

Temperature Measurement



Precise and reliable measurements even in aggressive liquids – all probes are encapsulated with PTFE for maximum chemical resistance.

PRODUCT TIPS



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PT 100 Temperature Probes



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Total Immersion Probes

BOLA Temperature Probes and Immersion Probes



Structure and function of BOLA Temperature Probes

All BOLA Temperature Probes are sensors based on platinum resistance changes under temperature influence with a deposited table of values.

The thermocouple itself is located at the end of a PTFE-encapsulated stainless steel tube (material code 1.4571).

The stainless steel tube provides certain rigidity, but can be bent to the requested form by hand, so that the probe can be used at the optimum measuring point.

A connection can either be made by using LEMO® couplings or by connecting the strands of the cable directly to your measuring device. The cable is also encapsulated with PTFE/PFA and connected tightly to the temperature probe.

Advantages of BOLA Temperature Probes

Reduction of response time

The probes have tapered tips which reduces the response time considerably.

Chemical resistance and no metal

The PTFE encapsulation provides an almost universal chemical resistance. All parts which are exposed to the medium do not contain any metal.

High measuring accuracy

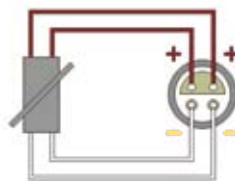
Due to the four-wire system, the influence of output and transfer resistance is almost eliminated (aberration approx. 0.002-0.004 %/Ohm). A comparison is normally not needed. The length of the cable can be quite long.

Safe to handle

Due to a collar ring at its end, the probe cannot fall into the medium.

Performance data of BOLA Temperature Probes

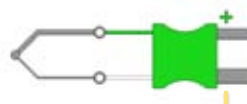
Pin configuration of the LEMO® coupling



Temperature probe / PT 100

Temperature range:	-50°C to +250°C
Specification:	DIN EN 60751
Type:	Platinum temperature sensor
Class:	A
Tolerance:	0,15 + (0,002 x (t))
Typical aberrations:	at 0°C: +/- 0,15°C at 100°C: +/- 0,35°C

Pin configuration of the Temperature Probe K



Temperature Probe K

Temperature range:	-0°C to +300°C
Specification:	IEC60584.3:2007
Type:	Typ K Thermoelement
Tolerance:	+/- 0,15° C



We produce temperature probes according to your indications

Do you need a different temperature probe?
 No problem – we can quote for your special requirements.

Coating custom temperature probes and thermometers

We can coat your temperature probes or thermometers with a PTFE heat shrinkable tubing so that they have the chemical resistance of PTFE. Even if the probes or thermometers break, there is no risk of contamination due to the PTFE coating.

Because of the thin coating, the probe or thermometer has slower response behaviour.

For coating, your probe/thermometer has to resist a short-time temperature of minimum +250°C.

Please contact us!



HELPFUL: page 244
 Determination of response times of temperature probes

Response times of BOLA Temperature Probes

Due to the properties of PTFE, the response times of PTFE-encapsulated temperature probes are longer than the response times of glass or metal probes. We have indicated all corresponding T 50 and T 90 values of our temperature probes.

Plugs and sockets

Our temperature probes PT100 are normally supplied with sockets type LEMO® size 1. Should you need a different LEMO® size or a plug instead of a socket, we can offer corresponding adaptors.

We can also supply temperature probes with your specific plug or socket. You can find below the most important dimensions for determination of LEMO® plugs and sockets.



Easy identification of plug and socket size!

You can find out your plug or socket size as follows:



Plug Lemo Size 0
 O.D. 7 mm



Plug Lemo Size 1
 O.D. 9 mm



Socket Lemo size 0
 O.D. 9 mm



Socket Lemo size 1
 O.D. 12 mm



BOLA Double Temperature Probes Lemo® Compact

BESTSELLER

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

Two independent thermocouples in one PTFE-encapsulated stainless steel tube (1.4571). Collar ring Ø 12 mm. Connection by two couplings (type Lemo®, socket size 1, 4-pole) fixed directly at the end of the probe.

