

Instruction Manual

EBV Gas Ballast Valves

Description	Item Number
EBV20 Gas Ballast Valve, 240 V, 50/60 Hz	A500-06-930
EBV20 Gas Ballast Valve, 110 V, 50/60 Hz	A500-06-984
EBV300S Gas Ballast Valve, 230 V, 50 Hz	A500-16-930
EBV300D Gas Ballast Valve, 240 V, 50/60 Hz	A500-17-930
EBV100S Gas Ballast Valve, 240 V, 50/60 Hz	A500-18-930
RV Adaptor for EBV20	A505-02-000
E1/E2M18 and E2M28 Adaptor Kit for EBV20	A500-06-003





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)

- EBV20 Gas Ballast Valve, 240 V, 50/60 Hz A500-06-930
- EBV20 Gas Ballast Valve, 110 V, 50/60 Hz A500-06-984
- EBV300S Gas Ballast Valve, 230 V, 50 Hz A500-16-930
- EBV300D Gas Ballast Valve, 240 V, 50/60 Hz A500-17-930
- EBV100S Gas Ballast Valve, 240 V, 50/60 Hz A500-18-930

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

- EN60730 Specification for Automatic Electrical Controls for Household and Similar Uses
- EN60529:1992+A2:2013 Specification for degree of protection provided by enclosures (IP code)
- EN50581: 2012 Technical Documentation for the Assessment of Electrical and Electronic Products with respect to the Restriction of Hazardous Substances

and fulfils all the relevant provisions of

- 2014/35/EU Low Voltage 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.

Mr Peter Meares
Senior Technical Support Manager, General Vacuum

10.05.2016, Burgess Hill

Date and Place

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

Contents

Section	Page
1	Introduction 1
1.1	Scope and definitions 1
1.2	Description 1
1.3	Applications 2
2	Technical Data 3
3	Installation 5
3.1	Unpack and inspect 5
3.2	Check the suitability of the valve 6
3.3	Fit an EBV20 Valve 6
3.3.1	Configure the EBV20 Valve (if necessary) 6
3.3.2	Fit an EBV20 Valve to an E2M0.7, E2M1.5, E2M2, E1M/E2M5, E1/E2M8 or E2M12 pump 6
3.3.3	Fit an EBV20 Valve to an RV3, RV5, RV8 or RV12 pump 8
3.3.4	Fit an EBV20 Valve to an E1/E2M18 or E2M28 pump 10
3.4	Fit an EBV100S Valve to an E1M40 or E1M80 pump 12
3.4.1	Fit the EBV100S (provide suckback protection on electrical supply failure) 12
3.4.2	Fit the EBV100S (provide remote gas ballast control and silencing air bleed when operating the pump at ultimate vacuum) 12
3.4.3	Fit the EBV100S (provide remote gas ballast control, silencing air bleed when operating the pump at ultimate vacuum, and suckback protection) 14
3.5	Fit an EBV300D Valve to an E2M40/80 or E2M175/275 pump 14
3.6	Fit an EBV300S Valve to an E1M175 or E1M275 pump 16
3.7	Connect a gas supply (if required) 18
3.8	Connect the EBV Valve to the electrical supply 18
4	Operation 21
5	Maintenance 23
5.1	Safety 23
5.2	Maintenance operations 23
6	Storage and Disposal 25
6.1	Storage 25
6.2	Disposal 25
7	Service and Accessories 27
7.1	Introduction 27
7.2	Service 27
7.3	Accessories 27
	Index 29

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

Illustrations

Figure	Page
1 Fit an EBV20 Valve to an E2M0.7, E2M1.5, E2M2, E1/E2M5, E1/E2M8 or E2M12 pump	7
2 Fit an EBV20 Valve to an RV3, RV5, RV8 or RV12 pump	9
3 Fit an EBV20 Valve to an E1/E2M18 or E2M28 pump	11
4 Fit an EBV100S Valve to an E1M40/80 pump	13
5 Fit an EBV300D Valve to an E2M40/80 or E2M175/275 pump	15
6 Fit an EBV300S Valve to an E1M175/275 pump	17
7 Connect the electrical supply to the EBV Valve	19

Tables

Table	Page
1 EBV Valve rotary pump applications	1
2 Checklist of EBV20 Valve components	5
3 Checklist of EBV100S and EBV300D/S Valve components	5
4 Checklist of E1/E2M18 & E2M28 Adaptor Kit for EBV20 components	5
5 Checklist of RV Adaptor for EBV20 components	5

Associated publications

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

1 Introduction

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the Edwards EBV Gas Ballast Valves (abbreviated to EBV Valve in the remainder of this manual). You must use the EBV Valves as specified in this manual.

Read this manual before you install and operate the EBV 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.



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

1.2 Description

The EBV Valves are solenoid operated, normally closed valves used to automatically switch on or switch off the gas ballast to an Edwards rotary pump.

You can connect the EBV Valve so that the gas ballast is switched off when the rotary pump is switched off, to prevent the return of air into your vacuum system. When fitted to a single stage rotary pump, the EBV Valve also prevents operation of the pump in the reverse direction when the pump is switched off.

A range of EBV Valves is available to suit your rotary pump, as shown in Table 1.

Note that you will need an RV Adaptor to fit an EBV20 Valve to an RV pump, and you will need an E1/E2M18 and E2M28 Adaptor Kit to fit an EBV20 Valve to an E1/E2M18 or E2M28 pump.

Table 1 - EBV Valve rotary pump applications

EBV Valve	Suitable for rotary pumps
EBV20	E2M0.7, E2M1.5, E2M2, E1M/E2M5, E1M/E2M8, E2M12, E1M/E2M18, E2M28, RV3, RV5, RV8, RV12
EBV100S	E1M40, E1M80
EBV300D	E2M40, E2M80, E2M175, E2M275
EBV300S	E1M175, E1M275

1.3 Applications



WARNING

The EBV Valves are not suitable for applications in which azides or pyrophoric materials are pumped.

You must ensure that the EBV Valve is suitable for use in your application. If in doubt, contact Edwards or your supplier to confirm that the EBV Valve can be used in your application. Note that:

- The EBV Valves are not suitable for use with azides.
- The EBV Valves may be suitable for an application in which flammable or pyrophoric materials are pumped: contact Edwards or your supplier for confirmation of suitability.
- The EBV Valves are generally suitable for use with inert purge gases, but you should contact Edwards or your supplier for confirmation of suitability.

