


# MATHESON LaserPro™ Gas Delivery Equipment



**MATHESON**

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The **MATHESON LaserPro™** systems for assist and resonator gases are designed to meet and exceed the laser industry's demanding requirements for gas purity, pressure and flow. All of our equipment complements our line of assist and resonator gases.

### Assist Gas Process Equipment

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Assist gases, Nitrogen or Oxygen, are supplied to the nozzle to assist with cutting by removing the metal that has been heated by the laser beam. Argon and Helium are used as assist gases for welding applications. MATHESON LaserPro™ assist gas equipment provides the high flow capacity with constant delivery pressures up to 1000 psig. Dome loaded regulators for assist gases are able to provide these flows and pressures with the economical pricing of a single stage regulator and the consistency of a more expensive two stage regulator. These are available for both cryogenic and high pressure sources.

Typically, Oxygen assist gas systems require lower pressures (250 psig and lower) and lower flows (< 1000 scfh), while Nitrogen, Argon and Helium systems require higher pressures (200 psig and greater, typically 450-500 psig) and higher flow rates (up to 6000 scfh and greater).

In addition to regulators, we offer wall mounting and installation kits, including hoses, fittings, and filters.

### Resonator Gas Delivery Systems

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Resonator gases are used to generate the laser beam, and the gas delivery system should be designed to provide a continuous supply with constant pressure while maintaining the purity of the gas from the cylinder to the laser. MATHESON LaserPro™ equipment is designed using high purity materials and processes to ensure purity throughout the system.

LaserPro™ regulators are manufactured using barstock bodies with stainless steel diaphragms. Diaphragm valves for isolation and venting incorporate the same materials.

LaserPro™ switchovers incorporate the same high quality materials and processes as our regulators, and provide an uninterrupted supply of gas to the laser. Many options are available for these switchovers, with high and low pressure isolation, venting, and alarms, just to mention a few.

Many types of systems are available, from simple regulators to complete wall or rack mount switchovers for pure gases or mixtures. Source panels or point of use panels are also available.



**MATHESON**  
*LaserPro™*

# Assist Gas Equipment

The model **LPHF Assist Gas Regulators** deliver high pressure and high flow of Nitrogen Oxygen, Argon and Helium. The key to the performance of this regulator is the servo-dome load technology. The servo-dome load feature allows the regulator to supply high flow rates with straight line pressure regulation. The LPHF series is constructed of brass barstock, with PTFE seats and seals. The maximum inlet pressure is 3000 psig (optional 5500 psig).

## Features:

- 250, 500, or 1000 psig delivery pressure
- Fast on/off response, even at high flow
- 3000 psig inlet pressure (5500 psig optional)
- Tamper proof, self-reseating internal safety valve on 250 and 500 psig models only
- One piece encapsulated seat design with 10 micron filtration
- 1/2" NPT female inlet / outlet
- Conforms to CGA E-4 standard for gas pressure regulators

## Specifications:

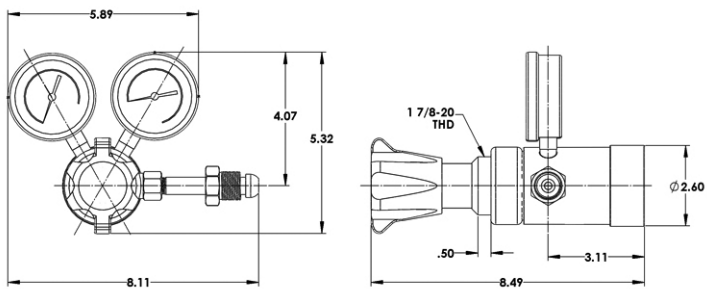
- Cv:
  - LPHF: 0.55
  - LPCR: 0.37
  - LP701: 0.17
- Maximum Flow Rate:
  - 6000 scfh Air LPHF series (inlet > 400 psig)
  - 2500 scfh Air LPCR series (inlet > 400 psig)
  - 1000 scfh Air LP701 series (inlet 2000 psig)
- Pressure Regulation\*:
  - 0.3 psig/100 psig for 250 and 500 psig delivery pressure (LPHF SERIES)
  - 0.5 psig/100 psig for 1000 psig delivery pressure
- Weight:
  - LPHF: 8.5 lbs
  - LP701: 3.5 lbs.
  - LPCR: 3.1 lbs



