

Devices for determination of the SF₆ gas quality

For verification of several parameters in one operation

3-038-R...

SF₆ Multi-Analyser without return system

3-038R-R...

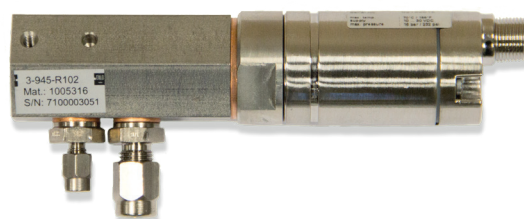
SF₆ Multi-Analyser with return system

This multi-functional device allows the determination of up to six quality parameters with only one measurement:

- SF₆ concentration (%)
- Moisture concentration
- SO₂ concentration (ppm_v)
- OPTION: HF concentration, H₂S concentration, CO concentration (in ppm_v each)

The SF₆ Multi Analyser is a user and maintenance-friendly device which guarantees high measuring accuracy.

First of all, the gas is checked for decompositions products. If critical SO₂ values are determined the measurement can be interrupted. In case of contaminated SF₆ the complete measuring gas can be recovered from the internal vessel. Thus, any contamination of the other sensors is avoided and the functionality of the device is ensured.



If the sensors have to be calibrated they can easily be exchanged by the operator on site. The device is immediately ready for use without loss of time based on the "Plug & Play" principle.

- No emissions of measuring gas
- Modular interchangeability of the sensors
- Easy handling and menu guidance via colour touch screen (5.7")
- Results of up to 100 measurements can be stored with name, date and time
- Data transmission to USB stick
- Adjustable user languages: DE, GB, FR, ES, IT, PT, CZ, PL, CN
- Trolley for comfortable transportation (3-038R-R... version)

Devices for determination of the SF₆ gas quality

3-038(R)-R...

SF₆ Multi-Analyser

Precise and correct results for subsequent measurements can be guaranteed by purging the measuring hoses prior to each measurement.

Another big advantage of the Multi Analyser is its high precision. SF₆ humidity is measured at operating pressure. Thus very precise results are obtained during a short measuring time even in the critical dew point range (< -40 °C). The dew point is calculated at ambient temperature.

The device is very maintenance friendly. The residual lifetime of the SO₂ / HF / H₂S / CO electrochemical sensors is indicated automatically. A very practical and useful device.

Note:

Devices with gas return system: The measuring gas is collected and stored in an internal vessel by means of the compressor. After measurement the stored measuring gas is pumped back automatically from the internal vessel in the gas compartment.

No SF₆ gas is released into the atmosphere!

Technical data:

Dimensions with gas return system: L 500 mm, W 625 mm, H 297 mm
Dimensions without gas return system: L 500 mm, W 625 mm, H 218 mm
Weight with gas return system: 33 kg
Weight without gas return system: 20 kg
Input pressure: p _e 0.3 - 9 bar
Operating temperature: -10 °C to +50 °C
Ambient moisture: up to 90 % relative moisture, non condensing during operation
Operating voltage: 100 - 240 V / 50 - 60 Hz / 10 A
Mains fuse: 2 x 3.15 A/T (time delay)
Number of measured values to be stored: max. 100
Interface: USB
Measuring time: variably calculated by the system, max. 15 minutes
Limit value vol.-%: adjustable from 0.0 to 99.9 vol.-%
Limit value dew point: adjustable from -60 °C to +20 °C
Limit value SO ₂ : adjustable from 0.0 to 499.9 ppm _v
Indication of moisture concentration in dew point °C or °F, referred to atmospheric or input pressure, reversible to indication in ppm _v , ppm _M
Input pressure indication in bar p _a or p _e , psi, kPa, MPa

Standard equipment:

Transport case (trolley version only available for devices with gas return system) 6 m long connecting hose with DILO couplings DN8 and DN20 power plug with 2 m long connecting cable
USB stick with data file for evaluation and reading out of measured data
CD-ROM
1 operating manual (multilingual) on CD-ROM

3-038(R)-R...

