



## Preferred Specifications

Document Number	Issue Date	Rev. Date
F-2847	07/18	

# AQUIS™ 3.0

## Fully Integrated Foam Proportioning System

The apparatus shall be equipped with an electronic, fully automatic, variable speed, direct injection and discharge side foam proportioning system. The system shall be capable of handling both Class A and Class B foam concentrate. The foam proportioning system shall operate based on direct measurement of water flows and remain consistent within the specified flows and pressures. System must be capable of delivering accuracy to within 5% of calibrated settings over the advertised operation range when installed according to factory standards. The system shall be equipped with an Operator Interface Terminal (OIT) for installation on the pump panel. Incorporated within the motor driver shall be a microprocessor that receives input from the system flowmeter, while also monitoring foam concentrate pump output.

An Operator Interface Terminal Digital Operation shall be incorporated into the Aquis 3.0 proportioner. This shall allow for push button control of Class A concentrate in infinite increments from .1% to 1% and Class B concentrate in increments of 1%, 3% and 6%, calibration of water flow rate, adjustable units of measure, simulated water flow, optional lockout.

The Operator Interface Terminal Digital Operation shall have a warning of low foam concentration supply that flashes and displays a steady "low concentrate" warning when the concentrate tank runs low. It will also flash a "no concentrate" warning when the concentrate tank is empty and a warning of an electronic malfunction that flashes an "error" warning with associated error code.

The Operator Interface Terminal Digital Operation shall operate in manual mode as a back-up and a separate plate panel with operation instructions is furnished.

An optional remote activation shall be installed to allow foam pump to be activated from an external 12 or 24 volt electrical source such as pump-in gear circuit or engine ignition power which eliminates a step in the foam system operation sequence.

A paddlewheel type flowmeter shall be installed in a brass tee which communicates water flow rate to the microprocessor in the foam pump control box. The brass tees have an external Victaulic groove connection and internal female NPT connection on each end and are available in the following sizes:

- 1.50 in. Inside Diameter (300 GPM / 1135 L/min)
- 2.00 in. Inside Diameter (500 GPM / 1893 L/min)
- 2.50 in. Inside Diameter (750 GPM / 2800 L/min)
- 3.00 in. Inside Diameter (1250 GPM / 4700 L/min)

A simulated flow feature shall be incorporated into the motor driver to simulate an approximate flow value of 100 gpm. This feature is to be engaged or disengaged with a momentary switch and will automatically disengage when the main system switch is turned off.

Cables and wires shall come with the system. Separate industry standard M12 connectors for connection of OIT and flowmeter to foam pump control box. Consists of shielded cables to prevent radio frequency or electro-mechanical interference. Furnished as follows:

- OIT connection to control box: 6 meters long
- Flowmeter connection to control box: 3 meters long
- Foam concentrate tank level switch to foam pump control box: 4 meters long

Optional: Foam tank level switches are optional from Waterous.

A Foam Concentrate Supply Line Strainer shall be installed in the foam concentrate supply line and screens out any concentrate contamination which may harm the foam pump. It shall consist of a 3/4 in. inline wye type brass strainer with a removable screen.

A Foam Concentrate Inject Line Check Valve shall be installed in the foam concentrate inject line and prevents water from flowing back into the foam pump. It shall consist of a 3/8 in. inline brass and stainless steel check valve.

The Operator Interface Terminal shall enable the pump operator to:

- Activate the foam proportioning system
- Select proportioning rates from 0.1% to 1.0% on Class A concentrate and 1%, 3% and 6% on Class B concentrate.
- Calibration of water flow rate.
- Adjustable units of measurement.
- Warnings of low foam concentrate supply: flashes and displays a steady "low concentrate" warning when the concentrate tank runs low. The system will shut down after two minutes. There shall also be a warning that flashes a "no concentrate" warning when the concentrate tank is empty.
- If apparatus has dual foam concentrate tanks, allows selection of tank A or B and displays which tank is in use.
- Operation in manual mode as a backup.

A 12 or 24-volt electric motor driven displacement plunger pump shall be provided. The pump capacity shall be from 0.1 gpm (0.38 L/min) to 3.0 gpm (11.5 L/min) at 150 psi (10 bar) with a maximum operating pressure up to 450 psi (31 bar). The pump shall have the capability to draw 3 foot of lift. The system will draw a maximum of 80 amps for 12 VDC and 50 amps at 24 VDC. The motor shall be controlled by the microprocessor (mounted to the base of the pump). It shall receive signals from the control module and power the 1/2 HP (.4 kW) electric motor in a variable stream. A full flow check valve shall be provided in the discharge piping to prevent foam contamination of fire pump and water tank. A 12 psi (.83 bar) opening pressure check valve shall be provided in concentrate line.