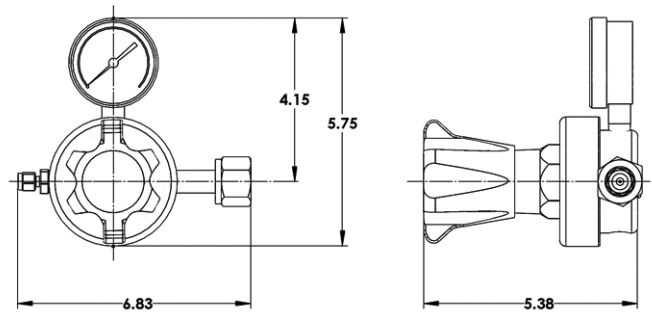
*LPHF Series for High Pressure and Cryogenic Source*



*LPCR Series for Cryogenic Source*



*LPHF Series*



*LPCR Series*

\*Delivery pressure change per cylinder pressure decay

# Assist Gas Equipment

## Ordering Information:

<b>LPHF-250-580</b>	Nitrogen, Argon and Helium, 0-250 psig delivery range, CGA 580 inlet, 1/2" FNPT outlet, internal relief valve, 10 micron inlet filter, Cv = 0.55
<b>LPHF-250-540</b>	Oxygen, 0-250 psig delivery range, CGA 540 inlet, 1/2" FNPT outlet, internal relief valve, 10 micron inlet filter, Cv = 0.55
<b>LPHF-500-580</b>	Nitrogen, Argon and Helium, 0-500 psig delivery range, CGA 580 inlet, 1/2" FNPT outlet, internal relief valve, 10 micron inlet filter, Cv = 0.55
<b>LPHF-500-540</b>	Oxygen, 0-500 psig delivery range, CGA 540 inlet, 1/2" FNPT outlet, internal relief valve, 10 micron inlet filter, Cv = 0.55
<b>LPHF-1000-580</b>	Nitrogen, Argon and Helium, 0-1000 psig delivery range, CGA 580 inlet, 1/2" FNPT outlet, 10 micron inlet filter, Cv = 0.4
<b>LPHF-1000-540</b>	Oxygen, 0-1000 psig delivery range, CGA 540 inlet, 1/2" FNPT outlet, 10 micron inlet filter, Cv = 0.4
<b>LPHF-250-N/I</b>	0-250 psig delivery range, 1/2" FNPT inlet, 1/2" FNPT outlet, internal relief valve, 10 micron inlet filter, Cv = 0.55
<b>LPHF-500-N/I</b>	0-500 psig delivery range, 1/2" FNPT inlet, 1/2" FNPT outlet, internal relief valve, 10 micron inlet filter, Cv = 0.55
<b>LPHF-1000-N/I</b>	0-1000 psig delivery range, 1/2" FNPT inlet, 1/2" FNPT outlet, 10 micron inlet filter, Cv = 0.4
<b>LP701-250-540</b>	0-250 psig delivery range, 1/4" FNPT inlet, 1/4" FNPT outlet, 10 micron inlet filter, Cv = 0.17
<b>LPCR-350-540</b>	0-350 psig delivery range, CGA 540 inlet, 1/4" FNPT outlet, 10 micron inlet filter, Cv = 0.37, for cryogenic Oxygen source

## Related Options:

<b>LPHF-PMN</b>	Panel mount nut (LPHF series only)
<b>LPHF-WMBR</b>	Wall mount bracket (LPHF series only)
<b>6086-580</b>	Stainless steel flex hose, 1/2" ID, 6', CGA 580 inlet, 1/2" NPTM out, 3500 psig MAWP
<b>6086-540</b>	Stainless steel flex hose, 1/2" ID, 6', CGA 540 inlet, 1/2" NPTM out, 3500 psig MAWP

## Cylinder Adapter Kits:

<b>580-4P-8P</b>	CGA 580 adapter kit, CGA 580 with 1/4" NPT female to 1/2" NPT male
<b>540-4P-8P</b>	CGA 540 adapter kit, CGA 540 with 1/4" NPT female to 1/2" NPT male

# Assist Gas Equipment

## Basic Laser Gas Kit

### Applications

**MATHESON LaserPro™ Universal Basic Laser Start-Up Kits** provide the most common equipment necessary for supplying assist gases to the laser. Basic kits contain a high-flow, dome-loaded regulator for Nitrogen, Oxygen, Argon or Helium assist gas, high-capacity hoses for the assist gas, and various fittings and filters to help with the laser installation.



