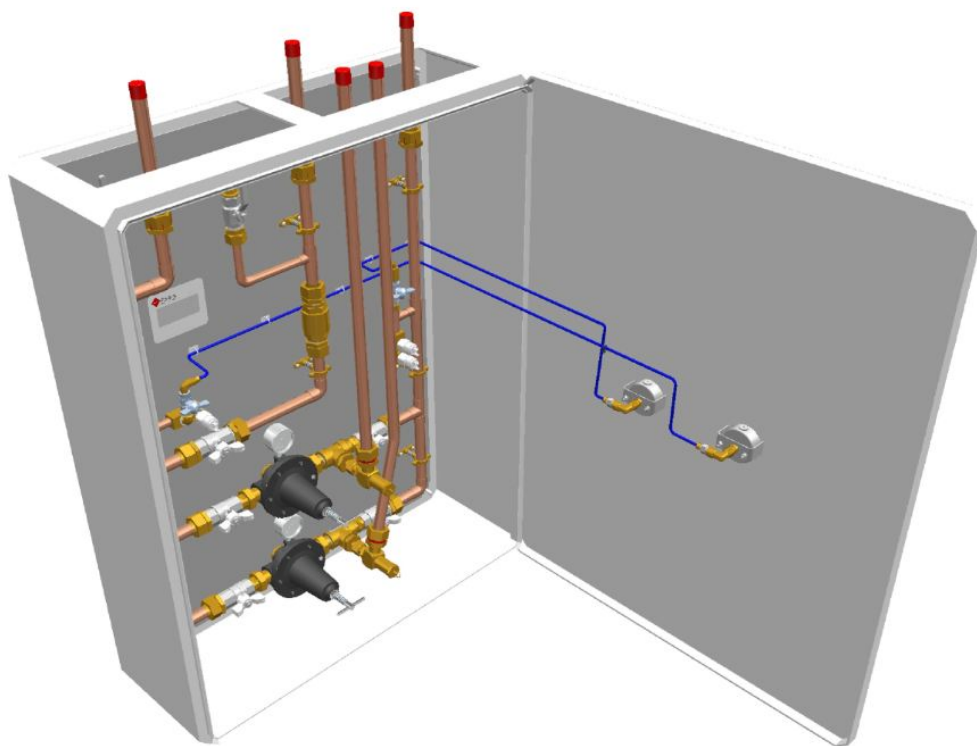


Vacuum Insulated Evaporator (VIE) Control Panel

Installation, Operation and Maintenance Manual



Published by Pneumatech Medical Gas Solutions.

All possible care has been taken in the preparation of this publication, but Pneumatech Medical Gas Solutions accepts no liability for any inaccuracies that may be found.

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Important

Personnel must make themselves familiar with the contents of this manual and the function of the unit before installing, operating or maintaining any Vacuum Insulated Evaporated (VIE) Control Panel.

Information contained in this manual is correct at the date of publication. The policy of Pneumatech Medical Gas Solutions is one of continuous product improvement. Pneumatech Medical Gas Solutions reserves the right to make changes that may affect instructions in this manual without prior notice.

For any enquiry regarding the servicing or repair of this device, contact the nearest accredited Pneumatech Medical Gas Solutions agent, or communicate directly with:



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Any complaints about the products or services provided by Pneumatech Medical Gas Solutions, please give as much of the following information as possible:

- Product Part Number
- Lot/ Batch Number
- Approximate date of purchase
- Apparent fault.

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Issue Record

Issue No.	Reason for Change	Pages affected	Date
1	Rebranding	All	October 2015

Introduction

This manual contains information needed to install, operate and maintain the Pneumatech Medical Gas Solutions (Pneumatech MGS) Vacuum Insulator Evaporator (VIE) Control Panel.

The contents of this manual are intended to be read and used by suitably qualified personnel.

WARNINGS, CAUTIONS and NOTES

The following Warnings, Cautions, and Notes must be read and understood before using the Vacuum Insulator Evaporator (VIE) Control Panel.

Warnings!

Warnings tell you about dangerous conditions that could lead to death or serious injury to the user that can occur if you do not obey all of the instructions in this manual.

