

P-0260

OPERATION & MAINTENANCE MANUAL



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Revision History

Date	Description	Revision
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Quality of Goods & Warranty

- 1.1. The Supplier warrants that on delivery, and for a period of 12 months from the date of delivery (Warranty Period), the Goods shall:
 - 1.1.1. conform in all material respects with their description;
 - 1.1.2. be free from material defects in design, material and workmanship;
 - 1.1.3. be of satisfactory quality (within the meaning of the Sale of Goods Act 1979); and
 - 1.1.4. be fit for any particular purpose expressly held out by the Supplier (but not any implied purpose).
- 1.2. Subject to clause 1.3, if:
 - 1.2.1. the Customer gives notice in writing during the Warranty Period within a reasonable time of discovery that some or all of the Goods do not comply with the warranty set out in clause 1.1;
 - 1.2.2. the Supplier is given a reasonable opportunity of examining such Goods (including, but not limited to permitting the Supplier to examine the Goods at the Customer's premises for the purposes of failure analysis);
 - 1.2.3. the Customer (if asked to do so by the Supplier) returns such Goods to the Supplier's place of business at the Customer's cost; and
 - 1.2.4. such defect shall be attributable to the Supplier,
the Supplier shall, at its option, repair or replace the defective Goods, or refund the price of the defective Goods in part or in full.
- 1.3. The Supplier shall not be liable for the Goods' failure to comply with the warranty in clause 1.1 if:
 - 1.3.1. the Customer makes any further use of such Goods after giving a notice in accordance with clause 1.2;
 - 1.3.2. the defect arises because the Customer or any third party (other than the Supplier) failed to follow the Supplier's oral or written instructions as to the storage, installation, commissioning, use or maintenance of the Goods or (if there are none) good trade practice;
 - 1.3.3. the Customer cannot provide the Supplier with evidence that the Goods have been maintained in accordance with all of the Supplier's oral and written instructions;
 - 1.3.4. the defect arises as a result of the Supplier following any drawing, design or specification supplied by the Customer;
 - 1.3.5. the Customer alters or repairs such Goods without the prior written consent of the Supplier or uses non-Supplier sourced or approved spares;

- 1.3.6. the Customer has modified the Goods in any way without the prior written consent of the Supplier, including, but not limited to, being painted;
 - 1.3.7. the defect arises as a result of fair wear and tear, wilful damage, negligence, or abnormal working conditions; or
 - 1.3.8. the Goods differ from their description as a result of changes made to ensure they comply with applicable statutory or regulatory standards.
- 1.4. Except as provided in this clause, the Supplier shall have no liability to the Customer in respect of the Goods' failure to comply with the warranty set out in clause 1.1.
 - 1.5. Where the Goods' failure to comply with the warranty in clause 1.1 is as a result of the circumstances in 6.3, the Customer shall pay the Supplier's reasonable costs of examining the Goods, including travel costs, accommodation (when required), and labour costs at the prevailing hourly rates of the Supplier at the time the Goods are examined.
 - 1.6. Except as set out in these Conditions, all warranties, conditions and other terms implied by statute or common law are, to the fullest extent permitted by law, excluded from the Contract.
 - 1.7. The terms of these Conditions shall apply to any repaired or replacement Goods supplied by the Supplier under clause 1.2.
 - 1.8. Where the Supplier repairs or replaces the Goods, the Warranty Period is treated as continuing as if the repaired or replacement Goods were supplied at the original date of delivery set out at clause 4.3.
 - 1.9. Where the Supplier attends the Customer's premises to inspect the Goods, the Customer shall use all reasonable endeavours to ensure that the Supplier's employees, representatives and agents are made aware of all applicable security, safety and other regulations at its premises, and of the relevant safety policy.
 - 1.10. The Supplier shall offer technical support without additional cost via telephone, fax or email during normal business hours in the United Kingdom, for the Warranty Period.
 - 1.11. Outside of the Warranty Period, technical support is provided free of charge via telephone.
 - 1.12. The Supplier shall only be able to provide technical support if the Customer is able to provide it with the following information:
 - Customer Name;
 - Customer Contact Details;
 - Device Type;
 - Device Serial Number;
 - Date of Supply; and
 - A clear description of the issue facing the Customer.

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.

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.

