Operating and Maintenance Handbook

ELASTOMER VALVES

REVISION HISTORY

REVISION	DATE	COMMENTS	INITIALS
1	July 1994	Original release	MJD
2	Aug 2015	VACGEN rebrand	AJL

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WARRANTY

1. Subject to fair wear and tear and the due, observance of any installation user, storage, operating or maintenance instructions the Seller undertakes to replace or, at its option repair free of charge to the purchaser, any goods which the purchaser can establish are defective by reason of defective workmanship or materials which are returned to the Seller, carriage paid, within 12 months of the date of dispatch by the Seller. In the event, however, that the Seller supplies spare parts either direct, or that are fitted or installed or replaced by the Sellers' service center such spare parts will be subject to a warranty period of six months only.
2. The Purchaser cannot return any product for warranty repair without the prior approval of VACGEN and the issue of a Goods Return Number (GRN). This shall be obtained by contacting the service center at VACGEN. All returned products must be accompanied by a completed Declaration of Contamination form. Customers must, in the first instance, contact the local selling agent.
3. We reserve the right to decline to service equipment, we consider is in any way hazardous until a clearance or safety certificate, in a form satisfactory to VACGEN, has been completed and returned by the customer.

REPAIR

The following additional terms and conditions apply in the event that the customer, elects to use the services of VACGEN workshop on a chargeable basis.

1. At its own cost the customer shall dispatch the equipment to the workshop, carriage paid, suitably packaged, protected and insured, bearing, a Goods Return Number (GRN) and a completed Declaration of Contamination certificate obtained from VACGEN in advance of shipment.
2. During the period that the equipment is on VACGEN premises, VACGEN will insure the equipment against all risks.
3. Vacuum Generator will provide an acknowledgement of the receipt together with an estimate of the repair charges. Such estimates are carried out on a visual basis and are therefore intended as a guide only. Formal fixed price repair quotations are available and involve the disassembly of the equipment to determine the full extent of
the work necessary to restore the equipment to an acceptable standard. In the event that the customer chooses not to proceed with the repair VACGEN will make a charge to cover this examination effort.

Note:
The above are extracts from VACGEN Conditions of sale. Complete copies can be obtained from: VACGEN, Maunsell Road, Castleham Industrial Estate, St. Leonards on Sea, East Sussex, TN38 9NN, United Kingdom.

1.0 Introduction

These Operating Instructions provide information on the VACGEN range of manual and pneumatic elastomer-sealed right-angled valves. The basic elements of these valves are illustrated in figure 1.

The GH Series are primarily gas handling valves which have Viton* face and bonnet seals fitted as standard. The GH valves have, a non-rising stem.

The VR (Viton*) and KR (Kalrez*) manual valves have elastomer face seal and welded bonnet seals. To service the face seal the valve must be removed from the system. The rising stem gives a visual indication of open and closed positions.

The VRD (Viton*) and KRD (Kalrez*) manual valves have elastomer face seals and OFHC copper bonnet seals. The bonnet seal is demountable so that the face seal can be accessed and changed with the valve body in situ. These valves also have a rising stem.

VRDP, KRDP and KRKP are pneumatic versions of the demountable bonnet-sealed valves. The actuator is spring closed to shut off in the event of air failure.

VRDP valve face and pneumatic seals are Viton*. KRDP valves have Kalrez* face seals and Viton* pneumatic seals. KRKP valve face and pneumatic seals are Kalrez*. An optional microswitch position indicating kit can be fitted to the pneumatic valves.