2 Technical Data

Mass

EBV20	0.5 kg
EBV100S	0.5 kg
EBV300D	1.0 kg
EBV300S	1.2 kg

Electrical supply

EBV20	110 V, 50/60 Hz or 240 V, 50/60 Hz
EBV100S, EBV300D	220/240 V, 50/60 Hz
EBV300S	230 V, 50 Hz

Electrical supply voltage tolerance ±10%

Electrical power (VA)	Inrush	Holding
EBV20	20	15
EBV100S	20	15
EBV300D	20	15
EBV300S	36	18

Fuse rating

220/230/240 V Valves	63 mA
110 V Valves	125 mA

Strain relief PG9 (∅ 4 to 8 mm cables)

Materials of construction Nylon, stainless steel, nickel-plated mild steel, brass, tin-plated copper, nitrile

Maximum gas supply pressure (no flow) * 1 bar.g. 2×10^5 Pa

Enclosure protection rating IP65 (with rubber gasket fitted)

* If a purge gas supply is connected, see Section 3.7

Technical Data

3 Installation

3.1 Unpack and inspect

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

Check that you have received the items listed in the appropriate Table 2, 3, 4 or 5.

If any item is missing, notify your carrier in writing within three days. If the equipment is not to be used immediately, store it in suitable conditions as described in Section 6.

Table 2 - Checklist of EBV20 Valve components

Qty	Description	Check (✓)
1	EBV20 Valve assembly	<input type="checkbox"/>
1	Restrictor - 0.8 mm diameter	<input type="checkbox"/>
1	Restrictor - 1.4 mm diameter	<input type="checkbox"/>
1	Restrictor - 2.2 mm diameter	<input type="checkbox"/>

Table 3 - Checklist of EBV100S and EBV300D/S Valve components

Qty	Description	Check (✓)
1	Valve assembly	<input type="checkbox"/>
1	Filter/silencer assembly *	<input type="checkbox"/>
1	1/4 inch BSP plug †	<input type="checkbox"/>

* EBV100S and EBV300S only. † EBV300D only

Table 4 - Checklist of E1/E2M18 & E2M28 Adaptor Kit for EBV20 components

Qty	Description	Check (✓)
1	Gas ballast adaptor	<input type="checkbox"/>
3	'O' rings	<input type="checkbox"/>
1	Banjo bolt	<input type="checkbox"/>
1	Adaptor	<input type="checkbox"/>

Table 5 - Checklist of RV Adaptor for EBV20 components

Qty	Description	Check (✓)
1	RV adaptor (gas bleed fitting)	<input type="checkbox"/>
2	'O' rings	<input type="checkbox"/>
1	Bonded seal *	<input type="checkbox"/>

* The bonded seal is not required to fit the adaptor.

3.2 Check the suitability of the valve



WARNING

Ensure that the EBV Valve is suitable for your application before you install the Valve: refer to Section 1.3.

1. Check that you have received the correct type of EBV Valve for your rotary pump: refer to Table 1.
2. Check that the EBV Valve is suitable for use with your electrical supply; the electrical rating of the EBV Valve is shown on the label on the coil assembly (Figure 1, item 10; Figure 2, item 4; Figure 3, item 18; Figure 4, item 7; Figure 5, item 7; Figure 6, item 7).

If the EBV Valve is not suitable for your pump or electrical supply, do not attempt to install and operate the EBV Valve.

3.3 Fit an EBV20 Valve

CAUTION

Ensure that the EBV20 Valve is correctly configured for your rotary pump. If you do not, you will not get the correct gas ballast flow into the pump

Note: Note: If you fit the EBV20 Valve to an E2M1.5 or RV pump fitted with an ITO, ITF, ITD or ITC20 inlet filter, you must fit an elbow to provide sufficient clearance from the filter; a suitable elbow is available as an accessory: refer to Section 7.3.

3.3.1 Configure the EBV20 Valve (if necessary)

The EBV20 Valve is supplied with a liner fitted. In this configuration, the EBV20 Valve is suitable for use with the E1M18, E2M18 or E2M28 rotary pumps.

When you fit the EBV20 Valve to another rotary pump, you must reconfigure the Valve by removing the liner and fitting the appropriate restrictor (supplied with the Valve), as follows:

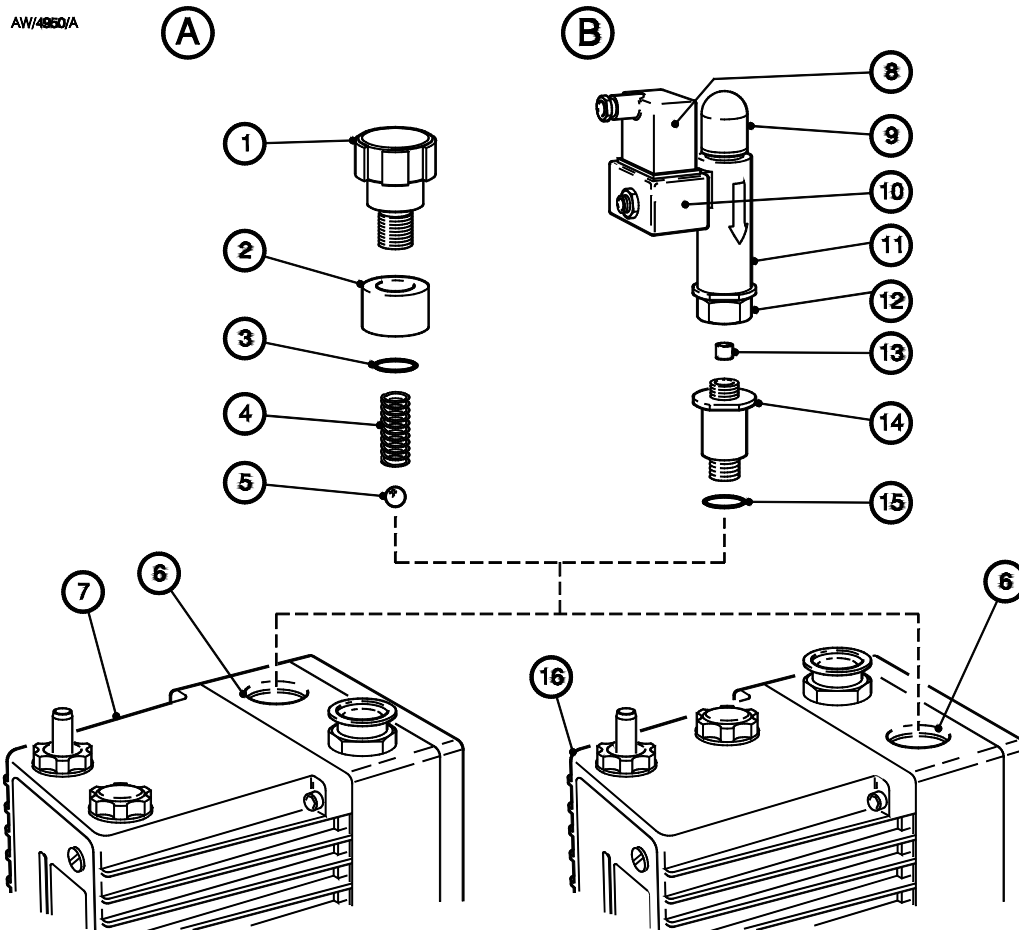
- Fit the $\text{Æ}0.8$ mm restrictor for E2M0.7, E2M1.5, E2M2 and RV3 pumps.
- Fit the $\text{Æ}1.4$ mm restrictor for E1M5, E2M5 and RV5 pumps.
- Fit the $\text{Æ}2.2$ mm restrictor for E1M8, E2M8, E2M12, RV8 and RV12 pumps.