SF₆ Multi-Analyser

Sensor data:

	Vol. %	Moisture	SO ₂	Option: HF	Option: H ₂ S	Option: CO
Operating temperature	-10 to +50 °C	-30 to +70 °C	-20 to +50 °C	-20 to +50 °C	-20 to +50 °C	-20 to +50 °C
Measuring range	0 - 100 vol.-%	-60 to +20 °C	0 - 20 ppm _v 0 - 100 ppm _v 0 - 500 ppm _v	0 - 10 ppm _v	0 - 100 ppm _v	0 - 500 ppm _v
Measuring accuracy	±0.5 vol.-%	±2 °C (at > -40 °C) ±3 °C (at < -40 °C)	< ±2 % of measuring range	< ±10 % of measuring range	< ±2 % of measuring range	< ±2 % of measuring range
Measuring gas pressure	atm. pressure	gas compartment pressure	atm. pressure	atm. pressure	atm. pressure	atm. pressure
Flow rate	0.3 - 0.5 l/h	16 - 17 l/h	1 - 3 l/h	1 - 3 l/h	1 - 3 l/h	1 - 3 l/h
Reaction time	< 2 min	< 5 min	< 20 s	< 5 min	< 20 s	< 20 s
Recommended calibration interval	every two years	every two years	every two years (lifetime)	every two years (lifetime)	every two years (lifetime)	every two years (lifetime)
Long term sensitivity drift			< 2 % per month	< 5 % per month	< 2 % per month	< 2 % per month
Overload protection	automatic	automatic	automatic	automatic	automatic	automatic

Ordering designations of the SF₆ Multi-Analyser:

Device without gas return system

3-038- R...

Device with gas return system

3-038R-R...

Single measuring device for percentage measurement 0 - 100 vol. -%	R101
Single measuring device for moisture measurement -60 °C to +20 °C dew point temperature	R102
Two-in-one measuring device for percentage and moisture measurement	R201
Three-in-one measuring device for measurement of percentage, moisture and SO ₂ with 0 - 20 ppm _v	R301
Three-in-one measuring device for measurement of percentage, moisture and SO ₂ with 0 - 100 ppm _v	R302
Three-in-one measuring device for measurement of percentage, moisture and SO ₂ with 0 - 500 ppm _v	R303
Four-in-one measuring device for measurement of percentage, moisture, SO ₂ with 0 - 20 ppm _v and HF with 0 - 10 ppm _v	R401
Four-in-one measuring device for measurement of percentage, moisture, SO ₂ with 0 - 100 ppm _v and HF with 0 - 10 ppm _v	R402
Four-in-one measuring device for measurement of percentage, moisture, SO ₂ with 0 - 500 ppm _v and HF with 0 - 10 ppm _v	R403
Six-in-one measuring device for measurement of percentage, moisture, SO ₂ with 0 - 100 ppm _v , HF with 0 - 10 ppm _v , H ₂ S with 0 - 100 ppm _v and CO with 0 - 500 ppm _v	R602

Options (please inquire separately):

All devices with percentage measuring system are additionally available for SF₆ concentrations in SF₆/CF₄ gas mixtures (measuring accuracy: ±2.0 vol. -%). Thus it is possible to switch over between the SF₆/N₂ and SF₆/CF₄ measurement.

Optional accessories at an extra charge:

Pressure reducer for SF ₆ reference gas bottle with W 21.8 x 1/14" connection	3-974-R003
Discharge gas collecting bag	B151R95
Adapter kit for measuring devices	Z340R10
6 m long connecting hose with self-closing couplings (as extension hose)	3-531-R060
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for 3-038	3-775-R009-C
Packing for 3-038R	3-775-R024-C

Devices for determination of the SF₆ gas quality

For determination of gas purity

3-035-R020 to R025

SF₆ Analyser 973

Since the gas purity is of great importance for the insulation properties of SF₆ gas, it is absolutely necessary to control the most important parameters regularly.

The SF₆ Analyser is based on the dew point measuring principle and scores by its measuring accuracy. The device was specifically designed for moisture measurements in SF₆ switchgear.

The device is optionally available with a SO₂ sensor. Thus the SF₆ Analyser 973 is able to determine up to three parameters.

- Moisture concentration (dew / frost point)
- SF₆ volume percentage
- SO₂ concentration (optionally)



- Integrated measuring gas return system
- Comfortable operation via touch screen
- User configurable display

3-035-R020 to R025

SF₆ Analyser 973

For both humidity and purity measurements accurate and reliable condensation techniques are used.

