

Installation Instructions



Manifold Header and Tailpipe

Part number: 4233500363

Revision: 03

Installation Manual

Manifold Header and Tailpipe

This unit is purchased from:

Date purchased:

Model number:

Serial number:

Option(s) included:

Any information, service or spare parts requests should include the serial number and be directed to:

BeaconMedaes Limited
Greaves Close, Markham Vale,
Chesterfield, S44 5FB, UK

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Email: gbn.info@beaconmedaes.com
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BeaconMedæs reserves the right to make changes and improvements to update products sold previously without notice or obligation.



BeaconMedaes Limited, Greaves Close, Markham Vale,
Chesterfield, S44 5FB, UK



Personnel must make themselves familiar with the contents of this manual and the function of the unit before installing, operating or maintaining.

Abbreviations			
Abbreviation	Full Description	Abbreviation	Full Description
HTM	Health Technical Memorandum	%	Percentage
BS	British Standard	Kg	Kilograms
BSP	British Standard Pipe	kPa	Kilo pascals
ISO	International Standard Organisation	PSI	Pounds per square inch
EN	European Standards	NRV	Non-return valve
ID	Identification	1st	First
Med	Medical	2nd	Second
°C	Degree Celsius	O2	Oxygen
ø	Diameter	N2O	Nitrous oxide
OD	Outside Diameter	N2O/O2	O2/N2O 50%/50% V/V
m	Meter	MA	Medical Air
mm	Millimetres	SA	Surgical Air
"	Inch	VAC	Medical Vacuum
Max	Maximum	CO2	Carbon Dioxide
Min	Minimum	N2	Medical Nitrogen

Issue Record

Document No	Revision No.	Details of Changes	Date
4233500363	03	IAR 10516: Project to transition from MDD to MDR	15-FEB-2024

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1. Safety Precautions

A notice to the user and/or patient that any serious incident that has occurred in relation to the device should be reported to the manufacturer and the competent authority of the Member State in which the user and/or patient is established.

⚠ CAUTION: If the “Manifold Header and Tailpipe is received with damaged packaging the product maybe compromised. Before putting into use check for any visible signs of damage to the product, with special attention to components that will be in contact with the medical gas with regard to ruptures or compromised cleanliness. Contact [BeaconMedaes] for guidance regarding repair or replacement if needed.

⚠ If you do not understand completely the information contained in this manual, DO NOT USE the device and contact BeaconMedaes in order to obtain any necessary information

- 1.1 This device is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of appropriate experience and knowledge
- 1.2 Remove the device from its packaging immediately before installation to avoid contamination
- 1.3 Check that no part of the device is visibly damaged, that each part is perfectly clean and especially free of lubricants
- 1.4 Do not oil or grease the device: this may cause fires and/or explosions

- 1.5 Do not use solvents, disinfectants or other substances not compatible with medical gases
- 1.6 The installation shall be carried out by competent and qualified technicians; BeaconMedaes is not responsible for installations carried out by non-competent and non-certified personnel
- 1.7 The use of the device is permitted only by persons who have received proper instructions and trained on the risks associated with oxygen and other medical gases in pressure
- 1.8 Maintenance shall be carried out exclusively by BeaconMedaes or by technicians authorized, trained and qualified by BeaconMedaes; BeaconMedaes is not responsible
- 1.9 for any maintenance carried out by personnel not expressly authorised, trained and qualified by BeaconMedaes
- 1.10 Use appropriate personal protective equipment
- 1.11 The tools used shall be appropriate and they do not damage the device
- 1.12 Do not use adapters and / or extension not suitable for oxygen and / or other medical gases in high pressure
- 1.13 Check the gaskets, they have to be genuine and intact
- 1.14 Handle the device with extreme caution
- 1.15 Do not smoke near the device
- 1.16 Do not approach with open flames
- 1.17 Do not tamper with the device
- 1.18 Place the device away from heat sources or flammable materials
- 1.19 Do not expose the device to environmental conditions different from those specified
- 1.20. During the opening of the valves, do not remain in front edge of gas

- 1.21 During operations wear appropriate protection goggles
- 1.22 Always open valves VERY SLOWLY and in particular the valve of the cylinder (when used for emergency / maintenance supply), ignition might occur due to oxygen pressure shocks
- 1.23 In order to prevent accidental fall of the cylinders, use adequate protection means in accordance with current regulations
- 1.24 Spare parts shall be original; BeaconMedaes is not responsible in case of use of any non-original spare parts
- 1.25 Always make sure that the device is not under pressure before its maintenance / replacement
- 1.26 At the end of the cycle of life, dispose of the device according to the current regulations
- 1.27 Do not remove any labels from the device
- 1.28 The vibrations due to long transport could slightly loosen the connections and cause small leaks, look for these leaks exclusively with proper liquid
- 1.29 Do not over tighten the threaded components
- 1.30 The entire pipeline system shall comply with all project requirements provided by current rules in order to ensure continuity of supply to the patients; the device alone can not guarantee the continuity of supply but it need additional components and procedures as required by current regulations
- 1.31 Check that any other components used with the device comply with current regulations and are perfectly clean and degreased in accordance with ISO 15001 standard
- 1.32 Once the installation is completed and before its commissioning, the device shall be tested according to the test procedures required by the relevant standards for medical gas pipeline systems
- 1.33 In order to prevent catastrophic damage, pay particular attention to the locations where the device is installed and in case of building works.
- 1.34 In addition, make sure that the locations are always accessible to authorized personnel

- 1.35 BeaconMedaes is not responsible for failure to follow the instructions provided in this document, for the use of non-genuine spare parts and/or of work performed by non-authorized technicians

2. Environmental Transport and Storage Conditions

2.1 Environmental Transport and Storage Conditions

All products are separately packaged and stored in controlled conditions.

Minimum storage temperature: 0°C
Maximum storage temperature: +40°C
Relative humidity (non-condensing): 10%-95%

2.3 Environmental Operating Conditions

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

Minimum working temperature: -20°C
Maximum working temperature: +60°C
Relative humidity (non-condensing): 40%-80%

 **WARNING! Only use approved leak detection fluids with this product. Other leak detection fluids may contain surfactants that can impair the structural integrity of the terminal unit.**

2.4 Cleaning

The exterior of the bracket should be wiped over with a damp cloth frequently to remove any dust or foreign substances

3. General Information

The device shall operate in a manner that complies to both HTM 02-01 and ISO 7396-1 requirements.

