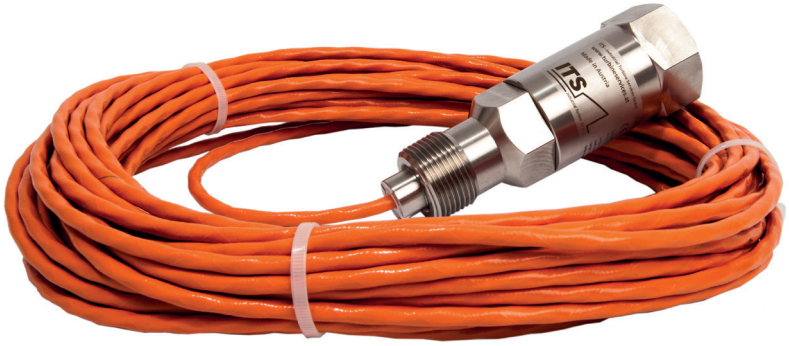
# Technical Specification Sheet

**Flame Scanner - ITS 967X7179M372**
Valid from 2018.03.29



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## Overview

As our flame scanners have evolved to an inherent part of our spare part portfolio, we continuously invest in research and development. Our flame scanners has been advanced to provide reliable information about flame intensity in the combustion chamber of gas turbines.

ITS flame scanner has been designed to detect the ultraviolet radiation emitted by a hydrocarbon flame. The result of this measurement is converted to pulse outputs which correlates to the intensity of the ultraviolet radiation. Based on a programmable threshold setting, the control system is able to determine whether there is flame or not.

The advantages of our products are:

Higher sensitivity
Larger spectral region
Longer life time
Low maintenance
No mounting modifications required
No changes in the controls required
Short delivery lead time

## Application

ITS flame scanners are currently used on land based as well as on offshore industrial heavy duty gas turbines. They have been designed for safe operation of General Electric gas turbine frames 5, 6, 7 and 9.

## Mode of Operation

When ultraviolet rays from an open flame hit the cathode leg of the sensor, the gas in the detector is ionized and photoelectrons are generated from the cathode.

The electrons and positive ions are accelerated towards the anode and cathode, creating more free electrons in the process. A burst of current flow is created by the avalanche effect. This burst of current will 'discharge' the detector by causing a drop in the potential difference across the anode and cathode. As a result, the avalanche effect is stopped, and the voltages at the anode and cathode start to build up again.

The cycle as described above will repeat as long as there is a presence of ultraviolet radiation. The frequency of the pulses (the number of generated pulses per second) depends on the intensity of the ultraviolet radiation.

## Installation Instructions

The flame scanner is intended to be connected to a conduit system. A certified conduit stopping box (a type of protective flameproof enclosure „d") shall be fitted immediately at the entrance of the enclosure. The stopping box must be suitable for the ambient temperature range and should be installed correctly.

For external earthing or bonding connection the cable lug shall be used in such a manner that the conductor is secured against loosening and twisting and that contact pressure is permanently secured.

## Functioning Life-Time

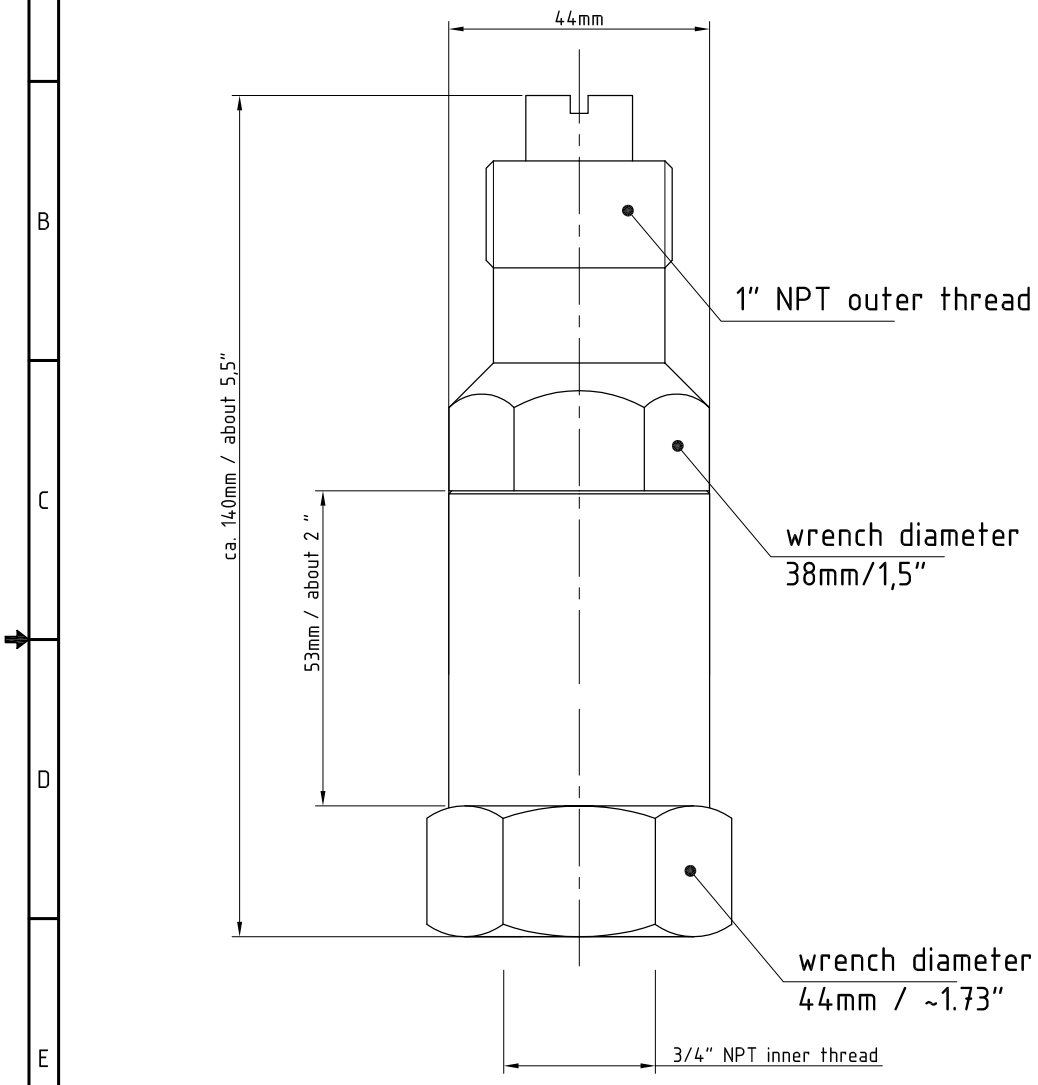
The unit is designed and manufactured for a life of not less than 2 (two) years or 16,000 (sixteen thousand) operating hours.

