


Flow Control Products

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NEW Restek Electronic Leak Detector



Why allow a tiny leak become a **GIANT** problem?

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NEW Restek ProFLOW 6000 Electronic Flowmeter

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Pressure Regulators - GasCon

Mas Flow Controllers (Analog)

Combo Pressure On/FF Needle ValvesValves

Soap Bubble Flowmeter

1ml

50ml

Restek

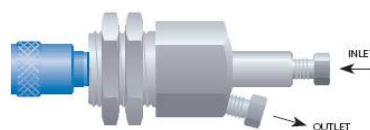
Soap Film
Bubble Flowmeter



Catalog # 20135 1 mL
 20136 50 mL

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Gas Flow Controllers



Items available; this FlipPAGE Soon ! . . . Ask!

EPC Electronic Pressure Control - parts kit **SRI**

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NEW Restek ProFLOW 6000 Electronic Flowmeter

Flowmeters that can measure flammable gases are becoming mandatory, due to the increased use of hydrogen in chromatography. With its Ex rating, the Restek ProFLOW 6000 Flowmeter is designed specifically with explosive and flammable gases in mind.

The new Restek ProFLOW 6000 is the only flowmeter you need for any type of chromatography gas measurement because of its wide range of capabilities. The ProFLOW 6000 is an electronic device capable of measuring bidirectional volumetric flow for most gases. Real-time measurements can be made for various types of flow paths, including continually changing gas types. This portable unit is designed for easy hand-held use, and the stand adds bench-top convenience.

State-of-the-art features include:

- Measures volumetric flow for all gases across a range of 0.5-500 mL/min.
- NIST traceable calibration
- Explosion-proof rating for flammable and explosive gases
- Accuracy of +/- 2% of flow or +/- 0.05 mL/min., whichever is greater
- Over range warning indicator
- Auto shut-off feature
- Use as a bench-top or hand-held unit
- Ergonomic design and side grips for comfort
- Measures most gas types*
- Convenient carrying/storage case included
- CE certified
- Uses 2-AA batteries
- Data output via USB port
- Re-calibration service available

Backed by a 1-year warranty, the Restek ProFLOW 6000 flowmeter will set the industry standard for electronic flowmeters!

Flowmeter Facts:

Type of Flow Meter:	volumetric
Battery:	2AA
Operating Temp. Range:	32-120°F (0-48°C)
Humidity Range:	0-97% (noncondensing)
Warranty:	one year
Certifications:	CE, Ex
Compliance:	WEEE, RoHS

Description	qty.	cat.#
Restek ProFLOW 6000 Electronic Flowmeter	ea.	22656
Soft-Side Storage Case	ea.	22657

*This flowmeter is designed to measure clean, dry, non-corrosive gases.

Contact your local
Restek representative to
**order yours
TODAY!**



**A perfect companion
for your Restek
Electronic Leak
Detector!**



Carrying/storage case included
with purchase of unit.



Soft-side storage case is ideal for
storing your flowmeter in smaller
spaces such as your tool box.

www.restek.com/flowmeter



Lit. Cat.# GNPC1194-INT

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Restek's **ProFLOW 6000** Electronic Flowmeter

Users Manual
Version 5.5
for cat.# 22656

RESTEK www.restek.com



The ProFLOW 6000
volumetric flowmeter.

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1.0 Introduction

Restek's ProFLOW 6000 Flowmeter is specifically designed for use with gas chromatography (GC) systems. The probe is applied directly to the gas flow stream and the measured flow rate is presented on the LCD screen. Units of flow are measured in mL/min.

This unit provides continuous real-time measurements of gas streams ranging from 0.50 mL/min to 500 mL/min. Because the technology uses volumetric flow measurement, the unit is compatible with all laboratory gases.



CAUTION: Do NOT exceed maximum operating flow rates. Recalibration may be required if the unit has been subjected to extreme flow rates.



Always use appropriate laboratory safety practices when operating this device. Wear laboratory safety goggles when operating this unit.

2.0 Specifications

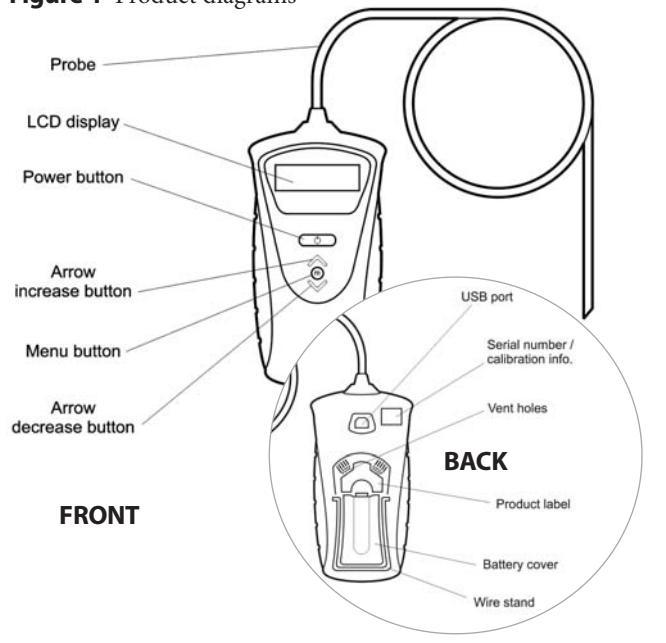
Table I

Type of measurement	Volumetric flow
Accuracy of measurements	$\pm 2\%$ flow or $\pm 0.2\text{mL/min.}$, whichever is greater
Power requirements	2 AA Alkaline Batteries 1.5VDC each/3VDC 200ma
Operating flow range	0.50 to 500mL/min.
Operating temperature range	32°-120°F (0°- 48°C)
Available communication	USB data port
Warranty	one year
Calibration	NIST traceable. Yearly recalibration is recommended.
Certifications	CE, Ex (see section 10.0)
Compliance	WEEE, RoHS (see section 10.0)

NOTE: There are no serviceable parts in this unit. Opening the device—other than to change the batteries—or tampering with the internal parts will void the factory warranty.

NOTE: To ensure accurate measurements and effective clearance of the flow gas from the unit, DO NOT obstruct the vent holes on the back of the unit.

Figure 1 Product diagrams



3.0 Installing the batteries

This unit uses 2 AA alkaline batteries.

To install batteries, extend the wire stand. Open the cover. Insert the batteries with the polarity (⊕ and ⊖) correctly aligned. Close the cover. (Figures 2 and 3)

Precautions for battery replacement:

- Load the new batteries with their polarity (⊕ and ⊖) aligned correctly.
- Do not use rechargeable batteries.



4.0 Battery power consumption

4.1 Battery lifetime

The battery lifetime is dependant on the number of options the user has enabled.

The unit is shipped with the most energy demanding options disabled (Table II).

The power saving functions can be changed.

- See Section 8.2: Adjust LCD Character Contrast (p.9).
- See Section 8.3: USB Activation (p.10).
- See Section 8.4: Adjust LCD Image Backlight (p.10).
- See Section 8.7: Adjust Auto Shutoff Duration (p.12).

4.2 Battery charge indicator

The unit includes a battery charge indicator. Replace batteries as needed.

- See Section 8.5: Show Battery Charge Indicator (p.11).

Figure 2 Extend the wire stand before opening battery door.



Figure 3
Insert the batteries as marked.

Table II Default settings for the ProFLOW 6000

Auto shutoff duration	6 minutes
LCD backlight	0 (off)
LCD character contrast	5
USB port	disabled


NOTE: Store your ProFLOW 6000 in its protective storage case following use. Keep the manual under the unit; placing the manual on top can result in the unit being turned on when the lid is closed.


5.0 Operating instructions



CAUTION: Do not exceed maximum operating flow rates. Recalibration may be required if the unit has been subjected to extreme flow rates.

Connect the white probe end tip to the output of the gas flow line to be measured. Be sure the probe tip connection is completely sealed around the flow source outlet and is free of leaks (Figure 4).

Press and hold the  (power) button until the unit responds with a regular clicking sound. The ProFLOW will immediately begin to provide flow measurements (Figure 5). Wait for the measured values to stabilize. It takes a few seconds for the unit to reach a steady state with the gas flow line.

To power down the unit press and hold the  (power) button until the unit stops clicking.

The unit is equipped with a timed auto shutoff option (Default: 6 minutes).

→ See Section 8.7: Adjust Auto Shutoff Duration (p.12).

Figure 4 Probe connected to a GC gas outlet.



Figure 5 LED displays the measured flow value.



6.0 Interpreting results

The unit has an operating range of 0.50mL/min. to 500mL/min. (Figure 7). If the flow is less than 0.50mL/min., the display will read “under range”.

If the flow exceeds 515mL/min., the display will read “over range”. Excessively high flow rates may damage this unit.

NOTE: units of mL/min. are equivalent to ccm.

6.1 Flow range display

The unit automatically adjusts the resolution of the display depending on the flow range being measured. Table III shows the resolution of the flow ranges.