This device is defined within ISO 7396-1 as one or more source of supply which assists with maintaining continuity of supply to the medical gas pipeline.

The device group scope covers the following types of source equipment.

- Supply systems with cylinders
- Supply systems with cryogenic vessels

Note – medical cylinders and cryogenic vessels are not within the scope of the device

Intended Use

The device is intended to work in conjunction with other devices within the medical gas pipeline system (MGPS) to assist with maintaining continuity of medical gas supply throughout the hospital to local connection points for eventual introduction into the human body.

The device controls the gas pressure within the specification as required by the MGPS. In all cases other devices outside of this scope are connected downstream of the MGPS are required to control the final gas pressure and flow requirements for safe supply to the patient. Therefore, this device is not intended to control supply parameter hazards directly to the patient, only to the MGPS.

Intended patient population

The device is intended to be used in conjunction with other medical gas pipeline equipment in hospitals and have no direct contact with patients. Medical Gas Pipeline Systems supply medical gases to medical equipment which can be used across any populations & all age groups.

Intended user profile

Manifold Header and Tailpipe are intended for use by appropriately qualified and trained personnel only who have undergone relevant 'HTM 02-01 Authorised Person' (AP) training regarding the safe use of medical gas supply systems.

The device 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 Part B: Operational Management). The device is intended for use by appropriately qualified technical personnel only. This condition is emphasised in the IFUs.

Reference: HTM 02-01 Medical gas pipeline systems – Part B: Operational Management
Authorised Person (MGPS)

4.21 The Authorised Person (MGPS) is defined as that person designated by the Executive Manager to be responsible for the day-to-day management of the MGPS at a particular site or sites. This includes the issue of permits in accordance with the permit-to work procedure.

The principal responsibilities of the Authorised Person (MGPS) in respect of the permit-to-work procedure are set out in paragraph 6.91. The Authorised Person (MGPS) also has specific duties with regard to VIE installations (see Appendix E).

Competent Person (MGPS)

4.40 The Competent Person (MGPS) is the person who carries out the installation and/or maintenance work on the MGPS. A list of his/her responsibilities and duties is set out in paragraph 6.92. The Competent Person (MGPS) should have received appropriate training and should be on a list of Competent Persons (MGPS). In the case of directly employed labour, this list should be held by the Authorised Person (MGPS); in the case of contracted labour, it should be held by the contractor's Authorised Person (MGPS) or project manager.

Part B: Operational Management

Authorised Person (MGPS)

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Indications

Manifold Header and Tailpipe are used as part of medical gas pipeline systems where an uninterrupted supply of medical gas is required. The medical device works in conjunction with other medical devices for the immediate and reliable delivery of medical gas to terminal units used for respiratory use in healthcare facilities. In all cases there are medical devices installed between this device and the patient that controls the flow and pressure to safe levels to the patient. This device therefore only delivers medical air within specification to the medical gas pipeline system, not directly to the patient.

Contraindications

If the device sustains any damage or malfunctioning, the assembly or faulty part should be replaced completely. This ensures all damaged components are replaced. Contraindications for use, warnings and precautions related to the safe use of the devices are detailed in the IFU supplied with the devices. These sections shall be read by the intended user before installing the device and starting to use it.

4. Description : Modular Header Manifolds

Modular Header Manifolds shall provide connection points for flexible cupronickel tailpipes. The headers shall be available in two pipe configurations named 'Header Pipe Rail Kit 1 gas' and 'Header Pipe Rail Kit 2 gases'. To create a simplification, we will simply call these items Header pipe rail Kit 1 gas[A] and the Header pipe rail kit 2 gases [B]. Each pipe kit is supplied with a 3/8" plug (with seal) to terminate the pipe and 3/8" x 5/8" adaptor (with o-rings) to connect to another pipe when required.

Figure 1

Header Pipe Rail Kit 1 gas [A]

2212020785



Note: NRV not included in part numbers.

Figure 2

Header Pipe Rail Kit 2 gases [B]

2212020786



Note: NRV not included in part numbers.

By combining these configurations, the user will be able to achieve a variable number of arrangements. For example, a 2x3 gases arrangement will be A+B, a 2x4 gases arrangement will be B+B, a 2x6 gases arrangement will be B+B+B, a 2x5 gases arrangement will be A+B+B, a 2x2 gases arrangement will be just B, note that it could also be an A+A but it won't be cost-effective. (Note, [A] could be both at the end or beginning of the final assemble) [A] or [B] headers are gas specific items and shall connect directly to the manifold control system, extensions for additional cylinders will be made by supplying further [A] and [B] kits with the correct NRV (Note, gas ID is stamped onto the flat face of the NRV caps). Non-return valves (NRV) shall be fitted to each tailpipe connection point to protect the system in the event of a tailpipe fracture.

CAUTION! Ensure that all the header rails supplied are the correct gas type. The gas ID is stamped onto the flat section of the NRV caps.



If additional headers are to be installed, remove the 3/8" BSP blanking plug and bonded seal from the end of the header block and fit the 3/8" x 5/8" adaptor that comes with 'O' ring.

Figure 3

Header with Non-return valves (NRV) on



Figure 4

3/8" x 5/8" adaptor that comes with 'O' ring.

2001213



Corner connectors shall be available to enable installation of manifold headers around corners of the manifold room. A custom length corner connector (Specified on order) shall also be available to enable header manifolds to be installed in a 'U' configuration across 3 adjacent walls of a manifold room.

2212020815



Header brackets configurations

The header pipe rail [A] and [B] are supplied with their relative "L" shaped Bracket.

Figure 5

Header Pipe Rail [A] on "L" Bracket



The "L" Bracket comes in 4 different sizes.

Part numbers and descriptions:

Table 1.00

Part Number	Description
2212020803	Header Rack for 1 Cylinder
2212020800	Header Rack for 2 Cylinders
2212020798	Header Rack for 4 Cylinders
2212020799	Header Rack for 6 Cylinders

Finish for the above part will be One coat primer, one coat gloss paint RAL7011.

Figure 6

Header Rack for 1 Cylinder

2212020803



Figure 7

Header Rack for 2 Cylinders

2212020800



Figure 8

Header Rack for 4 Cylinders

2212020798



Figure 9

Header Rack for 6 Cylinders

2212020799



The header rack assembly comes in 6 standard arrangements, all the master arrangements will create a LH (Left Hand) and RH(Right Hand).

