Semi Automatic and Manual Manifold Systems

SPECIFICATION

Semi Automatic Manifold Control Systems

The BeaconMedæs Semi Auto Manifold is designed to supply piped medical gas where continuity of supply is essential, and where the gas is to be supplied from high pressure gas cylinders. All individual components conform to ISO and HTM requirements to form a medical gas control panel to which maximises safety requirements with simplified function. The Semi Automatic Manifold shall be supplied fully tested.

The duty bank is determined by operating the right hand regulator leaver, which will adjust the set pressure to determine the lead regulator. Rotate clockwise to set right bank as duty, or anti-clockwise for left bank duty.

The duty bank will depleted until the pressure drops below the changeover parameters. The gas supply will then automatically changeover to the standby bank. A signal can be taken to a remote alarm from the contact gauges to alert the requirement to change cylinders. The duty selector leaver should then be switch over to the full running bank, and the empty cylinders changed. This cycle is then repeated to maintain continuous supply.

The manifold control panel shall be supplied as nominally 4 bar (5 bar max.) and 7 bar (8.5 bar max), either standard units or full feature (see table 1 for details). The 4 bar manifold is available with 100 or 250 bar contents gauges depending on the pressure of the cylinders to be used. These units can be supplied as standard unit or full feature. See table 1 for list of critical components included and optional extras supplied as bolt on kits.

The semi auto manifold can be used as either main supply or emergency reserve manifold (ERM). When used as a emergency backup manifold the line pressure regulator should be set slightly lower than the primary supply pressure. This will prevent it from feeding to the pipeline during normal operation of the primary system. The line pressure regulator can be increased to nominal distribution pressure in the event of emergency.

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.

Pressure Regulation

There shall be two separate stages of pressure regulation to enable high peak flow rates without a significant reduction in downstream pressure. Multistage regulators combined into a single unit are not acceptable. 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 1,000 l/min to a nominal 400 kPa distribution system, 2,000 l/min to a nominal 700 kPa distribution system, based on a maximum allowable pressure drop of 10% from static to full flow. All regulators shall be protected from over-pressurisation by relief valves.

A pre-piped kit shall be available for indoor installation, to enable the gas to be taken away and vented to atmosphere safely. Relief valves shall not be vented into the manifold room.

Materials

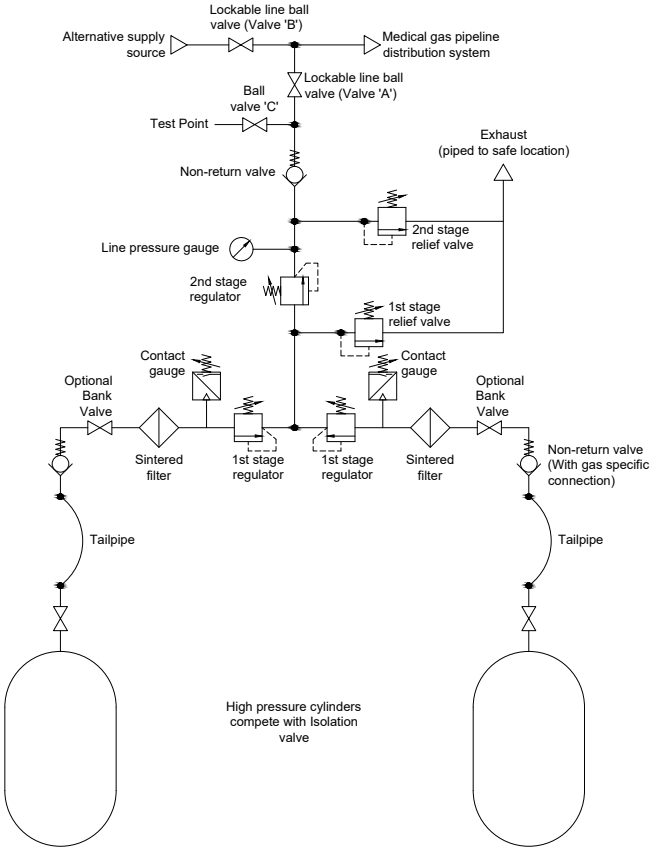
All polymers and elastomers in the gas flow that can be subjected to working pressure greater than 3000 kPa shall be halogen-free. The use of PTFE, PCTFE, Viton and other halogenated polymers in these applications is strictly prohibited. Non-return valves fitted to header manifolds shall have a metallic seat with ceramic ball. Soft seat non-return valves utilising polymers or elastomers are not acceptable.

Modular Header Manifolds

Modular header manifolds shall provide connection points for flexible cupro nickel tailpipes. They shall be available in 'primary' and 'secondary' configurations, with either single or double cylinder connection points. 'Primary' headers shall connect directly to the manifold control system with extensions for additional cylinders being provided by the addition of 'secondary' headers. Non-return valves shall be fitted to each tailpipe connection point to protect the system in the event of a tailpipe fracture.

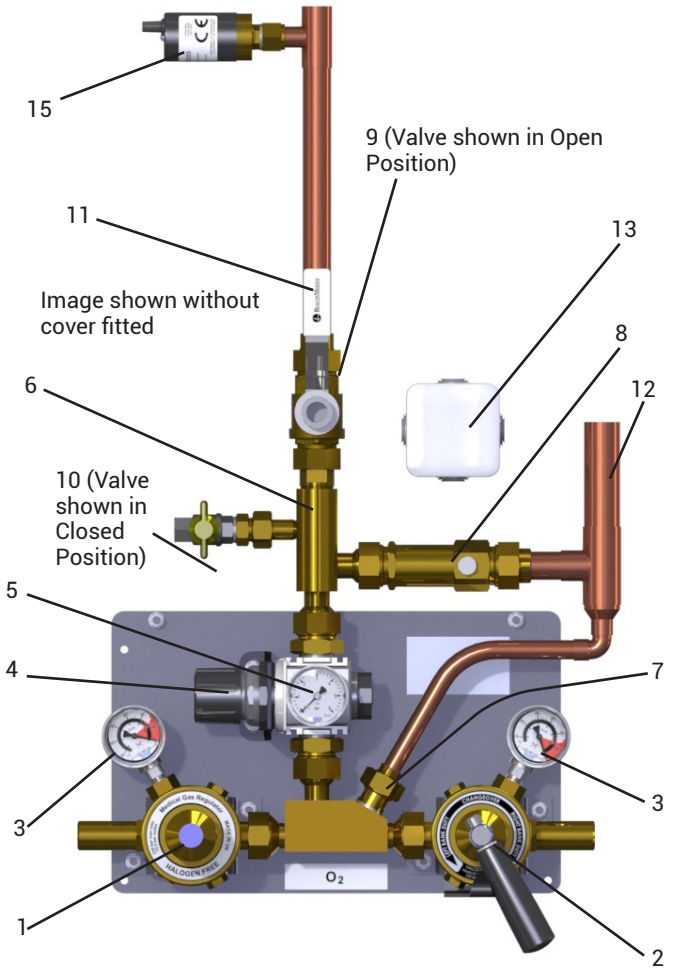
Corner connectors shall be available to enable installation of manifold headers around corners of the manifold room. A custom length corner connector shall also be available to enable header manifolds to be installed in a 'U' configuration across 3 adjacent walls of a manifold room.

