

Instruction Manual

Electropneumatic Control Valves

Description	Item Number
3-port Control Valves	
24 V d.c.	H062-00-124
24 V a.c., 1-phase, 50 or 60 Hz	H062-00-125
110 V a.c., 1-phase, 50 or 60 Hz	H062-00-126
230 V a.c., 1-phase, 50 or 60 Hz	H062-00-138
5-port Control Valve Kits	
24 V a.c., 1-phase, 50 or 60 Hz	B287-03-030
110 V a.c., 1-phase, 50 or 60 Hz	B287-03-031
230 V a.c., 1-phase, 50 or 60 Hz	B287-03-032
24 V d.c.	B287-03-055

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Declaration of Conformity

We, Edwards,
Manor Royal,
Crawley,
West Sussex RH10 9LW, UK

declare under our sole responsibility that the product(s)

3-Port Electropneumatic Control Valves:

24 V d.c.	H062-00-124 *	24 V a.c., 50/60 Hz	H062-00-125 *
110 V a.c., 50/60 Hz	H062-00-126 †	230 V a.c., 50/50 Hz	H062-00-138 †

5-Port Electropneumatic Control Valve Kits:

24 V a.c., 50/60 Hz	B287-03-030 *	110 V a.c., 50/60 Hz	B287-03-031 ††
230 V a.c., 50/60 Hz	B287-03-032 ††	24 V d.c.	B287-03-055 *

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

- † EN60730-1:2000 Automatic Electrical Controls for Household and Similar Use
- Part 1: General Requirements.
Section 2.8 Electrically Operated Water Valves, including Mechanical
Requirements.
- †† EN61010-1: 2001 Safety Requirements for Electrical Equipment for Measurement, Control
and Laboratory Use. Part 1 - General Requirements.

when installed in accordance with the instruction manual supplied with the pump, following the
provisions of:

2006/95/EC Low Voltage Directive

* 2006/95/EC is not applicable to these control valves.

Mr L Marini, Technical Manager

Date and Place

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

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

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1 INTRODUCTION

1.1 Scope and definitions

This manual provides installation, operation and maintenance instructions for the Edwards Electropneumatic Control Valves. You must use the Control Valves as specified in this manual.

Read this manual before you install and operate the Edwards Control 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 following warning symbols appear on the Control Valves:



Warning - refer to accompanying documentation.



Warning - hot surfaces.

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

1.2 Product description

Use Electropneumatic Control Valves to control the operation of pneumatically-actuated vacuum valves in your vacuum system.

The Control Valves are available in 3-port and 5-port versions and with different electrical supply voltages and frequencies to suit your application.

