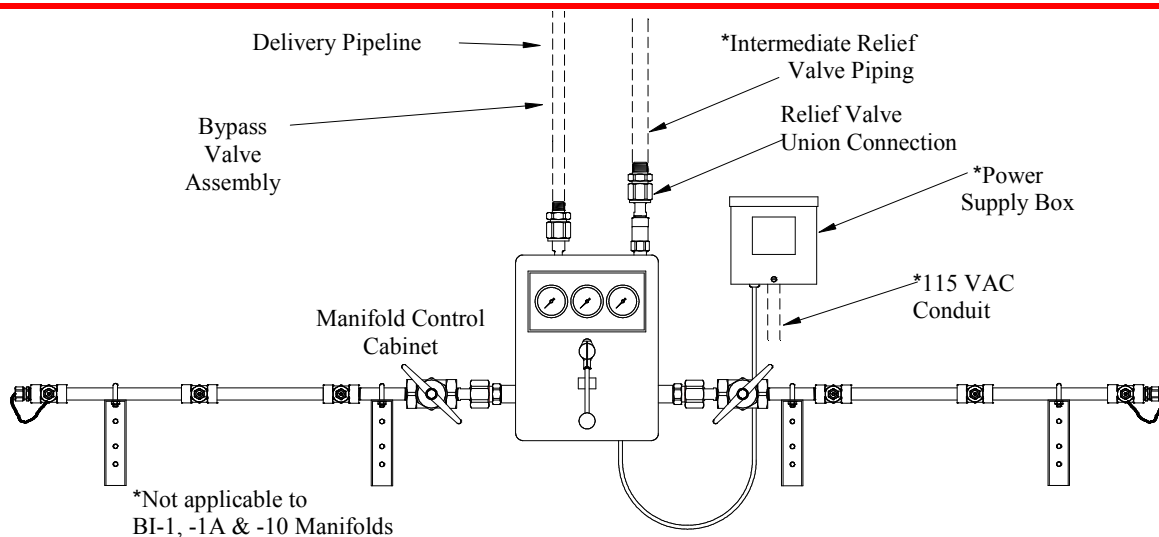


**BI - Series****Automatic Manifolds for High Pressure Cylinder (up to 3,000 psi.) for Industrial Applications**

The BI-series manifold systems are cleaned, tested and prepared for the indicated gas service and are built following National Fire Protection Association and Compressed Gas Association guidelines. The BI manifold consists of a manifold control, and two supply bank headers, one service and one reserve supply to provide an uninterrupted supply of gas for the specific gas application. The control unit is designed and built with features providing automatic changeover from the depleted "Service" supply bank to the "Reserve" supply with no loss or drop in delivery pressure. Pressure gauges, alarm signal connections and lights show system status and alert the need to replace depleted cylinders. Features of the automatic system include integral adjustable line regulator, stainless steel braided flexible pigtailed with check valves, rigid wall-mounted headers, and complete mounting hardware.

The BI - Series manifold should be installed in accordance with guidelines stated by the National Fire Protection Association, the Compressed Gas Association, OSHA and all applicable local codes. The Carbon Dioxide and Nitrous Oxide manifolds should not be placed in a location where the temperature will exceed 120°F (49°C) or fall below 20°F (-7°C). The manifold for all other gases should not be placed in a location where the temperature will exceed 120°F (49°C) or fall below -20°F (-29°C). A manifold placed in an open location should be protected against adverse weather conditions including rain and heavy moisture. During winter, protect the manifold from ice and snow. In summer, shade the manifold and cylinders from continuous exposure to direct rays of the sun. The manifold should be located in a clean, well ventilated area which is free of oil and combustible materials. All safety relief valves including those on flash arrestor (BI acetylene systems) shall be piped outside.