Furthermore the SF₆ Analyser 973 is equipped with a user configurable full colour active matrix LCD with integrated touch screen.

The device is also equipped with a gas recovery system by which the measured gas can be stored in an internal tank during the measurement procedure. After completion of the measurement, the stored gas may be pumped back automatically or manually into the original compartment or into another vessel. In addition the gas compartment pressure is measured.

Calibration:

Easily check the calibration at any time using the built-in "Ice Test" function.

Technical data:

Dimensions (with handle): W 420 mm, H 155 mm, D 390 mm
Dimensions (external) with transport case: W 650 mm, H 370 mm, D 510 mm
Weight: 16.5 kg
Weight (case included): 32 kg
Measuring range: Frost / dew point: -50 °C to +20 °C however -50 °C at +35 °C ambient temperature is possible
Values are valid for measurements at atmospheric pressure
Humidity content by volume: 40 to 20,000 ppm _v
Humidity content by weight: 5 to 2,500 ppm _w
SF ₆ volume percent: 80.0 to 100.0 vol.-% SF ₆
SO ₂ module: 0...100 ppm _v or 0...500 ppm _v SO ₂
Measuring accuracy: Frost / dew point: ≤ ±0,5 °C ppm _v / ppm _w : ±1 ppm +6 % of measured value SF ₆ volume percent: ±0,5 % SO ₂ : < 2 % of the measuring range Pressure: ±30 mbar
Reproducibility: Frost / dew point: ≤ ±0.2 °C SF ₆ volume percent: ±0.3 % SO ₂ : < 4 % / year or < 2 % / month Pressure: ±10 mbar
Input pressure: p _e 0.01 to p _e 9 bar
Pressure (pumping back): max. p _e 8 bar
Ambient temperature: -10 °C to +45 °C for storage and operation
Power supply: 100 - 120 VAC / 200 - 240 VAC, 50 - 60 Hz (auto switching)
Power consumption: max. 200 watt
Ambient moisture: max. 98 % relative humidity, non condensing during operation

Devices for determination of the SF₆ gas quality

3-035-R020 to R025

SF₆ Analyser 973

Standard equipment:

Housing with handle for transportation and placing
Flow meter with automatic control valve
Internal storage vessel for measuring gas
Measuring gas recovery system
6 / 12 m long connecting hose
DILO couplings DN8 and DN20
Power plug with 3 m long connecting cable
CD-ROM with USB driver
RS 232 / USB interface for transmission of measuring data to PC
Optionally with and without SO ₂ measurement
Transport case
1 operating manual (multilingual) on CD-ROM

Device selection SF₆ Analyser 973:

Device without SO ₂ measurement with 6 m long connecting hose	3-035-R020
Device with SO ₂ measurement and 100 ppm _v measuring module with 6 m long measuring hose	3-035-R021
Device with SO ₂ measurement and 500 ppm _v measuring module with 6 m long measuring hose	3-035-R022
Device without SO ₂ measurement with 12 m long connecting hose	3-035-R023
Device with SO ₂ measurement and 100 ppm _v measuring module with 12 m long measuring hose	3-035-R024
Device with SO ₂ measurement and 500 ppm _v measuring module with 12 m long measuring hose	3-035-R025

Optional accessories at an extra charge:

Additional operating manual on CD-ROM	6-0004-R213
---------------------------------------	--------------------

Packing:

Packing for 3-035-R...	3-775-R027-C
------------------------	---------------------

For determination of moisture

3-037-R001

Electronic moisture measuring device with dew point indication

Moisture is the most important criteria for the determination of the gas quality. This device has been designed specially for SF₆ moisture measurements. It also shows a higher resistance against contamination and SF₆ decomposition products than conventional moisture sensors and even minimises the usual long time drifting.

The integrated electronic flow meter supports the minimisation of the gas sample quantity and works independently of its position which is the optimum for gas sampling from circuit breaker. Pressure and temperature influences on the measuring result can be excluded. It is a reliable instrument which is indispensable.



