The environmental solution
to protect
oil & fuel systems

CHAININGS Filtration

Unit 1 & 2, Harrow Park
Harrow Road, HR4 0EN
Tel: +44 (0) 1432 356318
Fax: +44 (0) 1432 360808
Email: info@chainings.com

TECHNICAL BROCHURE

FOR CP4202-00616

OIL FILTRATION UNIT

(240V 50Hz Single Phase Supply)

CONTENTS

1. INTRODUCTION

The Filtration unit CP4202 is designed to clean a wide range of hydra-carbon fluids, some of the more general being – hydraulic, lubricating & transformer oils.

The unique Chainings 203mm-filter medium is fitted to the unit, which will remove water, acids, ethylene glycol and all other aqueous contaminants together with solids above 1 micron.

A reservoir is incorporated to provide the option of filtering stored fluid to a high level of cleanliness prior to use in 'topping up' or refilling systems. Alternatively, the unit can be applied to installations for system purging.

All features are mounted on a flat bed trolley with fixed & swivel (Braked) castors to aid mobility.

Note: The unit is suitable for use on a wide range of mineral oils. A certain amount of synthetic oils may also be cleaned after consultation with the manufacturer. However, there are types of fluid that cannot be cleaned using the unit, which include the following:

- Oils with properties that may corrode rig seals & pipework e.g. Phosphate Esters.
- Oils with sufficient water based properties that may be reduced, because of the filter element water retention feature, e.g. Fire Resistant Fluids.

It is advisable to contact the manufacturer before cleaning fluids where the characteristics are not known.

2. FILTRATION UNIT FEATURES

2.1 Trolley Assembly. Used to mount all of the unit features within the area of the trolley with no components protruding. A cowl of mild steel construction (Painted) is fixed over the trolley framework to protect the components. Access doors are incorporated into the cowl for ease of filter element change.

2.2 Electrical Panel; this houses all the electrical controls to & from the unit. All the components are secured in a weatherproof cabinet built to IP55 standard. The panel is provided with safety interlock, so that access cannot be gained unless electrically isolated. A lockable handle is provided for security. The following lamps & controls are mounted on the panel door;

a) Pump, Start/Fault override inch, Button (Green)
b) Pump Stop Button (Red)
c) Power On Indicator (Green Lamp)
d) Pump Running Indicator (Red Lamp)
e) Reservoir Level High Indicator (Amber Lamp, Labelled)
f) Reservoir Level Low Indicator (Amber Lamp, Labelled)
g) Pump Vacuum High Indicator (Amber Lamp, Labelled)
h) Heater On/Off Control Switch
i) Hours Counter Key Reset Switch
j) Flow Control Adjustment

Also located on the door, is;

k) A Programmable Hours Counter (Factory set to 500 Hours) which will record the time that the unit is in operation & once the number of programmed hours is achieved (i.e. filter element life, time limit), will automatically turn the unit off.
l) An Inverter Frequency readout which displays the output frequency in Hertz supplied to the pump motor whilst the unit is operation. Mounted on the top of the cabinet, is an amber beacon, which when flashing, indicates that the filter elements are blocked and require changing.

2.3 Filter Assembly; Part of the unique range of element types & sizes, the Chainings filter medium is housed in a corrosion resistant pot & sealed to provide the maximum efficiency for contamination control. Designed specifically for ease of element replacement.

2.4 Pump & Motor; Consisting of a 0.55Kw motor, inverter rated & driven, close coupled to a Triple Screw pump. This assembly has been selected to produce laminar circulation of fluid with the minimum revolutions of the pump's rotating parts, to aid the efficiency of the filters in removal of fluid contamination. The pump is fitted with a mechanical relief valve set to discharge fluid back to the pump's suction feed should the generated pressure exceed 10 Bar.

2. FILTRATION UNIT FEATURES Cont.

2.5 Reservoir Assembly; A steel tank with a removable sealed lid & capable of holding 75 Litres of fluid. The following features are included;

a) Fluid Level Indicators (Max. Fluid Level)
b) 3Kw 'Through feed' heater with thermostat control. (Set to 60Deg C)
c) Filler / breather Cap
d) High / Low level, fluid float switch

2.6 Divertor Valves; Located in the unit's circuit to provide the following options;

a) Purging the fluid held in the reservoir
b) If the unit is coupled to an installation, purging the fluid contained in the installation system
c) "Topping" systems up with fluid held in the reservoir.
d) Emptying fluid from systems into the reservoir.