## Shelf Life

The flame scanner will be working within the design values stated in this specification without adjustments or replacements of parts after an unused period of 12 months, preconditioned that the flame scanner had been prepared for storage and was stored in a manner that is at least equal to that of the original packaging by ITS. The Purchaser shall evaluate, review and approve each and every packaging received by ITS.

# Flame Scanner

for use at Gas Turbine Systems, ex -proof , made of 1.4571 stainless steel






ITS Industrial Turbine Services

| | |
|---|---|
| free dimension tolerance medium DIN ISO 2768 | surface by DIN ISO 1302 |
| oxygen cutting/welding by DIN 2310 / DIN 8570 | design and coat tolerances by DIN ISO 1101 |

Scale 1:1

Material 1.4571 stainless steel

Name

Flame Scanner Dimensions

| | Date | Name |
|---|---|---|
| Arrn. | 25.11.2004 | Dörsch |
| Proof. | 28.07.2005 | Finsterm.T. |
| Comm. | 28.07.2005 | Finsterm.T. |
| Norm | | |

| Zust. | Change | Date | Name |
|---|---|---|---|
| | REV 2 for customer information | 09.01.2013 | Burges |
| | REV 1 for customer information | 10.12.2012 | Schindler |
| | ISO-Anpassung | 28.07.05 | Dörsch St. |

Ursprr.

Drawing Number TS 967X7179M372 0007

Format A4

cap. 1

sht. 6

repl. f.: TS 967X 7179 M372

repl. d.:

## ITS 967X7179M372 Flame Scanner Characteristics

| Parameters | Details |
|---|---|
| Manufacturer | ITS Industrial Turbine Services, Austria |
| Sensor | UV Flame Scanner |
| Housing | 1.4571 stainless steel |
| Window | Fused Silica |
| Mounting | 3/4´´ internal NPT |
| Working Temperature | -40°C (-40°F) to 177°C (350°F) |
| Pressure sealing | Against 21bar (300 psi) at 316°C (600°F) continuously |
| Cable characteristics | Material: PTFE, cover color: orange<br>Lead colors: GRN (GND), BLK (+), YEL (-) |
| Lead length | 4.9m (16 Ft ± 1 Ft) |
| Average Spectral Sensitivity | 190 - 290nm, 250cpm = $10^{-13}$W/cm$^2$ λ:200nm |
| Discharge Starting Voltage (1) | < 260VDC |
| Background (2) | < 5 min$^{-1}$ |
| Response Time | <200ms |
| Recommended Operating Volt Range | 260 - 350VDC amplifier, recommended 325VDC ± 25VDC |
| Pulse Output (3) | Pulse 275 sec $^{-1}$ ± 25 sec $^{-1}$, continuous flame > 15Hz |
| Sensor Vibration | Continuous vibration of up to 0.7 in/sec @ 200 Hz and up to .35 in/sec @ 500 Hz or equivalent of 2.5 g acceleration |

*Note: Continuous product development may make it necessary to change these details without notice*

(1) Discharge Starting Voltage - Voltage where the sensor just starts its discharge under UV radiation.
(2) Background - Output count that is measured under room illuminations (approximately 500 lx) at recommended operating voltage
(3) Pulse Output - Flame intensity in counts/sec measured with a pulse counter.

## Office Locations

Austria – Steyrermühl
Tel: 0043 / (0)7613 / 44974 - 0
Fax: 0043 / (0)7613 / 44974 - 20

Germany – Essen
Tel: 0049 / (0)201 43728 - 0
Fax: 0049 / (0)201 43728 - 20

Malaysia – Puchong
Tel: 0060 3 8060 3178
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Further information on www.turbineservices.at