3.3.2 Fit an EBV20 Valve to an E2M0.7, E2M1.5, E2M2, E1M/E2M5, E1/E2M8 or E2M12 pump

1. Refer to Figure 1, detail A. Unscrew and remove the gas ballast knob (1).
2. Remove the filter, 'O' ring, spring and ball (2 to 5) from the gas ballast port (6) on the pump; to remove these components, either drain the oil from the pump then invert the pump so that the components fall out of the pump, or use a small magnet or small tweezers to remove the components.
3. Refer to detail B. Unscrew the coupling nut (12) and remove the combined valve assembly (11), coil (10) and filter/silencer assembly (9) from the pump adaptor assembly (14).
4. Apply a light wipe of pump oil or grease to the 'O' ring (15), then fit the 'O' ring and the adaptor (14) into the gas ballast port (6) on the pump. Ensure that the adaptor is firmly tightened.
5. Ensure that the correct size restrictor (13) for your rotary pump is fitted in the adaptor (14): refer to Section 3.3.1.

- Slide the coupling nut (12) on the valve assembly (11) over the thread on the adaptor (14), then tighten the coupling nut.

Figure 1 - Fit an EBV20 Valve to an E2M0.7, E2M1.5, E2M2, E1/E2M5, E1/E2M8 or E2M12 pump



A Pump gas ballast components

B EBV20 Valve components

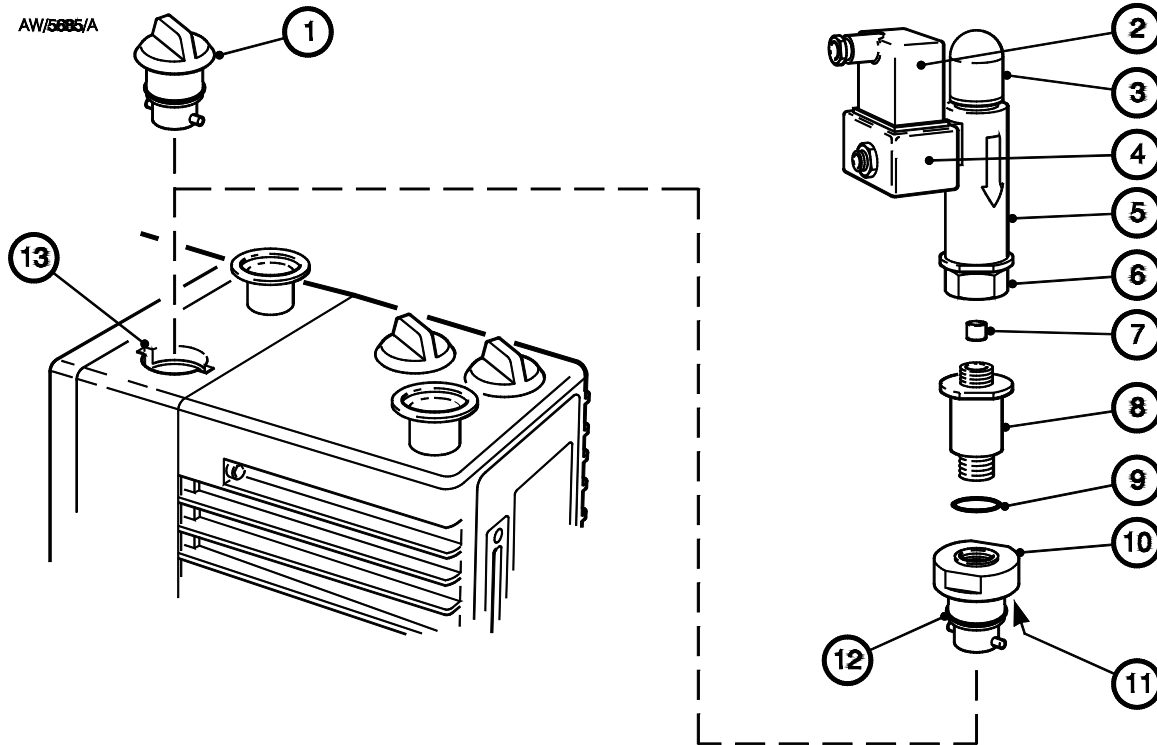
- | | | |
|---------------------|--|------------------------------|
| 1. Gas ballast knob | 7. E2M2, E1/E2M5, E1/E2M8 or E2M12 oil box | 12. Coupling nut |
| 2. Filter | 8. Electrical supply socket | 13. Restrictor or liner |
| 3. 'O' ring | 9. Filter/Silencer | 14. Adaptor |
| 4. Spring | 10. Coil assembly | 15. 'O' ring |
| 5. Ball | 11. Valve assembly | 16. E2M0.7 or E2M1.5 oil box |
| 6. Gas ballast port | | |

3.3.3 Fit an EBV20 Valve to an RV3, RV5, RV8 or RV12 pump

Note: You need an RV Adaptor for EBV20 to fit an EBV20 Valve to an RV pump

1. Refer to Figure 2. Turn the gas ballast knob (1) to the high flow position (position 'II'), push the knob down as far as it will go, then turn the knob anticlockwise slightly (to release the bayonet lugs on the knob) and remove the knob from the gas ballast port (13) on the RV pump.
2. Apply a light wipe of oil or grease to the 'O' ring (9), place the 'O' ring in position, then screw the threads of the upper adaptor (8) into the threaded port on the RV adaptor (10).
3. Apply a light wipe of pump oil or grease to the two 'O' rings (11, 12) and ensure that they are correctly in place on the RV adaptor (10), then fit the adaptor to the gas ballast port (13) on the RV pump, press the assembly down and turn it clockwise until it locks, so that the bayonet lugs on the RV adaptor engage in the pump. If you cannot turn the adaptor by hand, fit a 36 mm AF spanner to the flats on the RV adaptor (10); do not fit the spanner to the upper adaptor (8).
4. Ensure that the correct size restrictor (7) for your rotary pump is fitted in the adaptor (8): refer to Section 3.3.1.
5. Slide the coupling nut (6) on the valve assembly (5) over the thread on the adaptor (8), then tighten the coupling nut.