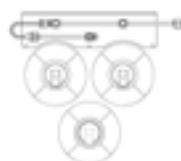
CAUTION! always check that all the assemblies are supplied with the correct gas type. The gas ID is stamped onto the flat section of the NRV caps.

Note:

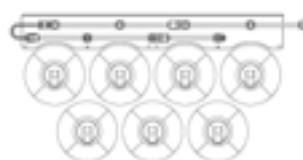
A double stack arrangement could be achieved in both the wall mounted and free standing configuration by using a loop connection Part number 2212020814, (illustration in page 13).

The double stacked arrangement can be achieved only using the "L" bracket, also called header rack for: 2, 4 and 6 cylinders. (Go to page 14 to see Loop connection detail)

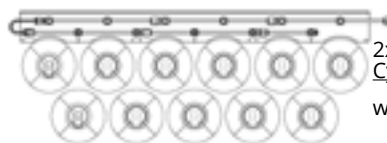
View below illustration.



2x2 can increase by 2 Cylinders
(1LH+1RH)
with the loop connection.



2x4 can increase by 6 Cylinders(3LH+3RH)
with the loop connection.



2x6 can increase by 10 Cylinders(5LH+5RH)
with the loop connection.

Tables for configurations

For a typical symmetrical arrangement, the part numbers to use are shown in Table 1.01: NEW - Generation Modular Headers Rack Table.

For a customised arrangement where independent assemblies are required(see page 16, sample config. 2) the part numbers to use are shown Table 1.02: Modular Header 1 side only

NEW - Generation Modular Headers Rack Table

Note - Below part numbers contain headers for both sides.

Table 1.01

Gas Type	2x1	2x2	2x3	2x4	2x5	2x6
Oxygen	8102371280	8102371281	8102371282	8102371283	8102371284	8102371285
Nitrous Oxide	8102371286	8102371287	8102371288	8102371289	8102371290	8102371291
Entonox O2/N2O	8102371292	8102371293	8102371294	8102371295	8102371296	8102371297
Medical Air	8102371298	8102371299	8102371300	8102371301	8102371302	8102371303
Nitrogen	8102371304	8102371305	8102371306	8102371307	8102371308	8102371309
Carbon Dioxide	8102371310	8102371311	8102371312	8102371313	8102371314	8102371315

Modular Header 1 side only Table

Cylinder Connection = Cyl. Conn.