- Indication in °C dew point, quick conversion into ppm values
- Measurement is possible under atmospheric or plant pressure
- Mains operation or operation by NiMH accumulators

Devices for determination of the SF₆ gas quality

3-037-R001

Electronic moisture measuring device with dew point indication

Technical data:

Dimensions (without handle): W 210 mm, H 85 mm, D 250 mm
Dimensions (transport case): W 360 mm, H 290 mm, D 165 mm
Weight: 2.8 kg
Measuring range: -70 to +20 °C dew point
Measuring accuracy: ±2 °C (from -60 to +20 °C), ± 4 °C (from -70 to -60 °C)
Input pressure: p _e 0.5 - 10 bar
Operating temperature: 0 - 50 °C
Ambient moisture: up to 90 % relative moisture, non condensing during operation
Operating voltage: 100 - 240 V / 50 - 60 Hz

Standard equipment:

Moisture measuring device with digital display
2 precise regulating valves and electronic flowmeter
Operation: mains-operated or by NiMH batteries (battery charger is integrated)
2 m long connecting hose with couplings DN8 and DN20
Robust housing with handle for placing and transportation
2 m long connecting cable with mains plug
Black plastic transport case
1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

Additional operating manual on CD-ROM	6-0004-R213
---------------------------------------	-------------

Packing:

Packing for 3-037-R001	3-775-R026-C
------------------------	--------------

For measurement of the volume percentage in air and nitrogen mixtures

3-027-R002

SF₆ Volume percentage measuring device

This device serves for measuring the gas purity necessary to maintain the dielectric property for arc quenching in circuit breakers. Thanks to the speed of sound measurement developed by DILO it provides results immediately. The microprocessor installed converts the values measured into the SF₆ volume percentage.

Easy rinsing after the measuring process - and the device can be used again for another gas compartment immediately.

The device can be deployed for measurements of pure SF₆ gas or SF₆ gas mixtures containing N₂ or CF₄.

In this case we kindly ask you to contact DILO.



- Easy handling
- Measurement independent of the air pressure and its position
- Response time about 1 minute
- Digital indication of the measuring values

Devices for determination of the SF₆ gas quality

3-027-R002

SF₆ Volume percentage measuring device

Technical data:

Dimensions (with handle): W 415 mm, H 155 mm, D 450 mm
Dimensions (transport case): W 535 mm, H 180 mm, D 470 mm
Weight: 10.5 kg
Weight with transport case: 14 kg
Measuring media: SF ₆ / N ₂ or SF ₆ / air-gas mixtures
Measuring range: 0 - 100 volume-% SF ₆
Measuring accuracy: ± 0.5 volume-% for SF ₆ / N ₂ -gas mixture or SF ₆ / air-gas mixture
Operating pressure: input pressure of the device without pressure regulation p _a (absolute) = 1.7 to 10 bar (p _e [effective] = 10.2 to 130.5 psi). At a pressure of p _a (absolute) = 1.2 to 1.7 bar (p _e [effective] = 2.9 to 10.2 psi) the function is still guaranteed. However, the response time increases.
Measuring pressure: The measuring process is effected under atmospheric pressure.
Operating temperature: temperature compensation of -20 °C to +50 °C (-4 °F up to +122 °F) ambient temperature
Ambient moisture: up to 90 % relative moisture, non condensing during operation
Response time: Approx. 1 min. with a rinsed connecting hose. The response time as well as the rinsing of the connecting hose depend on the supply pressure. In the most unfavourable case at p _a (absolute) = 1.7 bar (p _e [effective] = 10.2 psi) the time to get an exact measurement is 5 min. if the rinsing valve is not operated.
Flow rate: max. 1.2 g / min. (0.04 oz / min) at 100 % SF ₆ gas and an operating pressure of p _a (absolute) = 10 bar (p _e [effective] = 130.5 psi)
Electrical connection: 220 V - 240 V / 50 - 60 Hz reversible to 110V - 127V / 50 - 60 Hz
Interface: RS232

Standard equipment:

Volume percentage measuring device with digital display
Measuring cell with electronic part
2 m long connecting hose with coupling DN8 and DN20
Housing with front and back covering with big handle for transportation and placing of the device
Mains plug with 2 m long connecting cable
Transport case
1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

Data cable for RS232 interface and CD-ROM with computer indicating programme	6-1106-R001
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for 3-027-R002	3-775-R009-C
------------------------	---------------------

Modification for discharge gas collection unit (only for devices delivered up to the middle of 2004)

It is possible to modify the device in such a way as to allow the recovery and storage of measuring gas so that the measuring gas is no longer released into the atmosphere. The B151R95 measuring gas collecting bag is suitable for storing the measuring gas.

