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

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Possible applications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ambient temperature sensor</td>
<td>Cold stores&lt;br&gt;Store rooms&lt;br&gt;Production rooms&lt;br&gt;Cellars</td>
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<tr>
<td>TSBA (BA R-750)</td>
<td>Previous designation: BA R-RF/WTRF</td>
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<tr>
<td></td>
<td>Ambient indoor and outdoor temperature sensor</td>
<td>Cold stores&lt;br&gt;Outdoor temperature measurement&lt;br&gt;Store rooms&lt;br&gt;Production rooms&lt;br&gt;Cellars</td>
</tr>
<tr>
<td>TSBA (BA R-500)</td>
<td>TSBA (BA R-500-i) (Ex i Zone 1)</td>
<td></td>
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</table>
SensyTemp TSBA (BA R)
Resistance thermometer for building automation, machine construction and environmental engineering

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Possible applications</th>
</tr>
</thead>
</table>
| ![Image](A11071) | Air duct temperature sensor  
TSBA (BA R-300)  
Previous designation: BA R-L/WTL | Air ducts  
Average temperature sensor  
TSBA (BA R-900)  
Previous designation: BA R-Lm/WTLm | Air registers  
Water pipes  
Heating pipes  
Sewage pipes  
Mechanical engineering  
Environmental protection |
| ![Image](A11072) | Pipeline temperature sensor  
TSBA (BA R-150)  
Previous design.: BA R-Ro/1 / WTRo/1 | Water pipes  
Heating pipes  
Sewage pipes  
Mechanical engineering  
Environmental protection |
| ![Image](A11073) | 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 |
| ![Image](A11074) | 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
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

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

Three-wire circuit

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)**
t₀.₅ = 6 s, t₀.₉ = 20 s

**Insertion position**
Drilled hole in direction of flow

**Dimensions [mm], electrical connections**

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**Fig. 3**
A Connection head type B

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A11079
Ø 6
Ø 90
Ø 74
Ø 52 /
1 x Pt100
SensyTemp TSBA (BA R)
Resistance thermometer for building automation, machine construction and environmental engineering

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 m/s) t0.5 = 3.7 s; t0.9 = 8.8 s

Dimensions [mm], electrical connections

Fig. 5
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
A Red
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

A11083

N 1 x Pt100

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]

Electrical connections

Three-wire circuit
Two-wire circuit

Fig. 8

A11084

Fig. 9

A Type B (without transmitter)  B Type BH (with transmitter)
### Ordering information

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<thead>
<tr>
<th>Catalog No.</th>
<th>TSBA (BA R-750)</th>
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<td>Insertion length 330 mm</td>
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<td>Active length 10000 mm</td>
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<td>1 x Pt100, Two-wire circuit, with transmitter TTH200 -30 … 60 °C</td>
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<td>Active length 10000 mm</td>
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<td>1 x Pt100, Two-wire circuit, with transmitter TTH200 -20 … 40 °C</td>
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<td>Active length 10000 mm</td>
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<th>Catalog No.</th>
<th>TSBA (BA R-200)</th>
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<td>Nominal length 250 mm</td>
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<td>1 x Pt100, Three-wire circuit, with transmitter TTH200 -30 … 60 °C</td>
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<td></td>
<td>Nominal length 150 mm</td>
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<td>Nominal length 250 mm</td>
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<td>1 x Pt100, Three-wire circuit, with transmitter TTH200 -20 … 100 °C</td>
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<td>Nominal length 150 mm</td>
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Other versions on request
SensyTemp TSBA (BA R)
Resistance thermometer for building automation, machine construction and environmental engineering

### Ordering Information (continued)

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<td>Nominal length 150 mm</td>
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<td>Nominal length 250 mm</td>
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<td>Nominal length 400 mm</td>
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<td>Nominal length 150 mm</td>
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### Accessories

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<tr>
<th>Accessories</th>
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<td>Adjustable compression fitting for TSBA (BA R-200), TSBA (BA R-250)</td>
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<td>thread size G1/2 A material galv. Steel</td>
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<tr>
<td>thread size G1/2 A material stainless steel</td>
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<tr>
<td>thread size 1/2&quot; NPT material stainless steel</td>
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<tr>
<td>thread size M18x1.5 material galv. Steel</td>
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<td>Adjustable sheet metal flange (chromised) for TSBA (BA R-200), TSBA (BA R-250)</td>
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<tr>
<td>1 package mounting clamps for TSBA (BA R-900) (5 pcs. per package)</td>
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Other versions on request
## Mounting accessories

### for TSBA (BA R-200, BA R-250)

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<th>Material</th>
<th>Type</th>
<th>Description</th>
<th>Diagram</th>
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<td>Steel, galvanized / steel clamp ring</td>
<td>Adjustable compression fitting</td>
<td>Cylindrical thread, G 1/2 A</td>
<td><img src="A11086.png" alt="Diagram 1" /></td>
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<td>Stainless steel</td>
<td>Adjustable compression fitting</td>
<td>Cylindrical thread, M18 x 1.5</td>
<td><img src="A11087.png" alt="Diagram 2" /></td>
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<td>Stainless steel</td>
<td>Adjustable compression fitting</td>
<td>Conical thread, 1/2&quot; NPT</td>
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<td>adjustable sheet metal flange</td>
<td>Adjustable sheet metal flange</td>
<td>Diameter 90 mm, chromated</td>
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### for TSBA (BA R-900)

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