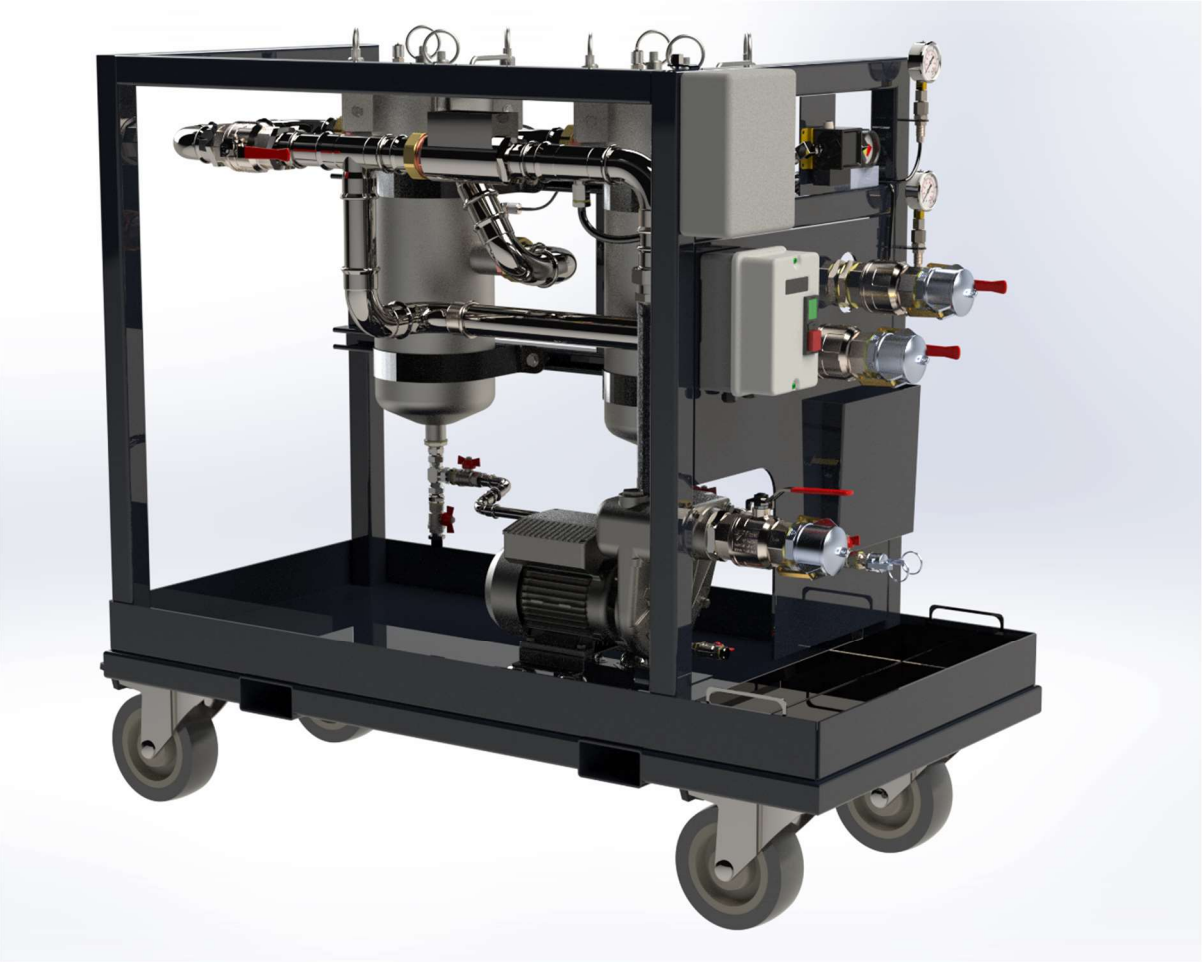
DDM3 SPECIAL. P-0125
OPERATION & MAINTENANCE MANUAL



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Revision History

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October 2019	FIRST ISSUE	1

Exclusion of Liability

In no event will the manufacturer be liable for direct, indirect, special, incidental or consequential damages resulting from any defect or omission in this manual. The Manufacturer reserves the right to make changes in this manual and the products it describes at any time, without notice or obligation. Revised editions are found on the manufacturer's website.