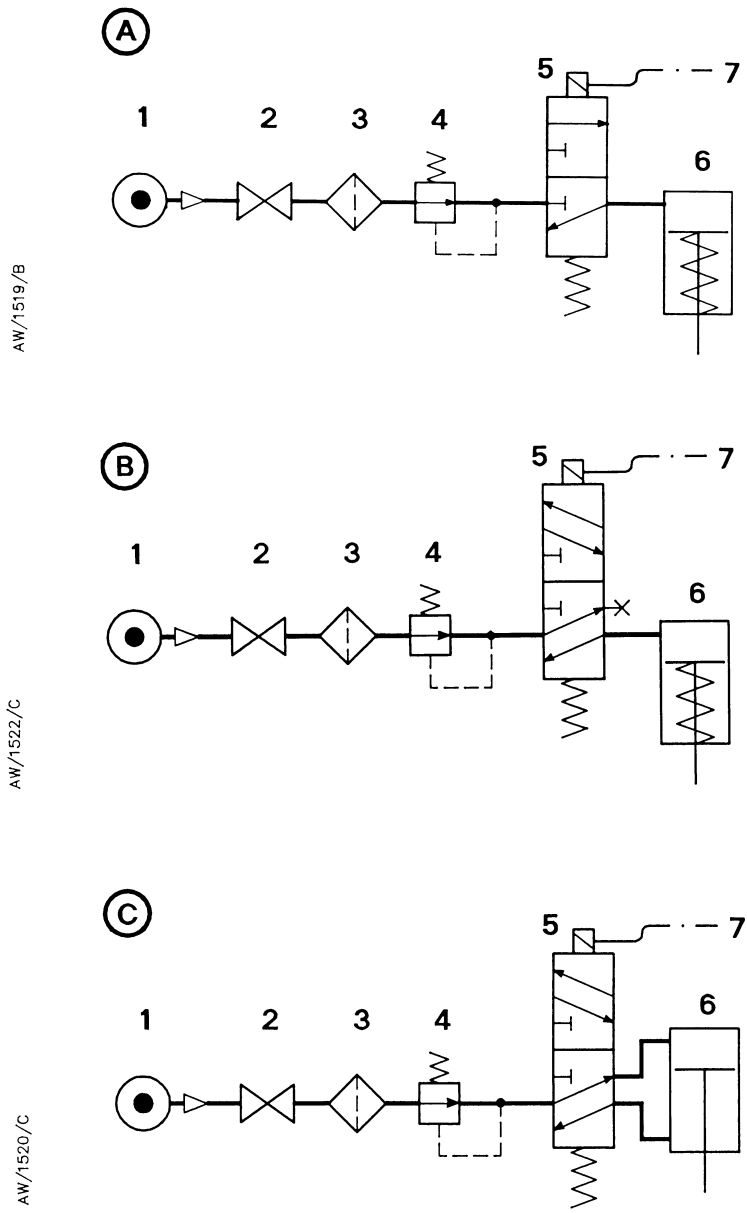
Select the Control Valve(s) you will need according to your electrical supply and the type of vacuum valve in your vacuum system, as shown in [Table 1](#).

Table 1 - Control valve configurations

Vacuum valve type	Edwards model	Recommended Control Valve configuration	Figure Number detail	Notes
Single-acting cylinder with spring return	PVPK Pipeline Valves	1 x 3-port 1 x 5-port kit	1, A 1, B	1 2
	QSB250 Quarter Swing Butterfly Valve	1 x 3-port 1 x 5-port kit	1, A 1, B	1 2
Double-acting cylinder with no spring return	GV Gate Valves	1 x 5-port kit	1, C	-
Double-acting cylinder with spring return to the mid-position (that is, isolated position)	BRV Backing/ Roughing Valve	2 x 5-port kits	2, A	3
		1 x 5-port kits	2, B	4, 5
Double-acting cylinder with no spring return	QSB63/100/160 Quarter Swing Butterfly Valves, Diffstak pump vacuum isolation-valves	1 x 5-port kit	2, B	5

