MFU INSTRUCTION MANUAL

STANDARDISED FOR ALL UNITS

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2020

MFU GUIDE

- Instructions
- Trouble shooting
- Parts list
- Cartridge change guide
- Contact details

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Welcome

to your new kleenoil micron filtration unit

This document serves to introduce you to the system, instruct on use, offer solutions to potential errors, and guide you through cartridge changes.

Kleenoil are available 24hr 7 days, to offer advice, technical support and re-ordering services, please do not hesitate to contact us..

MS2 Twin unit on trolley

MS4 Quad unit with bund

MS2 Twin pot on static frame

The Off-Line Micro-Filtration Unit is a multi-purpose fluid cleaning and transfer machine. It is ideal for cleaning most types of hydraulic, gear, and transmission fluid reservoirs and, because of its portable design, the unit can be used for many situations including fuel tank purging on trucks, construction equipment, and boats as well as for oil and fuel transfer and rotational cleaning of factory and industrial equipment. The specially designed cartridge filter achieves an ISO 4406 Cleanliness Code of 14/9: equivalent to NAS Class 6, well below the original standards of the equipment's original manufacturers and distributors. By filtering particles down to one micron, the Off-Line Micro-Filtration Unit minimizes the amount of dirt and debris within a machine and, as a result, will dramatically cut down on repair and maintenance costs.

The unit's operation is basically very simple. The fluid is drawn in through the mono pump inlet and enters the filter system via the pump outlet. If a pre-filter is fitted the fluid passes through the pump before passing through the pre-filter. Pressure can be monitored by the pressure gauge and is controlled by the pressure relief valve and the electrical cut off pressure control valve. Always ensure that the pressure does not exceed 75 lbs PSI. As the fluid passes in to the filter housings through the manifold it passes up the central tube of the cartridge and pressure is built up between the filter housing lid and the cartridge to force the fluid through the dense filter media

With the standard filter cartridges the filter media traps any free and emulsified water and particulates allowing only clean oil to return through the outlet to tank or reservoir. Cartridges are classed on BETA 3 rating Multipass. If transferring used oil from one container to another it is recommended that two full passes will be sufficient, clean new oil, one pass will suffice. If recirculating oil within the same container it is recommended that the volume of oil must pass through the unit a total of 7 times. This will vary depending on the amount of contamination in the oil.

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NB. If Quick Release Couplings are fitted to the unit **DO NOT** run the machine without hoses connected to the fluid inlet and outlet.

On / Off and pressure

When specified rigs may also be fitted with: Sensor Float Switch & Power supply for Particle Counter.

Pump and motor

Filtration:

Level of filtration applying to all units - BS 5540/4, ISO 14/9 and equivalent NAS 1638 class 6. Water removal to <0.05% up to capacity of cartridges which is 1.2 litres each.

Electrics:

Standard filter rigs are supplied with electrics to suit the specified power supply:

- Isolator Switch
- On/Off Switch
- Red/Green Indicator Lights
- Pressure Relief Cut Out
- Connection lead

All Mono motors are fitted with heat overload cut out/ re-set.

Flow Rate:

It is not possible to state an exact flow rate because it is dependent upon many factors such as viscosity, temperature, and the degree of contamination of fluid, and also pump pressure and degree of contamination of cartridges. As an approximate guide, with a Mono S range pump the flow of 32 sec. Hydraulic oil at room temperature through new cartridges will be:

MS1 Single Filter	**350 Litres per hour**
MS2 Twin Filter	**500 Litres per hour**
MS4 Four Filter	**750 Litres per hour**

FILTRATION RIG OPERATION

All units are supplied ready to operate with new filter cartridges are installed.

Please read these Operating Instructions carefully

1. Pease check the power supply**,110 volt, 240 volt or 380 volt** and use the correct electrical connections.
2. The unit must **NOT** be connected to machine pressure lines.
3. Please prime the suction line with approx 0.75 litre of fluid before the 1st use. At a maximum of 5 m head the pump does not require priming. Do **not** run the pump dry for more than 2 to 3 minutes as damage may/will occur.

Connect the suction and return lines to the filter rig
Suction line connects to the pump.
Return line connects to the outlet on the filter manifold.
Insert the suction line from the rig pump as near to the bottom of the oil tank as possible or connect to a drain or sump port.
Connect the return line from the filter units to either a spare port or directly in to the top of the existing tank (recirculation) above the level of oil, or to a clean holding tank.
Connect to the power supply
Turn the isolator switch to ON
The Red light should show.
Press Start and the pump will run
The Green and Red light will show
With new filter cartridges it will take approx 3-4 minutes to purge the air from the unit.

