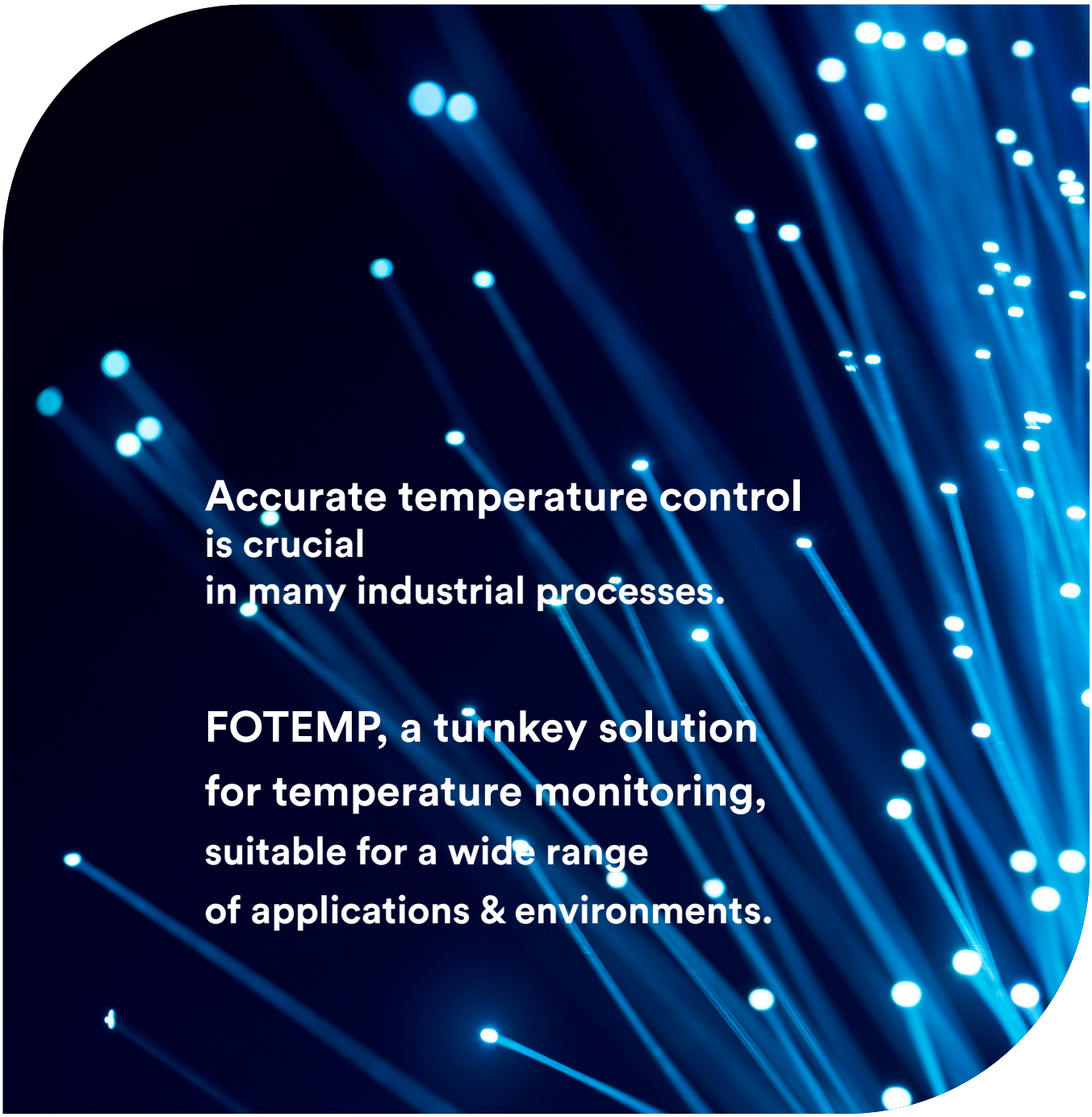
COMEM

PORTFOLIO BROCHURE

# FOTEMP

## Fiber optic temperature measurement systems



# Fiber optic devices

Our fiber optic temperature measurement devices, type FOTEMP, are designed to operate effectively in environments exposed to microwave radiation and high-frequency interference. They are suitable for high voltage applications, magnetic fields, and aggressive industrial settings, providing accurate temperature monitoring to protect your supplies and assets.

The FOTEMP devices come with customizable probes, sensors, and accessories to meet your specific needs. They can be calibrated to measure temperatures from -200°C to +300 °C and integrate seamlessly with our monitoring software for comprehensive data logging and visualization.