### Basic Assist Gas Kits

<b>LP-NAG-250-25</b>	LaserPro™ Nitrogen, Argon and Helium assist gas kit, 250 psig delivery pressure
<b>LP-NAG-500-25</b>	LaserPro™ Nitrogen, Argon and Helium assist gas kit, 500 psig delivery pressure
<b>LP-OAG-250-25</b>	LaserPro™ Oxygen assist gas kit, 250 psig delivery pressure
<b>LP-OCAG-250-25</b>	LaserPro™ Oxygen assist gas kit, Liquid Cylinders, 250 psig delivery pressure, with LPCR regulator

### Each kit consists of:

**Assist Gas Regulator:** See regulator listings for model numbers / delivery pressures

<b>LP-25HS</b>	25' of high flow capacity hose, rated to 2000 psig
<b>LP-FTR-90</b>	90 micron "T" filter
<b>LP-ADP-FP</b>	3/4" flair x 1/2" NPT male fitting
<b>LP-ADP-8-4</b>	1/2" MNPT x 1/4" MNPT
<b>LP-ADP-FBS</b>	3/4" flare x 1/2" bspp

### Options:

<b>LP-50HS</b>	50' of high flow capacity hose, rated to 2000 psig
<b>6083-8PF-8PF</b>	Stainless steel flex hose, 3', 1/2" ID, 1/2" NPT female in/out
<b>60810-8PF-8PF</b>	Stainless steel flex hose, 10', 1/2" ID, 1/2" NPT female in/out
<b>LPHF-WMBR</b>	Wall mount bracket for LPHF series regulators

# Resonator Gas Delivery Equipment

MATHESON's 80+ years of experience with gas handling equipment for the laboratory market ensures that the resonator gas delivery system maintains the high purity that you require. From materials to cleaning, assembly, and testing, the MATHESON line of resonator gas delivery equipment is the benchmark for the industry.

## Regulators

**MATHESON LaserPro™ Resonator Gas Regulators** are available in both single stage and two stage configurations, with delivery pressures of 2-30 psig, and 4-100 psig. Both single stage and two stage regulators are made from barstock material, with stainless steel diaphragms, and are supplied with vent diaphragm valves. Models are available for Helium, Nitrogen, Carbon Dioxide, and Multi-Component Laser Mixtures

### Single Stage Regulators

Brass barstock, SS diaphragms, 1/4" compression fitting on outlet, with vent valve

<b>LP-3537NV-320</b>	2-30 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3537NV-350</b>	2-30 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3537NV-580</b>	2-30 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He
<b>LP-3539NV-320</b>	4-100 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3539NV-350</b>	4-100 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3539NV-580</b>	4-100 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He

### Two Stage Regulators

Brass barstock, SS diaphragms, 1/4" compression fitting on outlet, with vent valve

<b>LP-3121NV-320</b>	2-30 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3121NV-350</b>	2-30 psig delivery pressure, CGA 350 with low pressure vent for Multi-Componentt mix
<b>LP-3121NV-580</b>	2-30 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He
<b>LP-3122NV-320</b>	4-100 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3122NV-350</b>	4-100 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3122NV-580</b>	4-100 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He

# Resonator Gas Delivery Equipment

## Wall Mount Cylinder Regulators

**Resonator Gas Regulators** are also available as wall mount units, with brackets, all stainless steel flex hoses, and integral check valves to prevent air from entering the system.

### Single Stage Regulators

Brass barstock, SS diaphragms, 1/4" compression fitting on outlet, with vent valve, 3' flex hose with CV, wall bracket

<b>LP-3537NV-320-WM</b>	2-30 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3537NV-350-WM</b>	2-30 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3537NV-580-WM</b>	2-30 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He
<b>LP-3539NV-320-WM</b>	4-100 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3539NV-350-WM</b>	4-100 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3539NV-580-WM</b>	4-100 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He

### Two Stage Regulators

Brass barstock, SS diaphragms, 1/4" compression fitting on outlet, with vent valve, 3' flex hose with CV, wall bracket

<b>LP-3121NV-320-WM</b>	2-30 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3121NV-350-WM</b>	2-30 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3121NV-580-WM</b>	2-30 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He
<b>LP-3122NV-320-WM</b>	4-100 psig delivery pressure, CGA 320 with low pressure vent for CO <sub>2</sub>
<b>LP-3122NV-350-WM</b>	4-100 psig delivery pressure, CGA 350 with low pressure vent for Multi-Component mix
<b>LP-3122NV-580-WM</b>	4-100 psig delivery pressure, CGA 580 with low pressure vent for N <sub>2</sub> & He

# Resonator Gas Delivery Equipment

## Switchover Systems

The **MATHESON LaserPro™ Switchover** systems were designed with you, the customer in mind. From a single switchover for multi-component resonator gases to multiple systems for pure gases, MATHESON has it all for your resonator gas needs.