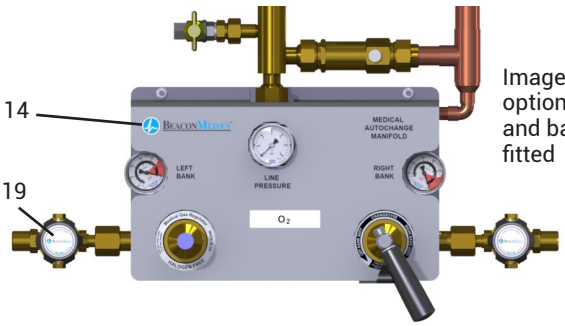
Schematic Diagram



Symbols to BS2971 & ISO 1219-1

Semi Automatic Manifold General Arrangement





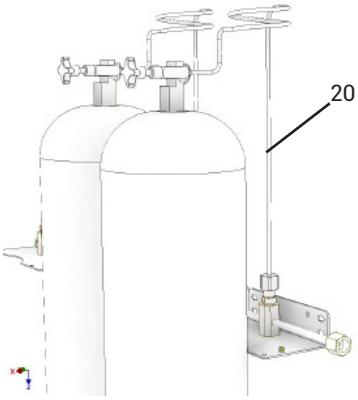


Table 1: Main features/components

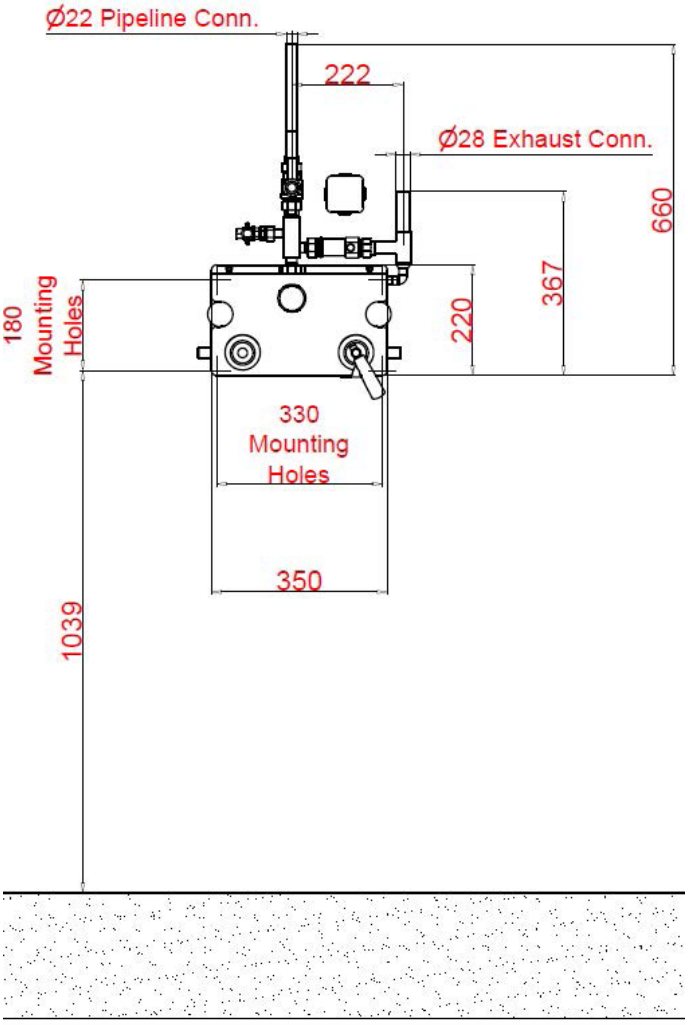
Item No	Description	Standard Unit	Full Feature	Optional Supply
1	Fixed cylinder regulator	✓	✓	
2	Duty bank control regulator	✓	✓	
3	Cylinder content/contact gauge	✓	✓	
4	Line regulator	✓	✓	
5	Line gauge	✓	✓	
6	Integral Non-return Valve Assembly	✓	✓	
7	1st Stage Pressure Relief Valve	✓	✓	
8	Line Pressure Relief Valve	✓	✓	
9	Lockable Isolation Valve	✓	✓	
10	Test point Isolation Valve	✓	✓	
11	Pipeline connection point (22mm OD Copper Tube)	✓	✓	
12	Pressure Relief Exhaust Connection point (28mm OD Copper Tube)		✓	✓
13	Termination Box For Remote Alarm		✓	✓
14	Cover Plate		✓	✓
15	Pressure Switch & Tee connection			✓
16	Single Line contact Module (Not shown)			✓
17	Double Line contact Module (Not shown)			✓
18	Manifold Headers C/W NRVs			✓
19	High Pressure Bank Valves			✓
20	Tailpipes			✓

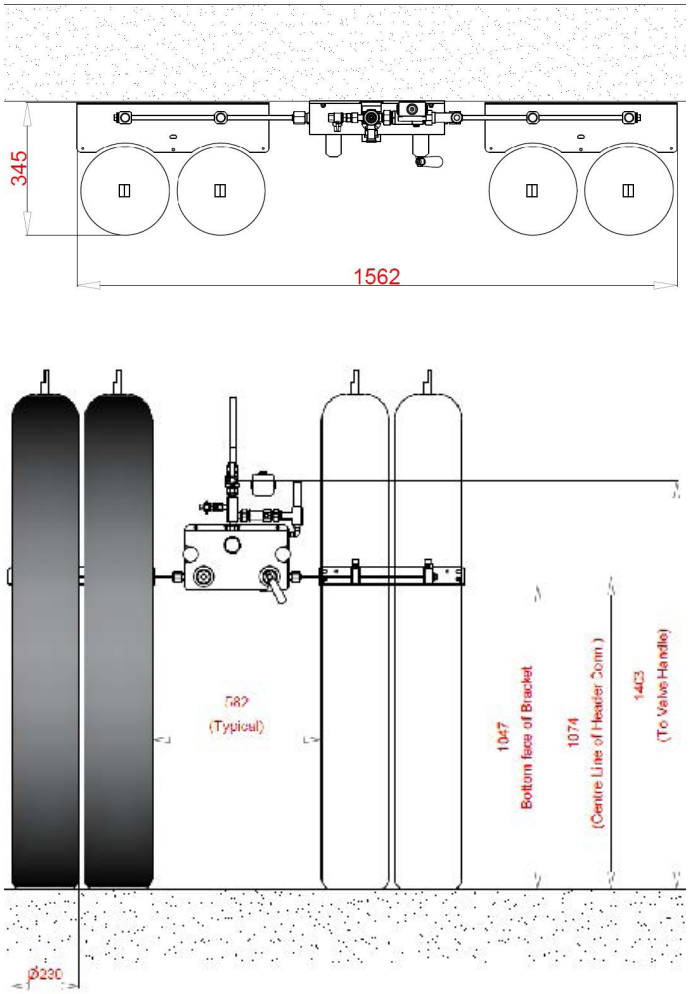
Notes:

Item 12 is recommended for indoor installations.

Item 16 & 17 are used to connect alarm outputs to a Medipoint medical alarm.

Typical Installation For Use With 'J' & 'G' Type Cylinder

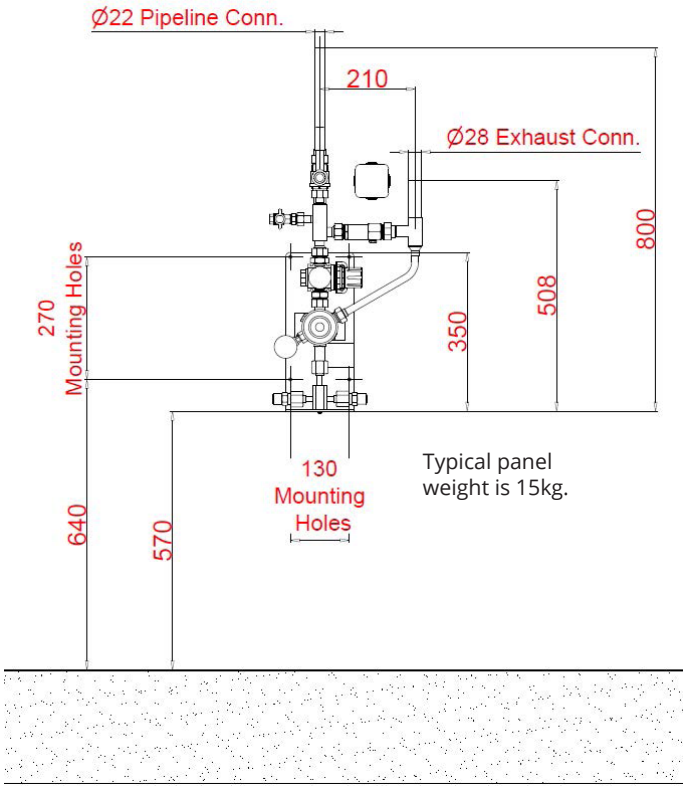


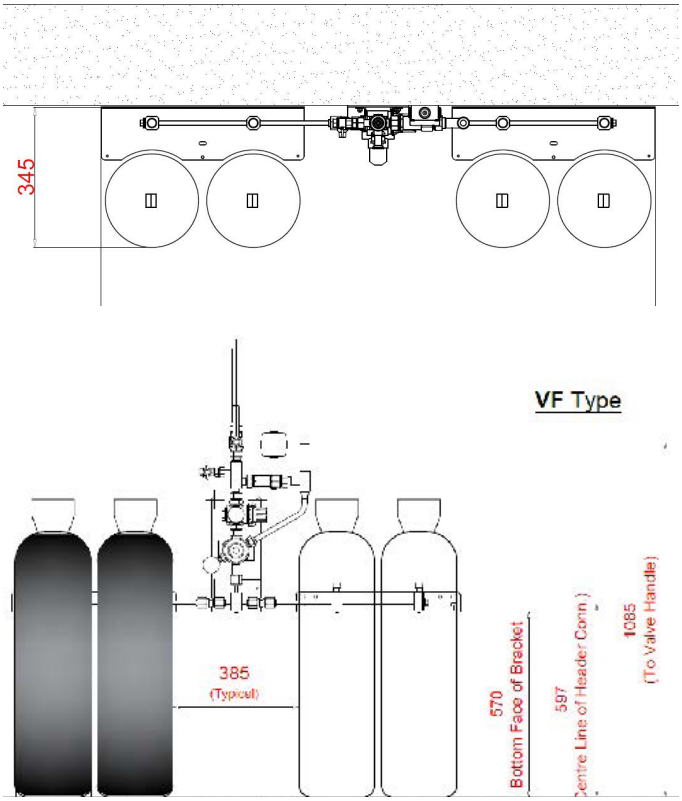


Note - 'J' type cylinders typically for Oxygen and Medical Air.
'G' type cylinders typically for Nitrous Oxide and N_2O/O_2 mix (Entonox).

Note - If option high pressure bank valves are used (see figure 1, item 19) the manifold width increases by 110mm per side.

Typical Installation For use with 'VF' Type Cylinders

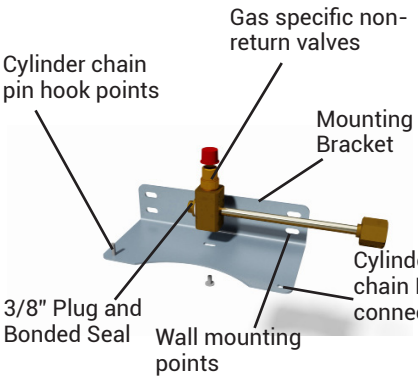




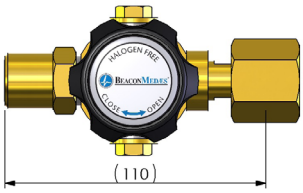
Note - 'VF' size cylinders are typically used for CO_2.

Note - If option high pressure bank valves are used (see figure 1, item 19) the manifold width increases by 110mm per side.