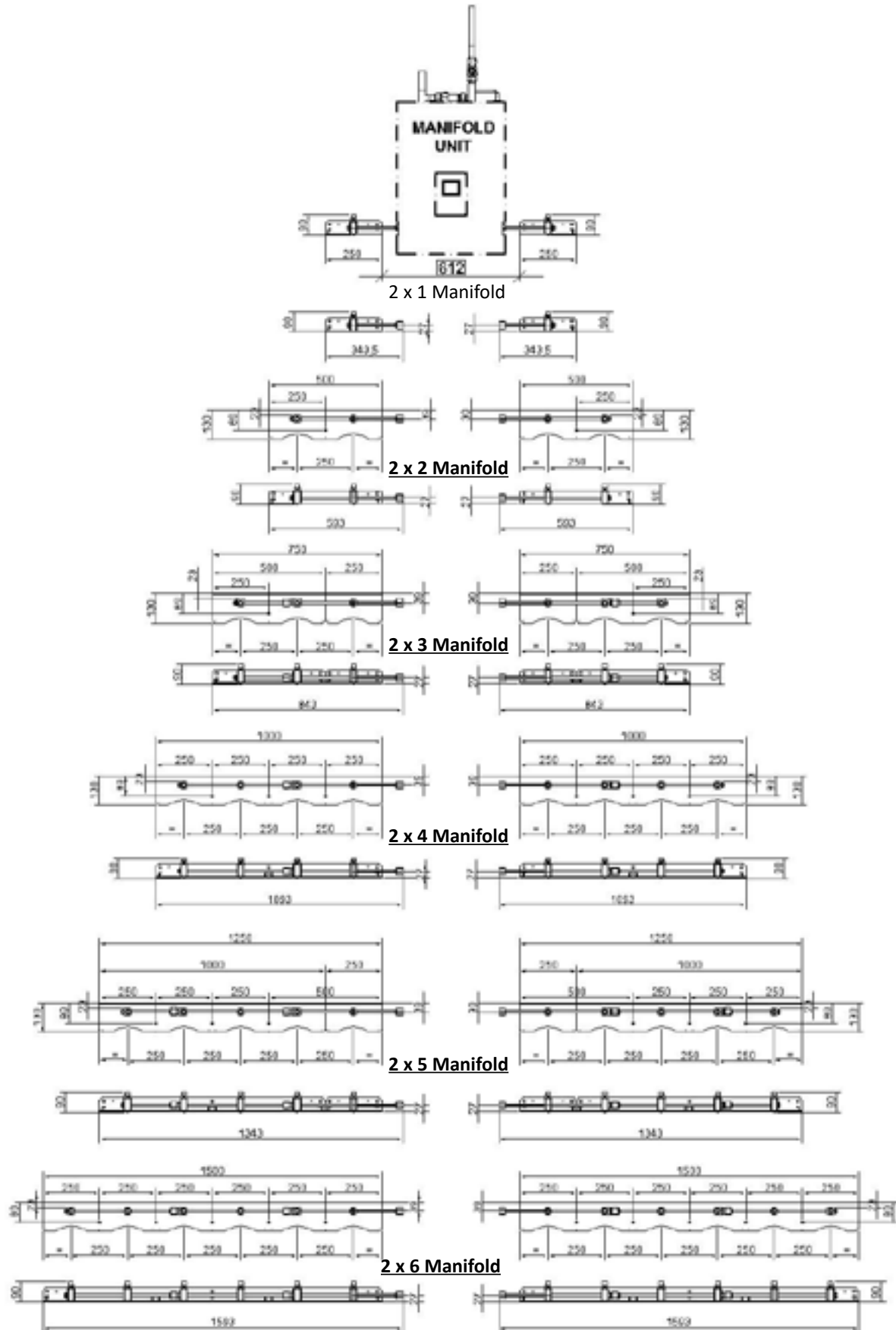
Left-hand = LH

Right-Hand = RH

Table 1.02

Gas Type	Cyl. Conn. 1	Cyl. Conn. 2	Cyl. Conn. 3	Cyl. Conn. 4	Cyl. Conn. 5	Cyl. Conn. 6
Oxygen	8102370396 [LH-RH]	8102370398 [LH-RH]	8102370400 [LH-RH]	8102370402 [LH-RH]	8102370404 [LH-RH]	8102370406 [LH-RH]
Nitrous Oxide	8102370425 [LH-RH]	8102370427 [LH-RH]	8102370429 [LH-RH]	8102370431 [LH-RH]	8102370433 [LH-RH]	8102370435 [LH-RH]
Entonox O2/N2O	8102370437 [LH-RH]	8102370439 [LH-RH]	8102370441 [LH-RH]	8102370443 [LH-RH]	8102370445 [LH-RH]	8102370447 [LH-RH]
Medical Air	8102370449 [LH-RH]	8102370451 [LH-RH]	8102370453 [LH-RH]	8102370455 [LH-RH]	8102370457 [LH-RH]	8102370459 [LH-RH]
Nitrogen	8102370461 [LH-RH]	8102370463 [LH-RH]	8102370465 [LH-RH]	8102370467 [LH-RH]	8102370469 [LH-RH]	8102370471 [LH-RH]
Carbon Dioxide	8102370473 [LH-RH]	8102370475 [LH-RH]	8102370477 [LH-RH]	8102370479 [LH-RH]	8102370481 [LH-RH]	8102370483 [LH-RH]

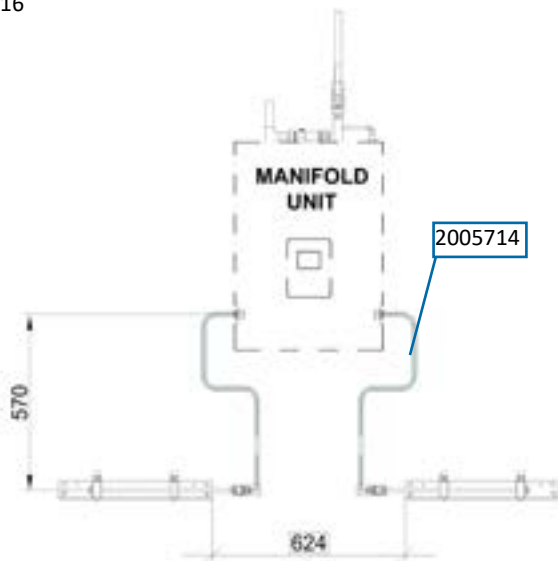
Header Arrangement Details



Header Arrangement for use with VF type Cylinders

View showing optional drop down connectors (P/N:2005714) for use with VF type cylinders.

Figure 16



NOTE - 'J' type cylinders typically for Oxygen and Medical Air. 'G' type cylinders typically for Nitrous Oxide and O₂/N₂O mix (Entonox), 'VF' size cylinders typically used for CO₂.

NRV - Table part numbers

Table 1.03

Gas Type	Symbol	Gas Service NRV Part Number
Oxygen	O ₂	2000288
Nitrous Oxide	N ₂ O	2000289
Entonox	O ₂ /N ₂ O	2000290
Medical Air	MA4	2000291
Nitrogen	N ₂	2000292
Carbon Dioxide	CO ₂	2005850

Header Pipe Rail assembly kit for 1 and 2 gases

The below list shows the items used to create the double stacked arrangement.

Part Numbers (P/N) as follow:

Table 1.04

Part Number	Description
8102370485	Header Pipe_Rail Kit 1 Gas with O ₂ NRV LH/RH
8102370486	Header Pipe_Rail Kit 1 Gas with N ₂ O NRV LH/RH
8102370487	Header Pipe_Rail Kit 1 Gas with O ₂ /N ₂ O NRV LH/RH
8102370488	Header Pipe_Rail Kit 1 Gas with MA NRV LH/RH
8102370489	Header Pipe_Rail Kit 1 Gas with N NRV LH/RH
8102370508	Header Pipe_Rail Kit 1 Gas with CO ₂ NRV LH/RH
8102370509	Header Pipe_Rail Kit 2 Gases with O ₂ NRV LH/RH
8102370510	Header Pipe_Rail Kit 2 Gases with N ₂ O NRV LH/RH
8102370511	Header Pipe_Rail Kit 2 Gases with O ₂ /N ₂ O NRV LH/RH
8102370512	Header Pipe_Rail Kit 2 Gases with MA NRV LH/RH
8102370513	Header Pipe_Rail Kit 2 Gases with N NRV LH/RH
8102370514	Header Pipe_Rail Kit 2 Gases with CO ₂ NRV LH/RH

Figure 17



Illustration Rendering 2x2 gas connection

Link to old generation modular headers

It is possible to link the new generation modular header to the old by using the existing Retrofit kit. Image below shows kit items, Part number 2212020146[1], 2205981[2], 1822236[3] and 2001213[4].(See table 1.06)

Figure 17
2212020146



2005981



Old generation modular headers Image

Figure 19
2000257

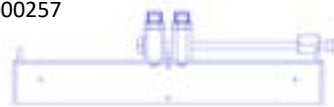


Figure 20
2000259



Old generation modular headers as follow:

Table 1.05

GAS TYPE	2 x 1	2 x 2	2 x 3	2 x 4	2 x 5	2 x 6
Oxygen (O ₂)	2005226	2000257	2000258	2000259	2000260	2000261
Nitrous Oxide (N ₂ O)	2005227	2000262	2000263	2000264	2000265	2000266
Oxygen/Nitrous Oxide (O ₂ /N ₂ O)	2005228	2000267	2000268	2000269	2000270	2000271
Medical Air	2005229	2000272	2000273	2000274	2000275	2000276
Nitrogen (N ₂)	2005230	2000277	2000278	2000279	2000280	2000281
Carbon Dioxide (CO ₂)	2005231	2005209	2005210	2005212	2005213	2005214

Note - Kits contain headers for both sides

Illustration of connection using the Retrofit adaptor Connection.

