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Installation & Maintenance Manual

Series 5010 Wash System

Two Additive Tanks

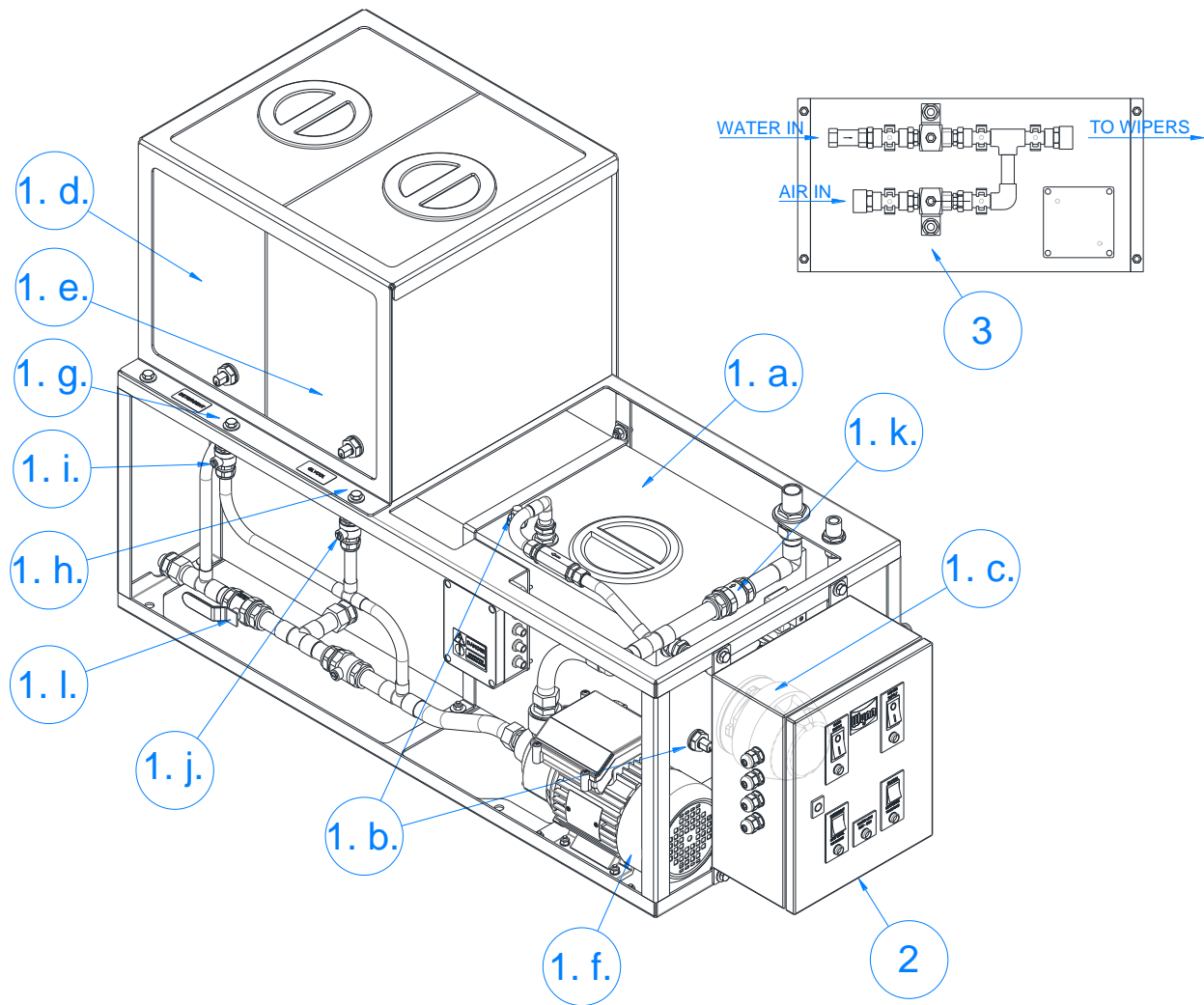
Issue 1

WARNING: A suitably qualified person should perform all installation and maintenance. All electrical wiring should be carried out in accordance with relevant regulations. Ensure all products are correctly earthed and all connections are made in accordance with the wiring diagram. Non-compliance may result in damage, malfunction or personal injury. Before commencing any installation or maintenance work, ensure that the electrical supply is disconnected.

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DESCRIPTION OF THE WINDOW WASH SYSTEM



The Window Wash System consists of a galvanised steel frame enclosing all containers, pipe work, valves and electrical controls required to provide a window washing function. The complete frame may be mounted to the deck.

The Wash system is supplied with water from the ship's fresh water system, the water then being held in a storage tank mounted in the frame that is topped up automatically. A high pressure boost pump draws water from this storage tank and delivers it through piping to groups of external nozzles above or below the bridge windows to remove salt deposits, grease and general debris in conjunction with the ship's window wipers.

These wash pipes and nozzles may be purged with compressed air after a wash cycle.

To cope with poor weather or operating conditions customers have the option to heat the water in the water tank as well as mixing detergent and/or glycol (anti-freeze) additives into the wash. Containers for these additives are mounted on the frame and are filled by hand.

A local control box mounted on the Window Wash System contains the necessary 24 Volt supply, Terminations, Relays and Circuit breakers to operate the Window Wash System. The Front Panel of this contains the switches and circuit breakers to control power, heat and additives.

In order to remotely control the Window Wash System, a switch incorporated in the bridge wiper control keypad selects wash operation. A wash control interface unit can be supplied to provide control from a 6000 Series Network Control System or an 8000 Series Network Control System.

Where wipers are not fitted, a dedicated switch on the bridge may control the wash system.

