

# Medical gases System

## Technical Datasheet

### Description

Automatic Changeover Manifolds are intended to provide a continuous supply of medical gases for respiratory, clinical and surgical use in healthcare facilities. The system shall be duplex such that the supply is maintained in single fault condition. Automatic Changeover Manifolds shall be supplied pre-piped, pre-wired and fully tested and comply with the United Kingdom Department of Health (DoH) publication HTM 2022, HTM 02-01 and NHS Model Engineering Specification C11. A test certificate shall be provided with each system detailing the results of the factory tests.

Automatic Changeover Manifolds are CE marked to the Medical Device Directive 93/42/EEC under the auspices of notified body no. 0088 (LRQA). Under this directive, manifold systems are classified as Class IIb Medical Devices.

### Classification

- PureGas™ Manifold is designed to HTM 2022 & HTM 02-01
- CE marked 0088
- EMC Test passed
- Adiabatic test passed
- Halogen polymers free

### Features

- Digital 3.5" colorful display
- Integrated test point (Zeus terminal unit)
- Central regulator panel with cylinder headers each side
- Headers are complete with gas specific cylinder tailpipes
- Pre-wired for alarm connection to BMS outputs
- All components degreased for oxygen use
- Average flow indication
- General maintenance indicator

### Services for Use

- |   |                             |
|---|-----------------------------|
| • Oxygen                                      | 400 kPa (4 bar)             |
| • Nitrous Oxide                               | 400 kPa (4 bar)             |
| • O <sub>2</sub> /N <sub>2</sub> O (50%/ 50%) | 400 kPa (4 bar)             |
| • Medical Air                                 | 400 kPa (4 bar)             |
| • Surgical Air                                | 700 & 1000 kPa (7 & 10 bar) |
| • Nitrogen                                    | 700 kPa (7 bar)             |
| • Carbon dioxide                              | 400 kPa (4 bar)             |



### Pressure Reduction Capacity

- Maximum inlet pressure: 30 000 kPa (300 bar)
- Outlet pressure reduced to: 400 kPa (4 bar), 700 kPa (7 bar) or 1000kPa (10 bar)

### Flow Rate

- |                            |            |
|----------------------------|------------|
| • 400 kPa (4 bar) system   | 1700 L/min |
| • 700 kPa (7 bar) system   | 2500 L/min |
| • 10 bar (1000 kPa) system | 2500 L/min |

### Header Rack Services

- |  |         |
|--|---------|
| • Gas specific tailpipes thread sizes: |         |
| • Nitrous Oxide                        | M18 x 2 |
| • Oxygen                               | M20 x 2 |
| • Air                                  | M24 x 2 |
| • O <sub>2</sub> /N <sub>2</sub> O     | M22 x 2 |
| • Nitrogen                             | M14 x 2 |

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- Nitrous Oxide 400 kPa (4 bar)
- O<sub>2</sub>/N<sub>2</sub>O (50%/ 50%) 400 kPa (4 bar)
- Medical Air 400 kPa (4 bar)
- Surgical Air 700 & 1000 kPa (7 & 10 bar)
- Nitrogen 700 kPa (7 bar)
- Carbon dioxide 400 kPa (4 bar)

## Mounting

- Mounted on a powder coated backplate.
- For simplicity of installation separate installation bracket provided
- Front fascia moulding made from lightweight chemical and corrosion resistant, glass-reinforced polymer

## Pressure Switches

- Pressure transmitters monitor both banks of cylinders
- Set to 15 bar changeover pressure (0-315 bar typically / 0-160 bar N<sub>2</sub>O)



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- Oxygen M20 x 2
- Air M24 x 2
- O<sub>2</sub>/N<sub>2</sub>O M22 x 2
- Nitrogen M14 x 2
- CO<sub>2</sub> 3/8" BSP

## Relief Valve Settings

- Nominal 4 bar manifold 530kPa (5.3 bar) relieving
- Nominal 7 bar manifold 1100kPa (11 bar) relieving
- Nominal 10 bar manifold 1320kPa (13 bar) relieving

## Electronic Control System

- System should have universal input and work in wide power range: AC 90 to 264 Volts 50/60 Hz.
- The manifold control system shall be powered by an extra low voltage on board supply. Separate power supply board should be foreseen. The controller shall include normally closed alarm connections and two sets of BMS connections for both

normally open and normally closed operation.

- Line pressure shall be continuously monitored by an electronic pressure sensors; mechanically actuated pressure switches are not acceptable.
- There shall be a manual changeover button to enable selection of the duty bank.
- Manifold shall be capable of being fully isolated via a full flow ball valve in order to change any regulator without interruption of supply.
- In the event of a low line pressure condition, both solenoid valves shall open to enable both banks to deliver gas and restore normal pipeline pressure.
- System should incorporate graphical display to indicate pressure in each bank of cylinders and a line pressure. Digital display should be backed up by mechanical gauges in case of power failure.
- All alarms should be duplicated on a display and embedded membrane panel with LEDs. A manifold status panel shall be provided with colour coded LED indication lights for the following operating and fault indications:

- Power On (Green)
- High Line Pressure (Red)
- Low Line Pressure (Red)
- Reserve Low (Amber)
- Left Bank Running (Green)
- Left Bank Low (Amber)
- Left Bank Empty (Amber)
- Right Bank Running (Green)
- Right Bank Low (Amber)
- Right Bank Empty (Amber)



In the event of a power supply failure, both solenoid valves shall open to enable gas to be supplied from both cylinder banks simultaneously until restoration of the power supply.

