

NFPA Automatic Changeover Medical High Pressure by High Pressure Manifold (Lifeline)

SPECIFICATION

Automatic Changeover Medical High Pressure Gas Manifold

The BeaconMedæS **Lifeline®** automatic Changeover manifold accommodates multiple high pressure cylinders equally divided into two banks for a specific gas service. The cylinder banks are arranged in a staggered configuration and provide an uninterrupted supply of gas for the specific gas application. The manifold is cleaned, tested, and prepared for the indicated gas service and constructed in accordance with requirements of the latest edition of NFPA 99 and CGA.

Manifold Design

A bank regulator (one for each cylinder bank) is used to initially reduce the cylinder pressure to the two line regulators which control the final line pressure. The manifold automatically changes from the depleted primary supply bank to the secondary supply bank without fluctuation in line pressure utilizing dome-bias loading and unloading of the bank regulators. After replacement of the depleted cylinders, the manifold automatically indicates the replaced cylinder bank as the secondary supply. Manual resetting of the control panel is not necessary.

The manifold includes a line pressure gauge, two cylinder bank pressure gauges (left bank and right bank), and color coded LED visual indicators for "IN USE" (green), "READY" (green), and "EMPTY" (red) for each cylinder bank.

The manifold has intermediate and line pressure relief valves that are internally connected to a common vent port, terminating into a 1/2" FNPT "O"-ring sealed "zero clearance" union. Master shutoff valves (one for each cylinder bank) are located outside the cabinet and both valves are fabricated with metallic seating surfaces. The manifold is designed for placement of four "H" cylinders directly underneath the manifold cabinet. The cabinet enclosure is easily removable by releasing draw latches for component accessibility and the enclosure may be secured from unauthorized access by locking the draw latches (locks provided by others).

The manifold includes high-pressure modular header assemblies with gas specific pigtail-to-header high-flow check valves to permit changing of cylinders without gas leakage. Stainless steel flexible pigtails are provided for each cylinder gas connection, except for O₂, He, CO₂O₂, O₂CO₂, HeO₂, and O₂He gases which are provided with rigid copper pigtails.

The power supply and control board are furnished inside a pre-mounted NEMA 4 enclosure. The power supply has electrical requirements as follows: 250mA max at 100-250VAC 50/60Hz single phase input to 24VDC output. The control board includes dry contacts for (2) separate, electrically isolated remote alarm connections for manifold Changeover.

The manifold is supplied with a 3/4" FNPT "O"-ring sealed "zero clearance" union outlet. The system also includes a 3/4" full port, three piece, ball-type source shut-off valve with 1/8" FNPT port. The source valve has a 3/4" NPT attachment to the union outlet and a 3/4" nominal copper (type K) tube for brazing to main supply line.

NOTE:

The flow capacity of a nitrous oxide and carbon dioxide manifold depends upon environmental conditions at the installation site and the number of cylinders in service. Installing a nitrous oxide or a carbon dioxide manifold in a location that exposes it to an ambient temperature below 32°F (0°C) is not recommended.

Environmental Considerations

Manifolds are to be installed in accordance with requirements stated by NFPA99, CGA and all applicable local codes. Manifold components are designed to work best over a temperature range of 0°F through 130°F. Wider temperature variation may cause manifold malfunctions to occur. The BeaconMedæS **Lifeline®** manifold has been environmentally tested to MIL STD 810F. The **Lifeline®** power supply and control board is fully contained inside a NEMA 4 enclosure, allowing for outdoor installations. Liquid-tight conduit fittings are required for outdoor installations.

Flow Characteristics at Minimum Cylinder (Changeover) Pressure

Delivery Line Pressure (PSIG)	Minimum Delivery Line Flow (SCFH)
55	3,300*
100	4,620*
180	5,340*

* Tested flow rate at 10% fall off

Note: Flow is tested for compliance as per ISO 10524-2 section 6.3.1

TESTING STANDARDS

Environmental Testing:

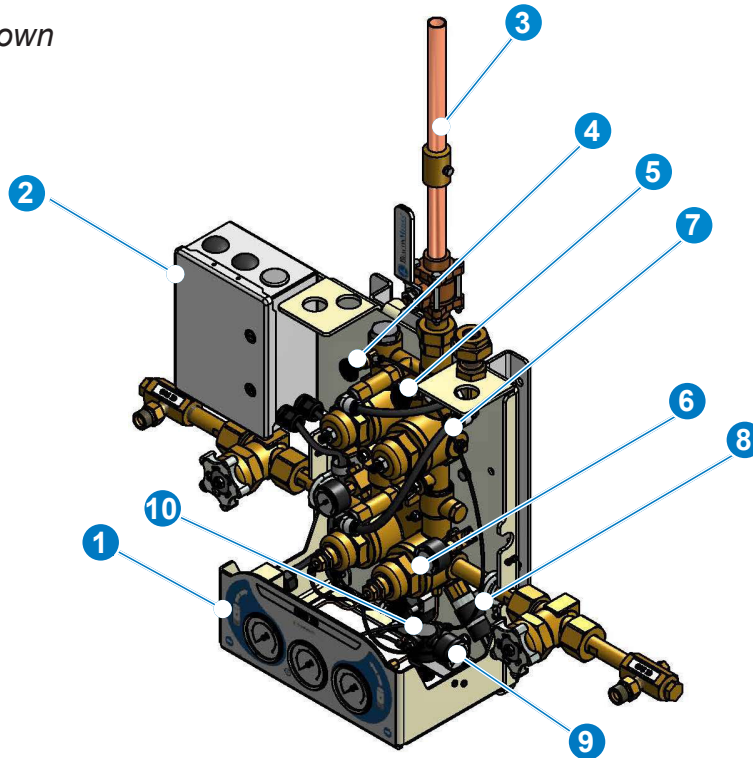
MIL STD 810F

Ignition Testing:

ISO 10524-2

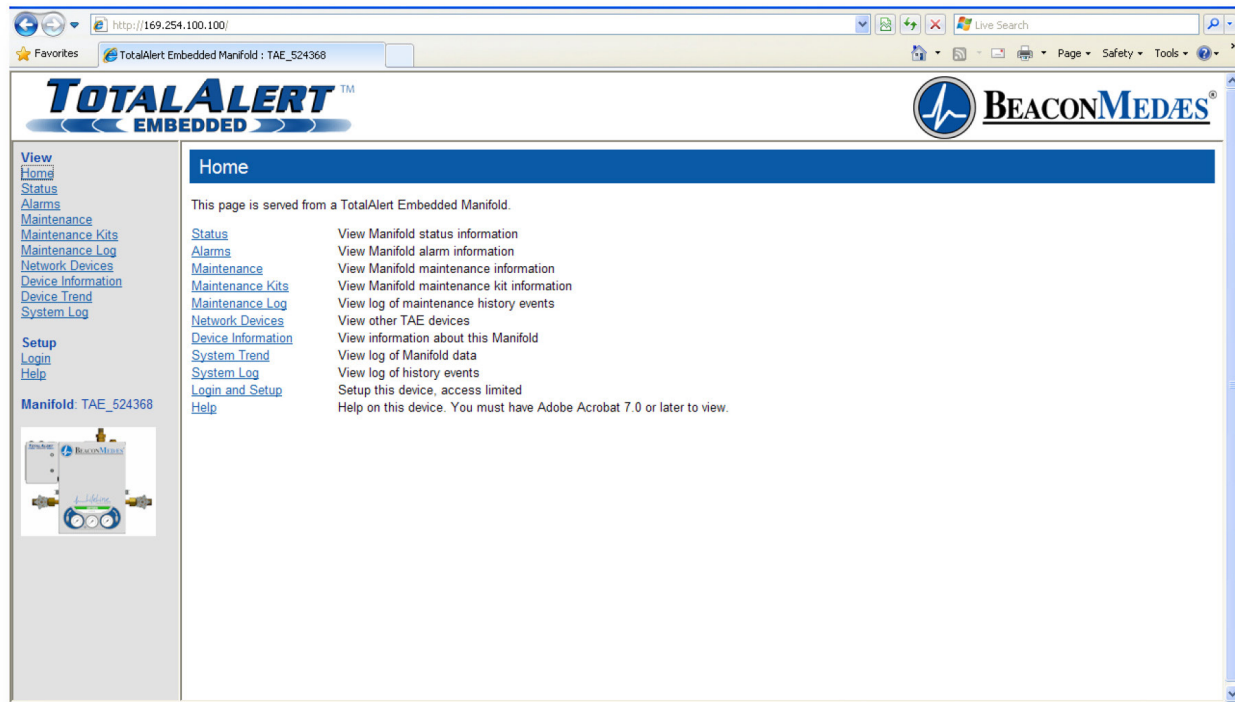
Standard Configuration

Standard Model Shown



- 1** *New LED Electronics Overlay for easy visual status of gas flow*
- 2** *The NEMA 4 Enclosure houses both Power Supply and Control Board. It is pre-drilled for power, alarm, and data connections for easy installation.*
- 3** *1/4 Turn Shut-Off Valve used to isolate manifold from hospital piping for repair*
- 4** *Vent Valve with ergonomic handle for easy operation. Mounted and tubed to conveniently vent to relief outlet*
- 5** *Service Valve to provide outlet gas to dome bias regulator and solenoid valve.*
- 6** *Bank regulator is housed in a brass forging to minimize connection points, therefore eliminating the opportunity of leaks. The regulator is a dome loaded, single-stage, diaphragm type regulator used to reduce incoming cylinder contents pressure to a lower intermediate pressure. Bleed valves are also present for servicing needs.*
- 7** *Line Regulator is housed in a brass forging to minimize connection points, therefore eliminating the opportunity of leaks. The regulator is a single-stage, diaphragm type regulator used to reduce incoming bank regulator pressure to a lower delivery pressure. Bleed valves are also present for servicing needs.*
- 8** *Pressure Switch is an adjustable, single pole switch that is connected to high pressure port of each bank regulator to monitor pressure in each bank of cylinders. Pressure Transducer (only available on TAE models) monitor pressure in each bank of cylinder and attach to each bank regulator and have a range of 0-3000 psi. (A pressure transducer ranging from 0-300 psi measures outlet pressure.)*
- 9** *Dome Bias Regulator with easily identifiable premounted gauge and locking ring to ensure constant bank regulator dome pressure*
- 10** *New Robust Solenoid Valve made of Stainless Steel including mufflers to reduce noise during change-overs.*

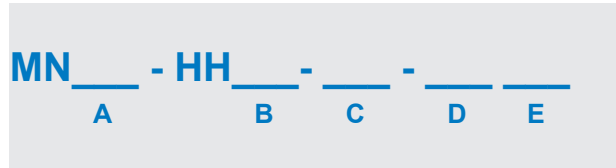
TotalAlert Embedded (TAE)-Optional Feature



Ethernet Connectivity with Embedded Web Page

- Built-in web server allows remote operator to view system controls and display information
- Ethernet communication compatible with TotalAlert and TotalAlert² alarm systems
- Web page provided to show links to other devices on the TotalAlert Embedded network, including alarms and other source equipment
- Electronic notification
 - » Accessible through any SMTP gateway
 - » Allows for remote alerts of alarm and warning conditions of manifold
 - » Allows for remote alerts of routine maintenance
 - » Allows for early warning of bank pressure

Ordering Information



BeaconMedæS Manifold Parent Model Number Chart			
Variable	Definition	Allowable Value	Description
A	Language	E S	English Spanish
B (See note ** for 4×4 or greater)	No. of Cylinders	0×0 1×1S 2×2S 1×1 2×2 3×3 4×4 5×5 6×6 7×7 8×8 9×9 10×10 11×11 12×12 13×13 14×14	0×0 1×1 Space Saver Header 2×2 Space Saver Header 1×1 2×2 3×3 4×4 5×5 6×6 7×7 8×8 9×9 10×10 11×11 12×12 13×13 14×14
C (See note ** for CO ₂)	Gas	O ₂ N ₂ O AIR N ₂ IAIR CO ₂ CO ₂ O ₂ O ₂ CO ₂ HEO ₂ O ₂ HE HE AR	Oxygen Nitrous Oxide Medical Air Nitrogen Instrument Air Carbon Dioxide Carbon Dioxide-Oxygen (CO ₂ > 7%) Oxygen-Carbon Dioxide (CO ₂ < 7%) Helium-Oxygen (He > 80%) Oxygen-Helium (He < 80%) Helium Argon
D	Delivery Pressure	A B C	55 psi delivery pressure 100 psi delivery pressure 180 psi delivery pressure
E	Electronics	S T	Standard Total Alert Embedded

