

08-C311-03-881  
July 1979  
Supersedes  
08-C311-03-860)

## PVE SERIES SOLENOID OPERATED PIPELINE VALVES

### General description

The PVE series of solenoid operated valves are an extension of the well-proven PV range of manual/pneumatic pipeline valves and are suitable for use on all vacuum pipeline systems down to  $10^{-9}$  millibar.

The valve mechanism consists of a solenoid actuated piston with integral valve pad and is isolated from the vacuum system by a stainless steel bellows. The piston is enclosed in an iron casing and the bellows assembly is housed in the lower body which terminates in two right-angle flanged ports. The screwed flanges are compatible with the international SC coupling system. The valve opens against spring pressure and valve pad sealing is by a Viton O-ring. Positive indication of valve open/closed positions is provided by means of two microswitches.

The plastic control box houses the electronic switching and rectification circuit and also contains the mains electrical and the microswitch terminals block connexions. The circuit is protected by a surge proof fuse and the control box is demountable to permit remote operation of the valve.

### Operation

The normal electrical supply required to operate the valve solenoid is 220/240V or 110/120V a.c.

Both windings of the double wound coil are energised initially and the inner, high energy or pulse coil provides the high opening force. The outer 'hold' coil maintains the valve in the open position and is spring assisted to ensure rapid, positive closure.

The valve resists and opens against one atmosphere pressure differential in either direction, so that it can be used in low positive pressure applications, but the maximum pressure to which the valve may be subjected must not exceed 3 bar.

## Instructions

08-C311-03-881

Amendment

Sept 1980

### PVE PIPELINE VALVES - PCB ASSEMBLIES

For increased reliability, a Sorbothane rubber pad (Code No. C311-03-033) is now included in this assembly, together with modified screw spacers (Code No. C311-03-032; 2 off per spacer).

The pad is fitted between the PCB assembly and the plastic housing assembly and is secured with the two modified spacers.

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# Technical data

Model	<u>PV10E</u>	<u>PV25E</u>	<u>PV40E</u>
Operating pressure range		10 <sup>-12</sup> to 1 bar	
Operating voltage(s)		200/240V, 50/60Hz 110/127V, 50/60Hz.	
Steady current - (110V) (milliamps) (240V)	25 10	45 25	55 25
Coil resistance ( $\Omega$ ) (110V) Pulse Hold (240V) Pulse Hold	35 3400 140 13500	15 1900 60 7000	8 1400 30 7000
Fuse type	20mm fuse link (time lag) DIN41571/3		
Fuse rating (amp) (110V) (240V)	0.63 0.315	1.6 0.8	3.15 1.6
Microswitch rating	3A at 240V ac		
Typical valve closure time ) Typical valve opening time )	0.1 sec		
Maximum leak rate - across seat ) - through body )	10 <sup>-9</sup> mbar ls <sup>-1</sup>		
Weight (Kg)	0.7	1.5	3.7
<u>Ordering No.</u> (200/240V) (110/127V)	08-C311-03-000 08-C311-04-000	08-C313-03-000 08-C313-04-000	08-C314-03-000 08-C314-04-000