### Control System

- The pressure regulators shall be designed and certified for use with oxygen at 300 bar and 60°C. Auto-ignition testing shall be carried out and a copy of the test report shall be available on request. All components in the gas stream and contact with the oxygen pressures above 30 bar shall be made from halogen-free materials;
- Isolation vall valves shall be foreseen to prevent back flow of gas from the opposite bank during maintenance. Non return valves are not allowed;
- The line pressure relief valve shall be provided with easing gear;
- Sintered filter at inlet to 1st stage;
- A line pressure safety valve with easing gear and a pinrod

### Installed manifold dimensions

Number of Cyl- inders	Overall Length (mm)	Weight, kg
2 x 1	1181	27
2 x 2	1509	28
2 x 3	2192	32
2 x 4	2519	32
2 x 5	3202	36
2 x 6	3529	37
2 x 7	4211	40
2 x 8	4538	41
2 x 9	5221	44
2 x 10	5548	45
2 x 11	6231	48
2 x 12	6558	49

### Manifold Part Numbers

Description	Part No
O <sub>2</sub> PureGas Manifold Control System	8102341320
N <sub>2</sub> O PureGas Manifold Control System	8102341321
O <sub>2</sub> /N <sub>2</sub> O PureGas Manifold Control System	8102341322
MA-4 PureGas Manifold Control System	8102341323
SA-7 PureGas Manifold Control System	8102341324
SA-11 PureGas Manifold Control System	8102341325
N <sub>2</sub> -7 PureGas Manifold Control System	8102341326
N <sub>2</sub> -11 PureGas Manifold Control System	8102341327
CO <sub>2</sub> PureGas Manifold Control System	8102341328
Heater Kit (N <sub>2</sub> O, CO <sub>2</sub> and N <sub>2</sub> O/O <sub>2</sub> 50%/50% mixture)	2000295

Note:

1. For N<sub>2</sub>O, CO<sub>2</sub> and N<sub>2</sub>O/O<sub>2</sub> 50%/50% mixture heater kit should be ordered separately.

2. Manifold control panel weight is 24 kg.





Header Assemblies							Header Extensions	
	2 x 1 Cyl	2 x 2 Cyl	2 x 3 Cyl	2 x 4 Cyl	2 x 5 Cyl	2 x 6 Cyl	1 Cyl	2 Cyl
O <sub>2</sub>	2005226	2000257	2000258	2000259	2000260	2000261	2000232	2000204
N <sub>2</sub> O	2005227	2000262	2000263	2000264	2000265	2000266	2000233	2000205
O <sub>2</sub> /N <sub>2</sub> O	2005228	2000267	2000268	2000269	2000270	2000271	2000234	2000206
Med Air	2005229	2000272	2000273	2000274	2000275	2000276	2000235	2000207
N <sub>2</sub>	2005230	2000277	2000278	2000279	2000280	2000281	2000242	2000243
CO <sub>2</sub>	2005231	2005209	2005210	2005211	2005212	2005213	2005110	2005108



- Notes: 1. header assembly come complete with left and right bank. Header extensions kits contain one side only and are not handed until final assembly on site (eg. 2 off required, 1 per side).
2. For additional cylinders beyond 6 continue to add the above for either single or double racks.
3. 3/8" plug and bonded seal is required on the last cylinder header on each bank.

Description	Part No
Header Corner Connector - one side	2000227

Description	Part No
2 Cylinder Spare Rack	2000282
3 Cylinder Spare Rack	2000283
4 Cylinder Spare Rack	2000284
5 Cylinder Spare Rack	2000285
6 Cylinder Spare Rack	2000286



Tailpipe	O <sub>2</sub>	N <sub>2</sub> O	N <sub>2</sub> O / O <sub>2</sub>	Air	CO <sub>2</sub>	N <sub>2</sub>
Pin-Indexed (ISO 407) <sup>2</sup>	8102340110	8102340123	8102340130	8102340140	8102340151	
Pin-Indexed (ISO 407) Extended	8102340116		8102340131	8102340146		
Bull nose (BS341) <sup>1</sup> Top entry	8102340111			8102340141		8102340161
Bull nose (BS341) <sup>1</sup> Side entry	8102340112	8102340120		8102340142	8102340150	
Bull nose (BS341) <sup>1</sup> Extended	8102340117	8102340125		8102340147	8102340154	
US Std (CGA)	8102340114	8102340122		8102340144		
Chinese Bullnose	8102340115	8102340124		8102340145	8102340152	8102340162

Notes: