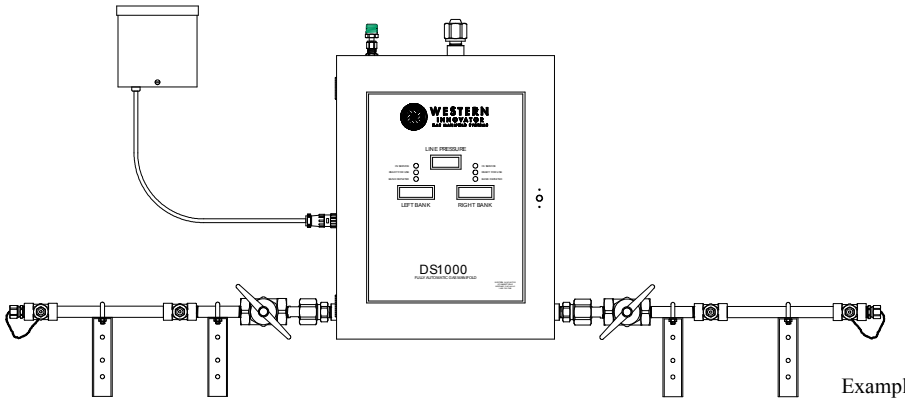
TECHNICAL DATA SHEET

DS1000 - Series
Fully Automatic Manifolds for High Pressure Cylinder (up to 3,000 psi.) for Industrial Applications

The DS1000 - series manifold systems are cleaned, tested and prepared for the indicated gas service and are built following Compressed Gas Association guidelines. The manifold consists of a manifold control unit, an internal adjustable line regulator, and two supply bank headers one service and one secondary supply to provide an uninterrupted supply of gas for the specific gas application. The manifold control unit is designed and built with features providing automatic changeover from the depleted "Service" supply bank to the "Secondary" supply bank while maintaining a constant delivery pressure. Digital pressure readouts, alarm, signal connections and lights show system status and alert the need to replace depleted cylinders. Features of the automatic system include an integral adjustable line regulator, power supply with dry contacts for connecting to a remote alarm, stainless steel braided flexible pigtails with check valves, rigid wall-mounted headers and complete mounting hardware.

Please note: This manifold is not for hospital applications. Does not meet NFPA-99 requirements for hospital use.

The DS1000 - 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 shall be piped outside. Follow all local and applicable codes for piping systems.



Example; DS1000-9-4

Specifications

- Fully Automatic Changeover - No levers to reset. Continuous , uninterrupted gas flow. The only manual function is to replace depleted cylinders.
- Available for the following gases: Air, Argon, Carbon Dioxide, Helium, Nitrogen, Nitrous Oxide and Oxygen.
- LED indicators provided system status for each bank. Light will indicate "In Service", "Ready for USE" , and "Bank Depleted".
- Large digital display provides constant readout of bank and delivery pressure.
- Display readout in PSIG, KPa or Bar.
- Micro controller monitors all functions and controls changeover.
- Built to accommodate future cylinder expansion by adding header extensions.
- Special header configurations available upon request.
- Optional Audio/Visual alarm and floor stands available.
- Made in the USA.
- Maximum inlet Pressure: 3000 PSIG (2000 PSIG CO_2 and N_2O)
- Delivery Pressure: DS1000 40-100 PSIG
  DS1000HL 40-100 PSIG
  DS1000HP 100-190 PSIG
- Manifold Outlet: 1/2" NPT male
- Relief valve outlet: 1/2" NPT male
- 24" Flexible stainless steel braided Teflon™ lined pigtails with check valves (EPDM seat all gases) Check valve is at header end of pigtail for all gases *except* Oxygen. *Note:* Helium manifolds shipped with synthetic fiber braided pigtails. Vertical crossover and staggered styles include 24" and 36" pigtails.
- 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.

Western Enterprises . 875 Bassett Rd . Westlake, Ohio 44145
www.westernenterprises.com . (440) 871-2160 . Fax (440) 835-8283 . Toll Free 1-800-783-7890

Manifold Operation

The DS1000 - series manifold control unit includes the following components and features: green "In Service", yellow "Ready for Use", and red "Bank Deplete" indicator lights, digital cylinder pressure readouts, digital line pressure readouts, intermediate pressure gauge, internal line regulator, intermediate relief valves, and fully automatic bank switching. Supply bank consists of a header with 24" stainless steel flexible pigtails 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. After initial power-up and with both banks empty, both red and green LED's will be illuminated. The bank that is pressurized first will be considered in service. The cylinder bank that supplies the piping system is know as the "Service" supply (as indicated by the green "In Service" light), while the cylinders on stand-by are referred to as the "Secondary" supply (as indicated by the yellow "Ready for Use" light). On the service bank, the gas flows into the manifold control unit inlet to the bank pressure transducer, then into the primary regulator before heading into an intermediate gauge. The gas then flows through a solenoid valve and into the line regulator. Delivery pressure is controlled by the line regulator and is adjustable. The gas exits the line regulator and proceeds past the line pressure transducer and into the delivery piping. The gas on the secondary bank flows into the manifold control unit inlet to the bank pressure transducer, then into the primary regulator before heading into an intermediate gauge. The gas enters the solenoid, but because this is the secondary bank, the solenoid is closed, preventing the secondary bank from flowing. Changeover from the "Service" to "Secondary" side is accomplished when the service pressure drops to a predetermined point (this changeover pressure is determined by the manifold PCB and is not adjustable). The PCB then signals the secondary bank solenoid to open, allowing it to start to flow without any interruption in line delivery pressure. There are two definite indicators as to which bank should be changed; (1) red "Bank Depleted: light and (2) cylinder bank pressure readout. After replacing empty cylinders, open cylinder valves. The PCB will read this pressure and automatically place the fresh bank of cylinders into reserve, making it the secondary bank. The yellow light will come on indicating the new back is "Ready for Use" and the red "Bank depleted" will be extinguished. Replacing the empty cylinders is all that is required to reset the manifold.