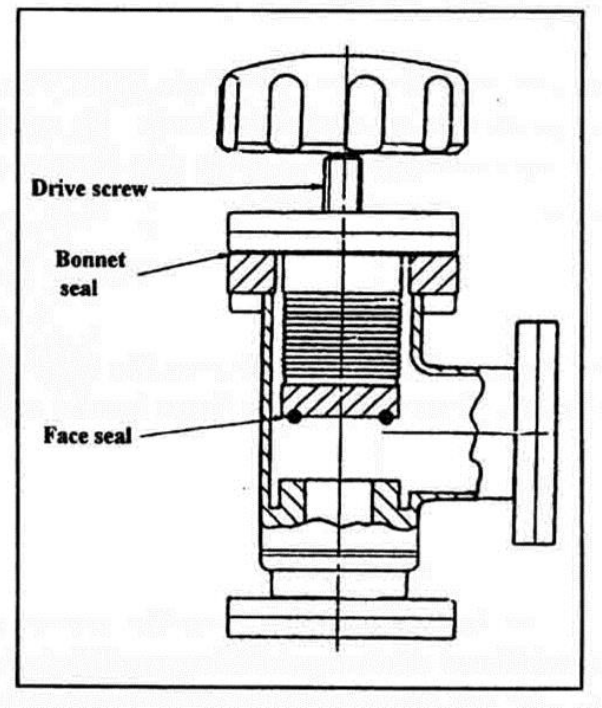

Figure 1- Manual valve

*Viton and Kalrez are trade names of the DuPont organisation.

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2.0 General Specifications

Actuator	Valve Type	Bake out Temp Open	Bakeout Temp Closed	Service Life (cycles)
Manual GH		140 °C	140 °C	10,000
	VR/VRD	200 °C	150 °C	100,000
	KP/KRD	250 °C	200 °C	100,000
Pneumatic				
	VRDP/KRDP	140 °C	150 °C	100,000
	KRKP	200 °C	200 °C	100,000

Pressure range : UHV to 4 bar
Leak rate less than 10^{-9} mbar ls^{-1}

Note.. When baking above 140°C the handwheel of the VR (D) and KR (D) valves should be removed (by simply pulling it off the drive nut).

3.0 Manual Valves Operation and Maintenance

The operation of the manual valve is simple and needs no special explanations. Avoid over tightening as this may damage the elastomer seal.

These valves should need no maintenance other than to periodically check leak tightness (depending upon process gases and bakeout conditions). In extreme cases the drive screw may need re-lubrication. If re-lubrication is necessary first clean the threads with a wire brush and then apply thread lubricant (part code ZTL).

3.1 GH Series

The seals of the GH valve are accessed by first opening the valve and then unscrewing the top flange from the threaded body. This exposes the Viton bonnet and face seals, which may be replaced.

3.2 VR and KR Series

The VR and KR valves must first be removed from the system since the movement is not demountable. The central M5 nut retaining the O-ring carrier is best removed from the axial port with the valve closed. A tool is provided for this. The valve can then be opened and the ring and its carrier withdrawn from the side port. Note: for this reason the side port must not be restricted to less than 35mm diameter. When refitting, always have the valve shut for final tightening of the nut.

3.3 VRD and KRD Series

The seals of the VRD or KRD valves are accessed by first opening the valve and then removing the upper flange bolts to demount the movement (or actuator), Use new copper gaskets when reassembling.

Note: When dismantling the valves always protect the knife edges of the bonnet seal and clean thoroughly before re-assembly. Use new copper gaskets. Pneumatic valves are spring closed. When removing any O-ring seal, use a tool which will not scratch the seal groove.

4.0 Pneumatic Valves

4.1 Installation

The pneumatic single acting cylinder (see Figure 2) fully opens the valve at a minimum pressure of 3 bar (45 psi). A flow restrictor is recommended on the inlet to prevent shock loads when opening from a high pressure supply. The valve is spring closed and may create a vibration on closure. Should this be a problem with sensitive equipment, fit a flow restrictor to the control valve exhaust, but ensure that this restriction is not enough to prevent closure. A normally closed solenoid actuated spool valve will ensure that the valve will close in the event of electrical or air failure.

