

# Industrial Gas Equipment



## Regulators

|  |   |
|--|---|
| Model 25 (Single-Stage Medium Duty) .....                    | 2 |
| Model 30 (High-Flow) .....                                   | 5 |
| Model 32 (Two-Stage Carbon Dioxide Ambient Vaporizing) ..... | 9 |
| Model 35 (High-Flow Manifold) .....                          | 5 |
| Model 40 (Ultra-High Pressure) .....                         | 8 |
| Model 45 (Single-Stage Heavy Duty) .....                     | 2 |
| Model 50 (Two-Stage General Purpose) .....                   | 4 |
| Model 55 (Two-Stage High-Flow) .....                         | 4 |
| Model 60 (Shielding Gas Flow Gauge).....                     | 3 |
| Model 65 (Shielding Gas Flowmeter) .....                     | 3 |
| Model 70 (Station).....                                      | 6 |
| Model 75 (Pipeline) .....                                    | 6 |
| Model 80 (Liquid Cylinder).....                              | 7 |
| Model 85 (Servo-Dome-Loaded).....                            | 7 |
| Model 90 (High-Flow High-Purity Pipeline).....               | 8 |
| Model 95 (High-Flow High-Purity Pipeline).....               | 8 |

## Flowmeters

|                |   |
|----------------|---|
| Model 10 ..... | 9 |
|----------------|---|

## Manifolds

|   |    |
|---|----|
| Model H (Header) .....                          | 10 |
| Model S (Pressure Differential Switchover)..... | 12 |
| Model SD (Station Drops) .....                  | 13 |
| Models SR, SL and D (Single Regulator) .....    | 11 |

## Cryogenic

|  |       |
|--|-------|
| Cylinder Carts .....                           | 16    |
| Hoses .....                                    | 15    |
| Hose Accessories .....                         | 15,16 |
| Model CWV (Whisper® Safety Relief Valve) ..... | 14    |
| SAE Flare Adapters.....                        | 16    |

## Accessories

|                                   |    |
|-----------------------------------|----|
| Cylinder Brackets .....           | 17 |
| Cylinder Carts .....              | 19 |
| Cylinder Leads/Pigtails .....     | 17 |
| Flash Arresters .....             | 18 |
| Manifold Connection Fittings..... | 18 |
| Valves .....                      | 18 |

## Liquid Cylinder Specifications

|   |    |
|---|----|
| Liquids and Containers .....            | 20 |
| Liquid Cylinder Performance Chart ..... | 21 |

## Air Liquide

One convenient supplier for all of your gas and equipment needs

## Choose the World Leader in Compressed Gas Technology

Established in 1902, Air Liquide is the world leader in gases for industry, health and the environment. With more than 43,000 employees and operating in 81 countries, we offer innovative solutions based on constantly enhanced technologies. Air Liquide maintains over 100 facilities in the United States and Canada.

Our SCOTT™ specialty gas and liquid mixtures are widely regarded as being the most accurate in the industry while our ALPHAGAZ™ pure gases have long been the global benchmark of quality. Air Liquide also offers exclusive brands of industrial gases such as ARCAL™, LASAL™, FLAMAL™ and ALIGAL™ which are specifically engineered for industrial uses such as welding, lasers, cutting and food processing respectively.

## Equipment for Industrial Gases and Cryogenics

Air Liquide industrial grade equipment delivers outstanding value by delivering cost-effective, reliable performance. When maintained properly, it provides many years of trouble-free performance. Most of our industrial grade equipment items are in stock and available for next day shipping.

In addition to the industrial grade equipment featured in this catalog, Air Liquide offers a diverse inventory of SCOTT equipment that is engineered for use with all types of specialty gases and guaranteed to provide precision gas delivery to the point-of-use, while maintaining gas integrity and purity.

## Not Sure What You Need?

Air Liquide maintains a staff of equipment experts, as well as technical and customer service team members who can provide solutions to all of your equipment or gas-related issues. Call us toll-free today and let us demonstrate to you how Air Liquide equipment and gas products and services will add measureable value to your bottom line.

## Safety and Product Information Resource

We provide several venues for customers to obtain accurate and helpful safety and product information. Catalogs, brochures and datasheets are readily available in both printed and electronic form via our website at [www.ALspecialtygases.com](http://www.ALspecialtygases.com).

Improve safety while saving time and money with our exclusive cylinder SMARTOP™ and ALTOP™

Available on many of our industrial gases.



### ALTOP with Built-In Regulator

- No pressure regulators to buy or maintain.
- Positive ON/OFF lever-activated valve prevents wasted gas due to partially open rotary-style valves.
- Visual reading of cylinder contents prevents accidental return of half-full cylinders.
- Ergonomic design permits safer, easier maneuvering of cylinder.
- Shock-absorbing cap protects against accidental injury if cylinder falls.
- Built-in gas flow restriction prevents sudden release of gas.
- Residual Pressure Valve prevents backflow to avoid contamination of cylinder contents.



### SMARTOP with SCANDINA™ Cap

- Positive ON/OFF lever action prevents gas leaks common to traditional valves.
- ON/OFF lever action opens and closes valve quickly in a single action and provides positive visualization of valve status.
- Built-in pressure gauge shows cylinder contents without use of a regulator.
- Residual Pressure Valve prevents backflow to avoid contamination of cylinder contents.
- SCANDINA cap permanently protects SMARTOP cylinder valve and allows easier, safer cylinder handling.
- Built-in gas flow restriction prevents sudden release of gas.

## Regulators

### Single-Stage Medium Duty Regulator

#### Model 25

The time-proven performance of our Model 25 regulator makes it a true industry workhorse. Designed to provide years of economical, yet reliable performance, this regulator sets the standard for most welding, cutting, brazing and heat treating applications.

#### Benefits and Features

- Conforms to CGA E-4 and UL Listed
- Chrome-plated bonnet with forged brass body
- 2" dual-scale gauges (psi/kpa)
- Regulator designed for propane service (IGR-25PB510) can be used with any other welding-grade liquid petroleum gas, EXCEPT acetylene
- Model 25E (IGR-25E580) is recommended for joint testing and purging on job sites
- One-piece encapsulated seat design with internal filter and PTFE Teflon® seat



Recommended for use with FLAMAL™ and all types of welding gases

| Model Number | Gas Service             | Maximum Inlet Pressure (psig) | Delivery Pressure Range (psig) | Inlet CGA | Outlet            |
|--------------|-------------------------|-------------------------------|--------------------------------|-----------|-------------------|
| IGR-25AA-300 | Acetylene               | 300                           | 0–15                           | 300       | 9/16"–18 LH       |
| IGR-25AA-510 | Acetylene               | 300                           | 0–15                           | 510       | 9/16"–18 LH       |
| IGR-25PB-510 | FLAMAL, Propane         | 300                           | 0–50                           | 510       | 9/16"–18 LH       |
| IGR-25C-540  | Oxygen                  | 3000                          | 0–100                          | 540       | 9/16"–18 RH       |
| IGR-25C-580  | Argon, Helium, Nitrogen | 3000                          | 0–100                          | 580       | 5/8"–18 RH Female |
| IGR-25C-590  | Industrial Air          | 3000                          | 0–100                          | 580       | 9/16"–18 RH       |
| IGR-25E-580  | Nitrogen                | 3000                          | 0–500                          | 580       | 1/4" x 1/4" FLARE |

### Single-Stage Heavy Duty Regulator

#### Model 45

Our Model 45 medium to high-capacity regulator delivers dependable performance in the harshest of environments. Featuring a stainless steel diaphragm, this is the regulator of choice for even the most challenging welding, cutting, brazing and heat treating applications.

#### Benefits and Features

- Conforms to CGA E-4 and UL Listed
- Stainless steel diaphragm
- Brass bonnet and bronze adjusting screw
- 2.5" dual-scale gauges (psi/kpa)
- Tamper-proof, self-reseating internal high-pressure safety valve
- One-piece encapsulated seat design with an internal filter and a PTFE Teflon® seat



Recommended for use with FLAMAL™ and all types of welding gases

| Model Number | Gas Service             | Maximum Inlet Pressure (psig) | Delivery Pressure Range (psig) | Inlet CGA | Outlet            |
|--------------|-------------------------|-------------------------------|--------------------------------|-----------|-------------------|
| IGR-45AA-300 | Acetylene               | 300                           | 0–15                           | 300       | 9/16"–18 LH       |
| IGR-45AA-510 | Acetylene               | 300                           | 0–15                           | 510       | 9/16"–18 LH       |
| IGR-45PB-510 | FLAMAL, Propane         | 300                           | 0–50                           | 510       | 9/16"–18 LH       |
| IGR-45B-540  | Oxygen                  | 3000                          | 0–50                           | 540       | 9/16"–18 RH       |
| IGR-45C-540  | Oxygen                  | 3000                          | 0–125                          | 540       | 9/16"–18 RH       |
| IGR-45C-580  | Argon, Helium, Nitrogen | 3000                          | 0–125                          | 580       | 5/8"–18 RH Female |

## Shielding Gas Flow Gauge Regulator

### Model 60

This compact regulator accurately controls and measures shielding gas flows up to 60 SCFH.

#### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Conforms to CGA E-4 and UL Listed
- Lightweight, rugged design
- 2" dual-scale inlet gauge (psi/kpa)
- 2" dual-scale (argon/carbon dioxide) SCFH outlet gauge
- One-piece encapsulated seat design with an internal filter and a PTFE Teflon® seat



Recommended for use with ARCAL™ and BLUESHIELD™

| Model Number | Gas Service    | Delivery Flow Range (SCFH) | Inlet CGA | Outlet            |
|--------------|----------------|----------------------------|-----------|-------------------|
| IQR-6060-320 | Carbon Dioxide | 0–60*                      | 320       | 5/8"–18 RH Female |
| IQR-6060-580 | Argon          | 0–60                       | 580       | 5/8"–18 RH Female |

\* On maximum continuous duty cycle, CO<sub>2</sub> flow to 20 SCFH.

## Shielding Gas Flowmeter Regulator

### Model 65

The Model 65 construction incorporates a regulator and flowmeter into one compact unit. It accurately controls and measures shielding gas flows to 70 SCFH.

#### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Regulator is preset at 20 psig
- Conforms to CGA E-4 and UL Listed
- Flow tube and float are easily changed for different gases
- Durable, easy-to-read flow tube and protective cover
- Dual-calibration on argon/carbon dioxide flow tube
- 2" dual-scale inlet gauge (psi/kpa)
- Sensitive needle valve for fingertip control
- One-piece encapsulated seat design with an internal filter and a PTFE Teflon® seat



Recommended for use with ARCAL™ and BLUESHIELD™

| Model Number | Gas Service            | Delivery Flow Range (SCFH) | Inlet CGA | Outlet            |
|--------------|------------------------|----------------------------|-----------|-------------------|
| IQR-6570-320 | Carbon Dioxide (Argon) | 0–70*                      | 320       | 5/8"–18 RH Female |
| IQR-6570-580 | Argon (Carbon Dioxide) | 0–70                       | 580       | 5/8"–18 RH Female |

\* On maximum continuous duty cycle, CO<sub>2</sub> flow to 20 SCFH.

#### Optional Equipment for Models 60 and 65

- **Model IGA-IH10:** A single line hose for use with argon/carbon dioxide shielding gases. 10 ft. of 3/16" hose with 5/8"–18 RH Male swivel end connections. Other lengths may be available—contact your Air Liquide representative.



## Regulators

### Two-Stage General Purpose Regulator

#### Model 50

Our Model 50 is recommended for applications where constant delivery pressure is required over a wide range of inlet pressures. This regulator sets the standard for general purpose, laboratory, industrial and welding applications.



Model 50

### Two-Stage High-Flow Regulator

#### Model 55

Capable of flowrates up to 3000 SCFH, this high-flow regulator provides constant delivery pressure over a wide range of inlet pressures for cylinders and manifold systems.



Model 55

#### Benefits and Features

- Conforms to CGA E-4
- Brass body and bonnets
- 2.75" neoprene diaphragm
- 2.5" dual-scale gauges (psi/kpa)
- For Model 50, low pressure (0-15 psig) uses neoprene seat
- For Model 55, 3/8" NPT outlet port, 180° from inlet with 1/4" male hex nipple installed
- Tamper-proof, self-reseating internal high-pressure safety valve
- One-piece encapsulated seat design with an internal filter and PTFE Teflon® seats

#### Model 50

| Model Number | Gas Service     | Maximum Inlet Pressure (psig) | Delivery Pressure Range (psig) | Inlet CGA | Outlet            |
|--------------|-----------------|-------------------------------|--------------------------------|-----------|-------------------|
| IQR-50AA-510 | Acetylene       | 300                           | 0–15                           | 510       | 9/16"–18 LH       |
| IQR-50PA-510 | FLAMAL, Propane | 300                           | 0–15                           | 510       | 9/16"–18 LH       |
| IQR-50PB-510 | FLAMAL, Propane | 300                           | 0–50                           | 510       | 9/16"–18 LH       |
| IQR-50B-320  | Carbon Dioxide  | 3000                          | 0–50                           | 320       | 5/8"–18 RH Female |
| IQR-50B-346  | Air             | 3000                          | 0–50                           | 346       | 9/16"–18 RH       |
| IQR-50B-350  | Flammables      | 3000                          | 0–50                           | 350       | 9/16"–18 LH       |
| IQR-50B-540  | Oxygen          | 3000                          | 0–50                           | 540       | 9/16"–18 RH       |
| IQR-50B-580  | Inerts          | 3000                          | 0–50                           | 580       | 5/8"–18 RH Female |
| IQR-50B-590  | Industrial Air  | 3000                          | 0–50                           | 590       | 9/16"–18 RH       |
| IQR-50C-320  | Carbon Dioxide  | 3000                          | 0–125                          | 320       | 5/8"–18 RH Female |
| IQR-50C-346  | Air             | 3000                          | 0–125                          | 346       | 9/16"–18 RH       |
| IQR-50C-350  | Flammables      | 3000                          | 0–125                          | 350       | 9/16"–18 LH       |
| IQR-50C-540  | Oxygen          | 3000                          | 0–125                          | 540       | 9/16"–18 RH       |
| IQR-50C-580  | Inerts          | 3000                          | 0–125                          | 580       | 5/8"–18 RH Female |
| IQR-50C-590  | Industrial Air  | 3000                          | 0–125                          | 590       | 9/16"–18 RH       |

#### Model 55

| Model Number | Gas Service | Maximum Inlet Pressure (psig) | Delivery Pressure Range (psig) | Inlet CGA | Outlet        |
|--------------|-------------|-------------------------------|--------------------------------|-----------|---------------|
| IQR-55E-350  | Flammables  | 3000                          | 0–350                          | 350       | 1/4" NPT Male |
| IQR-55E-540  | Oxygen      | 3000                          | 0–350                          | 540       | 1/4" NPT Male |
| IQR-55E-580  | Inerts      | 3000                          | 0–350                          | 580       | 1/4" NPT Male |

## High-Flow Regulator

### Model 30

This specially-designed regulator provides high gas flows for cylinders and manifold gas supply systems, and is ideal for high-flow applications such as heavy cutting and heating.

#### Benefits and Features

- Allows flow in excess of 2000 SCFH at 2000 psi inlet and 300 SCFH at 200 psi inlet
- Operates on high-pressure cylinders up to 3,000 psig (maximum inlet pressure)
- Conforms to CGA E-4
- Large 2.75" neoprene diaphragm
- 2.5" dual-scale gauges (psi/kpa)
- Tamper-proof and self-reseating internal high-pressure safety valve
- One-piece encapsulated seat design with an internal filter and PTFE Teflon® seat



| Model Number | Gas Service       | Delivery Pressure Range (psig) | Inlet CGA | Outlet            |
|--------------|-------------------|--------------------------------|-----------|-------------------|
| IGR-30C-346  | Air               | 0–125                          | 346       | 9/16"–18 RH       |
| IGR-30C-350  | Hydrogen, Methane | 0–125                          | 350       | 9/16"–18 LH       |
| IGR-30C-540  | Oxygen            | 0–125                          | 540       | 9/16"–18 RH       |
| IGR-30C-580  | Inerts            | 0–125                          | 580       | 5/8"–18 RH Female |
| IGR-30D-580  | Inerts            | 0–400                          | 580       | 3/8"–18 NPT Male* |
| IGR-30E-580  | Inerts            | 0–600                          | 580       | 3/8"–18 NPT Male* |

\*3/8" male hex nipple installed 180° from inlet port.

## High-Flow Manifold Regulator

### Model 35

Our Model 35 regulator was specially designed to provide high gas flow rates using a manifold gas supply system.

#### Benefits and Features

- Conforms to CGA E-4
- All brass construction of both body and bonnet
- Neoprene diaphragm
- 2.5" dual-scale gauges (psi/kpa)
- One-piece 1/4" encapsulated seat design
- 1/2" NPT inlet and outlet body ports
- 1.00-11.5 NPS fittings; CGA 1340 (RH) or 1350 (LH)
- Tamper-proof, self-reseating internal high-pressure safety valve



| Model Number  | Gas Service | Maximum Inlet Pressure (psig) | Delivery Pressure Range (psig) | Inlet CGA | Outlet CGA  |
|---------------|-------------|-------------------------------|--------------------------------|-----------|-------------|
| IGR-35AA-1350 | Acetylene   | 300                           | 0–15                           | 1350 Male | 1350 Female |
| IGR-35PA-1350 | Propane     | 300                           | 0–15                           | 1350 Male | 1350 Female |
| IGR-35C-1340  | Inerts      | 3000                          | 0–125                          | 1340 Male | 1340 Female |
| IGR-35C-1350  | Flammables  | 3000                          | 0–125                          | 1350 Male | 1350 Female |
| IGR-35D-1340  | Inerts      | 3000                          | 0–200                          | 1340 Male | 1340 Female |
| IGR-35D-1350  | Flammables  | 3000                          | 0–200                          | 1350 Male | 1350 Female |

## Regulators

### Station Regulator

#### Model 70

The Model 70 provides pressure control from gas distribution systems and are commonly used with Model SD station drops because of compatible mating connections.

