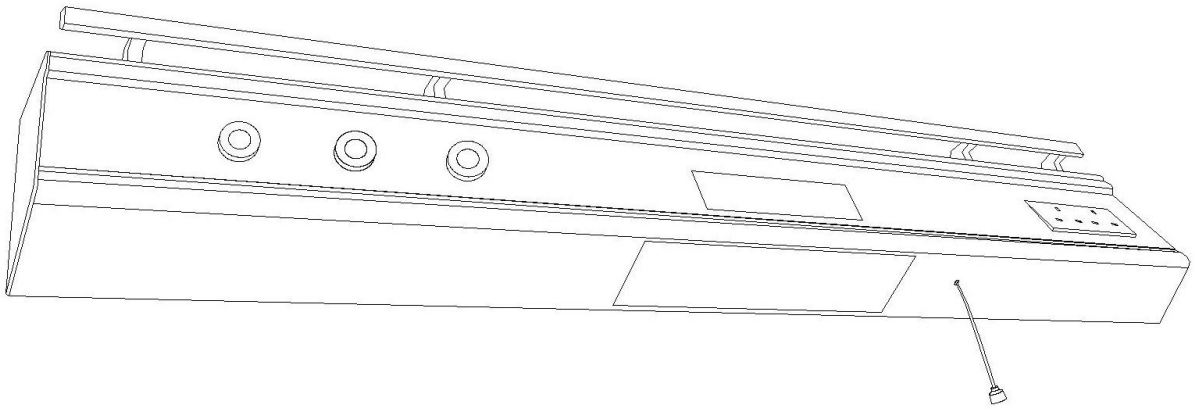
PRECISION UK Ltd

Specialists in HTM02-01 Medical Gas Pipeline Equipment

CPX BED HEAD UNIT

INSTALLATION, OPERATIONS & MAINTENANCE MANUAL



VERSION HISTORY

Version #	Implemented By	Revision Date	Approved By	Approval Date	Reason
1.0	*Kevin Pugh*	*16/08/2013*	*Rob Parry*		*1st Issue*

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1 INTRODUCTION

1.1 PURPOSE

The purpose of the CPX bed head unit is to provide services for patient and clinical staff at the patient location. These services can incorporate medical gases, power, lighting and a nurse call system if required.

1.2 AUDIENCE

The CPX bed head unit has been designed with a view to provide smooth lines, a stylish finish and pleasing aesthetics in order to blend into the room décor. The modular design of the unit allows flexibility with a choice of lengths from 1.2 to 6 metres, the length of the unit is determined by the quantity and type of switches and sockets, the number and type of gas outlets and if the provision of a nurse call system is required.

2 SYSTEM DESCRIPTION

2.1 KEY FEATURES

The CPX bed head unit has a number of features including:

- various medical gases available which are delivered from the gas specific terminal units mounted on the bed head unit via a low pressure hose assembly.
- The low voltage electrical supply comprises of a number of 13Amp sockets, room and reading lights for the patients and clinical staff.
- Also a protective extra low voltage system can be incorporated which could incorporate a nurse call system or data sockets.
- The unit is supplied pre piped with 12mm medical grade copper pipe to the customer's requirements, with piping conforming to HTM2022 standard.
- The unit is supplied pre wired to customer requirements with electrical components from a renowned European manufacturer.

2.2 INVENTORY

The medical gas terminal unit comprises of a Second Fix assembly and Check Valve assembly which are fitted to a First Fix assembly.

The CPX bed head units are designed for a voltage supply of 230V-240V 50-60Hz. The power connections from the mains supply to the bed head unit are to be pre-installed by others. All internal wiring terminates at terminals on the terminal block.

The electrical cabling inside the bed head unit is factory installed and tested for easy connection to the site electrical installation.

The bed head unit incorporates segregation of services as ISO11197:2004, this allows for Protective Extra Low Voltage servicing without isolating Low Voltage circuits.

2.3 ENVIRONMENT

The CPX bed head unit has been designed and built to enhance the environment of the patient whilst in hospital care. The CPX bed head unit has been designed with a view to provide smooth lines, a stylish finish and pleasing aesthetics in order to blend into the room décor.

