

## AGRU-8

HIGHEST ACCURACY & LOWEST COST



## SF<sub>6</sub> 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:
    - +30m<sup>3</sup>/h (60Hz - 110V) <1mbar --> 40 m<sup>3</sup>/h (Upgrade)
    - +25m<sup>3</sup>/h (50Hz - 220V) <1mbar --> 35 m<sup>3</sup>/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 SF<sub>6</sub> 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 SF<sub>6</sub> Gas from the switchgear to the storage tank.
- Evacuation:
  - Service hoses < 0.5 mbar
  - SF<sub>6</sub> Gas cart down < 0.5 mbar
  - Air and moisture from the switchgear < 0.5 mbar
- Purify SF<sub>6</sub> Gas by recirculating through the filter system:
  - (D1) & (D2)- Dryer Filter - Contains activated alumina to aid in the drying and purification of SF<sub>6</sub> 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 SF<sub>6</sub> Gas to the switchgear from the storage tank.
- Evacuate SF<sub>6</sub> 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 SF<sub>6</sub> 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 SF<sub>6</sub> storage bottles. 156 kg with four bottles or 300l (300 kg) with the tank.

## Applications:

- Recover and purify SF<sub>6</sub>.
- Evacuate air and moisture prior to filling.
- Consolidate SF<sub>6</sub> cylinders.
- Store SF<sub>6</sub> in liquid state in onboard storage or auxiliary bottles.
- Regulated filling of SF<sub>6</sub> equipment.
- Purification of SF<sub>6</sub> (removes particles, moisture, and SF<sub>6</sub> decomposition products).



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## AGRU-8 Specifications

<b>Type</b>	Portable SF <sub>6</sub> Gas Recovery Unit.
<b>Physical specifications</b>	58" (1470 mm) Wide x 45" (1140 mm) Deep x 74" (1900 mm) // 950 lbs. (432kgs.).
<b>Input power</b>	110Vac/60Hz - 220Vac/50Hz - other available configuration (choose it in the order).
<b>SF<sub>6</sub> Compressor</b>	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 <sup>3</sup> h <sup>-1</sup> displacement (60Hz).
<b>Suction pressure regulator</b>	One Suction pressure regulator, brass body, 0-2 bar, spring
<b>Vacuum compressor</b>	One diaphragm type vacuum compressor, 0.24kW motor, 5 m <sup>3</sup> h <sup>-1</sup> displacement (60 Hz), ultimate vacuum: 20 mbar. (Optionally available - Scroll vacuum compressor with ultimate vacuum whilst recovering SF <sub>6</sub> of < 1 mbar - allows 99.9% SF <sub>6</sub> gas recovery).
<b>Equalization circuit</b>	One Equalization circuit, to allow for high-pressure restarts of the compressor.
<b>Discharge check valve</b>	Nine discharge check valve, brass, prevents high pressure going back to compressor when performing a low-pressure equalization.
<b>Condenser</b>	One High efficiency, 4-pass, air-cooled SF <sub>6</sub> condenser to aid in liquification of SF <sub>6</sub> at higher ambient temperatures.
<b>Discharge pressure</b>	One High discharge pressure switch set to automatically shut unit down when it reaches maximum allowable pressure.
<b>Vacuum Pump</b>	Motor: 1.1 kW, 1750 RPM, TEFC electric motor. Optionally available 40 m <sup>3</sup> h <sup>-1</sup> vacuum pump. Displacement: - 30 m <sup>3</sup> /h (60Hz - 110V) - 25 m <sup>3</sup> /h (50Hz - 220V) Blank off pressure: 0.08 mbar. Pump also includes: positive antisuckback valve, isolation valve, gas ballast, and automatic oil return system.
<b>Storage Tank</b>	Cylinders secured onto a tray and manifold, in order to store up to 156kgs. of SF <sub>6</sub> 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 <sub>6</sub> Gas cylinder or tank rated at 40 bar minimum) can be attached to allow for unlimited storage of SF <sub>6</sub> . All storage tanks shall include an isolation valve, and an approved safety relief valve.
<b>Filters</b>	(D1) & (D2) - Dryer Pre- Filter & Filter - Contains activated alumina to aid in the drying and purification of SF <sub>6</sub> 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.
<b>Valves</b>	Designed for pressure, temperature and flow. Bronze body with Teflon seats and seals, quarter turn.
<b>Pressure Gauges</b>	One (4" stainless steel) for equipment pressure (compound). One (4" stainless steel) for discharge pressure.
<b>Vacuum Gauge</b>	0-50 mbar for vacuum system.
<b>Pressure Regulator</b>	One Pressure Regulator, Brass body, 0-7bar spring, to allow for safe regulated filling of SF <sub>6</sub> equipment.
<b>Hoses</b>	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.

## AGRU-8 - Optional Upgrades and Accessories

<b>Stainless Steel (SS) Tubing</b>	Unit can be supplied with stainless steel tubing replacing the standard copper tubing.
<b>Stainless Steel Hoses</b>	Unit can be supplied with stainless steel hoses replacing the standard rubber hoses.
<b>Storage Tank</b>	- An optional SF <sub>6</sub> 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 <sub>6</sub> Storage Tank, 300 litres (300 kgs.), can be supplied to increase the storage capacity of the AGRU-8.
<b>Storage Tank Heater</b>	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.
<b>Electronic Weigh Scale</b>	An optional electronic cylinder weighing scale to monitor the filling of the SF <sub>6</sub> cylinders. Weigh scale system comes complete with an adjustable maximum weight set point and includes a weighing system and cylinder mounting bracket.
<b>DN-20 Style Quick Connections</b>	Unit can be supplied with DN-20 style quick connections on equipment and hoses.
<b>Increase Hose Length</b>	Unit can be supplied with 6m. hoses instead of 3m.
<b>PLC Control Touch Screen</b>	Unit can be supplied with PLC control Touch Screen with Automatic or Manual Valve Control instead of conventional panel control.
<b>Increase Vacuum Compressor/Pump</b>	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 <sup>3</sup> h <sup>-1</sup> (60 Hz).

## AGRU-8- Spare Parts

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