

# *Instructions*

## RV Pump Motor Conversion Kits

Description	Item Number
RV Pump Motor Conversion Kit (NEMA motors)	A652-01-040
RV Pump Motor Conversion Kit (IEC 72-1 motors)	A652-01-041



## Important safety Information

- Vacuum pumps are potentially dangerous if incorrectly used, repaired or maintained, so please approach the repair or maintenance with caution.
- Any incorrectly fitted spare parts could damage your pump and could be potentially dangerous.
- Never allow unqualified personnel to attempt to remove or replace any part of the pump.
- If you have any doubts about the servicing procedures or the products capabilities please contact Edwards.
- Before returning any equipment to Edwards for repair please follow the Edwards HS1 procedure and complete an HS2 declaration form to warn of any substances used or produced in the equipment that can be dangerous. The procedure and forms are included with the pump instruction manuals and can be downloaded together with Edwards local contact details from [www.edwardsvacuum.com](http://www.edwardsvacuum.com)
- Always conform to service schedules unless adverse conditions necessitate more frequent servicing.
- Report any defect before an accident or consequential damage can occur.
- Observe local and country specific regulations, norms and guidelines.
- Never allow anyone to remove large or heavy components without adequate lifting equipment.
- Before maintenance work is begun, ensure the pump is switched off and isolated from the mains.
- The pump may have been exposed to processes which use hazardous substances or produces by-products which are dangerous to human health and safety, for example, chemically active, biologically active or radioactive substances.
- Before working on a pump, ensure that the correct personal protective equipment is available and being used. Always wear safety goggles. Wear a breather mask with positive air pressure and take other precautions if you believe the pump may be contaminated with hazardous substances and dusts.
- When applying sealants and lubricants, prevent contact with the skin by wearing suitable gloves.
- Seals may contain fluoroelastomer, which when properly handled is not dangerous but which may produce a toxic and corrosive residue (hydrogen fluoride or hydrofluoric acid) in the event of excessive heat or fire depending on the circumstances of degradation and other materials involved.
- On completion of maintenance, check the pump functions correctly and that all guards and protection devices are fitted and working correctly and that the pump is electrically safe.
- If the pump is used for handling hazardous substances check the pump for leak-tightness before use.
- Dispose of waste oil and any process by-products in accordance with local and national safety and environmental requirements. It is usually illegal to dispose of waste oil into drains or water courses, or to bury it.

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# Associated publications

Publication title	Publication number
RV3, RV5, RV8 and RV12 Rotary Vane Pumps .....	A652-01-880

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# 1 Introduction

## 1.1 Scope and definitions

This manual provides installation instructions for the RV Pump Motor Conversion Kits (abbreviated to Motor Conversion Kits in the remainder of this manual) for the Edwards RV Rotary Vane Pumps. You must use the Motor Conversion Kits as specified in this manual.

Read this manual before you use the Motor Conversion Kit. Important safety information is highlighted as WARNING and CAUTION instructions; you must obey these instructions. The use of WARNINGS and CAUTIONS is described 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.

## 1.2 Description

Use a Motor Conversion Kit to replace the standard pump motor in an RV rotary pump with a different type of pump motor (which you must supply). Two types of Motor Conversion Kit are available, for installation of the following types of motor on the RV pump:

- An IEC 72-1 motor with an (IM B14) FT85 face mounting and 14 mm diameter shaft.
- A NEMA 56C motor with a  $\frac{5}{8}$  inch diameter shaft.

The new pump motor must have an adequate power rating for use with the RV pump: refer to the RV pump instruction manual.

## 1.3 Safety



### **WARNING**

Do not touch or inhale the thermal breakdown products of fluorinated materials which may be present if the RV pump has been heated to 210 °C and above. These breakdown products are very dangerous. Some of the seals in the pump are made from fluorinated materials.

The dynamic seals and O-rings used in the RV pump are made from fluorinated materials. Fluorinated materials are safe in normal use but can decompose into very dangerous materials (which may include hydrofluoric acid) if they are heated to 210 °C and above.

The pump may have overheated if it was misused or if it was in a fire. If the pump has overheated, take extreme care to avoid skin contact with any part of the pump and to avoid inhalation of vapours from the pump. Material Safety Data Sheets for the fluorinated materials used in the RV pump are available on request: contact your supplier or Edwards.

## 2 Unpack and Inspect

Remove all the packing materials and protective covers and check the Motor Conversion Kit.

If the Motor Conversion Kit is damaged, notify your supplier and the carrier in writing within three days; state the Item Number of the Motor Conversion Kit together with your order number and the supplier's invoice number. Retain the packing materials for inspection. Do not use the Motor Conversion Kit if it is damaged.