Retrofit kit for discharge gas collection unit (modification carried out by DILO)	6-1104-R011
Retrofit kit for discharge gas collection unit (modification executed by the customer)	6-1104-R021

For measurement of the SO₂ concentration in gas mixtures

3-032-R...

Portable SO₂ measuring device with LED indication

Before maintenance works are carried out it is absolutely necessary to know the gas quality. This special equipment allows precise measurement of SO₂ in gas mixtures. Furthermore this device is very resistant against contamination and SF₆ decomposition products and is therefore a reliable instrument for each revision of circuit breakers.



- Minimization of the usual long term drifting
- No pressure and temperature influences on the measuring result
- Indication in ppm_v

Devices for determination of the SF₆ gas quality

3-032-R...

Portable SO₂ measuring device with LED indication

Technical data:

Dimensions (without handle): W 170 mm, H 85 mm, D 260 mm
Dimensions (with handle): W 210 mm, H 85 mm, D 315 mm
Dimensions (transport case): W 360 mm, H 165 mm, D 290 mm
Weight: 2.9 kg
Weight with transport case and accessories: 5.1 kg
Available measuring ranges: R101 = 0 - 20 ppm _v R102 = 0 - 100 ppm _v R103 = 0 - 500 ppm _v
Measuring accuracy: < ± 2 % of the measuring range
Operating temperature: 0 - 40 °C
Ambient moisture: up to 90 % relative moisture, non condensing during operation
Input pressure: p _e 0.5 - 10 bar
Operating voltage: 100 - 265 V / 50 - 60 Hz
Connection: quick coupling
Response time: < 15 s (90 % of the final value)
Measuring time: < 2 minutes
Lifetime of the sensor: 6 months when storing in protective foil; 24 months operating life in air
Long term sensitivity drift: < 2 % of the SO ₂ sensor per month
Flow rate: 1 - 3 l _N / h
Rinsing function: automatic rinsing of the measuring cell with ambient air when switching off
Indication: digital LED display (24 x 48 mm)
Batteries: NiMH batteries rechargeable

Standard equipment:

SO ₂ measuring device with digital display
Operation: mains-operated or with batteries (with integrated battery charger with deep discharge protection and battery charge level indicator), automatic switchover
Automatic rinsing of measuring cell when switching off
2 m long connecting cable with mains plug
4 m long connecting hose with quick couplings DN8 and DN20
Output coupling for connecting a gas collecting unit
Robust housing with handle for placing and transportation
Black plastic case
1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

Additional operating manual on CD-ROM	6-0004-R213
---------------------------------------	-------------

Packing:

Packing for 3-032-R...	3-775-R026-C
------------------------	--------------

For precise measurement

3-032-R003

Measuring device for different decomposition products and gas residues

During the operation of gas insulated switchgear decomposition products might occur after a breakdown which has a negative impact on the gas quality in the circuit breaker as well as on the insulation properties.

For this reason the measurement of decomposition products is very important. The measurement can be carried out easily by means of test tubes and plastic bags. The following concentrations can be measured:

- Sulphur dioxide SO_2 : 1 to 500 ppm_v
- Hydrogen fluoride HF: 1.5 to 15 ppm_v
- Oil mist: 1 to 10 mg/m^3 (0.16 to 1.6 ppm_v)



- The device is supplied in a handy plastic case. Gastight couplings DN8 and DN20 are also included in the scope of supply.

Devices for determination of the SF₆ gas quality

3-032-R003

Measuring device for different decomposition products and gas residues**Technical data:**

Dimensions: W 198 mm, H 115 mm, D 165 mm
Case dimensions: W 360 mm, H 290 mm, D 165 mm
Weight without case: 2.4 kg

Standard equipment:

Measuring device for decomposition products with flowmeter and needle valve
Safety valve
Mounting for test tubes
DILLO connecting couplings in DN8 and DN20
Tube opener
Connecting piece with connecting hose
2 spare O-rings
2 m long flexible connection
Black plastic transport case
1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

