Helijet+

Portable helium spray set

User manual

N°521214-01

DATE	ORIGINATOR	REV.	COMMENTS
12/11/2012	IBT	A	Creation
08/25/2015	LRT	B	Section §4.2 updated

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Product usage statement

WARNING:

Read this entire and all other publications pertaining to the work to be performed before you install, operate or maintain this equipment. Practice all plant and product safety instructions and precautions. Failure to follow instructions can cause personal injury and/or property damage. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment maybe impaired. OMICRON Technologies provide information on its product and associated hazard s, but it assumes no responsibility for after-sale operation of the equipment or the safety practices of the owner or user.

Customer feedback

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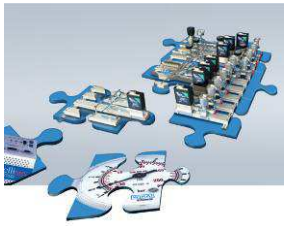

OMICRON Technologies

DU COMPOSANT AU SYSTEME
FLUIDES, VIDE, TEMPERATURE, PLASMAS

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1. Introduction

1.1 Product scope

Among the non-destructive tests conducted in industry and research, helium sniffing or spray leak detection is a common and widespread technique.
The latter method consists of spraying helium in a small area of the surface of a part connected to a leak detector. When a leak is present, thin molecules of this tracer gas are detected and a leak rate can be measured.
The Helijet+ fully portable helium spray set is addressed to users of the second method.

Helium is usually stored in bulky and heavy cylinders, which makes difficult their transportation on testing sites. In addition, multiplying the number of cylinders has a financial impact, due to their leasing costs.
The Helijet+ is an economical answer to helium transportation and handling, for leak testing operations.

1.2 Theory of operation

The Helijet+ is designed around a vessel that can be refilled on a standard helium cylinder, thanks to a refill assembly. Once filled, the vessel is to be inserted in its protective frame and carried by the shoulder strap and placed closest to the testing site. The ergonomic spray gun, coming with a thin and long nozzle, gives an helium jet with a reduced dispersion cone, thus facilitating small leaks location.
A combination of a multi-turns adjustable valve and a double-stage pressure regulator allows the Helijet+ to offer a large dynamic of flow range : from the smallest ones (for fine leak search) to bigger flows (for a global testing).

1.3 Conventions and Abbreviations

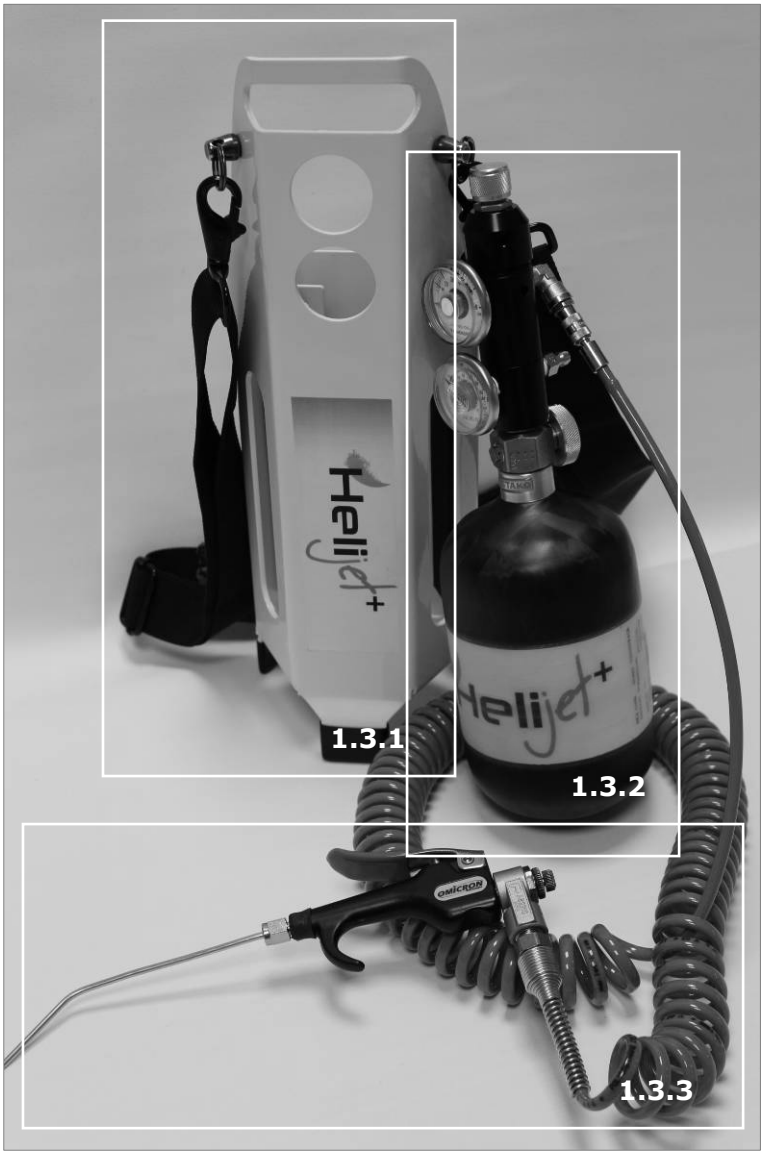
Pressures are expressed in relative Bars (***Bar***).
We will differentiate:

