

Emergency Reserve Manifold

HTM02-01/ ISO7396-1

SPECIFICATION

Emergency Reserve Manifold

The Emergency Reserve Manifold shall conform to NHS Health Technical Memorandum No. 02-01 (HTM 02-01), BS EN ISO 7396-1, BS EN ISO 15001 and BS EN ISO 10524-2.

The manifold control system shall provide an uninterrupted supply of a specific medical gas from equally sized high pressure cylinder banks via a suitable arrangement of pressure regulators, providing a constant nominal downstream pipeline gauge pressure of 400 kPa, 700 kPa or 1.100 kPa.

The Emergency Reserve Manifold shall be supplied fully assembled and tested. A Gem Shield terminal unit test point shall be fitted, which shall be isolated from the main supply with a ball valve. The manifold shall be supplied with a non-return valve and lockable line isolation valve for connection to the distribution system, enabling a continuous supply of gas to the distribution system upon failure of the normal supply. High pressure bank isolation valves shall be supplied to enable one bank to be designated as “duty” (open in normal operation) and one bank to be designated as “standby” (closed in normal operation). Visual indication of the open bank shall be included.

To simplify installation the manifold shall be supplied with the primary manifold headers and non-return valves for connection of tailpipes. The complete manifold shall be fitted to a wall mounting plate attached to the wall with four screws.

Pressure Regulation

There shall be two separate stages of pressure regulation to enable high peak flow rates without a significant reduction in downstream pressure. The inlet of the 1st stage regulator shall be protected from the particulate matter by a 25µm sintered brass filter. Sintered aluminium bronzes shall not be used. Regulators shall comply with BS EN ISO 10524-2 and shall be supplied with documented test reports upon request, confirming successful completion of the oxygen ignition tests stated therein.

The manifold control system shall be capable of supplying a flow of 1,200 l/min to a nominal 400 kPa distribution system, 2,000 l/min to a nominal 700 kPa distribution system and a flow of 2,000 l/min to a nominal 1,100 kPa distribution system based on a 10% reduction in flowing pressure from a static pressure set point. All regulators shall be protected from over-pressurisation by relief valves, which shall be pre-piped into the manifold exhaust line stub pipe to enable the gas to be taken away and vented to atmosphere safely. Relief valves shall not be vented into the manifold room.

Alternatively, for small installation (required flow less than 200 l/min) a simplified version of Emergency Reserve Manifold with multistage regulator (ERM ECO) shall be available.

Materials

All polymers and elastomers in the gas flow that can be subjected to working pressure greater than 3,000 kPa shall be halogen-free. The use of PTFE, PCTFE, Viton and other halogenated polymers in these applications is strictly prohibited. Non-return valves fitted to header manifolds shall have a metallic seat with ceramic ball. Soft seat non-return valves utilising polymers or elastomers are not acceptable.

Emergency Reserve Manifold Operation

Either the left or right hand of the manifold bank shall be designated as "Duty", with the other manifold bank designated as "Standby" by use of the high pressure bank isolation valves. When the bank

pressure in the “Duty” bank falls to 68 bar (14 bar for nitrous oxide), a “Reserve Low” or “Reserve Fault” alarm condition shall be initiated by a contact pressure gauge, which shall be indicated on the relevant medical gas central alarm panel and/or primary supply automatic manifold panel. The “Standby” bank shall also be provided with a contact pressure gauge, such that any leakage of gas over an extended period of which causes the pressure in the standby bank to fall below 68 bar (14 bar for nitrous oxide), will also initiate a “Reserve Low” or “Reserve Fault” alarm condition.

Modular Header Manifolds

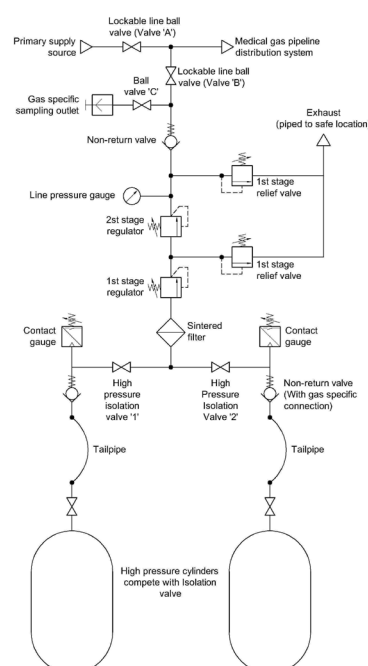
Modular Header Manifolds shall provide connection points for flexible cupronickel tailpipes. Pin indexed tailpipes shall comply to EN ISO 407:2004 as required. Non-return valves shall be fitted to each tailpipe connection point to protect the system in the event of a tailpipe fracture.

