Sections in red include options for the SmartCAFS system. Delete the options that are not desired for final specification.

**Compressed Air Foam System**

1. The Compressed Air Foam System (CAFS or CAF System) will be installed on a Hale QmaxXS | Hale Qmax | Hale Qtwo | Hale DSD pump.
2. The CAF System will be controlled by a Class1 UltraView SmartCAFS Controller that actuates an electric Air Ratio Control (ARC) valve which permits the user to make discrete adjustments of CAFS consistency over the full operational range from wet (1:3 ratio) to dry (1:20 ratio). The SmartCAFS Controller is supplied loose and will be mounted by the installer.
3. The SmartCAFS Controller will allow up to ten (10) fully programmable presets that allow the user a single-button-press operation. The presets shall allow configuration of the foam percentage, foam tank selection, and CAFS consistency. The preset indicators will have background color, icons, and text that are configurable by the user through password protected set-up screens.
4. The SmartCAFS Controller shall provide on-screen tutorials to assist the user during calibration.
5. The SmartCAFS Controller shall provide multiple language support.
6. The SmartCAFS Controller will incorporate an air/water pressure duplex gauge which indicates the operational pressure range of the CAF System (75 to 150 psi | 5.2 to 10.3 bar).
7. The SmartCAFS Controller will automatically open the air actuated tank-to-pump valve when the vehicle is placed into pump gear.
8. A Class1 Sentry Pressure Governor and Twister Throttle Control shall be provided for controlling engine rpm/pump pressure. The SmartCAFS Controller will automatically set the Class1 Sentry Governor into the proper operating mode and engine speed when a CAFS preset is selected by the user.
9. A Hale Auto-Fill system will be installed to operate the direct booster tank fill valve. The SmartCAFS Controller will automatically gate the Auto-Fill’s electric Water Tank Refill Valve during CAFS operation to keep the booster tank full when fed with an adequate incoming water supply source (note: a Hale Fill-Thief and Master Intake Valve (MIV) is required to maintain an adequate water supply source).
10. A Hale Fill-Thief and Master Intake Valve (MIV) will be installed on the Hale pump.
11. The CAF System will utilize an integrated air compressor and oil reservoir separator tank assembly mounted to the pump at the factory and tested for reliability and functionality. This assembly will provide a connection on the air discharge piping in order to facilitate the installation of hoses/connectors for air tools and/or fire hose inflation.
12. The CAFS air compressor shall be a rotary screw compressor capable of producing 220 SCFM (6231 LPM) and have a continuous duty rating of 150 psi (10.3 bar). The air compressor will have an automatic pressure tracking system capable of tracking pressures between 75-150 psi (5.2 to 10.3 bar).
13. The CAFS air compressor will be driven by an integrated belt drive system utilizing a herringbone-type drive belt and gears to eliminate any belt slippage and ensure maximum reliability. This belt drive system shall be concealed with a protective cover.
14. The CAF System will use an integrated heat exchanger to ensure proper system cooling during CAFS operation. The heat exchanger shall be capable of 500 psi (34.5 bar) test pressures on the water side to comply with NFPA standards, and 250 psi (17.2 bar) on the air side. This heat exchanger shall be pre-plumbed with the compressor and separator tank at the factory for ease of installation.
15. The CAF System will use an air operated clutch to engage and disengage the CAF System from the main water pump. The air will be supplied to the clutch via an electric solenoid valve and a CAFS enable switch. Truck air is required for proper operation.
16. The CAFS System will include an air sensing valve assembly for use in showing the air flow rate on the SmartCAFS Controller.
17. The CAFS System will include an externally attached mechanical air flow meter for completing annual CAFS Capacity Testing.
18. A Hale EZ-Fill, 5 gpm (12 volt | 24 volt), Foam Refill System shall be installed for refilling the on-board foam cell. The EZ-Fill push-button Smart Switch is used to easily fill or flush the system. The Pickup Wand is attached using a positive seal quick connect fitting and is used to pull the foam concentrate from its container and transfer into the on-board foam cell.
19. The SmartCAFS Controller shall include an over-speed protection interlock to keep the end user from over speeding the compressor and causing damage to the system. The interlock shall keep the clutch from being engaged if input speed conditions are higher than permitted by the system. An audible alarm and visible warning message shall be present to signal the over-speed condition during compressor operation.
20. The SmartCAFS Controller shall include over-temperature protection for the compressor system which will automatically disengage the compressor clutch to protect the CAFS compressor. An audible alarm and visible warning message shall be present to signal the over-temperature condition during compressor operation.
21. The SmartCAFS Controller will monitor the air pressure in the CAF System and will not allow the operator to engage the compressor clutch until the air pressure has dropped to the safe engagement level. A visible warning message shall be present to signal that the air pressure is too high during the compressor clutch engagement request.
22. An air operated “blow down” valve will be installed in the system to relieve pressure in the oil reservoir separator and air compressor. The SmartCAFS Controller will automatically control the “blow down” valve when the CAF System is turned OFF.
23. Four stage static mixing chambers shall be installed on the discharge of the CAF System. These mixing chambers will consist of modular cast sections utilizing integrally cast “fins” for semi-directional motionless agitation of the foam solution and air flow creating the CAFS discharge.
24. The CAF System manifold shall be adequate to carry air at the rated 220 SCFM capacity, carry water at the rated 750 gpm | 1000 gpm capacity, and shall meet all NFPA standards. The compressed air and foam solution pipe work shall be 300 series stainless steel or brass construction and meet all working pressures and maximum expected temperatures.

