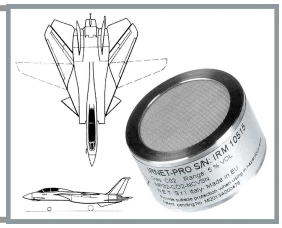
IRNET-P (IREF)

Advanced NDIR sensor for R1234yf gas detection



Features

- Analogue voltage standard output
- **Standard sensor size 32 mm**
- **Micro technology based (*MEMS*) IR source**
- Fast response
- Solid, rugged construction
- **Wide operating temperature and humidity range (-20°C +50°C)**
- **SIL2 (TÜV approved)**

Description

The IR series of infrared gas detection sensors use the technique of NDIR (Non Dispersive Infrared) to monitor the presence of R1234yf. This technique is based on the fact that the gas has an unique and well defined light absorption curve in the infrared spectrum that can be used to identify the specific gas. The gas concentration can be determined by using a suitable infrared source and analysing the quantity of energy absorbed from the gas inside the optical path. It's suited for signal linearization and temperature compensation suited for instrument manufacturers without any specialist knowledge in IR technology.

The IREF sensor is equipped with electronics and firmware in order to provide an output that is linearized and temperature compensated (see fig. 1). The output is analogue voltage type [0.4 V—2 V] dc (other voltages are available on request).

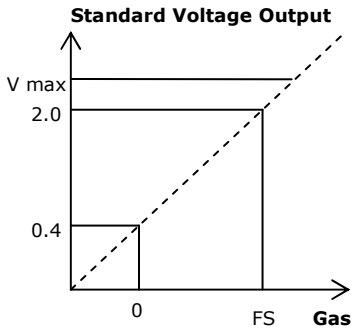


Fig. 1: Characteristics of output voltage

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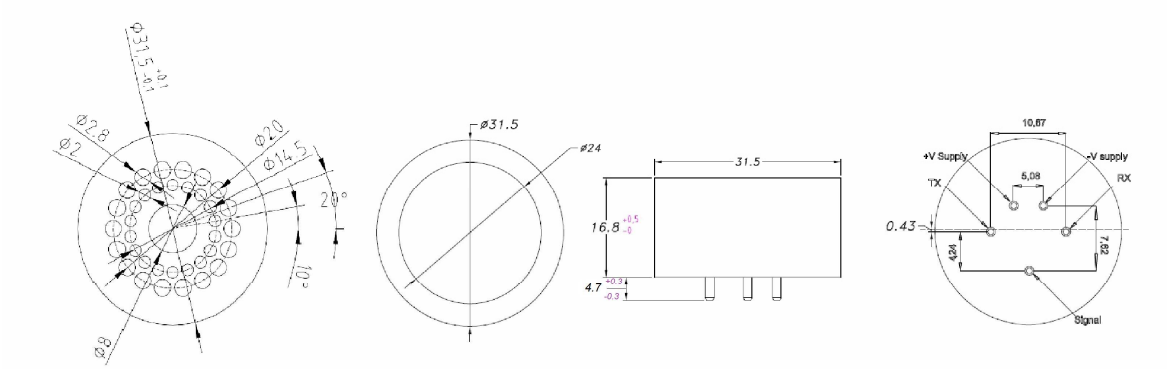
Mechanical characteristics

Top view Lateral view Bottom view



All the dimensions in the figures are indicated in millimeters.
The 3 pins version without TX and RX pins (for MODBUS protocol communication), is available on request.

SIL certification and performance approval


COMPLIANCE
with EN 50402:2005 + A1:2007

Certificate No.: C-IS-245124-01

CERTIFICATE OWNER: NET S.r.l. Via Legnano, 48 20010, Cornaredo (MI) - Italy

WE HEREWITH CONFIRM THAT THE IR-SENSORS IN THE TABLE ENCLOSED TO THE PRESENT DOCUMENT MEET THE SIL REQUIREMENTS OF EN 50402 (LOW DEMEND MODE OF OPERATION) SYSTEMATIC INTEGRITY: SIL3 CAPABLE RANDOM INTEGRITY: SIL2 OR SIL3 DEPENDING ON CONFIGURATION (T-IS-245124-01)

