

Helijet⁺

Portable helium spray set



User manual

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Product usage statement



WARNING :

Read this entire manual 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 hazards, but it assumes no responsibility for after-sale operation of the equipment or the safety practices of the owner or user.

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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) and PSI.

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.

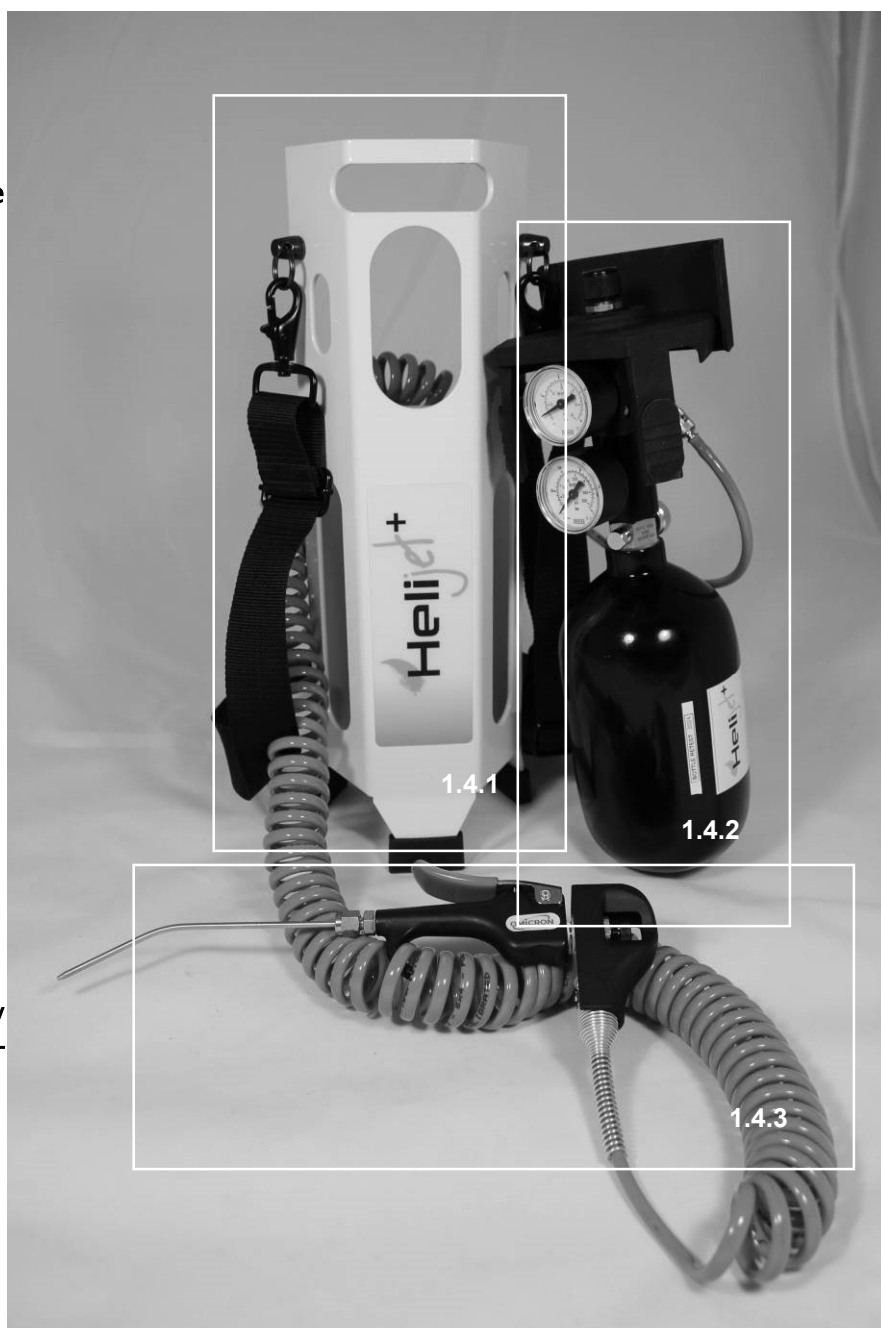
We will name « vessel » the helium reserve supply of the **Helijet⁺**, and « cylinder » the helium source container.