**Contact us and get support with the product selection.**



FOTEMP T30

## Why buy:

- Turnkey and customizable solutions
- Very high accuracy: ± 0.2 °C
- Intuitive and user-friendly interface
- Immune to electromagnetic and radio-frequency interferences
- Immune to Microwave radiations
- Versatile capabilities applicable in a wide range of applications

## Application:

- Power transformers
- Switchgears
- High voltage applications
- Nuclear environments
- Harsh and hazardous environments
- Instrument application
- Aerospace applications
- Process monitoring
- Laboratories
- Medical applications

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## Technical data at a glance:

| DEVICE TYPE | FOTEMP MN30 | FOTEM HD20 | FOTEMP MS10 | FOTEMP C15 | FOTEMP C20 | FOTEMP T20 | FOTEMP T30 |
|---|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |  |
| Number of channels | 1 | 1 or 2 | 1 - 40 | 1, 2 or 4 | 1, 2 or 4 | 2 to 16 | 2 to 16 |
| Modules | - | - | 10x7TE or 5x14TE | - | - | - | 4x up to 4 channels |
| Measuring range | -200°C to +300°C | -200°C to +300°C | -200°C to +300°C | -200°C to +300°C | -200°C to +300°C | -200°C to +300°C | -200°C to +300°C |
| Accuracy | ± 0.2 K | ± 0.2 K | ± 0.2 K | ± 0.2K | ± 0.2 K | ± 1.0 K | ± 1.0 K |
| Sample rate channel | 250 ms | 250 ms | 250 ms | 250 ms | 250 ms | 250 ms | 250 ms |
| Display | - | 3,5“ LCD | 0.96” on 7TE or 1.92” on 14TE OLED | - | 2,8“ LCD | 4.3” LCD | 7” LCD |
| Analog output | - | - | 0 - 10 V or 4 - 20 mA | 0-10 V or 4-20 mA | 0 - 10 V or 4 - 20 mA | 0 - 10 V or 4 - 20 mA | 0 - 10 V or 4 - 20 mA |
| Relay | - | - | 1 per channel | 1 per channel | 1 per channel | 2 programmable, 1 sensor fault, 1 watchdog | 16 free programmable relays |
| Interface | TTL, RS232, RS485, USB | USB, Reference sensor | RS232, USB | USB (standard) or RS485 | USB (standard) or RS485 (option) | RS485, USB, Ethernet | RS485, Ethernet |
| Additional protocol | Modbus | - | - | Modbus | Modbus | Modbus | Modbus DNP3.0, IEC61850, IEC60870-104 |
| Data Logging | Continuous or timed logging on microSD | Continuous or timed logging, spectrum snapshots | - | - | - | Continuous or timed logging on microSD | - |
| Power Supply | USB-Powered (standard) 9-24 VDC | 9 VDC | 100-240 VAC/ 50-60 Hz | 12 VDC | 12 VDC | 24 VDC | 24 VDC |
| Mounting/ housing options | Mounting holes | - | 19” rack mount chassis, 84TE or 42TE Cabinet | DIN rail mounting bracket, Pressed nuts, Threaded bolts | DIN rail mounting bracket, Pressed nuts, Threaded bolts | DIN rail mounting bracket | DIN rail or standard mounting bracket |
| Connector type | ST | ST | ST | ST | ST | ST | ST |

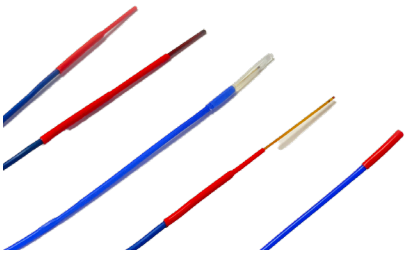
## Application:

| | For embedded instrument applications | EMI, RFI and microwave environments | High voltage environments | Harsh and hazardous environments | Nuclear environments | Aerospace applications | Process monitoring | Medical applications | Oil-filled transformers | MRI and other magnetic field applications |
|---|---|---|---|---|---|---|---|---|---|---|
| FOTEMP MN30 | ● | ● | | | | ● | ● | ● | | ● |
| FOTEMP HD20 | | ● | ● | ● | ● | | ● | | | ● |
| FOTEMP MS10 | | ● | ● | | | | ● | | | ● |
| FOTEMP C15 | ● | ● | ● | ● | | ● | ● | ● | ● | ● |
| FOTEMP C20 | | ● | ● | | | | ● | ● | | ● |
| FOTEMP T20 | | ● | ● | ● | ● | ● | ● | | ● | ● |
| FOTEMP T30 | | ● | ● | ● | ● | | ● | | ● | ● |

# Fiber optic sensors

The FOTEMP series fiber optic sensors, consisting of Gallium Arsenide (GaAs) crystal mounted at the end of an optical fiber, are the best choice for measuring temperatures in environments exposed to microwave radiation and high-frequency interference.
These sensors are recommended for high-voltage applications, magnetic fields, and aggressive environments where traditional metallic sensors, like resistance temperature devices or thermocouples, may not be suitable.
Choose our solution for accurate temperature monitoring to ensure your assets' optimal operation and safety. All sensors can seamlessly connect to our FOTEMP devices and provide consistently accurate and reliable temperature readings..