Check that you have received the items listed in Table 1 or 2 as appropriate. If any item is missing, notify your supplier within three days.

If the Motor Conversion Kit is not to be used immediately, replace the protective covers and repack the Motor Conversion Kit in the packing materials. Store the Motor Conversion Kit in cool, dry conditions until it is required for use.

Table 1 - Checklist of kit components: NEMA motors

Quantity	Description	Check (✓)
1	Motor support	<input type="checkbox"/>
1	Fan and coupling element	<input type="checkbox"/>
1	Ducting sheet	<input type="checkbox"/>
4	Cap-head screws, 3/8 inch - 16 UNC	<input type="checkbox"/>
4	Cap-head screws, M6 x 20	<input type="checkbox"/>
1	Cap-head screw, M5 x 40	<input type="checkbox"/>

Table 2 - Checklist of kit components: IEC 72-1 motors

Quantity	Description	Check (✓)
1	Motor support	<input type="checkbox"/>
1	Fan and coupling element	<input type="checkbox"/>
1	Ducting sheet	<input type="checkbox"/>
8	Cap-head screws, M6 x 20	<input type="checkbox"/>
1	Cap-head screw, M5 x 40	<input type="checkbox"/>

## 3 How to use the Motor Conversion Kit

### 3.1 Remove the standard motor from the pump

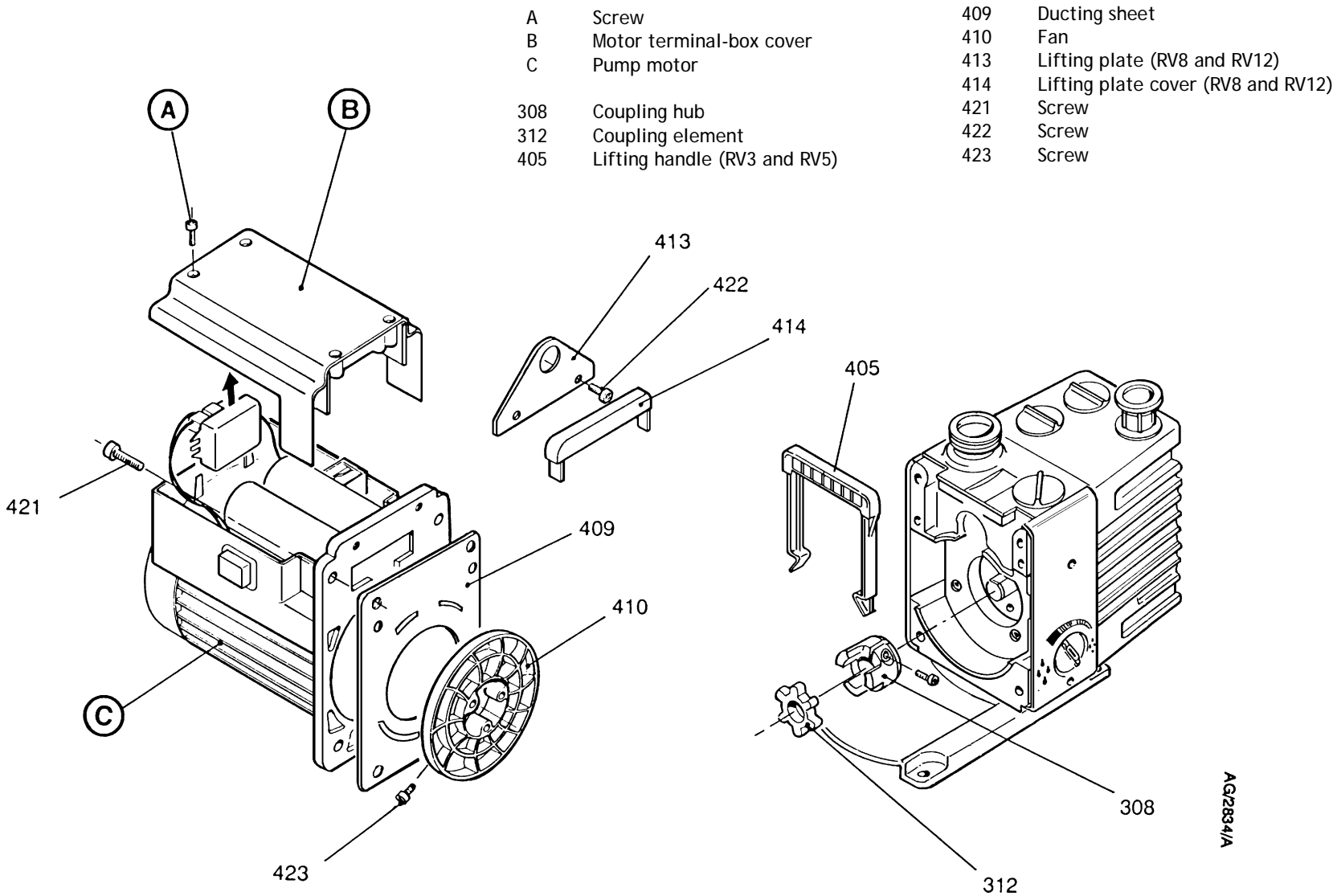
1. Switch off the RV pump, disconnect it from the electrical supply and allow the pump to cool to a safe temperature.
2. Refer to [Figure 1](#). If you have a single-phase motor, undo the four screws (A) and remove the lid of the terminal-box (B).
3. Support the motor (C), while you undo and remove the four screws (421) which secure the motor to the pump, then remove the motor from the pump.
4. Remove the coupling element (312) from the coupling hub (308).
5. On RV3 and RV5 pumps, remove the handle (405). On RV8 and RV12 pumps:
  - Remove the lifting plate cover (414).
  - Undo the two screws (422) and remove the lifting plate (413).