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

CE Marking

The standard range of BeaconMedæ's Emergency Reserve Manifolds are 'CE' marked under the Medical Devices Directive 93/42/EEC with approval from notified body no. 0088 (Lloyd's Register Quality Assurance). Under this directive, the specified products are classified as Class IIb Medical Devices.

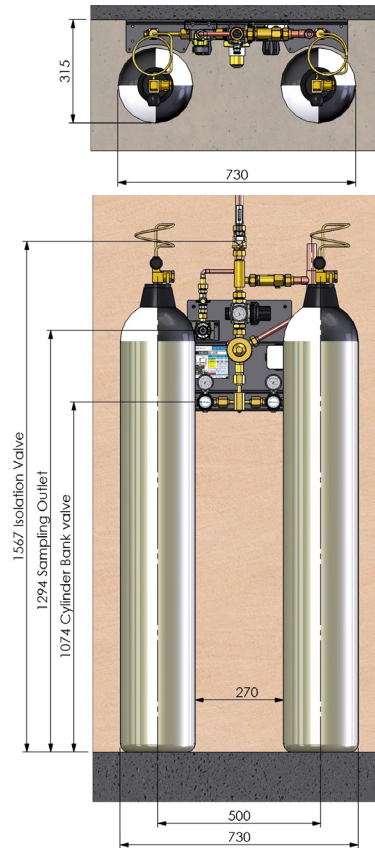
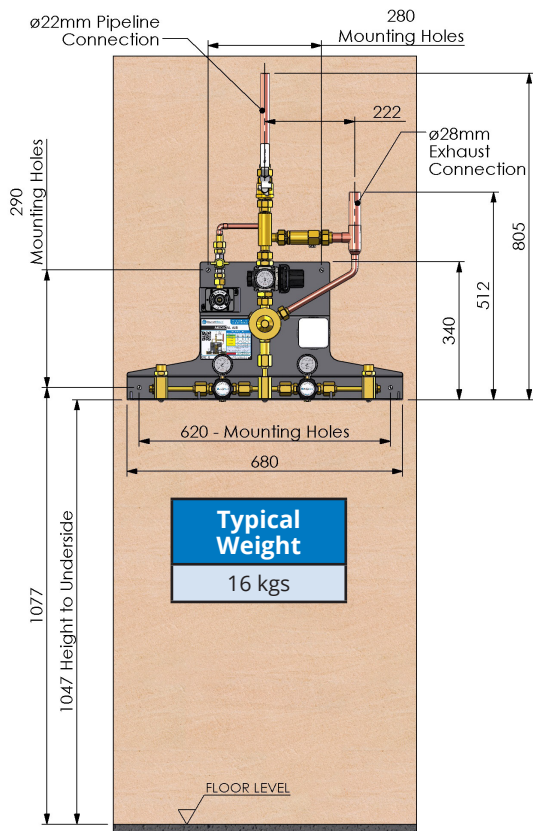
Schematic Diagram



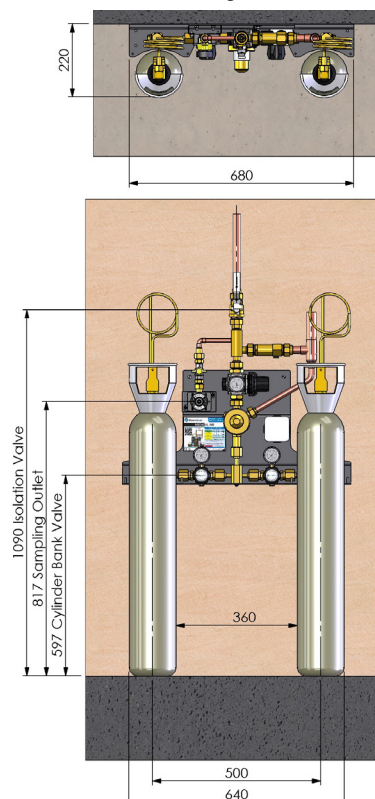
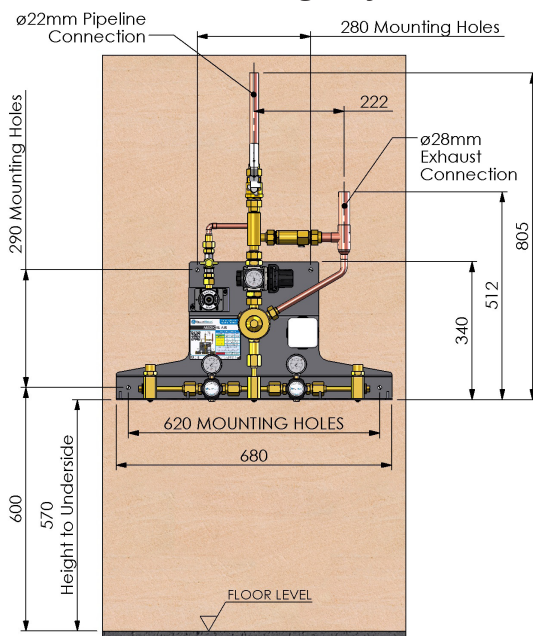
Note: ERM ECO based on a multistage pressure regulator, where 1st and 2^d stage regulators combined into one unit.