- **Read through this entire instruction manual before using or showing others how to use this equipment. As with all medical equipment, attempting to use this device without a thorough understanding of its operation may result in patient or user injury.**
- **Do not attempt to modify this device in any way not strictly described within this manual.**
- **Vacuum Insulated Evaporator (VIE) Control Panels must be protected from access by unauthorised personnel.**
- **Risk of fire or explosion: Do not lubricate this product with oil or grease. Safe and compatible lubricants can be obtained from Pneumatech Medical Gas Solutions if necessary.**
- **Do not use this product if it is damaged in any way or if there is evidence of contamination internally or on any of gas wetted connections (e.g. debris, particles, oil, lubricant or grease).**
- **Keep all components dry and clean during storage and installation.**
- **Pneumatech Medical Gas Solutions vacuum plant can be safely handled and stored under normal working and environmental conditions.**
- **Adverse environmental conditions and harsh abrasives or chemicals may cause damage to the unit.**
- **Install the system as directed by the site engineer, for the optimum position. Check that the specified pressure safety valves, non-return valves and line valves have been fitted and verify the valves are certified to operate in accordance with the contract specification and conform to BS 6759: part 2 1984.**

Cautions!

Cautions tell you about dangerous conditions that can occur and cause damage to the equipment if you do not obey all of the instructions in this manual.

- **Use of sub-standard or inappropriate parts and materials may damage the product and invalidate the warranty. Only use genuine Pneumatech Medical Gas Solutions spare parts.**
- **Always open valves slowly.**
- **Be careful not to over-torque face seal fittings.**
- **Only use leak detection fluids that are compatible with the materials being tested.**
- **Always wash leak detection fluids off with clean water immediately after use.**

Notes:

- All information, specifications and illustrations within this manual are those in effect at the time of printing.
- The manufacturer reserves the right to change or make improvements without notice and without incurring any obligation to make changes or add improvements to products previously provided.
- Due regard must be paid to the safety of personnel. Testing should not create a hazard, particular attention being given to foreign matter located in discharge outlets.
- Take care when brazing into the gas pipeline, to prevent damage to the regulator due to heat transfer.
- Pneumatech Medical Gas Solutions will not accept responsibility for damage caused during installation.
- It is possible to test the correct lift pressure of the regulator output safety valve by isolating ONLY the output of the standby line pressure regulator (clockwise to increase pressure).
- Pressure regulators are supplied Oxygen clean. If necessary, only Oxygen safe lubricants should be used. Contact the Pneumatech Medical Gas Solutions Service Department for further information.
- Failure through misuse or abuse is usually not repairable, and is not covered by the manufacturer's warranty.

Abbreviations used

The following abbreviations are used in this manual:

Abbreviation	Full name
MGS	Medical Gas Solutions
VIE	Vacuum Insulator Evaporator
GMDN	Global Medical Device Nomenclature
EC MDD	European Commission Medical Devices Directive
GHTF	Global Harmonization Task Force
°C	Degrees Centigrade
R.H.	Degrees Centigrade
kPa	kilopascal
IP4X	Ingress Protection standard
l/min	Litres per minute

Scope of this manual

This manual describes the Operation Service, Repair and Testing of the Pneumatech MGS Vacuum Insulator Evaporator (VIE) Control Panel.

Pneumatech Medical Gas Solutions service contact

In the event of any queries or problems that cannot be resolved using information in this manual, please call:

+44 (0) 1235 463051

Quote if possible, the:

- Product part number
- Lot/ Batch number
- Approximate date of purchase
- Apparent fault

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Storage

All products are separately packaged and stored in under controlled conditions. Adverse environmental conditions and harsh abrasives or chemicals may cause damage.

Identification

Pneumatech Medical Gas Solutions VIE control panels can be identified by the label fixed to the metal backplate and is visible through the cover window.

1 Description

The Pneumatech MGS Vacuum Insulated Evaporator (VIE) Control Panel is intended to supply oxygen pipeline installations complying with UK DoH Health Technical Memorandum No. 2022 or 02-01, ISO 7396-1, NFPA 99, AS 2986 or similar guidelines or standards

Pneumatech MGS Vacuum Insulated Evaporator (VIE) Control Panels are available in a duplex configuration, with one 'Standby' and one 'Duty' regulator set. The Pneumatech MGS VIE control panel is designed to accept a supply of gaseous oxygen from the VIE at 10.5 bar or from the standby manifold at 850 kPa (8.5 bar) and to reduce this to a nominal 420 kPa (4.2 bar) pipeline distribution system pressure.

