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HELIUM RECYCLING UNIT

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EXTENDED ABSTRACT

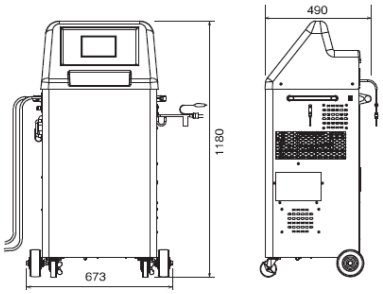
■Development Background.
Helium leak testing is a highly effective method for detecting minute leaks with high precision, but the complexity and high cost of the equipment, coupled with recent challenges such as the difficulty of obtaining helium gas and rising prices, have made it difficult to introduce. In light of this situation, we developed this device with the aim of reducing the cost of helium leak testing. Despite its simple structure, this device features helium gas pressurization and recovery functions, reducing gas consumption by over 80% (compared to our previous model). It maintains high testing accuracy while achieving significant reductions in both initial and operating costs.

■Features of the Equipment
This equipment enables very simple pressurization and recovery of helium gas for helium leak testing.
In pressurization mode, it automatically performs helium gas concentration measurement, vacuum pumping, vacuum achievement confirmation, and vacuum holding confirmation with a single touch, and then pressurizes the helium gas to the desired pressure. After the airtightness test, helium gas can be efficiently recovered into the unit with a single touch.
In the event of an airtightness failure (NG), setting the recovery to atmospheric pressure prevents air contamination. Furthermore, when the helium gas concentration decreases due to repeated reuse, the concentration can be restored by refilling or replacing with new gas.
Equipped with a vacuum pump, the unit also prevents air contamination during cylinder replacement or workpiece injection, maintaining the helium gas concentration. For convenience, casters are provided, and the system can operate independently from the helium cylinder, making it highly user-friendly at the site. The standard maximum helium gas pressurization pressure is 1 MPa, but higher pressure specifications can be supported upon request. Integration with existing equipment can also be handled on a case-by-case basis. This equipment is designed for helium gas pressurization and recovery in leak testing methods involving sealed spaces, such as the vacuum chamber method, pressure accumulation method, sniffer method, and bombing method.

■Conclusion
As described above, this device significantly reduces the amount of helium gas used in helium leak tests, thereby reducing environmental impact. At the same time, its low cost is expected to expand the range of applications for helium leak tests.

Fig. 1 Appearance of the device

Fig. 2 Outline specifications



Power supply	Single-phase 100V 50/60Hz
Operation	Automatic / Manual
Control panel	Color LCD touch panel
Main unit weight	72kg
Compressor	Motor: Condenser-start AC motor 380W (1/2HP)
	Compression method: Oil-free reciprocating type
Vacuum pump	Motor: 2-port DC motor 150W (1/5HP)
	Suction method: Oil-circulating two-stage rotary type
	Capacity: 25 L/min (50 Hz) 28 L (60 Hz) 2 Pa/15 microns
Connection container	Capacity: 11 L
Sensors	Pressure gauge: Diaphragm-type transducer
	Concentration gauge: Pirani-type