

Instruction Manual

*AUTO 306 accessories:
Rotary Workholder*

*Volume 1 - Installation and Maintenance
Instructions*

<i>Description</i>	<i>Item Number</i>
<i>Rotary Workholder</i>	<i>E090-49-000</i>



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Declaration of Conformity

We, Edwards High Vacuum International,
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declare under our sole responsibility that the product(s)

AUTO 306 Rotary Workholder (50/60 Hz) E090-49-000

to which this declaration relates is in conformity with the following standard(s)
or other normative document(s)

EN50081-2 *	Electromagnetic Compatibility, General Emission Standard. Generic Standard Class: Heavy Industrial.
EN50082-2 *	Electromagnetic Compatibility, General Immunity Standard. Generic Standard Class: Heavy Industrial.

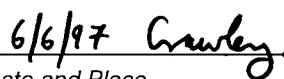
* The Rotary Workholder complies with these standards when installed on the AUTO 306 in accordance with the instruction manuals supplied with the Rotary Workholder and with the AUTO 306.

following the provisions of

73/023/EEC	Low Voltage Directive.
89/336/EEC	Electromagnetic Compatibility Directive.



Dr. A. P. Troup, Director of Technology



Date and Place

CONTENTS (Volume 1)

Section	Title	Page
1	INTRODUCTION	1
1.1	Scope and definitions	1
1.2	Description	2
1.3	Controls and indicator	2
2	TECHNICAL DATA	4
2.1	Operating and storage conditions	4
2.2	Performance	4
2.3	Mechanical data	4
2.4	Electrical data	4
2.5	Materials exposed to vacuum	4
3	INSTALLATION	5
3.1	Unpack and inspect	5
3.2	Installation safety	5
3.3	Fit the control box and motor controller	6
3.4	Fit the workholder drive and workholder plate	8
3.5	Electrical connections	10
3.5.1	Introduction	10
3.5.2	Fit the control box electrical supply cable and motor cable	10
3.5.3	Fit the controller supply and control cables	12
3.6	Complete the installation	12
4	MAINTENANCE	15
4.1	Safety	15
4.2	Replace the fuses	15
4.2.1	Introduction	15
4.2.2	Replace the electrical supply fuse	16
4.2.3	Replace the motor controller fuse	16
4.3	Fault finding	18
5	STORAGE AND DISPOSAL	19
5.1	Storage	19
5.2	Disposal	19
6	SERVICE, SPARES AND ACCESSORIES	19
6.1	Introduction	19
6.2	Service	19
6.3	Spares	20
6.4	Accessories	20
7	ENGINEERING DIAGRAMS	20
	RETURN OF EDWARDS EQUIPMENT	

Illustrations

Figure	Title	Page
1	Controls and indicators	3
2	Prepare the AUTO 306	7
3	Fit the workholder drive	9
4	Cable routes for the electrical supply cable and the motor cable	11
5	Cable routes for the motor controller supply and control cables	13
6	Electrical connections on the control box	14
7	Electrical connections on the motor controller	14
8	Replace the motor controller fuse	17
9	Circuit diagram	21

Associated publications

Publication title	Publication Number
Vacuum leadthroughs	E100-99-880

Tables

Table	Title	Page
1	Checklist of components	5
2	Fault finding	18

CONTENTS (Volume 2)

Section	Title	Page
1	INTRODUCTION	1
1.1	Scope and definitions	1
2	OPERATION	1
2.1	Operator safety	1
2.2	Unload/load substrates onto the workholder plate	2
2.3	Switch on and start the Rotary Workholder	2
2.4	Adjust the rotation speed (optional)	4

Illustrations

Figure	Title	Page
1	Components of the Rotary Workholder	3

1 INTRODUCTION

1.1 Scope and definitions

This manual is supplied in two volumes; Volume 1 provides installation and maintenance instructions for the Rotary Workholder accessory for the AUTO 306, Volume 2 provides operating instructions. You must use the Rotary Workholder as specified in this manual.

Read this volume of the manual before you install and maintain the Rotary Workholder. Important safety information is highlighted as WARNING and CAUTION instructions; you must obey these 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 symbols may appear on the accessory:



Caution - refer to accompanying documents.



Caution - risk of electric shock.



Alternating current.



Earth (ground) terminal.



Protective conductor terminal.

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

1.2 Description

Use the Rotary Workholder to rotate substrates during your deposition process. You will need to use one of the following AUTO 306 chamber accessories to fit and use the Rotary Workholder:

- Cylindrical Chamber (and Top Plate Counterbalance)
- FL400 Front Loading Chamber.

The Rotary Workholder has a workholder drive, a workholder plate, a control box and a motor controller. The workholder drive is mounted on the top-plate of the chamber and the workholder plate is mounted inside the chamber. The rotation of the workholder drive motor is transmitted to the workholder plate through a rotary leadthrough which is mounted through the top-plate of the chamber.

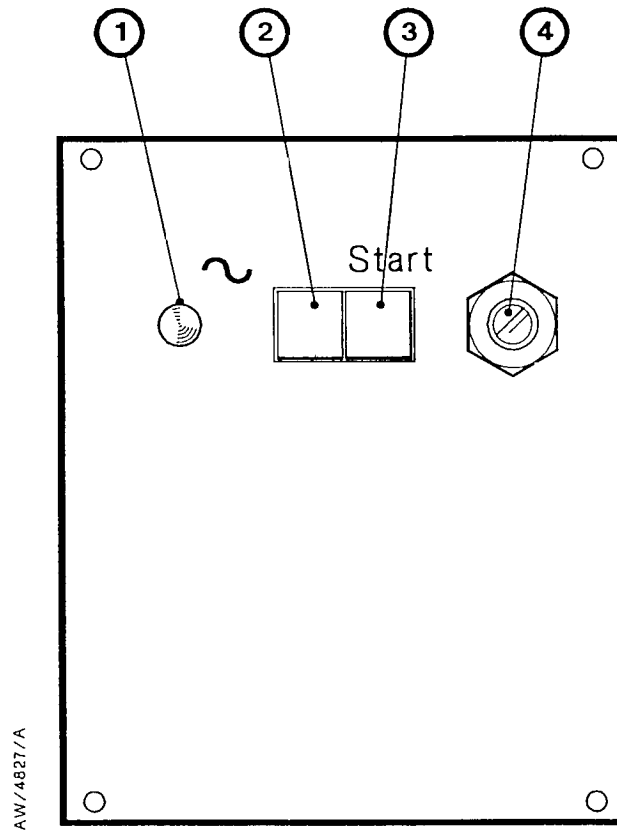
The workholder plate is a plain disk of aluminium. You can machine the workholder plate to suit the substrate that you will use.

The motor controller is mounted inside the AUTO 306 electrical control cabinet and provides smooth acceleration and deceleration of the workholder plate to its maximum rotation speed; this minimises the movement of substrates mounted on the workholder plate.