Figure 2 - Fit an EBV20 Valve to an RV3, RV5, RV8 or RV12 pump



- | | |
|-----------------------------|------------------------------------|
| 1. Gas ballast knob | 8. Adaptor |
| 2. Electrical supply socket | 9. 'O' ring |
| 3. Filter/silencer | 10. RV adaptor (gas bleed fitting) |
| 4. Coil assembly | 11. 'O' ring |
| 5. Valve assembly | 12. 'O' ring |
| 6. Coupling nut | 13. Gas ballast port |
| 7. Restrictor or liner | |

3.3.4 Fit an EBV20 Valve to an E1/E2M18 or E2M28 pump

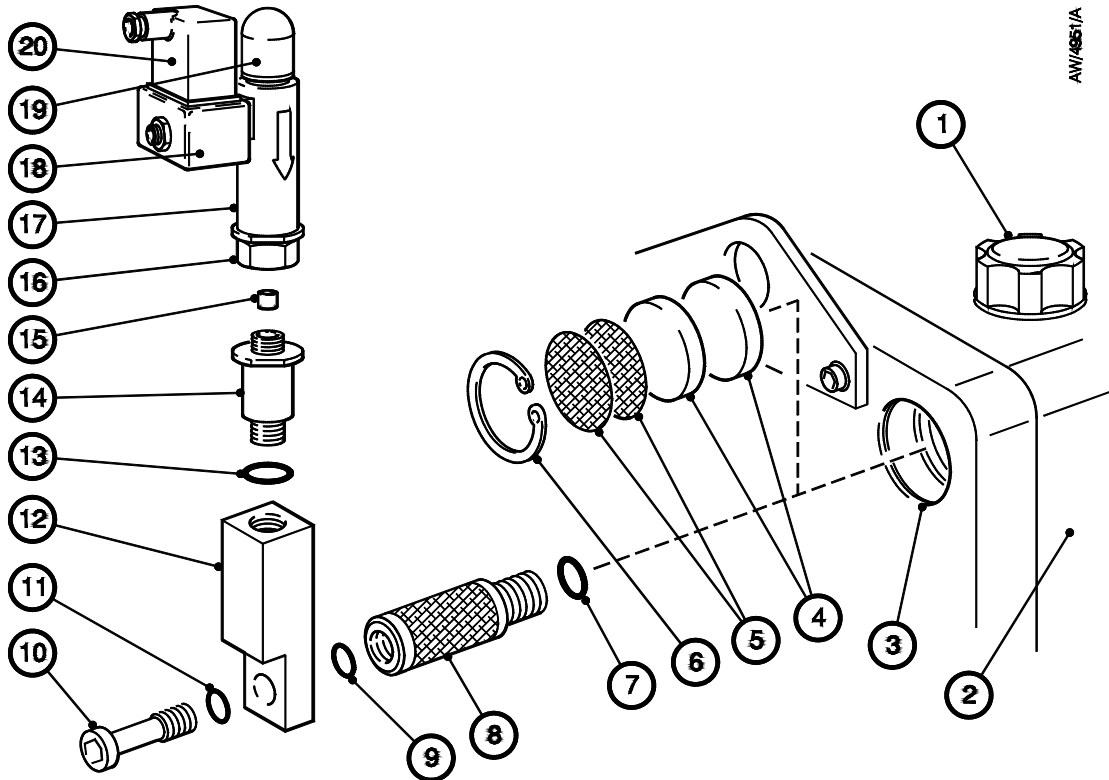
CAUTION

Ensure that the gas ballast knob is in the fully open position. If the gas ballast knob is in the closed position, you will not get any gas ballast flow into the pump.

Note: Note: You need an E1/E2M18 and E2M28 Adaptor for EBV20 Kit to fit an EBV20 Valve to an E1/E2M18 or E2M28 pump.

1. Refer to Figure 3. Remove the circlip (6) from the gas ballast port (3) on the rotary pump (2), then remove the mesh (5) and filters (4) from the port.
2. Apply a light wipe of pump oil or grease to the 'O' ring (7), fit the 'O' ring (7) to the gas ballast adaptor (8), then use an 8 mm hexagonal key to secure the adaptor to the gas ballast port (3).
3. Apply a light wipe of pump oil or grease to the two 'O' rings (9, 11), then use the banjo bolt (10) and the two 'O' rings to fit the adaptor (12) to the gas ballast adaptor (8).
4. Apply a light wipe of pump oil or grease to the 'O' ring (13), fit the 'O' ring to the upper adaptor (14), then screw the threads of the upper adaptor (14) into the threaded port on the adaptor (12).
5. Ensure that the correct size restrictor (15) for your rotary pump is fitted in the adaptor (14): refer to Section 3.3.1.
6. With the thread downwards, slide the coupling nut (16) on the valve assembly (17) over the thread on the adaptor (14), then tighten the coupling nut.

Figure 3 - Fit an EBV20 Valve to an E1/E2M18 or E2M28 pump



- | | | |
|---------------------|------------------|------------------------------|
| 1. Gas ballast knob | 8. Adaptor * | 15. Restrictor or liner |
| 2. Pump | 9. 'O' ring * | 16. Coupling nut |
| 3. Gas ballast port | 10. Banjo bolt * | 17. Valve assembly |
| 4. Filters | 11. 'O' ring * | 18. Coil assembly |
| 5. Mesh | 12. Adaptor * | 19. Filter/silencer |
| 6. Circlip | 13. 'O' ring * | 20. Electrical supply socket |
| 7. 'O' ring * | 14. Adaptor | |

* Components of the E1/E2M18 and E2M28 Adaptor for EBV20 kit

3.4 Fit an EBV100S Valve to an E1M40 or E1M80 pump

CAUTION

Ensure that the gas ballast knob is in the fully open position. If the gas ballast knob is in the closed position, you will not get any gas ballast flow into the pump.

Refer to Figure 4, detail B. The gas ballast bearing plate (15) on the pump has two 1/4 inch BSP holes; one hole (1) is open and the other hole has a plug (10) fitted.

You can install the EBV100S Valve in one of three ways:

- To ensure that the application has suckback protection when the electrical supply fails: install the Valve as described in Section 3.4.1.
- To provide remote gas ballast control and to provide silencing air bleed when operating the pump at ultimate vacuum: install the Valve as described in Section 3.4.2.
- To provide remote gas ballast control, silencing air bleed when operating the pump at ultimate vacuum, and suckback protection: install the Valve as described in Section 3.4.3.

3.4.1 Fit the EBV100S (provide suckback protection on electrical supply failure)

If you use the following procedure, you can then use the EBV Valve assembly to remotely switch on or switch off gas-ballast flow. This configuration will minimise the pressure rise in the vacuum system in the event of an electrical supply failure (as the EBV Valve will automatically close). With the EBV Valve closed and the pump operating at ultimate vacuum, there will be some hydraulic noise.