The Window Wash System consists of the following items:

1. Wash system module to supply up to 10 nozzles simultaneously consisting of:
 - a. Wash water storage tank
 - b. Float switch unit in wash water tank with dual switching facility to operate solenoid valve supplying fresh water from ship's cold water system to the wash water storage tank
 - c. Water tank immersion heater with an adjustable thermostat (if this option is fitted)
 - d. Additive tank for Glycol (Anti-freeze) or Detergent
 - e. Additive tank for Glycol (Anti-freeze) or Detergent
 - f. Motor-driven wash pump with isolating valve
 - g. Additive 1 solenoid valve
 - h. Additive 2 solenoid valve
 - i. Additive 1 flow valve
 - j. Additive 2 flow valve
 - k. Non-return valve in pump discharge line
 - l. Drain valve for Storage Tanks and Pump
2. Window Wash Control Box with relays, contactors and fused power supply terminals. Front panel control switches and indicators for water and additive injection.
3. Water/Air Purge Solenoid Valve Plate Assemblies (if this option is fitted)
4. Nozzles (Quantity Optional)
5. Wash Control Interface Unit Panel (if this option is fitted)

TECHNICAL SPECIFICATION OF WASH SYSTEM

Liquid Storage Tanks for wash water, anti-freeze and detergent additives

Capacity	Wash water tank	60 litres
	Additive tank	30 litres each
Material	Polyethylene	

Immersion Heater fitted to wash water storage tank (if option is fitted)

Capacity	3kW
Voltage	115/230V single phase $\pm 10\%$ 50Hz/60Hz
Immersed length	280mm (3kW))
Thermostat	Adjustable range 5° to 80° C with auto reset

Wash Pump

The pump is designed to operate up to 80° C.

It has an output of approximately 35 Litres/min with a 5 meter head at 5bar and a maximum working pressure of 6 bar. The pump complies with ISO 2548 Class C Annex B.

Wash Pump Motor

The motor is a constant speed totally enclosed fan cooled single-phase motor. Insulation is to Class F and the protection to IP44 with automatic thermal overload. The motor is further protected by an overload circuit breaker within the Wash System Control Panel.

Motor Specifications

Model	Hz	Voltage	Full load Current	HP	KW	Weight (Kg)
5010-121-115-50	50	115 AC	7.4A	0.8	0.6	9.5
5010-121-115-60	60	115 AC	5.5A	0.8	0.6	9.5
5010-121-230-50	50	230 AC	3.8A	0.8	0.6	9.5
5010-121-230-60	60	230 AC	4A	0.8	0.6	9.5

Wash System Connections

Fresh water feed is ½" BSP parallel male connection.

Wash system outlet to wash nozzles is ¾" BSP parallel male connection.

Optional mounting plate has ½" BSP tapered female connections.

Solenoid Valves – Glycol (Anti-freeze) and Detergent

Two solenoids supply additives from the relevant tank, each solenoid being located below each tank. The solenoids are replaceable without tools.

Solenoid Valves – Water and Air Purge

An optional Water/Air Purge Solenoid Valve Plate Assembly is available with water and air purge valves fitted along with a wiring termination box.

INSTALLATION OF WINDOW WASH SYSTEM

General



Caution: The position of the Wash System Module **must allow easy access to all the equipment** within the module for maintenance or repair and manual filling of additive storage tanks. 2-3 feet around the sides is suggested.

Caution: A ground cable must be fitted to the sledge

In order to install the system, the following items are required:

1. Wash system water piping (with insulation as required)
2. Suitable pipe work and fittings for wash nozzles
3. Clean fresh water supply to storage tank
4. Ship's drain for draining storage tanks and pump
5. 115V or 230V AC single phase 50 or 60Hz fused electrical supply
6. Control cabling from Bridge Wiper Control system to Wash Control Interface Unit.
7. Control cabling from Wash Control Interface Unit to Window Wash System Control panel.
8. Control cabling from control panel on Window Wash System to Wash Remote Manifold assembly (if fitted).
9. Compressed air supply (max 7bar) and necessary pipe work to Wash Remote Manifold Assembly (if fitted) via a stopcock.

Wash Sledge Installation

1. Mount the Window Wash System in a suitable location. Adequate room around the Wash System should be left for maintenance. It is suggested that 2-3 feet around the sides are left to enable access to water pipes, pumps, valves etc.
2. Connect a suitable clean (filtered) water supply to the Window Wash System fresh water feed ½" BSP parallel male connection.
3. Connect the appropriate single-phase supply to the Window Wash System Control Panel.

Wash Remote Manifold Assembly

1. Mount the Water/Air Purge Solenoid Valve Plate Assemblies in the required locations.
2. Connect the water line from the Window Wash System to the input of the non-return valve connected to the wash solenoid valve.
3. Connected the compressed air supply (max 7bar) to the input of the purge solenoid valve.
4. Connect the output of the Wash Remote Manifold Assembly to the pipe to the wash nozzles.
5. Connect the wiring from the solenoid junction box to the wiper control system or Wash Control Interface Unit as necessary.

OPERATION OF WINDOW WASH SYSTEM

This requires two men, one on the bridge and one with the wash system. If possible, it is preferable to test the system with water only and then with additives if these options are fitted.

Commissioning Water only

1. Install the Window Wash System according to the Installation procedures and connect to suitable bridge control system or bridge control switch.
2. Set the Window Wash System Isolating Valves to the following settings – see System Drawing for reference.

Drain Valve	Closed (OFF)
Pump Output Valve	Open (ON)

3. Set all Control Panel Switches to the OFF position.
4. Ensure that the water supply is connected and made available to the System. Inspect for any leaks and fix if necessary.
5. Apply mains power to the System.
6. Switch the Wash Supply ON. The switch light should come on to show power is available. The tank fill solenoid valve will activate and the tank begins to fill automatically.

Note: The Water Low Cut-Out warning light on the Control Box Front Panel will be on until the water tank fills to about 25% of capacity. Power to the wash boost pump will be inhibited to prevent it running dry until the tank reaches this capacity.

7. Inspect for any leaks and fix if necessary.
8. Once full, the tank fill solenoid will turn off the water supply automatically.



WARNING: Do not start the wash pump unless the wash water tank is at least $\frac{3}{4}$ full.

WARNING: The wash pump must never run dry.

WARNING: Do not start the wash pump more than 30 times in 1 hour.

9. From the Bridge Control System select the Wash function for a window or group of windows.
10. The Window Wash System will open the appropriate solenoid valve start the pump to supply water for the set period of the wash cycle. At completion of the wash cycle, the pump will stop. The air purge solenoid will automatically open for the set period of the air purge cycle and water will be purged from the pipes and nozzles. At completion, the Wash Valve and Purge Valve will close.

Commissioning Additives

1. If Glycol or Detergent options are present, switch the relevant Control Box Front Panel switch ON.
2. The warning light on the control switch will come on, indicating that the additive tank is below 25% full. Additive solenoids are inhibited from operating until the tank has sufficient additive.
3. Fill the appropriate tank with the correct additive. Once the 25% level is reached, the warning light will go off. Inspect for any leaks and fix if necessary.