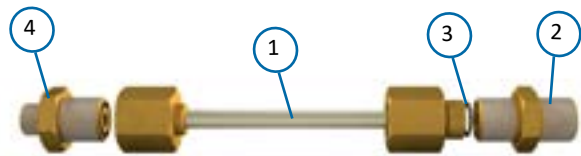


Figure 18

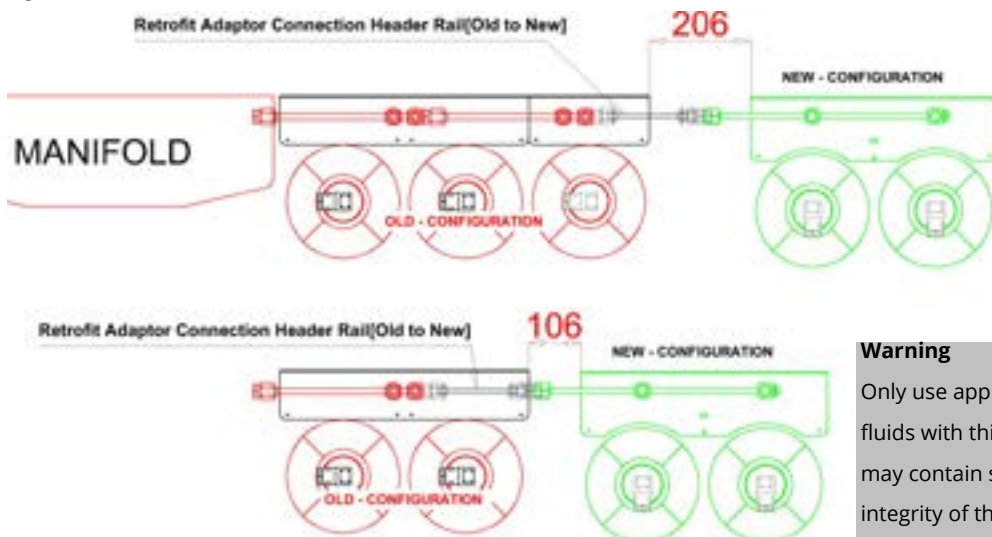


Table 1.06

Part Number	Number	Description
2212020146	1	Brazed connector
2005981	2	5/8" BSP Adaptor
1822236	3	"O" Ring Seal
2001213	4	3/8" x 5/8" Adaptor C/W "O" Ring

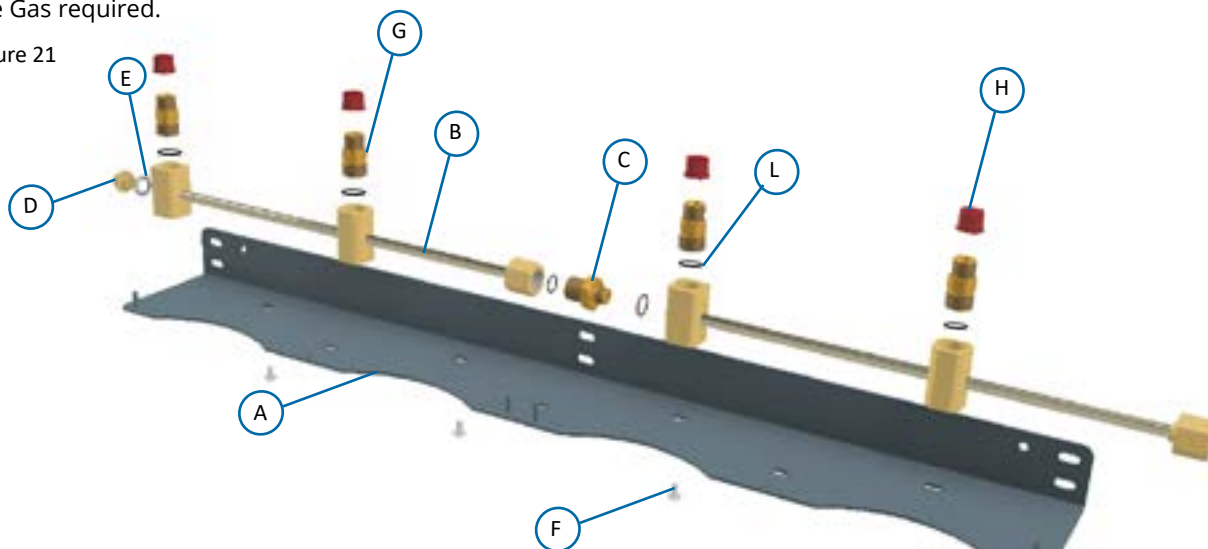
Warning

Only use approved leak detection fluids with this product. Other leak detection fluids may contain surfactants that can impair the structural integrity of the terminal unit.

5. Installation: Assembly procedure

Below exploded illustration is representing the Modular Header Rack Assembly (x4)LH-RH [8102370402], the NRV are Gas Specific therefore will vary according to the Gas required.

Figure 21



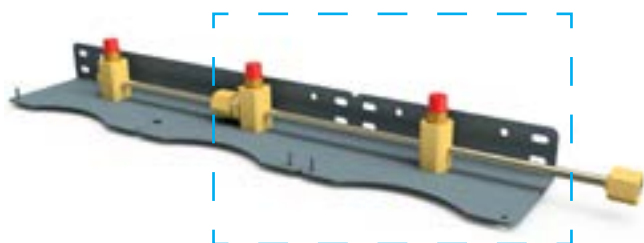
The illustration above is a typical configuration for the Wall mounted option but will be the same for the new free standing option. Main parts for a Modular header system are:

Table 1.07

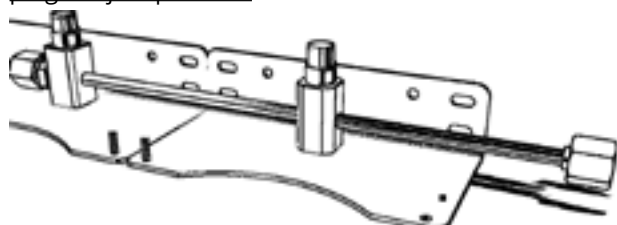
Description	Pos
Header Rack for 4 Cylinders	A
Header Pipe Rail 2 Gases	B
3/8" x 5/8" Adaptor C/W 'O' Ring	C
3/8" Brass Plug	D
3/8" Bonded Seal Self Centering	E
M6x12 Socket Head Button Screws With Flange	F
Gas Service NRV	G
NRV O2 End cap	H
Seal Washer	L

For Odd number cylinder connections example 2x3, 2x5, 2x7 etc The "L" Bracket will be as illustration below, a 2 gases header pipe rail should overlap the join position when and where possible.

Figure 22



Detail illustration showing 2 gases header pipe rail overlapping the join position.



CAUTION! Supplied fixings are for use with solid masonry walls only. Alternative fixing types are not supplied with the unit.

Installation and positioning

Ensure the header rail is level, mark the header rail mounting holes or slots.