#### Benefits and Features

- Maximum inlet pressure is 200 psig
- Conforms to CGA E-4
- Chrome-plated bonnet with forged-brass body
- Back entry inlet port
- 2" dual-scale gauge (psi/kpa)
- Economically priced
- One-piece encapsulated seat design with 10 micron filter prevents contamination



Recommended for use with FLAMAL™ and all types of welding gases

| Model Number | Gas Service        | Delivery Pressure Range (psig) | Inlet              | Outlet            |
|--------------|--------------------|--------------------------------|--------------------|-------------------|
| IQR-70AA     | Acetylene          | 0–15                           | 7/8"–14 LH Female  | 9/16"–18 LH       |
| IQR-70AIB    | Air                | 0–50                           | 9/16"–18 RH Female | 9/16"–18 RH       |
| IQR-70OB     | Oxygen             | 0–50                           | 7/8"–14 RH Female  | 9/16"–18 RH       |
| IQR-70PB     | FLAMAL, Fuel Gases | 0–50                           | 7/8"–14 LH Female  | 9/16"–18 LH       |
| IQR-70IB     | Inerts             | 0–50                           | 5/8"–18 RH Male    | 5/8"–18 RH Female |
| IQR-70AIC    | Air                | 0–125                          | 9/16"–18 RH Female | 9/16"–18 RH       |
| IQR-70OC     | Oxygen             | 0–125                          | 7/8"–14 RH Female  | 9/16"–18 RH       |
| IQR-70IC     | Inerts             | 0–125                          | 5/8"–18 RH Male    | 5/8"–18 RH Female |

### Pipeline Regulator

#### Model 75

The Model 75 provides pressure control of high gas flows from gas distribution systems.

#### Benefits and Features

- Maximum inlet pressure is 400 psig
- Conforms to CGA E-4
- Chrome-plated bonnet with forged-brass body
- 1/4" NPT Female back entry inlet port
- 2" dual-scale gauge (psi/kpa)
- Economically priced
- One-piece encapsulated seat design with 10 micron filter prevents contamination



Recommended for use with FLAMAL™ and all types of welding gases

| Model Number | Gas Service        | Delivery Pressure Range (psig) | Inlet           | Outlet            |
|--------------|--------------------|--------------------------------|-----------------|-------------------|
| IQR-75AA     | Acetylene          | 0–15                           | 1/4" NPT Female | 9/16"–18 LH       |
| IQR-75OB     | Oxygen             | 0–50                           | 1/4" NPT Female | 9/16"–18 RH       |
| IQR-75PB     | FLAMAL, Fuel Gases | 0–50                           | 1/4" NPT Female | 9/16"–18 LH       |
| IQR-75IB     | Air/Inerts         | 0–50                           | 1/4" NPT Female | 5/8"–18 RH Female |
| IQR-75OC     | Oxygen             | 0–125                          | 1/4" NPT Female | 9/16"–18 RH       |
| IQR-75IC     | Air/Inerts         | 0–125                          | 1/4" NPT Female | 5/8"–18 RH Female |
| IQR-75I20P   | Air/Inerts         | 20*                            | 1/4" NPT Female | 5/8"–18 RH Female |

\*IQR-75I20P is preset at 20 psig and has no gauge. It is commonly used with our Model 10 flowmeters—see page 9.

## Liquid Cylinder Regulator

### Model 80

Our Model 80 regulator is designed for use on the gaseous withdrawal port of cryogenic liquid containers. Featuring a metal diaphragm design, this regulator is ideal for applications requiring both high-flow and diffusion-resistant pressure regulation. Typical applications include laser-assist gases, purging, pressure testing and blanketing.

#### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Conforms to CGA E-4
- Designed specifically to operate on liquid cylinders, but can also be used on high-pressure cylinders without damage
- 2.75" stainless steel diaphragm
- 2.5" dual-scale gauge (psi/kpa)
- Tamper-proof, self-reseating internal high-pressure safety valve
- One-piece encapsulated seat design with an internal filter and PTFE Teflon® seat



Recommended for use with LASAL™

| Model Number  | Gas Service                 | Delivery Pressure Range (psig) | Inlet CGA       | Outlet          |
|---------------|-----------------------------|--------------------------------|-----------------|-----------------|
| IGR-80C-(CGA) | Carbon Dioxide/Oxygen/Inert | 0–125                          | 320, 540 or 580 | 1/4" NPT Female |
| IGR-80D-(CGA) | Carbon Dioxide/Oxygen/Inert | 0–350                          | 320, 540 or 580 | 1/4" NPT Female |
| IGR-80E-(CGA) | Carbon Dioxide/Oxygen/Inert | 0–500                          | 320, 540 or 580 | 1/4" NPT Female |

Note: Order by complete model number. Where (CGA) is indicated above, insert appropriate CGA connection number to complete the model number (i.e. IGR-80E-580).

## Servo-Dome-Loaded Regulator

### Model 85

The Model 85 is a high-pressure, high-flow regulator system featuring servo-dome-load technology. This feature allows the regulator to supply high flow rates with straight-line pressure regulation. Typical applications include laser-assist gases, pressure transfer, blanketing and high-flow manifolds.

#### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Conforms to CGA E-4
- Ergonomic knob for improved grip
- 2.5" dual-scale gauges (psi/bar)
- 1/2" NPT inlet and outlet body ports
- Tamper-proof, self-reseating internal high-pressure safety valve
- One-piece encapsulated seat design with 10 micron filtration



Recommended for use with LASAL™

| Model Number | Gas Service | Delivery Pressure Range (psig) | Inlet           | Outlet          |
|--------------|-------------|--------------------------------|-----------------|-----------------|
| IGR-85E      | Inerts      | 0–500                          | 1/2" NPT Female | 1/2" NPT Female |

## Regulators

# Ultra-High Pressure Regulator

## Model 40

Our Model 40 is designed to operate on high-pressure cylinders up to 7500 psig. Inert and air models are self-relieving. Typical applications include high-pressure testing, charging accumulators, and pressurizing aircraft struts.

### Benefits and Features

- Conforms to CGA E-4
- Several delivery pressures available
- Ergonomic knob for improved grip
- 2.5" dual-scale gauges (psi/bar)
- 1/4" NPT outlet port with stainless steel 1/4" tube fitting
- One-piece encapsulated seat design with an internal filter and PTFE Teflon® seat



| Model Number  | Gas Service       | Maximum Inlet Pressure (psig) | Delivery Pressure Range (psig) | Inlet CGA | Outlet              |
|---------------|-------------------|-------------------------------|--------------------------------|-----------|---------------------|
| IGR-40RHA-677 | Inerts            | 7500                          | 0–1500                         | 677*      | 1/4" SS Compression |
| IGR-40RHB-677 | Inerts            | 7500                          | 0–3000                         | 677*      | 1/4" SS Compression |
| IGR-40RHC-677 | Inerts            | 7500                          | 0–4500                         | 677*      | 1/4" SS Compression |
| IGR-40RHD-677 | Inerts            | 7500                          | 0–6000                         | 677*      | 1/4" SS Compression |
| IGR-40NMA-695 | Hydrogen, Methane | 5500                          | 0–1500                         | 695       | 1/4" SS Compression |
| IGR-40NMB-695 | Hydrogen, Methane | 5500                          | 0–3000                         | 695       | 1/4" SS Compression |
| IGR-40NMC-695 | Hydrogen, Methane | 5500                          | 0–4500                         | 695       | 1/4" SS Compression |

\*Models with CGA 677 inlet connections are self-venting.

# High-Purity Pipeline Regulators

## Models 90 and 95

These in-line manifold regulators provide high gas flows for pipelines and other applications up to 3000 psig inlet pressure. The metal diaphragms are specifically designed for high-purity bulk applications requiring both high reliability and diffusion-resistance.

Model 90 has both inlet and outlet gauges, while Model 95 incorporates an outlet gauge only. The high delivery pressure ranges of 250 psig and 500 psig are ideal for special laser cutting applications

### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Brass barstock body and bonnets
- 2.75" stainless steel diaphragm
- 2.5" dual-scale gauges (psi/bar)
- One-piece encapsulated seat design with an internal filter and PTFE Teflon® seat
- Self-seating safety relief valve



Model 90

Recommended for use with ALIGAL™ and LASAL™

Model 95

| Model Number |          | Gas Service           | Delivery Pressure Range (psig) | Inlet           | Outlet          |
|--------------|----------|-----------------------|--------------------------------|-----------------|-----------------|
| Model 90     | Model 95 |                       |                                |                 |                 |
| IGR-90B      | IGR-95B  | Oxygen, Inerts, Fuels | 0–50                           | 1/2" NPT Female | 1/2" NPT Female |
| IGR-90C      | IGR-95C  | Oxygen, Inerts, Fuels | 0–125                          | 1/2" NPT Female | 1/2" NPT Female |
| IGR-90D      | IGR-95D  | Oxygen, Inerts, Fuels | 0–250                          | 1/2" NPT Female | 1/2" NPT Female |
| IGR-90E      | IGR-95E  | Oxygen, Inerts, Fuels | 0–500                          | 1/2" NPT Female | 1/2" NPT Female |

## Two-Stage Carbon Dioxide Ambient Vaporizing Regulator

### Model 32

Carbon dioxide frequently causes ordinary regulators to freeze. Our Model 32 is designed to handle gas phase withdrawal of carbon dioxide from non-siphoned tube cylinders at flow rates up to 100 SCFH at 70°F (21°C) without freeze-up or the need for electrical connections.

#### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Regulator is preset dynamically at 50 psig
- Conforms to CGA E-4
- Multi-finned aluminum black body design provides high-rate of heat transfer into the regulator
- Two-stage design spreads out the cooling effect of CO<sub>2</sub> pressure-reduction
- 2.5" dual-scale gauge (psi/kpa)
- Sensitive needle valve permits highly accurate flow settings
- Durable, easy-to-read flow tube and protective cover
- One-piece encapsulated seat design with an internal filter and PTFE Teflon® seats



| Model Number  | Gas Service    | Delivery Flow Range (SCFH) | Inlet CGA | Outlet            |
|---------------|----------------|----------------------------|-----------|-------------------|
| IGR-32100-320 | Carbon Dioxide | 0–100 (50 psig)            | 320       | 5/8"–18 RH Female |

## Gas Flowmeter

### Model 10

Our Model 10 flowmeter delivers accurate measurement of gas flow for gas shielded arc welding and general laboratory applications.

#### Benefits and Features

- Maximum inlet pressure is 75 psig
- Flows to 140 SCFH
- Sensitive needle valve for fingertip flow control
- Durable, easy-to-read flow tube and protective cover
- Tamper-proof, self-reseating high-pressure safety valve



Use with Model IGR-75I20P  
Pipeline Regulator



Model 10

| Model Number | Gas Service (Dual-Calibration) | Calibration Pressure (psig) | Delivery Flow Range (SCFH) | Inlet           | Outlet            |
|--------------|--------------------------------|-----------------------------|----------------------------|-----------------|-------------------|
| IGF-10ARC70  | Argon/Carbon Dioxide           | 20                          | 0–70*                      | 5/8"–18 RH Male | 5/8"–18 RH Female |
| IGF-10ARC70M | Argon/Carbon Dioxide           | 20                          | 0–70*                      | 1/4" NPT Male   | 5/8"–18 RH Female |
| IGF-10ARC100 | Argon/Carbon Dioxide           | 50                          | 0–100*                     | 5/8"–18 RH Male | 5/8"–18 RH Female |
| IGF-10NA100  | Nitrogen/Air                   | 20                          | 0–100/0–140                | 5/8"–18 RH Male | 5/8"–18 RH Female |
| IGF-10HH2100 | Helium/Hydrogen                | 20                          | 0–100/0–140                | 5/8"–18 RH Male | 5/8"–18 RH Female |
| IGF-10ARH45  | Argon/Helium                   | 20                          | 0–45                       | 5/8"–18 RH Male | 5/8"–18 RH Female |

\* On maximum continuous duty cycle, CO<sub>2</sub> flow to 20 SCFH.

#### Optional Equipment

- **Model IGA-IH10:** Single line hose for use with inert gases. 10 ft. of 3/16" hose with 5/8"–18 RH Male swivel end connections.
- **Model IGR-75I20P:** Model 75 preset (20 psi) regulator for pipeline applications. 400 psig maximum inlet, 20 psig preset, 1/4" NPT Female inlet and 5/8"–18 RH Female outlet.

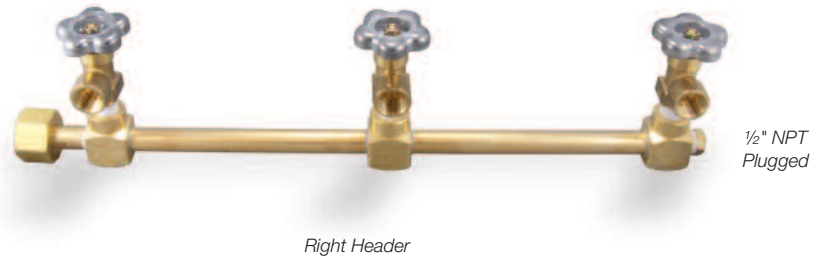
## Manifolds

# Manifold Headers

## Model H

### Benefits and Features

- Header valves with CGA 580 connections included
- Comes in 2, 3 or 4 cylinder configurations
- Brass headers are 1/2" NPT silver-brazed pipe
- Removable plug for expansion
- Wall brackets included
- Order pigtailed separately (see tables below)
- CGA 1340 or 1350 female outlet connection included
- 10" center-to-center station spacing



| Model H Manifolds   |                        |                            |                        |                            |
|---------------------|------------------------|----------------------------|------------------------|----------------------------|
| Number of Cylinders | Right Header           |                            | Left Header            |                            |
|                     | CGA 1340 (Inert Gases) | CGA 1350 (Flammable Gases) | CGA 1340 (Inert Gases) | CGA 1350 (Flammable Gases) |
| 2                   | IGH-2R-1340            | IGH-2R-1350                | IGH-2L-1340            | IGH-2L-1350                |
| 3                   | IGH-3R-1340            | IGH-3R-1350                | IGH-3L-1340            | IGH-3L-1350                |
| 4                   | IGH-4R-1340            | IGH-4R-1350                | IGH-4L-1340            | IGH-4L-1350                |

| 24" Flexible Pigtailed* |                         |                 |                        |
|-------------------------|-------------------------|-----------------|------------------------|
| Model Number            | Cylinder CGA Connection | Inner Core      | Pressure Rating (psig) |
| IGH-P24-300AF           | 300A                    | PTFE            | 500                    |
| IGH-P24-320             | 320                     | PTFE            | 3000                   |
| IGH-P24-326             | 326                     | PTFE            | 3000                   |
| IGH-P24-346             | 346                     | PTFE            | 3000                   |
| IGH-P24-350             | 350                     | PTFE            | 3000                   |
| IGH-P24-350H            | 350H                    | Stainless Steel | 3000                   |
| IGH-P24-510             | 510                     | PTFE            | 500                    |
| IGH-P24-510AF           | 510A                    | PTFE            | 500                    |
| IGH-P24-540             | 540                     | Stainless Steel | 3000                   |
| IGH-P24-580             | 580                     | PTFE            | 3000                   |
| IGH-P24-580H            | 580H                    | Stainless Steel | 3000                   |

| 36" Flexible Pigtailed* |                         |                 |                        |
|-------------------------|-------------------------|-----------------|------------------------|
| Model Number            | Cylinder CGA Connection | Inner Core      | Pressure Rating (psig) |
| IGH-P36-300AF           | 300A                    | PTFE            | 500                    |
| IGH-P36-320             | 320                     | PTFE            | 3000                   |
| IGH-P36-326             | 326                     | PTFE            | 3000                   |
| IGH-P36-346             | 346                     | PTFE            | 3000                   |
| IGH-P36-350             | 350                     | PTFE            | 3000                   |
| IGH-P36-350H            | 350H                    | Stainless Steel | 3000                   |
| IGH-P36-510             | 510                     | PTFE            | 500                    |
| IGH-P36-510AF           | 510A                    | PTFE            | 500                    |
| IGH-P36-540             | 540                     | Stainless Steel | 3000                   |
| IGH-P36-580             | 580                     | PTFE            | 3000                   |
| IGH-P36-580H            | 580H                    | Stainless Steel | 3000                   |

\* Pigtailed include check valve at cylinder connection. Acetylene pigtailed (CGA 300A, 510A) include dry-type flash arrester on cylinder end. All pigtailed for hydrogen, helium and oxygen service are constructed with stainless steel innercore and a double overbraided.

Please note: manifold accessories are available — see page 18.

# Single Regulator Manifolds

## Models SR, SL and D

Single regulator manifolds provide an economical means to regulate and control multiple cylinders with a single high-flow regulator (not included). The simplex model has a master shutoff valve designed to attach to single row manifolds. Two configurations, right and left, allow for a regulator to be connected on either right or left header style manifolds. The duplex model manifold has two master shutoff valves for use with two cylinder banks or header manifolds that can be manually switched from the in-service to reserve side. This is an economical system for installations not requiring automatic changeover operation while allowing empty cylinders to be replaced without interruption of gas supply to the process.



Complete Duplex System with Manifold



Left Simplex Model IGS-L



Right Simplex Model IGS-R



Duplex Model IGD

### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Acetylene systems (CGA 510A) include dry-type flash arresters on pigtail end
- All systems include stainless steel flexible pigtails with a PTFE Teflon®-lined inner core, except those for hydrogen, helium and oxygen systems which have a stainless steel inner core
- All pigtails are 24" and include check valves at the cylinder connection
- Regulator sold separately, see page 5 for more information on the Model 35

Use the tables below to complete the model numbers and order the appropriate manifold.