**Specifications**

- All functional components (regulators, pressure switches, check valves, etc.) are enclosed in a tamper-resistant metal case.
- Adjustable integral line regulator: BI (standard): 30-125 PSIG, BIHP: 50-200 PSIG, Acetylene: 0-15 PSIG, LPG: 0-35 PSIG
- Manifold Outlet: 1/2" NPT male.
- 24" Flexible stainless steel braided Teflon™ lined pigtailed with check valves (EPDM seat all gases, Argon/Methane mixtures use Viton). Check valve is at header end of pigtail for all gases *except* Oxygen. *Note:* Helium and Hydrogen manifolds shipped with synthetic fiber braided pigtailed. Vertical crossover and staggered styles include 24" and 36" pigtailed.
- Acetylene manifolds are shipped complete with a dry 300 SCFH flashback arrestor, a separate flash arrestor with check valve on each pigtail, and connecting piping. Hydraulic flashback arrestors are available as an option for an additional charge.
- System alarm lights with 115/24 VAC power supply box included for all gas service except fuel gases.
- High quality master valves and individual headers shut-off valves at each cylinder location. (Units with 4 cylinder or larger - all gases except Oxygen) Oxygen units shipped with check valve outlets in place of header valves to provide added safety from "heat of recompression".
- Headers are a single unit design, constructed of 1/2" brass pipe and tees, silver brazed at each connection, painted almond and labeled for the indicated gas service.
- Relief valve outlet is 3/4" NPT male
- Complete wall mounting hardware and operating instructions.
- Optional remote audio/visual alarm panels and fuel gas alarm kits.
- Western will customize headers to meet end user requirements (sketch required).
- Current draw: .075 amps standard units, 4.0 amps heater units
- Control unit weight: Approx. 35 lbs.

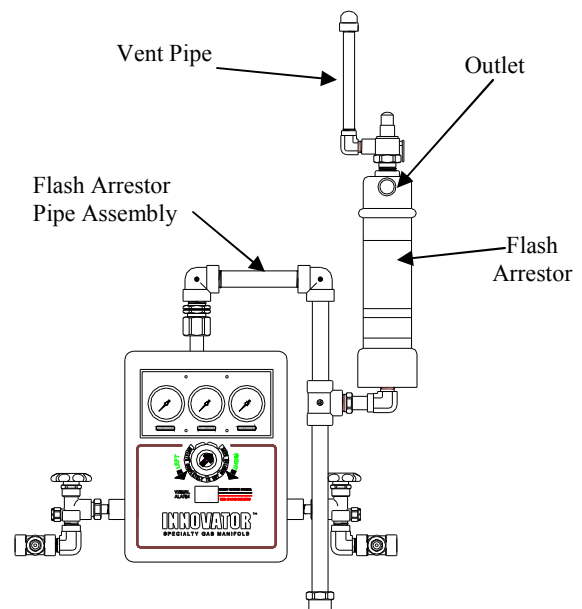
**BI - Series****Automatic Manifolds for High Pressure Cylinder (up to 3,000 psi.) for Industrial Applications****Manifold Operation**

The BI-series manifold control unit, includes the following components and features: green “System Normal” and red “Replace Depleted Bank” indicator lights (all but fuel gas units), cylinder pressure gauges, a line pressure gauge, intermediate safety relief valve, supply bank control indicator lever and automatic bank switching. Supply banks consist of a header with 24” stainless steel flexible pigtailed with check valves, individual header valves (units with 4 cylinders or larger) - all gases *except* Oxygen. Oxygen units shipped with check valve outlets in place of header valves to provide added safety from “heat of recompression”, master shut-off valves (units with 4 cylinders or larger), and union connections for attachment to the control unit. The cylinder bank that supplies the piping system is known as the “Service” supply, while the cylinders on stand-by are referred to as the “Reserve” supply. On the “service” side, gas flows into the manifold control to first the primary regulator and then through the line regulator. On the “reserve” side, gas flows through the manifold control to first the primary regulator and then through the intermediate regulator before entering the line regulator. Delivery pressure is controlled by the line regulator and is adjustable via the access hole in the upper left hand side of the cabinet. Changeover from the “Service” to “Reserve” side is accomplished by a pressure differential between the primary and intermediate regulators. As cylinder contents are depleting, the pressure feeding the primary regulator will drop. When this pressure drops to a set pressure of the intermediate regulator, a pressure switch is actuated causing a green “System Normal” light to go out and a red “Replace Depleted Bank” light to come on. The “Reserve” bank will automatically begin to flow without any interruption in service line delivery pressure. There are two definite indicators as to which bank should be changed; (1) the arrow on the control indicator lever in conjunction with the red “Replace Depleted Bank” light and (2) the cylinder bank pressure gauge. After replacing empty cylinders, open the cylinder valves. Because the cylinder pressure will actuate the pressure switch, the red “Replace Depleted Bank” light will be extinguished. The lever indicator must be turned to its opposite position to place the new cylinder bank in reserve. Rotating the indicator lever to its new position after replacement of an empty bank is the only action that must be taken to reset the manifold. The indicator lever must always be in the extreme right or left position.