Caution

Prior to any maintenance or service work, the system pressure should be released.

The operator should ensure that they are fully familiar with the contents of the manual before carrying out any operational or maintenance procedures.

If in any doubt contact IPU using the contact details on the front cover of this document.

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.

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INTRODUCTION

Scope and Definition

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

IMPORTANT: The unit is available in various forms which include stainless steel or mild steel enclosures, frame mounted, or wall mounted without enclosures. The images included in this manual are representative of the unit only, and the final unit may differ to the images shown. However, the operational instructions remain the same for every variant.

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.



SPECIFICATIONS

Specification	Detail
Dimensions	(H) 1133 mm (W) 625 mm (D) 826 mm
Weight	101 kg
Finish	Powder Coated: RAL 5004 Blue Black
Voltage	240VAC (±5%)
Frequency	50Hz
Nominal Motor Wattage	950W
Nominal Motor Current (Amp)	4.5A
Motor Protection	Automatic Thermal Protection Switch
Outdoor Use	When used outdoors, a suitable RCD "Residual Current Device" must be used in conjunction with the power supply
Pump	Self - Priming Vane Type
Duty Cycle	Continuous
Noise Level	<85dB @ 1 Metre
Fluid Compatibility	Diesel & Mineral Oils
Filtration	Particulate - 1, 5, 10 or 25 Micron Water Absorbing - Filtasorb 2 Stainless Steel Mesh - 10, 20 Micron
Filter Blocked Indicator	Electronic via Panel and Volt Free Output
Pressure	Nominal Working Pressure - 1 Bar (14.5 psi) Maximum Working Pressure - 6 Bar (87 psi)
Operating Conditions*	-20°C to +60°C
Pump Capacity	Up to 100 Litres/min
Environment	Control Box IP66
Inlet/Outlet	1" Camlock Male Inlet (Capped) 1" Camlock Male Outlet (Capped)

*This is dependent on media conditions, and this can affect performance.

**If in doubt, please contact your IPU Representative.

Typical Applications

Typical applications for the filtration unit include:

- Filtering the fluid in a diesel storage tank periodically as a supplement to continuous filtration by system filters.
- Cleaning heavily contaminated fuel to eliminate water, solid particulate and tank sludge.
- Cleaning your fuel system before restarting the system following component failure.
- Providing clean fuel when re-filling and adding fuel to storage tanks.
- Reclaiming contaminated diesel fuel.
- Transferring diesel fuel from one storage location to another.
- Emptying waste fuel quickly.

General System Requirements

Positioning	<p>The difference in height between the pump and the fluid level must be kept as small as possible and, at any rate, within the 2 meters anticipated for the priming phase. If this height is exceeded, it will always be necessary to install a foot valve to allow for the filling of the suction tube and provide tubing of wider diameter. It is recommended that the pump not be installed at a difference in height greater than 3 meters.</p> <p>In the case that the suction tank is higher than the pump, it is advisable to install an anti-siphon valve to prevent accidental diesel fuel leaks. Dimension the installation in order to control the back pressures due to water hammer</p>
Pump Inlet Pressure	When the system is functioning, the pump can work with pressure at the inlet as high as 0.5 bar, beyond which cavitation phenomena can begin, with a consequent loss of flow rate and increase of system noise and pump damage
Permitted Use	<p>Diesel fuel at a viscosity of between 2 and 5.35 cSt (@ 37.8°C)</p> <p>Minimum Flash Point (PM): 55°C</p>
NOT PERMITTED	RELATED DANGERS
Gasoline	Fire- Explosion
Inflammable Liquids with Flash Point >55°C	Fire- Explosion
Liquids with Viscosity >20cSt	Motor Overload
Water	Pump Oxidation
Food Liquids	Contamination of the same
Corrosive Chemical Products	Pump Corrosion
Solvents	<p>Injury to persons</p> <p>Fire- Explosion</p> <p>Damage to gasket seals</p>

Health, Safety & Environmental Considerations

Caution/Warning

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 other than its intended purpose 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.

DO NOT run the pump dry, this can cause serious damage to its components.

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.

Unit Identification

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 portable filtration unit is a compact, self-contained filtration system, equipped with a high efficiency, high capacity filter cell capable of removing particulate contaminants and/or water quickly, conveniently and economically. It is designed for on-site preventative maintenance and is fitted with two standpipes and hoses for efficient fluid transfer. The suction standpipe is fitted with a strainer to trap any large contaminants and protect the pump.



