

AGRU-8

HIGHEST ACCURACY & LOWEST COST



SF₆ Gas Recovery Unit

AGRU-8

- Storage no included. Two Options:
 - + 300l- ASME Tank with weight Scale
 - + Horizontal 3 cylinder storage with evaporator and Scale
 - Vacuum Capacity:
 - + 30m³/h (60Hz - 110V) <1mbar --> 40 m³/h (Upgrade)
 - + 25m³/h (50Hz - 220V) <1mbar --> 35 m³/h (Upgrade)
 - Evacuate pressure < 0,5 mbar
 - Weight: 950 lbs - 432 Kg
 - Dimensions: 74"x45"x58" - 1900x1140x1470 mm - (H x W x D)
- Optional:
PLC control touch screen, Tank heater, SS tubing and hoses,
increase vacuum compressor and pump.

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We developed the AGRU-8 for our customers who found they needed more storage and recovery capacity than smaller handcart mounted units, the AGRU-8 is available without the bulk and high price of a large skid or trailer mounted unit. The equipment is designed for use in field service of insulated metal clad switchgear, bus ducts and individual circuit breakers. The AGRU-8 SF₆ Gas Servicing Cart shall be fully assembled on a two-wheeled heavy-duty handcart, which shall be sufficiently braced to minimize vibration. Handcart will be complete with lifting eye, hose hook and power cable storage.

Functions:

- Recover, purify and store SF₆ Gas from the switchgear to the storage tank.
- Evacuation:
- Service hoses < 0.5 mbar
- SF₆ Gas cart down < 0.5 mbar
- Air and moisture from the switchgear < 0.5 mbar
- Purify SF₆ Gas by recirculating through the filter system:
 - (D1) & (D2)- Dryer Filter - Contains activated alumina to aid in the drying and purification of SF₆ Gas.
 - (P1) - Purification Filter - Contains Molecular Sieve 5X to remove arcing by-products.
 - (F1) - Particulate Filter - Will filter all particulate matter down to 0.1 micron nominal.
- Pressure regulated recharging of SF₆ Gas to the switchgear from the storage tank.
- Evacuate SF₆ Gas from the cart to an external storage tank for maintenance purposes.



Features:

- Mounted on a convenient hand cart with 10" (400mm) pneumatic tires for ease of movement in gravel switchyard environments.
- Very easy to operate - only two valves to switch operating modes.
- High pressure, direct-drive oil-less compressor with 1000:1 compression ratio (capable of 1000psi – 69 bar).
- Capable of liquid SF₆ storage.
- Purifies, dries and filters to 0.1 microns during recovery and re-pressurization.
- Filters are easily changed without disconnecting any tubing or using any special tools.
- Auxiliary connection allows for infinitely expandable storage through use of external tanks.
- Comes complete with 9.8ft / 3m hoses and power cable.
- Colour change moisture indicator to monitor moisture in gas.
- Mounted on a cart with casters and rack for storage up to three SF₆ storage bottles. 156 kg with four bottles or 300 kg with the tank.



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Applications:

- Recover and purify SF₆.
- Evacuate air and moisture prior to filling.
- Consolidate SF₆ cylinders.
- Store SF₆ in liquid state in onboard storage or auxiliary bottles.
- Regulated filling of SF₆ equipment.
- Purification of SF₆ (removes particles, moisture, and SF₆ decomposition products).



