# $SF_6$ GAS DENSITY SENSOR

## Unique electronic $SF_6$ gas density monitoring

- Continuous digital or analogue output signal
- Usable for $SF_6$ trend analysis
- Wide density range
- Additional output of sensor temperature (digital version)
- Extremely drift free signal
- Outdoor application without additional protection


Trafag AG
Sensors & Controls

Industriestrasse 11
CH-8608 Bubikon

Tel. +41 44 922 32 32
Fax +41 44 922 32 33

www.trafag.com
trafag@trafag.com

trafag
sensors controls

# Trafag Gas Density Sensor 8774

## Unique electronic $SF_6$ gas density monitoring with quarz tuning fork

The Trafag gas density sensor type 8774 was specifically designed for monitoring insulation gases. This unique patented sensor technology opens new paths for the energy distributing industry to realize comprehensive trend analysis and monitoring. It measures directly and continuously the gas density providing an analogue or digital output signal. The version with digital output signal also provides the signal of the gas temperature.

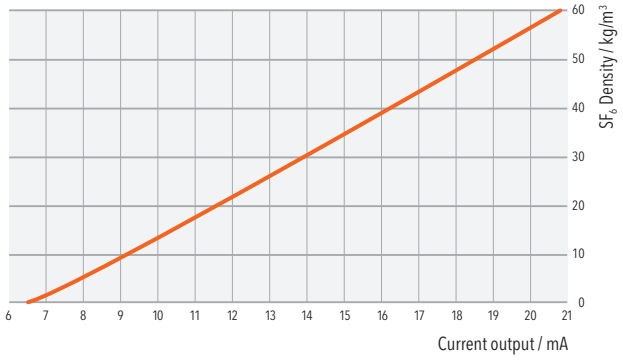
## Advantages

- Continuous digital or analogue output signal usable for $SF_6$ trend analysis
- Wide density range
- Additional output of sensor temperature (digital version only)
- Extremely drift-free signal
- Outdoor application without additional protection
- Electromagnetic compatibility (EMC) according to EN/IEC 61000-4
- Density measurement of all gases possible
- Facilitates compliance with greenhouse gas regulations

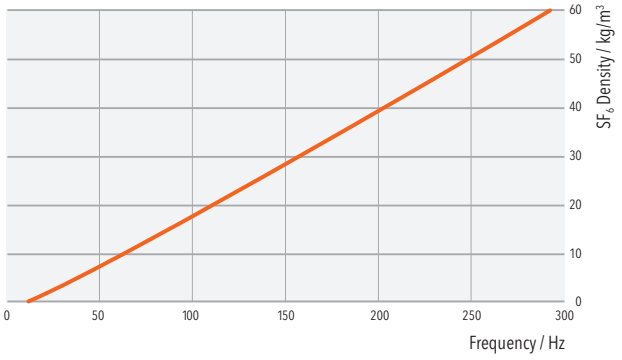
## Operating principle of the electronic gas density sensor

The constant resonant frequency of a quartz oscillator under vacuum is compared with the resonant frequency of an identical quartz situated in the sample gas. The difference in the resonant frequency is proportional to the density of the sample gas. This difference is processed into an analogue or digital output signal. With the digital variant the temperature can be measured using the pulse width of the frequency signal.

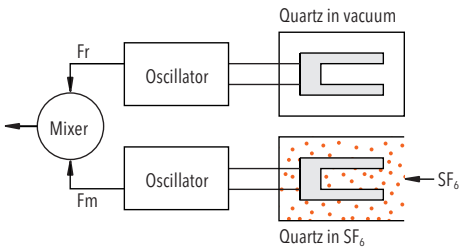
$SF_6$ gas density: analogue output signal