To calculate operating times when re-circulating oil. The oil must pass through the unit at least 7 times to achieve cleanliness level.
E.g. Filter rig that will process 750 litres of 32 sec oil per hour at room temperature.
Tank/system volume = 500 litres
Multiply by 7 = 3500
Divide by pump flow rate e.g. 750 = 4.7 hours.

advisory:

If transferring oil to a clean container two passes are sufficient (one out, one in). It is always recommended to facilitate an oil analysis program to fully evaluate the condition of any oil.

If the oil is contaminated with water, cartridge life is reduced. Each cartridge will absorb approx 1.2 litres of water.
If water contamination is high, operate the unit for 2-3 hours then change the cartridges. See reverse for cartridge change instructions.

Float switch sets:

Some rigs are fitted with safety float switches, if the rig stops check the float switch first, drain any excess liquid from the bund and re-start, check for leaks.

Sampling sets:

Rigs are fitted with minimess sampling points to which the OLPC6 particle counter can also be connected.

Used oil transfer:

If the rig is to be used to transfer waste or used oil for disposal, the delivery feed line from the pump to the filter units can be disconnected and the hose connected direct to the pump outlet.

Alternatively remove cartridges or a three way ball valve can be installed on the pump outlet.

Filter Cartridge Operation

Oil enters the central tube in the cartridge and is forced in to the area between the top of the cartridge and the lid of the filter housing. Pressure from the pump continually pushes the oil through the tightly wound cellulose impregnated filter media. The filtered oil then exits through the outlet to the return line.

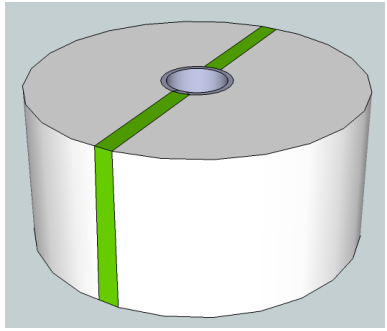
FILTER CARTRIDGE CHANGE PROCEDURE

1. Switch off the unit.
2. Remove the suction line from the oil tank.
3. Start the unit and operate for 2-3 minutes to purge the oil from the filter units.
4. Switch off and isolate the power supply
5. Remove the four retaining nuts from each filter unit.
6. Remove the lids
7. Pull the filter cartridge straight up (they may be very tight as the suction of the oil holds them in place)

DO NOT USE A METAL LEVERAGE TO REMOVE

8. Rest the cartridge at an angle above the filter housing
9. Remove the new cartridge from the polythene bag.
10. Place polythene bag over your hand and remove the old cartridge into the bag for disposal.
11. Place the new cartridge, **with the brass ring to the top**, into the filter housing.
12. Push down, firmly to seat.
13. Check and replace the lid seal if required, with new seal provided.
14. Repeat for second unit etc
15. Place lids on to the filter housing and push down.
16. Replace all bolts and nuts to each lid.
17. Tighten nuts. **DO NOT OVERTIGHTEN THE RETAINING NUTS**

Replace the suction line.



Dispose of used cartridges as per the environmental regulations and your company guidelines.

OVERLOAD SWITCH:

The CROMPTON 3000 SERIES box is located with the electrics on each MFU—this protects the unit from overheating and power surges—in such event it will automatically turn off the pump and motor whereby protecting the electrics.

FLOAT SWITCH

This is mounted at the lowest point of the rig with a 20mm movable float—so in the event of a leak/burst pipe/fitting—the rise of the oil in the bund will trigger the switch and turn off the motor—so stopping potential oil over spilling the bund.

If the motor does stop ; check the float switch first, drain any excess liquid from the bund and re-start, check for leaks.