1.4 General description

Protective frame

Vessel assembly
(« bottle »)

Spray Gun assembly
HELIJET



1.4.1 Protective Frame



Carrying handle

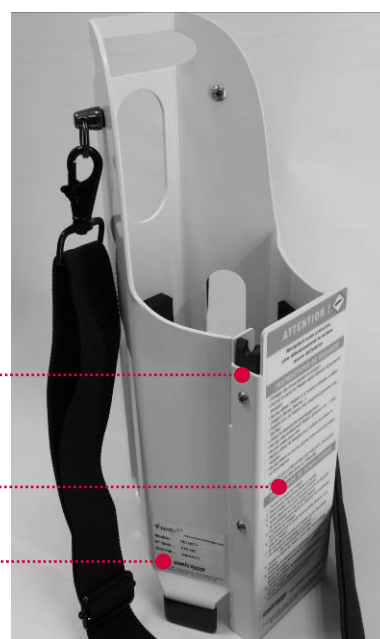
Adjustable shoulder strap

Rubber support feet

Spray gun storage compartment

Safety instructions and refill procedure

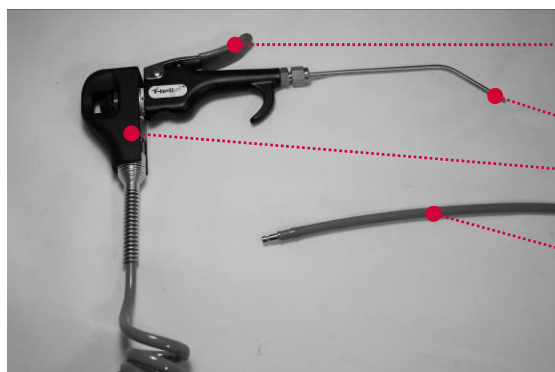
Product information label
(model and serial number)



1.4.2 Vessel, pressure regulator and safety devices



1.4.3 Helijet spray gun assembly



Ergonomic gun

Stainless steel bent nozzle

Protective cap

Flexible coiled tubing



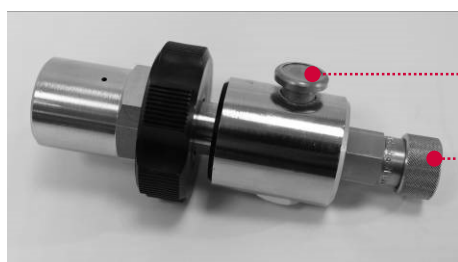
Adjustable valve

Locking nut

LP quick-coupling to be connected to pressure
regulator

Protective stiffener

1.4.4 Refill device

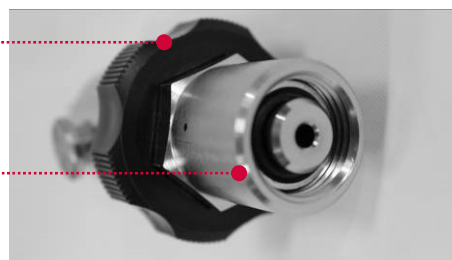


Purge button

HP quick-coupling to be connected to the
vessel

Manual tightening wheel

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



1.5 Product specifications

Vessel capacity.....	0.79 L
Vessel max. filling pressure.....	250 Bar / 3600 PSI
Vessel proof pressure.....	450 Bar / 6500 PSI
Pressure gauges :	
HP.....	0...250 Bar / 0...3600 PSI
LP.....	0...4 Bar / 0...60 PSI
Usage and storage temperature range.....	-15°C...+45°C

Standards :

Vessel	ISO 11119-2, « π » marking
HP Shut-off valve.....	EN ISO 10297, « π » marking

Overpressure safety device :

LP : safety relief valve, at pressure regulator outlet.....	4.2 Bar / 60 PSI
HP : burst disc, at pressure regulator inlet.....	340 Bar / 5000 PSI

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.
Pressure 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.....	~ 150mm
Weight.....	~ 2.5 kg

2. Safety Guidelines

2.1 Standards and Directives

The vessel and shut-off valve are “Pi” marked (π) and DOT approval. 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.

