

USER MANUAL

Mobile Oil Filtration Cart – FCV1
Fluid Power Solutions Ltd.



FLUIDTM
POWER
SOLUTIONS

USER MANUAL

MANUAL REFERENCE NUMBER: FCV1

**THIS MANUAL COVERS THE OPERATOR'S INSTRUCTIONS OF
FLUID POWER SOLUTIONS LTD. MOBILE OIL FILTRATION CART**

MODEL – MOBILE OIL FILTRATION CART

SERIAL NUMBER – FCV1

YEAR OF MANUFACTURE: 2022

Manufacturer: Fluid Power Solutions Ltd.

Address:

Fluid Power Solutions Ltd.
Unit 1 Avro Park
First Avenue
Auckley
Doncaster
DN9 3RJ
United Kingdom

Phone: +44 (0) 1302 743399

Fax: 08701308928

Website: www.fluidpowersolutions.co.uk

Email: sales@fluidpowersolutions.co.uk



Table of Contents

1. Introduction	3
1.1 Introduction	3
1.2 Product Order Code	4
2. Safety	5
2.1 Personal Safety	5
2.2 Hydraulic Safety	5
2.3 Electrical Safety	6
2.4 Operational Safety	6
3. Operation User Guide	8
3.1 Connecting/Disconnecting The Filter Cart – First Use Or New Connection	8
3.2 Starting Filter Cart For The First Time / Operating Filter Cart	10
3.3 Checking Direction Of The Motor	11
3.4 (OPTIONAL EXTRA) - Operating The Particle Counter	11
4. Maintenance Guide	12
4.1 Replacing Filter Elements	12
4.2 Draining System Of Oil	14
5. Electrical System	15
5.1 Electrical Circuit Diagram	15
6. Hydraulic System.....	16
6.1 Hydraulic Circuit Diagram.....	16
7. Dimensions	17
8. Technical Specification	18
9. Troubleshooting	19
10. Spare Parts Diagram.....	20

1. Introduction

1.1 Introduction

Disclaimer – “The intended use of this equipment is for the filtration of hydraulic oil in hydraulic systems. Read this manual carefully before commissioning, maintaining or operating the unit.

Before carrying out any installation or work on and/or with the machine it is necessary to strictly follow the instructions listed in this manual. It is also necessary to comply with the provisions in force concerning accident prevention and safety in the workplace. Fluid Power Solutions Ltd accepts no responsibility for the safe use of this equipment.”



This user manual is written to instruct the operation of Fluid Power Solutions Ltd. Mobile Oil Filtration Cart FCV1. The instructions in these manuals, specifications, illustrations and drawings are based on the information available at the time of writing. To ensure you have the most recent revision of this manual please contact Fluid Power Solutions using the details on page 1.



1.2 Product Order Code

Example order code : **FCV1-110-A03-N**

	BOX 1	BOX 2	BOX 3	BOX 4
EXAMPLE ORDER CODE	FCV1	110	A03	N

BOX 1	SERIES	
	FCV1	<i>Model Type</i>

BOX 2	MOTOR VOLTAGE	
	110	<i>110v (1-phase)</i>
	230	<i>230v (1-phase)</i>
	415	<i>415v (3-phase)</i>

BOX 3	FILTRATION RATING	
	A03	<i>Inorganic microfiber 3 μm</i>
	A06	<i>Inorganic microfiber 6 μm</i>
	A10	<i>Inorganic microfiber 10 μm</i>

BOX 4	ADD ONS	
	N	<i>Base Model</i>
	P	<i>With Particle Counter</i>

2. Safety

You should read and understand all the safety instructions and operating instructions before you start commissioning, maintaining or operating this Filter Cart.



Fluid Power Solutions Ltd. is not responsible for the safe operation and maintenance of this equipment. Ensure that you follow your relevant site safety procedures and protocols in conjunction with the safe operation of this equipment.



2.1 Personal Safety

Personal protective equipment

Always use approved protective equipment.

Operators and all other persons in the working area must comply with site rules and must wear protective equipment, including at a minimum:

- Impact resistant eye protection with side protection
- Protective gloves
- Proper protective boots
- Appropriate work overall or similar clothing (not loose-fitting) that covers your arms and legs.

Drugs, alcohol or medication

Drugs, alcohol or medication may impair your judgment and powers of concentration. Poor reactions and incorrect assessments can lead to severe accidents or death.

- Never use the Filter Cart when you are tired or under the influence of drugs, alcohol or medication.
- No person who is under the influence of drugs, alcohol or medication may operate the Filter Cart.

2.2 Hydraulic Safety

Hydraulic oil at high pressure

Thin jets of hydraulic oil under high pressure can penetrate the skin and cause permanent injury.