2.4 SYSTEM OPERATIONS

The low voltage electrical supply comprises of a number of 13Amp sockets, room and reading lights for patients and clinical staff.

Also a protective extra low voltage system can be incorporated which could incorporate a nurse call system or data sockets.

Various medical gases are available which are delivered from the gas specific terminal units mounted on the bed head unit via a low pressure hose assembly.

The medical gas terminal unit comprises of a Second Fix assembly and Check Valve assembly which are fitted to a First Fix assembly. The first fix assembly includes a 12mm copper pipe for brazing to the fixed pipeline system or a non-interchangeable screw thread (NIST) connector for connection to a hose assembly.

Terminal units are available for oxygen, nitrous oxide, 50% oxygen/50% nitrous oxide mixture, medical air, surgical air and medical vacuum.

2.5 SAFETY

- The CPX bed head unit must be fixed in consultation with the construction manager during installation procedure.
- The methods described for the fixation, gases and power supply are general recommendations and there implementation is to be planned and designed for each individual case by qualified experts.
- **Precision UK bed head units are not suitable for use in potentially explosive areas.**
- The CPX bed head units are intended to carry and position medical devices in non-critical and critical areas of hospitals, to supply these devices with electricity and medical gases. According to the end-user requirements.
- CPX bed head units are suitable for continuous duty.
- CPX bed head units can be customized with additional fittings for connections to other services like telephone system, nurse call system and intercom system.
- Bed head units are pre wired in accordance with BS EN 7671 wiring regulations.

This equipment should be kept clean and be free from oil and grease at all times. Oil and grease will ignite spontaneously in the presence of oxygen. If you suspect that any equipment is contaminated. DO NOT USE IT.

No attempt should be made to use or modify this equipment for use with gas other than the gas identified.

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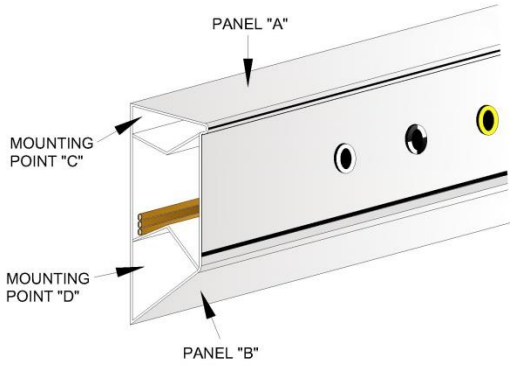
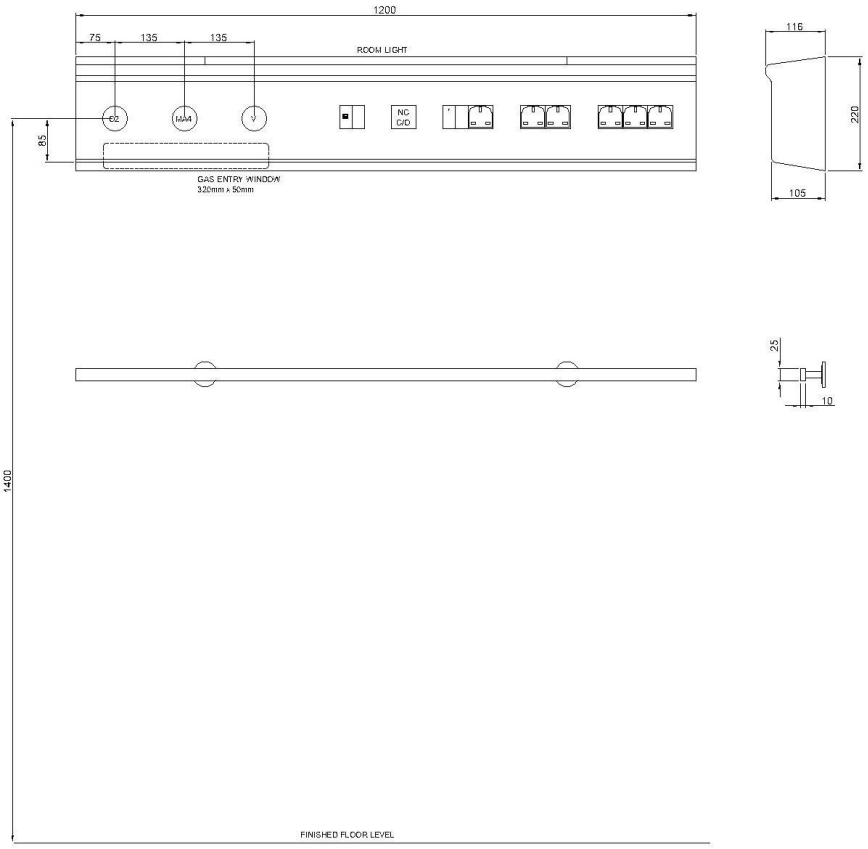
3 ISTALLATION ON THE WALL