**Contact us and get support with the product selection.**



TS2P, TS3, TS4, TS5, TST

## Why buy:

- Very high accuracy: ± 0.2 °C
- Stable and repeatable measurements
- Flexible bending radius:
  - Longtime bending radius (>10min) = 27,0mm
  - Momentary bending radius (≤10min) = 10,0mm
- Immune to electromagnetic and radio-frequency interferences
- Immune to microwave radiations
- Resistant to extreme temperatures
- Versatile capabilities applicable in a wide range of applications

## Application:

- Power transformers
- Switchgears
- High voltage applications
- Nuclear environments
- Harsh and hazardous environments
- Instrument application
- Aerospace applications
- Process monitoring
- Laboratories
- Medical applications

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## Technical data at a glance:

| Sensor type | TS2P | TS3 | TS4 | TS5 | TST |
|---|---|---|---|---|---|
| |  |  |  |  |  |
| **Long-term temperature range** | -200°C to +260°C | -200°C to +260°C | -200°C to +260°C | -200°C to +260°C | -200°C to +260°C |
| **Short-term temperature range** | +260°C to 300°C | +260°C to 300°C | +260°C to 300°C | +260°C to 300°C | +260°C to 300°C |
| **Accuracy** | +/- 0.2 K | +/- 0.2 K | +/- 0.2 K | +/- 0.2 K | +/- 0.2 K |
| **Thermal response** | 20 K/s | 12 K/s | 7 K/s | 19 K/s | 3 K/s |
| **Probe dimension** | D1: 0,45 mm<br>D2: 1,7 mm<br>D3: 1,3 mm | D1: 1,0 mm<br>D2: 1,7 mm<br>D3: 1,3 mm | D1: 1,0 mm<br>D2: 1,7 mm<br>D3: 1,3 mm | D1: 0,55 mm<br>D2: 1,7 mm<br>D3: 1,3 mm | D1: 1,7 mm<br>D2: 1,3 mm<br>D3: 3,0 mm |
| **Other dimensions** | L1: 2 mm<br>L2: 42 mm<br>L3: 2 - 20 m | L1: 15 - 550 mm<br>L2: 20 mm<br>L3: 2 - 20 m | L1: 15 - 550 mm<br>L2: 10 mm<br>L3: 2 - 20 m | L1: 15 - 550 mm<br>L2: 20 mm<br>L3: 2 - 20 m | L1: 10 mm<br>L2: 15 mm<br>L3: 2 - 12 m |
| **Cable coating** | Polyimide / PTFE | Polyimide / PTFE | PTFE | Polyimide / PTFE | PTFE |
| **Connector type** | ST | ST | ST | ST | ST |
| **Optional** | - | - | - | - | Nomex® J-Spacer<br>Nomex® Disk-Spacer |

## Selection matrix:

| Sensor type | Application | | Key features |
|---|---|---|---|
| **TS2P** | General use | Radio-frequency environments, High voltage applications, Semiconductors, and Medical testing | Smallest size, Bare GaAs crystal (300 µm x 300 µm) for very small surface areas, Semiconductor devices, and micro vials, Non-conductive |
| **TS3** | General use | Food, Microwave oven, and Radio Frequency environments | Customizable semi rigid probe, Immune to EMI/RFI and Microwave emissions, Non-conductive |
| **TS4** | Harsh environments | Harsh & Chemical environments, Liquid immersion | High accuracy, corrosion resistant, PTFE coated, Non-conductive |
| **TS5** | Medical & Small Form Factor | Medical environments, Catheter instrumentation, Semicoductors, Small Form Factor | Customizable probe, Small form factor, Compact size, Non-conductive |
| **TST** | Transformers | Oil-filled & dry-type transformers | Specifically designed to be used in oil-filled and dry -type transformers, without air inclusions, Non-conductive |

# Fiber optic accessories

## Feedthrough DF1 - NPT 1/4”



| | |
|---|---|
| Temperature range | -40°C to +120°C |
| Pressure | Max. 200 bar |
| Thread size | ¼“ NPT |
| Thread angle | 60°C |
| Connector type | ST |
| Probes | Compatible with all COMEM fiber optic sensors |

## Feedthrough DF5 - Metric M14



| | |
|---|---|
| Temperature range | -40°C to +120°C |
| Pressure | max. 2 bar |
| Thread size | M14 X 1.5 |
| Thread angle | 60°C |
| Connector type | ST |
| Probes | Compatible with all COMEM fiber optic sensors |