The on-tank Fuel Polishing 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 unit 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.

Unit Ref:	XXX-XXX-XXX
Serial No:	AXXXXX
Weight (kg):	XX
	INDUSTRIAL POWER UNITS LTD, CYGNUS WAY, WEST BROMWICH, WEST MIDLANDS, B70 0XB, UK t: +44 (0) 121 511 0400 e: ipu@ipu.co.uk
	 YEAR OF MANUFACTURE 2017 30/07/2018

The main part number identifies the units flow rate, operating voltage, filter ratings and control option.

Annotated Illustration

TEST POINT

SIZE 1 FILTER HOUSING



1" CAMLOCK MALE OUTLET
(CAPPED)

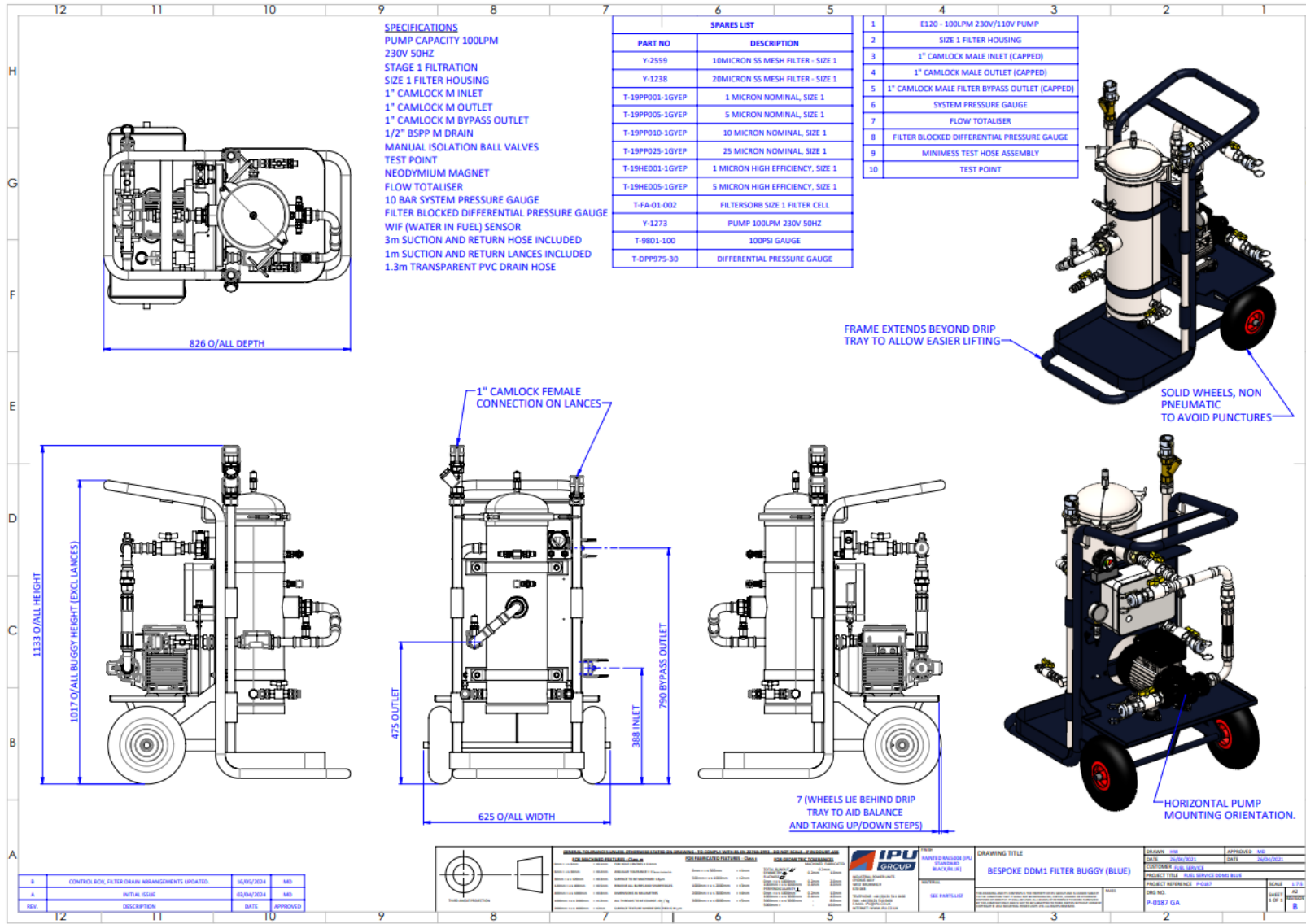
SYSTEM PRESSURE GAUGE

1" CAMLOCK MALE FILTER
BYPASS OUTLET
(CAPPED) CONNECTION

E120 - 230V PUMP - 100LPM
PUMP CAPACITY

1" CAMLOCK MALE INLET
(CAPPED)

General Arrangement Drawing



OPERATING INSTRUCTIONS

General Operation

Best Efficiency

When used for recirculation filtration (as opposed to transfer filtration) position the ends of both the inlet and outlet standpipe as far apart as possible inside the reservoir in order to ensure proper recirculation and cleaning.