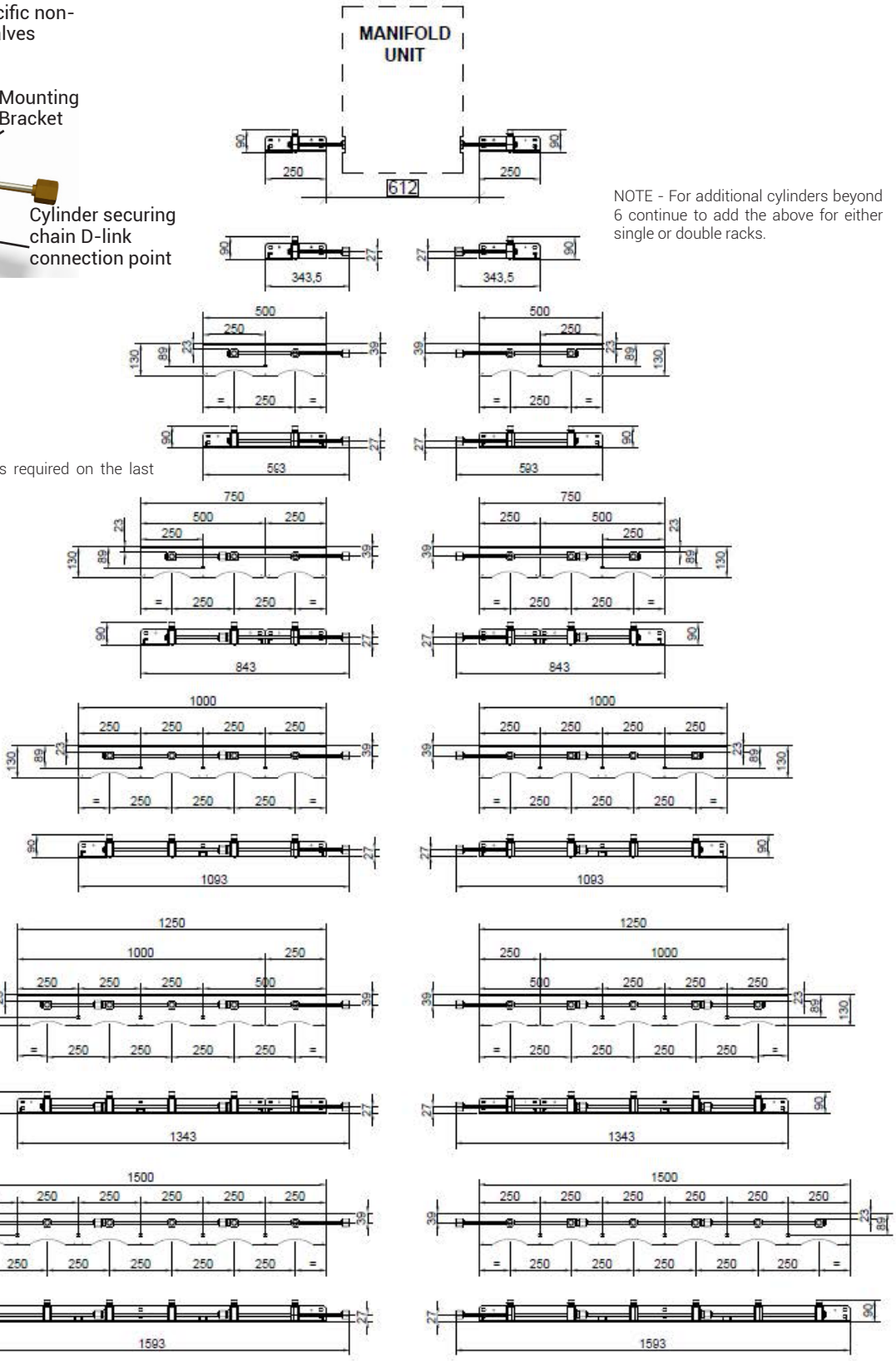
Typical cylinder header & extension layout details



NOTE - 3/8" plug and bonded seal is required on the last cylinder header on each bank.



Note - If optional high pressure bank valves are installed, add typically 110mm per side for manifold assembly length



NOTE - For additional cylinders beyond 6 continue to add the above for either single or double racks.

Manual Manifold Control Systems

The BeaconMedæs Manual Manifold is designed to supply piped medical gas where continuity of supply is essential, and where the gas is to be supplied from high pressure gas cylinders. All individual components conform to ISO and HTM requirements to form a medical gas control panel which maximises safety requirements with a simplified function. The manual manifold is ideal for small installations with low flow demands. The unit should be monitored from a close by location for quick reaction times to manually changeover the cylinder banks when empty. The Manual Manifold shall be supplied fully tested.

The manifold control panel shall be supplied as nominally 4 bar (5 bar max.) and 7 bar (8.5 bar max), either standard units or full feature (see table 1 for details). The 4 bar manifold is available with 100 or 250 bar contents gauges depending on the pressure of the cylinders to be used. These units can be supplied as standard unit or full feature.

See table 2 for list of critical components included and optional extras supplied as bolt on kits.

The manual manifold can be used as either main supply or emergency reserve manifold (ERM). When used as a emergency backup manifold the line pressure regulator should be set slightly lower than the primary supply pressure . This will prevent it from feeding to the pipeline during normal operation of the primary system. The line pressure regulator can be increased to nominal distribution pressure in the event of emergency.

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.

Pressure Regulation

There shall be two separate stages of pressure regulation to enable high peak flow rates without a significant reduction in downstream pressure. Multistage regulators combined into a single unit are not acceptable. 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 1,000 l/min to a nominal 400 kPa distribution system, 2,000 l/min to a nominal 700 kPa distribution system, based on a maximum allowable pressure drop of 10% from static to full flow. All regulators shall be protected from over-pressurisation by relief valves.

A pre-piped kit shall be available for indoor installation, to enable the gas to be taken away and vented to atmosphere safely. Relief valves shall not be vented into the manifold room.

