

ABB MEASUREMENT & ANALYTICS | DATA SHEET

SensyTemp TSBA (BA R)

Resistance thermometer



Measurement made easy

Resistance thermometer for building automation, machine construction and environmental engineering

Different outputs

- Pt100 signal
- 4 to 20 mA, HART®

Short response time

Intrinsically safe circuits available

High operational reliability

- Long term stability
- Maintenance free

General description

The product range presented in this catalog is a special selection adapted to the specific requirements of building automation, machine construction and environmental engineering. It is a result of both our close co-operation with our customers and our experience gained over years in the field of temperature measurement and process control instrumentation.

The transmitter is installed directly in the connection head, yielding the following benefits:

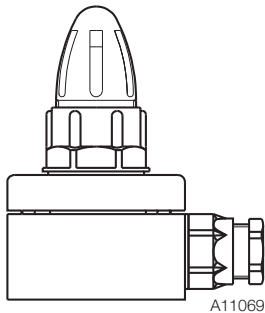
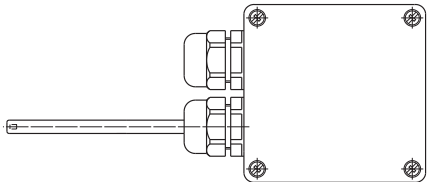
- simplified installation and commissioning procedure
- cost reduction due to minimized cabling expenditure
- interference immunity for 4 ... 20 mA signal transmission, even over long distances
- error signalling in the event of sensor break, sensor short circuit and polarity reversal

- long-time stability, since no potentiometers are used
- high immunity to environmental influences and vibration due to full encapsulation

Our quality assurance system in accordance with DIN EN ISO 9001 guarantees that our products comply with the highest quality standards. Our environmental management system to DIN EN ISO 14001 introduced and certified in 1997 ensures that the production in our factory is both resource-saving and environmentally friendly.

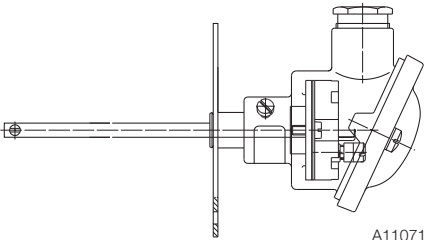
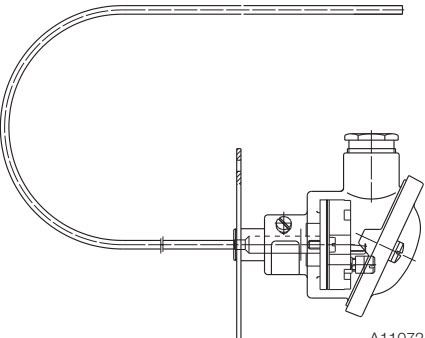
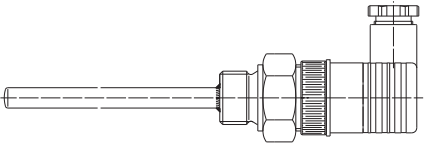
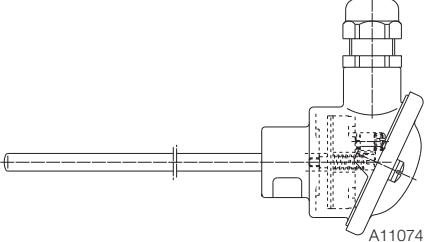
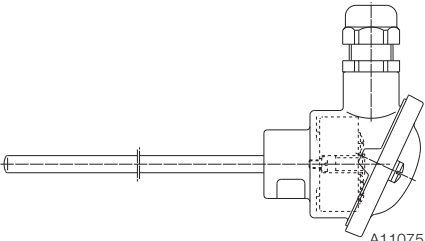
These temperature sensors for building automation, machine construction and environmental engineering use platinum resistance sensor elements. Most sensor types are available with or without an integrated transmitter. The measuring range is set permanently in factory. The transmitter is HART compatible.