1.3 Controls and indicator

Refer to Figure 1, which shows the controls and the indicator on the control box. These controls and the indicator are used as described below. Refer to Volume 2 for a full description of the uses of the controls.

On lamp (1)	This green lamp is on when the electrical supply to the control box is switched on; that is, the control box is connected to the electrical supply in the AUTO 306, the On(off) button has been used to switch on the control box, and the AUTO 306 safety interlocks are made.
On(off) button (2)	Use this to switch the control box on and off.
Start button (3)	Use this to start and stop the workholder drive
Speed potentiometer (4)	Use this to adjust the rotation speed of the workholder plate.



1. On lamp
2. On(off) button
3. Start button
4. Speed potentiometer

Figure 1- Controls and indicator

2 TECHNICAL DATA

2.1 Operating and storage conditions

Operating environment	Indoor use only
Operating temperature range	5 to 40 °C
Maximum operating humidity	
Ambient temperature 5 to 31 °C	80% RH
Ambient temperature 31 to 40 °C	50% RH
Maximum operating altitude	2000 m
Storage humidity range	0 to 90% RH
Installation category	II
Pollution degree	2

2.2 Performance

Rotation speed	0 to 60 rev.min ⁻¹
Acceleration time: stationary to full rotation speed	2 s
Deceleration time: full rotational speed to stationary	2 s

2.3 Mechanical data

Mass	12.5 kg
Workholder plate	
Material	Aluminium
Diameter	260 mm
Thickness	6 mm

2.4 Electrical data

Motor power rating	0.5 kW (maximum)
Electrical supply	200 to 250 V, 50/60 Hz
Fuses	
Electrical supply fuse	2 A, 250 V, fast-blow, 5 x 20 mm
Motor controller fuse	3.15 A, 250 V, fast-blow, 5 x 20 mm

2.5 Materials exposed to vacuum

When the accessory is fitted, the following materials are exposed to vacuum: stainless steel 304, fluoroelastomer, aluminium HE30, Apiezon vacuum grease.

3 INSTALLATION

3.1 Unpack and inspect

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

Check that your package contains the items listed in Table 1. If any of these items is missing, notify your supplier in writing within three days. If the accessory is not to be used immediately, replace the protective covers and store the accessory in suitable conditions, as described in Section 5.

Qty	Description	Check (✓)
1	Workholder drive	<input type="checkbox"/>
1	Workholder plate	<input type="checkbox"/>
1	Control box	<input type="checkbox"/>
1	Rotary leadthrough	<input type="checkbox"/>
1	Drive coupling	<input type="checkbox"/>
1	Pack of fixing screws	<input type="checkbox"/>
1	Electrical supply cable	<input type="checkbox"/>
1	Motor cable (RW5 - RW6)	<input type="checkbox"/>
1	Controller supply cable (RW1 - RW3)	<input type="checkbox"/>
1	Controller control cable (RW2 - RW4)	<input type="checkbox"/>
1	Earth (ground) wire	<input type="checkbox"/>
1	Motor controller (with bracket fitted)	<input type="checkbox"/>
10	Cable ties	<input type="checkbox"/>
5	Self-adhesive clips	<input type="checkbox"/>
1	Plain washer	<input type="checkbox"/>
1	M6 screw	<input type="checkbox"/>

Table 1 - Checklist of components

3.2 Installation 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.

- Read this instruction manual and the instruction manuals supplied with other AUTO 306 accessories before you install any accessories.

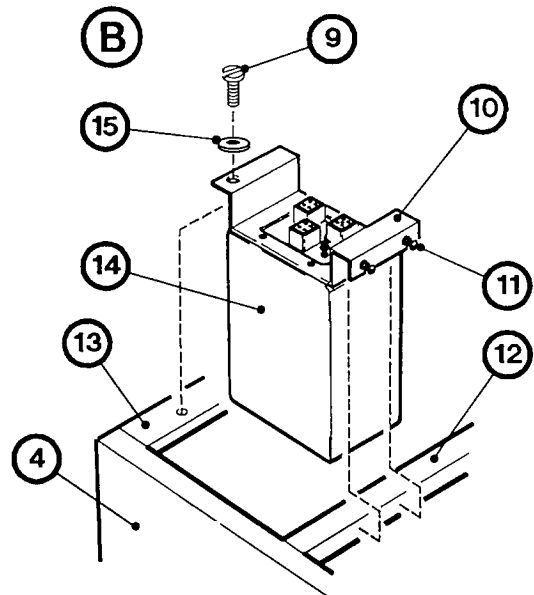
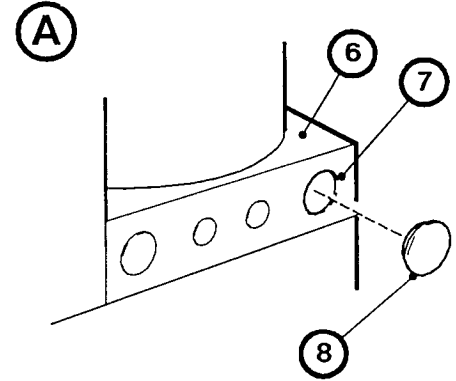
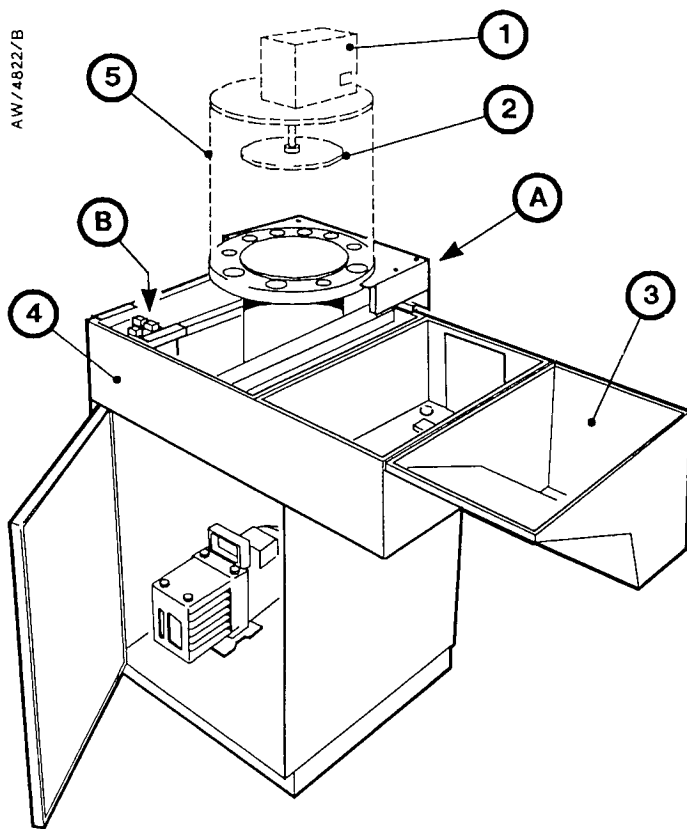
(Continued on page 6)

- Switch off the electrical supply and disconnect the AUTO 306 from the electrical supply before you start installation work.
- This accessory has been designed for installation and use on the Edwards AUTO 306 vacuum coating system with its comprehensive safety features. If the accessory is installed and used on any other equipment, you must install devices to ensure that you adequately support, safely enclose, insulate, interlock, and provide short circuit protection for the accessory, as appropriate.
- Ensure that a suitably trained and supervised technician installs the accessory. Obey your local and national safety requirements. The Rotary Workholder must be connected to a suitably fused and protected electrical supply and a suitable earth (ground) point.
- Allow hot surfaces in the AUTO 306 to cool before you start work. Do not touch any part of the liquid nitrogen reservoir or connecting pipes (if fitted) in the AUTO 306. Do not allow liquid nitrogen vapour to touch your skin. These surfaces and the vapour are at a very low temperature and can cause tissue damage.
- Instructions to open the AUTO 306 electrical control cabinet and to remove the covers are given in the AUTO 306 instruction manual. It is important that you obey these instructions carefully to prevent damage to components such as the chamber leak valve.