Materials

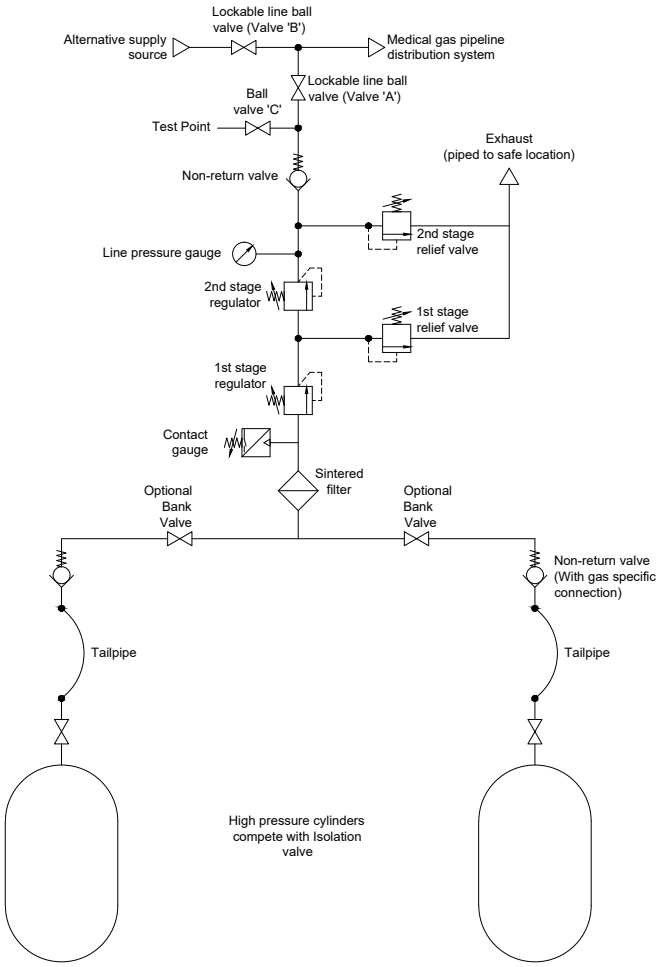
All polymers and elastomers in the gas flow that can be subjected to working pressure greater than 3000 kPa shall be halogen-free. The use of PTFE, PCTFE, Viton and other halogenated polymers in these applications is strictly prohibited. Non-return valves fitted to header manifolds shall have a metallic seat with ceramic ball. Soft seat non-return valves utilising polymers or elastomers are not acceptable.

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.

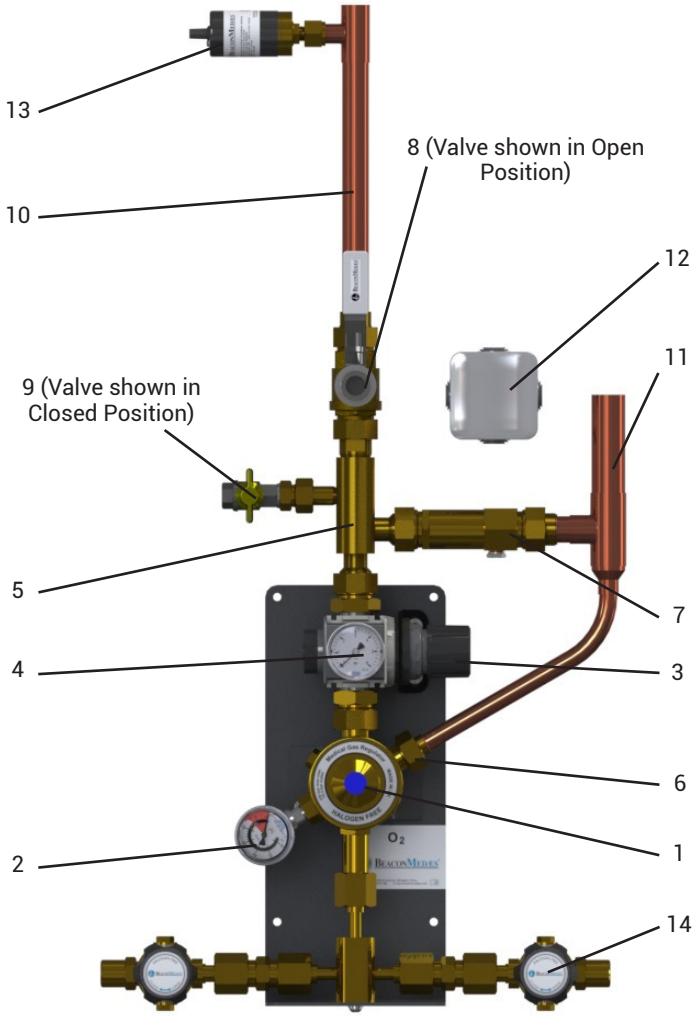
Corner connectors shall be available to enable installation of manifold headers around corners of the manifold room. A custom length corner connector shall also be available to enable header manifolds to be installed in a 'U' configuration across 3 adjacent walls of a manifold room.