Type overview

Model	Type	Possible applications
 A11069	Ambient temperature sensor TSBA (BA R-750) Previous designation: BA R-RF/WTRF	Cold stores Store rooms Production rooms Cellars
 A11070	Ambient indoor and outdoor temperature sensor TSBA (BA R-500) TSBA (BA R-500-i) (Ex i Zone 1)	Cold stores Outdoor temperature measurement Store rooms Production rooms Cellars

SensyTemp TSBA (BA R)

Resistance thermometer for building automation, machine construction and environmental engineering

Model	Type	Possible applications
 A11071	Air duct temperature sensor TSBA (BA R-300) Previous designation: BA R-L/WTL	Air ducts
 A11072	Average temperature sensor TSBA (BA R-900) Previous designation: BA R-Lm/WTLm	Air registers Air ducts Air shafts Environmental protection
 A11073	Pipeline temperature sensor TSBA (BA R-150) Previous design.: BA R-Ro/1 / WTRo/1	Water pipes Heating pipes Sewage pipes Mechanical engineering
 A11074	Pipeline and air duct temperature sensor with exchangeable measuring inset TSBA (BA R-200) Previous design.: BA R-Ro/2 / WTRo/2	Air ducts, water pipes, heating pipes, sewage pipes, mechanical engineering, environmental engineering
 A11075	Pipeline and air duct temperature sensor TSBA (BA R-250)	Air ducts, water pipes, heating pipes, sewage pipes, mechanical engineering, environmental engineering

Ambient temperature sensor TSBA (BA R-750)

Quick-response resistance thermometer for measuring the air temperature in dry and humid indoor rooms.
Typical applications: Cold stores, store rooms, production rooms, cellars, air shafts.

Technical data

Sensor

1 x Pt100 or 2 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Two-wire circuit

Measuring range

-30 ... 70 °C

Housing

Material

Polycarbonate

Color

Light grey (RAL 7035)

Degree of protection

IP 65

Cable entry

M16 x 1.5

Dimensions [mm]

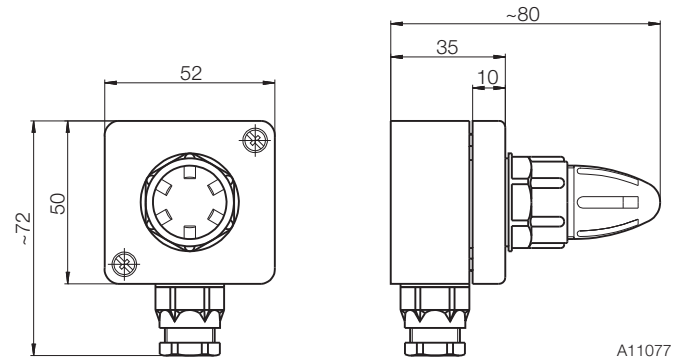


Fig. 1

SensyTemp TSBA (BA R)

Resistance thermometer for building automation, machine construction and environmental engineering

Ambient indoor and outdoor temperature sensor TSBA (BA R-500)

Resistance thermometer for measuring the air temperature in dry and humid indoor rooms and outside.
The type TSBA (BA R-500) without transmitter is applicable for zone 1. The version with integrated transmitter (BA R-500 i) is applicable in zone 2 according to a compliance declaration from ABB.
Typical applications: Outdoor temperature measurement, cold rooms, store rooms, production rooms, cellars.