4. If either of the additive storage tanks level drops below about 10% of capacity, the relevant low-level switch will close the additive supply solenoid valve to prevent air entering the wash pump suction line and a red indicator will light on the Window Wash System Control Panel.
5. Repeat the previous test, this time the additive solenoid will also open for the wash cycle period and the additive is drawn into the water stream automatically.
6. In order to adjust the volume of detergent drawn into the water, adjust the needle valve directly below the relevant additive tank. Rotating anti-clockwise increase the amount of detergent.
7. In order to adjust the volume of Glycol drawn into the water, adjust the ball valve directly below the relevant additive tank. Rotating anti-clockwise increase the amount of glycol.
8. To test the heater, turn the Heater switch on the Control Box Front Panel ON. It will take approximately 20-30 minutes for a full tank to reach maximum temperature, but a noticeable difference to the wash tank temperature will be seen after 10 minutes.
9. The maximum temperature is set to a nominal 65°C. If required this may be reduced, but should not be increased as the water tank is not rated at higher temperatures. In order to adjust this temperature, remove the plastic cover from the heater element and reduce the rotary selector switch (see drawing).

MAINTENANCE OF THE WASH SYSTEM EQUIPMENT

General

The Wash System will be used for very short and infrequent periods and therefore maintenance will consist mainly of inspection for corrosion and general deterioration rather than for wear. It is recommended that the following maintenance procedures be included in the overall ship's planned maintenance system.

Adequate room around the Wash System should be left for maintenance. It is suggested that 2-3 feet around the sides are left to enable access to water pipes, pumps, valves etc.

Nozzles

Alignment and spray pattern of each nozzle should be checked weekly by operating the wash system and checking each nozzle's performance. A poor spray pattern will be usually due to fouling of the nozzle orifice by the growth of natural organisms or by debris having passed through the piping and becoming trapped in the nozzle orifice.

Solenoid valves

These valves are similar and require no maintenance other than a 12 monthly external inspection for signs of leaks, security of fastenings and loose connections.

Wash Pump

The pump has pre-packed bearings and the only internal maintenance required should be an inspection of the mechanical seal and impellor every 24 months. The pump and adjacent piping, fastenings, etc should be inspected every 6 months for leaks, security and deterioration.

Wash Pump Motor

The motor is an induction type and totally enclosed with pre-packed bearings. No maintenance should be necessary other than an external inspection every 6 months of mounting fastenings, electrical cabling and glands for security and deterioration.

Liquid Containers

The containers are constructed of a non-corrodible material and their structure should require no maintenance. Security of piping connections, fastenings and cable connections, etc should be inspected every 6 months

The 3 containers should be drained down every 12 months and internally inspected for deposits and growth of organisms. If any is found the container should be removed and rinsed with fresh water. Container screw caps and aperture seals should be examined for security and deterioration and renewed as necessary.

Immersion heater (if option is fitted)

Every 3 months

1. Inspect the unit overall for leaks, fastener security and any deterioration.

Every 6 months

1. Remove the terminal cover and check the box is dry and clean and that all connections are tight.

Every 12 months

1. Check the element resistance is at least 2 mega ohms and check the continuity of all elements.
2. Check and renew the cover gasket when necessary.



Caution: If the heater is not used for 3 months or longer, carry out the 3 and 6 monthly maintenance routines before use.

System valves (auto/hand operated)

The following valves require no maintenance other than being worked through their full range and an inspection every 12 months for leaks, security of connections, glands, fastenings, etc:

1. Non-return check valves (2)
2. Anti-freeze metering valve (if option is fitted)
3. Detergent metering valve (if option is fitted)
4. Wash water tank drain valve

System piping and fittings

The wash system module piping and associated fittings are made from non-corrodible materials and should require no maintenance other than an inspection every 12 months for leaks or deterioration, pipe connection and support fastening security, etc.

WASH SYSTEM FAULT FINDING

NOTE: This fault finding guide assumes a reasonable level of technical ability and should be carried out by a suitably qualified person.

Problems: Wash water does not spray windows when switched on by control keypad.

Possible Cause	Solution
The wash pump is not running.	<p>Check Wash Control system on Bridge is functioning – see appropriate Control Module fault Finding guide.</p> <p>Check the ship's 115/230V supply to Window Wash System and ensure Wash switch is selected..</p> <p>Verify power is available at motor with meter when wash function is selected. Check pump/motor for mechanical freedom. If rotor is stiff to rotate, replace pump/motor unit.</p> <p>If motor running but no water being pumped, bleed the pump by unscrewing the top bleed nut.</p>
The wash water control solenoid valves are not open	<p>Check Wash Control system on Bridge is functioning – see appropriate Control Module fault Finding guide.</p> <p>Check the ship's 115/230V supply to Window Wash System and ensure Wash switch is selected.</p> <p>Check valve solenoid coil continuity with resistance meter. If continuity is fine but still not working, replace valve.</p>
The wash water tank is empty	<p>Check vessel's water supply. Restore if OFF</p> <p>Check the ship's 115/230V supply to Window Wash System and ensure Wash switch is selected.</p> <p>Check Water Fill Valve solenoid coil continuity with meter. If continuity is fine but valve not opening, replace valve.</p> <p>Check operation of vertical float switches and ensure free float mechanism as necessary. If float or switches is not working, replace switch unit.</p>
A pump isolating valve is shut	Open isolating valve(s)

Problems: Air purging does not operate after wash water spray stops

Possible Cause	Solution
No air supply from ship's compressed air system	Check ship's air supply. Restore as necessary
Air purge solenoid valve not opening	<p>Check the ship's 115/230V supply to Window Wash System and ensure Wash switch is selected.</p> <p>If 115/230V is present, check output to solenoid valve. If all control output are working, check valve solenoid coil continuity.</p> <p>If continuity is OK, replace valve.</p>

Problems: Additive injection function does not work when switched on.

Possible Cause

Solution

Additive tank is empty

Fill tank with correct additive

Additive supply solenoid valve not opening

Check ship's 115/230V supply is present. Restore as necessary.

If power is present, check solenoid coil continuity.

If coil continuity is OK, replace valve.

Additive metering valve not adjusted correctly

Adjust metering valve setting as necessary

Problems: Wash water is not heated when heater is switched on

Possible Cause

Solution

Ship's 115/230V power supply failure

Check ship's 115/230V supply to Window Wash System is present. Restore power as necessary

Thermostat set incorrectly /defective

Check thermostat setting, if incorrect reset.

