

# *Instruction Manual*

## EOF External Oil Filtration System

Description	Item Number
EOF External Oil Filtration System HC	A540-01-999
EOF External Oil Filtration System CR	A540-11-999
EOF Connection Kit for E1M/E2M18, 28 and 30 pumps	A540-00-001
EOF Connection Kit for E1M/E2M40 pumps	A540-00-002
EOF Connection Kit for E1M/E2M80 pumps	A540-00-004
EOF Connection Kit for E1M/E2M175 and 275 pumps	A540-00-006
EOF Canister 25 CR	A540-12-022
EOF Canister 40 CR	A540-14-022
EOF Canister 80 CR	A540-18-022
EOF Filter Element 25P	A223-04-066
EOF Filter Element 40P	A223-04-068
EOF Filter Element 25C	A223-04-090
EOF Filter Element 40C	A223-04-091



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## Associated publications

Publication title	Publication number
Vacuum pump and vacuum system safety	P300-20-000

# 1 INTRODUCTION

## 1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the Edwards EOF External Oil Filtration System (abbreviated to EOF in the remainder of this manual). You must use the EOF as specified in this manual.

Read this manual before you use the EOF. Important safety information in this manual is highlighted as WARNING and CAUTION instructions. The use of WARNINGS and CAUTIONS is defined below.



### **WARNING**

Warnings are given where failure to observe the instruction could result in injury or death to people.

### **CAUTION**

Cautions are given where failure to observe the instruction could result in damage to the equipment, associated equipment and process

The following IEC warning labels appear on the pump:



Warning - refer to accompanying documentation.



Warning - Edwards offer European customers a recycling service.

The units used throughout this manual conform to the SI international system of units of measurement.

## 1.2 Description

Use the EOF to filter and clean the pump oil in an Edwards rotary vacuum pump, to extend the operational life of the pump.

The oil from the rotary pump is passed through one or two filter elements in an oil canister. There are three sizes of oil canisters, so that you can use the size most suitable for your rotary vacuum pump and application. A range of filter elements allow you to use the element most suited to your application (see [Section 1.4](#)). Refer to [Section 7](#) for the Item Numbers of oil canisters and filter elements.

You must fit the appropriate connection kit to connect the pump to the EOF. The Item Numbers of the connection kits are shown on the front cover.

## 1.3 Applications

There are two versions of the EOF:

The EOF HC (hydrocarbon) is suitable for use with rotary vacuum pump in which the oil contaminants are particulate, and where there is little or no chemical contamination of the oil. The EOF HC is not suitable for applications for gases which contain more than 20% oxygen are pumped. Use 25P and 40P filter elements with the EOF HC.

The EOF CR (corrosion resistant) is suitable for use with a rotary vacuum pump in which the oil contaminants are particulate and chemical. Use 25C and 40C filter elements with the EOF CR.

The EOF is suitable for use with the rotary vacuum pumps shown in Table 1. If the serial number of your pump is earlier than the serial number shown in Table 1, contact your supplier or Edwards for advice.

Table 1 - Rotary Vacuum Pumps Suitable for Use With the EOF

Pump	Serial Number	Pump	Serial Number
E1M18	1241	E1M175	848
E2M18	5518	E2M175	739
E1M40	720	E2M175F	*
E2M40	3168	E1M275	995
E1M80	463	E2M275	619
E2M80	1926	E2M275F	*

\* All of these pumps are suitable for use with the EOF

### 1.4 Principle of operation

Refer to Figure 1. The EOF is connected to the rotary pump by the quick-release connectors (1, 11). The EOF oil pump (9) pumps oil from the rotary vacuum pump oil box through the flexible oil inlet pipeline (10) into the oil canister (6). The filter(s) in the oil canister traps and removes contaminants in the oil, and the cleaned oil is then pumped back through the flexible oil outlet pipeline (2) to the rotary vacuum pump.

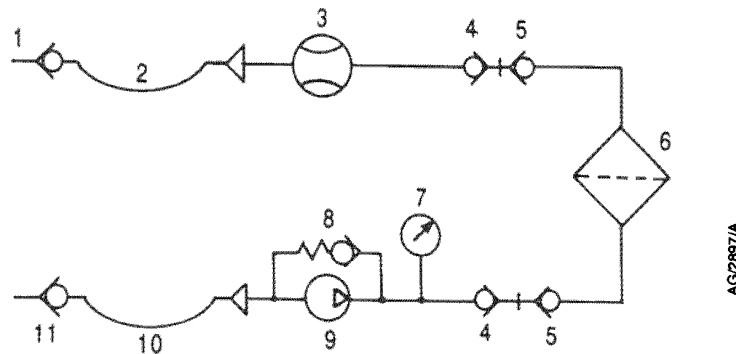
The EOF has a pressure gauge (7) so that you can see the back-pressure in the oil pipeline. This back-pressure identifies when the filter element needs to be changed (see Section 4.3).

The oil canister is connected to the EOF through self-sealing quick-release connectors (4, 5) and you can easily remove the oil canisters when you need to change the filter element.

A flow indicator (3) in the oil return pipeline shows the oil flow through the EOF.

The EOF oil pump (9) is a permanent magnet drive gear pump. The oil pump has an integral pressure relief valve (8) which operates to prevent over-pressurisation of the oil pipelines.

Figure 1 - Schematic Diagram of the EOF System



- 1. Quick-release connector
- 2. Flexible oil outlet pipe
- 3. Flow indicator
- 4. Quick-release connector (on EOF base)
- 5. Quick-release connector (on canister)
- 6. Oil canister and filter element
- 7. Pressure gauge
- 8. Pressure relief valve
- 9. Oil pump
- 10. Flexible oil inlet pipe
- 11. Quick-release connector

## 2 TECHNICAL DATA

*Note: Where applicable, technical data in the following sections is based on nominal hydrocarbon oil density of 0.9 kg.l<sup>-1</sup> and nominal PFPE (perfluoropolyether) oil density of 1.9 kg.l<sup>-1</sup>.*

### 2.1 Operating and storage conditions

Ambient operating temperature range	12 to 40°C
Ambient storage temperature range	-30 to 70°C
Maximum operating humidity	90%RH

### 2.2 Mechanical data

Dimensions	See Figure 2
Mass	
EOF base	22.8 kg
Oil canister (empty)	
25CR	2.8 kg
40CR	4.0 kg
80CR, 80HC	7.6 kg
Pump hose connections	3/8 inch quick-release connectors
Protection degree (as defined by IEC529)	IP44