10 pieces test tubes for sulphur dioxide SO ₂ type 1/a; measuring range 1 to 25 ppm _v Plastic bags with a volume of 1 litre are needed (3-032-21)	3-032-15
10 pieces test tubes for sulphur dioxide SO ₂ type 20/a; measuring range 20 to 220 ppm _v Plastic bags with a volume of 1 litre are needed (3-032-21)	3-032-16
10 pieces test tubes for sulphur dioxide SO ₂ type 50/b; measuring range 50 to 500 ppm _v Plastic bags with a volume of 1 litre are needed (3-032-21)	3-032-17
10 pieces test tubes for hydrogen fluoride HF type 1.5/b; measuring range 1.5 to 15 ppm _v Plastic bags with a volume of 2 litres are needed (3-032-20)	3-032-18
10 pieces test tubes for detection of oil mist type 1/a; measuring range 1 to 10 mg/m ³ (0.16 to 1.6 ppm _{mass}) Plastic bags with a volume of 10 litres are needed (3-032-22)	3-032-19
5 pieces plastic bags with a volume of 1 litre	3-032-21
5 pieces plastic bags with a volume of 2 litres	3-032-20
3 pieces plastic bags with a volume of 10 litres	3-032-22
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for 3-032-R003	3-775-R026-C
------------------------	---------------------

Gas leak detectors

For quick detection and measuring small SF₆ leaks

3-033-R100

SF₆ Leakcheck

3-033-R110

SF₆ Leakcheck HighSens Version

The SF₆ Leakcheck serves for detection of SF₆ leaks and allows tracing of even smallest leaks on all SF₆ components in a safe and reliable way. The detection limit of the leak system is $1 \cdot 10^{-7}$ mbar l/s (...R100) and $1 \cdot 10^{-8}$ mbar l/s (...R110). The device can be switched over from search mode to measuring mode or concentration measurement.

The Leakcheck is also suitable for the integral leak measurement in closed rooms.



- Programmable alarm threshold
- Comfortable one-hand operation
- Quick return to zero position even after detection of large leaks
- Integral concentration measurement in closed rooms is possible
- LCD touch screen / data storing
- Data transfer via serial interface

Gas leak detectors

3-033-R100 / 3-033-R110

SF₆ Leakcheck

SmartSensor

The system's wear parts are integrated in a plug-in SmartSensor which can be exchanged for maintenance by the operator within a few seconds. Since three SmartSensors are already included in the scope of supply availability of the system is increased considerably. The end of the sensor lifetime is indicated.

Technical data:

Case dimensions: W 486 mm, H 194 mm, D 398 mm
Weight (console): 12.5 kg
Weight (hand-held device): 563 g
Detector: NIC (high voltage ionisation detector)
Detection limit of leak system: up to $1 \cdot 10^{-7}$ mbar l/s or 1 ppm _v
HighSens version (3-033-R110): up to $1 \cdot 10^{-8}$ mbar l/s or 0.1 ppm _v
Response time t ₉₀ : approx. 0.5 s
Recovery time t ₁₀ : approx. 0.5 s
Alarm signal: audible signal, status LED, vibration alarm
Indication: hand-held device with analogue indication, basic unit with digital display, text indicator
Measuring data storage: approx. 100 measuring data can be stored possible transfer to PC or printer via serial interface
Self-diagnosis: suction quantity, sensor lifetime, state of battery charge, hardware failure
Battery: integrated accumulator with automatic charge control, measuring operation (approx. 10h)
Operating temperature: 0 °C to 50 °C
Storage temperature: -10 °C to 60 °C
Operating voltage: 100 - 265 V / 50 - 60 Hz

Standard equipment:

SF ₆ Leakcheck with LCD touch screen
Robust, waterproof plastic case
Hand-held device with 5 m long cable, pluggable
3 pieces of SmartSensors (calibrated)
Power cable
Calibration certificate
1 operating manual (multilingual) on CD-ROM

3-033-R100 / 3-033-R110

SF₆ Leakcheck

Optional accessories at an extra charge:

Spare SmartSensor	3-033-R101
SmartSensor (maintenance)	3-033-R102
5 m long cable extension	3-033-R103
10 m long cable extension	3-033-R104
15 m long cable extension	3-033-R105
300 mm long sensor extension	3-033-R106
500 mm long sensor extension	3-033-R107
Leak calibrator, leak rate min. $3 \cdot 10^{-8}$, max. $1 \cdot 10^{-2}$ mbar l /s, indication required	3-033-R108
Front filter (package 10 pieces each)	3-033-R109
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for 3-033-R100 / 3-033-R110	3-775-R031-C
-------------------------------------	--------------

Gas leak detectors

For quick tracing of small SF₆ leaks

3-033-R002

SF₆-LeakPointer

The cordless battery-operated device measures in six sensitivity levels within a very short response time. The device switches automatically to the next higher level of sensitivity for detection of larger leaks. It is possible to switch over the device to the most sensitive measuring range by simply pressing the corresponding key. The SF₆ concentration is displayed next to the indication of the measuring range by an LED bar display and an audible signal.



- Quick response time
- Low "Recovery" time
- Automatic switching over to levels of sensitivity
- Detection of leaks of up to 5 g / year
- Single-handed operation
- Battery-operated
- Temperature-compensated

3-033-R002

SF₆-LeakPointer

Technical data:

Dimensions with case: B 300 mm, H 75 mm, T 230 mm
Weight with case and accessories: 1160 g
Power supply: 3 x 1.5 V alkaline batteries C LR14
Sensitivity: 5 g SF ₆ / year
Operating temperature: -20 °C to +50 °C
Ambient moisture: up to 90 % relative moisture, non condensing during operation
Measuring principle: high voltage ionisation
Response time T90: approx. 1s
Recovery time: approx. 1s
Indication: 8 segment bar display + 7 LED measuring range indication + acoustic signal
Sensor length: 385 mm

Standard equipment:

Carrier case
Three 1.5 V alkaline batteries
Spare sensor
1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

Spare sensor	3-033-R017
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for 3-033-R002	3-775-R028
------------------------	-------------------

Room monitoring devices

For monitoring the air of SF₆ indoor plant in permanent operation

3-026-R115

SF₆ Air Sensor

The device even detects smallest SF₆ concentrations and displays the current measuring values permanently. For the operating personnel it is absolutely necessary to know that no radioactive source is used. Therefore no special measures must be taken during operation.

The SF₆ Air Sensor guarantees a quick reaction time. Furthermore, there is no cross sensitivity to moisture and unaffected by background contamination and the measuring result remains constant. Parameters for warning messages and alarm tripping are freely configurable.



- Measuring range: 0 up to 1,500 ppm_v SF₆
- High longtime stability
- No maintenance and consumables are required
- Indication of the measuring value via LCD on the front of the device
- Air pressure compensated
- Analogous and serial interface

3-026-R115

SF₆ Air Sensor

Technical data:

Dimensions: W 80 mm, H 150 mm, D 60 mm
Weight: 250 g
Measuring principle: NDIR (double beam)
Measuring range: 0 up to 1,500 ppm _v SF ₆
Measuring accuracy: < ±2 % of measured value
Long-time stability / drift: < ±2 % of measured value / year
Warming time: < 2 min (run-up), 15 min. (full specification)
Response time: < 2 min
Indication: directly via LCD
Operating voltage: 24 V DC, 160 mA, 3.9 W
Ambient moisture: max. 95 % relative humidity, non condensing during operation
Protection class: IP 41
Calibration / Maintenance: is not required due to the life time of sensor (about > 10 years)
Operating temperature: -10 to 40 °C

Standard equipment:

1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

Additional operating manual on CD-ROM	6-0004-R213
---------------------------------------	-------------

Packing:

Packing for 3-026-R115	3-948-R001
------------------------	------------

Important note:

The device can only be used together with the SF₆ Network Monitor. It cannot be operated autonomously.

The device can also be connected with other devices to the SF₆ Network Monitor directly in order to build up monitoring points for SF₆ gas in the room via a network for monitoring.

Room monitoring devices

Central monitoring and indication of measuring values

3-026-R114

SF₆ Network Monitor

The SF₆ Network Monitor is the central control unit from up to five SF₆ Air Sensors to be connected. Warning and alarm thresholds can be set for each SF₆ Air Sensor.

The plug-and-play operating concept makes the handling very comfortable. Measuring values can be stored and called on the 5.7" coloured touch screen, if necessary.