Operate the filtration unit until the total volume of the system fluid passes through the unit. For recirculation filtration, cycle the reservoir fluid through the filter cart six to eight times to ensure the total system fluid is filtered completely. Many more or fewer cycles may be necessary depending on many factors such as the type of filtration media, the inlet and outlet locations, the size of the tank and the condition of the fuel.

Precautionary Measures

- The pump may be run dry for short periods of time to allow for priming the lines, running dry for excessive periods will damage the pump.
- The filtration unit is designed for diesel fuel only.
- It is not to be used for highly volatile fluids, such as gasoline, paint thinners etc.

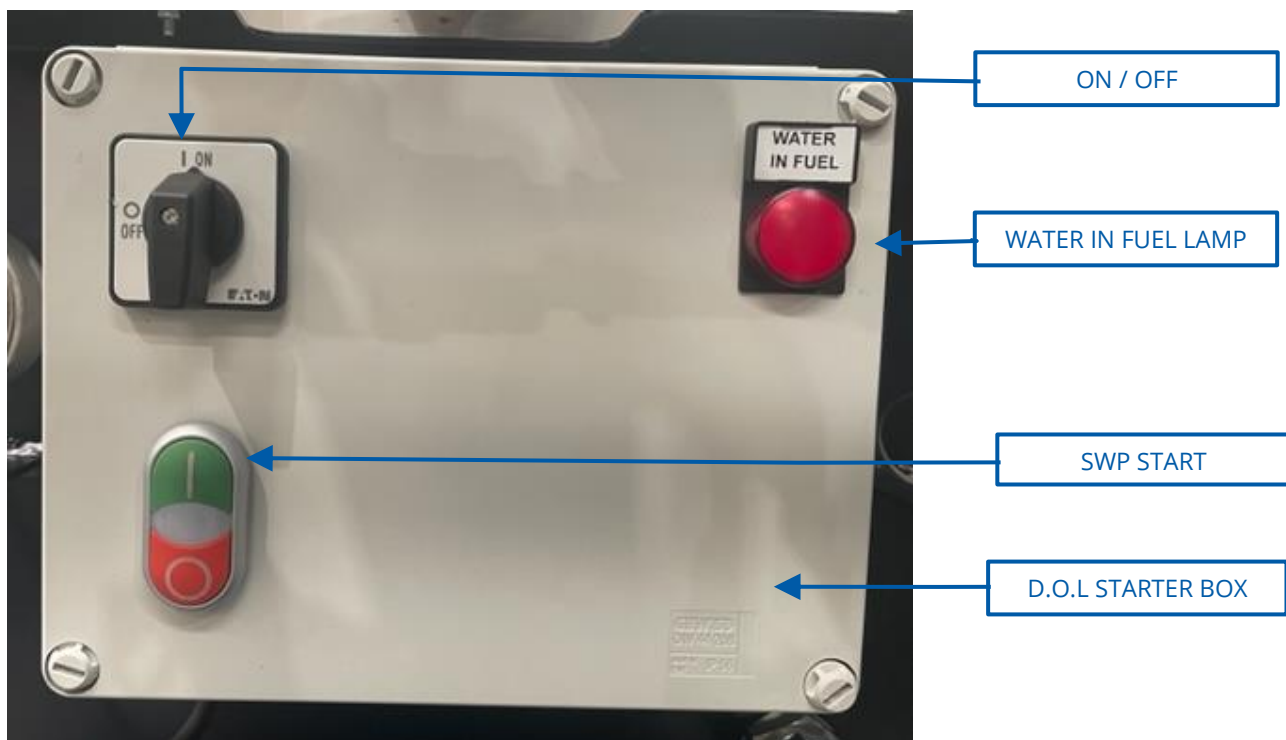
Caution - Do not use the unit with the following fluids:

Fluids not to be used	Related dangers
Gasoline	Fire / Explosion
Inflammable liquids with PM <55°C	Fire / Explosion
Water	Oxidation
Corrosive chemicals	Oxidation / Injury to persons
Solvents	Fire / Explosion / Damage to gaskets

Starting & Stopping – DOL (Direct-On-Line)

To start the unit, make sure it's plugged into a fused supply (with RCD when used outdoors) of the correct voltage rating and that the inlet and outlet hoses have been correctly attached. Before switching on the unit ensure hoses are connected to the fuel supply pipework and/or lances are securely inserted into the barrel/tank.

The unit is supplied with a DOL (Direct-On-Line) starter box. Once connected to the mains supply the unit can be switched on and off via the two push buttons. If for any reason the power supply cuts out, the internal contactor will unlatch to prevent accidental spillage once power is restored.



Filtration

The unit is equipped with a single filter cell housing which can be fitted with a range of media for removing large quantities of particulate and water contamination from diesel fuel.

Differential Pressure Gauge

The unit comes with a differential pressure gauge that gives 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	23-30 psid	Indicates the filter is now fully blocked and requires changing

The filter cell housing is monitored by a visual differential pressure indicator, displaying the filter's condition via a green, yellow and red traffic light system.

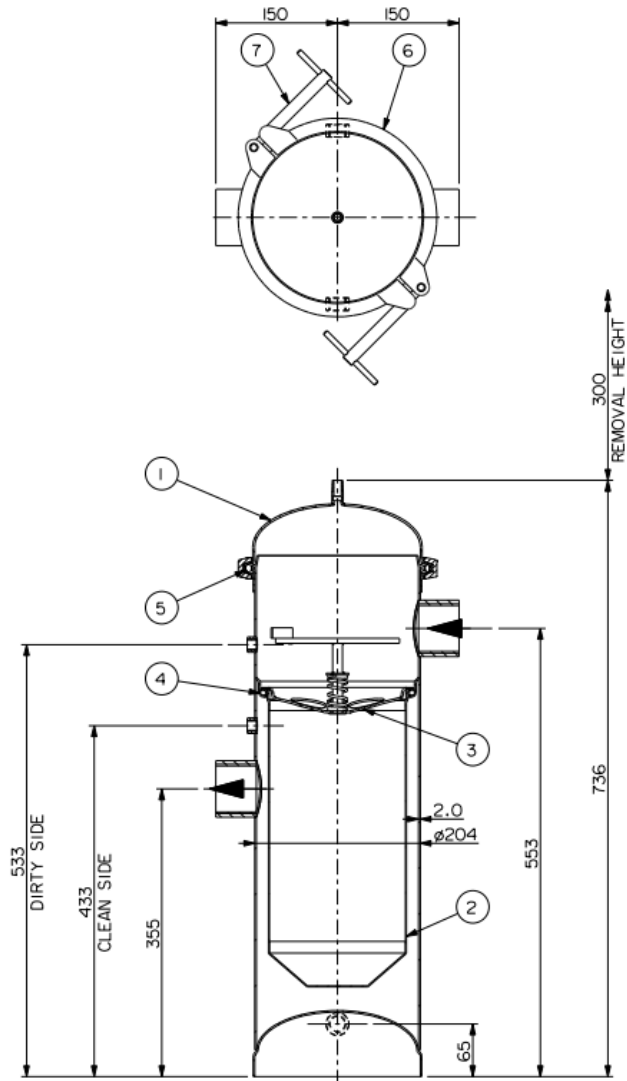
Filter Cell Housing

Changing a Filter Cell

As a guideline, the following procedure can be used for changing a filter cell:

- Ensure inlet and outlet pipework has been closed off to prevent siphoning.
- Relieve any excess pressure by briefly opening the drain valve or vent.
- Loosen the clamp and open the lid.
- Remove the filter securing bracket (if the optional magnet is included, clean off any rust).
- Lift out the filter cell via the strap handle. It is likely the filter basket will also come out.
- Remove the filter cell from the basket and replace with a clean filter.
- Refit the filter basket, making sure the basket O-ring is still in place and correctly seated.
- Refit the filter securing bracket, making sure the spring is attached.
- Close the lid.
- Gradually tighten each sealing clamp until lid is secure.





