East SP and Zeus SP Terminal Units
User Instructions
Includes Second Fix Installation Information
Published by Pneumatech Medical Gas Solutions

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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 East SP and Zeus SP Terminal Units.
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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Sales Spares Service
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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.

Complaints
T: +44 (0) 1246 474242
complaints@p-mgs.com
1  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 these instructions. 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 these instructions. 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 renewed immediately. Should such a repair be necessary, it is recommended that a request for service advice be made to the nearest Pneumatech MGS Service Centre.
This device and any of its constituent parts must be repaired only in accordance with written instructions issued by Pneumatech MGS and must not be altered or modified in any way without the written approval or Pneumatech MGS. 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 MGS or their appointed agents.

2  Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tr>
<td><img src="icon.png" alt="Warning!" /></td>
<td>Indicates a potentially hazardous situation which, if not avoided, could result in personal injury to the user or others.</td>
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<tr>
<td><img src="icon.png" alt="Caution!" /></td>
<td>Indicates a potentially hazardous situation which, if not avoided, could result in damage to the device or property.</td>
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<tr>
<td><img src="icon.png" alt="Note" /></td>
<td>Emphasises points that might allow more convenient or efficient operation of the device.</td>
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<td>Consult accompanying documents</td>
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<td><img src="icon.png" alt="Service due date" /></td>
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<td><img src="icon.png" alt="Ambient pressure range" /></td>
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<tr>
<td><img src="icon.png" alt="Ambient temperature range" /></td>
<td>xx °C</td>
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3  Warnings, Cautions, and Notes

**Warnings!**
1. Read through these entire instructions 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.
2. Do not attempt to modify this device in any way not strictly described within this manual.
3. Protect East SP or Zeus SP Terminal Units from access by unauthorised personnel.
4. No attempt should be made to use this product with a gas service or at a pressure other than as identified.
5. Do not use this product if it appears damaged in any way.
6. Do not use this product if there is evidence of contamination internally or on any of gas wetted connections (e.g. debris, particles, oil, lubricants or grease).
7. This equipment should only be installed, commissioned, operated and maintained by technicians who are suitably trained with medical gas systems, such as Competent or Authorised Persons as defined in UK Department of Health Technical Memorandum No. 02-01 (HTM 02-01).

8. Before loosening any pressurised connection, ensure that the pressure has been isolated.

9. 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.

10. Do not use this product if there is evidence of contamination internally or on any of gas wetted connections (e.g. debris, particles, oil, lubricant or grease).

11. Terminal units that are not rigidly fixed should not be installed in MRI locations.

12. Vacuum terminal units should be treated as a bio-hazard and handled and de-contaminated accordingly if microbiologically contaminated.

Cautions!

1. 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.

2. Pressurised air from the medical gas pipeline system may cause personnel injury or property damage if the unit is incorrectly operated or maintained.

3. Terminal unit probes, particularly those attached to high pressure hoses can be ejected from the terminal unit with considerable force. Probes or other equipment should be restrained/ supported during removal from a terminal unit to prevent injury or damage.

4. Be careful not to over-torque face seal fittings.

5. Leak detection fluids contain surface active agents (surfactants) that can damage plastic components under stress. Only use leak detection fluids that are compatible with the materials being tested.

6. Always wash leak detection fluids off with clean water immediately after use.

7. Nickel plating may cause mild localised allergic skin reaction in some people.

Notes:

All information, specifications and illustrations within these instructions 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.

4 Technical Specifications

Height/ Width/ Depth/ Weight: Varies with model

Environmental Transport, Storage and Operating Conditions

- Temperature: 10 to 40°C
- Humidity: 10 to 95% R.H. non-condensing
- Pressure range: 700 to 1100 kPa
- Mode of operation: Continuous (may be left on indefinitely)
- Ingress protection class: IP4X – for indoor installation only
- Degree of mobility: Permanently installed

Performance: Volumetric Flow Rate: Varies with model

Regulatory Classification

- GMDN Code (Term): 37512 (Medical gas Terminal Units)
- EC MDD Classification: Class IIa
- GHTF Classification: Class C
5 Description

Intended Use
Terminal units provide a safe supply of medical gas, vacuum, and AGSS (anaesthetic gas scavenging system) from a central supply system, and are designed to accept gas specific probes to prevent interchangeability between services. Various formats allow flexibility of installation.