NEW

FDA conform

Typical response times:

- » T 50: 20 - 24 s
- » T 90: 30 s

See page 244 for detailed explanation.

Usable length mm	Probe dia. mm	Total length mm	Number of thermo- couples	Width of coupling A mm	Cat. No.:
300	8	400	2 x PT 100	27	P 1740-20
400	8	500	2 x PT 100	27	P 1740-23
500	8	600	2 x PT 100	27	P 1740-30
300	6	400	2 x PT 100	27	P 1740-40

Applications:

- » parallel temperature measurement in aggressive liquids
- » double safety due to redundant systems
- » control function due to two independent thermocouples
- » simultaneous temperature measurement and safety switching in only one port
- » ideal for built-in measurement cables



BOLA INNOVATION

Double Temperature Probes Lemo® Compact

Two PT100 elements in one PTFE-encapsulated stainless steel tube combine several functions: for example measuring temperature in aggressive liquids or making measurements in safety circuit.

BOLA BENEFITS

- » Compact production series
- » Different length of cable can be connected
- » Exchange of the cable is possible without any problems

BESTSELLER

BOLA Temperature Probes Lemo® Compact

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

One thermocouple in a PTFE-encapsulated stainless steel tube (1.4571). Temperature probe Ø 8 mm, tip Ø 6 mm, collar ring Ø 12 mm. Connection by a coupling (type Lemo®, socket size 1, 4-pole) fixed directly at the end of the probe.

FDA conform

Typical response times:

- » T 50: 7 - 12 s
- » T 90: 14 - 16 s

See page 244 for detailed explanation.

Usable length mm	Total length mm	Cat. No.:
80	150	P 1730-10
300	370	P 1730-20
400	470	P 1730-23
500	570	P 1730-25

Applications:

- » temperature measurement in aggressive liquids
- » ideal for built-in measurement cables



probe tip

socket



BOLA INNOVATION

Temperature Probes Lemo® Compact

Many thermocouples are connected directly to the cable. The Lemo® connector of BOLA Temperature Probes Compact is connected to the thermocouple so that the temperature probe can be exchanged easily.



SUITABLE: page 93
Swivelling screw fittings

BOLA Temperature Probes Lemo®

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

One thermocouple in a PTFE-encapsulated stainless steel tube (1.471). Temperature probe Ø 8mm, tip Ø 6mm, collar ring Ø 12mm. With white PTFE-coated cable (length: 1,5m) and coupling (type Lemo® socket size 1, 4-pole).

FDA conform

Typical response times:

» T 50: 7 - 12 s

» T 90: 14 - 16 s

See page 244 for detailed explanation.

Usable length mm	Total length mm	Cat. No.:
100	160	P 1760-10
200	260	P 1760-15
300	360	P 1760-20
500	560	P 1760-25
600	660	P 1760-30

Applications:

- » temperature measurement in aggressive liquids
- » cable provides flexible connection from measuring device to medium

« |>>|
Special Request?
+49 (0) 93 46-92 86-0



probe tip

socket

BOLA Temperature Probes

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

One thermocouple in a PTFE-encapsulated stainless steel tube (1.471). Temperature probe Ø 8mm, tip Ø 6mm, collar ring Ø 12mm. With white PTFE-coated cable (length: 1,5m, 4 strands).

FDA conform

Typical response times:

» T 50: 7 - 12 s

» T 90: 14 - 16 s

See page 244 for detailed explanation.

Usable length mm	Total length mm	Cat. No.:
100	160	P 1750-10
200	260	P 1750-15
300	360	P 1750-20
500	560	P 1750-25
600	660	P 1750-30

Applications:

- » temperature measurement in aggressive liquids
- » cable provides flexible connection from measuring device to medium



probe tip

connecting cable

BOLA Total Immersion Probes Lemo®

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

Total immersion probe (class A, PRT 100), with white PTFE-coated cable, coupling (type Lemo®, socket size 1, 4- pole) and collar ring Ø 5 mm.

FDA conform

Typical response times:

» T 50: 4 - 6 s

» T 90: 6 - 8 s

See page 244 for detailed explanation.