3.3 Fit the control box and motor controller

1. Select the required position of the Rotary Workholder control box on the AUTO 306 control unit; a typical position is shown in Figure 4.
2. Remove the selected blank panel from the AUTO 306 electrical control cabinet and disconnect the earth (ground) wire from the rear of the blank panel. Retain the panel securing screws.
3. Hold the Rotary Workholder control box next to its required installation position, then connect the earth (ground) wire (disconnected in Step 2) to the earth (ground) stud (Figure 6, item 3) on the rear of the control box.
4. Fit the control box into position in the AUTO 306 electrical control cabinet and secure with the screws removed in Step 2.
5. Remove the front baseplate cover from the AUTO 306 cabinet, and open the control panel enclosure: refer to the AUTO 306 instruction manual.
6. Refer to Figure 2, detail B. Place the bracket and motor controller (10, 14) in position in the AUTO 306 cabinet (4); ensure that the fixing-hole on the left-hand side of the bracket (10) aligns with the fixing hole on the top of the side cross-member of the cabinet (13), and that the right-hand side of the bracket goes over the cross-member (12) in the cabinet.
7. Use the screw (9) and plain washer (15) to secure the bracket (10) to the side cross-member (13), then tighten the two screws (11) to secure the bracket to the cross-member (12).

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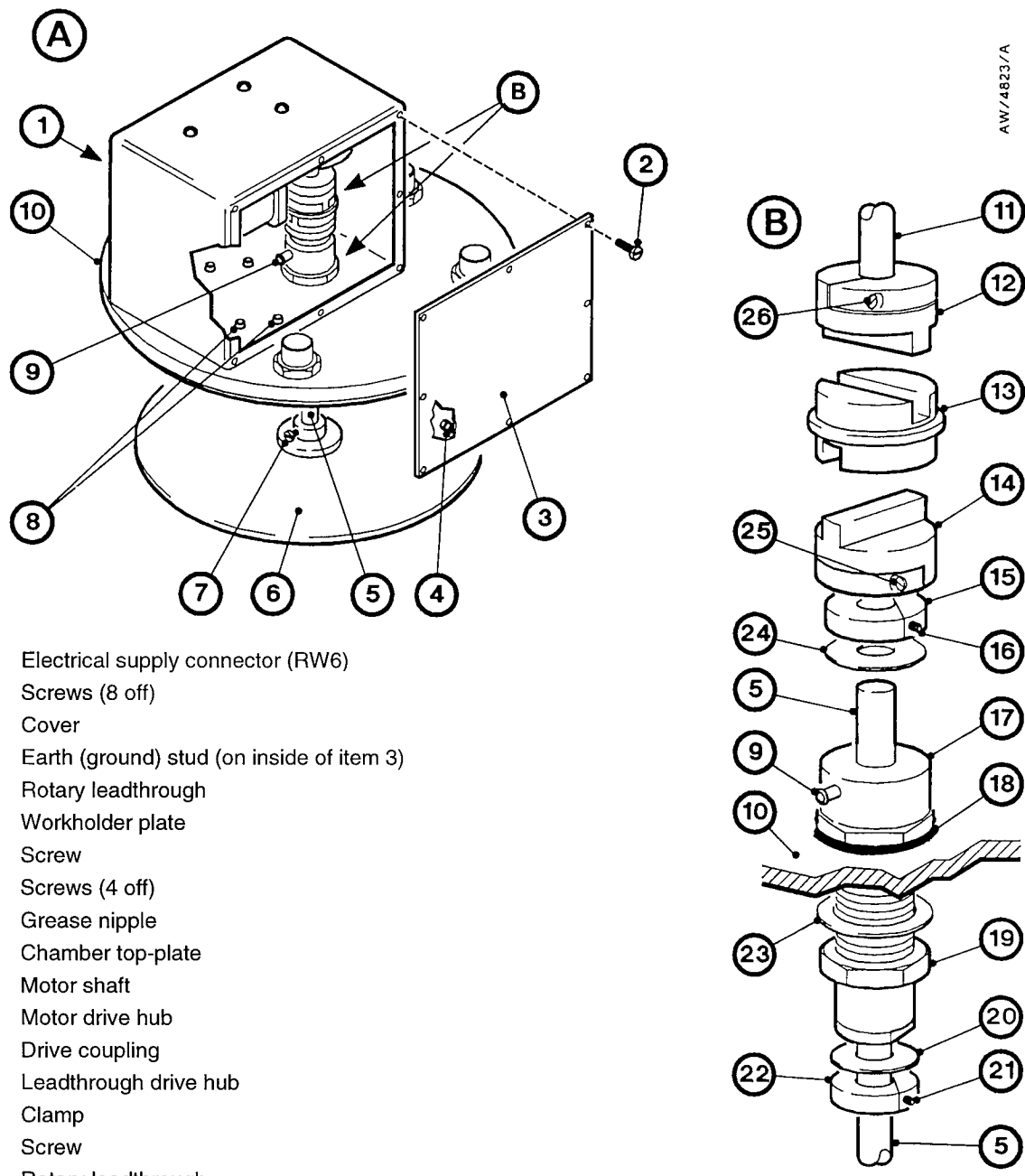
1. Position of the workholder drive
2. Position of the workholder plate
3. Electrical control cabinet
4. AUTO 306 cabinet
5. Cylindrical chamber
6. Rear baseplate cover
7. Leadthrough hole
8. Blanking-plug
9. Screw
10. Bracket
11. Screws (2 off)
12. Cross-member
13. Side cross-member
14. Motor controller
15. Washer

Figure 2 - Prepare the AUTO 306 (shown with Cylindrical Chamber accessory, and with front baseplate cover removed)