Technical data

Sensor

1 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Three-wire circuit

Measuring range with or without integrated transmitter

-40 ... 70 °C / -40 ... 80 °C

Transmitter

Type TTH200

Housing

Material

Plastic, ABS

Color

Light grey

Degree of protection

IP 66

Cable entry

M20 x 1.5

Dimensions [mm], electrical connections

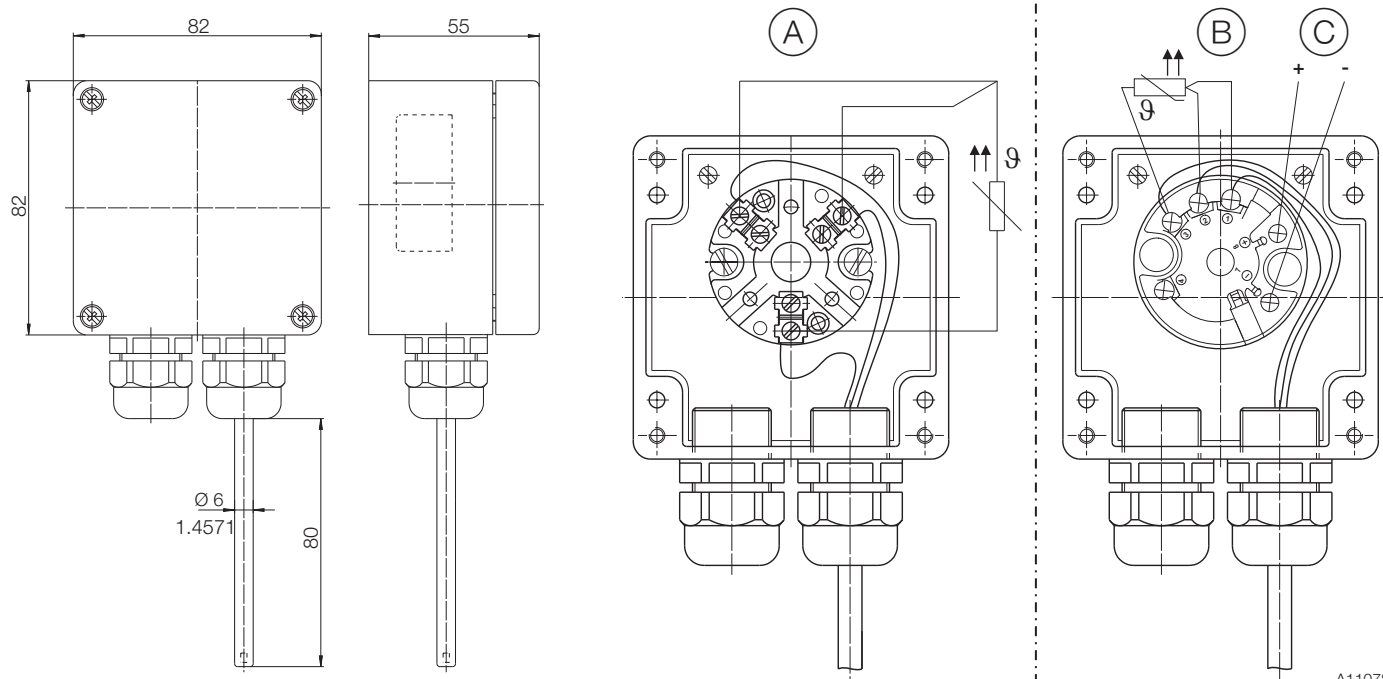


Fig. 2

(A) Without transmitter (B) With integrated transmitter (C) Transmitter output

Air duct temperature sensor TSBA (BA R-300)

Resistance thermometer for temperature measurement in air ducts.

Typical applications: Air ducts, air shafts.

Technical data

Sensor

1 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Two-wire circuit

Measuring range without integrated transmitter

-50 ... 130 °C

Transmitter

Type TTH200

Measuring range of the integrated transmitter

-30 ... 60 °C

Mounting

Sheet metal flange, chromated, diameter 90 mm

Insertion length [U]

200 mm or 330 mm

Measuring inset

- exchangeable
- diameter 6 mm, base not closed, tip with 2 drilled holes
- stainless steel sheath
- inset length = insertion length + 38 mm

Connection head

Type B: without transmitter, Type BH: with transmitter

Cable entry

M20 x 1.5

Degree of protection

IP 53

Response times (medium air, $v = 1$ m/s)