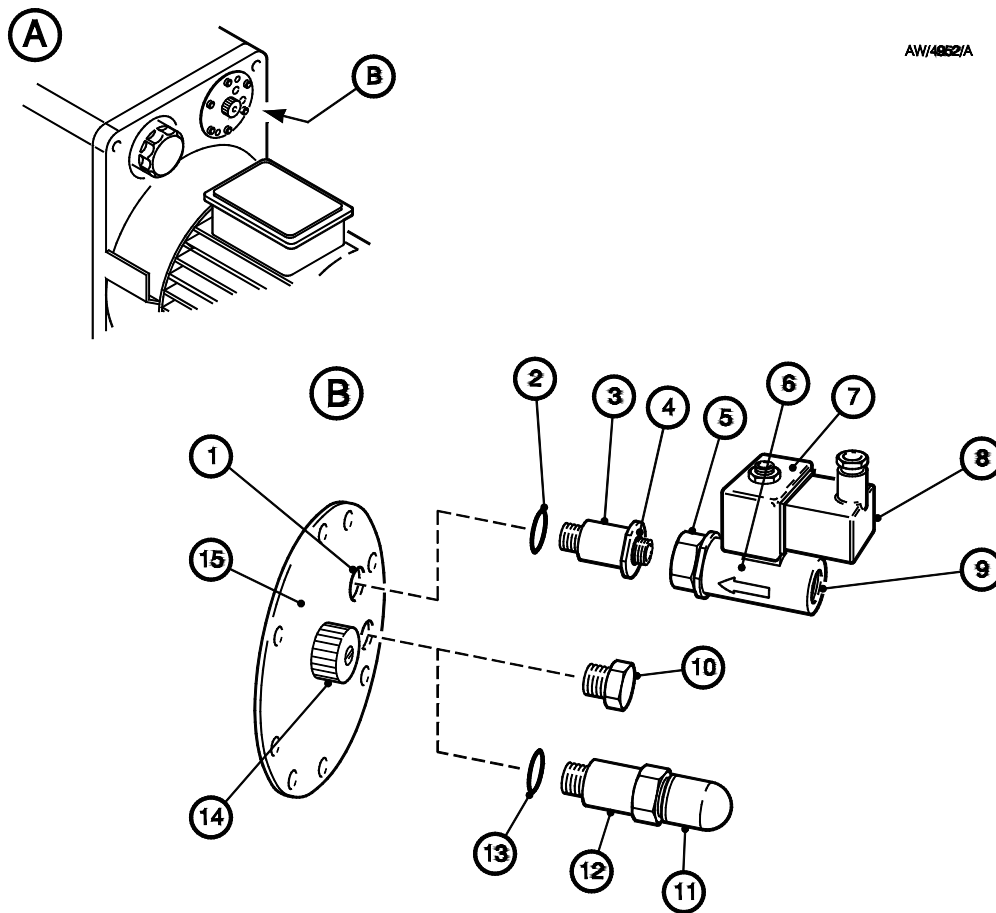
1. Refer to Figure 4, detail B. Unscrew the coupling nut (5) and remove the pump adaptor assembly (3) from the combined valve assembly (6) and coil assembly (7).
2. If necessary, disconnect and remove the adaptor (12), 'O' ring (13) and filter/silencer assembly (11) from the valve inlet (9).
3. Apply a light wipe of pump oil or grease to the 'O' ring (2), then fit the 'O' ring and the adaptor (3) into the gas ballast port (1) on the pump. Ensure that the adaptor is firmly tightened.
4. Ensure that the 'O' ring (4) is correctly in place, then slide the coupling nut (5) on the valve assembly (6) over the thread on the adaptor (3), then tighten the coupling nut.
5. Ensure that the gas ballast knob (14) is in the fully open position: refer to the instruction manual supplied with your rotary pump.

3.4.2 Fit the EBV100S (provide remote gas ballast control and silencing air bleed when operating the pump at ultimate vacuum)

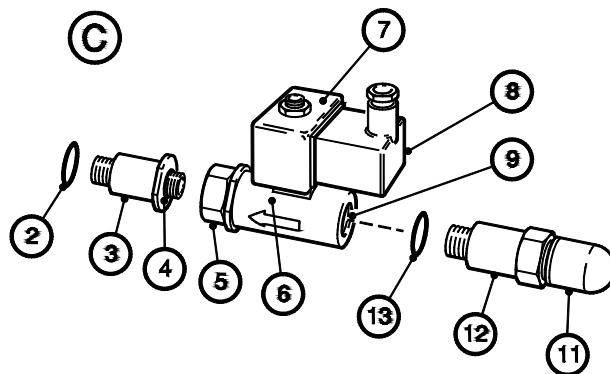
If you use the following procedure, you can then use the EBV Valve assembly to remotely switch on or switch off gas-ballast flow. This configuration will not prevent a pressure rise in the vacuum system in the event of an electrical supply failure, but will reduce the hydraulic noise if operating at ultimate vacuum.

1. Fit the valve assembly as described in Steps 1 to 4 of Section 3.4.1.
2. Refer to Figure 4, detail B. Remove the 1/4 inch BSP plug (10) from the gas ballast bearing plate (15).
3. Apply a light wipe of pump oil or grease to the 'O' ring (13), fit the 'O' ring to the adaptor (12), then screw the adaptor with the filter/silencer assembly (11) into the hole in the gas ballast bearing plate (15).
4. Ensure that the gas ballast knob (14) is in the fully open position: refer to the instruction manual supplied with your rotary pump.

Figure 4 - Fit an EBV100S Valve to an E1M40/80 pump



- A. E1M40/80 pump
- B. Fit the EBV Valve
- C. Complete valve configuration
- 1. Gas ballast port (open)
- 2. 'O' ring
- 3. Adaptor
- 4. 'O' ring
- 5. Coupling nut
- 6. Valve assembly
- 7. Coil assembly
- 8. Electrical supply socket
- 9. Valve inlet
- 10. Plug
- 11. Filter/silencer
- 12. Adaptor
- 13. 'O' ring
- 14. Gas ballast knob
- 15. Gas ballast plate



3.4.3 Fit the EBV100S (provide remote gas ballast control, silencing air bleed when operating the pump at ultimate vacuum, and suckback protection)

Note: Note: You will need two EBV100S Valves for this installation option.

If you use this procedure, you will fit an EBV100S Valve assembly to each hole in the gas ballast bearing plate. You can then use one EBV Valve assembly to remotely switch on or switch off gas-ballast flow.

You can also use the second EBV Valve assembly (with the filter/silencer (11) and adaptor (12) fitted, as shown in detail C) to remotely switch on or switch off the silencing air bleed.

This configuration will prevent a pressure rise in the vacuum system in the event of an electrical supply failure and will reduce the hydraulic noise if operating at ultimate vacuum.

1. Fit the first EBV100S Valve assembly to the pump as described in Steps 1 to 4 of Section 3.4.1.
2. Refer to Figure 4, detail B. Remove the 1/4 inch BSP plug (10) from the gas ballast bearing plate (15).
3. Fit the second EBV100S Valve: use the method described in Steps 1 to 4 in Section 3.4.1.
4. Refer to detail C. Apply a light wipe of pump oil or grease to the 'O' ring (13), fit the 'O' ring to the adaptor (12), then screw the adaptor with the silencer/filter assembly (11) into the inlet (9) of the second EBV100S Valve.
5. Ensure that the gas ballast knob (14) is in the fully open position: refer to the instruction manual supplied with your rotary pump.