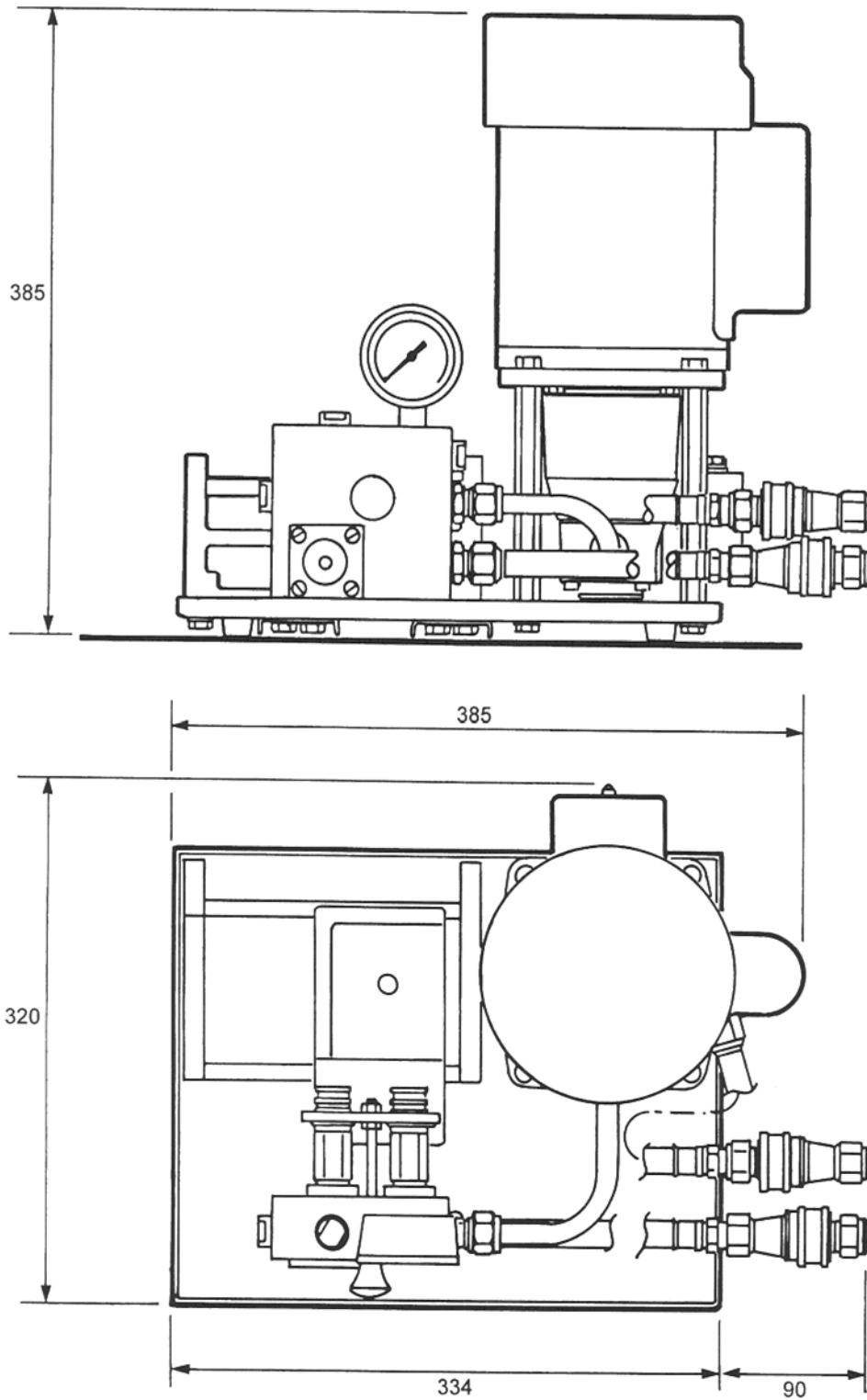
### 2.3 Performance

Oil flow rate through the EOF	
50 Hz electrical supply	3.5 l.min <sup>-1</sup>
60 Hz electrical supply	4.2 l.min <sup>-1</sup>
Oil pump rotational speed	
50 Hz electrical supply	2850 r.min <sup>-1</sup>
60 Hz electrical supply	3450 r.min <sup>-1</sup>
Pressure relief valve operating pressure	8.2 psi
Oil volumes	See Table 2

Table 2 - Oil volumes (litres)

	Oil canister size		
	25CR	40CR	80CR/HC
Canister volume	2.3	3.4	6.8
EOF base volume	0.2	0.2	0.2
Total EOF volume	2.5	3.6	7.0

Figure 2 - Dimensions (mm)



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## 2.4 Electrical data

Electrical supply	100-200 V or 200-240 V, 1-phase, 50 or 60 Hz
Current rating	
50 Hz electrical supply	5.2 A
60 Hz electrical supply	2.6 A
Oil pump rotational speed	200 W

## 2.5 Materials in contact with the rotary vacuum pump oil

The following materials of the EOF HC are in contact with the rotary vacuum pump oil: Stainless steel, cast iron, steel, bronze, nitrile rubber, PFPE (perfluoropolyether), aluminium, fluoroelastomer.

The following materials of the EOF CR are in contact with the rotary vacuum pump oil: Stainless steel, cast iron, PFPE (perfluoropolyether), aluminium, fluoroelastomer.

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## 3 INSTALLATION

### 3.1 Safety



#### **WARNING**

Obey the safety instructions given below and take note of appropriate precautions. If you do not, you can cause injury to people and damage to equipment.

- A suitably trained and supervised technician must install the EOF.
- Switch off the rotary pump, isolate it from the electrical supply and allow it to cool before you start work.
- Ensure that the installation technician is familiar with the safety procedures which relate to the pump oil and products pumped. Wear the appropriate safety-clothing when you come into contact with contaminated components. Dismantle and clean contaminated components inside a fume-cupboard.
- Do not allow debris to get inside the EOF or the rotary vacuum pump during installation.
- When you use the installation procedures in an associated publication, you must obey all of the WARNING and CAUTION instructions in the publication.

### 3.2 Unpack and inspect

Remove all packing materials and protective covers and inspect the EOF and the connection kit. If any of the equipment is damaged, notify your supplier and the carrier in writing within three days; state the Item Number of the EOF or connection kit, together with your order number and your supplier's invoice number. Retain all packing materials for inspection. Do not use the equipment if it is damaged.

Check that you have received the items listed in Table 3 and the appropriate Table 4, 5 or 6. If any item is missing, notify your supplier in writing within three days.

If the EOF is not to be used immediately, replace the protective covers. Store the EOF and connection kit in suitable conditions, as described in Section 6.1.

Table 3 - Checklist of Components for the EOF

Quantity	Description	Check (✓)
1	EOF base	<input type="checkbox"/>
1	Quick-release connector (pair)	<input type="checkbox"/>
1	Oil Canister	<input type="checkbox"/>
*	Filter element(s)	<input type="checkbox"/>

\* The number of filter elements depends on the elements and their canister you have ordered.

Table 4 - Checklist of Components for the Connection Kit for E1M/E2M18, 28 and 30 Pumps

Quantity	Description	Check (✓)
1	1/8 hex nipple	<input type="checkbox"/>
1	Reducing bush	<input type="checkbox"/>
1	Adaptor	<input type="checkbox"/>
1	Elbow	<input type="checkbox"/>
1	E1M/E2M18 modified side panel	<input type="checkbox"/>
1	E2M28/30 modified side panel	<input type="checkbox"/>

Table 5 - Checklist of Components for the Connection Kit for E1M/E2M40 and 80 Pumps

Quantity	Description	Check (✓)
1	Adaptors	<input type="checkbox"/>
1	Elbows	<input type="checkbox"/>
1	Modified side panel	<input type="checkbox"/>

Table 6 - Checklist of Components for the Connection Kit for E1M/E2M175 and 275 Pumps

Quantity	Description	Check (✓)
1	Hex nipples NPT/BSP	<input type="checkbox"/>
1	Reducing adaptors	<input type="checkbox"/>
1	T-piece	<input type="checkbox"/>
1	Hex nipple BSP	<input type="checkbox"/>

