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C417-80-880
Issue C Original

Instruction Manual

LCPVEK Solenoid Operation Isolation Valves

Description	Item Number	Description	Item Number
LCPV16EKA 230 V a.c. Solenoid Valve	C417-80-000	LCPV25EKA 230 V a.c. Solenoid Valve	C417-90-000
LCPV16EKA 110 V a.c. Solenoid Valve	C417-80-100	LCPV25EKA 110 V a.c. Solenoid Valve	C417-90-100
LCPV16EKA 24 V a.c./d.c. Solenoid Valve	C417-80-200	LCPV25EKA 24 V a.c./d.c. Solenoid Valve	C417-90-200

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www.edwardsvacuum.com

Declaration of Conformity

We, Edwards,
Innovation Drive,
Burgess Hill,
West Sussex,
RH15 9TW, UK

declare under our sole responsibility, as manufacturer and person within the EU authorised to assemble the technical file, that the product(s)

LCPV16EKA 24 V a.c./d.c. Solenoid Valve	C41780200
LCPV16EKA 110 V a.c./d.c. Solenoid Valve	C41780100‡
LCPV16EKA 230 V a.c./d.c. Solenoid Valve	C41780000‡
LCPV25EKA 24 V a.c./d.c. Solenoid Valve	C41790200
LCPV25EKA 110 V a.c./d.c. Solenoid Valve	C41790100‡
LCPV25EKA 230 V a.c./d.c. Solenoid Valve	C41790000‡

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

EN 61000-6-2:2005	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
EN 61000-6-4:2007/A1:2011‡	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
EN 60664-1:2007‡	Insulation coordination for equipment within low-voltage systems – Part 1. Principles, requirements and tests

and fulfils all the relevant provisions of

2014/35/EU‡	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Certain Hazardous Substances (RoHS) Directive

Note: This declaration covers all product serial numbers from the date this Declaration was signed onwards.

L G Marini

Mr L Marini, Senior Technical Manager

27.09.2017, Eastbourne

Date and Place

This product has been manufactured under a quality management system certified to ISO 9001:2008

Declaration of Incorporation

We, Edwards,
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Burgess Hill,
West Sussex,
RH15 9TW, UK

declare under our sole responsibility, as manufacturer and person within the EU authorised to assemble the technical file, that the machine(s)

LCPV16EKA 24 V a.c./d.c. Solenoid Valve	C41780200
LCPV16EKA 110 V a.c./d.c. Solenoid Valve	C41780100‡
LCPV16EKA 230 V a.c./d.c. Solenoid Valve	C41780000‡
LCPV25EKA 24 V a.c./d.c. Solenoid Valve	C41790200
LCPV25EKA 110 V a.c./d.c. Solenoid Valve	C41790100‡
LCPV25EKA 230 V a.c./d.c. Solenoid Valve	C41790000‡

to which this declaration relates is intended to be incorporated into other equipment and not to function independently. The machine(s) must not be put into service until the equipment into which it is incorporated has been brought into conformity with the provisions of the Machinery Directive, 2006/42/EC.

The machine(s) is in conformity with the following standard(s) or other normative document(s)

None.

and fulfils all the relevant provisions of

2014/35/EU‡	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility (EMC) Directive
2011/65/EU	Restriction of Certain Hazardous Substances (RoHS) Directive

The relevant essential requirements of the Machinery Directive 2006/42/EC Annex 1 have been applied and fulfilled so far as practicable for this partly completed machinery. The relevant technical documentation has been compiled in accordance with Annex VII Part B. In response to a reasoned request by the national authorities, Edwards Ltd undertakes to provide relevant information on the partly completed machinery (via email).

Note: This declaration covers all product serial numbers from the date this Declaration was signed onwards.

L G Marini

Mr L Marini, Senior Technical Manager

11.11.2016, Eastbourne

Date and Place

This product has been manufactured under a quality management system certified to ISO 9001:2008

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1 Introduction

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the following Edwards products:

- LCPV16EKA 230 V a.c. Solenoid Valve
- LCPV16EKA 110 V a.c. Solenoid Valve
- LCPV16EKA 24 V a.c./d.c. Solenoid Valve
- LCPV25EKA 230 V a.c. Solenoid Valve
- LCPV25EKA 110 V a.c. Solenoid Valve
- LCPV25EKA 24 V a.c./d.c. Solenoid Valve

Use the valves as specified in this manual.

Read this manual before installing and operating the valve. Important safety information is highlighted as WARNING and CAUTION instructions; these instructions must be obeyed. 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 valve:



Warning - refer to accompanying documentation.