- Immediately consult a doctor if hydraulic oil has penetrated the skin.
- Never use your fingers to check for hydraulic fluid leaks.
- Keep your face away from any possible leaks.

Hydraulic oil

Spilled hydraulic oil can cause burns, accidents due to slippery conditions and will also harm the environment.

- Take care of all spilled oil and handle it according to your safety and environmental regulations.
- Hydraulic oil can cause eczema if it comes in contact with the skin.
- Avoid getting hydraulic oil on your hands.
- Always use protective gloves when working with hydraulic oil.
- Wash hands after contact with hydraulic oil.

2.3 Electrical Safety

An appropriate electrical cable is supplied with the Filter Cart:

- There is a risk of electrical shocks if the electrical cable is not treated correctly, this can lead to serious injuries or death.
- Always make sure that the electrical supply cable is kept away from water, oil and sharp edges.
- Make sure the electrical cable is not pinched in doors, fences or similar.
- Check that the electrical cable and cable plug are intact and in good condition.
- Never connect a damaged electrical cable to the machine.
- Never touch the electrical cable if it becoming damaged while working.


2.4 Operational Safety

- Accidents can be caused by ignorance of instructions, neglect of safety measures and carelessness.
- A person operating, servicing or repairing should always be alert and have adequate training and skill to operate the Filter Cart and conduct the other actions properly and according to the instructions.
- An operator is responsible for the proper use of the Filter Cart.
- Incorrect use or repair can be dangerous and lead to physical injury or damage to the Filter Cart
- Safe and efficient operation of this Filter Cart requires that it be maintained in good condition and that it's operator be thoroughly familiar with the controls of the Filter Cart.
- The hydraulic oil is under pressure during operation. Prior to disconnecting any parts from the hydraulic system make sure that you relieve the pressure.
- Take adequate measures when working with hot machine parts.
- Store all materials and fluids in properly designed and marked containers.
- Do not keep any loose items on the Filter Cart. They should be stored in appropriate compartments or elsewhere outside the Filter Cart.
- Report damage to Filter Cart components immediately.
- Repair oil leakages without delay.


- Do not stand on any parts of the framework, hydraulic tubes or hoses.
- Do not let outside personnel into the working area.
- No adjustments should be made during operation unless expressly instructed to do so.
- Keep your hands away from any moving parts.

3. Operation User Guide

3.1 Connecting/Disconnecting The Filter Cart – First Use Or New Installation



Warning - This Filter Cart has been designed to provide oil filtration of a hydraulic system. This Filter Cart should **NOT** be used for any other purpose without contacting Fluid Power Solutions Ltd. (Contact details – page 1)



Electrical Connections:


Supply cable to the HPU control panel:

110v model – Single phase connection. A 5 Metre long supply cable with a 3 pin 16amp plug has been installed to the filter cart for connection to an appropriate power source.



230v model – Single phase connection. A 5 Metre long supply cable with a 3 pin 16amp plug has been installed to the filter cart for connection to an appropriate power source.

415v model – Three Phase connection. A 5 Metre long supply cable with a 3 pin 16amp plug has been installed to the filter cart for connection to an appropriate power source.


Hydraulic Connections:



Warning - Always ensure that the return hose is connected before operation commences.



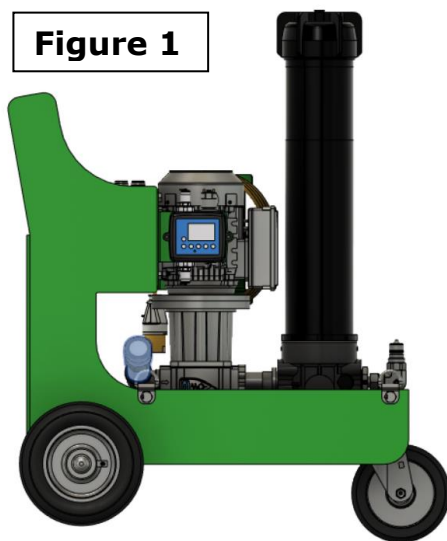
Warning - Always ensure there is a zero pressure reading on any pressure gauge before connecting the hoses between the Filter Cart and the hydraulic system requiring filtration.



- Two quick release hose assemblies are provided with the Filter Cart:
H-001 = Delivery/ Suction hose – 1 1/4" BSP Connection end 1, 1" BSP Connection end 2
H-002 = Return Hose – 3/4" female BSP connection on end 1
- Please follow the hydraulic schematic (Page 16) to ensure connections between the Filter Cart and the system requiring filtration

Suction – H001

- Connect end 1 (1 ¼" BSP male connection) to the 1 1/4" BSP female quick release on the filter cart (see below Figure 1 – highlighted in blue).
- Connect end 2 (1" female connection) to the pressure line of hydraulic system requiring filtration.