### 3.3 Fit the connection kit to the rotary vacuum pump

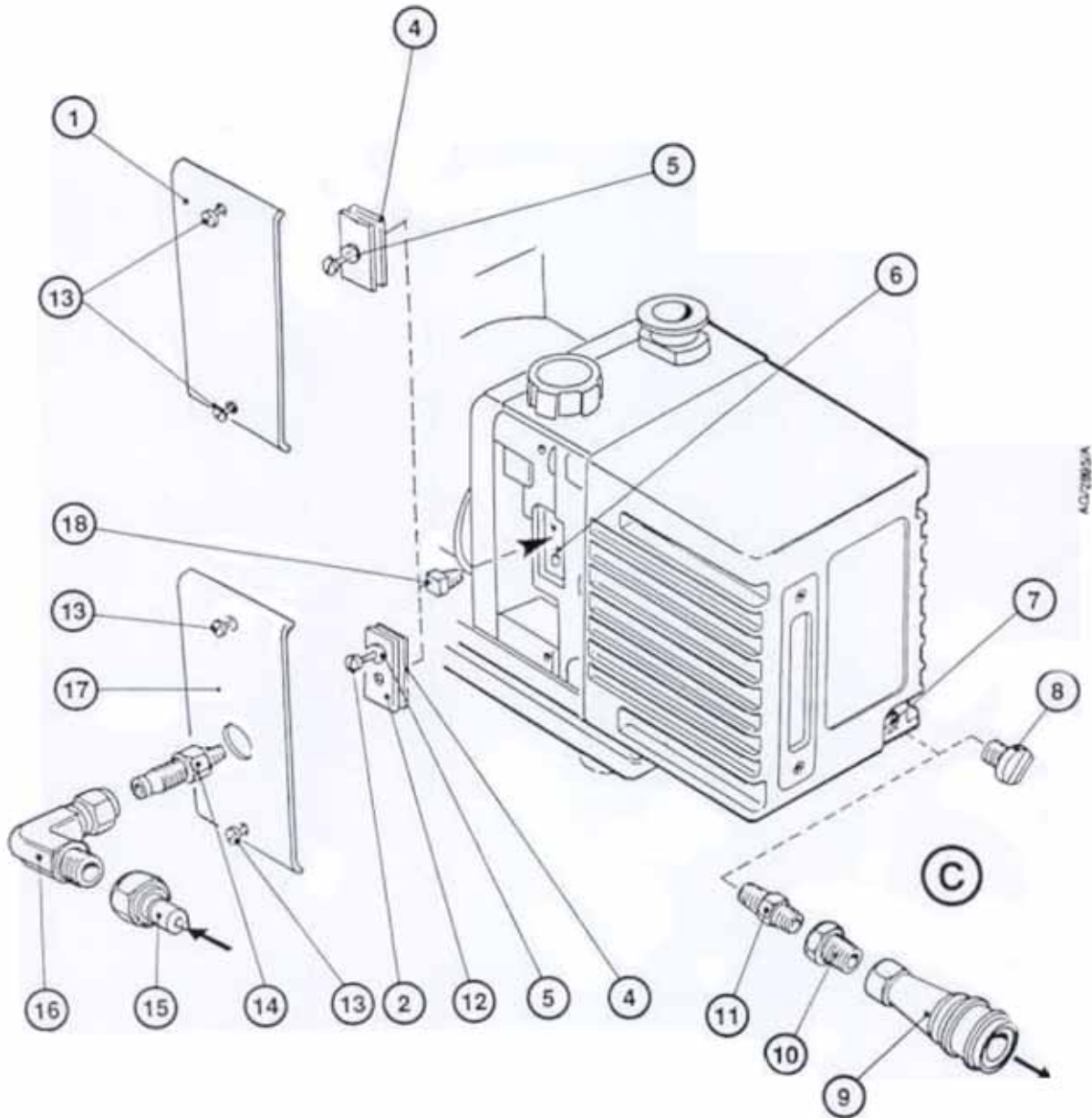
*Note:* Where necessary in the following procedures, refer to the instruction manual supplied with your vacuum pump.

Use a suitable thread sealant when you fit the connection kit components to the vacuum pump.

#### 3.3.1 E1M/E2M18, 28 and 30 pumps

- Refer to [Figure 3](#). Place a suitable container under the oil drain-plug (8), remove the drain-plug and allow the oil to drain from the pump.
- Fit the hex nipple (11) and the reducing bush (10) to the oil drain port (7).
- Undo and remove the two screws (13) and remove the side panel (1) from the pump.
- On the E2M28 and E2M30 pumps:
  - Undo and remove the screw (2) and remove the seal (5), blanking plate (3) and gasket (4).
  - Use the screw (2) and seal (5) to fit the adaptor plate (12) over the oil pressure port (6).
- On the E1M/E2M18 pumps, remove the plug (18) from the oil pressure port (6).
- Use the two screws (13) to fit the modified side panel (17) to the pump.
- Fit the adaptor (14) to the oil pressure port (6), then fit the elbow (16) to the adaptor.
- Fit the female quick-release connector (9, supplied with the EOF base) to the reducing bush (10).
- Fit the male quick-release connector (15, supplied with the EOF base) to the elbow (16).

Figure 3 - Fit the Connection Kit to E1M/E2M18, 28 and 30 Pumps



- |                      |                                     |                                    |
|----------------------|-------------------------------------|------------------------------------|
| 1. Side panel        | 7. Oil drain port                   | 13. Screw                          |
| 2. Screw ♦           | 8. Oil drain-plug                   | 14. Adaptor ▽                      |
| 3. Blanking plate ♦  | 9. Female quick-release connector # | 15. Male quick-release connector # |
| 4. Gasket ♦          | 10. Reducing bush ▽                 | 16. Elbow ▽                        |
| 5. Seal ♦            | 11. 1/8 hex nipple ▽                | 17. Modified side panel ▽          |
| 6. Oil pressure port | 12. Adaptor plate ▽                 | 18. Plug ⊕                         |

