

SensyTemp TSHY (HY R) Resistance thermometer for the food and beverage industries



For insertion in pipelines and vessels

Fast response

- Halftime < 2.5 s

Various designs

- Sensor smooth, with threaded compression fitting or welded flange

Corrosion-resistant

- Sensor and connection head made of stainless steel, IP 66

Hygienic

- Materials permissible for use with food, surface polished smooth, mounting suitable for CIP (Cleaning In Place)

Selectable transmission of measured values

- Pt 100 signal or 4 ... 20 mA with installed transmitter

High operational reliability

- Components have long-term stability and are maintenance-free, environment-resistant and vibration-resistant

Type approved

- for use in milk-heating plants which require approval, in accordance with Directive 85/357/EEC or the German Milk Executive Order (MVO)

General description

The temperature sensors TSHY (SensyTemp HY R) have been designed, in terms of construction, choice of materials and mounting, specially for use in the food and beverage industries.

Several designs are available for mounting at measuring junctions. The hygienic conditions are complied with as well as the requirement of reliable cleaning using the CIP method.

Another special feature is the halftime of < 2.5 seconds. With this short halftime, the measurement and control tasks on the large-surface heat exchangers in these industries with their short reaction times are performed reliably.

The measured value can be transmitted as a Pt 100 signal or by the installed transmitter as a 4...20 mA current signal. A programmable or HART-compatible transmitter can be integrated upon request.

Sensors with installed head-mounted transmitters comply with the EMC Directive 89/336/EEC of May 1989 and the EU Directive for CE conformity identification.

Design and dimensions

Temperature sensor TSHY (SensyTemp HY R-1E)

The typical feature of the HY R-1E sensor is its smooth polished sensor tube with 6 mm external diameter.

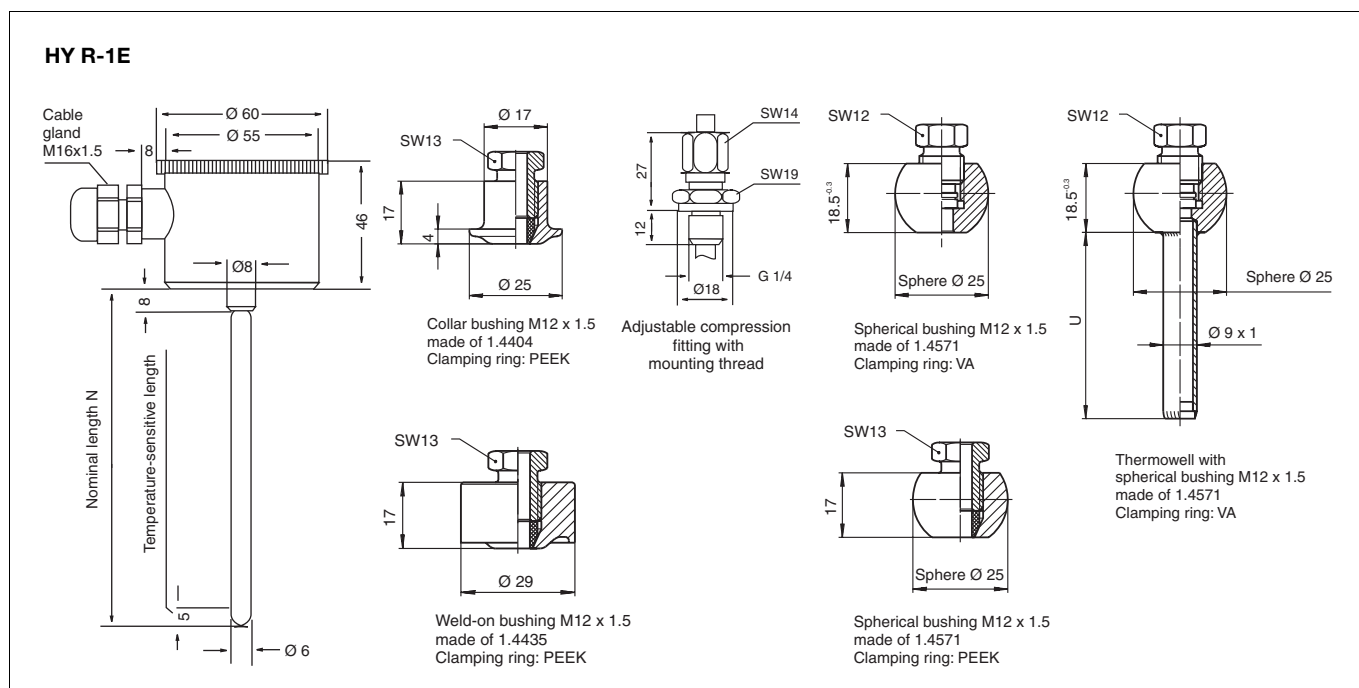
The HY R-1E sensor is variable in terms of the selectable process connector. For applications where the sensor is exposed to the medium, the immersion depth can be determined individually. A minimum immersion depth of at least 3 to 5 times the thermowell diameter should be observed. The immersion depth must not be less than the length of the temperature-sensitive part.