PRESSURE RELIEF VALVE

The Pressure Relief Valve is set at 8.5 bar in order to protect the pump and motor from over pressuring through filter blockages—in this event it will shut down to

Rig will not run :

- Check Power Supply is correct voltage.
- If fitted check for faulty fuse (240v Models)
- Check power cable for any damage
- Check that the power supply is connected and the Isolator Switch is ON.
- Check to see if the **RED** light is illuminated……..No light…no supply. Check power supply.
- **RED** light on press Start Switch…… No **GREEN** light…..Disconnect from Power Supply and request for a qualified Electrician to investigate the control box.
- Check trip switch inside the control box.
- If the unit is bunded and is fitted with a float switch, check for any fluid spillage in the bund. Drain the excess fluid and re-start the unit. Check for any leaks.

Poor Flow Rate:

- Cartridges are clogging with dirt and/or water.
- Cartridge inserted upside down. Remove lid and check brass ring is at the top.
- Partial blockage in the pipe work or manifold.
- By pass valve is opening due to partial blockage, cartridge clogging or too high viscosity of oil.
- High viscosity rate of fluid will also reduce flow rate e.g. very heavy gear oil. Warmer oil flows more freely than cold oil, as the unit operates the oil will get warmer and flow will increase.

Rig keeps stopping:

- Start the rig and watch the pressure gauge. If this goes above 70 psi and the rig stops there is either a blockage between the pump and manifolds or the cartridges are clogged.

Leak around Filter Lid:

- Seals are worn or damaged…..remove and replace with new seals.
- Check for any damage around the filter housing top …….. if someone has used a screwdriver or similar to remove cartridges they may have damaged the aluminium lip.
- Check tightness of bolts.

No flow:

- Check all fittings are tight on the suction side of the pump.
- Prime the pump and if still no flow, check to see if the motor and pump are running. Disconnect the feed line to the manifold and if still no flow then check and replace pump stator.

Filter Rig fitted with L port Diverter Valve

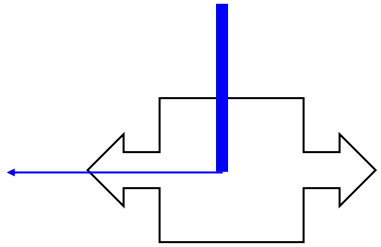
The diverter valve directs the flow independently to either of the two filter units. The rig can be used to filter different oils without having to keep changing the cartridges.

If using the rig on different oils remove the suction line from the first oil and allow the pump to purge the system for 3-4 minutes. Disconnect the existing lines and fit the second lines.

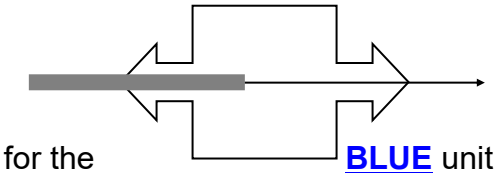
If using the rig for coolant and oil it is beneficial to use on oil first and then coolant. After filtering the coolant, lift the suction line out of the coolant and purge the rig for 3 or 4 minutes to flush out the excess coolant.

The valve handle must be moved in the correct direction and moved to its furthest stop position: Failure to set the handle in the stop position will result in fluid passing to both filters;

When looking at the filter unit from the front:
HANDLE UPRIGHT: Flow goes to **Blue** filter unit



HANDLE DOWN: Flow goes to Silver filter unit



To enable ease of use please use the **BLUE** hoses for the **BLUE** unit and the **BLACK** hoses for the SILVER unit.

It is likely that a small proportion of fluid will remain in the pump even after purging. If absolute cleanliness is required we recommend disconnecting of the feed line from the diverter valve and pump a small amount of fluid that is to be filtered through the pump and valve assembly. Then reconnect the hose to the valve

Prefilters :

Pre-filters are available in various sizes.
Magnetic Filters: 5”, 10” and 20”

Polypropylene 20” Housings.

Cartridges available in 1, 5, 10, 20, 50 Micron ratings

MCM: Magnet core module

Using a central core within the unit itself, the entire volume of fluid must pass within 5mm of its 8000 gauss magnet many times collecting any ferrous particulate, annihilating any form of diesel bug, and then through the depth filter to remove the remaining debris down to 3 micron and remove all water.

