 100	2.1A, 3.3	Yes	Yes
4010	100	3.3, 5.0	Yes	Yes

Please note that this version of the Prima UV SmartCAFS integrated CAFS pump is referred to as "Prima UV SmartCAFS GEN 2.0", to distinguish it from the previous version. The difference is that the GEN 2.0 version uses the Rotorcomp Compressor and not the Gardner Denver compressor used by previous versions. The Prima UV SmartCAFS GEN 2.0 was first available in April 2021 with the Prima UV SmartCAFS50 and CAFS100 models.

### Important Notes

#### Please read this manual before operating the pump

**Critical: The pump bearing housing, Gearbox and Compressor are not filled with oil ex works. Refer to section on oil filling points before operation.**

Correct lubrication and maintenance is essential if satisfactory performance is to be maintained

### Spares

Use only approved replacement parts as recommended by Godiva Ltd. Use of non-approved parts or unauthorised modification of the Godiva Fire Pump may result in death or injury and invalidate any product warranty.

### Ordering

When ordering replacement parts please state:

- Model – e.g PC1A2010, where -  
P = Godiva Prima Series  
1 = Single pressure, 2 = Twin pressure  
A = Aluminium, B = Bronze  
2010 = Main pump output - 2010 = 2000 l/min, 3010 = 3000 l/min, 4010 = 4000 l/min,
- Serial number - stamped on the side of the volute or on a plate on the instrument panel.
- Year of manufacture
- All the above details are also provided on a plate which will be attached to the pump panel or the side of the pump bay by the vehicle builder.

### Pump

Godiva products may only be repaired or serviced by persons trained in said procedures by either Godiva Ltd., or their approved agents.

## SAFETY

Please read this manual before operating the machinery.

Safety notices -



= non-compliance could affect safety

**IMPORTANT**

= in case of damage to pump

**ATTENTION**

= in case of personal hazards

### Installation and Commissioning

- Once packaging has been removed, installer should ensure rotating parts are not accessible.

### In operation

- Rotating parts must be guarded against accidental contact.
- Do not insert items into the suction tube when pump is running.
- Discharge hoses must not be disconnected when the unit is running.
- No components must be unfastened when the unit is running.
- When installing or removing the pump, suitable lifting equipment must be used.
- Suitable ear protection must be worn when pump is running – if necessary.
- When filling the gearbox - avoid spilling oil onto the floor to prevent the danger of slipping.
- Maximum allowable inlet pressure is 12 bar
- Do not run the pump without water for more than one minute as dry running will damage the seal

### Training

Godiva pumps must only be operated by trained personnel.

### Maintenance

The user must maintain the equipment in an operational condition, as per regulation 5 in the Provision and Use of Work Equipment Regulations 1998.

### Environmental Protection

Used oil from the pump bearing housing must be disposed of in accordance with your local regulations

### Clutch Engagement

When the clutch is first engaged it is possible to observe some sparking occurring around the clutch assembly. This small amount of sparking is quite normal and nothing to be concerned about. The lower the engagement speed the less sparking will occur.

### Risk Assessment

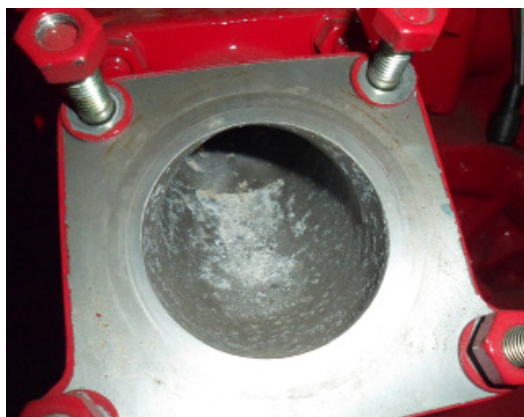
It is the duty of the pump installer to make a method statement and risk assessment of their operations when installing the pump, please contact Godiva Ltd. if assistance is required.

## Transportation and Storage

The pump is supplied mounted on a wooden pallet and covered with a wooden box. This protection is suitable for standard methods of freight handling using forklift trucks. No more than one pump should be stacked on top of another. The box is not suitable for storage outside, or when open to the elements. The pump is sprayed internally with a moisture inhibitor when leaving the factory, this treatment may be required if the pump is in long term storage (6 months or more) before use. On receipt of the pump a full inspection must be carried out, if any damage has occurred please contact Godiva Ltd.

## Post-production Cleaning Fluid

Immediately after production a special cleaning solution is used to clear the pump of any oil or grease that may be remaining inside the pump. Occasionally this cleaning solution leaves a deposit. This deposit has no effect on the performance and will be flushed away when the pump is first used.



Cleaning fluid deposit  
– will be flushed away  
when pump is used

## Warranty

For all issues relating to warranty claims please contact Godiva Ltd. Please be prepared to quote the six figure pump serial number located on the pump volute.

## Associated Publications

Publication	Part No
Spare Parts Manual	TBA

## Pump specification numbering

Typical pump model will be PC1A2010

P	C	1	A	2010
= pump series	= compressed air foam	1 = Single pressure 2 = Multi-pressure	A = Aluminium B = Bronze	20 = nominal flow in litres per minute 10 = pressure in bars

Serial numbering - 616123 = typical serial number, located on the side of the volute body and on a plate on the instrument panel.

## Spares

Spare parts for the Prima SmartCAFS are supplied in kit form for the various parts of the pump. Please refer to the Spare Parts List.

## TECHNICAL DATA

### Description

Pump type P1	Single stage - centrifugal
Pump type P2	Two stage. 1 <sup>st</sup> stage centrifugal, 2 <sup>nd</sup> stage regenerative
Shaft	Stainless steel
Seal	Self-adjusting mechanical type
Material	Aluminium or bronze (applies to main castings) See Materials of Construction list for details
Direction of rotation	Gearbox input - clockwise only (viewed on gearbox input drive flange)
Priming system	Reciprocating, positive displacement piston
Temperature range	-15°C to +40° ambient (ref: EN1028-1)

### Lubrication -

	Oil type	Quantity - litres
Bearing housing	SAE10W/40 or 15W/40	1.0
Gearbox	BP Energol GRXP68	1.2
Compressor - 50scfm	Screw compressor type oil in compliance with ISO viscosity grade 32 to 46. Alternative - SAE 10W/40 automotive multi-grade oil	3.5 (4.0 with filter change)
Compressor - 100scfm		4.5 (6.0 with filter change)

Safety devices	42°C Thermal relief valve (74°C option). Fitted as standard on P2, optional on P1  P2 only - Suction pressure relief valve opens at 13 Bar
Angle of inclination	15° in any plane
Maximum inlet pressure	12 bar
Pump minimum idle speed	900-1000 rpm
Pump maximum recommended speed	3600 rpm

### Prima UV SmartCAFS / FoamLogix System / Compressor - Compatibility Chart

Pump model	FoamLogix	FoamLogix	FoamLogix	FoamLogix	Compressor
Prima SmartCAFS50	2.1A	3.3			Rotorcomp EVO 3
Prima SmartCAFS100	2.1A	3.3	5.0		Rotorcomp EVO 6

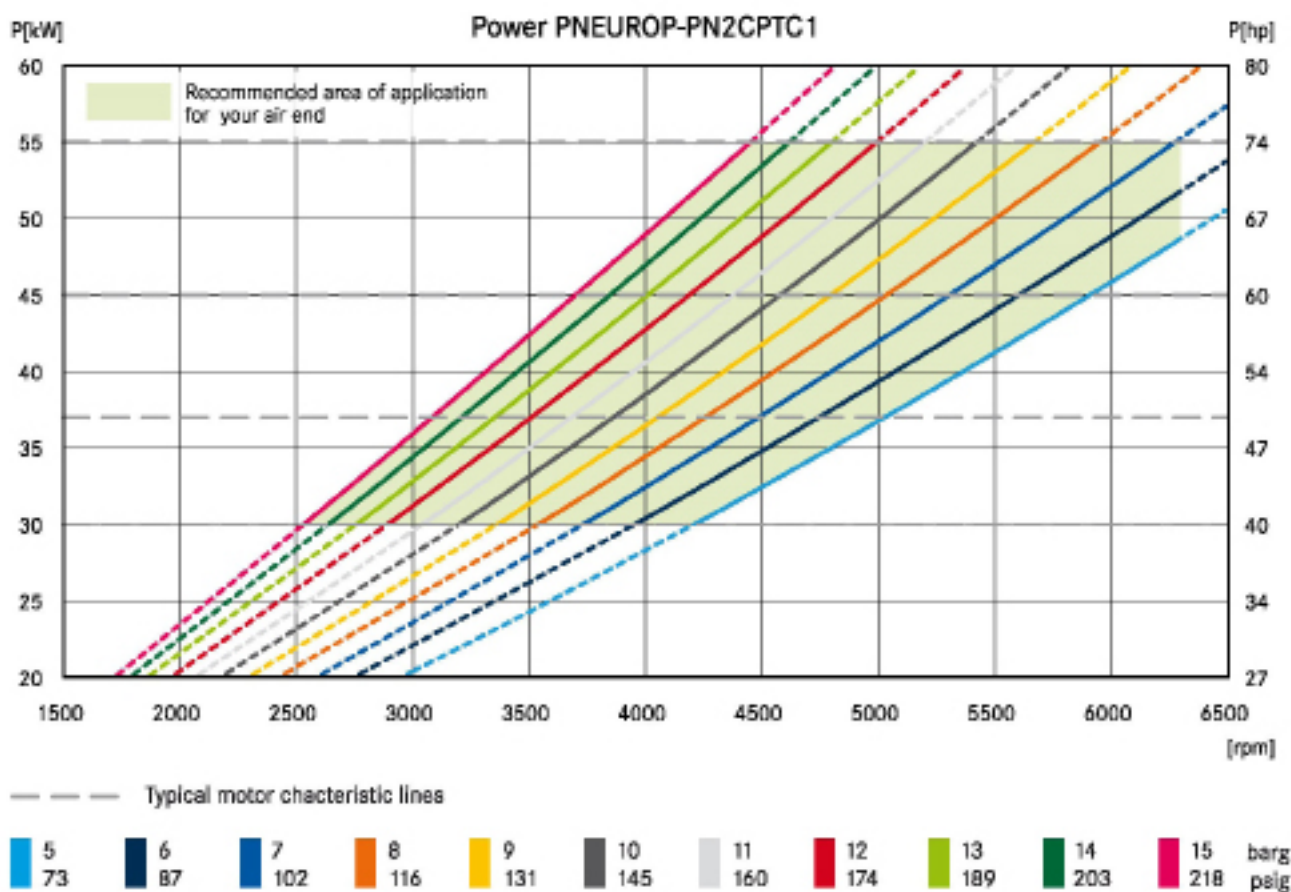
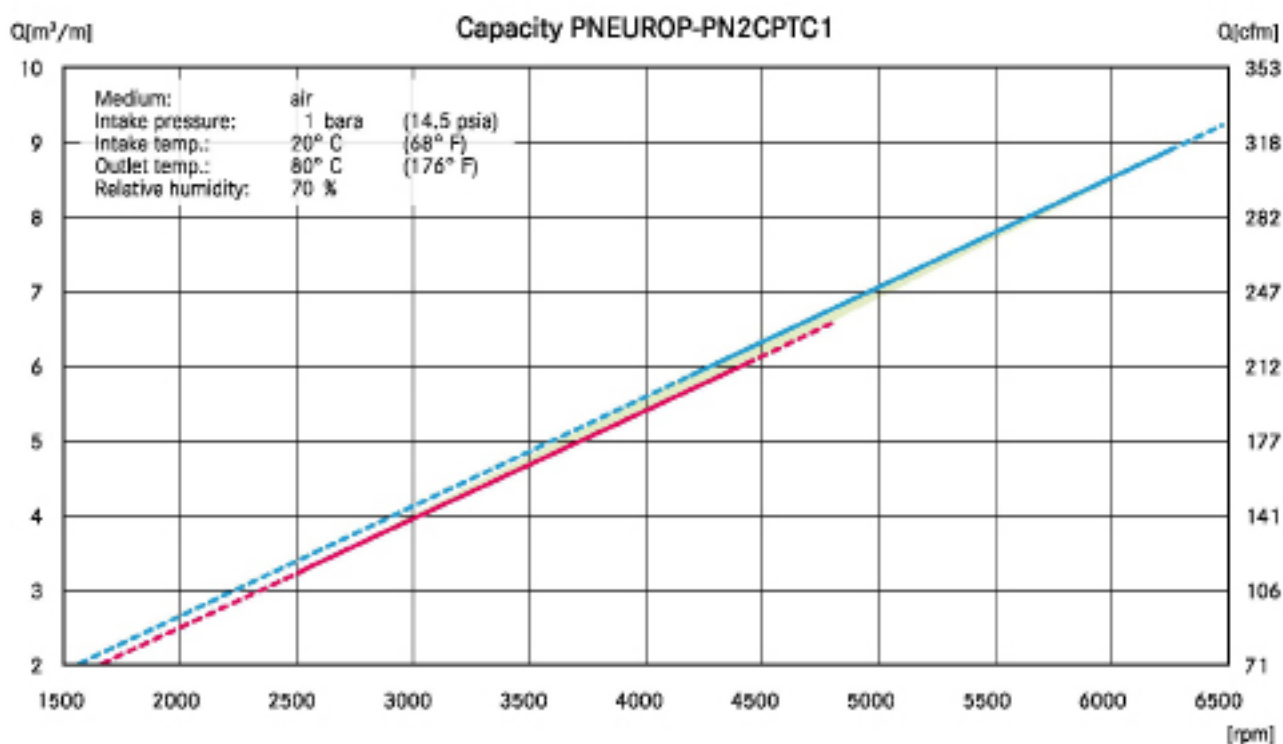
## Compressor Data

<b>Compressor rating</b>	<b>50scfm</b>
<b>Model</b>	<b>EVO 3</b>
Compressor rating	50 scfm
Operating speed range	See graph
Nominal speed of operation	4400 rpm @ 10 Bar
Nominal power draw	Up to 55 kW
Direction of rotation	Anti-clockwise (viewed on pulley)
Maximum volume output	2.9 m <sup>3</sup> /min (766 USGPM)
Oil capacity	4 litres (1.06 USGPM) approximately
Operational pressure range	4-10 bar (58-145 psi)
Cooling System	Plate type

<b>Compressor rating</b>	<b>100scfm</b>
<b>Model</b>	<b>EVO 6</b>
Compressor rating	100 scfm
Operating speed range	See graph
Nominal speed of operation	4400 rpm @ 10 Bar
Nominal power draw	Up to 55 kW
Direction of rotation	Anti-clockwise (viewed on pulley)
Maximum volume output	6.2 m <sup>3</sup> /min (1638 USGPM)
Oil capacity	9 litres (2.4 USGPM)
Operational pressure range	4-10 bar (58-145 psi)
Cooling System	Plate type



## Compressor Performance Data



## FoamLogix Data

Foam Proportioning System	FoamLogix 2.1A - Class A Foam Compatible
Type	Electronic foam proportioning system
Operating voltage	12V and 24V systems available
Fuse rating 12V / 24V	50 / 40 amp
Current draw (operating) 12V / 24V	25 / 13 amp
Current draw (Maximum) 12V / 24V	40 / 20 amp
Wire size 12V / 24V	Minimum 6.0mm <sup>2</sup>
Maximum Foam Agent Flow Rate	8.0 l/min

Foam Proportioning System	FoamLogix 3.3 - Class A and B Foam Compatible
Type	Electronic foam proportioning system
Operating voltage	12V and 24V systems available
Fuse rating 12V / 24V	60 / 40 amp
Current draw (operating) 12V / 24V	30 / 24 amp
Current draw (Maximum) 12V / 24V	60 / 30 amp
Wire size 12V / 24V	Minimum 8.5mm <sup>2</sup>
Maximum Foam Agent Flow Rate	12.0 l/min

Foam Proportioning System	FoamLogix 5.0 - Class A and B Foam Compatible
Type	Electronic foam proportioning system
Operating voltage	12V and 24V systems available
Fuse rating 12V / 24V	70 / 40 amp
Current draw (operating) 12V / 24V	30 / 15 amp
Current draw (Maximum) 12V / 24V	60 / 30 amp
Wire size 12V / 24V	Minimum 8.5mm <sup>2</sup>
Maximum Foam Agent Flow Rate	19.0 l/min

## Lubricants

Pump Gearbox	
Capacity	1.2 litres approximately
Recommended specification	BP Energol GR XP 68 or similar

Pump Bearing Housing	
Capacity	1.0 litres approximately
Recommended specification	10W/40 or 15W/40 Multi-grade engine oil

## Recommended Foam Agents

Hale FoamLogix Models 2.1A, 3.3 or 5.0 can be used with the foam concentrates specified on the Hale Foam Proportioning System Foam Concentrate Compatibility List provided below, Hale Bulletin #650, Rev 32 , 7-17-07.

The foam concentrates in the list have been tested by Hale Products to ensure compatibility with FoamLogix models 2.1A, 3.3, or 5.0. This information is intended to assist the end user in selecting compatible foam concentrate(s) but is not a determination of fire fighting efficiency. Always consult local application and environmental regulations before selecting a foam concentrate and refer to the FoamLogix user manual for additional information.

Please contact your Hale representative if your foam is not listed.

Class A Foam	Manufacturer	Brand name
US Forestry Service Approved	Ansul	Silvex Class A Foam Concentrate
	Angus	Forexpan S (0.1% - 1.0%)
		Hi-Combat Class A (1st Defense Class A Cold WaterFoam)
	Kerr Fire	Kerr Forest Foam (0.1%-1.0%)
	Chubb National Foam	1st Defense Class A Coldwater Foam
	Chubb National Foam	Knock-Down
	Solberg	Fire-Brake Class A Foam (3150A)
	ICL Performance Products	Phoscheck WD881
		First Response
	Chemonics	Fire-Trol Fire Foam 103
		Fire-Trol Fire Foam 104
	3M	Light Water FT-1150
	ChemGuard	First Class - Class A Faom P/N 5100-307
Non U.S. Forestry Service Approved	ChemGuard	Class A Plus
	Unifoam Co Ltd.	UniA 1%
	3M	Light Water SFFF
	National Foam	Responder
	Angus Fire	FirePower Class A
	Fire Response Systems Inc.	Class A - Fire Stop-R CCR# GOLD7368
	Dr. Stahmer	Sthamex-Class-A Synthetic Class A Foam

Class B Foam	Manufacturer	Brand name
AFFF-Alcohol Resistant Concentrates	3M	3% Alcohol Type AFFF Concentrate (P/N 98-0211-6573-7)
	Ansul	3x3 Low Viscosity Alcohol Resistant Concentrate
		T'storm ATC AR-AFFF 1% or 3%
	ChemGuard	AR 3%-6% Part # CAR36P
		AR-AFFF, 3%x3%, Part # C333
		Ultraguard 1%-3% Part # C133
		3%-6% AR-AFFF Product # C361
		3%-6% AR-AFFF Product # C363
	National Foam	Universal Gold 3% AR-AFFF
		Universal Gold 1% - 3% AR-AFFF
	US Foam	1-3% Alcohol Resistant AFFF (P/N US- AR13)
		3-6% Alcohol Resistant AFFF (P/N US-FCAR36)
	Angus Fire	Niagara 3-3 – AR-FFFP (Class B)
	Solberg	Arctic Foam RF 3x6 ATC – Synthetic AR Foam Concentrate (Class B)
	Williams Fire	ThunderStorm® ATC AR-AFFF 1% or 3% F-601B
AFFF	National Foam	1% Aero-Water
<b>Specialty Foam Concentrates</b>		
Protein	National Foam	Terra Foam 3% CF
	Chemonics	Durra Foam 3%
<b>Fire Fighting Water Additive</b>		
	Hazard Control Tech.	F-500 (1%, 3%, 6%)
	SPL Control LLC	Pyrosolv (FF Agent – 6% Solution) P/N-720328 (MSDS#)
	Novacool	UEF 4%
	Fire Blockade	Fire Extinguishing Agent, 0.4 - 6.0%
	No. 3000-1003	
	FireAde 2000	Fire Fighting Emulsifier 0.25-6% P/N FA2000-5
	FIRE CAP	
	Fire Suppression Products, Inc	Fire Cap 0.25%-6%
	Verde Environmental Inc.	Micro-Blaze Out 2-3%
	Bio Ex S.A.S	Bio for N – FSFF (Fluoro Surfactant Free Foam) Wetting Agent. (Class A)
		Ecopol AR-FFF (Fluoro compound-Free Foam) (Class B)

## EN Designation (EN 1028:-1:2002)

Godiva Description and specification	European standard	Classification	Limit pressure pa lim bar
Fire fighting centrifugal pump 2010, low pressure	EN 1028-1	FPN 10 – 2000	17
Fire fighting centrifugal pump 3010, low pressure	EN 1028-1	FPN 10 – 3000	17
Fire fighting centrifugal pump 4010, low pressure	EN 1028-1	FPN 10 – 4000	17
Fire fighting centrifugal pump 6010, low pressure	EN 1028-1	FPN 10 – 6000	17
Fire fighting centrifugal pump – 2010, 3010, 4010, 6010, high pressure	EN 1028-1	FPH 40-250	54.5

## Materials of construction

	Material	Material
Component	Aluminium alloy pump	Gunmetal pump
Volute casing	Aluminium Alloy	Gunmetal
Pump head	Stainless steel	Stainless steel
Suction cover	Aluminium Alloy	Gunmetal
L.P. Impeller	Aluminium Alloy	Gunmetal
Front wear ring	Delrin Polymer	Delrin Polymer
Rear wear wing	Delrin Polymer	Delrin Polymer
Bearing housing	Iron	Iron
Shaft	Stainless steel	Stainless steel
Mechanical seal	Silicon carbide / Carbon	Silicon carbide / Carbon
Other mechanical seal components	Stainless steel	Stainless steel
H.P. Impeller – P2 only	Stainless steel	Stainless steel
Cover Plate – P2 only	Stainless steel	Stainless steel

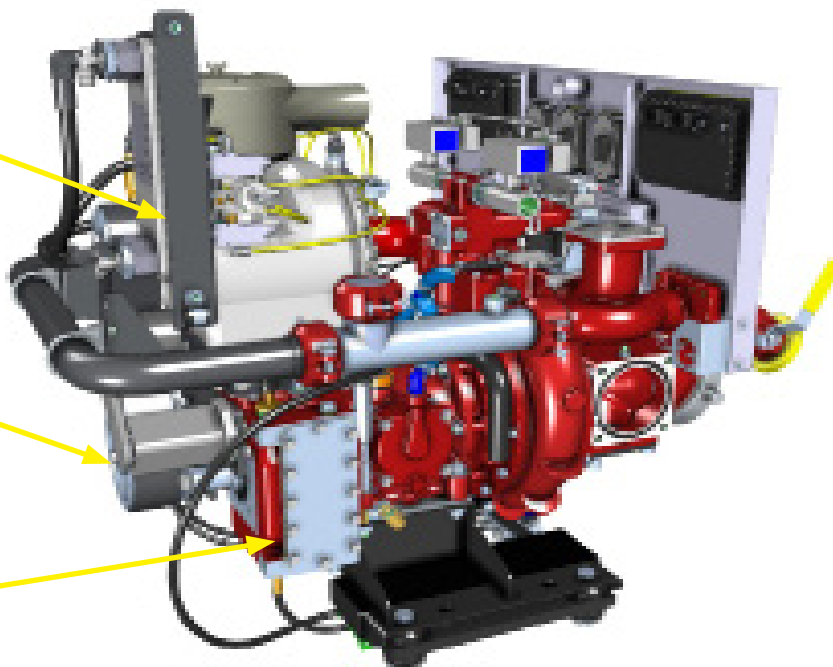
## Major components and controls - Prima UV SmartCAFS50

Note: the CAFS50 and CAFS100 are similar in design.

Rotary twin screw compressor with integral air receiver/separator, heat exchanger and lubrication system.

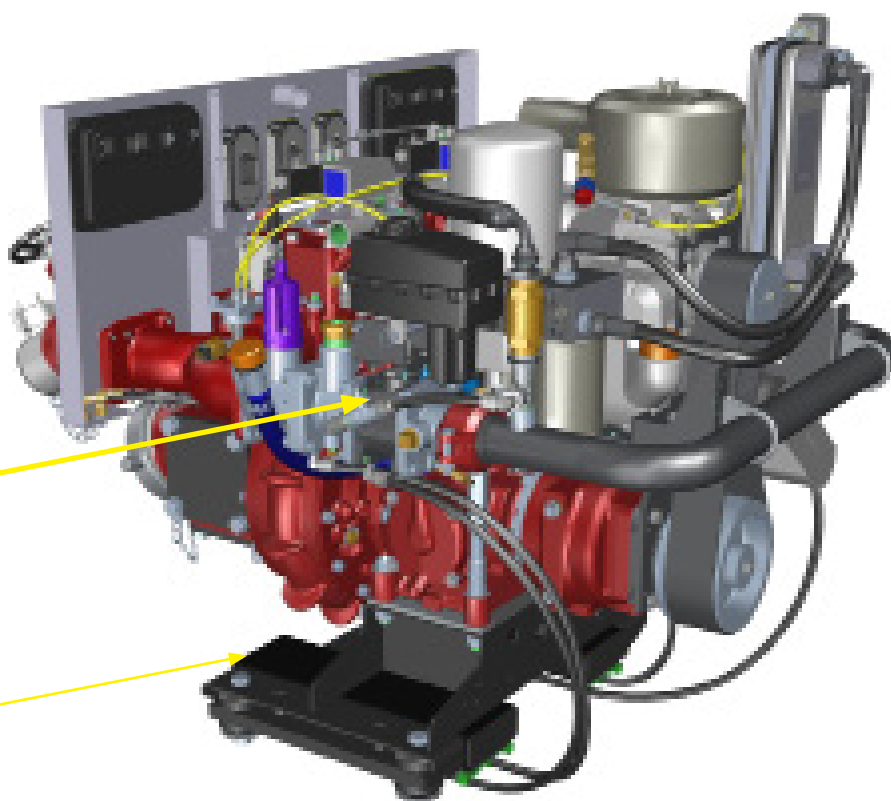
PTO driven gearbox with compressor drive

Integral gearbox oil cooler



Water/foam/air mixing manifold

Mounting platform incorporates forklift points, anti-vibration mountings and fluid drain points



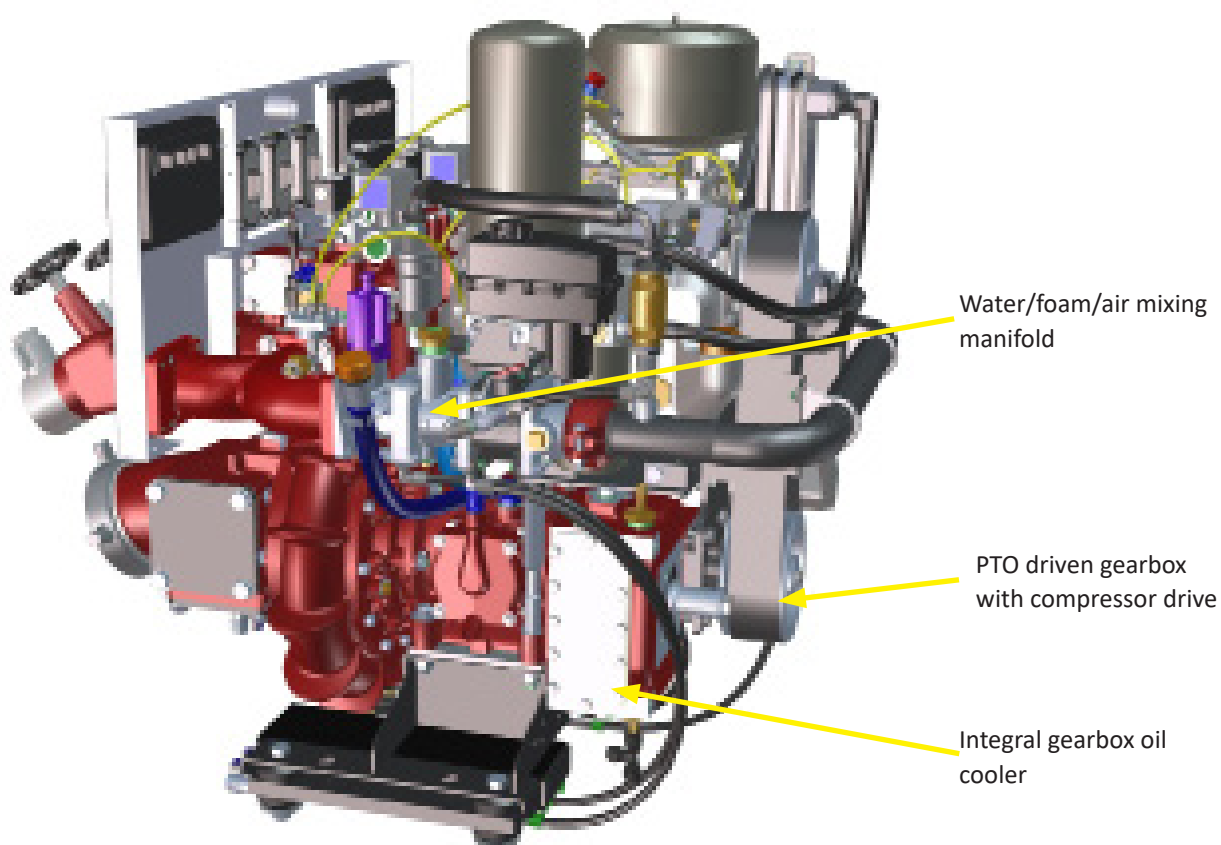
## Major components and controls - Prima UV SmartCAFS100

UltraView SmartCAFS  
control unit

Intelli-tank water and  
foam tank level indicators

UltraView SmartGOV  
control unit

Rotary twin screw  
compressor with  
integral air receiver/  
separator, heat  
exchanger and  
lubrication system.