3.4

Fit the workholder drive and workholder plate

1. Refer to Figure 3 detail A. Remove the blanking-plug from the centre leadthrough hole in the chamber top-plate (10).
2. Undo and remove the eight screws (2) and remove the cover (3) from the workholder drive.
3. Refer to detail B. Undo the bolt (21) and remove the clamp (22) and thrust washer (20) from the rotary leadthrough.
4. Undo and remove the locknut (19) and the washer (23) from the rotary leadthrough (15), then (from the outside of the chamber top-plate) pass the leadthrough through the centre leadthrough hole in the chamber top-plate (10). Ensure that the leadthrough 'O' ring (18) is correctly in place.
5. Turn the rotary leadthrough so that that the grease nipple (9) will be accessible when the workholder drive is fitted, then fit the washer (23) to the vacuum side of the rotary leadthrough, then fit and tighten the locknut (19) to secure the rotary leadthrough in position.
6. Fit the thrust washer (20) and the clamp (22) to the rotary leadthrough shaft (5), then tighten the bolt (21) to secure in place.
7. Fit the drive coupling (13) to the leadthrough drive hub (14); ensure that the slot in the drive coupling correctly fits over the tab on the drive hub.
8. Hold the workholder drive over the top-plate, turn the leadthrough drive hub (14) so that the slot in the drive coupling (13) aligns with the tab on the motor drive hub, then lower the workholder drive onto the chamber top-plate, so that the motor drive hub engages with the drive coupling.
9. Refer to detail A. Adjust the position of the workholder drive so that the fixing-holes in the base align with the four fixing holes in the chamber top-plate (10), then fit the four screws (8) to secure the workholder drive in place.
10. Refit the cover (3) and secure with the eight screws (2).
11. Drill holes in the workholder plate (6) as required, so that you can mount substrates on the workholder plate.
12. Fit the workholder plate (6) to the end of the rotary leadthrough shaft (5); ensure that the bottom surface of the workholder plate is level with the end of the rotary leadthrough shaft, then tighten the screw (7) to secure the workholder plate in place.
13. If you have fitted the workholder drive to a Cylindrical Chamber accessory, adjust the tension of the spring in the Top Plate Counterbalance to allow for the mass of the workholder drive: refer to the instruction manual supplied with the Top Plate Counterbalance accessory.



1. Electrical supply connector (RW6)
2. Screws (8 off)
3. Cover
4. Earth (ground) stud (on inside of item 3)
5. Rotary leadthrough
6. Workholder plate
7. Screw
8. Screws (4 off)
9. Grease nipple
10. Chamber top-plate
11. Motor shaft
12. Motor drive hub
13. Drive coupling
14. Leadthrough drive hub
15. Clamp
16. Screw
17. Rotary leadthrough
18. Leadthrough 'O' ring
19. Leadthrough nut
20. Thrust washer
21. Screw
22. Clamp
23. Washer
24. Thrust washer
25. Screw
26. Screw

Figure 3 - Fit the workholder drive

3.5 Electrical connections

WARNING

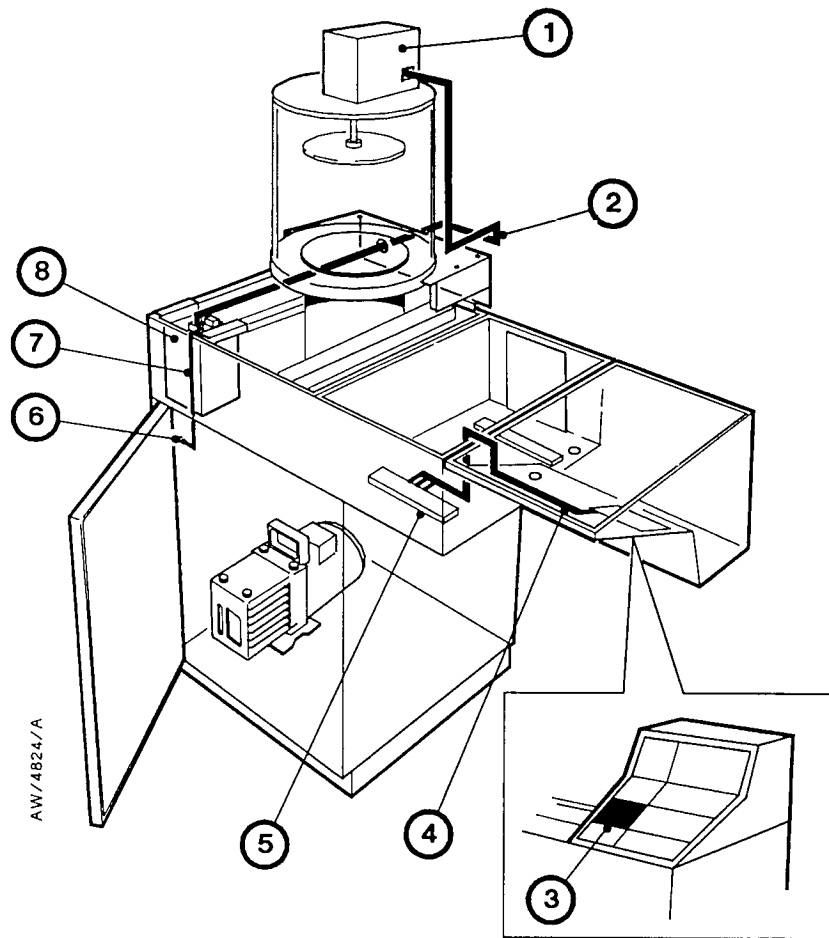
Ensure that the earth (ground) wire on the chamber is correctly connected to the earth (ground) terminal in the AUTO 306 electrical control cabinet (refer to the instruction manual supplied with the chamber accessory). If you do not, the installation will not be safe and there will be a risk of injury or death by electric shock.

3.5.1 Introduction

Make the electrical connections as described in Sections 3.5.2 and 3.5.3. Note that Figures 6 and 7 show the electrical connections on the control box and motor controller, and that a schematic electrical circuit diagram of the electrical connections is shown in Figure 9.

3.5.2 Fit the control box electrical supply cable and motor cable

1. Refer to Figure 4. Fit the connector on the end of the electrical supply cable (4) to the electrical supply connector on the rear of the control box (3).
2. Route the cable as shown in Figure 4, then connect the wires at the other end of the cable:
 - Connect wire #14 to terminal 14 on terminal block TB1 (5).
 - Connect wire #7 to terminal 7 on terminal block TB1 (5).
 - Connect the earth (ground) wire to a spare earth terminal on terminal block TB1 (5).
3. Fit plug RW5 on the end of the motor cable (2) to socket RW5 on the top of the motor controller (7).
4. Route the cable as shown in Figure 4, through the leadthrough hole in the rear baseplate cover (Figure 2, detail A).
5. Fit socket RW6 on the other end of the motor cable (2) to plug RW6 on the side of the workholder drive (1).
6. Connect the free end of the earth (ground) wire (7, fitted to the earth (ground) stud on the rear of the motor controller) to the earth (ground) stud (6) on the AUTO 306 cabinet.



