

SF₆ GAS SOLUTIONS • NDIR SENSING

Infrared gas analyzer for SF₆ and refrigerant gases

Model TRM-IR

■ APPLICATIONS

- Continuous monitoring of SF₆ concentration in the working-zone air of gas-insulated switchgear (GIS) and enclosed switchgear of power stations
- Leak detection and air-quality control in electrical substations
- Monitoring of refrigerant gases (R-134a, R-125, R-22, R-404A and others) in industrial and cold-storage rooms

■ SPECIAL FEATURES

- 2-beam infrared optical technology with reference channel for long-term stability
- Heated measuring cuvette prevents moisture condensation
- Diffusion sampling — no pump or moving parts
- Wide operating range -40 ... +60 °C, IP67 enclosure
- RS-485 / Modbus RTU digital output
- Optical IR sensor of in-house design and manufacture

■ DESCRIPTION

The **Tremon IR** is a stationary gas analyzer that measures gas concentration in air, nitrogen or other inert-gas mixtures on the principle of **infrared absorption**, and transmits the measured value to external systems over a digital protocol.

Robust & reliable construction

A rugged sealed aluminium-alloy housing protects the electronic and optical components. Only corrosion-resistant materials are exposed to the environment. The **IP67** rating ensures dependable operation in harsh conditions.



Stationary IR gas analyzer, model TRM-IR-SF₆-1000

In-house sensor production

Tremon IR analyzers use optical IR sensors of our own design and manufacture. Full control over quality at every production stage delivers more reliable and accurate sensors and reduces dependence on external supply.

Traceable calibration

Every analyzer is calibrated in-house against reference gas mixtures, with a documented, traceable calibration record supplied at delivery.

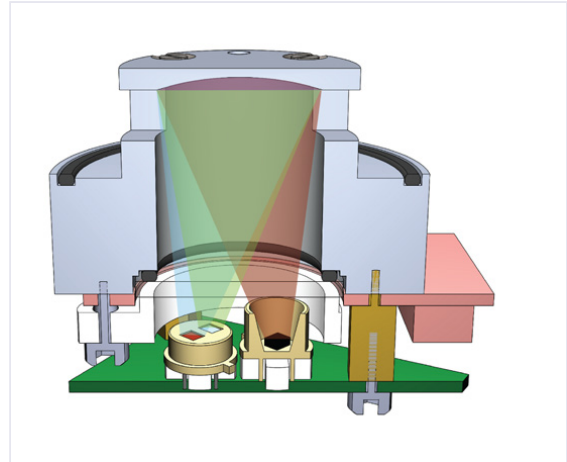
■ MEASURING PRINCIPLE

The monitored air enters the optical measuring cuvette by **diffusion** through openings in the splash guard, enhanced by a thermal-convective effect (the "chimney effect").

An infrared heater emits radiation across a wide spectrum in the IR range, invisible to the human eye. The radiation leaves the optical window in the housing and passes through the measuring cuvette twice. A mechanically robust, one-piece metal mirror reflects the infrared beams onto the detectors in the optical module.

The measuring cuvette is continuously **heated** by thermal elements placed directly at the optocoupler, preventing condensation of atmospheric moisture caused by temperature changes.

Zero-point stability is ensured by a **reference channel** that compensates for contamination of the mirror and window as well as variations in the intensity of the IR source. The **2-beam optical technology** provides long-term stability and compensates for possible contamination and dust in the optical cuvette.



2-beam optical measuring path with heated cuvette & reference channel

■ INFRARED TECHNOLOGY – ADVANTAGES

- Accurate concentration determination
- Low maintenance cost (long-term operating stability)
- Fault tolerance
- Insensitivity to flow velocity
- Insensitive to polymerising and corrosive substances and to sensor poisons
- High gas concentration does not disable the sensor
- Operates in oxygen-free and oxygen-rich atmospheres
- Insensitive to other gases

■ MICROPROCESSOR TECHNOLOGY

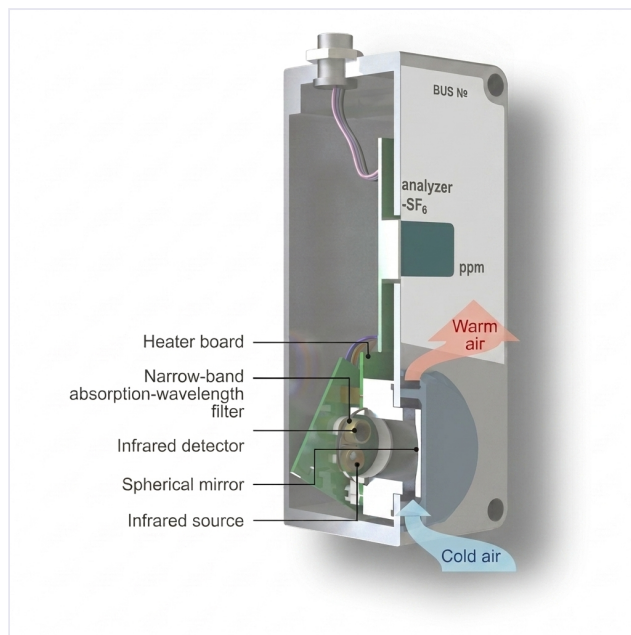
- Device-fault detection with warning via status indicator and digital interface
- Special calibration mode that suppresses alarms at the central controller during service
- One-person calibration
- Temperature compensation
- Freely selectable measuring range