Due to the additional thermowell with weld-in type spherical bushing the temperature sensor can be exchanged and calibrated without the need to open the product chamber. Both the thermowell and the spherical bushing are made of stainless steel and, thus, meet all hygienic requirements and resist to process pressures up to 40 bars. Thermowells are available with insertion lengths of 50 mm and 180 mm.

The following connection options are possible for direct exposure of the HY R-1E sensor to the medium, i.e. without using a thermowell:

1. With threaded compression fitting G 1/4A. Made of 1.4571, with stainless steel clamping ring. For general industrial mounting. Pressure-resistant up to 40 bar.
2. With spherical bushing M12 x 1.5. Made of 1.4571, with stainless steel clamping ring. For general industrial mounting. Pressure-resistant up to 40 bar.
3. With spherical bushing M12 x 1.5. Made of 1.4571, PEEK clamping ring. Hygienic design. The shape of the PEEK clamping ring prevents an angular gap between the thermowell and the bushing. Pressure-resistant up to 10 bar.
4. Weld-on bushing M12 x 1.5. Made of 1.4435, PEEK clamping ring. Hygienic mounting without gap. Pressure-resistant up to 10 bar.
5. Collar-type bushing M12 x 1.5. Made of 1.4404. PEEK clamping ring. Hygienic mounting without gap. Pressure-resistant up to 10 bar.

The HY R-1E with transmitter measuring range 0...100 °C and 50...100 °C is approved for use in milk-heating plants acc. MVO.



Temperature sensor TSHY (SensyTemp HY R-2E)

The typical features of the HY R-2E sensor are its fixed insertion length and the small dimensions of the temperature-sensitive sensor tube and the high pressure resistance up to 140 bar.

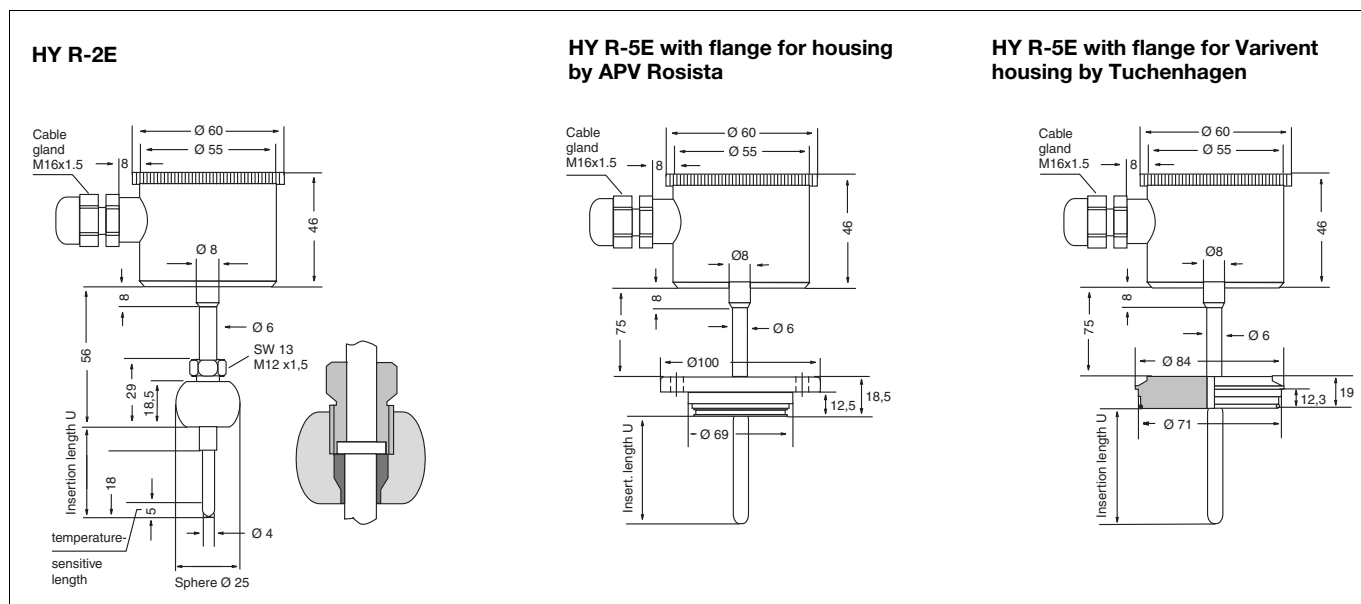
It is possible to choose between the insertion lengths 20 and 60 mm. The spherical welded bushing is fixed by a collar welding onto the sensor tube.