♦ E2M28 and 30 pumps only

⊕ E1M18 and E2M18 pumps only

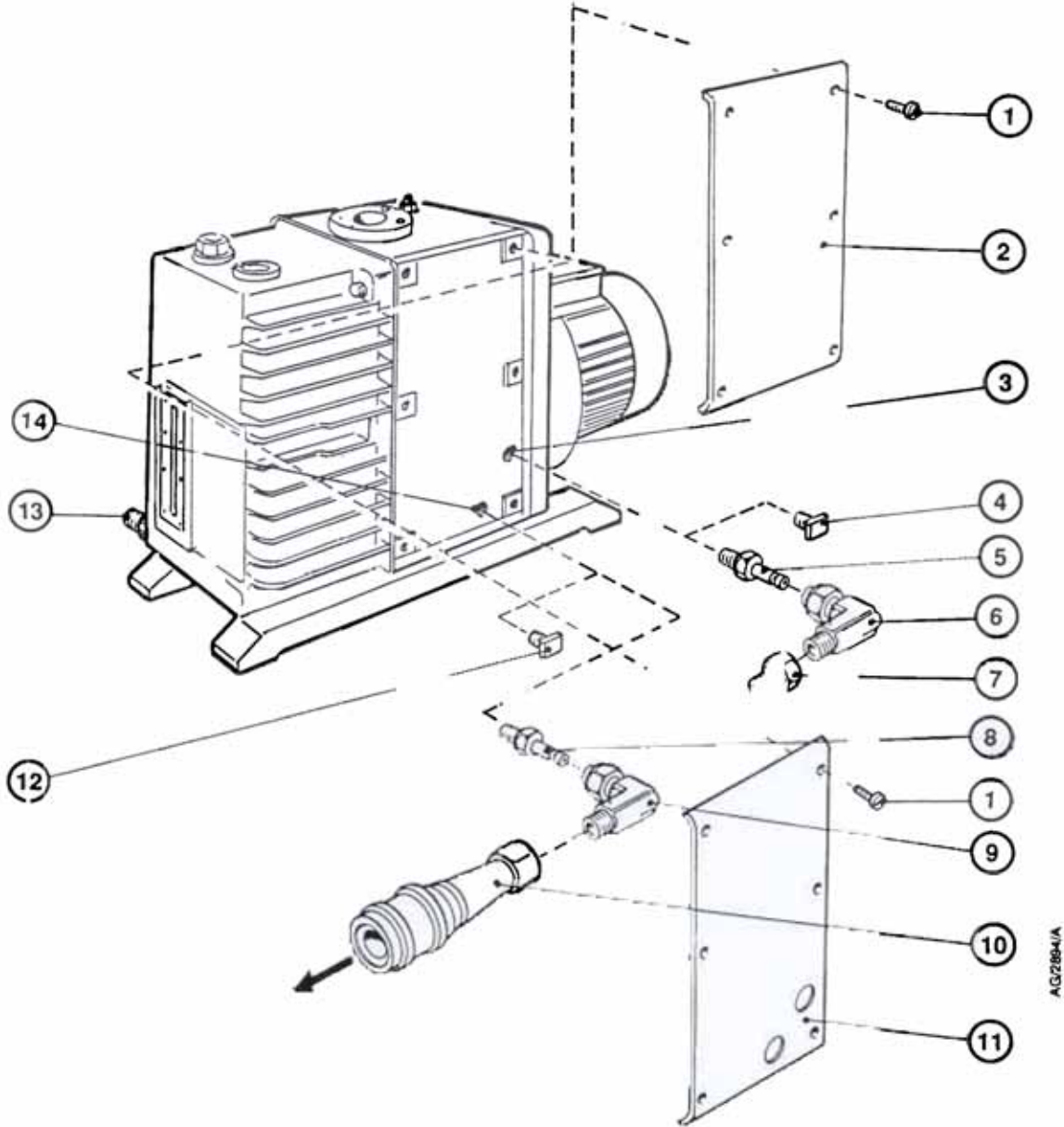
▽ Supplied in the connection kit

# Supplied in the EOF base

**3.3.2 E1M/E2M40 and 80 pumps**

1. Refer to Figure 4. Place a suitable container under the drain valve (13), then open the drain valve and allow the oil to drain from the pump. Close the drain valve.

Figure 4 - Fit the Connection Kit to E1M/E2M40 and 80 Pumps



- |                   |                                      |                         |
|-------------------|--------------------------------------|-------------------------|
| 1. Screw          | 6. Elbow                             | 11. Modified side panel |
| 2. Side panel     | 7. Male quick-release connector      | 12. Plug                |
| 3. Oil inlet port | 8. Adaptor                           | 13. Oil drain valve     |
| 4. Plug           | 9. Elbow                             | 14. Oil outlet port     |
| 5. Adaptor        | 10. Female quick-release connector ♦ |                         |

♦ Supplied with the EOF base

2. Undo and remove the six screws (1) and remove the side panel (2) from the pump.
3. Remove the plugs (4, 12) from the oil inlet and outlet ports (3, 14).
4. Use the six screws (1) to fit the modified side panel (11) to the pump.
5. Fit the two adaptors (5, 8) to the oil inlet and outlet ports (3, 14).
6. Fit the two elbows (6, 9) to the adaptors (5, 8).
7. Fit the male quick-release connector (7, supplied with the EOF base) to the elbow (6) on the oil inlet port.
8. Fit the female quick-release connector (10, supplied with the EOF base) to the elbow (9) on the oil outlet port. Fit the Connection Kit to E1M/E2M40 and 80 Pumps.

### 3.3.3 E1M/E2M175 and 275 pumps

1. Refer to [Figure 5](#). Place a suitable container under the oil drain tap (9), then open the tap and allow the oil to drain from the pump.
2. Unscrew and remove the oil drain tap (9) from the oil drain port (10).
3. Unscrew and remove the plug (2) from the filter bypass port (1).
4. Fit the hex nipple (3) to the filter bypass port (1), then fit the reducing adaptor (4) to the hex nipple.
5. Fit the hex nipple (6) to the oil drain port (10), then fit the T-piece (8) to the hex nipple.
6. Fit the oil drain tap (9) to the T-piece (8).
7. Fit the hex nipple (3) to the T-piece (8), then fit the reducing adaptor (4) to the hex nipple.
8. Fit the male quick-release connector (5, supplied with the EOF base) to the reducing adaptor (4) on the filter bypass port.
9. Fit the female quick-release connector (7, supplied with the EOF base) to the reducing adaptor (4) on the oil drain port.

## 3.4 Locate the EOF

Locate the EOF in its required operating position. Ensure that the EOF is close enough to the rotary vane pump for the quick-release connectors on the inlet and return pipelines to be fitted to the quick-release connectors on the pump.

## 3.5 Connect the electrical supply to the oil pump

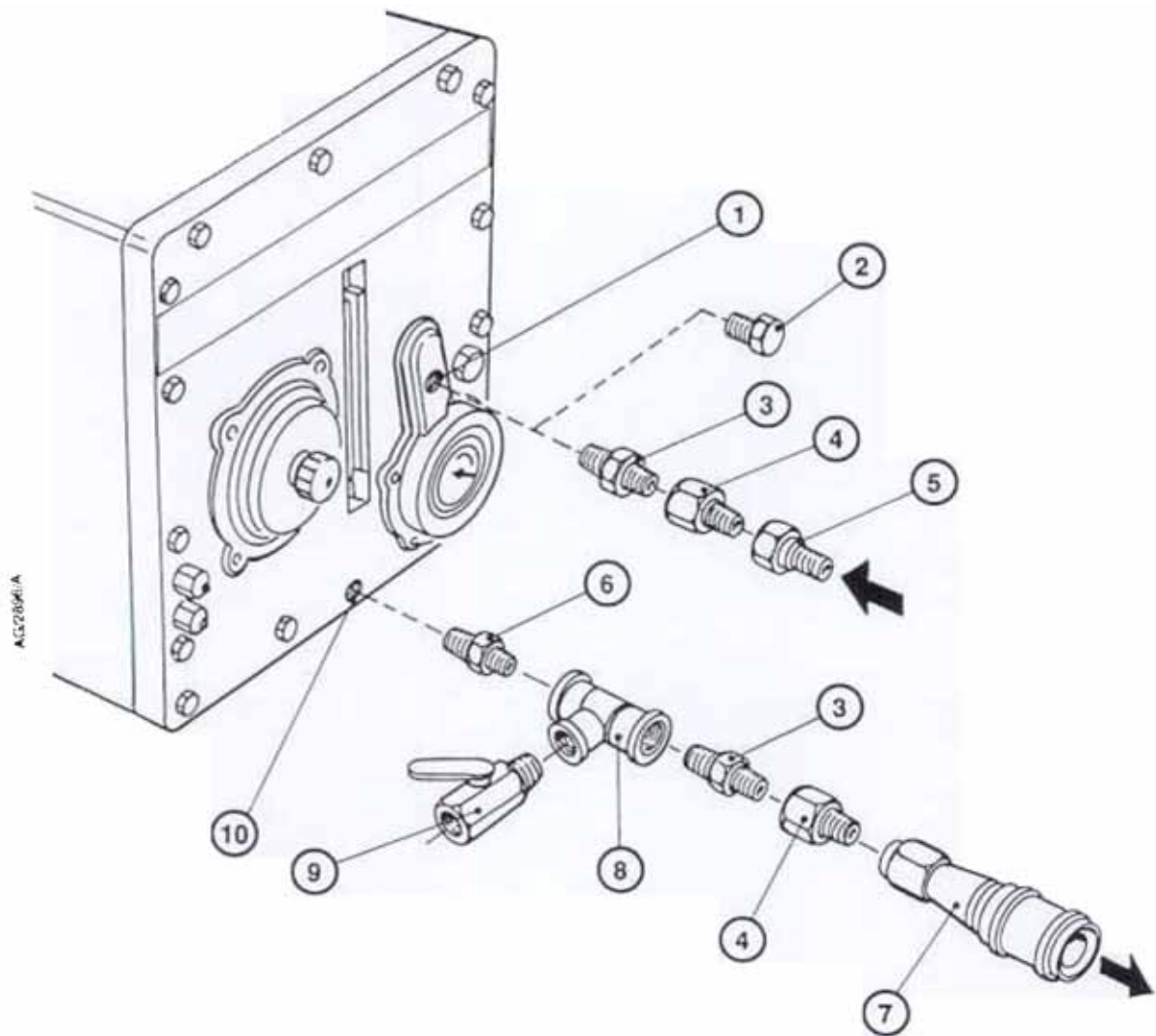


### **WARNING**

Ensure that the electrical installation of the EOF conforms with your local and national safety requirements. It must be connected to a suitably fused and protected electrical supply and a suitable earth (ground) point.

