

AGRU-7

For circuit breakers up to 132 kV



Recovers, purifies, stores and refills SF6 from a single compact cart

AGRU-7

SF6 gas recovery unit

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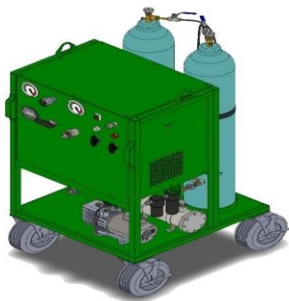
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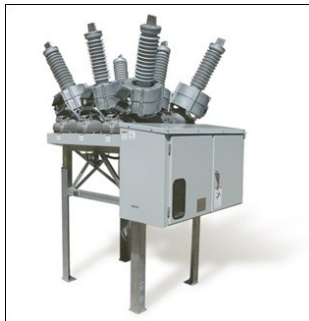
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Overview



AGRU-7 in its current configuration: two on-board cylinders and four swivel casters.



SF6-insulated high-voltage circuit breaker.

More capacity without the bulk of a trailer

The AGRU-7 was developed for users who need more storage and recovery capacity than small handcart units offer, but without the bulk and price of a skid- or trailer-mounted unit. It recovers, temporarily stores, conditions and returns SF6 gas during field servicing of metal-clad switchgear, bus ducts and individual circuit breakers up to 132 kV.

A single valve to switch modes

Operation is very simple: a single valve selects the operating mode. The high-pressure, fully oil-less compressor allows SF6 to be stored in liquid form, and the gas is purified, dried and filtered to 0.1 μm during recovery and filling.

Applications

- Recover and purify SF6; recovered gas is purified twice during the normal operating cycle.
- SF6 purification: removal of particles, moisture and decomposition products.
- Evacuate air and moisture prior to filling.
- Consolidate partially used SF6 cylinders.
- Store SF6 in liquid state on board or in auxiliary cylinders.
- Regulated filling of SF6 equipment.



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Functions and purification



SF6 power circuit breakers.



Substations and transmission networks.

Functions

- Recovery, purification and storage of SF6 from the circuit breaker to the storage cylinders.
- Evacuation of air and moisture from the circuit breaker, the hoses and the cart itself with the vacuum pump (< 1 mbar).
- Purification of SF6 by recirculating it through the filter system.
- Pressure-regulated recharging of the circuit breaker from the cylinders.
- Transfer of SF6 from the cart to an external tank for maintenance purposes.

Filtration and moisture control

The circuit includes a D-1 dryer filter, with activated alumina, that helps dry and purify the SF6; a purifier cartridge, with molecular sieve, that removes arcing by-products; and an F-1 particulate filter that retains particles down to 0.1 μm . Filters are changed without disconnecting any tubing or using special tools, and a colour-change moisture indicator shows the condition of the gas.

Construction

Stainless steel tubing and fittings instead of copper or brass, for better corrosion resistance and durability. The cart moves on four swivel casters and includes a 3 m power cord.



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Compressor, vacuum and storage

High-pressure oil-less compressor

Direct-drive, fully oil-less SF6 compressor rated at 2 m³/h and capable of 34 bar (500 psi), which liquefies the SF6 and stores it in the on-board cylinders. An air-cooled condenser helps liquefy the gas at high ambient temperatures, and a discharge pressure switch shuts the unit down when the maximum allowable pressure is reached.

Recovery down to 100 mbar or below 1 mbar

In its standard version, the AGRU-7 recovers SF6 down to 100 mbar, which means recovering 99.6% of the gas. The XDS version adds a 6 m³/h vacuum compressor that brings the residual SF6 pressure below 1 mbar, for 99.9% recovery, and includes a digital vacuum gauge.

Vacuum pump

17 m³/h (10 CFM) vacuum pump that takes the equipment below 1 mbar to evacuate air and moisture before filling. It includes an anti-suckback valve, isolation valve, gas ballast and automatic oil return.