MATHESON LaserPro™ Resonator Gas Switchovers provide a continuous supply of gas to the laser when interruptions in the gas supply cannot be tolerated, or high duty cycles require additional cylinders of gas. Models are available in three delivery pressure ranges of 2-30 psig, 4-100 psig, and 4-150 psig. These switchover systems incorporate the same high quality materials and processes as the regulators, such as barstock material, with stainless steel diaphragms. Models are available for Nitrogen, Helium, Oxygen, Carbon Dioxide, and Multi-Component gases.

The switchovers operate by pressure differential, switching over from a depleted cylinder to a full cylinder at about 150 psig. Setting the primary side is extremely easy; just turn the switchover knob 270° until it hits the stop, and it is ready to start the switchover operation again. The switchover requires no electricity to operate (unless the optional alarms are added), saving installation costs.

Switchovers are mounted on back plates for easy wall mounting, and include CGA fittings with integral check valves to prevent air from entering the system during cylinder changes and all stainless steel flex hoses. Many options are available, such as isolation and vent diaphragm valves, and alarms to alert users that one side is depleted.



*LaserPro™ Switchover*

### Switchovers

Switchover, single body regulator, line regulator, 3' flex hoses, integral check valve in the CGA, 1/4" compression out, rated for 5 scfm Nitrogen

<b>M523-A28TR-N2</b>	2-30 psig delivery, CGA 580 for Nitrogen
<b>M523-A28TR-HE</b>	2-30 psig delivery, CGA 580 for Helium
<b>M523-A28WR-CO2</b>	2-30 psig delivery, CGA 320 for Carbon Dioxide
<b>M523-A28TR-PMIX</b>	2-30 psig delivery, CGA 580 for Multi-Component Mix (no CO)
<b>M523-A28VR-PMIX</b>	2-30 psig delivery, CGA 350 for Multi-Component Mix (with CO)
<b>M523-B28TR-N2</b>	4-100 psig delivery, CGA 580 for Nitrogen
<b>M523-B28TR-HE</b>	4-100 psig delivery, CGA 580 for Helium
<b>M523-B28WR-CO2</b>	4-100 psig delivery, CGA 320 for Carbon Dioxide
<b>M523-B28TR-PMIX</b>	4-100 psig delivery, CGA 580 for Multi-Component Mix (no CO)
<b>M523-B28VR-PMIX</b>	4-100 psig delivery, CGA 350 for Multi-Component Mix (with CO)
<b>M523-J28TR-N2</b>	4-150 psig delivery, CGA 580 for Nitrogen
<b>M523-J28TR-HE</b>	4-150 psig delivery, CGA 580 for Helium
<b>M523-J28WR-CO2</b>	4-150 psig delivery, CGA 320 for Carbon Dioxide
<b>M523-J28TR-PMIX</b>	4-150 psig delivery, CGA 580 for Multi-Component Mix (no CO)
<b>M523-J28VR-PMIX</b>	4-150 psig delivery, CGA 350 for Multi-Component Mix (with CO)

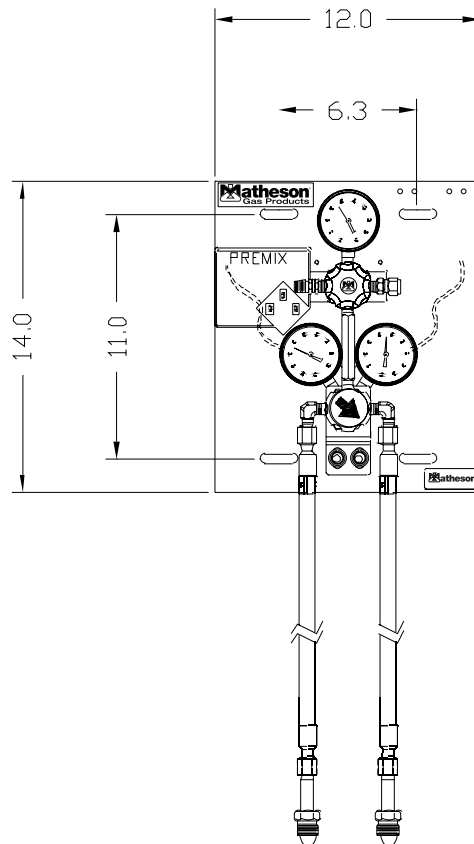
# Resonator Gas Delivery Equipment

## Switchover Options:

"7"	HPI – High pressure isolation valve
"A"	HPV – High pressure vent valve
"D"	IPS – Indicating pressure switch for low cylinder alarm
"J"	PM-24 Local channel alarm monitor (for use with IPS)