**Fuel gas Manifolds - Flashback arrestors**

A dry flash arrestor is provided with all Western acetylene manifolds. A flash arrestor shall also be used on all fuel gas manifolds (not provided with manifold) used in applications with an oxidizer. Installed in the main gas line, the arrestor protects the manifold and cylinders from the dangers of reverse flow and flashbacks. A safety relief valve is installed on the outlet side of the flash arrestor. Should excessive pressure occur, the gas is then vented out and away to a safe location.

| Fuel Gas Type       | BI Series | Flow Capacity | Relief Valves |
|---------------------|-----------|---------------|---------------|
| Acetylene/Hydraulic | BI-FKA    | 300 SCFH      | 20 PSIG       |
| Hydraulic           | BI-FK     | 300 SCFH      | 40 PSIG       |
| Dry                 | BI-FKD    | 300 SCFH      | 35 PSIG       |



**BI - Series  
Automatic Manifolds for Industrial Applications****Flow Capability**

- Oxygen: 1200 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure.  
500 SCFH maximum at 50 PSIG delivery with a 5 PSI pressure drop and 2000 PSIG inlet pressure.
- Nitrogen: 1200 SCFH maximum at 160 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure.
- Carbon Dioxide: The flow capability of Carbon Dioxide cylinder manifold will depend upon conditions at the installation site, demands of the delivery system, and the number of cylinders in supply service. Maximum capability is 500 SCFH at 50 PSIG delivery and 850 PSIG inlet pressure without adding additional heaters. Installing a Carbon Dioxide manifold in a location which exposes it to ambient temperatures below 20°F (-7°C) is not recommended.
- Compressed Air: 1200 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure.
- Argon
- Helium: 1200 SCFH maximum at 50 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure
- Hydrogen
- Nitrous Oxide: The flow capability of Nitrous Oxide cylinder manifold will depend upon conditions at the installation site, demands of the delivery system, and the number of cylinders in supply service. Maximum capability is 500 SCFH at 50 PSIG delivery and 750 PSIG inlet pressure without adding additional heaters. Installing a Nitrous Oxide manifold in a location which exposes it to ambient temperatures below 20°F (-7°C) is not recommended.
- Acetylene: 300 SCFH maximum at 15 PSIG delivery with a 5 PSI inlet pressure drop and 200 PSIG inlet pressure.
- LPG: 400 SCFH maximum at 30 PSIG delivery with a 7 PSI inlet pressure drop and 100 PSIG inlet pressure.

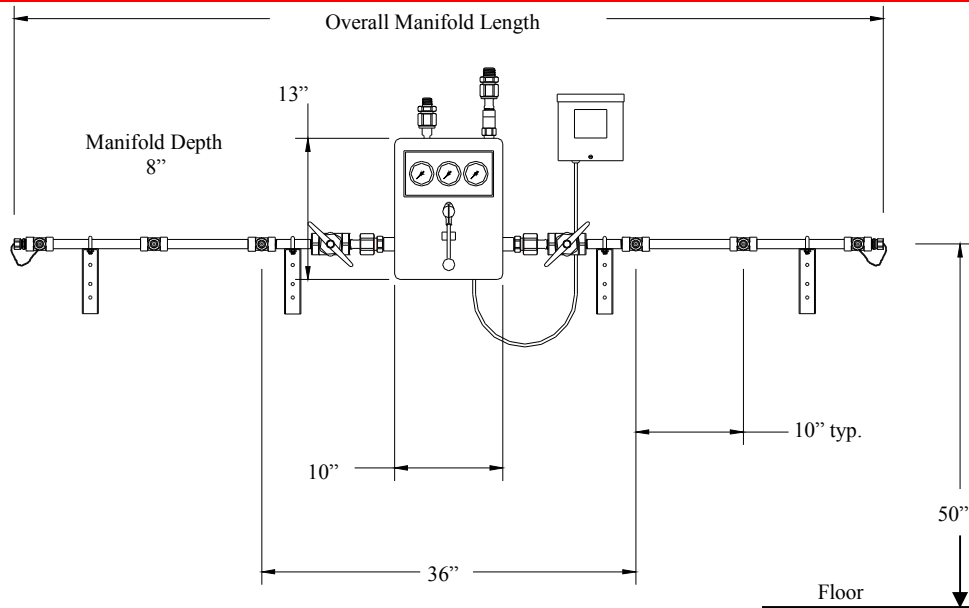
**Power Source Requirements**

A 115 VAC to 24 VAC power supply is provided with the manifold except with fuel gases, to operate the alarm lights on the manifold. Under normal operation the manifold will draw a maximum of 75 millamperes (.075 amperes).

Nitrous Oxide and Carbon Dioxide systems includes a 500 SCFH capacity heater. The thermostatically controlled heater warms the gas before entering the regulator, preventing “freeze-up”. The heater operates at 115 VAC and draws approximately four amperes.