Return – H002

- Connect end 1 of the ¾" BSP female connection to the ¾" male connection on the filter cart. (see above Figure 2 – highlighted in blue)
- Connect end 2 (¾" male connection) to the hydraulic system return line that is requiring filtration



Warning - Always ensure that the quick release couplings are connected securely



3.2 Starting The Filter Cart For The First Time / Operating the Filter Cart

If all connections are made as explained in section 3.1 and you have connected the power cable to an appropriate electricity source:

- Check for leaks
- Walk around the filter cart and check for any further system leaks.
- Press the **green "Start"** button to begin operation of the filter cart.
- The **green "Start"** button will now illuminate and filtration will continue until the operator presses the **red "Stop"** button
- In the event of the **red "Stop"** button illuminating whilst the cart is in operation this will be because the electric the motor had overloaded . The motor overload itself is set to auto reset. In the event of this occurring wait for it to reset automatically, no pushbuttons are required to be pressed. The **red "Stop"** tripped light will out when it auto resets .
- In the event of the **yellow "Over-Pressure reset"** light illuminating this is due to pressure becoming too high and will trip the system requiring resetting. This can be as a result of several factors see "Section 9 – Troubleshooting" for further detail on the causes of Over-Pressure.
- In the event of the **Blue "Filter Blocked"** light illuminating this means the filter element (FCVSP-004) requires changing – see section 4.1 (Page 12) for instructions on how to conduct the change.

3.3 Checking Direction Of Motor

To check the direction of the motor (with someone positioned with a clear view of the top of the motor):

- Press the **green "Start"** button and then immediately as the motor starts to run press the **red "Stop"** button.
- Check the direction of the motor. It should be turning clockwise looking from the rear of the motor cowl.
- If the motor is not turning clockwise then a qualified electrical engineer will need to rotate the phases on the supply cable.
- Check the system again for leaks , if none are present you are ready to operate.

3.4 (OPTIONAL EXTRA) – Operating The Particle Counter

Please see ICMWMKUG12.0 manual that is supplied with the particle counter for full connection details and how to operate the particle counter.

4. Maintenance Guide

4.1 Replacing Filter Elements

In the event of the In-Line Filter Element (FCVSP-003) requiring changing the corresponding "Filter Blocked" indicator on the control panel will illuminate. Spare filter elements can be purchased direct from Fluid Power Solutions Ltd. (contact details can be found on page 1)

To replace the pressure filter element (FCVSP-004) follow the instructions below:

1. Ensure that the filter cart is isolated before beginning filter change.
2. Ensure that the filter cart is depressurised and operation has ceased before disconnecting the filter body to replace the filter elements.



Warning – " DO NOT START THIS PROCEDURE UNTILL THE FILTER CART IS TURNED OFF, DO NOT START THE FILTER CART UNTILL THE FILTER ELEMENT HAS BEEN CHANGED AND ALL STEPS FOLLOWED.



3. Unscrew the oil drain valve and collect the fluid in a suitable container (see page 14 – 4.2 draining the system of oil).
4. When the filter has fully drained unscrew the cover/housing and extract the filter element (See Figure 3-6)
5. Collect the spent oil and element in a suitable container, follow your individual companies policy/ procedure for the safe disposal of waste oil and used filter elements in compliance with statutory legislation.
6. To avoid damaging the components, check the cover/housing threads thoroughly.
7. Insert the new filter element into the body (See Figure 7) .
(replacement filter elements can be purchased form Fluid Power Solutions – See spare parts list on page 10)
8. Screw the cover/housing back onto the filter body (See Figure 8).



Warning – " DO NOT APPLY EXCESSIVE TIGHTENING TORQUE"



9. Start the filter cart and check for the absence of leaks. Ensure that the corresponding filter blocked indicator on the control panel has de-luminated.



Figure 3 –
Unscrew the cover



Figure 4 – Choose
endcap with bypass
or blind endcap



Figure 5 / 6 - Insert the endcap with
bypass (Fig. 5) or the possibly
selected blind endcap (Fig. 6) in the
filter element



Figure 7 - Insert the
filter element into
the filter body



Figure 8 – Screw on
the cover

4.2 Draining System Of Oil

- A 3/8" BSP drain valve is fitted to the In-line filter. To drain the system of oil connect a 3/8" BSP hose to this valve and the 2nd end of the 3/8" hose to an appropriate oil container.
- Rotate the T handle anti-clockwise (highlighted in blue on figure 9) to open the valve and drain the oil from the filter element.
- Once the system has been drained of oil rotate the T handle clockwise to close the valve.
- Disconnect the 3/8" hose from the system and dispose of the oil following your individual companies oil disposal policy and local regulations in relation to disposal of hazardous / special waste.

