



Fiber Optic Temperature System

MEDICAL

APPLICATION

FISO is a pioneer in the introduction of fiber optic sensing technologies in medical applications. We have also built a strong reputation in laboratories and medical research centers with the versatility of the solutions it can offer.

In addition, the automation level reached in the assembly processes allowed FISO to reach the status of world leader as OEM supplier of fiber optic sensors with over 300,000 units sold on a yearly basis.

FISO OFFERS THE MOST COMPLETE LINE OF FIBER OPTIC TEMPERATURE PROBES FOR MEDICAL DEVICES.

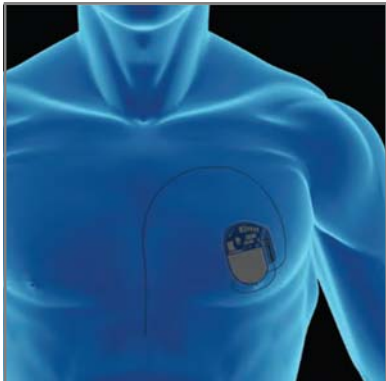


HYPERTHERMIA AND ABLATION

FISO's temperature probes have been designed to meet the maneuverability and reliability required by scientists and researchers active in hyperthermia and thermal therapy world-wide.

- Ease of insertion
- Long-term fidelity
- Immune to electromagnetic interference, therefore temperature measurements can be made without interrupting procedure
- No need to recalibrate between each use

Ask for FISO related publications



RF INDUCED HEATING

The sensor is designed and constructed in consideration of the future standard F2182 (Measurement of Radio Frequency Induced Heating on or Near Passive Implants During Magnetic Resonance Imaging) currently under development.

- Temperature resolution
- Small probe size
- Excellent repeatability



PATIENT MONITORING

For many years, FISO's temperature probes, integrated into FDA approved devices, have monitored hundreds of patients undergoing MRI examination. When quality and manufacturing capabilities are needed FISO marks the path.

- Quality system
- Reliable supplier
- Experienced engineering
- FISO offers OEM solutions

Preliminary



Temperature Fiber Optic Sensor

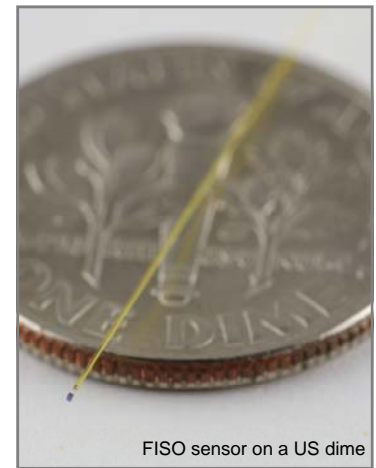
MEDICAL

STANDARD SENSOR

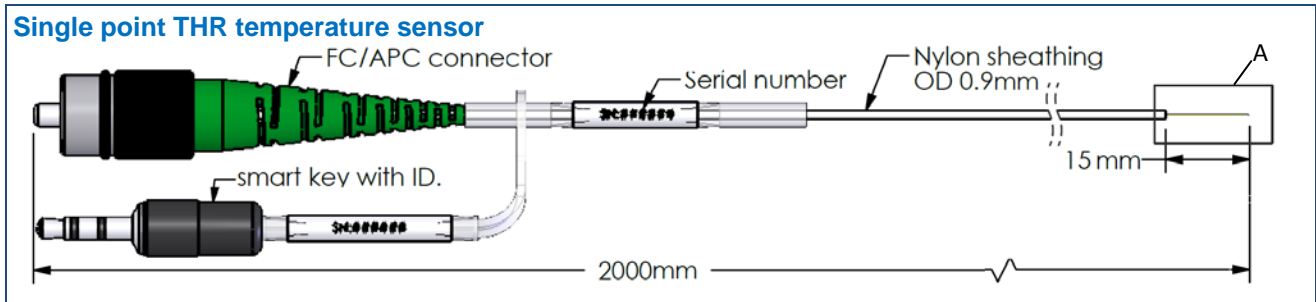
The information below pertains to FISO's standard configurations. If you have special needs, FISO can review your application. Please contact your representative for more details.