An additional PEEK ring prevents the formation of an annular gap between the sensor tube and the welded bushing. The HY R-2E sensor thus meets the highest hygiene and cleaning requirements.

Temperature sensor TSHY (SensyTemp HY R-5E) (inline)

The typical feature of the HY R-5E sensor is the flange which is welded to the sensor tube. The flange allows inline mounting in connection with housings of make “APV-Rosista” or “Tuchenhagen”.

With inline technology, measuring junctions for various process variables are standardized. This technology, which has been specially developed for the food and beverage industries, also meets the highest hygiene and cleaning requirements.

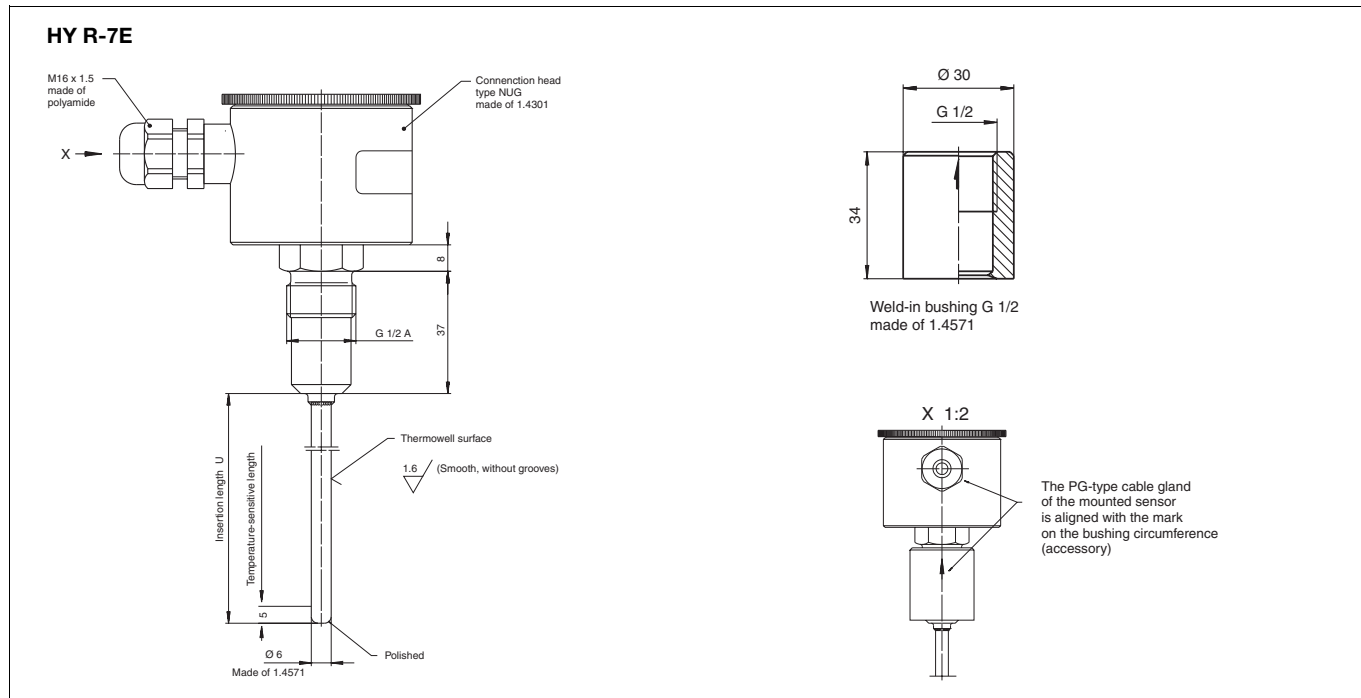


Temperature sensor TSHY (SensyTemp HY R-7E)