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- | | |
|----------------------------|------------------------|
| 1. Workholder drive | 5. Terminal box TB1 |
| 2. Motor cable | 6. Earth (ground) stud |
| 3. Control box | 7. Earth (ground) wire |
| 4. Electrical supply cable | 8. Motor controller |

Cable Name	Wire Number	From	To
Electrical supply cable	Earth (green/yellow)	Control box	Terminal block TB1, earth terminal
	#14	Control box	Terminal box TB1, terminal 14
	#7	Control box	Terminal box TB1, terminal 22
Motor cable	-	Motor controller, socket RW5	Workholder drive, plug RW6
Earth (ground) wire	-	Motor controller, earth stud	Cabinet earth (ground) stud

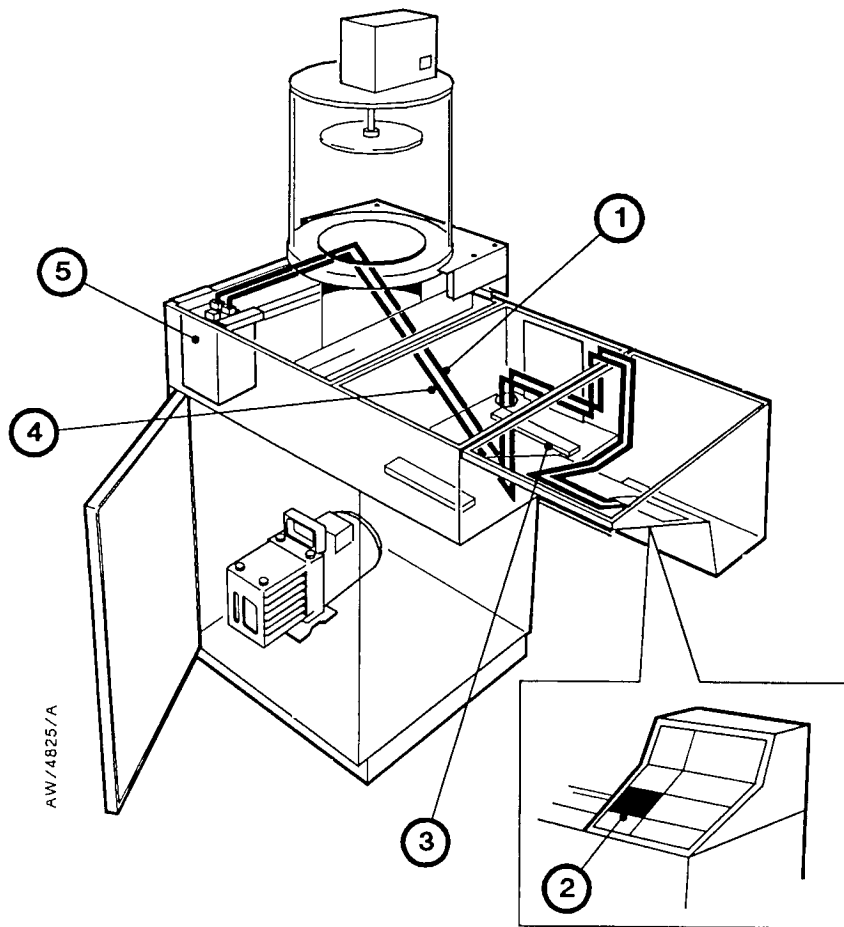
Figure 4 - Cable routes for the electrical supply cable and the motor cable

3.5.3 Fit the controller supply and control cables

1. Refer to Figure 5. Fit plug RW1 on the end of the controller supply cable (1) to socket RW1 on the rear of the control box (2).
2. Fit socket RW2 on the end of the controller control cable (4) to plug RW2 on the rear of the control box (2).
3. Route the two cables as shown in Figure 5, through the leadthrough hole next to terminal block TB2 (3) and into the base of the electrical control cabinet.
4. Route the cables as shown in Figure 5, around the back of the control cabinet, then along the side of the control cabinet, towards the motor controller (5).
5. Fit plug RW4 on the end of the controller control cable (4) to socket RW4 on the motor controller (5).
6. Fit socket RW3 on the end of the controller supply cable (1) to plug RW3 on the motor controller (5).

3.6 Complete the installation

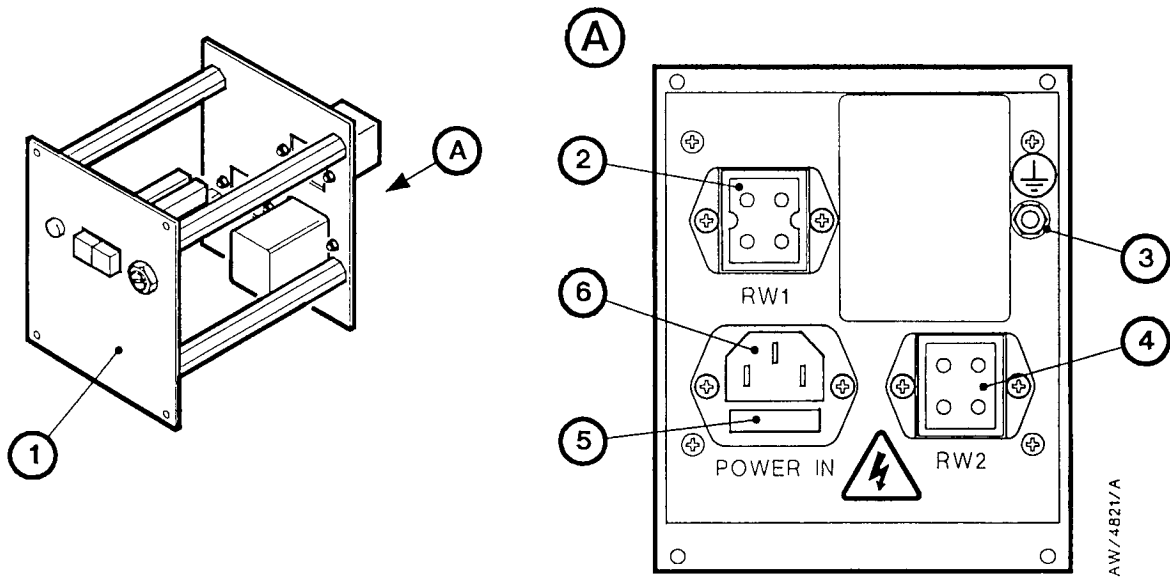
1. Use the cable ties and the self-adhesive clips supplied to secure all of the cables in the AUTO 306 control cabinet. Ensure that none of the cables touch components which can be very hot or very cold (for example, the diffusion pump or the liquid nitrogen trap).
2. Refit the front baseplate cover to the AUTO 306 cabinet and close the control panel enclosure: refer to the AUTO 306 instruction manual.