- Different acoustic warning, alarm and malfunction signals
- Own names for each SF₆ Air Sensor connected
- Connection between SF₆ Air Sensors and Network Monitor via bus cable with plug connectors

3-026-R114

SF₆ Network Monitor

Technical data:

Dimensions: W 250 mm, H 218 mm, D 120 mm
Weight: 2.0 kg
Indication: coloured 14.5 cm (5.7") touch screen
Connection: max. 5 SF ₆ Air Sensors via bus system
Max. length of power and bus cable: 150 m / connection
Operating voltage: 100 V - 240 V AC, 50 / 60 Hz, max. 30 VA
Ambient moisture: max. 95 % relative moisture, non condensing during operation
3 relay contacts max. charge: 2.5 A / 230 VAC
Protection class: IP 42
Sound pressure signal: > 75 dbA, 1m

Standard equipment:

1 operating manual (multilingual) on CD-ROM

Optional accessories at an extra charge:

2 m long power and bus cable	3-026-95
10 m long power and bus cable	3-026-96
25 m long power and bus cable	3-026-97
50 m long power and bus cable	3-026-98
Power and bus cable per meter	3-026-99
Connecting parts power and bus cable	3-026-89
Bus-Repeater up to 1,200 m bus length	3-026-85
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for 3-026-R114	3-948-R004
------------------------	-------------------

Note:

For each SF₆ Air Sensor (3-026-R115) to be connected a power and bus cable is necessary.

The power and bus cable leads from the SF₆ Network Monitor to the first SF₆ Air Sensor and then to the next SF₆ Air Sensor until the last SF₆ Air Sensor is connected.

Accessories

For mobile and preliminary storage of SF₆ measuring gas

B151R95

Discharge gas collecting bag

This bag is a simple and cost-effective system for collecting measuring gas in case it cannot be returned directly into the circuit breaker. Its handling is very easy: Connect the bag with the hose included in the scope of supply to the measuring device.

The discharge gas collecting bag allows collecting the SF₆ from up to 25 measurements. The gas can be removed by means of any service cart. When using this system no SF₆ is released into the atmosphere. It is light, practical and environmentally friendly.



- 52 l capacity
- Light folding bag for comfortable transportation
- Integrated safety valve ($p_e = 100 \text{ mbar}$)
- Self-closing miniature couplings

B151R95

Discharge gas collecting bag

Technical data:

Dimensions folded: L 300 mm, W 600 mm, H 80 mm
Dimensions filled: L 600 mm, W 900 mm, H 300 mm
Weight: 1.2 kg

Standard equipment:

2 operating manuals in German, English or French
--

Optional accessories at an extra charge:

DILO coupling DN20 with hose connection (between service cart and bag)	6-1161-R023
Adapter case for measuring devices	Z340R10
Additional operating manual on CD-ROM	6-0004-R213

Packing:

Packing for B151R95	3-948-R007
---------------------	-------------------

Note:

All DILO measuring devices equipped with a gas return system can be connected to the discharge gas collecting bag (see data sheets of the SF₆ Measuring devices).

Accessories

Practical kit in a portable plastic case

Z340R10

Adapter for measuring device

When using devices of different construction you will be convinced of this adapter kit. It includes different adapters to enable the connection to older measuring devices as well as pressure reducers for measuring the gas quality in SF₆ bottles. Furthermore, this kit contains adapters for retrofitting self-closing coupling systems.

A kit for all applications.



Z340R10

Adapter for measuring device

Technical data:

Case dimensions: W 360 mm, H 290 mm, D 165 mm
Weight: 4.2 kg

Standard equipment:

Hose connection DN8	3-389-R008 P
Adapter for measuring gas connection	3-969-R001
Adapter for measuring gas connection	3-969-R002
Adapter for measuring gas connection	3-969-R003
Adapter for measuring gas connection	3-969-R004
Transition piece DN20 for bottle pressure reducer	3-240-R003 P
Pressure reducer for SF ₆ reference gas bottle	3-974-R001
Manifold with self-closing couplings	3-817-R004
Manifold for measuring gas output	3-817-R005
4 m long extension hose	6-1116-R040
Instructions for the "application range of the different adapters" in two languages: German / English	

Packing:

Packing for Z340R10	3-775-R026-C
---------------------	--------------