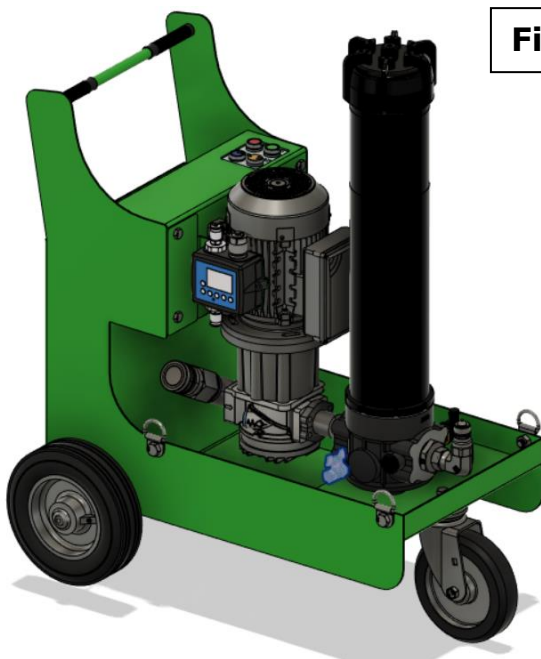
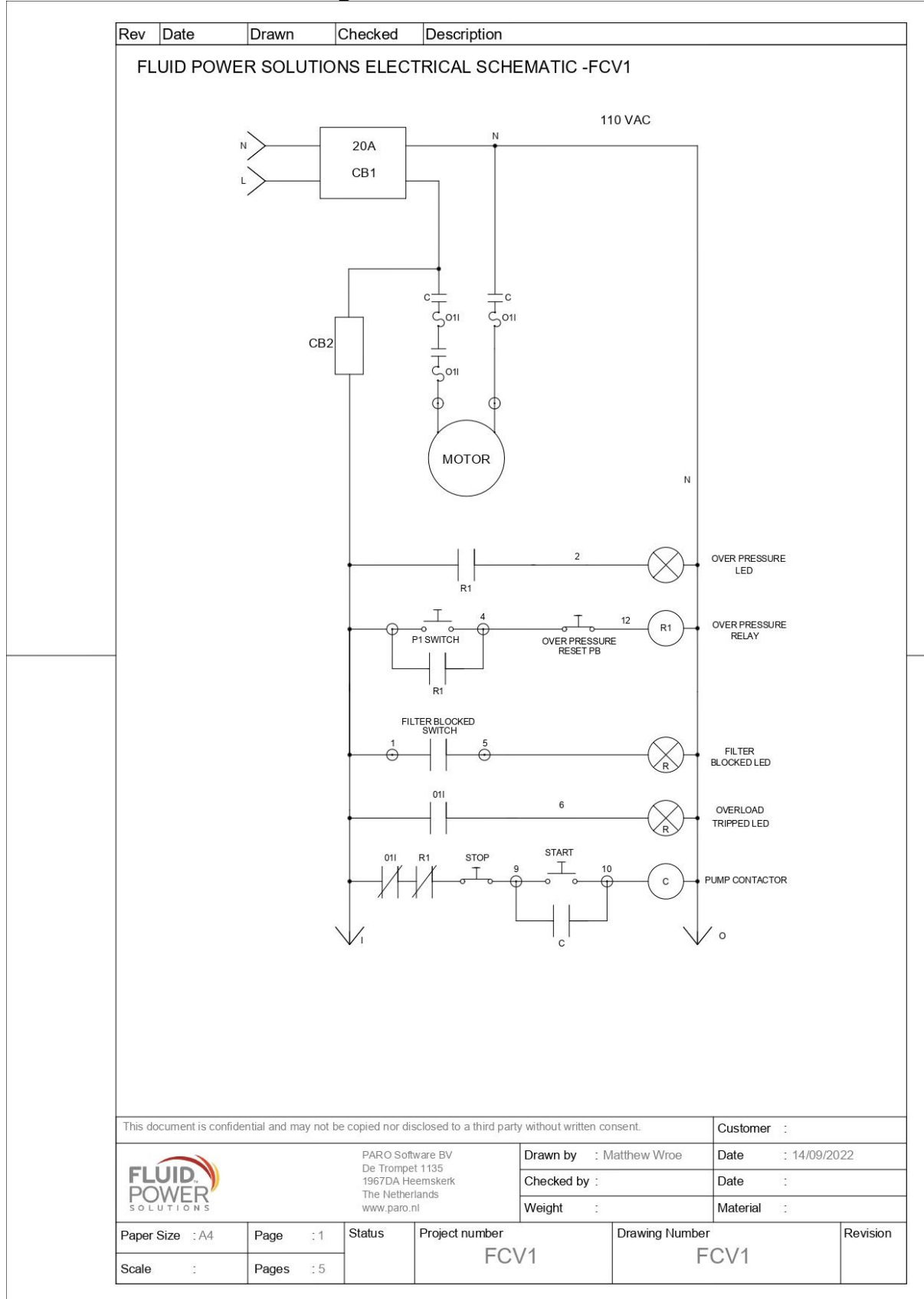