Examination result: The above described Modules were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-245124-01, dated May, 23rd 2014) according to EN 50402:2005 + A1:2007: under fulfillment of the conditions listed in the Reports, mentioned in the same table, in their currently valid version, on which this Certificate is based

Examination parameters: Functional characteristics, reliability and availability parameters

Official Summary Table No.: T-IS-245124-01 dated May, 23rd 2014

Expiry Date: May, 22nd 2017

IT IS TO BE INTENDED THAT THE ABOVE OFFICIAL REPORT AND ITS ANNEXES ARE AN INTEGRAL PART OF THIS DOCUMENT
THE PRESENT DOCUMENT SUBSTITUTES AND REPEALS THE DOCUMENT C-IS-163072-01

Reference Standard: EN 50402:2005 + A1:2007

Sesto San Giovanni, May, 23rd 2014

TÜV ITALIA Srl — TÜV ITALIA Srl Industry Services Division Director — Bernardo Oliva

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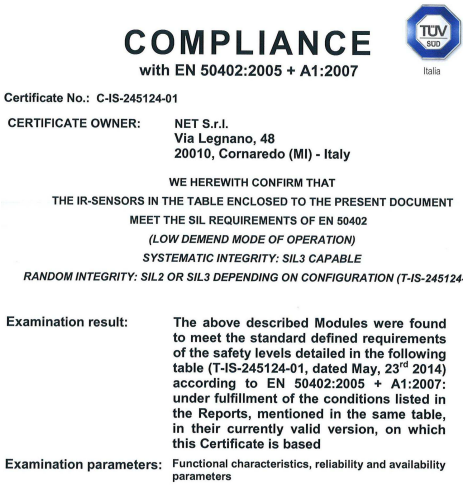
ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT ◆ CERTIFICAAT ◆ 認証書


COMPLIANCE
with EN 50402:2005 + A1:2007
Italia

Certificate No.: C-IS-245124-01

CERTIFICATE OWNER: NET S.r.l. Via Legnano, 48 20010, Cornaredo (MI) - Italy

WE HEREWITH CONFIRM THAT
THE IR-SENSORS IN THE TABLE ENCLOSED TO THE PRESENT DOCUMENT
MEET THE SIL REQUIREMENTS OF EN 50402
(LOW DEMEND MODE OF OPERATION)
SYSTEMATIC INTEGRITY: SIL3 CAPABLE
RANDOM INTEGRITY: SIL2 OR SIL3 DEPENDING ON CONFIGURATION (T-IS-245124

Examination result: The above described Modules were found to meet the standard defined requirements of the safety levels detailed in the following table (T-IS-245124-01, dated May, 23rd 2014) according to EN 50402:2005 + A1:2007: under fulfillment of the conditions listed in the Reports, mentioned in the same table, in their currently valid version, on which this Certificate is based

Examination parameters: Functional characteristics, reliability and availability parameters

Certification	SIL certification number	C-IS-245124-01
	Reference standards	EN 50402:2005 + A1:2007 (IEC EN 61508 parts 1 to 7)
	Systematic and random integrity	SIL3 capable, SIL2 or SIL3 depending on configuration
	Performance approval	Designed for use in a detector that complies to IEC EN 60079-29-1