To install the bed head unit on the wall:

- Remove panels “A” and “B” see fig 1.
- The centre line of the bed head unit should be at a height of 1400 - 1500mm from finished floor level.
- Drill holes in the correct position on wall or backing support to line up with fixing holes in the bed head unit, if required put anchors into the wall.
- Check the mounting points “C” and “D” are correct to the holes drilled in the wall and affix the bed head unit using the appropriate screws or anchors.
- Complete the connections to the medical gas and electrical services, as described in section 3.1
- When connections are completed replace panels “A” and “B”.

Fig 1





3.1 INSTALLATION OF SERVICES

MECHANICAL CONNECTION

To complete the connections to the pipeline system

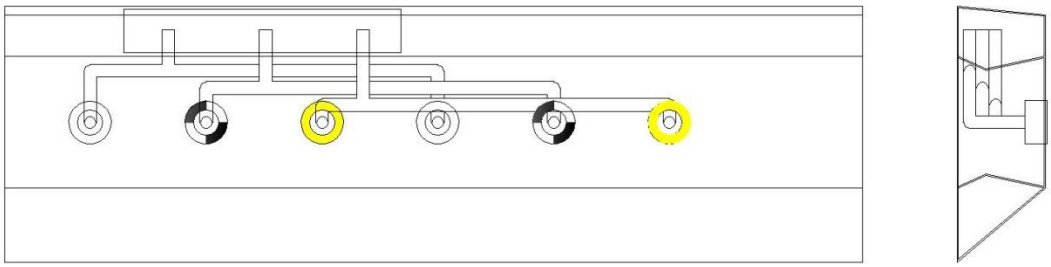
Connect stub pipes to the distribution pipeline system using the appropriate CPX fitting and braze.

The copper stub pipe is manufactured to BS13348 for connection to the pipeline system and joints shall be made on site using copper, phosphorus and silver brazing alloy CuP282 to BS EN 17672:2010. Brazing should be carried out using oxygen free nitrogen as an inert gas shield to prevent the formation of oxides on the inside of the pipe.

- Check and tighten all mechanical joints.

- Pressure test the system. If testing as part of the first fix test, plug all ports.

Typical Medical Gas Terminal Layout.



LOW VOLTAGE ELECTRICAL CONNECTIONS

The CPX bed head units are designed for a voltage supply of 230V-240V 50-60Hz. The power connections are pre-installed from the mains supply to the bed head unit according to the drawing. In addition the earth connections are pre-installed to terminals on the terminal block.

The electrical cabling inside the bed head unit is factory installed and tested for the connection to the site electrical installation.

For the equipment requiring uninterrupted power supply lines (e.g. nurse call) that will be installed on the CPX bed head unit the necessary supply lines should be drawn taking into consideration the necessary length to reach the terminal point within the unit.

- Planning, execution and testing of electrical installation must be carried out at the mains by specialist electro-planners and approved specialist electrical companies.
- The electrical installation in the room concerned must meet the applicable national specifications. The number of electrical units depends on the design of the bed head units, specific to that customer. If several electrical circuits are required these must be taken into account on the terminal blocks.

Multicore connections must be provided with end sleeves for the strands.

Typical Low Voltage Circuit Diagram

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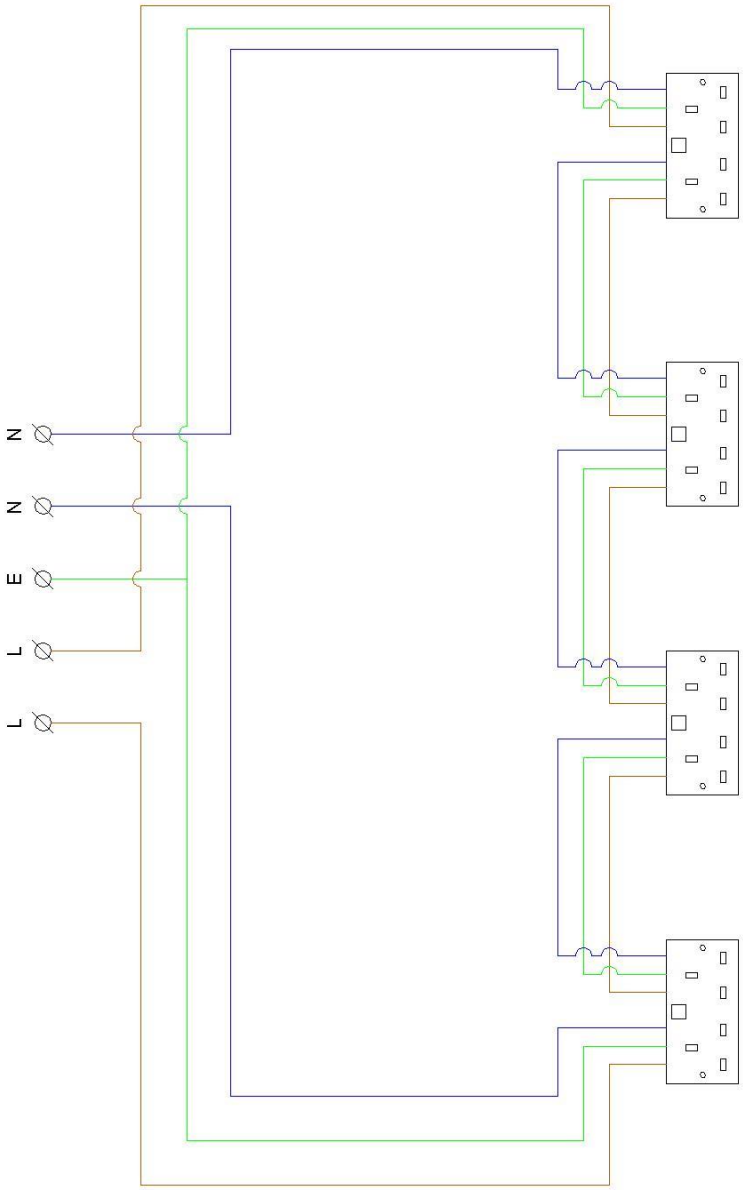
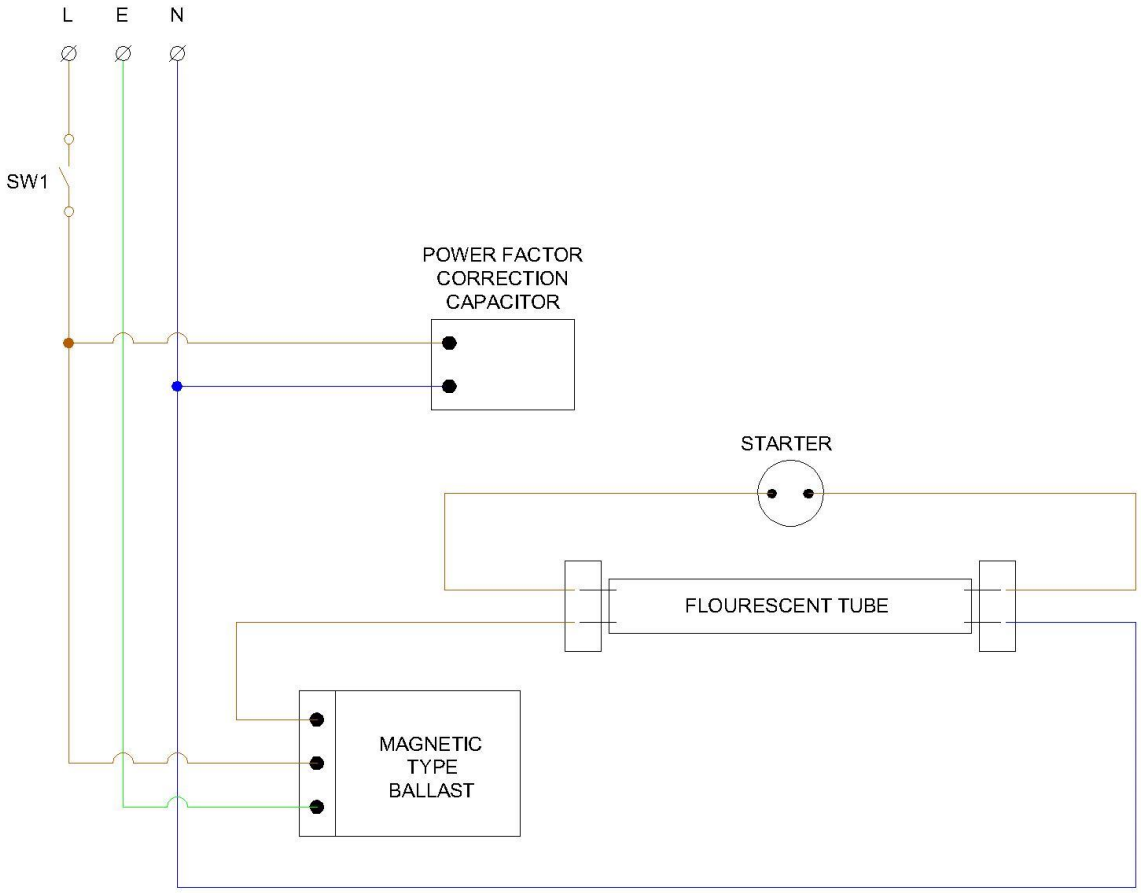