Features
1. Positive action of rolling pin latch mechanism, which holds the probe securely.
2. Integral check valve (flutter disc) and retaining ring to allow removal of the socket assembly without depressurising the system.
3. Gas tight shut-off after probe removal, and gas tight seal to probe when inserted.
4. Gas specific indexing - eliminates the risk of connecting a socket assembly of one service to a terminal block of another, either during installation or maintenance.
5. Integral NIST connector fitted when installed via a flexible hose assembly.
6. Quick and simple installation.

General Description

Major Components
1. The terminal block assembly (A) is fixed either permanently to the medical gas pipeline system or via a NIST connector (B) for a pendant.
2. The socket and check valve assembly (C) is designed to accept and retain a probe.
3. Anti-swivel units are available (see Section 8).
4. Surround and Fascia (see Section 8).

6 Installation - Second Fix Assembly
Pneumatech Medical Gas Solutions terminal units 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.

Environmental Conditions
Warning! Keep all components dry and clean during installation. Pneumatech Medical Gas Solutions terminal units can be safely handled and stored under normal working and environmental conditions. Adverse environmental conditions, harsh abrasives or chemicals may damage to the unit.

Mounting the Terminal Unit
Terminal Units can be wall-mounted, installed in pendant, or mounted in a bedhead trunking system. Wall and trunking mounted terminal units should be installed between 900mm and 1400mm above the finished floor level, with not less than 200mm to any obstruction. Where terminal units are to be installed in banks of several units at any one space, they should be mounted to the following criteria: (A) 2 units in tandem: 150mm +/- 2.5mm centres; (B) 3 or more units in tandem: 135mm +/- 2.5mm centres.

The horizontal or vertical sequence should be:
Oxygen; Nitrous Oxide; Oxygen/ Nitrous Oxide 50/50; Medical Air 400 kPa; Surgical Air 700 kPa; Vacuum; Anaesthetic Gas Scavenging.
Installation
1. Inspect all components as they are unpacked.
2. Install the second fix assembly with the anti-swivel pin (A - if fitted) in the 12 o'clock position.
Locate the flush surround (if fitted) over the location lip on the rear of the fascia and secure to the cover box (screws in kit).

Do not over-tighten the screws.

7 Commissioning
Commissioning ensures that all components are serviceable and takes place in full after initial installation, after a major component change, and as part of planned preventative maintenance. Personnel must be qualified, and understand the information in these Instructions.

Pre-use Checks
Before use, ensure that each terminal unit is checked to HTM 2022 and HTM 02-01 procedures (for further details refer to the Installation, Operation and Maintenance Manual).

AGSS System Pre-use Checks
Performance requirements:
1. AGSS performance, including the terminal unit, must be as defined in BS6834:1987 (1992).
2. Flow at any terminal shall not exceed 130 L/min. when a resistance of 1 kPa is applied.
3. Flow at any terminal shall not be less than 80 L/min, when a resistance of 4 kPa is applied.
4. Each terminal on a system shall remain within those limits, irrespective of the number of terminal units in use on the system.
The performance of the disposal system may vary between maintenance and require adjustment. Adjust also, if the flow adjusters have been disturbed during maintenance.

Setting Procedure:
To vary the flow rate through each terminal unit the integral flow adjuster is screwed in to increase flow, or screwed out to decrease flow. The flow adjuster (accessed through the front of the terminal unit) is very sensitive. Adjust in small increments. Check the system performance after each adjustment.

Note: Adjustments should only be made as part of the installation or setting of the complete system. BS6834:1987 (1992) defines the performance of the system as a whole, and adjustments to individual terminal units will affect the balance of the whole system.

A suitable test unit for measuring the performance at a terminal unit is the Pneumatech Medical Gas Solutions AGSS Test Unit, part no. 068193. A test unit is required for each terminal unit that is connected to a single power source.

1. Place a test unit in one terminal unit, ensuring that all other terminal units are closed.
2. Adjust the test unit restrictor to give a resistance of 1 kPa (~10 mbar)
3. Use a 5mm Allen key to achieve a flow through the terminal unit of 130 L/min.
4. Remove the test unit and move to the next terminal unit.
5. Repeat steps 1 to 3 on each terminal unit that is connected to the same power unit.
6. At the first terminal unit, insert the test unit. Set the restrictor to give a resistance of 4 kPa (~40 mbar). Record the flow and remove the test unit.
7. Repeat steps 6 and 7 on each terminal unit connected to the same power unit.
8. Place a test unit in each terminal unit and adjust the test unit restrictor to give 1 kPa (~10 mbar) on each unit at the same time.
9. Record the flow on each test unit. Flow must not be greater than 130 L/min.
10. Readjust the test units to give a resistance of 4 kPa (~40 mbar) on each unit at the same time.
11. Record the flow on each test unit. It must not be less than 80 L/min.
12. For any reading less than 80 L/min, it may be possible to increase the vacuum setting of the relief valve at the power unit - check the appropriate Installation, Operation and Maintenance manual for the power unit. The vacuum setting must not exceed −200 mbar, or that given in the power unit specification. If the vacuum setting is altered in any way, repeat steps 1 to 12 in full.

8 Operating Instructions

Probes

Medical Gas and Vacuum
The probe for each medical gas or vacuum service has its own specific guard ring (A). The terminal unit socket assembly incorporates a recess, which matches the guard ring on the probe for its own service. This ensures that the probe for one service cannot be inserted into the socket assembly for any other service. It is important to use only probes that conform to BS5682:1984.

Anti-swivel Function
Insert the probe so that the cut-out slot (B) in the guard ring is uppermost. When the probe is fully inserted in this position, the cut-out engages the anti-swivel pin (see Section 6.3), preventing rotation. 

Note: When fixed equipment (such as a flowmeter or vacuum controller) is connected directly to the probe, it should be assembled to the probe so that the cut-out (B) in the guard ring is in the top position when the equipment is in its working position.

Probe Engagement

Medical Gas and Vacuum
Insert the appropriate probe in the centre hole (A) of the socket assembly and push fully home. The action of pushing the probe home lifts the check valve in the socket assembly from its seat allowing gas to flow. When the probe is fully home retaining pins latch into the groove in the probe to ensure that it is held securely in position. At the same time the nose of the probe is held against an internal seal to provide a gas-tight path.

Anaesthetic Gas Scavenging
Insert the AGSS probe (A) in the centre hole of the socket assembly (B), and push fully home.

Screw the knurled retaining nut (C) fully onto the socket assembly. The action of pushing the probe home lifts the check valve in the socket assembly from its seat allowing the gas to flow.

Note: If the probe is not fully inserted in the socket assembly, the flow through the system may be inadequate.
Probe Disengagement  
**Medical Gas and Vacuum**

**Caution!** The socket assembly does not incorporate a secondary lock. When the interlock ring on the front of the socket assembly is pressed to release the probe the residual gas pressure may cause the probe to be rapidly ejected from the terminal unit. Hold the device or hose attached to an engaged probe firmly, then operate the interlock ring.

To disengage, the probe should be gripped firmly and pushed in slightly. At the same time the sliding interlock ring (A) on the front of the socket assembly should be pressed in forward to release the probe latching mechanism. When the probe is removed the unit seals against gas flow.

**Anaesthetic Gas Scavenging**

Refer to the diagrams in Section 8: Grip the AGSS probe and unscrew the knurled nut (C). Withdraw the probe (A) from the socket assembly (B).

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9 **Maintenance**

1. Sub-standard or inappropriate parts and materials may damage the terminal unit and invalidate the warranty. Only use genuine Pneumatech Medical Gas Solutions spare parts.

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

3. **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. Obtain all necessary spare parts before commencing work.

4. **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.

5. **Minimum requirements** - Routine inspections, checks, and maintenance are given below. Observe these in full to ensure continued safe operation of the terminal units system.

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**Annually & 5-yearly:** Commissioning procedure, check for access for maintenance  
**Quarterly:** Check ambient temperature, and for adequate access for maintenance  
**Commissioning:** Check ambient temperature, suitability of location, adequate room ventilation, and adequate access for maintenance

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10 **Fault Diagnosis**

Refer to the Installation, Operation and Maintenance Manual for fault diagnosis.

11 **Recommended Spares Holding**

Refer to Installation, Operation and Maintenance Manual for recommended spares holding.

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