### Simplex Models

| IGS-(L or R)-(X)-XXX(X) |             |                      |                 |                      |
|-------------------------|-------------|----------------------|-----------------|----------------------|
| Model Number            | Description | No. of Cylinders (X) | CGA Code XXX(X) | Gas Service          |
| IGS-L                   | Left        | 1                    | 510A            | Acetylene            |
| IGS-R                   | Right       | 2                    | 346             | Air                  |
|                         |             | 3                    | 590             | Air (Industrial)     |
|                         |             | 4                    | 580             | Argon, Nitrogen      |
|                         |             |                      | 320             | Carbon Dioxide       |
|                         |             |                      | 580H            | Helium               |
|                         |             |                      | 350H            | Hydrogen             |
|                         |             |                      | 510             | LPG Fuel Gas         |
|                         |             |                      | 350             | Methane, Natural Gas |
|                         |             |                      | 540             | Oxygen               |

### Duplex Model

| IGD-(X)L-(X)R-XXX(X) |                  |                   |                 |                      |
|----------------------|------------------|-------------------|-----------------|----------------------|
| Model Number         | No. of Cylinders |                   | CGA Code XXX(X) | Gas Service          |
|                      | Left Header (X)L | Right Header (X)R |                 |                      |
| IGD                  | 0                | 0                 | 510A            | Acetylene            |
|                      | 1                | 1                 | 346             | Air                  |
|                      | 2                | 2                 | 590             | Air (Industrial)     |
|                      | 3                | 3                 | 580             | Argon, Nitrogen      |
|                      | 4                | 4                 | 320             | Carbon Dioxide       |
|                      |                  |                   | 580H            | Helium               |
|                      |                  |                   | 350H            | Hydrogen             |
|                      |                  |                   | 510             | LPG Fuel Gas         |
|                      |                  |                   | 350             | Methane, Natural Gas |
|                      |                  |                   | 540             | Oxygen               |

Please note: manifold accessories are available — see page 18.

## Manifolds

# Pressure Differential Switchover Manifold

## Model S

The Model S Manifold uses two high-flow regulators (one connected to each bank) which act as a changeover device. Delivery pressure of regulator No. 1 is set 10–15 psi higher than regulator No. 2. This causes regulator No. 1 to flow gas while holding regulator No. 2 closed. When the gas in bank No. 1 is exhausted, regulator No. 2 will begin to flow gas. Inlet pressure gauges on the regulators indicate pressure in each manifold bank. When gas in the first cylinder bank has been exhausted and a changeover has occurred, the empty cylinders are replaced and the regulator delivery pressure settings are readjusted. This will cause a reverse changeover when bank No. 2 is exhausted. Because delivery pressure drops slightly when a changeover occurs, the outlet regulator (Model 35 ordered separately based upon delivery pressure requirements) will eliminate delivery pressure variations.



### Benefits and Features

- Maximum inlet pressure is 3000 psig
- Acetylene systems (CGA 510A) include dry-type flash arresters on pigtail end
- Master shutoff valves included
- Headers include 24" flexible pigtails, check valves and station valves. Hydrogen, helium and oxygen systems include stainless steel flexible pigtails. All other systems include stainless steel flexible pigtails with a PTFE-lined inner core.
- 1/2" brass construction with silver-brazed connections with two Model 30 high-flow regulators (see page 5)
- Outlet regulator sold separately, see page 5 for more information on the Model 35

Use the table below to complete the model numbers and order the appropriate manifold.

| IGS-(X)L-(X)R-XXX(X) |                  |                   |                 |                      |
|----------------------|------------------|-------------------|-----------------|----------------------|
| Model Number         | No. of Cylinders |                   | CGA Code XXX(X) | Gas Service          |
|                      | Left Header (X)L | Right Header (X)R |                 |                      |
| IGS                  | 1                | 1                 | 510A            | Acetylene            |
|                      | 2                | 2                 | 346             | Air                  |
|                      | 3                | 3                 | 590             | Air (Industrial)     |
|                      | 4                | 4                 | 580             | Argon, Nitrogen      |
|                      |                  |                   | 320             | Carbon Dioxide       |
|                      |                  |                   | 580H            | Helium               |
|                      |                  |                   | 350H            | Hydrogen             |
|                      |                  |                   | 510             | LPG Fuel Gas         |
|                      |                  |                   | 350             | Methane, Natural Gas |
|                      |                  |                   | 540             | Oxygen               |

Please note: manifold accessories are available — see page 18.

## Station Drops

### Model SD

Drop stations are a means of safely conveying gas from a centralized pipeline to the point-of-use. In addition, the devices are properly labeled to avoid the misapplication of gases. Drop stations come with a master shutoff valve, CGA specific pipeline fittings for regulators and flowmeters, cap and chain to protect the outlet fitting, and a drip leg and plug for the removal of moisture that can accumulate in gas piping systems.

#### Benefits and Features

- Maximum inlet pressure is 200 psig
- Controls on and off flow of gas at individual workstations
- Each drop station is labeled for gas service for added safety
- 1/4-turn in-line shutoff valve (1/2" NPT female)
- Gas-specific CGA pipeline connection
- Cap and chain plug included
- Drip leg for moisture removal
- Available in single or double outlet configurations



| Model Number               |                            | Gas Service      | Outlet Connection |
|----------------------------|----------------------------|------------------|-------------------|
| Single Outlet (25" Length) | Double Outlet (35" Length) |                  |                   |
| IGSD-1C2H2                 | IGSD-2C2H2                 | Acetylene        | 7/8"–14 LH Male   |
| IGSD-1AIR                  | IGSD-2AIR                  | Air (Compressed) | 9/16"–18 RH       |
| IGSD-1AR                   | IGSD-2AR                   | Argon            | 5/8"–18 RH Female |
| IGSD-1CD                   | IGSD-2CD                   | Carbon Dioxide   | 5/8"–18 RH Female |
| IGSD-1HE                   | IGSD-2HE                   | Helium           | 5/8"–18 RH Female |
| IGSD-1H2                   | IGSD-2H2                   | Hydrogen         | 7/8"–14 LH Male   |
| IGSD-1LPG                  | IGSD-2LPG                  | LPG Gases        | 7/8"–14 LH Male   |
| IGSD-1N2                   | IGSD-2N2                   | Nitrogen         | 5/8"–18 RH Female |
| IGSD-1O2                   | IGSD-2O2                   | Oxygen           | 7/8"–14 RH Male   |

## Cryogenic

# Whisper Valve® Cryogenic Relief Valve Silencer

## Model CWV

Most cryogenic relief valves issue a loud "bang" (over 100 dB) when activated that can startle and even frighten employees, causing disruptions in normal work flow.

Our Model CWV Whisper Valve installs easily on the existing vent valve of any cryogenic container to quietly relieve pressure at a pressure level that is set slightly below that of the standard installed valve. Activation blow-off sound is less than 50 dB (average library noise level is 40 dB).

The Whisper Valve also reduces gas loss to an average of less than 48 cubic feet over 24 hours. It is available in four standard psig settings: 22, 230, 350 and 500. Other settings are available on request.



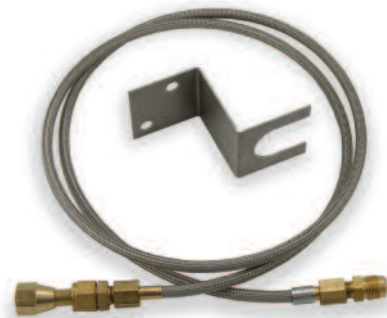
## Benefits and Features

- Reduces cryogenic relief valve blow-off noise to 40–50 dB
- Easily installs on any cryogenic argon, oxygen or nitrogen container
- Available in four ranges to prevent most loud blow-offs
- Reduces gas loss to average of less than 48 cubic feet per 24 hours
- Convenient wall mount kit available to prevent damage during container changeout

| Model Number | Gas Service     | Cryogenic Container Relief Settings (psig) | Inlet CGA  |
|--------------|-----------------|--|------------|
| IG-CWV-22    | Argon, Nitrogen | 22   | 295 Female |
| IG-CWV-230   | Argon, Nitrogen | 230 or 235                                 | 295 Female |
| IG-CWV-350   | Argon, Nitrogen | 350  | 295 Female |
| IG-CWV-500   | Argon, Nitrogen | 500  | 295 Female |
| IG-CWVO2-22  | Oxygen          | 22   | 440 Female |
| IG-CWVO2-230 | Oxygen          | 230 or 235                                 | 440 Female |
| IG-CWVO2-350 | Oxygen          | 350  | 440 Female |
| IG-CWVO2-500 | Oxygen          | 500  | 440 Female |

## Optional Equipment

- **Model IG-CWV-KIT:** Wall mount kit for use with argon or nitrogen service Whisper Valves (IG-CWV). Includes wall mount bracket, panel mount nut and six-foot hose with CGA 295 connections.
- **Model IG-CWVO2-KIT:** Wall mount kit for use with oxygen service Whisper Valves (IG-CWVO2). Includes wall mount bracket, panel mount nut and six-foot hose with CGA 440 connections.