### 3.2 Fit the new motor to the pump

1. Refer to [Figure 2](#). Use the four screws (455) to fit the motor support (453) to the new pump motor.
2. On RV3 and RV5 pumps, refit the handle (405). On RV8 and RV12 pumps:
  - Use the two screws (422) to refit the lifting plate (413).
  - Refit the lifting plate cover (414).
3. Fit the new ducting sheet (409) supplied with the Motor Conversion Kit.
4. Ensure that the key (B) is in place on the motor shaft, then push the fan (452) onto the motor shaft. Ensure that the end of the motor shaft aligns with the bottom of the cavity in the fan (452) and that the back of the fan is 2.5 mm from the ducting sheet (409). Secure the fan to the shaft with the screw (454). Tighten the screw to a torque between 7 and 9 Nm.
5. Use a suitable rubber lubricant to lubricate the coupling element (312), then fit the coupling element to the coupling hub (308).
6. Align the coupling element (312) on the fan with the coupling hub (308), then fit the new motor assembly to the pump. The gap between the coupling on the fan and the coupling hub must be 2 mm or less; adjust the position of the coupling hub (308) on the pump shaft to adjust the gap.
7. Secure the motor with the four screws (421). Tighten the screws to a torque between 10 and 12 Nm.

# How to use the Motor Conversion Kit

Figure 1 - Remove the standard motor from the pump



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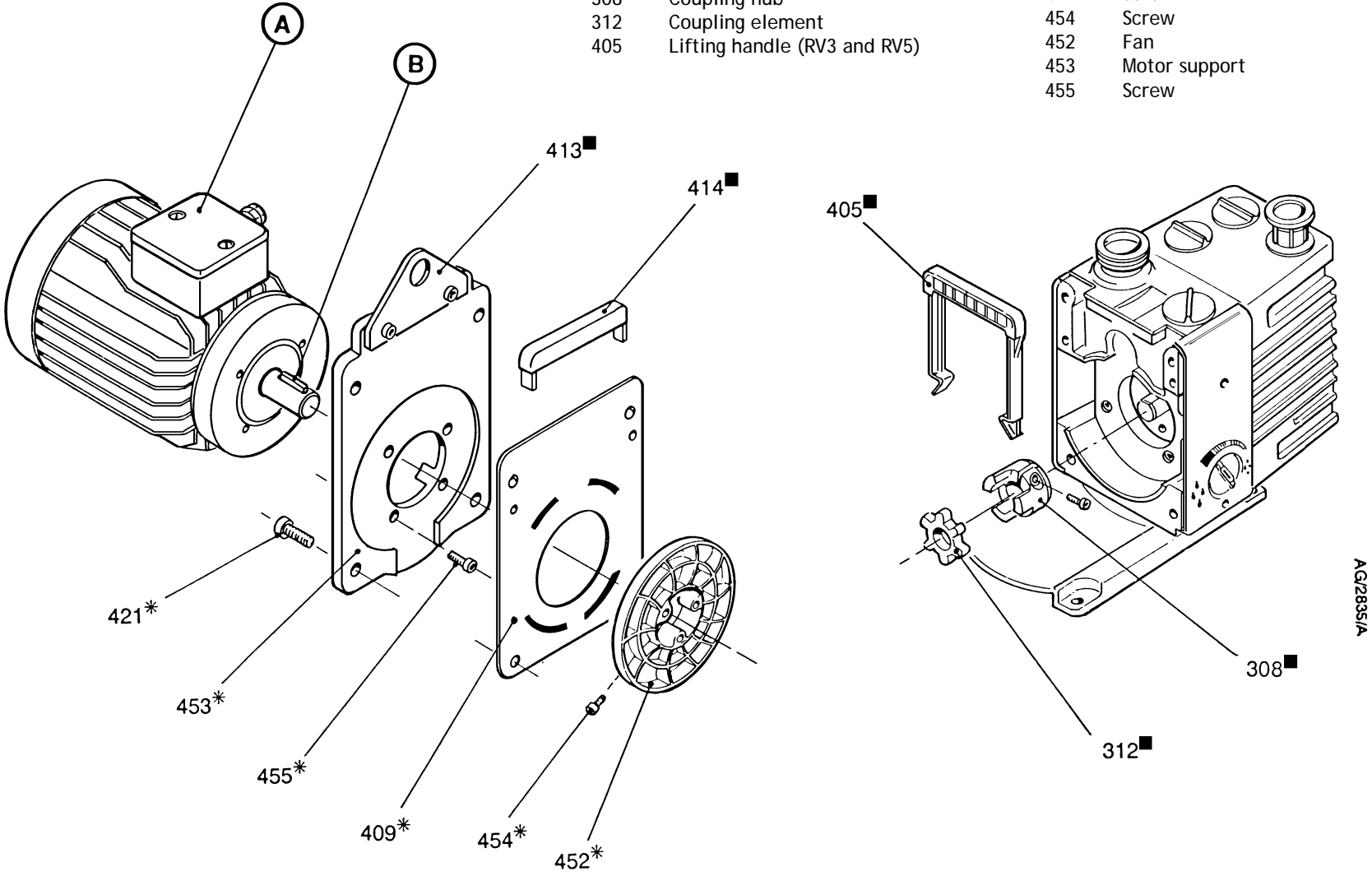
# How to use the Motor Conversion Kit

Figure 2 - Fit the new motor to the pump

- \* Supplied as part of the Motor Conversion Kit
- Shown for reference only

- A Pump motor
- B Key (in shaft)
- 308 Coupling hub
- 312 Coupling element
- 405 Lifting handle (RV3 and RV5)

- 409 Ducting sheet
- 413 Lifting plate (RV8 and RV12)
- 414 Lifting plate cover (RV8 and RV12)
- 421 Screw
- 454 Screw
- 452 Fan
- 453 Motor support
- 455 Screw



### 3.3 Electrical installation

#### 3.3.1 Check and configure the motor

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#### *CAUTION*

If you operate the pump and the motor is not correctly configured for your electrical supply, you may damage the motor.

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Before you connect the motor to the electrical supply, check the rating plate on the motor and ensure that the motor is suitable for use with your electrical supply. If the motor is multi-voltage, ensure that the motor is correctly configured for your electrical supply voltage and frequency: refer to the manufacturer's information supplied with the motor.

