


PORTFOLIO BROCHURE

# FOTEMP

**Fiber optic  
temperature measurement systems**

A background image showing a dense array of fiber optic cables. The cables are illuminated from the bottom, creating a bright blue glow that radiates upwards. The light creates a sense of depth and movement, with many individual points of light and overlapping beams of light.

**Accurate temperature control  
is crucial  
in many industrial processes.**

**FOTEMP, a turnkey solution  
for temperature monitoring,  
suitable for a wide range  
of applications & environments.**

# Fiber optic devices

Our fiber optic temperature measurement devices type FOTEMP are designed to perform well in environments with microwave radiation and high-frequency interferences. They are not only suitable for high voltage applications, magnetic fields, and aggressive industrial settings but also provide accurate temperature monitoring to protect your supplies and assets.

Our FOTEMP devices come with customizable probes, sensors, and accessories to meet your specific needs. They can be calibrated from  $-200^{\circ}\text{C}$  to  $+300^{\circ}\text{C}$  and seamlessly integrate with our monitoring software for comprehensive data logging and visualization.

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



FOTEMP T30

## Why buy:

- Turnkey solution
- Very high accuracy:  $\pm 0.2^{\circ}\text{C}$
- 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



## 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, 2	1, 2, 4 per Module	1, 2, 4	1, 2, 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 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, RS232 (standard) or RS485 (option)	USB, RS232 (standard) or RS485 (option)	RS232, RS485, USB, Ethernet	RS232 DEBUG), 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	-
Internal Data Logging	Yes	Yes	-	-	-	Yes	Yes
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 that is mounted on the end of an optical fiber, are the best choice for measuring temperatures in environments with microwave radiation and high-frequency interferences.

They are also 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 the optimal operation and safety of your assets. All sensors can be seamlessly connected to our devices type FOTEMP, providing 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:  $\pm 0.2$  °C
- Stable and repeatable measurements
- Flexible bending radius:
  - Longtime bending radius (>10min) = 27,0mm
  - Momentary bending radius ( $\leq 10$ min) = 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



### 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 D2: 1,7 mm D3: 1,3 mm	D1: 1,0 mm D2: 1,7 mm D3: 1,3 mm	D1: 1,0 mm D2: 1,7 mm D3: 1,3 mm	D1: 0,55 mm D2: 1,7 mm D3: 1,3 mm	D1: 1,7 mm D2: 1,3 mm D3: 3,0 mm
Other dimensions	L1: 2 mm L2: 42 mm L3: 2 - 20 m	L1: 15 - 550 mm L2: 20 mm L3: 2 - 20 m	L1: 15 - 550 mm L2: 10 mm L3: 2 - 20 m	L1: 15 - 550 mm L2: 20 mm L3: 2 - 20 m	L1: 10 mm L2: 15 mm L3: 2 - 12 mm
Cable coating	Polyimide / PTFE	Polyimide / PTFE	PTFE	Polyimide / PTFE	PTFE
Connector type	ST	ST	ST	ST	ST
Optional	-	-	-	-	Nomex® J-Spacer 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, Semiconductors, 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 DN125 R: 125 mm L: 30 mm Box 156x156x164,5 mm
Number of feedthroughs	1 - 16
Mounting	Welded or screwed on tank wall
Probes	Compatible with all COMEM fiber optic sensors



## Distance cable



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

## Distance cable - multiwire



Inner Material	PVC
Outer Material	PE
Account 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. Busbar used with TS3 probe
Dimensions	Consult drawings
Other lengths 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

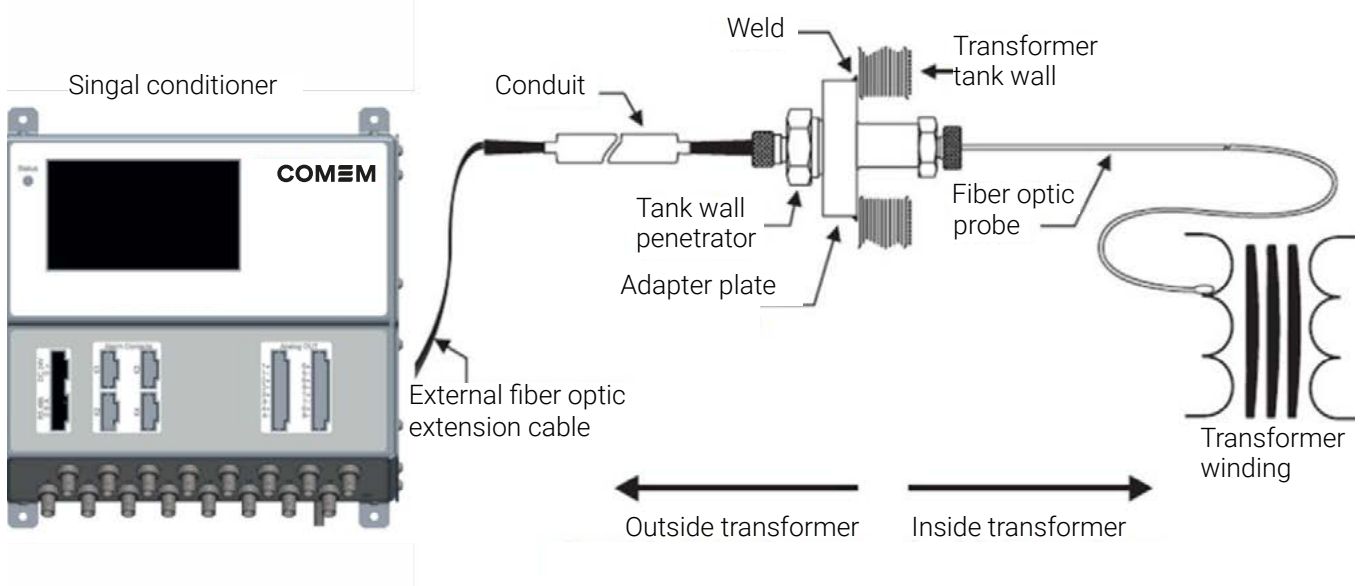
### ● Turnkey & custom solution

- Product identification
- Technical inquiries
- Calibration services
- Tests



### Transformer application example

#### FOTEMP system overview



[www.comem.com](http://www.comem.com)

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