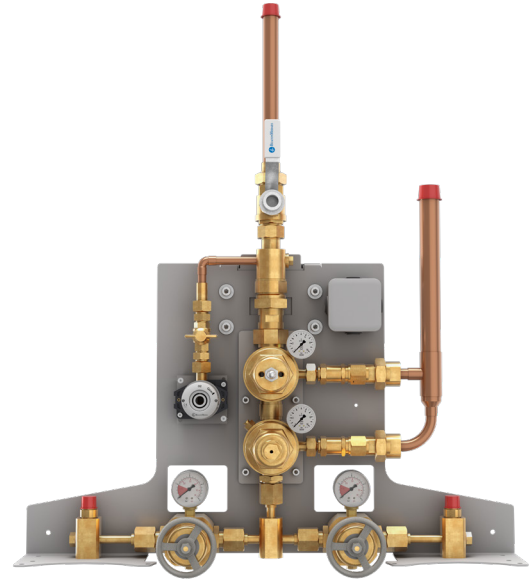


## Emergency Reserve Manifold (MER) HTM02-01/ISO7396-1 MER (HTM/ISO version)



Low flow model



High flow model

### Description and Intended Use

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 Emergency Reserve Manifold 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, 800 kPa or 1100 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 stainless steel screen mesh. 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.

For high flow range, the manifold control system shall be capable of supplying a flow of 1800 l/min to a nominal 400 kPa distribution system, 2000 l/min to a nominal 800 kPa distribution system and a flow of 1800 l/min to a nominal 1100 kPa distribution system based on 10% reduction in flowing pressure from a static pressure set point.

For low flow range, the manifold control system shall be capable of supplying a flow of 800 l/min to a nominal 400 kPa distribution system, 1500 l/min to a nominal 800 kPa distribution system and a flow of 1500 l/min to a nominal 1100 kPa distribution system based on a 10% reduction in flowing pressure from a static pressure set point.

All regulators shall be protected from over-pressurization 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.

## Materials

All polymers and elastomers in the gas flow that can be subjected to working pressure greater than 3000 kPa are halogen-free. The materials selected are compatible with oxygen and other types of gases.

## 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 50 bar cylinder and below), 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 50 bar cylinder and below), will also initiate a "Reserve Low" or "Reserve Fault" alarm condition.

## Modular Header Manifolds

The Modular Header Manifolds shall provide connection points for flexible cupronickel tailpipes. Pin indexed tailpipes shall comply with 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 are available to enable installation of manifold headers around corners of the manifold room.

## CE Marking

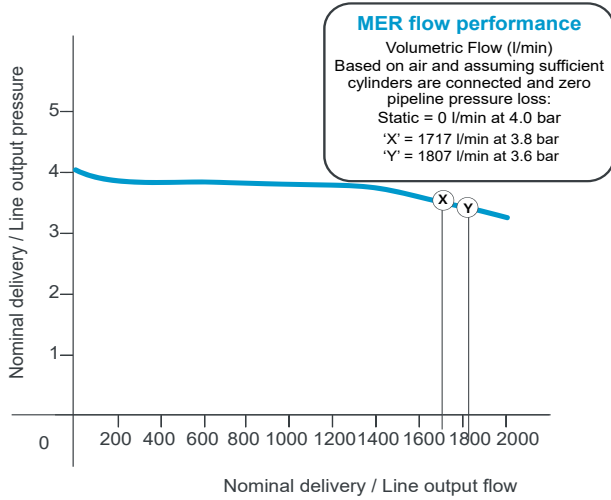
The standard range of Emergency Reserve Manifolds are 'CE' marked with approval from a notified body (more detailed information available on request). Mark as a Class IIb medical device according to MDR ( Medical Device Regulation) (E.U.) 2017/745.

Features	Customer Benefit
Built-in test terminal unit	A medical gas terminal unit is built in for easy testing. It removes the need to install terminal units, copper pipes, brazing, and testing on-site, giving you additional installation time and cost savings. In addition, Gem Shield terminal units offer high durability and antimicrobial protection at any time.
Analog gauges	The MER comes equipped with analog gauges to give you the peace of mind that you can always monitor gas pressure and operation.
Individual exhaust line for pressure relief	The MER ensures compliance with HTM standards by offering individual pressure relief valves for 1st stage and 2nd stage regulator.
Integrated non-return valve	The MER has an integrated non-return valve along with a lockable isolation valve to the distribution system to ensure compliance with HTM/ISO standards and to ensure safety.

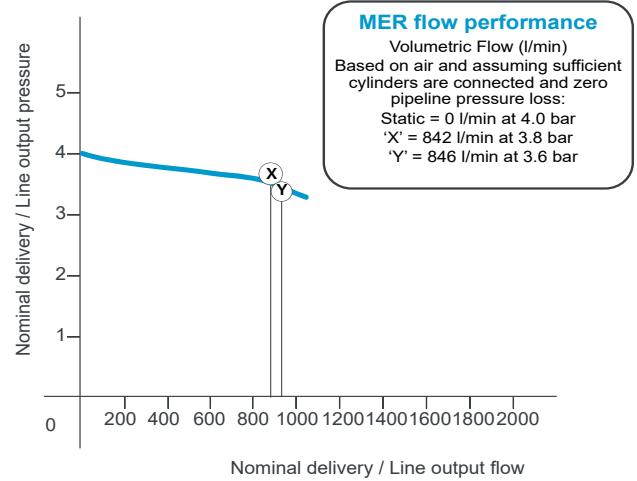
## Output Flow

MER output flow is tested according to ISO 10524-2.

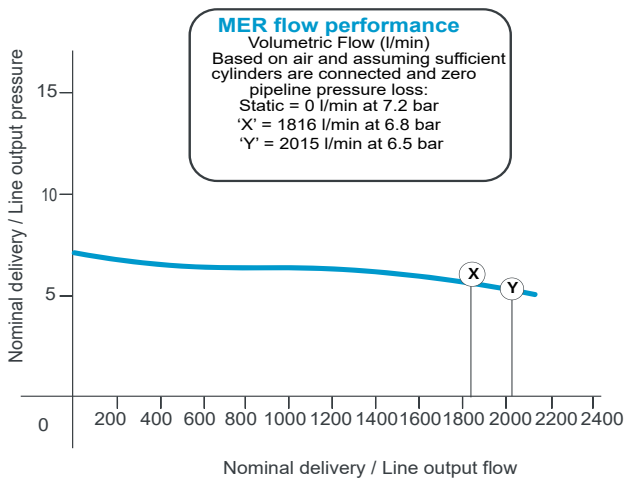
### MER-HH-XX-A high flow



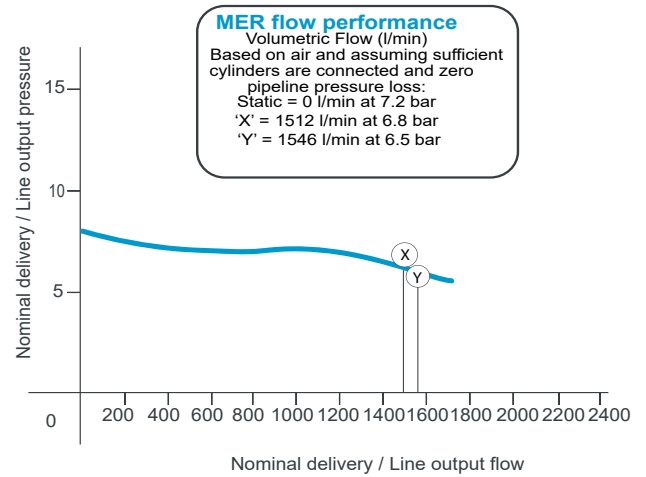
### MER-HH-XX-A low flow



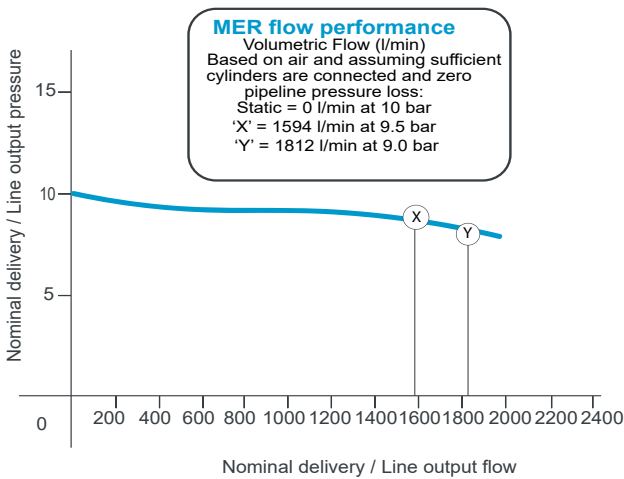
### MER-HH-XX-B high flow



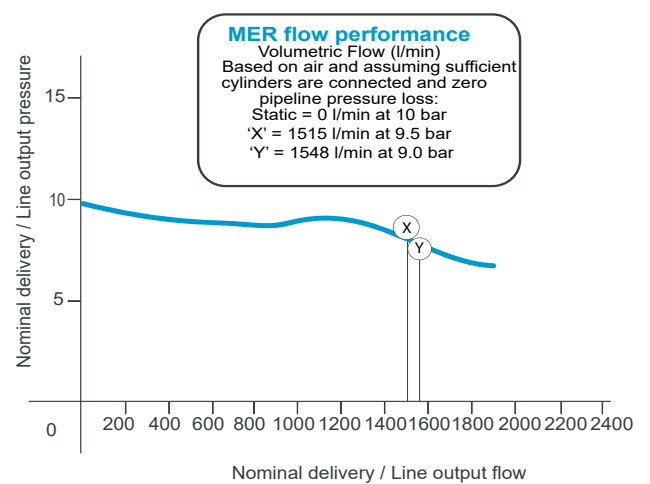
### MER-HH-XX-B low flow

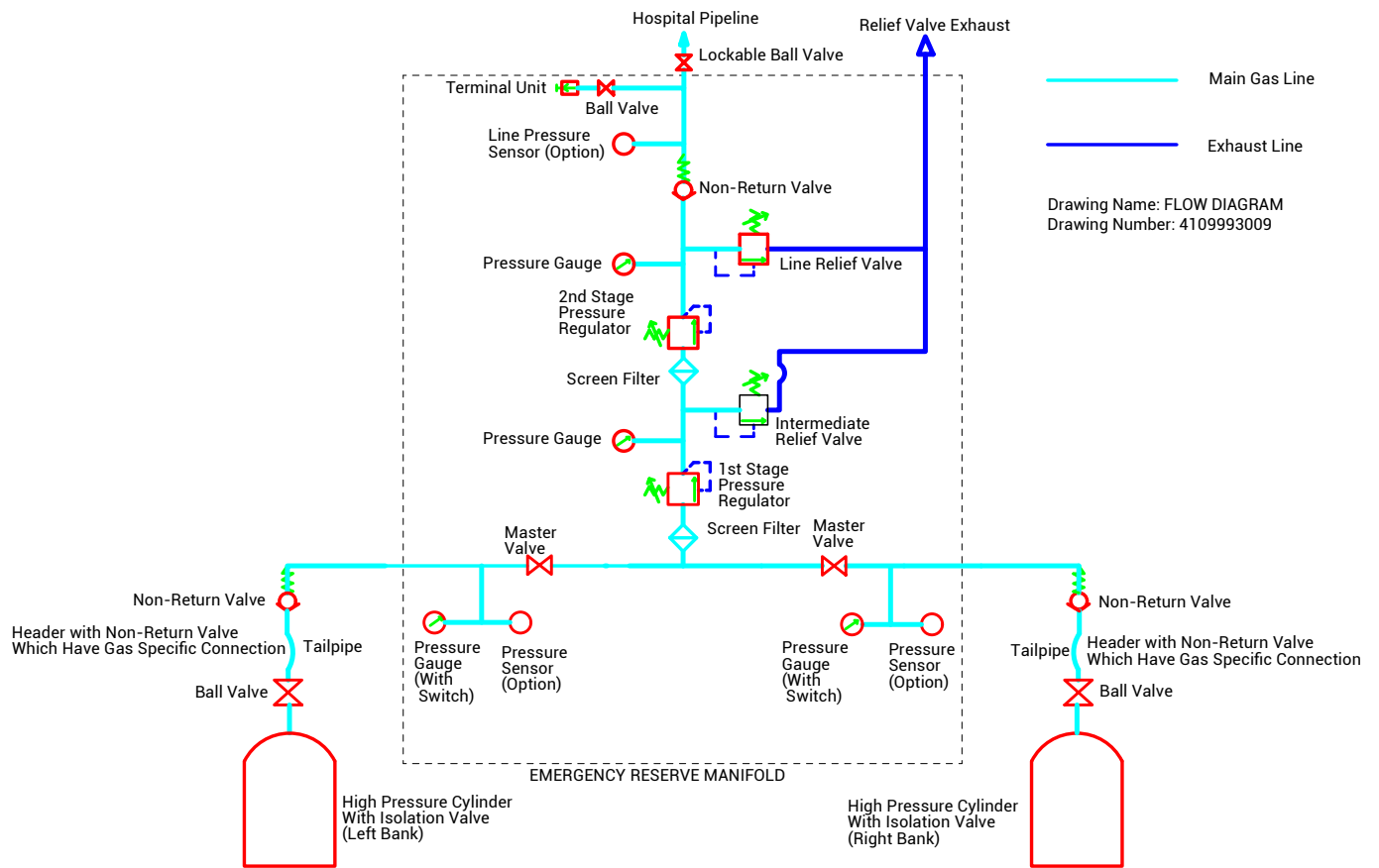


### MER-HH-XX-C high flow



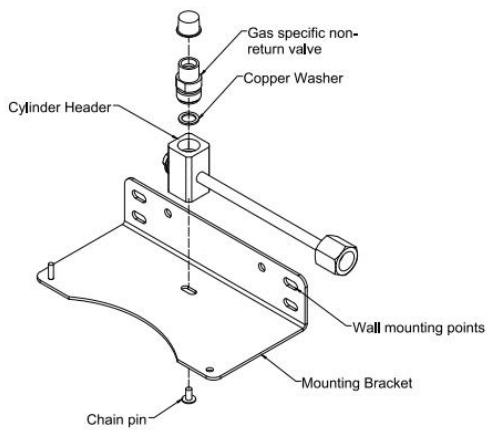
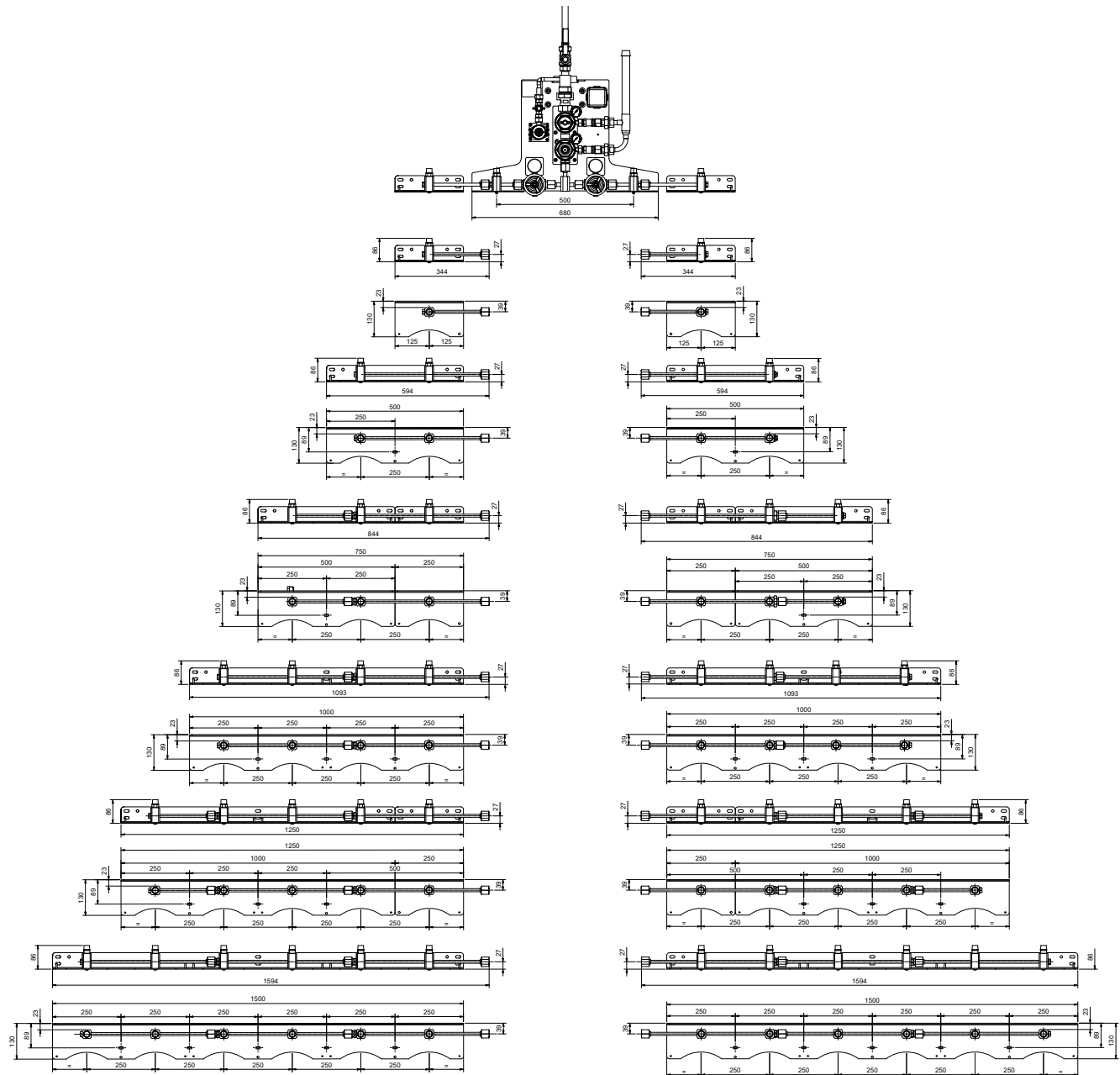
### MER-HH-XX-C low flow



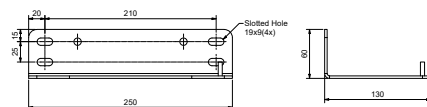


## Technical Parameter

HTM/ISO Technical Parameters						
Model Type	MER-HH-XX-A		MER-HH-XX-B		MER-HH-XX-C	
	Low Flow	High Flow	Low Flow	High Flow	Low Flow	High Flow
Max. Static Pressure	4±0.1		7.2±0.1		10±0.1	
2nd Stage Regulator Test Pressure as per ISO 10524-2 at 10% Pressure Drop (Normally delivery pressure) (bar)	3.6±0.1		6.5±0.1		9±0.1	
2nd Stage Regulator Output Flow (Single) as per ISO 10524-2 at 10% Pressure Drop (l/min)	800±50	1800±50	1500±50	2000±50	1500±50	1800±50
Maximum Input Pressure Range (bar)	230					
1st Stage Regulator Pressure (Intermediate) (bar)	14±0.1		14±0.1		14±0.1	
High-Pressure Regulator Relief Valve Setting (bar)	24.1±3%					
Line Pressure Relief Valve Setting (bar)	5.3±3%		11±3%		13±3%	
Low Pressure Warning (bar)	bar (50 bar cylinder and below) 68 bar (137 bar cylinder and above)		68		68	