Figure 9

5. Electrical System

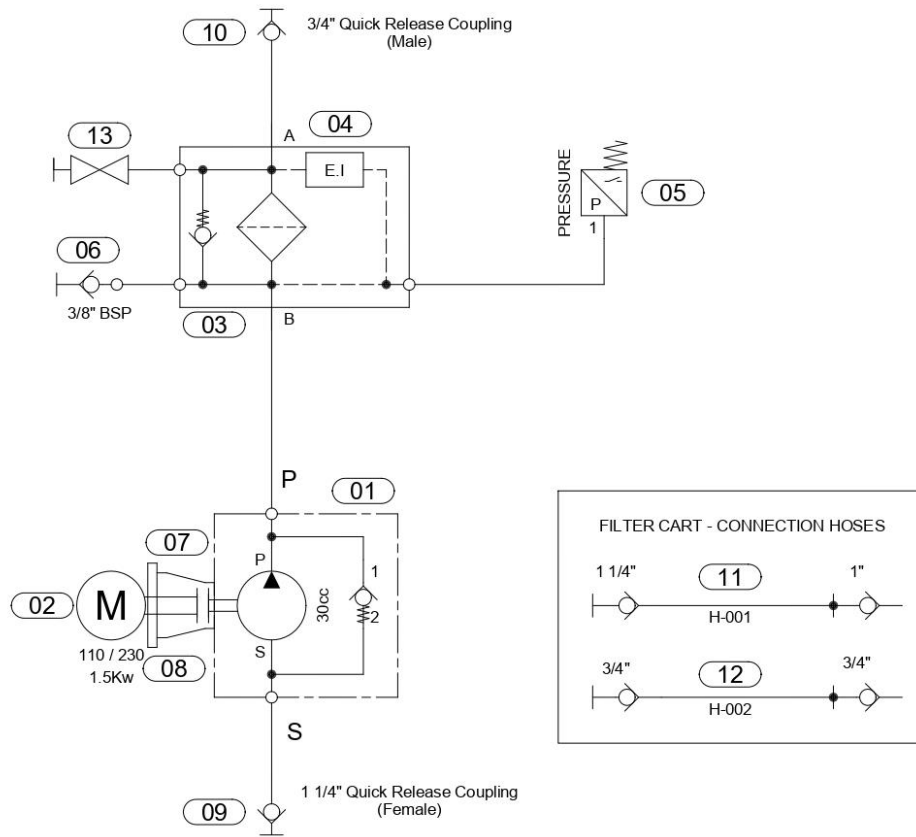
5.1 Electrical Circuit Diagram



6. Hydraulic System

6.1 Hydraulic Circuit Diagram

Pos.	Qty.	Spare Part Number	Description
01	1	FCVSP-001	Gerotor Pump
02	1	FCVSP-002	1.5Kw Motor
03	1	FCVSP-003	In-Line Filter
04	1	FCVSP-004	Electrical Indicator
05	1	FCVSP-005	Pressure switch
06	1	FCVSP-006	Test Point
07	1	FCVSP-007	Drive Coupling </td
08	1	FCVSP-008	Bell Housing
09	1	FCVSP-009	1 1/4" Quick Release Coupling (Female)
10	1	FCVSP-010	3/4" Quick Release Coupling (Male)
11	1	FCVSP-011	Hose Assembly - H-001
12	1	FCVSP-012	Hose Assembly - H-002
13	1	FCVSP-029	Drain Valve