Warning - hot surfaces.



Warning - risk of electric shock.

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

1.2 Description

The solenoid operated valves are designed for general vacuum use where there is a requirement to open and close a vacuum line. The vacuum line is opened and closed by a fluoroelastomer pad on the base of the valve plunger which seals against the body of the valve.

The valve has two ports with NW flanges at 90 degrees to each other.

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The valve coil is powered using an electronic actuator circuit which provides an initial power surge to open the valve but subsequently modulates the power supply to reduce the power consumption. The valve can only be operated with the electronic actuator fitted and power should never be applied directly to the coil.

The valve body can be rotated with respect to the valve coil and the electronic actuator can be fitted in two orientations depending on whichever combination of orientations is deemed appropriate.

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2 Technical data

2.1 General

Table 1 - General technical data

Mass: LCPV16EKA LCPV25EKA	 0.9 kg 0.9 kg
Ambient operating temperature	-10 to +55 °C
Storage temperature range	-20 to +70 °C
Vent gas temperature range	-10 to +130 °C

2.2 Performance

Table 2 - Performance data

Leak rate	Typically 1 x 10^{-6} mbar.litres/second *
Recommended pressure range	1 x 10^{-6} mbar to 1000 mbar (absolute)
Maximum pressure differential (pressure differential acting to close valve)	1000 mbar
Time to open	20 ms
Time to close	50 ms
Maximum cycle frequency	600 per hour

* *Leak rate across valve pad with pressure differential acting to close valve.*

2.3 Materials

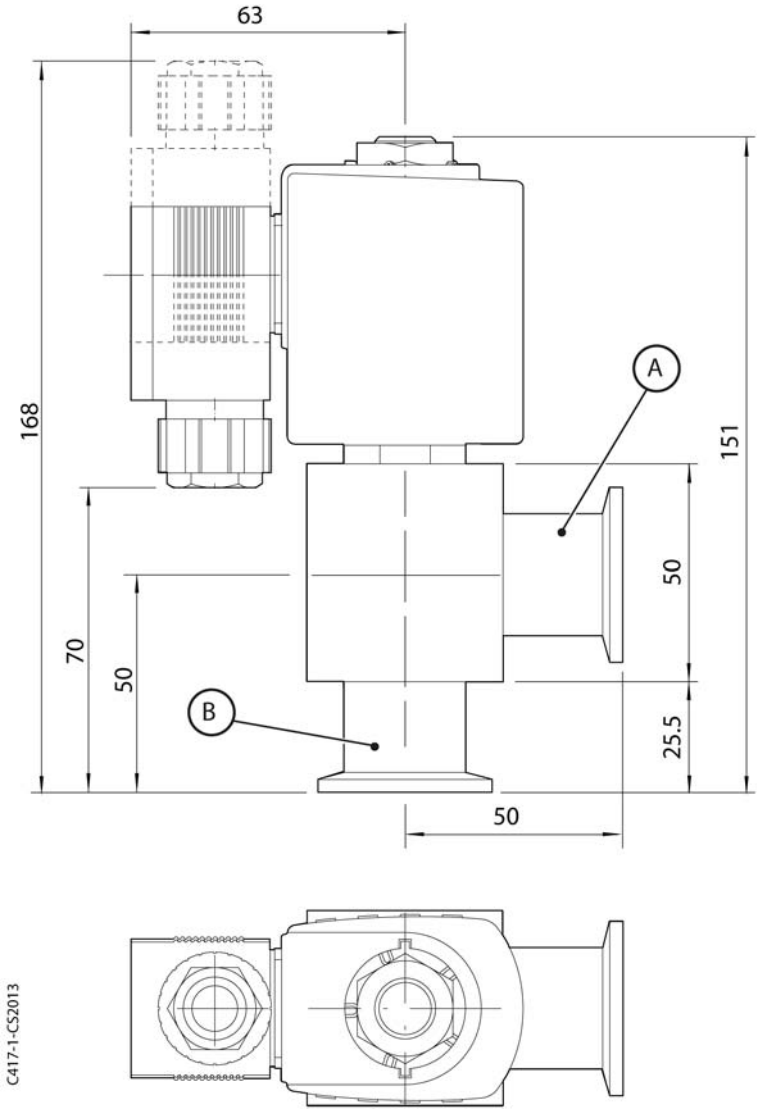
The valves are manufactured from the following materials that are exposed to vacuum:

Table 3 - Material data

Body	Aluminimum
Valve seals	FKM (fluoroelastomer)
Actuator	Stainless steel
Shading rings	Silver
Coil insulation	Class H

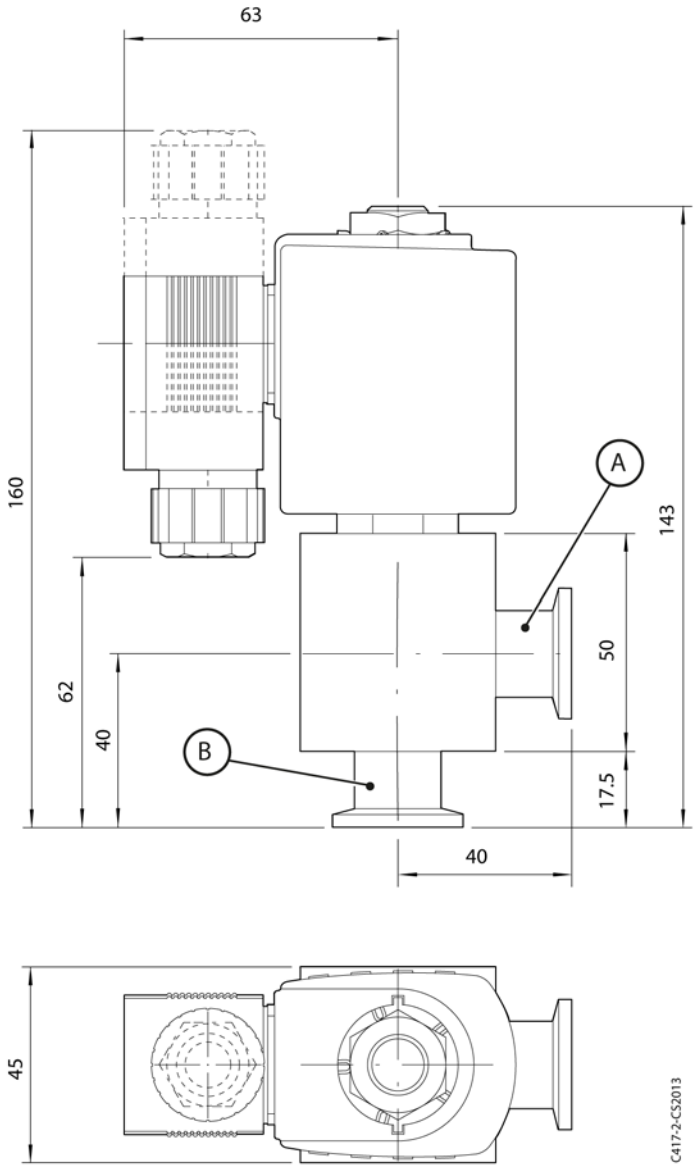
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Figure 1 - Dimensions of NW25 valve



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Figure 2 - Dimensions of NW16 valve



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2.4 Electrical data

Table 4 - Electrical data

Electrical supply 24 V a.c./d.c. 110 V a.c. 230 V a.c.	 24 V 50/60 Hz 1 phase or 24 V d.c. 110 V 50/60 Hz 1 phase 230 V 50/60 Hz 1 phase
Electrical supply tolerance	± 10%
Duty cycle	100% (continuous)
Enclosure rating	IP65
Electrical supply cable outer diameter	6 to 7 mm
Electrical supply cable conductor section	1.5 mm^2 maximum
Power consumption (a.c. supply) Open Hold	 72 W (400 ms) typically 5 W*
Power consumption (d.c. supply) Open Hold	 72 W (50 - 110 ms) typically 5 W

* *Typically 7 W hold on 230 V a.c. versions.*

2.5 Product item numbers

Table 5 - Product item numbers

LCPV16EKA 230 V a.c.	C417-80-000
LCPV25EKA 230 V a.c.	C417-90-000
LCPV16EKA 110 V a.c.	C417-80-100
LCPV25EKA 110 V a.c.	C417-90-100
LCPV16EKA 24 V a.c./d.c.	C417-80-200
LCPV25EKA 24 V a.c./d.c	C417-90-200

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3 Installation



WARNING

Do not operate the LCPVEKA valve in safety critical applications. The LCPVEKA valve is not intended to be fail-safe.



WARNING

If the nature of the application requires there to be an electrical connection between the valve and adjacent pipework, the electrical connection should be adequately verified before the system to which the valve is connected is operated.

