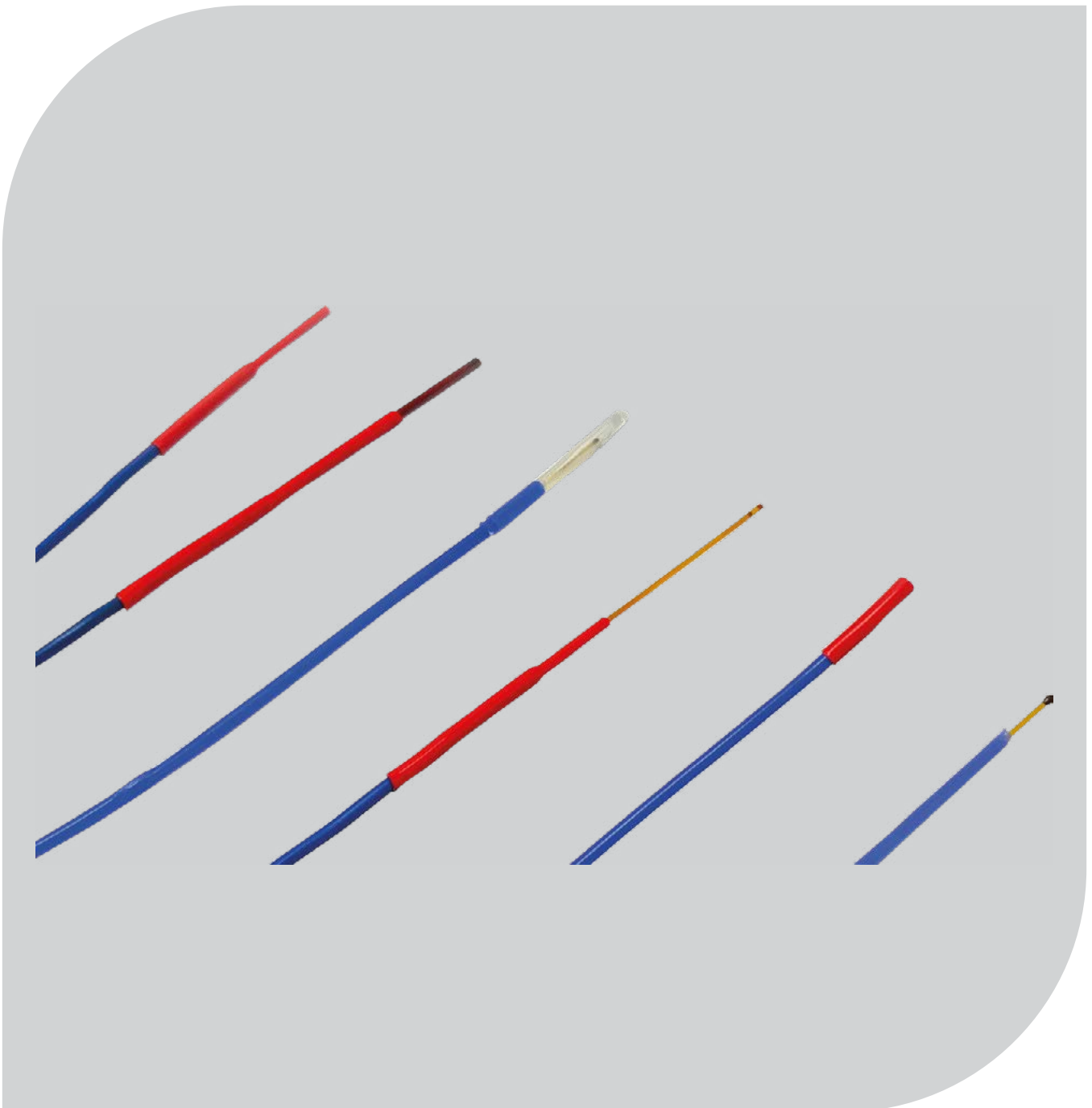


TECHNICAL GUIDE

## Fiber optic sensors & accessories










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# Application

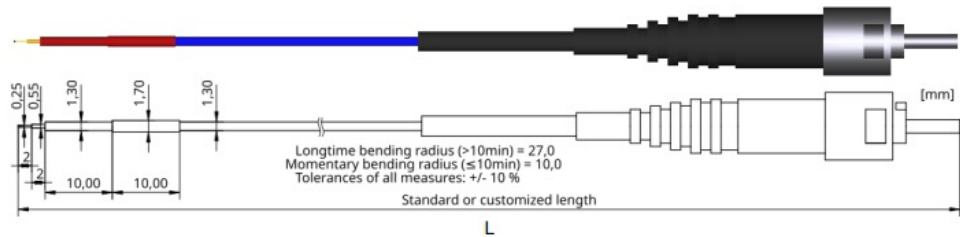
Sensor type	Application	
TS2P	General use	Radio-frequency environments, High voltage applications, Semiconductor, and Medical testing
TS3	General use	Food, Microwave oven, RF environments, NMR analytical chemistry applications, and Pharmaceutical drying
TS4	Harsh environments	Harsh & Chemical environments, Liquid immersion, Natural Gas pipelines, Battery testing, and Nuclear environments
TS5	Medical & SFF	Medical Environments, Catheter instrumentation, Semiconductors, Small Form Factor
TST	Transformers	Oil-filled transformers, Generators, Monitoring of hot-spot inside transformers, and Measurement in gas insulated power breakers
J-Spacer	General use	Transformer windings, Bus Bars, and other Switchgears