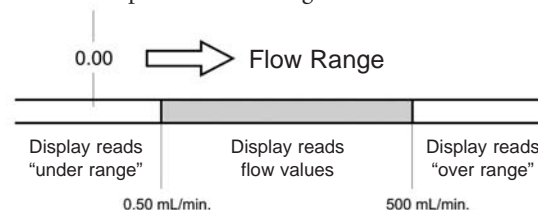
Table III Display resolution vs. flow range.

Flow range	Display resolution (mL/min.)
0.50 – 9.99	0.01
10.0 – 99.9	0.1
100 – 500	1

Figure 6 Example flow value.



Figure 7 Description of flow ranges.



7.0 Data collection on the PC



WARNING: ONLY connect USB cable to USB port while unit is OFF.

The ProFLOW 6000 provides you with a data stream of real time flow values via the USB port (Figure 1, p. 3). In order to use this feature, you must first install the appropriate FTDI Virtual Com Port (VCP) Driver available at:

<http://www.ftdichip.com/Drivers/VCP.htm>

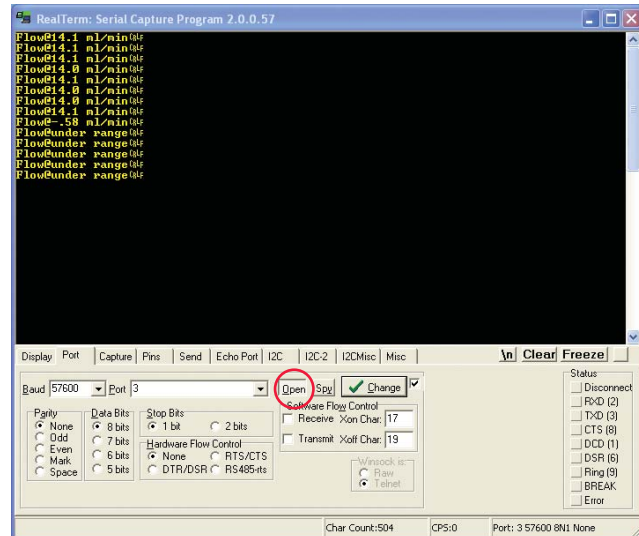
The VCP driver will cause the ProFLOW to appear as a standard RS-232 port. This will work on any operating system for which there is an FTDI VCP driver. After installing the driver, connecting the device, and determining which port it creates, you can access the data stream through any programmatical means, or by using any serial terminal software.

For Windows systems:

To determine which port the ProFLOW is using, go to the Control Panel and open System. Go to the Hardware tab and click the Device Manager button. Expand the Ports (COM & LPT) entry. Make sure the VCP driver is installed, then connect a powered ProFLOW 6000 to the USB port. You will see the new COM port appear. Open your serial terminal.

→ See Section 8.3: USB Activation (p.10).

Figure 8 Screen capture of data collection.



If you do not already have serial terminal software, free, open source options are available online (i.e. RealTerm, etc.). You can download RealTerm* software from:

<http://realterm.sourceforge.net/>

After installation, click the Port tab and set the following:

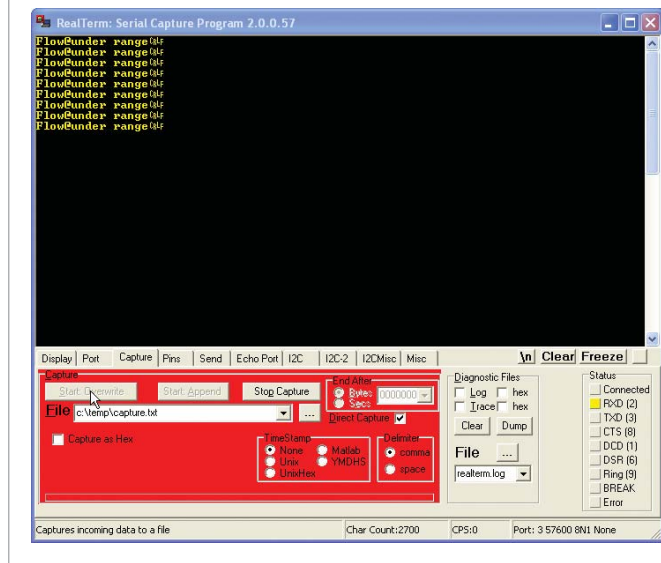
Baud: 57600
Port: the appropriate VCP for your ProFLOW
Parity: None
Data Bits: 8 bits
Stop Bits: 1 bit
HardwareFlow Control: None

Go to the USB menu entry in the ProFLOW and turn the transmission on. Finally, click **Open** on the Port tab in RealTerm and you will see the serial data stream begin in the terminal window (Figure 8).

If you would like to log the flow data, this can be done by clicking on the Capture tab. Set File to the name and location of the log file that you would like to save and click either the **Start: Overwrite** or **Start: Append** buttons appropriately (Figure 9).

**This software is not supplied or supported by Restek. User assumes all responsibility for the downloading and use of the program.*

Figure 9 Screen capture of data collection.



8.0 ProFLOW 6000 menu structure

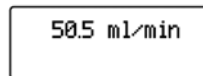
8.1 Unit power up/power down


Press the  (power) button:

The LCD screen will display the device intro screen:



Followed by measured flow data:



To power off, press and hold the  (power) button:

Other messages encountered at power up

Calibration
-expired-


Appears temporarily if the unit's calibration has expired (>1 year).



→ See Section 14.0: Calibration and Service

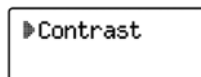
under range

If the unit is hooked up to a flow stream with a flow rate less than 0.50 mL/min. the unit will report an "under range" status for the flow. This message will appear until the flow rate exceeds 0.50 mL/min.



8.2 Adjust LCD character contrast


Press the  (menu) button.

Use the 
 (arrow) keys to select the contrast menu:




Press the  (menu) button again to enter the value select screen.


Use the 
 (arrow) keys to select the contrast value.
Contrast Values: 1 (lightest) and 5 (darkest).

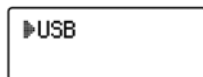
To return to the main menu screen, press the  (menu) button.

To exit and return to measuring flow, press the  (menu) button again.


8.3 USB activation


To enable the USB, press the  (menu) button.

Use the  (arrow) keys to select the USB menu:



Press the  (menu) button again to enter the value select screen.


Use the  (arrow) keys to toggle between USB 'on' and 'off'.


To return to the main menu screen, press the  (menu) button.

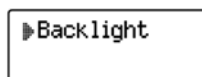
To exit and return to measuring flow, press the  (menu) button again.

→ See Section 7.0: Data Collection on the PC


8.4 Adjust LCD image backlight


Press the  (menu) button.


Use the  (arrow) keys to select the backlight menu:




Press the  (menu) button again to enter the value select screen.


Use the  (arrow) keys to select the backlight value.
Backlight Values: 0 (off) and 5 (maximum).

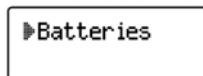
To return to the main menu screen, press the  (menu) button.

To exit and return to measuring flow, press the  (menu) button again.

8.5 Show battery charge indicator

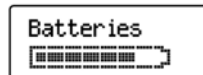
Press the  (menu) button.

Use the  (arrow) keys to select the Batteries menu:




Press the  (menu) button again.


The battery life is displayed.




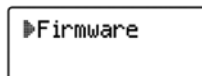
To return to the main menu screen, press the  (menu) button.

To exit and return to measuring flow, press the  (menu) button again.

8.6 Firmware version information

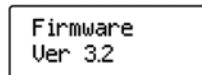
Press the  (menu) button.


Use the  (arrow) keys to select the Firmware menu:




Press the  (menu) button again.


The most recent version of Firmware is displayed.




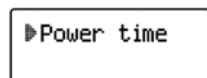
To return to the main menu screen, press the  (menu) button.

To exit and return to measuring flow, press the  (menu) button again.


8.7 Adjust auto shutoff duration


To conserve battery life, the unit automatically turns off after 6 minutes. To customize the auto shutoff setting, press the  (menu) button.


Use the  (arrow) keys to select the Power time menu:



Press the  (menu) button again to enter the value select screen.

Use the  (arrow) keys to select the auto shutoff setting.
Values: 1–59 minutes or ‘constant on’ (max.)

To return to the main menu screen, press the  (menu) button.

To exit and return to measuring flow, press the  (menu) button again.

9.0 Troubleshooting

Problem	Possible Cause(s)	Suggested Solution(s)
Multiple readings are not giving reproducible results.	<ul style="list-style-type: none">• Unit is out of calibration• Value is being compared to a bubble flowmeter	<ul style="list-style-type: none">• Return the unit to Restek for recalibration*• See Section 12.0 for a discussion of the weaknesses of bubble flowmeters
Unit does not power up	<ul style="list-style-type: none">• Dead batteries	<ul style="list-style-type: none">• Replace with 2 new AA alkaline batteries
Flow value display is erratic/jumpy	<ul style="list-style-type: none">• The ProFLOW 6000 is very sensitive to small changes in flow	<ul style="list-style-type: none">• Allow more time for flow to stabilize

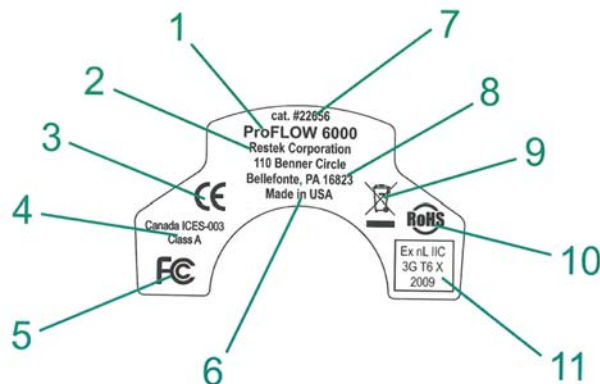
*Contact Restek or your Restek representative for return instructions for servicing a damaged unit. Additional charges may apply if the warranty has expired or the unit is damaged due to misuse.