#### Connect the motor to the electrical supply




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#### *WARNING*

Ensure that the electrical installation of the pump 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.

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Connect the motor to the electrical supply as specified in the manufacturer's information supplied with the motor. Note also the following points:

- You must use a suitable electrical supply cable.
- Connect the electrical supply to the motor through a starter or circuit breaker which has thermal over-current protection which can be adjusted to suit the full load current ratings for the motor, and ensure that the fuse you use is suitable for the starting current for the motor: refer to the RV pump instruction manual and to the manufacturer's information supplied with the motor.
- In the UK, if the motor is single-phase and has built-in over-current or thermal protection, you can use a 13 A plug to connect the motor to the electrical supply. The plug must comply with BS1363A and be fitted with a 13 A fuse which complies with BS1362.
- We recommend that you connect the motor to the electrical supply through suitable control equipment which must be reset manually after an electrical supply failure. If you do not, the motor will automatically restart when the electrical supply is restored.

#### 3.3.2 Check the direction of rotation

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#### *CAUTION*

Ensure that the motor rotates in the correct direction. If it does not, the pump and your vacuum system can become pressurised.

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1. Watch the motor, switch on the electrical supply to the motor for a few seconds, then switch off the electrical supply.
2. Check that the direction of rotation is correct for the RV pump (refer to the RV pump instruction manual). If the direction of rotation is incorrect, isolate the motor from the electrical supply and reconfigure the electrical connections to the motor: refer to the manufacturer's information supplied with the motor.
3. Repeat the above check to ensure that the direction of rotation is now correct.