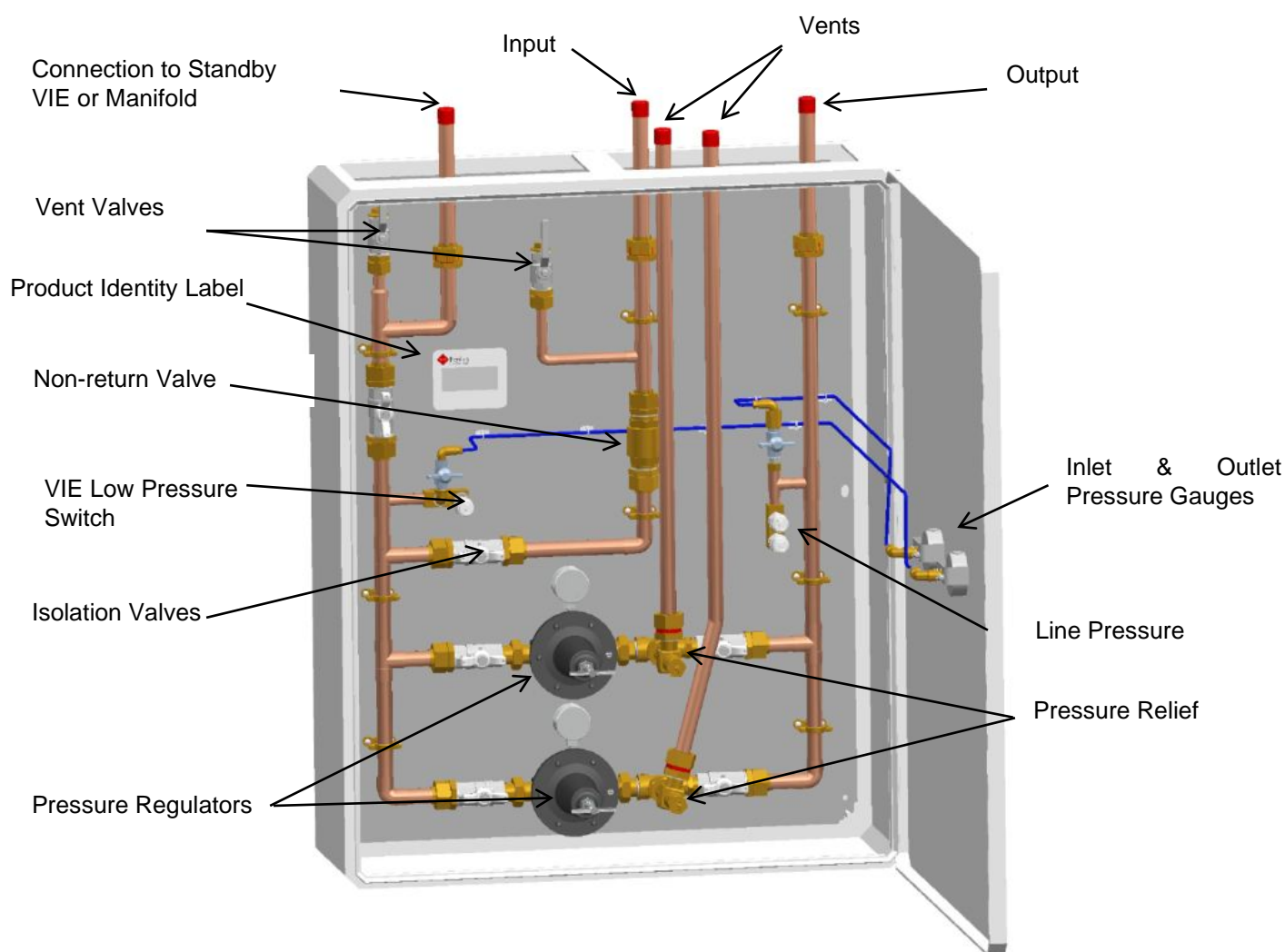


Figure 1-1 VIE Control Panel (cover not shown)

1.1 Features

- Pressure relief valves are fitted as standard
- VIE Control Panels are supplied in a duplex configuration, with one 'Standby' and one 'Duty' regulator set.

1.1.1 Ball Valves

Pneumatech Medical Gas Solutions ball valves are constructed from a satin nickel plated body. The ball plug and valve stem are machined to a high surface finish and electrolytically coated with chrome to resist wear and chemical attack. The valve stem has an integral ball sealed by both nitrile seats and O-ring seals.

1.1.2 Safety Relief Valves

Pneumatech Medical Gas Solutions safety relief valves are the high lift, atmospheric discharge type, suitable for medical air and oxygen applications. The flow is de-rated and measured in accordance with BS6759 Part 2: 1984. The valve re-seats by minus 10% of the set pressure.

1.1.3 Pressure Regulators

Pressure regulators, supplied as part of a VIE control panel, are modified by Pneumatech MGS personnel to include pressure gauges and blanking plugs to improve their performance and service life.

Note: Pressure regulators are supplied Oxygen clean. If necessary, only Oxygen safe lubricants should be used. Contact the Pneumatech MGS Service Department for further information.