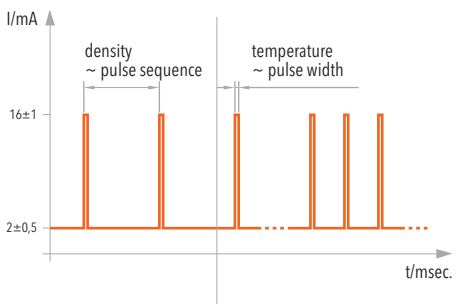

$SF_6$ gas density: digital output signal



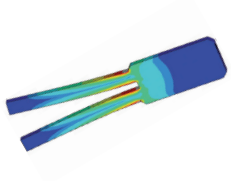

Functional diagram



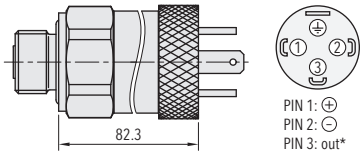

Current pulses (typical height 12–14 mA)



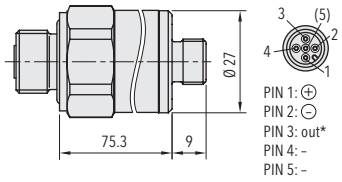

Finit element stress analysis of an oscillating tuning fork



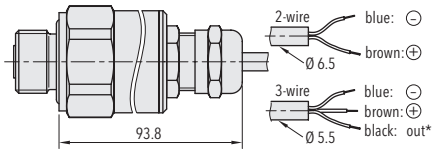
| Technical data Gas Density Sensor 8774 | | | |
|---|---|---|---|
| Principle | Oscillating quartz measurement | Digital output signal | Current pulses |
| Material pressure connection | 1.4435 (AISI316L) | Digital density signal | Pulse frequency |
| Material tube | 1.4301 | Digital temperature signal | Pulse width |
| Operating & Media temperature | –40 ... +70 °C | Analogue output signal | 6.5 ... 20 mA |
| Measuring range | 0 ... 0.85 MPa / 0...60 kg $SF_6/m^3$ | Analogue density signal | Current loop |
| Accuracy of sensor | ±1.0% FS typ., ±1.8% FS max. | Degree of protection | IP65 |
| Sensor supply analogue ouput | 2-wire, 10 ... 32 VDC | Vibration | 15 g (max. 6 mm), 5 ... 2000 Hz |
| Sensor supply digital output | 2-wire, 10 ... 20 VDC | Shock | 100 g / 6 ms |
| Sensor supply digital output | 3-wire, 14 ... 28 VDC | Weight | ~200–400 g |



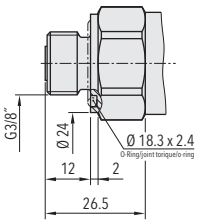

* for digital 3-wire version 8774.XX.XXX3...

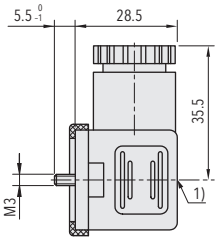



* for digital 3-wire version 8774.XX.XXX3...

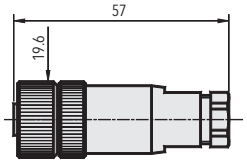



* for digital 3-wire version 8774.XX.XXX3...

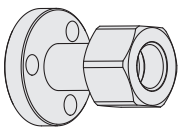


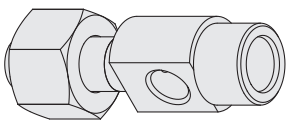



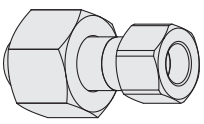

1) Torque moment 50...60 Ncm




## Various pressure connections available









trafag sensors controls

# Leading companies trust in Trafag's superior knowledge

Certified Management System SQS Reg. Nr. 114950/1 ISO 9001

ABB

ALSTOM

AREVA

HYOSUNG

HYUNDAI ENGINEERING CO., LTD.

MITSUBISHI MOTORS

SIEMENS

TOSHIBA

... and many more

trafag sensors controls

Subject to change H70649a Trafag AG 10/2011