The Standard of Excellence in Safety, Quality, and Performance

CENTURION™ SOURCE SYSTEMS

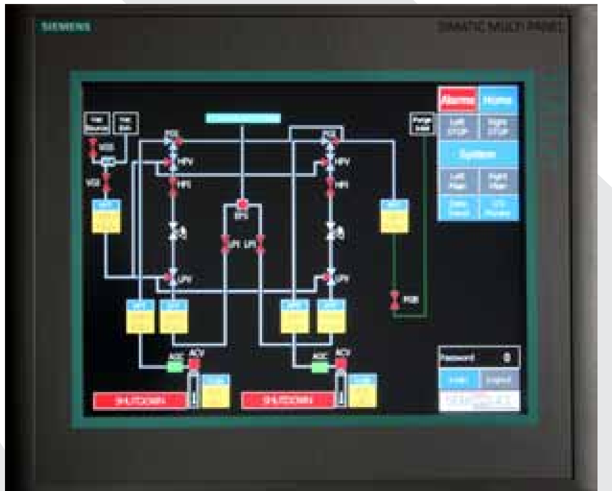
Centurion™ source systems are the latest offering from Semi-Gas® Systems, a division of Applied Energy Systems with one of the largest installed bases of gas source and distribution equipment in the world. Centurion™ source systems are the result of 30 years of innovation in gas distribution and control technology at Semi-Gas® Systems. Semi-Gas® Systems was the first supplier of micro-processor based automated gas source systems. Today, Centurion™ source systems are available in state-of-the-art PLC driven Automatic, Semi-Automatic and Manual designs.

Centurion™ source systems enjoy success in the top tier semiconductor marketplace, as an easily expandable platform that meets the specific requirements of varied semiconductor fabs. The Centurion™ product line is engineered to conform to SEMI-S2 and the International Fire Code. A Centurion™ Automatic source system includes a SEMI-S2 compliant Consul™ controller with Color Touch Screen interface. The Consul™ controller provides system status outputs, auxiliary programable outputs and is also easily upgradeable to Ethernet and other communications protocols. Applied Energy Systems offers an extensive list of upgrades and options to customize Centurion™ source systems to meet our customer's specific requirements.

Founded in 1968, Applied Energy Systems specializes in the design, manufacture and installation of ultra-high purity gas systems worldwide. In 2009, Applied Energy Systems acquired Semi-Gas® Systems, a premier supplier of gas distribution and control technology since 1980. Applied Energy Systems proudly offers Centurion™ source systems to the leaders in the University, Research and Development, Photovoltaic and Semiconductor markets, as well as customers in related industries that seek our world-class designs for safety, quality and performance.

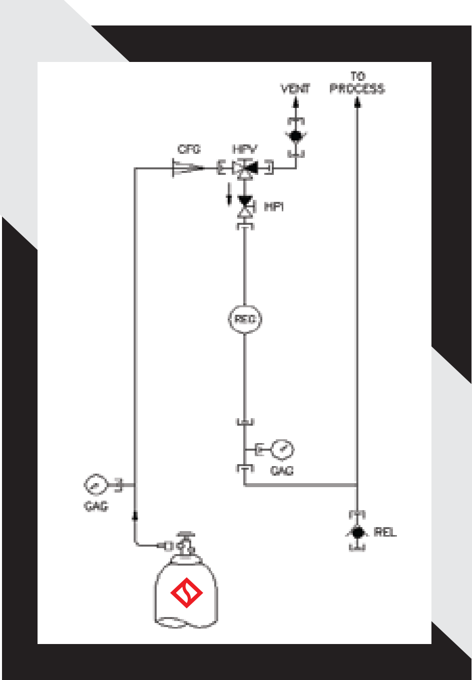
CENTURION™ CONTROLS

The Centurion™ Consul™ PLC Controller is the latest state-of-the-art offering in Automatic gas control technology from Semi-Gas® Systems. The SEMI-S2 compliant Consul™ controller features an 8", and optional 12", Color Touch Screen interface to display pertinent system information and guide the operator through automated purge routines. An intuitive system schematic on the home screen displays relevant information at a glance, while the Centurion™ source system delivers gas to your most important process tools.



The Centurion™ PRO-201 PLC Controller is the latest state-of-the-art offering in Semi-Automatic gas control technology from Semi-Gas® Systems. The SEMI-S2 compliant PRO-201 controller provides the functionality of several earlier Semi-Gas® controllers within a single compact package. The PRO-201 controller provides emergency shut off control, automatic switchover, and weight scale display, for Semi-Automatic and Manual Centurion™ source systems.