Emergency Reserve Manifold Installation with J or G Cylinders



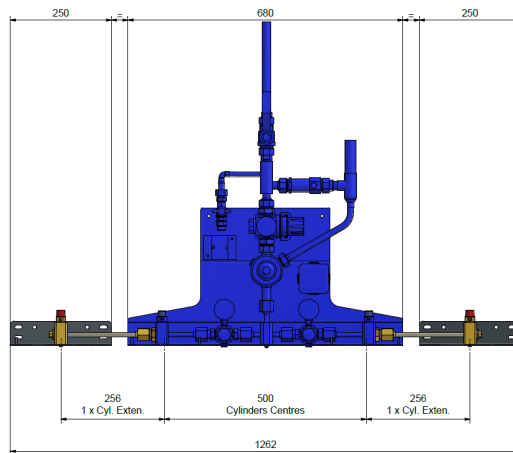
Emergency Reserve Manifold Installation with VF Cylinders



Note: Dimensions for standard and ERM ECO version of ERM are identical.

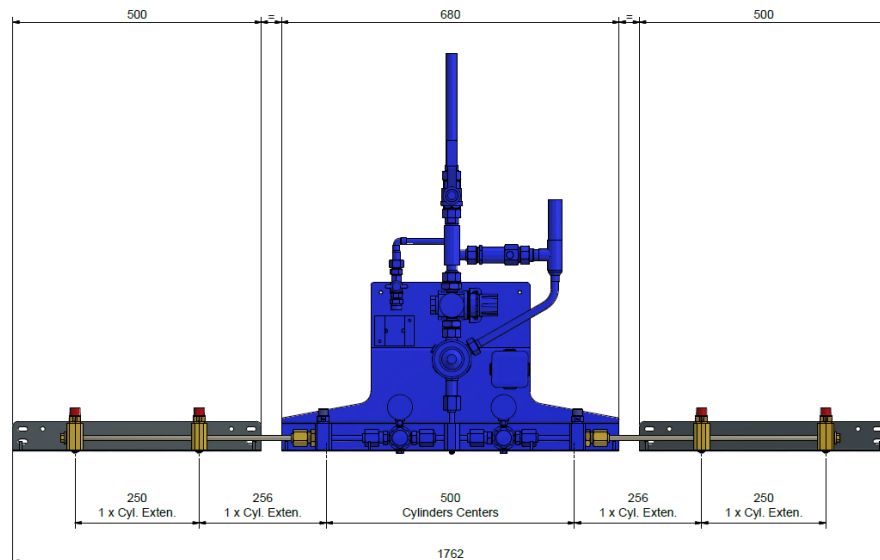


Emergency Reserve Manifold Installation with 2x2 extension

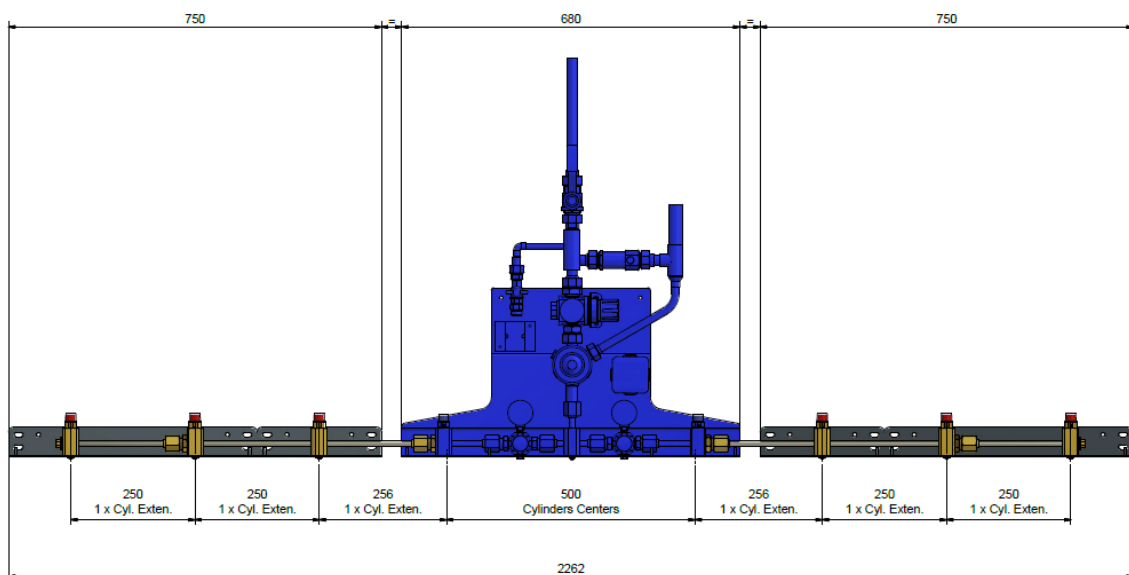


Manifold Size (No. of Cylinders)	Total Width (mm)
2 x 1	730
2 x 2	1200
2 x 3	1942
2 x 4	2269
2 x 5	2952
2 x 6	3979