$t_{0,5} = 6$ s, $t_{0,9} = 20$ s

Insertion position

Drilled hole in direction of flow

Dimensions [mm], electrical connections

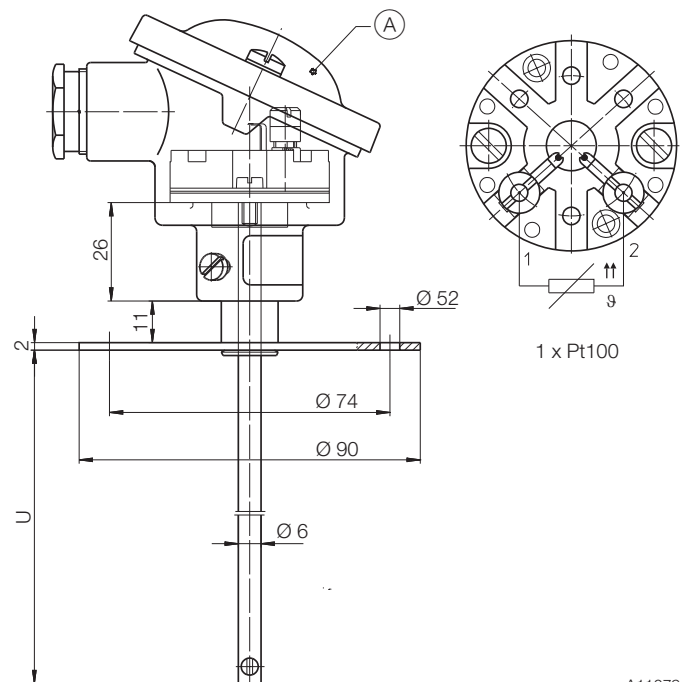


Fig. 3

(A) Connection head type B

A11079

SensyTemp TSBA (BA R)

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Average temperature sensor TSBA (BA R-900)

The average temperature sensor has a measuring winding over its entire length for measuring the average temperature in large rooms or ducts.

Typical applications: Air registers, air ducts, air shafts, environmental protection equipment.

Technical data

Measuring winding

1 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Two-wire circuit

Measuring range without integrated transmitter

-40 ... 150 °C

Transmitter

Type TTH200

Measuring range of the integrated transmitter

-20 ... 40 °C or -30 ... 60 °C

Thermowell

Diameter: 4 mm, Material: copper

Mounting

Chromated sheet metal flange, diameter 90 mm

Accessories: 5 mounting clamps, included in scope of delivery

Active length

6000 mm or 10000 mm

Connection head

Type B: without transmitter, Type BH: with transmitter

Cable entry

M20 x 1.5

Degree of protection

IP 53

Dimensions [mm], electrical connections

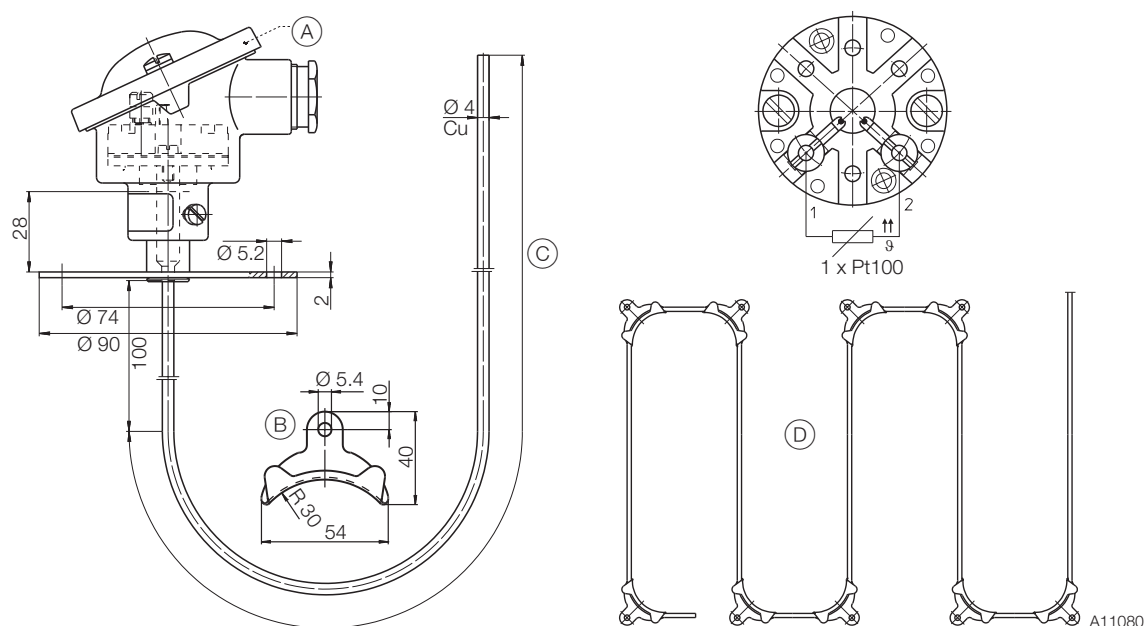


Fig. 4

(A) Connection head type B (B) Mounting clamp (C) Active length (D) Laying diagram

