

# CARTEN®

## Ultra High Purity Regulators



### Product Features

- Vacuum to 3500PSIG working pressure
- 100% Helium leak tested for high leak integrity and containment
- 100% Clean room welded and assembled for high purity
- 100% DI-Water cleaned for ultra-cleanliness
- Precise pressure control of media
- High flow rates in 1/2" and 3/8" sizes



## RG2 Series

> ULTRA-HIGH PURITY AND HIGH PERFORMANCE PRESSURE CONTROL REGULATORS  
> FOR LOW AND HIGH PRESSURE APPLICATIONS

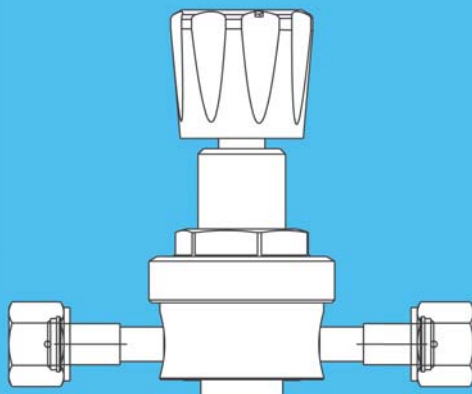
Carten Controls Ltd is a member of the Fujikin Group.



## Product Features



> TOP VIEW



> FRONT VIEW

## UHP High Performance High and Low Pressure Regulators

### Carten RG2 Series

Carten's RG2 series ultra-high purity regulator is designed for high performance and precise control in point-of-use and high flow gas systems. Carten's RG2 regulator provides high purity gas delivery and containment solutions for customers who demand precise pressure control in the semiconductor, photovoltaic, flat panel display, fibre-optics, LED and other high technology industries. All UHP regulators are assembled and tested in a class 10 cleanroom which support the final cleanliness and purity for Carten's regulator range of products.

The RG2 series is capable of precise control of gas pressure at or near the process tool for flow rates up to 600 SLPM at 300 PSIG inlet pressure. The RG2 series regulator has a metal-to-metal diaphragm seal which provides enhanced leak tight integrity up to  $1 \times 10^{-9}$  atm cc/sec of Helium. The RG2 series is designed with three primary operating components: a loading mechanism, a sensing element, and a control element and these three components work together to accomplish pressure reduction through the regulator. Carten's standard internal surface finish of 10Ra in contact with the wetted area enhances the surface quality to support high purity gas delivery to the point-of-use.

Applications for the RG2 series regulator include:

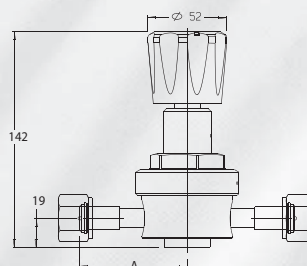
- Gas Cabinets
- Gas Chambers
- Gas Panels
- Gas Sticks
- High Performance Gas and Solvent Systems.

### RG2 Series Key Performance Data

| Size (inch) | Inlet/Outlet Pressure (psig)        | Flow Rate (slpm) | Leak Rate (atm cc/sec) | Cv   | Grade  |
|-------------|-------------------------------------|------------------|------------------------|------|--------|
| 1/2"        | 3500~600/<br>30, 60, 100<br>and 150 | 600              | $1 \times 10^{-9}$     | 0.50 | EP, BA |

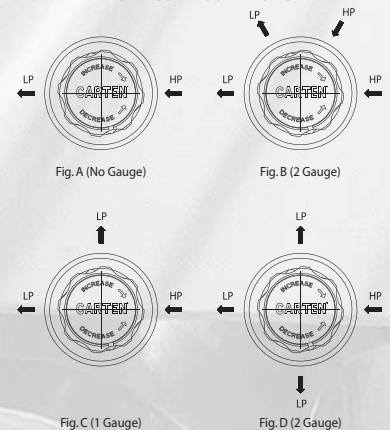
\* Flow Rate: N<sub>2</sub> gas, at inlet 1000 psig and outlet pressure 100 psig

#### MAJOR CONFIGURATION



| Size | Connection | A ± 0.5 |
|------|------------|---------|
| 3/8" | SW         | 58.2    |
| 3/8" | TW         | 47      |
| 1/2" | VF         | 71      |
| 1/2" | VM         | 71      |
| 1/2" | SW         | 58.2    |
| 1/2" | TW         | 47      |

#### PORT CONFIGURATIONS



2 - M5 x 0.8 TAP 8mm DP.



## Product Specifications

### Fluid Media

The RG2 series is suitable for most inert, explosive and corrosive gasses or those requiring high purity regulation compatible with materials of construction. For other media applications please consult with Carten group members for details.

### Pressure Rating (per criteria of ANSI/AME B31.3)

- Maximum rated inlet pressure:  
3500, 1000 or 600 psig (241, 69 or 41 Bar)
- Outlet pressure ranges:  
1-30; 1-60; 1-100 or 1-150 psig (0.1-2.1; 0.1-4.1; 0.1-6.9 or 0.1-10.3 Bar)
- Design Proof Pressure:  
150% of Maximum rated pressure

### Materials of Construction (Wetted Area)

- Body: 316L Stainless Steel (Electropolished or BA)
- Seat: PCTFE (Vespel® optional for 3500 PSIG model only)
- Diaphragm: Hastelloy C-22
- Spring, Stem and Valve Bush: 316L Stainless Steel