SPECIFICATIONS

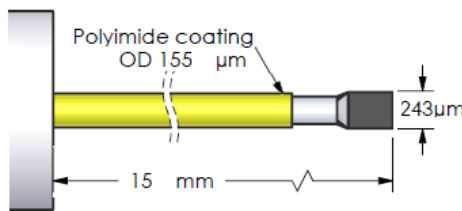
| | |
|------------------------------|---|
| Temperature Range | 20°C to 50°C <i>(range may be extended down to -20 and up to 200 °C)¹</i> |
| Resolution | 0.1°C rms |
| System Accuracy ² | ±0.5°C |
| Response time ³ | 25msec / 100msec |
| Cable Sheathing | Nylon Sheathing, OD: 0.9 mm |
| Tip Termination | Bare / Sheathed with gel / Custom design possible |
| Standard Sensor Length | 2 meters / Custom length possible |
| Connector | FC-APC with smart key communicating calibration data to the reading module. |



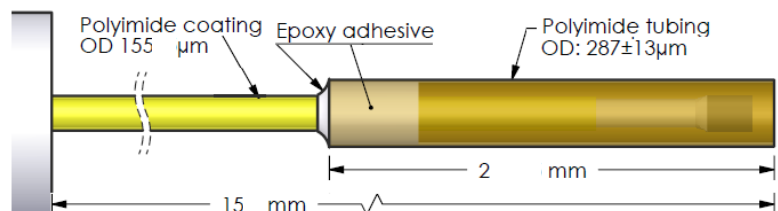
SINGLE POINT



THR-NS-1082A: Bare
Detail A of Bare sensor



THR-NS-1084A: Sheathed with gel
Detail A of sheathed sensor



Preliminary

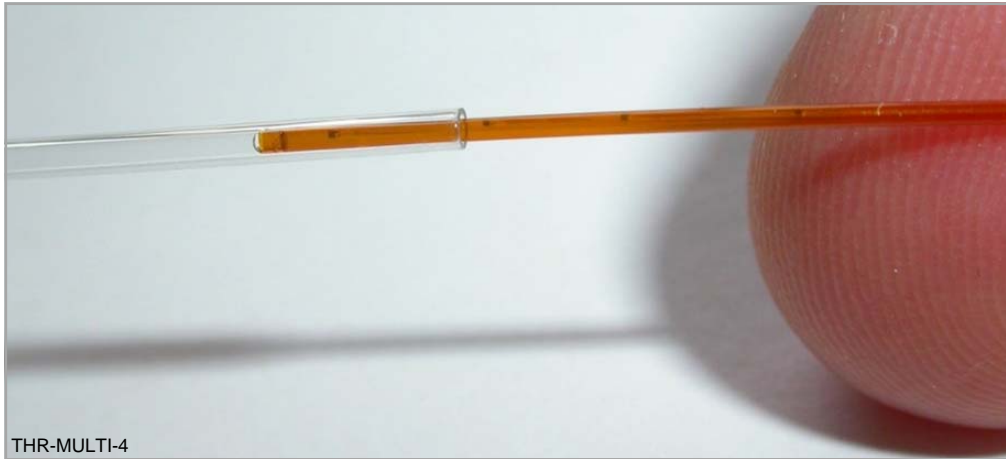
1. Custom temperature range may impact accuracy and resolution. Contact your representative for more details.
2. THR sensor and SPC-HR between 20 to 50°C: includes reproducibility (sensor/module interchangeability), repeatability and hysteresis, non-linearity, scale error, offset error, conditioner temperature compensation error.
3. Model dependent—contact your representative for more details