Please read this entire manual before unpacking, setting up or operating this equipment. Pay attention to all **IMPORTANT**, **WARNING** and **CAUTION** statements. Failure to do so could result in serious injury to the operator or damage to the equipment.

Make sure that the protection provided by this equipment is not impaired. Do not use or install this equipment in any manner other than that specified in this manual.

CONTENTS

INTRODUCTION

Scope and definition

This manual provides operation and maintenance instructions for the system. You must use the system as described in this manual. Read this manual before you install, operate and maintain the system.

Important

The system is available in various forms such as in a GRP enclosure or frame mounted. The images included in this manual are representative of the system only. The final unit may differ to the images shown. However, the operational instructions remain the same for every variant of the system.

Warnings and Cautions

Important safety information is highlighted as **WARNING** and **CAUTION** instructions.

- Warnings are given where failure to observe the instruction could result in injury or death to people.
- Cautions are given where failure to observe the instructions could result in damage to the equipment, associated equipment or process.

Warning Labels

Labels are located on the unit to identify potential hazards as well as help identify safe working procedures. The below examples are some of the labels located on this unit. Please note other labels other than what is shown below may be present. It is the end user's responsibility to ensure the unit is used in a safe way.

FLUID COMPATIBILITY

Positioning: Horizontal Operation only, operation on an incline to be avoided

Pump Pressure: See pump datasheet

Permitted Use: Diesel fuel at a viscosity of between 2 and 5.35 cSt (@ 37.8°C)
Minimum Flash Point (PM): 55°C

NOT PERMITTED:	**RELATED DANGERS:**
GASOLINE	FIRE - EXPLOSION
LIQUIDS WITH FLASH POINT < 55° C	FIRE - EXPLOSION
LIQUIDS WITH VISCOSITY > 20 cSt	MOTOR OVERLOAD
WATER	PUMP OXIDATION
FOOD LIQUIDS	CONTAMINATION OF THE SAME
CORROSIVE CHEMICAL PRODUCTS	PUMP CORROSION INJURY TO PERSONS
SOLVENTS	FIRE - EXPLOSION DAMAGE TO GASKET SEALS

GENERAL CAUTION/WARNINGS

WARNING: Inappropriate use of this equipment can cause serious injury. Only competent and authorised persons should be permitted to operate this equipment. Children/minors should NEVER be permitted to operate or move this equipment.

WARNING: This product should only be used for its intended purpose. Using this product for any purpose other than that intended it could result in serious injury or death.

Always use appropriate safety equipment e.g. safety glasses, protective gloves, safety shoes etc. Observe local health and safety requirements.

Prolonged contact with diesel fuel can damage the skin. The use of safety glasses and protective gloves is recommended.

Only use this product with DIESEL FUELS having a viscosity of between 2 & 5.35 cSt (@ 37.8°C) and a minimum Flash Point (PM) of 55°C. It must NOT be used for any other liquids.

Never start or stop the pump by connecting or disconnecting the unit from the mains power supply or any other plugs or switches that will isolate the power supply to the unit.

The unit is fitted with a gear pump which should never be run dry. The unit is fitted with a priming port which allows a small amount of fuel to be fed to the pump while the main suction line is priming.

WARNING: Always disconnect the equipment from the mains electrical supply before carrying out any routine maintenance or repairs.

DO NOT operate switches with wet hands.

Periodically check the power supply cable for damage.

Observe local environmental requirements and ensure there is appropriate equipment available to clear up any accidental diesel fuel spills.

Special consideration should be given when this equipment is used in a marine environment.

Appropriate equipment should be available to clean up any accidental diesel fuel spills and always ensure that any used filters or coalesced water removed from the filter bowl are disposed of according to local environmental requirements.

WARNING: Do not open, or attempt to open, the control panel unless you are qualified to do so – increased risk of electric shock and death.

RISK ASSESSMENT

A full risk assessment has been carried out on this equipment by IPU Group Ltd.