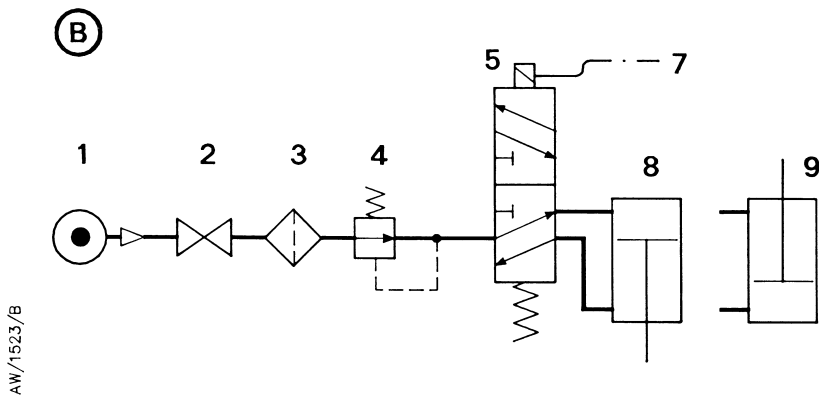
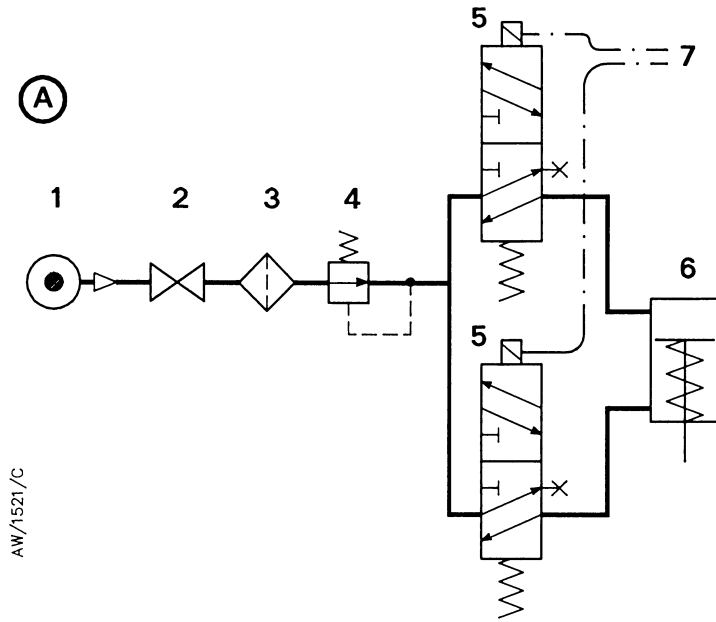
- Notes:**
1. The Control Valve can be installed directly on the vacuum valve.
 2. The Control Valve must be installed remote from the vacuum valve.
 3. This configuration allows the use of the 'isolated' position of the vacuum valve.
 4. This configuration only allows use of the 'roughing' and 'backing' positions of the vacuum valve.
 5. The flow of air from the exhaust port(s) can be used to identify the position of the vacuum valve.

Figure 1 - Pneumatic circuit diagrams: single 3-port and 5-port Control Valves



- | | | | |
|---|---|----|------------------------|
| A | 3-port Control Valve and PVPK or QSB250 valve | 1. | Compressed air supply |
| B | 5-port Control Valve and QSB250 valve | 2. | Shut-off valve |
| C | 5-port Control Valve and GV gate valve
(GV gate valve normally open) | 3. | Filter |
| | | 4. | Pressure regulator |
| | | 5. | Control Valve |
| | | 6. | Vacuum valve |
| | | 7. | Electrical connections |

Figure 2 - Pneumatic circuit diagrams: 2 x 5-port Control Valves



- A 2 x 5-port Control Valves and BRV valve
- B 5-port Control Valve and BRV, QSB valve or Diffstak inlet-isolation valve

- 1. Compressed air supply
- 2. Shut-off valve
- 3. Filter
- 4. Pressure regulator
- 5. Control Valve
- 6. Vacuum valve
- 7. Electrical connections
- 8. Vacuum valve (electrical fail to closed position, except for BRV valve)
- 9. Vacuum valve (electrical fail to open position, except for BRV valve)

