

# *Instruction Manual*

## LCPVEK Solenoid Operation Isolation Valves

Description	Item Number
LCPV16EKA 230 V Solenoid Valve	C417-51-000
LCPV16EKA 110 V Solenoid Valve	C417-51-100
LCPV16EKA 24 V a.c./d.c. Solenoid Valve	C417-51-200
LCPV25EKA 230 V Solenoid Valve	C417-52-000
LCPV25EKA 110 V Solenoid Valve	C417-52-100
LCPV25EKA 24 V a.c./d.c. Solenoid Valve	C417-52-200





# Declaration of Conformity

We, BOC Edwards,  
Manor Royal,  
Crawley,  
West Sussex RH10 2LW, UK

declare under our sole responsibility that the product(s)

LCPVEK Solenoid Operation Isolation Valves	
LCPV16EKA 230 V Solenoid Valve	C417-51-000
LCPV16EKA 110 V Solenoid Valve	C417-51-100
LCPV16EKA 24 V d.c. Solenoid Valve	C417-51-200
LCPV25EKA 230 V Solenoid Valve	C417-52-000
LCPV25EKA 110 V Solenoid Valve	C417-52-100
LCPV25EKA 24 V d.c. Solenoid Valve	C417-52-200

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

EN60730-1	Specification for Automatic Electrical Controls for Household and Similar Use. Generic Standard Class: General Requirements.
EN60730-2-8	Specification for Automatic Electrical Controls for Household and Similar Use. Generic Standard Class: Electrically Operated Water Valves, Including Mechanical Requirements.
EN61326 (Industrial environment, - EMC Requirements. Class B Emissions)	Electrical Equipment for Measurement, Control and Laboratory Use

following the provisions of

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

Dr. J.D. Watson, Senior Technical Manager, VED

Date and Place

This product has been manufactured under a quality system registered to ISO9001

# Contents

Section	Page
1 Introduction .....	1
1.1 Scope and definitions .....	1
1.2 Description .....	1
2 Technical Data .....	3
2.1 General .....	3
2.2 Performance .....	3
2.3 Materials .....	3
2.4 Electrical data .....	5
2.5 Product item numbers .....	5
3 Installation .....	7
3.1 Unpack and inspect .....	7
3.2 Install the valve .....	7
3.3 Electrical connections .....	7
4 Operation .....	9
5 Maintenance .....	9
6 Storage and disposal .....	9
6.1 Storage .....	9
6.2 Disposal .....	9

For return of equipment, complete the HS Forms at the end of this manual.

# Illustrations

Figure	Page
1 Dimensions of NW25 valve .....	4
2 Dimensions of NW16 valve .....	4
3 Electrical supply .....	8

# Associated publications

Publication title	Publication number
Vacuum pump and vacuum system safety	P400-40-100

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# 1 Introduction

## 1.1 Scope and definitions

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

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

You must use the valves as specified in this manual.

Read this manual before you install and operate the valve. Important safety information is highlighted as WARNING and CAUTION instructions; you must obey these instructions. The use of WARNINGS and CAUTIONS is defined below.



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### **WARNING**

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

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### **CAUTION**

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

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

## 1.2 Description

The solenoid operated low cost 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 and may be mounted for pumping in either direction.

# Introduction

## 2 Technical Data

### 2.1 General

Dimensions	See Figure 1
Mass	
LCPV25EKA	840 g
LCPV16EKA	810 g
Ambient operating temperature	5 to 45 °C
Vent gas temperature range	-10 to 130 °C
Maximum humidity	80% at 31 °C
Maximum altitude	4000 m
Pollution degree (IEC 664)	2
Installation category (IEC 1010)	II

### 2.2 Performance

Leak rate	$< 1 \times 10^{-6} \text{ mbar} \cdot \text{Is}^{-1}$
Pressure range	$1 \times 10^{-6}$ to 1000 mbar
Maximum pressure differential (open/close)	1000 mbar
Time to open	60 msec
Time to close	$< 20$ msec
Maximum cycle frequency	1800/hour
Reliability (MTTF)	500,000 cycles
Enclosure rating	IP67

### 2.3 Materials

The valves are manufactured from the following materials:

Body	Aluminium
Valve seal	Fluoroelastomer
Actuator	Stainless steel
Coil insulation	Class H

The vacuum path through the valve is free from heavy metals.