Components of the complete proportioning system as described above shall include:

- Operator Interface Terminal
- Paddlewheel flowmeter
- Pump and electric motor/motor driver
- Wiring harnesses
- Foam injection check valve
- Master waterway check valve

An Aquis 3.0 Foam Proportioning System shall be equipped with a USB interface for PC-connectivity which allows a qualified technician to perform upgrades, diagnostics and monitor system functions in real time. The system can also be remotely monitored through the USB interface using any PC with internet access, allowing technicians to easily connect to the Waterous dedicated website to assure proper operation and to update the foam system hardware by uploading new features and functions as they become available.

Additional components to complete system installation

The Aquis system includes the major components required for installation except for those listed below which are to be supplied by the installer. Some of the components listed below are available as optional add-on items from Waterous.

An optional Master Waterway Check Valve shall be available for the Aquis 3.0 Foam Proportioning System. It shall be installed in water line from the fire pump and prevents foam solution (concentrate and water) from contaminating the fire pump and water supply. Use a full bodied check valve with an appropriate pressure rating. Note that foam concentrate injection must occur downstream of this valve. Waterous offers a 2.5 in. iron manifold with integral check valve and flowmeter. This simplifies installation as flowmeter and waterway check valve installation is accomplished with one component. When ordered, a flowmeter and tee is not furnished and a separate Waterway Check Valve is not needed.

A Foam Concentrate Tank shall be available for the Aquis 3.0 Foam Proportioning System. The Foam Concentrate Tank shall be supplied that suits the application and meets the needs of the end user. The tank shall meet the minimum requirements as published in applicable NFPA apparatus standards. Tank should have a valve which allows the foam supply to be shut off for maintenance of the foam pump and cleaning of supply line screen. Tank is not available from Waterous. The optional Waterous Foam Concentrate Supply Line kit includes a foam tank shut off valve.

A Foam Concentrate Tank Level Switch shall be available for the Aquis 3.0 Foam Proportioning System. It shall be installed on-board foam concentrate tank to communicate low concentrate level to foam pump.

A Foam Concentrate Supply Line shall be available for the Aquis 3.0 Foam Proportioning System. Hoses and fittings that run from the foam tank to the foam pump inlet should be a minimum 3/4 in. inside diameter hose. Hose and fittings must be rated for a minimum of 23 in. Hg (0.78 bar) vacuum and 50 psi (3.45 bar) of pressure. The hose and fittings must be made of corrosion resistant material and be compatible with the foam concentrate to be used. Foam supply hose shall have a reinforced clear wall as required by NFPA to allow viewing of foam pump priming operations. Available as an optional Foam Concentrate Supply Line kit. Note that this kit also includes a foam tank shut-off valve.

A Foam Concentrate Inject Line shall be available for the Aquis 3.0 Foam Proportioning System. Hoses and fittings that run from the foam pump to the foam injection point in the water line from the fire pump should be a minimum of 3/8 in. inside diameter hose. Hose and fittings must be rated for a minimum of 450 psi (31 bar). The hose and fittings must be made of corrosion resistant material and be compatible with the foam concentrates to be used. The injection point must be on the downstream side of the check valve installed in the water line from the fire to prevent foam contamination of the fire pump and water supply. The 3/8 in. check valve supplied with the foam pump must be installed in this line to prevent water flowing back into the foam pump. Available as an optional Foam Concentrate Inject/Bypass Hose kit.

A Bypass Line shall be available for the Aquis 3.0 Foam Proportioning System. This hose is used for pumping concentrate into a container to empty the foam tank or to assist in priming the foam pump. The hose and fittings may have a lower pressure rating since the end of the hose is left open to the atmosphere and will not receive high pressures. Available as part of optional Foam Concentrate/Bypass Hose kit.

Optional:

A foam tank switch shall be available to be installed in on-board foam tank to communicate low concentrate level to foam pump. A 24-in. long wire shall be included. It is available for side mount in tank and top or bottom mount in tank.