PM-24



Two Cylinder Switchover Panel

# Resonator Gas Delivery Equipment

## MATHESON LaserPro™ Switchover Racks and Wall Mount Systems

The **MATHESON LaserPro™ Switchover** rack systems were designed for ease of installation of your switchover systems. From a single switchover free standing rack, or wall mount system for multi-component resonator gases to a six cylinder rack or wall system for pure gases, MATHESON has it all for your resonator gas needs.

MATHESON LaserPro™ racks are constructed from high quality steel, painted to resist everyday work atmospheres, and are simple to assemble. Complete assembly instructions are included for easy installation.

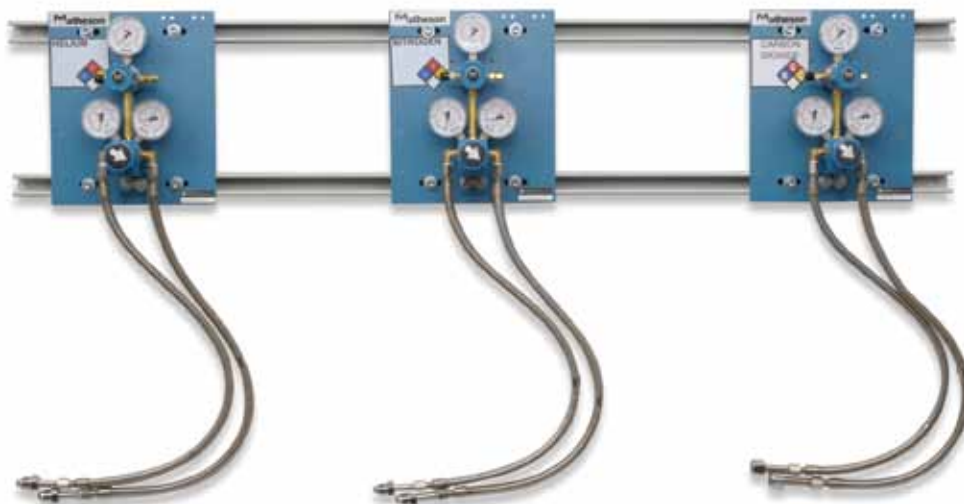
MATHESON LaserPro™ Switchover systems provide an uninterrupted supply of resonator gases when interruptions in the gas supply cannot be tolerated, or high duty cycles require additional cylinders of gas.

### Features:

- Two cylinder rack system with a differential switchover for 1x1 multi-component cylinders
- Six cylinder rack system with three differential switchovers for lasers that require pure resonator gases in high duty cycles. Included are three 1x1 systems for Nitrogen, Helium, and Carbon Dioxide
- Complete with 3' flex hoses and cylinder connections with integral check valves to prevent air infiltration during cylinder changes
- Delivery pressure ranges up to 150 psig
- Stainless steel diaphragms to maintain purity throughout the system
- Flow rates up to 5 scfm (rated in Nitrogen)
- Many options available for the switchover systems, including alarms, high pressure isolation and vent valves, and low pressure isolation valves
- Assembly and installation instructions included
- Custom configurations available