2 TECHNICAL DATA

2.1 Electrical data

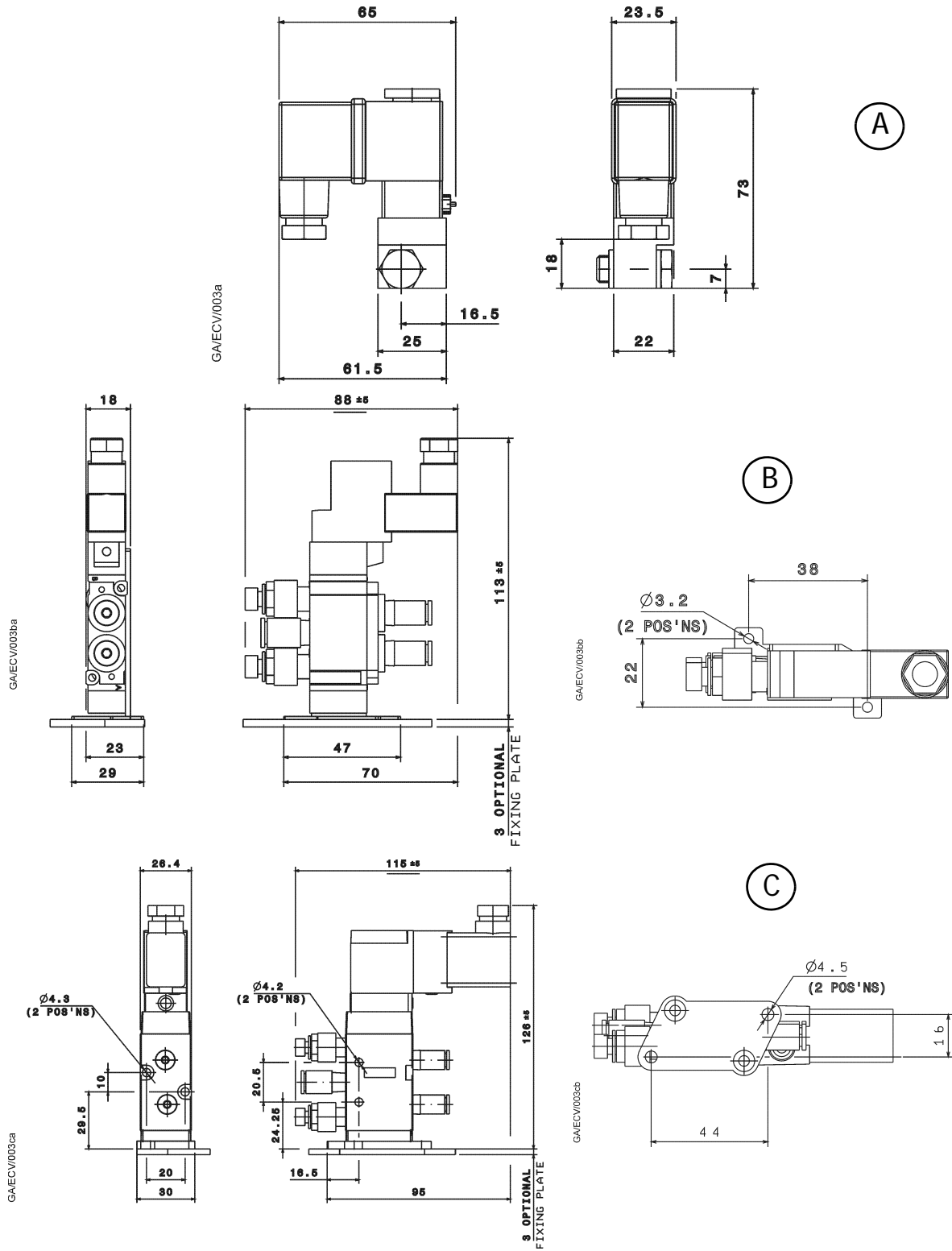
3-port Control Valve

Electrical supply voltage tolerance	-10 %, +15 %
Electrical supply	(Nominal power)
24 V d.c.	5.0 W
24 V a.c., 1-phase, 50 or 60 Hz	6.0 VA
110 V a.c., 1-phase, 50 or 60 Hz	5.3 VA
230 V a.c., 1-phase, 50 or 60 Hz	7.5 VA

5-port Control Valve kits

Electrical supply voltage tolerance	-10 %, +10 %
VA holding	(Nominal power)
24 V d.c.	0.6 W
24 V a.c., 1-phase, 50 or 60 Hz	0.5 VA
110 V a.c., 1-phase, 50 or 60 Hz	1.1 VA
230 V a.c., 1-phase, 50 or 60 Hz	5.6 VA

Figure 3 - Dimensions of 3-port and 5-port Control Valves (mm)



- A 3-port Control Valve
- B 5-port Control Valve 24 V d.c., 24 V a.c., 110 V a.c
- C 5-port Control Valve 230 V

2.2 Mechanical data

Table 2 - Mechanical data

	Control Valve	
	3-port	5-port
Approximate mass (kg)	0.14	0.17 *
** Operating ambient temperature range (°C)	-10 to 50	-10 to 50
Pneumatic supply pressure range (barg)	0 to 8	1.5 to 7
Maximum cycles.min-1	600	300
Inlet port size	1/8 inch BSP female	Ø 6 mm push fitting
Outlet port size	1/8 inch BSP male	Ø4 mm push fitting
Cable diameter	6 - 8 mm	3.5 - 7 mm ***

* 230 V 5-port kit has mass of 0.25 kg

** Edwards recommends the use of dry air at low temperatures to prevent bedewing

*** 6 - 8 mm on 230 V valve kit.

3 INSTALLATION



WARNING

Electropneumatic valves should not be used in applications where in the event of a valve failure, injury could be caused to people or damage could be caused to equipment.