The assessment was carried out according to the requirements and guidelines set out in BS EN ISO 12100:2010

SYSTEM SPECIFICATION

Weight	260 kg
Frame Material	Mild Steel
Finish	Powder Coated: RAL 5004 Black Blue
Voltage	230 V
Frequency	50 Hz
Nominal Motor Wattage	1.5 kW
Nominal Motor Current (Amp)	9.2
Outdoor Use	When used outdoors, a suitable RCD “Residual Current Device” must be used in conjunction with the power supply
Pump	Self-Priming Centrifugal, Piusi E300
Duty Cycle	100% (Continuous use)
Noise Level	68 dB
Fluid Compatibility	Diesel & Mineral Oil
Filtration	Size 1 Filters to less than 1 micron or water filtration
Filter Indicator	Dual Traffic Light Differential Pressure Gauges
Max Operating Pressure	Approx. 1.6 Bar G
Max Design Pressure	10 Bar G
Fluid Temperature	0°C to 50°C
Ambient Operating Temp	0°C to 50°C
Ingress Protection	Control Box & Electrical Equipment Minimum IP65
Connections	2” Camlock

UNIT OPERATION

Basic Description

Diesel fuel is known to be inherently unstable. Particulate contamination such as rust and dirt enters the fuel, condensation introduces water and this in turn encourages microbial growth. These 3 forms of contamination will eventually clog engine filters and potentially damage fuel injection equipment leading to unplanned maintenance and potential engine failure.

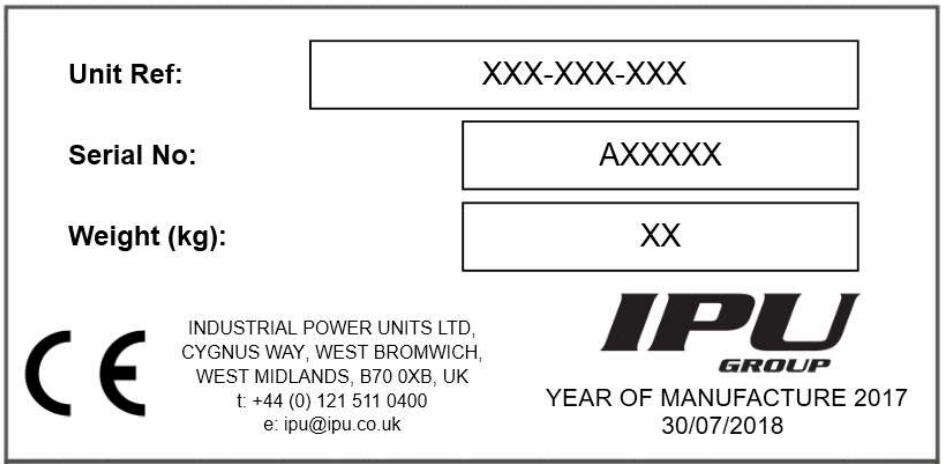
The system is designed to be used for the “polishing” of diesel fuels having a viscosity between 2 and 5.35 cSt (@ 37.8°C) and a minimum Flash Point (PM) of 55°C. It must NOT be used for any other liquids.

The system can be used in conjunction with a suitable biocide and a rigorous fuel management program. The system will condition and stabilise the fuel, remove water and solid particulates.