Pipeline temperature sensor TSBA (BA R-150)

Resistance thermometer for temperature measurement in pipelines

Due to its excellent response time and its immunity to shock and vibration, the TSBA (BA R-150) model is best suited for temperature measurement in mechanical engineering. Standardized connectors to EN 175301-803 are used for making the electrical connection. The contact pins of the connector plugs are gold-plated to avoid transition resistance resulting from corrosion. Due to this special feature the TSBA (BA R-150) model is also suitable for use in harsh industrial environments.

The device connector socket complies with flame class V0 to UL94. A profile packing is used to seal the transition between the fixed and the removable connector part. Contrary to the most commonly used flat packing the profile packing remains on the device socket even when the device is disconnected and, thus, cannot be lost.

Typical applications: Water pipes, heating pipes, sewage pipes, temperature measurement of cooling water, oil, and engine intake air.

Technical data

Measuring winding

1 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Three-wire circuit

Measuring range

-50 ... 250 °C

Thermowell

Diameter: 6 mm, Material: 1.4571

Mounting

Screwed plug, G1/2" thread to DIN 3852

Type A, Material 1.4571

Insertion length [U]

60 mm or 100 mm

Electrical connection

Connector socket to EN 175301-803, type A, max. permissible temperature 125 °C

Cable entry

M20 x 1.5

Degree of protection

IP 63

Response times

(Medium water, $v = 0.3 \text{ m/s}$) $t_{0.5} = 3.7 \text{ s}$; $t_{0.9} = 8.8 \text{ s}$

Dimensions [mm], electrical connections

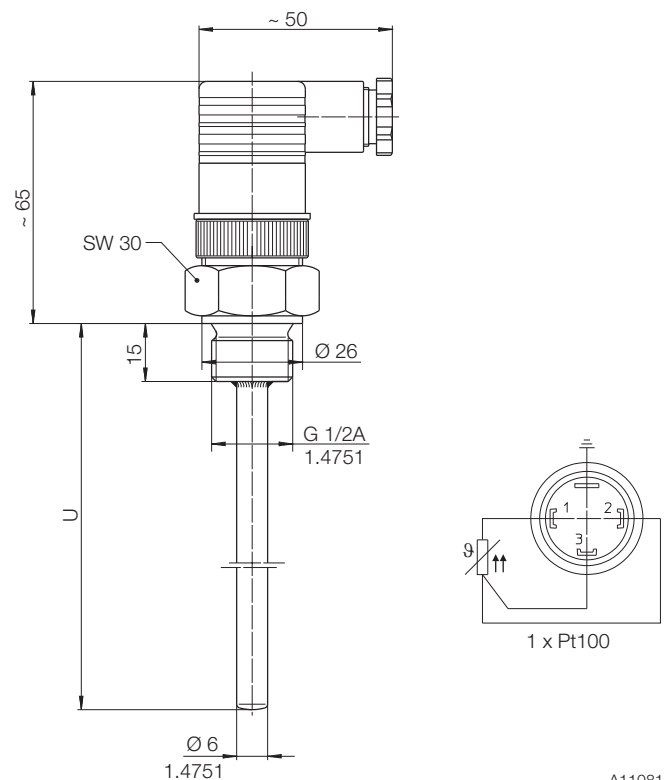


Fig. 5

A11081

SensyTemp TSBA (BA R)

Resistance thermometer for building automation, machine construction and environmental engineering

Pipeline and air duct temperature sensor TSBA (BA R-200)

Resistance thermometer for temperature measurement in pipelines and air ducts, with exchangeable measuring inset. Typical applications: Water pipes, heating pipes, sewage pipes, air ducts, mechanical and environmental engineering.