CENTURION™ MANIFOLDS

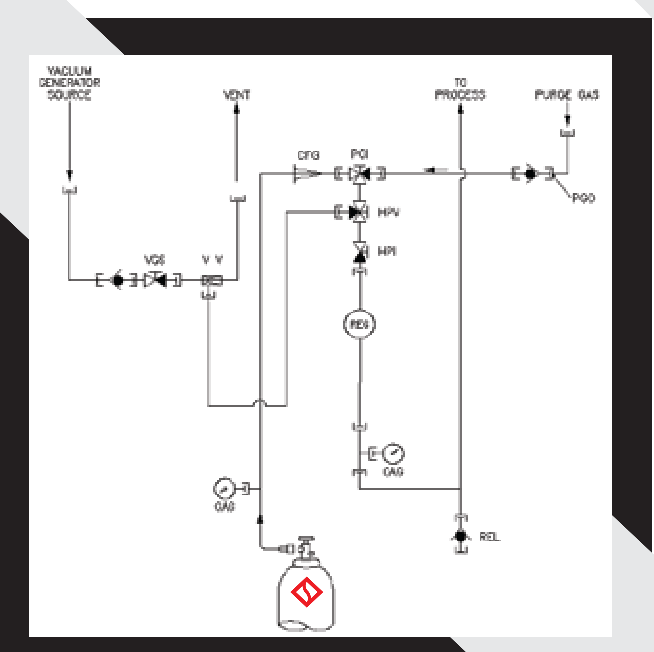


Two Valve Manual Centurion™ Systems

Two Valve Manual manifolds are designed for nitrogen and other self-purging inert gases. The manifold design enables the removal of atmospheric contaminants trapped between the cylinder and regulator by pressurizing the high pressure side of the manifold with process gas and subsequently venting through the High Pressure Vent (HPV) valve.

Semi-Automatic Centurion™ Systems

Semi-Automatic manifolds are designed to control hazardous gases. The Semi-Automatic manifold design incorporates an Emergency Shut-Off (ESO) Valve, Excess Flow Switch (EFS), and dual valve isolation from the process line. The High Pressure Vent (HPV) and Low Pressure Vent (LPV) valves enable a manual purge of both high and low pressure sides of the manifold using an inert purge gas source.

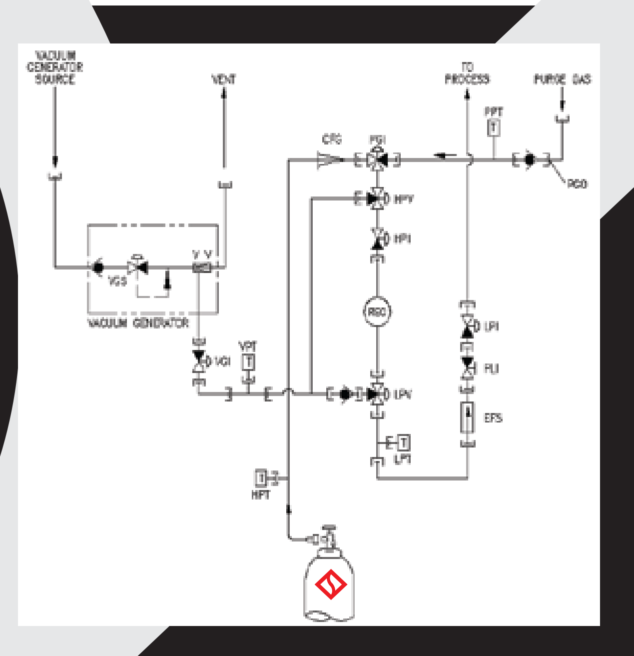


Three Valve Manual Centurion™ Systems

Three Valve Manual manifolds are also designed for inert gases. The manifold design is similar to a Two Valve Manual manifold except an additional Purge Gas Isolation (PGI) valve enables a secondary inert purge gas to enter the manifold and subsequent venting is enhanced through use of a Venturi Vacuum Generator (VV).

Automatic Centurion™ Systems

Automatic manifolds are also designed to control hazardous gases. Automatic manifolds feature pneumatically operated valves and transducer based pressure monitoring. The Automatic manifold design enables automated purge routines, for cylinder change or manifold maintenance, using a Consul™ PLC controller with Color Touch Screen interface and an inert purge gas source.