Regarding DOT :

A cylinder designed and constructed in conformance with the applicable requirements prescribed in 49 CFR 178.70, 178.71(a) and 178.71(l) for an ISO Standard 11119-2 is a UN standard bre-reinforced, composite gas cylinder with a load sharing metal liner. Cylinders that are fully in conformance with ISO 11119-2 do not require a DOT-SP or CA Approval. (Pipeline and Hazardous Materials Safety Administration’s declaration)

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 equipment against chocks
- Properly ventilate the vehicle
- Do not unnecessarily leave the equipment in the vehicle

2.3 Rules for safe gas cylinders handling



CYLINDER FALL HAZARD

Prior 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

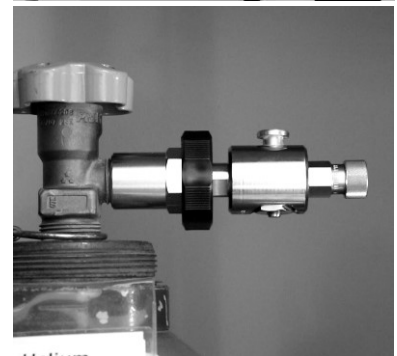
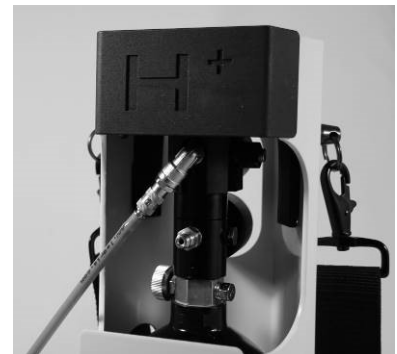
Product operation can only be made by trained and qualified personnel, all necessary precautions should be taken.

- Do not use if vessel shows cracks, unraveled or charred surface : *see details in § 4.2 Vessel specific checkings.*
- To be filled with Helium gas only (max. filling pressure 250 Bar / 3600 PSI)
- Use the refill device or the refill station, with a correct and compatible fitting
- 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](https://www.omicron-technologies.com) (contact@omicron-technologies.com) in case of dysfunction.
- Never attempt to disassemble connectors under pressure.
- Never attempt to disassemble or partially connect the refill adapter to a gas cylinder.
- When in use, vessel should rest in its protective frame.
- Vessel should be reapproved every 5 years (*see § 4.2 Vessel specific checkings*)

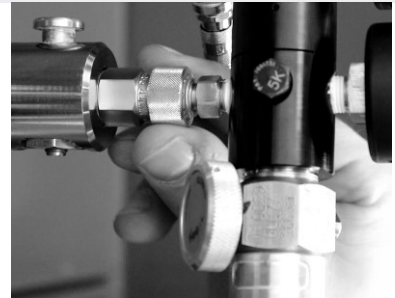
3. Settings for operation

3.1 Refilling the **Helid+** vessel

- 1) With shut-off valve closed, put pressure on the push-pieces simultaneously to liberate the vessel. Then 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 device 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 250 Bar / 3600 PSI !

- 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 the vessel back in its protective frame until it's locked.
- 11) Disconnect refill device, store it until the next refill.
- 12) Your **Helijet⁺** can be safely carried on your testing site.



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



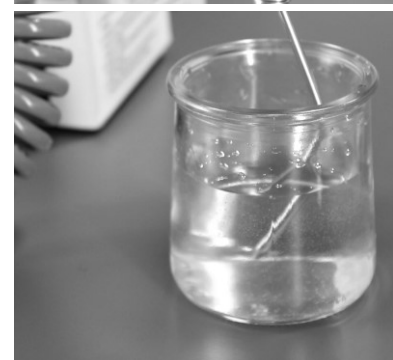
Pressure outlet is read on the BP gauge situated on the front side (PSI/BAR graduation)

- 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/7PSI), 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 /28 PSI), 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 operation !