See operational layout in Section 3.

2.7 Bypass Valve; Used to initially circulate oil direct from the pressure line to return in order to remove oil held in the filter elements if the unit has been stationary for a period of time. Normally left in the Closed position.

2.8 Pressure Gauge; A 0-20 Bar pressure gauge located in the filter circuit to provide a visual indication of the pressure generated during the cleaning cycle.

2.9 Pressure Switch; Located in the filter circuit & factory set to 9 Bar. Its function is to protect the filters from excess pressure due to filter element blockage. Should the pressure rise to the defined setting, the pressure switch will latch an electrical signal, automatically turning off the unit & activating the Amber Beacon.

2.10 Snap-On Couplings; "Flat Face" types used for;

a) Inlet port - Connection of hose used for filling purposes. (3/4" Male)
b) Outlet port - For connection to the customer's system. (3/4" Female)

NOTE; **If purging an installation system, do not operate the unit unless the feed & delivery hoses are properly connected & the diverter valves are in the correct mode of operation.**
(See Section 3)

2.11 Vacuum Switch; Located on the suction feed circuit to the pump. Its function is as follows;

a) To electrically isolate the pump motor if the strainer becomes blocked.
b) To electrically isolate the pump motor if the unit inlet feed hose is not connected & the unit inlet, diverter valve is not selected to the correct position.

2. FILTRATION UNIT FEATURES Cont.

2.12 Strainer; Located before the feed to the pump, it's role is to prevent any contaminants above 500 Microns passing through the unit which may incur damage.

NOTE; Dependent on the cleanliness of the system to be cleaned, the mesh within the strainer should be regularly inspected and if necessary, cleaned. Set diverter valves to Mode of Operation (b) before cleaning, (Interconnecting hoses disconnected).

3. INSTALLATION & OPERATION OF THE UNIT

3.1; Installation; The unit may be operated in four modes as follows;

a) Purging of fluid stored in the reservoir
b) Purging of fluid contained in the applied systems
c) Refilling or 'topping up' applied systems from the reservoir
d) Transferring fluid from applied systems to the reservoir

In all modes of operation, the electrical supply to the unit should be connected to a suitable Single-phase 240vac 50Hz supply. (Min. current rating 16Amps, with type 'B' overload protection).

Conductor colour codes are as follows;

Brown	**=**	**Live**	**(L)**
Blue	**=**	**Neutral**	**(N)**
Green/Yellow	**=**	**Earth**	**(E)**

Before operation of the unit, ensure that the elements are fitted into the Chainings filter housings. Ensure that there is sufficient fluid in the reservoir before operating in modes a) b) & c). (Fill to Blue line on upper sight glass)

Note:Unit has been tested with Mobil DTE13M oil (ISO32). During initial operation, it is advisable to fill and flush the system before using on intended application.

Use of the unit in operation modes b) c) & d) (See above) will require the connection hoses to be fitted between the unit Inlet & Outlet ports & the applied system.

Note; Ensure that the Flat-Faced Snap-On Couplings on the connection hoses are firmly assembled onto the unit couplings.

It is important to ensure that the supply to & the delivery from the unit is free from restrictions otherwise malfunction may occur.