Emergency Reserve Manifold Installation up to 2x3 extension

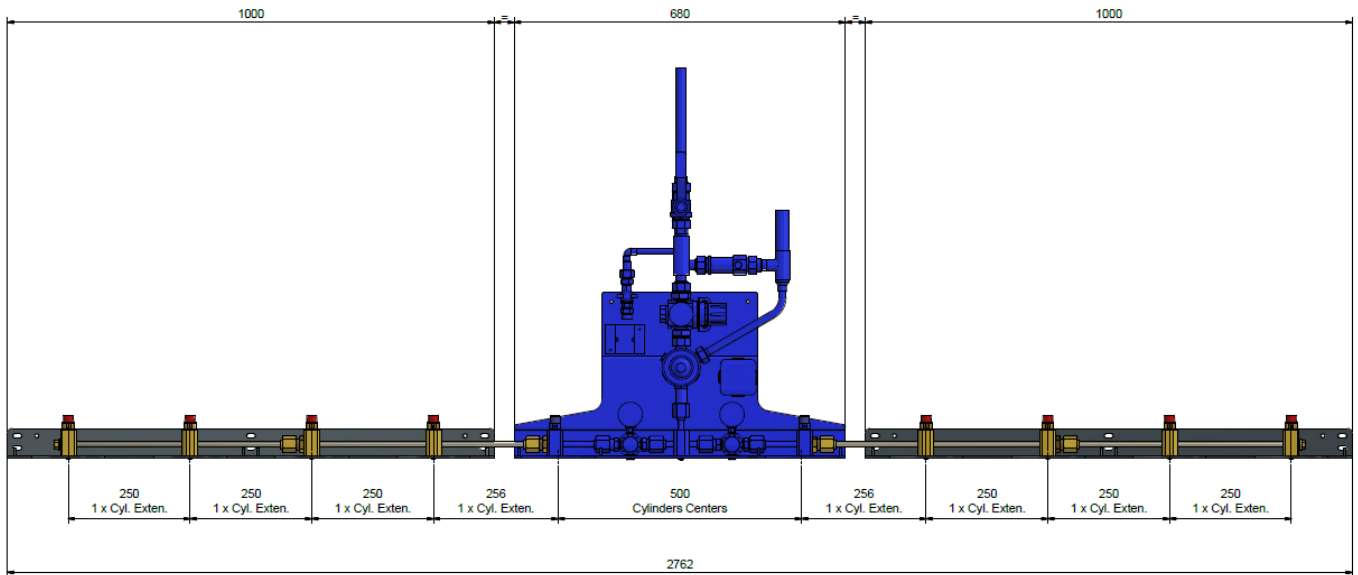


Emergency Reserve Manifold Installation up to 2x4 extension

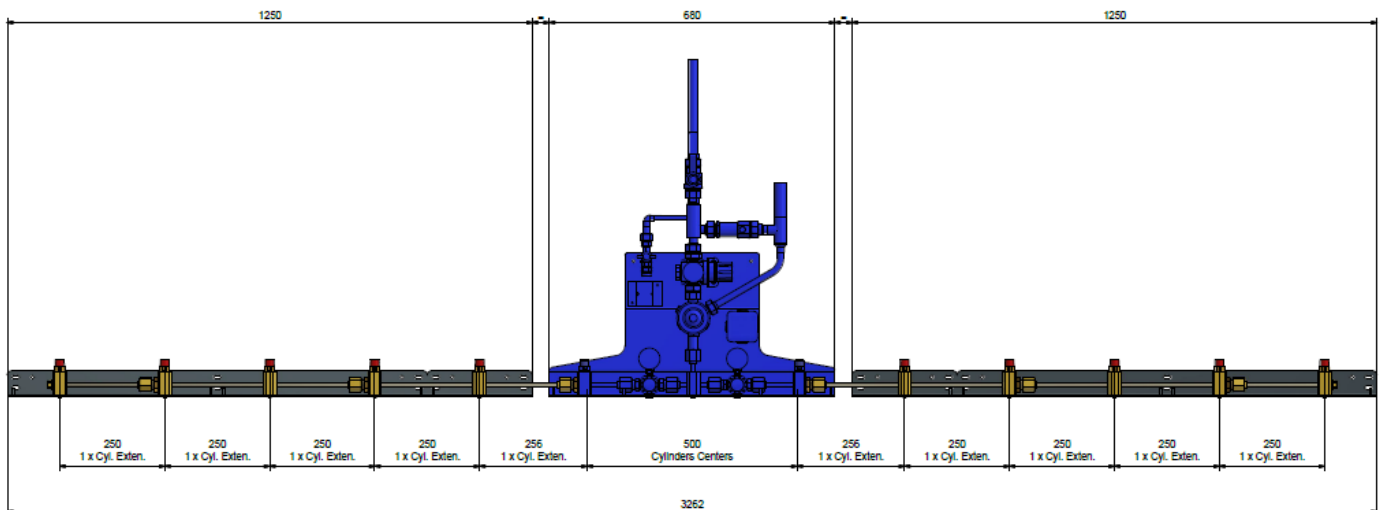




Emergency Reserve Manifold Installation up to 2x5 extension



Emergency Reserve Manifold Installation up to 2x6 extension



Ordering

Gas ID	Control Panel 2x1 Part N°	
	ERM	ERM ECO ¹
Oxygen	2005747	8102341736
Nitrous Oxide	2005748	8102341737
Oxygen / Nitrous Oxide	2005749	8102341738
Medical Air	2005750	8102341739
Surgical Air, 7 bar	2005751	8102341740
Surgical Air, 11 bar	2005752	n/a
Carbon Dioxide	2005753	8102341741
Nitrogen, 7 bar	2005754	8102341742
Nitrogen, 11 bar	2005755	n/a

Description	Part No
1 Cylinder Spare Rack	8102371105
2 Cylinder Spare Rack	8102371106
4 Cylinder Spare Rack	8102371107
6 Cylinder Spare Rack	8102371108

Description	Part No
Heater Kit (N2O and N2O/O2 50%/50% mixture)	2000295
Manifold Header Corner Connector - one side	2212020815

Other parts available: Safety signs etc as per HTM02-01 requirements.

Note: 1. Due to the ERM ECO using a multistage regulator instead of two stage pressure regulation (ERM), the gas flow is limited to 200 l/m.

Tailpipe	O2	N2O	N2O / O2	Air	CO2	N2