- High Pressure (***HP***): refill pressure, upstream from the pressure regulator.
- Low Pressure (***LP***): spray gun supply pressure, downstream from the pressure regulator.

We will name « *vessel* » the helium reserve supply of the Helijet+, and « *cylinder* » the helium source container.

1.4 General description

Protective frame

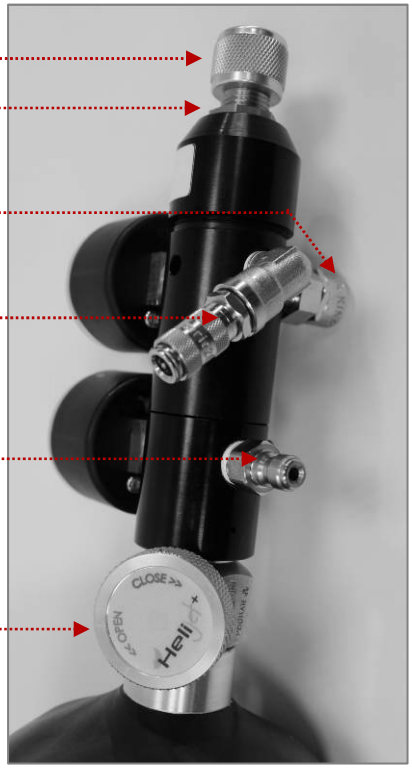


Vessel assembly

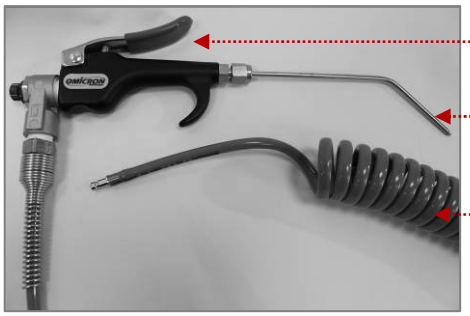
Spray gun assembly
Helijet

1.4.1 Protective frame

1.4.2 Vessel, pressure regulator and safety devices



1.4.3 Helijet aspersion gun assembly



Ergonomic gun

Stainless steel bent nozzle

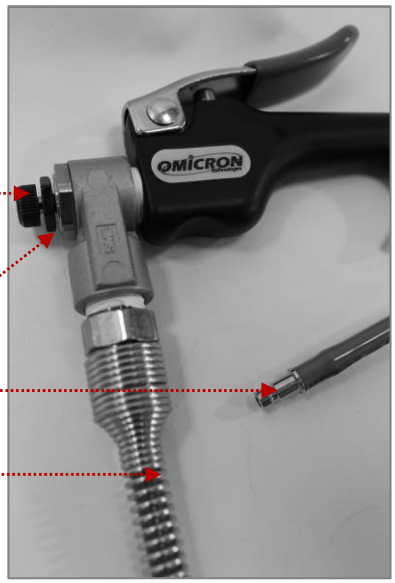
Flexible coiled tubing

Adjustable valve

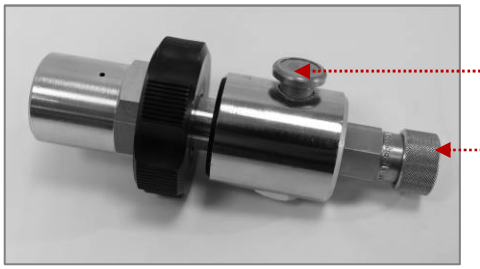
Locking nut

LP quick-coupling to be connected to pressure regulator

Protective stiffener



1.4.4 Refill assembly



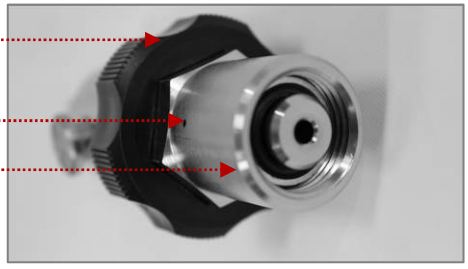
Purge button

HP quick-coupling to be connected to the vessel

Manual tightening wheel

Purge vent

Gas cylinder fitting (sealing varies with fitting type, see Appendix A)



1.5 Product specifications

Vessel capacity	0.7 L
Vessel max. filling pressure	200 Bar
Vessel proof pressure	450 Bar
Pressure gauges :	
HP	0…240 Bar
LP	0…4 Bar
Usage and storage temperature range	-15°C…+45°C
Standards:	
Vessel	EN 12245:2002 , « π» marked
Shut-off valve	EN ISO 10297, « π» marked
Overpressure safety devices :	
LP: safety relief valve, at pressure regulator outlet	60 psig (4.2 Bar)
HP: burst disc, at pressure regulator inlet	5000 psig (340 Bar)
Materials :	
Protective frame	Coated Aluminium alloy, rubber support foot
Shoulder strap	Nylon
Vessel	Thermoplastic liner, carbon fibers coating
Shut-off valve	Brass body, EPDM o'rings
Pressure regulator	Anodized aluminium body, brass fittings, neoprene diaphragm and seat.
Gauges	Stainless steel case, polycarbonate window, brass fittings
Spray gun assembly	Coated Zamac spray gun, stainless steel nozzle, polyurethane tubing
Dimensions :	
Height :	~ 400 mm
Diameter :	~ 150 mm
