

Cable Resistance Thermometers for Shipbuilding Industry

Model TR197 Penetration Probe

WIKA Data Sheet TE 69.15



Applications

- Temperature measurement of stored foods on reefer vessels or delivery trucks
- For soft goods
- Mobile control survey

Special Features

- Portable
- Quick response time
- Ingress protection IP 67
- Neoprene cable
- DNV, GL and LR approval



Cable Resistance Thermometer Model TR197

Description

Resistance thermometers for measuring the temperature of soft goods, such as fruits or other foods. The standard temperature range is $-40\text{ °C} \dots +70\text{ °C}$. The probe tip is angled.

The thermometer is extremely robust due to the neoprene cable and the stainless steel probe tip. It is also possible to connect this probe to a hand-held instrument for a local read out of the measured values.

Sensor

Sensor limiting error

- class B to DIN EN 60 751
- class A to DIN EN 60 751 (not with 2 wire connection)
- 1/3 DIN B at 0 °C (not with 2 wire connection)

With 2 wire connection the lead resistance of the cable compounds the error.

Therefore, cable resistance thermometers with limiting error class B should not exceed 1000 mm of total length (probe plus cable). Also it makes no sense to combine 2 wire connection with class A or 2 wire connection with 1/3 DIN B, because the lead resistance of the cable overrides the higher sensor accuracy.

Basic values and limiting errors

Basic values and limiting errors for the platinum measuring resistors are laid down in DIN EN 60 751.

The nominal value of Pt 100 sensors is 100 Ω at 0 °C. The temperature coefficient α can be stated simply to be between 0 °C and 100 °C with:

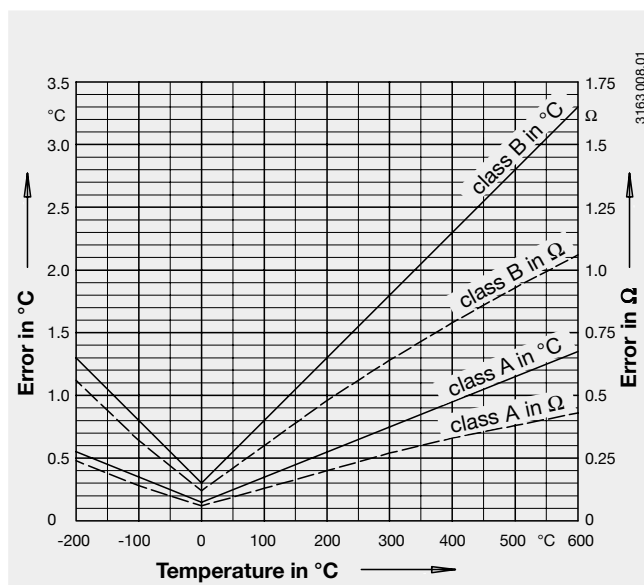
$$\alpha = 3.85 \cdot 10^{-3} \text{ } ^\circ\text{C}^{-1}$$

The relationship between the temperature and the electrical resistance is described by polynomes which are defined in DIN EN 60 751. Furthermore, this standard lays down the basic values in °C stages.

The limiting error is defined for two classes:

Class	Limiting error in °C
A	0.15 + 0.002 • t ¹⁾
B	0.3 + 0.005 • t

1) |t| is the value of the temperature in °C without consideration to the prefix



Basic values and limiting errors for the platinum measuring resistors per DIN EN 60 751

Temperature (ITS 90) °C	Basic value Ω	Limiting error DIN EN 60 751			
		Class A		Class B	
°C	Ω	°C	Ω	°C	Ω
-40	84.27	± 0.23	± 0.09	± 0.5	± 0.19
0	100	± 0.15	± 0.06	± 0.3	± 0.12
50	119.40	± 0.25	± 0.09	± 0.55	± 0.21

Probe

Design:	rigid tube with angled tip
Diameter:	6 mm, others on request
Length:	70 mm, others on request
Material:	stainless steel 1.4571
Ingress protection:	IP 67

Cable

Insulation:	Neoprene
Permissible ambient temperature:	-80 °C ... +65 °C
Core material:	Cu (strand)
Core cross section:	1.5 mm ²
Number of cores:	according to number of sensors and method of sensor connection
Wire ends:	bare
Cable length:	to customer's specification

Connection box, fitted to cable (optional)

Material:	aluminium, epoxy coated
Cap:	detachable, 2 fixing screws, EPDM flat seal
Cable glands:	Pg 16
Ingress protection:	IP 67
Terminal block:	ceramic, max. 1.5 mm ² , screws captive
Ground terminal:	included