**Typical Cylinder Header & Extension Layout Details**


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

**DETAIL OF MOUNTING BRACKET ( 1 : 2 )**


## MER Designation

e.g. MER-HH-O2-A  
A-B-C-D

Variable	Definition	Allowable Value	Allowable Value Description
A	Model Name	MER	Emergency Reserve Manifold
B	Input Type	H.H.	High-pressure gas cylinder
		L.H.	Low-pressure liquid cylinder
C	Gas Type	O2	Oxygen (O2)
		N2O	Nitrous Oxide (N2O)
		O2/N2O	Entonox (O2/N2O)
		MA	Medical Air (MA)
		SA	Surgical Air (SA)
		N2	Nitrogen (N2)
		CO2	Carbon Dioxide (CO2)
D	Nominal Delivery / Line pressure	A	4 bar
		B	8 bar
		C	11 bar

Description	Part No. (high flow)	Part No. (low flow)	Warning Pressure
MER-HH-O2-A	4109005464	4109005396	14 bar
MER-HH-O2/N2O-A	4109005465	4109005397	14 bar
MER-HH-MA-A	4109005466	4109005398	14 bar
MER-HH-O2-A	4109005454	4109005310	68 bar
MER-HH-O2/N2O-A	4109005456	4109005312	68 bar
MER-HH-MA-A	4109005457	4109005313	68 bar
MER-HH-O2-B	4109005463	4109005319	68 bar
MER-HH-N2O-B	4109005455	4109005311	68 bar
MER-HH-SA-B	4109005458	4109005314	68 bar
MER-HH-CO2-B	4109005460	4109005316	68 bar
MER-HH-N2-B	4109005461	4109005317	68 bar
MER-HH-N2-C	4109005318	4109005462	68 bar
MER-HH-SA-C	4109005459	4109005315	68 bar
Sensor box kit *	4109150796		N.A
Heater kit	4109150803		N.A

\* Note: The sensor box kit includes the left bank pressure sensor, right bank pressure sensor, and the line pressure sensor to show the pressure status, which can enable the connectivity with the MAT-S controller. If the customer orders the sensor box kit, the pressure signal will be transmitted to the MAT-S controller.

## Headers (With Rack and All Components) / Both Sides

Gas Type	2X1	2X2	2X3	2X4	2X5	2X6
Oxygen (O2)	4109150303	4109150304	4109150305	4109150306	4109150307	4109150308
Nitrous Oxide (N2O)	4109150309	4109150310	4109150311	4109150312	4109150313	4109150314
Entonox (O2/N2O)	4109150315	4109150316	4109150317	4109150318	4109150319	4109150320
Medical Air (MA)	4109150321	4109150322	4109150323	4109150324	4109150325	4109150326
Nitrogen (N2)	4109150327	4109150328	4109150329	4109150330	4109150331	4109150332
Carbon Dioxide (CO2)	4109150333	4109150334	4109150335	4109150336	4109150337	4109150338

## Headers (With Rack and All Components) / One Side

Gas Type	1X1	1X2	1X3	1X4	1X5	1X6
Oxygen (O2)	4109150396	4109150397	4109150398	4109150399	4109150400	4109150401
Nitrous Oxide (N2O)	4109150402	4109150403	4109150404	4109150405	4109150406	4109150407
Entonox (O2/N2O)	4109150408	4109150409	4109150410	4109150411	4109150412	4109150413
Medical Air (MA)	4109150414	4109150415	4109150416	4109150417	4109150418	4109150419
Nitrogen (N2)	4109150420	4109150421	4109150422	4109150423	4109150424	4109150425
Carbon Dioxide (CO2)	4109150426	4109150427	4109150428	4109150429	4109150430	4109150431