The typical features of the HY R-7E sensor are its fixed insertion length and the metal-type sealing system. In conjunction with the appropriate welded bushing this design ensures sealing without clearance volume and in compliance with the hygienic requirements of food applications. No additional seal is required.

When the system is mounted properly, the temperature sensor's cable gland is aligned with the mark on the bushing circumference.

A tightening moment of 30...50 Nm should be applied. The sealing system is pressure-resistant up to 10 bar. Various insertion lengths are available.

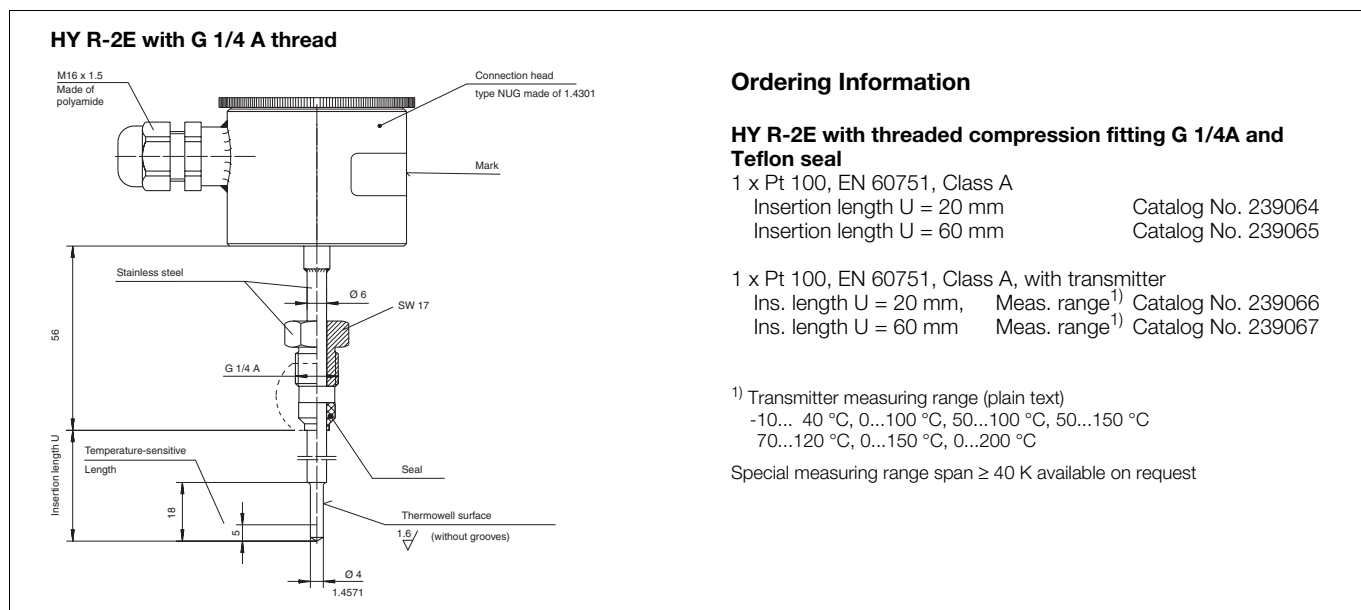


Temperature sensor TSHY (SensyTemp HY R-2E) with G 1/4 A thread

This sensor is intended to be used as a spare part for existing systems with spherical welded bushing, with G 1/4 thread and Teflon seal.

Since this type has been replaced with the welded bushing M12 x 1.5 with PEEK seal, the welded sphere G 1/4 is not included in the scope of delivery.

If the welded sphere should be defective, please use type M12 x 1.5 with PEEK seal.