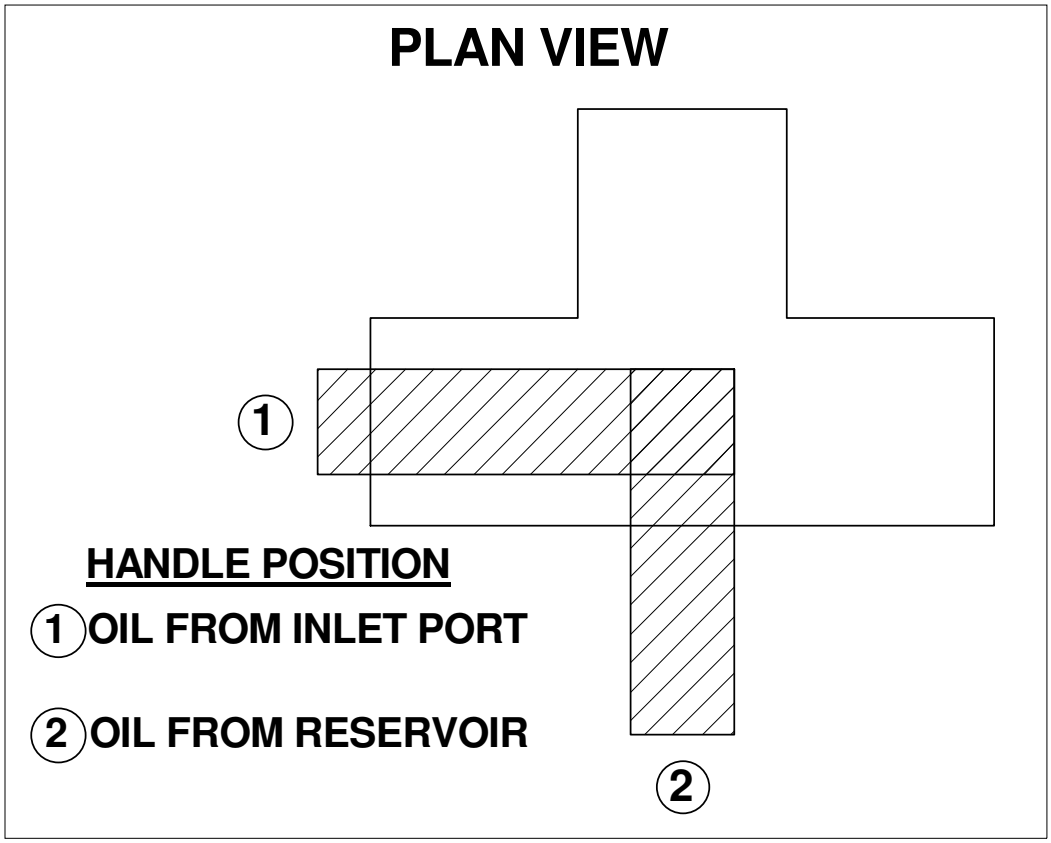
To move the unit, remove the transport pin located inside between the front of the framework and the turntable.

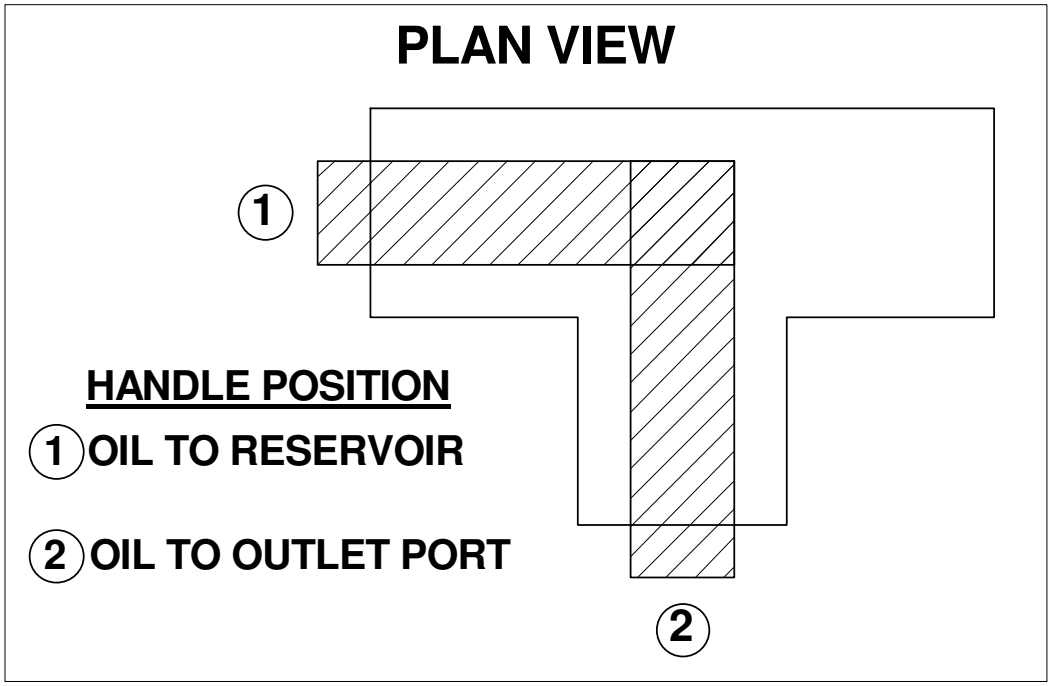
3.2; Operation; Once the operational mode is selected (See overleaf) & electrical power is present (Indicated by a **Green** 'Power On' light on the electrical cabinet), the unit may be operated by pressing the **Green** 'Pump Start' button. Given the correct conditions (See Section 4, Program Summary), the unit will circulate the fluid to be cleaned. Operation of the unit can be stopped at any time by pressing the **Red** 'Pump Stop' button.