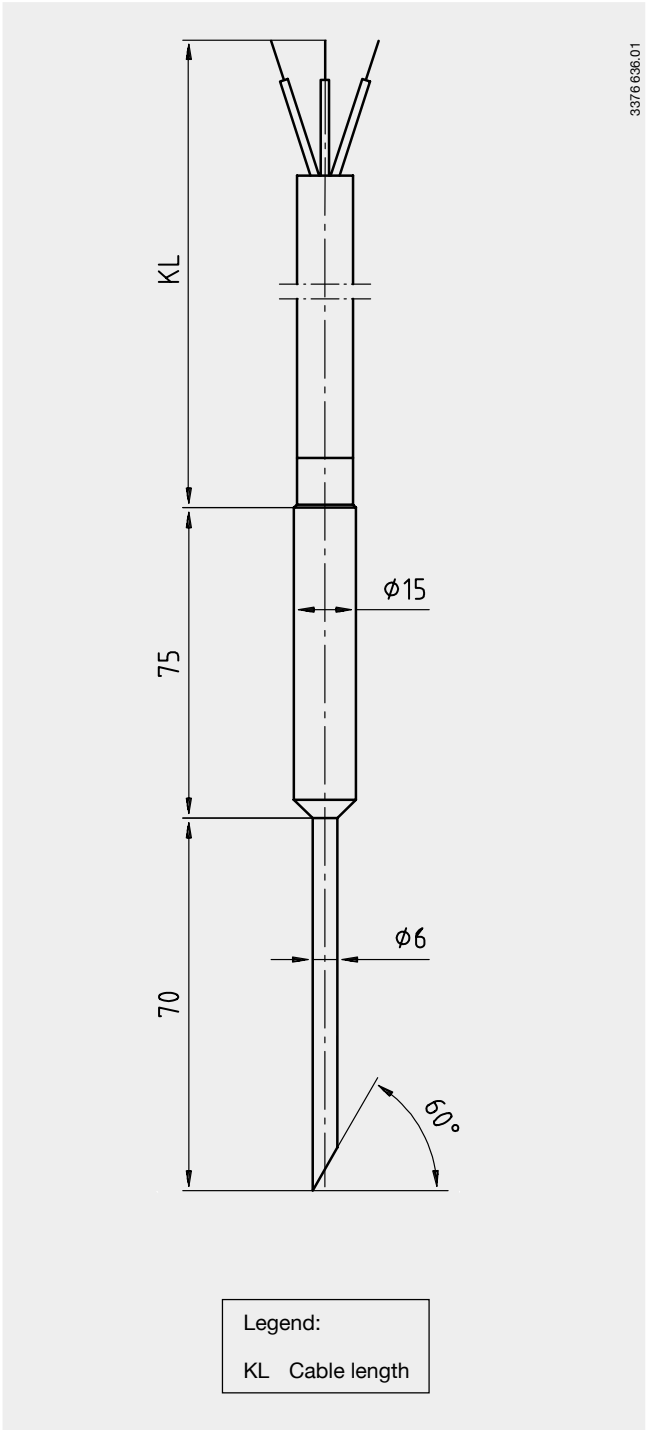
Transmitter (optional)

An optional transmitter can be mounted in the connection box.

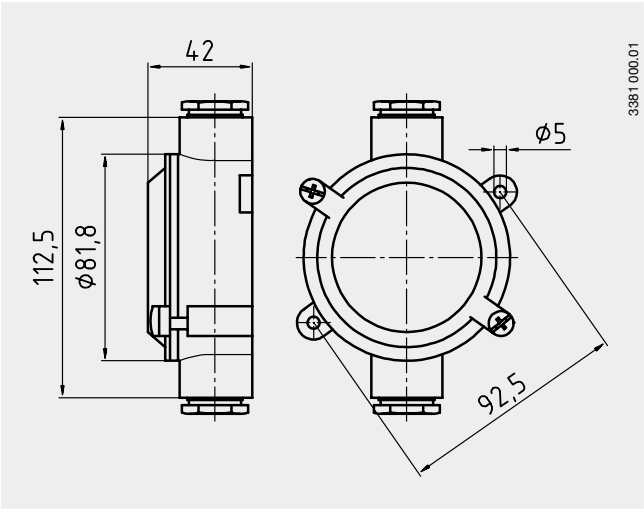
The T24 can be delivered with separate certification according to Germanischer Lloyd.

Dimensions in mm

Model TR197



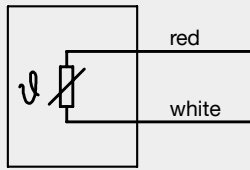
Connection box



Electrical connection

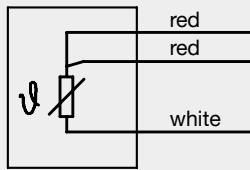
Cable

1 x Pt 100
2 wire

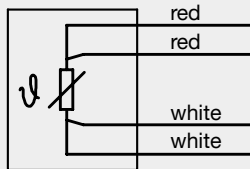


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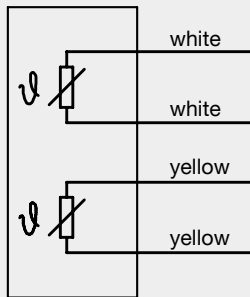
1 x Pt 100
3 wire



1 x Pt 100
4 wire

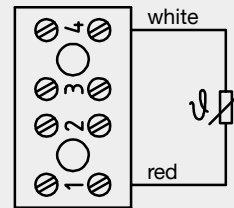


2 x Pt 100
2 wire



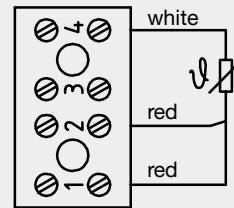
Connection box

1 x Pt 100
2 wire

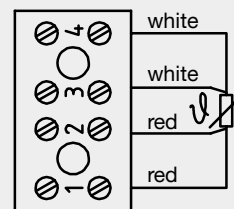


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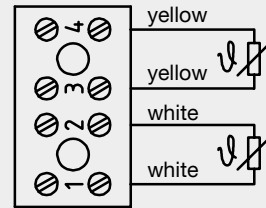
1 x Pt 100
3 wire



1 x Pt 100
4 wire




2 x Pt 100
2 wire



Type Approval Certificates

- Det Norske Veritas
- Germanischer Lloyd
- Lloyd's Register



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. A-8597
 This Certificate consists of 2 pages

This is to certify that
Temperature Sensor
with type designations
Resistance Thermometers
TR 192, TR 195, TR 197, TR 291, TR 292,
TR 293, TR 295, TR 791, TR 890
Thermocouples
TC 191, TC 192, TC 293, TC 791

Certificate holder
WIKA Alexander Wiegand GmbH & Co. KG
 Klingenberg/Main, Germany


is found to comply with
 Det Norske Veritas' Rules for Classification of Ships and Mobile Offshore Units

Application/limitation
 Location classes:

Temperature	D
Humidity	B
Vibration	B
EMC	Not relevant
Enclosure	B

Place and date
Høvik, 2002-11-21
for DET NORSKE VERITAS AS

Knut-Helge Knutsen
Knut-Helge Knutsen
Head of Section



Local Office
DNV Essen


Rolf O. Bjørvik
Rolf O. Bjørvik
Surveyor

This Certificate is valid until
2003-12-31

Note: This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

If any service/condition has to be changed which is provided by these rules, issued by any registered or unregistered of Det Norske Veritas, then Det Norske Veritas shall give consideration to such proposal for the period which may or may not exceed one year, but not more than 12 months, and the approval shall be renewed upon request. Approval for the extended period shall not exceed 12 months in any period. Det Norske Veritas shall reserve the right to suspend or withdraw its approval at any time without notice, suspension, expiration, agreement and any other action on behalf of Det Norske Veritas.

DET NORSKE VERITAS AS VERITASVEIEN 1, 1322 HØVIK, NORWAY TEL: (+47) 67 57 99 00 FAX: (+47) 67 57 99 11
 Form No. 20.90a Issue: January 98 Page 1 of 2



Type Approval Certificate

Germanischer Lloyd

This is to certify that the undernoted product(s) has/have been tested in accordance with the relevant requirements of the GL Type Approval System.

Certificate No. 43 197 - 02 HH
 Company WIKA Alexander Wiegand GmbH & Co. KG
 Alexander-Wiegand-Straße
 D-63911 Klingenberg

Product Description Temperature Sensor (Thermoelement)
 Temperature Sensor (Pt 100 and PT 1000)
 Type TC 191, TC 191 (angled), TC 192, TC 293, TC 791
 TR 291, TR 292, TR 197, TR 890, TR 195
 Environmental Category D, H, EMC1