*6-Cylinder Rack System*



*6-Cylinder Wall System*

# Resonator Gas Delivery Equipment

## Ordering Information:

### Free Standing Rack Systems:

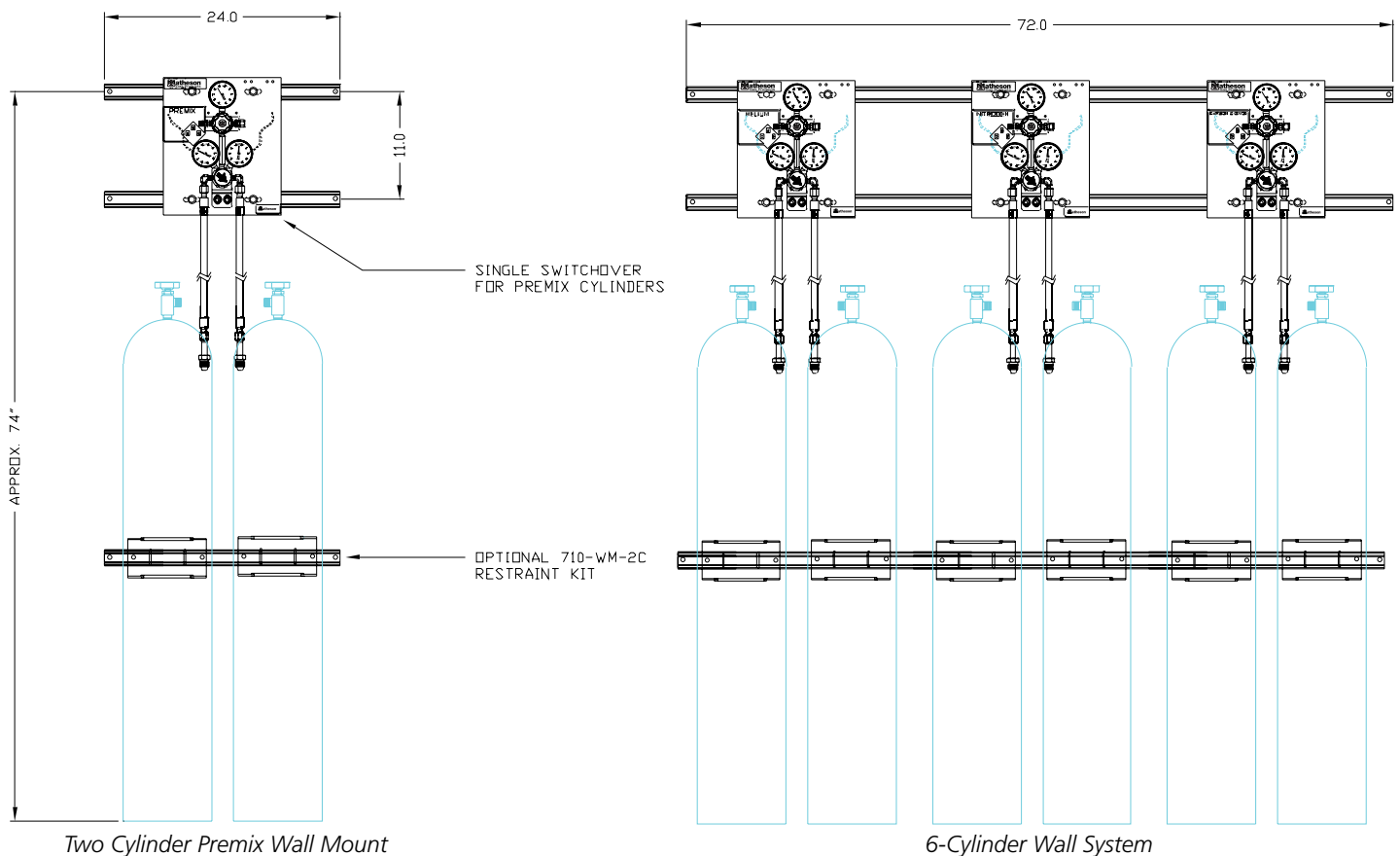
<b>LP-RCK-MIX-100</b>	Floor mount rack, 1 switchover, 1x1 Multi-Component Mix cylinders, 100 psig, CGA 580
<b>LP-RCK-MIX-150</b>	Floor mount rack, 1 switchover, 1x1 Multi-Component Mix cylinders, 150 psig, CGA 580
<b>LP-RCK-CO/MIX-100</b>	Floor mount rack, 1 switchover, 1x1 Multi-Component CO Mix cylinders, 100 psig, CGA 350
<b>LP-RCK-CO/MIX-150</b>	Floor mount rack, 1 switchover, 1x1 Multi-Component CO Mix cylinders, 150 psig, CGA 350
<b>LP-RCK-HNC-100</b>	Floor mount rack, 3 switchovers, 1x1 He, 1x1 N <sub>2</sub> , 1x1 CO <sub>2</sub> , 100 psig
<b>LP-RCK-HNC-150</b>	Floor mount rack, 3 switchovers, 1x1 He, 1x1 N <sub>2</sub> , 1x1 CO <sub>2</sub> , 150 psig

