



# User Manual

## Spray Gun Probes for Helium Leak Detection



**P1012177**



**P1011211**



**P105182**



**P104871**

## WARRANTY

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Prior to returning any product we require that you contact us by phone or email to determine if the issue can be resolved quickly. A technical support representative will work with you to resolve the problem. If the issue cannot be resolved quickly we will provide an RMA number and product return instructions.

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## CUSTOMER SERVICE AND SUPPORT

If you have any questions concerning the installation or operation of this equipment, or if you need warranty or repair service, please contact us. Customer Service and Technical Support is available weekdays, from 8am-5pm, Mountain Time.

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# IMPORTANT SAFETY INFORMATION

Thank you for purchasing this equipment from Ideal Vacuum Products. We want you to operate it safely.



- **Read this manual and all associated equipment manuals before installing or operating this equipment. Failure to follow the warnings and instructions may result in serious injury or equipment damage.**
- **Keep this manual in a safe location for future reference.**
- **This equipment should only be installed and operated by trained, qualified personnel, wearing appropriate protective equipment.**
- **Follow all codes that regulate the installation and operation of this equipment.**



**Explosion or rupture hazard. Do not exceed the rated pressure of tank, cylinder, regulator or supply hose.**



**Always use regulated helium. Do not exceed 60 psig when operating the spray probe. Never connect the spray probe directly to a helium tank or cylinder.**



**Never inhale helium. Helium is a non-toxic gas, but can cause asphyxiation.**



**Always wear appropriate protective equipment including eye protection and gloves.**

## OVERVIEW

This manual provides general information and set up information about each of Ideal Vacuum's spray gun probe models. It also outlines spraying techniques for achieving optimal leak detection results. Last, step-by-step detailed instructions are presented for safely refilling the small helium gas cylinder in our premium helium spray gun probe kit (P1012177).

## SPRAY PROBE MODEL INFORMATION



**Do not exceed the rated pressure of tank, cylinder, regulator or supply hose.**

### P104871 - Basic Helium Spray Probe Gun Kit:

The included 10 ft. supply hose has a push-to-connect fitting on the gun end and a male 1/4" NPT fitting on the other end for connection to a regulated helium supply tank hose. This kit also includes a 4" rigid stainless steel probe tip and an 8" long flexible probe tip. The helium inlet pressure to the gun must not exceed 10 psig. Helium flow is adjusted on the tank or cylinder's regulator.

### P105182 - Regulated Helium Spray Probe Gun Kit:

This model has a regulator attached to the gun which can be adjusted to supply a light flow of helium (1-5 psig). The included 10 ft. supply hose has a push-to-connect fitting on the gun end and a male 1/4" NPT fitting on the other end for connection to a regulated helium supply tank hose. This kit also includes a 4" rigid stainless steel probe tip and an 8" long flexible probe tip. Helium flow is adjusted on the supply tank's regulator and must be less than 250 psig into the gun's low flow adjustable regulator.

### P1011211 - Precise Flow Valve Regulated Helium Spray Probe Gun Kit:

This model includes a Swagelok® S series low flow precise flow metering valve with Swagelok 1/4" tube compression fittings. The valve's vernier handle helps ensure repeatable flow adjustments and provides accurate readings to 1/25 turn. Factory flow settings are set at 4 to 10 std cm<sup>3</sup>/min with 15 psig (1.0 bar) inlet pressure. Maximum flow coefficient (Cv) is 0.004 at 10 full turns open. The included 10 ft. supply hose has a Swagelok 1/4" tube compression fitting for the gun's regulator end and a male 1/4" NPT fitting on the other end for connection to a regulated helium supply tank hose. This kit also includes a 4" rigid stainless steel probe tip, and an 8" long flexible probe tip. Helium flow is adjusted on the supply tank's regulator and must be less than 250 psig into the gun's precise flow regulator.

### P1012177 - Premium Helium Spray Gun Probe Kit with 1 Liter Cylinder:

This model includes a refillable high pressure aluminum cylinder with a precise, detachable regulator. Helium flow rate can be adjusted between 0 and 0.1 Standard Liters Per Minute (SLPM). The cylinder is 3" diameter x 11" tall, has a 1000cc volume, and a burst pressure rating of 1800 psi. We recommend it be filled normally to about 500 psig. This kit includes a refill adapter for refilling the cylinder from a larger supply tank (see [refilling instructions, p. 6](#)). The 10 ft flexible supply hose has C10 quick connect fittings on either end to connect the cylinder's regulator to the spray gun. Also included is a 1/4 turn shutoff valve mounted on the gun, a 4" rigid stainless steel probe tip, and an 8" long flexible probe tip. Please contact us for additional cylinders.