Call Technical Service at 800-356-1688 or 814-353-1300, ext. 4 (or your Restek representative) if you have any questions about this product or any other Restek product.

10.0 Product back label legend

Description

- 1 Product name
- 2 Company name
- 3 This unit conforms to EU/EMC Directive 2004/108/EC; standards to which conformity is declared include 61326:1997 w/A3 Class A.
- 4 This Class A digital apparatus complies with Canadian ICES-003.
- 5 This complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
- 6 Country of origin
- 7 Product catalog number
- 8 Company address
- 9 This unit is WEEE compliant.
- 10 This unit is RoHS compliant.
- 11



Ex nL	EN60079-0: 2006; Electrical apparatus for explosive gas atmospheres- Part 0: General Requirements. EN60079-15: 2005; Electrical apparatus for explosive gas atmospheres- Part 15: Construction, test and marking of type of protection "nL" energy limited apparatus.
IIC	Group II applies to areas above ground environments. Gas Group IIC relates to hydrogen and related gas types.
3G	Category 3 relating to gas analysis; normal safety measure. Sufficient safety during normal operation. Normal operation described as measuring flows of flammable or explosive gases in a nonflammable environment.
T6	During testing neither internal nor external elements exceed 85°C.
X	Additional information: Operating range: $32^{\circ}\text{F} \leq \text{Tamb} \leq 120^{\circ}\text{F}$ $0^{\circ}\text{C} \leq \text{Tamb} \leq 48^{\circ}\text{C}$ Not intended for outdoor use or wet locations.
2009	Year of product design release.

11.0 Volumetric vs. mass flow measurements

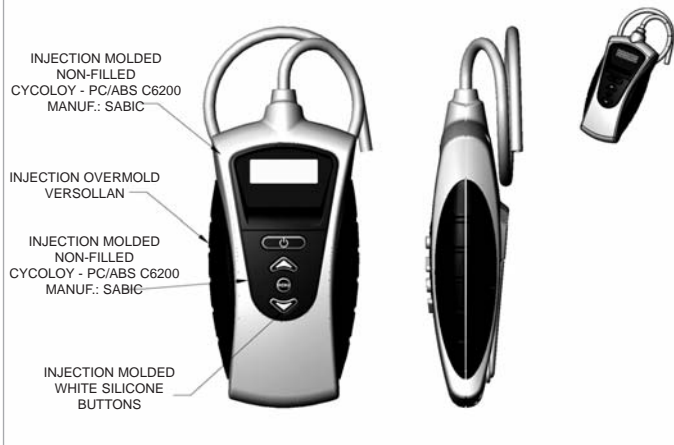
The Restek ProFLOW 6000 is a volumetric flow measurement device. Volumetric flow is the measurement of the volume of gas through a conveyance per quantity of time. Standard units of measure for this parameter are given in mL/min. The advantage of measuring volumetric flow is its independence to the composition of the flow gas. It is not necessary to correct the flow values based on the gas composition, as is required for mass flow devices.

Mass flow measures the weight of the gas flowing through the instrument per quantity of time. Mass flow units of measure are commonly g/sec.

12.0 Bubble flowmeter measurements

If you employ bubble flowmeters in your laboratory, you may find they give slightly different flow rate values than the Restek ProFLOW 6000. This error is due to technology limitations inherent in the bubble flowmeter device; error from variances in air humidity within the bubble chamber and its direct contribution to the measured flow rate. In the event a bubble flowmeter is used to measure flow gas where the gas is at elevated temperatures, the error due to humidity contributions can be extreme. For the most accurate measurement of laboratory gas flow rates, we recommend using the Restek ProFLOW 6000 over bubble flowmeters.

13.0 Product case specifications



14.0 Calibration and service

The Restek ProFLOW 6000 comes factory calibrated and carries a one year warranty from time of purchase. All units are calibrated to NIST traceable standards.

Recommended schedule for recalibration is once every year from time of purchase. Customers will need to return the unit to Restek for recalibration. At that time, preventative maintenance services can also be performed. A fee will be charged for recalibration and servicing of the unit. Prolonged failure to recalibrate the instrument may result in increased error.

**Call Technical Service at 800-356-1688 or 814-353-1300, ext. 4 (or your Restek representative)
if you have any questions about this product or any other Restek product.**

Please have the serial number available when calling Restek with any concerns you may have.
Additional charges may apply if the warranty is expired or the damage is due to misuse.

This manual is also available in electronic format at **www.restek.com**.

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NEW Restek Electronic Leak Detector

Ever have a small leak turn into a costly repair?
Protect your data and analytical column by using a Restek Leak Detector!

- Optimized sample flow path.
- A sleek, new ergonomic, hand-held design.
- Rugged side grips for added durability.
- Handy probe storage for cleanliness.
- Longer lasting battery, up to 6 hours of continuous use.
- Automatic shut-off capabilities.
- A convenient carrying and storage case.
- A universal charger set (US, European, UK and Australian plugs included).

Backed by a 1 year warranty, the new Restek Leak Detector will again set an industry standard for performance and affordability in a hand-held leak detector.

Contact your local
Restek representative to
**order yours
TODAY!**



Carrying/storage case included with purchase of unit.

Leak Detector Facts

Detectable Gases:	helium, nitrogen, argon, carbon dioxide, hydrogen
Battery:	Rechargeable Ni-MH internal battery pack (6 hours normal operation)
Operating Temp. Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
Warranty:	one year
Certifications:	CE, Japan
Compliance:	WEEE, RoHS

Detection Limits

Gas	Minimum Detectable Leak Rate (atm cc/sec.)	Indicating LED Light Color
Helium	1.0×10^{-5}	Red
Hydrogen**	1.0×10^{-5}	Red
Nitrogen	1.4×10^{-3}	Yellow
Argon	1.0×10^{-4}	Yellow
Carbon Dioxide	1.0×10^{-4}	Yellow

Restek's Competitive Advantage

	Restek Leak Detector	Agilent 63388A Leak Detector
Probe Storage	✓	
Ergonomic Design	✓	
Hand Grips	✓	
Optimized Sample Flow Path	✓	
Storage Case	✓	
LED Leak Strength Indicator	✓	
6-Hour Battery	✓	

Avoid using liquid leak detectors on a capillary system! Liquids can be drawn into the system.

Caution: The Restek Electronic Leak Detector is NOT designed for determining leaks in a combustible environment. A combustible gas detector should be used for determining combustible gas leaks under any condition. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.



Soft-side storage case is ideal for storing your leak detector in smaller spaces such as your tool box.



Verify hard-to-reach leaks using the small probe adaptor.

Description	qty.	cat.#
Leak Detector with Universal Charger Set (US, UK, European, Australian)	ea.	22839
Soft-Side Carry/Storage Case	ea.	22657
Small Probe Adaptor	ea.	22658

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Restek's Electronic Leak Detector

(cat.# 22839)



Instruction Manual

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Restek Electronic Leak Detector

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Operating Instructions

1.0 Introduction

Restek's portable Leak Detector is specifically designed for use with gas chromatography (GC) systems. It detects minute leaks of any gas with a thermal conductivity different from air. The reference gas inlet (Figure 1) draws in ambient air for comparison to air drawn into the sample probe. A leak is indicated by both an LED light display and an audible alarm.

Restek's Leak Detector is manufactured by Restek so you are assured of the same Restek quality and service you have come to recognize with the Restek name.

Should you require assistance at anytime regarding our Leak Detector, please contact Restek Technical Service at 1-800-356-1688 or 814-353-1300, ext. 4.

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2.0 Battery Charging:

Only use the universal charger provided. The Leak Detector should be fully charged prior to use. When the unit's charge is low, the green battery indicator LED light will begin to blink when the unit is powered up (Figure 1). The Leak Detector cannot be used during the charging cycle.

Unit status while engaged with the wall charger	Charge LED Condition
Pre-charge qualification (immediately following plug-in)	1Hz flash
Unit is charging	Continuous on
Unit is fully charged	Off

NOTE: Replacement of the rechargeable cells in this unit is performed at the factory. There are no serviceable parts in this unit. Opening the case or tampering with the internal parts will void the factory warranty.