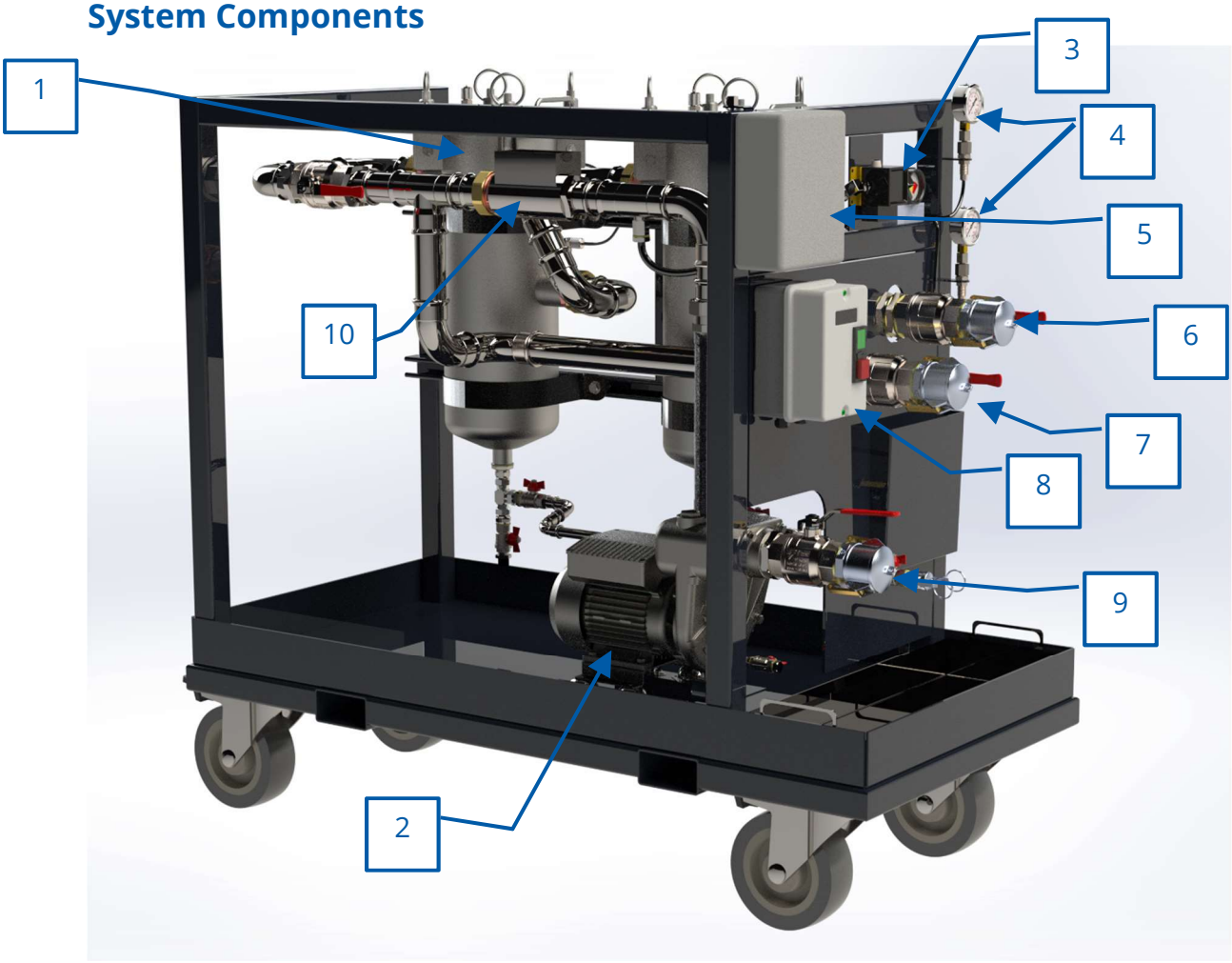
Unit Identification

Each unit carries a unique serial number together with a model part number. This can be found on the front of the electrical panel inside the cabinet.

Always quote the Part number and serial number when requesting spare parts, service or warranty assistance.



System Components



1.	SIZE 1 FILTER CELL HOUSING
2.	E300 PUMP
3.	FILTER BLOCKED DIFFERENTIAL PRESSURE GAUGE X 2
4.	SYSTEM PRESSURE GAUGE X 2
5.	WATER SENSOR CONTROL BOX
6.	2” CAMLOCK OUTLET
7.	2” CAMLOCK AUXILIARY
8.	PUSH BUTTON CONTROL BOX
9.	2” CAMLOCK INLET
10.	FLOWMETER

OPERATING INSTRUCTIONS

General Operation

The DDM3 has two stage filtration which allows for several different combinations of filters to best suit all applications and contamination levels.

In normal operation Fuel is sucked into the system via the inlet and is pushed through each filter stage. The fuel then flows out of the machine and back into the tank via the outlet. This cycle will repeat as defined by the schedule created via the control panel.