On-board, expandable storage

The cart carries two 52 kg storage cylinders, for an on-board capacity of 104 kg of SF6 in liquid form, which keeps indefinitely at ambient temperatures below 45.5 °C without refrigeration. The auxiliary connection allows storage to be expanded without limit using external cylinders or tanks (rated at 40 bar minimum).



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AGRU-7 – SPECIFICATIONS BY VERSION

Parameter	AGRU-7	AGRU-7 XDS
Type	Portable SF6 gas recovery unit	
Application	Circuit breakers up to 132 kV, metal-clad switchgear and bus ducts	
Power supply	220 V, single-phase, 50/60 Hz (other voltages on request)	
SF6 compressor	High pressure, direct drive, oil-less; 2 m³/h; up to 34 bar (500 psi)	
Vacuum compressor	—	6 m³/h
SF6 recovery	Down to 100 mbar (99.6%)	Down to < 1 mbar residual pressure (99.9%)
Vacuum gauge	0 - 50 mbar	Digital
Vacuum pump (air and moisture evacuation)	17 m³/h (10 CFM); < 1 mbar	
Filtration	D-1 dryer filter, purifier cartridge and F-1 particulate filter (0.1 µm)	
Moisture indicator	Colour change	
On-board storage	2 × 52 kg cylinders: 104 kg of liquid SF6; expandable with external tanks	
Tubing and fittings	Stainless steel	
Mobility	4 swivel casters	
Power cord	3 m	
Hoses	Not included: ordered separately (see accessories)	
Dimensions (height × width × depth)	1727 × 851 × 1003 mm (68 × 33.5 × 39.5")	
Weight	324 kg (714 lb), with two cylinders	

Data subject to change without notice.



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AGRU-7 – COMPONENTS

Suction pressure regulator	0 - 2 bar, spring-loaded
Equalization circuit	Allows the compressor to restart at high pressure
Check valves	Prevent high pressure from returning to the compressor during low-pressure equalization
Condenser	High-efficiency, four-pass, air-cooled; helps liquefy SF6 at high ambient temperatures
Discharge pressure switch	Automatically shuts the unit down when the maximum allowable pressure is reached
Vacuum pump	0.37 kW TEFC motor; blank-off pressure 0.03 mbar (20 microns); anti-suckback valve, isolation valve, gas ballast and automatic oil return
Valves	Quarter-turn, with PTFE seats and seals, rated for system pressure, temperature and flow
Pressure gauges	Two 4" stainless steel gauges: equipment pressure (compound) and discharge pressure
Filling pressure regulator	0 - 7 bar, spring-loaded, for safe regulated filling
Storage	Liquid SF6 kept indefinitely at ambient temperatures below 45.5 °C without refrigeration; connection for external tanks rated at 40 bar minimum

Storage cylinders and tanks include a relief valve and inlet and outlet valves.



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AGRU-7 – SCOPE OF SUPPLY, OPTIONS, ACCESSORIES AND CONSUMABLES

Standard supply	AGRU-7 unit, 220 V, 1 phase, 50/60 Hz, with 2 m ³ /h SF6 compressor, 17 m ³ /h vacuum pump, stainless steel tubing, D-1 dryer filter, F-1 particulate filter, purifier cartridge, 3 m power cord, four swivel casters and shipping crate
XDS version	6 m ³ /h vacuum compressor to recover SF6 down to < 1 mbar residual pressure (99.9%), with digital vacuum gauge
Option	Digital platform scale for SF6 cylinders, to monitor filling
Storage cylinder	52 kg (115 lb) SF6 cylinder with CGA-590 valve, dry
Hoses	Set of two 3 m or 6 m hoses, with DN20 female connection at both ends
Adapters	DN8 male × DN20 female; DN20 male × DN20 male; DN20 × CGA-590 with valve, for North American cylinders; DN20 × DIN 477 with valve, for European cylinders
SF6 fittings kit	With carry case and foam with labelled cut-outs
Filter kit	D-1 dryer filter, F-1 particulate filter and purifier cartridge; replacement recommended every 50 hours of compressor operation
Vacuum pump oil	946 ml bottle; check the level every time the pump is started

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