CENTURION™ COMPONENTS

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Conical Filter Gasket (CFG). Protects manifold components from large particles and impurities

High Pressure Transducer (HPT). Senses pressure within cylinder pigtail

Vacuum Access Isolation (VAI) Valve. Enables leak check access to vent piping

Line Isolation (LI) Valve. Provides final manual isolation from process line (optional)

Vent Pressure Transducer (VPT). Senses pressure within vent piping

Excess Flow Switch (EFS). Senses excessive process gas flow

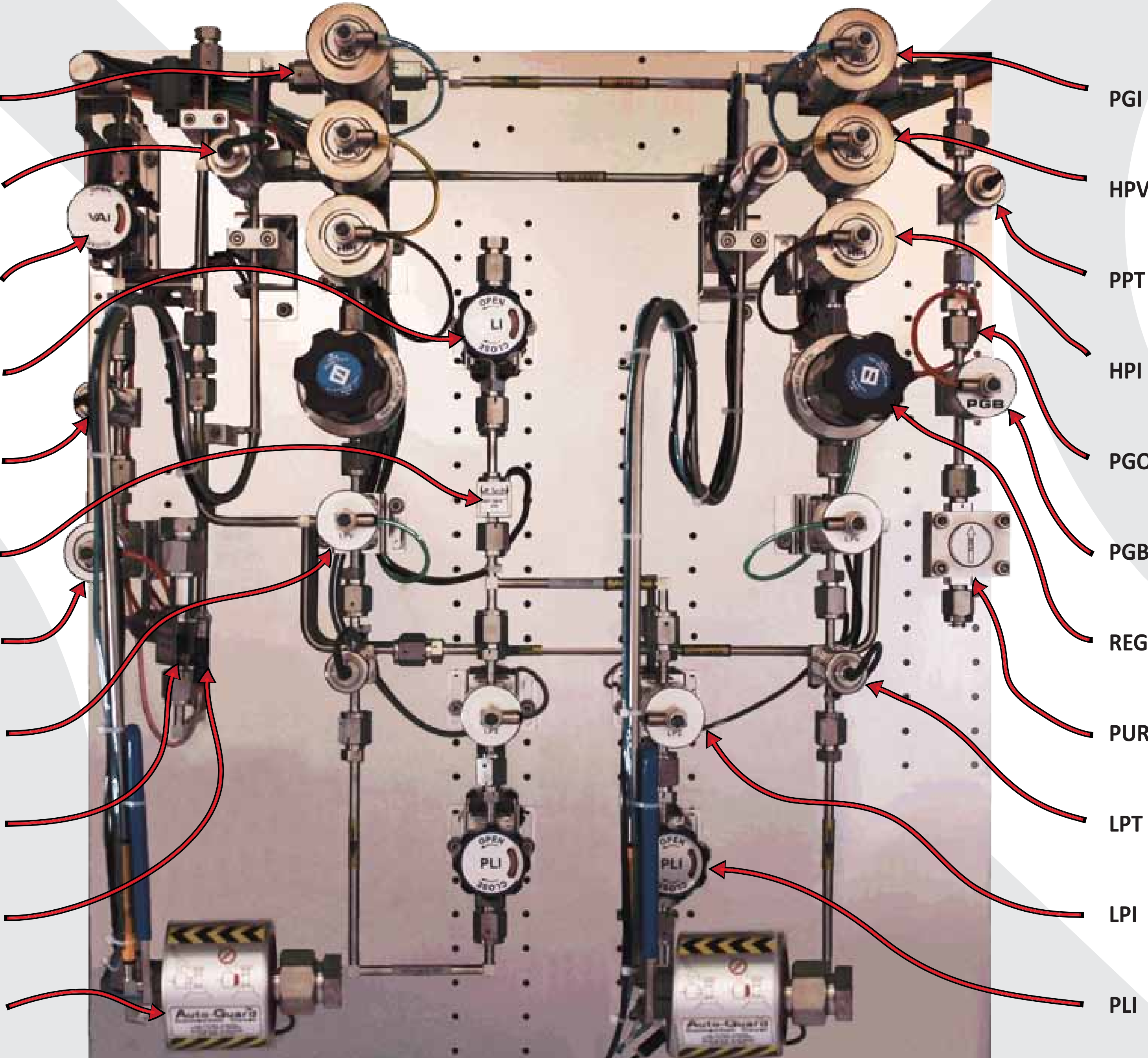
Vacuum Generator Isolation (VGI) Valve. Isolates vacuum generator from manifold (optional)

Low Pressure Vent (LPV) Valve. Vents low pressure side of manifold

Vacuum Generator Supply (VGS) Valve. Isolates vacuum generator from inert gas supply