WARNING

Compressed air can be dangerous. Ensure that you control the release of compressed air when you connect or disconnect the pneumatic supply. If you do not, the sudden release of high-pressure air may cause injury.



WARNING

When an electropneumatic Control Valve changes state, compressed air can be released from the exhaust ports. You must ensure that such a release of compressed air will not cause injury to people or damage to equipment.



WARNING

The surface temperature of electropneumatic Control Valves can reach temperatures above 70 °C.

3.1 Unpack and Inspect

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

If you have a 5-port Control Valve, check that you have received the items listed in [Table 3](#). If any item is missing, notify your supplier in writing within three days.

If the Control Valve is not to be used immediately, replace the protective covers. Store the Control Valve in suitable conditions as described in [Section 5.1](#).

Table 3 - Checklist of items for the 5-port Control Valve kits

Quantity	Description	Check (✓)
1	Control Valve	<input type="checkbox"/>
2	Pneumatic fittings	<input type="checkbox"/>
1	Plug	<input type="checkbox"/>
1	Fitting-plate	<input type="checkbox"/>
2	Screws	<input type="checkbox"/>
1	1 m length of Ø 4 mm nylon tube	<input type="checkbox"/>

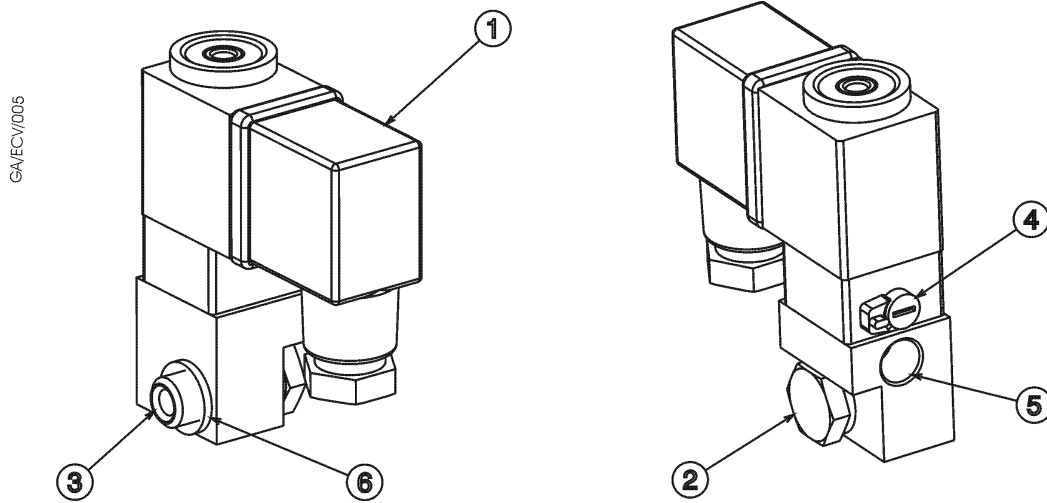
3.2 Fit the 3-port Control Valve

Fit the 3-port Control Valve directly to a pneumatic inlet-port by the threaded vacuum valve connector on the Control Valve ([Figure 4](#), item 3). [Figure 1](#) detail A shows the pneumatic circuit for the use of the 3-port Control Valve.

Refer to [Figure 4](#) and use the procedure below to fit the 3-port Control Valve to a PVPK valve. Refer to the instruction manual supplied with the PVPK valve for an illustration of the Control Valve fitted to the PVPK valve.