No.	Description	Material	Part Number	Qty
1	LID ASSEMBLY	316L ST. STL	60S050000	1
2	SINGLE BASKET	304 ST. STL	80S012U07	1
3	BASKET COMPRESSION PLATE	316L ST. STL	80S000000	1
4	INNER GASKET	VITON	80S01000V	1
5	TOP GASKET	VITON	60S05000V	1
6	CLAMP	304 ST. STL	60S050002	1
7	CLAMP TEE BAR	316L ST. STL.	60S000022	2

Cleaning the Magnet (Optional)

An optional magnet can be installed into the filter housing basket clamp for removal of ferromagnetic material, extending the useful life of the filter cell.

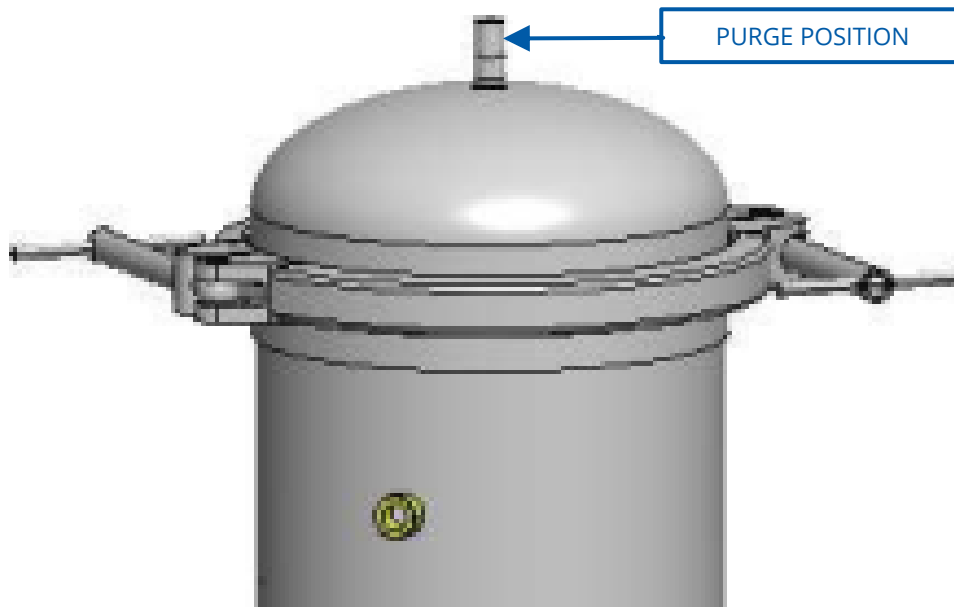


Removal of ferromagnetic material can be carried out using a suitable tool as shown above.

The tool is to be located at the top of the magnet and downward force applied to push the material off the magnet. This waste material can then be disposed of or recycled.

Purging Air from the Filter Housing

When starting the system for the first time or after a filter cell change air will be trapped within the upper section of the filter housing and require purging. Failure to remove all the air can result in aeration of the fuel and reduced filtration performance.



With the system is turned on the sampling / vent tube can be screwed onto the vent port, where the remaining air will be pushed out of the filter housing. The end of the tube should be inserted into a sample bottle or cloth to prevent any fluid from spraying towards the operator.

Once all the air has been removed make sure the sampling / vent tube is disconnected to prevent siphoning or spillage of fluid.