Typical Flourecsent Tube Circuit Diagram

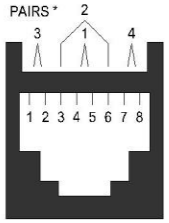


EXTRA LOW VOLTAGE ELECTRICAL CONNECTIONS

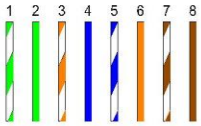
The protective low voltage electrical equipment may incorporate a complicated nurse call system which will need to be specified by the customer. There could be a requirement for data sockets to be provided to allow clinical staff access to the hospital network or an internet connection for the patient.

Typical examples of CAT5 or CAT5e plug wiring for data sockets.

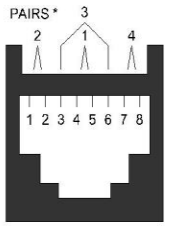
EIA/TIA 568A CAT-5 WIRING SCHEME



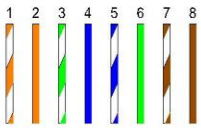
EIA/TIA 568A CABLE			
PIN	COLOUR	PAIR	DESCRIPTION
1	WHITE/GREEN	3	RECEIVE DATA +
2	GREEN	3	RECEIVE DATA -
3	WHITE/ORANGE	2	TX DATA +
4	BLUE	1	UNUSED
5	WHITE/BLUE	1	UNUSED
6	ORANGE	2	TX DATA -
7	WHITE/BROWN	4	UNUSED
8	BROWN	4	UNUSED



EIA/TIA 568B CAT-5 WIRING SCHEME



EIA/TIA 568B CABLE			
PIN	COLOUR	PAIR	DESCRIPTION
1	WHITE/ORANGE	2	TX DATA +
2	ORANGE	2	TX DATA -
3	WHITE/GREEN	3	RECEIVE DATA +
4	BLUE	1	UNUSED
5	WHITE/BLUE	1	UNUSED
6	GREEN	3	RECEIVE DATA -
7	WHITE/BROWN	4	UNUSED
8	BROWN	4	UNUSED



4 SYSTEM USAGE

4.1 INSTRUCTIONS

The CPX bed head unit has a number of features with simple operations. The unit is supplied completely assembled and ready for installation.

Terminal Unit

The medical gas terminal unit is to be used for the administration of a medical gas from a central supply system via a fixed pipeline in conjunction with other equipment fitted with a probe (quick connector) complying with BS EN 9170-1:2008.

The range of terminal units is suitable for use with the following medical gases;

- Oxygen
- Nitrous Oxide
- 50% Oxygen/50% Nitrous Oxide mixture
- Medical Air
- Surgical Air
- Medical Vacuum

The terminal unit is used to supply gas to the equipment when the appropriate probe has been correctly inserted and will shut-off the gas supply automatically when the probe is disconnected.

It shall not be possible to connect a probe for a different gas into a terminal unit intended and labelled for another gas.

The terminal units are used to supply gases used during anaesthesia for analgesic purposes and to induce narcosis when used in conjunction with an anaesthetic machine or trolley.

The terminal units are used to supply the drive gas to support breathing in conjunction with a lung ventilator during anaesthesia and in intensive care and-or neo-natal units.

The terminal units are used to supply gas for oxygen therapy in conjunction with flowmeters, nebulizers, humidifiers and facemasks.

The terminal units are used supply air to drive surgical tools used during operations.

The terminal units are used for the drainage of excess body fluids in conjunction with a suction controller and suitable receiving system.

The terminal units are used in medical engineering workshops for the testing of medical equipment used in conjunction with medical gases.

Medical vacuum terminal units should not be used for the removal of the smoke produced during laser surgery.

Low voltage Electrical Equipment

The low voltage electrical supply comprises of a number of 13Amp sockets, room and reading lights for the patients and clinical staff.

The low voltage power supply is to provide power and lighting for patient and clinical staff. An adequate number of 13A twin sockets are installed as part of the bed head unit, to supply electrical power to the various items of non-clinical equipment and obviate the need to use extension leads. The wiring system is selected in accordance with BS7671 wiring regulations.

The bed head unit has a built in room light which is operated by an on/off switch on the front of the bed head unit.

A patient reading light is also incorporated within the unit which is operated by a pull cord located on the bottom of the bed head unit.

Protective Low Voltage Equipment

Also a protective extra low voltage system can be incorporated within the bed head unit. This could incorporate a customer specified nurse call system. Manufacturers operating and maintenance instructions for the system specified will be provided. Please refer to the manufacturer's instructions for use of this equipment.

Data sockets may be required to allow clinical staff access to the hospital network or allow patient access to the internet.

The bed head unit incorporates segregation of services as ISO11197:2004, this allows for Protective Extra Low Voltage servicing without isolating Low Voltage circuits.

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5 TESTING

Prior to testing the bed head installation, please check the following.

(a) All components have been installed are tightened.

(b) The mains power supply has been installed and power is available.

(c) Ensure all electrical functions are working correctly.

6 COMMISSIONING

Mechanical

(a) Perform a cross connection test in accordance with HTM02-01

(b) Slowly open the down steam isolation valve to allow the system to pressurize.

(c) Check for leaks.

(d) Confirm the outlets are correctly installed and have the correct identification labels.

(e) Check the flow and pressure drop at each terminal unit.

(f) Check the mechanical function of each terminal unit.

(g) Create a leak and allow the system to de-pressurize.

Low Voltage Electrical

(a) Perform a dielectric rigidity test in accordance BS EN 7671 wiring regulations.

(b) Perform an insulation resistance test in accordance with BSEN 7671 wiring regulations.

(c) Perform an earth continuity test in accordance with BS EN 7671 wiring regulations.

Extra Low voltage electrical

Commissioning should be carried out by the manufacturer or the manufacturer's representative for nurse call systems.