**Foam System**

1. The foam system shall consist of a 5.0 GPM 12VDC (or) 24VDC electronic foam induction system, for use with Class A and Class B foam concentrates. Total foam concentrate output shall be 5.0 gallons per minute (19 liters per minute) minimum.
2. The system shall be equipped with a Class1 UltraView SmartCAFS Controller as the single point of operation for the CAFS and foam systems. The SmartCAFS Controller will show the water flow per minute, foam percentage, total water flowed, and total foam flowed.
3. The SmartCAFS Controller will maintain a running total of the amount of water and foam used during the current power cycle.
4. The SmartCAFS Controller will allow push-button modification of the foam proportioning rate from 0.1% to 10.0% in 0.1% increments. The SmartCAFS Controller will always begin operation at the preconfigured foam proportioning rate dictated by the preset selected by the user.
5. The foam concentrate pump discharge line shall be equipped with a bubble tight check valve, rated at 500 psi (34 bar) and 10 gpm (38 lpm), to prevent water flow into the concentrate pump from the apparatus fire pump. This valve shall be made from brass or 300 series stainless steel. This valve shall have a cracking pressure of 4-6 psi (0.3-0.4 bar) to prevent flowing concentrate through the pump due to head pressure from the concentrate reservoir.
6. The SmartCAFS Controller will protect the foam pump from being run “dry” by showing a “low foam” warning when the low-level tank switch is activated and only allowing the foam pump to run for another sixty (60) seconds before turning off the foam pump and showing a “no foam” warning.
7. Single tank foam systems shall include flushing capabilities via a three-way flush valve. A switch provided integral to the three-way valve will indicate when the valve is in the “FLUSH” position. The “FLUSH” position will provide fresh water-flushing capabilities to prevent foam concentrate deterioration of the foam pump.
8. Dual tank foam systems shall include a manually operated MDT II dual tank selector valve assembly (or) an air operated ADT dual tank selector valve assembly for switching between A and B tanks. The dual tank selector valve shall have a center selector position to provide fresh water-flushing capabilities to prevent foam concentrate deterioration of the foam pump. The SmartCAFS Controller will inform the user when a “FLUSH” operation is required. The SmartCAFS Controller will not allow the user to flow different types of foam through the system until a “FLUSH” operation is completed.
9. When the manual dual tank selector, single tank flush valve or a single tank system without flushing capabilities is installed a three way bypass valve shall be provided on the discharge of the foam pump to permit operation of the foam concentrate pump for test and calibration purposes without injecting foam concentrate into the water discharge. The bypass valve shall be capable of being panel mounted.
10. In-line, field serviceable foam concentrate strainer(s) shall be installed in the foam concentrate suction line(s).
11. Foam concentrate proportioning systems that use a venturi (either directly or indirectly) to measure water flow, and therefore cause a restriction to that flow, will not be accepted.