## FoamLogix 2.1A Foam Pump Component Group

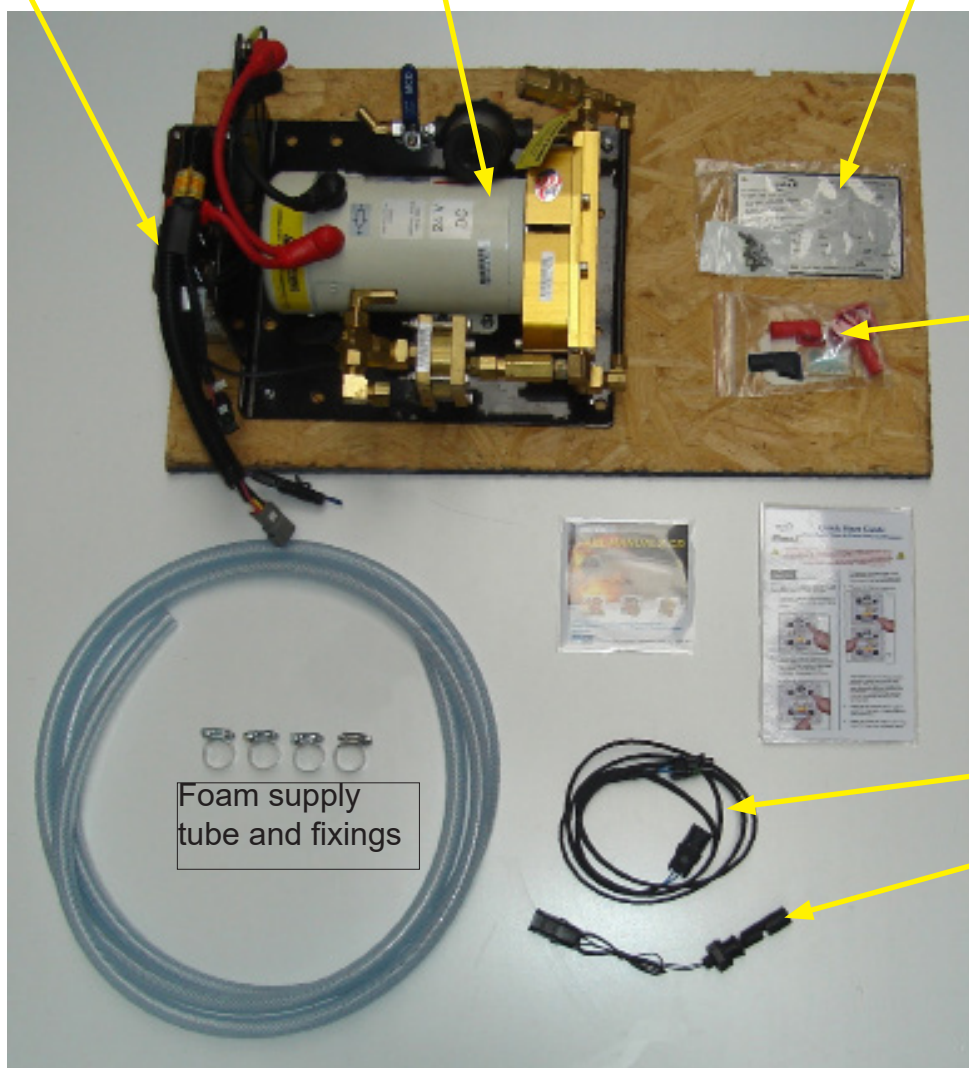
Showing parts supplied loose with standard pump.

Foam pump harness fitted to Distribution box (motor controller/driver)

FoamLogix 2.1A Pump (24V shown)

Instruction plate and fixings

Covers for power leads



Foam supply tube and fixings

Extension lead for low foam level sensor



## FoamLogix 3.3 or 5.0 Foam Pump Component Group

Showing parts supplied loose with standard pump.

FoamLogix 3.3 shown.



1. MDT Foam Tank Selector can be -

MST – Manual Single Tank. Select one foam tank or flush option (not shown)

MDT – Manual Dual Tank. Select one of two foam tanks or flush option (shown)

ADT – Air Dual Tank. Air operated valve, select one of two foam tanks or flush option (not shown)

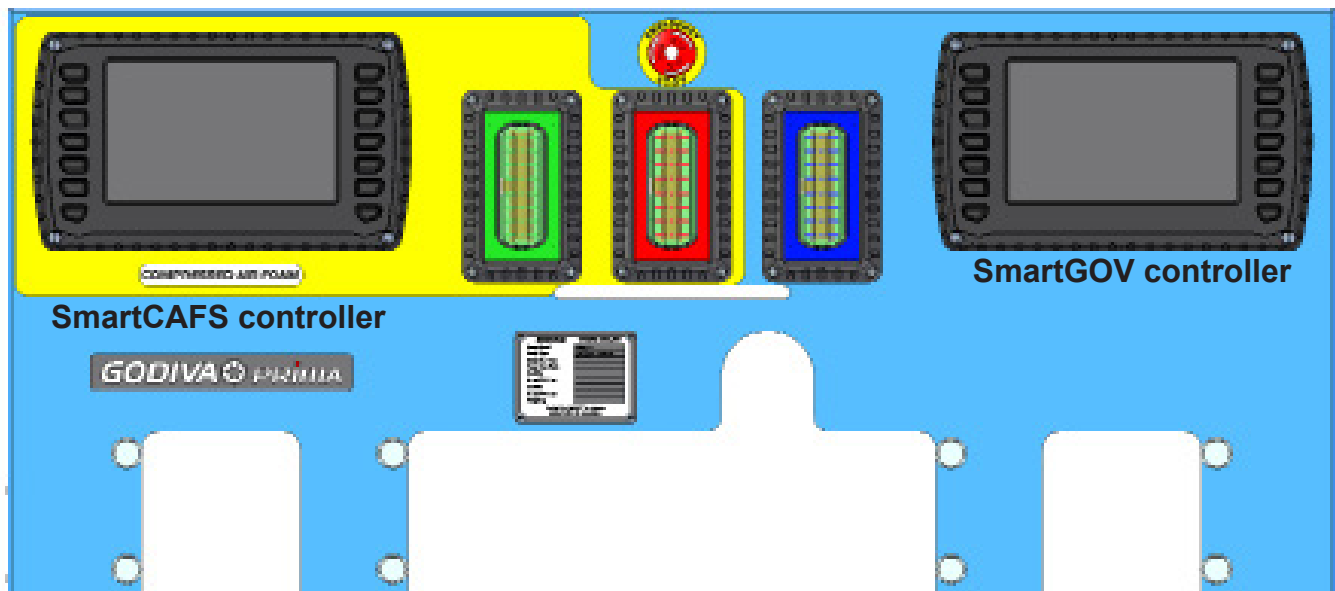
(2) High pressure switches only supplied loose when blue water panel is not fitted

## 1. Typical Control Panel - SmartCAFS control unit with analogue gauges and manual control of pump speed

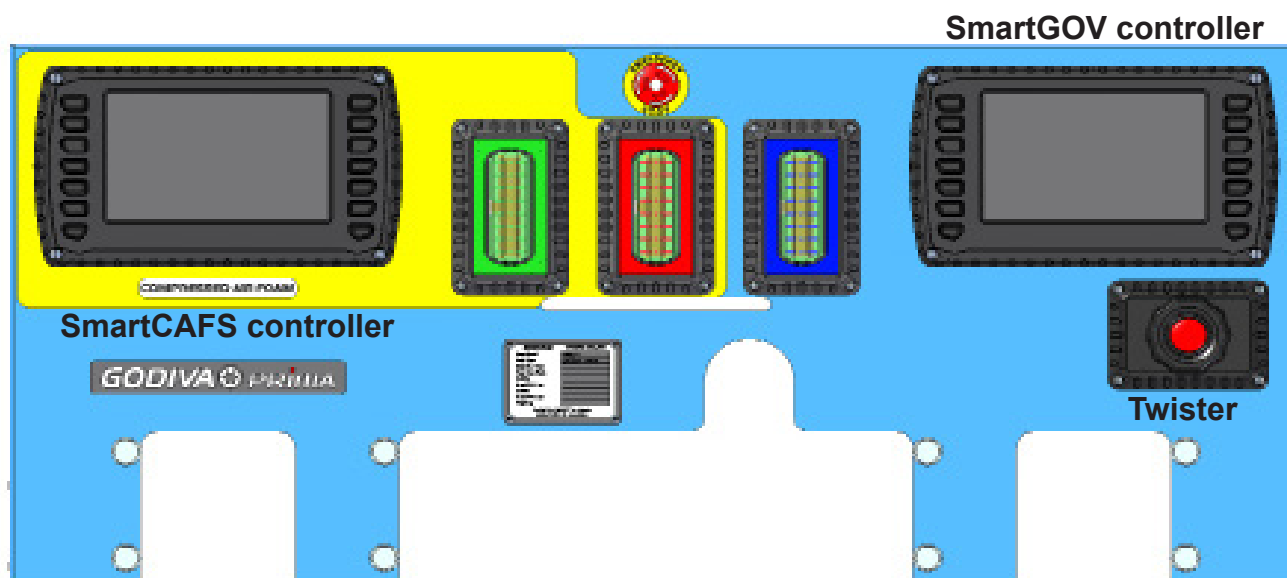


1-Pump low pressure gauge 2-Emergency Stop 3-Pump high pressure gauge  
4-Compound gauge 5-Pump tachometer & hour counter 6-Engine speed control Up=increase, Down=decrease, Left or right=preset speeds 7-Vehicle status lamps - Engine high coolant temperature. Engine low oil pressure. 8-Low battery charge. Low fuel. 9-Foam tank level gauge 10-UltraView SmartCAFS controller 11-Water tank level gauge 12-Spare switch locations, can be used for electro-pneumatic control of High/Low pressure selection, and high pressure discharge valve if fitted. 13-High/Low pressure manual selector 14-High pressure stage strainer.

## 2. Typical Control Panel - SmartCAFS and SmartGOV control units - complete electronic control of CAFS and pump operation



### 3. Typical Control Panel - SmartCAFS and SmartGOV control units with Twister for manual control of pump speed



### 4. Typical Control Panel - SmartCAFS control unit supplied to fit within the vehicle builder panel design



## SYSTEM OVERVIEW

The PC1\_ or PC2\_ is a Compressed Air Foam System comprising of three major components (in addition to the main water pump) – Air compressor, FoamLogix (foam proportioning unit) and Manifold (foam mixing and control system).

The FoamLogix components (foam pump and motor assembly) are mounted separately from the water pump and are designed to be remotely mounted according to the vehicle builders requirements.

A metered amount of foam concentrate is introduced into the Manifold and mixed with water from the pump discharge manifold to produce a solution. The foam and water blend is then fed to a control valve (ARC) where wet or dry foam may be selected (air ratio control section of manifold). Compressed air is then injected and the resulting foam / water / air combination is completely mixed by the X-mixers during discharge.

Safety interlocks are provided to ensure that:

1. Foam concentrate cannot be introduced unless water is flowing through the unit. Compressed air cannot be introduced unless foam concentrate is flowing.
2. 'Slugging' (unmixed air and water) in the discharge line is prevented. Air cannot be injected in the absence of foam and water.
3. Air injection when the foam tank is empty is prevented. Foam tank low level switches are provided and MUST be fitted.

### Compressor

There are three levels of compressor used –

For Prima SmartCAFS50 systems

The rotary twin-screw compressor is rated at 50 scfm @ 7 bar

For Prima SmartCAFS100 systems

The rotary twin-screw compressor is rated at 100 scfm @ 7 bar

All compressors are driven by a belt drive. The compressor is continuously engaged with the pump drive.

Compressor lubricating oil is cooled by water taken from the main pump, via the water supply line; cooling water being supplied from pump delivery and returned to pump suction. The compressor will reject approx. 8.0 kW (CAFS50), 15.0 kW (CAFS100), of heat energy to cooling. The installer must consider this additional thermal load.

When the compressor is stationary, residual system pressure is vented by a blow-down valve.

NOTE: The compressor should not be run without cooling water.

### Manifold

The manifold incorporates an air ratio control valve through which varying degrees of wet or dry foam mixture can be selected. Compressed air is then injected and the resulting foam / water / air combination is thoroughly mixed by the X-mixers during discharge.

A By-pass valve is fitted to help obtain the required dry foam flow rate, this valve is adjusted and set during the installation stage, it is not required to be adjusted during normal operation.

CAFS units are best suited for use with Fresh Water.

For salt water compatible foams, seek advice from the foam agent manufacturers.

#### FoamLogix - Foam Proportioning System

The FoamLogix system consists of three main components:

- 1) Foam Pump / Motor Assembly.
- 2) UltraView Controller (integral with main pump control panel).
- 3) Flow measurement and injection manifold.

All three elements combine to provide accurate foam proportioning. From the control panel the operator can initiate the system, adjust the foam ratio, monitor 'real time' water flow rate and record total water and foam concentrate usage.

The FoamLogix system should be powered up when the PTO is engaged. Foam concentrate is only injected when the RED ON control button is operated.

The Foam ON light will illuminate when the FoamLogix is turned on, and flash when injecting foam.

The Hale FoamLogix 2.1A foam proportioning system provides consistent foam concentrate injection for Class A foam operations and is capable of delivering a ratio of 0.1% to 10.0% foam concentrate directly into the water discharge stream.

Further information is available in the FoamLogix Model 2.1A Description, Installation and Operation manual, part number 029-0020-74-0

Hale 3.3, 5.0 FoamLogix systems may be used for Class A or B foams,

Further information is available in the FoamLogix Model 3.3/5.0 Description, Installation and Operation manual, part number 029-0021-68-0.



## INSTALLATION AND INITIAL SET-UP

PRIMA SMARTCAFS50  
USING FOAMLOGIX 2.1A, 3.3

PRIMASMARTCAFS100  
USING FOAMLOGIX 3.3, 5.0

The following connection points should be considered when installing the PC1\_ or PC2\_ assembly into a vehicle.

Lifting Points – Prima SmartCAFS50 and Prima SmartCAFS100

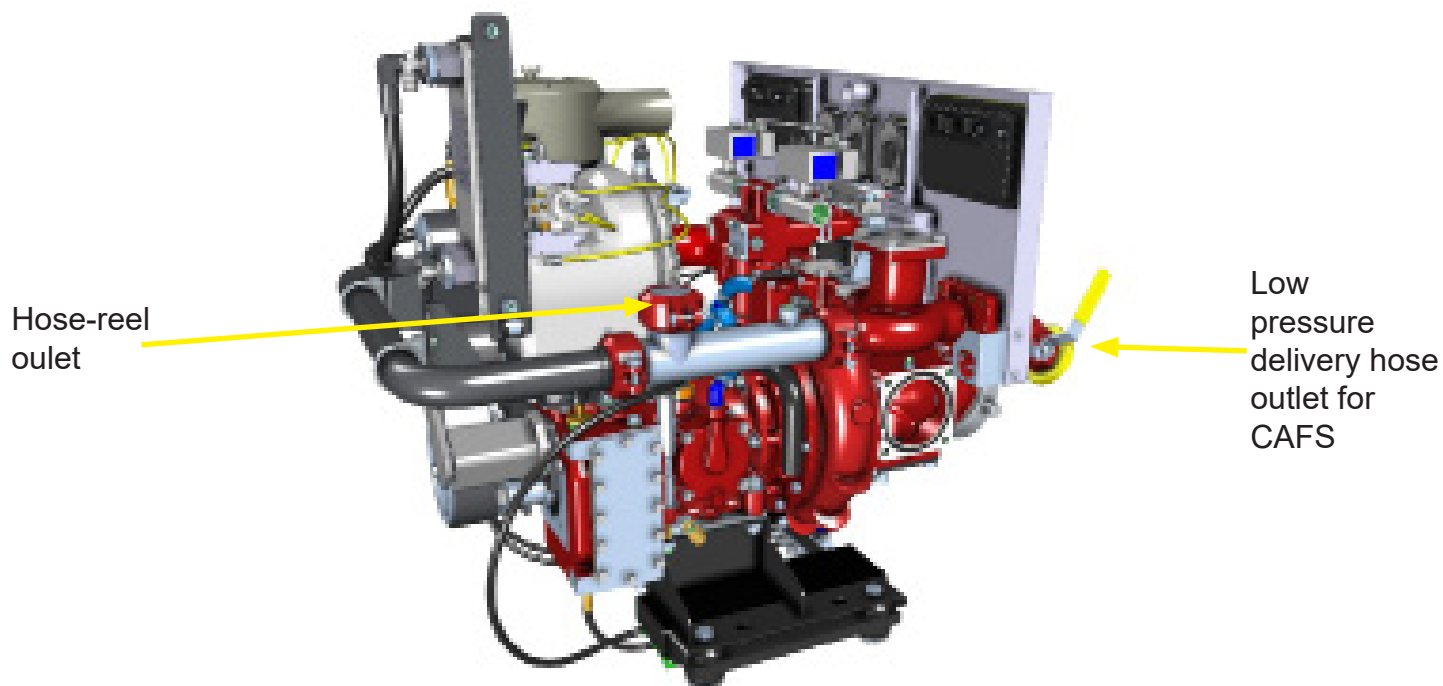
Secure handling of the unit for installation and maintenance is vital. Use only the lifting points provided on the unit.



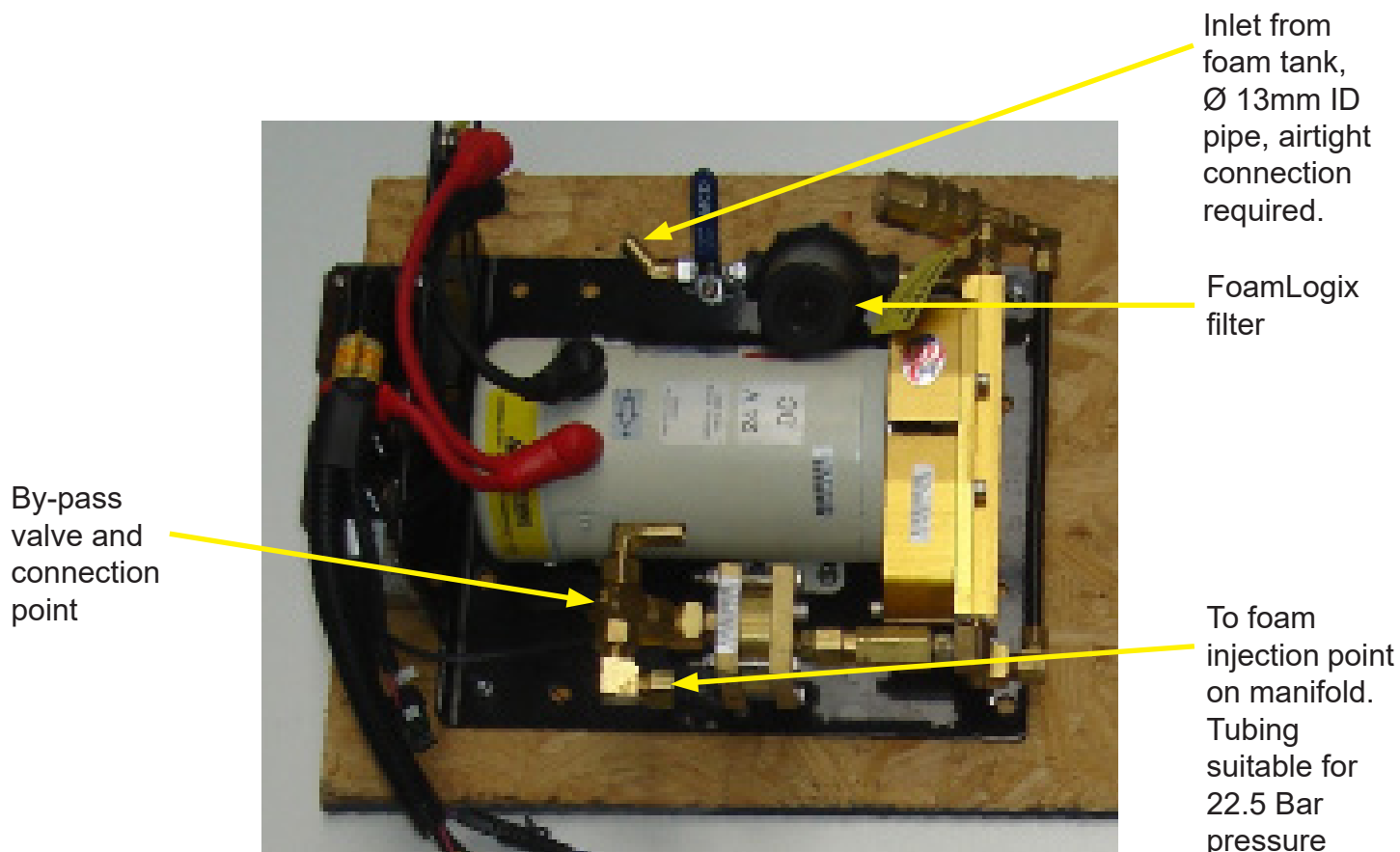
Forklift points

## Prima SmartCAFS50 System

CAFS Discharge ports (see installation drawing for dimensions)

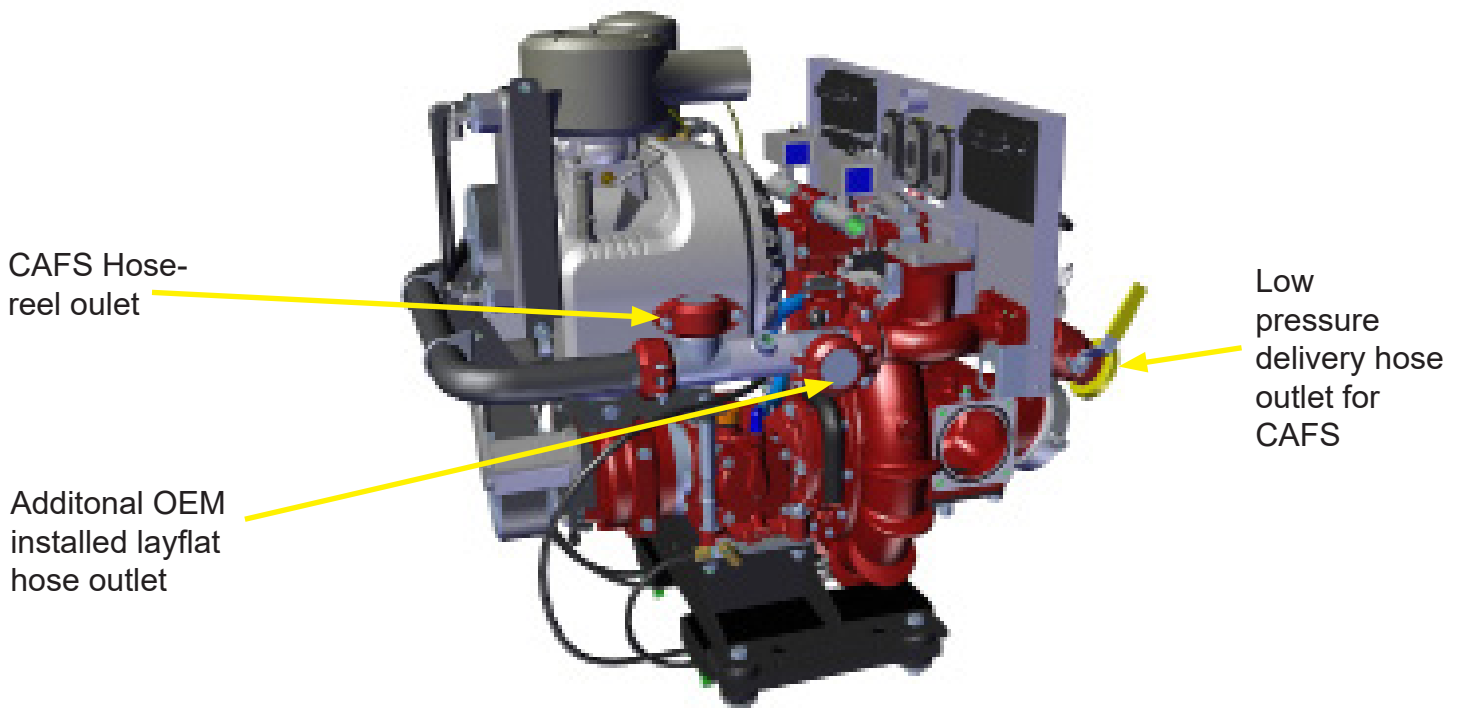


## FoamLogix 2,1A System - Remote Mounted



## Prima SmartCAFS100 System

CAFS Discharge ports (see installation drawing for dimensions)



## FoamLogix 3.3, 5.0 System - Remote Mounted



Inlet from foam tank.

Models 3.3, 5.0 - 19mm ( $\frac{3}{4}$ inch) NPT

Note: foam tank must be located above FoamLogix unit. Also refer to installation notes in FoamLogix manual.

By-pass valve and connection point (on reverse of valve)

To foam injection point on manifold.  
13mm ( $\frac{1}{2}$ inch)  
NPT Tubing suitable for 22.5 Bar pressure



## Fluid Drain Points

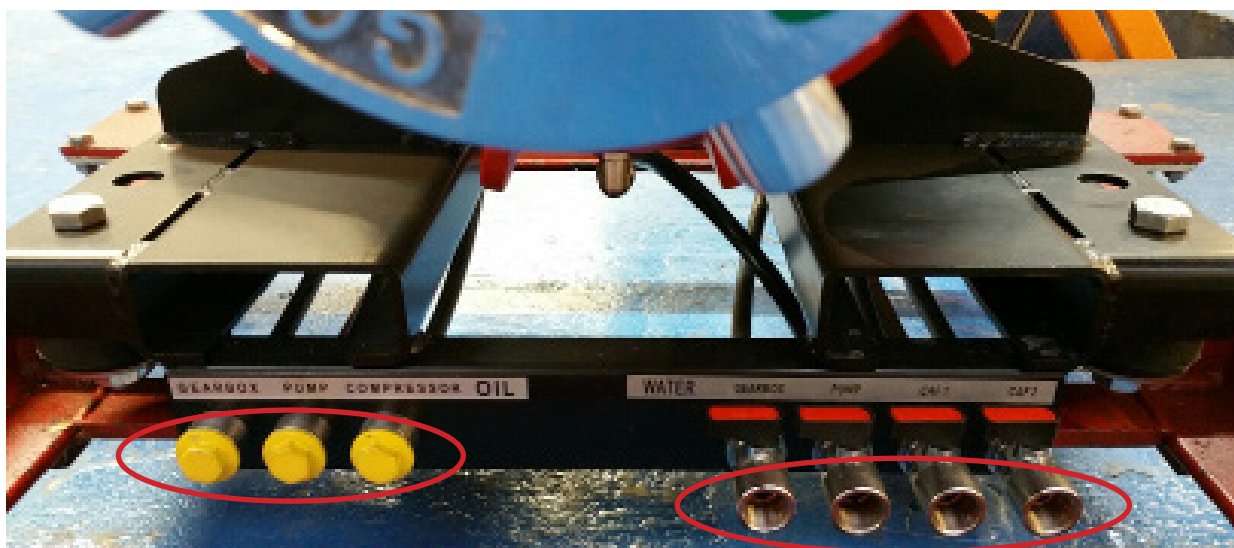
Prima SmartCAFS50 / 100 Systems

Compressor, Bearing housing, and Gearbox oil drain points are located at the lower left side of the pump (viewed from the suction tube end).

ATTENTION

IMPORTANT

Note: Oil should only be drained from the gearbox/compressor/bearing housing when it has cooled to a reasonable temperature to avoid accidental or inadvertent injury through contact with hot oil. The oil can be slightly warm to assist in flowing from the unit.



Gearbox/heat exchanger coolant and the CAFS manifold drain points are located at the lower right hand side of the pump. Please note that both manifold drains must be utilized.

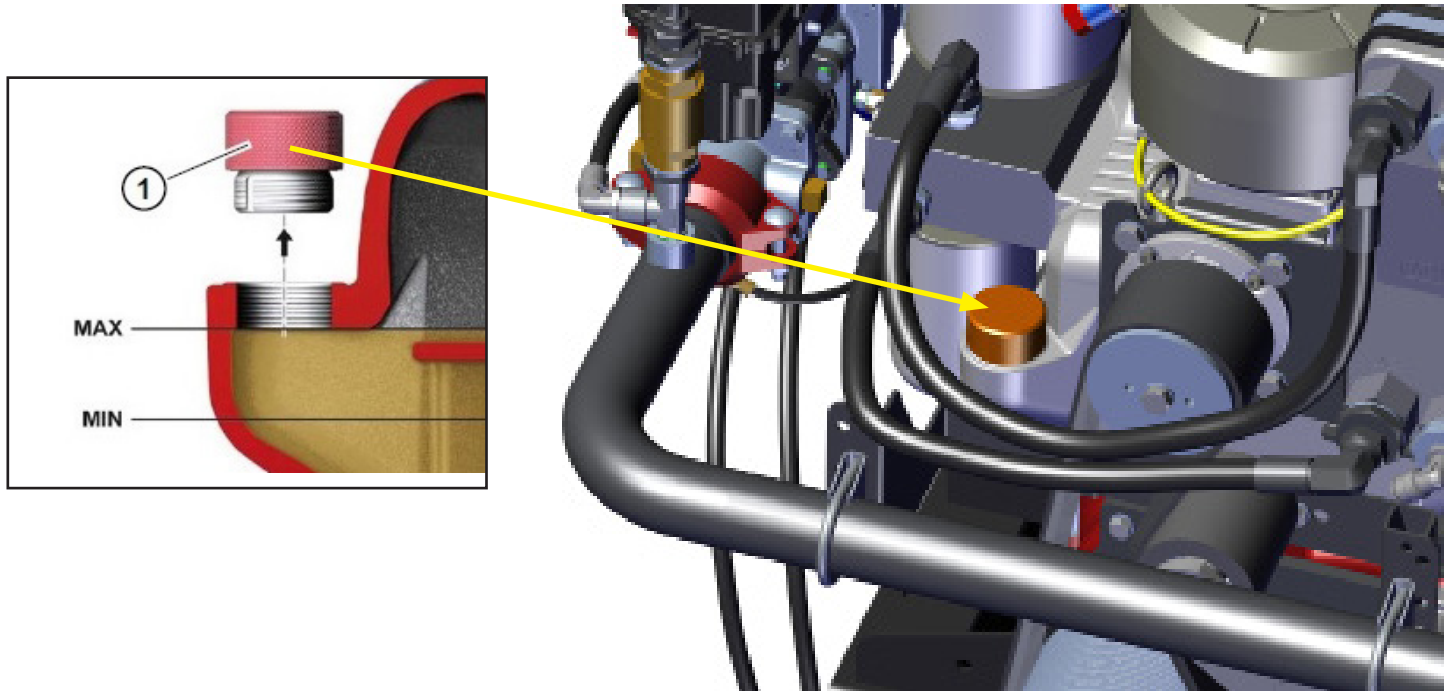
## Oil Filling Points - Prima SmartCAFS50 / CAFS100

Prima SmartCAFS100 is very similar to the CAFS50 arrangement

The unit is supplied without oil and must be filled with the correct quantity and specification before starting the pump.