Usable length mm	Probe dia. mm	Cable length m	Cat. No.:
50	4	4	P 1790-20

Applications:

- » e.g. for measuring temperatures in autoclaves
- » can be immersed totally into the liquid



probe tip

socket



Temperature Probes

- »» Compared to stainless steel probes, BOLA Temperature Probes offer best chemical resistance. And unlike glass, they are unbreakable.



Inge Fenstad » Chiron AS

BOLA Total Immersion Probes

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

Total immersion probe (class A, PRT 100), with white PFA-coated cable (4 strands) and collar ring Ø 5 mm.

FDA conform

Typical response times:

» T 50: 4 - 6 s

» T 90: 6 - 8 s

See page 244 for detailed explanation.

Usable length mm	Probe dia. mm	Cable length m	Cat. No.:
50	4	4	P 1780-20

Applications:

- » e.g. for measuring temperatures in autoclaves
- » can be immersed totally into the liquid



probe tip

connecting cable



BOLA Temperature Probes K

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

Thermocouple K (Ni Cr + Ni) in a PTFE-encapsulated stainless steel tube (1.4571). Temperature probe Ø 8 mm, pointed tip, collar ring Ø 12 mm. With green PTFE-coated cable (length: 1,5m)

NEW

Typical response times:

- » T 50: 25 s
- » T 90: 59 s

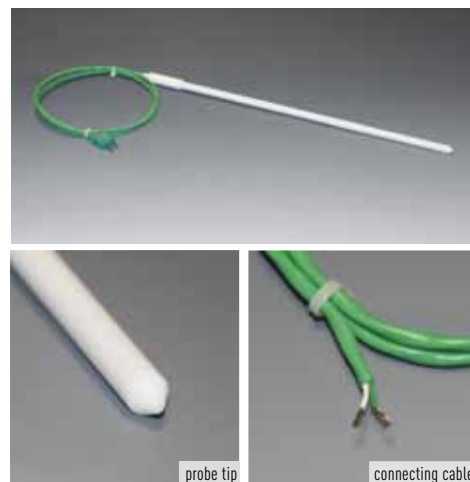
FDA conform

See page 244 for detailed explanation.

Usable length mm	Total length mm	Cat. No.:
200	260	P 1850-15
300	360	P 1850-20
500	560	P 1850-25

Applications:

- » temperature measurement in aggressive liquids
- » cable provides flexible connection from measuring device to medium



probe tip

connecting cable

BOLA Temperature Probes K and SMP-Connector

Material: PTFE	Temperature resistance: from -200°C to +250°C	Chemical resistance: +++ universal	Temperature range from -50°C to +250°C
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Product description:

Thermocouple K (Ni Cr + Ni) in a PTFE-encapsulated stainless steel tube (1.4571). Temperature probe Ø 8 mm, pointed tip, collar ring Ø 12 mm. With green PTFE-coated cable (length: 1,5m) and SMP-connector.

NEW

Typical response times:

- » T 50: 25 s
- » T 90: 59 s

FDA conform

See page 244 for detailed explanation.

Usable length mm	Total length mm	Cat. No.:
200	260	P 1860-15
300	360	P 1860-20
500	560	P 1860-25

Applications:

- » temperature measurement in aggressive liquids
- » cable provides flexible connection from measuring device to medium



probe tip

plug

BOLA Adaptors for Temperature Probes

Product description:

4-pole adaptors. All BOLA temperature probes are equipped with a socket size 1.

NEW

	Size first side	Size second side	Length mm	Transition from size	Cat. No.:
A	Plug 1	Plug 1	72	Socket size 1 to Socket size 1	P 1720-16
B	Plug 1	Plug 0	65	Socket size 1 to Socket size 0	P 1720-32
C	Plug 1	Socket 0	65	Socket size 1 to Plug size 0	P 1720-24

Applications:

- » for the connection of different sizes of plugs and couplings
- » for the connection of existing ports to temperature probes
- » for the connection of existing measurement cables with plugs or sockets of company Lemo®