■ IN-HOUSE PRODUCTION & INTERNAL DESIGN

Every Tremon IR analyzer is assembled and calibrated in-house. Controlling the full production chain — from the optical IR sensor to final calibration — lets us guarantee accuracy, repeatability and a documented traceable calibration for each unit.

Complete in-house control

Design, optical-sensor manufacture, assembly and final calibration are all performed under one roof. This vertical integration keeps quality consistent, shortens lead times and removes dependence on external sensor suppliers.



Cutaway – internal optics: heated cuvette, spherical mirror, IR source & detector

■ TRACEABLE CALIBRATION

Each analyzer is calibrated against certified reference gas mixtures whose values are **traceable to national metrology standards**. A documented calibration certificate is supplied with every unit, stating the reference mixtures, measuring range and calibration date.

Calibration procedure

- Two-point calibration: zero point and span (test-gas concentration)
- One-person calibration via the magnetic key or the Tremon Toolbox
- Built-in temperature compensation across the full $-40 \dots +60$ °C range
- Linearised gas characteristics stored in the analyzer firmware

Service & recalibration

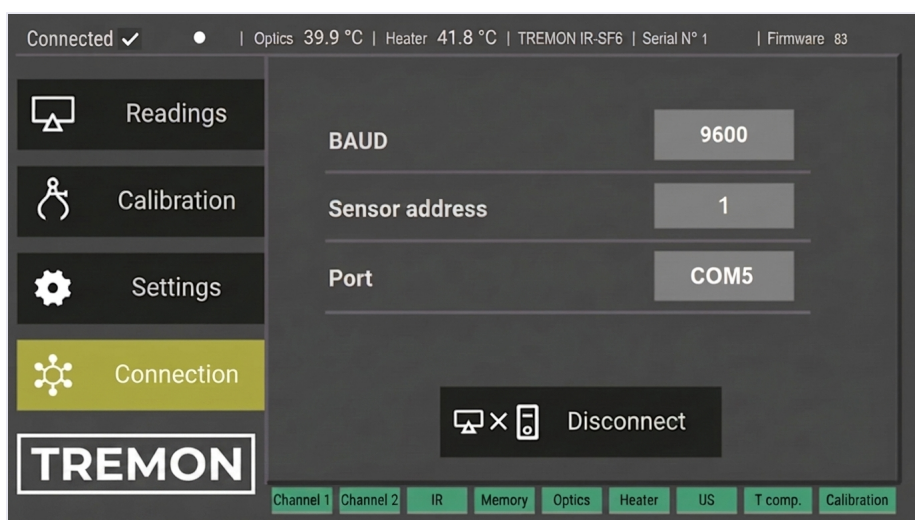
- Recommended recalibration interval: **1 year**
- Special service mode suppresses false alarms at the central controller during calibration
- Zero and span can be re-adjusted in the field without removing the analyzer
- Next calibration due-date tracked and reported by the Toolbox software

Traceable calibration is the foundation of dependable long-term measurement — it links every reading back to a recognised reference, so results stay comparable and audit-ready over the life of the instrument.

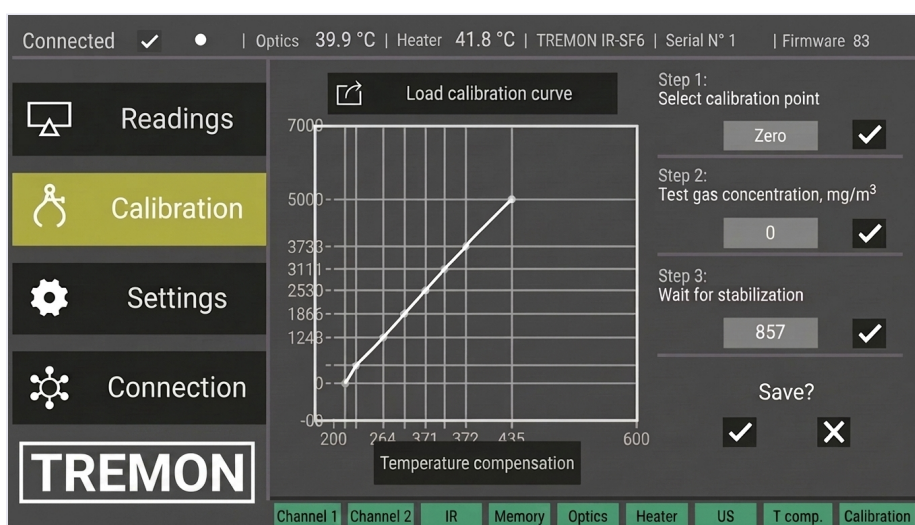
TREMON TOOLBOX SERVICE SOFTWARE

Tremon IR analyzers are serviced with the **Tremon Toolbox** software. It contains linearised gas characteristics, lets you set the analyzer zero remotely, and reports comprehensive information about the analyzer's current state and settings.