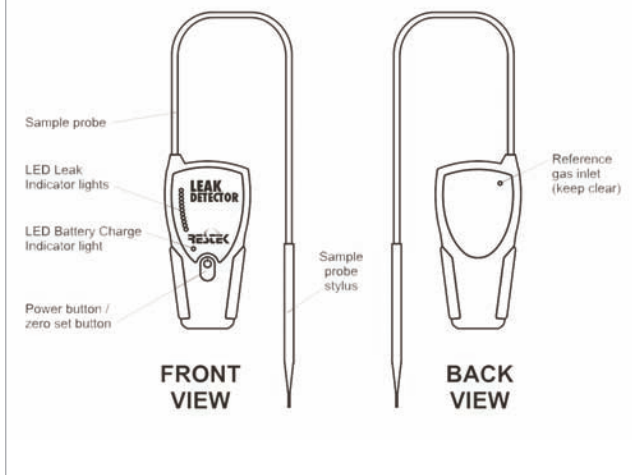
3.0 Powering Up

Depress and hold the power button (Figure 1) until the unit responds with the wake-up mode. The leak detector will run through a self-calibration sequence for approximately 15 seconds. During this time **DO NOT** attempt to zero the unit.

4.0 Zeroing the Unit

After the LED lights stop flashing, the unit is ready for use. The instrument may need to be zeroed periodically between uses, especially if it is moved from room to room, or between areas of differing temperature or humidity. Do not attempt to zero the unit while the probe is stored in the holder. The probe **MUST** be removed from the storage container before zeroing the unit. To re-zero, press the Zero switch. The unit will run a self-calibration sequence for approximately 4 seconds. When all LED lights stop flashing and the green LED light is lit, the unit is ready for use.

Figure 1 Leak Detector schematic.



NOTE: To avoid false read

5.0 Prior to Operation

Verify the operation of the Leak Detector before each use by sampling gas from a GC split vent, or other source of hydrogen or helium. Also, visually inspect the probe tip, reference gas inlet, and exhaust port for obstructions (Figure 1).

IMPORTANT: *Fittings being checked must be clean and dry; liquid leak detecting agents, dust, and other debris may damage the Leak Detector if drawn into the probe.*

The Leak Detector responds to almost any gas you can smell, and many gases that you can't smell. Solvent vapors, split vent exhaust, or even strong air currents around the probe or reference inlet can cause instability or false positive readings. Be careful not to breathe into the reference inlet when checking for leaks or to cover/block the inlet with your hand.

6.0 Detecting Leaks

Slowly move the probe tip around fittings and other potential leak sources. If the Leak Detector senses a gas other than air, the LED bar graph will begin to light, and an alarm will sound when the last LED light illuminates. The red LED lights indicate helium and hydrogen leaks. The yellow LED lights indicate a nitrogen, argon, or carbon dioxide leak. Remove the probe from the vicinity of the leak and allow the unit to return to zero. If a large amount of gas has entered the probe, it may take a few seconds for the instrument to clear itself. Please do not attempt to zero the unit while it is clearing out the gas from the probe. This may cause the unit to malfunction. Place the probe near the leak again to confirm its location. The reference gas inlet (Figure 1) must not be restricted or the unit will not operate correctly. Similarly, the exhaust port allows the gas being tested to exit the Leak Detector and must remain unobstructed. The exhaust port is located in the probe docking station.

CAUTION: *This unit is **NOT** designed for determining leaks of combustible gases. A combustible gas detector should be used for determining combustible gas leaks in a hazardous environment.*

7.0 Specifications

Power Rating: 12 Volts DC (battery charger supplied)

Battery Rating: 6 hours normal operation

Operating Temp. Range: 32°C

Humidity Range: 0–97%

Warranty: One year warranty.

Certifications: CE and Japan

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8.0 Maintenance

Avoid spilling liquids onto the unit or it may malfunction. If a liquid is spilled onto the unit, turn off the power immediately, remove heavy liquids with a dry towel, and let the unit sit until the liquid dries. Dust and debris can enter the probe tip of the Leak Detector and, over time, can clog the small-bore tubing inside the unit. To prevent this, clean the probe tip periodically. To clean the probe tip, unscrew the cap to expose the brush (Figures 2 and 3). Gently clean the brush, using a small brush or your fingers to remove dust and debris, then replace the cap. Do not use liquids to clean the probe. Liquids can damage the Leak Detector if drawn in through the probe.

Information on where to have the unit sent for maintenance or service is listed at the end of this document.

Figure 2 Cap unscrewed and partially removed.



Figure 3 Cap removed, exposing probe tip brush for cleaning.



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9.0 Troubleshooting

Problem	Possible Cause	Suggested Solution
Sensitivity decreased	Probe clogged Probe line punctured Weak battery	Clean the probe tip to remove any debris Visually inspect probe line for holes* Recharge or return to Restek for battery replacement*
Response decreased	Detector not zeroed	Re-zero detector
LED bar graph stays lit during operation	Detector re-zeroed before unit was purged out Reference gas inlet covered by hand or other object	Allow adequate time for detector to purge, then re-zero Remove obstruction

**Contact Restek or your Restek representative for return instructions for servicing a damaged unit. Additional charges may apply if the warranty has expired or the unit is damaged due to misuse.*



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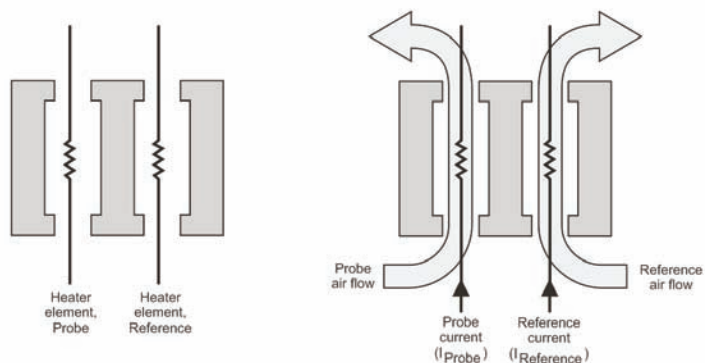
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10.0 Technology

The Leak Detector measurement is based on thermal conductivity comparisons between the probe air and a reference air. The device employs a dual thermistor technology which measures the ratio of [probe]:[reference] heat exchange values and displays the results on an LED scale (Figure 4). Under ideal operating conditions, a ratio of 1:1 indicates identical air samples for both [probe] and [reference], and therefore no leak is present.

Figure 4 Schematic layout of the Leak Detector technology.



LEFT: Dual analysis is achieved with heater elements positioned in separate flow chambers.

RIGHT: Probe and reference air streams are simultaneously monitored for thermal conductivity. Differences in air composition are indicated by differences in the heater element currents.

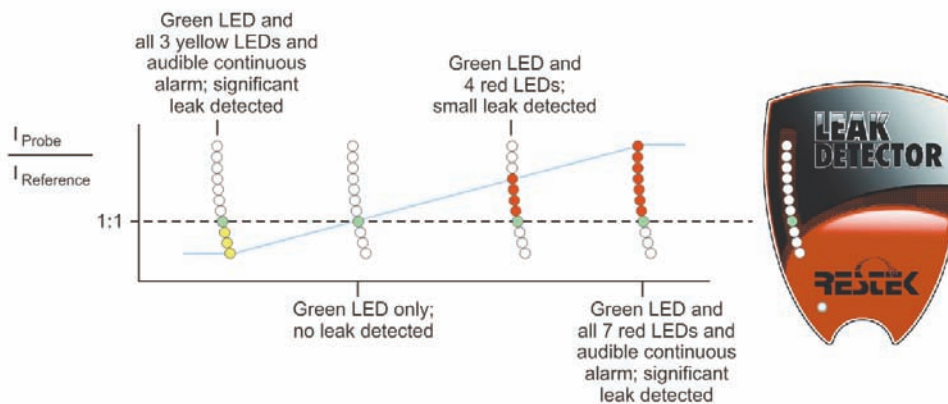
Because of slight differences in air temperature and/or humidity between the reference inlet (Figure 1) and the probe tip, a small response indicated by a single red or yellow LED light is generally insufficient to positively identify a gas leak. Small to moderate leaks are reliably indicated with four red LED lights, larger leaks are indicated with all red LED lights or yellow LED lights lit and the continuous alarm is audible.

11.0 Interpreting the Results

Figure 5 illustrates the Leak Detector's LED light response range. The greater the number of red or yellow LED lights lit correlates in general to the size of the leak. **NOTE:** The Leak Detector is not a quantitative device, rather it is designed to detect leaks in gas line connections commonly associated with laboratory equipment

Gas	Minimum Detectable Leak Rate (atm cc / sec.)	Indicating LED Light Color
Helium	1.0×10^{-5}	Red
Hydrogen**	1.0×10^{-5}	Red
Nitrogen	1.4×10^{-3}	Yellow
Argon	1.0×10^{-4}	Yellow
Carbon dioxide	1.0×10^{-4}	Yellow

Figure 5 LED light response chart for the Leak Detector. A 1:1 ratio of $I_{\text{Probe}} : I_{\text{Reference}}$ indicates no leak present. Red LED lights indicate the presence of one or more of the following gases: helium or hydrogen. Yellow LED lights indicate the presence of one or more of the following gases: nitrogen, argon, or carbon dioxide.