A visual indication of the motor running frequency will be displayed on the front of the electrical cabinet. It is recommended to select the Heater Switch in the "On" position, particularly if the oil is cold and/or with a heavy viscosity. The Switch should be turned to the "Off" position only when the unit has been turned off but electrical power is still present.

NOTE; This product is fully tested to specification before it leaves the factory. Should any queries or problems arise, then the manufacturer should be contacted immediately. Adjustments made to the product without the prior knowledge of the manufacturer may invalidate any warranty claims.

3. INSTALLATION & OPERATION OF THE UNIT





4. PROGRAMME SUMMARY

Manual Operation

Turn Mains Isolation Switch to the 'ON' position.

⇓

'Green' Power Lamp 'ON'
Inverter Readout displays '0.0'

⇓

If; Amber High or Low Level Lamps are on, Amber High Vacuum Lamp is on, Amber Beacon is flashing, or Hours counter has reached set limit, refer to table below.

⇓

Press 'Green' Start button.

⇓

'Green' Power Lamp remains on.
'Red' Pump Running Lamp on.
Inverter Readout displays Frequency value.

⇓

Hours Counter will display time achieved whilst unit is in operation
(Count down from pre-set time)
The unit will continue to circulate fluid until manually stopped by pressing 'Red' Stop button or automatically by the following alarm conditions;

Alarm	Reason	Action
Red Beacon flashes	1. Filters blocked	Replace filter elements.
	2. Diverter Valve 'B' in wrong selection, for mode of operation	Position Diverter Valve handle, for correct mode of operation
Amber Low Level lamp On	Insufficient fluid in reservoir	Fill reservoir to upper sight glass level.
Amber High Level lamp On	Excess fluid in reservoir	Drain fluid from reservoir to upper sight glass level.
Amber Vacuum High lamp On	1. Diverter valve 'A' in wrong selection for mode of operation	Position Diverter Valve handle for correct mode of operation
	2. Strainer blocked	Empty all fluid from reservoir, remove Strainer mesh & clean
Hours Counter reads 0 Hours	Filter element life expectancy expired	Replace Filter Elements. Turn Key clockwise and Press "Pump On" to reset Hours Counter. Turn Key back when Counter reads 500

Note;

To cancel Flashing Beacon, Amber low/High Level or Vacuum High lamps, the Mains Isolator must be turned to the 'Off' position then back 'On' again, to recommence operation of the unit.