3.1 Unpack and inspect

Remove all packing materials and protective covers from the LCPVEKA valve.

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

If the valve is not to be used immediately replace the protective covers. Store the valve in suitable conditions, as described in Section 6.

3.2 Install the valve

Connect the valve to the vacuum system with standard NW coupling components.

If the valve is used to vent directly from the atmosphere, it is recommend that a filter is fitted to the inlet of the valve to prevent blockage of the valve by dust.

The valve is rated to seal against a 1000 mbar pressure differential in one direction. Referring to Figure 1 and 2, for optimum valve performance, install the valve with the direction of gas flow from port A to port B.

3.3 Electrical connections



WARNING

Ensure that the electrical installation of the LCPVEKA valve conforms to local and national safety requirements. It must be connected to a suitable fused and protected electrical supply.



WARNING

Do not apply power directly to the valve coil, permanent damage will result. Always apply power to the valve using the electronic actuator supplied.



WARNING

Ensure that the protective conductor terminal (PE) on 110 V a.c. and 230 V a.c. versions is connected to an external protective earthing system. This is required for safety.

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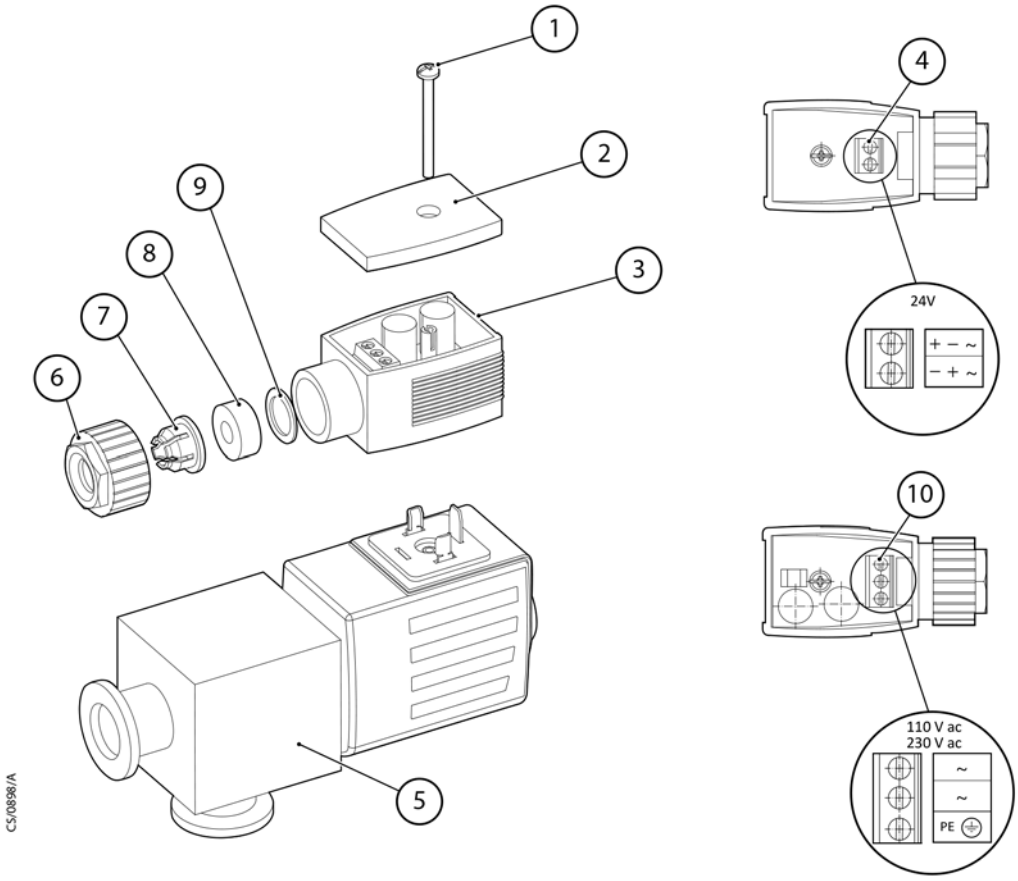
Refer to Figure 3 for the item numbers in brackets and use the following procedure to connect the electrical supply to the valve; ensure that a suitable size electrical supply cable is used. Refer to Section 2.4.