Drill the previously marked holes and use supplied fixings. Place the header pipe rail on to the header rack [for specified number of cylinder] and fit with the M6x12 Socket Head Button Screws With Flange.

Figure 23



Figure 24



Free standing configuration

The illustration below shows the new free standing option. The free standing assembly is a contained, optimised and space saving configuration, see figure 27. Main parts are:

Table 1.08

Description	Part Number	Pos
Post for manifold support		1
Post for Cylinder rack support		2
Manifold Header Assembly		3



Post for manifold support to be supplied with kit [8102370394]. BackPlate attachment profile are however supplied loose, this will allow connection between the Post and the manifold Mounting plate.

Figure 26



Post for Cylinder rack support to be supplied with kit [8102370395], this items is used as an intermediate or end connection support for the manifold header rack assembly. see Figure 27 and 28 illustration.

Figure 27

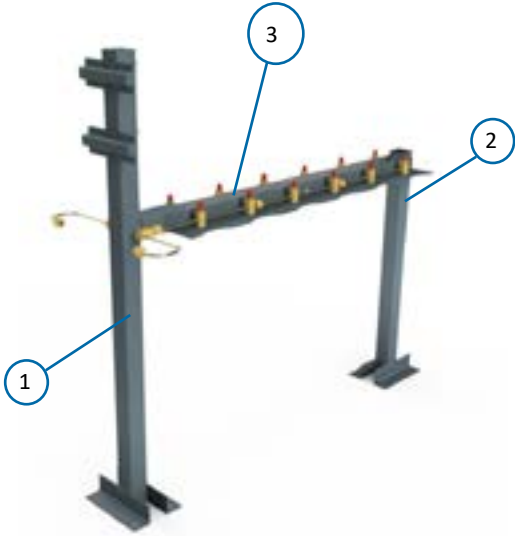


Figure 28



Post for manifold support and Post for Cylinder rack support are to be fitted to the floor with floor anchor.

Note:
The concrete must be fully cured. Floor anchor to be suitable to the mechanical strength of the concrete. Information about concrete type could be obtained from the architect. Avoid fixing through cracked concrete and through floor joint.



Baseplate holes appropriate for Light sleeve anchor for push-through installation. Suitable fixing: M12x75 Type Sleeve Floor Anchor for Concrete C12/15 to C20/25

Note:
Make sure the Free standing assembly is levelled and in final position before fixing to floor with anchor.
Below illustration shows the header pipe rail in position, the item is connected to the “L” bracket and assembled to the post for manifold support, and finally linked to the drop down connection.
Figure 29



Part number 2212020787



Drop Down Connector

Part number 2212020999



Post joint to Cylinder rack

Below illustration shows how the Post joint to cylinder rack[2212020999] is used.
Figure 30

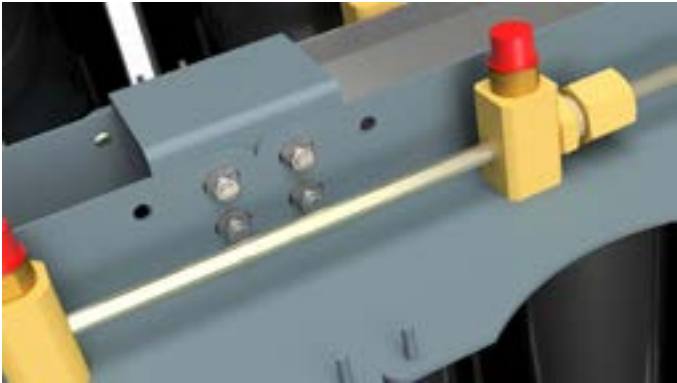
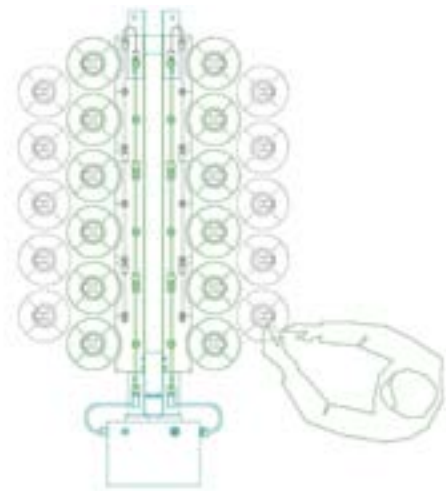


Figure 31



Below illustration shows how to fix the final “End off” free standind assembly.

Figure 32



The above configuration shows the flexibility of the free standing option. The 2 x 6 gases could become a 2 x 11 gases by using the loop connection shown below in Figure 33. More example are shown on Page 14 and 15.

Figure 33



Fixings use to assemble the free standing configuration are:

Table 1.09

Description	Pos	Part Number
Part Thread Hex Screw M8x100 Ref: ISO 4014	Supplied	2212021184
Nyloc Insert Lock Nut M8 - DIN 985	Supplied	2212020808
Flat Washer M8 - ISO 7089	Supplied	1903270
Plain Washer M5 Form C - BS 4320	Supplied	1820448
M12x75 Type Sleeve Floor Anchor	See Note	

NOTE - The concrete must be fully cured. Floor anchor to be suitable to the mechanical strength of the concrete. Information about concrete type could be obtained from the architect. Avoid fixing through cracked concrete and through floor joint. Floor Anchor NOT supplied

Loop Connection Detail



The items needed to create the loop connection above are:

Table 1.10

Description	Item
Loop Connection	1
Header Pipe Rail 2 Gases	2
Header Pipe Rail 1 Gas	3

Item 1

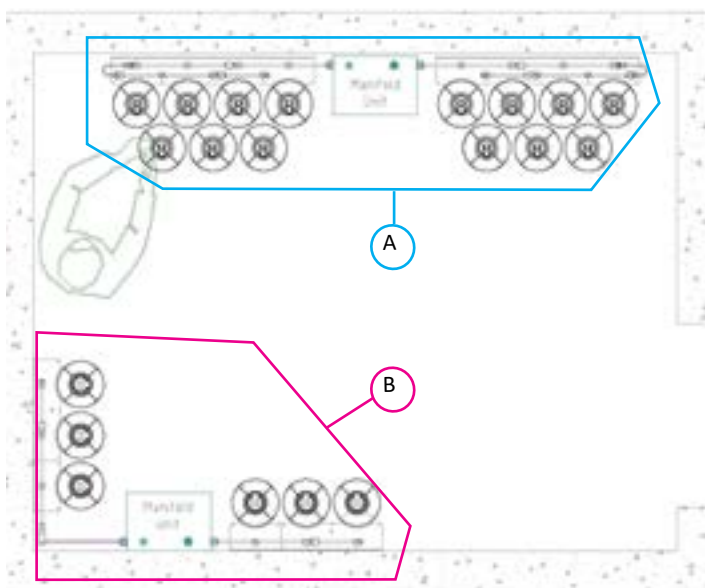


The above render shows the final assembly of the loop connection done on a 2x4 header rack.