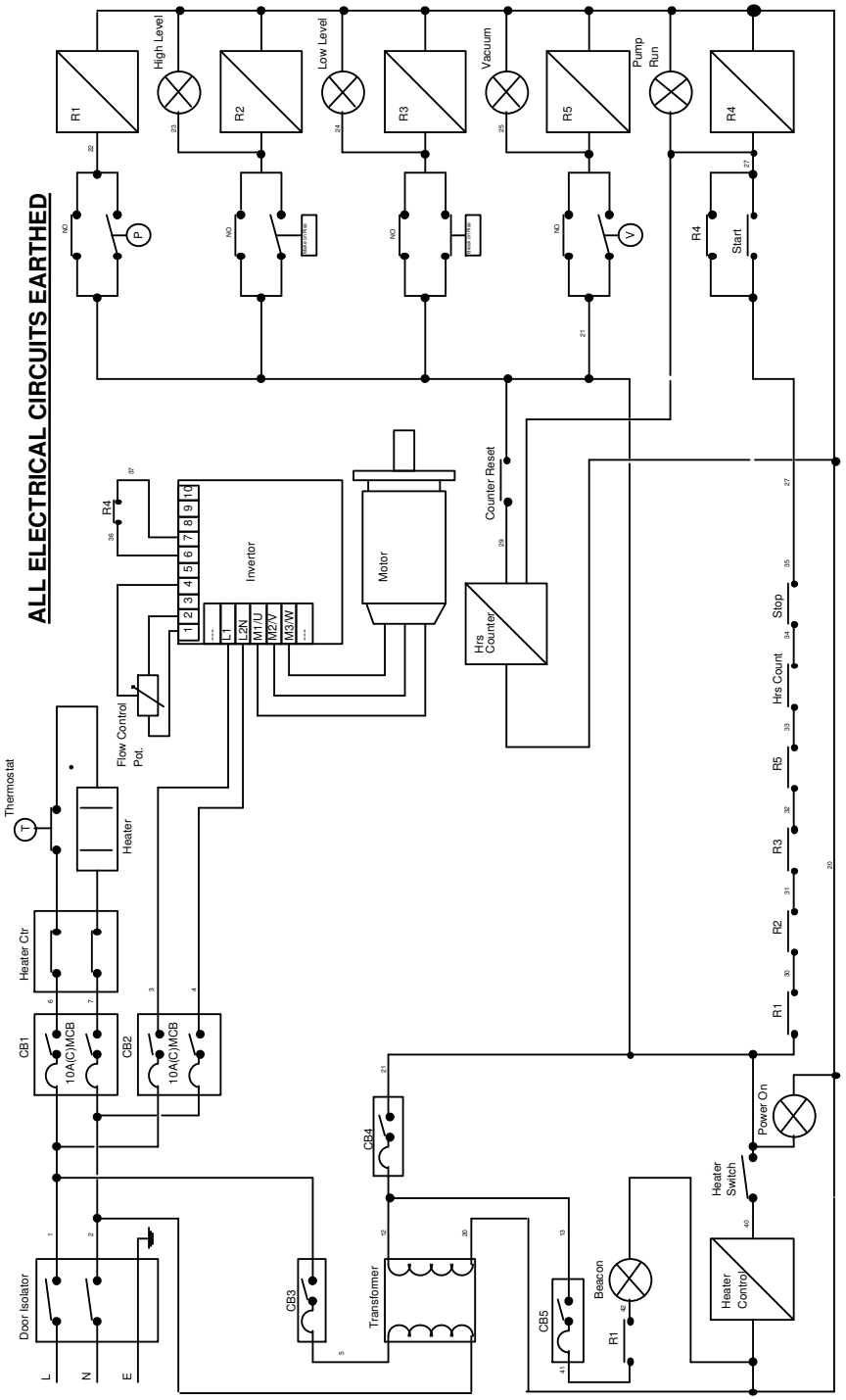
5. SPECIFICATIONS

1.	TYPE OF FILTRATION UNIT	CP4202
2.	TYPE OF FILTER HOUSING	CHO2010H
3.	SIZE OF FILTER ELEMENT	OCH2010 *
4.	POWER SUPPLY TO CABINET	240vac 50Hz 1Ph
5.	CONTROL SUPPLY	24vAc (Except supply to motor)
6.	PUMP/MOTOR SPEC.	Motor; 0.55Kw W-DA80MM-D Pump; SPF10R56G8-3-W20 Min Rpm 104 Max Rpm 1044
7.	MINIMUM FREQUENCY SETTING	6Hz
8.	FREQUENCY SETTING @ 70 Deg C	60Hz
9.	MINIMUM FLOW RATE	1.6Lpm
10.	MAXIMUM FLOW RATE	10.0Lpm
11.	RESERVOIR CAPACITY	97 Litres
12.	OIL CAPACITY BETWEEN HIGH & LOW LEVELS	65 Litres
13.	HEATER SPECIFICATION	3Kw 240v 1Ph, with thermostat
14.	HEATER THERMOSTAT SETTING	60 Deg C
15.	INLET PORT SIZE	¾" BSP (Female Flat Face)
16.	OUTLET PORT SIZE	¾" BSP (Male Flat Face)
17.	WEIGHT	350Kgs (Reservoir FULL)
18.	SIZE	135-75-100cm
19.	MIN & MAX OPERATING TEMP (AMBIENT)	10 – 30 Deg C
20.	MIN & MAX OPERATING TEMP (OIL)	10 – 80 Deg C
21.	OIL VISCOSITY RANGE	20 – 300 CSt
22.	MAXIMUM PRESSURE TO THE UNIT	0.5 Bar
23.	MAXIMUM SUCTION LIFT	5 Metres
24.	VACUUM SWITCH SETTING	25"-30"Hg
25.	MIN OPERATING PRESSURE	2Bar
26.	MAX OPERATING PRESSURE	a) Pressure switch setting 9 Bar b) Relief valve setting 9.5 Bar