Flow Capability

Oxygen:	2200 SCFH at 50 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure. 800 SCFH at 50 PSIG delivery with a 5 PSI pressure drop and 2000 PSIG inlet pressure.
Nitrogen:	4650 SCFH at 160 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure. 400 SCFH at 160 PSIG delivery with a 5 PSI pressure drop and 2000 PSIG inlet pressure.
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.
Air:	2500 SCFH at 50 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure. 650 SCFH at 50 PSIG delivery with a 5 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.
Helium:	2200 SCFH at 50 PSIG delivery with a 15 PSI pressure drop and 2000 PSIG inlet pressure.

Power Source Requirements

A 115 VAC to 24 VAC power supply is provided with the manifold to operate the status lights on the manifold. Under normal operation the manifold will draw a maximum of 1.5 amperes.

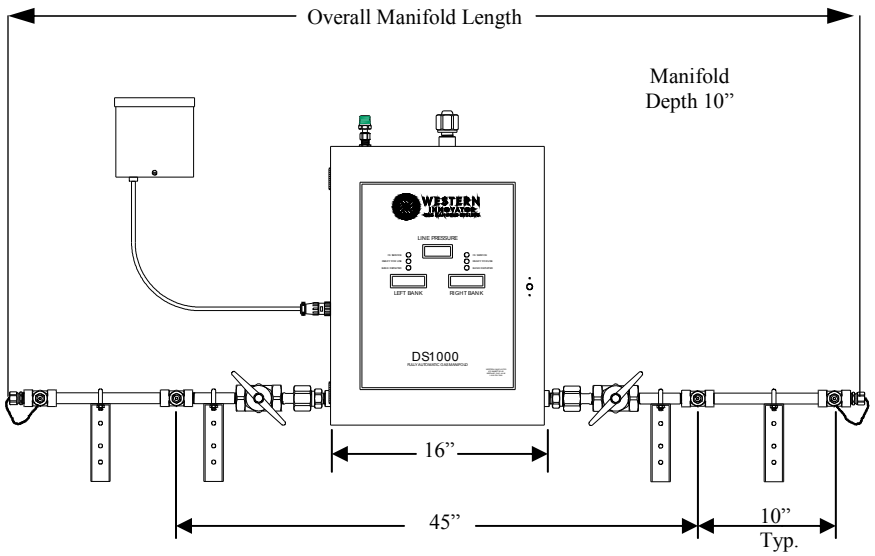
Nitrous Oxide and Carbon Dioxide systems includes a 500 SCFH capacity heater. The thermostatically controlled heater warms the gas before entering the regulator, preventing "freeze-up". The heater operates at 115 VAC and draws approximately four amperes.

Western Enterprises . 875 Bassett Rd . Westlake, Ohio 44145
www.westernenterprises.com . (440) 871-2160 . Fax (440) 835-8283 . Toll Free 1-800-783-7890

DS1000 - Series
Fully Automatic Manifolds for High Pressure Cylinder (up to 3,000 psi.) for Industrial Applications

DS1000HL - Models 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 provides power only for 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.



Total Number of Cylinders	2	4	6	8	10	12	16
Standard (10" Centers) Overall Manifold Length	4'-3" (1.30M)	5'-11" (1.80M)	7'-7" (2.31M)	9'-3" (2.82M)	10'-11" (3.33M)	12'-7" (3.84M)	15'-11" (4.85M)
Staggered Design (5" Centers) Overall Manifold Length	N/A	5'-1" (1.55M)	5'-11" (1.80M)	6'-9" (2.06M)	7'-7" (2.31M)	8'-5" (2.57M)	10'-1" (3.07M)
Vertical Crossover (10" Centers) Overall Manifold Length	N/A	4'-3" (1.30M)	N/A	5'-11" (1.80M)	N/A	7'-7" (2.31M)	9'-3" (2.82M)
Crossover (10" Centers) Overall Manifold Length	N/A	4'-3" (1.30M)	N/A	5'-11" (1.80M)	N/A	7'-7" (2.31M)	9'-3" (2.82M)

***How to Order**:* Specify; Control type (V) - Service (W) - Number of Cylinders (X) Header Configuration (Y) Mounting (Z)
Example: DS1000-9-4S represents DS1000 for oxygen service and a staggered header configuration of two cylinders per side which is mounted on the wall.

Control Type (V)	Gas Service (W)	Number of Cylinders (X)	Header Configuration (Y)	Mounting (Z)
	(2) Compressed Air CGA-346		BLANK-Standard 10" on center	
DS1000	(3) Argon CGA-580			Blank = Wall Mount
(40-100 psig)	(4) Carbon Dioxide CGA-320		S-STAGGERED 5" on center	(Standard)
	(5) Helium CGA-580			
DS1000HL	(7) Nitrogen CGA-580		V- VERTICAL CROSSOVER	F - Floor Stand
(40-100 PSIG)	(7A) Industrial Air CGA-590		Standard 10" on center	
(500 SCFH heater in-	(8) Nitrous Oxide CGA-326			
cluded in HL model for	(9) Oxygen CGA-540		C-CROSSOVER (Floor Mount Only)	
CO_2 and N_2O)			Standard 10" on center	
DS1000HP			U-SHAPED - SKETCH REQUIRED	
(100-190 psig)			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.

Western Enterprises . 875 Bassett Rd . Westlake, Ohio 44145
www.westernenterprises.com . (440) 871-2160 . Fax (440) 835-8283 . Toll Free 1-800-783-7890