# Technical data

Sensor type	TS2P	TS3	TS4	TS5	TST
					
<b>Key features</b>	Smallest size, Bare GaAs crystal (300 μm x 300 μm) for very small surface areas, Semiconductor devices, & Micro Vials, Non-conductive.	Customizable semi rigid probe, Immune to EMI/RFI & Microwave emissions, Non-conductive.	High accuracy, Corrosion resistant, PTFE coated, Non-conductive	Customizable probe, Small form factor, Compact size, Non-conductive	Designed to be used in oil-filled and dry-type transformers, without air inclusions, Non-conductive
<b>Long-term temperature range</b>	-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
<b>Short-term temperature range</b>	+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
<b>Accuracy</b>	± 0.2 K	± 0.2 K	± 0.2 K	± 0.2 K	± 0.2 K
<b>Thermal response</b>	20 K/s	12 K/s	7 K/s	19 K/s	3 K/s
<b>Fiber diameter</b>	200/220/240μm	200/220/240μm	200/220/240μm	200/220/240μm	200/220/240μm
<b>Cable coating</b>	Polyimide / PTFE	Polyimide / PTFE	PTFE	Polyimide / PTFE	PTFE
<b>Connector type</b>	ST	ST	ST	ST	ST
<b>Optional</b>					Nomex® J-Spacer Nomex® Disk-Spacer

# Dimensions

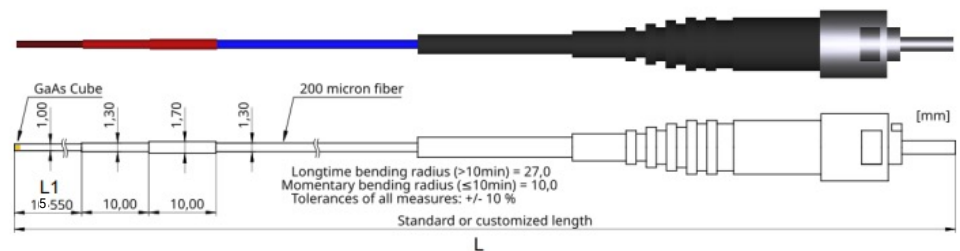
## TS2P



<b>Probe dimensions</b>	D1	0.45 mm
	D2	1.7 mm
	D3	1.3 mm
<b>Dimensions *</b> <b>Other lengths on request</b>	L1	2 mm
	L2	42 mm
	L3	2 - 20 m

\* 2m standard, other lengths on customer request up to 20m

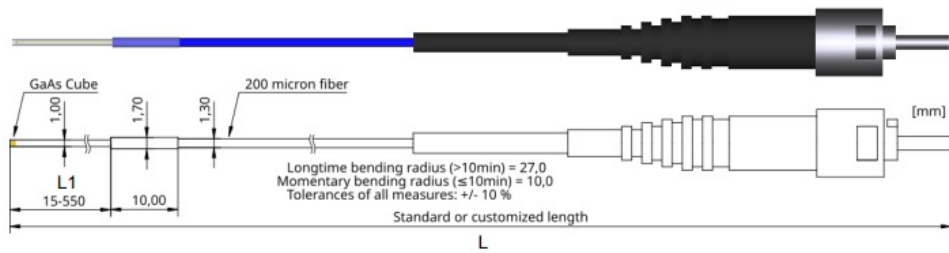
## TS3



<b>Probe dimensions</b>	D1	1.0 mm
	D2	1.7 mm
	D3	1.3 mm
<b>Dimensions *</b> <b>Other lengths on request</b>	L1	15 - 550 mm
	L2	20 mm
	L3	2 - 20 m

\* 2m standard, other lengths on customer request up to 20m

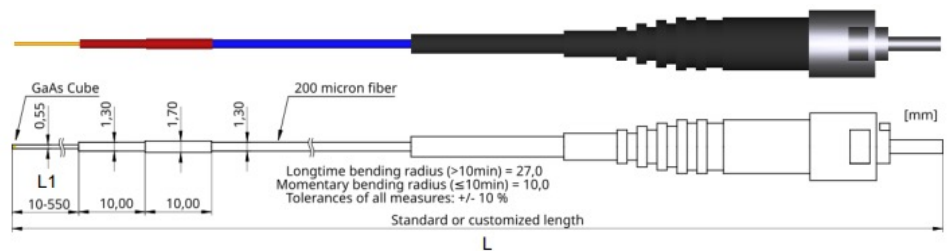
TS4



<b>Probe dimensions</b>	D1	1 mm
	D2	1.7 mm
	D3	1.3 mm
<b>Dimensions *</b> <b>Other lengths on request</b>	L1	15 - 550 mm
	L2	10 mm
	L3	2 - 20 m