### Wall Mount Systems (complete with Unistrut):

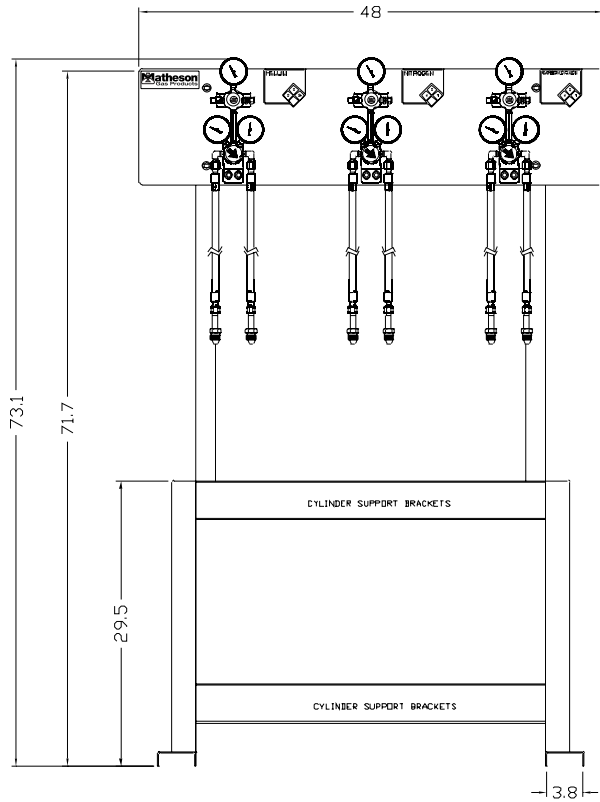
<b>LP-WM-MIX-100</b>	Wall mount rack, 1 switchover, 1x1 Multi-Component Mix cylinders, 100 psig, CGA 580
<b>LP-WM-MIX-150</b>	Wall mount rack, 1 switchover, 1x1 Multi-Component Mix cylinders, 150 psig, CGA 580
<b>LP-WM-CO/MIX-100</b>	Wall mount rack, 1 switchover, 1x1 Multi-Component CO Mix cylinders, 100 psig, CGA 350
<b>LP-WM-CO/MIX-150</b>	Wall mount rack, 1 switchover, 1x1 Multi-Component CO Mix cylinders, 150 psig, CGA 350
<b>LP-WM-HNC-100</b>	Wall mount rack, 3 switchovers, 1x1 He, 1x1 N <sub>2</sub> , 1x1 CO <sub>2</sub> , 100 psig
<b>LP-WM-HNC-150</b>	Wall mount rack, 3 switchovers, 1x1 He, 1x1 N <sub>2</sub> , 1x1 CO <sub>2</sub> , 150 psig

### Accessories

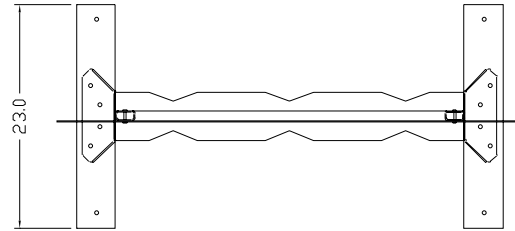
<b>710-WM-2C</b>	Wall mount cylinder restraint kit, (2) 710 restraints with unistrut, for two cylinders
<b>710-WM-6C</b>	Wall mount cylinder restraint kit, (6) 710 restraints with unistrut, for six cylinders



# Resonator Gas Delivery Equipment



SPECIFICATIONS:  
CONSTRUCTED FROM 11 GAUGE OR HEAVIER PLATE STEEL.  
FULLY WELDED  
EPOXY POWDER PAINT FINISH  
ELEVATED 48" X 14" TOP PLATE TO MOUNT CONTROLS  
1.5' POLYPROPYLENE STRAPS (6) FOR CYLINDER RESTRAINTS  
STEEL REINFORCED VINYL EDGE GAURDS TO PROTECT CYLINDERS  
WEIGHT: 129 LBS. W/O SWITCHOVERS  
185 LBS W/ SWITCHOVERS



*Optional Model 6530 Series Cylinder Racks Available*

# Resonator Gas Delivery Equipment

## POU Resonator Gas Panels

**MATHESON's Point of Use (POU)** panels are designed to supply resonator gases to multiple lasers from a central source. The addition of another laser will not require additional equipment.

The panel, set up for Helium, Nitrogen, Carbon Dioxide, and Multi-Component Laser Mixtures, is available with delivery pressures of 30, 100, and 200 psig, and is built with the same high purity components as the rest of our resonator line of gas delivery equipment.

Each section should be supplied by a source system, such as a switchover panel, or a single station manifold. The inlet pressure should be approximately 100 psig higher than the selected delivery pressure.