The oil filling points for the compressor is located at the right side of the pump (viewed from suction tube).

The oil filling points for the bearing housing is located on the right side of the pump (viewed from suction tube).



### Compressor Oil Filling for empty compressor

Remove the oil filler cap 1.

Fill the compressor with oil until the oil level is just below the maximum point indicated (just below the threaded section). CAFS50 compressor will require approximately 4 litres, CAFS100 9 litres.

Run the compressor for 2 minutes in standby condition.

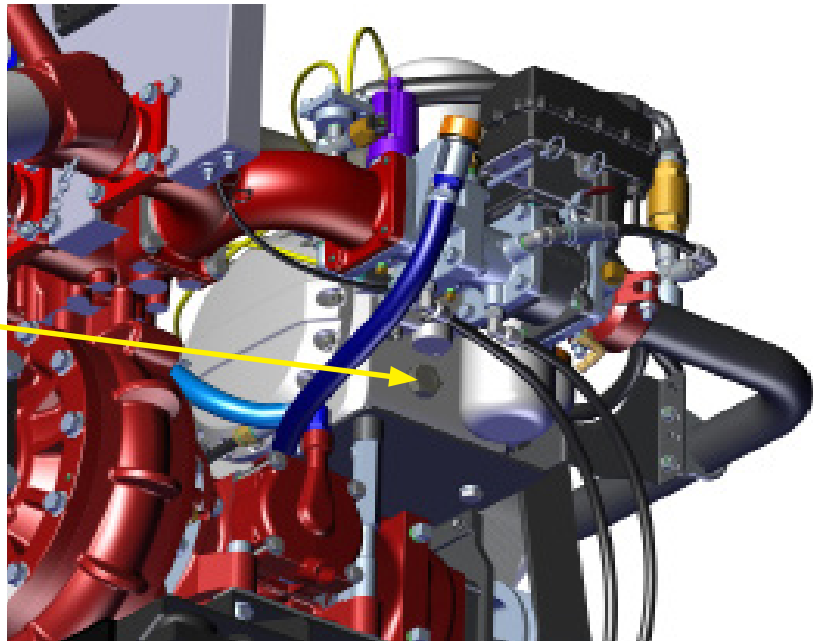
Allow compressor to stand for 1 minute then remove the filler plug and top up the compressor oil level to the bottom of the thread at the filler aperture.

### Subsequent oil level checking

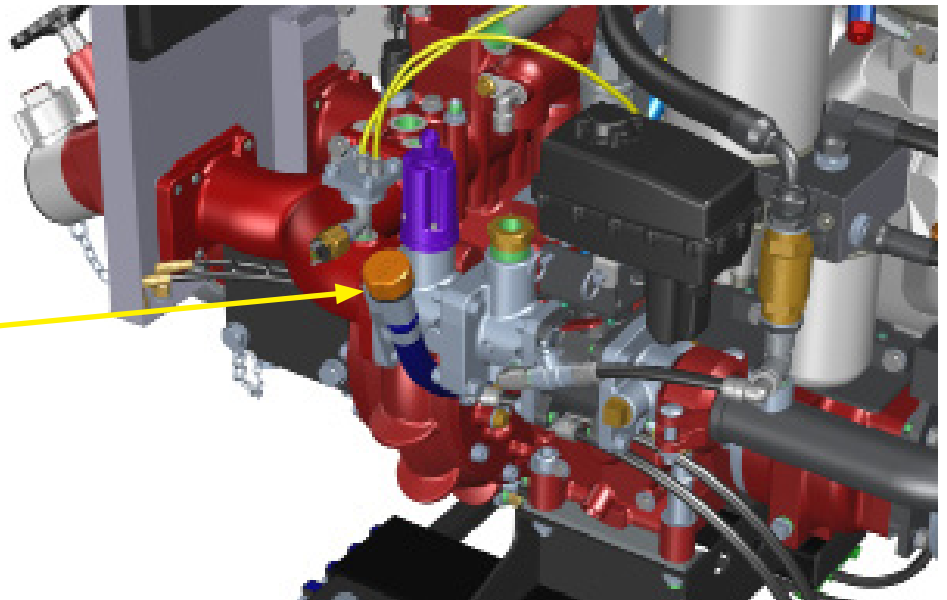
Remove the oil filler cap 1.

Top up the compressor with oil until the oil level is just below the maximum point indicated (just below the threaded section).

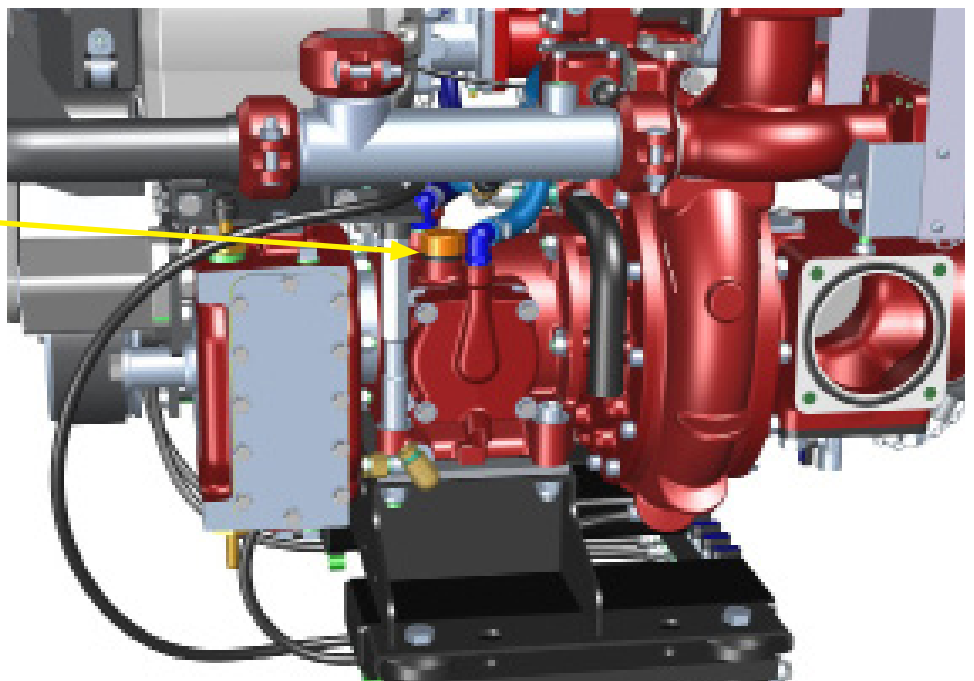
This sight glass is to show that excess oil is being scavenged out of the air. When oil is dripping behind the glass, it indicates the scavanging process is in action



Bearing housing oil fill point



Pump bearing housing -  
Oil level dipstick.



## Compressor Filters

### 1. Air filter

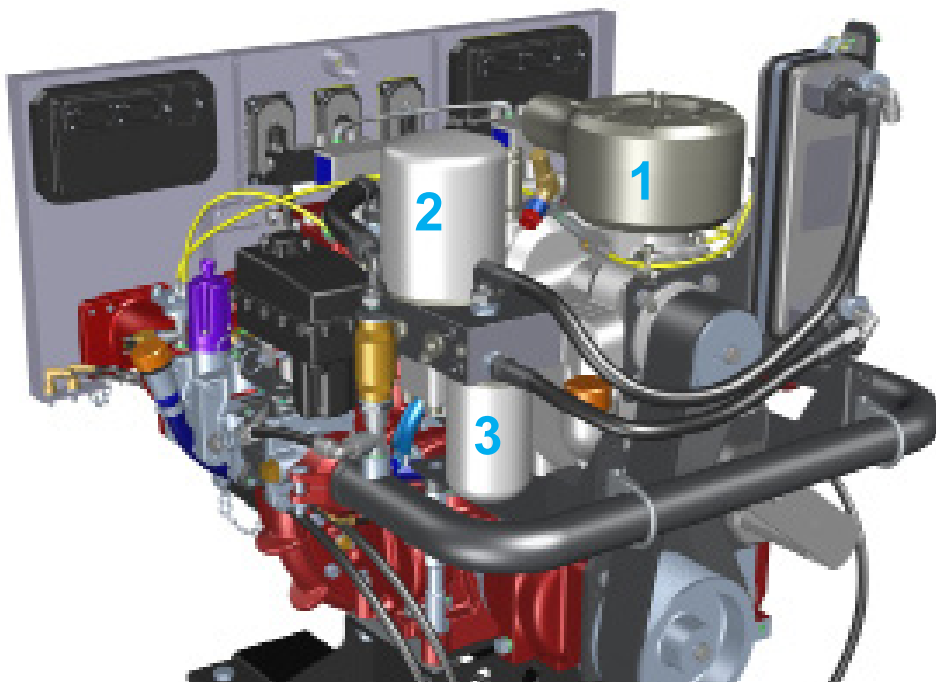
The filter element is accessed by removing the cover.

### 2. Oil fine separator filter

The filter is removed by unscrewing in an anti-clockwise direction. A seal is provided with the filter.

### 3. Oil filter

The filter is removed by unscrewing in an anti-clockwise direction. A seal is provided with the filter.



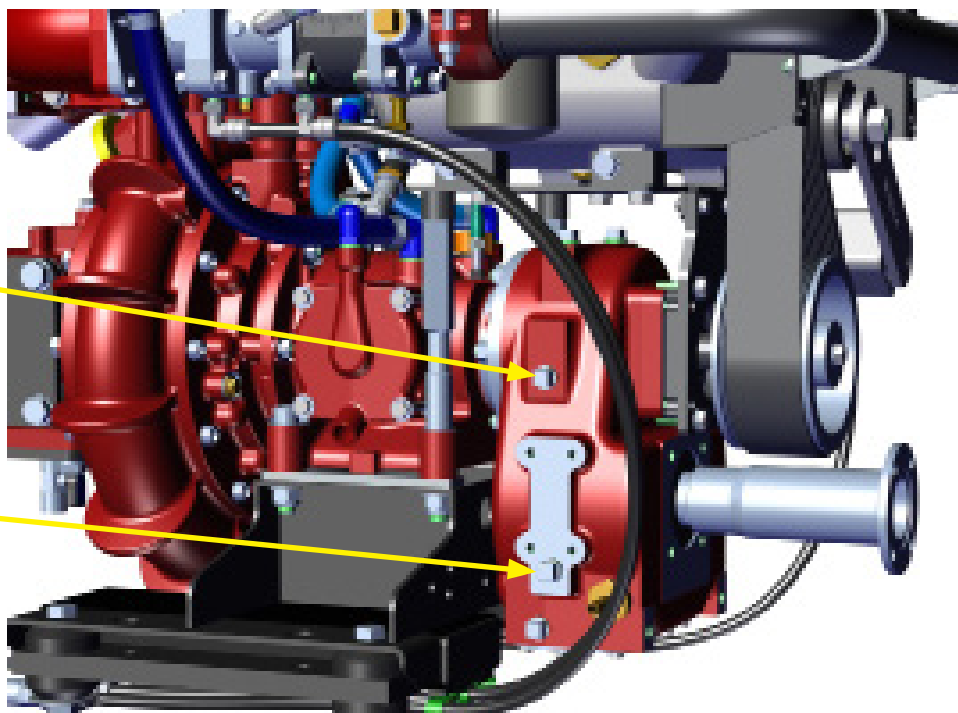
## Gearbox Filling Points - Prima SmartCAFS50 / 100

The pump gearbox filling point depends on the gearbox position in relation to the pump.

### Gearbox in down position

Oil filling point.  
For oil type and capacity refer to Recommended Lubricants

Oil level check point



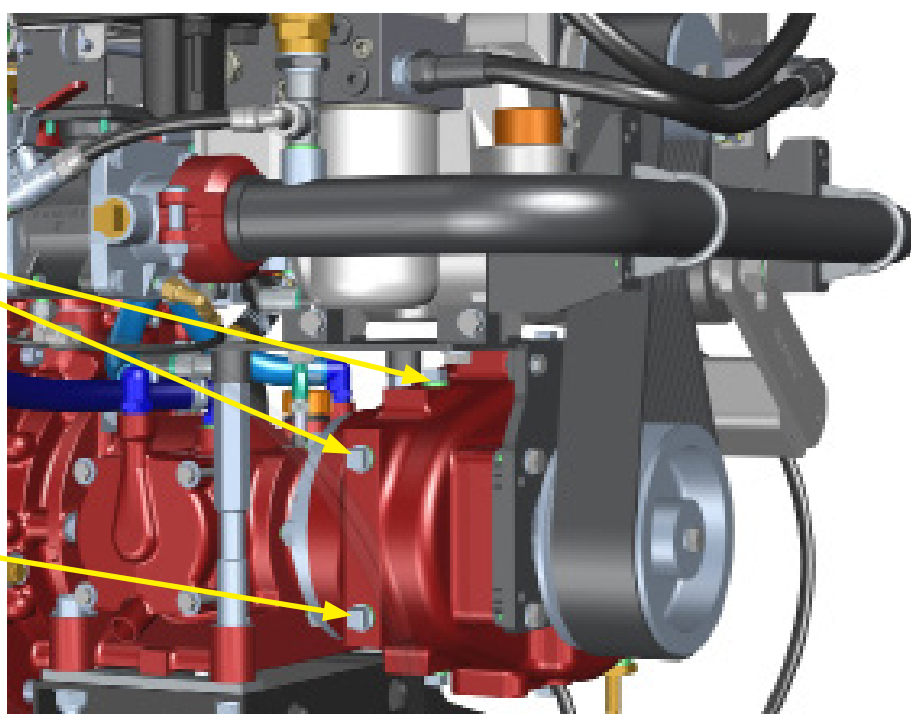
### Gearbox in left and right position

The oil filling point is on the side of the casing (RH gearbox shown) and is symmetrically opposite for LH gearbox.

The oil level check point is lower on the side. Oil capacity and type as Down position detail.

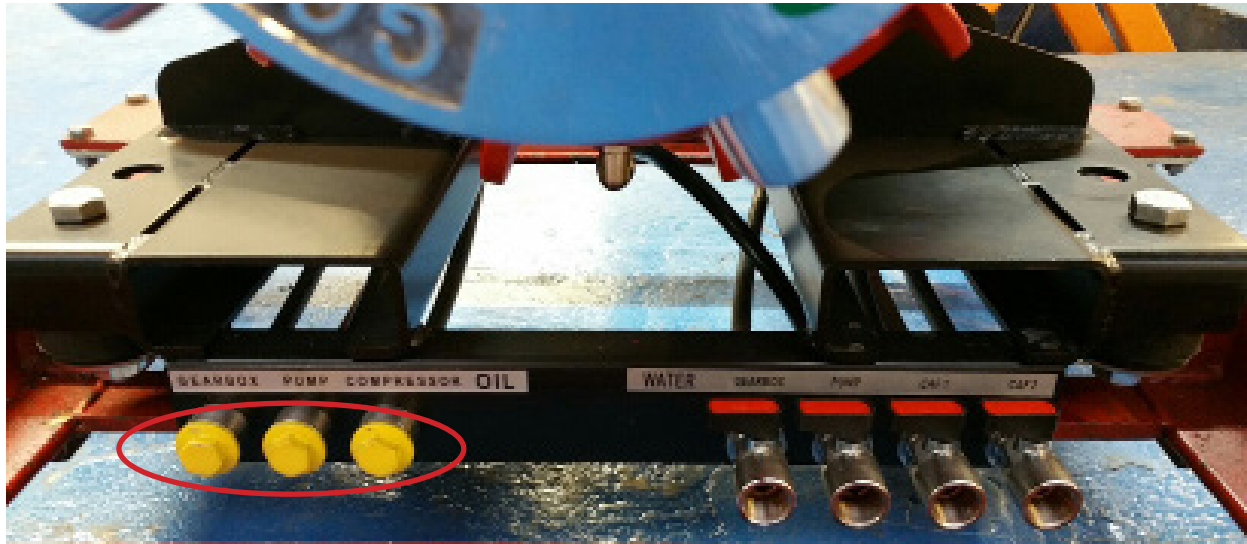
Oil filling point for oil type and capacity refer to Recommended Lubricants

Oil level check point



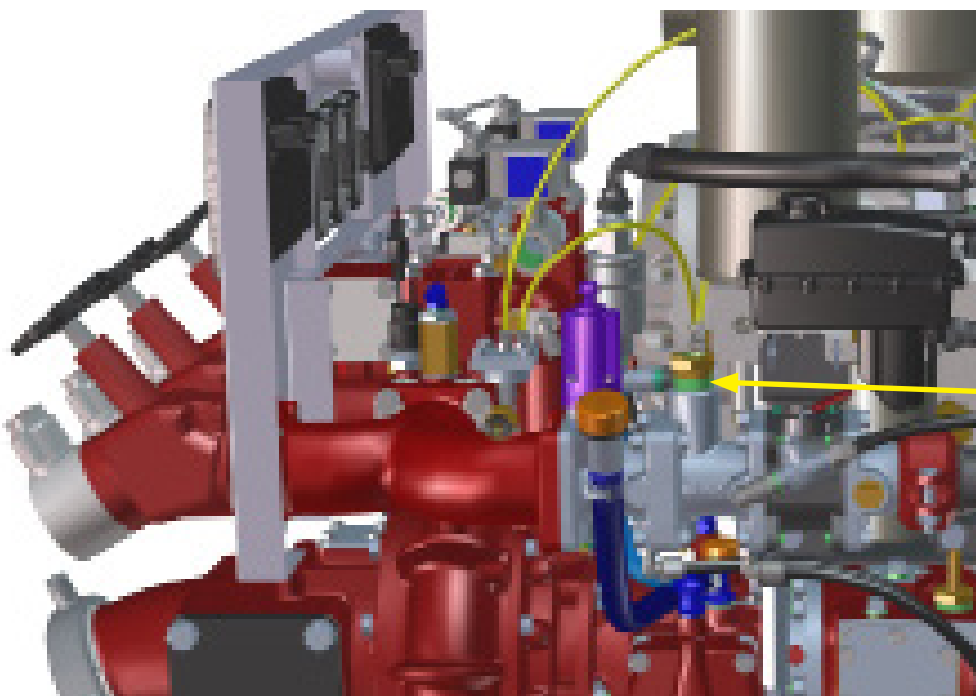
The oil drain points (gearbox, pump bearing housing and compressor) are located at the front of the mounting platform

Fill the gearbox until the oil flows from the oil level check point. This is the only accurate method of checking that the correct amount of oil has been added to the gearbox, as it allows for different sizes of gear ratios. Approximate capacity is 1.2 litres.



## Foam Injection Point

Prima SmartCAFS50 / 100.



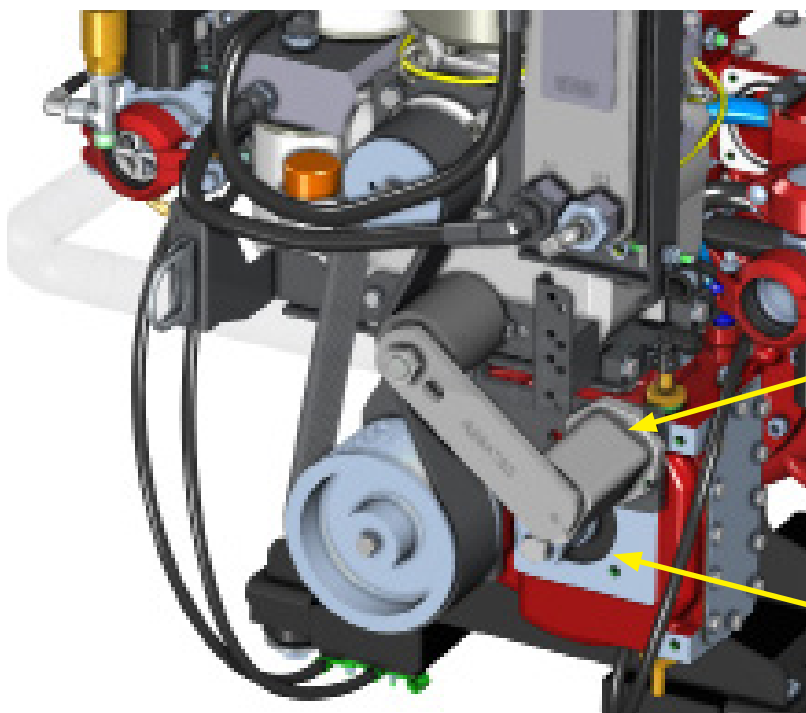
Foam injection point - connect tubing suitable for 22.5 Bar pressure. Connection thread is ½ NPT

## Compressor Drive Belt - Prima SmartCAFS50

The compressor is driven by a Polydrive ribbed belt, part number 088-00047-001.

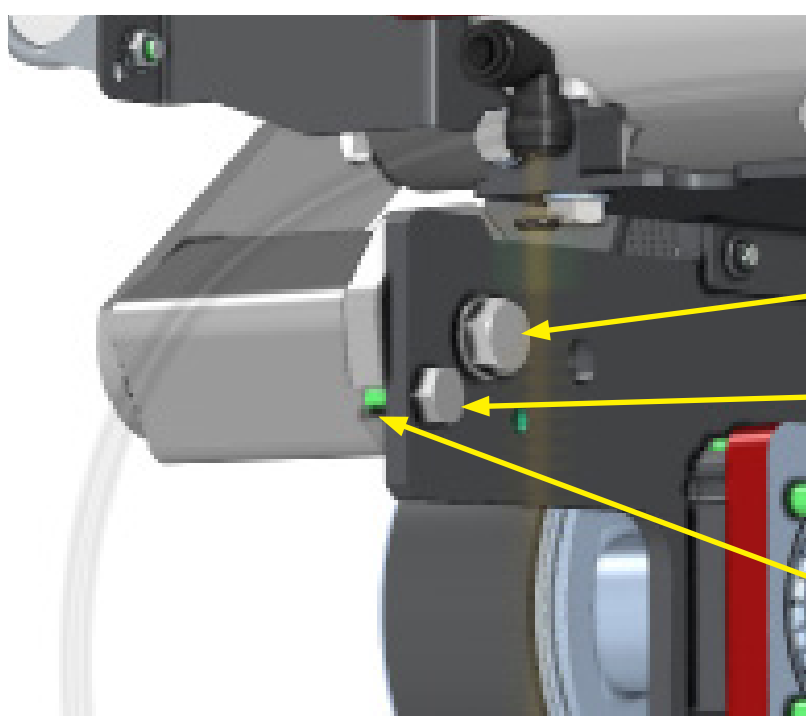
The drive belt is installed and set at the correct tension at the Godiva factory, by using an automatic belt tensioner. There should be no need to alter the belt tension.

To fit a new belt, the locking bolt item 2 in picture below, is removed. This allows the belt tensioner to move away from the belt and the tension relaxed. The belt can then be moved away from the pulleys. A new belt can then be fitted over the two pulleys and the tension arm pushed against the belt. When the hole in the support bracket aligns with the "notch" on the pivot end of the tensioner arm, the locking bolt can be inserted to secure the tensioner in that position.



Automatic belt tensioner

PTO drive flange connection  
Various specifications available.



1. Pivot point for automatic belt tensioner

2. Locking bolt to maintain belt tensioner in correct position

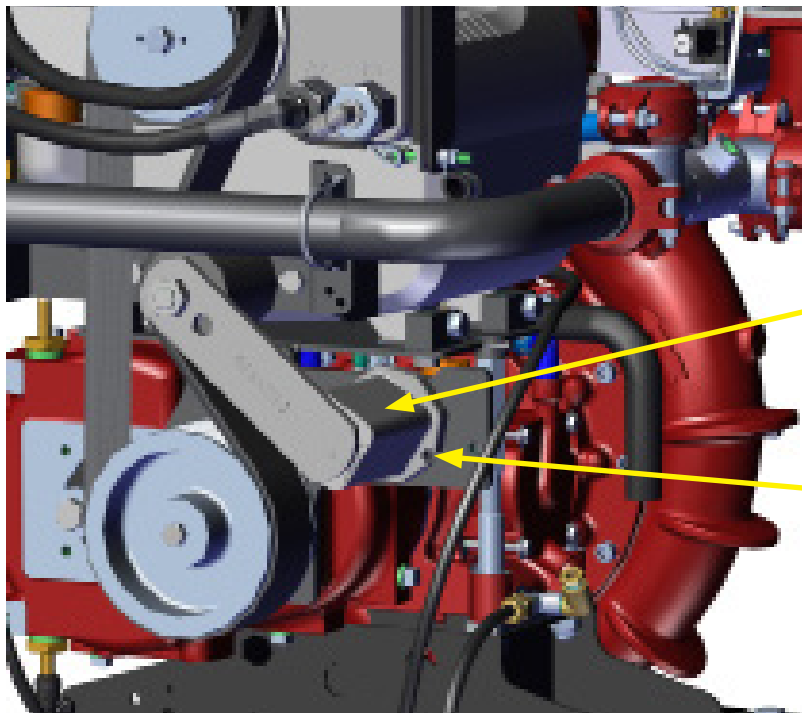
3. Notch on tensioner arm, in line with locking bolt

## Compressor Drive Belt - Prima SmartCAFS100

The compressor is driven by a Polydrive ribbed belt, part number 088-00047-002.

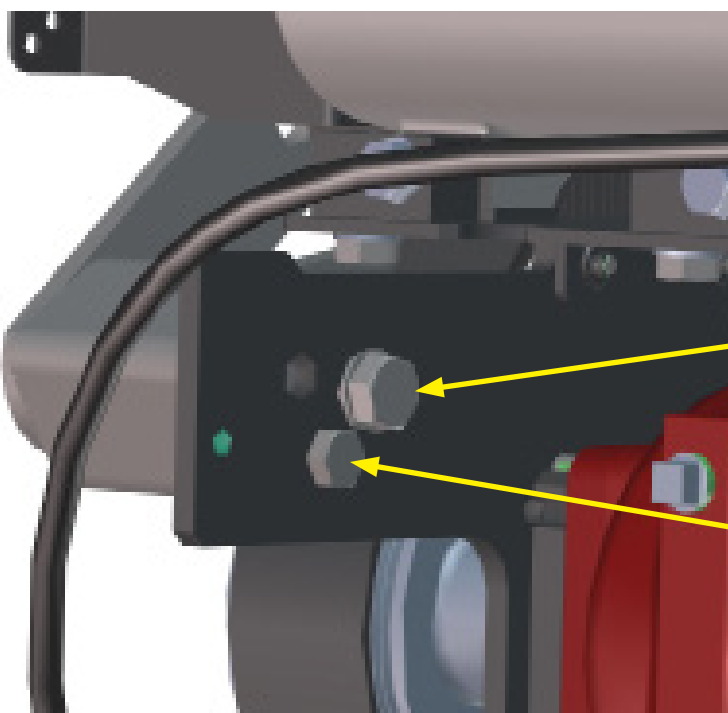
The drive belt is installed and set at the correct tension at the Godiva factory, by using an automatic belt tensioner. There should be no need to alter the belt tension.

To fit a new belt, the locking bolt item 2 in picture blow, is removed. This allows the belt tensioner to move away from the belt and the tension relaxed. The belt can then be moved away from the pulleys. A new belt can then be fitted over the two pulleys and the tension arm pushed against the belt. When the hole in the support bracket aligns with the "notch" on the pivot end of the tensioner arm, the locking bolt can be inserted to secure the tensioner in that position.