** External vaporizers are recommended for CO₂ manifolds larger than 4 cylinders per side

Example: NFPA ENGLISH HP × HP 2×2 CYLINDER OXYGEN 55 PSI STANDARD ELEC

Example Model Number: MNE-HH2X2-O2-AS

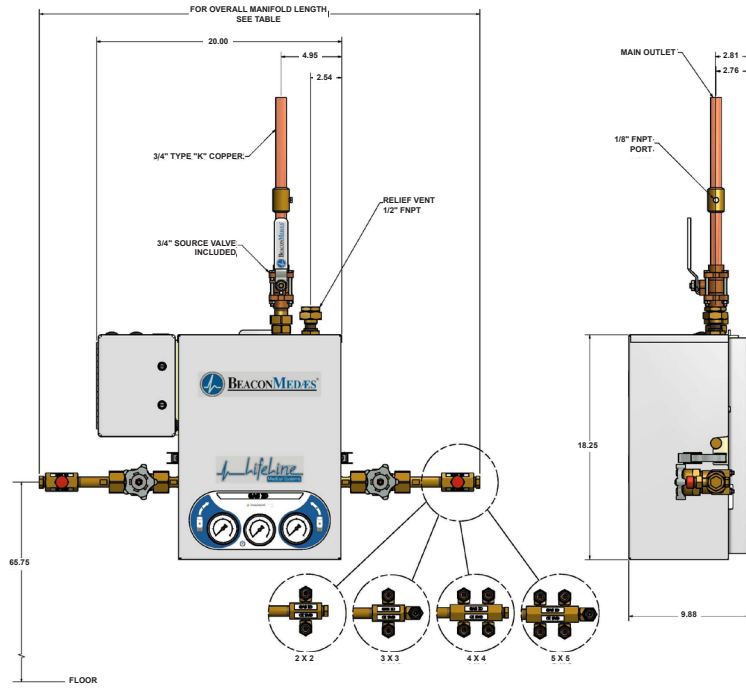
Example: NFPA SPANISH HP × HP 2×2 SPACE SAVER NITROGEN 180 PSI TAE ELEC

Example Model Number: MNS-HH2X2S-N2-CT

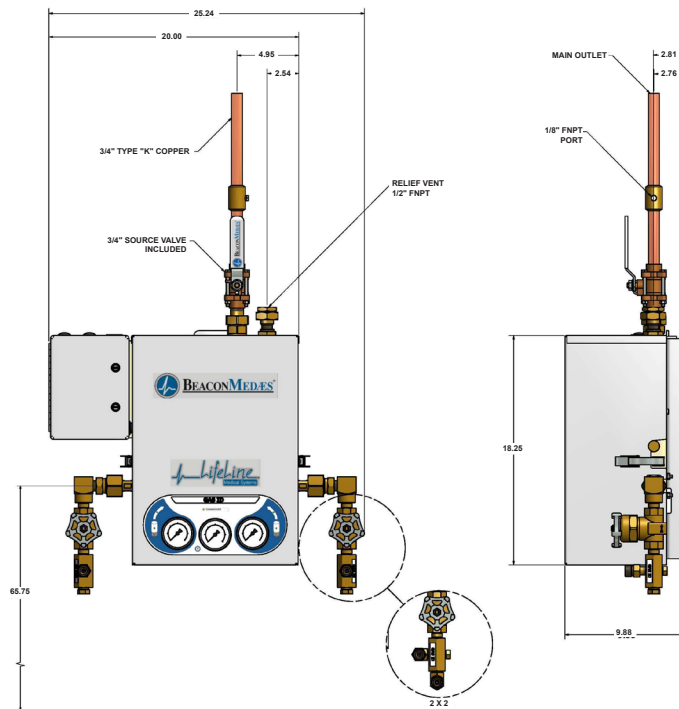
U.S. Design Patent No. D734,854



Standard Configuration



Space Saver Configuration



Manifold Length

No. of Cylinders Per Bank	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Overall Length (Inches)	36	36	38	39	41	54	56	74	76	86	104	114	116	134