7 MAINTENANCE

Maintenance of the bed head unit should be restricted to periodic checking and if necessary the replacement of faulty components. It should be noted that although many of the components appear to be standard items, many have been selected and treated to make them suitable for the gases carried and the pressures involved.

Regular inspections and maintenance of the bed head unit will prolong the units life and reduce the possibility of sudden, inconvenient component failures.

8 PREVENTATIVE MAINTENANCE

Bed head unit should be subjected to regular inspection and testing as detailed below.

- Monthly;

(a) Visually inspect the bed head unit for signs of damage.

(b) Check all mechanical joints for leaks.

(c) Check fluorescent tubes are in working order.

- Annually;

  (a) Visually inspect the bed head unit for signs of damage.

  (b) Check all mechanical joints for leaks.

  (c) Test the bed head unit as indicated in section 6 to confirm correct operation.

All maintenance should be carried out with the knowledge of the hospital engineer and in accordance with the Permit-to-Work system.

9 SPARE PARTS

When ordering spare parts, please quote the batch number of the equipment and a description of the component required to ensure that you receive the component that you require!

10 WARRANTY

The CPX Bed Head Unit comes with a 12 month warranty from day if shipment. Within this period Precision UK will repair, replace any part on site, or at the factory, which is proven defective at Precision UK's cost.

Furthermore, Precision UK will warrant its materials to be free from defects for an additional period of four (4) years (five (5) in total from date of shipment).Within this period Precision UK will replace any part, at no charge, which is proven to be defective. Shipping cost after the first twelve (12) months will be borne by the customer.

This warranty is valid when the product has been properly installed according to Precision UK's specifications, used in a normal manner and serviced according to the factory recommendations. It does not cover failure due to damage which occurs in shipments or failures which resulted from accidents, misuse, abuse, neglect, mishandling, alteration, misapplication or damage that may be attributable to acts of god.

Precision UK shall not be liable for incidental or consequential damages resulting from the use of this equipment.

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11 CONTACT US

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12 REGULATORY REQUIREMENTS

The following British, European and International Standards have been consulted during the design, manufacture and testing of the bed head unit.

√	BS EN 1441:1998	Medical Devices. Risk Analysis.
√	BS EN 13348:2001	Copper and copper alloys. Seamless round copper tubes for medical gases or vacuum.
√	BS EN 1044:1999	Brazing. Filler metals.
√	BS EN 980:1997	Graphical symbols for use in the labelling of medical devices.
√	BS EN 1089:3:1997	Transportable gas cylinders. Gas cylinder identification (excluding LPG). Colour coding.
√	ISO 7396-1	Medical gas pipeline systems. Pipeline systems for compressed medical gases and vacuum.
√	ISO 7396-2	Medical gas pipeline systems. Anaesthetic gas scavenging disposal systems.
√	ISO 11197:2004	Medical Supply Units.
√	BS EN 60601-1	Medical electrical equipment general requirements for basic safety and essential performance.
√	BS EN 60601-1-2	Medical electrical equipment general requirements for basic safety and essential performance collateral standards electromagnetic compatibility.
√	ISO 32	Gas cylinders for medical use. Marking for identification of content.
√	ISO 554	Standard atmospheres for conditioning and/or testing. Specifications.
√	SS 01 91 02	Colour atlas.
√	HTM08-03	Health Technical Memorandum Bedhead Services
√	HTM 2022	Medical gas pipeline systems. Design, installation, validation and verification.
√	HTM 02-01	Medical gas pipeline systems. Design, installation, validation and verification
√	C11	NHS model engineering specification – medical gases.

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Appendix A: Operations & Maintenance Manual Approval

The undersigned acknowledge they have reviewed the Bed Head Unit **Installation, Operations & Maintenance Manual** and agree with the approach it presents. Changes to this **Operations & Maintenance Manual** will be coordinated with and approved by the undersigned or their designated representatives.

Signature: _____ Date: _____
Print Name: _____
Title: _____
Role: _____

Signature: _____ Date: _____
Print Name: _____
Title: _____
Role: _____

Signature: _____ Date: _____
Print Name: _____
Title: _____
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