\* 2m standard, other lengths on customer request up to 20m

TS5

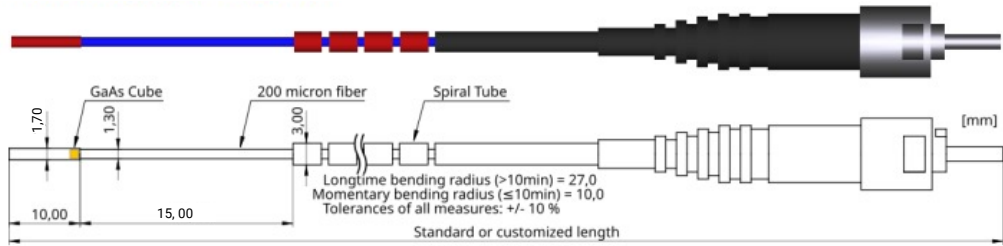


<b>Probe dimensions</b>	D1	0.55 mm
	D2	1.7 mm
	D3	1.3 mm
<b>Dimensions *</b> <b>Other lengths on request</b>	L1	15 - 550 mm
	L2	20 mm
	L3	2 - 20 m

\* 2m standard, other lengths on customer request up to 20m

# Dimensions

## TST

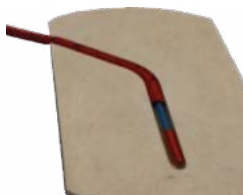


Probe dimensions	D1	1.7 mm
	D2	1.3 mm
	D3	3 mm
Dimensions * Other lengths on request	L1	10 mm
	L2	15 mm
	L3	1 - 12 m

\* 2m standard, other lengths on customer request up to 12m

### Optional accessories

#### J-Spacer



#### Disk-Spacer





# Order sheet

## Sensors



Date	
Rev.	
Customer reference	

Optical sensor type	Quantity	
TS2P		
TS3		
TS4		
TS5		
TST		

Lengths	
2 m (Standard)	
Other lengths from 2 to 20m (upon request)	

Tip length (TS3, TS4, TS5)	
15 - 550 mm	

# Order sheet

## Accessories

Date	
Rev.	
Customer reference	

### J-Spacers

ZM0060



EOF0203



EOF0200



### Technical specifications

EOF0200	J-Spacer for mounting TST temperature probe in transformer winding, Nomex + Peek
EOF0203	Disk-Spacer for mounting TST temperature probe in transformer winding, Nomex
ZM0060	Busbar for radial mounting up to two TS3 temperature probe on high voltage busbar, Peek

### Order sheet

### Quantity

J-Spacer		
Disk-Spacer		
Busbar for radial mounting		

### Feedthrough DF1- NPT 1/4"



### Technical specifications

Temperature range	-40 °C to 120 °C
Pressure	Max. 200 bar
Thread size	1/4" NPT
Connector type	ST

### Order sheet

### Quantity

Feedthrough DF1		
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### Feedthrough DF5 - metric M14



### Technical specifications

Temperature range	-40 °C to 120 °C
Pressure	Max. 2 bar
Thread size	M14 x 1.5
Connector type	ST

### Order sheet

### Quantity

Feedthrough DF5		
-----------------	--	--

# Order sheet

## Accessories

Date	
Rev.	
Customer reference	

### KF40 Flange



#### Technical specifications

Material	Stainless steel
Dimension	R: 27,5 mm L: 59,3 mm
Number of feedthroughs	1-2
Mounting	Welded

Order sheet	Quantity	
KF40 Flange		
Number of feedthroughs (1-2)		

### TWP Set Tank wall plate, Block flange & J-Box



#### Technical specifications

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

#### Order sheet

Tank wall plate	Quantity	
TWP 8 (1 - 8 feedthrough)		
TWP 16 (9 - 16 feedthrough)		

Block flange	Quantity	
DN125		

J-Box	Quantity	
Box		

# Order sheet

## Accessories

Date	
Rev.	
Customer reference	

### Distance cable



#### Technical specifications

Operating temperature	-40 °C to 85 °C
Material	PVC or PTFE
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 °C to 85 °C)

#### Order sheet

Lengths	Quantity	
2 - 20m		
Spiral wrap (only with PTFE)		
Material PTFE		
Material PVC		

### Multiwire distance cable FO - DC6



#### Technical specifications

Inner material	PVC
Outer material	PE
Aount PCF-Elements (200/230)	6
Wire-ø (mm)	3.5 mm
External-ø (mm)	7.5 mm
Min. blending radius (short term)	120 mm
Min. blending 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



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