

Rapidox 6100 Pump Back

Zero-emissions SF₆ gas analyser



RAPIDOX 6100

Fully automatic SF₆ analysis with gas return

amperis

www.amperis.com

 C/ María Barbeito, 14
27003, Lugo, Spain

 Contact

T [+34] 982 20 99 20
info@amperis.com | www.amperis.com

Fully automatic, zero-emissions analyser: it tests the SF₆ and pumps it back into the equipment.

Product overview



Rapidox 6100 Pump Back with hoses and gas storage bag in the lid



The analyser in its wheeled Peli transport case

Zero-emissions SF₆ analysis

The Rapidox 6100 Pump Back monitors the quality and purity of the SF₆ used in high-voltage switchgear, circuit breakers and transformers without releasing any gas. Specially selected sensors deliver exceptional accuracy and stability, and the modular layout allows up to eight compatible gases to be analysed at once: the instrument accepts mixtures of SF₆, CF₄, N₂ and air, detects toxic contaminants such as SO₂, HF, H₂S and CO, and reports the water content as dew point, µL/L or ppm to confirm acceptable dryness.

Features and advantages

- Fully automatic testing and data logging, with walk-away timer, auto-abort and auto-clean functions.
- Gas-cylinder testing mode and special N₂ display mode for SF₆/N₂ users.
- Modular sensor choice; the large storage bag allows up to five tests before a pump-back is required.
- 7" (18 cm) full-colour touchscreen with soft menu keys and alphanumeric keypad.
- One lithium battery for electronics and pump: ~8 h of use, 2-4 h recharge, greater IATA compliance.
- Heavy-duty IP66 Peli case with wheels and handle; vacuum line purge; optional in-vehicle charging.
- Real-time display; MS Excel-compatible data download via USB memory stick.
- Integrated Unicode printer: on-site printing in the language of choice.
- Editable test locations and user names, with password protection.
- 2-year manufacturing warranty (terms and conditions apply).



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✉ Contact

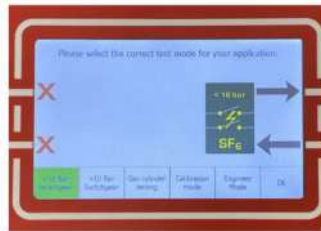
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A vacuum purge cycle and internal storage ensure no contamination and no SF₆ loss.

Operating cycle



Closed transport case, ready for transit



Test-mode selection wizard on the touchscreen

Automatic sampling and gas return

The analyser travels in a tough Peli case fitted with special tongue-and-groove self-sealing couplings (DN8 and DN20, compatible with leading brands) and a 2 m sampling hose (4, 6, 8 or 10 m on request). Once powered and connected, it draws a small quantity of gas automatically or manually, governed by an inlet auto pressure-sensing function that accepts up to 35 bar. A vacuum purge cycle combined with an internal gas storage system prevents air from contaminating the sample and stops any SF₆ escaping during the test.

All measured gases are analysed and data-logged simultaneously, with a stable reading available in minutes; an intuitive on-screen wizard guides the operator step by step. When the test is complete, a powerful 10 bar compressor supplied by the lithium battery returns the gas to the equipment at high pressure, while multiple safety features supervise the cycle to rule out gas loss or cross-contamination.

Built-in dew-point moisture traps dry the gas with a desiccant before it is pumped back to source. Three SF₆ calibrations — cold (–10 °C to 9 °C), warm (10 °C to 29 °C) and hot climate (30 °C to 50 °C) — compensate sensor drift anywhere in the world, and pre-calibrated sensors can be fitted locally through simplified user access, with no return to base. All current IEC and CIGRE test configurations are pre-programmed, and customised tests can be created.

Applications

- Quality and purity control of SF₆ in HV switchgear, circuit breakers and transformers, with zero emissions.
- Gas verification against IEC and CIGRE criteria during commissioning and routine maintenance.
- Testing of SF₆ gas cylinders (dedicated cylinder testing mode).



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Regular SF₆ analysis protects personnel, equipment and the environment.