Weight :	~ 2 kg

2. Safety guidelines

2.1 Standards and Directives

The vessel and shut-off valve are "Pi" marked (π). The Helijet+ set fully complies with European safety directives on Transportable Pressure Equipment (TPED) **2010/35/EU**. This directive repeals and replaces the Directive 1999/36/CE, and allow all transportable pressure equipments being "Pi" marked (π) to move freely within European Union. Its central objective is to enhance safety during pressure equipment rail or road transportation.

2.2 Rules for safe transportation

SUFFOCATION HAZARD

Prior to any transportation of the spray set in vehicle:
- Carefully close the shut-off valve, ensure there is no leakage.
- Protect the equipement against chocks
- Properly ventilate the vehicule
- Do not unnecessarily leave the equipment in the vehicule

2.3 Rules for safe gas cylinders handling

CYLINDER FALL HAZARD

Priori to refilling the vessel :

- Ensure the gas cylinder is stable, check for its proper stowing (strap, chain,…)

- In case the gas cylinder must be handled, always wear appropriate PPE (safety shoes and gloves).

2.4 Rules for safe operation

Product operation can only be made by trained and qualified personnel, all necessary precautions should be taken.

- Do not use if vessel shows cracks, unraveled or charred surface.
- To be filled with Helium gas only (max. pressure 200 Bar)
- Use the provided refill station only, check for proper gas cylinder fitting.
- Do not fully empty (min. residual pressure : 3 Bar)
- Do not subject to vacuum
- Do not use detergent or solvent to clean up vessel surface.
- Do not use or store near heat, open flame or hot surfaces.
- Do not disassemble or modify this equipment : contact OMICRON Technologies in case of dysfunction.
- Never attempt to disassemble connectors under pressure.
- Never attempt to disassemble or partially connect the refill station to a gas cylinder.
- When in use, vessel should rest in its protective frame.
- Vessel should be replaced every 5 years.