Ordering Information

HY R-2E with threaded compression fitting G 1/4A and Teflon seal

- 1 x Pt 100, EN 60751, Class A
Insertion length U = 20 mm Catalog No. 239064
- Insertion length U = 60 mm Catalog No. 239065

- 1 x Pt 100, EN 60751, Class A, with transmitter
Ins. length U = 20 mm, Meas. range¹⁾ Catalog No. 239066
- Ins. length U = 60 mm Meas. range¹⁾ Catalog No. 239067

¹⁾ Transmitter measuring range (plain text)
-10... 40 °C, 0...100 °C, 50...100 °C, 50...150 °C
70...120 °C, 0...150 °C, 0...200 °C

Special measuring range span ≥ 40 K available on request

Technical data

Temperature sensor

Resistance element

1 x Pt 100 in accordance with EN 60751, class A, 3-wire circuit
or
2 x Pt 100 in accordance with EN 60751, class B, 2-wire circuit

Measuring range

Temperature: -50...+250 °C
Pressure: For HY R-1E see details about compression fitting on page 2
max. 140 bar
For HY R-2E in accordance with the pressure class of the housing
For HY R-5E

Response time

acc. to VDE/VDI 3511, media water, $v = 0,4 \text{ m/s}$
HY R-1E + R-5E + R-7E HY R-1E with SR HY R-2E
 $t_{0,5}$ < 2.5 s 5.0 s 2.0 s
 $t_{0,9}$ < 5.2 s 11.4 s* 3.4 s
* This value can be reduced to 6 s by using heat-conductive paste.

Insulation voltage

Max. 250 V DC

Sensor tube

For HY R-1E Smooth without compression fitting
For HY R-2E With fixed insertion length, spherical welded bushing

For HY R-5E With fixed insertion length and weld-on flange
For HY R-7E With fixed insertion length, metal sealing system
Length In accordance with order details or dimensional drawings

Diameter 6 or 6/4 mm (see dimensional drawings)
Material Stainless steel 1.4571 (AISI 316-TI)

Connection head

Stainless steel 1.4301 (AISI 304) with screwed lid, sealable
Degree of protection IP 66
Cable gland M16 x 1.5 for cable diameter 3.5...8.0 mm
Screw terminals for the connection cable

Transmitter

Design TSHY (SensyTemp HY R)

Installation design, suitable for the connection head of the HY R temperature sensor, only possible in connection with a single winding

Input

Pt 100 (EN 60751),
3-wire circuit, fixed ranges

Output

4...20 mA, temperature linear

Power supply

$U_s = 10.5...30 \text{ V DC}$, polarity safe

Climatic conditions

Ambient temperature

-40...+85 °C

Relative humidity

≤ 100 % (condensation possible)

Characteristics at rated conditions

(percentage referred to the measuring span)

Measurement deviation (upper-range value)

nominal value 0 °C: ≤ 0.15 % or 0.15 K
nominal value < or > 0 °C: ≤ 0.2 % or 0.2 K