SF₆ gas and accessories



1) Calibration kit



2) Gas recovery bag



3) Tongue-and-groove self-sealing couplings

A gas that must stay contained

SF₆ is an extremely stable, non-flammable and highly electronegative gas with excellent dielectric properties, widely used in medium- and high-voltage equipment as insulating, arc-quenching and cooling medium.

Since it is classified as a greenhouse gas, it must be kept within a closed circuit and never vented into the atmosphere; the international Kyoto agreement mandates emission reductions among its member states.

SF₆ technology remains essential for the power transmission and distribution network, so regular gas analysis should form part of the maintenance schedule: the early identification of decomposition products and moisture helps avoid unnecessary shutdowns, outages and failures, and reduces maintenance costs.

Accessories

- Calibration kit and service.
- Gas recovery bag.
- Tongue-and-groove self-sealing couplings.
- Stainless-steel braided sampling hoses.



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TECHNICAL SPECIFICATION

Sample connections	Special tongue-and-groove self-sealing couplings (compatible with leading brands) with 2 m connection hose (4, 6, 8 and 10 m lengths available)
Measurement time	User-specified: 2, 4, 6 or 8 min
Gas flow rate	0.5 L/min
Pressure range	0.3-35 bar, displayed on screen
Max. inlet pressure	35 bar (gauge)
Compressor	Up to 10 bar, with up to 15 cycles per battery charge
Display	7" (180 mm) full-colour LCD touch screen with soft menu keys and on-screen wizard
Languages	English (default), Italian, Spanish, French, German, Portuguese, Chinese (simplified and traditional), Korean, Turkish, Japanese
Printer	Integrated Unicode printer, results printed on demand
Data storage	8 GB internal memory, approximately 1 year of continuous monitoring
Data outputs	MS Excel-compatible data via USB memory stick
Ambient operating conditions	-10 °C to +40 °C (up to +50 °C without battery charging), 10-90 % RH, 600-1,100 mbar (absolute)
Warm-up time	3-4 min initial warm-up; 15 min at 20 °C for full accuracy
Voltage (charging)	90-260 V AC, 50/60 Hz
Battery life	Up to 8 h; 2-4 h charge
In-vehicle charging	Optional accessory
Analyser dimensions	270 mm (H) × 560 mm (W) × 450 mm (D)
Weight	20 kg (total instrument and case)
Warranty	2-year manufacturing warranty (terms and conditions apply)



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SENSOR SPECIFICATION

The modular configuration allows up to eight compatible gases to be analysed simultaneously with one analyser.

Sensor	Measuring range	Accuracy	Calibration	Life span	Sensor type
SF ₆ (sulphur hexafluoride)	0-100 %	±0.5 %	Every 12 months	> 5 years	Infrared (IR) / density
H ₂ O (dew point)	-60 °C to +20 °C dp at P(atm) (10-24,000 ppmV); reading corrected to RT or 20 °C	±2 °C dp of reading	Every 12 months, by sensor exchange	2-3 years	Polymer
SO ₂ (sulphur dioxide)	0-100, 150, 200, 500 or 0-2,000 ppm	±2 % full-scale	Every 12 months	Up to 4 years	Electrochemical
HF (hydrogen fluoride)	0-10 ppm or 0-20 ppm	±2 % full-scale	Every 12 months (using HCl gas)	Up to 4 years	Electrochemical
CF ₄ * (tetrafluoromethane)	0-80 %	±1 % of reading	n/a	n/a	Balance of SF ₆ + air reading
H ₂ S (hydrogen sulphide)	0-100 ppm	±2 % full-scale	Every 12 months	Up to 4 years	Electrochemical
CO (carbon monoxide)	0-1,000 ppm	±2 % full-scale	Every 12 months	> 5 years	Electrochemical
Air / N ₂ (nitrogen)	0-100 %	Full-scale, based on the oxygen component	Every 12 months	Up to 5 years	Electrochemical O ₂ scaled to read as air or nitrogen

* For analysers containing a CF₄ sensor, the measurement of air is also required.
All sensor replacements must be carried out by Amperis or approved repair agents.



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