## KF40 flange



| | |
|---|---|
| Material | Stainless steel |
| Dimension | On customer request |
| Number of feedthroughs | 1 - 2 |
| Mounting | Welded |
| Probes | Compatible with all COMEM fiber optic sensors |

## TWP set: tank wall plate, block flange & J-Box



| | |
|---|---|
| Material | Stainless steel |
| Dimension | TWP R: 125 mm L: 30 mm<br>DN125 R: 125 mm L: 30 mm<br>Box 156x156x164,5 mm |
| Number of feedthroughs | 1 - 16 |
| Mounting | Welded or screwed on tank wall |
| Probes | Compatible with all COMEM fiber optic sensors |

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## Distance cable



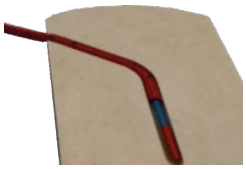
| | |
|---|---|
| Temperature range | -40°C to +85°C |
| Fiber Ø | 200 um |
| Sensor standard lengths | 2 m up to 20 m<br>(up to 30 m with PVC) |
| Connector type | ST with metallic ferrule<br>(-40 to 85 °C) |
| Signal conditioner | Compatible with all COMEM fiber optic sensors |

## Distance cable - multiwire



| | |
|---|---|
| Inner Material | PVC |
| Outer Material | PE |
| Acount PCF-Elements (200/230) | 6 |
| Wire-Ø [mm] | 3.5 mm |
| Exterior-Ø [mm] | 7.5 mm |
| Min. bending radius (short term) | 120 mm |
| Min. bending radius (long term) | 100 mm |
| Max. load (short term) | 1200 N |
| Max. load (long term) | 1000 N |
| Weight | ca. 80 kg/km |
| Operating Temperature | -40°C to +70°C |

## J-spacer, disc & busbar



| | |
|---|---|
| **Probe dimensions** | J-Spacer & Disk for use with TST probe.<br>Busbar used with TS3 probe |
| **Dimensions** | Consult drawings |
| **Other lenghts available on request** | |

**Contact us and get support with the product selection.**

# Service & Calibration

## for fiber optic temperature measurement systems

### Pre-sales & After-sales support

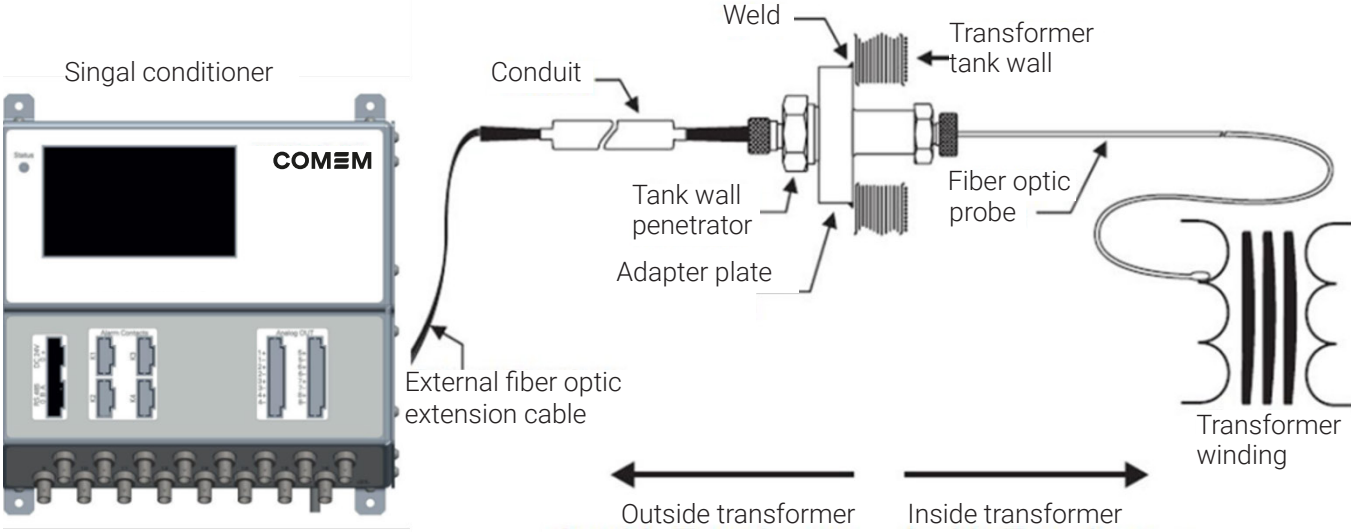
- Product identification
- Technical inquiries
- Calibration services
- Tests




### Turnkey & customized solution

- Product identification
- Technical inquiries
- Calibration services
- Tests

FOTEMP system overview




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