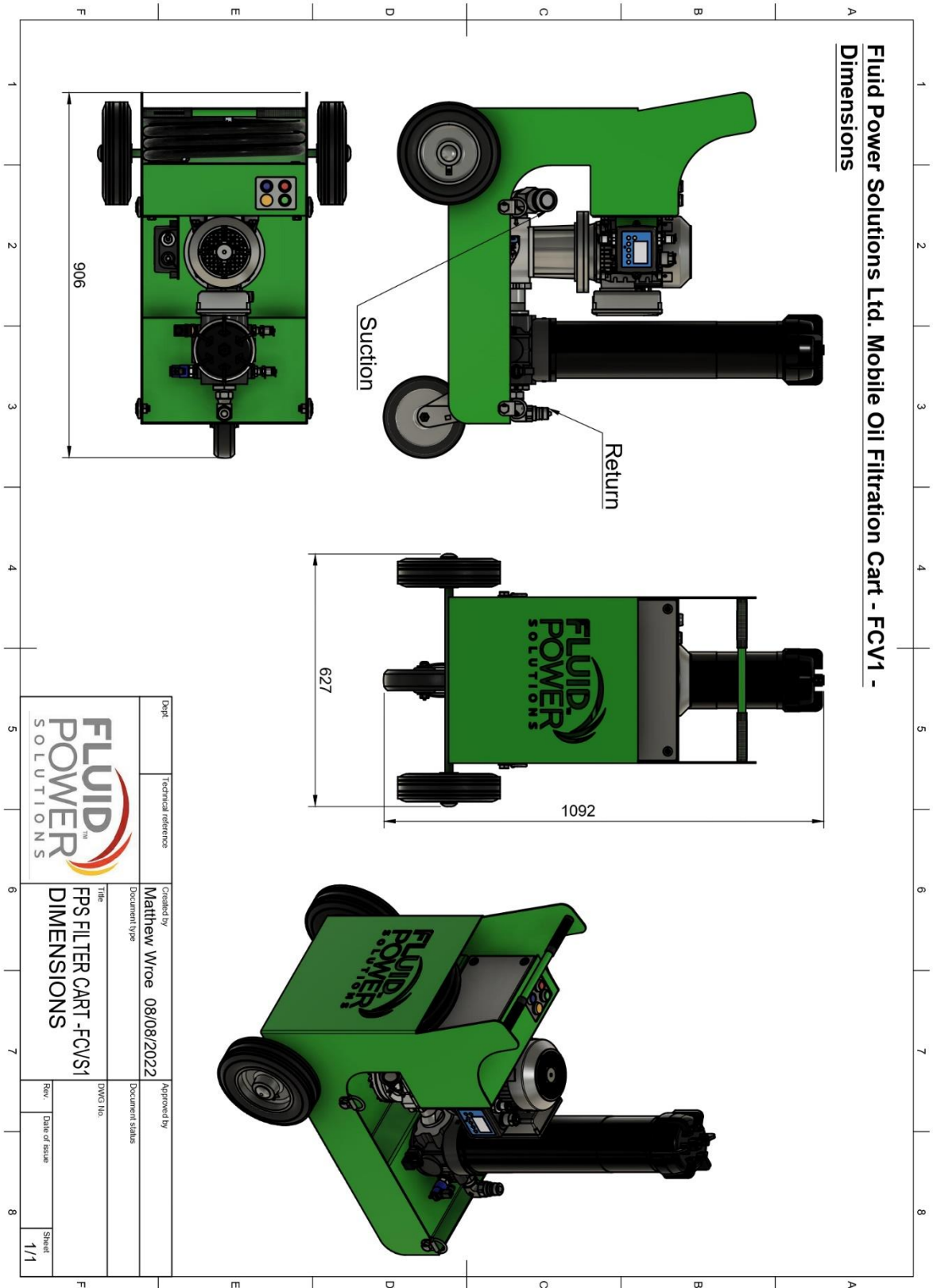
FILTER CART - CONNECTION HOSES		
1 1/4"	011	1"
H-001		
3/4"	012	3/4"
H-002		

This document is confidential and may not be copied nor disclosed to a third party without written consent.

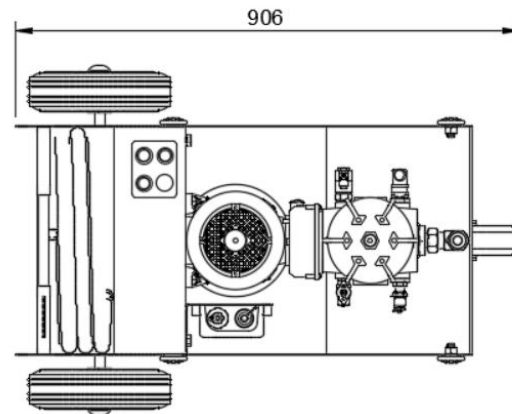
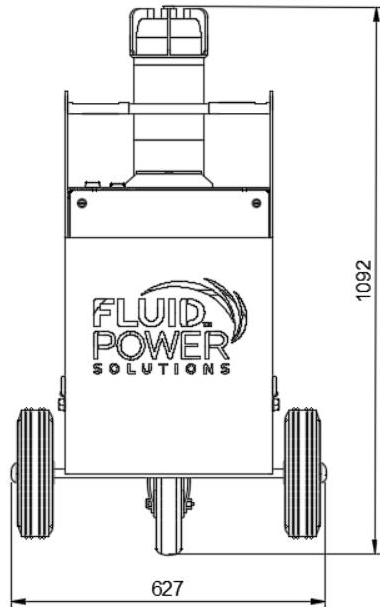
	Fluid Power Solutions Ltd Unit 1 Avro Park First Avenue Auckley Doncaster		Customer :	
	Drawn by : Matthew Wroe	Date : 11/10/2022		
	Checked by : Adrian Wroe	Date : 04/08/2022		
Weight :		Material :		