1. Controller supply cable
2. Control box
3. Terminal block TB2
4. Controller control cable
5. Motor controller

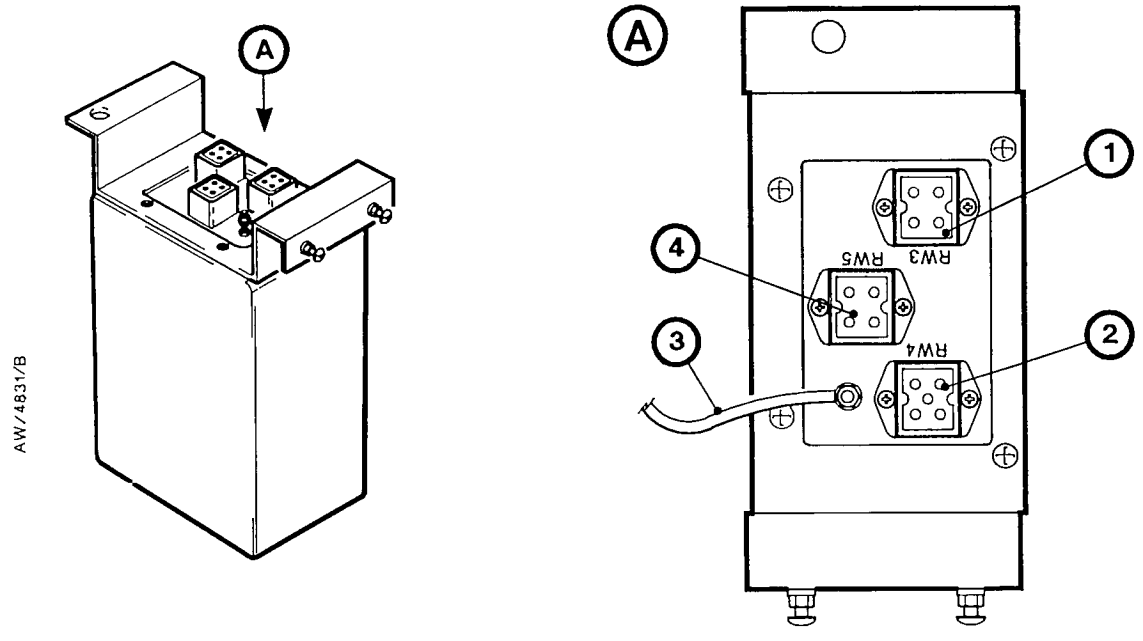
Cable Name	Wire Number	From	To
Controller supply cable	-	Control box, socket RW1	Motor controller, plug RW3
Controller control cable	-	Control box, plug RW2	Motor controller, socket RW4

Figure 5 - Cable routes for the motor controller supply and control cables



- | | |
|------------------------|---------------------------|
| 1. Front panel | 4. Plug RW2 |
| 2. Socket RW1 | 5. Fuse holder |
| 3. Earth (ground) stud | 6. Electrical supply plug |

Figure 6 - Electrical connections on the control box



- | | |
|---------------|------------------------|
| 1. Plug RW3 | 3. Earth (ground) wire |
| 2. Socket RW4 | 4. Socket RW5 |

Figure 7 - Electrical connections on the motor controller

4 MAINTENANCE

4.1 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.

- Switch off and disconnect the electrical supply from the AUTO 306 before you start any maintenance work.
- Do not touch surfaces inside the AUTO 306 which are very hot or very cold.
- Some materials that may have been used or formed in your process may be toxic or dangerous if inhaled. Take appropriate precautions when you clean accessories. Wear suitable protective clothing where appropriate: for example, non-absorbent gloves, a laboratory coat, a protective face mask and an orinasal respirator (to BS2091, BS6061 or later standards). Obey all local safety regulations.
- Do not use wire wool to clean accessories, as the fine wires break away and can cause damage to 'O' rings and the seal on the high vacuum valve.
- Do not use high-pressure air or water to clean accessories in the chamber.
- Regularly inspect electrical connections to ensure that they are not loose, and check that the wires and cables are not damaged and have not overheated.
- Use glass bead blasting to clean chamber components. If this is not available, use a mild abrasive cleaner such as 3M 'Scotchbright'.

4.2 Replace the fuses

4.2.1 Introduction

If a fuse fails, determine the fault which caused the failure and rectify the fault before you change the fuse. After you have changed a fuse, if the fuse fails again immediately, there is an electrical fault in the AUTO 306 or the Rotary Workholder drive: contact your supplier or Edwards for advice.

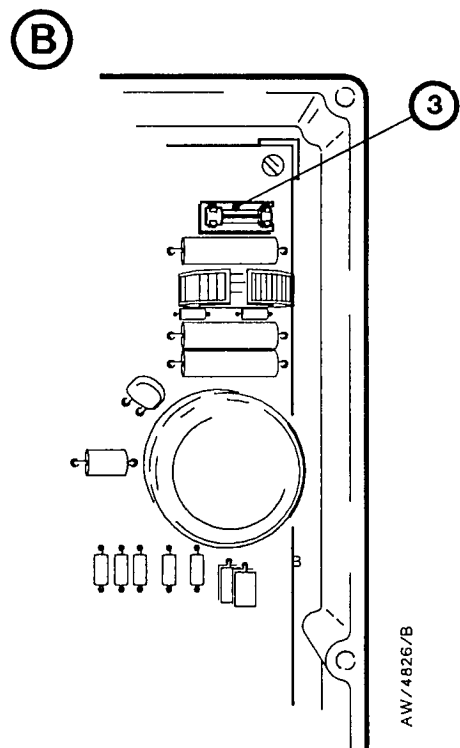
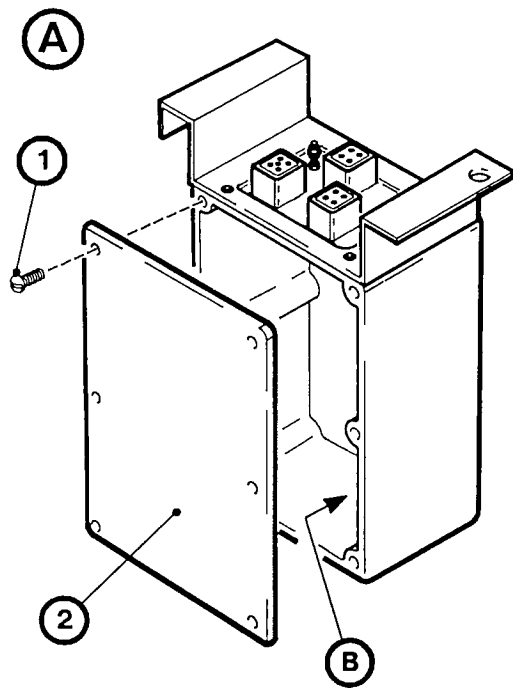
Always replace a failed fuse with a new fuse of the correct type and rating: see Section 2.

4.2.2 Replace the electrical supply fuse

1. Open the AUTO 306 control panel enclosure: refer to the AUTO 306 instruction manual.
2. Refer to Figure 6. Remove the fuse holder (5) from the electrical supply connector (6).
3. Remove the failed fuse from the fuse holder and dispose of it.
4. Fit a new fuse of the correct rating and type (refer to Section 2) to the fuse holder (5), then refit the fuse holder to the electrical supply connector (6).
5. Close the AUTO 306 control panel enclosure: refer to the AUTO 306 instruction manual.