Technical data

Measuring winding

1 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Three-wire circuit

Measuring range without integrated transmitter

-50 ... 400 °C

Transmitter

Type TTH200

Measuring range of the integrated transmitter

-30 ... 60 °C or -20 ... 100 °C

Thermowell

Diameter: 8 mm, Material: 1.4571

Mounting

see "Mounting accessories"

Nominal length [N]

150 mm or 250 mm

Measuring inset

- exchangeable
- diameter 3 mm
- inset length = nominal length + 25 mm

Connection head

Type B: without transmitter, Type BH: with transmitter

Cable entry

Skintop M20 x 1.5

Degree of protection

IP 66

Dimensions [mm], electrical connections

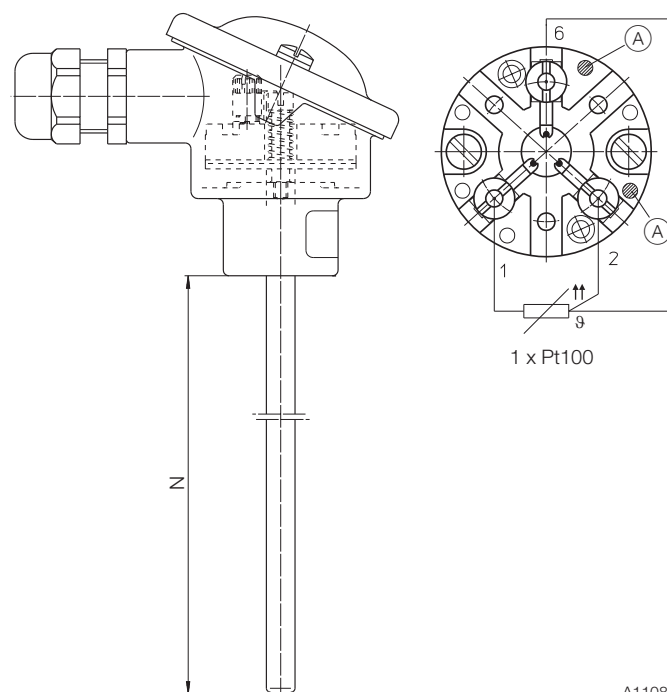


Fig. 6
Red

A11082

Pipeline and air duct temperature sensor TSBA (BA R-250)

Resistance thermometer for temperature measurement in pipelines and air ducts.

Due to its special design providing for good vibration immunity, the TSBA (BA R-250) model is perfectly suited for mechanical engineering applications.

Typical applications: Water pipes, heating pipes, sewage pipes, air ducts, mechanical and environmental engineering.

Technical data

Measuring winding

1 x Pt100

Standard, tolerance

EN 60751 (IEC 60751), class B

Three-wire circuit

Measuring range without integrated transmitter

-50 ... 250 °C

Transmitter

Type TTH200

Measuring range of the integrated transmitter

-30 ... 60 °C or -20 ... 100 °C

Thermowell

Diameter: 8 mm, Material: 1.4571

Mounting

see "Mounting accessories"

Nominal length

100 mm, 150 mm, 250 mm or 400 mm

Connection head

Type B: without transmitter, Type BH: with transmitter

Cable entry

Skintop M20 x 1.5

Degree of protection

IP 66

Dimensions [mm], electrical connections

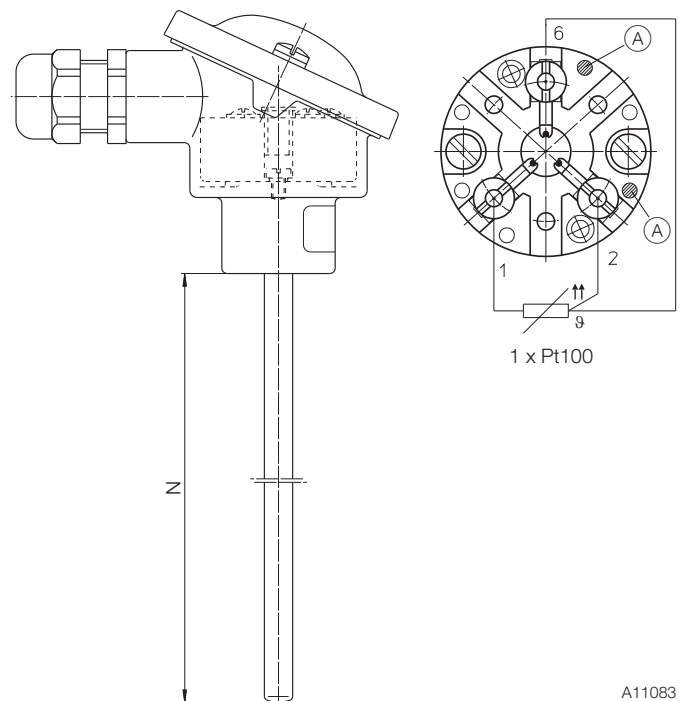


Fig. 7
A Red

SensyTemp TSBA (BA R)

