

SF₆-Breaker-Analyser



SF₆-Percentage, Moisture, SO₂-Content

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The SF₆-Breaker-Analyser is a modular device to check moisture, decomposition and purity of SF₆. The base unit contains a computer board for data acquisition and storage, and all necessary hardware to make a physical connection to gas insulated equipment. Users can purchase test cards for specific contaminants. The device will function with one, two or all three cards.

Features:

- Compact, lightweight
- Low maintenance
- Cost-effective
- Integrated data acquisition and storage
- No consumables
- Highly sensitive
- Automatically validates readings
- Fast test results, typically 5 minutes total
- Modular upgrades
- Battery power (8 hours)

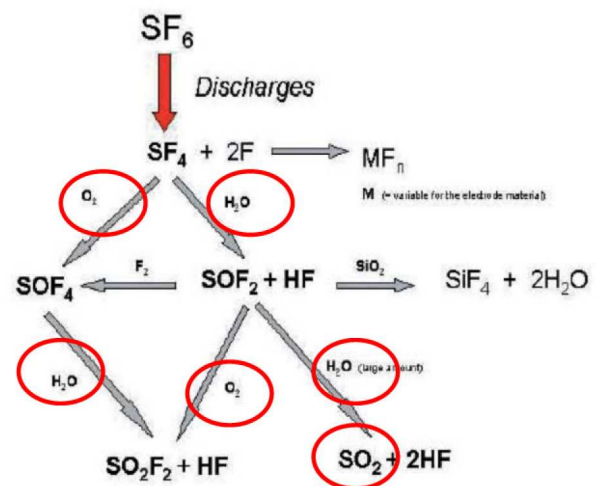
With all three cards installed, the operator simply makes a connection to equipment being tested, and with the push of a button, will receive test values for **moisture, decomposition and purity**. The test values are internally compared to the CIGRE B3.02.01 or IEC standard for SF₆ contamination or reuse (or customer defined value), and a pass/fail indicator will illuminate on the analyzer. All tests values will be stored on internal flash memory – which can later be downloaded to a PC. Because of the modular approach, the user may opt to initially purchase only one card, and as funding becomes available, purchase the additional two cards later. When a card needs calibration, the entire device does not need to be returned – simply exchange the card and avoid all downtime.



Impurity	Specification
Air and/or CF ₄	3% v/volume [note 1]
H ₂ O	25 ppmw [notes 2 and 3]
Mineral oil	10 ppmw [note 4]
Total reactive gaseous decomposition products	50 µl/l total or 12 µl/l for (SO ₂ +SOF ₂) or 25 µl/l HF

Note 1: In case of SF₆ mixtures, the equipment manufacturer shall specify the levels for these gases.
Note 2: Converted to ppmv these levels shall also apply to mixtures until a suitable standard becomes available.
Note 3: 25 mg/kg (25 ppmw) is equivalent to 200 ppmv (200 µl/l) and to a dew point of -36 °C, measured at 100 kPa and 20 °C.
Note 4: If gas-handling equipment (pump, compressor) containing oil is used, it may be necessary to measure the oil content of the SF₆. If all equipment in contact with the SF₆ is oil-free, then it is not necessary to measure oil content.

IEC 60480 for HV-Equipment on used SF₆



Decomposition scheme of SF₆

Technical Specifications	Sensors		
	SO ₂	Moisture	SF ₆ -Percentage
System			
Connection: Self-sealing quick connector	Range	0-10, 0-20, 0-100, 0-500 ppm _v	+ 20 to -60 °C dewpoint
Pressure: 0,5-14 bar (gaseous) with automatic flow rate regulation	Indication	Resolution: 0.1 ppm _v for 0-10 and 20 ppm _v , 1 ppm _v for 0-100 and 500 ppm _v , Temperature compensated	Related to ambient pressure and temperature compensated in °C _{td} , ppm _v and ppm _w
Flow rate: Depending on installed modules	Tolerance	± 1 ppm _v (0-10, 20ppm _v) ± 2% of value	Temperature compensated
Operation: Purge function for tube cleaning Cleaning function with air if necessary (impurities)	Flow rate	10 L/h	dewpoint +20...-40 °C: ± 2°C dewpoint < -40 °C: ± 4 °C
Display: Graphic Display (240x128 Pixel)	Calibration	None required	± 0.5 % based on SF ₆ -N ₂ -Mixtures
Supply: Lithium-Ion battery with 8 h capacity, Rechargeable 100-265 AC V 50/60Hz	Humidity range	up to 90% not condensating	3 L/h
Temperature: Storage: -10 to 60 °C Operation: 0 to 50 °C	Lifetime	2 years	
Dimensions: 380 x 185 x 440 mm (WxHxL)	Maximum zero shift	0,1 ppm _v	
Weight: 12 kg	Long-term stability	< 1 % signal degradation per month (linear) < 0.5 % (0-500ppm _v)	