Use a suitably rated electrical supply cable to connect the electrical supply to the EOF oil pump. Connect the electrical supply through a suitably fused unit or circuit breaker. Incorporate an isolator so that you can switch off the electrical supply of the EOF for maintenance.

Figure 5 - Fit the Connection Kit to E1M/E2M175 and 275 Pumps



- |                                   |                                     |
|-----------------------------------|-------------------------------------|
| 1. Oil bypass port                | 6. Hex nipple BSP *                 |
| 2. Plug                           | 7. Female quick-release connector # |
| 3. Hex nipple NPT/BSP *           | 8. T-piece *                        |
| 4. Reducing adaptor *             | 9. Oil drain valve                  |
| 5. Male quick-release connector # | 10. Oil drain port                  |

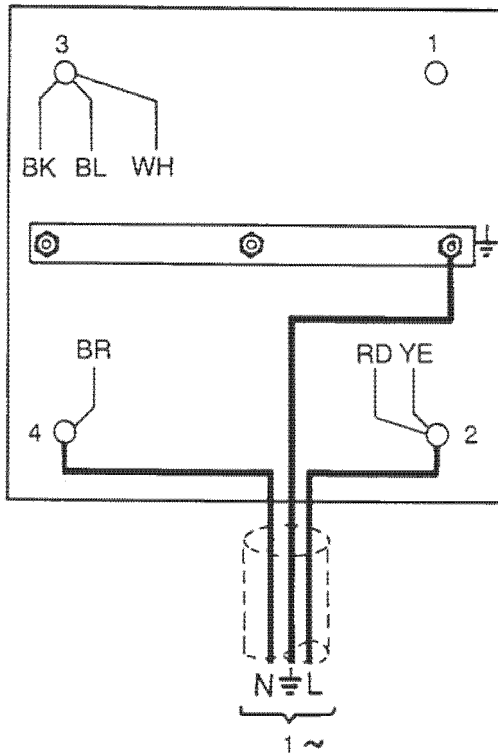
\* Supplied in the connection kit

# Supplied with the EOF base

1. Refer to [Figure 7](#). Undo the screw which secures the cover of the oil pump motor terminal-box (2), and remove the cover.
2. The terminal box is supplied configured for high voltage (200-240 V) operation, as shown in [Figure 6](#), detail A. If necessary, configure the terminal-box for low voltage (100-120 V) operation, as follows:
  - Remove the terminal-box wires from terminal 3.
  - Fit the wires to terminals 2 and 4, as shown in [Figure 6](#), detail B.

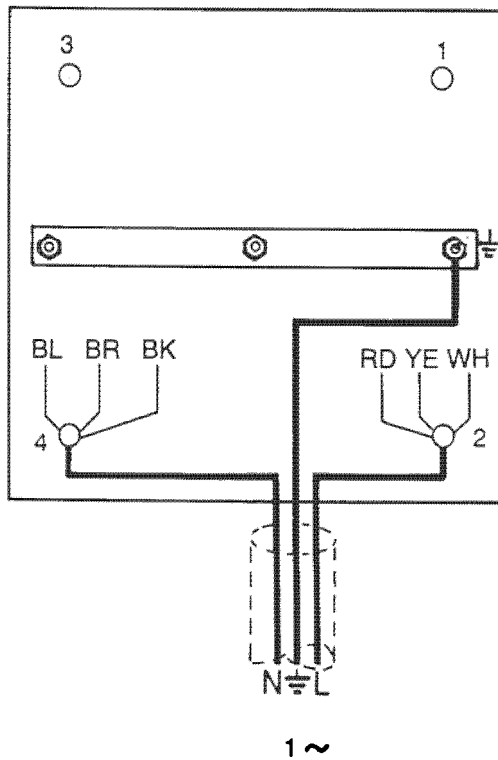


Figure 6 - Motor Terminal-Box Wiring



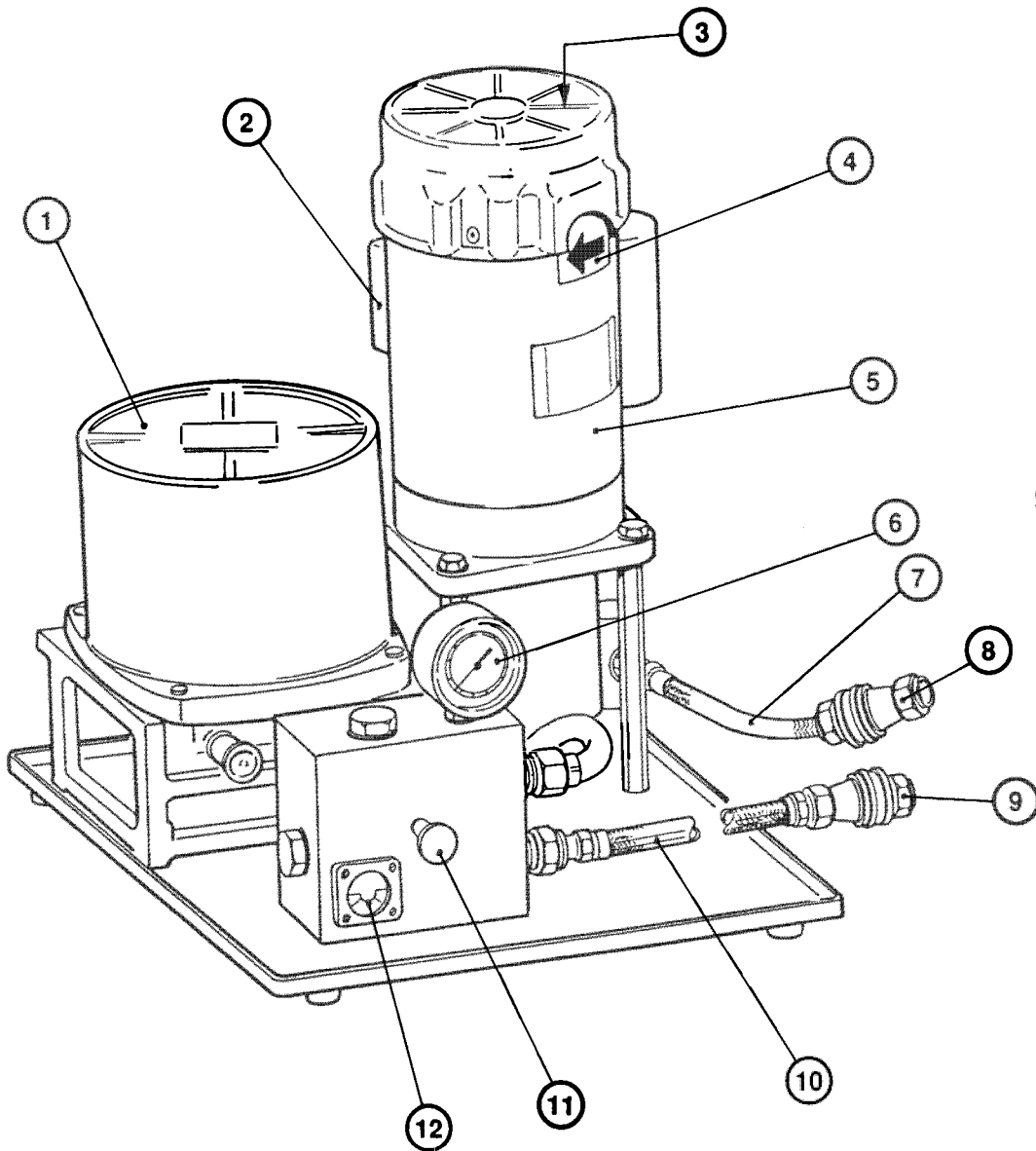
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- BK Black
- BL Blue
- BR Brown
- RD Red
- WH White
- YE Yellow
- A High voltage configuration (200-240 V)
- B Low voltage configuration (100-120 V)



3. Pass your electrical supply cable through the cable-gland on the terminal-box, then connect the wires in the cable as shown in Figure 6.
4. Tighten the cable-gland, the refit the cover to the terminal-box and secure with the screw.
5. Connect the other end of the cable to your electrical supply.

