

# Instruction Manual

## *FL20K Foreline Trap*

*Description*

*Item Number*

FL20K

A133-05-000



**Edwards High Vacuum International**

Manor Royal, Crawley, West Sussex, RH10 2LW, UK

Telephone: (01293) 528844 Fax: (01293) 533453 Telex: 87123 Edivac G



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# 1 INTRODUCTION

## 1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the Edwards FL20K Foreline Trap. You must use the FL20K as described in this manual.

Read this manual before you install and operate the FL20K. 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 equipment, associated equipment and process.

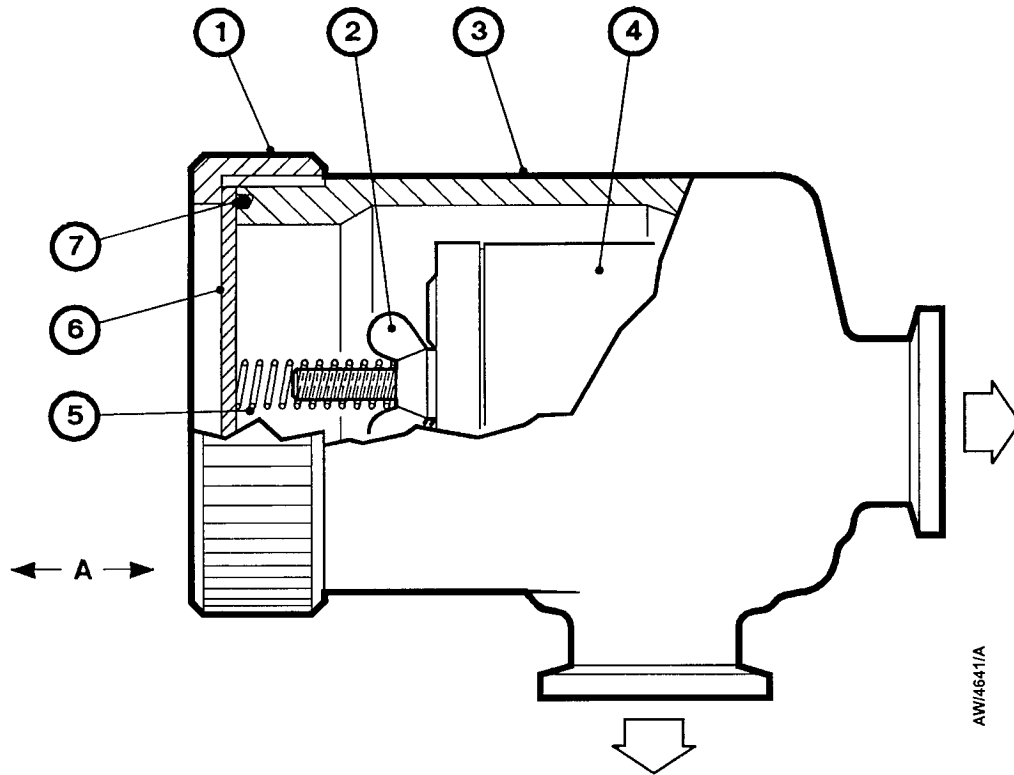
The units used throughout this manual conform to the SI international system of units of measurement.

## 1.2 General description

The FL20K has been developed for use in clean pumping systems to prevent the back-migration of rotary pump oil vapour into the systems; we particularly recommend that you use an FL20K with two-stage rotary pumps.

The component parts of the FL20K are illustrated in Figure 1. The FL20K consists of a metal basket (4) located within a cast aluminium body (3), the metal basket is secured in place by a knurled nut (1), lid (6) and spring (5).

A sorbent is contained in the metal basket to absorb any oil which back-migrates from the pump. The sorbent material used is activated alumina which has exceptional trapping properties for oil vapour. It has a long life (up to six months) before it becomes saturated and has to be renewed.



- |             |                       |
|-------------|-----------------------|
| 1. Nut      | 5. Compression spring |
| 2. Wing nut | 6. Lid                |
| 3. Body     | 7. 'O' ring           |
| 4. Basket   |                       |

A Clearance required for removal of basket (4)

Figure 1 - Component parts of the FL20K

## 2 TECHNICAL DATA

### 2.1 Operating conditions

Ambient operating temperature range 0 to 50 °C

### 2.2 Performance

Leak tightness (1 bar ( $1 \times 10^5$  Pa) differential)  $1 \times 10^{-6}$  mbar.ls<sup>-1</sup>,  
 $1 \times 10^{-4}$  Pa.ls<sup>-1</sup>