Schematic Diagram



Symbols to BS2971 & ISO 1219-1

Manual Manifold General Arrangement



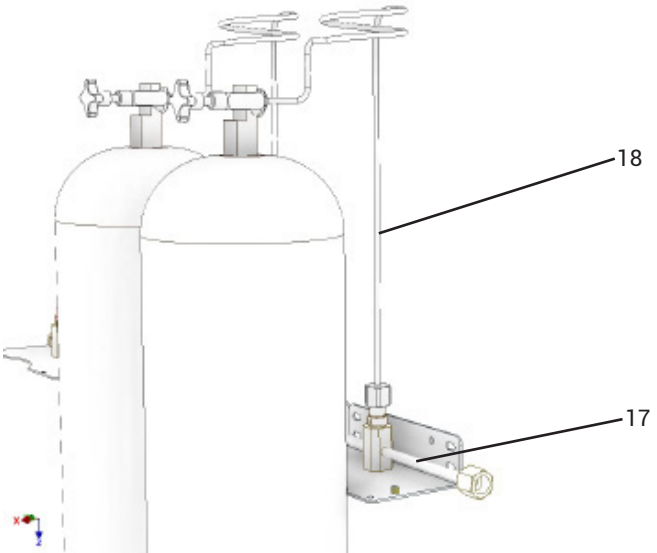


Table 2: Main features/components

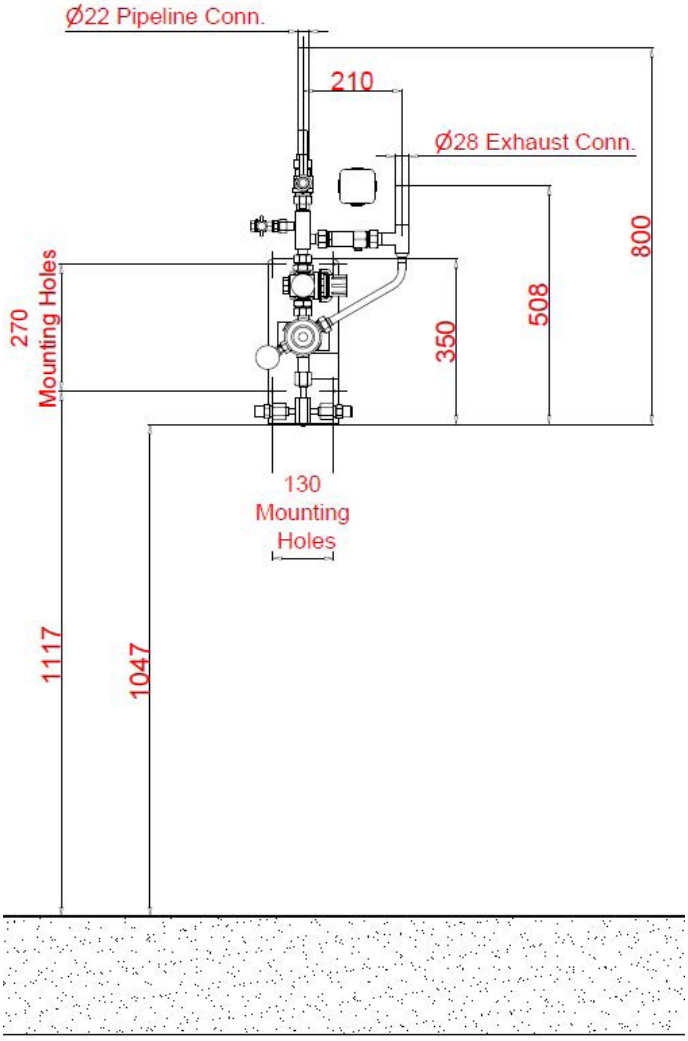
Item No	Description	Basic Unit	Optional Supply
1	1 stage regulator	✓	
2	Cylinder content/contact gauge	✓	
3	Line regulator	✓	
4	Line gauge	✓	
5	Integral Non-return Valve Assembly	✓	
6	1st Stage Pressure Relief Valve	✓	
7	Line Pressure Relief Valve	✓	
8	Lockable Isolation Valve	✓	
9	Test point Isolation Valve	✓	
10	Pipeline connection point (22mm OD Copper Tube)	✓	
11	Pressure Relief Exhaust Connection point (28mm OD Copper Tube)		✓
12	Termination Box For Remote Alarm		✓
13	Pressure Switch		✓
14	High pressure bank valves		✓
15	Single Line contact Module (Not shown)		✓
16	Double Line contact Module (Not shown)		✓
17	Manifold Headers C/W NRVs		✓
18	Tailpipes		✓

Notes -

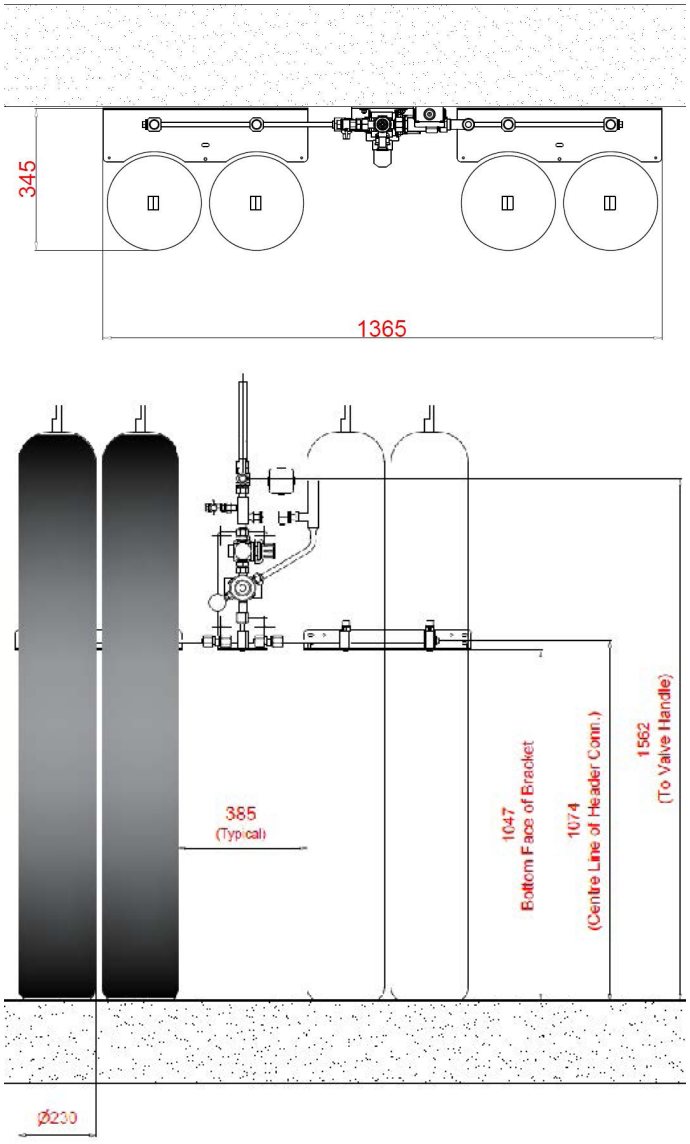
Item 11 is recommended for indoor installations.

Item 15 & 16 are used to connect alarm outputs to a Medipoint medical alarms.