Technical Data / Range of Application	Type No.	Range (°C)	Sensor	Level	z 0.5	z 0.9	Length (mm)
	TC 191	5850001	800 NiCr-Ni	30 g	7.5 s	30 s	150
	TC 191	5850021	800 NiCr-Ni	30 g	7.5 s	30 s	150
	TC 192	5851044	800 NiCr-Ni	15 g	33 s	160 s	200
	TC 293	5852001	800 NiCr-Ni	15 g	33 s	107 s	200
	TC 791	5856001	800 NiCr-Ni	4 g	0.7 s	2 s	200
	TR 291	5452001	-50/1400 Pt 100/1000	4 g	55 s	150 s	100
	TR 295	5452802	250 Pt 100/1000	4 g	55 s	150 s	150
	TR 292	5451002	-50/1400 Pt 100/1000	4 g	5 s	16 s	100
	TR 197	5854001	-50/1125 Pt 100	4 g	6 s	18 s	90
	TR 890	5853001	-50/1125 Pt 100	4 g	5 s	18 s	100
	TR 195	5860001	200 Pt 100	4 g	1 s	4 s	46

Accuracy: Ni Cr-Ni: class 2 DIN IEC 584 T2
 Accuracy: Pt 100 1 DIN or 1/6 DIN
 Degree of protection: IP65 (sensors)
 Protective pocket material: AISI 316

Test Standard Regulations for the Performance of Type Tests, Part 1, Edition 2001
 Documents Test report: RMS 5-03/96 dated 25-03-1996, 3-12/97 dated 20-01-1998
 Drawings identical with Type Nos.


Remarks None

Valid until 2008-07-29
 Page 1 of 1
 File No. I.D.02
 Hamburg, 2003-07-30

Germanischer Lloyd


J. Wittburg
J. Wittburg

Type Approval Symbol



A. Grün
A. Grün

This certificate is issued on the basis of "Regulations for the Performance of Type Tests, Part 0, Procedure".



LR Type Approval Certificate Extension

This is to certify that Certificate No. 02/70004 for the undernoted products is extended and renumbered as shown.

This certificate is issued to:

PRODUCER WIKA Alexander Wiegand GmbH & Co. KG
 Alexander-Wiegand-Straße
 D-63911 Klingenberg
 Germany

PLACE OF PRODUCTION Mesterladden 41
 DK-2820 Gentofte
 Denmark

DESCRIPTION Pt-100 platinum resistance temperature sensors

TYPES TR291, Thermometer assembly 5452001/B
 TR295, Thermometer assembly 5452802/B
 TR197, needle probe 5854001/B
 TR292, K in temp. sensor 5451002/B
 TR195 Thermometer assembly 5860001/B
 TR890 Thermometer assembly 5853001/B

APPLICATION Marine, offshore and industrial applications for use in environmental categories ENV1, ENV2 and ENV3, as defined in LR Type Approval System, Test Specification Number 1, 1990, Print Edition 2.

ADDITIONAL TEST Low temperature test (-25°C/18 hrs.).

SPECIFIED STANDARD IEC 751: 1983

"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify LR of any modification or changes to the equipment in order to obtain a valid certificate."

Certificate No. 02/70004 (E1)
 Issue Date 03 March 2003
 Expiry Date 17 February 2007
 Sheet 1 of 2

Lloyd's Register

Lloyd's Register of Shipping
 71 Fenchurch Street, London EC3M 4BS

P.E. Hansen
P.E. Hansen
CPN Type Approval

THIS DOCUMENT IS SUBJECT TO THE TERMS AND CONDITIONS OVERLEAF

Ordering information

Field No.	Code	Features
Type and number of sensors		
1	Q	1 x Pt100 application range -40 °C ... +70 °C
	R	2 x Pt100 application range -40 °C ... +70 °C <i>not with 3 or 4 wire connection</i>
Sensor method of connection		
2	2	2 wire
	3	3 wire
	4	4 wire
Sensor limiting error		
3	B	class B per DIN EN 60 751
	A	class A per DIN EN 60 751 (max. 450 °C) <i>not with 2 wire connection</i>
	C	1/3 DIN B at 0 °C <i>not with 2 wire connection</i>
	?	other <i>please state as additional text</i>
Probe diameter		
4	7	6 mm, with 60° angled tip
	?	other <i>please state as additional text</i>
Probe length		
5	4	70 mm
	?	other <i>please state as additional text</i>
Cable length		
6		length in mm, e.g. 0850 for 850 mm
	????	longer than 9999 mm <i>please state as additional text</i>
Connection box		
7	Z	without
	A	aluminium, epoxy coated
Transmitter		
8	ZZ	without
	TF	mounted in the connection box <i>only with sensor 1x Pt100 2 or 3 wire</i>
Additional order info		
9	YES	NO
	T	Z

Order code:

1	2	3	4	5	6	7	8	9
TR197	-	Z	-					

Additional text: _____

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.