Maximum internal pressure 1 bar absolute,  $1 \times 10^5$  Pa

### 2.3 Mechanical data

Dimensions See Figure 2

Mass 1 kg

Sorbent charge 0.07 kg

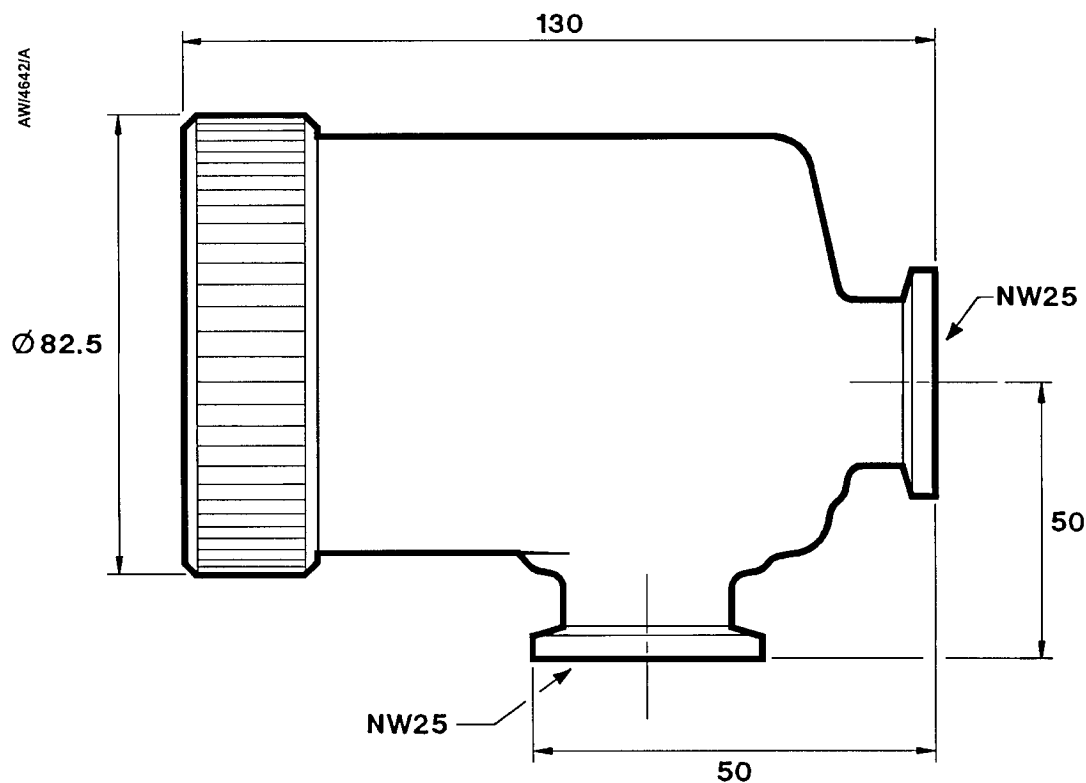


Figure 2 - Dimensions (mm)

### 3 INSTALLATION

#### 3.1 Unpack and inspect

Remove all packing materials and check the FL20K. If the FL20K is damaged, notify your supplier and carrier in writing within three days; state the Item Number of the FL20K together with your order number and your supplier's invoice number. Retain all packaging materials for inspection. Do not use the FL20K if it is damaged.

Check that your package contains the items shown in Table 1. If any one of these items is missing, notify your supplier in writing within three days.

Qty	Description	Check (✓)
1	FL20K Valve	<input type="checkbox"/>
1	Tin of activated alumina	<input type="checkbox"/>

Table 1 - Checklist of items

If the FL20K is not be used immediately, return it to its protective packaging.

#### 3.2 Install the FL20K

We recommend that you mount the FL20K horizontally, as shown in Figure 1. If necessary, however, you can mount the FL20K in any orientation, as the sorbent is securely retained in the basket. The mass of the FL20K will be adequately supported by the pipeline connections and you can connect either port to the rotary vacuum pump. However, we recommend that you mount the FL20K as close to the vacuum system and as far from the rotary pump as possible, to maximise the useful life of the sorbent. When you mount the FL20K, ensure that you leave adequate clearance to enable the sorbent basket to be removed.

Use standard KF coupling components (that is, NW clamping rings, centring rings and 'O' rings) to connect the FL20K to the pump and the vacuum system.