Figure 1 - Dimensions of NW25 valve

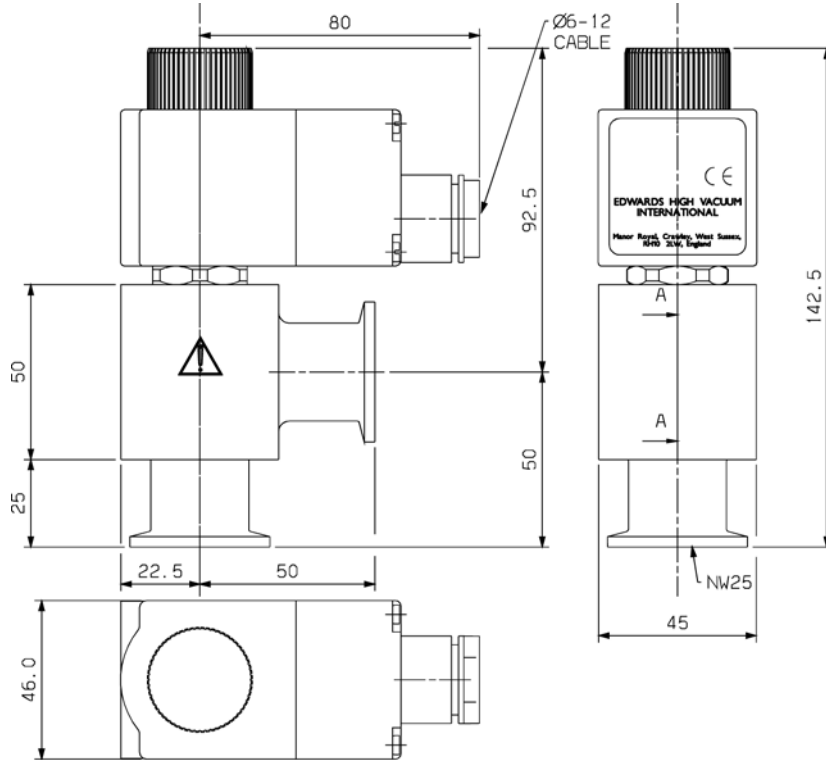
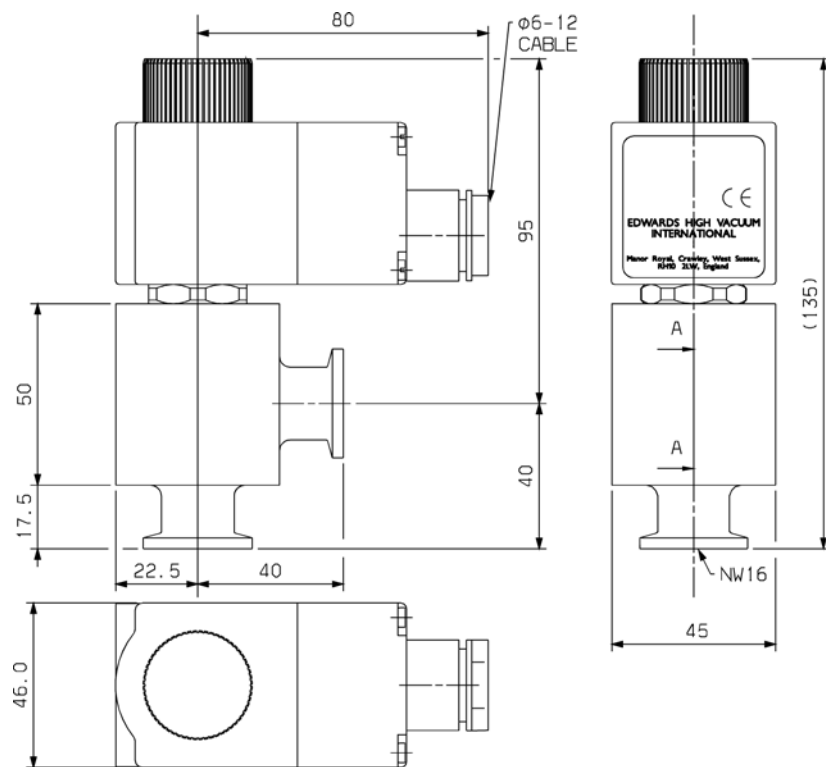


Figure 2 - Dimensions of NW16 valve





## 2.4 Electrical data

Electrical supply	110 V or 230 V ac 1 phase 50/60 Hz / 24 V ac/dc
Electrical supply tolerance	230 V $\pm$ 10% 110 V / 24 V ac/dc -10% +15%
Duty cycle	100% continuous
Protection class	IP67
Electrical supply cable	
Strain relief classification	PG13.5
Power consumption	
Open	95 W for 60 msec approx.
Hold	2.5 W to 4 W

## 2.5 Product item numbers

LCPV16EKA 230 V	C417-51-000
LCPV16EKA 110 V	C417-51-100
LCPV16EKA 24 V a.c./d.c.	C417-51-200
LCPV25EKA 230 V	C417-52-000
LCPV25EKA 110 V	C417-52-100
LCPV25EKA 24 V a.c./d.c.	C417-52-200

# Technical Data

## 3 Installation

### 3.1 Unpack and inspect

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

If the valve is damaged, notify your supplier and the carrier in writing within three days; state the Item Number of the valve together with your order number and your 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



#### **WARNING**

Take appropriate safety precautions when you install the valve in a system in which dangerous process substances have been pumped.