## Cryogenic Hoses

### Cryogenic Liquid Transfer Hoses for Argon, Nitrogen and Oxygen

#### Benefits and Features

- Maximum operating pressure is 500 psig
- Constructed with 316 Stainless Steel for all wetted parts
- Cleaned for oxygen service
- Machined CGA stainless steel end connections
- Exceptional flexibility, hose resists kinking



| Model Number  | Gas Service     | Length | Inlet CGA | Outlet CGA |
|---------------|-----------------|--------|-----------|------------|
| IG-CHS48-295  | Argon, Nitrogen | 48"    | 295       | 295        |
| IG-CHS60-295  | Argon, Nitrogen | 60"    | 295       | 295        |
| IG-CHS72-295  | Argon, Nitrogen | 72"    | 295       | 295        |
| IG-CHS120-295 | Argon, Nitrogen | 120"   | 295       | 295        |
| IG-CHS144-295 | Argon, Nitrogen | 144"   | 295       | 295        |
| IG-CHS48-440  | Oxygen          | 48"    | 440       | 440        |
| IG-CHS60-440  | Oxygen          | 60"    | 440       | 440        |
| IG-CHS72-440  | Oxygen          | 72"    | 440       | 440        |
| IG-CHS120-440 | Oxygen          | 120"   | 440       | 440        |
| IG-CHS144-440 | Oxygen          | 144"   | 440       | 440        |

## Hose Accessories

### Phase Separator and Fill Elbows

#### Benefits and Features

- Maximum operating pressure is 500 psig
- Phase separator eliminates splashing and increases efficiency when filling dewars
- 90° fill elbow connects to container to prevent over-bending and abrasion



Phase Separator

Fill Elbow

| Model Number | Gas Service             | Description                    | Inlet           | Outlet   |
|--------------|-------------------------|--------------------------------|-----------------|----------|
| IG-CPS-38*   | Argon, Nitrogen, Oxygen | Phase Separator                | 3/8" NPT Female | N/A      |
| IG-CFE-295   | Argon, Nitrogen         | 90° Stainless Steel Fill Elbow | 295 Female      | 295 Male |
| IG-CFE-440   | Oxygen                  | 90° Stainless Steel Fill Elbow | 440 Female      | 440 Male |

\*To attach a phase separator (IG-CPS-38) to a transfer hose, use IG-CF295M6M for CGA 295 or IG-CF440M6M for CGA 440—see page 17.

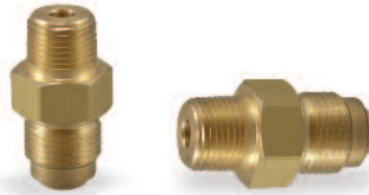
## Cryogenic

### Hose Accessories

#### Brass SAE Flare Adapters

##### Benefits and Features

- Maximum operating pressure is 500 psig



| Model Number | Cryogenic Service | Description              | SAE Flare |
|--------------|-------------------|--------------------------|-----------|
| IG-CF295M4M  | Argon, Nitrogen   | CGA 295 to 1/4" NPT Male | 1/2"      |
| IG-CF295M6M  | Argon, Nitrogen   | CGA 295 to 3/8" NPT Male | 1/2"      |
| IG-CF295M8M  | Argon, Nitrogen   | CGA 295 to 1/2" NPT Male | 1/2"      |
| IG-CF440M4M  | Oxygen            | CGA 440 to 1/4" NPT Male | 5/8"      |
| IG-CF440M6M  | Oxygen            | CGA 440 to 3/8" NPT Male | 5/8"      |
| IG-CF440M8M  | Oxygen            | CGA 440 to 1/2" NPT Male | 5/8"      |
| IG-CF440M12M | Oxygen            | CGA 440 to 3/4" NPT Male | 5/8"      |

## Cryogenic Cylinder Carts

### Cylinder Delivery Cart

#### Model IG-CC4W

Designed to deliver a single liquid cylinder (160–230L), this cart features an adjustable hook that can be used with a variety of cylinders with simple adjustment. Its pneumatic wheels roll easily over any surface while swivel casters on the trailing wheel make maneuverability easy. Small, front-mounted steel wheels make loading large liquid cylinders quick and easy.

##### Specifications

**Height:** 63" vertical

**Width:** 20"

**Weight:** 119 lbs.



### EZ Load Cart

#### Model IG-CC3W

Intended for hospitals, labs or fill plants, the EZ Load Cart is the ultimate cart for any location where handling and maneuverability are paramount. Its phenolic wheels and swivel caster move easily and soundlessly over flat surfaces. Loading large liquid cylinders (160–230L) is simple because of the low front-loading platform. The cart can be used with platform scales to prevent the slamming of cylinders on scales.

##### Specifications

**Height:** 48"

**Width:** 29"

**Weight:** 79 lbs.



### Flat Platform Cart

#### Model IG-CCP4W

Built on the same concept as the EZ Load, the Model IG-CCP4W has a flat platform designed to move large liquid cylinders (160–230L) with ease. It utilizes four ultra-quiet swivel casters to maximize maneuverability while minimizing noise, making it perfect for labs and hospitals.

##### Specifications

**Baseplate:** 22" x 22"

**Height:** 6"

**Width:** 33"

**Weight:** 65 lbs.



## Cylinder Brackets

### Wall Bracket

#### Model IG-AWBA1

Nylon strap with buckle allows for fast adjustment. Recessed mounting holes are located in each end of the bracket for mounting to a wall or any vertical surface.



- Cast aluminum
- Supports cylinders up to 14" OD
- 1" wide x 54" long nylon strap has a nickel-plated steel, non-slip spring catch

### Wall Bracket with Safety Chain

#### Model IG-AWBA1C

Similar to our Model IG-AWBA1 but also includes a sturdy safety chain for added security in case of fire.



### 2-Cylinder and 3-Cylinder Wall Brackets

#### Models IG-AWBS2 and IG-AWBS3

Fitted with steel reinforced polyethylene edge guards, these brackets will safely support cylinders up to 12" OD. Each includes straps with nickel-plated steel, non-slip spring catches and buckles for fast adjustment.

- Heavy 11 gauge HR steel
- Finished in chemical-resistant epoxy
- Support cylinders up to 12" OD
- 1.5" wide by 40" long polypropylene straps



## Manifold Brackets

### Adjustable Wall Bracket

#### Model IG-AHWBA

This L-shaped steel wall bracket includes strap and nuts. It is painted black with  $\frac{3}{8}$ " holes pre-drilled.

- 1.75" wide x 5" high x 3.5" deep
- 1" ID zinc-plated steel u-bolt with 1.25" center-to-center width



## Cylinder Leads (Pigtails)



### Rigid Pigtails

#### Model IG-APB364F4F

- Maximum working pressure is 3000 psig
- 36" pigtail with 5" diameter service loop providing a 20" usable length
- Assembled with  $\frac{5}{16}$ " OD x 0.065" wall annealed brass tubing
- Silver brazed  $\frac{1}{4}$ " NPT Female end fittings

### Stainless Steel Flexible Hose Pigtails

#### Models IG-AHS244F4F and IG-AHS364F4F

- Maximum working pressure is 3850 psig at 70°F
- Available in 24" and 36" lengths
- Stainless steel inner core features a double overbraid with stainless steel end fittings
- Fittings are heliarc welded to both corrugated liner and overbraid
- 0.28" nominal ID, 0.63" nominal OD with  $\frac{1}{4}$ " NPT Female end fittings



### Teflon®-Lined Flexible Hose Pigtails

#### Models IG-AHT244F4F and IG-AHT364F4F

These pigtails are used to transfer compressed and liquefied gases.\*

- Maximum working pressure is 3000 psig at 70°F
- Available in 24" and 36" lengths
- Teflon-lined inner core
- Single stainless steel overbraid with brass end fittings
- Fittings are swaged to the liner and overbraid
- 0.25" nominal ID, 0.38" nominal OD with  $\frac{1}{4}$ " NPT Female end fittings

\* Not recommended for oxygen service—refer to CGA E-9 Standard for additional information. Not recommended for use with hydrogen or helium. Although these gases are compatible with the materials of construction, experience shows that permeation through the PTFE core can occur.



## Flash Arresters

### Acetylene

#### Model IG-AFAA4F4M

Designed for use with acetylene to prevent flashback into a cylinder, these flash arresters extinguish a flash or flame by dividing it into hundreds of tiny parts that instantly cool and die out before reaching the cylinder. Can be used in any cylinder lead not exceeding 3/8" diameter with flow in either direction. UL listed for acetylene use only.

- Rated capacity is 40 SCFH with a 5 psi drop
- 1/4" NPT Female x 1/4" NPT Male connections (flow can be in either direction)

*Safety note: The flash arrester must be replaced after a flash or when the pressure drop through the arrester reaches 10 psi or greater. It cannot be cleaned or refilled.*



### Fuel Gas and Oxygen Gas

#### Models IG-AFA916LFM and IG-AFA916RFM

Designed to provide protection against flashback of fuel gas or oxygen, these flash arresters are compact in design and are constructed of brass. They are commonly installed on the outlet of regulators and are listed by Underwriter Laboratories to U/L 23Y5. The following safety elements are provided when used in a delivery system:

- 100 micron filtration
- Reverse flow check valve
- Flame barrier
- Thermal cut-off valve

They help meet ANSI Z49.1.2005, OSHA and NFPA safety requirements.