Figure 7 - Components of the EOF



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- |                                |                            |
|--------------------------------|----------------------------|
| 1. Oil canister                | 7. Oil inlet pipeline      |
| 2. Oil pump motor terminal-box | 8. Quick-release connector |
| 3. Motor cooling-fan           | 9. Quick-release connector |
| 4. Direction of rotation arrow | 10. Oil outlet pipeline    |
| 5. Oil pump motor              | 11. Disconnect handle      |
| 6. Oil pressure gauge          | 12. Oil flow indicator     |

### 3.6 Check the direction of oil pump rotation

Refer to [Figure 7](#). Watch the motor cooling-fan (3), switch on the electrical supply to the EOF, then switch it off again. The correct direction of rotation of the cooling-fan is shown by the arrow (4) on the motor casing. If the direction of rotation was incorrect:

- Isolate the pump from the electrical supply, undo the screw which secures the cover of the oil pump motor terminal-box (2) and remove the cover.
- Refer to [Figure 6](#). Disconnect the yellow and blue terminal-box wires from terminals 2 and 4, then connect the yellow terminal-box wire to terminal 4, and connect the blue terminal-box wire to terminal 2.
- Refit the cover to the motor terminal-box, and secure with the screw, reconnect the EOF to the electrical supply and repeat the check to ensure that the direction of rotation is now correct.

### 3.7 Prepare the EOF

Remove the lid of the canister as described in Steps 5 to 8 of [Section 5.3.1](#) and fit element(s) o the canister and refit the canister of the EOF as described in [Sections 5.3.2](#) and [5.3.3](#).

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## 4 OPERATION

### 4.1 Switch on

Switch on the EOF as described below. Where necessary, refer to the instruction manual supplied with the rotary vacuum pump. You will need sufficient new, clean pump oil to switch on the EOF: refer to [Table 2](#).

1. Ensure that the rotary vacuum pump is switched off.
2. Ensure that the oil-level in the rotary vacuum pump is at the maximum level on the oil sight-glass.
3. Watch the oil level sight-glass on the rotary vacuum pump and switch on the electrical supply to the EOF. The oil level in the rotary pump should fall, as the pump oil is drawn into the EOF:
  - If the oil level falls, this indicates that the EOF operates correctly: continue at Step 4.
  - If the oil level does not fall, this indicates that the EOF has not primed correctly: continue at step 5.
4. Pour more oil into the rotary vacuum pump until the oil level stabilises at the maximum mark on the oil level sight-glass. You can then switch on the rotary vacuum pump and continue to operate the EOF: refer to [Sections 4.2 and 4.3](#).
5. Ensure that the oil canister is correctly fitted to the EOF base: refer to [Section 5.3](#). If the oil level falls, continue at Step 9, otherwise continue at Step 6.
6. Switch off the electrical supply to the EOF, then remove the canister from the EOF base and check that the lid is correctly fitted: refer to [Section 5.3](#).
7. Refit the canister to the EOF base: refer to [Section 5.3](#).
8. Check that the electrical connections to the EOF oil pump are correct: refer to [Section 3.5](#). Ensure that you re-check the direction of rotation of the oil pump if you change any of the electrical connections.
9. Refer to [Figure 6](#). Remove the plug on the suction invert, pour approximately 15 ml of pump oil into the invert, then refit the plug.
10. Continue at Step 3 to try and prime the EOF again.

### 4.2 Monitor the oil flow rate

Refer to [Figure 7](#). Look at the flow indicator (12) to monitor the oil flow through the EOF: the wheel in the flow indicator sight-glass turns when oil flows through the EOF.

When you first start the EOF, gas bubbles may appear in the sight-glass, but these should disappear within two to three minutes. If the gas bubbles do not disappear, there may be a leak into the EOF: check that the lid is correctly fitted to the canister and check that the canister is correctly fitted to the EOF base (refer to [Section 5.2](#)). If the lid and canister are correctly fitted, inspect the flexible oil pipelines and check that they are not damaged; replace them if necessary.

### 4.3 Monitor the back-pressure

The back-pressure shown on the pressure gauge ([Figure 7](#), item 6) will vary according to the oil temperature and the condition of the filter element(s). The pressure will be approximately as shown in the "cold oil" row in [Table 7](#) or [8](#), when you first switch on the pump. As the pump oil warms up, the pressure will fall to approximately the pressure shown in the "warm oil" row in [Table 7](#) or [8](#).

When the oil is warm (and the oil canister is warm to touch) and a back-pressure of 50 psi or more is shown on the pressure gauge, this indicates that the filter element(s) is exhausted: change the filter element(s) as described in [Section 5.3](#).

Table 7 - Typical Pressure Readings: 25P/40P Filter Elements

	Electrical supply	
	50 Hz	60 Hz
Cold oil	30 psig	39 psig
Warm oil	20 psig	26 psig

Table 8 - Typical Pressure Readings: 25C/40C Filter Elements

	Electrical supply	
	50 Hz	60 Hz
Cold oil	34 psig	43 psig
Warm oil	24 psig	30 psig

## 5 MAINTENANCE

### 5.1 Safety



#### WARNING

Obey the safety instructions given below and take note of appropriate precautions. If you do not, you can cause injury to people and damage to equipment.

- A suitably trained and supervised technician must maintain the EOF.
- Ensure that the installation technician is familiar with the safety procedures which relate to the pump oil and products pumped. Wear the appropriate safety-clothing when you come into contact with contaminated components. Dismantle and clean contaminated components inside a fume-cupboard.
- Isolate the EOF from the electrical supply so that it cannot be operated accidentally.
- Re-check the direction of rotation of the EOF oil pump, if the electrical supply cable has been disconnected from the pump or from the electrical supply.
- Take care to protect sealing-faces from damage.
- Do not touch or inhale the thermal breakdown products of fluorinated materials which may be present if the EOF has been overheated to 260°C and above. These breakdown products are very dangerous. The EOF may be overheated if it was misused, if it malfunctioned, or if it was in a fire. Edwards Health and Safety Data sheets for the Fluorinated materials used in the EOF are available on request: contact your supplier or Edwards.