## Installation

### Mounting

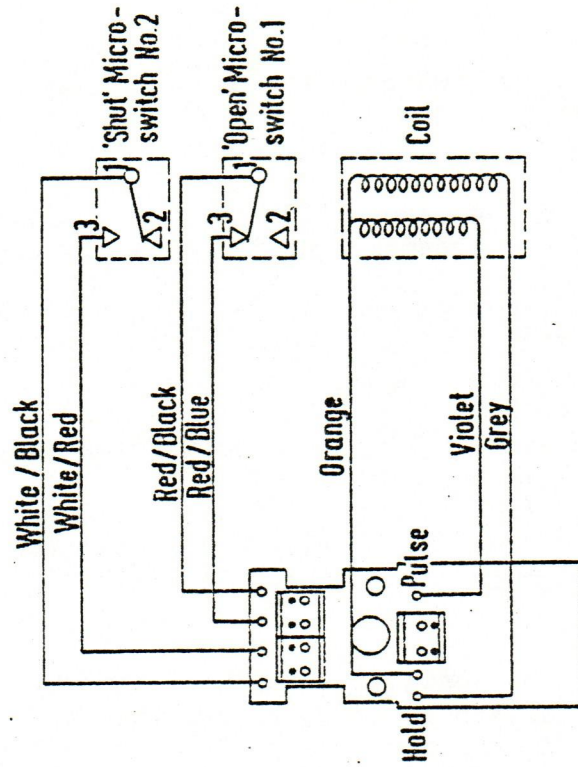
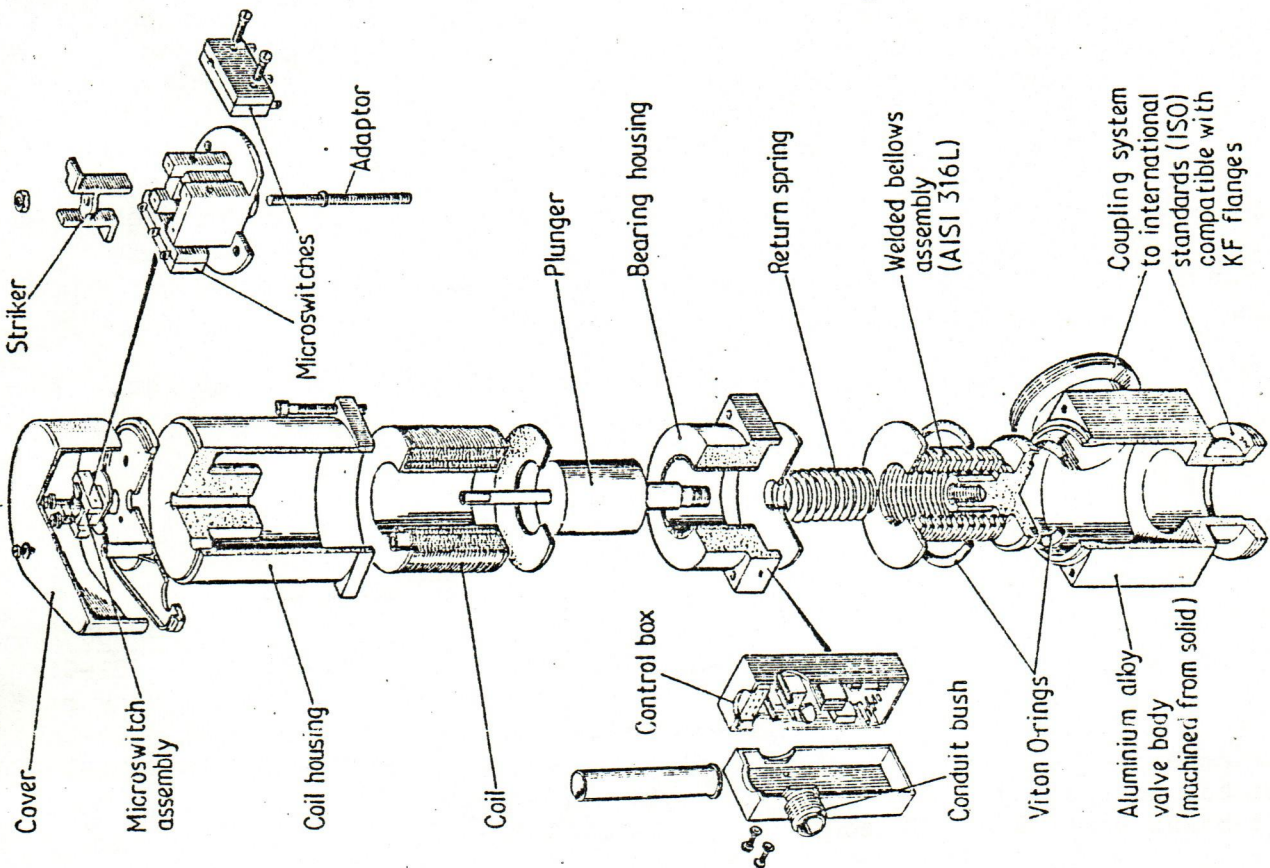
The valve is pipeline supported and can be mounted in any attitude. For more permanent fixing, the two M4 threaded holes in the body can be utilised.

### Vacuum Pipeline Connexions

Two SC coupling nuts are supplied for connexion of the valve ports to the pipeline system and are compatible with the international KF clamped and SC screwed coupling systems. For more permanent connexions, the SC couplings can be welded, brazed, soft soldered or cemented (depending on material and preference) to 15 mm, 28 mm and 42 mm o/d tube. For recommended methods of coupling, refer to instruction sheet M08781.