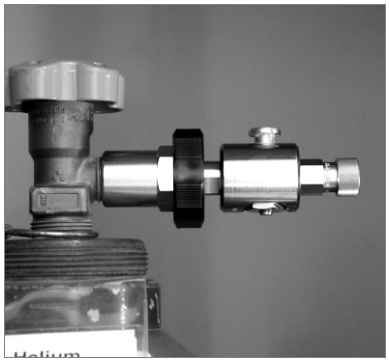
3. Settings for operation

3.1 Refill Helijet+ vessel

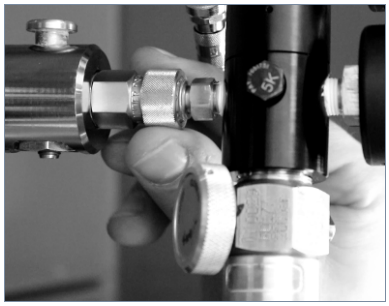
1) With Helijet+ shut-off valve closed, gently slide the vessel out from its protective frame (do not force or bend the pressure regulator assembly).

2) Disconnect spray gun tubing (quick-coupling connector on pressure regulator outlet)

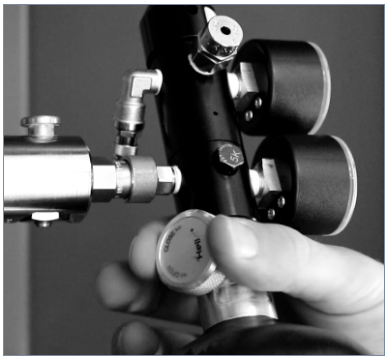
3) Connect refill station [**HELIJET-DR-xxx**] to a standard helium cylinder (refer to §*2.3 Rules for safe gas cylinder handling*)



4) Connect the vessel to the refill station, by mean of the HP quick-coupling connector.



5) Gently open the helium cylinder shut-off valve.

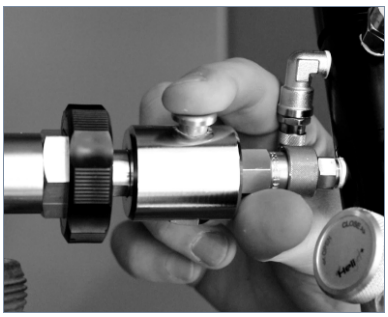


6) Gently open the vessel shut-off valve.

7) Check for pressure rise on HP gauge (situated on the front side)

> ⚠ **Do not pressurise over 200 Bar !**

8) Once the refill is done, close the vessel shut-off valve first, then the gas cylinder shut-off valve.

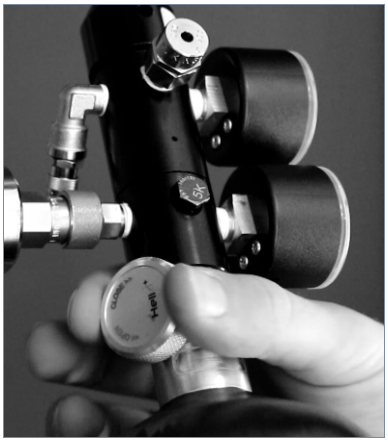


9) Relieve the residual pressure in the refill station by pressing the purge button for a few seconds.

10) Disconnect HP quick-coupling connector from vessel, slide it back in its protective frame.

11) Disconnect refill station, store it until the next refill.

3.2 Setting the pressure regulator outlet



1) Open the vessel shut-off valve

2) Unlock pressure regulator setting by untightening the locking nut. Then, set the outlet pressure by adjusting the setting knob :

- Unscrew the knob to increase outlet pressure
- Screw the knob to decrease outlet pressure (nominal pressure : 1 Bar).

Pressure outlet is read on the BP gauge situated on the front side.

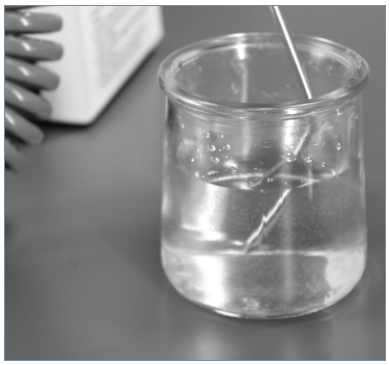
3) Secure this setting by tightening the locking nut.

3.3 Setting spray flow rate

1) After setting the pressure regulator outlet (*§ 3.2*) : unlock spray flow rate setting by untightening locking nut on adjustable valve.

2) For a small flow (pressure regulator outlet set at 0.5 Bar) : tighten screw the adjustable valve (shuts off the flow)…

3) … soak the spray nozzle into a recipient filled with deionized water or isopropanol. Press the spray gun trigger and open the adjustable valve until you get a "bubble" flow rate.