### 3.3 Fill the FL20K with sorbent

#### WARNING

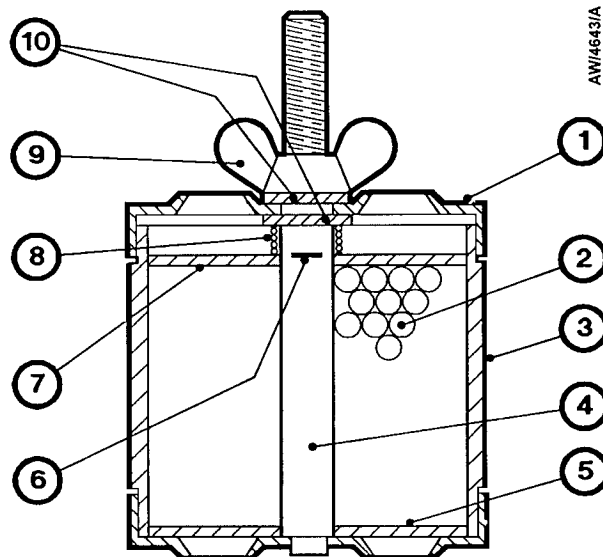
Activated alumina is a desiccant and will absorb materials from your process system. You must take suitable precautions to protect people from the harmful effects of any noxious materials released if you bake the spent alumina to reactivate it. Avoid inhalation of its dust, eye contact and unnecessary skin contact.

#### CAUTION

Do not overfill the basket with sorbent. If you do, crushed sorbent could be sucked into the rotary pump and damage the pump.

1. Refer to Figure 1; unscrew and remove the nut (1) and the lid (6).
2. Remove the basket (4) and spring (5) from the trap body (3).
3. Refer to Figure 3. Remove the wing nut (9) and end cap (1) from the basket (3). Remove the washer (10), compression spring (8) and perforated end disk (7).
4. Fill the basket with sorbent; when full, the end disk (7) should align with the marker (6) on the spindle:
  - Fill the basket with alumina balls so that the top of the sorbent charge is approximately level with the marker (6).
  - Tap the basket gently to settle the sorbent, then add more alumina balls if necessary.
5. Place the perforated end disk (7) on top of the alumina balls and slide the spring (8) over the spindle (4) so that it rests on the end disk (7). Ensure that both end disks (5, 7) have their smooth side in contact with the balls.
6. Refit the washer (10) and end cap (1) over the spindle.
7. Refit the second washer (10) and wing nut (9) over the spindle (4) and tighten the wing nut (9). To ease tightening of the wing nut, push the lid down gently.

8. Position the charged basket in the trap, ensuring that it is fully located on the bottom 'O' ring seal.
9. Refer to Figure 1 and replace the spring (5), lid (6) and nut (1).



- |                      |                       |
|----------------------|-----------------------|
| 1. End cap           | 6. Alignment marker   |
| 2. Activated alumina | 7. End disk           |
| 3. Basket            | 8. Compression spring |
| 4. Spindle           | 9. Wing nut           |
| 5. End disk          | 10. Washer (M6)       |

Figure 3 - Component parts of the basket assembly

## 4 OPERATION

### WARNING

Activated alumina is a desiccant and will absorb materials from your process system. You must take suitable precautions to protect people from the harmful effects of any noxious materials released if you attempt to reactivate spent alumina by baking. Avoid inhalation of its dust, eye contact and unnecessary skin contact.

Take note of the following information:

- In common with other types of sorbent, activated alumina absorbs moisture. This will not affect its oil vapour trapping properties but may tend to prolong rough pumping on successive pumping cycles. Regular regeneration by baking the trap or renewal of the sorbent will be necessary for rapid pump-down.
- If the FL20K has been open to atmosphere for a long period of time, it may be necessary to carry out prolonged pumping with a gas-ballasted rotary pump to remove absorbed moisture. Alternatively, remove the basket from the FL20K and bake it at 250 °C to 300 °C for two hours.
- Use a valved by-pass line to minimise vapour absorption during pump-down.

## 5 MAINTENANCE

### 5.1 Replace the sorbent charge

#### WARNING

Activated alumina is a desiccant and will absorb materials from your process system. You must take suitable precautions to protect people from the harmful effects of any noxious materials released if you attempt to reactivate spent alumina by baking. Avoid inhalation of its dust, eye contact and unnecessary skin contact.

During normal use, the sorbent material nearest to the port connected to the rotary pump will become brown in colour. When the discolouration reaches the sorbent layer furthest from the port, you must change the sorbent charge. The time taken for this to occur depends on the frequency of use and the location of the trap in relation to the rotary pump. A typical charge life is six months, although we recommend that you change the charge every three months as a routine maintenance procedure.

1. Refer to Figure 1. Unscrew and remove the nut (1) and the lid (6).
2. Remove the basket (4) and spring (5) from the trap body (3).
3. Refer to Figure 3. Remove the wing nut (9) and end cap (1) from the basket (3). Remove the washer (10), compression spring (8) and perforated end disk (7).
4. If the trap body interior appears oily or dirty, wash it out with iso-propyl or ethyl alcohol and then dry it thoroughly.
5. Fill the basket (3) with sorbent: refer to steps 4 to 9 of Section 3.3.

## **6 STORAGE AND DISPOSAL**

### **6.1 Storage**

1. Return the FL20K to its protective packaging.
2. Store the FL20K in clean dry conditions, away from direct sources of heat and sunlight.