Fuel Sampling



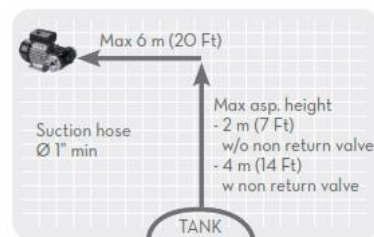
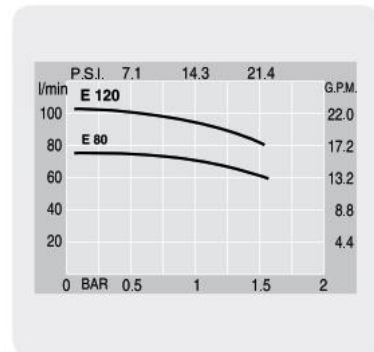
The filter housing incorporates ports either side of the filter cell which are used for monitoring the differential pressure. These ports are fitted with 1620 Minimes test points, where the existing tube connections can be removed and the sampling tube can be attached for pre-and post-filtration sampling.

When taking a fuel sample ensure the tube has already been inserted into the sampling container before attaching to the 1620 Minimes test points to avoid accidental spillage.

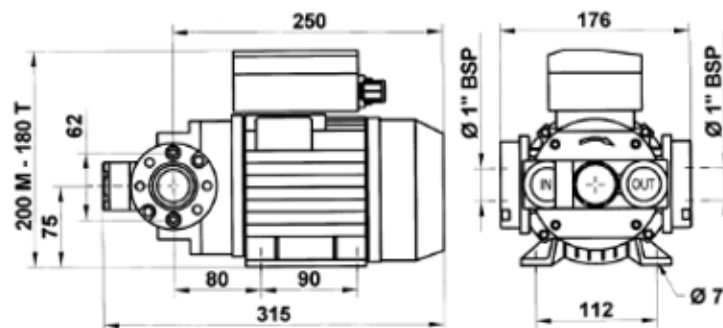
The upper port will provide pre-filtration sampling, while the lower port will provide post-filtration sampling.

Alternatively, a particle counter can be attached to these ports for providing real-time instant readings of fuel cleanliness.

Pump Performance



E120



Isolation Valves



Isolation valves are fitted to the inlet and outlet ports. These should be closed off when the system is not in use, or when filter cells are being changed out. It is also advisable to cap off ends of the pipework to prevent contaminants from entering the system.

Hoses & Lances

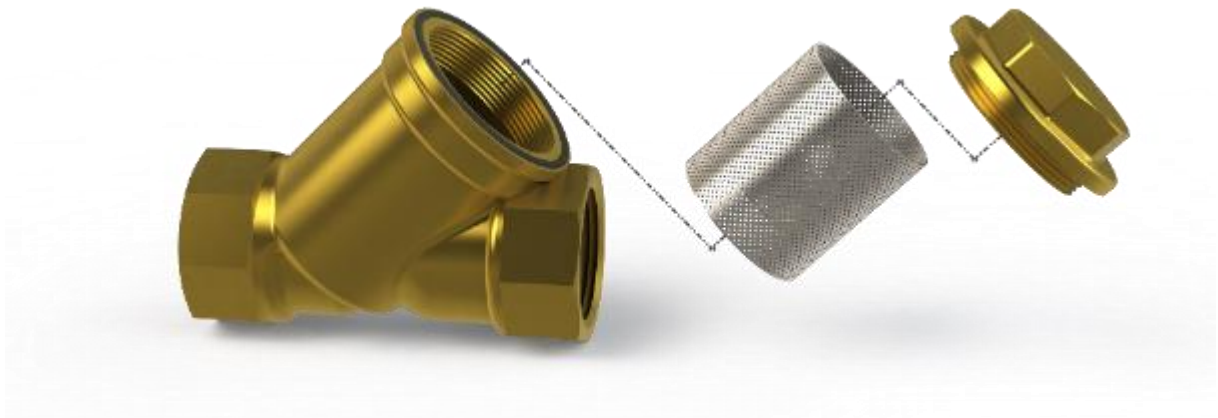
The unit is supplied with two lances, a suction lance with strainer to protect the pump and a discharge lance. Each lance is 1000mm long.

When not in use it is advisable to plug the hoses and cap off the lances to prevent ingress of dust or other contaminants.

Lances should be cleaned prior to inserting in the tank/barrel being cleaned.