2 Technical Specification

Table 2-1 Technical Specification

Vacuum Insulated Evaporator (VIE) Control Panel	
Physical Characteristics:	
Height	650mm
Width	425mm
Depth	200mm
Weight	30kg
Environmental Transport, Storage and Operating Conditions:	
Temperature	10 to 40°C
Humidity	10 to 95% R.H. Non-condensing
Air pressure	Operating: 90 to 110 kPa
Mode of operation	Continuous (may be left on indefinitely)
Ingress Protection Class	IP4X – for indoor installation only
Degree of mobility	Permanently installed
Performance:	
Operating pressure range (operating)	Refer to table 2-2
Volumetric flow rate	Refer to table 2-2
Regulatory Classification:	
GMDN Code (Term)	36271 (Medical gas and vacuum supply systems)
EC MDD Classification	Class IIb
GHTF Classification	Class C

Table 2-2 Operating Pressure Range and Flow Rates

Part Number	Inlet/Outlet Pressure	Flow	Connection Sizes
3269632	10 - 4 bar	1500 L/min	15mm
3269633	10 - 4 bar	3000 L/min	22mm
3269634	10 - 4 bar	3000 L/min	28mm

3 User Responsibility

This device has been built to conform to the specification and operating procedures stated in this manual and/ or accompanying labels and notices when checked, operated, maintained and serviced in accordance with these instructions.

To ensure the safety of this device it must be checked and serviced to at least the minimum standards laid out in this manual. A defective or suspected defective product must not be used under any circumstances.


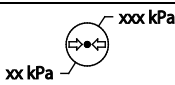
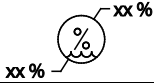
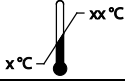

The user must accept responsibility for any malfunction which results from non-compliance with the servicing requirements detailed in this manual. Additionally, the user must accept responsibility for any malfunction which may result from misuse of any kind, or non-compliance with other requirements detailed in this manual.



Worn, broken, distorted, contaminated or missing components must be replaced immediately. Should such a repair be necessary, it is recommended that a request for service advice be made to the nearest Pneumatech Medical Gas Solutions Service Centre.

This device and any of its constituent parts must be repaired only in accordance with written instructions issued by Pneumatech Medical Gas Solutions and must not be altered or modified in any way without the written approval of Pneumatech Medical Gas Solutions.

The user of this equipment shall have the sole responsibility for any malfunction which results from improper use, maintenance, repair, damage or alteration by anyone other than Pneumatech Medical Gas Solutions or their appointed agents.

4 Description of Symbols

	Indicates a potentially hazardous situation which, if not avoided, could result in personal injury to the user or others.
CAUTION!	Indicates a potentially hazardous situation which, if not avoided, could result in damage to the device or property.
Note:	Emphasises points to achieve more convenient or efficient use of the device.
	Ambient pressure range
	Ambient humidity range
	Ambient temperature range
	Consult accompanying documents

	Service due date
	The number 0088 identifies the notifying body under which the Quality Systems operated within Pneumatech MGS.
L	Connection for the live conductor on permanently installed equipment.
N	Connection for the neutral conductor on permanently installed equipment.
E	Connection for the earth conductor on permanently installed equipment.

5 Installation

Pneumatech Medical Gas Solutions VIE control panels should only be installed, commissioned, and maintained by technicians who are suitably trained with piped medical gas systems, and who are fully conversant with the contract specifications and safety procedures.

WARNING! Keep all components dry and clean during storage and installation.

WARNING! Pneumatech Medical Gas Solutions vacuum plant can be safely handled and stored under normal working and environmental conditions.

WARNING! Adverse environmental conditions and harsh abrasives or chemicals may cause damage to the unit.

Install the system as directed by the site engineer, for the optimum position. Check that the specified pressure safety valves, non-return valves and line valves have been fitted and verify the valves are certified to operate in accordance with the contract specification and conform to BS 6759: part 2 1984.

Notes:

1. Take care when brazing into the gas pipeline, to prevent damage to the regulator due to heat transfer.
2. Pneumatech Medical Gas Solutions will not accept responsibility for damage caused during installation.