Check thermostat continuity with resistance meter. If not working, replace thermostat

Immersion heater defective

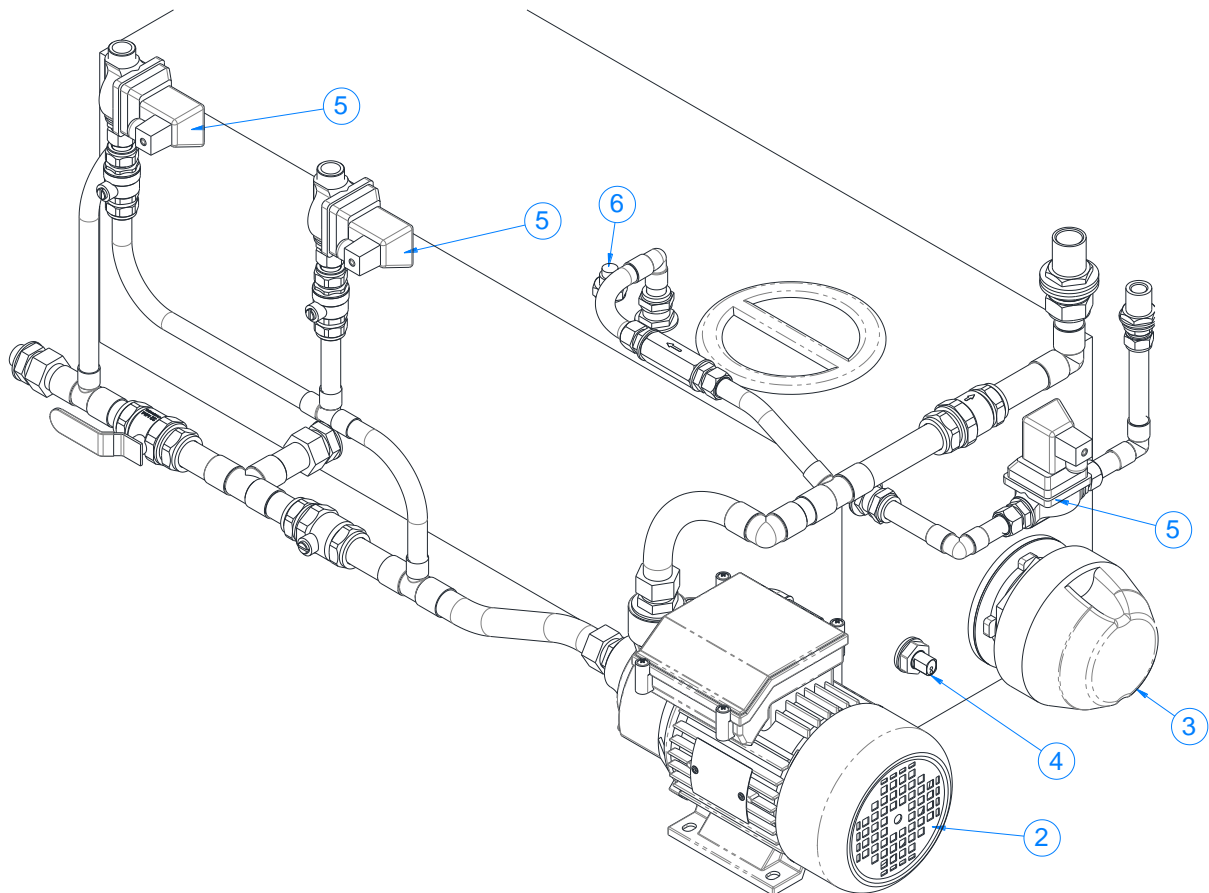
Check element continuity with resistance meter. If not working replace heater complete

WASH SYSTEM SPARES

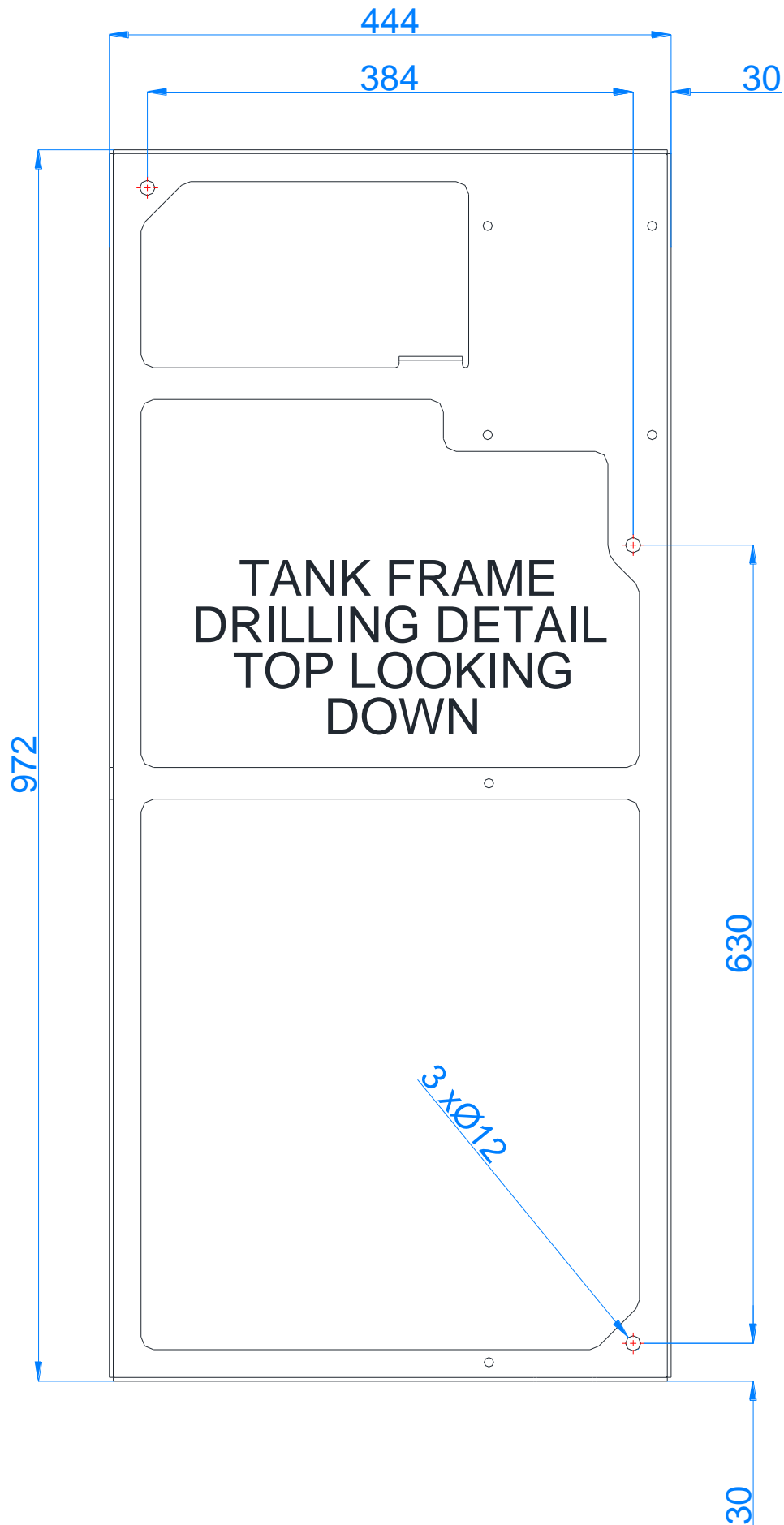
A recommended spares list for the Wynn Window Washing System supplying 10 nozzles is shown below. It is recommended that in order that ship's staff can undertake maintenance and repairs to Wynn Marine equipment, this manual should be kept safely and up to date with a complete stock of recommended spare parts maintained on board.