1. Make sure that the nylon washer (6) is correctly located on the Control Valve.
2. Place the threaded pneumatic supply port (3) in the inlet-port of the PVPK valve.
3. Tighten the bolt (2) to secure the Control Valve in place.
4. Use suitable fittings and pipe or tube to connect the pneumatic supply to the supply port (5).
5. Ensure that the manual override (4) is in the off position, that is, is in the '0' position, at right-angles to the body of the valve.

Figure 4 - Components of the 3-port Control Valve



- | | |
|---------------------------|--------------------------|
| 1. Electrical connector | 4. Manual override |
| 2. Bolt | 5. Pneumatic supply port |
| 3. Vacuum valve connector | 6. Nylon washer |

3.3 Fit the 5-port Control Valve kit



WARNING

Do not dismantle the electrical actuator mechanism on the 5-port valve. The valve contains no user serviceable parts and hazardous voltages may exist within the unit.

To fit the Control Valve directly onto a GV gate valve (as shown in [Figure 5](#)):

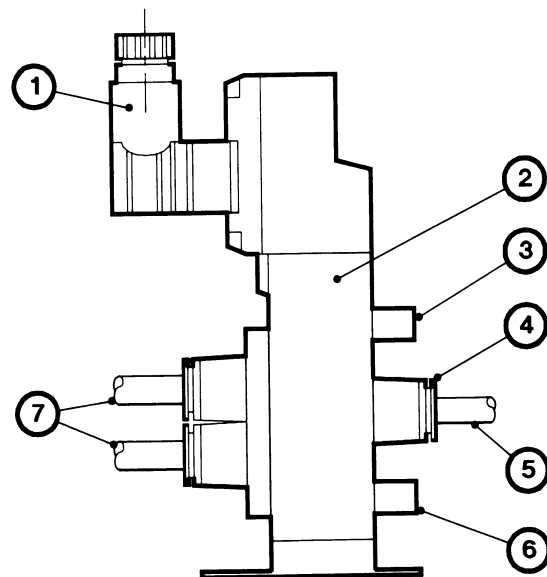
1. Use the screws supplied to secure the fitting-plate (9) to the base of the Control Valve (7).
2. Secure the fitting-plate (9) to the GV gate valve (1); if necessary, refer to the instruction manual supplied with the gate valve.

Alternatively, use suitable screws through the fixing-holes on the base of the Control Valve to secure the Control Valve to your system.

Make the pneumatic connections as follows:

1. If necessary, screw the pneumatic fittings supplied into the ports on the vacuum valve.
2. Cut two suitable lengths of the 4 mm diameter tube supplied to make two outlet pneumatic pipes, and fit them to the pneumatic fittings on the vacuum valve and to the outlet ports on the Control Valve. Refer to [Section 1.2](#) and to [Figure 1](#) to select the best pneumatic circuit for your application.
3. If you fit the Control Valve to a QSB250 valve, you must blank off one of the Control Valve ports (refer to [Figure 1](#) detail B for the pneumatic circuit diagram); a blanking-plug is supplied with the 5-port Control Valve kit to place in one of the adaptors fitted to the ports.
4. Use a suitable length of 6 mm diameter tube (not supplied) to make an inlet pneumatic pipe, and fit the pipe to your compressed air supply and to the inlet port on the Control Valve.

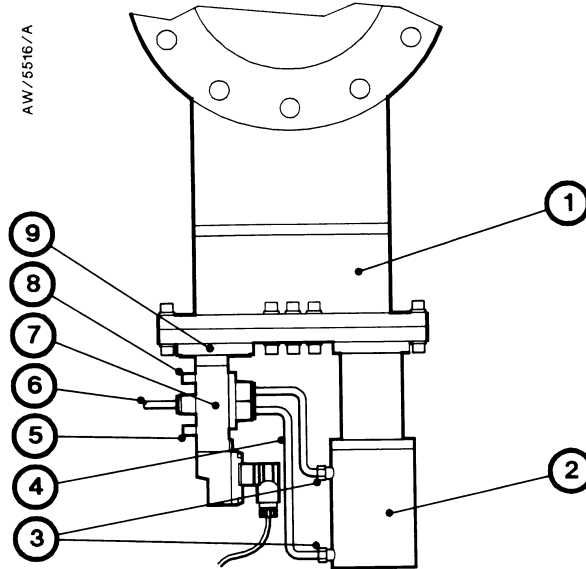
Figure 5 - Components of the 5-port Control Valve