**This unit is NOT designed for determining combustible gas leaks in a hazardous environment.

combustible gas leaks in a

Tip drift

Tip drift is the phenomenon when a false LED light response is registered as the unit is quickly turned or swept in dramatic arc movements. Tip drift is inherent to all dual thermistor leak detector technology and is based in large part on the asymmetry of the flow cells; shaking or tipping the unit influences the air flow profiles which impacts the rates of heat exchange. If the device is functioning normally, the LED light signal will return to zero in 3-5 seconds after the unit is held still. In extreme cases, the unit may require another 'zero' cycle before using. To avoid tip drift, be sure to hold the unit steady while making measurements.

12.0 Service

The Restek Leak Detector carries a one year limited warranty from time of purchase. Please have the Leak Detector serialn Number available when calling Restek with any concerns you may have. Additional charges may apply if the warranty is expired or the damage is due to misuse.

Expected battery lifetime is two years from time of purchase. Customers will need to return the unit to Restek for battery replacement. At that time, preventative maintenance services can also be performed on the unit. A fee will be charged for servicing the unit.

For questions, problems, repair services:

Within the USA:

Call Restek Technical Service at 800-356-1688 or 814-353-1300, ext. 4

Outside the USA:

Contact your Restek representative

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GasCon Systems

(Australian Standard)

Cylinder Pressure Regulators

Brass-Body



**401
High
Purity**

Single-Stage



**411
High
Purity**

Dual-Stage

also available

**SS-Body : Corrosive Gases
CGA(-180,N2) Bottle Thread**

see also Restek CGA Regulators & Accessories

Gascon Systems Single Stage Regulators



The Gascon Systems range of single stage regulators are manufactured from brass bar stock and are recommended for use in non-corrosive gas applications. Versions are available for industrial, laboratory, medical and scientific grade gases.

Wide range of options including; inlet connection orientations, inlet fittings (eg. AS, CGA, BS, DIN, AFNOR), diaphragm materials, outlet pressure ranges, ventable pressure relief valves, internal flow restrictors for pressure charging systems, preset outlet pressure models, different seat configurations for different flow/pressure characteristics, wall mount brackets and panel mount kits.

Specifications:

Max. Inlet Pressure: 20,000 kPa @ 15°C
(31,500 kPa optional)

Outlet Pressures: 0 – 20,000 kPa

Gauges: 50mm diameter brass

Body Ports: 1/4" NPT (F)

Weight: 1.4 kg

Materials:

Body: Chrome plated brass bar stock

Bonnet: Chrome plated brass

Seat: PCTFE or PTFE

Filter: 63 micron cupro nickel

Diaphragm: Neoprene; EDPM; PTFE coated neoprene; or 316L stainless steel

- Encapsulated seat assembly with built-in filter
- Bar Stock body
- Maximum outlet pressure adjusting stop
- Colour coded control knobs
- Australian made

Applications:

- For use in non-corrosive gas applications
- Where a slight variation in delivery pressure is acceptable as cylinder contents pressure decreases
- Regulator is used for intermediate short periods of time
- Used with liquefied gas supplies
- Laboratory reticulation system supply regulator.

ORDERING INFORMATION XX - X - X - X - XXXX - XXX - XXX - XXX - XX - XXXX

Model	Ports	Inlet	Pressure Adjustment	Outlet Pressure	Optional Fittings	Inlet Fitting	Outlet Fitting	Options	Gas
R Standard (up to grade 3.5)	2	V Vertical	A Adjustable	Required	G Inlet Gauge	T10 (AS2473 Type 10)	4F (1/4" Female Port)	WM Wall Mount Bracket	ACET Acetylene
PR Laboratory (up to grade 4.5)	3	S Side	P Preset	Outlet	GG Inlet & Outlet Gauge	T11 (AS2473 Type 11)	2S (1/8" Tube Fitting)		AIR Air
HR High Purity (up to grade 5.5)	4	R Rear		Pressure in kPa	P Pressure Relief Valve	T20 (AS2473 Type 20)	4S (1/4" Tube Fitting)	PM Panel Mount Bracket	AR Argon
MR Medical	5				GGP 2 Gauges & PRV	T30 (AS2473 Type 30)	6S (3/8" Tube Fitting)		CO Carbon Monoxide
	6					T50 (AS2473 Type 50)	8S (1/2" Tube Fitting)		CO2 Carbon Dioxide
						T51 (AS2473 Type 51)	2M (1/8"NPT male)		HE Helium
						T60 (AS2473 Type 60)	4M (1/4" NPT male)		H2 Hydrogen
						T61 (AS2473 Type 61)	6M (3/8" NPT male)		LPG Propane
						320 (CGA320)	8M (1/2" NPT male)		METH Methane
						330 (CGA330)	2B (1/8" hose barb)		N2 Nitrogen
						350 (CGA350)	4B (1/4" hose barb)		N2O Nitrous Oxide
						510 (CGA510)	8B (1/2" hose barb)		OXY Oxygen
						540 (CGA540)	FA (fine adjust valve)		SF6 Sulfur Hexafluoride
						580 (CGA580)	58R (5/8"-18UN RH)		OTHERS by Symbol
						Y (Medical Yoke)	58L (5/8"-18UN LH)		
						4F (1/4" Female NPT)	SIS (medical sleeve indexed system)		
						Others by Description	Others by Description		

Ordering examples

HR-5-V-A-1000-GGP-T20-4S-H2

Scientific hydrogen single stage regulator, vertical Type 20 inlet, adjustable to 1000 kPa, inlet and outlet gauges, pressure relief valve and 1/4" brass tube outlet fitting

MR-4-S-P-400-GP-Y-SIS-AIR

Medical air single stage regulator, side pin indexed yoke inlet, preset 400 kPa, inlet gauge, pressure relief valve and a sleeved indexed outlet fitting

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SYSTEMS

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GC Systems Dual Stage Regulators



- Encapsulated seat assembly with built-in filter
- Bar Stock body
- Maximum outlet pressure adjusting stop
- Australian made

Applications:

- For use in non-corrosive gas applications
- Where a constant delivery pressure is required as cylinder contents pressure decreases
- Regulator is used for continuous long periods of time
- Laboratory reticulation system supply regulator

The GC Systems range of dual stage regulators are manufactured from brass bar stock and are recommended for use in non-corrosive gas applications. Versions are available for industrial, laboratory, medical and scientific grade gases.

Wide range of options including; inlet connection orientations, inlet fittings (eg. AS, CGA, BS, DIN, AFNOR), diaphragm materials, outlet pressure ranges, ventable pressure relief valves, preset outlet pressure models, different seat configurations for different flow/pressure characteristics, and panel mount kits.

Specifications:

Max. Inlet Pressure: 20,000 kPa @ 15°C
(31,500 kPa optional)

Outlet Pressures: 0 – 5,000 kPa

Gauges: 50mm diameter brass

Body Ports: 1/4" NPT (F)

Weight: 2.1 kg

Materials:

Body: Chrome plated brass bar stock

Bonnet: Chrome plated brass

Seat: PCTFE or PTFE

Filter: 63 micron cupro nickel

Diaphragm: Neoprene; EDPM; PTFE coated neoprene; or 316L stainless steel

ORDERING INFORMATION XX - X - X - X - XXXX - XXX - XXX - XXX -XXX - XXXX

Model	Ports	Inlet	Pressure Adjustment	Outlet Pressure	Optional Fittings	Inlet Fitting	Outlet Fitting	Options	Gas
D Standard (up to grade 3.5)	2	V Vertical	A Adjustable	Required	G Inlet Gauge	T10 (AS2473 Type 10)	4F (1/4" Female Port)	PM Panel Mount Bracket	ACET Acetylene
PD Laboratory (up to grade 4.5)	3	S Side	P Preset	Outlet Pressure in kPa	GG Inlet & Outlet Gauge	T11 (AS2473 Type 11)	2S (1/8" Tube Fitting)		AIR Air
HD High Purity (up to grade 5.5)	4				P Pressure Relief Valve	T20 (AS2473 Type 20)	4S (1/4" Tube Fitting)		AR Argon
MD Medical	5				GGP 2 Gauges & PRV	T30 (AS2473 Type 30)	6S (3/8" Tube Fitting)		CO Carbon Monoxide
	6				GGPP 2 Gauges & 2 PRV's	T50 (AS2473 Type 50)	8S (1/2" Tube Fitting)		CO2 Carbon Dioxide
						T51 (AS2473 Type 51)	2M (1/8" NPT male)		HE Helium
						T60 (AS2473 Type 60)	4M (1/4" NPT male)		H2 Hydrogen
						T61 (AS2473 Type 61)	6M (3/8" NPT male)		LPG Propane
						320 (CGA320)	8M (1/2" NPT male)		METH Methane
						330 (CGA330)	2B (1/8" hose barb)		N2 Nitrogen
						350 (CGA350)	4B (1/4" hose barb)		N2O Nitrous Oxide
						510 (CGA510)	8B (1/2" hose barb)		OXY Oxygen
						540 (CGA540)	FA (fine adjust valve)		SF6 Sulfur Hexafluorid
						580 (CGA580)	58R (5/8"-18UN RH)		OTHERS by Symbol
						Y (Medical Yoke)	58L (5/8"-18UN LH)		
						4F (1/4" Female NPT)	SIS (medical sleeve indexed system)		
						Others by Description	Others by Description		

Ordering examples

HD-5-V-A-700-GGP-T10-4ST-OXY Scientific oxygen dual stage regulator, vertical Type 10 inlet, adjustable to 700 kPa, inlet and outlet gauges, pressure relief valve and 1/4" stainless steel tube outlet fitting

PD-5-S-A-100-GP-Y-4B-CO2 Medical carbon dioxide dual stage regulator, side pin indexed yoke inlet, adjustable to 100 kPa, inlet and outlet gauges, pressure relief valve and a 1/4" hose barb outlet

401 Series Single Stage Brass Bodied Scientific Regulator



The 401 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases, or where minor fluctuations in outlet pressure (as gas supply diminishes) can be tolerated.