Automatic belt tensioner

"Notch" on belt tensioner to align with locking bolt



1. Pivot point for automatic belt tensioner

2. Locking bolt to maintain belt tensioner in correct position



## Electrical Grounding Requirements

### Ground Point Installation

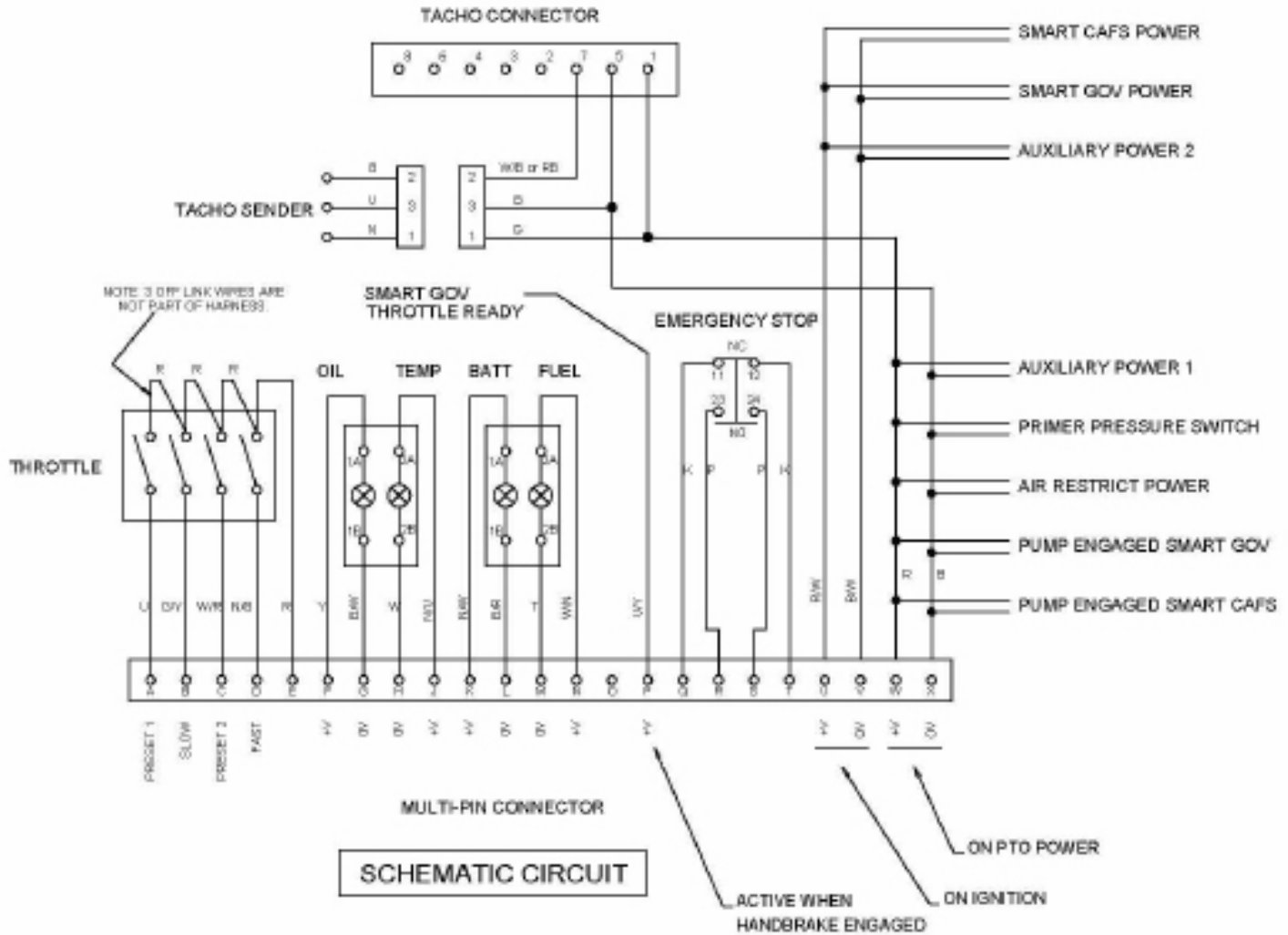
It is recommended that the ground point shall be taken directly from the battery ground to an earth stud on or near the pump. (OEM supplied)

This stud shall then be used as the main ground point for the Prima Pump Electrical Components.

The recommended gauge for the ground cable from the battery ground to the earth stud, is 4 AWG / 25 mm<sup>2</sup>.

## Electrical Connections - Prima SmartCAFS50 / 100

Connect the engine control and warning light module to the vehicle electrical system with the multi-pin plug (supplied with the unit, part number 60764). The connections used will vary according to the pump specification. Power to the system should be such that the minimum required system voltage is maintained continuously throughout operation.

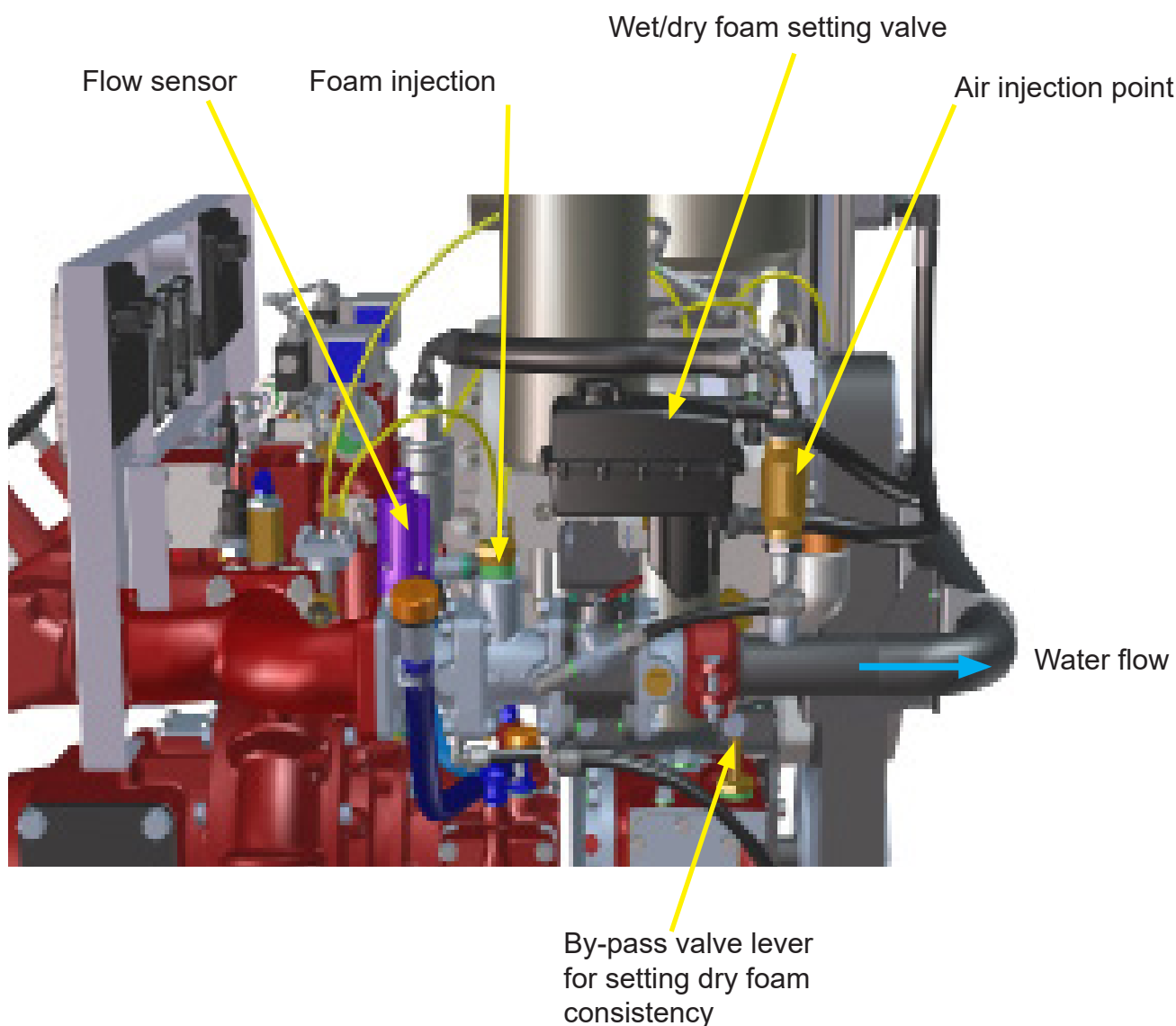


Note -

1. The pins marked U and W are powered separately. U powered with ignition on and W powered with PTO engage.
2. Pin P requires a positive power supply when the handbrake is engaged. This only applies when the system is fitted with a SmartGOV controller as well as SmartCAFS.

## Prima SmartCAFS 50/100 - Mixing Manifold

Installation information relevant to these models only



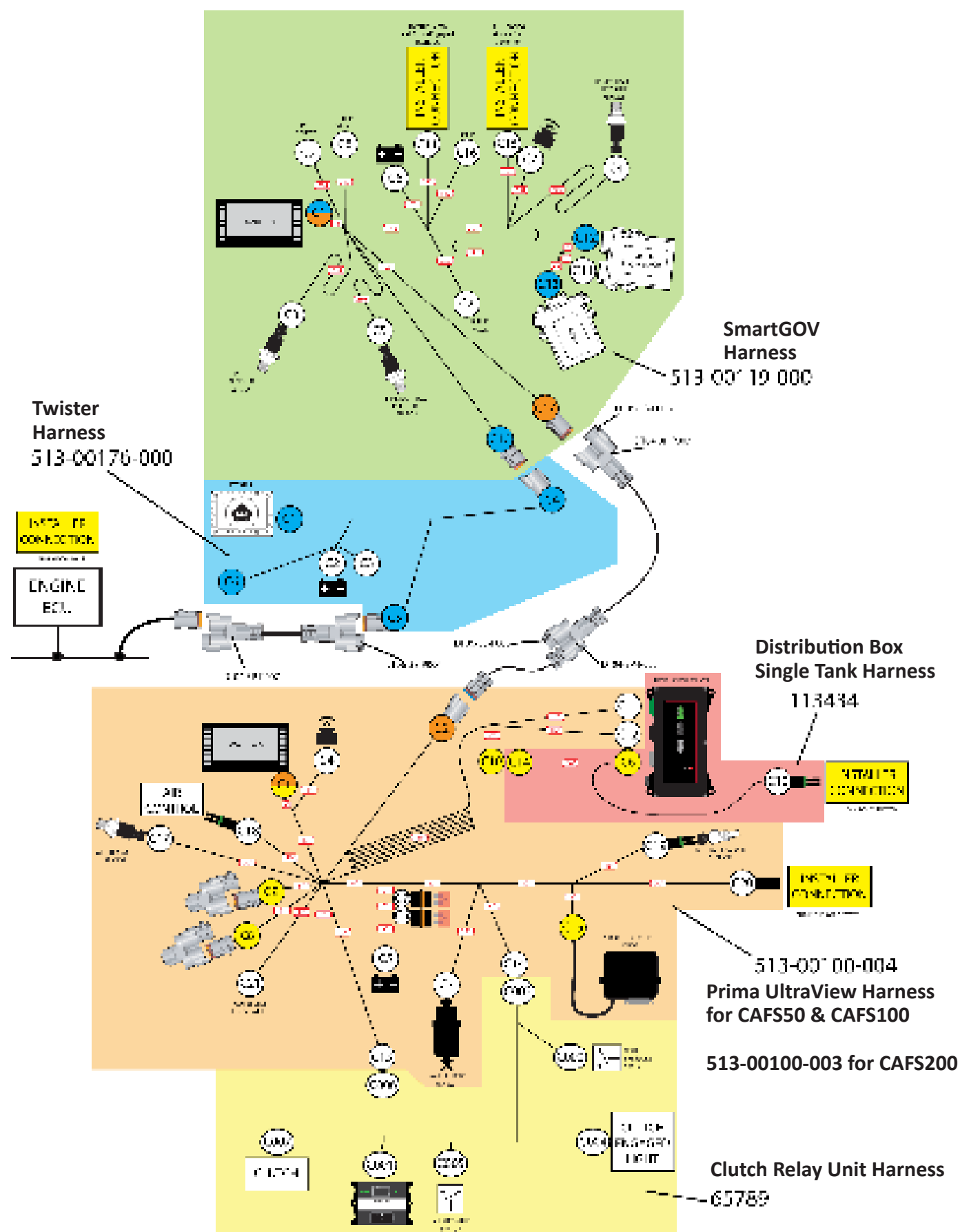
### By-Pass Valve

This valve is adjusted to give the required dry foam flow-rate - typically 70 litres/minute @ 7 Bar.

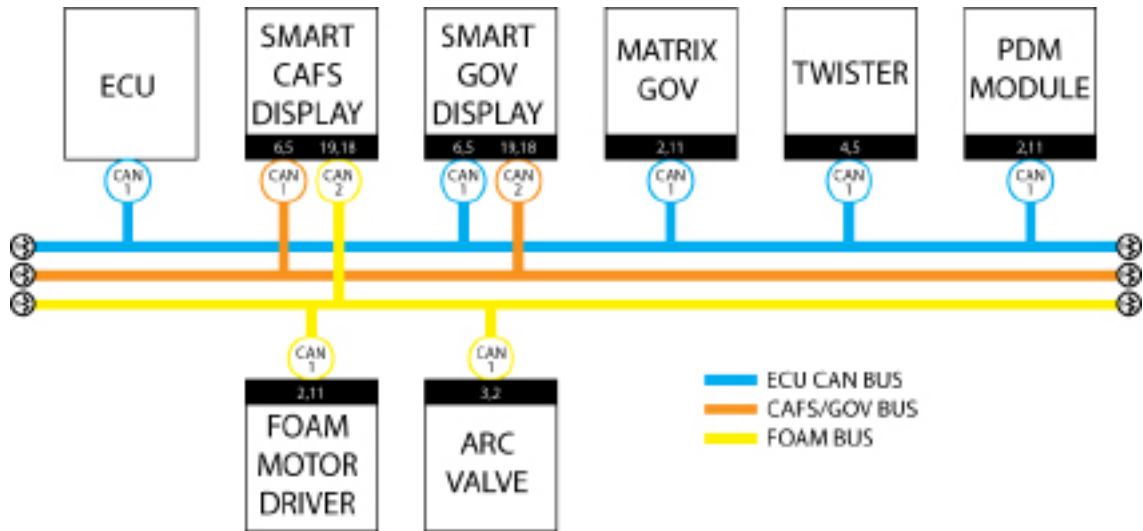
To set the required dry foam constituency –

1. Install the system as directed
2. Run the system at normal operating pressure, discharge compressed air foam through the most restrictive line, typically a Hose-reel.
3. Set the SmartCAFS ARC control to the full dry position.
4. Open or close the By-pass valve (as shown in photograph above) until the required dry foam flow rate is achieved.
5. Remove the By-pass valve lever so this setting cannot be changed in operation.

## Prima UV SmartCAFS - Overview of Relationship Between Harnesses



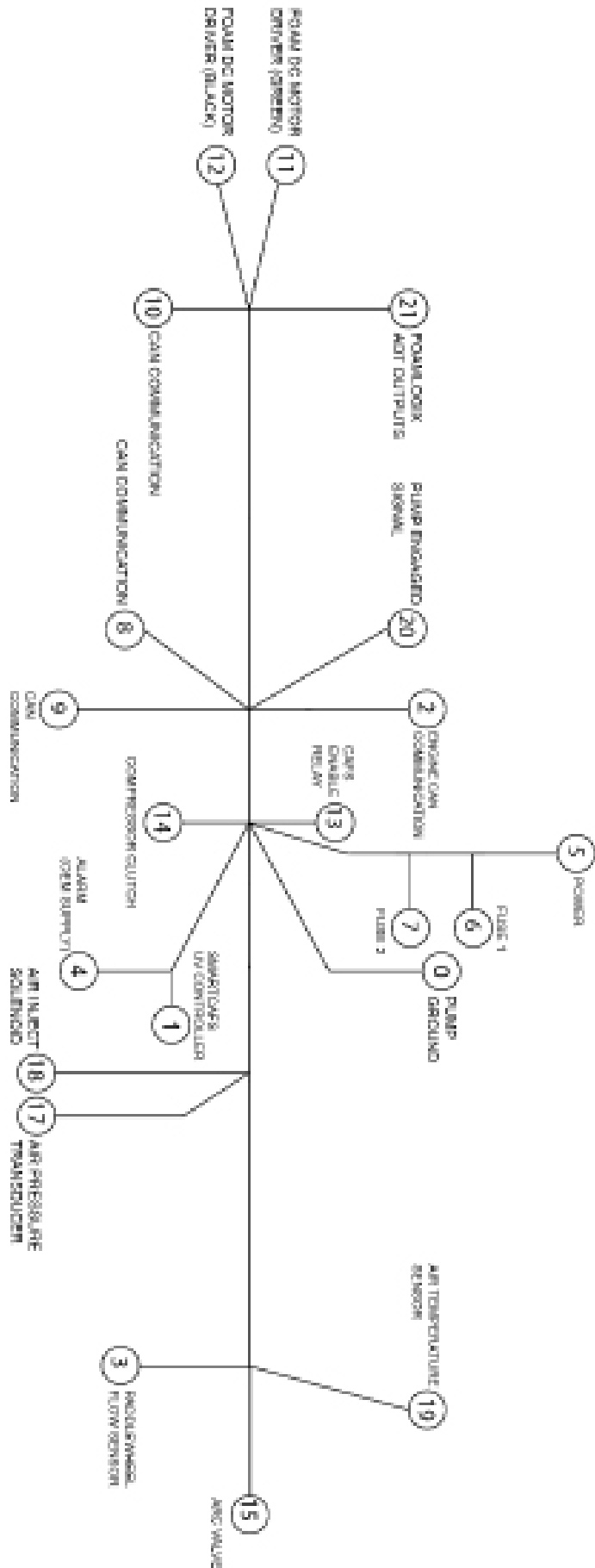
Prima UV SmartCAFS, SmartGOV, Twister Block Diagram.



**Prima SmartCAFS 50/100 - Wiring Harness - with new motor controller**

**Harness for Prima UV SmartCAFS 50/100 with new motor Driver**

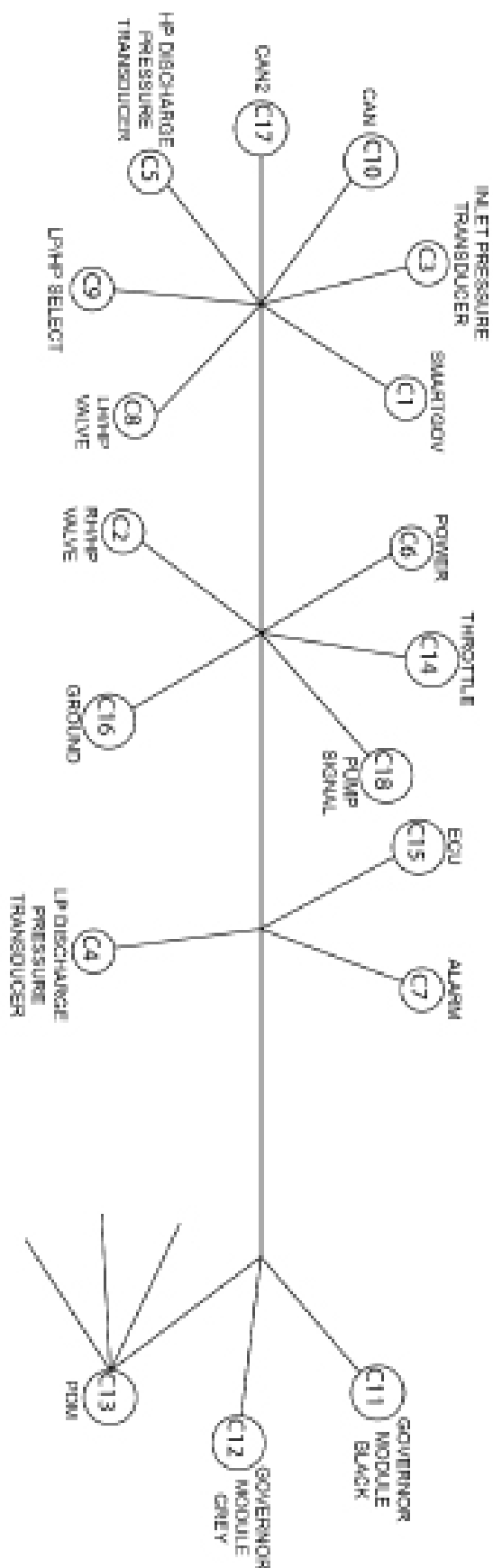
The numbers refer to the connectors on the harness  
Drawing -313-00100-004 Rev B



## Prima SmartCAFS 50, 100 - SmartGOV Wiring Harness

### Harness for Prima UV SmartGOV

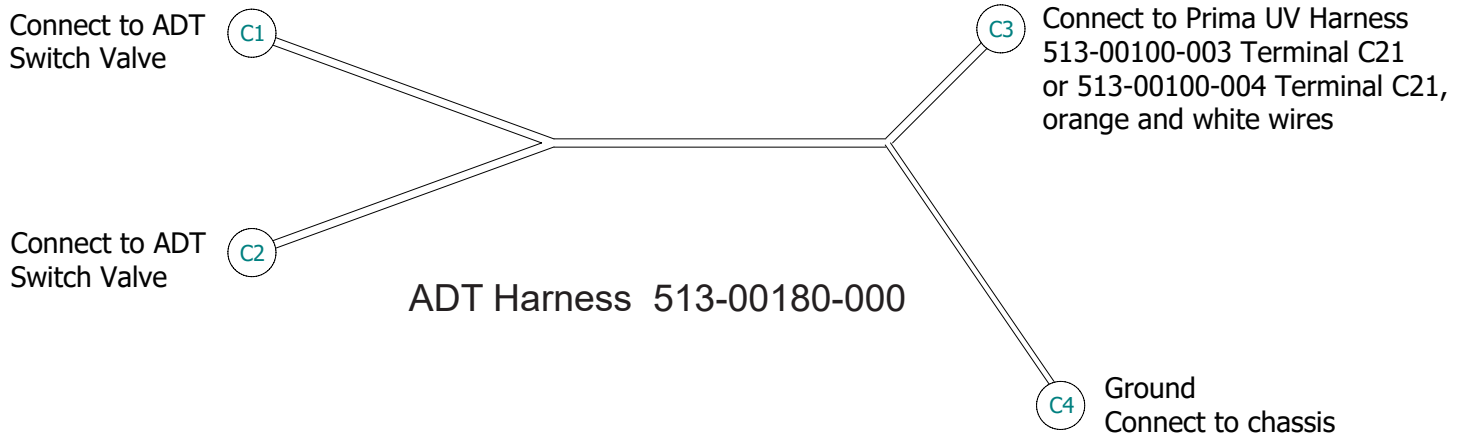
The numbers refer to the connectors on the harness  
Drawing -S13-00119-000



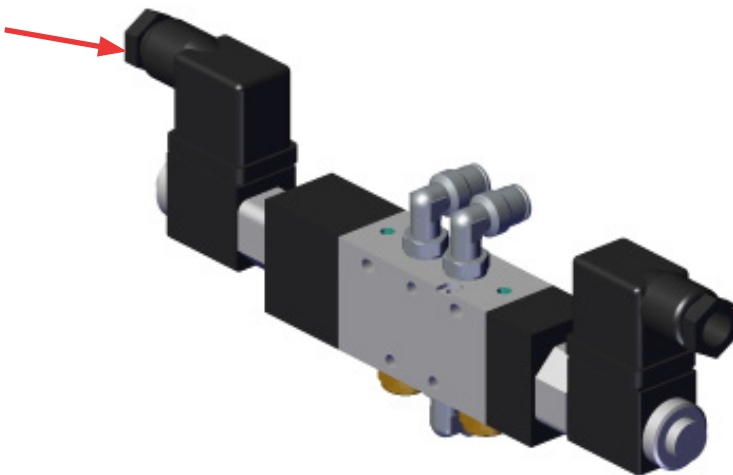
## ADT Valve Switch - Additional Wiring and Connections

If an ADT tank selector is supplied as part of the specification, then follow these instructions to connect the ADT valve switch to the main pump harness. The valve switch is supplied loose and must be mounted at a suitable location between the foam pump and main harness to connect the two items.

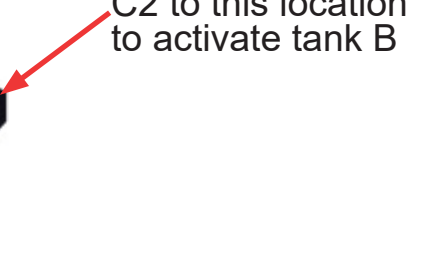
The ADT valve switch, P/N 538-00102-000, will require the harness supplied, 513-00180-000, to be connected between the ADT valve switch and the main pump harness.



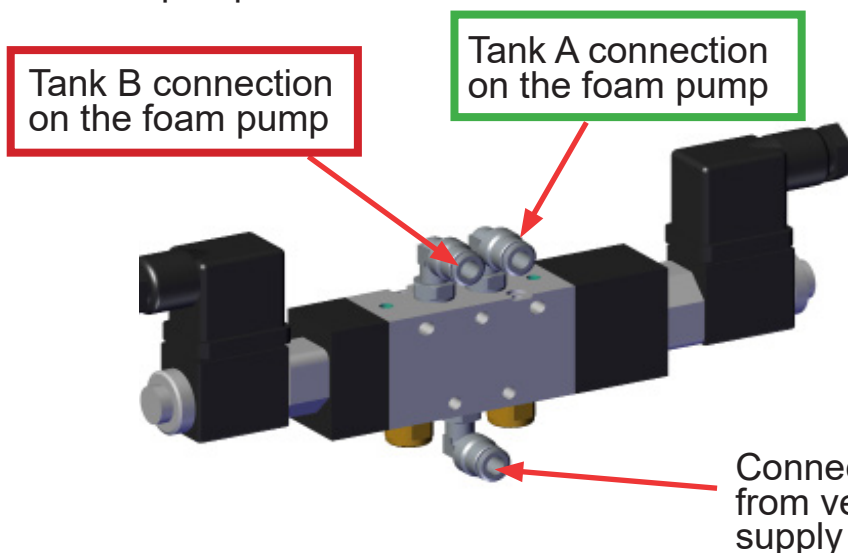
Connect terminal C1 to this location to activate tank A



Connect terminal C2 to this location to activate tank B



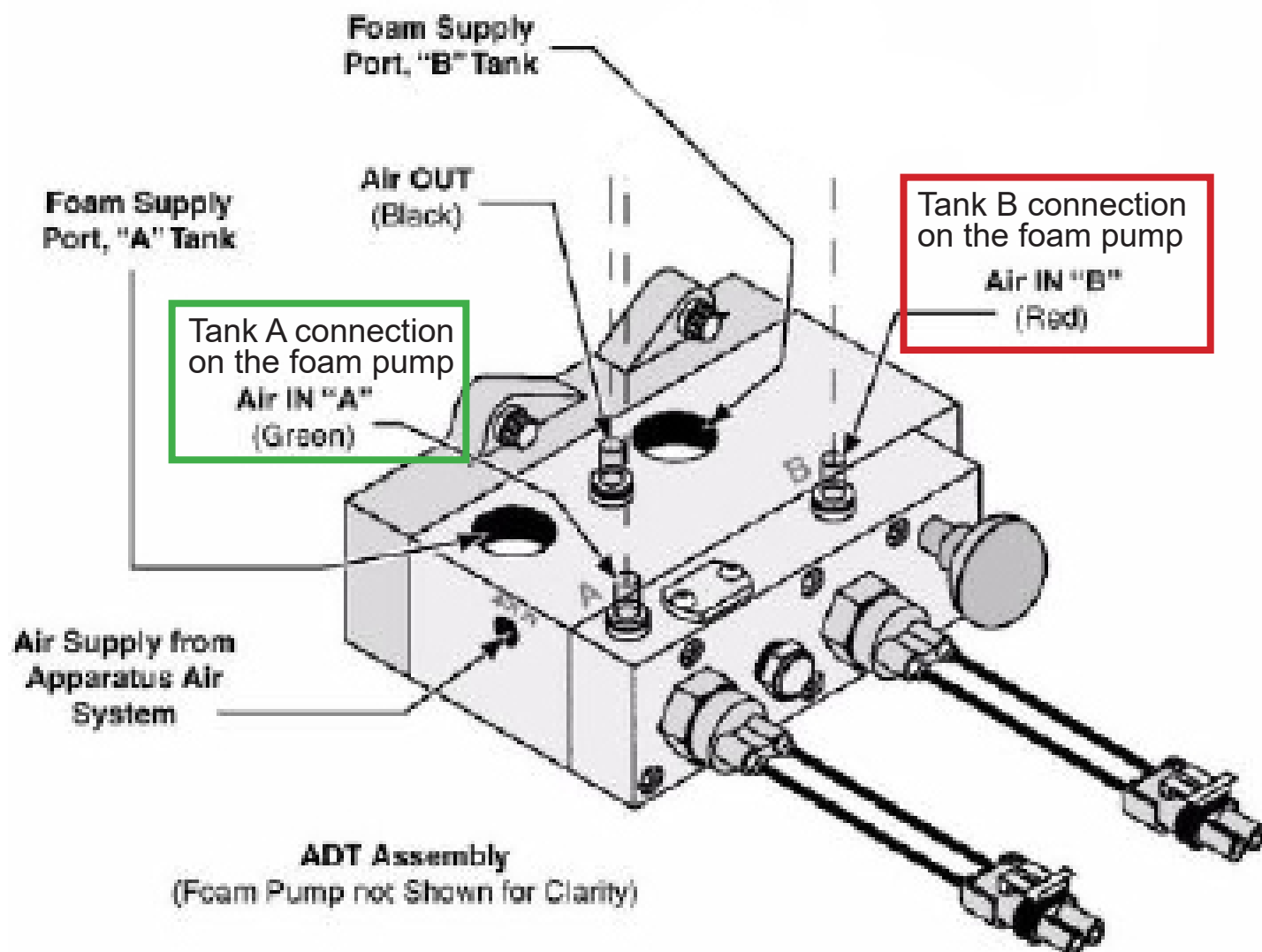
Connect 6mm tubing to the air connections on the foam pump





## ADT Valve Switch - Additional Wiring and Connections

The air connections from the ADT valve switch are connected to these locations on the ADT assembly attached to the foam pump.



## Foam Tank Low Level Sensor

The unit is supplied with a connector for a low foam level sensor. The sensor is supplied with the unit ready for installation (instructions supplied with the sensor).

The low foam level sensor is part of the Safety Interlock system and must be installed.

Note: there are two possible types of sensor in use. In both types the arrow or ridge must point up for correct installation.

### Type 1 - Blue Sensor

In this type the float will fall down to the sensor body to register low foam level.

Note: The low foam level sensor must be installed in the tank in the correct orientation. The sensor has a raised ridge on the outer casing, which must be installed pointing upwards, see yellow circle.

The foam tank requires a 23mm hole for secure fitting of the switch device and the maximum allowable thickness of the tank wall material is 4mm.

The centre of the level switch should be located a minimum of 40mm above the foam concentrate outflow to the foam pump.