N.B. Spares holdings should be multiplied by the number of wash modules installed.

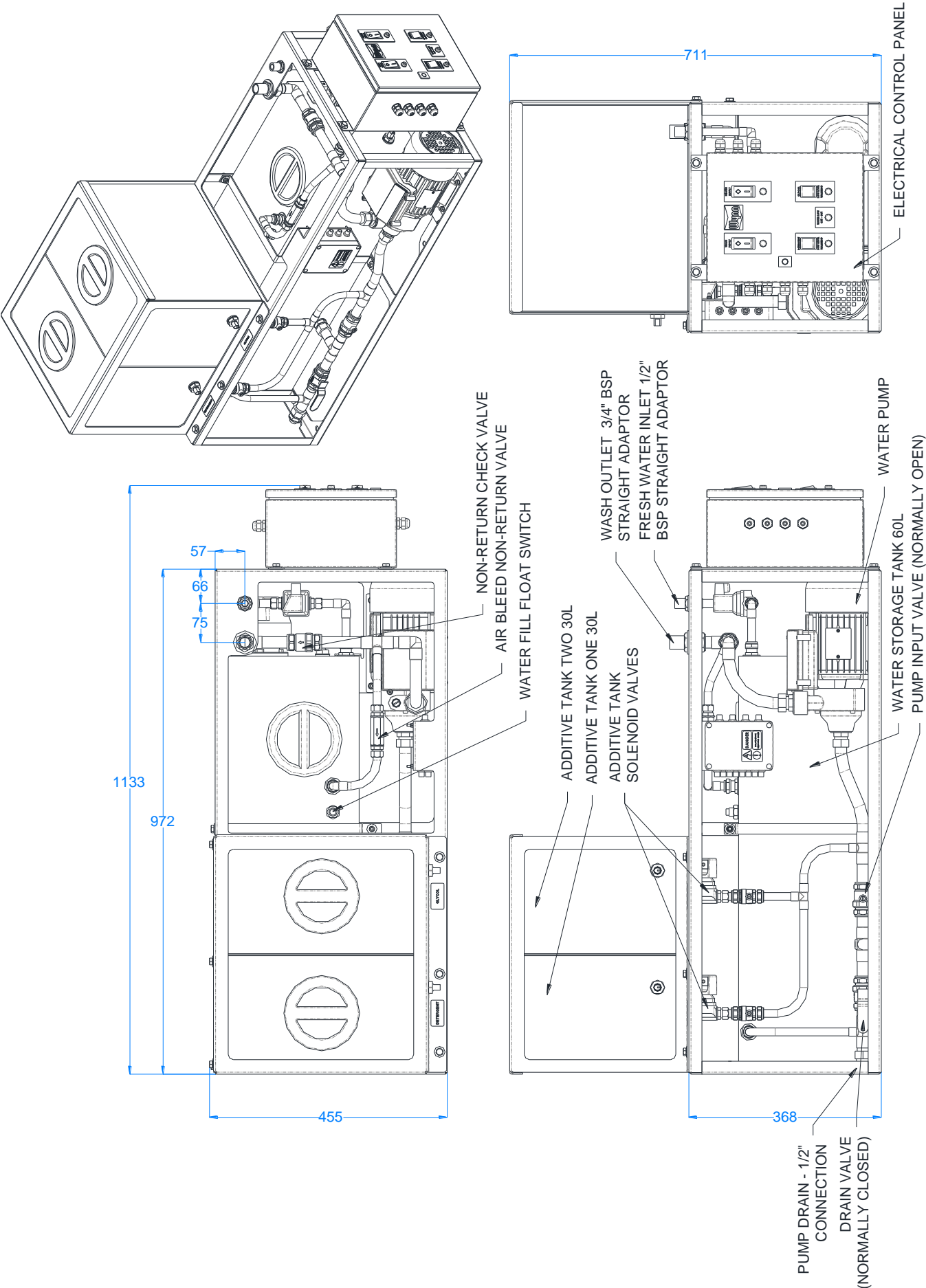
Ident	Description	Quantity	Part Number
2	Wash Boost Pump 110V 50Hz	1	5010-121-110-50
	Wash Boost Pump 110V 60Hz	1	5010-121-110-60
	Wash Boost Pump 230V 50Hz	1	5010-121-230-50
	Wash Boost Pump 230V 60Hz	1	5010-121-230-60
3	Immersion Heater 230V	1	5010-120-230
	Immersion Heater 110V	1	5010-120-115
4	Float Switch Horizontal	3	5010-119
5	1/2in Solenoid Valve Assembly	3	1588-694-24VDC
6	Float Switch Vertical	1	5010-118