**BIHL - Model for use with Carbon Dioxide and Nitrous Oxide**

Carbon Dioxide and Nitrous Oxide systems include a 500 SCFH capacity heater. The thermostatically controlled heater warms the gas before entering the regulator, preventing “freeze-up”. The control is supplied with a 6-foot cord and plug for 115 VAC power and draws approximately four amperes. This cord only provides power to the heater, you must wire in the power supply to activate the indicator lights on the front of the manifold control. If a manifold is ordered without the heater and used in the service of Carbon Dioxide or Nitrous Oxide, the primary regulators will not carry a warranty.

**BI - Series**  
**Automatic Manifolds for Industrial Applications**


| Total Number of Cylinders                                | 2                | 4                | 6                | 8                 | 10                | 12                | 16                |
|--|------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|
| Standard (10" Centers) Overall Manifold Length           | 2'-0"<br>(0.61M) | 5'-5"<br>(1.65M) | 7'-1"<br>(2.16M) | 8'-9"<br>(2.67M)  | 10'-5"<br>(3.18M) | 11'-9"<br>(3.58M) | 15'-3"<br>(4.65M) |
| Staggered Design (5" Centers) Overall Manifold Length    | 2'-0"<br>(0.61M) | 4'-7"<br>(1.40M) | 5'-5"<br>(1.65M) | 6'-3"<br>(1.91M)  | 7'-1"<br>(2.16M)  | 7'-11"<br>(2.41M) | 9'-7"<br>(2.92M)  |
| Vertical Crossover (10" Centers) Overall Manifold Length | N/A              | 3'-9"<br>(1.14M) | N/A              | 5'-5"<br>(1.65M)  | N/A               | 7'-1"<br>(2.16M)  | 8'-9"<br>(2.67M)  |
| Crossover (10" Centers) Overall Manifold Length          | N/A              | 3'-9"<br>(1.14M) | N/A              | 5'-5"<br>(1.65M)  | N/A               | 7'-1"<br>(2.16M)  | 8'-9"<br>(2.67M)  |
| Acetylene Manifold (13" Centers) Overall Manifold Length | 2'-0"<br>(0.61M) | 5'-9"<br>(1.75M) | 8'-0"<br>(2.44M) | 10'-2"<br>(3.10M) | 12'-4"<br>(3.76M) | 14'-5"<br>(4.40M) | 16'-7"<br>(5.06M) |

**How to Order:** Specify; Control type (V) - Service (W) - Number of Cylinders (X) Header Configuration (Y) Mounting (Z)  
 Example: BIHL-4-6V represents BI with heater, for CO<sub>2</sub> gas service with vertical crossover header configuration of 3 cylinders per side which is mounted on the wall.

| Control Type (V)  | Gas Service (W)   | Number of Cylinders (X)                             | Header Configuration (Y)   | Mounting (Z)                     |
|---|---|---|--|----------------------------------|
| BI (30-125psig)   | (1) Acetylene<br>(1A) Acetylene   | CGA 510<br>CGA 300                                  | BLANK-Standard 10" on center<br>13" on center for Acetylene & LPG  | Blank = Wall Mount<br>(Standard) |
| Acetylene (0-15psig)<br>LPG (0-35 psig)   | (2) Compressed Air<br>(3) Argon<br>(4) Carbon Dioxide                                   | CGA 346<br>CGA 580<br>CGA 320                       | S-STAGGERED 5" on center<br>6.5" on center for Acetylene & LPG   |                                  |
| BIHL (30-125 psig)<br>(500 SCFH heater included in HL model for CO <sub>2</sub> and N <sub>2</sub> O) | (5) Helium<br>(6) Hydrogen<br>(6A) Argon/Methane<br>(7) Nitrogen<br>(7A) Industrial Air | CGA 580<br>CGA 350<br>CGA 350<br>CGA 580<br>CGA 590 | V- VERTICAL CROSSOVER<br>Standard 10" on center<br>13" on center For Acetylene & LPG   | F - Floor Stand                  |
| BIHP (50-200 psig)  | (8) Nitrous Oxide<br>(9) Oxygen<br>(10) Liquefied Fuel Gases (LPG)                      | CGA 326<br>CGA 540<br>CGA 510                       | C-CROSSOVER (Floor Mount Only)<br>Standard 10" on center<br>13" on center for Acetylene & LPG<br><br>U-SHAPED - SKETCH REQUIRED<br>L-SHAPED- SKETCH REQUIRED |                                  |

**Warranty**

All Western manifolds are warranted against defects in materials and workmanship for the period of one year from the date of shipment, except as noted with HL units. For complete information on the warranty please see the back cover of the Installation and Operations manual.