Rig Order Specs

MODEL TYPE

MS……..…Micro System

1,2,4,6 ……Number of filter Housings

KU65, 9788, KU85
……Type of filter housing

110,240, 380
……..Type of power supply

B……Bunded

MF…… Magnet

PF… Pre Filter Polypropylene

T……Trolley

FS…… ……Float Switch

W…….. Wheeled
MCM …… mag’core module

E.g. MS2/9788/110/T

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1888S	Filter Cartridges Sleeved for all oils & Fuels	Supplied box of 6
1888	Filter Cartridges for fuels & Light oils	Supplied box of 6
KF65	Filter Cartridges	Supplied box of 6
KF85P	Filter Cartridges for water based oils	Supplied box of 6
9788	Filter Housing	Complete Unit
KU65	Filter Housing	Complete Unit
KU85	Filter Housing	Complete Unit
PMB01	Polyethylene Manifold Single Unit	Complete with seals/adaptors
PMB02	Polyethylene Manifold Twin Unit	Complete with seals/adaptors
ISOS110	Isolator Switch 110 volt	Complete Unit
ISOS240	Isolator Switch 240 volt	Complete Unit
ISOS380	Isolator Switch 380 volt	Complete Unit
SS110	Stop/Start Switch 110 volt	Complete Unit
SS240	Stop/Start Switch 240 volt	Complete Unit
SS380	Stop/Start Switch 380 volt	Complete Unit
DAN100	Pressure Cut Out Switch	Complete Unit
BP80	By Pass Valve	Complete Unit
FS110	Float Switch 110 volt	Switch Only
FS240	Float Switch 240 volt	Switch Only
FS380	Float Switch 380 volt	Switch Only
QCA12	Quick Coupler Male 19mm	Single Unit
QCB12	Quick Coupler Female 19mm	Single Unit

FR500	Frame 500mm	Frame Only
FR1000	Frame 1000mm	Frame Only
TR500	Trolley 500mm	Trolley Only
BD500	Bund 500mm	Bund Only
BD1000	Bund 1000mm	Bund Only
CW06	Castor Wheels	Single Unit
HA3000S	Suction Hose	3 Metre BSP Female 19mm
HA3000R	Return Hose	3 Metre BSP Female 19mm
FT12	Filter Trap Suction Line 19mm	Single Unit
SP15	Mini mess Sampling Point	Single Unit
MAG5	Magnetic Filter 5 inch	Complete Unit
MAG10	Magnetic Filter 10 inch	Complete Unit
MAG20	Magnetic Filter 20 inch	Complete Unit
MAGSP	Magnetic Filter Cleaning Tool	Single Unit
PF10	Pre-filter 10 inch	Complete Unit
PF20	Pre-filter 20 inch	Complete Unit
HABP350	Hose Assembly By Pass	Complete
HAPM500	Hose Assembly Pump/ Manifold	Complete
OLPC6	Particle Counter (where fitted)	See separate manual

ATEX statement:

All Kleenoil MFU Systems

Standard Kleenoil Systems are not Atex compliant. Where a unit is to be installed in a potentially explosive atmosphere ensure that this has been specified at the time of purchase and that the equipment has been supplied accordingly and displays an ATEX nameplate or is supplied with a certificate of conformity. If there is any doubt as to the suitability of the equipment please contact Kleenoil Limited before commencing with installation and commissioning.

Electrical installation and maintenance work should only be carried out by suitably qualified and competent persons and must be in accordance with relevant electrical regulations.
All electrical equipment, including control and safety devices, should be suitably rated for the environment in to which they are installed

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

EC Declaration of Incorporation

This declaration is only valid when partly completed machinery has been supplied.
In this case, the machinery meets the requirements of the said directive and is intended for incorporation into other machinery or for assembly with other machinery in order to constitute relevant machinery as defined by the said directive including any amendments, which are valid at the time of supply.

IMPORTANT

This declaration is only valid when the machinery has been installed, operated and maintained in accordance with these instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment.
The following harmonised standards are applicable: BS E N 809, BS EN ISO 12100 Parts 1 & 2
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EC Declaration of Conformity

In this case the machinery meets the requirements of the said directive including any amendments which are valid at the time of supply.
We further declare that, where applicable, said machinery also meets the requirements of:
The EMC Directive 2004/108/EC
The Low Voltage Directive 2006 /95/E
Pressure Equipment Directive 97/23/EC
The Outdoor Noise Directive 2005/88/EC
The Drinking Water Directive 99/83/EC

IMPORTANT

This declaration is only valid when the machinery has been installed, operated and maintained in accordance with these instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment

Further details of pump and motor are available on request as a pdf file or disc.
Contact sales@kleenoil.co.uk

START-UP PROCEDURE

Pumps must be filled with liquid before starting. The initial filling is not for priming purposes, but to provide the necessary lubrication of the stator until the pump primes itself. When the pump is stopped, sufficient liquid will normally be trapped in the rotor/stator assembly to provide lubrication upon re-starting.
If, however, the pump has been left standing for an appreciable time, moved to a new location, or has been dismantled and re-assembled, it must be refilled with liquid and given a few turns before starting. The pump is normally somewhat stiff to turn by hand owing to the close rotor/stator fit. However, this stiffness disappears when the pump is running normally against pressure.