- Pressure ranges of 0-15 to 0-500 PSI are available to cater for a broad range of applications
- Brass barstock body means a smoother surface finish
- Versatility of configuring the regulator with either front or rear panel mounting
- Metal-to-metal diaphragm seal prevents gas contamination
- Capsule seat design for greater serviceability and life
- 316L stainless steel diaphragm
- Leak test certificate

Specifications:

Max. Inlet Pressure: 3000 PSI (210 BAR)
4500 PSI (310 BAR) Option

Gauges: 2" diameter brass, (chrome plated)

Temperature Range: -40° C to 60° C

Body Ports: 1/4" FPT

Helium Leak Integrity: 1×10^{-9} scc/sec

Cv: 0.1

Weight: 1.8 kg

Materials:

Body: Brass bar stock

Bonnet: Chrome plated brass

Seat: PTFE
PCTFE with 4500 PSI inlet option

Filter: 10 micron sintered bronze

Diaphragm: 316L stainless steel

Internal Seals: PTFE

ORDERING INFORMATION

S401 - XXX - XXX - XXX - XX

Series	Outlet Pressure	Inlet Fitting	Outlet Fitting	Options
401	15 (0-15 psi)	T10 (AS2473 Type 10)	4F (1/4" NPT Female)	Inlet Purge
	50 (0-50 psi)	T20 (AS2473 Type 20)	2S (1/8" Tube)	Captured Bonnet Vent
	100 (0-100 psi)	T30 (AS2473 Type 30)	4S (1/4" Tube)	Panel Mount Kit
	150 (0-150 psi)	T50 (AS2473 Type 50)	8S (1/2" Tube)	Wall Mount Bracket
	250 (0-250 psi)	T60 (AS2473 Type 60)	2B (1/8" Hose Barb)	
	500 (0-500 psi)	350 (CGA350)	4B (1/4" Hose Barb)	
		540 (CGA540)	FA (Fine adjust valve)	
		580 (CGA580)	4M (1/4" NPT Male)	
		4F (1/4" NPT Female)	DK (1/4" Diaphragm valve)	
		Othe		

401 Series Regulator

Single Stage
Brass Barstock Body
Six-Port
Configuration
316L Stainless Steel
Diaphragm



401-1331 shown

The 401 Series regulators are intended for primary pressure control of noncorrosive, high purity or liquefied gases, or for applications where minor fluctuations in outlet pressure due to diminishing inlet supply can be tolerated.

Typical Applications

- Gas and liquid chromatography
- High purity carrier gases
- Zero, span and calibration gases
- High purity chamber pressurization
- Liquefied hydrocarbon gas control
- Control of cryogenic gases

Advanced Features

- Brass barstock body
Smooth surface finish
- Front and rear panel mountable
Versatile system configuration
- Pressure ranges 0-15 to 0-500 PSIG
Broad range of applications

400 Advantage

- *Metal-to-metal diaphragm seal*
No possibility of gas contamination
- *Capsule® seat*
Increased serviceability and life
- *316L stainless steel diaphragm*
No inboard diffusion
- *Orientable captured vent capable*
Safety in any installation
- *Low wetted surface area*
Minimal purge requirements
- *Field-adjustable pressure limit*
Safeguard downstream equipment
- *Pipe away relief valve*
Safely vent exhaust gases
- *Delivery pressure range easily changed*
Maximum flexibility

Materials

Body
Brass barstock

Bonnet
Chrome Plated barstock

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

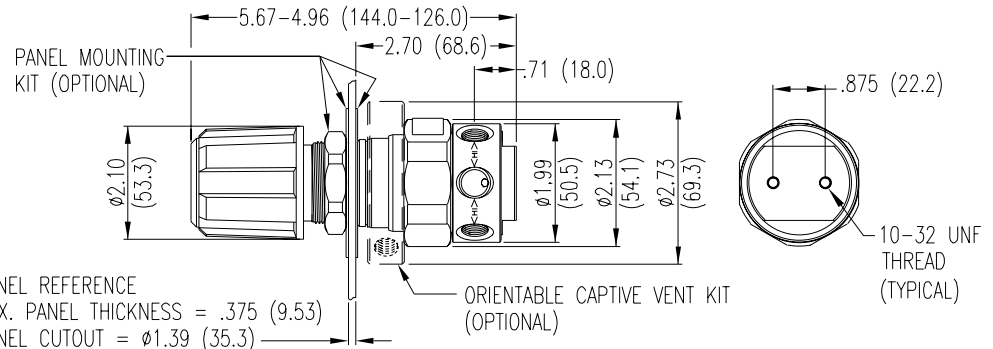
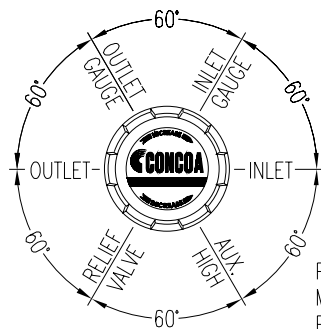
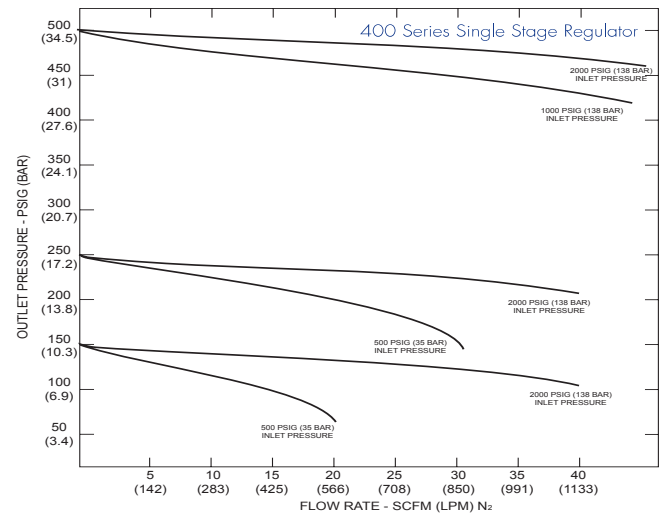
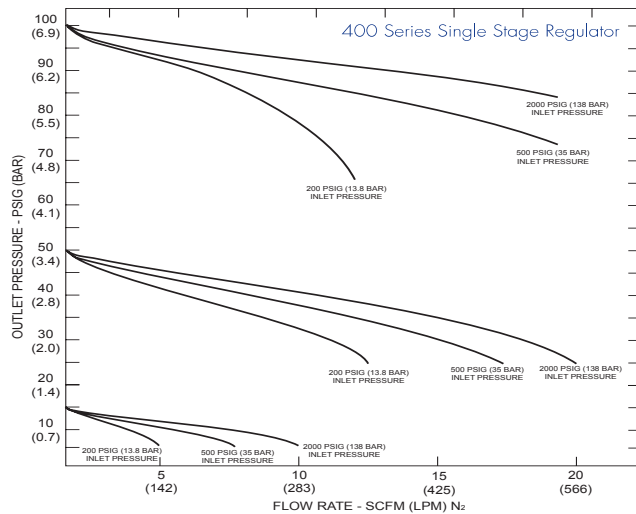
Gauges
2" diameter chrome plated

Ports
1/4" FPT

Helium Leak Integrity
1 x 10⁻⁹ scc/sec

Cv
0.1

Weight (401-1331-580)
3.99 lbs. (1.81 kg)



Ordering Information *(For information about how to use this table please see page 4.)*