3.5 Fit an EBV300D Valve to an E2M40/80 or E2M175/275 pump

CAUTION

Ensure that the gas ballast knob is in the fully open position. If the gas ballast knob is in the closed position, you will not get any gas ballast flow into the pump.

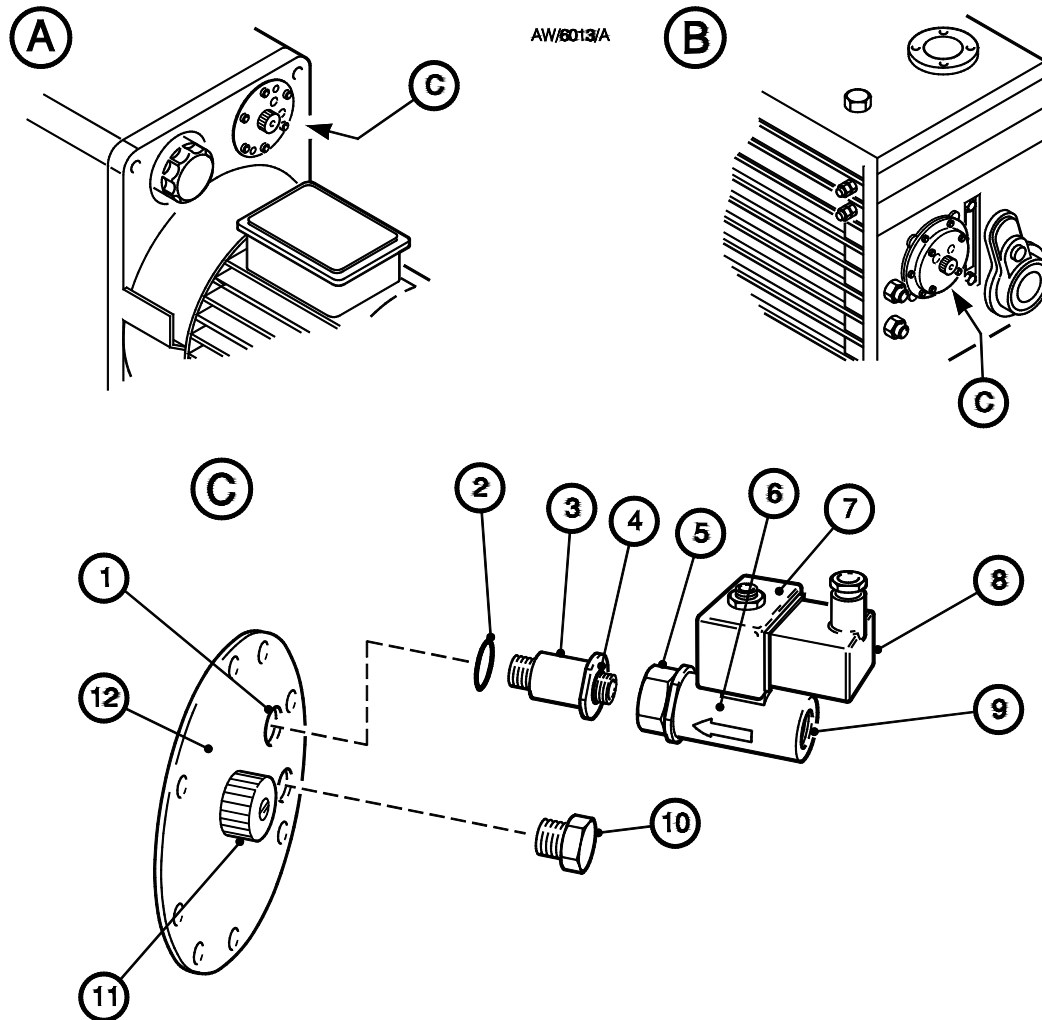
Refer to Figure 5, detail C. On E2M40 and E2M80 pumps, the gas ballast bearing plate (12) has two 1/4 inch BSP holes: one of the holes (1) is open and the other hole has a plug (10) fitted. You can fit the EBV300D Valve assembly to hole (1) and leave the plug (10) fitted to the other hole. You can then use the EBV Valve assembly to remotely switch on or switch off gas-ballast flow. This configuration will minimise the pressure rise in the vacuum system in the event of an electrical supply failure (as the EBV Valve will automatically close).

On E2M175 and E2M275 pumps, both holes in the gas ballast bearing plate (12) are open. You can fit the EBV300D Valve assembly to one hole (1) and fit the 1/4 inch BSP plug (10, supplied with the EBV Valve) to the other hole. You can then use the EBV Valve assembly to remotely switch on or switch off gas-ballast flow. Note that the E2M175 and E2M275 pumps are supplied with inlet valves fitted to provide vacuum system protection.

Use the following procedure to fit the EBV300D Valve:

1. Refer to Figure 5, detail C. Unscrew the coupling nut (5) and remove the pump adaptor assembly (3) from the combined valve assembly (6) and coil assembly (7).
2. Apply a light wipe of pump oil or grease to the 'O' ring (2), then fit the 'O' ring and the adaptor (3) into the gas ballast port (1) on the pump. Ensure that the adaptor is firmly tightened.
3. Ensure that the 'O' ring (4) is correctly in place, then slide the coupling nut (5) on the valve assembly (6) over the thread on the adaptor (3), then tighten the coupling nut.
4. If you are fitting the EBV300D to an E2M175 or E2M275 pump, fit the 1/4 inch BSP plug (10) to the gas ballast bearing plate (12).
5. Ensure that the gas ballast knob (11) is in the fully open position: refer to the instruction manual supplied with your rotary pump.

Figure 5 - Fit an EBV300D Valve to an E2M40/80 or E2M175/275 pump



- A. Gas ballast port location: E2M40/80 pump
- B. Gas ballast port location: E2M175/275 pump
- C. Fit the EBV Valve

- | | | |
|----------------------------|-----------------------------|-----------------------|
| 1. Gas ballast port (open) | 5. Coupling nut | 9. Valve inlet |
| 2. 'O' ring | 6. Valve assembly | 10. Plug |
| 3. Adaptor | 7. Coil assembly | 11. Gas ballast knob |
| 4. 'O' ring | 8. Electrical supply socket | 12. Gas ballast plate |

3.6 Fit an EBV300S Valve to an E1M175 or E1M275 pump

CAUTION

Ensure that the gas ballast knob is in the fully open position. If the gas ballast knob is in the closed position, you will not get any gas ballast flow into the pump.