DRY RUNNING

NEVER RUN THE PUMP IN A DRY CONDITION EVEN FOR A FEW REVOLUTIONS OR THE STATOR WILL BE DAMAGED IMMEDIATELY. CONTINUAL DRY RUNNING COULD PRODUCE SOME HARMFUL OR DAMAGING EFFECTS.
LUBRICATION

ROTOR AND STATOR

The wear rate on these components is dependent on many factors, such as product abrasivity, speed, pressure etc. When pump performance has reduced to an unacceptable level one or possibly both items will need replacing.

C E CONFORMITY

CE

CERTIFICATE & DECLARATION OF CONFORMITY FOR CE MARKING

Company contact details:
KLEENOIL FILTRATION LIMITED
'THE MALTINGS' FENTON LANE, SHERBURN IN ELMET, LS25 6EZ, UNITED KINGDOM
Tel: 01977 682810 Fax: 01977 685457 Email: sales@kleenoil.co.uk

KLEENOIL FILTRATION LIMITED declares that their:
Micron Filtration Unit MS1
Micron Filtration Unit MS2
Micron Filtration Unit MS4

are classified within the following EU Directives:
Machinery Directive 2006/42/EC
Low Voltage Directive 2006/95/EC
Electromagnetic Compatibility Directive 2004/108/EC

and further conform with the following EU Harmonized Standards:
EN ISO 12100:2010
EN 809:1998+A1:2009
EN 60204-1:2006+A1:2009
EN 61000-6-2:2005
EN 61000-6-4:2007+A1:2011

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UNIT SYSTEM

The Kleenoil Bypass Filter System is a bypass oil filtration system that passes only a small portion of the total oil flow through a very dense filter cartridge. At a slow speed, it is possible to remove particles down to 1 micron (3 absolute), remove 99.95% of all water, greatly decrease engine wear and prolong oil life.

Kleenoil can eliminate water and particle contamination, extend oil life up to 5 times and hydraulic oil up to 10 times, reduce engine/ machine wear and component wear. Castings subjected to batch and individual testing constructed of Aluminum BS1490 LM6 (M)

KLEENOIL

M F U

KLEENOIL have developed a secondary range of replacement cartridges to suit specific uses.

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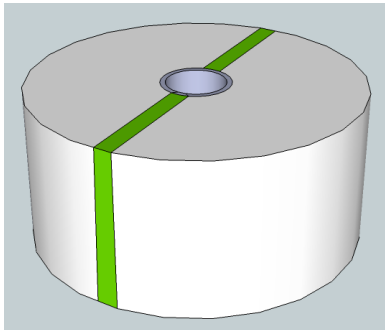


ORIGINAL

Construction

Long fibre cellulose body with nylon cover and brass fastening.

Performance

Specifications of engine, gear and hydraulic oils. Filtration Level: Particulate contamination in accordance with BS 5540 part 4: 1981 and ISO/DIS 4406. ISO equivalent to NAS 1638 class 6. (Hydraulic oil specification)

STANDARD

Construction

Long fibre cellulose body with nylon cover and brass fastening. Additional graded polypropylene disc. Handles.

Performance

Filtration Level: ISO 14/11/9 equivalent to NAS 1638 class 6. (Hydraulic oil specification)

Disc reduces particle migration and handles help for ease of extraction.

For all general use where, by preventing lower particle migration achieves better ISO readings faster.