If an auxiliary/transfer line is fitted the unit can be used to transfer fuel without filtration or a secondary pump can be used to pump fuel through the unit rather than using the built-in pump.

Mains connection

After the unit has been plugged into a suitable electrical connection. The plug should be always be removed to prevent the system from being accidentally powered on during servicing or maintenance.

WARNING: Risk of shock - Electrical connections must only be carried out by qualified, competent persons. Only suitably qualified persons should access the control box.

Before Starting the Unit

Ensure that the system is standing on or fixed to a firm surface and that it is in a horizontal position. Never operate the system in any position other than horizontal. Always double-check the general condition of the system before use, paying special attention to electrical cables, valve connections and hoses. **WARNING**: If there are any signs of damage or excessive wear, DO NOT USE IT.

Before switching on the unit ensure pipework is connected to the inlet and outlet connections. Ensure inlet and outlet isolation valves are in the open position. It is important to check all connections and fittings to ensure they have not become loose in transit. Some pumps are inherently dry run resistant such as open impellor centrifugal. However, units with gear pumps should never be dry run. Vane pumps can be run dry for a small amount of time in accordance the manufacturers recommendation.

Priming the Pump

The gear pump fitted to the unit will prime quickly providing there are no leaks in the suction line. The pump can prime up to a height of 6 metres if suction side piping is in good condition however a large lift will reduce the flowrate. The pump is not resistant to dry running and should never be run dry for any more than a few seconds. There is a priming port connected to the suction side to allow the pump to be fed with a small amount of fuel for lubrication. By connecting a short hose to the priming port put into an IBC of fuel. After starting the pump open the priming port valve to allow some fuel to be drawn into the pump. Once the pump is fully primed and drawing fuel through the suction line, the priming port valve can be closed completely.

Start Stop Buttons

When all the relevant checks have been performed and if it safe to do so the pump may be run using the green button on the start stop box. The pump can be stopped by pressing the red button on the start stop box

Differential Pressure Gauge

The unit comes with 2 differential pressure gauges that give an indication of the filter condition via a green, yellow and red visual indication.

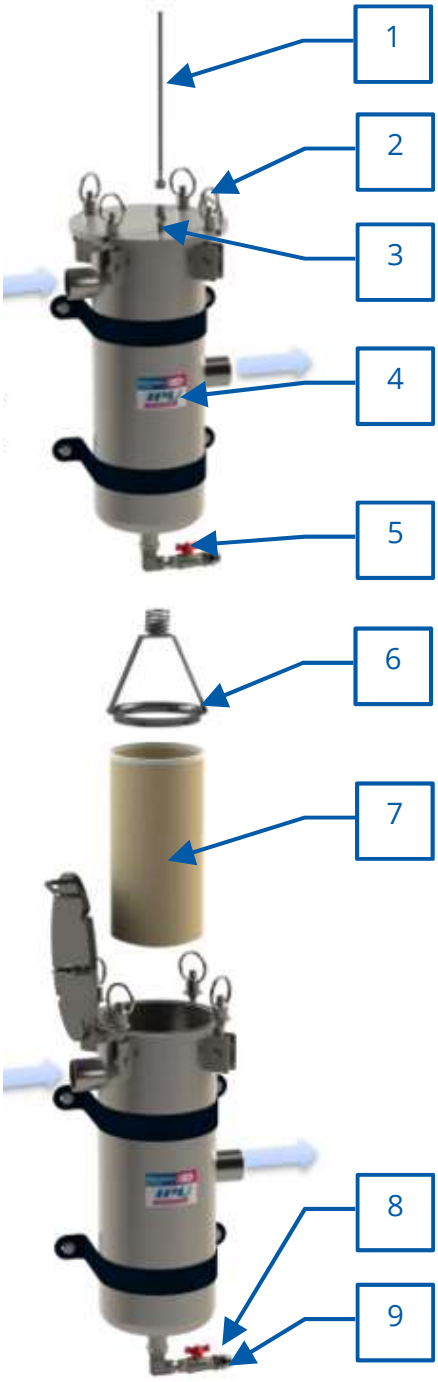
Colour	Pressure Range	Notes
Green	0-15 psid	Indicates a clean and healthy filter
Yellow	16-22 psid	Indicates the filter is starting to become blocked and requires more frequent monitoring
Red	23-30psid	Indicates the filter is now fully blocked and requires changing