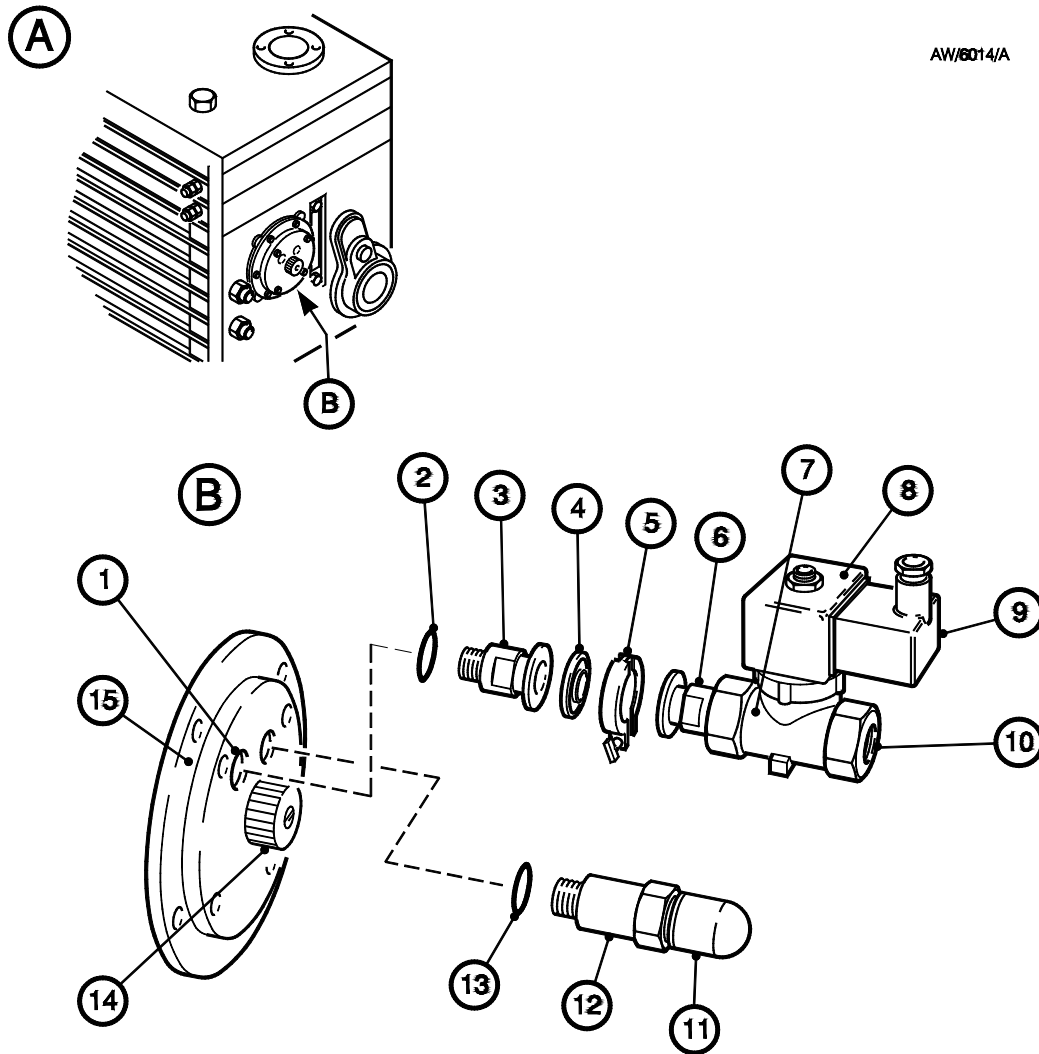
Refer to Figure 6, detail B. On E1M175 and E1M275 pumps, the gas ballast bearing plate (15) has a 1/4 inch BSP hole and a 3/8 inch BSP hole: both holes are open.

You can fit the EBV300S Valve assembly into the 3/8 inch BSP hole, and fit the filter/silencer (11) and adaptor (12) into the 1/4 inch BSP hole. You can then use the EBV Valve assembly to remotely switch on or switch off gas-ballast flow. Note that the E1M175 and E1M275 pumps are supplied with inlet valves fitted to provide vacuum system protection.

Use the following procedure to fit the EBV300S Valve:

1. Refer to Figure 6, detail B. Undo and remove the clamp (5) and centring-ring and 'O' ring (4) and remove the pump adaptor assembly (3) from the combined valve assembly (7) and coil assembly (8).
2. Apply a light wipe of pump oil or grease to the 'O' ring (2), fit the 'O' ring to the adaptor (3), then fit the adaptor to the 3/8 inch BSP hole (1) in the gas ballast bearing plate (15). Ensure that the adaptor is firmly tightened.
3. Ensure that the centring-ring and 'O' ring (4) is correctly in place, then fit the coupling flange (6) on the valve assembly (7) to the flange on the adaptor (3), and secure with the clamp (5).
4. Apply a light wipe of pump oil or grease to the 'O' ring (13), fit the 'O' ring to the adaptor (12), then screw the adaptor with the filter/silencer assembly (11) into the 1/4 inch BSP hole in the gas ballast bearing plate.
5. Ensure that the gas ballast knob (14) is in the fully open position: refer to the instruction manual supplied with your rotary pump.

Figure 6 - Fit an EBV300S Valve to an E1M175/275 pump



AW/6014/A

- A. Gas ballast port location
- B. Fit the EBV Valve

- | | | |
|-------------------------------|-----------------------------|-----------------------|
| 1. Gas ballast port (open) | 6. Coupling flange | 11. Filter/silencer |
| 2. 'O' ring | 7. Valve assembly | 12. Adaptor |
| 3. Adaptor | 8. Coil assembly | 13. 'O' ring |
| 4. Centring-ring and 'O' ring | 9. Electrical supply socket | 14. Gas ballast knob |
| 5. Clamp | 10. Valve inlet | 15. Gas ballast plate |

3.7 Connect a gas supply (if required)

Note: EBV20 Valves are supplied with the filter/silencer fitted to the valve assembly, as shown in Figure 1. On an EBV100S or EBV300S Valve, you must remove the filter/silencer (Figure 4 or 6, item 11) from the adaptor (Figure 4 or 6, item 12) if you want to fit the filter/silencer to the valve assembly.

On any of the EBV Valves, you can:

- Leave the valve assembly open to atmosphere (as shown in Figure 4).
- Fit the filter/silencer to the valve assembly (as shown in Figure 1).
- Connect a gas supply to the inlet of the coil assembly (Figure 4, item 9).