PREMIUM

Construction

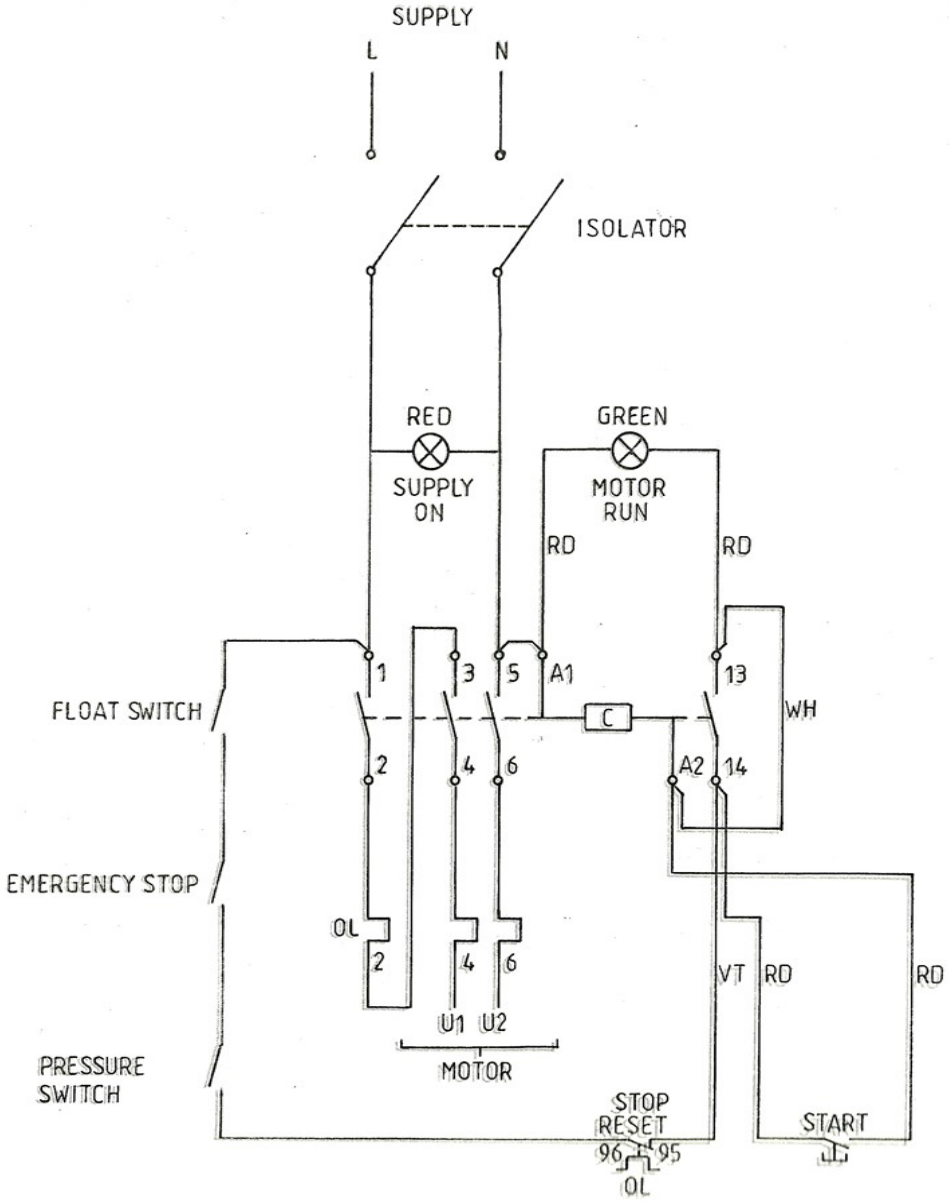
Long fibre cellulose body with nylon cover and brass fastening. Additional graded polypropylene discs—split layer filtration level. Handles.

Performance

Filtration Level: ISO 14/11/9 equivalent to NAS 1638 class 6. (Hydraulic oil specification) Arrests channelling & provides secondary phase of filtration, taking a larger volume of smaller particles

The PREMIUM offers a second stage of filtration to substantially increase both volume and speed of particle retention. Ask our sales team for some analytical records on performance of these cartridges

ELECTRICAL DIAGRAM



PROCESS CHART

KLEENOIL FILTRATION LTD
OIL FILTRATION BOX RIG CIRCUIT DIAGRAM
JANUARY 2010
NOT TO SCALE

PRODUCT PARTS SHEETS

Customer

Completed build date 23/07/18

Model MS8

ID
ENGINEER TL

CHECK VALVE 4 BAR

DANFOSS FACTORY SETTING

PUMP I.D

MOTOR I.D

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CONTACT

FOR FURTHER INFORMATION

CONTACT HQ or your direct contact

YOUR SALES REPRESENTATIVE

NAME

……..

DIRECT DIAL

……

E MAIL

……..