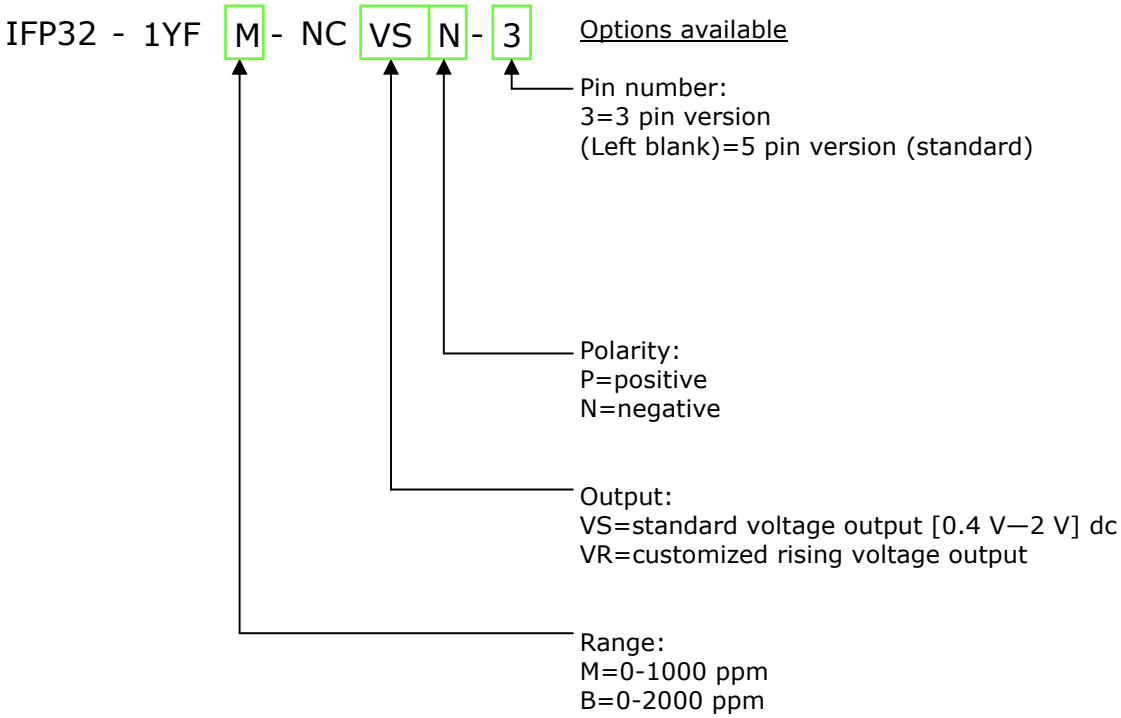
Specifications

General	Operating temperature range	-20 to +50 °C
	Storage temperature range	-40 to +85 °C
	Operating humidity range	0-95% non condensing
	Gas types	R1234yf
	Weight	34 g
	MTBF	≥ 5 years
	Patent information	pending request MI2013A000478 , EP14001065, US14/219631, CA2.847.491
	Firmware and digital technology	Designed for use in a detector that complies to EN 50271 **SIL2 (TÜV approved)**
	Electromagnetic Compatibility (EMC)	Designed for use in a detector that complies to EN 50270
	Optics	Metal optics treated to increase brightness and prevent oxidation
	Enclosure	Stainless steel
	Calibration	Individually calibrated with temperature compensation. Test report supplied.
Measurement	Sensing method	NDIR (dual beam technology)
	Measurement range	0 - 1000 ppm 0 - 2000 ppm
	Repeatability	±1% of FS range
	Accuracy *	±2% of FS range
	Resolution	0.2% of FS range
	Long Term Zero Stability	±2% of FS range/year
	Temperature Performance	±3% of FS range
	Pressure dependence	0.1 % to 0.2 % value per hPa
	Response time T_{90}	Approx. 30 s
Electrical	Power voltage	3.5-5.5 Vdc
	Operating current	120 mA Idc average (@ 3.5Vdc) 85 mA Idc average (@ 5Vdc)
	Warm up time	60 s for full operation @ 25 °C At least 15 min for full specification @ 25 °C
	Max output current	±7.5 mA
	DC output impedance	100 Ω
	Max capacitance load	1000 pF
Signal Output	Analog output (standard for voltage mode)	Standard voltage [0.4 V—2 V] dc (other voltages available on request)
	Digital communication	MODBUS protocol communication (documentaion available on request)

* Test conditions: 25°C ambient temperature and 1000hPa absolute pressure

Ordering details

When making an order the customer must specify the basic physical and electrical properties that are needed for their specific application. This is made through the part number here below. The squared fields of the part number below can be modified according to the options on the right. See DS2203 for complete instructions on how to compile the part number for the entire IR series.



N.E.T. has a policy of continuous development and improvement of its products. As such the specification for the device outlined in the data sheet may be changed without notice.

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