

Temperature Measurement



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

PRODUCT TIPS



Page 143
PT100 Temperature Probes



Page 142
Double PT100 Temperature 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

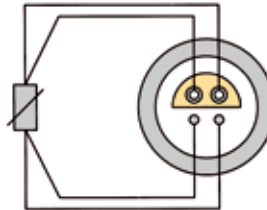
Due to the four-wire system, the influence of output and transfer resistance is almost eliminated (aberration approx. 0.002-0.004 %/Ohm). A comparison is normally not needed. The length of the cable can be quite long.

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



Denomination:	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



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 224
 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 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

Product description:

Two independent thermocouples in one PTFE-encapsulated stainless steel tube (1.4571). Temperature probe \varnothing 8 mm, tip \varnothing 6 mm, collar ring \varnothing 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 224 for detailed explanation.

Usable length mm	Total length mm	Number of thermocouples	Width of coupling A mm	Cat. No.:
300	400	2 x PT 100	27	P 1740-20
400	500	2 x PT 100	27	P 1740-23
500	600	2 x PT 100	27	P 1740-30

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



probe tip

socket

BOLA Temperature Probes Lemo® Compact

Material: PTFE
 Temperature resistance: from -200°C to +250°C
 Chemical resistance: +++ universal

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 224 for detailed explanation.

Usable length mm	Total length mm	Cat. No.:
100	170	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

BESTSELLER



SUITABLE: page 71
 Swivelling screw fittings

BOLA Temperature Probes Lemo®

Material: **PTFE** Temperature resistance: **from -200°C to +250°C** Chemical resistance: **+++ universal**

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 224 for detailed explanation.

Usable length mm	Total length	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



probe tip

socket

BOLA Temperature Probes

Material: **PTFE** Temperature resistance: **from -200°C to +250°C** Chemical resistance: **+++ universal**

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 224 for detailed explanation.

Usable length mm	Total length	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**

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 224 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

BOLA Total Immersion Probes

Material: **PTFE** Temperature resistance: **from -200°C to +250°C** Chemical resistance: **+++ universal**

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

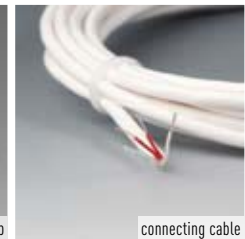
» T 90: 6 - 8 s

See page 224 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 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®