Temperature Fiber Optic Sensor

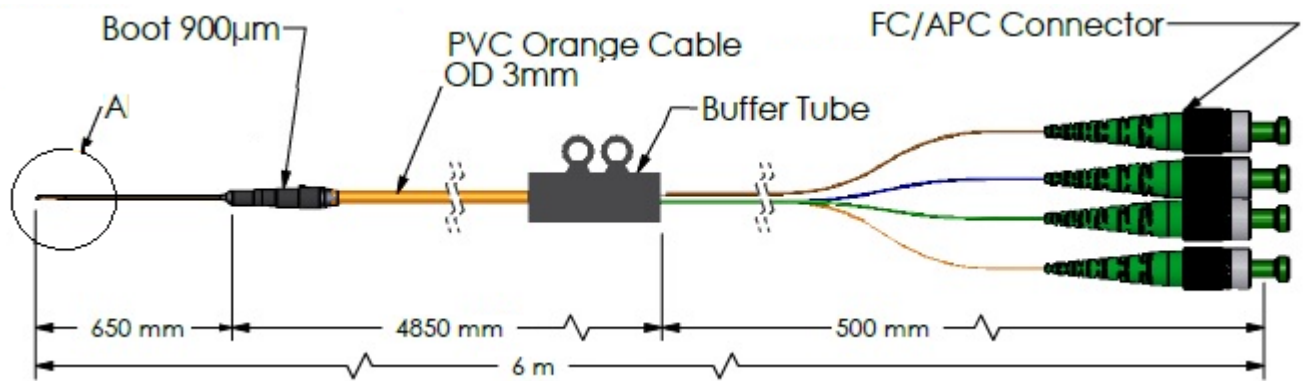
MEDICAL

MULTI-POINT SENSORS



THR-MULTI-4

MULTI-POINT SENSORS



Detail A of multi-point sensor distal tip¹



¹The number of temperature points can also be customised, and more or less distance between sensors, please contact your FISO representative.

Preliminary



SPC-HR reading module

MEDICAL



The SPC-HR reading module is designed for research and OEM applications

Description

The SPC-HR, like all FISO FPI Modules, is compatible with **evolution** chassis and with the **evolution** software¹.

The SPC-HR is suitable for medical temperature measurements.

It can be used with the same chassis as other FISO FPI Modules and used at the same time on an EVO platform.

The light source life expectancy is above 20,000hrs.

The SPC-HR is RoHS compliant.

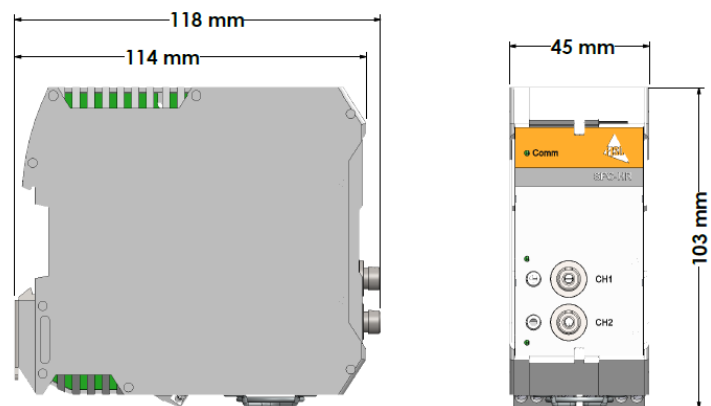
EVOLUTION Chassis Configurations

- ☐ EVO-SD-2 (up to 2 modules)
- ☐ EVO-SD-5 (up to 5 modules)
- ☐ EVO-RM-8 (up to 8 modules)

Specifications

| | |
|---|--|
| | SPC-HR |
| Number of channel(s) | 2 channels |
| Sampling rate up to | 125Hz |
| Analog output | 0 to 5V 16 bit resolution |
| Analog output delay response ² | 16ms |
| Power consumption | 24VDC, 5 Watts |
| Operating temperature | 10°C to 50°C |
| Storage temperature | -30°C to 80°C |
| Communication | USB via EVO chassis, TS 35 DIN RAIL |

Dimensions



1. The evolution software is included with the evolution chassis.
2. Delay between the physical phenomenon and the analog output change.

Preliminary

The **evolution** chassis is the easiest way to configure and use **evolution** modules.



Description

The **evolution** chassis footprint, communication capabilities and speed make it the ideal tool for laboratory and on-site test environments.

The **evolution** chassis can house different module types with different channel capabilities to combine results from a single acquisition source.

The **evolution** chassis has a different number of module slots, depending on the model.

USB communication interface is available on all chassis.

The SD-2, SD-5 and RM **evolution** chassis package includes the following components:

- **evolution** chassis unit,
- **i-vo** module,
- Power supply adaptor and cord,
- USB interface cable,
- Module removal tool,
- User guide,
- CD containing software driver and manual (pdf).