### Features:

- High purity brass barstock regulators with stainless steel diaphragms
- Metal to metal seals to ensure leak integrity and purity
- 1/4" compression inlets
- 1/4" compression outlets
- NFPA labels to identify each gas and hazard levels
- 400 psig maximum inlet pressure

### Materials of Construction

Regulator Body:	Brass barstock
Regulator Seat:	Teflon
Valve Seat:	Kel-F
U-Channel Frame:	Painted steel (incl. attachment hardware)

### Specifications

Gases Delivered:	Helium Nitrogen Carbon Dioxide Multi-Component Mixtures
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### Operating Pressures (3 Ranges):

- 0-30 psig
- 0-100 psig
- 0-200 psig

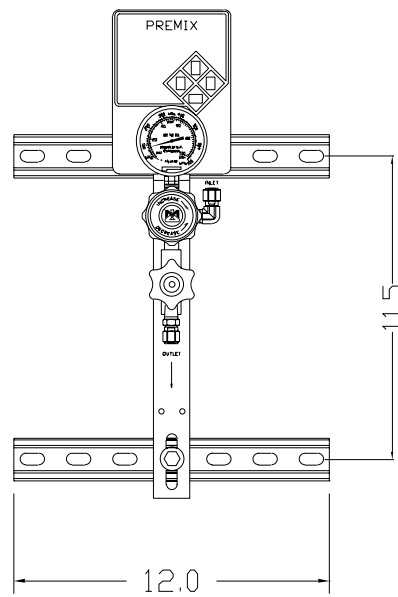


*3-Gas Point of Use Panel*

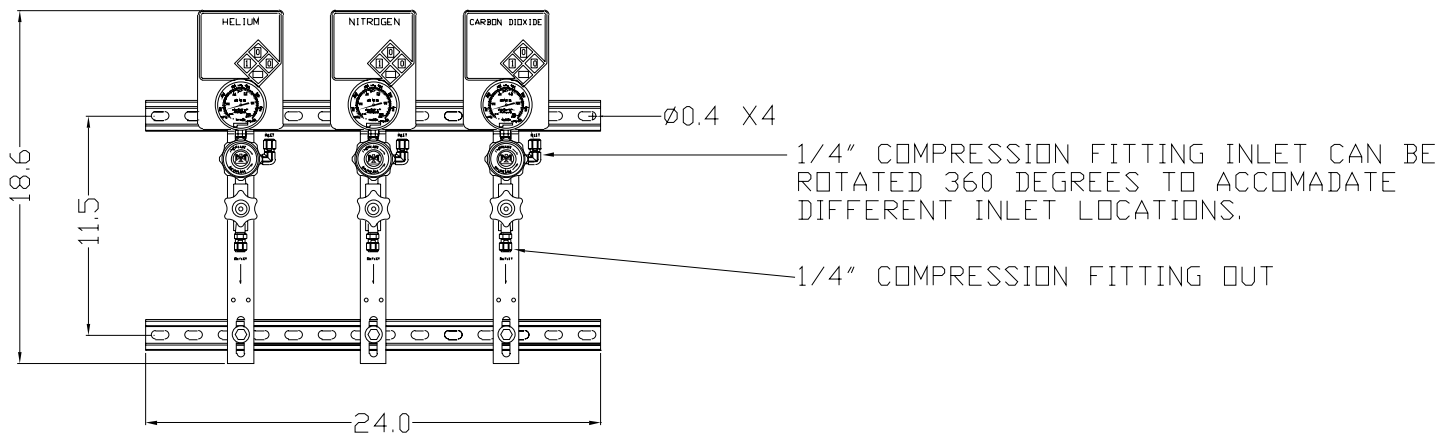
# Resonator Gas Delivery Equipment

## Ordering Information:

<b>P-D1-MIX</b>	One section POU panel for Multi-Component mixture, 30 psig delivery pressure
<b>P-D2-MIX</b>	One section POU panel for Multi-Component mixture, 100 psig delivery pressure
<b>P-D3-MIX</b>	One section POU panel for Multi-Component mixture, 200 psig delivery pressure
<b>P-D1G-D1M-D1E</b>	Three section POU panel for Helium, Nitrogen, and Carbon Dioxide, 30 psig delivery pressure
<b>P-D2G-D2M-D2E</b>	Three section POU panel for Helium, Nitrogen, and Carbon Dioxide, 100 psig delivery pressure
<b>P-D3G-D3M-D3E</b>	Three section POU panel for Helium, Nitrogen, and Carbon Dioxide, 200 psig delivery pressure



Multi-Component Point of Use Panel



3-Gas Point of Use Panel.



# MATHESON

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