401	A	B	C	D	-Inlet	Options
Series 401	Outlet Pressure 1: 0-15* 30"-0-30 PSIG 2: 0-50 30"-0-100 PSIG 3: 0-100 30"-0-200 PSIG 4: 0-250 0-400 PSIG 5: 0-500** 0-1000 PSIG 7: 0-150 30"-0-200 PSIG <i>*Not available with 4500 PSIG maximum inlet pressure</i> <i>**Standard assembly does not include relief valve</i>	Inlet Gauge 0: None 3: 0-4000 PSIG 5: 0-1000 PSIG 6: 0-300 PSIG 7: 0-400 PSIG 8: 0-6000 PSIG* <i>*Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE Seat Capsule</i>	Outlet Assemblies 0: ¼" FPT Port 1: ¼" MPT 2: ¼" Tube Fitting 3: Diaphragm Valve ¼" Tube Fitting 4: Diaphragm Valve ¼" MPT 5: Needle Valve ¼" MPT 6: 1/8" Tube Fitting 7: 1/8" Tube Fitting 8: Diaphragm Valve 1/8" Tube Fitting 9: Diaphragm Valve ¼" FPT A: 1/8" BSP Right Hand Fitting M: 6mm Tube Fitting S: Diaphragm Valve 6mm Tube Fitting	Assembly/ Gauges 0: Bare Body 1: Standard Assembly (PSIG/kPa Gauges) 2: Standard Assembly (BAR/PSIG Gauges) 4: Cleanroom Assembly (PSIG/kPa Gauges) 5: Cleanroom Assembly (BAR/PSIG Gauges)	Inlet Connections 000: ¼" FPT TF2: 1/8" Tube TF4: ¼" Tube TF6: 1/8" Tube M06: 6mm Tube	Installed Options A: Protocol Alarm Station (110V) B: Protocol Alarm Station (220V) C: Protocol Switchover Station D: Deep Purge* G: Protocol Switchover Station with Alarm (110V) H: Protocol Switchover Station with Alarm (220V) M: Protocol Station <i>*Not available with 4500 PSIG max inlet pressure</i>
Related Options		<ul style="list-style-type: none"> • Panel Mount Kit (550-0002) • Captured Vent Kit (550-0001) • Helium Leak Certification (476-0002) 				

411 Series

Dual Stage Brass Bodied Scientific Regulator



The 411 Series regulators are intended for primary pressure control of non-corrosive, high purity or liquefied gases for applications requiring constant pressure control and delivery regardless of supply pressure variations.

- Pressure ranges of 0-15 to 0-400 PSI are available to cater for a broad range of applications
- Brass barstock body means a smoother surface finish
- Front panel mountable that is easily installed
- Metal-to-metal diaphragm seal prevents gas contamination
- Capsule seat design for greater serviceability and life
- 316L stainless steel diaphragm
- Leak test certificate

Specifications:

Max. Inlet Pressure: 3000 PSI (210 BAR)
4500 PSI (310 BAR) Option

Gauges: 2" diameter brass, (chrome plated)

Temperature Range: -40° C to 60° C

Body Ports: 1/4" FPT

Helium Leak Integrity: 1×10^{-9} scc/sec

Cv: 0.1

Weight: 2.4 kg

Materials:

Body: Brass bar stock

Bonnet: Brass bar stock

Seat: PTFE
PCTFE with 4500 PSI inlet option

Filter: 10 micron sintered bronze

Diaphragm: 316L stainless steel

Internal Seals: PTFE

ORDERING INFORMATION

S411 - XXX - XXX - XXX - XX

Series	Outlet Pressure	Inlet Fitting	Outlet Fitting	Options
411	15 (0-15 psi)	T10 (AS2473 Type 10)	4F (1/4" NPT Female)	Inlet Purge
	50 (0-50 psi)	T20 (AS2473 Type 20)	2S (1/8" Tube)	Captured Bonnet Vent
	100 (0-100 psi)	T30 (AS2473 Type 30)	4S (1/4" Tube)	Panel Mount Kit
	150 (0-150 psi)	T50 (AS2473 Type 50)	8S (1/2" Tube)	
	250 (0-250 psi)	T60 (AS2473 Type 60)	2B (1/8" Hose Barb)	
	400 (0-400 psi)	350 (CGA350)	4B (1/4" Hose Barb)	
		540 (CGA540)	FA (Fine adjust valve)	
		580 (CGA580)	4M (1/4" NPT Male)	
		4F (1/4" NPT Female)	DK (1/4" Diaphragm valve)	
		Others by description	Others by description	

411 Series Regulator

Dual Stage
Brass Barstock Body
Six-Port
Configuration
316L Stainless Steel
Diaphragm



411-1331 shown

The 411 Series regulators are intended for primary pressure control of noncorrosive, high purity or liquefied gases for applications requiring constant pressure control and delivery regardless of supply pressure variations.

Typical Applications

- EPA Protocol gases
- Gas and liquid chromatography
- High purity carrier gases
- Zero, span and calibration gases
- High purity chamber pressurization

Advanced Features

- Brass barstock body
Smooth surface finish
- Front panel mountable
Easy installation
- 10 micron filtration in both stages
Fail-safe seat performance
- Pressure ranges 0-15 to 0-250 PSIG
Broad range of applications

400 Advantage

- *Metal-to-metal diaphragm seal*
No possibility of gas contamination
- *Capsule® seat*
Increased serviceability and life
- *316L stainless steel diaphragm*
No inboard diffusion
- *Orientable captured vent capable*
Safety in any installation
- *Low wetted surface area*
Minimal purge requirements
- *Field-adjustable pressure limit*
Safeguard downstream equipment
- *Pipe away relief valve*
Safely vent exhaust gases
- *Delivery pressure range easily changed*
Maximum flexibility

Materials

Body
Brass barstock

Bonnet
Chrome-Plated Brass barstock

Seat
PTFE
PCTFE with 4500 PSIG inlet option

Filter
10 micron sintered bronze

Diaphragm
316L stainless steel

Internal Seals
PTFE

Specifications

Maximum Inlet Pressure
3000 PSIG (210 BAR)
4500 PSIG (310 BAR) optional

Temperature Range
-40°F to 140°F (-40°C to 60°C)

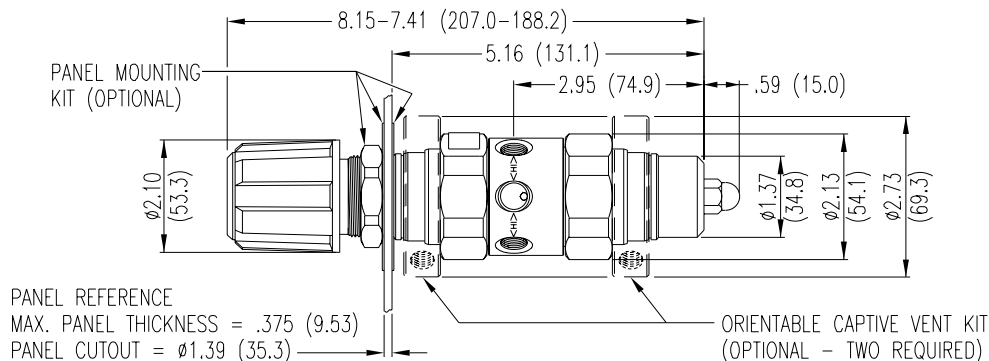
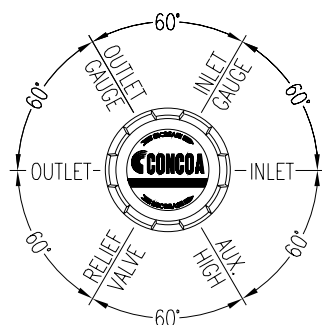
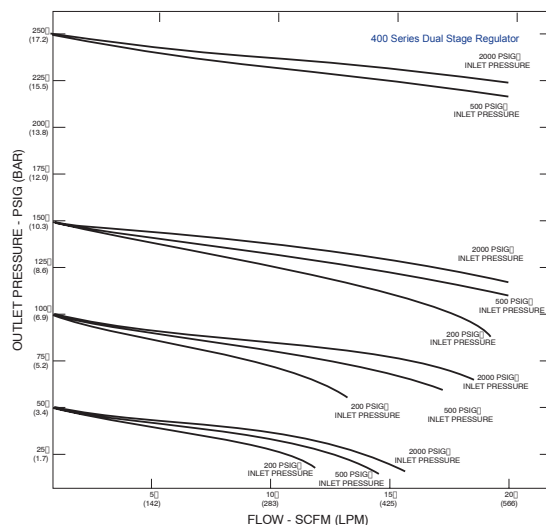
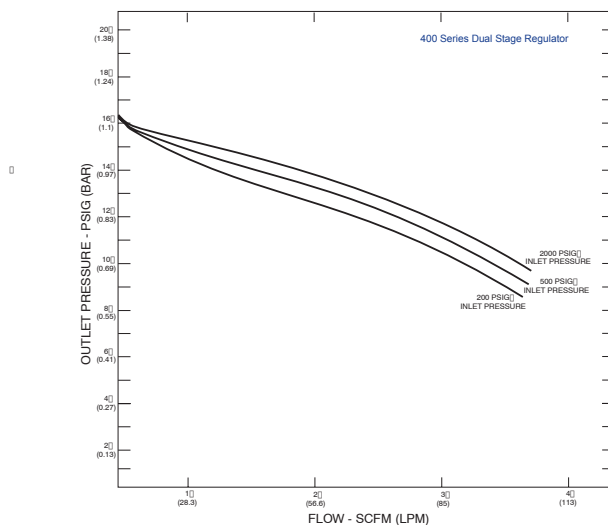
Gauges
2" diameter Chrome Plated

Ports
1/4" FPT

Helium Leak Integrity
1 x 10⁻⁹ scc/sec

Cv
0.1

Weight (411-2331-580)
5.3 lbs. (2.40 kg)