Typical Installation For Use With 'J' & 'G' Type Cylinder

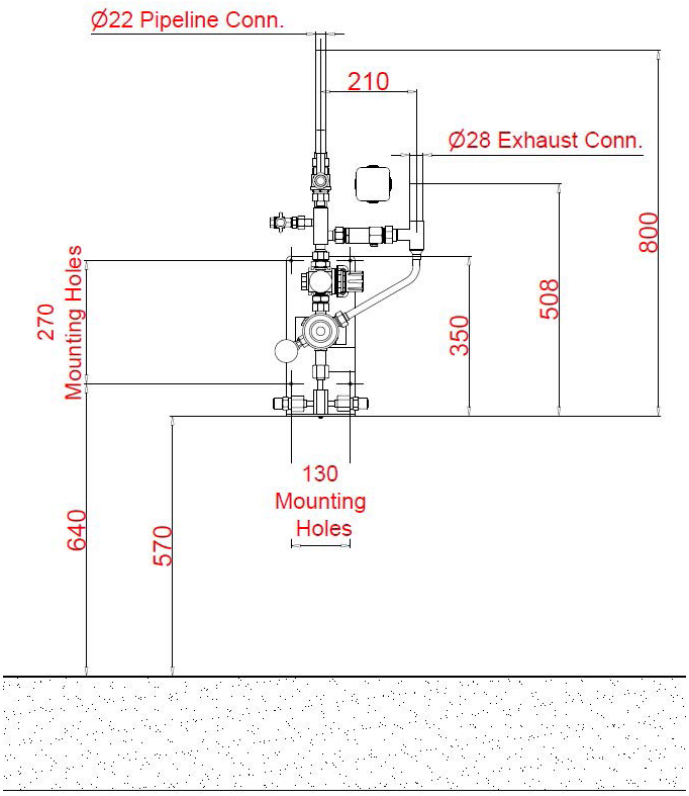


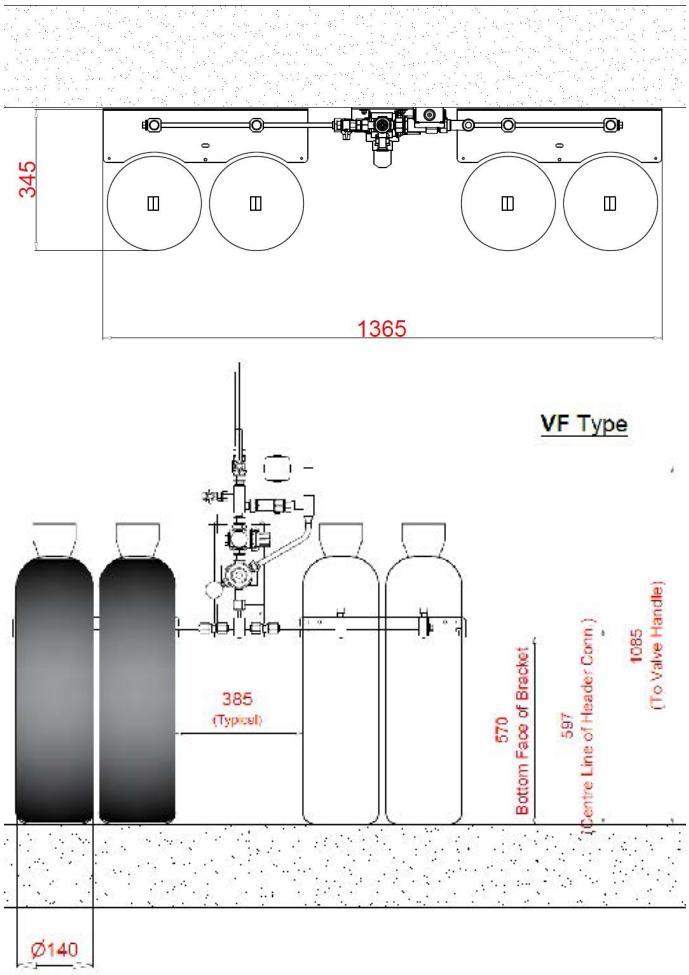
Note - 'J' type cylinders typically for Oxygen and Medical Air. 'G' type cylinders typically for Nitrous Oxide and N_2O/O_2 mix (Entonox).



Note - If option high pressure bank valves are used (see figure 1, item 14) the manifold width increases by 110mm per side.

Typical Installation For use with 'VF' Type Cylinders

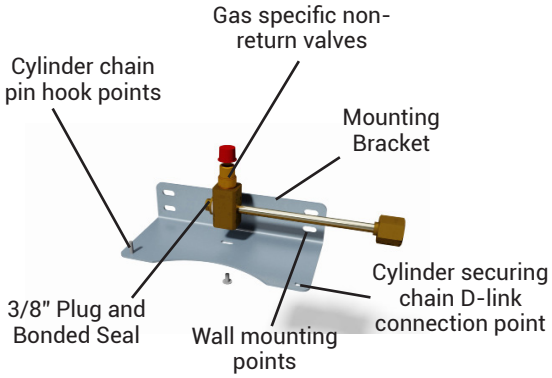




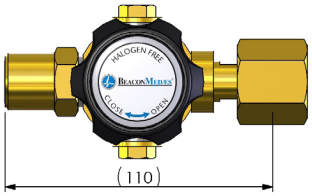
Note - 'VF' size cylinders are typically used for CO_2.

Note - If option high pressure bank valves are used (see figure 1, item 14) the manifold width increases by 110mm per side.

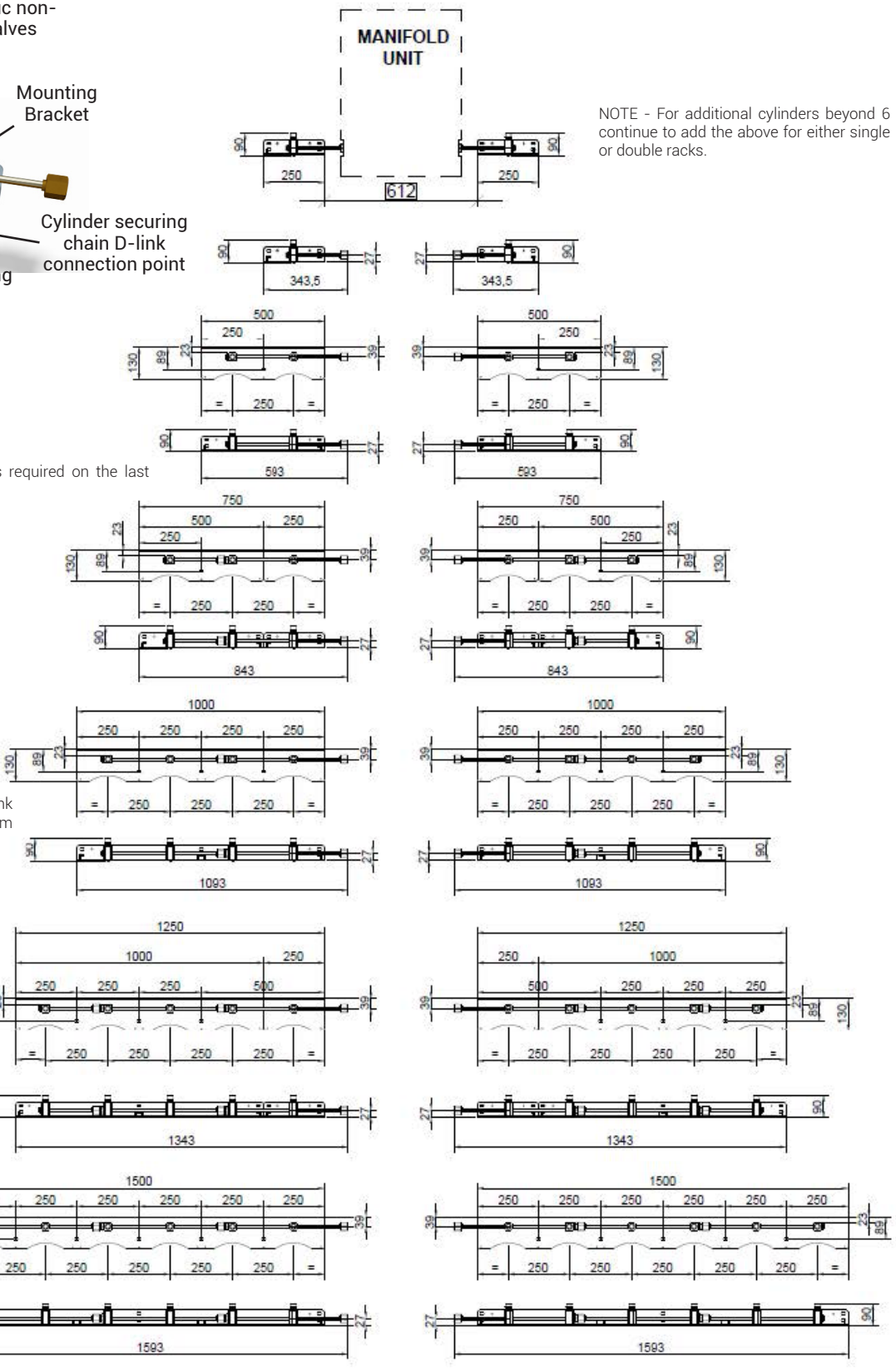
Typical cylinder header & extension layout details