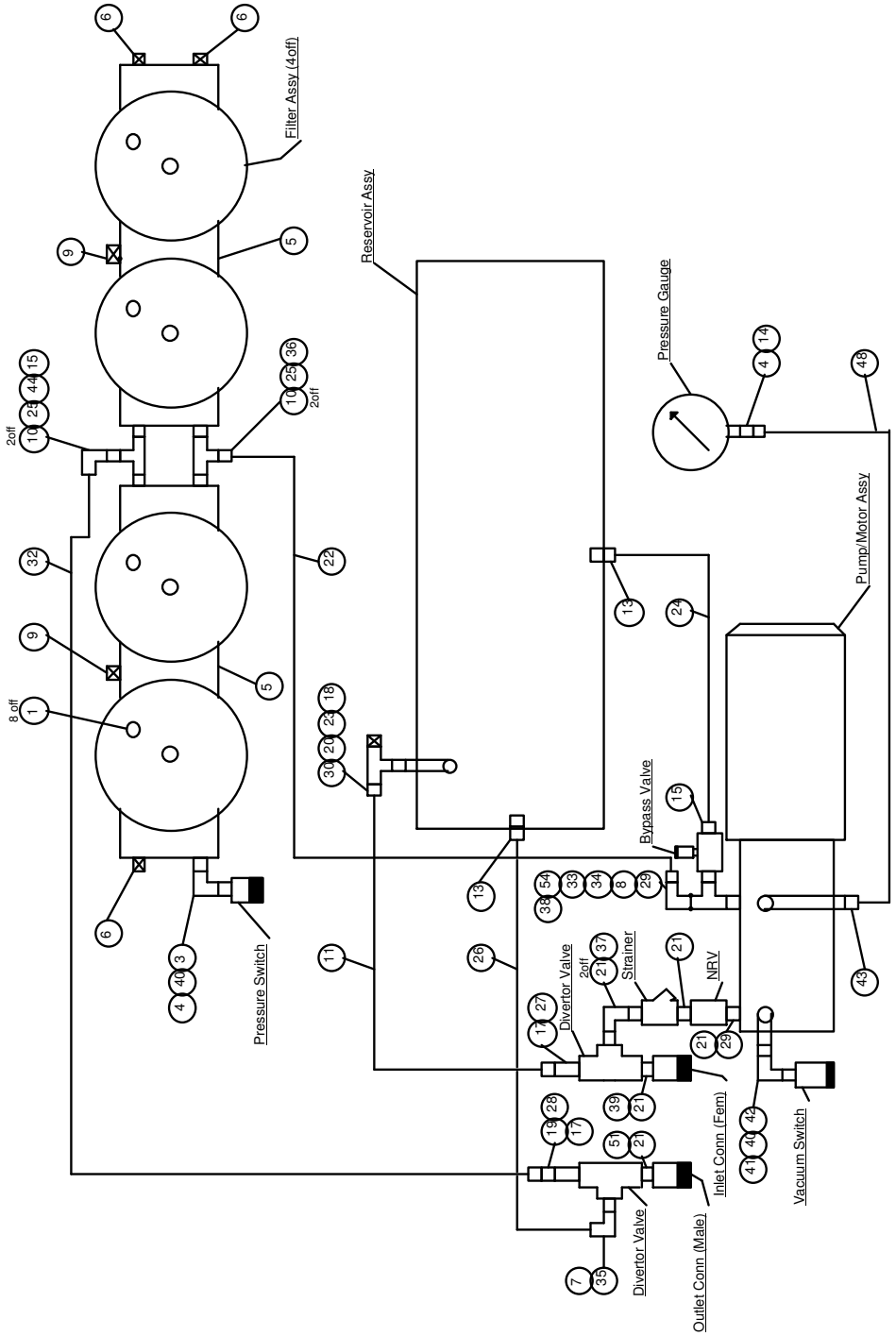
- **For re-ordering Filter Elements quote OCH2010-Pack of 4 elements.**

6. DRAWINGS

ELECTRICAL CIRCUIT DIAGRAM CP4202-0616-01



6a, **DRAWINGS Cont.**
Piping Diagram CP4202-0616-03

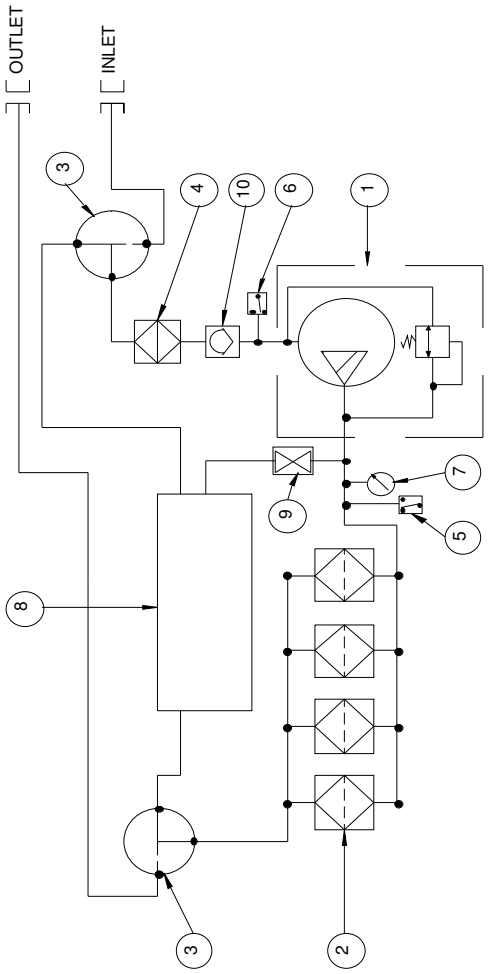


6a. DRAWINGS Cont.

Parts list for piping diagram CP4202-0616-03

REF.	PART No.	DESCRIPTION	QTY
1	CRX04BMG	¼ BSP BANJO BOLT (SPECIAL)	8
2	CP2010MAN3	MANIFOLD ADAPTER	2
3	BA06BM04BF	3/8 - ¼ BSP M-F ADAPTER	1
4	BA04BM04BF(GAUGE)	GAUGE ADAPTER	2
5	CP2010MAN2	MANIFOLD	2
6	BA06BMT	3/8 BSPT MALE BLANK	3
7	T-WE15-LR3/8keg	3/8 BSPT – 15 90 ELBOW ADAPTER	1
8	BA12BM08BF	¾ - ½ BSP M-F ADAPTER	1
9	BA06BM	3/8 BSP MALE BLANK	2
10	BA06BM06BF	3/8 BSP M-F ADAPTER	4
11		22mm STEEL PIPE ASSY (500mm Lg)	1
12			
13	SV15L	15mm BULKHEAD c/w LOCKNUT	2
14	T-GA6-LR ¼	¼ BSP FEM – 6 STR ADAPTER	1
15	T-GE15-LR3/8	3/8 BSP – 15 STR ADAPTOR	2
16	T-GA15-LR3/8	3/8 BSP FEM – 15 STR ADAPTER	2
17	BA12BM12BM (BULK)	¾ BSP BULKHEAD	2
18	BA12BM	¾ BSP MALE BLANK	1
19	BA12BF08BM	¾ BSP FEM – ½ BSP MALE ADPTR	1
20	BA12BF12BF12BF	¾ BSP FEM TEE	1
21	BA12BM12BM	¾ BSP M-M ADAPTER	6
22		15 mm STEEL PIPE ASSY (500mm Lg)	1
23	T-GE22-LR3/4	¾ BSP – 22 STR ADAPTER	1
24		15 mm STEEL PIPE ASSY (600mm Lg)	2
25	BA06BM06BM06BM	3/8 BSP TEE	2
26		15 mm STEEL PIPE ASSY (500mm Lg)	1
27	T-GA22-LR3/4	3/4 BSP FEM – 22 ADAPTER	1
28	T-GA15-LR 3/4	3/4 BSP FEM– 15 STR ADAPTER	1
29	CP2010MAN5	PUMP FLANGE	2
30	BA12BM12BM	3/4 BSP M – M ADAPTER	4
31	BA12BM12BM	3/4 BSP M – M ADPTR	1
32		15MM STEEL PIPE ASSY (1500mm Lg)	1
33	BA08BM06BM	1/2-3/8 BSP M – M ADPTR	1
34	BA08BF08BF08BF	1/2 BSP FEM TEE	1
35	BA12BM06BF (FIXED)	3/4 BSP MALE – 3/8 BSP FIXED FEM	1
36	T-GA15-LR3/8	3/8 BSP – 15 FEM ADAPTER	1
37	BA12BF90K12BF	¾ BSP F – F COMPACT 90 ELBOW 1	1
38	T-GA15-LR ½	½ BSP FEM– 15 STR ADAPTER	1
39	FFC08-12FBF	¾ BSP FLAT FACED CARRIER	1
40	05026	¼ BSP F – F COMPACT 90 ELBOW	1
41	BA04BMT04BM	¼ BSPT – ¼ BSP M – M ADAPTER	1
42	BA02BMT04BM	1/8 BSPT – ¼ BSP M – M ADAPTER	1
43	T-GE6-LR1/4	1/4 BSP – 6 STR ADAPTER	1
44	BA06BF90K06BF	3/8 BSP F-F 90 ELBOW COMPACT	1
45			
46			
47			
48		6mm STEEL PIPE ASSY (1000mm Lg)	1
49			
50			
51	FFP08-12FBF	¾ BSP FLAT FACED PROBE	1
52			
53			
54	BA08BM90K08BF	½ BSP M-F COMPACT 90 ELBOW	1

6. DRAWINGS Cont.
HYDRAULIC CIRCUIT DIAGRAM CP4202-0616-02



Ref	Part No.	Description	Qty
1	SPF10R56G8.3-W20	Pump/Motor Assy	1
2	CHO2010H	Chainings Filter Assy	4
3	1283L	Divertor Valve	2
4	365-6741	100Mesh Strainer	1
5	SMMF9R4GASP8	Pressure Switch	1
6	151454153	Vacuum Switch	1
7	MGR63G10	Pressure Gauge 0-20 Bar	1
8	CP4201-0616-11	Reservoir assy	1
9	201012	Manual Bypass Valve	1
10	328-5412	Suction Non Return Valve	1
11			

7. PARTS LIST

REF.	PART No.	DESCRIPTION	QTY
1	CP4202-0616-01	RIG FRAME ASSY	1
2	CP4202-0616-11	RESERVOIR ASSY	1
3	CP4202-0616-12	ELECTRICAL CABINET	1
4	CP4202-0616-15	RIG COWL ASSY	1
5	CP4202-0616-01	ELECTRICAL CIRCUIT	1
6	CP4202-0616-02	HYDRAULIC CIRCUIT	1
7	CP4202-0616-03	PIPING DIAGRAM	1

Parts list for Reservoir Assembly CP4202-0616-11

REF.	PART No.	DESCRIPTION	QTY
1	CP2202-0583-11-01	RESERVOIR	1
2	CP-LEVEL127	OIL LEVEL SIGHT GLASS	1
3	845-976	HIGH/LOW LEVEL FLOAT SWITCH	2
4	TAP90F10A001P01	FILLER/ BREATHER	1
5	HBY030/12A	3Kw HEATER ASSY	1

8. FILTER CHANGE PROCEDURE

Removal of used element;

1. Turn diverter valve Handles to positions shown in Mode of Operation, b). See section 3. Ensure that the inter-connection hoses are **NOT** fitted.
2. Gradually loosen the Steel Blank fitted to the Filter Lid, to decay any residual pressure.

   WARNING: Care should be taken to avoid the risk of oil contacting the operator, in case of undue pressure being released.
3. Loosen & remove the M8 clamping screws, spring washers & plain washers, securing the lid to the filter housing.
4. Unlock the nuts fitted to the underside of the two M8 bolts located on the Filter Lid & screw the bolts downward to assist removal of the lid.
5. Once the Filter Lid has been removed, pull the Filter Element upwards & away from the Filter Housing.
6. Dispose of the Filter Element in accordance with any legislative procedures that may be applicable.

Installation of new element;

1. Ensure that the Filter Housing is clean & free from contaminates & that the 'Inlet' & 'Outlet' ports are not blocked.
2. Ensure that the 'O' Ring on the Centre Tube is correctly positioned & Not damaged.
3. Install the replacement Filter Elements & ensure that it is seated firmly at the bottom of the Filter Assembly.
4. Ensure that the 'O' Ring on the Filter Lid is correctly fitted & Not damaged.
5. Apply a film of clean oil around the 'O' Ring on the Filter Lid & ensure that the ends of the two bolts for extraction purposes, are not protruding through the bottom of the Filter Lid.
6. Line up the holes in the Filter Lid with the tappings in the Filter Housing & press down to locate the lid.
7. Replace the clamping screws, spring washers & plain washers & Torque tighten each screw in a diagonal fashion, to 20Nm.
8. Hand tighten the two bolts on the Filter Lid & lock to the Lid with the nuts fitted to the underside of each bolt. **Note; The Filter Element has been designed to compress as the lid is being tightened down.**
9. Tighten the steel blank into the filter lid.
10. Turn the diverter handles to the desired mode of operation as shown in Section 3).

WARNING: ALWAYS USE GENUINE Chainings FILTER ELEMENTS.