#### **WARNING**

The valve should be earthed to all connecting pipelines to prevent them becoming hazardous live in the event of a plasma discharge inside the vacuum system.

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

To achieve the MTTF stated in Section 2, you must fit the valve so that the actuator is vertical to the valve body.

If you use the valve to vent directly from the atmosphere, we recommend that you fit a filter to the inlet of the valve to prevent blockage of the valve by dust.

### 3.3 Electrical connections



#### **WARNING**

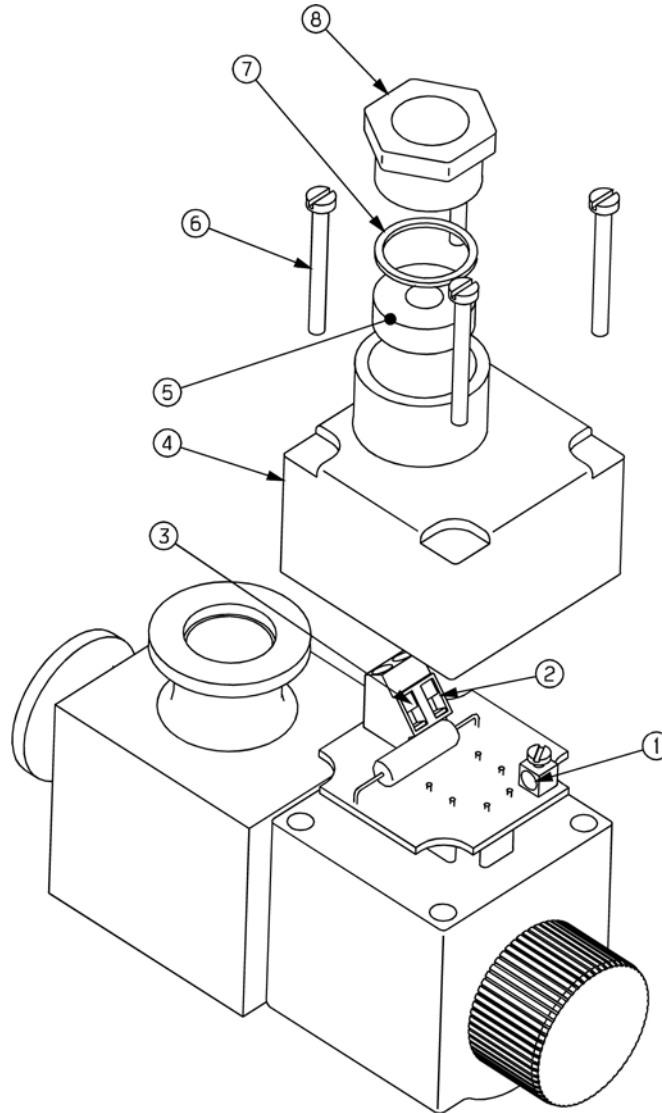
Ensure that the electrical installation of the LCPVEKA valve conforms with your local and national safety requirements. It must be connected to a suitable fused and protected electrical supply.

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 you use a suitable size electrical supply cable (6.5 mm to 13 mm). Refer to Section 2.4.

1. Ensure that the electrical supply corresponds with the voltage stated on the valve label.
2. Undo the four screws (6) and remove the PCB box cover (4) from the valve. (Do not remove electronic device).
3. Unscrew the gland compression screw (8) and detach from the PCB box cover (4).
4. Detach the steel gland compression ring (7) and the rubber cable gland (5) from the PCB box cover (4).
5. Strip back the outer sheath on the three core cable selected to be affixed for a distance of 30 mm and strip the insulation from each core for a distance of 5 mm.
6. Slide the gland compression screw (8) followed by the steel gland compression ring (7) onto the cable.
7. Adjust the inner bore diameter of the rubber cable gland (5) by removing laminated layers until the rubber cable gland (5) is a sliding fit on the outer cable sheath.

8. Pass the connection cable through the hole in the PCB box cover (4) and attach the wire ends to the terminals. Earth wire to terminal (1) Neutral wire to terminal (2) and Live wire to terminal (3).
9. Slide the PCB box cover (4) over the PCB and attach using four box retaining screws (6).
10. Slide rubber cable gland (5) and steel gland compression ring (7) down the cable and into the hole in the PCB box cover (4).
11. Insert gland compression screw (8) into the PCB box cover (4) and tighten to retain cable.

Figure 3 - Electrical supply



- |                          |                                 |
|--------------------------|---------------------------------|
| 1. Earth wire terminal   | 5. Rubber cable gland           |
| 2. Neutral wire terminal | 6. Box retaining screws         |
| 3. Live wire terminal    | 7. Steel gland compression ring |
| 4. PCB box cover         | 8. Gland compression screw      |

## 4 Operation

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.

## 5 Maintenance

The LCPVEKA valves do not require routine maintenance during their normal operational life and cannot be serviced by the user. Carry out the following checks when you maintain your 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.

## 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.

# Storage and disposal