AW/6515/A

- | | |
|-------------------------|------------------------------|
| 1. Electrical connector | 5. Inlet pneumatic pipe |
| 2. Control Valve | 6. Exhaust flow-controller B |
| 3. flow-controller A | 7. Outlet pneumatic pipes |
| 4. Inlet port | |

Figure 6 - 5-port Control Valve fitted to GV gate valve



- | | |
|----------------------------------|------------------------------|
| 1. Gate valve | 6. Inlet pneumatic pipe |
| 2. Gate valve pneumatic actuator | 7. Control Valve |
| 3. Pneumatic fittings | 8. Exhaust flow-controller B |
| 4. Pneumatic outlet pipes | 9. Fitting-plate |
| 5. Exhaust flow-controller A | |

3.4 Electrical connections

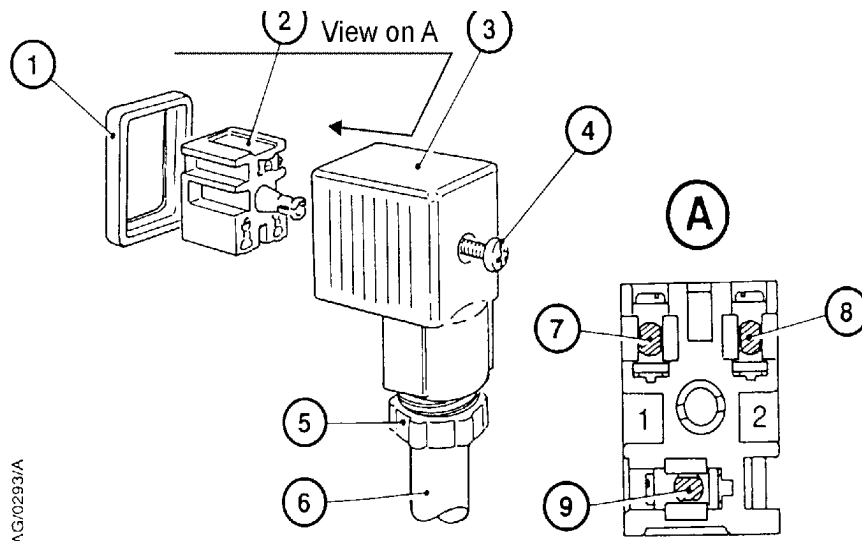


WARNING

Ensure that the electrical installation of the Control Valve conforms with your local and national safety requirements. It must be connected to a suitably fused and protected electrical supply and a suitable earth point.

1. Check that the electrical supply corresponds with the voltage stated on the Control Valve.
2. Refer to Figures 7 and 8. Undo the screw (4) and remove the electrical supply socket (3) from the Control Valve. Remove the sealing-gland (1) and prise out the connector block (2).
3. Loosen the strain-relief nut and pass the electrical supply cable through the nut and into the socket.
4. Connect the electrical supply cable to the connector block (2) as shown in Figures 7 and 8 detail A.
5. Push the connector block back into the socket; ensure that it is orientated correctly so that the sockets mate with the corresponding pins on the Control Valve.
6. Gently pull on the cable to ensure that the cable is trapped inside the connector. Tighten the strain-relief nut.
7. Refit the sealing-gland over the socket and push the socket onto the three connector pins on the Control Valve.
8. Refit the retaining screw and tighten until there is a slight compression of the sealing-gland.