AGRU-8 Specifications

Type	Portable SF ₆ Gas Recovery Unit.
Physical specifications	58" (1470 mm) Wide x 45" (1140 mm) Deep x 74" (1900 mm) // 950 lbs. (432kgs.).
Input power	110Vac/60Hz - 220Vac/50Hz - other available configuration (choose it in the order).
SF₆ Compressor	Three (3) High Pressure Single Stage Direct Drive Oil-less Compressors capable of producing pressures of 70 bar. Compressor motor 1/2 kW, 3450 rpm. Compressor has metal valve construction. 6.6 m ³ h ⁻¹ displacement (60Hz).
Suction pressure regulator	One Suction pressure regulator, brass body, 0-2 bar, spring
Vacuum compressor	One diaphragm type vacuum compressor, 0.24kW motor, 5 m ³ h ⁻¹ displacement (60 Hz), ultimate vacuum: 20 mbar. (Optionally available - Scroll vacuum compressor with ultimate vacuum whilst recovering SF ₆ of <1 mbar – allows 99.9% SF ₆ gas recovery).
Equalization circuit	One Equalization circuit, to allow for high-pressure restarts of the compressor.
Discharge check valve	Nine discharge check valve, brass, prevents high pressure going back to compressor when performing a low-pressure equalization.
Condenser	One High efficiency, 4-pass, air-cooled SF ₆ condenser to aid in liquification of SF ₆ at higher ambient temperatures.
Discharge pressure	One High discharge pressure switch set to automatically shut unit down when it reaches maximum allowable pressure.
Vacuum Pump	Motor: 1.1 kW, 1750 RPM, TEFC electric motor. Optionally available 40 m ³ h ⁻¹ vacuum pump. Displacement: - 30 m ³ /h (60Hz – 110V) - 25 m ³ /h (50Hz – 220V) Blank off pressure: 0.08 mbar. Pump also includes: positive antisuckback valve, isolation valve, gas ballast, and automatic oil return system.
Storage Tank	Cylinders secured onto a tray and manifold, in order to store up to 156kgs. of SF ₆ in liquid form indefinitely, at ambient temperatures of less than 114°F (45.5°C), without the need for refrigeration. The AGRU-8 shall come equipped with an external storage port, to which any SF ₆ Gas cylinder or tank rated at 40 bar minimum) can be attached to allow for unlimited storage of SF ₆ . All storage tanks shall include an isolation valve, and an approved safety relief valve.
Filters	(D1) & (D2) – Dryer Pre- Filter & Filter - Contains activated alumina to aid in the drying and purification of SF ₆ Gas. (P1) - Purification Filter - Contains Molecular Sieve 5X to remove arcing by-products. (F1) - Particulate Filter - Will filter all particulate matter down to 0.1 micron nominal.
Valves	Designed for pressure, temperature and flow. Bronze body with Teflon seats and seals, quarter turn.
Pressure Gauges	One (4" stainless steel) for equipment pressure (compound). One (4" stainless steel) for discharge pressure.
Vacuum Gauge	0-50 mbar for vacuum system.
Pressure Regulator	One Pressure Regulator, Brass body, 0-7bar spring, to allow for safe regulated filling of SF ₆ equipment.
Hoses	Two Permeation Rubber Resistant Hoses: 12 mm I.D. X 4.5 meter. Long, complete with quick disconnect self-sealing end fittings. Hoses will be suitable for system pressure, temperature and flow.



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AGRU-8 - Optional Upgrades and Accessories

Stainless Steel (SS) Tubing	Unit can be supplied with stainless steel tubing replacing the standard copper tubing.
Stainless Steel Hoses	Unit can be supplied with stainless steel hoses replacing the standard rubber hoses.
Storage Tank	- An optional SF ₆ Cylinder, Size H - 52 kg., with CGA 590 valve connection with no check valve, 99.9% dry can be provided. The AGRU-8 has a capacity to hold 3 bottles on board to give a total storage capacity of 156 kgs. - An optional SF ₆ Storage Tank, 300 litres (300 kgs.), can be supplied to increase the storage capacity of the AGRU-8.
Storage Tank Heater	300 W storage tank heater. Heater comes with its own power cable and has a thermostat preset at 125 °F (52 °C) and is protected from overheating by a thermal cut-off. The heater maintains an even temperature for a constant positive pressure that speeds up the charging process.
Electronic Weigh Scale	An optional electronic cylinder weighing scale to monitor the filling of the SF ₆ cylinders. Weigh scale system comes complete with an adjustable maximum weight set point and includes a weighing system and cylinder mounting bracket.
DN-20 Style Quick Connections	Unit can be supplied with DN-20 style quick connections on equipment and hoses.
Increase Hose Length	Unit can be supplied with 6m. hoses instead of 3m.
PLC Control Touch Screen	Unit can be supplied with PLC control Touch Screen with Automatic or Manual Valve Control instead of conventional panel control.
Increase Vacuum Compressor/Pump	Unit can be supplied upgrading ultimate pressure of vacuum compressor < 1mbar (instead of 20mbar). Also, unit can be supplied upgrading vacuum pump to 40 m ³ h ⁻¹ (60 Hz).

AGRU-8- Spare Parts

Filter D-1	Dryer Filter – recommended to change each 50 hours of compressor work.
Filter P-1	Purification Filter – recommended to change each 50 hours of compressor work.
Filter F-1	Particulate Filter – recommended to change each 50 hours of compressor work.
Vacuum Pump Oil	Vacuum pump oil level has to be checked each time you turn it on. Available in two quantities: 946 ml or 3780 ml.



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