### **6.2 Disposal**

Dispose of the FL20K safely in accordance with all local and national safety and environmental requirements.

## 7 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 world wide network of distributors. The majority of these centres employ people 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

### 7.2 Spares

Description	Item Number
0.45 kg activated alumina	H026-00-050

### 7.3 Accessories

Description	Item Number
Stainless steel clamping ring - NW20/25	C105-14-401
Polymer clamp - NW20/25	C105-14-403
Centring ring and 'O' ring - NW25 (polymer with nitrile 'O' ring)	C105-14-393
Centring ring and 'O' ring - NW25 (stainless steel with nitrile 'O' ring)	C105-14-396
Centring ring and 'O' ring - NW25 (polymer with fluoroelastomer 'O' ring)	C105-14-394
Centring ring and 'O' ring - NW25 (stainless steel with fluoroelastomer 'O' ring)	C105-14-395
Changeover valve	C079-02-000

# 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: \_\_\_\_\_

# Edwards International

## EUROPE

### UNITED KINGDOM

Edwards High Vacuum International  
Manor Royal  
Crawley  
West Sussex RH10 2LW  
Tel: +44 (0) 1293 528844  
Fax: +44 (0) 1293 533453

### BELGIUM

Edwards  
Bergensesteenweg 709  
B1600 Sint-Pieters-Leeuw  
Tel: +32 (0) 2 363 0030  
Fax: +32 (0) 2 363 0064

### FRANCE

Edwards SA  
125 Avenue Louis Roche  
92238 Gennevilliers, Cedex  
Tel: +331 (1) 47 98 24 01  
Fax: +331 (1) 47 98 44 54

### GERMANY

Edwards Hochvakuum GmbH  
Postfach 1409  
D35004 Marburg  
Tel: +49 (0) 6420 82410  
Fax: +49 (0) 6420 824111

### ITALY

Edwards Alto Vuoto SpA  
Via Carpaccio 35  
20090 Trezzano Sul Naviglio  
Milano  
Tel: +39 (0) 2 4840 2258  
Fax: +39 (0) 2 4840 1638

### SWITZERLAND

Edwards (ECH)  
Postfach  
CH-4104 Oberwil-Basel  
Tel: +41 (0) 61 401 4344  
Fax: +41 (0) 61 401 4352

## AMERICAS

### USA

Edwards High Vacuum International  
One Edwards Park  
301 Ballardvale Street  
Wilmington, MA 01887-1075  
Tel: +1 (1) 508 658 5410  
Fax: +1 (1) 508 658 7969

Edwards High Vacuum International  
Sierra Technology Center  
Building 'A' Suite 120  
3100 Alvin Devane Boulevard  
Austin, TX 78741  
Tel: +1 (1) 512 389 3883  
Fax: +1 (1) 512 389 3890

Edwards High Vacuum International  
550 Sycamore Drive  
Milpitas, CA 95035  
Tel: +1 (1) 408 946 4707  
Fax: +1 (1) 408 946 8510

### CANADA

Edwards High Vacuum  
Tel: 800 387 4076  
Fax: +1 (1) 905 845 4924

### BRAZIL

Edwards Alto Vácuo  
Rua Bernardo Wrona, 222  
Bairro do Limão  
02710 - São Paulo - SP  
Tel: +55 (0) 11 8580377  
Fax: +55 (0) 11 2652766

## PACIFIC

### SINGAPORE

Edwards High Vacuum  
338 Swee Hong Industrial Building  
Circuit Road  
Singapore 1337  
Tel: +65 841 0615  
Fax: +65 841 0625

### JAPAN

Nippon Edwards KK  
Shuwa Shiba Park Bldg. A-3F  
2-4-1 Shibakoen  
Minato-ku  
Tokyo 105  
Tel: +81 (0) 3 5470 6530  
Fax: +81 (0) 3 5470 6521

Nippon Edwards KK  
Esaka Yodo Bldg. 5F  
16-34 Enoki-cho  
Suita-shi  
Osaka 564  
Tel: +81 (0) 6 384 7052  
Fax: +81 (0) 6 384 7504

Nippon Edwards KK  
508-1 Yomogi-machi  
Kumamoto-shi  
Kumamoto 861-55  
Tel: +81 (0) 96 326 7300  
Fax: +81 (0) 96 326 7302

### HONG KONG

Edwards High Vacuum (Pacific)  
1308 Tower II  
World Trade Square  
123 Hoi Bun Road  
Kwun Tong, Kowloon  
Hong Kong  
Tel: +852 2796 9111  
Fax: +852 2796 9095

### REPUBLIC OF KOREA

Songwon Edwards Ltd  
Sun In Building  
738-41 Panpo-Dong  
Sochu-Gu, Seoul  
Tel: +82 (0) 2 515 1811  
Fax: +82 (0) 2 515 1818