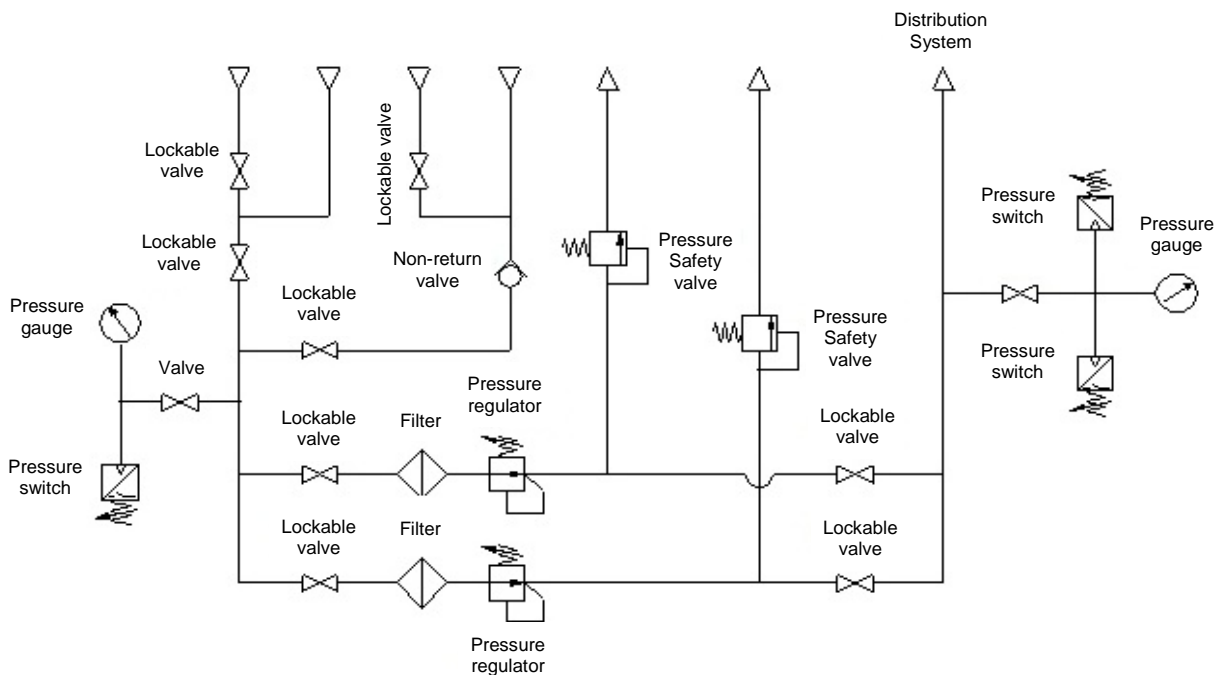


Figure 5-1 VIE Control Panel Schematic Diagram

5.1 Installation Dimensions

All dimensions are common to 15mm, 22mm and 28mm VIE Control Panels

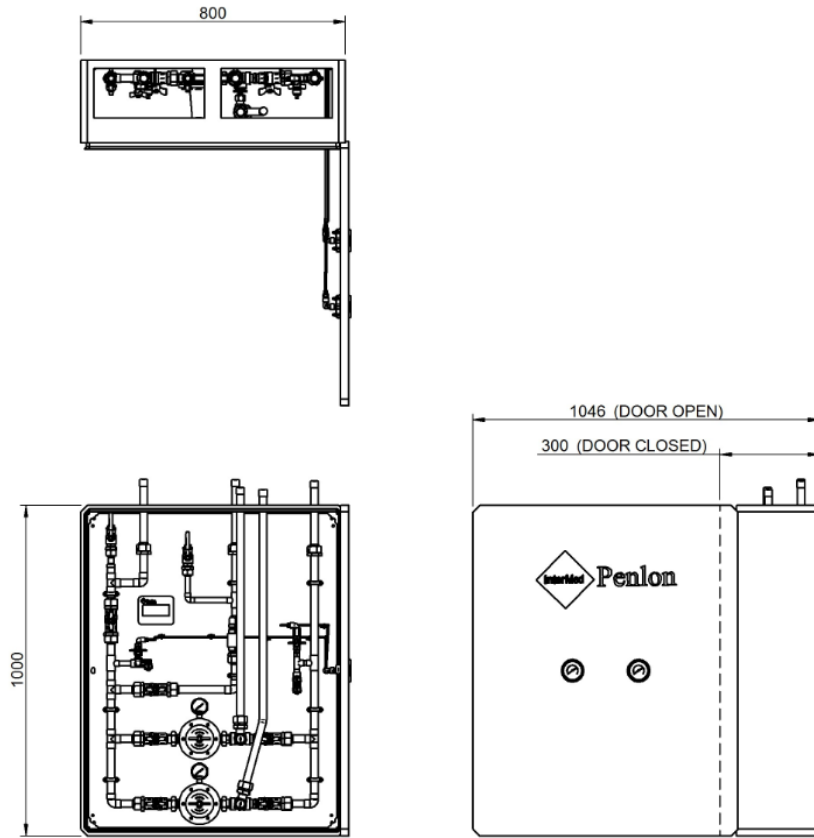


Figure 5-2 VIE Control Panel Dimensions

5.2 Mounting Dimensions

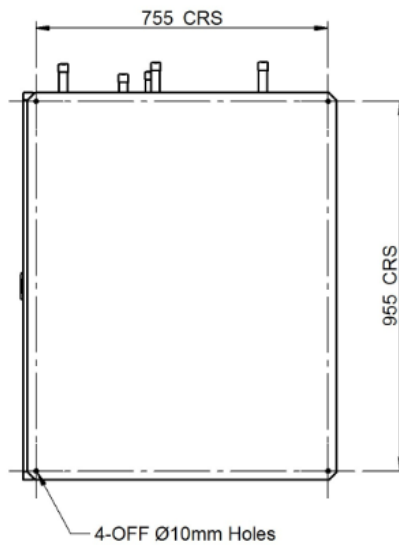


Figure 5-3 VIE Control Panel Mounting Dimensions

6 Commissioning

6.1 Introduction

Commissioning is carried out in full after initial installation, after a major component change, and as part of a planned preventative maintenance programme. The object of commissioning is to ensure that all components are serviceable. Personnel carrying out the following commissioning procedure must be qualified and fully conversant with the information contained in this manual.

Commissioning consists of alternately checking the gas flow through each side of the VIE control panel, and ensuring the pressure is reduced to the required level.

Pneumatech Medical Gas Solutions VIE control panels are tested and certified prior to despatch from the manufacturing plant, there should be no need to make adjustments during commissioning.

Table 6-1 VIE Control Panel - Pressure Switch Settings

Pressure Switch	Setting (bar)
VIE Low Pressure	8.4
Low Line Pressure	3.75
High Line Pressure	4.9

6.2 Pre-use Test

Note: Due regard must be paid to the safety of personnel. Testing should not create a hazard, particular attention being given to foreign matter located in discharge outlets.

Pneumatech Medical Gas Solutions VIE panels are subjected to a series of tests including visual inspections and pressure tests, which includes the following:

Pressure testing the copper pipework to 11 bar.

Checking the operation of the pressure relief valves.

Subjecting regulators to creep test.

Checking the accuracy of the pressure gauges.

Setting the regulator pressures.

Leak test.

Inspecting the overall finish of the assembly.

7 Operating Instructions

Figure 7.1 shows a VIE Control Panel. All isolating valves are shown open, although in normal operation only one regulator would be in use. To isolate the 'Standby' regulator, turn off the inlet and outlet ball valves to that regulator.

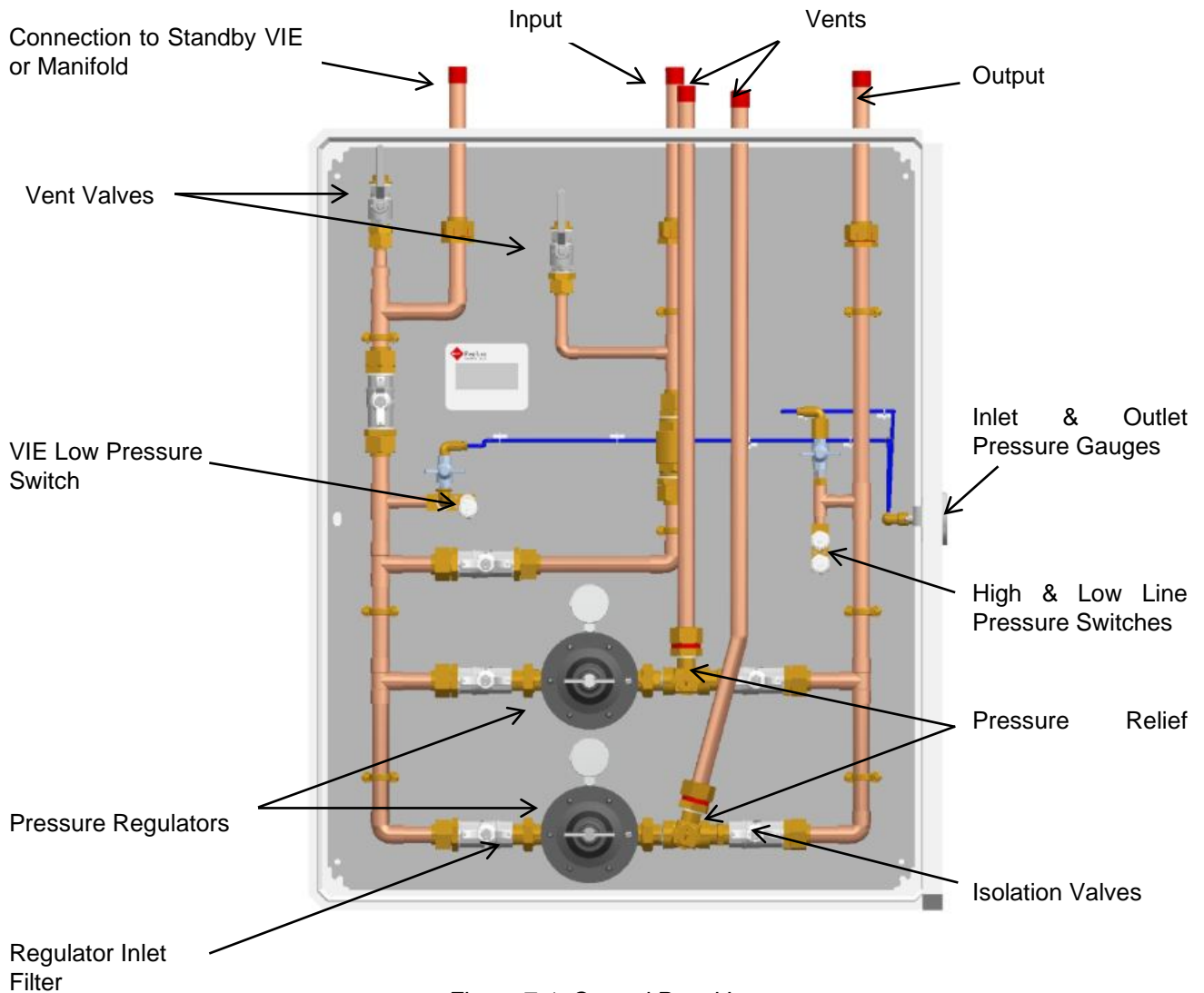


Figure 7-1 Control Panel Layout

The VIE Control Panel is normally operated with one of the pressure regulators as the Duty regulator and the other regulator as the Standby regulator. This is achieved by turning the isolating valves to the 'inline' open position each side of the Duty regulator. To isolate the Standby regulator, the isolation valves must be turned to the closed position each side of the Standby regulator.

Note: Either regulator can be Duty or Standby. All isolation valves are shown open, although in normal operation only one regulator would be in use.

To change from one regulator to the other, first open the isolation valve upstream of the Standby regulator. Check the static pressure reading on the Standby pressure gauge. Adjust, if necessary using the tee bar on the top of the regulator, these are factory set and locked. They should not require adjustment on installation; however periodic adjustment during service may be necessary.

8 Maintenance

WARNING! Use of sub-standard or inappropriate parts and materials may damage the line valve and invalidate the warranty. Only use genuine Pneumatech Medical Gas Solutions spare parts.

WARNING! Obtain a work permit before commencing any work on medical gas equipment.

8.1 Introduction

Pneumatech Medical Gas Solutions VIE Control panels are designed to operate with the minimum of maintenance, however regular routine minor maintenance operations are recommended to prove the system integrity.

Maintenance operations are carried out in accordance with the planned preventative maintenance contract purchased by the customer. Maintenance engineers must fully understand the operation of VIE control panels and must be conversant with the information contained in this manual.

Service and Maintenance is limited to replacement of worn or damaged components.

8.2 Tools and Equipment

No special tools are required, however all common hand tools used must be clean, completely free of oil and grease and checked for serviceability before commencing maintenance procedures. All necessary spare parts must be obtained before commencing work.

8.3 Routine Inspection, Checks and Maintenance

8.3.1 Cleaning

The use of abrasive or solvent based cleaning solutions is not recommended.

Cleaning external surfaces - use a damp cloth only. Mild soap solution may be used but detergent/surfactant solutions are not recommended.

Do not use any phenol or halogen based disinfectants or agents that release chlorine or oxygen.

8.3.2 Minimum Requirements

Minimum requirements for routine inspections, checks and maintenance are given in *Table 8-1* and must be observed in full to ensure continued safe operation of the line valve system.