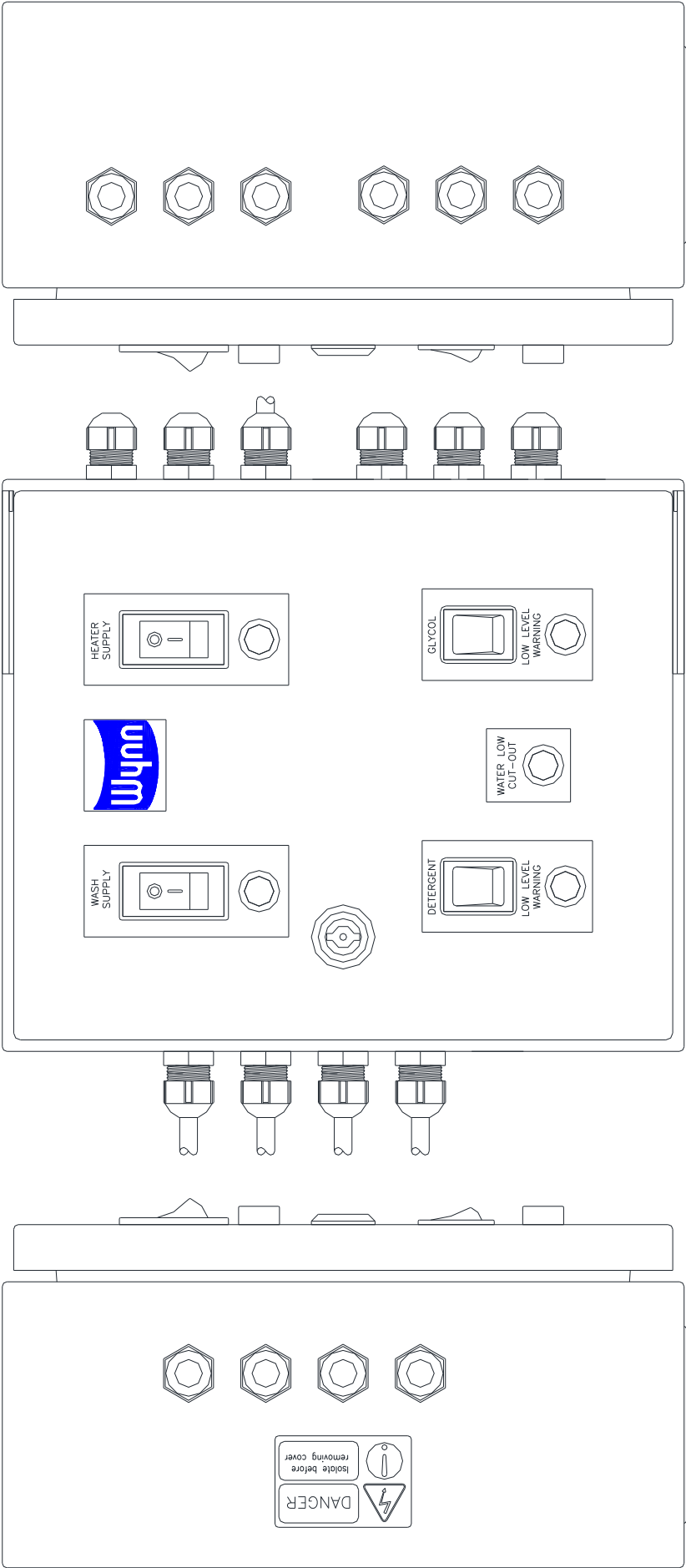
WINDOW WASH SYSTEM MOUNTING LOCATIONS



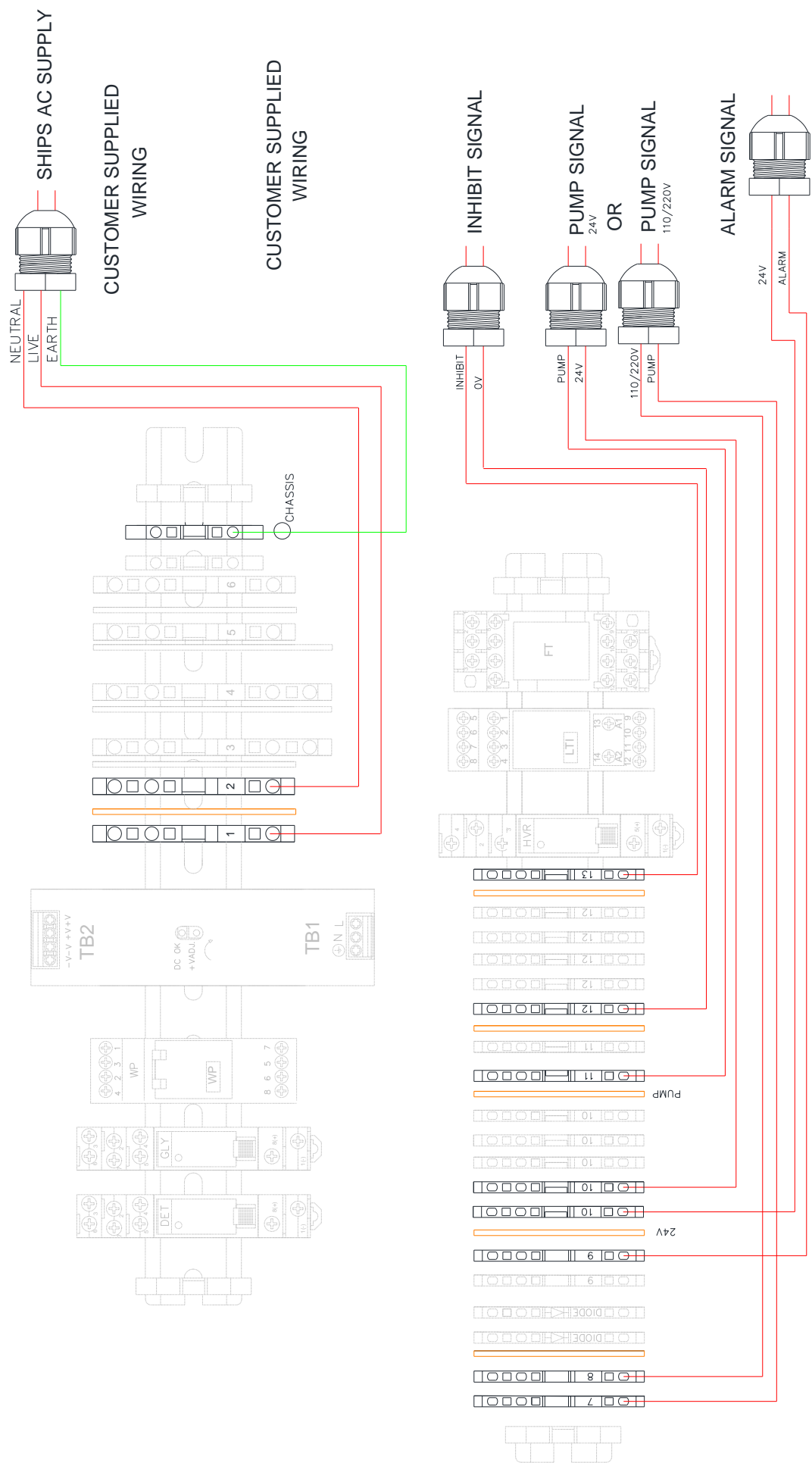
WINDOW WASH SYSTEM



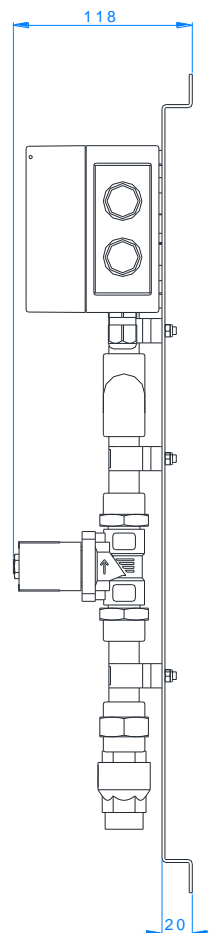