A full bodied, brass Master Waterway Check Valve shall be available to be incorporated into the Aquis 3.0 proportioner. It shall include a foam concentrate injection port on the downstream side. It shall be available in the following sizes and end connections:

- 1.5 in. Victaulic Inlet x FNPT/Victaulic Outlet
- 1.5 in. FNPT Inlet x FNPT/Victaulic Outlet
- 2.0 in. Victaulic Inlet x Victaulic Outlet
- 2.0 Victaulic Inlet x FNPT Outlet
- 2.5 in. Victaulic Inlet x Victaulic Outlet
- 2.5 in. Victaulic Inlet x FNPT Outlet
- 3.0 in. Victaulic Inlet x Victaulic Outlet
- 3.0 in. Victaulic Inlet x FNPT Outlet

A Manifold with Flowmeter and Check Valve shall be available to be incorporated into the Aquis 3.0 proportioner. This shall consist of a 2.5 in. inside diameter iron manifold with built-in check valve and flowmeter. A Flowmeter Tee is not furnished and a separate Waterway Check Valve is not needed. A Manifold with Flowmeter and Check Valve shall be available in the following sizes and end connections:

- 1.5 in. FNPT / 2.0 in. Victaulic Inlet and Outlet
- 2.0 in. FNPT / 2.5 in. Victaulic Inlet and Outlet
- 2.5 in 4-Bolt Flange Inlet and Outlet
- 2.5 in. 4-Bolt Flange Inlet and 2.0 in. FNPT / 2.5 in. Victaulic Outlet
- 2.5 in. 4-Bolt Flange Inlet and 2.5 in. FNPT / 3.0 Victaulic Outlet

A Foam Concentrate Supply Hose Kit shall be available to be incorporated into the Aquis 3.0 proportioner. It shall provide hoses and fittings to bring foam concentrate from an on-board tank to the foam pump. A foam concentrate tank shut-off valve shall also be included.

A Foam Concentrate Inject/Bypass Hose Kit shall be available to be incorporated into the Aquis 3.0 proportioner. It shall provide hoses and fittings to bring foam concentrate from the foam pump to the injection point, and hose and fittings from foam pump to atmosphere (bypass).

A OIT/HMI Extension cable shall be available as an option on the Aquis 3.0 proportioner. It shall be available in both 3 and 6 meter lengths.

A Flowmeter Extension Cable shall be available as an option on the Aquis 3.0 proportioner. It shall be available in a length of 3 meters.

A Tank Level Switch Cable Extension shall be available. It shall be available in a 4-meter length. A Foam System Rating Panel Plate shall be available. It meets requirements of NFPA 1901 and 1906. A Foam Fill System shall be available. It shall be used for filling an on-board foam concentrate tank from an overboard pail or tank. It shall consist of a pump, panels, two tank level switches and an overboard pick-up hose with a stainless steel wand.

A Dual Operator Interface Terminal Kit shall be available to be incorporated into the Aquis 3.0 proportioner. It provides and additional OIT and cables if foam pump is to be operated from two locations. All functions are available at both locations. An Overboard Foam Pick-up Kit shall be available to be incorporated into the Aquis 3.0 proportioner. It allows foam concentrate to be drawn from an external overboard pail/tank. It shall include a pump, panel connection, fittings and hoses including a foam pick up hose. If the Overboard Foam Pick-up Kit is used in conjunction with an on-board tank, a Dual Tank Selector Kit is also required.

A Foam Pick-up Hose shall be available to be incorporated into the Aquis 3.0 proportioner. It is used to transfer foam concentrate from external containers to the foam pump or an on-board tank. The following sizes are available:

- 3/4 in. x 10-foot hose with stainless steel wand
- 1 in. x 10-foot hose with stainless steel wand

Optional:

A Dual Foam injection kit shall be available to be incorporated into the Aquis 3.0 proportioner. It allows for foam concentrate to be injected at two locations. It shall consist of an electric 3-way valve, control panels and fittings. A Run Logic Module shall be available to be incorporated into the Aquis 3.0 proportioner. If *Remote Activation* feature of foam pump is being used and Dual Operator Interface Terminal panels are not being used, allows OEM to install a switch to activate the foam pump and a light to indicate it is operational. A Panel Mounted Foam Concentrate Strainer shall be available to be incorporated into the Aquis 3.0 proportioner. It shall be used in place of foam supply line in-line strainer furnished with system. It moves strainer to the operator's panel which allows easier access for maintenance.