- Windows 7–10 support
- USB connection
- IR-emitter status
- Heater & optics temperature
- Serial number & firmware version
- Analyzer calibration
- Next calibration due date
- Network address of the analyzer
- Online analyzer readings
- Zero & span adjustment



Tremon Toolbox – connection screen



Tremon Toolbox – calibration screen

TECHNICAL DATA

TREMON IR GAS ANALYZER

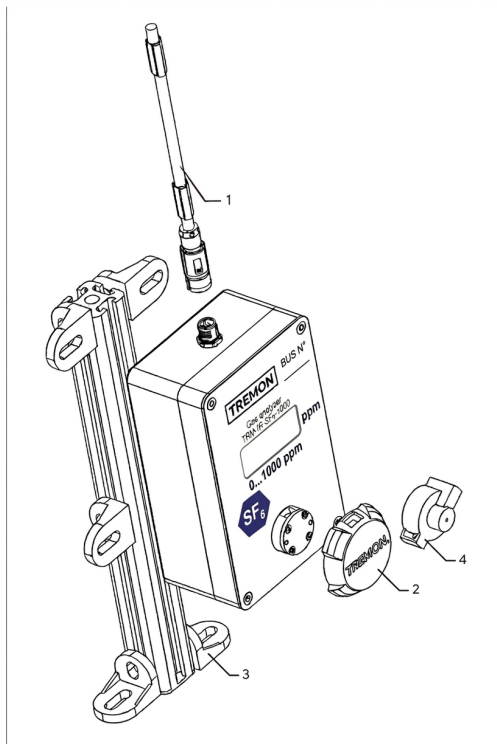
Type	Stationary gas analyzer
Measuring principle	Infrared absorption, 2-beam technology with temperature compensation
Housing	Aluminium alloy, powder-coated
Output signal	RS-485 (protected to 75 V) · Modbus RTU
Ambient conditions	-40 ... +60 °C · rel. humidity 0 ... 100 % · atmospheric pressure 90.6 ... 107 kPa
Power supply	24 V DC ± 2.4 V
Power consumption (with heater)	2 W
Ingress protection	IP67
Response time	10 s
Dimensions	160 × 100 × 60 mm
Weight	≤ 1.0 kg
Sampling	Diffusion, heated cuvette

MEASURED GASES & RANGES

MEASURED COMPONENT	RANGE, MG/M ³	RANGE, PPM
Sulphur hexafluoride (SF ₆)	0-6000 / 0-12000	0-1000 / 0-2000
1,1,1,2-tetrafluoroethane (R-134a)	0-4240 / 0-8480	0-1000 / 0-2000
Pentafluoroethane (R-125)	0-4990 / 0-9980	0-1000 / 0-2000
Chlorodifluoromethane (R-22)	0-3600 / 0-7200	0-1000 / 0-2000
1,1,2-trichlorotrifluoroethane (R-113)	0-7790 / 0-15580	0-1000 / 0-2000
Dichlorodifluoromethane (R-12)	0-251 / 0-503	0-50 / 0-100
Heptafluoropropane (R-227ea)	0-7070 / 0-35350	0-1000 / 0-5000
Refrigerant blend R-407c	0-3583 / 0-7165	0-1000 / 0-2000
Other component	On request	On request

ppm values are volumetric (v/v), converted at 20 °C and 101.3 kPa. Two measuring ranges available per component; the analyzer is factory-configured to the ordered range.

MOUNTING & ACCESSORIES



The mounting kit allows the Tremon IR analyzer to be installed on a floor or a wall.

#	ACCESSORY	CODE
1	Connection cable	TRM-0601
2	Protective cap	TRM-0602
3	Mounting kit	TRM-0603
4	Calibration adapter	TRM-0604
-	USB adapter for PC connection	TRM-0605
-	Magnetic calibration key	TRM-0606

Analyzer with mounting rail & accessories

ORDERING INFORMATION

MODEL	COMPONENT	RANGE, MG/M ³	RANGE, PPM
TRM-IR-SF6-1000	SF ₆	0...6000	0...1000
TRM-IR-SF6-2000	SF ₆	0...12000	0...2000
TRM-IR-R134a-1000	R-134a	0...4240	0...1000
TRM-IR-R125-1000	R-125	0...4990	0...1000
TRM-IR-R22-1000	R-22	0...3600	0...1000
TRM-IR-R227-1000	R-227ea	0...7070	0...1000
TRM-IR-CUSTOM	On request	On request	On request

MANUFACTURER

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