Resistance thermometer for building automation, machine construction and environmental engineering

Technical data of integrated transmitter

See data sheet DS/TTH200

General data and safety data

Environmental capabilities

Storage temperature

-40 ... 20 ... 100 °C

Ambient temperature

-40 ... 20 ... 85 °C

Humidity

0 ... 100 % relative humidity (with insulated sensor connection)

Power terminals

M 3.5

Weight

50 g (module)

Connection head

Dimensions [mm]

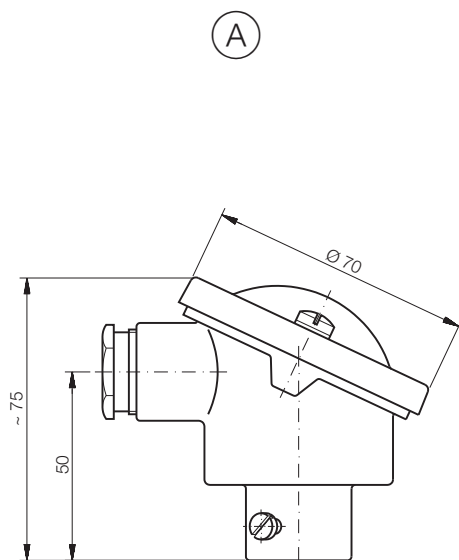


Fig. 9

(A) Type B (without transmitter) (B) Type BH (with transmitter)

Electrical connections

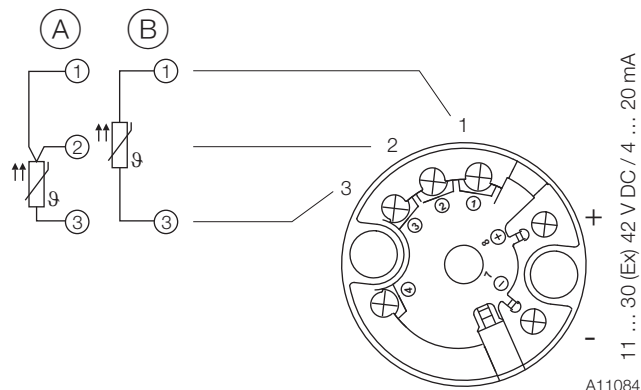
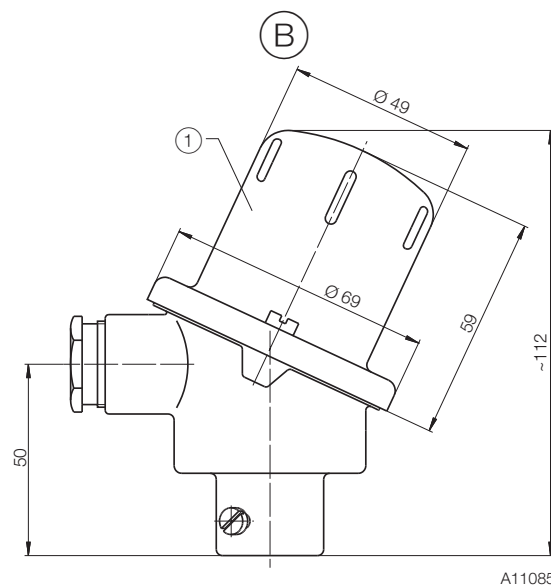