### Type 2 - Black Sensor

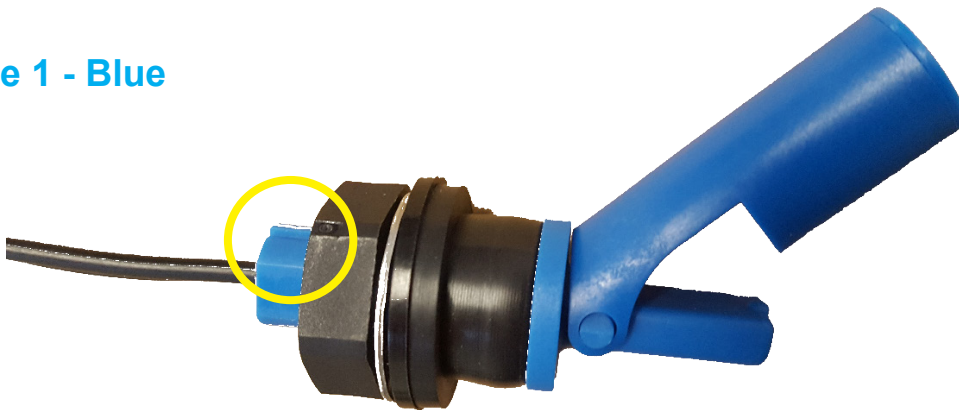
In this type the float will fall away from the sensor body to register low foam level.

Note: The low foam level sensor must be installed in the tank in the correct orientation. The sensor has an arrow on the casing, which must be installed pointing upwards, see yellow circle.

The foam tank requires a 23mm hole for secure fitting of the switch device and the maximum allowable thickness of the tank wall material is 4mm.

The centre of the level switch should be located a minimum of 40mm above the foam concentrate outflow to the foam pump.

### Type 1 - Blue



### Type 2 - Black



## Additional Installation Points

### Foam Tank to Foam Pump

The foam feed line must not at any point be lower than the foam pump and be fitted with an isolating tap for maintenance purposes. The isolating tap should be located as close to the tank as possible. A flushing point should be fitted close to the isolating tap to ensure that the maximum length of hose line can be flushed out. The flushing line should also be fitted with an isolating valve.

Foam supply line I.D.	Class A	19mm minimum
	Class B	25.4mm minimum

The foam tank must be located to provide a positive head of foam concentrate to the FoamLogix unit, and the supply hose should be arranged to fall gradually from the tank to the foam pump inlet to avoid air pockets. A tank drain valve must also be fitted.

### **To prevent over-pressurisation ensure the foam tank is adequately vented.**

The foam tank should be made of plastic or stainless steel, with a volume of at least 25 litres to accommodate the contents of a standard foam container.

Note: To ensure correct operation of the FoamLogix pump, all connections must be secure and pressure tight.

## VEHICLE DESIGN CONSIDERATIONS

The following information is included to assist the vehicle builder to achieve a successful installation.

The in line foam strainer / valve assembly is a low-pressure device, rated at 3 bar and will NOT withstand high flushing water pressure.

Seal all electrical power and ground connections with silicone sealant to prevent corrosion.

The system will not operate correctly with poor electrical connections. Verify all electrical connections prior to start up.

Each Hale FoamLogix system is tested at the factory using the wiring harness provided. Improper handling and abuse of connections will cause harm and may result in other system damage.

Use fixings which are compatible with those foam concentrates used. Brass or 300 series stainless steel are suitable.

The areas containing the PC2\_ or PC1\_ components must be adequately shielded from the ingress of road spray / debris and chassis and vehicle power train lubricant. Exposure to dirt, water and grease will have a detrimental effect on the working life of the drive belt and electronics.

Full access to the bearing housing, compressor and gearbox oil fill points and level checkpoints must be considered as well as access for general unit maintenance. The use of removable side panels is advisable. If the compressed air foam is to discharge through one or both of the side lockers and the vehicle builder is fitting the necessary pipe work and isolating ball valves, those components must have a consistent bore of 38mm up to the hose connector.

To prevent compressed air from being trapped in the pipe work, sealed blank caps MUST NOT be used on CAFS discharges.

Direction of rotation of the input drive flange is clockwise, when viewed on the gearbox.

---

## **INSTALLATION AND INITIAL SET-UP FOAMLOGIX 2.1A**

For foam pump installation, please refer to the FoamLogix Model 2.1A Description, Installation and Operation manual, part number 029-0020-74-0, supplied separately.

## **INSTALLATION AND INITIAL SET-UP FOAMLOGIX 3.3, 5.0, 6.5**

For foam pump installation, please refer to the FoamLogix Model 3.3, 5.0, 6.5 Description, Installation and Operation manual, part number 029-0021-68-0, supplied separately.

For further information on the MST Manual Tank Selector, please see the separate manual supplied, part number 029-0020-48-0.

For further information on the MDTII Manual Tank Selector, please see the separate manual supplied, part number 029-0020-40-0.

## SMARTCAFS - OPERATION

The Foam unit system consists of three main components:

- 1) Foam Pump / Motor Assembly.
- 2) Control Panel (integral with main pump control panel).
- 3) Flow measurement and injection manifold.

All three elements combine to provide accurate foam proportioning. From the control panel the operator can initiate the system, adjust the foam ratio, monitor 'real time' water flow rate and record total water and foam concentrate usage.

Press to start foam injection

Foam concentrate is only injected when the foam button has the **RED** selector around the control button.

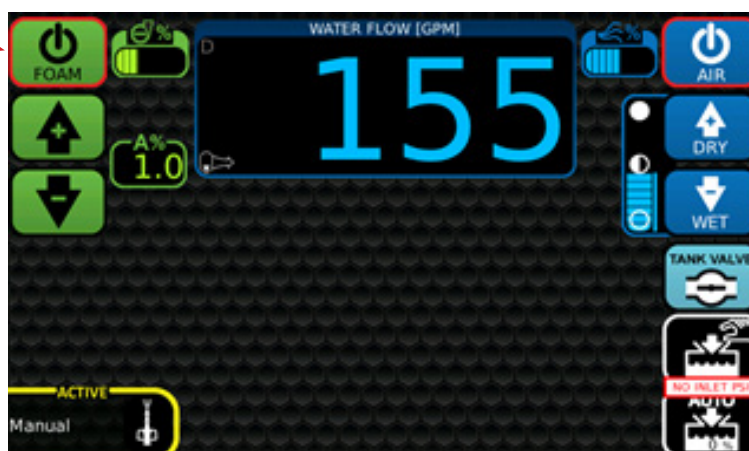


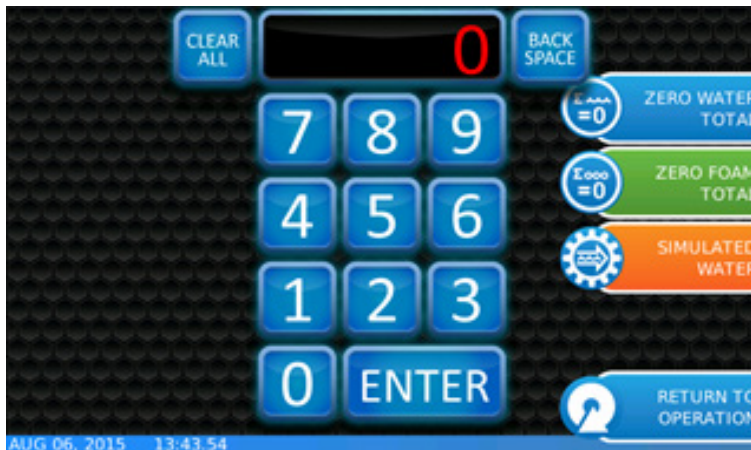
Figure 1 SmartCAFS Foam/CAFS Screen

The Foam unit 3.3, 5.0 system for Class A or B foams, will inject foam in the range of 0.1% to 10.0%. Further information is available in the Foam unit Model 3.3/5.0 Description, Installation and Operation manual.

The FoamLogix 2.1A system is for Class A foam, and will inject foam in the range of 0.1% to 1.0%. Further information is available in the Foam unit Model 2.1A Description, Installation and Operation manual.


## COMMISSIONING / START-UP PROCEDURE

1. Check that all the necessary connections have been correctly made.
2. Ensure that the Compressed Air / Oil Separator Tank and pump gearbox are filled with the correct oil type and quantity.
3. Prime and Run the water pump at 8.5 Bar (0.86MPa/125 PSI) with compressor engaged.
4. Run the compressor for 30 seconds to allow oil to circulate.
5. Stop unit and check compressor oil level – top up if necessary.
6. Turn the bypass valve on the Foam unit pump to “bypass” and provide a suitable receptacle to collect the foam agent.
7. Ensure that there is sufficient foam agent in the tank(s). For Foam unit 3.3/5.0 select tank A
8. Select simulated flow on the UV display by pressing the Menu button then pressing the “Simulated Water” button on the screen or button. Then return to the operating screen by selecting the “Return to Operation” button.



Simulated Flow



9. Press the Foam Power button,  and the Foam unit pump will prime itself. The pump will run for 30 seconds or until prime is achieved. If no prime is made, the display will show a plain test warning. Repeat this step once more to attempt to prime the pump.  
If priming is not achieved after several attempts, ensure the foam supply is connected and available to the pump.
10. For 3.3/5.0 Foam unit, flush then select tank B, and repeat the priming procedure for that tank.
11. When prime is achieved, deselect simulated flow by returning to the menu and turning off simulated flow.
12. Return the bypass valve to the inject position.

The unit is now ready to run.



## WARNING



NEVER USE CAFS WITH A PRESSURE FEED INTO THE EYE OF THE PUMP.

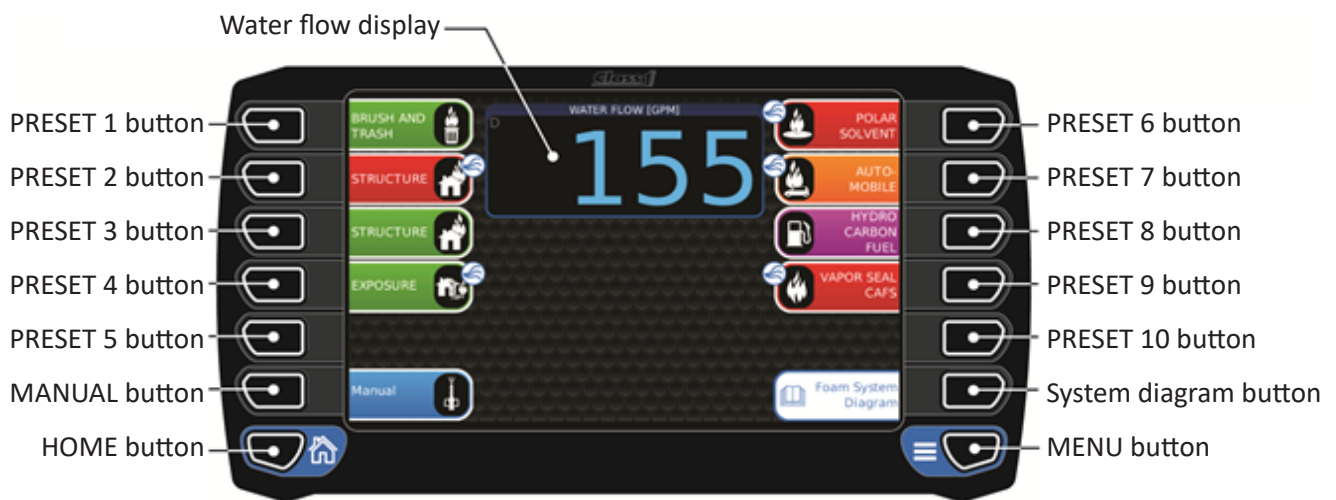
SMARTCAFS PUMPS SHOULD ONLY BE USED WHEN WORKING FROM OPEN WATER OR A TANK FEED.

PROBLEMS WILL OCCUR WITH THE WATER / AIR PRESSURE RATIO, SHOULD PRESSURISED (HYDRANT) WATER SUPPLY BE APPLIED DIRECTLY TO THE SUCTION TUBE.

HYDRANT SUPPLY MAY ONLY BE USED TO MAINTAIN THE WATER LEVEL IN THE VEHICLE TANK.

## PRESET SCREEN (START SCREEN)

The SmartCAFS Controller shows the start screen after a power cycle. This screen allows the operator to select one of 10 preset operating modes (configurable) or manual operating mode.



## Preset Buttons



There are 10 configurable preset buttons. The text, icon, bar color, and CAFS indicator are configurable by the user through a password protected configuration screen. The preset configuration screen allows the user to select the operating foam tank (A/B), foam percentage, CAFS mode, and ARC valve position.

The operating screen is entered when a preset button is pressed and held for 0.5 seconds. The operating mode of the foam and CAFS will be set to the configured preset settings.

## Water flow display

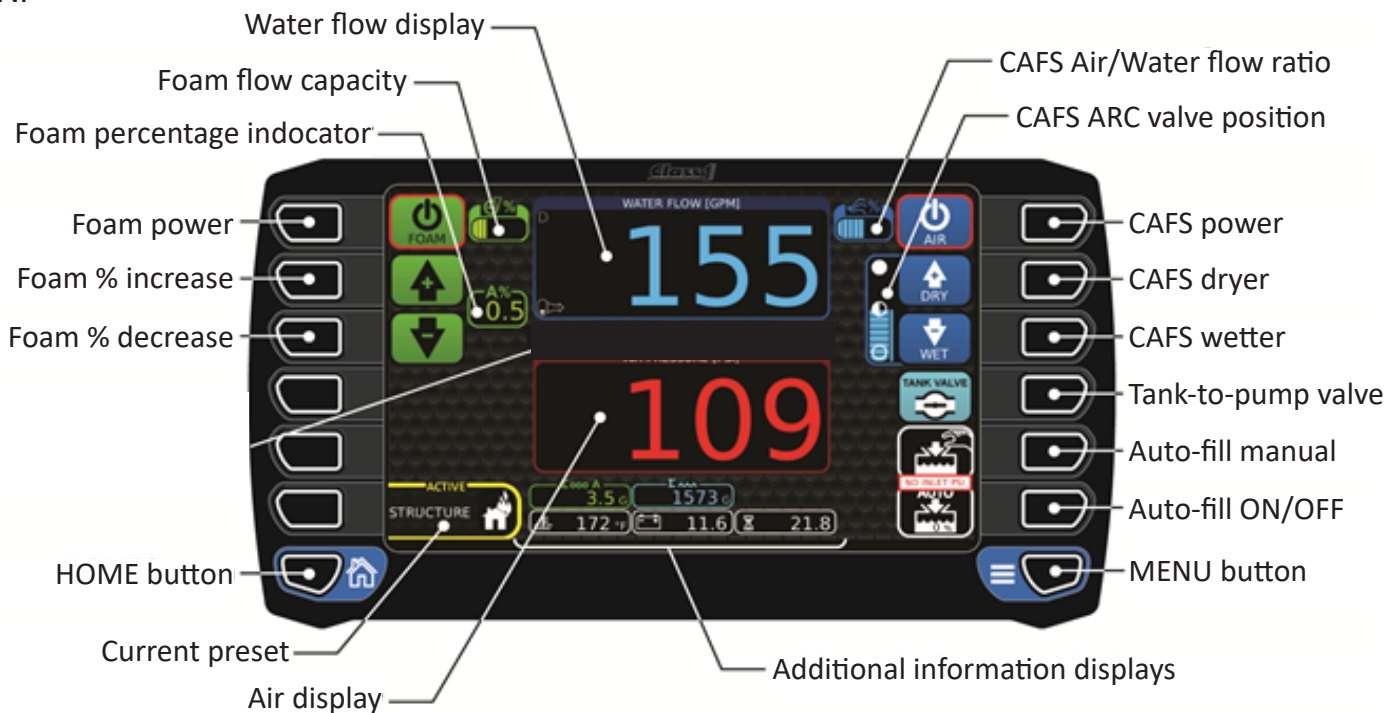
The water flow display is always visible and shows the current water flow rate through the Foam/CAFS discharge manifold.

1. Home button  
This button toggles the display between the Preset Screen and the Operating Screen.
2. Menu button  
This button shows/hides the additional information displays. When this button is pressed and held for 3 seconds the menu will be displayed.



## OPERATING SCREEN

The operating screen allows control over the foam and CAFS, and if configured, the tank valve. The water flow display is always active, but the air flow display is only shown when the CAFS power is ON.



### Water flow display

The water flow display is always visible and shows the current water flow rate through the Foam/ CAFS discharge manifold.

### Foam flow capacity

The foam flow capacity is a bar graph that shows how hard the foam pump is working (0% to 100%).

### Foam percentage indicator

The foam percentage indicator shows the foam proportioning rate for the currently selected tank.

### Foam power button

The foam power button turns the foam system OFF or ON. The foam power button's color indicates the currently selected foam tank (A green, B red, FLUSH orange). The border of the power button is black when OFF and red when ON.



Foam system OFF



Foam system ON

### Foam increase and decrease buttons

The increase and decrease foam buttons change the foam percentage for the currently selected foam tank. The color of these buttons indicates the tank selected and foam system power state:

- green = foam system ON, tank A selected
- red = foam system ON, tank B selected
- gray = foam system OFF

These buttons will modify the foam percentage value even when the foam power button is OFF.

### Home button

Return to the preset screen.

### Current preset

This display shows the currently selected preset name and icon (or “manual” if manual was selected).

### Air display

This display shows the current air pressure, CAFS ratio, or current air flow rate based on the “CAFS air display” selection configured in the “user menu” (see section 0). The air flow rate and CAFS ratio displays are only shown when CAFS is turned ON.

### CAFS air/water flow ratio

The CAFS air/water flow ratio is a bar graph that shows the relationship between the air flow and water flow rates (0% to 100%). This display is only available when equipped with the Hale air flow sensing valve.

### CAFS ARC valve position

The ARC valve position indicator is a bar graph that shows the gating of the valve (0% [full wet] to 100% [full dry]). The border color indicates the state of air injection – red = not injecting air, blue = injecting air.

### CAFS power button

The CAFS power button activates the CAF System (it will start the foam system if it is not already active). CAFS will be turned OFF when the foam power button is turned OFF. The CAF System will also evaluate the air pressure, compressor temperature, water flow, and foam flow before activating the air injection. The border of the power button is black when OFF and red when ON. The power button’s color is gray when the clutch has been disengaged.



CAFS OFF, clutch disengaged



CAFS OFF, clutch engaged



CAFS ON

### CAFS Wet and Dry buttons

The wet and dry buttons open/close the ARC valve. These buttons are only active when CAFS power is active. These buttons are active when they are blue and inactive when they are gray.

### **Tank-to-pump valve button - Optional feature**

The tank valve button opens or closes the tank valve. The icon on the button indicates the current position of the valve (open or closed). The tank-to-pump valve can be configured (in the user menu) to open automatically when the pump engaged signal is detected. Even when set to automatic mode this button can be utilized to manually open/close the tank-to-pump valve.

### **Auto-fill manual button - Optional feature**

(When an auto-fill system is installed) The auto-fill manual button opens the KZCO valve connected to the inlet in order to fill the water tank. This button is a momentary button and the valve will only be open as long as the button is held. The on-screen icon changes to green to indicate that the valve is being forced open.

### **Auto-fill ON/OFF button- Optional feature**

(When an auto-fill system is installed) The auto-fill ON/OFF button turns ON or OFF the automatic water refill system. The on-screen icon shows the status of auto-fill: white = auto-fill ON, white with RED / = auto-fill is OFF.

The auto-fill system will only operate if there is sufficient inlet pressure (7+ PSI). If there is not enough inlet pressure the "NO INLET PSI" warning will be shown between the buttons.

### **Menu button**

Toggle button shows/hides the additional information displays. When this button is pressed and held for 3 seconds it shows the password enter screen.

### **Additional information display**

The additional information displays show the total water flowed, total foam flowed, battery voltage, pump engaged operating hours, and compressor oil temperature. This display is toggle ON/OFF with the menu button.

NOTE: Total water flowed and total foam flowed are erased when the system is repowered. These values may also be zeroed during operation when desired in the system menu.

## OPERATING THE SYSTEM



### WARNING

DO NOT APPLY HYDRANT PRESSURE TO PUMP SUCTION WHEN OPERATING CAFS. MAY BE OPERATED FROM OPEN WATER OR TANK FEED ONLY

NOTE: The automatic tank-to-pump open function is a menu selectable item and must be set for “automatic: for this operation to occur (this is the default). The SmartCAFS Controller will automatically open the tank-to-pump valve (see note) when the pump engaged signal is recognized.

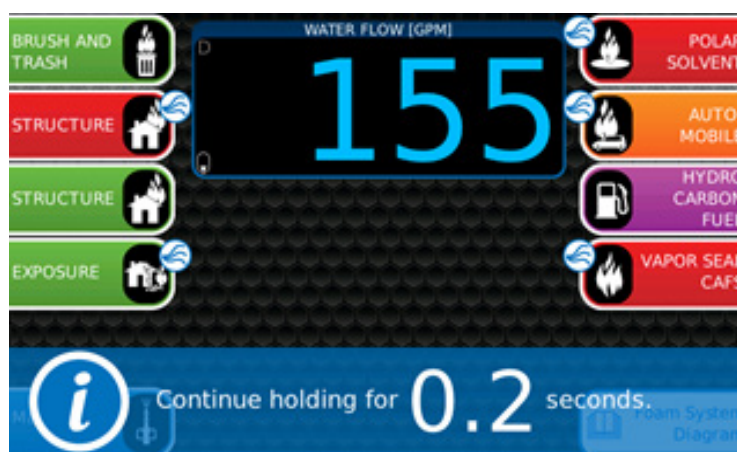
NOTE: The SmartCAFS Controller will automatically engage the compressor clutch when the pump engaged signal is recognized OR when a CAFS preset button is first pressed. This operation is a menu selectable item. If pump input speed is >900rpm the compressor will not engage and a plain text error message will appear. Reduce speed below 900 RPM then the CAFS compressor can be engaged.

NOTE: when the clutch is first engaged it is possible to observe some sparking occurring around the clutch assembly. This small amount of sparking is quite normal and nothing to be concerned about. The lower the engagement speed the less sparking will occur.

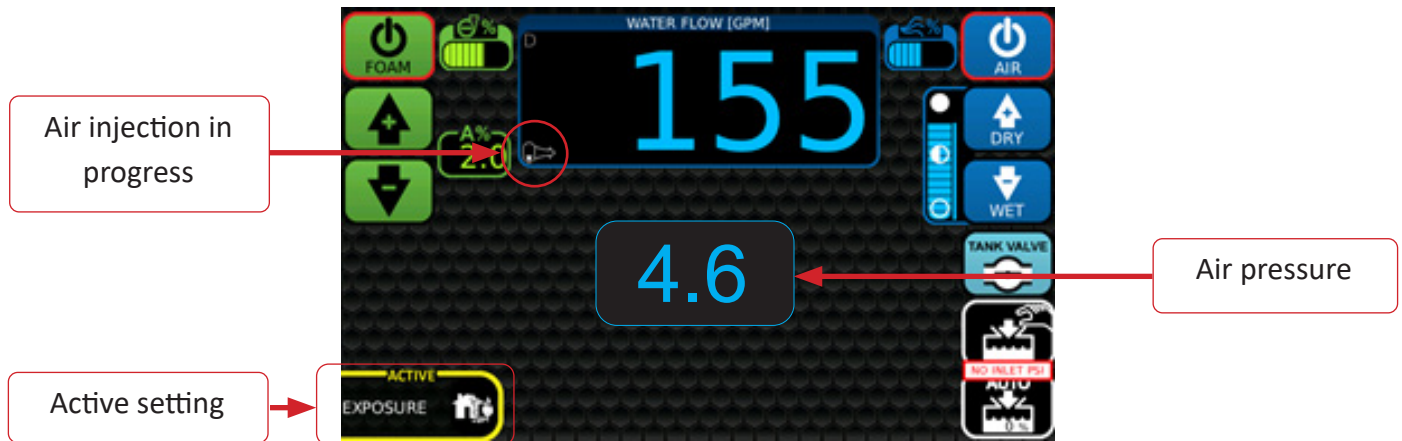
NOTE: When discharging dry foam at low pump pressure, the possibility of hose kinking is increased and should be considered when deploying hoses.

### START FOAM/CAFS OPERATION BY SELECTING A PRESET (OR MANUAL)

Press and hold the desired preset button for 0.5 seconds. The display will show an information bar to indicate to keep holding the button for the required time.



The display will then show the operation screen. The SmartCAFS Controller is now ready to manage the foam/CAF System as the preset dictates when water flow is detected. Water flow is the driving factor for system operation in both “foam only” or “foam and air” (CAFS).



The bottom left corner of the screen shows the currently active preset.

### INCREASE ENGINE SPEED FOR DESIRED WATER PRESSURE

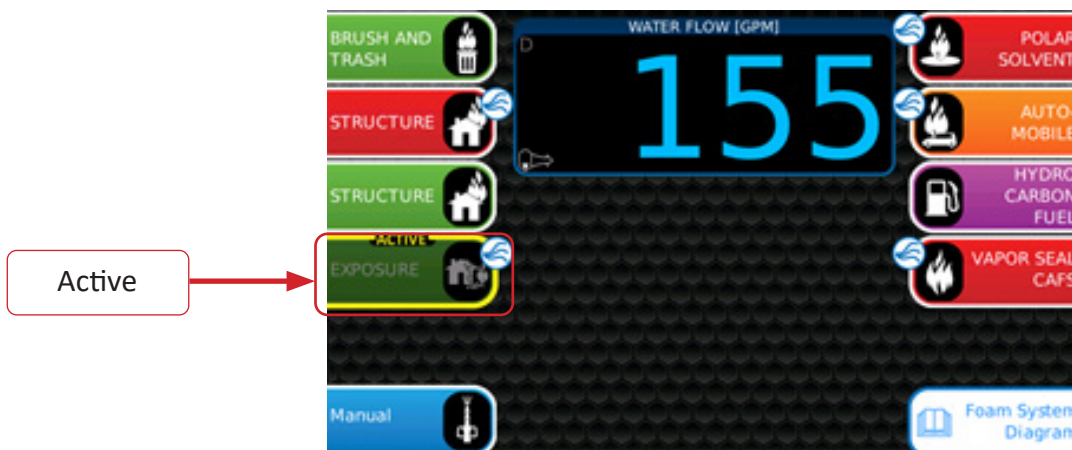
(With SmartGOV fitted) – The SmartCAFS Controller automatically communicates with the SmartGOV governor to set the governing system to RPM mode and ramp to its preset 1 engine speed.

(Without SmartGOV) – Manually adjust the engine speed to set the water/air pressure to the desired value (CAFS operating range = 4 to 10 Bar (58 psi to 145 psi). When using a governor other than the SmartGOV make sure the governing mode is set to RPM.

### SELECTING A NEW PRESET

If a new preset is desired, press the HOME button to move back to the preset screen.

NOTE: The system continues to operate using the current foam/CAFS setting when going back to the preset screen.

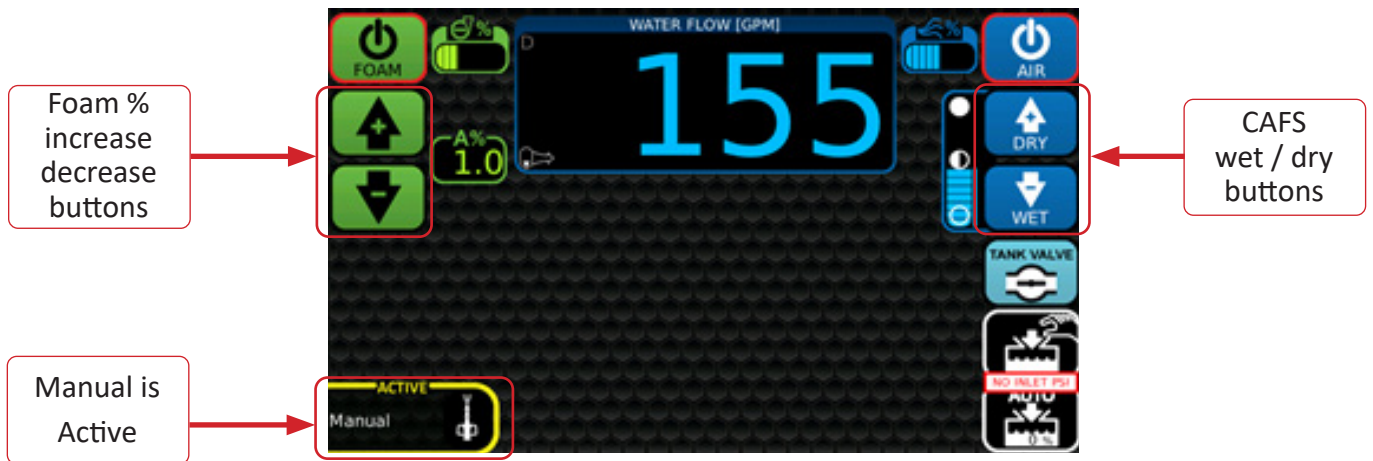


The currently active preset will be indicated by the flashing “ACTIVE” border. Press a new preset button (or manual). Simply press the HOME button again if a new preset is not desired. The operation screen will again be shown.

### MODIFY THE CURRENT OPERATING PARAMETERS

At any time the operating parameters can be modified by pressing the foam percentage (increase/decrease) buttons or by pressing the CAFS wet/dry buttons.





The bottom left corner of the screen will now show “manual” because the settings have been changed from the original preset values.

The foam and/or CAFS power buttons can be pressed to enable/disable the foam/CAF Systems.

- When foam and CAFS are ON, pressing the foam power button will turn OFF foam and CAFS.
- When foam and CAFS are ON, pressing the CAFS power button turns OFF only CAFS.
- When foam and CAFS are OFF, pressing the foam power button will turn ON only foam.
- When foam and CAFS are OFF, pressing the CAFS power button turns ON foam and CAFS.

## OVERHEAT SHUT DOWN

1. Should the compressor oil temperature reach 105°C (220°F) a control panel warning indicator will appear on the screen. The compressor can sustain 105°C (220°F) for short periods without damage.
2. If the compressor oil temperature reaches 110°C (230°F), the drive clutch will automatically disengage. This will stop the compressed air supply and only foam/water solution will be discharged. The compressor cannot be re-engaged until the unit has been cooled and the pump input speed is returned to below 900 RPM.
3. The most probable cause of compressor overheating is insufficient cooling water flow.

## FLUSHING

When returning the apparatus to ready condition after using class B foam, the Hale Foam unit foam pump must be flushed. This is because some Class B foam concentrates deteriorate rapidly. It is recommended to flush for the preset time in the SmartCAFS.