NOTE - 3/8" plug and bonded seal is required on the last cylinder header on each bank.



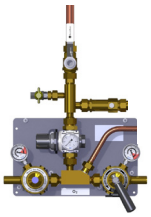
Note - If optional high pressure bank valves are installed, add typically 110mm per side for manifold assembly length



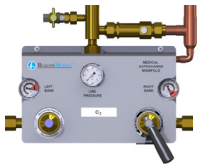
NOTE - For additional cylinders beyond 6 continue to add the above for either single or double racks.

Ordering - Manifolds and Accessories

Panel Description	Gas Type	Typical Cylinder	Part No
Semi Auto Manifold - 4 bar Standard unit (100 bar Contents Gauge)	N_2O	G - 44 bar	2005945
	CO_2	VF - 50 Bar	
Semi Auto Manifold - 4 bar Standard unit (250 bar Contents Gauge)	O_2	J - 137 bar	2005946
	O_2/N_2O	J - 137 bar	
	AIR	J - 137 bar	
Semi Auto Manifold - 7 bar Standard unit (250 bar Contents Gauge)	AIR	J - 137 bar	2005947
	N_2	J - 137 bar	
Semi Auto Manifold - 4 bar Full Feature unit (100 bar Contents Gauge)	N_2O	G - 44 bar	2005948
	CO_2	VF - 50 Bar	
Semi Auto Manifold - 4 bar Full Feature unit (250 bar Contents Gauge)	O_2	J - 137 bar	2005949
	O_2/N_2O	J - 137 bar	
	AIR	J - 137 bar	
Semi Auto Manifold - 7 bar Full Feature unit (250 bar Contents Gauge)	AIR	J - 137 bar	2005950
	N2	J - 137 bar	

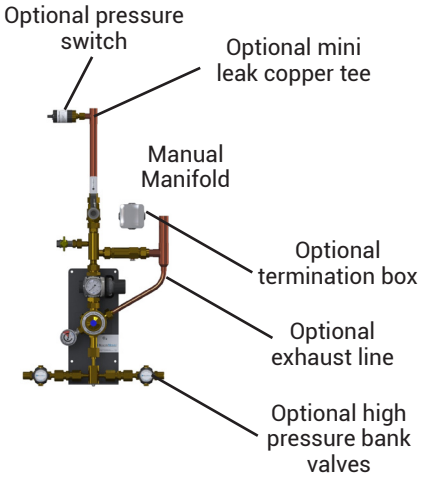


Semi Auto Manifold - Standard Model



Semi Auto Manifold - Full Feature Model

Panel Description	Gas Type	Typical Cylinder	Part No
Manual Manifold - 4 bar standard unit (100 bar Contents Gauge)	N_2O	G - 44 bar	2006003
	CO_2	VF - 50 Bar	
Manual Manifold - 4 bar standard unit (250 bar Contents Gauge)	O_2	J - 137 bar	2006004
	O_2/N_2O	J - 137 bar	
	AIR	J - 137 bar	
Manual Manifold - 7 bar standard unit (250 bar Contents Gauge)	AIR	J - 137 bar	2006005
	N_2	J - 137 bar	



Option Description	Part No
Exhaust Pipe Connection Kit - (Semi Auto)	2006218
Exhaust Pipe Connection Kit - (Manual)	2006233
Termination Box For Remote Alarm	2006219
Cover Plate - (Semi Auto)	2006220
High Pressure Bank Valves (pair)	2005928
4 Bar Pressure Switch with Line Contact Monitor	1829936
4 bar Pressure Switch without Line Contact Monitor	2000131
7 Bar Pressure Switch with Line Contact Monitor	1829937
7 bar Pressure Switch without Line Contact Monitor	2000132
22mm Pressure Switch Connection Tee	1824434
Single Line contact Module	1826618
Double Line contact Module	1826499

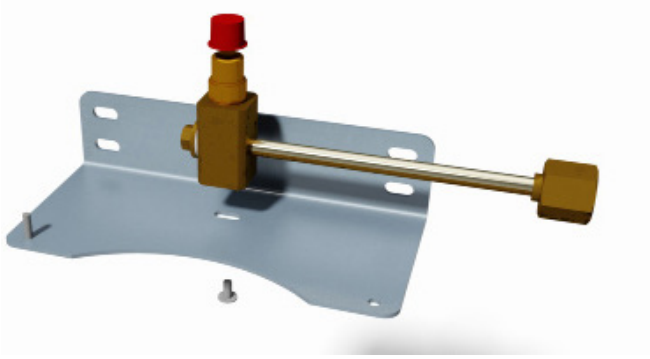
Description	Part No
Manifold Header Corner Connector - one side	2212020815

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

Tailpipe	O_2	N_2O	N_2O / O_2	Air	CO_2	N_2
Pin-Indexed (ISO 407) [2]	8102340110	8102340123	8102340130	8102340140	8102340151	
Pin-Indexed (ISO 407) Extended	8102340116		8102340131	8102340146		
Bull nose (ISO5145) [2,3], 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

Gas Type	2x1	2x2	2x3	2x4	2x5	2x6
Oxygen	8102371280	8102371281	8102371282	8102371283	8102371284	8102371285
Nitrous Oxide	8102371286	8102371287	8102371288	8102371289	8102371290	8102371291
Entonox - O_2/N_2O	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

Note - Manifold header assembly come complete with left and right bank. For header extension kit 1 side only, please refer to latest manifold header manual.



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CERTIFIED ISO 13485
CERTIFIED ISO 14001
CERTIFIED OHSAS 18001