1. Ensure that the electrical supply corresponds with the voltage stated on the valve label.
2. Undo the cover retaining screw (1).
3. Gently prise the electronic actuator cover (2) from the electronic actuator (3).
4. Unscrew the gland compression nut (6) and detach from the electronic actuator (3).
5. Detach the cable grip (7), rubber cable gland (8) and gland compression ring (9) from the electronic actuator (3).
6. Strip back the outer sheath on the cable by a distance of 20 mm and strip the insulation from each core for a distance of 5 mm.
7. Slide the compression nut (6), cable grip (7), rubber cable gland (8) and gland compression ring (9) onto the cable.
8. Pass the cable through the hole in the electronic actuator (3) and attach the wire ends to the terminals (4 or 10 depending on version).
9. Replace the electronic actuator cover (2) on the electronic actuator (3) and replace the cover retaining screw (1).
10. Slide the gland compression ring (9), rubber cable gland (8), cable grip (7) and compression nut (6) down the cable and screw the compression nut (6) onto the electronic actuator (3) to a maximum torque of 2.5 Nm.
11. Screw the electronic actuator (3) to the valve (5) using the retaining screw (1) to a torque of 50 to 80 Ncm.

Note: *The electronics actuator can be replaced in one of two orientations 180 º apart depending on whichever orientation is preferred.*

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Figure 3 - Electrical supply connections



1. Retaining screw
2. Electronic actuator cover
3. Electronic actuator
4. Connector (24 V version)
5. Valve
6. Compression nut
7. Cable grip
8. Rubber cable gland
9. Gland compression ring
10. Connector (110 V/230 V version)

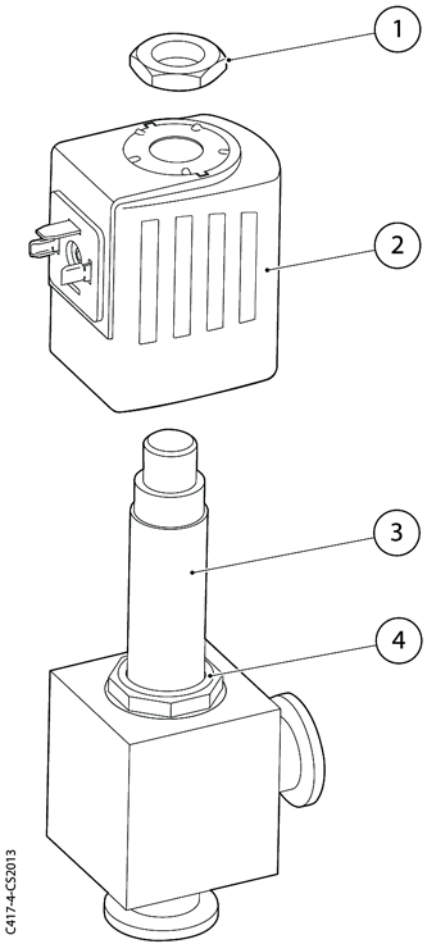
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3.4 Valve coil orientation adjustment

Refer to Figure 4 for the item numbers in brackets and use the following procedure to change the valve coil orientation.

1. Ensure that the power supply to the valve is switched off before attempting to adjust the valve coil orientation.
2. Remove the coil retaining nut (1) from the valve.
3. Rotate the valve coil (2) about the armature tube (3) to the required orientation.
4. Replace the coil retaining nut (1).
5. Tighten the coil retaining nut (1) to 15 Nm so that the coil (2) is securely pressed against the O-ring (4).

Figure 4 - Valve body orientation adjustment



1. Coil retaining nut
2. Valve coil
3. Armature tube
4. O-ring

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4 Operation

WARNING



Do not touch the valve coil during operation. It may be hot.

Once correctly installed the operation of the LCPVEKA valve is dependent only upon the switching of the electrical supply to the valve.

This range of normally closed valves open when the electrical supply to the valve is switched on; the valve closes automatically when the electrical supply is switched off.

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5 Maintenance

WARNING



Do not inhale or touch the breakdown products of fluorinated materials which may be present if the vacuum system has been heated to 250 °C or more. These breakdown products are very dangerous.

The LCPVEKA valves do not require routine maintenance during normal operational life and cannot be serviced by the user. The following checks must be made when carrying out maintenance on the vacuum system:

- Check that the connection to the vacuum system is secure.
- Check that the electrical connections are secure and that the electrical cable is not damaged.

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6 Storage and Disposal

6.1 Storage

Place protective covers over the valve ports and store the LCPVEKA valve in cool, dry conditions until required for use. When required, prepare and install the valve as described in Section 3.

6.2 Disposal

Dispose of the valve and any components from it safely in accordance with all local and national safety and environmental requirements.

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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/, 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.*

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