Pin-Indexed (ISO 407) ²	8102340110	8102340123	8102340130	8102340140	8102340151	
Pin-Indexed (ISO 407) Extended	8102340116		8102340131	8102340146		
Bull nose (ISO5145), Side entry	8102369663		8102369664			
Bull nose (BS341) ¹ Top entry	8102340111			8102340141		8102340161
Bull nose (BS341) ¹ Side entry	8102340112	8102340120		8102340142	8102340150	
Bull nose (BS341) ¹ Extended	8102340117	8102340125		8102340147	8102340154	
US Std (CGA)	8102340114	8102340122		8102340144		
Chinese Bullnose	8102340115	8102340124		8102340145	8102340152	8102340162

Notes: 1. Bullnose tailpipes (except Chinese type) are to the following BS standards: Oxygen, Air, Nitrogen: BS: 341-1 No. 3; Carbon dioxide: BS: 341-1 No. 8; Nitrous oxide: BS: 341-1 No. 13.

2. Mixture N₂O - O₂, (registered trade name Entonox BOC) low pressure cylinder "G" type has Pin-indexed connector according to standard BS EN ISO 407 and 230 bar cylinder "EW" type has Bull nose connector according to ISO 5145 No. 13.

3. Oxygen cylinder "J" type has Pin-Indexed connector according to ISO 407, where "W" type (230 bar) has Bull nose according to ISO 5145 No. 5.

Extension Modular Headers Rack Table

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