### 5.2 Inspect the pipelines, cables and connections

Do the following checks when you maintain the rotary vacuum pump:

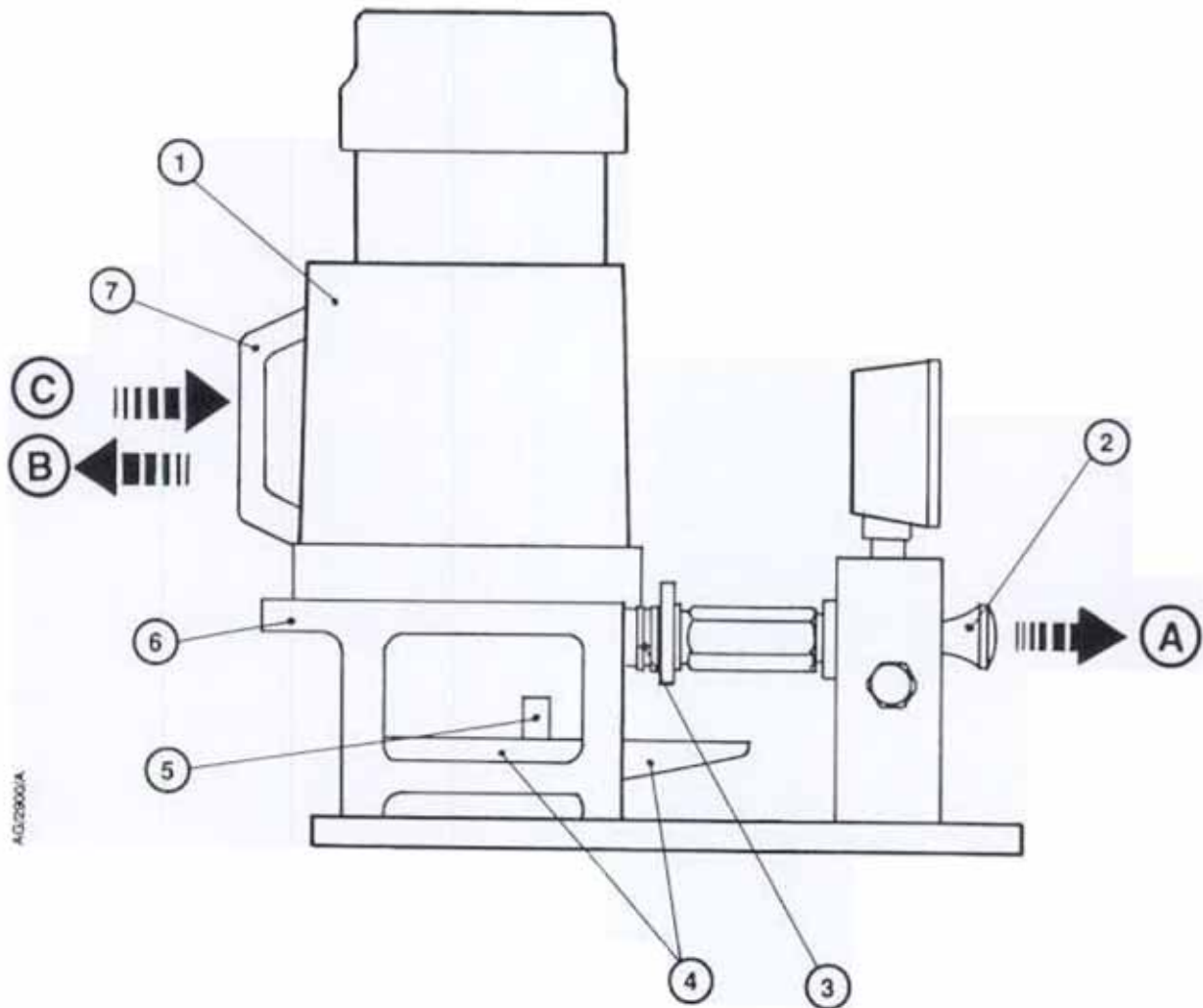
1. Inspect the oil pipelines and check that they are not damaged. Repair or replace any damaged pipeline.
2. Inspect the oil connections on the EOF and the rotary vacuum pump and check for leaks. Tighten any loose connection as necessary, and replace connectors which leak.
3. Inspect the electrical cable and check that it is not damaged and has not overheated. Repair or replace the cable if it is damaged or has overheated.

### 5.3 Change the filter element(s) (when necessary)

#### 5.3.1 Remove the canister and filter elements

1. Switch off the electrical supply to the EOF.
2. Refer to [Figure 8](#). Pull the disconnect knob (2) to disconnect the oil canister from the quick-release connectors (3) on the EOF base.
3. Hold the handle (7) and pull back the canister (1) (in the direction of arrow B) and lift the canister off of the base.
4. Refer to [Figure 9](#). Turn over the canister so that the quick-release connectors (1) are at the top (as shown in detail A), then place the canister on a drip tray (or suitable absorbent material).
5. Use a suitable tool to press the centre of one of the quick-release connectors (1), to release the pressure in the canister.

Figure 8 - Remove and Refit the Oil Canister

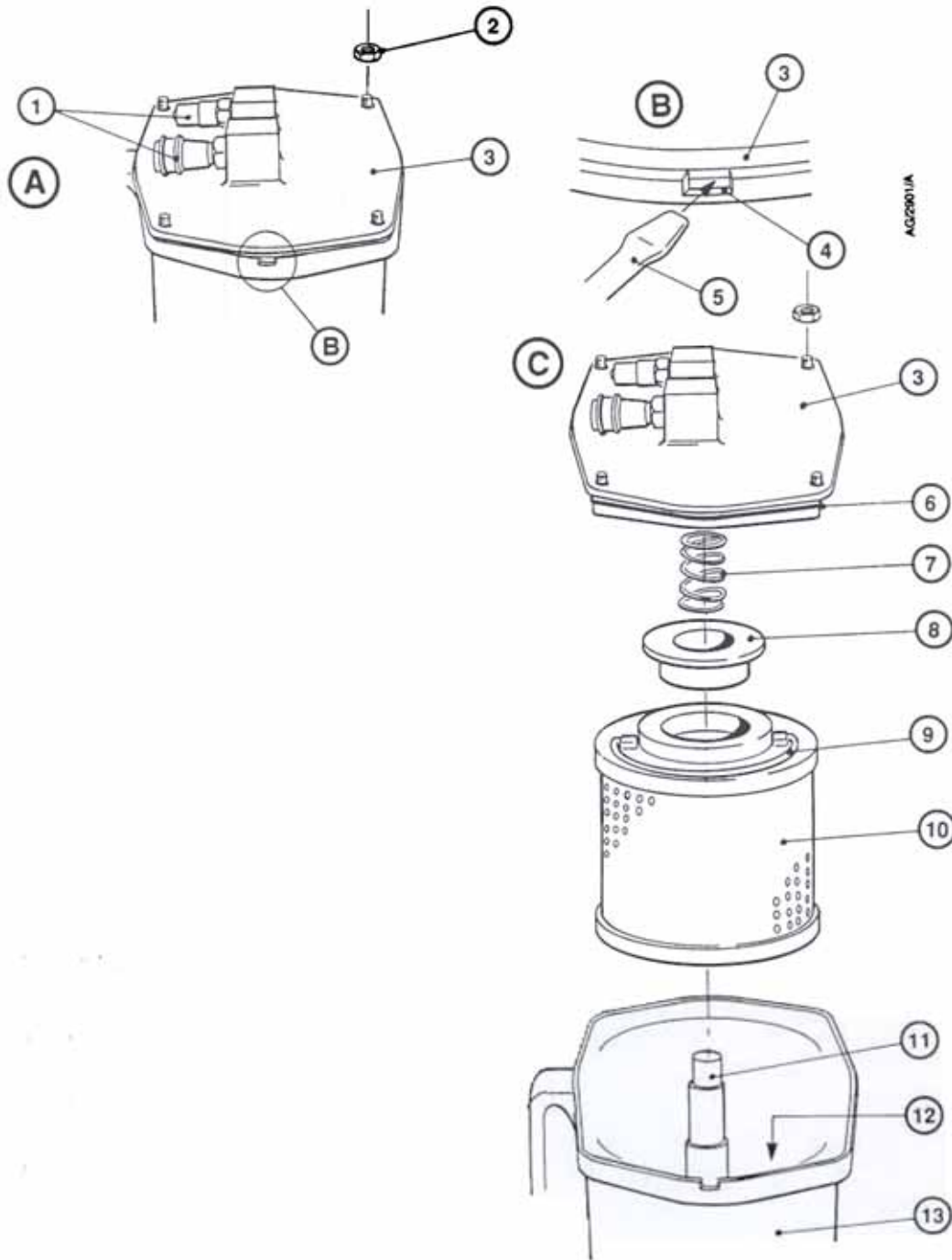


- |                             |   |
|-----------------------------|---|
| 1. Oil canister             | A Pull the disconnect handle to disconnect the canister from the EOF quick-release connectors |
| 2. Disconnect handle        | B Pull the canister off of the EOF frame  |
| 3. Quick-release connectors | C Push the canister to engage it with the EOF quick-release connectors                        |
| 4. Oil drip tray            |   |
| 5. Drip tray handle         |   |
| 6. EOF frame                |   |
| 7. Canister handle          |   |