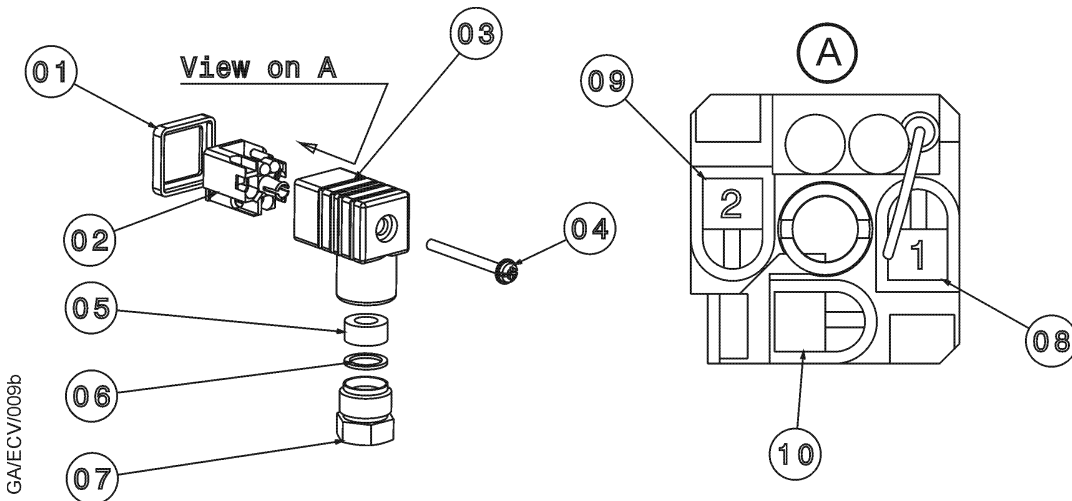
Figure 7 - Electrical supply socket - 3-Port Control Valve



AG/0293/A

- | | |
|-----------------------------|---------------------|
| 1. Sealing-gland | 6. Electrical cable |
| 2. Connector block | 7. Live |
| 3. Electrical supply socket | 8. Neutral |
| 4. Screw | 9. Earth (ground) |
| 5. Strain-relief nut | |

Figure 8 - Electrical supply socket - 5-Port valve kit *



GA/ECV/009b

- | | |
|-----------------------------|----------------------|
| 1. Sealing-gland | 6. Washer |
| 2. Connector block | 7. Strain relief nut |
| 3. Electrical supply socket | 8. Live |
| 4. Screw | 9. Neutral |
| 5. Sealing-gland | 10. Earth (ground) |

* For 230 V 5-Port valve kit refer to [Figure 7](#).

3.5 Adjust the 5-port Control Valve (if necessary)

CAUTION

You must correctly set the opening and closing times of the gate valve. If you do not, you can damage the gate valve.

Note: The ISO200, ISO250 and ISO320 gate valves are spring assisted when they close. To adjust the Control Valve to operate one of these valves, set the opening time first and then check the closing time.

If you have fitted a 5-port Control Valve to a GV Gate Valve, use the following procedure to adjust the opening and closing times of the gate valve. Refer to [Figure 6](#).

1. Operate the Control Valve to actuate the gate valve; use a stopwatch to measure the opening and closing times of the gate valve.
2. Adjust exhaust flow-controllers (5,8) to set the opening time and closing times; the times must not be less than the values shown in [Table 4](#):
 - Turn a flow-controller clockwise to increase the opening/closing time;
 - Turn a flow-controller anticlockwise to decrease the opening/closing time.

Table 4 - Opening and closing times of the gate valve

Gate valve size	Opening time(s)	Closing time(s)
NW40	0.5	0.5
NW50	0.5	0.5
ISO63	1.0	1.5
ISO100	1.5	1.5
ISO160	1.5	1.5
ISO200	3.0	3.0
ISO250	4.0	4.0
ISO320	4.0	4.0

4 MAINTENANCE

The Control Valves contain no parts which you can service.

To maintain the Control Valves in normal use, do the following checks when you maintain the components of your vacuum system:

- Check that the pneumatic connections are secure
- Check that the pneumatic pipelines are not damaged
- Check that the electrical connections are secure
- Check that the electrical cables are not damaged.

5 STORAGE AND DISPOSAL

5.1 Storage

Place protective covers over the ports of the Control Valve and store in cool, dry conditions.

When required for use, install the Control Valve as described in [Section 3](#).

5.2 Disposal

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