Venturi Vacuum Generator (VV). Produces vacuum to increase speed and efficiency of purge process

Auto-Guard (AG). Controls access to cylinder connection fitting (optional)



Purge Gas Isolation (PGI) Valve. Isolates purge supply from manifold

High Pressure Vent (HPV) Valve. Vents high pressure side of manifold

Purge Pressure Transducer (PPT). Senses pressure at purge supply inlet

High Pressure Isolation (HPI) Valve. Isolates process manifold from pigtail and cylinder

Purge Gas Orifice (PGO). Enables inert bleed through pigtail during cylinder change

Purge Gas Bleed (PGB) Valve. Enables inert bleed through pigtail during cylinder change (optional)

Pressure Regulator (REG). Regulates process gas to desired outlet pressure

Purge Supply Purifier (PUR). Purifies purge supply to manifold (optional)

Low Pressure Transducer (LPT). Senses regulator outlet pressure

Low Pressure Isolation (LPI) Valve. Isolates manifold from process line automatically

Process Line Isolation (PLI) Valve. Isolates manifold from process line manually

CENTURION™ FEATURES AND OPTIONS

	AUTOMATIC	SEMI-AUTOMATIC	MANUAL
ENCLOSURE FEATURES AND OPTIONS			
Welded 11 Ga Steel Enclosure	S	S	O
Light Gray Powder Coat	S	S	O
Self-Closing and Self-Latching Door	S	S	O
UL Approved Fire Sprinkler	S	S	O
1/4" Thick Safety Glass Window	S	S	O
Adjustable Damper with Air Filter	S	S	O
Rack Mount or Wall Mount Systems	O	O	S
Cylinder Shelf for Short Cylinders	O	O	O
Cylinder Holder for Small Diameter Cylinders	O	O	O
Cylinder Restraint with Strap and Chain	S	S	S
Dual Cylinder Restraints	O	O	O
Rubber Floor Mat	S	S	O
MECHANICAL DESIGN FEATURES AND OPTIONS			
Ultra-High Purity Orbital Welded and VCR Construction	S	S	S
Ultra-High Purity Fluid Components	S	S	S
Venturi Vacuum Generator	S	S	O
Single Stage Tied Diaphragm Regulator	S	S	S
Dual Stage Tied Diaphragm Regulator	O	O	O
Hastelloy Trim Regulator	O	O	N
Ultra-High Purity Diaphragm Valves	S	S	S
Excess Flow Switch	S	S	N
Transducer Based Pressure Monitoring	S	N	N
Switch Based Pressure Monitoring	N	S	N
Gauge Based Pressure Monitoring	N	N	S
High Gas Flow Rate Capacity	O	O	O
Cylinder Scales for Liquefied Gases	O	O	O
Vacuum Access Isolation (VAI) Valve	O	O	O
Purge Gas Bleed (PGB) Valve	O	N	N
Dual Outlet Module for Multiple Points of Use	O	O	O
Valve Status Pneumatic Winks	S	S	O
High and Low Pressure Purge Access (HPA/LPA) Valves	O	O	N

S = Standard, O = Optional, N = Not Applicable

CENTURION™ FEATURES AND OPTIONS

	AUTOMATIC	SEMI-AUTOMATIC	MANUAL
MECHANICAL DESIGN FEATURES AND OPTIONS			
Process Line Outlet Filter (0.003 micron)	O	O	O
Coaxial Tubing Outlet Module	O	O	N
Process & Purge Gas Purification	O	O	O
Damage Control Configurations	O	O	N
Purity Testing for Particles, H20, O2	O	O	O
Cylinder Heating and Cooling	O	O	O
Manifold Heating	O	O	O
Multiple Cylinder Pigtails	O	O	O
Pigtail Shut-Off Valve	O	O	N
Conical Filter Gasket	S	S	S
Auto-Guard (AG)	O	N	N
ELECTRICAL DESIGN FEATURES AND OPTIONS			
8" Color Touch Screen Interface	S	N	N
12" Color Touch Screen Interface	O	N	N
Text and Keypad User Interface	N	S	O
User Configurable Security Access	S	N	N
Detailed Alarm Logging	S	S	O
Remote Shutdown and Alarm I/O	S	S	O
Automatic Cycle Purge Routines	S	N	N
Automatic Switchover Capabilities	S	S	O
Inherent Current Limiting Design	S	S	O
Multiple Communications Protocols Including Ethernet	O	O	O
Controller Z-Purge Kit	O	O	O
Dual Infrared Fire Detector (IIR)	O	O	N
Automatic Cylinder Valve (ACV) Control	O	O	N
Hazardous Gas Sensor	O	O	O
Low Pneumatic Pressure Sensor	S	S	O
Cylinder Weight Scale Display	S	S	O
Semi-S2 Compliant Controller	S	S	O
PLC Based Controller	S	S	O
Exhaust Sensor	S	S	O