Table 8-1 Inspection and Maintenance Schedule

5 yearly	Annually	6 monthly	Quarterly	Monthly	Commissioning
Actions					
Inspection, Checks and Tests:					
			■		■
Ambient temperature					
					■
Suitability of location					
					■
Adequate room ventilation					
			■		■
Adequate access for maintenance					
				■	■
Visually inspect the unit for damage					
				■	■
Ensure free movement of all parts					
					■
Line Pressure Switch Operation					
					■
			■		■
Relief Valve Exhaust Clearance and Free from Debris					
Planned Preventative Maintenance:					
					■
Complete Commissioning Procedure					
					■
Check regulator; adjust if necessary.					
					■
Safety Relief Valve - see 9.3.3					
Component Replacement					
					■
Regulator Inlet Filter					
					■
Pressure Safety Valves					
					■
Pressure Regulator Service Kit					

8.3.3 Safety Relief Valves

All Pneumatech Medical Gas Solutions VIE Control Panels include safety relief valves with easing gear. The correct procedure, once installed is:

Every Six Months-

Ensure free movement of all parts, using the easing gear, when the valve is under pressure of not less than 75% of the set pressure.

Every Twelve Months -

Safety relief valves should be checked for correct function, as above, and for correct lift pressure.

Remove the valve from the station and test for correct lift pressure using the external test rig.

Under no circumstances increase the operating pressure of the station in an attempt to test safety relief valves.

NOTE: It is possible to test the correct lift pressure of the regulator output safety valve by isolating ONLY the output of the standby line pressure regulator (clockwise to increase pressure).

1.

9 Fault Diagnosis

There are a number of faults that can be diagnosed on Pneumatech Medical Gas Solutions VIE Control Panels.

These are relatively simple to remedy, without replacing expensive regulator assemblies. The majority of faults can be avoided by undertaking a regular planned maintenance routine, carried out by a competent person.

NOTE: Failure through misuse or abuse is usually not repairable, and is not covered by the manufacturer's warranty.

Table 9-1 Leaking from Bonnet Vent Hole

Possible Cause	Remarks/rectification action
Diaphragm split or punctured	Replace diaphragm.

Table 9-2 Leak from Back Knurled Nut

Possible cause	Remarks/rectification action
O-ring split or perished	Replace O-rings

Table 9-3 Regulator Setting Erratic or Creeping

Possible cause	Remarks/rectification
Valve seat or plunger seal damaged or perished	Replace seat or plunger seals and 'O' rings

10 Recommended Spares

Table 10-1 Minimum Recommended Spares Schedule

Description	15mm	22mm	28mm
	Part Number		
Regulator Gauge		2935-850	
Pressure Relief Valve – 5.5bar	3261480	3261480	5003690
Non Relieving Regulator	3260437	3260751	3260765
Low Pressure Switch		3260149	
Low Line Pressure Switch		3260149	
High Line Pressure Switch		3260150	
Inlet Pressure Gauge 0-20 bar		340031	
Outlet Pressure Gauge 0-10 bar		340030	
Regulator Inlet Filter	5002094	5002095	5002096

For all Service Spares enquiries, contact the Pneumatech Medical Gas Solutions Spares Department, giving as much of the following information as possible:

Product Part Number:
Lot / Batch Number:
Approximate date of purchase:

This information can be found on the plant rating label which is affixed to the Plant Control Unit.

Spares Department:

T: +44 (0) 1235 463053

F: +44 (0) 1235 463011

spares@p-mgs.com

11 Declaration of Conformity

Declaration of Conformity

Manufacturer	Atlas Copco Ltd. trading as Atlas Copco Medical 18 Nuffield Centrum, Nuffield Way, Abingdon, OX14 1RL, UK
Product	Medical Liquid Oxygen Control Panel
Classification	Ila
Conformity Route	Annex II
Quality Management System	EN ISO 13485:2012
GMDN Code	36271
GMDN Term	Medical gas and vacuum supply systems
Standards Applied	EN 837-1, EN 980, EN 1041, EN 4126, EN ISO 14971, EN ISO 7396-1, EN ISO 13348, EN ISO 10524-2, EN ISO 15001, EN ISO 14971, EN ISO 10993-1
Notified Body	Lloyd's Register Quality Assurance Limited, 71 Fenchurch Street, London EC3M 4BS United Kingdom (LRQA Notified Body Number 0088)
MDD Certificate(s)	LRQ 4007749/C
Start of CE Marking	3 rd April 2013
Place and Date of Issue	Abingdon, 3 rd September 2015

We hereby declare that the above mentioned products meet the provisions of the Council Directive 93/42/EEC concerning Medical Devices, as amended by Directive 2007/47/EC. All supporting documentation is retained under the premises of the manufacturer.

Endorsing Signature
Turgay Ozan (General Manager)

A handwritten signature in black ink, appearing to read 'Turgay Ozan', is written over a horizontal line.

Document ref.: RDOC0008v6.docx

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