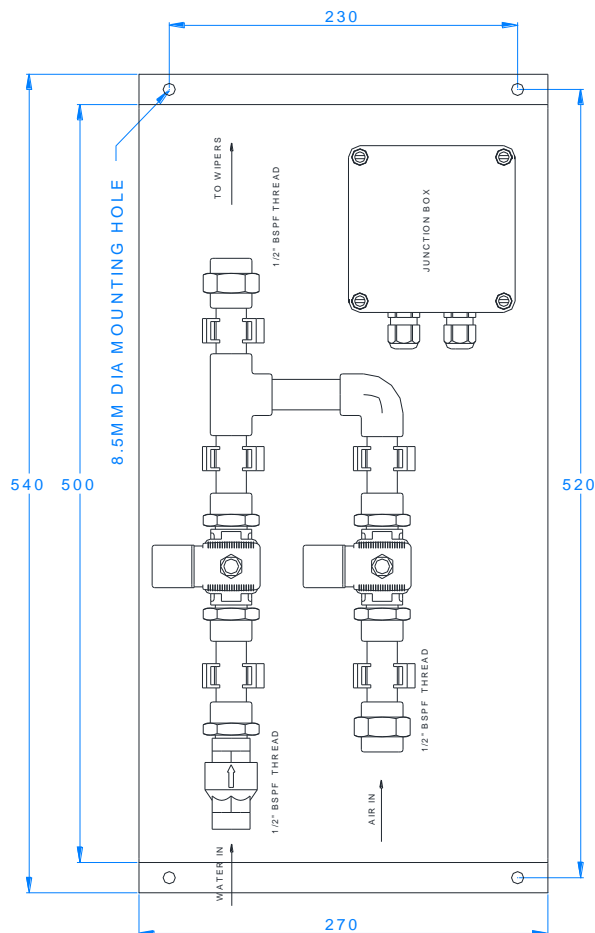
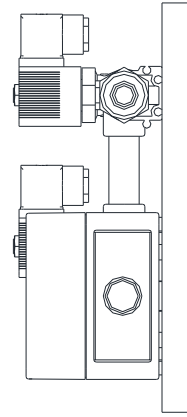
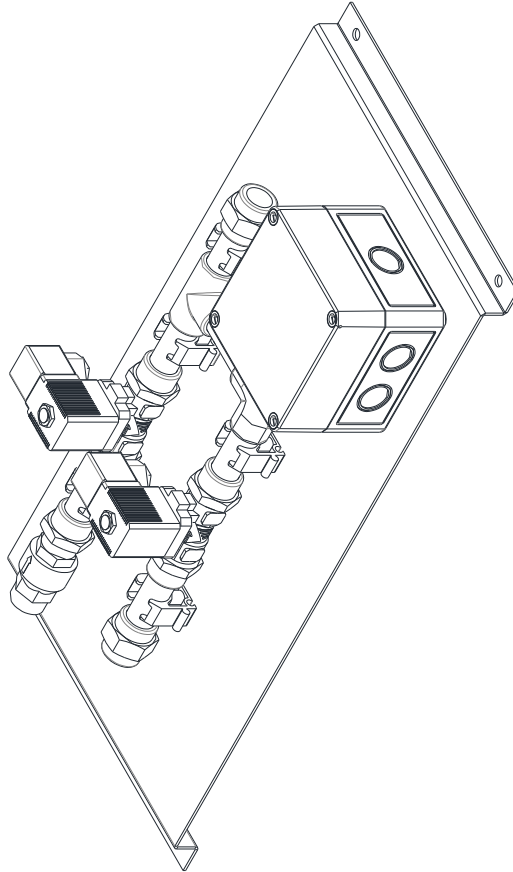
WASH SYSTEM CONTROL PANEL – 2 ADDITIVE