3.8 Connect the EBV Valve to the electrical supply

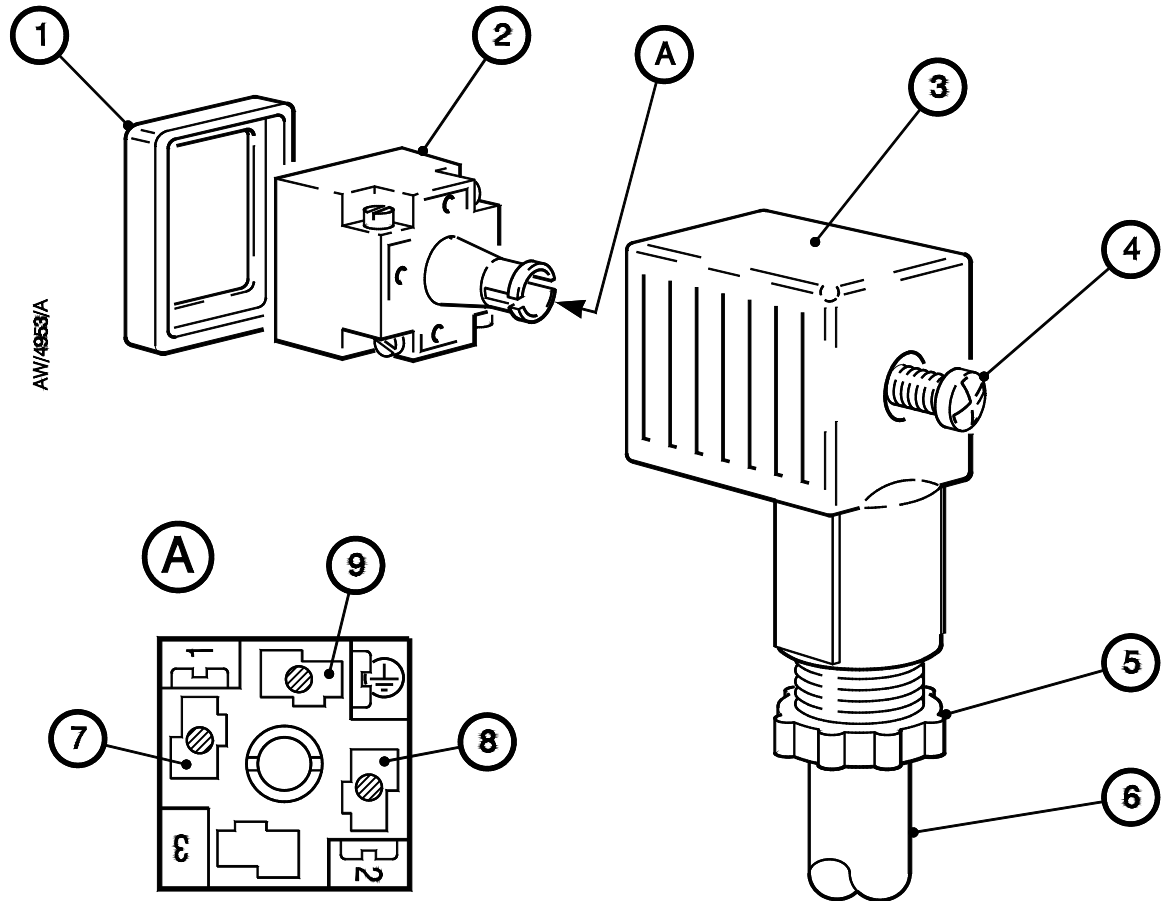


WARNING

Use a suitably rated cable, of a size to fit the cable-gland, to connect the EBV Valve to the electrical supply.

1. Refer to Figure 1 to 6, as appropriate. Remove the electrical supply socket from the valve coil.
2. Refer to Figure 7. Undo and remove the screw (4), remove the sealing gland (1), extract the connector block (2) and loosen the cable-gland strain relief nut (5).
3. Push your electrical supply cable through the cable-gland strain relief nut (5), then connect the wires in the cable to the connector block terminals as follows:
 - Connect the yellow/green earth (ground) wire to the earth (ground) terminal (9).
 - Connect the brown live wire to the live terminal (7).
 - Connect the blue neutral wire to the neutral terminal (8).
4. Refit the connector block (2) in the socket (3), then refit the sealing gland (1).
5. Refit the screw (4) through the connector block in the socket (3).
6. Tighten the cable-gland strain relief nut (5).
7. Refit the socket to the valve coil (Figure 1, item 10 or Figure 2, item 4), then tighten the screw (4).
8. Connect the electrical supply cable to a suitable fused external electrical supply.

Figure 7 - Connect the electrical supply to the EBV Valve



- | | |
|---|--|
| <ul style="list-style-type: none"> 1. Sealing-gland 2. Connector block 3. Electrical supply socket 4. Screw 5. Cable-gland strain-relief nut | <ul style="list-style-type: none"> 6. Electrical cable 7. Live terminal 8. Neutral terminal 9. Earth (ground) terminal |
|---|--|

Installation

4 Operation

CAUTION

Do not open the EBV Valve unless the pump is operating. Do not blank off the pump outlet.

Note: If you have connected a gas supply to the EBV Valve (see Section 3.7), ensure that the gas supply is switched on and off when necessary.

Operate the EBV Valve as follows:

- To switch on gas ballast flow to the pump (that is, to open the EBV Valve), switch on the electrical supply to the EBV Valve.
- To switch off gas ballast flow to the pump (that is, to close the EBV Valve), switch off the electrical supply to the EBV Valve.

5 Maintenance

5.1 Safety



WARNING

Obey the precautions given below. If you do not, you can cause injury to people and damage to equipment

- Do not use abrasive or reactive chemical substances to clean the EBV Valve. Do not use solvents to clean seals or 'O' rings.
- Safely dispose of all components which have been contaminated by dangerous process substances.
- Do not touch or inhale the thermal breakdown products of fluorinated materials which may be present if the EBV Valve has been overheated to 260 oC and above. These breakdown products are very dangerous. The 'O' rings used in the EBV Valve are made from fluorinated materials. The EBV Valve may have overheated if it has been misused, or if your vacuum system has malfunctioned, or if the EBV Valve has been in a fire. Edwards Material Safety Data Sheets for fluorinated materials used in the EBV Valve are available on request: contact your supplier or Edwards.

5.2 Maintenance operations

Do the following checks as appropriate when you maintain your rotary pump and vacuum system:

- Inspect the EBV Valve connections and check that they are tight. Tighten any loose connections.
- Inspect all electrical connections and check that they are tight. Tighten any loose connections. Inspect the electrical cable and check that it is not damaged or has overheated. Replace the cable if it is damaged or has overheated.
- Inspect all gas connections and check that they are tight. Tighten any loose connections.

6 Storage and Disposal

6.1 Storage

Place the EBV Valve in its protective packaging and store the valve in cool, dry conditions until required for use.

When required, prepare and install the EBV Valve as described in Section 3.

6.2 Disposal

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

Storage and Disposal

7 Service and Accessories

7.1 Introduction

Edwards products, spares and accessories are available from Edwards companies in Belgium, Brazil, China, France, Germany, Israel, Italy, Japan, Korea, Singapore, 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 the part

7.2 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.

7.3 Accessories

You will need an elbow accessory when you install an EBV20 on an E2M1.5 or RV pump fitted with an ITO, ITF, ITD or ITC20 inlet filter.

Accessory	Item Number
1/4 inch BSP M/F elbow	H035-18-141

Service and Accessories