MAINTENANCE

The system has been designed to require minimal servicing and maintenance. The system contains two filter units, each of which has a replaceable filter element. The primary particulate filter has a replaceable filter bag that will need to be replaced once the filter alarm detects a blockage. The frequency of this will depend on the condition of the fuel. There will also be a requirement to remove water collected in the filter bowl.
CAUTION: PPE must be worn at all times when operating or servicing the machine.

To change the filter cell (7)

- Ensure that the pump has stopped running.
- Close the inlet & outlet ball valves. (As fitted by others)
- Remove the drain point cap (8)
- Ensure secure connection to filter drain port (9).
- Place hose into suitable container.
- **CAUTION**: open all valves slowly to ensure fuel is not expelled quickly due to residual pressure in the system.
- Attached the sample hose (1) to the vent valve (3) on the top of the filter housing to allow for the pressure inside the canister to equalize.
- Open the drain port valve (5) to allow for excess fuel to drain from the filter canister.
- Once the filter housing (4) is fully drained, remove the sample hose (1) and loosen the 4 retaining clamps (2) on the filter lid.
- Remove the filter lid with caution it may be heavy and have residual fuel on the inside surface.
- Remove the Retaining Brace (6).
- Carefully lift out the existing Filter cell (7).
- Fit the new Filter cell ensuring it has been securely pushed down and seated inside the housing
- Replace the Retaining Brace (6).
- Replace the Filter Lid
- Secure the filter lid by tightening the four retaining swing bolt clamps (2)
- Shut the ½“ drain valve (5) and replace the valve cap (8)



General Maintenance

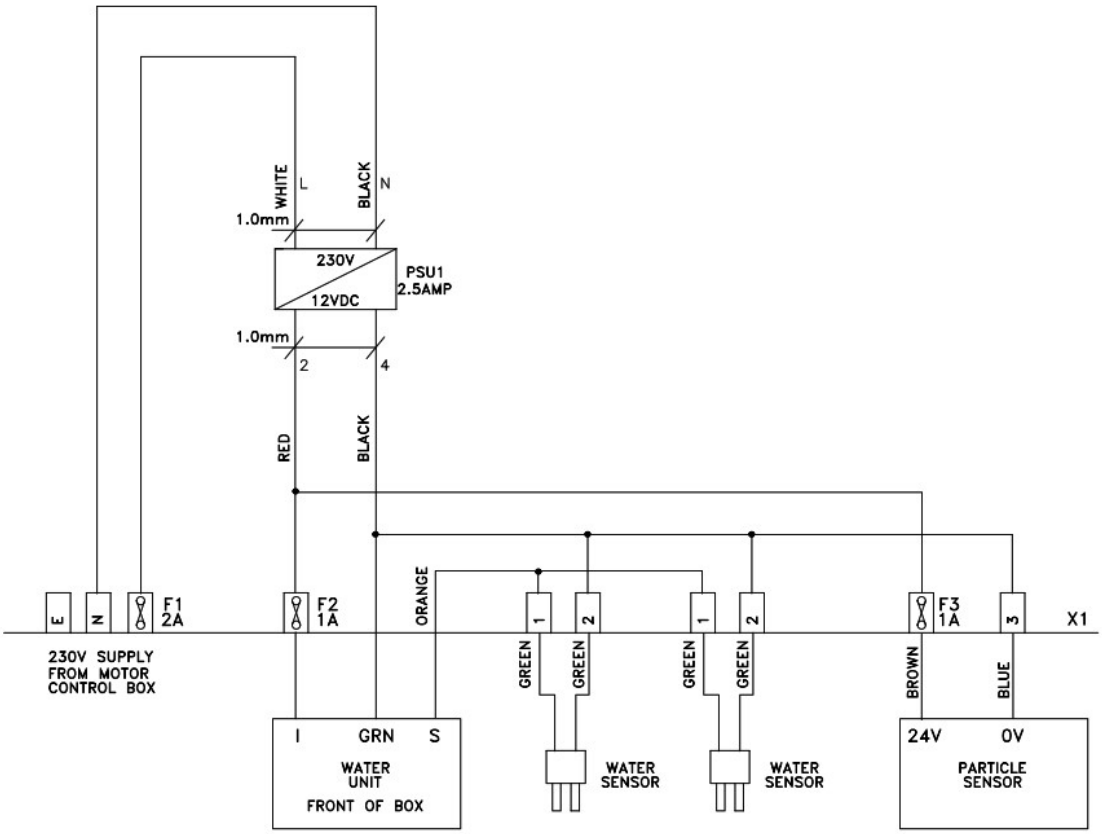
The system has been designed to require a minimum amount of maintenance:

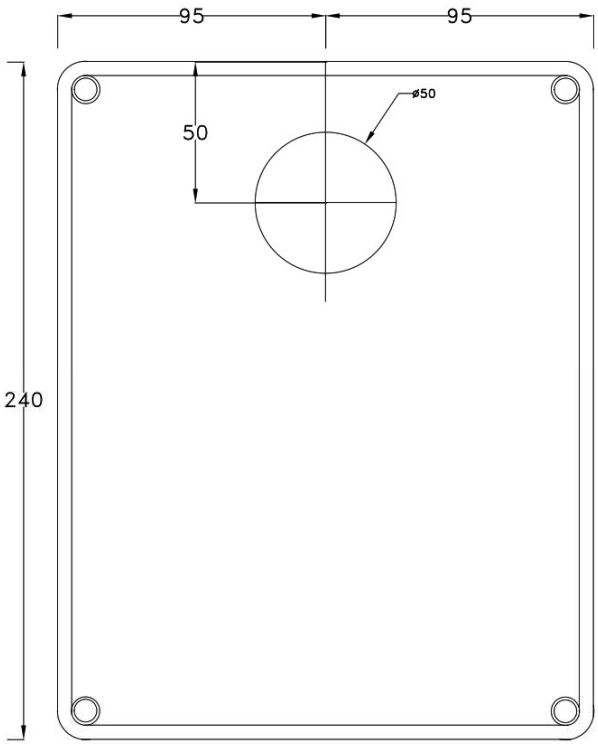
- On a weekly basis, conduct visual check of connections and joints to ensure they have not loosened
- On a weekly basis, check pressure gauges as this can serve as an early indication of potential blockages
- Once a blockage has been detected, replace filters

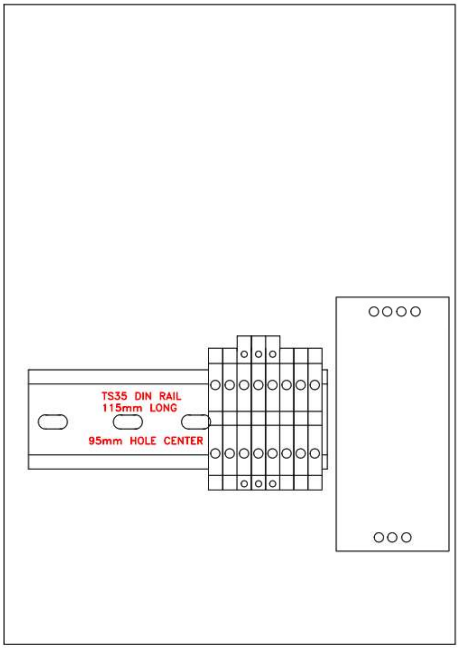
The pump requires minimal maintenance. The following are guidelines outlined by the pump manufacturer for pump the maintenance of the pump:

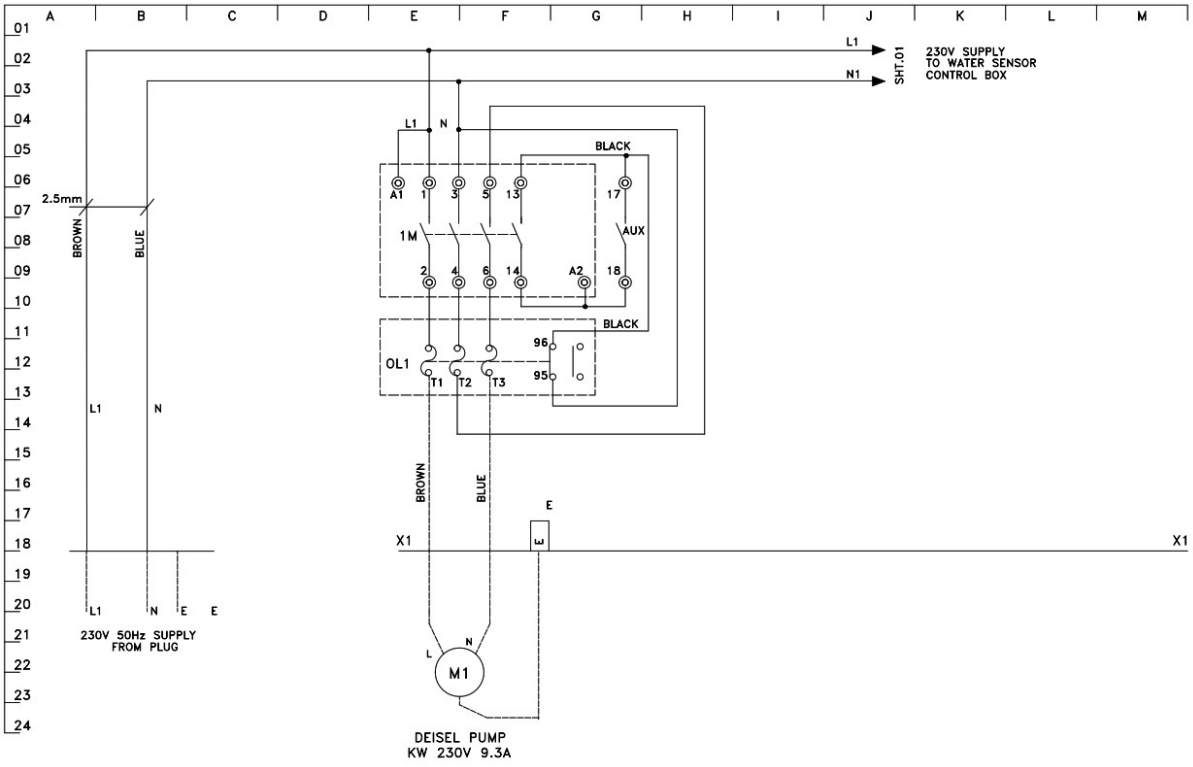
- On a weekly basis, check that the tubing joints have not loosened, to avoid any leakage.
- On a monthly basis, check the pump body and keep it clean of any debris
- Before use, check that the electric power supply cables are in good condition

Wiring Diagram








L1
N1
SHT.01
230V SUPPLY
TO WATER SENSOR
CONTROL BOX
2.5mm
BROWN
BLUE
L1
N
BLACK
A1
1
3
5
13
17
1M
AUX
2
4
6
14
A2
18
BLACK
OL1
96
95
T1
T2
T3
BROWN
BLUE
E
X1
X1
L1
N
E
E
230V 50Hz SUPPLY
FROM PLUG
L
N
M1
DEISEL PUMP
KW 230V 9.3A

Troubleshooting

ISSUE	RESOLUTION
O/LOAD FAULT ALARM	• Isolate the system from the mains power supply • Investigate the entire system and resolve any faults present • Remove the cover and open the Start/Stop box • Reset the overload • Replace the cover • Connect the power and start the system again • If the overload repeatedly trips, contact your supplier or IPU for further advice
THE MOTOR TURNS SLOWLY WHEN STARTING	• Low voltage in the electric power line
INCREASED PUMP NOISE	• Cavitation occurring. Reduce suction pressure • Air present in the fluid. Verify the suction connections are not leaking air into the system

DIRECTIVE PROVISIONS

EC Declaration as defined by Machinery Directive 2006/42/EC:

The equipment described above conforms to The EMC Directive 2014/30/EC, & Machinery Directive 2006/42/EC