4.2.3 Replace the motor controller fuse

1. Remove the AUTO 306 front baseplate cover: refer to the AUTO 306 instruction manual.
2. Refer to Figure 5. Remove plug RW4 on the end of the controller control cable (4) from socket RW4 on the motor controller (5).
3. Remove socket RW3 on the end of the controller supply cable (1) from plug RW3 on the motor controller (5).
4. Refer to Figure 4. Disconnect the earth (ground) wire (7) from the earth (ground) stud (6) on the AUTO 306 control cabinet.
5. Remove plug RW5 on the end of the motor cable (2) from socket RW5 on the motor controller (8).
6. Refer to Figure 2, detail B. Undo and remove the single screw (9) and washer (15) and the two screws (11) which secure the bracket (10) to the AUTO 306 control cabinet, then lift the motor controller (14) and bracket (10) out of the control cabinet.
7. Refer to Figure 8 detail A. Undo and remove the six screws (1) and remove the cover (2) from the motor controller.
8. Refer to detail B. Remove the fuse (3) and dispose of it, then fit a new fuse of the correct type and rating (refer to Section 2).
9. Refer to detail A. Refit the cover (2) and secure with the six screws (1).
10. Refer to Figure 2, detail B. Refit the bracket and motor controller (10, 14) in the AUTO 306 control cabinet and secure with the single screw (9) and washer (15) and the two screws (11).
11. Refer to Figure 4. Fit plug RW5 on the end of the motor cable (2) to socket RW5 on the motor controller (8).
12. Connect the end of the earth (ground) wire (7) to the cabinet earth (ground) stud (6).
13. Refer to Figure 5. Fit socket RW3 on the end of the controller supply cable (1) to plug RW3 on the motor controller (5).
14. Fit plug RW4 on the end of the controller control cable (4) to socket RW4 on the motor controller (5).
15. Refit the AUTO 306 front baseplate cover: refer to the AUTO 306 instruction manual.



- 1. Screws (6 off)
- 2. Cover
- 3. Fuse

Figure 8 - Replace the motor controller fuse

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4.3

Fault finding

Symptom	Check	Action
The On lamp does not go on when the On(off) button is pressed.	<p>Is the electrical supply cable correctly fitted ?</p> <p>Has a safety interlock operated ?</p> <p>Has the electrical supply fuse failed ?</p> <p>Has the lamp failed ?</p>	<p>Ensure that the electrical supply cable is correctly fitted between the control box and terminal box TB1: refer to Section 3.5.2.</p> <p>Check that the AUTO 306 safety interlocks are correctly made: refer to the AUTO 306 instruction manual.</p> <p>Check the fuse and replace if necessary: refer to Section 4.2.2.</p> <p>If the workholder plate rotates when the Start button is pressed, the On lamp has failed: contact your supplier or Edwards.</p>
The workholder plate does not rotate when the Start button is pressed.	<p>Is the control box switched off ?</p> <p>Are the cables incorrectly connected ?</p> <p>Has the motor controller fuse failed ?</p>	<p>Check that the On lamp is on, to indicate that the control box is switched on. If the lamp is off, press the On(off) button to switch on the control box. If the lamp does not go on, see above.</p> <p>Check that the controller supply and control cables and the motor cable are correctly connected: refer to Sections 3.5.2 and 3.5.3.</p> <p>Check the fuse and replace if necessary: refer to Section 4.2.3.</p>
Samples are not fully covered by evaporant.	<p>Is the workholder plate incorrectly fitted ?</p>	<p>Ensure that the workholder plate is correctly fitted to the end of the rotary leadthrough: refer to Section 3.4.</p>

Table 2 - Fault finding

5 STORAGE AND DISPOSAL

5.1 Storage

1. Return the accessory to its protective packaging.
2. Store in a cool dry place.
3. When required, install the accessory as described in Section 3.

5.2 Disposal

Dispose of the accessory safely in accordance with all local and national safety and environmental requirements. Take particular care with components which have been contaminated with dangerous substances.

6 SERVICE, SPARES AND ACCESSORIES

6.1 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 world-wide network of distributors. The majority of these centres employ Service Engineers who have undergone comprehensive Edwards 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 part

6.2 Service

Edwards products are supported by a world-wide network of Edwards Service Centres. Each Service Centre offers a wide range of options including: equipment decontamination; service exchange; repair; rebuild and testing to factory specifications. Equipment which has been serviced, repaired or rebuilt is returned with a full warranty.

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.

6.3 Spares

Description	Item Number
Rotary leadthrough	E100-44-120
Workholder plate	E090-53-002
Motor	E219-33-005
Motor controller fuse	E219-09-048
Electrical supply fuse	E219-09-035

6.4 Accessories

Description	Item Number
Cylindrical Chamber	E090-27-000
Top Plate Counterbalance	E090-62-000
FL400 Front Loading Chamber	E090-90-000

7 ENGINEERING DIAGRAM

Refer to Figure 9 which shows the circuit diagram for the Rotary Workholder.