**Extend connector 180°**

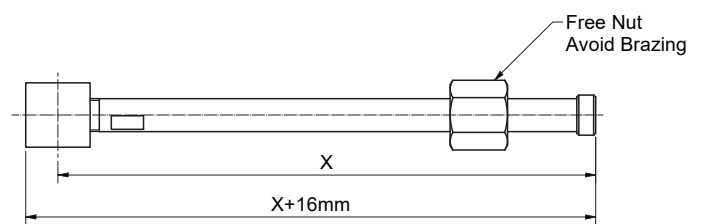
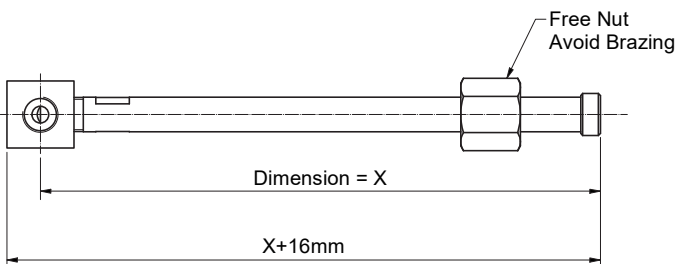
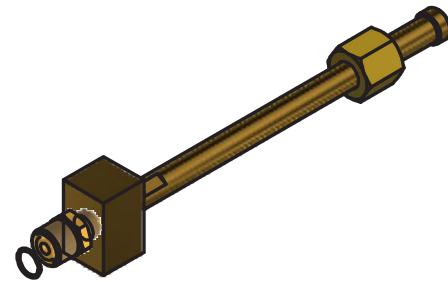
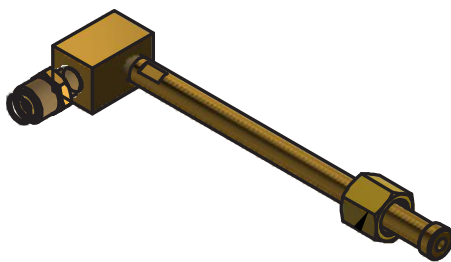
4109150435

**VF cylinder connector**

4109150436

Corner connector 90°	X value (mm)	Part number
Corner connector 50 mm	50	4109005661
Corner connector 100 mm	100	4109005662
Corner connector 150 mm	150	4109005663
Corner connector 200 mm	200	4109005664
Corner connector 500 mm	500	4109005423

Header connector	X value (mm)	Part number
Header connector 100 mm	100	4109005666
Header connector 150 mm	150	4109005667
Header connector 200 mm	200	4109005668
Header connector 500 mm	500	4109005669



## Tail Pipe

Gas Type	Pin-Indexed (ISO 407)	Pin-Indexed (ISO 407) Extended	Bull Nose (ISO5145) Side Entry	Bull Nose (BS341) Top Entry	Bull Nose (BS341) Side Entry	Bull Nose (BS341) Extended	US Std (CGA)	Chinese Bull Nose
Oxygen (O2)	4109150344	4109150345	4109150346	4109150347	4109150348	4109150349	4109150350	4109150351
Nitrous Oxide (N2O)	4109150352	-	-	-	4109150353	4109150354	4109150355	4109150356
Entonox (O2/N2O)	4109150357	4109150358	4109150359	-	-	-	-	-
Medical Air (MA)	4109150360	4109150361	-	4109150363	4109150364	4109150365	4109150366	4109150367
Nitrogen (N2)	-	-	-	4109150368	-	-	-	4109150369
Carbon Dioxide (CO2)	4109150370	-	-	-	4109150371	4109150372	-	4109150374

**Notes:**

- Bullnose tailpipes (except Chinese type) comply 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.
- 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.
- 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.