Paper Size : A4	Page : 1	Status	Project number	Drawing Number	Revision
Scale :	Pages : 1		FCV1	FPS Filter Cart	

7. Dimensions



8. Technical Specification

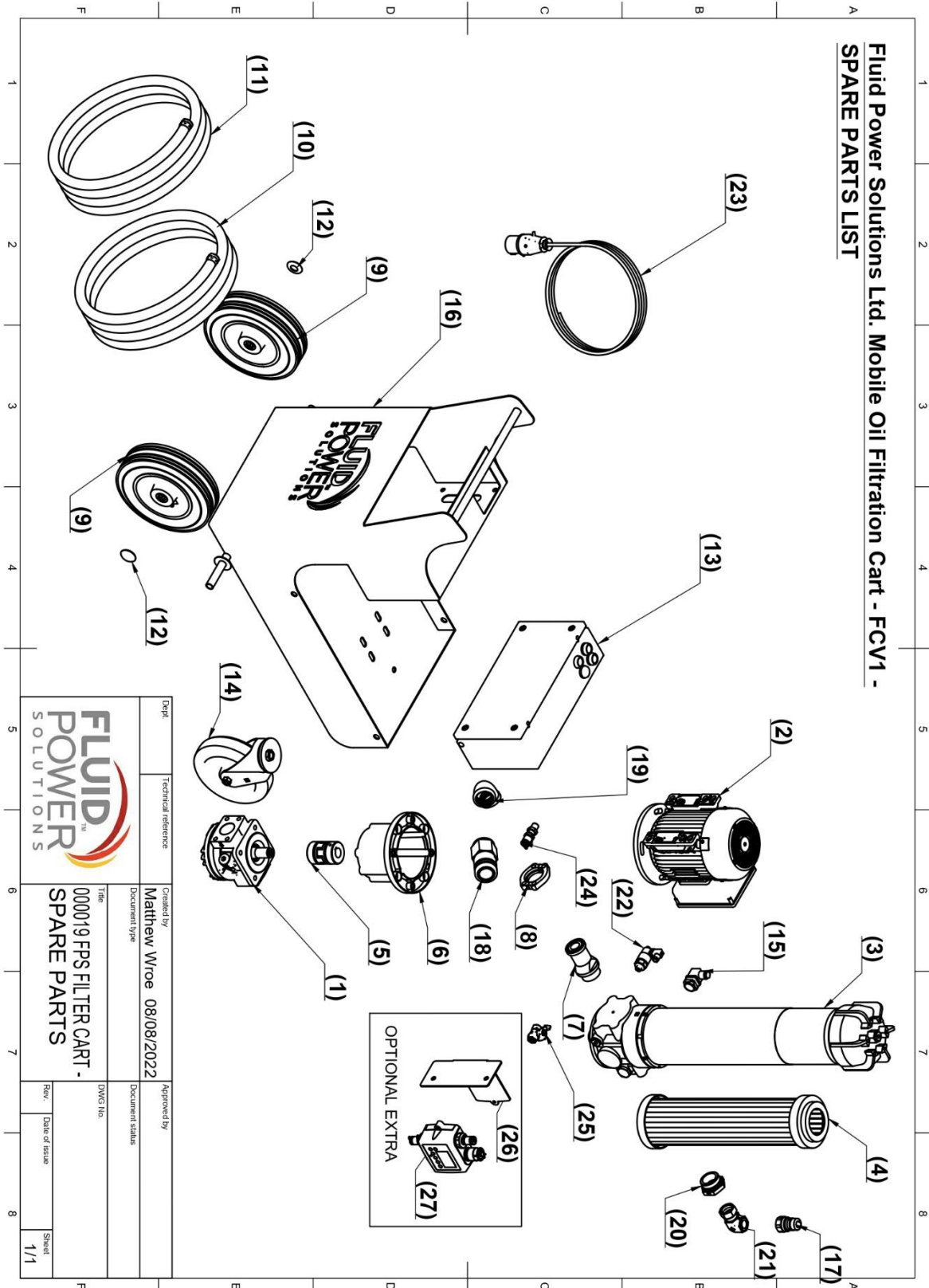


		Mobile Oil Filtration Cart - FCV1
Pump		<i>Gerotor Pump</i>
Electric Motor		<i>1.5Kw Motor</i>
Temperature	Fluid	<i>From -10° to +80 °C</i>
	Ambient	<i>From -20° to +45 °C</i>
Protection class		<i>IP 55</i>
Flow Rate (l/min)		<i>50 l/min - 1450 Rpm</i>
Max Operating Pressure (Bar)		<i>10 Bar</i>
Viscosity Range	(min Operation)	<i>10 cSt</i>
	(max Operation)	<i>500 cSt</i>
Filtration Rating		<i>3/6/10/25 μm β>1000 flow through the element Out/In</i>
Fluid Compatibility		<i>Any Mineral oil (DIN 51524)</i>
Voltage	Single Phase	<i>110v/ 230v</i>
	Three phase	<i>415v</i>
Suction Hose		<i>1 1/4" BSP Connection end 1 , 1" BSP Connection end 2</i>
Pressure Hose		<i>3/4" BSP Connection end 1, 3/4" BSP Connection end 2</i>
Dimensions	Length	<i>906mm</i>
	Width	<i>627mm</i>
	Height	<i>1092mm</i>
Weight	Dry	<i>87kg</i>
	Wet	<i>97Kg</i>

9. Troubleshooting

Issue	Potential Cause	Recommended Fix
Power indicator not illuminated	Issue with electrical supply	Check supply source by using a different device.
		Check plug use (if installed)
		Check supply cable
Low Pressure	Pre-filter blocked	Check pre-filter for blockages
	No oil available at inlet hose	Check inlet hose
"Stop" Button illuminated	Electric Motor has overloaded	The motor overload itself is set to auto reset. In the event of this occurring wait for it to reset automatically, no pushbuttons are required to be pressed. The red tripped light will out when it auto resets.
"Over Pressure Button" illuminated	System pressure is too high	Filter element maybe blocked and require replacing (see page 13)