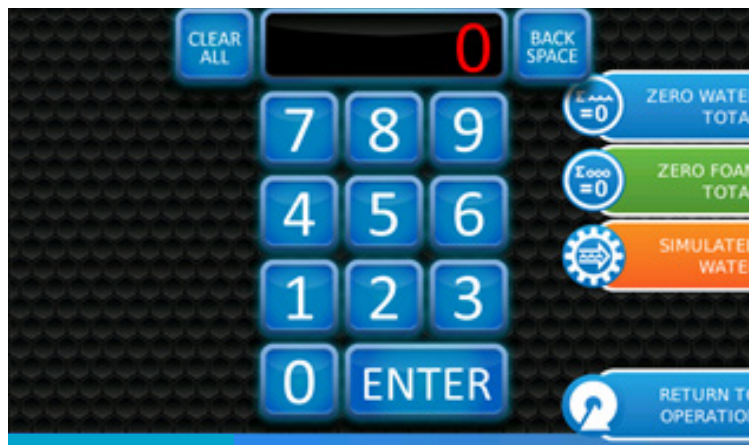
NOTE: Approved class A foam concentrates do not deteriorate at the rate of class B foam concentrates. Provided that an approved class A foam concentrate is used and the system is used within 30 days, flushing is not required. After class B foam concentrate has been used, flush the system then select class A.

For detailed flushing instructions, please refer to the Foam unit Model 3.3/5.0/6.5 Manual 029-0021-68-0.

## SYSTEM MENU

Press and hold the MENU button for 3 seconds until the system menu is shown. The system menu allows the clearing (zero) of the total water and total foam display, setting the simulated water flow (for diagnostics), and entering passwords for other menus (user and OEM), for calibrations (water and foam), and for configuration (presets).

NOTE: The password keyboard greyed out if the foam and/or CAFS power buttons are ON.



Touch here  
to set the  
time

## SETTING THE SYSTEM TIME

Press the blue bar in the bottom right corner of the system menu screen (over the month and day) and the “set the date and time” screen will appear. Enter the new date/time and press the “green check mark” to save.

NOTE: The display will re-boot after pressing the “green check mark”.

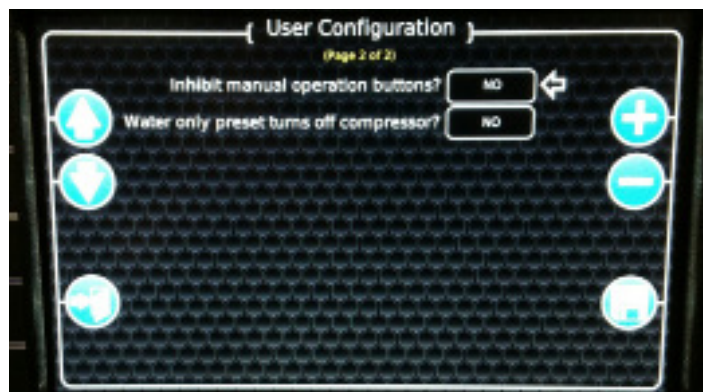
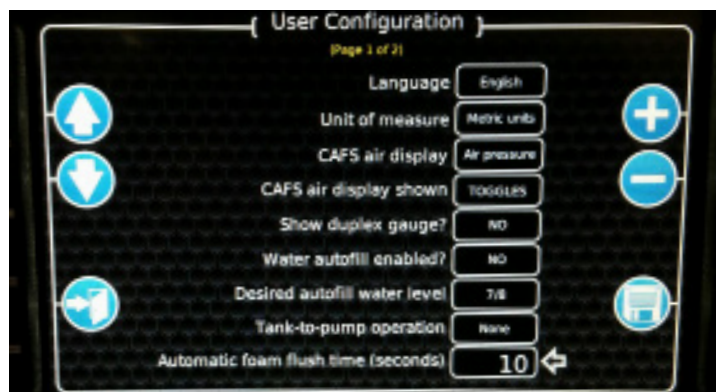


Do not  
update date  
and time

Update date  
and time  
(save)

## USER MENU

Enter the password 1849 in the system menu's keyboard to open the user menu. The user menu allows setting of user configurable items.



Language	select the desired language to show within the SmartCAFS Controller. <b>Default: English</b>
Unit of measure	select the desired unit of measure for the system (English or metric). <b>Default: English units</b>
CAFS air display	select the desired display to be shown for the air. This display is shown beneath the water flow display (none, air pressure). <b>Default: None - Set Yes</b>
CAFS air display shown	select to show the CAFS air display. <b>Default: Always</b>
Show duplex gauge	select whether to show the duplex gauge when additional information is toggled. <b>Default: No</b>
Water autofill enabled	select whether to use auto-fill. <b>Default: No</b>
Desired autofill water level	select the level to maintain in auto-fill (fill, 7/8, 3/4, 5/8, 1/2, 3/8, 1/4, 1/8, empty). <b>Default: 7/8</b>
Tank-to-pump operation	select whether the tank-to-pump valve is operated manually or automatically (or none if an air actuated tank-to-pump valve is not installed). <b>Default: Set none</b>
Automatic foam flush time	number of seconds that the foam system must be flushed (2 to 60 seconds). <b>Default: 10 seconds</b>
Inhibit manual operation button	<b>Default: No</b>
Water only preset turns off compressor	<b>Default: No</b>



**UP/DOWN arrow buttons** - Move the arrow to select the menu item. The white arrow points to the currently selected menu item.



**“+” and “-” buttons** - Change the value of the currently selected menu item.



**Exit button** - Exit the menu

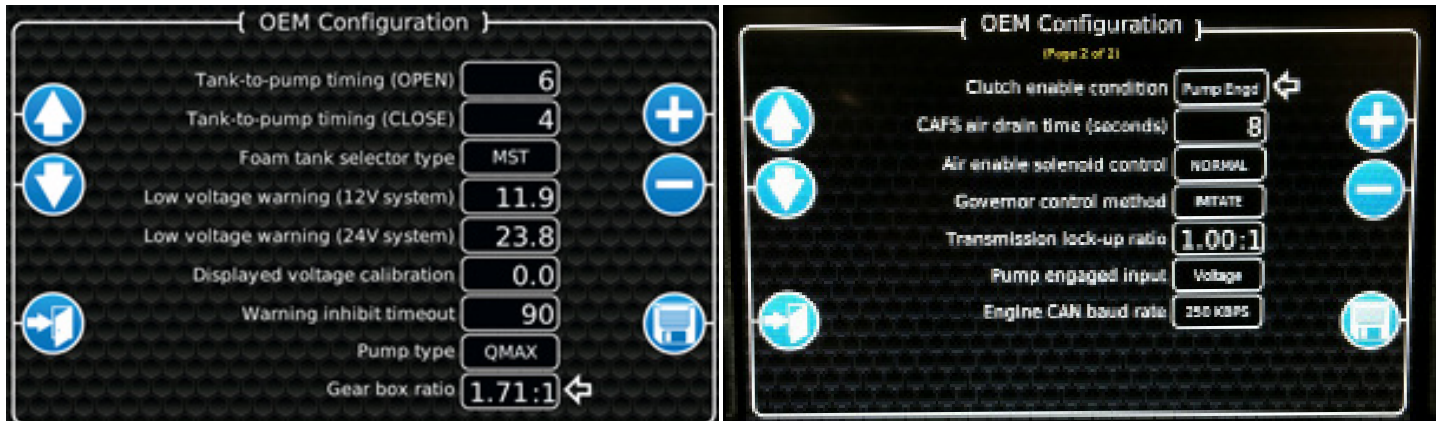


**Save button** - Save all items the menu



## OEM MENU

Enter the password 2314 in the system menu's keyboard to open the OEM menu. The user menu allows setting of user configurable items.



Tank-to-pump timing OPEN	select the amount of time the “open” air solenoid is activated. The tank-to-pump valve is controlled via an linear air cylinder so this setting allows for fine tuning of the amount of time it actually takes to fully stroke the cylinder. <b>Default: 6 seconds</b>
Tank-to-pump timing CLOSE	select the amount of time the “close” air solenoid is activated. The tank-to-pump valve is controlled via an linear air cylinder so this setting allows for fine tuning of the amount of time it actually takes to fully stroke the cylinder. <b>Default: 4 seconds</b>
Foam tank selector type	select the foam tank selector type. Single tank systems (none or MST), dual tank systems (MDT or ADT). <b>Default: MST</b>
Low voltage warning (12V)	select the low voltage warning level for 12V systems. <b>Default: 11.9 volts</b>
Low voltage warning (24V)	select the low voltage warning level for 24V systems. <b>Default: 23.8 volts</b>
Displayed voltage calibration	if the displayed voltage in the additional information displays does not match the actual system voltage this value can be adjusted to calibrate (offset) the voltage (-1.5 to +1.5 volts). <b>Default: 0.0 volts</b>
Warning inhibit timeout	sets the amount of time (30 to 300 seconds) that a warning, which was inhibited (cleared) by the operator, will stay hidden until it shown again (if the warning is still active). <b>Default: 90 seconds</b>
Pump type	select the pump type (PC1, PC2, QMAX-XS, QMAX, QTWO, or DSD). <b>Default: Prima</b>
Clutch enable condition	select when the compressor clutch will be enabled (Pump Engd = clutch engaged when the pump engaged signal is activated, Preset = clutch engaged when a CAFS preset is first pressed). <b>Default: Pump Engd</b>

CAFS air drain time	select how long the air drain solenoid is open when the pump engage signal is deactivated (0 to 10 seconds). This allows the residual air to be bled off after system usage. <b>Default: 8 seconds</b>
Air enable solenoid control	sets how the air enable solenoid is controlled. Inverted = air IS NOT blown into the air valve assembly to activate air injection. Normal = air IS blown into the air valve assembly to activate air injection. Note: when using the Hale air sensing valve this value should be set to "inverted". <b>Default: INVERTED</b>
Governor control method	Imitate or direct
Transmission lock-up ratio	1.01 : 1
Pump engaged input	voltage or Pressure
Engine CAN baud rate	125 / 250 / 500 KBPS



**UP/DOWN arrow buttons** - Move the arrow to select the menu item. The white arrow points to the currently selected menu item.



**“+” and “-” buttons** - Change the value of the currently selected menu item.



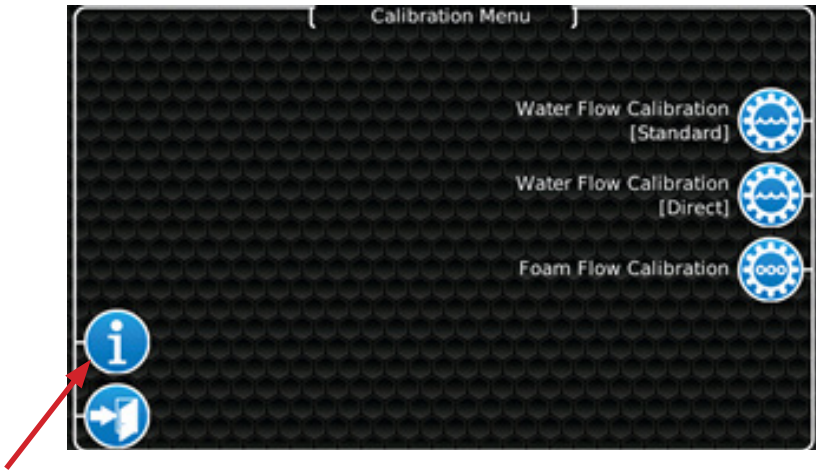
**Exit button** - Exit the menu



**Save button** - Save all items the menu

CALIBRATIONS

Enter the password 6679 in the system menu’s keyboard to open the calibration menu. The calibration menu allows the foam and water calibrations to be performed.



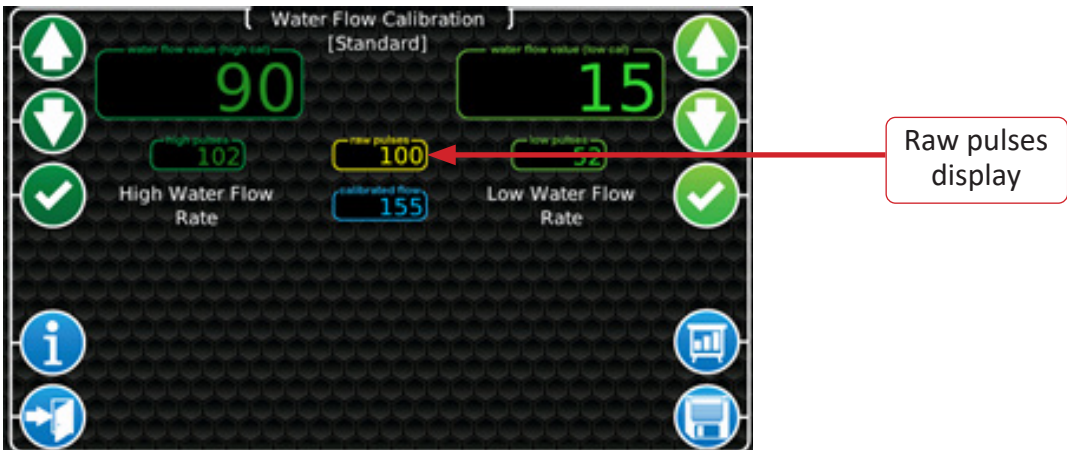
NOTE: Anytime the i button is shown it can be pressed to pop-up a tutorial about the current screen. The tutorial can be canceled at any time by pressing the i button again.

WATER FLOW CALIBRATION (STANDARD)

The standard water flow calibration requires plain water to be flowed through a foam/CAFS capable discharge. The water flow calibration requires flows at a high rate and a low rate. The high and low rate is determined by the person calibrating the system. This two-point calibration yields a very precise water flow calibration across the entire range.

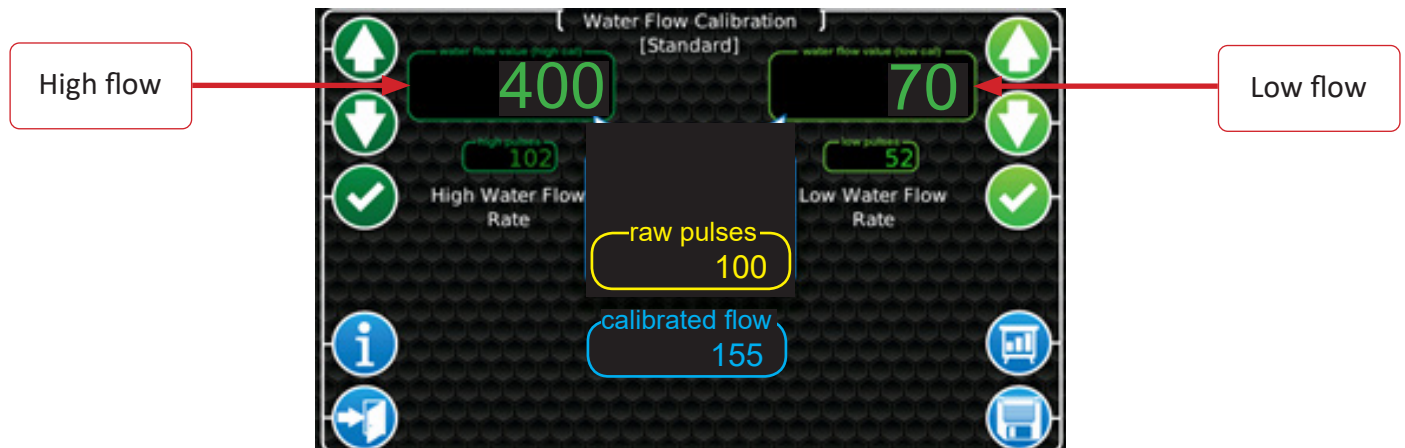
NOTE: An accurate flow measuring device must be used to measure the water flow when calibrating the flow sensor. Use a suitable size, smooth bore nozzle or an accurate inline flow sensor.

- 1. Establish flow through a foam/CAFS capable discharge at either the high or low rate. Use the yellow “raw pulses” display window to verify that the paddlewheel sensor is detecting the water flow.

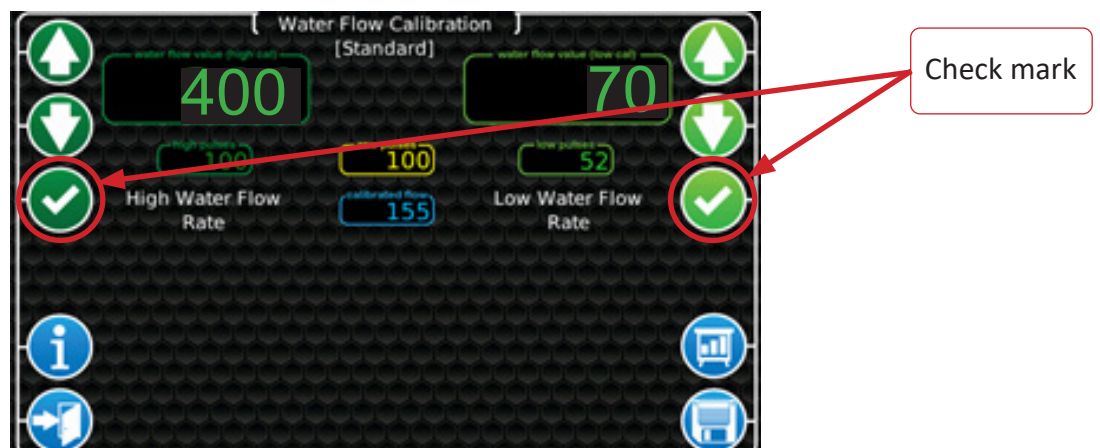


System	Low - l/min	High - l/min
CAFS50	70	400
CAFS100	70	800

- The display will ask you to enter the flow value. Press the display where you want the value to be placed. Use the UP and DOWN arrows to set the flow rate to a known value.



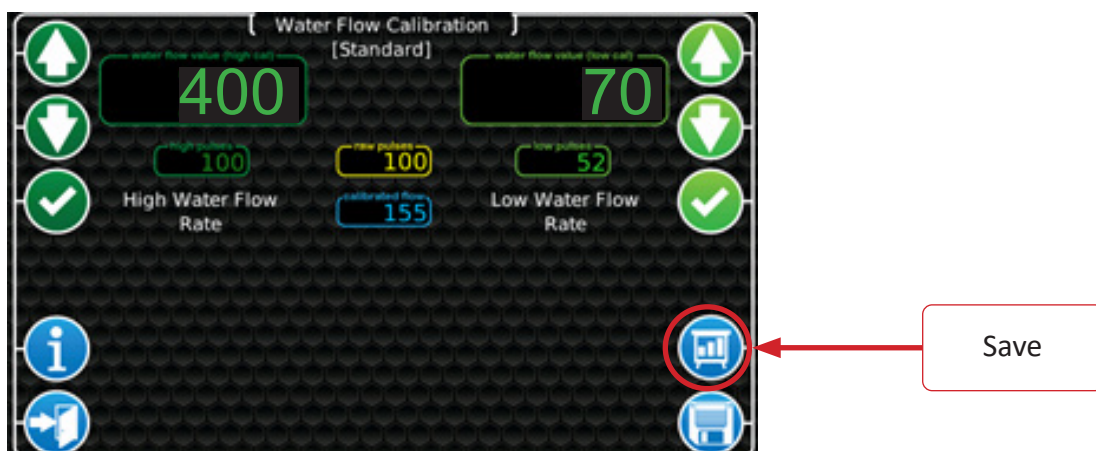
- Press the "check mark" button on the desired side (high or low). Make sure that the value in the yellow "raw pulses" display window is now in the green "high pulses" (or "low pulses") display window.



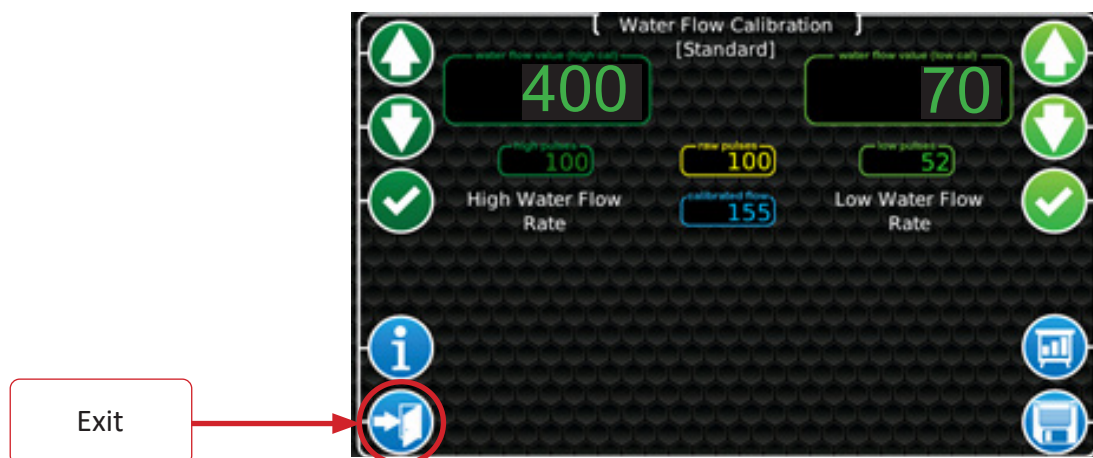
- Perform these same steps for the other flow rate.



7. Press the “save” button to complete the calibration. Decrease the throttle and stop water flow

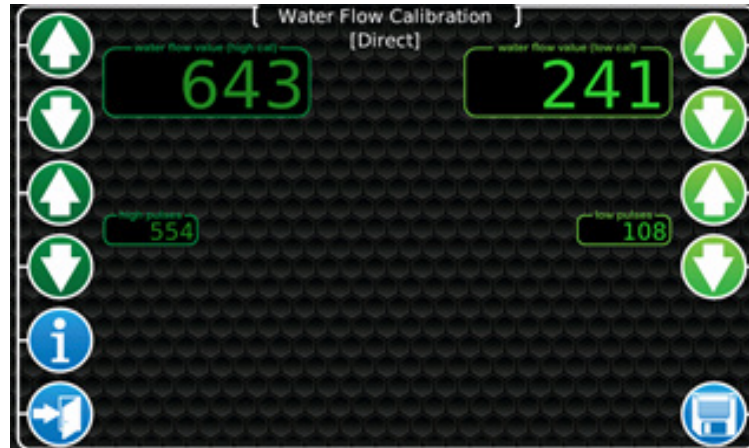


8. Press the “exit” button to return to the calibration menu.



## WATER FLOW CALIBRATION (DIRECT)

The direct water flow calibration is simply a means of entering the values from a previous water flow calibration without the need to actually flow water. The direct water flow calibration requires the known values for the water flow value and its related water flow pulses (high and low) from a previously completed calibration. This is typically used when having to replace the SmartCAFS Controller or when another vehicle is determined to be exactly the same as a previous vehicle.

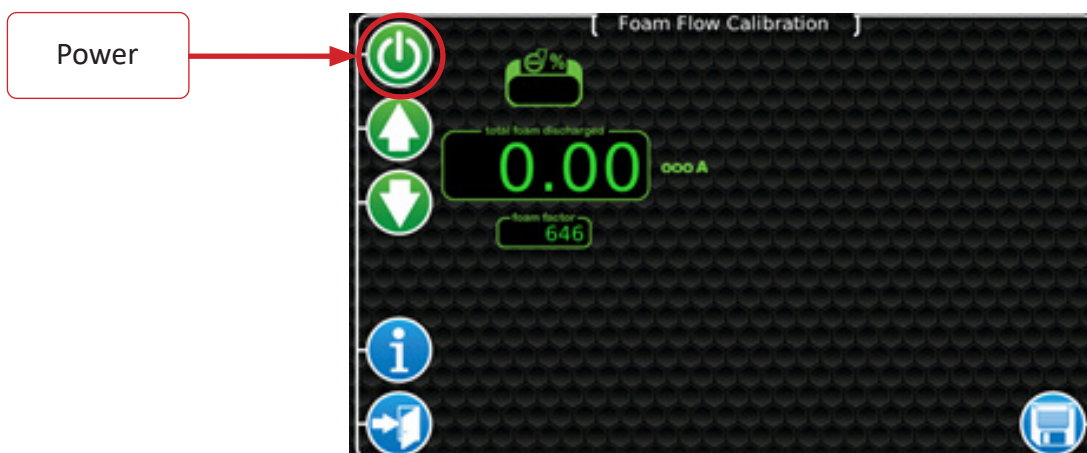


## FOAM FLOW CALIBRATION

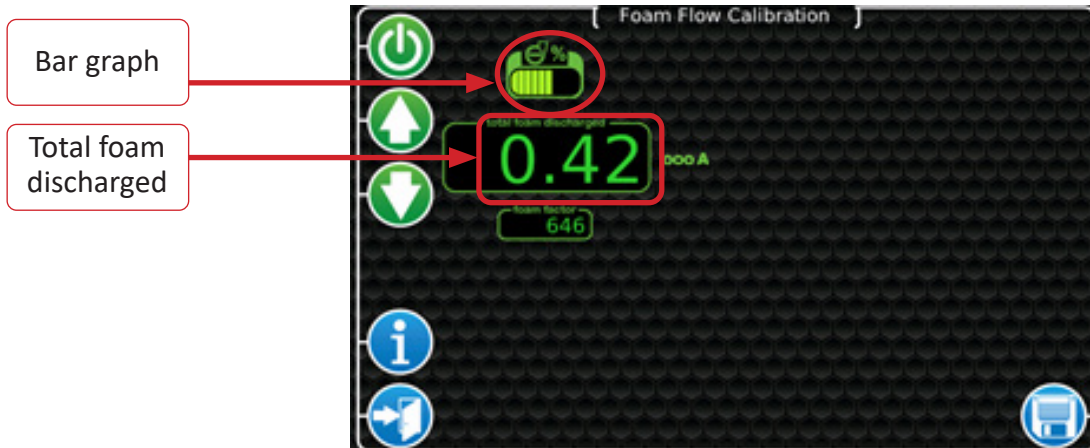
The foam flow calibration requires the discharge of a known quantity of foam concentrate into a calibrated container.

NOTE: Be sure to set the foam bypass handle into the “bypass” position so that the discharged foam concentrate may be collected.

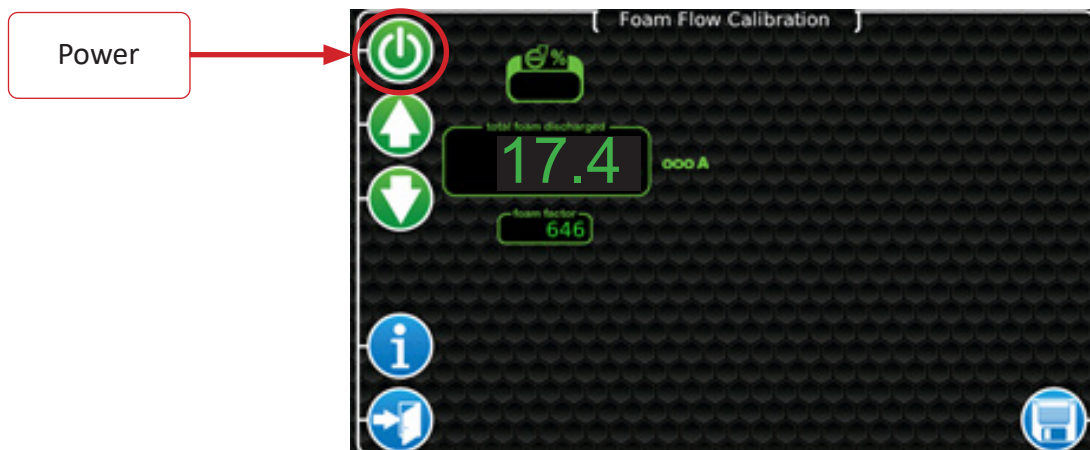
1. Place the foam bypass handle into the “bypass” position. Select the appropriate foam tank, A or B.
2. Place the calibrated container so that it will be filled with foam concentrate as it is discharged through the bypass hose.
3. Press the power button.



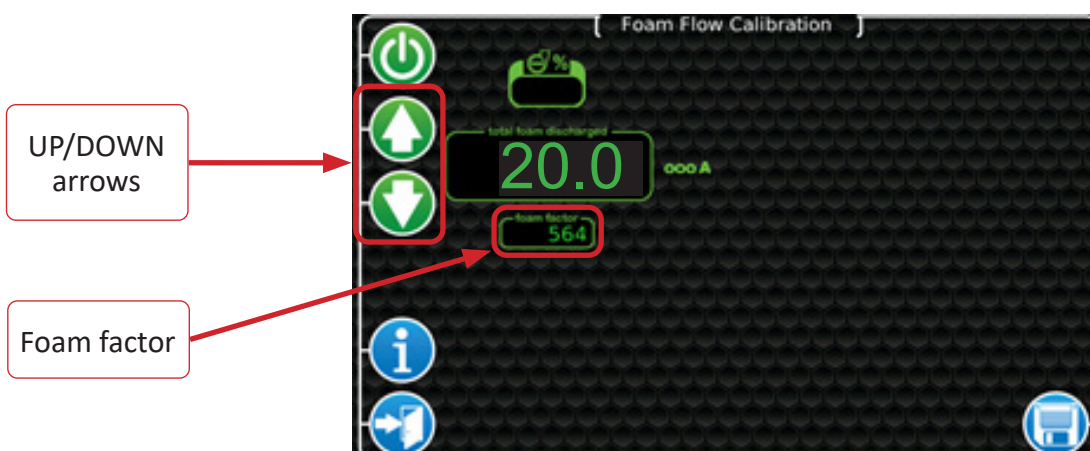
4. The bar graph will increase to indicate that the foam pump is running and the system will begin discharging foam concentrate. The “total foam discharged” display will begin incrementing.