### Electrical connexions

- (i) Check that the mains electrical supply corresponds with the voltage specified.
- (ii) Remove the control box cover and connect up the mains leads and the micro-switch external leads (if required) to the terminal block - as indicated on the diagram inside the control box cover. The earth lead should be soldered to the earth tag provided.
- (iii) Fit the conduit adaptor (supplied separately) in the cover - the conduit tube should be screwed on to the bush which has a moulded hexagon register in the cover.



Circuit Diagram

Fig.1 Exploded view of PVE valve

# Maintenance

The valve should not require maintenance or servicing during normal operating life. However if, after many tens of thousands of trouble-free operating cycles, malfunctioning of the microswitches should occur, they should be reset as follows:

- (i) Remove the top cover and unscrew the lock-nuts on the central threaded rod. Note - if the rod rotates with the nut, the LOCTITE coating on the lower threads of the rod will require renewal.
- (ii) Remove the two retaining screws from the microswitch carrier and detach the microswitch assembly and the striker.
- (iii) Unscrew and remove the threaded rod from the actuator then thoroughly clean off old LOCTITE coating from bottom threads. Apply LOCTITE 217 sparingly to bottom three threads on rod.

Note: Re-assembly and resetting of the microswitches must be carried out immediately subsequent to this operation.

- (iv) To set the 'open' microswitch - screw the rod in or out (as appropriate) until the microswitch is actuated by the collar on the rod via the striker .
- (v) To set the 'closed' microswitch - screw in the nut on the threaded rod until the microswitch is actuated via the striker. Secure with the lock nut then fit the top cover.

To replace the valve pad seal and/or the bellows assembly:

- (i) To renew the valve pad seal:

Remove the four socket head retaining screws from the valve body then detach the body. Examine the valve pad seal (and body O-ring) and renew if damaged or deteriorated.

- (ii) To replace the bellows assembly:

Detach the top cover and remove the nuts from the screwed adjusting rod on the microswitch assembly. The bellows assembly and actuator can now be withdrawn from the case and the bellows detached using the peg holes or slot in the base of the bellows.

Note: Check the number of threads engaged by the bellows on the actuator, during removal. The replacement bellows should be screwed on to the actuator an identical number of threads.

# Spares

	<u>Ordering No.</u>		
	<u>PV10E</u>	<u>PV25E</u>	<u>PV40E</u>
O-ring (valve pad seal) Viton A	08-HQ21-06-009	08-HQ21-06-025 (pack of 5)	08-HQ21-06-041 (pack of 5)
O-ring (body) Viton A	08-HQ21-06-251	08-HQ21-06-252	08-HQ21-06-164
Bellows assembly (stainless steel)	14-C311-03-004	14-C313-03-004	14-C314-03-004
Circuit board assembly, 240V ac	14-0111-21-010		
Circuit board assembly, 110V ac	14-0111-22-010		

## Accessories

Pipeline connexions - a basic pack of quick-release screwed vacuum coupling components is available as an accessory. Two packs required per valve.

Each pack contains:

1 - screwed body (brass)	SC10 pack	08-C110-02-101
1 - compression sleeve (aluminium alloy)	SC25 pack	08-C110-04-101
1 - coupling nut (plastic)		
1 - O-ring carrier (stainless steel) with O-ring (nitrile)	SC40 pack	08-C110-05-101

## RETURN TO MANUFACTURER

If a fault occurs in the unit beyond the scope of customer facilities, the customer should notify Edwards High Vacuum.

### United Kingdom only

Write to, or phone the Service Department, Edwards High Vacuum stating:-

- a) The model number of the faulty equipment.
- b) The serial number of the faulty equipment.
- c) Date of purchase.
- d) Edwards sales reference, and customers order number.
- e) The nature of the fault.

Edwards Service Department will normally arrange for either a Service Engineer to call or for the faulty equipment to be returned. Equipment should not be returned without prior agreement.

The above procedure also applies to damage to equipment incurred during transit, but both Edwards High Vacuum and the Carrier MUST be notified within three days of receipt of the unit.

### Destinations other than United Kingdom

Notify the accredited distributors of Edwards High Vacuum who will provide the required information regarding their procedure for the return of faulty equipment. Any notification will be relayed to Edwards High Vacuum by their accredited distributors.