- Rated air flow capacity at 50 psig inlet is 260 SCFH, with a 5 psi pressure drop

#### Connections

**Model IG-AFA916LFM:** 9/16"-18 LH female inlet x male outlet (fuel gas)

**Model IG-AFA916RFM:** 9/16"-18 RH female inlet x male outlet (oxygen)



## Valves

### Header Station Valve

#### Model IG-VHSV

- Forged brass body
- Packed stem valve
- 1/2" NPT Male inlet
- CGA 580 outlet



### Master Shut-Off Valve

#### Model IG-VMSSO

- Forged brass body
- Packed stem valve
- 1/2" NPT Female inlet
- 1/2" NPT Female outlet
- Tee handle for easy operation



### Regulator Needle Valve

#### Model IG-VNB44

- Forged brass body
- Packed stem valve
- Steel ball seat
- 1/4" NPT Male inlet
- 1/4" NPT Male outlet



## Manifold Connection Fittings

### Models IG-F1340 and IG-F1350

- Maximum inlet pressure is 3000 psig
- 1/2" NPT Male outlet connection



Union Nut and Nipple

Union Bushing

| Model Number | Gas Service | Description   | CGA          |
|--------------|-------------|---|--------------|
| IG-F1340CGA  | Inerts      | 1.00-11.5 NPS union nut, RH with 1/2" NPT union nipple, 3" long | 1340 Female* |
| IG-F1350CGA  | Flammables  | 1.00-11.5 NPS union nut, LH with 1/2" NPT union nipple, 3" long | 1350 Female* |
| IG-F1340M8M  | Inerts      | 1.00-11.5 NPS X 1/2" NPT union bushing, RH                      | 1340 Male    |
| IG-F1350M8M  | Flammables  | 1.00-11.5 NPS X 1/2" NPT union bushing, LH                      | 1350 Male    |

\* Connections consist of CGA nut and nipple—refer to CGA Publication V-10.

## Cylinder Carts

### Single Cylinder Cart with Semi-Pneumatic Wheels

#### Model IG-ASC4WC

Designed to safely hold and easily transport a cylinder up to 12" OD, this cart features two 3" rear swivel casters which fall into place automatically after removing a locking pin. The operator carries no load. A heavy-duty polypropylene cylinder strap with steel cinch buckle secures cylinder in place and 8" semi-pneumatic wheels provide for safe transport.

- Heavy 10-gauge HR steel supports
- 14-gauge round steel tube welded construction
- Powder-paint finished
- **Size (approx.):** 19" x 19" x 47"
- **Weight (approx.):** 44 lbs.



### Single Cylinder Cart with Pneumatic Wheels

#### Model IG-ASC4WCPW

Designed to safely hold and easily transport a cylinder up to 12" OD. This cart is furnished with the same features included with the IG-ASC4WC except it has 10.5" fully pneumatic wheels to provide for excellent all-surface control.

- **Size (approx.):** 19" x 21" x 47"
- **Weight (approx.):** 46 lbs.



### Double Cylinder Cart with Pneumatic Wheels

#### Model IG-ADC4WCPW

The cart is furnished with the same features included with the IG-ASC4WCPW except it will hold and easily transport two 12" maximum OD cylinders.

- **Size (approx.):** 24" x 32" x 47"
- **Weight (approx.):** 66 lbs.



## Firewall Cylinder Carts

### Two Wheel Firewall Cylinder Cart

#### Model IG-ADC2WFWC

Designed to safely hold and easily transport two cylinders up to 12" (fuel) and 10" (oxygen) OD, this cart features 16" 4-ply speed-rated pneumatic wheels to provide for excellent all-surface control. Each cylinder is held in place with individual heavy-duty straps and welded twist loop chains.

- 1.5" polypropylene cylinder straps
- **Size (approx.):** 24" x 35" x 60"
- **Weight (approx.):** 131 lbs.



### Construction-Site Firewall Cylinder Cart

#### Model IG-ADC2WFWCC

Furnished with the same features provided with Model IG-ADC2WFWC plus cylinder locking rings with posts to hold cylinders (38" to 62" in height) securely in place, a hoist ring balanced lifting system and a tool box with padlock capable locking lid.

- **Size (approx.):** 24" x 35" x 64"
- **Assembled weight (approx.):** 165 lbs.



### Four Wheel Firewall Cylinder Cart

#### Model IG-ADC4WFWC

Furnished with the same features as Model IG-ADC2WFWC, this cart also has two retractable 5" rear casters that drop into place when needed for additional load handling support, or lock into the frame when not required.

- **Size (approx.):** 24" x 35" x 60"
- **Weight (approx.):** 155 lbs.



## Cylinder Specifications

## Cryogenic Liquids

Cryogenic liquids are classified as compressed gases and are liquefied gases that are maintained in a liquid state at extremely low temperatures. They include gases such as argon, helium, nitrogen and oxygen, and have boiling points colder than  $-238^{\circ}\text{F}$  ( $-150^{\circ}\text{C}$ ). Other gases, such as carbon dioxide and nitrous oxide are often included in this category despite having higher boiling points.

All cryogenic liquids are gases at normal temperature and pressure, and must be cooled before an increase in pressure can force them into a liquid state. All gases transform into cryogenics under varying temperature and pressure conditions. The vapors and gases released from cryogenic liquids remain very cold and often condense the moisture in ambient air to create a visible fog.

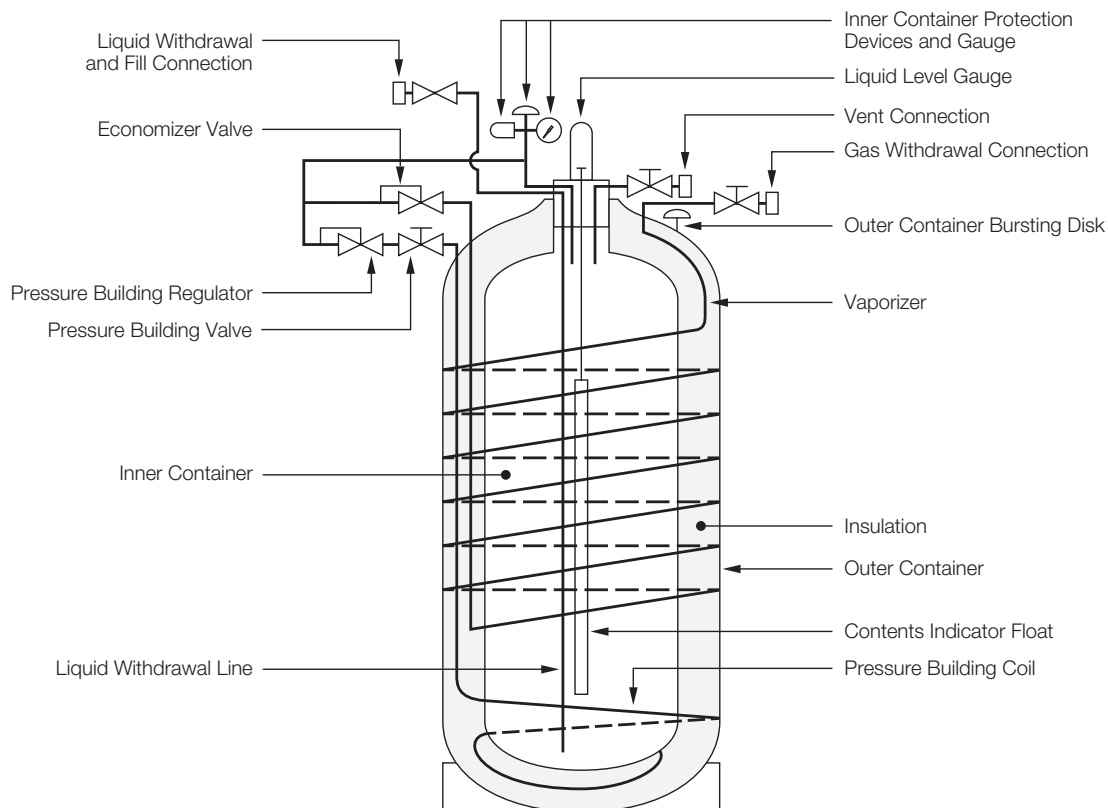
## Cryogenic Containers

Cryogenic liquid containers are vacuum vessels that are generally constructed of stainless steel. They contain double walls (see illustration below) with multiple layers of insulation between them. Cryogenic liquid containers are easily handled and shipped, and contain a large volume of gas at low pressure as compared to typical high-pressure (2000 psig) compressed gas cylinders. These vessels are sometimes incorrectly referred to as dewars. A true dewar, however, is a nonpressurized vessel used to contain cryogenics that is similar to a thermos.