## TECHNIQUES TO OBTAIN OPTIMAL RESULTS

1. For gross leak testing, the helium spray output pressure can be adjusted between 0-5 psig.
2. For pin-pointing leak locations, use lower helium pressure.
3. Adjust spray pressure by placing the probe tip in a small glass or beaker of water. The probe tip will release helium bubbles. Gauge the amount of helium being released by the frequency of the bubbles and adjust the regulator accordingly.
4. When spraying helium over the test part, use the lowest practical flow of helium. For determining if a leak exists, a larger flow may be appropriate. However, for pinpointing leak location, reduce the flow of bubbles to around 1-3 bubbles per second when the probe tip is immersed in water.
5. To assist in pinpointing a leak location, spray the suspect area in short spurts. Note the response time of the leak detector as well as the magnitude of the signal that appears. A short response time and a large signal indicate a leak location close to the spray point.
6. When leak testing a part with multiple potential leak locations, start by spraying areas at the top of the part and work down. Because helium rises, starting from the bottom or sides can cause a misleading leak location.
7. Compressed air can be used to dissipate helium trapped on or near the part. This may help reduce the helium signal to the leak detector to make leak location faster.

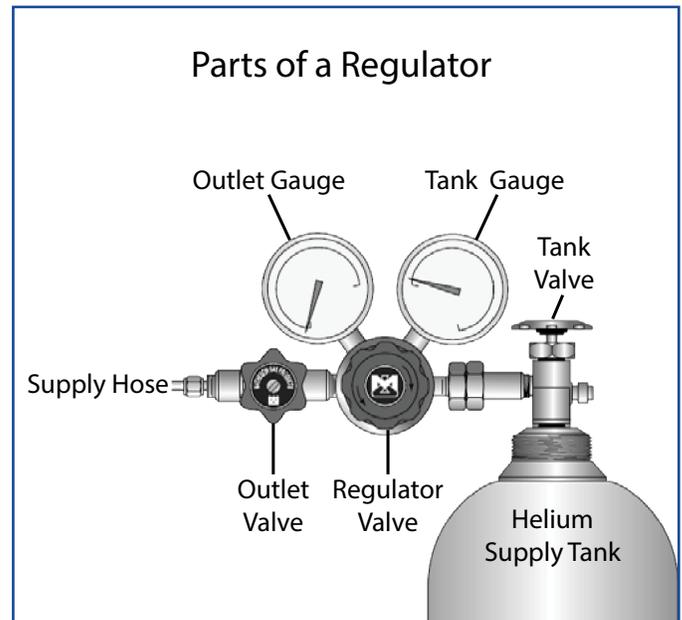
## ABOUT PROBE TIPS

1. All spray gun kits are supplied with both a rigid and a flexible tip.
2. The rigid tip is used for general spraying.
3. The flexible tip is easily bent for leak testing hard-to-reach areas.
4. Use care not to over-bend the flexible tip, particularly near the nut which secures it to the gun.
5. Make sure the probe tip does not get plugged.
6. To change tips, unscrew the Swagelok nut at the gun and replace with the other tip (7/16" wrench). Tighten the nut slightly past hand tight.

# HOW TO REFILL SMALL CYLINDERS

In the following pages, step-by-step, detailed instructions are provided for safely refilling the small helium gas cylinder in our premium helium spray gun probe kit (P1012177).

- The cylinder is shipped empty and must be filled before it can be used.
- A regulated helium supply tank with supply hose is required to fill or refill the kit's small cylinder.
- The helium supply hose must have a female 1/4 NPT connector termination.
- The P1012177 kit includes a C10-to-male 1/4 NPT refill adapter with a built-in check valve, used to connect the supply hose to the cylinder.
- Evacuation of the cylinder is not required to top off or refill it.



## STEP 1

Make sure the supply tank valve is closed.