### Key Performance Parameters

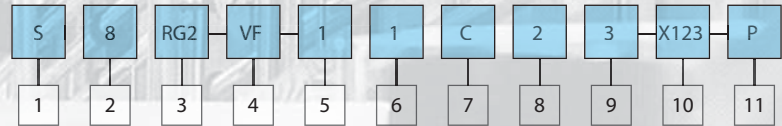
- Flow coefficient: CV = 0.50
- Maximum inboard leak rate:  $1 \times 10^{-9}$  atm cc/sec He
- Internal surface finish: 10Ra or 5Ra microinch (0.25µm or 0.13µm)
- Operating temperature:  
PCTFE seat: -15°F to +200°F (-26°C to +93°C)  
Vespel® seat: -15°F to +300°F (-26°C to +149°C)
- Weight (w/o gauges): 3.5 lbs (1.6kg)

## PSIG Pressure Conversion

|                   |                                                                                             |
|-------------------|---------------------------------------------------------------------------------------------|
| <b>100 PSIG =</b> | 6.89 Bar<br>7.03 Kg/cm <sup>2</sup><br>0.6894 Megapascals (MPa)<br>689.47 Kilopascals (KPa) |
|-------------------|---------------------------------------------------------------------------------------------|

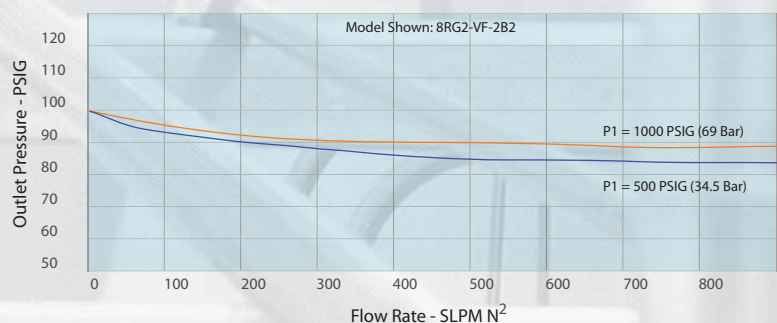
## Product Selection and Ordering Information

### Product Example



| (1) Material                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (2) Connection Size                                                        | (3) Product Series                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| S = 316L Stainless Steel Single Melted<br>D = 316L Stainless Steel Double Melted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6 = 3/8"<br>8 = 1/2"                                                       | RG2 Series                                                                                     |
| (4) Connection Type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | (5) Maximum Inlet Pressure                                                 | (6) Maximum Range of Inlet Gauge                                                               |
| NF = Female NPT Thread<br>SW = Compression Lok Fitting<br>TW = Tube Butt Weld<br>VF = Female Type Face Seal<br>VM = Male Type Face Seal<br>VMF = Fixed Male Type Face Seal                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 = 3500 psig<br>2 = 1000 psig<br>3 = 600 psig                             | 1 = 600 psig<br>2 = 1000 psig<br>3 = 3500 psig<br>4 = 4000 psig<br>Blank = No Gauge            |
| (7) Gauge Port Configuration                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (8) Outlet Pressure Range                                                  | (9) Maximum Range of Outlet Gauge                                                              |
| A = No Gauge Port (Fig. A)<br>B = 1/4" Internal Face Seal (Fig. C)<br>C = 1/4" Internal Face Seal (Fig. B)<br>D = 1/4" Internal Face Seal (Fig. D)<br>E = 1/4" Male Face Seal (Fig. D)<br>F = 1/4" Male Face Seal (Fig. C)<br>G = 1/4" Male Face Seal (Fig. B)<br>H = 1/4" Female Face Seal (Fig. D)<br>I = 1/4" Female Face Seal (Fig. C)<br>J = 1/4" Female Face Seal (Fig. B)<br>K = 1/4" Fixed Male Face Seal (Fig. B)<br>L = 1/4" Fixed Male Face Seal (Fig. C)<br>M = 1/4" Fixed Male Face Seal (Fig. D)<br>N = 1/4" Female NPT Thread (Fig. B)<br>O = 1/4" Female NPT Thread (Fig. C)<br>P = 1/4" Female NPT Thread (Fig. D) | 0 = 1 ~ 30 psig<br>1 = 1 ~ 60 psig<br>2 = 1 ~ 100 psig<br>3 = 1 ~ 150 psig | 0 = 30 psig<br>1 = 60 psig<br>2 = 100 psig<br>3 = 160 psig<br>4 = 200 psig<br>Blank = No Gauge |
| (10) User Option                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | (11) Surface Quality                                                       |                                                                                                |
| Customisation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Blank = BA Standard (10Ra)<br>P = Electropolishing (5Ra)                   |                                                                                                |

## Carten RG2 Flow Curves



## Quality, Engineering and Performance

Carten Controls is committed to providing the highest quality products, service and support for our clients that meets customer expectations. Carten's commitment to our customers and quality is demonstrated through our ongoing membership and compliance to the IS EN ISO9001:2008 QMS programme and by the implementation of continuous improvement initiatives throughout the company.

It is Carten's intention to provide specific customer drawings for each UHP regulator configuration ordered by our customers. This will ensure that you – our customer – will receive a detailed dimensional drawing including the UHP regulator performance

data for the exact product ordered thus ensuring clarity and transparency for customer orders.

Carten Controls are part of the Fujikin Group of companies. Carten Controls Ltd. and its products comply with the requirements of Pressure Equipment Directive (ref.# 97/23/EC) and sound engineering practices (ref. CE040).

\*Vespel is a registered trademark of DuPont Company.

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Ultra High Purity Regulators

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## Other Products By Carten

- Ultra-High Purity Bellows Valves
- Ultra-High Purity Diaphragm Valves
- Ultra-High Purity Regulators
- Ultra-High Purity Integrated Diaphragm/Check Valves
- High Purity Check Valves
- High Purity Ball Valves
- Vacuum Generators
- Gas Sticks
- Gas Panels



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