4. Maintenance

The **Heli jet**⁺ requires periodic checks but very few maintenance.

4.1 General periodic checkings

- Systematically inspect refill adapter sealing o'ring on cylinder side (if applicable). Replace it if necessary
- Inspect polyurethane tube and check for absence of perforation throughout its length.
- Regularly check for leak at pressure 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 Vessel specific checkings

The vessel should be reappraised on a preventive basis every 5 years (check for printed « Final Date » on the vessel label).

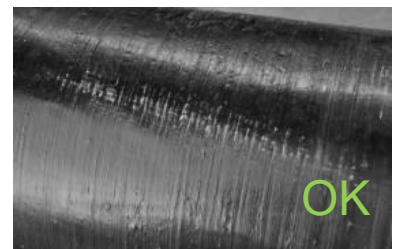


In case of ageing signs appearance (see below), the assembly will be replaced on corrective maintenance.

4.2.1 Scratches

In the contact of a tank with solid surfaces chafes, abrasions, scratches may appear on the vessel surface.

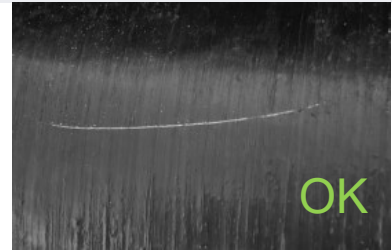
- Small chafing, scratches not causing visible damage of a bigger quantity of fibers and not exceeding 0.5 mm in depth, are not dangerous to the vessel
- Wide scratches or abrasions more than 1 mm deep.



4.2.2 Cuts

Damages caused by contact with sharp edges, objects or corners in a way that they cut or damage the fibers of the tank, reducing the effective composite thickness.

- Small scratches, also long, but not causing visible damage to bigger quantity of fibers and not deeper than 0.5 mm



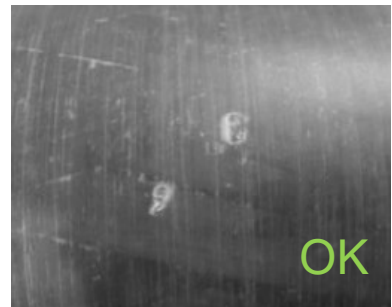
- Cuts bigger than 1 mm in depth and 25mm in length



4.2.3 Impacts

Impacts can be caused by the fall of the vessel from any height or by the collision with other objects. The damages may have the form of cracks of the resin layer, delamination of the fibers, dents, damages of the composite layer.

- Small dents, not causing damage to the fibers. Slight cracks of the resin layer.



- Cuts or grooves resulting from a fall or impact, above 0.5 mm in depth and larger than 25 mm in length.



4.3 Consumables, accessories and spare parts

Please contact OMICRON Technologies or your local distributor for any quote or information requests about those items.

P/N	Description
HELIJET-BTL	Vessel assembly replacement kit
HELIJET-O-15-H+	Spray gun kit (ergonomic gun, coiled hose, 150mm bent
HELIJET-DR-C	Adaptateur de remplissage, AFNOR C type fitting
HELIJET-DR-DIN6	Refill device, DIN6 type fitting
HELIJET-DR-DIN9	Refill device, DIN9 type fitting
HELIJET-DR-DIN10	Refill device, DIN10 type fitting
HELIJET-DR-NEN	Refill device, NEN 3268 RU3 type fitting
HELIJET-DR-BS3	Refill device, BS 341 type fitting
HELIJET-DR-UNI	Refill device, UNI 4412-1 type fitting
HELIJET-DR-CGA	Refill device, CGA 580 type fitting
HELIJET-STATION	Refill Station
HELIJET-VT	HELIJET+ carrying case

Appendix

Refill adapters selection guide

Fitting type	Specifications	Standard	Countries	Refill adapter reference
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-9	External thread, Right handed, G 3/4"	DIN 477 Part 1	Russie	HELIJET-DR-DIN9
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 N°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
CGA 580	Right handed, External thread (1/14") CGA 580	CGA	USA	HELIJET-DR-CGA

* « W » : Witworth profile

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.)

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