## STEP 2

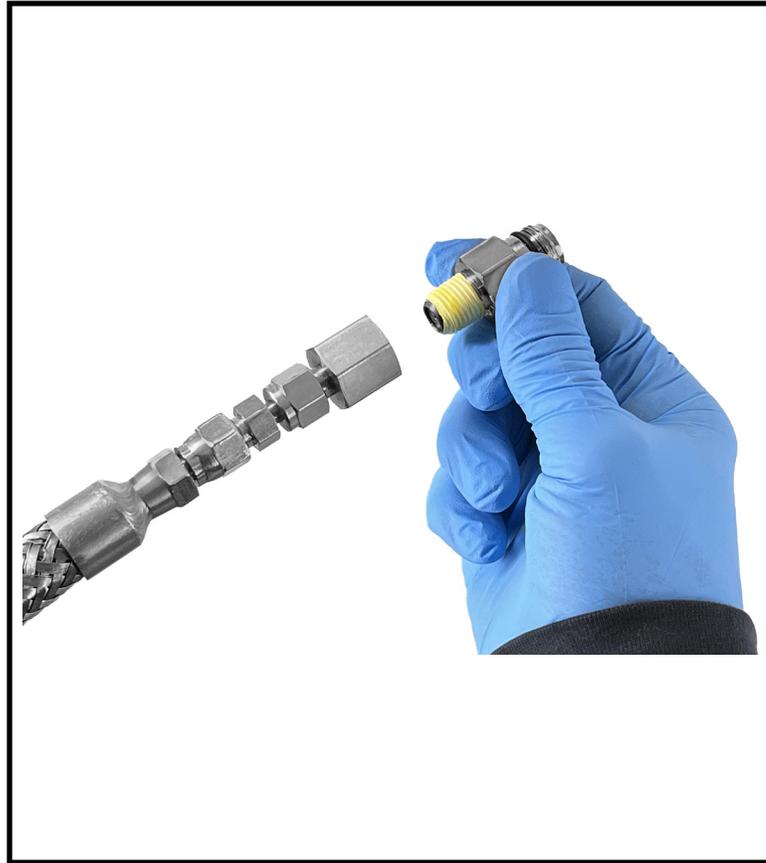
Bleed off any residual pressure in the regulator by opening the outlet valve (turn counterclockwise).

Once the tank and outlet pressure gauges are zero, close the outlet valve completely.



## STEP 3

Apply teflon tape to the NPT threads of the refill adapter.



## STEP 4

Connect the refill adapter to the supply tank hose.

Use a 7/8 and 13/16", or two adjustable wrenches.



## STEP 5

Decrease the tank regulator valve until it feels loose (turn counterclockwise).



## STEP 6

Get the cylinder from the spray probe kit.

Disconnect the regulator/gauge assembly from the cylinder by spinning the cylinder off of the regulator/gauge assembly.

**Note:** No tools are required - the assembly is hand-tight.

**The cylinder does not need to be empty - the cylinder has an internal valve.**



## STEP 7

Spin the cylinder onto the helium supply hose, hand-tight.

**Note:** Do not use tools to tighten.



## STEP 8

SLOWLY open the supply tank valve.

The tank pressure gauge will increase (to the pressure in the supply tank).



## STEP 9

SLOWLY open the regulator valve to increase outlet gauge pressure to 50psi (turn clockwise).



## STEP 10

SLOWLY open the outlet valve to allow helium into the cylinder (turn counterclockwise).

Listen for any leaks. Correct if necessary.



## STEP 11

Continue slowly opening the regulator valve until the outlet gauge pressure reads 500-1000psi (turn clockwise). Here the pressure is set to 500psi.

**Note: Although the cylinder's maximum rated pressure is 1800psi, it is recommended to fill to a more conservative pressure.**

Wait for one minute (1:00) to allow the cylinder to fill. You may not hear the transfer of gas.





## STEP 12

Close the outlet valve completely (turn clockwise).



## STEP 13

Decrease the tank regulator valve until it feels loose (turn counterclockwise).

**Note:** The gauges will continue to show pressure until the regulator is bled off later.

## STEP 14

Turn off the supply tank valve completely.



## STEP 15



VERY SLOWLY begin to unscrew the cylinder from the supply hose refill adapter.

When you hear gas hissing, STOP UNSCREWING! This starts bleeding off the gas in the the supply hose (only).

**Initially, the supply hose is at the fill pressure (500-1000psi). If the cylinder is completely unscrewed before the hose is completely bled, the cylinder could become a missile, or the hose could whip uncontrollably causing injury.**

Wait until the hissing stops (several minutes) before completely unscrewing the cylinder.



## STEP 16

To release pressure in the regulator (for tank storage), open the outlet valve (turn counterclockwise).

Both gauges will go to zero pressure.

Close the outlet valve. The tank is now in its normally stored state.



## STEP 17

Get the cylinder regulator/gauge assembly.

Spin the cylinder onto the assembly.

The pressure gauge on the cylinder shows the fill pressure. Here it is 500 psi.

The cylinder refill procedure is complete.



## STEP 18

Once the kit's quick connect spray hose is connected to the cylinder and gun, it is ready to be used for leak testing.

Use the knurled valve knob on the cylinder regulator/gauge assembly to open and adjust the helium to flow to the gun.



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