		Potential blockage in the delivery line, check that the subsequent connection is not blocked by either leaving the blanking cap attached to the hose or an obstruction in the line.
"Filter Blocked" light illuminated	Filter Element requires replacement	Change Filter Element (Page 13)

10. Spare Parts Diagram



Item Number	Hydraulic Schematic Number	Description	Quantity	Fluid Power Solutions Spare Part Number	Note.
1	01	Gear Pump	1	FCVSP-001	
2	02	1.5Kw Motor - 110V	1	FCVSP-002A	Select appropriate voltage for your application
2	02	1.5Kw Motor - 230V	1	FCVSP-002B	
3	03	In-Line Filter	1	FCVSP-003	Select appropriate size filter element for your application
4	N/A	Filter Element - 3 MICRON	1	FCVSP-013A	
4	N/A	Filter Element - 6 MICRON	1	FCVSP-013B	
4	N/A	Filter Element - 10 MICRON	1	FCVSP-013C	
5	07	Drive Coupling	1	FCVSP-007	
6	08	Bell Housing	1	FCVSP-008	
7	N/A	Filter-Pump Flange	1	FCVSP-014	
8	N/A	Split Flange Haive's	1	FCVSP-015	
9	N/A	Cart Rear Wheel	2	FCVSP-016	
10	11	Hose-Assembly - H001	1	FCVSP-011	
11	12	Hose-Assembly - H002	1	FCVSP-012	
12	N/A	Fastner	2	FCVSP-017	
13	N/A	Electrical Cabinet	1	FCVSP-018	
14	N/A	Cart Front Castor	1	FCVSP-019	
15	04	Electrical Indicator	1	FCVSP-004	
16	N/A	Cart Body	1	FCVSP-020	
17	10	3/4" Quick Release Coupling (Male)	1	FCVSP-010	
18	09	1 1/4" Quick Release Coupling (Female)	1	FCVSP-009	
19	N/A	Suction Elbow	1	FCVSP-021	
20	N/A	Straight Fitting	1	FCVSP-022	
21	N/A	90° Fitting	1	FCVSP-023	
22	05	Pressure Switch	1	FCVSP-005	
23	N/A	Electrical Cable	1	FCVSP-025	
24	06	Test Point	1	FCVSP-006	
25	13	Drain Valve	1	FCVSP-029	
26	N/A	Particle Counter Bracket	1	FCVSP-027	OPTIONAL EXTRA
27	N/A	Particle Counter	1	FCVSP-028	