CENTURION™ RECOMMENDATIONS

GAS NAME	FORMULA	CYLINDER PRESSURE (PSIG at 70°F)	LIQUID OR COMPRESSED	NFPA RATING	FLAMMABLE	DISS	AUTOMATIC	SEMI-AUTOMATIC	MANUAL
Ammonia	NH_3	114	L	3, 1, 0	Y	720	R	O	NR
Argon	Ar	2640	C	0, 0, 0	N	718	O	O	R
Arsine	AsH_3	205	L	4, 4, 2	Y	632	R	O	NR
Boron Trichloride	BCl_3	4	L	3, 0, 2	N	634	R	O	NR
Boron Trifluoride	BF_3	2000	C	3, 0, 1	N	642	R	O	NR
Carbon Dioxide	CO_2	830	L	1, 0, 0	N	716	O	O	R
Carbon Monoxide	CO	2000	C	3, 4, 0	Y	724	R	O	NR
Chlorine	Cl_2	85	L	4, 0, 0	N	728	R	O	NR
Diborane	B_2H_6	2150	C	4, 4, 3	Y	632	R	O	NR
Dichlorosilane	SiH_2Cl_2	9	L	4, 4, 2	Y	636	R	O	NR
Disilane	Si_2H_6	33	L	1, 4, 2	Y	632	R	O	NR
Fluorine/Krypton/Neon	F_2/Kr/Ne	500	C	4, 0, 4	N	728	R	O	NR
Germane	GeH_4	88	C	4, 4, 3	Y	632	R	O	NR
Halocarbon 14	CF_4	2000	C	1, 0, 0	N	716	O	O	R
Halocarbon 23	CHF_3	635	L	2, 0, 0	N	716	O	O	R
Halocarbon C318	C_4F_8	25	L	1, 0, 0	N	716	O	O	R
Helium	He	2640	C	0, 0, 0	N	718	O	O	R
Hydrogen	H_2	2400	C	0, 4, 0	Y	724	R	O	NR
Hydrogen Bromide	HBr	320	L	3, 0, 0	N	634	R	O	NR
Hydrogen Chloride	HCl	613	L	3, 0, 1	N	634	R	O	NR
Krypton/Neon	Kr/Ne	1800	C	1, 0, 0	N	718	O	O	R
Methane	CH_4	2400	C	1, 4, 0	Y	724	R	O	NR
Nitric Oxide	NO	500	C	4, 0, 1	N	728	R	O	NR
Nitrogen	N_2	2650	C	1, 0, 0	N	718	O	O	R
Nitrogen Trifluoride	NF_3	1450	C	1, 0, 0	N	640	R	O	NR
Nitrous Oxide	N_2O	745	L	1, 0, 0	N	712	O	O	R
Oxygen	O_2	2640	C	0, 0, 0	N	714	O	O	R
Phosphine	PH_3	590	L	4, 4, 2	Y	632	R	O	NR
Silane	SiH_4	1650	C	2, 4, 3	Y	632	R	O	NR
Silicon Tetrachloride	$SiCl_4$	-11	L	3, 0, 2	N	636	R	O	NR
Sulfur Hexafluoride	SF_6	320	L	1, 0, 0	N	716	O	O	R
Tungsten Hexafluoride	WF_6	3	L	3, 0, 2	N	638	R	O	NR

R = Recommended, O = Optional, NR = Not Recommended

SEMI-GAS® SYSTEMS PRODUCTS AND MARKETS

Semi-Gas® Systems offers a complete line of gas distribution and control technology.

- Centurion™ Source Systems
- Semiconductor OEM Gas Panels
- Valve Manifold Boxes and Panels
- Bulk Source Gas Systems
- Bulk Distribution Systems
- Liquid Delivery Systems
- Custom Engineered Solutions
- Field Services
- Piping and Installation

Semi-Gas® Systems proudly supplies gas distribution and control technology to the leaders in the semiconductor industry as well as customers in related industries that seek our world-class designs for safety, quality and performance.

- Semiconductor
- Photovoltaic
- Government and Research Labs
- Universities
- General Industry

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