Plan view example configurations

Sample configuration 1

Wall mounted Plus a double stacked arrangement.



For the double stacked arrangement letter "A", the items below are required:

Table 1.11

Part Number	Description	QTY
8102371283	Oxygen Manifold Header Rack 2x4	1
8102370509	Header pipe rail kit 2 gases	2
8102370485	Header pipe rail kit 1 gas	2
2212020814	Loop connection	2

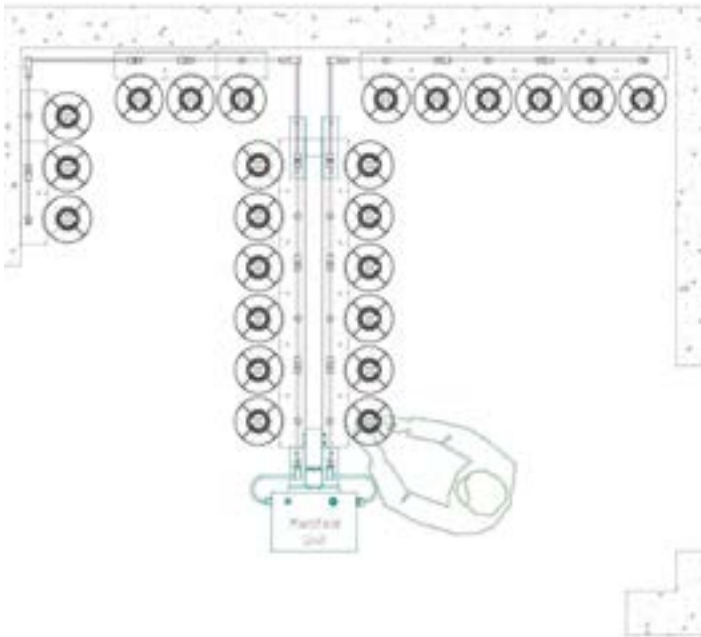
For the arrangement letter "B", the items below are required:

Table 1.12

Part Number	Description	QTY
8102371282	Oxygen Manifold Header Rack 2x3	1
2212020815	(Length specified on order) Corner Conn.	1

Sample configuration 2

Mix between the free standing and the wall mounted arrangement.



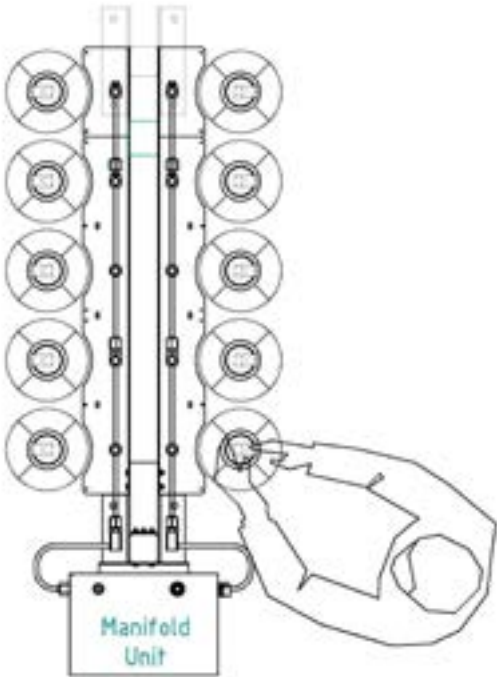
For the arrangement shown in Configuration 2, the items below are required:

Table 1.13

Part Number	Description	QTY
8102371285	Oxygen Manifold Header Rack 2x6	1
8102370406	Modular Header Rack Assembly (x6)	1
8102371282	Oxygen Manifold Header Rack 2x3	1
2212020815	(Length specified on order) Corner Conn.	3
8102370394	Kit - Post for manifold supp	1
8102370395	Kit - Post for Cylind. rack supp	1
2212020787	Drop Down Connector	2

Sample configuration 3

Free standing arrangement.



For the arrangement shown in Configuration 3, the items below are required:

Table 1.14

Part Number	Description	QTY
8102371284	Oxygen Manifold Header Rack 2x5	1
8102370394	Kit - Post for manifold supp	1
8102370395	Kit - Post for Cylind. rack supp	1
2212020787	Drop Down Connector	2
2212020999	Post joint to Cylinder rack	1

Headers & Tailpipes

The manifold headers and tailpipes are intended to be used in conjunction with manifold control panels acting as the connection point between the medical gas cylinders and the control panel thus enabling a large quantity of bottles to be connected at any one time.

Manifold Headers and Tailpipes are designed to be installed indoors but can be installed outside. All locations should have good visibility. The device is designed to be operated continuously.

The tailpipes are only disconnected from the attached gas cylinders by trained hospital porters when changing cylinders.

There are several most common standards that can be used to specify the cylinder valve outlets used with medical gas cylinder packages:

BS EN ISO 407 (known as "Pin-Indexed")

BS EN ISO 407 is typically used to define the valve outlets for cylinders up to 5 litre water capacity. This standard details the pin index valve outlet configurations used specifically for medical gas service, providing up to 16 different outlets for a range of medical gases and medical gas mixtures. This standard has also been adopted for the valve outlets of larger medical gas cylinders to provide a gas specific outlet. There are no proposals to change the specifications of these valve outlets.

BS 341 (known as "Bull Nose")

BS 341 Part 3 (known as "Bull Nose") is used to specify all other medical gas cylinder valve outlets.

This standard provides unique product specific valve outlets for nitrous oxide and carbon dioxide but specifies the 5/8" BSP bullnose valve outlet (No.3) for use in medical oxygen, medical air, medical carbon dioxide mixtures, medical helium, medical helium/oxygen mixtures and medical oxygen/carbon dioxide mixtures. This standard is also used to specify the same 5/8" BSP bullnose valve outlet for a number of industrial gas cylinders, including industrial oxygen, nitrogen, argon and helium. Thus there is potential for confusion not only between specific medical gas cylinders but also with other industrial gas cylinders.