4) For a bigger flow rate (pressure regulator outlet set at 2 Bar), press the gun trigger and adjust the flow rate by opening/closing the valve.

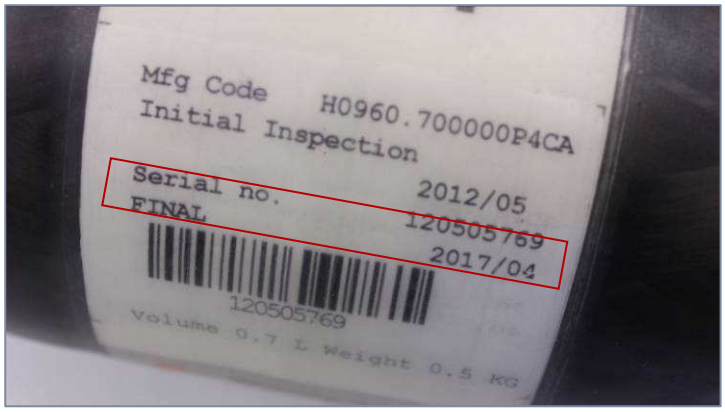
5) Once you get the desired flow rate, lock the setting by tightening the locking nut.
6) Your Heli jet+ is now ready for transportation and operation !

4. Maintenance

4.1 Periodic checks

The Hellfet+ does not require a lot of maintenance, we just need to check :

- To replace vessel every 5 years (check for printed date on the vessel label), and before in any case of aging signs appearance (cracks, unraveled or charred surface, swelling…)



- To systematically inspect refill station sealing o'ring on cylinder side (if applicable). Replace it if necessary
- Check for leak at presure regulator seat :
  - ⇨ Open vessel shut-off valve,
  - ⇨ Unscrew pressure regulator knob,
  - ⇨ Decrease pressure down to 0 Bar by pressing spray gun trigger.
  - ⇨ On LP pressure gauge, check after 30 minutes that the pressure has not increased.
  - ⇨ If pressure has increased, contact your local distributor.

4.2 Consumable, spare parts and accessories

P/N	Description
DIV-SP534A-A	Composite vessel assy
HELIJET-0-15-H+	Spray Kit (gun, tubing, 150mm nozzle)
HELIJET-DR-C	Refill station, AFNOR C fitting
HELIJET-DR-DIN6	Refill station, DIN-6 fitting
HELIJET-DR-DIN10	Refill station, DIN-10 fitting
HELIJET-DR-NEN	Refill station, NEN 3268 RU3 fitting
HELIJET-DR-BS3	Refill station, BS 341-3 fitting
HELIJET-DR-UNI	Refill station, UNI 4412-1 fitting
contact OMICRON Technologies	Refill station, dedicated cylinder fitting sealing o'ring

Appendix

Refill station selection guide

Fitting type	Fitting specifications	Standard	Countries	Refill assy ref.
AFNOR-C	Right handed, External thread (1/14") Isometric profile External Ø 21.7 mm	AFNOR NFE 29-650	France Spain Portugal	**HELIJET-DR-C**
DIN-6	Right handed, External thread (1/14") W profile * External Ø 21.8 mm	DIN 477 Part 1	Germany Luxembourg Switzerland Austria Baltic States	**HELIJET-DR-DIN6**
DIN-10	Right handed, External thread (1/14") W profile * External Ø 24.32 mm	DIN 477 Part 1	Finland	**HELIJET-DR-DIN10**
UNI 4412	Right handed, External thread (1/14") W profile * External Ø 24.5 mm	UNI	Italy	**HELIJET-DR-UNI**
BS 341-3	Right handed, Internal thread (1/14") BSP profile External Ø 22.91 mm	BS 341	UK Ireland	**HELIJET-DR-BS3**
NEN-3268 RU3	Right handed, External thread (1/14") W profile * External Ø 24.32 mm	NEN-3268	Netherlands Belgium	**HELIJET-DR-NEN**

** "W" : Whitworth*

This reference guide is aimed to help customer determine an appropriate Helijet+ refill station depending on his gas cylinder fitting. Product selection is the sole responsibility of the user, regardless of any recommendation made, as many other types can be found in different countries (CGA, JIS, etc.)