6. Use a 13 mm A/F spanner to remove the four M8 nuts (2) which secure the lid (3) to the canister.
7. Refer to detail B. Lever the lid off of the canister:
  - Place the blade of a suitable screwdriver (5) in the slot (4) on one side of the canister, and lever the lid (3) upwards slightly.
  - Use the same method to lever the other side of the lid upwards slightly.
  - Repeat the above two bullet points, until you can lift the lid (3) off of the canister.
8. Refer to detail C. Remove the spring (7) and thrust plate (8).



Figure 9 - Remove and Refit Filter Element(s)



- |                             |                           |
|-----------------------------|---------------------------|
| 1. Quick-release connectors | 7. Spring                 |
| 2. Nut                      | 8. Thrust plate           |
| 3. Canister lid             | 9. Wire handle            |
| 4. Slot                     | 10. Filter element        |
| 5. Screwdriver              | 11. Oil return tube       |
| 6. O-ring                   | 12. Element locating seat |
|                             | 13. Oil canister          |

9. Use the wire handle (9) to lift the used filter element (10) out of the canister. Dispose of the element: refer to [Section 6.2](#).
10. If there is another element in the canister, remove it and dispose of it: use the method in Step 9.
11. Empty any used oil from the canister and dispose of the oil: refer to [Section 6.2](#).
12. Wipe clean the inside of the canister (13); ensure that the element locating seat (12) at the bottom of the canister is clean.
13. Wipe clean the sealing-faces of the thrust plate (8).

### 5.3.2 Fit the new filter element(s)

When you fit a new 25C or 40C element, take note of the following:

Remove the filter element from its protective bag immediately before you fit the element, and leave the element exposed to atmospheric moisture for as short a time as possible. If you do not, the life of the element will be reduced.

If the filter element has been in storage for a year or more, the element may have absorbed moisture. To regenerate the element before you fit it, you must bake the element at a temperature of approximately 100°C for four hours or more.

Use the following procedure to fit the new filter element(s) in the oil canister:

1. Refer to [Figure 9](#), detail C. Fit a new filter element (10) over the oil return tube (11) and into the canister (13), with the wire handle (9) upwards. Ensure that the element is correctly located on the element locating seat (12) in the canister.
2. If necessary (for example, when you use 40C elements in an 80CR canister), fit the second element in the canister, with the wire handle (9) upwards.
3. Pour new pump oil into the canister, until the oil-level is at the top of the element(s). Leave the canister for approximately five minutes to allow the oil to soak into the filter element(s).
4. Pour more new pump oil into the canister, until the oil-level is at the top of the element(s).
5. Inspect the lid O-ring (6). If the O-ring is not damaged, wipe it clean. If the O-ring is damaged, replace it: refer to [Section 7](#).
6. Use a suitable grease to lubricate the lid O-ring (6), then replace the lid (3) on the canister and secure with the four nuts (2).

### 5.3.3 Refit the canister to the EOF

1. Turn over the canister, so that the lid is at the bottom, as shown in [Figure 8](#).
2. Refer to [Figure 8](#). Place the canister (1) on the EOF base frame (6), so that the quick-release connectors on the canister align with the quick-release connectors (3) on the EOF base.
3. Hold the handle (7) and push the canister (in the direction of arrow C) until the quick-release connectors on the canister engage with the quick-release connectors (3) on the EOF base. When the connectors are correctly engaged, the disconnect handle (2) will click forwards.
4. Use the handle (5) to remove the oil drip tray (4) from the EOF base and dispose of the oil in the drip tray: refer to [Section 6](#).
5. Clean up any oil spillage on the EOF base, then refit the oil drip tray (4).

## 6 STORAGE AND DISPOSAL

### 6.1 Storage

Store the EOF in clean, dry conditions. When required for use, install the EOF as described in [Section 3](#).

### 6.2 Disposal

Dispose of the EOF, components and used pump oil in accordance with all local and national safety and environmental requirements.

Take particular care with oil and components which have been contaminated with dangerous substances.

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## 7 SERVICE, SPARES AND ACCESSORIES

### 7.1 Introduction

Edwards products, spares and accessories are available from Edwards companies in Belgium, Brazil, Canada, France, Germany, Hong Kong, Italy, Japan, Korea, Switzerland, United Kingdom, U.S.A. and a worldwide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive training courses.

Order spare parts and accessories from your nearest Edwards company or distributor. When you order, please state for each part required:

- Model and Item Number of your equipment.
- Serial Number (if any).
- Item Number and description of the part.

### 7.2 Service

Edwards products are supported by a worldwide network of Edwards Service Centres. Each Service Centre offers a wide range of service options, including: equipment decontamination; service exchange; repair; rebuild and testing to factory specifications.

Your local Service Centre can also provide Edwards engineers to support on-site maintenance, service or repair of your equipment.

For more information about service options, contact your nearest Service Centre or other Edwards company.

### 7.3 Spares

Spare	Item Number
Oil pump (without motor)	A560-13-050
Oil pump motor	A560-03-051
Oil pipeline and quick-release connector assembly (HC)	A540-31-050
Oil pipeline and quick-release connector assembly (CR)	A540-41-050
Flow indicator kit	A540-01-053
Pressure gauge	H019-00-016
EOF base quick-release connector kit (HC)	A540-31-051
EOF base quick-release connector kit (CR)	A540-41-051
Oil canister seals kit	A540-11-820
Oil canister lid assembly (HC)	A540-01-054
Oil canister lid assembly (CR)	A540-11-054

### 7.4 Accessories

Fit the sample valve so that you can sample the oil while the EOF and the rotary vacuum pump are operating (for example, so that you can test the acidity of the oil).

Accessory	Item Number
Sample valve	A504-09-000

## 7.5 Outlet pressure gauge

Fit the outlet pressure gauge so that you can see the pressure in the oil outlet pipeline, and so determine the pressure differential across the filter element.

Accessory	Item Number
Outlet pressure gauge	H019-00-013

## Return the equipment or components for service

Before you send your equipment to us for service or for any other reason, you must send us a completed Declaration of Contamination of Vacuum Equipment and Components - Form HS2. The HS2 form tells us if any substances found in the equipment are hazardous, which is important for the safety of our employees and all other people involved in the service of your equipment. The hazard information also lets us select the correct procedures to service your equipment.

We provide instructions for completing the form in the Declaration of Contamination of Vacuum equipment and Components - Procedure HS1.

If you are returning a vacuum pump, note the following:

- If a pump is configured to suit the application, make a record of the configuration before returning the pump. All replacement pumps will be supplied with default factory settings.
- Do not return a pump with accessories fitted. Remove all accessories and retain them for future use.
- The instruction in the returns procedure to drain all fluids does not apply to the lubricant in pump oil reservoirs.

Download the latest documents from [www.edwardsvacuum.com/HSForms/](http://www.edwardsvacuum.com/HSForms/), follow the procedure in HS1, fill in the electronic HS2 form, print it, sign it, and return the signed copy to Edwards.

**Note:** *If we do not receive a completed HS2 form, we will not accept the return of the equipment.*