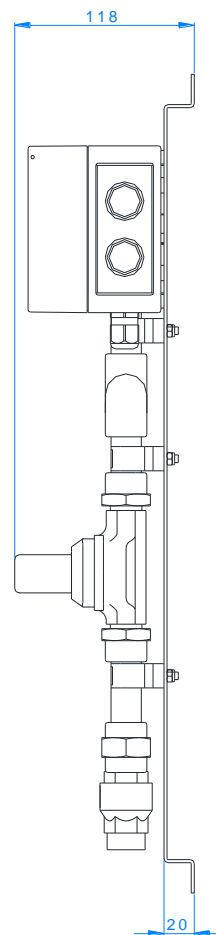
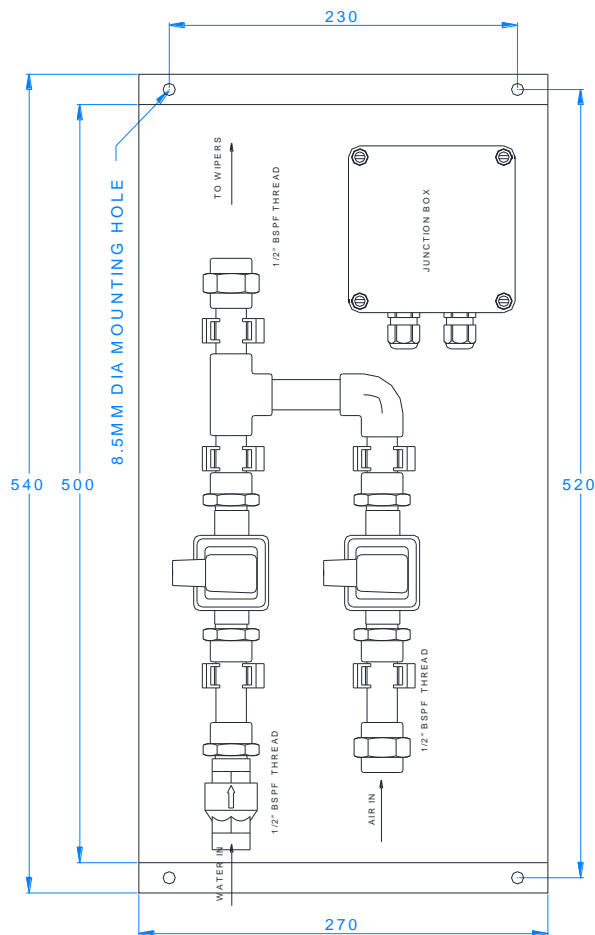
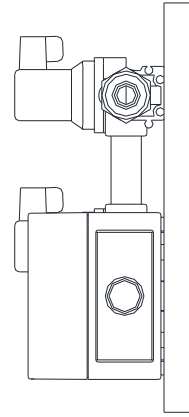
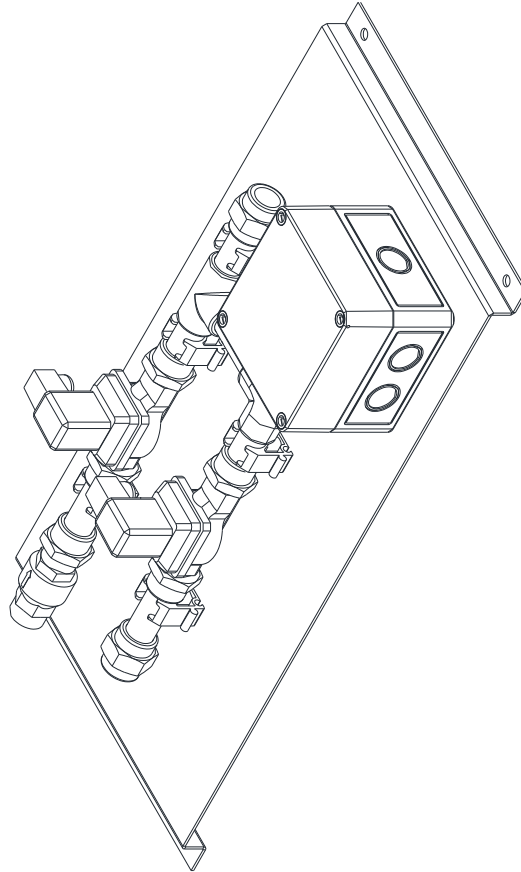
Customer Wiring



SOLENOID VALVE PLATE – 230V



SOLENOID VALVE PLATE – 115V



DOCUMENTATION

Whilst every effort is made to provide accurate information in good faith, no responsibility can be accepted by Wynn for inaccuracies and Wynn reserves the right to alter and amend specifications and designs without prior notice in line with our policy of continued improvement.

Spares Parts

To enable technical troubleshooting and ordering of spare parts, this manual should be kept in a safe place on board. It is also advisable to keep one set of spare parts on board for emergency use. Please contact Wynn directly or your local distributor / service centre for all order requirements.

Maintenance Schedules

Plan your maintenance work according to the schedule in this manual.

Our Commitment

We are committed to a 10 year product support programme. This ensures that any spare part will be available for any wiper at least 10 years after its purchase. It is strongly recommended that only genuine replacement parts manufactured by WYNN be used. This will guarantee that only suitable materials have been used and will ensure interchangeability of parts.

Quality and Testing

We are committed to the principles of Total Quality Management, ISO 9000. We manufacture our range of marine products to the highest standard and quality. We therefore maintain an ongoing schedule of product improvement and testing. To help us sustain such standards we maintain a salt-water test rig on which our products are taken, at random from the production line, and subjected to 3,000 hour continuous testing. We are sure you will receive many years trouble-free service from your Wynn product and hope you find this information pack comprehensive.

Guarantee

All Wynn equipment is tested before despatch from our works. The Windscreen Wiper System supplied has a 1 year warranty period provided the installation of the system and the subsequent maintenance is in accordance with the installation/maintenance instructions.

We cannot accept any responsibility for the installation of equipment, or damage to the equipment during installation, or normal wear and tear. The guarantee is negated if the equipment is not installed strictly observing the instructions set out in this manual, or not maintained as specified.

The Wiper System is very reliable but to ensure its continued smooth running we recommend that the following guidelines are adhered to:-

Monthly

- Check for wear on all parts subject to friction
- Visual inspection should be made of the blades to ensure that they are still in good condition and replace as soon as there are signs of wear or damage

Annually

- It is recommended that the blades are changed every 12 months

After the Wiper System has been operating in severe weather conditions it is advisable to thoroughly check the unit for signs of wear or damage.

This warranty excludes the wiper blades which are a consumable item and any replacements that are detailed in the manual as part of any regular maintenance requirement.

This guarantee is expressly in lieu of all other guarantees expressed or implied and of all other obligations or liabilities on our part, and we neither assume nor authorise any other person to assume for us any other liability in connection with the sale of our equipment. Faulty equipment must be returned, carriage paid, to our works for examination. Any legal action must be settled in the English courts under English law.

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A worldwide network of agents supports Wynn's Marine product range. For details of the nearest Wynn agent please contact our Head Office. Wynn Agents operate in the following countries.

Argentina, Australia, Brazil, Canada, Chile, China, Croatia, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, Iceland, India, Israel, Italy, Japan, Korea, Netherlands, New Zealand, Norway, Oman, Peru, Poland, Portugal, Russia, Singapore, South Africa, Spain, Sweden, Taiwan, Turkey, Ukraine, U.S.A.



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