Suction Strainer



The suction strainer will periodically need cleaning by unscrewing the cap, removing the mesh strainer and cleaning this out with a fluid suited for the units intended purpose

Digital Turbine Flow Meter (Optional)



Units can be equipped with a digital turbine flow meter for displaying batch and accumulative totals for fluid transfer operations.

Battery Replacement

The digital flow meter is powered by two AAA alkaline batteries, which can be replaced while the meter is installed. When batteries are removed the batch and cumulative totals will reset to zero, but the factory calibration is retained.

If the screen becomes dim or blank replace the batteries as follows:

- Remove the four Philips-head screws and lift out the faceplate from the turbine body.
- Remove the old batteries and clean off any corrosion from the terminals.
- Fit the new batteries ensuring correct alignment.
- Check the display turns on before reassembling.
- Reassemble ensuring the seal is correctly seated to prevent damage from water ingress.

General Maintenance

The unit 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.
- Once a blockage has been detected, replace filters, as well as check and clean suction filter installed in the pump

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 Mapress unions have not loosened, to avoid any leakage.
- On a monthly basis, check the pump body and keep it clean of any impurities.
- On a monthly basis, check and keep the pump filter clean and any other filters installed.
- On a monthly basis, check that the electric power supply cables are in good condition

Troubleshooting

Symptom	Problem	Solution
DOES NOT START	On/Off switch	Turn switch on pump/motor and control box
	No electrical power	Check fuses
ERRATIC MOTOR NOISE	Defective motor	Replace motor
	Motor overheated	Allow motor to cool
	Worn motor vanes	Replace motor vanes
INTERMITTENT START/STOP OPERATION	High viscosity fluids	H.V fluids cause the motor to overheat intermittently
HOT MOTOR	Pumping heavy load	Motor will heat up, allow to cool
NO FLOW	No fluid in filter housing	Run the unit for a few seconds
ERRATIC PUMP NOISE	Suction leak	Check inlet fittings and hoses
NO SUCTION	Blocked strainer	Clean or replace strainer
REDUCED FLOW	High viscosity	Check fluid compatibility
	Filter cell dirty	Replace filter cell
	Obstruction in hoses	Clean hoses
	Suction leak	Check tightness of fittings
	Worn vanes	Replace vanes
DIFFERENTIAL PRESSURE INDICATOR SHOWS YELLOW/RED	Filter cell dirty	Replace or clean filter cell
	Obstructed outlet	Clear outlet obstruction
DIFFERENTIAL PRESSURE INDICATOR DOES NOT MOVE	No cell fitted	Install filter cell
HOSES DISCOLOUR	Fluid Compatibility	May occur over time, should not impair performance
HOSES BECOMING RIGID	Fluid Compatibility	Brittle hoses would require replacement
SPILLS UNDER UNIT	Defective shaft seal	Replace seals where necessary
	Hose leaks	Tighten all joints

Spare Parts List

Description	Part Number
1 µm Disposable Polypropylene	T-19PP001-1GYEP
5 µm Disposable Polypropylene	T-19PP005-1GYEP
10 µm Disposable Polypropylene	T-19PP010-1GYEP
25 µm Disposable Polypropylene	T-19PP025-1GYEP
50 µm Disposable Polypropylene	T-19PP050-1GYEP
100 µm Disposable Polypropylene	T-19PP100-1GYEP
200 µm Disposable Polypropylene	T-19PP200-1GYEP
10 µm Re-Cleanable Nylon	T-19NM010-1GYEP
25 µm Re-Cleanable Nylon	T-19NM025-1GYEP
50 µm Re-Cleanable Nylon	T-19NM050-1GYEP
75 µm Re-Cleanable Nylon	T-19NM075-1GYEP
100 µm Re-Cleanable Nylon	T-19NM100-1GYEP
200 µm Re-Cleanable Nylon	T-19NM200-1GYEP
300 µm Re-Cleanable Nylon	T-19NM300-1GYEP
400 µm Re-Cleanable Nylon	T-19NM400-1GYEP
600 µm Re-Cleanable Nylon	T-19NM600-1GYEP
800 µm Re-Cleanable Nylon	T-19NM800-1GYEP
1 µm High Efficiency Disposable Polypropylene	T-19HE001-1GYEP
5 µm High Efficiency Disposable Polypropylene	T-19HE005-1GYEP
1 µm Filtasorb2 Water Removal Cell	T-FA-01-002

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