AW/482B/A

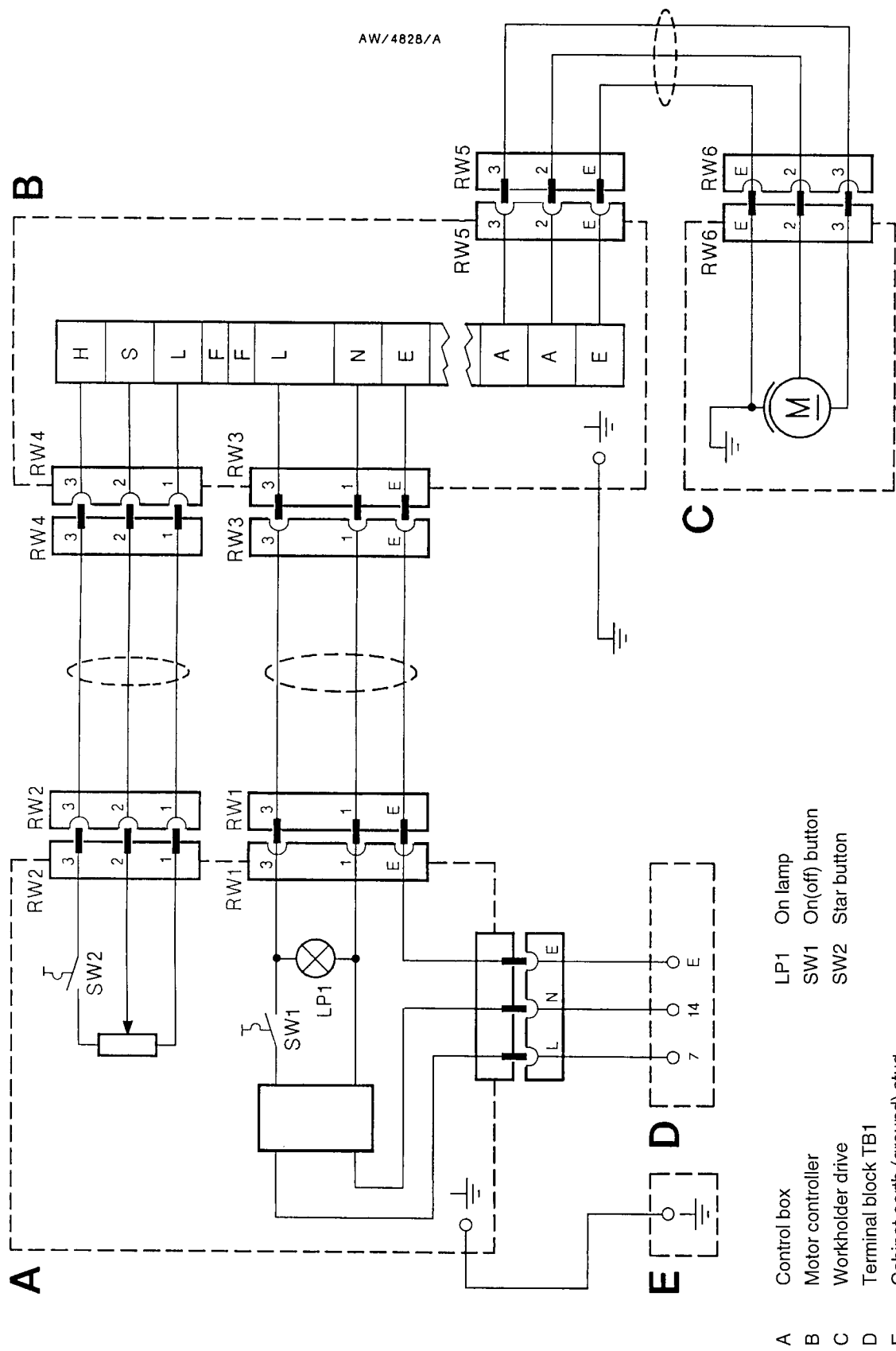


Figure 9 - Circuit diagram

Return of Edwards Equipment - Procedure (Form HS1)

Introduction

Before you return your equipment you must warn your supplier if the substances you used (and produced) in the equipment can be dangerous. You must do this to comply with health and safety at work laws.

You must complete the Declaration (HS2) on the next page and send it to your supplier before you dispatch the equipment. If you do not, your supplier will assume that the equipment is dangerous and he will refuse to accept it. If the Declaration is not completed correctly, there may be a delay in processing your equipment.

Guidelines

Take note of the following guidelines:

- Your equipment is '**uncontaminated**' if it has not been used or if it has only been used with substances that are not dangerous. Your equipment is '**contaminated**' if it has been used with any dangerous substances.
- If your equipment has been used with radioactive substances, you must decontaminate it before you return it to your supplier. You must send independent proof of decontamination (for example a certificate of analysis) to your supplier with the Declaration (HS2). Phone your supplier for advice.
- We recommend that contaminated equipment is transported in vehicles where the driver does not share the same air space as the equipment.

PROCEDURE

Use the following procedure:

1. Contact your supplier and obtain a Return Authorisation Number for your equipment.
2. Turn to the next page(s), photocopy and then complete the Declaration (HS2).
3. Remove all traces of dangerous gases: pass an inert gas through the equipment and any accessories which will be returned to your supplier. Drain all fluids and lubricants from the equipment and its accessories.
4. Disconnect all accessories from the equipment. Safely dispose of the filter elements from any oil mist filters.
5. Seal up all of the equipment's inlets and outlets (including those where accessories were attached). You may seal the inlets and outlets with blanking flanges or heavy gauge PVC tape.
6. Seal contaminated equipment in a thick polythene bag. If you do not have a polythene bag large enough to contain the equipment, you can use a thick polythene sheet.
7. If your equipment is a large pump (or any other large piece of equipment), strap the equipment and its accessories to a wooden pallet. Preferably, the pallet should be no larger than 510mm x 915mm (20" x 35"); contact your supplier if you cannot meet this requirement.
8. If your equipment is too small to be strapped to a pallet, pack it in a suitable strong box.
9. If the equipment is contaminated, label the pallet (or box) in accordance with laws covering the transport of dangerous substances.
10. Fax or post a copy of the Declaration (HS2) to your supplier. The Declaration must arrive before the equipment.
11. Give a copy of the Declaration to the carrier. You must tell the carrier if the equipment is contaminated.
12. Seal the original Declaration in a suitable envelope; attach the envelope securely to the outside of the equipment package. **WRITE YOUR RETURN AUTHORISATION NUMBER CLEARLY ON THE OUTSIDE OF THE ENVELOPE OR ON THE OUTSIDE OF THE EQUIPMENT PACKAGE.**

Return of Edwards Equipment - Declaration (Form HS2)

Return Authorisation Number: _____

You must:

- Know about all of the substances which have been used and produced in the equipment before you complete this Declaration
- Read the Procedure (HS1) on the previous page before you attempt to complete this Declaration
- Contact your supplier to obtain a Return Authorisation Number and to obtain advice if you have any questions
- Send this form to your supplier before you return your equipment

SECTION 1 : EQUIPMENT

Equipment model _____

Serial Number _____

Has the equipment been used, tested or operated?

yes Go to Section 2 no Go to Section 4

FOR SEMICONDUCTOR APPLICATIONS ONLY :

Tool Reference Number _____

Process _____

Failure Date _____

Serial Number of Replacement Pump _____

SECTION 2 : SUBSTANCES IN CONTACT WITH THE EQUIPMENT

Are any of the substances used or produced in the equipment

- Radioactive yes no
- Biologically active yes no
- Dangerous to human health and safety? yes no

If you have answered 'no' to all of these questions, go to Section 4.

Your supplier will not accept delivery of any equipment that is contaminated with radioactive substances, unless you:

- Decontaminate the equipment
- Provide proof of decontamination

YOU MUST CONTACT YOUR SUPPLIER FOR ADVICE BEFORE YOU RETURN SUCH EQUIPMENT

SECTION 3 : LIST OF SUBSTANCES IN CONTACT WITH THE EQUIPMENT

Substance name	Chemical symbol	Precautions required (for example, use protective gloves, etc.)	Action required after spillage or human contact
1			
2			
3			
4			
5			
6			

SECTION 4 : RETURN INFORMATION

Reason for return and symptoms of malfunction: _____

If you have a warranty claim:

- who did you buy the equipment from ? _____
- give the supplier's invoice number _____

SECTION 5 : DECLARATION

Print your name: _____ Print your job title: _____

Print your organisation: _____

Print your address: _____

Telephone number: _____ Date of equipment delivery: _____

I have made reasonable enquiry and I have supplied accurate information in this Declaration. I have not withheld any information. I have followed the Return of Edwards Equipment Procedure (HS1) on the previous page.

Signed: _____ Date: _____