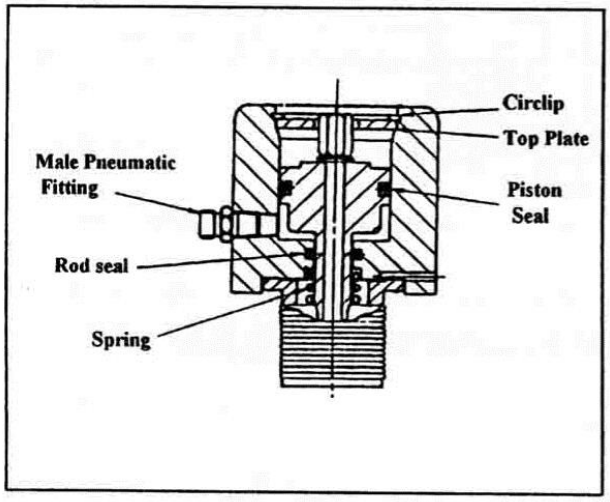

Figure 2 - Pneumatic actuator

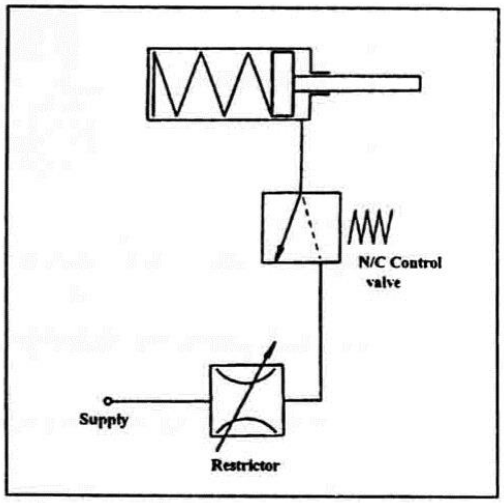

Figure 3 - Typical pneumatic system

Figure 3 shows a typical arrangement. If the valve is to be baked provision needs to be made for the pneumatic fittings (these should he situated outside the bakeout zone) and for the air line lubrication. These valves can run on dry air.

All pneumatic valves are provided with a 1/8” BSP tapping.

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4.2 Operation

The pneumatic valves are designed for high endurance, low maintenance situations and will normally perform well throughout the stated life. Some applications will be more demanding than others, however, and it is advisable to make routine inspections of the pneumatics (by checking the pressure required to fully open the valve) and of the face seal (by leak checking). The frequency of inspections will depend on individual situations where factors such as bakeout temperature and duration process gas composition and critical safety will need to be considered.

Should it be found that any seal needs attention, the valve is easily dismantled.

When baking the valve, remove the microswitches (where fitted) and any non-bakeable pneumatic component or fitting (unless these can be situated outside the bakeout zone and adequately cooled).

5.0 Fitting the Micro switch Kit to Pneumatic Valves

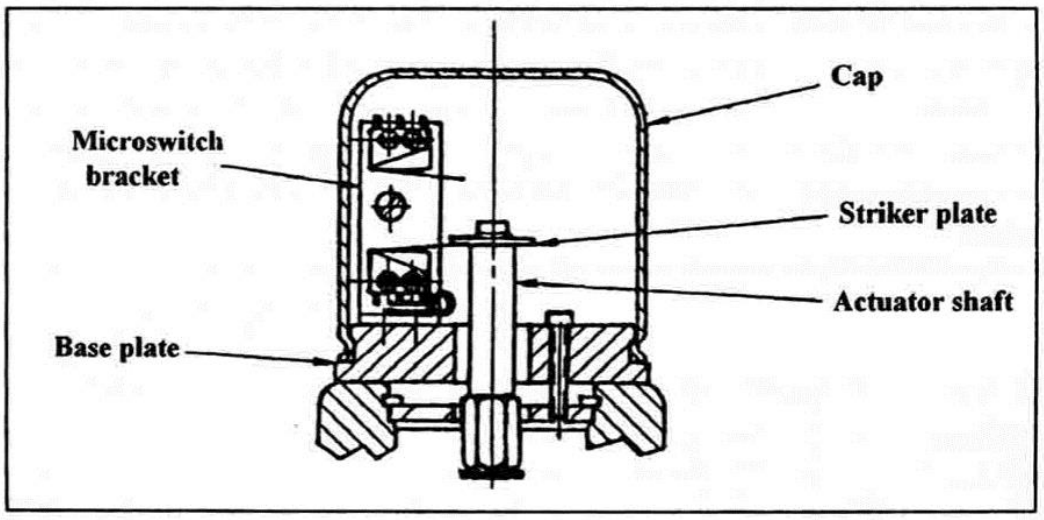

Figure 4 – Micro switch assembly

1. With the valve in the closed position, remove the circlip and top plate.

2. Screw the actuator shaft in position.

3. Fit the new top plate and secure in position with the original circlip.

4. Fit the base plate using the three M3 screws.

5. Wire the micro switches as required, using the 'P' clip to clamp the cable in position and to provide strain relief.

6. Fit the bracket and striker disc. Adjust the position of the closed micro switch first and then the open micro switch.

Caution: Increase pressure gently to prevent a snap opening.

7. Fit the outer cap.

6.0 Dismantling the Pneumatic Actuator

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1. Detach the air line and micro switch assembly (where fitted). Remove the pneumatic actuator from valve body. Note: this assembly is under spring pressure.