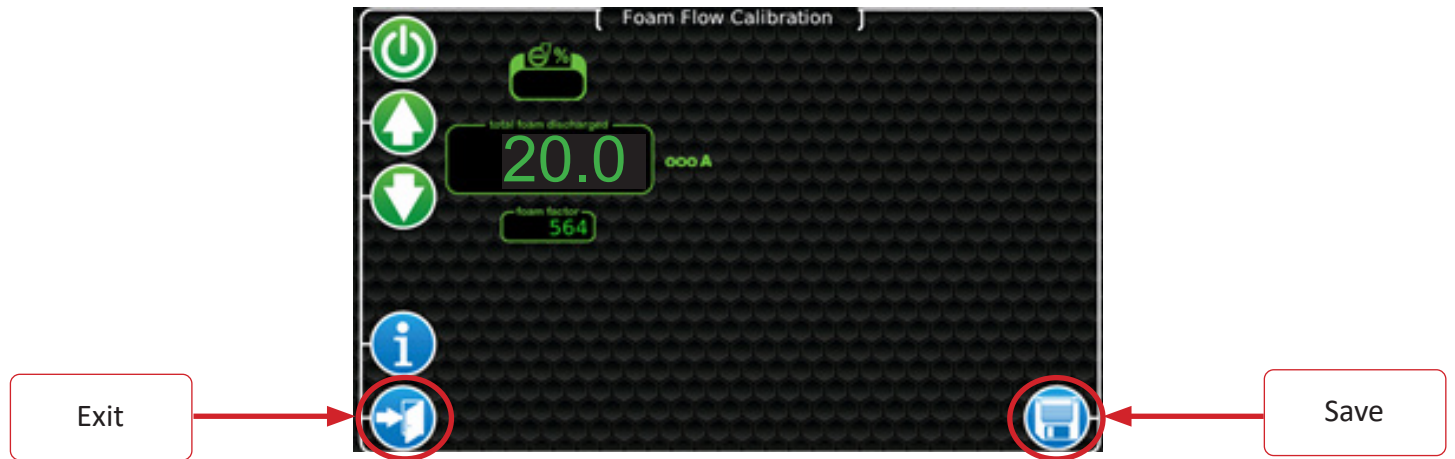
5. When the foam concentrate has filled the container to a known level press the power button again to stop the foam system.



6. Use the UP/DOWN arrow buttons to change the value shown in the "total foam discharged" window to reflect the value actually collected in the container (the "foam factor" value will be changing, but in the inverse direction).



7. Press the "save" button. Repeat for the second foam tank.
8. Press the "exit" button to return to the calibration menu.



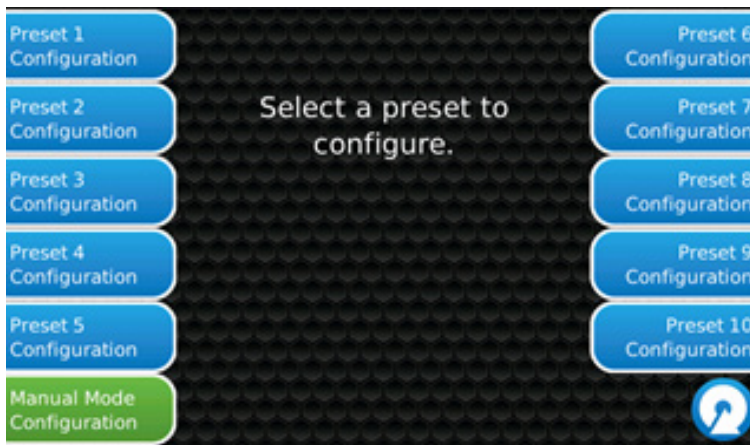
8. Place the bypass handle back to the “inject” position.



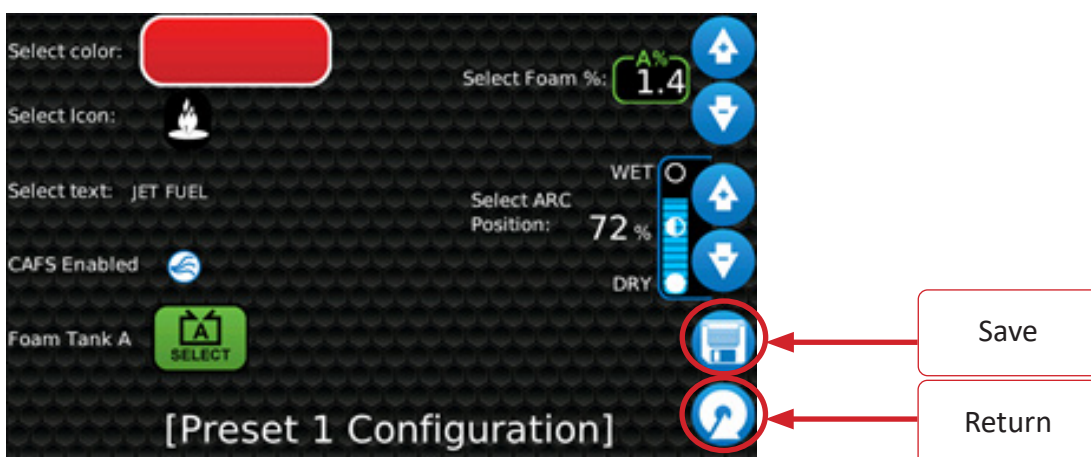
## PRESET CONFIGURATION (STANDARD)

The SmartCAFS Controller allows up to 10 presets to be configured. These presets can be set for foam only or foam and air (CAFS).

Enter the password 1023 in the system menu's keyboard to open the preset configuration menu.



Select the preset to configure and that preset's configuration screen will be shown.

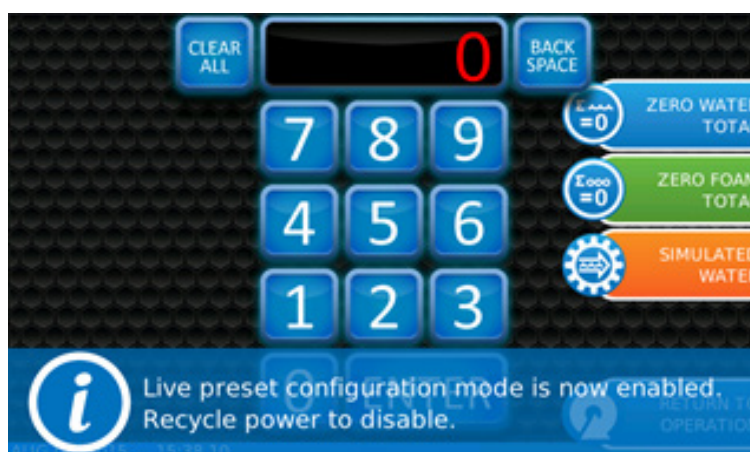


Select colour	Select the color for the preset's bar (green, red, orange, purple, blue, disabled). If "disabled" is selected then the preset is turned OFF.
Select icon	Select the icon to use for this preset.
Select text	Pops-up a keyboard so that text can be set for this preset (9 characters per line, up to 3 lines).
CAFS enabled/disabled	Select whether this preset will be using CAFS or foam only.
Foam tank	Select which foam tank is used with this preset. If the foam selector is not set for the correct tank the SmartCAFS Controller will pop-up a warning to inform the operator to switch to the correct tank.
Select foam %	Set the foam concentrate percentage required for this preset (this option is only visible if CAFS is enabled for this preset).
Select ARC position	Set the consistency of the CAFS by setting the Air Ratio Control valve between WET and DRY (this option is only visible if CAFS is enabled for this preset).
"Save" button	Save this preset to memory.
"Return" button	Return to the "select a preset" configuration menu.

## PRESET CONFIGURATION (LIVE)

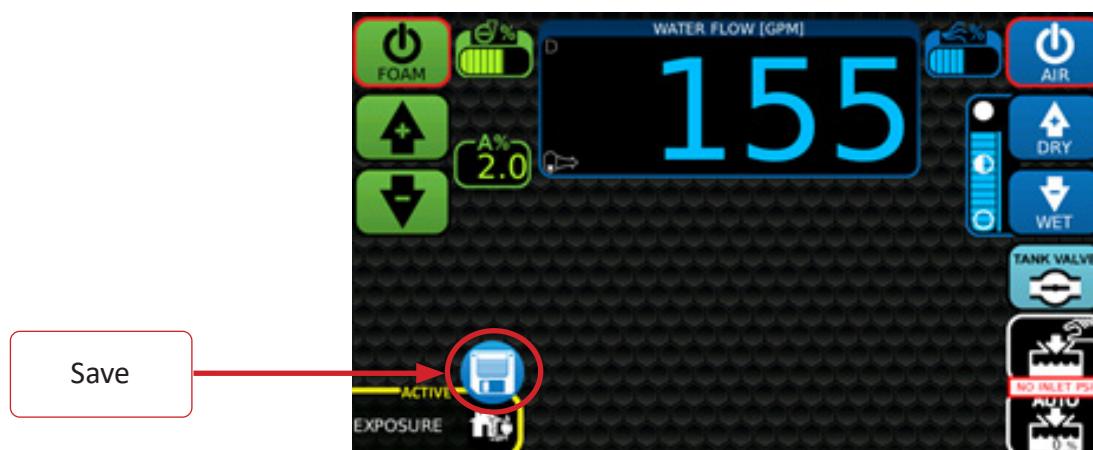
Once a preset has been configured via the standard configuration it may not have produced the CAFS consistency desired. The “live” preset configuration allows the operator to flow CAFS while adjusting the consistency and then re-save that new value to the desired preset.

Enter the password 40692 in the system menu’s keyboard to open the user menu. This enables the “live” preset ability. Information banners will pop-up to indicate that the “live” preset ability has been activated. Touch the banner to dismiss the message.



**NOTE:** You must recycle the SmartCAFS Controller’s power to disable the live preset configuration.

1. Select the desired preset from the preset page. You will notice a “save” icon above the currently selected preset (bottom left corner of the screen).

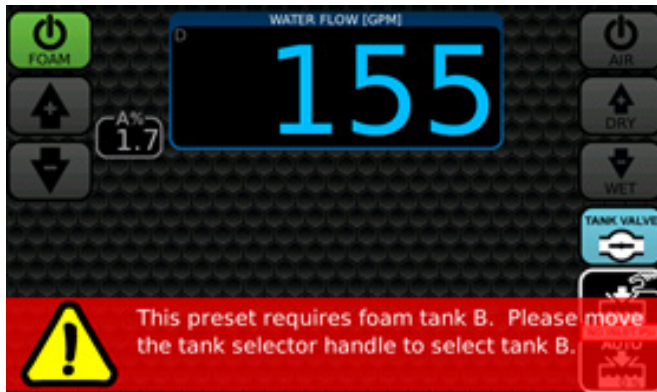


2. Run the CAFS and adjust the CAFS consistency as desired (WET/DRY buttons).
3. Press the button next to the currently selected preset indicator. The “saving” indicator will appear momentarily indicating that the new consistency has been saved.

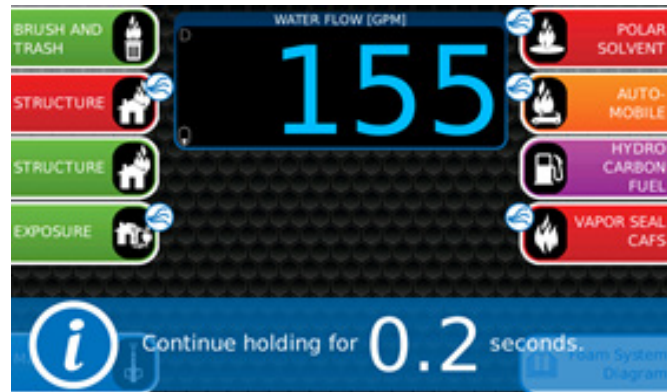


## ON SCREEN WARNINGS and INFORMATION

The SmartCAFS Controller uses on-screen pop-up warnings and information to indicate system status to the operator.



Warnings use a red background



Information uses a blue background

Touch the warning/information to dismiss it (inhibited). The warning will be hidden for the number of seconds set in the OEM menu's "warning inhibit timeout". If the condition that caused the warning still exists the warning will pop-up again.

## MAINTENANCE SCHEDULE PC1\_/PC2\_

Note: The Godiva Compressor service intervals replace those in the Rotorcomp Compressor manuals.

Equipment	Action	Procedure
After every use		
	Flush the system with clean water	
Every 3 months		
Pump, PC1 or PC2	Check the pump bearing housing and gearbox oil levels	Pages 26-29
	Do a vacuum test for leaks	Page 66
Pump, PC2 only	Clean the high pressure filter	Page 65
Compressor	Check the oil level and top up if necessary. Run compressor for 15 minutes	Page 26 for
	Check the drive belt condition, check for cracks on inside surface.	Pages 31-32
Mixing manifold	Grease air ratio control valve	Page 66
FoamLogix 2.1A, 3.3, 5.0	Check that foam pipe connections are tight	See FoamLogix manual
	Operate the system in bypass to move the concentrate and prevent gelling (if concentrate is left in the system without use for three months)	See FoamLogix manual
Every 12 months		
Pump, PC1 or PC2	Change the bearing housing oil	Pages 26-29
Compressor	Change the air filter	Page 28
	Change the oil and filter	Page 26, 28, 30
Gearbox	Change the gearbox oil	Page 29-30
FoamLogix 2.1A, 3.3, 5.0,	Inspect wiring/connections, hoses/connections	See FoamLogix manual
	Clean the foam strainer	See FoamLogix manual
	Verify water flow calibration	See FoamLogix manual
	Verify foam feedback calibration	See FoamLogix manual
Every 24 months		
Pump, PC1 or PC2	Replace the primer seals	See Workshop Manual
	Replace the priming valve seals and diaphragm	See Workshop Manual
	Test the thermal relief valve	Page 67
Compressor	Replace the fine oil separator element	Page 28
Every 5 years		
Compressor	Replace the compressor drive belt	Page 31-32
IMPORTANT! In high usage or abnormal operating conditions, the above procedures may need to be more frequent.		



## MAINTENANCE OPERATIONS

### PC2 Pumps Strainer - High Pressure

- 1) Remove strainer / Cap assembly
- 2) With care, remove debris from the strainer by washing.
- 3) The Dowty seal may be reused if free from damage or cuts.
- 4) Re-fit the strainer assembly and secure.



Strainer - high pressure

### Gauges

Do not clean the glass surfaces of the gauges with abrasive or solvent cleaners. These will cloud the glass surface. Use a mild detergent and water.

## CAFS Mixing Manifold – Greasing Ball Valve

### Prima SmartCAFS50 / 100

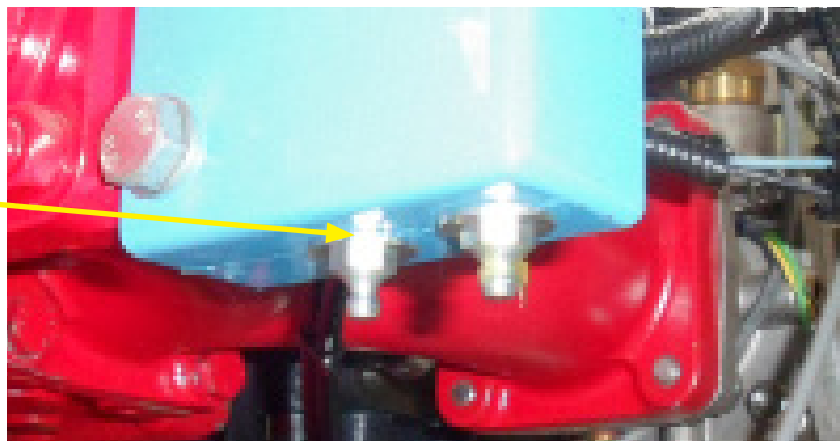
The CAFS Mixing Manifold contains a ball valve as part of the air ratio control system.

This ball valve must be maintained by inserting lubricating grease at three monthly intervals to ensure smooth and efficient operation.

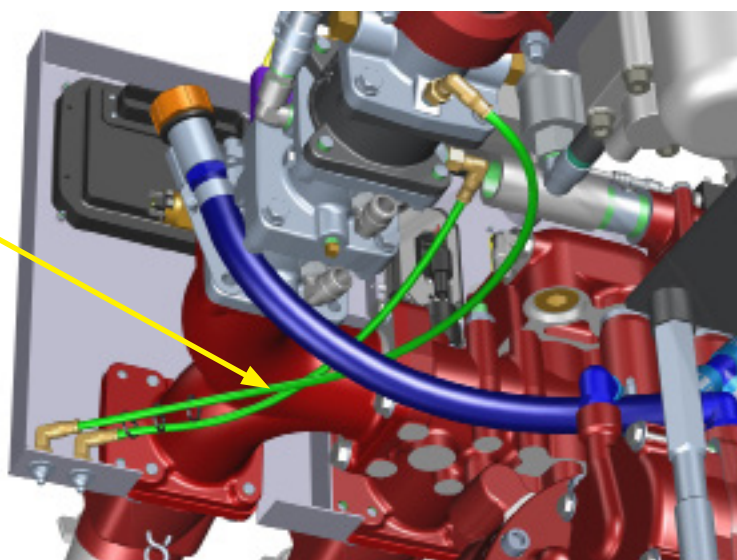
Use a marine waterproof grease, e.g “Aquaslip” (supplied by Tetrosyl Ltd., Bury, Lancashire, BL9 6RE. [www.tetrosyl.com](http://www.tetrosyl.com))

The CAFS mixing manifold is fitted with two grease lines, these allow grease to be inserted from the front panel.

Grease injection points



Grease lines to mixing manifold



### Vacuum Test

Place the blanking cap(s) in position on the inlet(s) of the pump and close the delivery valves. Run the pump at 1300-1500 rpm and observe the vacuum/compound needle. When a vacuum of 0.81bar is obtained, stop the pump. This vacuum should be maintained for at least 15 seconds or drop no more than 0.07bar in a minute.

If the pump will not hold the vacuum with the blanking caps in position, a leak is present in the pump, and the pressure test detailed below must be carried out to trace it.

Should the pump not reach a vacuum of 0.81bar but will hold a lower pressure, a fault in the priming system is indicated.

### **Pressure Test - carried out without pump running**

This test is to be carried out if the pump will not hold a vacuum with blanking cap(s) in position, and is intended to trace the leaks responsible for the loss of vacuum.

Apply a water pressure of 3.5 - 7.0 bar to the pump and check for leaks. The area causing the leak should be visible, and can be dismantled and rectified.

Check each primer drain hole for water leakage. If leakage is found, replace the primer seals and O rings as described in the Maintenance Manual Procedures.

If the pump will not achieve 0.81 bar vacuum, and will not hold what it does achieve, there is a leak, and possibly also a fault, in the priming system.

If no leaks are apparent, the leakage must lie between the priming valve and the primer. Points to be checked are:

The inlet seal in the primer end cap

The priming valve diaphragm

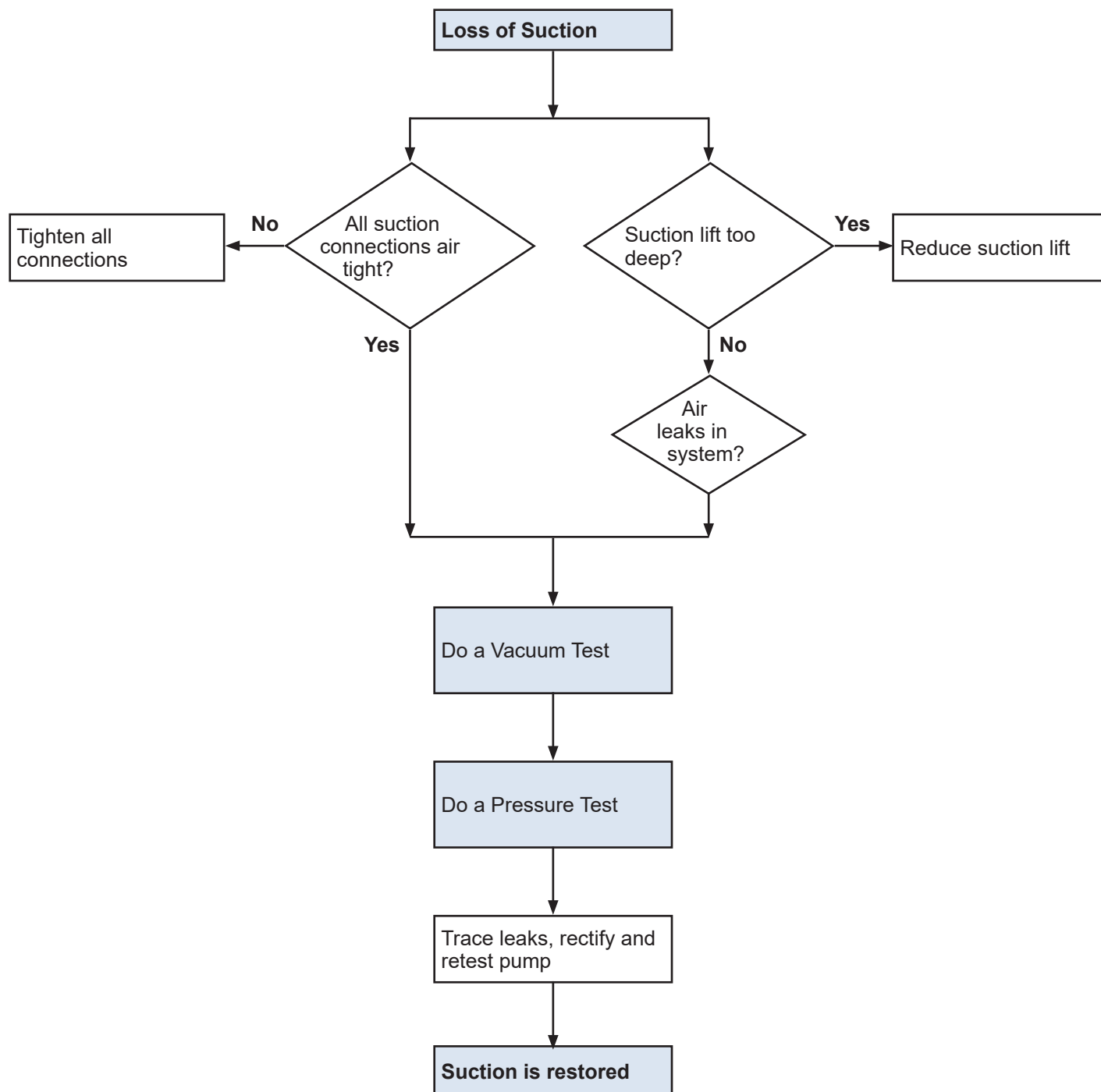
### **Thermal Relief Valve (TRV) Test**

With the pump primed, close all discharges. Run the pump, with high pressure selected, at approximately 2800rpm to permit it to heat up. The TRV should open and discharge water when the pump temperature is in the order of 45 - 55°C with the standard temperature option and 70-75°C with the high temperature option. Observe the valve discharge, if it is open to atmosphere, or feel the discharge pipe become warm if it returns to the vehicle tank. Open a pump discharge valve to permit cool water to enter the pump. The flow from the TRV should now cease.

## FAULT FINDING

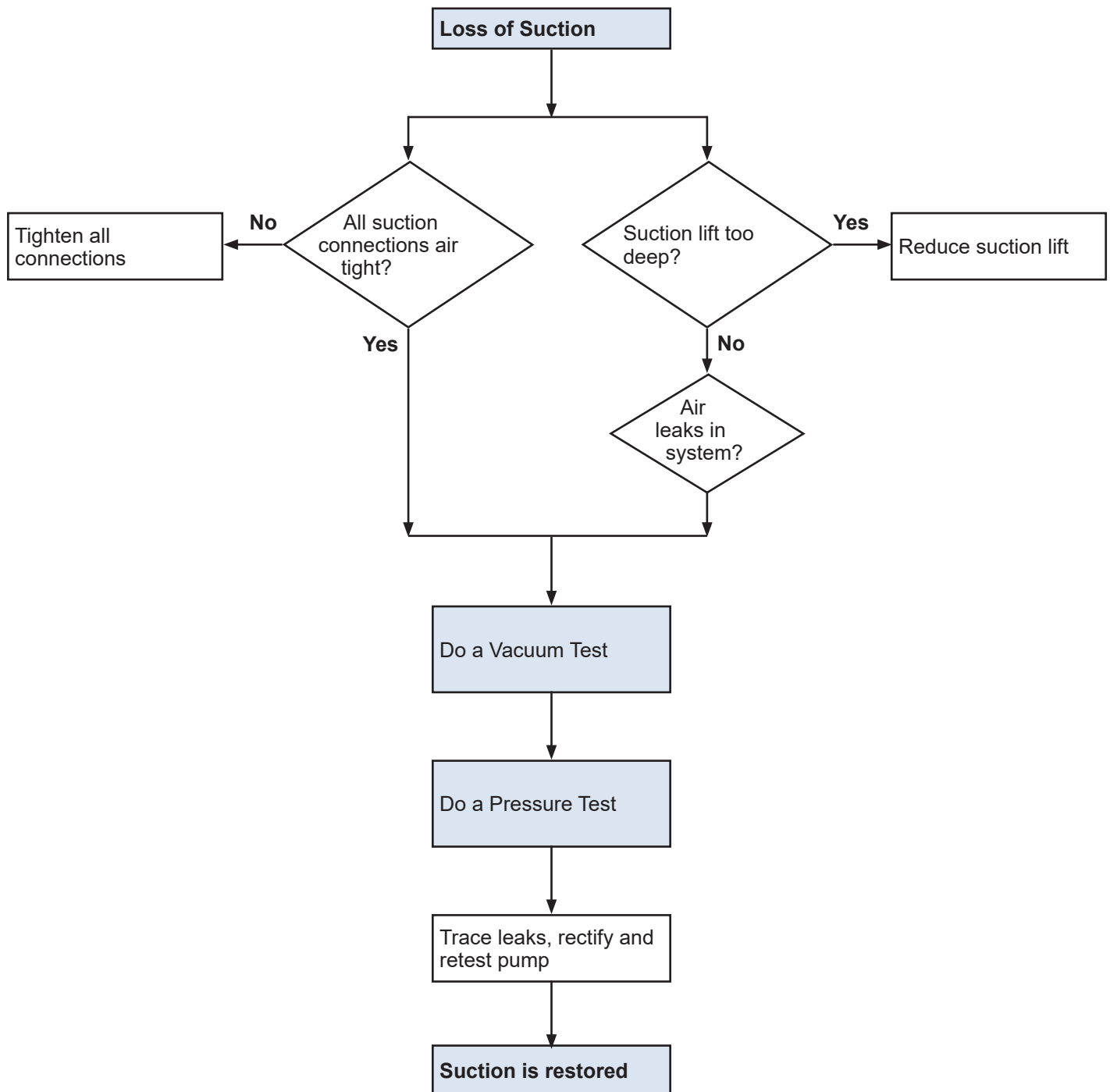
Note: For specific FoamLogix model trouble shooting, please refer to the relevant FoamLogix 2.1A or 3.3/5.0 Description, Installation and Operation manual.