In May 2002 British Standard BS 341 (1), was revised by issuing a Part 3. Specification for industrial valves for working pressures up to and including 300 bar, which was thus made obsolescent. The main changes were as follows:

1. The connections detailed in BS 341-1: 1991 (2) continued unchanged in BS 341-3: 2002 (1), except that the maximum working pressure allowed for these connections was reduced from 300 bar to 250 bar.
2. Four new connections were introduced for use with four gas groups at maximum working pressures* of 250 to 300 bar. The four gas groups were:

- Oxidising gases and gas mixtures (including oxygen) BS 341 No. 32
- Inert gases and their mixtures BS 341 No. 30
- Flammable gases and mixtures BS 341 No. 38
- Air and synthetic air BS 341 No. 31

The new connections are identical to the 'New European Valve Outlet Connection' system (referred to as NEVOC) developed by the European Industrial Gas Association (EIGA) and detailed in BS ISO 5145 (3), Cylinder valve outlets for gases and gas mixtures. Selection and dimensioning.

BS ISO 5145

BS ISO 5145 includes a number of medical gas connections for the major medical gases and gas mixtures. In medical gas service, this standard is primarily used for the filling connection for valves with integral pressure regulators to provide product specific connection. This outlet is also used on medical gas cylinders which have non-pressure regulated outlets, where the supplier wants to provide a different valve connection for higher pressure cylinders. This provides some protection against the inadvertent connection of a high pressure cylinder to equipment that is not designed for the pressure.



CGA

CGA In North America, outlet connections are usually designated by a three-digit number preceded by the letters CGA, for example, CGA 350. Sometimes an ultra-high integrity connection is preceded by a "DISS" designation rather than the more common CGA designation. DISS is the acronym for Diameter Index Safety System. The CGA systems employ a large number of connections to minimize the ability to inadvertently connect a cylinder to a system that may not be compatible with the gas or cylinder pressure, or that may contain a gas that would be unsafe (i.e., inert gas to a medical oxygen system).



NOTE - More detailed information can be found on document PdBu-54 High pressure cylinder connections standards.

Cylinder Connection to Tailpipes

CAUTION! Ensure that all the tailpipes supplied are the correct gas type. The gas ID is stamped onto the nut that connects to the header non-return valve.

Connect the tailpipes to the non-return valves on the header racks as shown in figure 34 and figure 35.

Refer to hospitals/site policy for safe cylinder handling, move the cylinders into place (see figures 34) ready for connection to the tailpipes.

Figure 34

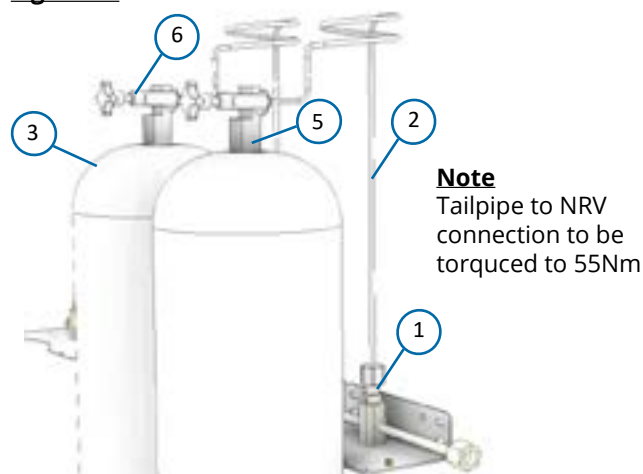
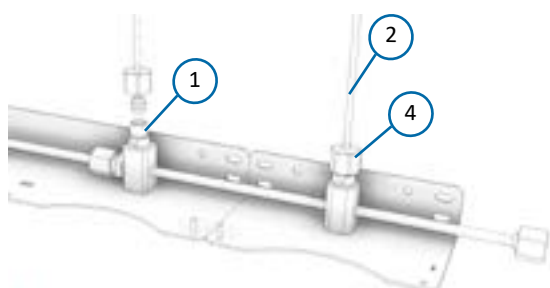


Table 1.15

Description	Item
Header Non-Return Valve (NRV)	1
Tail-pipe	2
Medical Gas Cylinder	3
Tailpipe to NRV connection	4
Tailpipe Pin Index Connection to Cylinder	5
Bodok Seal	6

Connect the cylinders to the pin indexed clamp on the tail pipe, as shown in figure 34. Ensure the Bodok seal is in place at the opposite side to the thumb screw on the pin index clamp before connection.

Figure 35



CAUTION! Only persons who have had specific training in the safety of medical gases, manual handling techniques and cylinder changing procedures should be allowed to change cylinders on medical gas manifolds or medical equipment.

Typical cylinder bank changeover pressure

For each empty cylinder, disconnect the tailpipe from the cylinder by either undoing the hand wheel or unscrewing the nut at the cylinder end, depending on the cylinder connection type.

NOTE - The tailpipe non-return valves are not totally leak tight, therefore to reduce potential gas leakage while changing empty cylinders, ensure all cylinders have been changed before opening the cylinder valves. Slowly open the cylinder valves for all the newly replaced cylinders.

CAUTION! ALL cylinder valves should be opened gently. TAPPING the operating key GENTLY with a soft-faced (copper) mallet is acceptable but undue force should not be used. If it is obvious that injury or damage could arise from trying to open a sticking valve, the cylinder should be removed from service and returned to the supplier as a faulty cylinder.

CAUTION! Opening cylinder valves SLOWLY will prevent a sudden rise in pressure in the system. It is at this time when there will be most stress on components and when most explosions will occur due to adiabatic compression of any oil or grease that may be present.

Spares scheduling

The following table below are the manufacturer recommended spares holding.

Table 1.16

Part Number	Description kit
4233540023	Spare seal kit for a 6 gases connection

NOTE - Spare seal kit based on a 6 gases connection.

Service Tailpipe Kits

Table 1.17

Part Number	Description NRV
2000288	Oxygen (O2)
2000289	Nitrous Oxide (N2O)
2000290	Oxygen/Nitrous Oxide (O2/N2O)
2000291	Medical Air / Surgical Air
2000292	Nitrogen (N2)
2005850	Carbon Dioxide (CO2)

NOTE - quantities for the header non-return valves is 1 per cylinder connection.

Table 1.18

Part Number	Description
2000226	M24 X 2 Blank Plug Brass
4233400561	Seal Washer NRV cap

NOTE - Typically used to close the header block during servicing.



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