2. Remove the circlip and top plate from the cylinder to access the top of the pneumatic piston.

3. Use a spanner to unscrew the nut whilst preventing the stem from turning with a screwdriver in the slotted shaft tip,

4. Remove the bellows assembly and push the piston out through the top of the housing.
The O-ring seals may be prised carefully from the piston and bore of the housing.

7.0 Spares and Accessories

7.1 GH Series

Order Code	Description
ZGH714VS	Replacement Face and Bonnet Seats
ZGH714MM	Manual Movement Assembly (quote serial number)

7.2 VR and KR Series

Order code	Description
ZVR40VS	Viton Face Seal for VR40
ZVR60VS	Viton Face seal for VR60
ZKR40KS	Kalrez Face Scat for KR40
ZKR60KS	Kalrez Face Seal for KR60

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7.3 VRD and KRD Series

Order code	Description
ZVR40VS	Viton Face Seal for VRD40
ZVR60V8	Viton Face seal for VRD60
ZKR40KS	Kalrez Face Seal for KRD40
ZKR60KS	Kalrez Face Seal for KRD60
ZCU38	Copper Bonnet Gasket for VRD40 or KRD40 (10)
ZCU64	Copper Bonnet Gasket for VRD60 or KRD60 (10)
ZVIT38	Viton Bonnet Gasket for VRD40 or KRD40 (2)
ZVIT64	Viton Bonnet Gasket for VRD60 or KRD60 (2)

Note.. Bakeout temperature is 140^{o}C maximum if Viton bonnet seals are fitted

ZVRD40MA	Manual Movement Assembly for VRD40 or KRD40
ZVRD60MA	Manual Movement Assembly for VRD60 or KRD60

7.4 VRDP, KRDP and KRKP Series

Order Code	Description
ZVR40V8	Viton Face Scat for VRDP40
ZVR60V8	Viton Face seal for VRDP60
ZKR40KS	Kalrez Face Seal for KRDP40 or KRKP40
ZKR60KS	Kalrez Face Seal for KRDP60 or KRKP60
ZVR40VPS	Viton Pneumatic Seal for VRDP40 or KRDP40
ZVR60VPS	Viton Pneumatic Seal for VRDP60 or KRDP60
ZVR40KPS	Kalrez Pneumatic Seal for KRKP40
ZVR60KPS	Kalrez Pneumatic Seal for KRKP60
ZVRDP40MA	Pneumatic Actuator for VRDP40 or KRDP40
ZVRDP60MA	Pneumatic Actuator for VRDP60 or KRDP60
ZVRMS40	Microswitch kit for 40-type Valves
ZVRMS60	Microswitch Kit for 60-type Valves
ZTL	Thread Lubricant

Service and Repair Form

Declaration of Contamination of Equipment and Components
Serving and repairs will only be carried out if the conditions for Servicing and Repair are complied with in full, according to the VACGEN Ltd. Conditions of Sale. A summary of these requirements are included on the inside front cover of the Operating Instructions. The manufacturer will refuse to accept any equipment without a signed declaration attached to the OUTSIDE of the packaging. This declaration can only be completed and signed by authorized and qualified staff.

1 Description of Equipment and Components

Equipment Type……Model Number……
Serial Number…… Your Reference Number……

2 Reasons for return……
……
……
……
……
……

3 Condition of Equipment

YES ( ) NO ( ) Toxic?
YES ( ) NO ( ) Explosive?
YES ( ) NO ( ) Radioactive?
YES ( ) NO ( ) Corrosive?
YES ( ) NO ( ) Biological Hazard?
YES ( ) NO ( ) Other Harmful Substances?

Equipment and Components that have been contaminated, WILL NOT be accepted without written evidence of decontamination.

5 Contamination Materials

List all the substances, gases and by-products that may have come in contact with the equipment, giving trade name, manufacture, chemicals names or symbols.
Please note that any of these listed, must be completely removed, so it is safe to handle and weld, without giving off health threatening gases. Please enter details below and/or attach data sheets
……
……
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6 Legally Binding Declaration

I hereby declare that the information supplied on this form is complete and accurate.
There by stating that the goods offer no risk to health or safety
Organisation…… Name……
Country…… Job Title……
Post/ZIP code…… Telephone……
Email……
Signature…… Date……

Return goods to: Address at top
Phone: (0) 1424 851291 Fax (0) 1424 851489 (Form VGF33)