### PUMP OPERATING FAULTS 1 – LOSS OF SUCTION

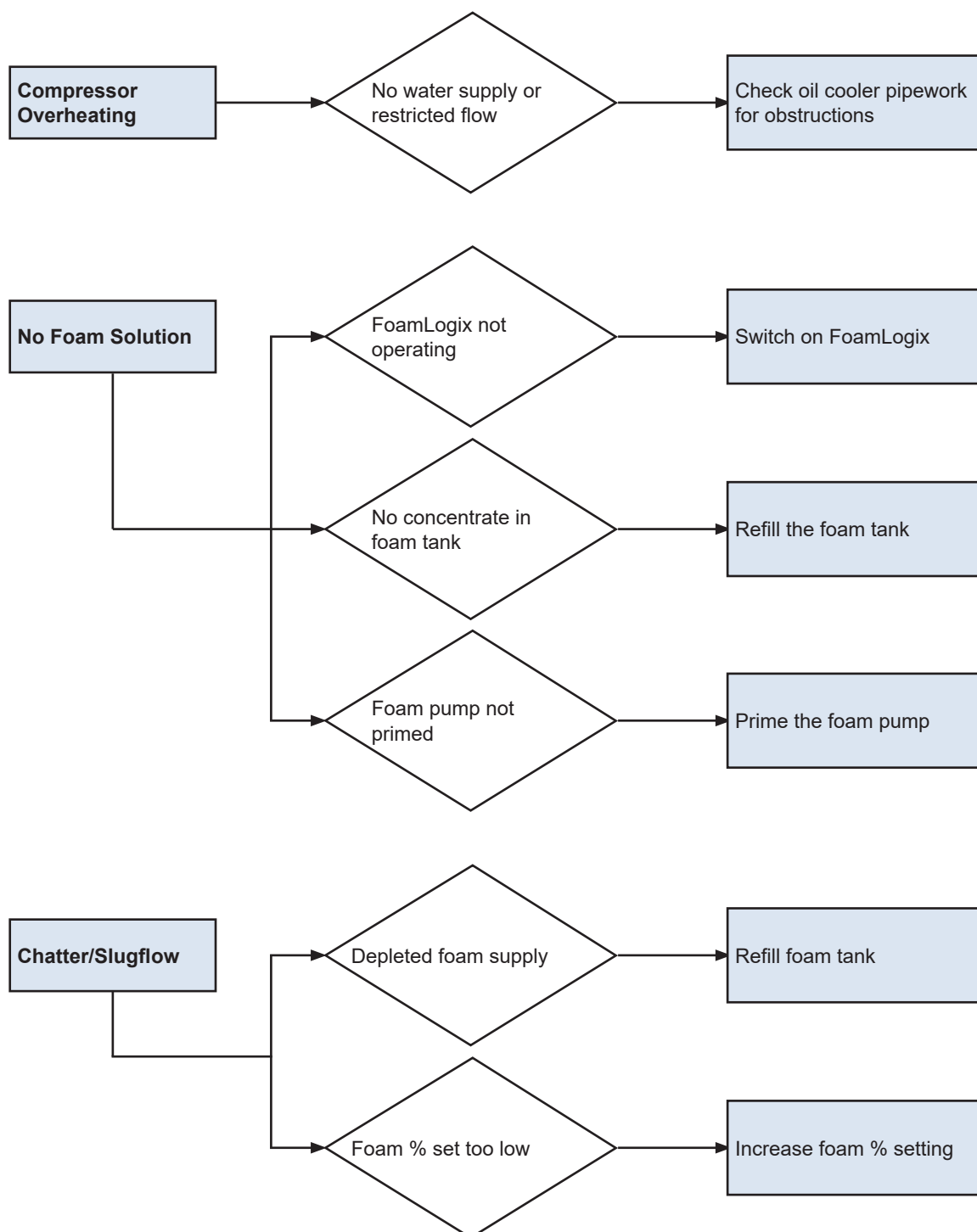




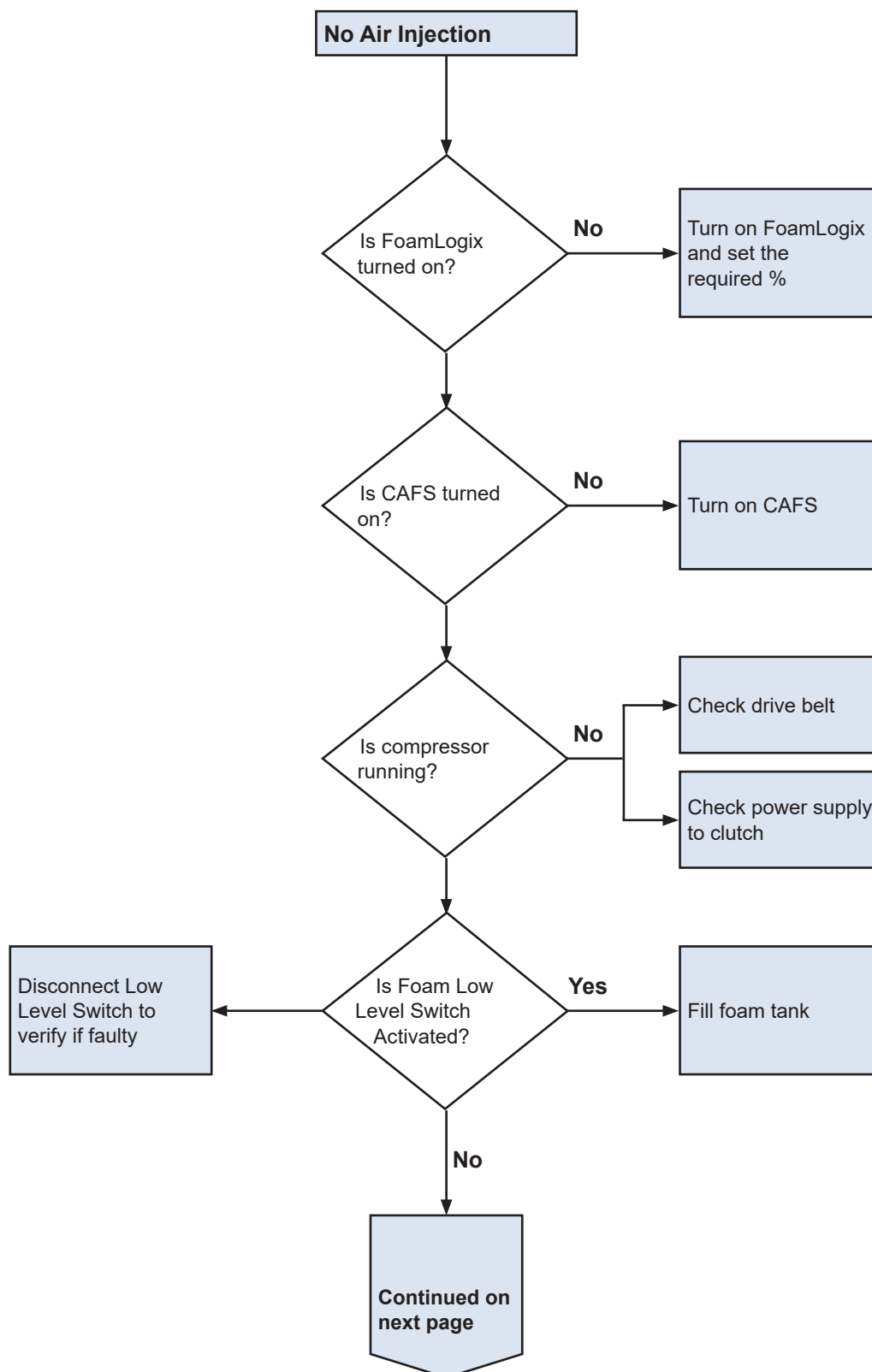
## PUMP OPERATING FAULTS 1 – EXCESSIVE PUMP NOISE



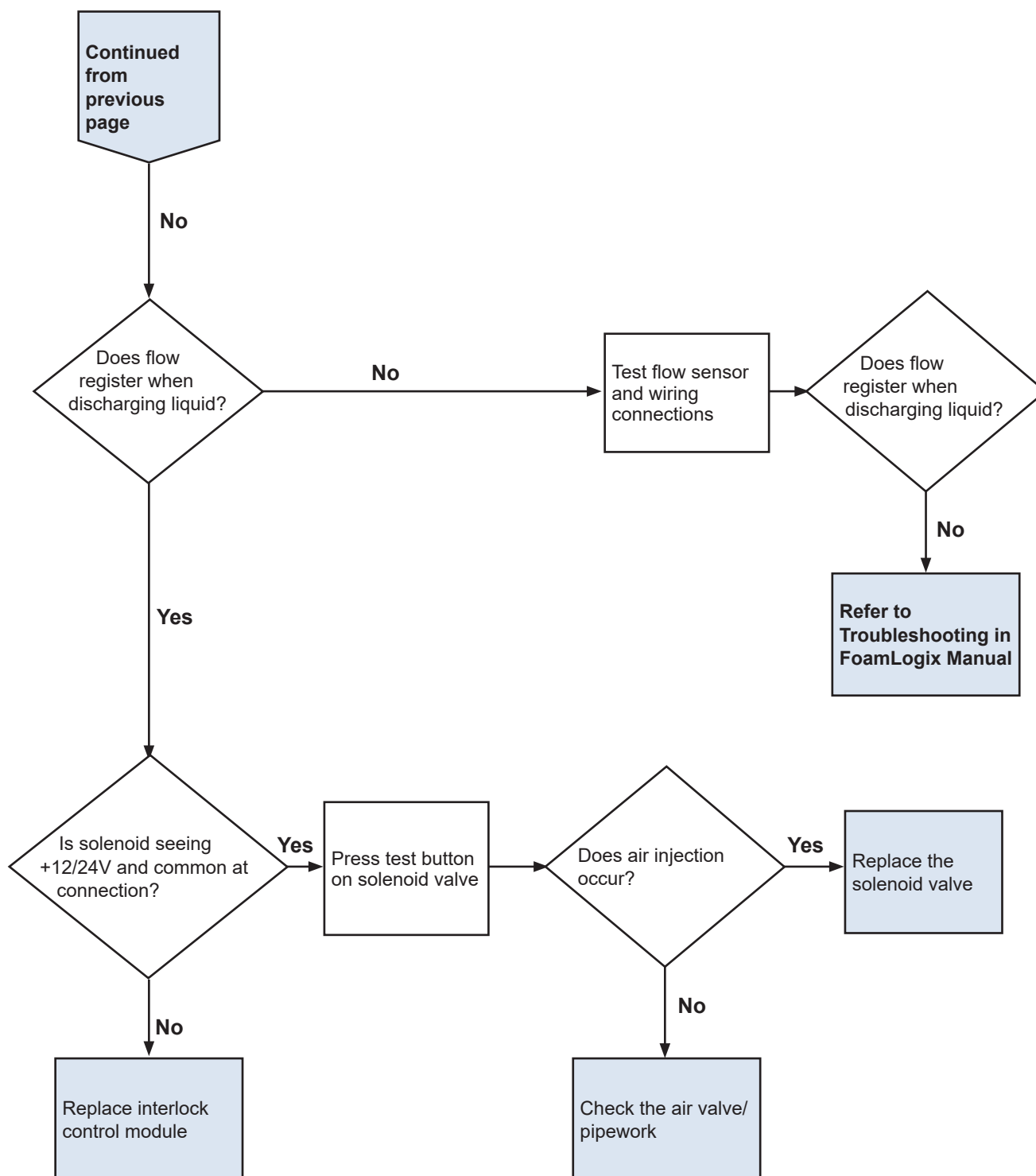
## GENERAL OPERATING FAULTS – CAFS



## AIR INJECTION FAULTS



## AIR INJECTION FAULTS continued



## PARTS LISTS

Godiva Prima pump illustrated parts list  
Please refer to Godiva Ltd.

Compressor illustrated parts list for Prima SmartCAFS50 and Prima SmartCAFS100  
Please refer to:  
ROTORCOMP SCREW COMPRESSOR AIR ENDS EVO2, EVO3, EVO6, EVO9

Foamlogix illustrated parts list  
Please refer to:  
FoamLogix Model 2.1A Description, Installation and Operation manual,  
part number 029-0020-74-0.

FoamLogix Model 3.3/5.0/6.5 Description, Installation and Operation manual,  
part number 029-0021-68-0-A

## RECOMMENDED SPARES KIT FOR BI-ANNUAL SERVICE

Qty	Description	Part Number	Comment
<b>Prima SmartCAFS50</b>			
	Compressor EVO 3		
1	Oil fine separator filter	ROT85485	
1	Oil filter	ROTN32047	
1	Air filter	ROTN37236	
1	Belt - Drive	088-00047-001	
<b>Prima SmartCAFS100</b>			
	Compressor EVO 6		
1	Oil fine separator filter	ROT85484	
1	Oil filter	ROTN100333	
1	Air filter	ROTN34545	
1	Belt - Drive	088-00047-002	
	Prima Pump		
As required	Strainer - Hi Pressure	60051	Not PC1_ series
4	Washer - Dowty - Oil drain	UFP 2303/08	
2	Washer - Dowty - High Pressure strainer	UFP 2303/15	Common part
2	Washer - Dowty - NRV Inlet	UFP 2303/10	Common part

## PRIMA SMARTGOV SPARES

Spares - as needed for the whole life of the pump

Item	Qty	Description	Part Number	Comment
1	1	SmartGOV Display	599-00034	In panel
2	1	Matrix Governor	610-00052	Right side of pump*
3	1	Kit, CAN Connectors	599-00038	
4	1	Twister CAN control	C1-119970	In panel
5	1	Harness, Twister	513-00176-000	Connected to Twister
6	1	Harness, SmartGOV	513-00119-000	Connected to SmartGOV
7	1	Transducer 300 PSI 0-5V ABS, Vacuum	200-00092	Suction tube
8	1	Transducer 600 PSI 0-5V ABS, Low Pressure	200-00108	Low pressure manifold, or on later models the suction tube
9	1	Transducer 1000 PSI 0-5V ABS, High Pressure	200-00126-000	High pressure manifold
10	1	Harness, SmartCAFS & GOV	513-00165-000	
11	1	Interlock control mounting bracket	65114	Right side of pump
12	1	PDM-8 Outlet	610-00034	Right side of pump
13	2	Spacer	048-00098-000	For above
14	2	Washer	MS25/7	For above
15	2	Bolt	MS16/70	For above
* When viewed from the front or suction tube part of the pump.				

## OPERATOR MAINTENANCE LOG

Pump serial number .....

Use this log to record faults, part replacements and major overhauls.

Please contact Customer Service at **Godiva Ltd.** prior to any proposed return of either a single part, or a complete assembly.

[illegible]



## CUSTOMER SUPPORT DOCUMENTS

To find these Godiva documents, scan these QR codes -

**Contact Customer Service**

[Click here for details](#)

[www.godiva.co.uk/customer-support/](http://www.godiva.co.uk/customer-support/)



**Warranty Statement**

[Click here for details](#)

[www.godiva.co.uk/warranty\\_statement](http://www.godiva.co.uk/warranty_statement)



**Warranty Claim Form**

[Click here for details](#)

[www.godiva.co.uk/customer-support-warranty-claim/](http://www.godiva.co.uk/customer-support-warranty-claim/)



**Godiva terms and Conditions of Sale**

[Click here for details](#)

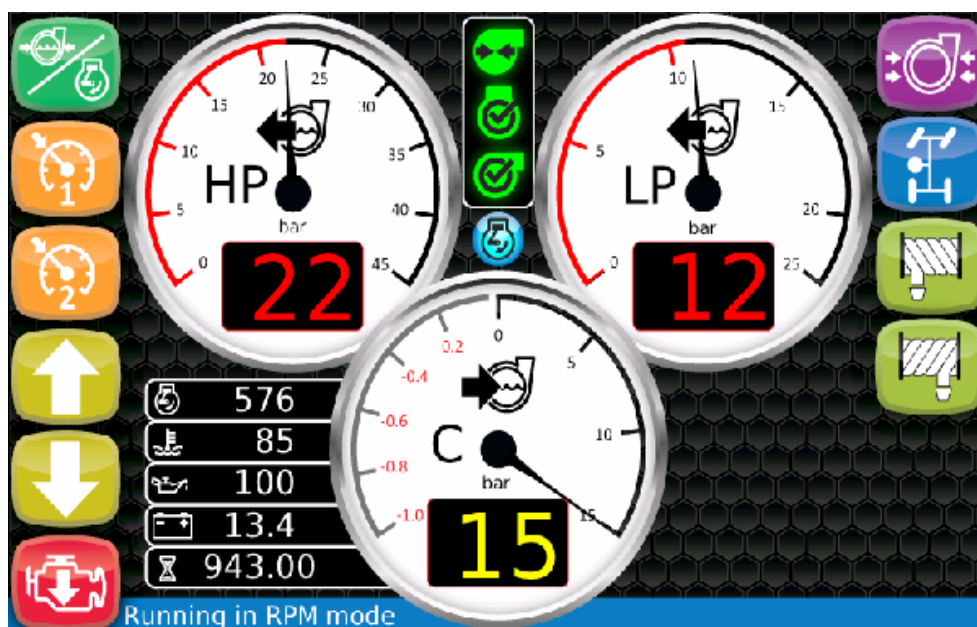
<https://www.godiva.co.uk/customer-support-terms-conditions/>



## Supplement to UV SmartCAFS Manual

# UV SmartGOV Operation

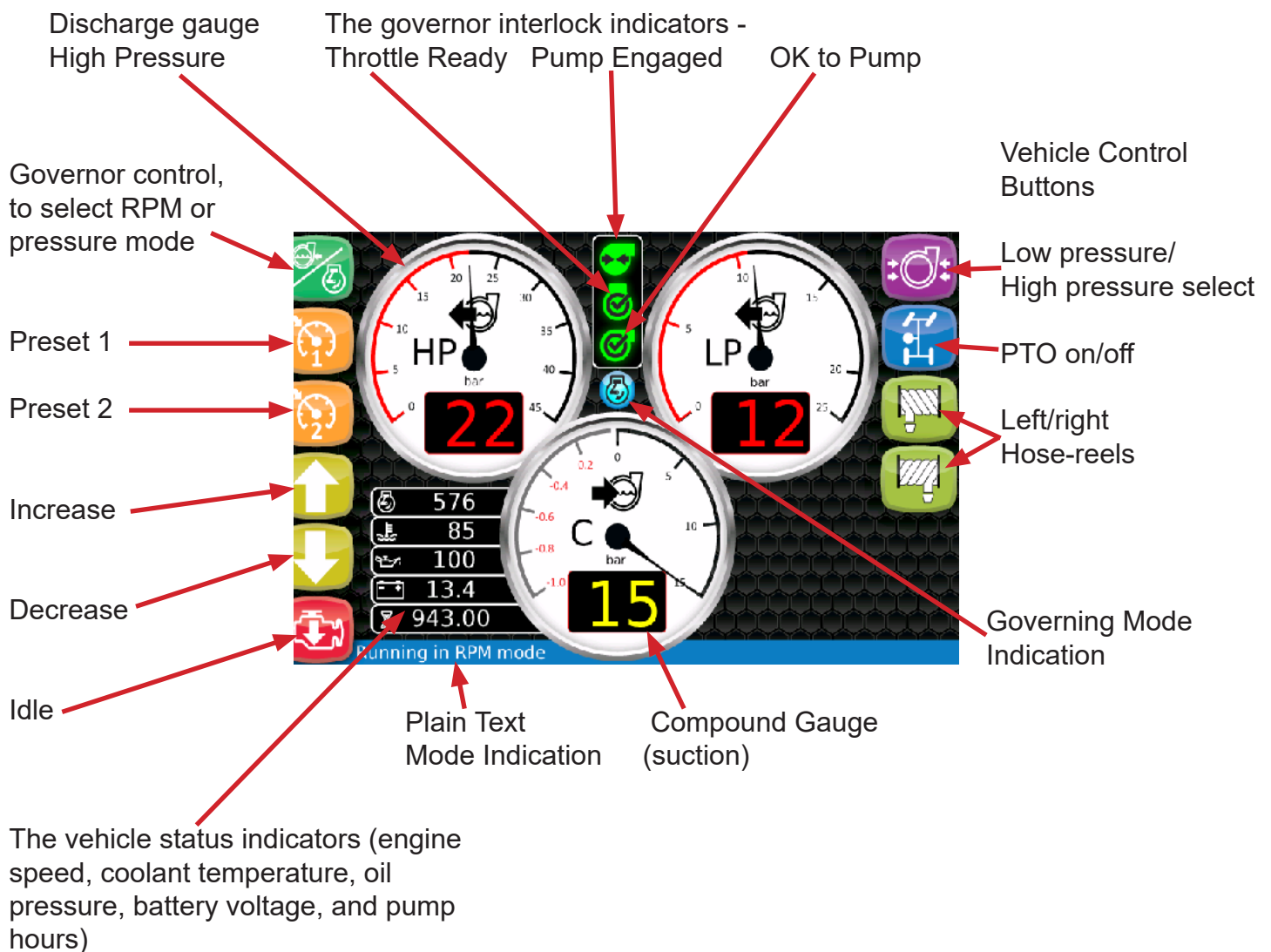
## UV700 Matrix Governor display



### 1.1. Governor screen

Note: The Control Buttons appearing on the screen once powered up will depend on the actual vehicle settings and configuration. Contact your vehicle builder or the factory for more details. The vehicle builder may have done some specific settings within the Setup-Menu to meet certain operation requirements. The settings can be changed by authorised personnel.

The governor screen shows all aspects of the pump operation:



The buttons on the left side of the screen will control the pump pressure by adjusting the engine speed. Engine speed can be controlled manually with the up and down arrow buttons or automatically by selecting a preset (rpm or pressure). There are two presets for rpm and pressure each. If “Auto Mode” is not selected in the Setup Menu, it is required to select a mode (rpm or pressure) as the first operation step before changing the engine speed manually or requesting a preset.

- RPM Mode will maintain a user pre-set engine speed independently from the load on the engine
- PRESSURE Mode will maintain a user pre-set pump pressure independently from the flow rate of the pump (within the limits of the pump’s physical capacity)

The buttons on the right side of the screen will control the pump and related functions like:

- Engaging PTO
- Switching from HP to LP Operation
- Opening Valves for the HP Hose-reels
- Two additional functions are available that can be configured by the vehicle builder

The Display comprises the following:

- Pressure on “Normal Pressure” outlets (LP)
- Pressure on “High Pressure” outlets (HP)
- Pressure on the pump inlet (Compound Gauge) which will be positive when the pump is fed by a pressurised water supply (Hydrant) or negative when the pump is drafting water through a suction hose.

A window shows engine data transmitted via SAE J 1939 CAN from the engine. This could be RPM, oil pressure, coolant temperature, engine hours and chassis battery voltage.

### 1.1.1. Interlock indicators

The interlock indicator icons illuminate green when interlocks are active.



Pump engaged active



Throttle ready active



Okay to pump active

### 1.1.2. Governing mode indicator

The governing mode indicator will show the current operating mode



Pressure mode active











RPM mode active

1.1.3. Governor control buttons

The governor control buttons (excluding the mode button) are grey when a mode is not currently selected. To select a mode – ensure the interlocks are active and then press the mode button. Subsequent presses of the mode button will toggle the governing mode between rpm and pressure.

1.1.4. Vehicle control buttons

All buttons (excluding primer) are toggle buttons. The primer button is momentary.

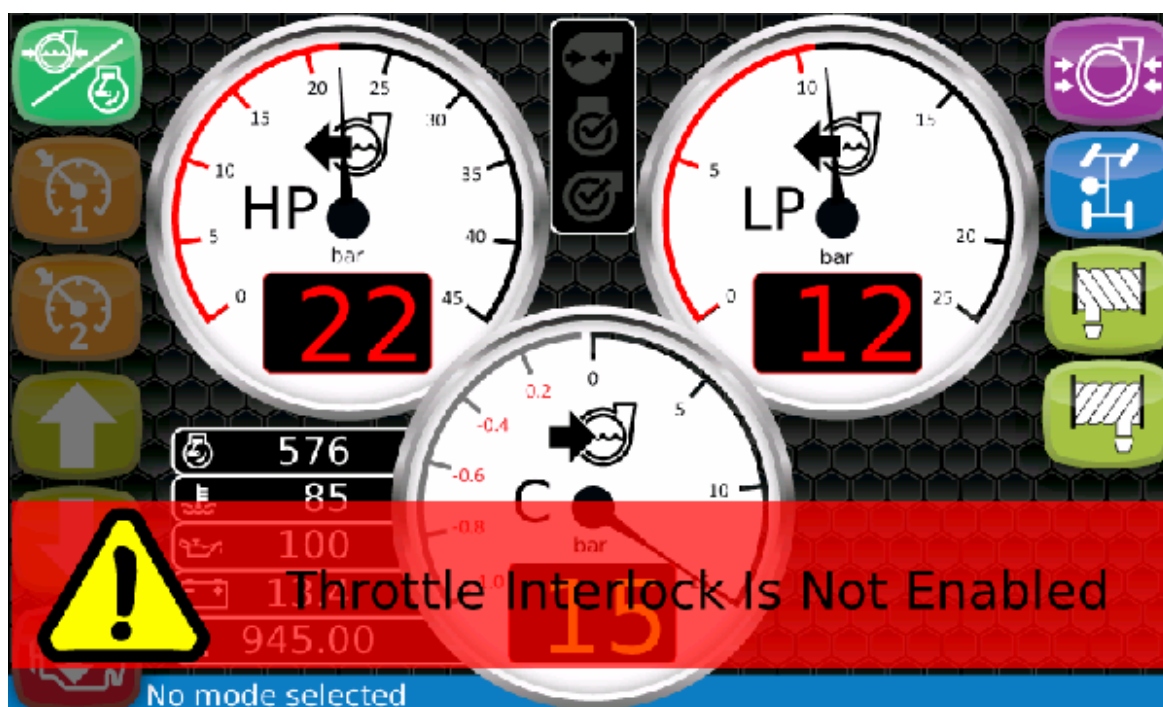
 LP select	 HP select	 Left Hose-reel OFF	 Left Hose-reel ON
 PTO ON	 PTO OFF	 Right Hose-reel OFF	 Right Hose-reel ON

Note that the Display is capable of two additional functions which may be configured by the vehicle builder. As an example these functions could be:

- Opening a “Pump to Tank” valve.
- Opening a “Direct Tank Fill” valve

### 1.1.5. Warnings

Warnings will pop-up within a red banner and will provide a clear explanation of the current warning.



## 2. Operation

### 2.1. Initialization

Upon powering up, the UV700 display will search for the Matrix cycling between 250K and 500K baud rates. Once the Matrix is found the display will stop cycling. Please note that the Matrix does the same cycling process when searching for the engine.

### 2.2. Operating Mode Selection

#### 2.2.1. Throttle Mode

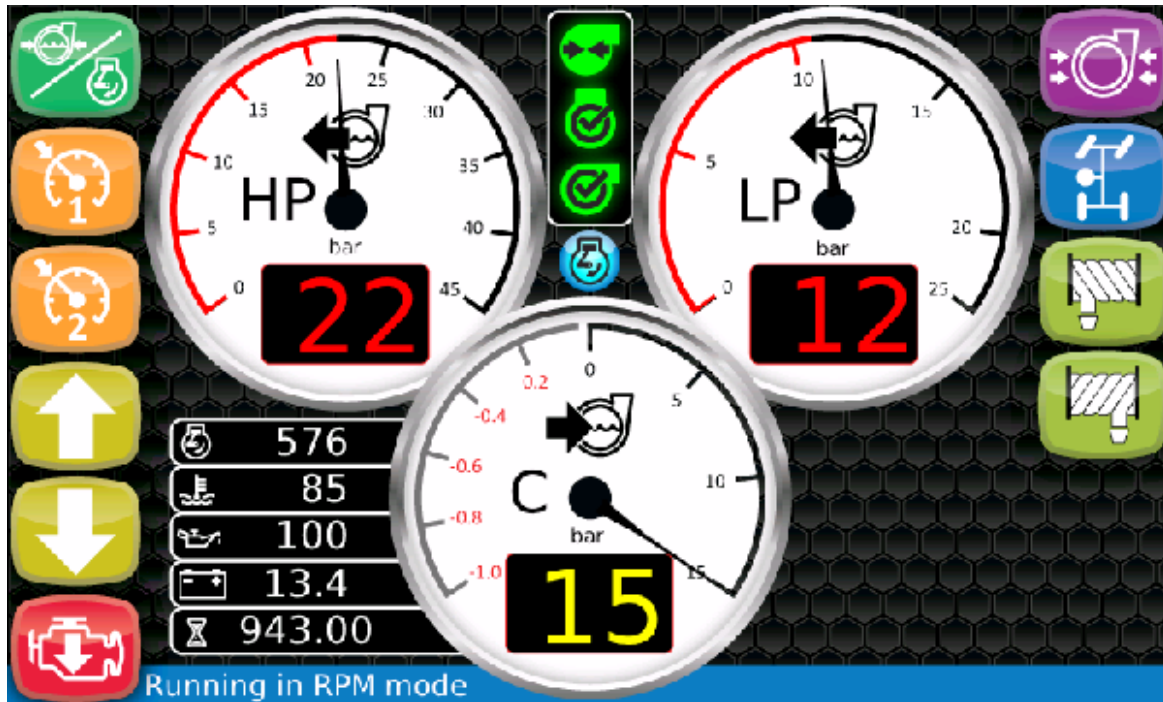
In throttle mode the display will transmit RPM based commands from the Presets and Increase/Decrease buttons. Throttle mode requires that the Throttle Ready interlock be active. Any loss of this interlock will send the governor and engine into Idle mode.

#### 2.2.2. Pressure Mode

In Pressure mode the display will transmit Pressure commands from Presets and Increase/Decrease buttons. Depending on the Units the gauges on screen may change but their location will not. Pressure mode requires all interlocks to be active. If an interlock is lost the governor will drop to Idle mode.



## 2.3. Operation Step by Step



### 2.3.1. Start Operation

1. The Engine must be running and the screen will show engine data such as rpm, temperature etc.. Parking brake must be applied PTO must be engaged the "Okay to Pump" indicator will show.  
Note: Depending on configuration the PTO button on the right side of the screen can be used to engage or disengage PTO.
2. A mode must be selected by pressing the appropriate button (top green on left) this could be rpm mode or pressure mode . Pressure mode will maintain the desired pump pressure even if flow conditions will change.
3. It is now possible to change the engine speed or pressure by using the yellow UP or DOWN arrow buttons.  
Alternatively one of the Presets (orange buttons) can be pressed and the desired value will be adjusted and maintained.  
The actual Pump Pressures will show on the gauges.
4. If necessary the pressure on the HP Hose-reels can be selected by choosing HP to LP options.
5. To control the valves on the installed Hose-reels an OPEN button or CLOSE button can be used.
6. For additional functions refer to the instructions given by the truck builder.

### **2.3.2. During Operation**

- The selected pressure or rpm values will be maintained automatically. Pressures and engine data can be monitored on the screen.
- Selected values can be changed at any time by using the UP or DOWN buttons or selecting another Preset.
- Valves can be controlled at any time, HP – LP may be selected as required.

### **2.3.3. End of Operation**

- Close the necessary discharge valves
- Reduce pump- pressure or engine speed
- Press the IDLE button (lower red button on the left)
- Disengage PTO

## **3. Warning and Error Messages**

### **3.1. List of Warning/Error Messages**

#### **3.1.1. Throttle Interlock is Not Enabled**

This warning will pop up when the user attempts to enter a mode and the Throttle Interlock is not active.

#### **3.1.2. Pump Engaged Interlock Not Enabled**

This warning will pop up when the user attempts to enter Pressure mode and the Pump Engaged Interlock is not active.

#### **3.1.3. Okay to Pump Interlock Not Enabled**

This warning will pop up when the user attempts to enter Pressure mode and the Okay to Pump Interlock is not active.

#### **3.1.4. DM1 Errors**

This warning will pop up when a DM1 error becomes active on the bus and will provide the SPN, FMI, Source address and description of the DM1 being transmitted.

## SmartGOV - Installer Connections

These connection details apply to pumps where a SmartGOV is installed.

Electrical power, and in some instances, compressed air supply to the pump are required for full operation.

There are several connections that the vehicle builder will have to make in addition to connecting to the 26way plug located at the lower left side of the panel.

The electrical and air connections are specified below -

Connection	Location/comment
C13 PDM Power input	Located adjacent to CAFS Manifold. Connect +v to stud with 30A supply
C13 PDM Power output: PTO Engage	Located adjacent to CAFS Manifold. Pin 1. Red/Blue cable pigtail
C13 PDM Power output: Pump tank fill	Located adjacent to CAFS Manifold. Pin 5 Orange cable pigtail
C13 PDM Power output: Auto tank fill	Located adjacent to CAFS Manifold. Pin 8 Blue/White cable pigtail
C7 Overheat Alarm	Pigtail Behind panel. Connect to alarm if required
C15 ECU connection for Analogue throttle, if applicable	Behind panel. 3way sureseal connector
C14 Throttle and pump signal	Behind panel. 2-way sureseal connector, +v input required when active
Engine CAN	3-way Deutsch connector behind panel
Tank level	3m cable to connect to tank level sensor
Vehicle Air. Required if pneumatic valves are fitted	6mm nylon hose behind centre of panel