Fig. 8

(A) Three-wire circuit (B) Two-wire circuit



A11085

Ordering information

	Catalog No.
TSBA (BA R-750)	
1 x Pt100, Two-wire circuit	220103
2 x Pt100, Two-wire circuit	220104
TSBA (BA R-500)	
1 x Pt100, Three-wire circuit	239925
1 x Pt100, Three-wire circuit, with transmitter TTH200	-30 ... 60 °C 239926
TSBA (BA R-500-i)	
1 x Pt100, Three-wire circuit	240856
TSBA (BA R-300)	
1 x Pt100, Two-wire circuit	
Insertion length 200 mm	7962541
Insertion length 330 mm	7962542
1 x Pt100, Two-wire circuit, with transmitter TTH200	-30 ... 60 °C
Insertion length 200 mm	7962544
Insertion length 330 mm	7962545
TSBA (BA R-900)	
1 x Pt100, Two-wire circuit	
Active length 6000 mm	7962547
Active length 10000 mm	7962548
1 x Pt100, Two-wire circuit, with transmitter TTH200	-30 ... 60 °C
Active length 6000 mm	7957661
Active length 10000 mm	7957664
1 x Pt100, Two-wire circuit, with transmitter TTH200	-20 ... 40 °C
Active length 6000 mm	7962549
Active length 10000 mm	7962550
TSBA (BA R-150)	
1 x Pt100, Three-wire circuit	
Insertion length 60 mm	238590
Insertion length 100 mm	238591
TSBA (BA R-200)	
1 x Pt100, Three-wire circuit, measuring inset exchangeable	
Nominal length 150 mm	240427
Nominal length 250 mm	240428
1 x Pt100, Three-wire circuit, with transmitter TTH200	-30 ... 60 °C
Nominal length 150 mm	240429
Nominal length 250 mm	240430
1 x Pt100, Three-wire circuit, with transmitter TTH200	-20 ... 100 °C
Nominal length 150 mm	240431
Nominal length 250 mm	240432

Other versions on request

SensyTemp TSBA (BA R)

Resistance thermometer for building automation, machine construction and environmental engineering

Ordering Information (continued)		Catalog No.
TSBA (BA R-250)		
1 x Pt100, Three-wire circuit		
Nominal length 100 mm		240840
Nominal length 150 mm		240841
Nominal length 250 mm		240842
Nominal length 400 mm		240843
1 x Pt100, Three-wire circuit, with transmitter TTH200	-30 ... 60 °C	
Nominal length 100 mm		240844
Nominal length 150 mm		240845
Nominal length 250 mm		240846
Nominal length 400 mm		240847
1 x Pt100, Three-wire circuit, with transmitter TTH200	-20 ... 100 °C	
Nominal length 100 mm		240848
Nominal length 150 mm		240849
Nominal length 250 mm		240850
Nominal length 400 mm		240851
Accessories		
Adjustable compression fitting for TSBA (BA R-200), TSBA (BA R-250)		
thread size G1/2 A	material galv. Steel	230646
thread size G1/2 A	material stainless steel	228302
thread size 1/2" NPT	material stainless steel	238451
thread size M18x1.5	material galv. Steel	222024
Adjustable sheet metal flange (chromised) for TSBA (BA R-200), TSBA (BA R-250)		233889
1 package mounting clamps for TSBA (BA R-900) (5 pcs. per package)		242804

Other versions on request

Mounting accessories

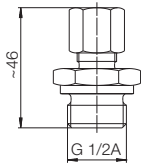
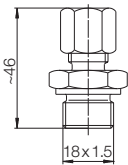
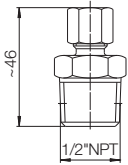
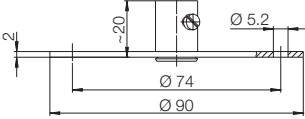
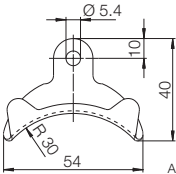
for TSBA (BA R-200, BA R-250)  A11086  A11087  A11088  A11089 Adjustable compression fitting Cylindrical thread, G 1/2 A Material steel, galvanized / steel clamp ring Material stainless steel Adjustable compression fitting Cylindrical thread, M18 x 1.5 Material steel, galvanized / steel clamp ring Adjustable compression fitting Conical thread, 1/2" NPT Material stainless steel Adjustable sheet metal flange Diameter 90 mm, chromated	for TSBA (BA R-900)  A11090 Mounting clamp, copper, Min. quantity to be ordered: 10 pieces
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