Key Features

- **i-vo** module for communication and for power supply distribution
- USB communication
- Evolution software for sensor and module configuration and for data acquisition up to 5k samples/sec. total.
- External data acquisition system required for acquisition rates > 5k samples/sec.
- Full bandwidth via analog output connectors

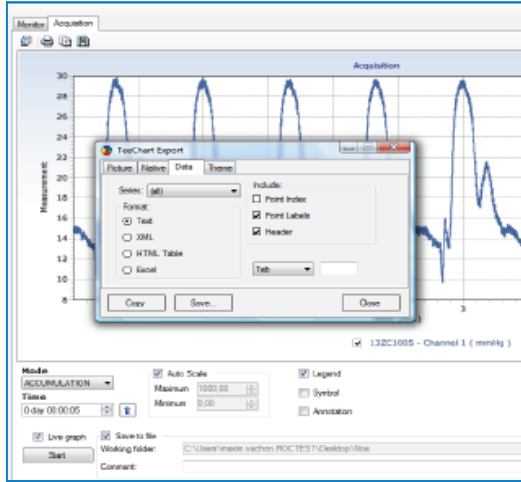
Applications

- Laboratory measurements with evolution modules
- Easy set-up of evolution modules before migrating modules into your own equipment

Specifications

| Model | EVO-SD-2 | EVO-SD-5 | EVO-RM |
|--|-------------------------|-------------------------|-------------------------|
| Communication | USB | USB | USB |
| Data logging | Via computer | Via computer | Via computer |
| Number of modules | Up to 2 | Up to 5 | Up to 8 |
| Power supply | 24 VDC 70 W | 24 VDC 70 W | 24 VDC 150 W |
| Evolution software | Included | Included | Included |
| Maximum rate of acquisition ¹ | 5 k samples/sec. total | 5 k samples/sec. total | 5 k samples/sec. total |
| Dimensions | W:133 x H:177 x D:156mm | W:269 x H:177 x D:156mm | W:483 x H:132 x D:175mm |

¹. With the **evolution** software and chassis. Analog output is available directly on the reading modules, offering full acquisition rate. Ex. FPI-HS plugged on analog is at 15Ksamples/sec.



EVOLUTION Software and Solution Summary

Configure and control the reading instrument

In the most common set-up, users will configure the 0-5V analog output level to the temperature or pressure range of interest, but the user will also enjoy the visual confirmation of proper communication between catheters and instrument.

Simple monitoring and real-time graphing

Users may choose to display a reading of the actual measurement, or plot in real-time with user specified screen refresh rates.

Export data

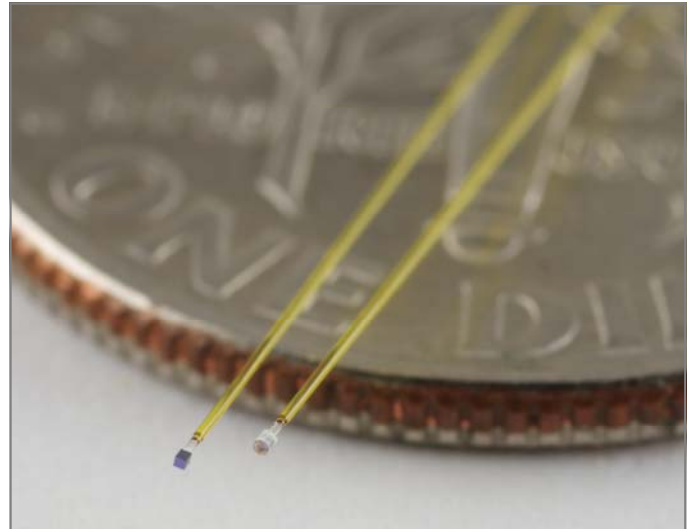
While users generally prefer to use 125Hz analog output on the SPC-HR, data may also be recorded and saved in multiple file formats

Other Accessories: Extensions cable

Be sure to purchase this 3 meter extension cable when a longer working distance is required. It can be removed when working close to the subject.



Temperature and Pressure sensors on a US dime.



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