Ordering Information *(For information about how to use this table please see page 4.)*

411	A		B	C	D	-Inlet	Options
Series 411	Outlet Pressure	Outlet Gauge	Inlet Gauge	Outlet Assemblies	Assembly/ Gauges	Inlet Connections	Installed Options
	1: 0-15	30"-0-30 PSIG	0: None	0: ¼" FPT Port	0: Bare Body	000: ¼" FPT	A: Protocol Alarm Station (110V)
	2: 0-50	30"-0-100 PSIG	3: 0-4000 PSIG	1: ¼" MPT	1: Standard Assembly (PSIG/kPa Gauges)	TF2: 1/8" Tube	B: Protocol Alarm Station (220V)
	3: 0-100	30"-0-200 PSIG	5: 0-1000 PSIG	2: ¼" Tube Fitting	2: Standard Assembly (BAR/PSIG Gauges)	TF4: ¼" Tube	C: Protocol Switchover Station
	4: 0-250	0-400 PSIG	6: 0-300 PSIG	3: Diaphragm Valve ¼" Tube Fitting	4: Cleanroom Assembly (PSIG/kPa Gauges)	TF6: 1/8" Tube	D: Deep Purge*
	7: 0-150	30"-0-200 PSIG	7: 0-400 PSIG	4: Diaphragm Valve ¼" MPT	5: Cleanroom Assembly (BAR/PSIG Gauges)	M06: 6mm Tube	G: Protocol Switchover Station with Alarm (110V)
			8: 0-6000 PSIG*	5: Needle Valve ¼" MPT		CGA DIN 477 BS 341 and others available	H: Protocol Switchover Station with Alarm (220V)
			*Maximum inlet pressure 4500 PSIG (310 BAR) with PCTFE Seat Capsule®	6: 1/8" Tube Fitting			M: Protocol Station
				7: 3/8" Tube Fitting			*Not available with 4500 PSIG max inlet pressure
				8: Diaphragm Valve 1/8" Tube Fitting			
				9: Diaphragm Valve ¼" FPT			
				A: 3/8" BSP Right Hand Fitting			
				M: 6mm Tube Fitting			
				S: Diaphragm Valve 6mm Tube Fitting			

Related Options

- Panel Mount Kit (550-0002)
- Captured Vent Kit (550-0001)
- Helium Leak Certification (476-0002)

492 Series Regulator

*Single Stage
Piston-Sensed
Ultra-High
Pressure
Chrome-Plated
Brass Barstock Body*



492-5952 shown

The 492 Series regulators are intended for primary pressure control of non-corrosive gases at a maximum inlet pressure of 6000 PSIG.

Typical Applications

- Airplane strut charging
- Research and development laboratories
- Chemical manufacturing
- Aerospace hydraulic systems
- Pharmaceutical manufacturing
- Gauge calibration

Advanced Features

- Chrome-plated brass barstock body
Smooth surface finish
- Front and rear panel mountable
Versatile system configuration
- Pressure ranges 0-750 to 0-6000 PSIG
Broad range of applications
- Six-port design
Flexible installation alternatives

Features

- *Large piston sensor*
Safely control pressures to 6000 PSIG
- *Capsule® seat*
Increased serviceability and life
- *Low wetted surface area*
Minimal purge requirements
- *Field-adjustable pressure limit*
Safeguard downstream equipment

Materials

Body
Chrome-plated brass barstock

Bonnet
Chrome-plated brass barstock

Seat
PCTFE (3000 and 4500 PSIG inlet)
Arlon® (PEEK) (6000 PSIG inlet)

Piston
Brass barstock

Filter
10 micron sintered brass

Internal Seals
Viton®

Specifications

Maximum Inlet Pressure
6000 PSIG (420 BAR)

Temperature Range
-40°F to 140°F (-40°C to 60°C)

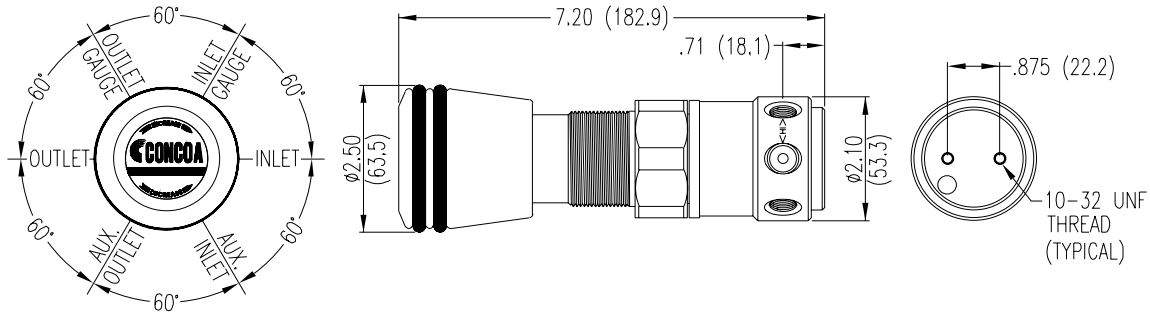
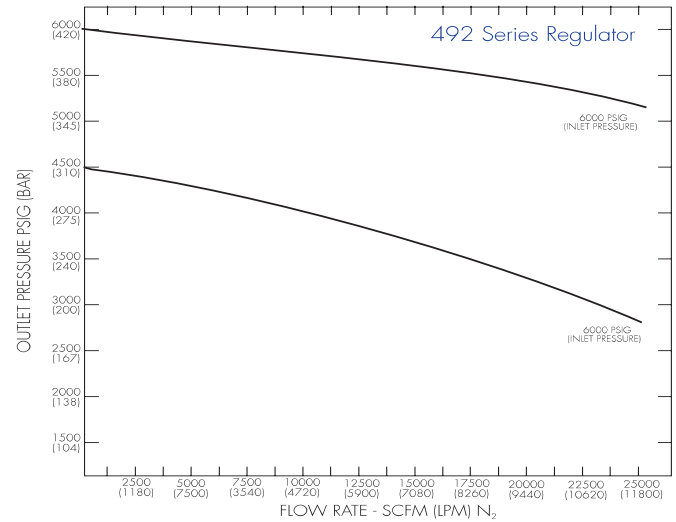
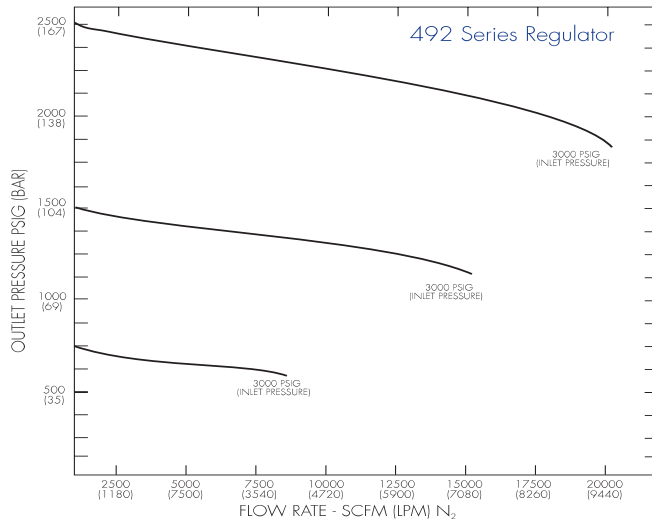
Gauges
2½" diameter chrome-plated brass

Ports
¼" FPT

Cv
0.1

Weight (492-4851-680)
5.59 lbs. (2.54 kg)

Flow Performance Curves



Ordering Information *(For information about how to use this table please see page 4.)*

492-	A		B		C	D	-Inlet	Options
Series 492	Outlet Pressure	Outlet Gauge	Inlet Maximum	Inlet Gauge	Outlet Assemblies	Assembly/ Gauges	Inlet Connections	Installed Options
	1: 0-750	0-1000 PSIG	0: 6000 PSIG	None	0: ¼" FPT	0: Bare Body*	CGA	A: Protocol Alarm Station (110V)
	2: 0-1500	0-4000 PSIG	3: 3000 PSIG	0-4000 PSIG	1: ¼" MPT	1: Standard Assembly (PSIG/kPa Gauges)	DIN 477	B: Protocol Alarm Station (220V)
	3: 0-2500	0-4000 PSIG	8: 5500 PSIG	0-6000 PSIG	2: ¼" Tube	2: Standard Assembly (BAR/PSIG Gauges)	BS 341 and others available	C: Protocol Switchover Station
	4: 0-4500*	0-6000 PSIG	9: 6000 PSIG	0-10,000 PSIG	5: Needle Valve ¼" MPT			G: Protocol Switchover Station with Alarm (110V)
	5: 0-6000†	0-10,000 PSIG			6: ⅛" Tube			H: Protocol Switchover Station with Alarm (220V)
	6: 0-3500*	0-6000 PSIG			7: ⅜" Tube			M: Protocol Station
	*Not available with 3000 PSIG maximum inlet pressure				M: 6mm Tube			
	†Only available with 6000 PSIG maximum inlet pressure					*6000 PSIG maximum inlet only		
Related Options			• Panel Mount Kit (830-6483)					