Although cryogenic liquid containers are well insulated, the second law of thermodynamics dictates that due to the huge temperature difference between the cryogen and the ambient environment, heat will inevitably migrate into the cylinder contents. This will cause vaporization to occur. Vaporized product, if not drawn off, will collect in the head-space above the liquid and will build what is referred to as head-pressure. Head-pressure must be periodically vented via a pressure relief valve. Normal vaporization rates will vary and may be as low as 0.4% or as high as 3% of the container's volume per day.

Gases are packaged and supplied as cryogenics for several reasons. Firstly, they allow for more efficient packaging and distribution because they hold many more cubic feet of gas than a typical high-pressure cylinder. For example, a 160MP liquid nitrogen container features a capacity of approximately four times that of a 44-liter high-pressure cylinder (11.5-gallons). And since a small amount of cryogenic liquid expands into a very large volume of gas, the 160MP will provide 16 times the quantity of gaseous nitrogen. Secondly, purity of cryogenic liquids tends to be very good, making them a cost-effective solution for many specialty gas applications that do not require ultra-high-purity. In addition, since cryogenic liquid cylinders are changed out less frequently, process efficiency and stability is maximized.

## Typical Cryogenic Container for Dispensing Liquid or Gas



## Liquid Cylinder Performance Data

| Specification                                      | Unit  | Container Size & Pressure |                |                |                |                |                |                |                |                |                |
|--|---|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|  |   | 160 MP                    | 160 HP         | 180 MP         | 180 HP         | 200 MP         | 200 HP         | 230 MP         | 230 HP         | 265 MP         | 265 HP         |
| <b>Capacity</b>                                    |   |                           |                |                |                |                |                |                |                |                |                |
| Liquid (Gross)                                     | liters  | 176                       | 176            | 196            | 196            | 209            | 209            | 240            | 240            | 276            | 276            |
| Liquid (Net)                                       | liters  | 165                       | 165            | 185            | 185            | 196            | 196            | 230            | 230            | 265            | 265            |
| Gas (N <sub>2</sub> )*                             | ft <sup>3</sup> /<br>Nm <sup>3</sup>                  | 3685/<br>97               | 3464/<br>91    | 4099/<br>108   | 3864/<br>102   | 4375/<br>115   | 4072/<br>108   | 5024/<br>132   | 4734/<br>124   | 5769/<br>152   | 5438/<br>143   |
| Gas (O <sub>2</sub> )*                             | ft <sup>3</sup> /<br>Nm <sup>3</sup>                  | 4577/<br>120              | 4348/<br>114   | 5096/<br>134   | 4843/<br>127   | 5435/<br>143   | 5048/<br>133   | 6244/<br>164   | 5930/<br>156   | 7186/<br>189   | 6811/<br>179   |
| Gas (Ar)*  | ft <sup>3</sup> /<br>Nm <sup>3</sup>                  | 4448/<br>117              | 4226/<br>111   | 4961/<br>130   | 4709/<br>124   | 5290/<br>139   | 4932/<br>130   | 6073/<br>160   | 5763/<br>151   | 6982/<br>183   | 6634/<br>174   |
| Gas (CO <sub>2</sub> )*                            | ft <sup>3</sup> /<br>Nm <sup>3</sup>                  | —                         | 3382/<br>89    | —              | 3766/<br>99    | —              | 4011/<br>105   | —              | 4614/<br>121   | —              | 5305/<br>132   |
| Gas (N <sub>2</sub> O)*                            | ft <sup>3</sup> /<br>Nm <sup>3</sup>                  | —                         | 3207/<br>84    | —              | 3574/<br>94    | —              | 3810/<br>100   | —              | 4378/<br>115   | —              | 5034/<br>132   |
| <b>Performance</b>                                 |   |                           |                |                |                |                |                |                |                |                |                |
| NER (N <sub>2</sub> )                              | % per day   | 2                         | 2              | 1.9            | 1.9            | 1.85           | 1.85           | 1.8            | 1.8            | 2              | 2              |
| NER (O <sub>2</sub> -Ar)                           | % per day   | 1.4                       | 1.4            | 1.3            | 1.3            | 1.2            | 1.2            | 1.2            | 1.2            | 1.4            | 1.4            |
| NER (CO <sub>2</sub> -N <sub>2</sub> O)            | % per day   | —                         | 0.5            | —              | 0.5            | —              | 0.5            | —              | 0.5            | —              | 0.5            |
| Gas Flow<br>(N <sub>2</sub> , O <sub>2</sub> , Ar) | ft <sup>3</sup> per hour/<br>Nm <sup>3</sup> per hour | 350/<br>10                | 350/<br>10     | 350/<br>10     | 350/<br>10     | 400/<br>11     | 400/<br>11     | 400/<br>11     | 400/<br>11     | 400/<br>11     | 400/<br>11     |
| Gas Flow<br>(CO <sub>2</sub> , N <sub>2</sub> O)   | ft <sup>3</sup> per hour/<br>Nm <sup>3</sup> per hour | —                         | 110/<br>3      | —              | 110/<br>3      | —              | 110/<br>3      | —              | 110/<br>3      | —              | 110/<br>3      |
| <b>Dimensions &amp; Pressure Ratings</b>           |   |                           |                |                |                |                |                |                |                |                |                |
| Relief Valve<br>Setting                            | psig/<br>bar  | 230/<br>16                | 350/<br>24     | 230/<br>16     | 350/<br>24     | 230/<br>16     | 350/<br>24     | 230/<br>16     | 350/<br>24     | 230/<br>16     | 350/<br>24     |
| DOT/CTC Rating                                     |   | 4L200                     | 4L292          | 4L200          | 4L292          | 4L200          | 4L292          | 4L200          | 4L292          | 4L200          | 4L292          |
| Diameter   | in/<br>cm   | 20/<br>50.8               | 20/<br>50.8    | 20/<br>50.8    | 20/<br>50.8    | 20/<br>50.8    | 20/<br>50.8    | 26/<br>66.0    | 26/<br>66.0    | 26/<br>66.0    | 26/<br>66.0    |
| Height   | in/<br>cm   | 59.6/<br>151.3            | 59.6/<br>151.3 | 63.5/<br>161.3 | 63.5/<br>161.3 | 65.8/<br>167.1 | 65.8/<br>167.1 | 52.9/<br>131.9 | 52.9/<br>131.9 | 57.8/<br>146.8 | 57.8/<br>149.8 |
| Empty Weight                                       | lb/<br>kg   | 250/<br>113.4             | 280/<br>126.9  | 260/<br>117.9  | 300/<br>136.1  | 280/<br>126.9  | 320/<br>145.1  | 300/<br>136.1  | 340/<br>154.2  | 340/<br>154.2  | 360/<br>163.6  |
| Full Weight (N <sub>2</sub> )                      | lb/<br>kg   | 517/<br>234               | 531/<br>241    | 557/<br>253    | 580/<br>263    | 597/<br>271    | 618/<br>280    | 664/<br>301    | 683/<br>310    | 758/<br>344    | 754/<br>343    |
| Full Weight (O <sub>2</sub> )                      | lb/<br>kg   | 629/<br>285               | 640/<br>290    | 682/<br>309    | 701/<br>318    | 730/<br>331    | 747/<br>339    | 817/<br>370    | 831/<br>377    | 935/<br>424    | 924/<br>420    |
| Full Weight (Ar)                                   | lb/<br>kg   | 710/<br>322               | 717/<br>325    | 773/<br>351    | 787/<br>357    | 827/<br>375    | 839/<br>380    | 928/<br>421    | 936/<br>424    | 1062/<br>481   | 1046/<br>475   |
| Full Weight (CO <sub>2</sub> )                     | lb/<br>kg   | —                         | 667/<br>303    | —              | 731/<br>331    | —              | 779/<br>353    | —              | 868/<br>393    | —              | 967/<br>439    |
| Full Weight (N <sub>2</sub> O)                     | lb/<br>kg   | —                         | 647/<br>293    | —              | 709/<br>321    | —              | 756/<br>343    | —              | 841/<br>381    | —              | 936/<br>425    |

\*At relief valve settings.

Data provided by Chart® Industries



Founded in 1902, Air Liquide is a world leader in industrial and medical specialty gases and related services, providing innovative solutions for the manufacture of everyday products and for the protection of life.

NOTE: This catalog is intended for general information purposes only and is not intended as a representation or warranty of any kind, or as a statement of any terms or condition of sale. The information herein is believed to be correct, but is not warranted for correctness or completeness or for applicability to any particular customer or situation.

Teflon® is a registered trademark of E.I. du Pont de Nemours and Company.  
Whisper Valve® is a registered trademark of SGD Incorporated.

ALIGAL, ALPHAGAZ, ALTOP, ARCAL, BLUESHIELD, FLAMAL, LASAL, Molecules that Matter, SCANDINA, SCOTT and SMARTOP are registered trademarks of the the Air Liquide Group.  
©2011 Air Liquide America Specialty Gases LLC



Air Liquide America Specialty Gases LLC  
6141 Easton Road  
Box 310  
Plumsteadville, PA 18949

Phone: 800.217.2688  
Fax: 215.766.2476  
Email: [solutions.center@airliquide.com](mailto:solutions.center@airliquide.com)  
[www.ALspecialtygases.com](http://www.ALspecialtygases.com)