Deviation of linearity

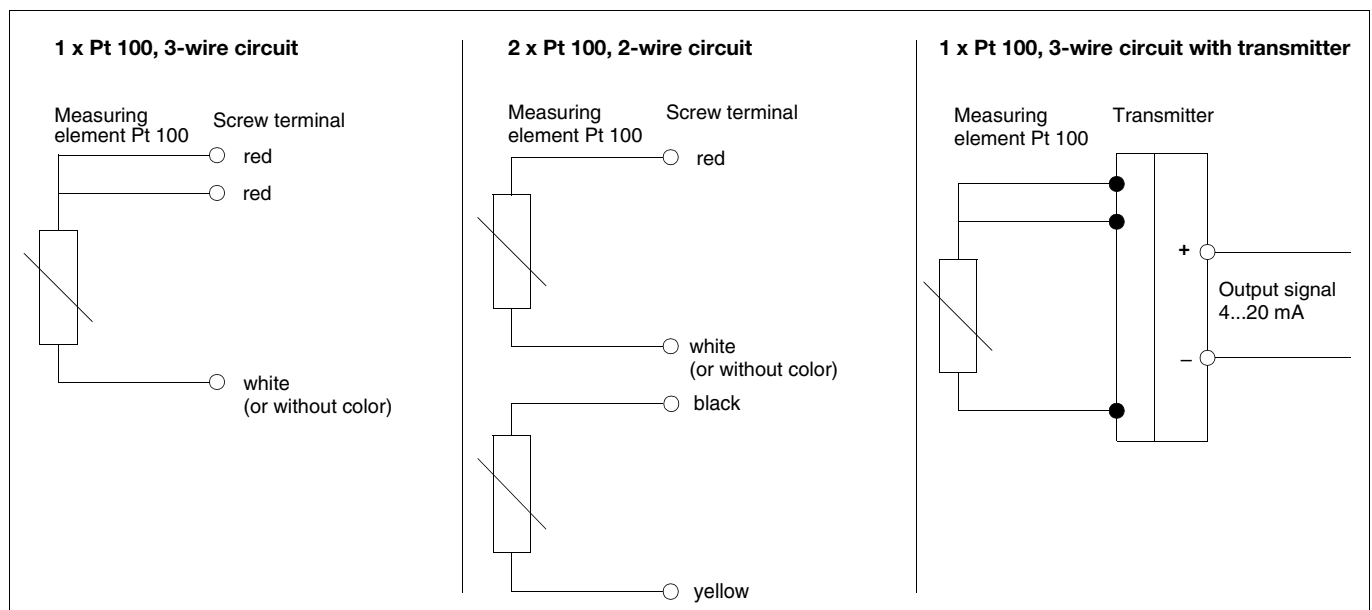
< 0.10 %

Electromagnetic compatibility

according to NAMUR NE 21

CE conform

Connection diagram



Ordering Information

	Catalog No.		
Temperature sensor TSHY (SensyTemp HY R-1E)			
Sensor smooth, without threaded compression fitting			
1 x Pt 100, EN 60751, class A, 3-wire circuit			
Sensor nominal length	N = 100 mm		7963706
	N = 250 mm		7963705
	N = 450 mm		7963704
2 x Pt 100, EN 60751, class B, 2-wire circuit			
Sensor nominal length	N = 100 mm		7963703
	N = 250 mm		7963702
	N = 450 mm		7963701
1 x Pt 100, EN 60751, class A, 3-wire circuit with head mounted transmitter 4...20 mA			
Sensor nominal length	N = 100 mm	Measuring range -10...+40 °C	7958188
	N = 100 mm	Measuring range 0...100 °C	2) 7958189
	N = 100 mm	Measuring range 50...100 °C	2) 7958190
	N = 100 mm	Measuring range 50...150 °C	7958191
	N = 100 mm	Measuring range 70...120 °C	7958192
	N = 100 mm	Measuring range 0...150 °C	7958219
	N = 100 mm	Measuring range 0...200 °C	7958218
	N = 100 mm	Measuring range	1) 7963709
	N = 250 mm	Measuring range	1) 7963708
	N = 450 mm	Measuring range	1) 7963707
Temperature sensor TSHY (SensyTemp HY R-2E)			
Sensor with fixed spherical welded bushing M12 x 1,5			
1 x Pt 100, EN 60751, class A, 3-wire circuit			
Insertion length	U = 20 mm		7963710
	U = 60 mm		7963711
2 x Pt 100, EN 60751, class B, 2-wire circuit			
Insertion length	U = 20 mm		7963714
	U = 60 mm		7963715
1 x Pt 100, EN 60751, class A, 3-wire circuit with head mounted transmitter 4...20 mA			
Insertion length	U = 20 mm	Measuring range	1) 7963712
	U = 60 mm	Measuring range	1) 7963713
Temperature sensor TSHY (SensyTemp HY R-5E)			
Sensor with fixed flange for "inline" mounting			
1 x Pt 100, EN 60751, class A, 3-wire circuit			
Flange for Varivent housing DN 40...125 by Tuchenhagen			
Insertion length	U = 25 mm		7963723
Flange for case DN 40...125 by APV-Rosista			
Insertion length	U = 25 mm		7963724
2 x Pt 100, EN 60751, class B, 2-wire circuit			
Flange for Varivent housing DN 40...125 by Tuchenhagen			
Insertion length	U = 25 mm		7963725
Flange for case DN 40...125 by APV-Rosista			
Insertion length	U = 25 mm		7963726
1 x Pt 100, EN 60751, class A, 3-wire circuit with head mounted transmitter 4...20 mA			
Flange for Varivent housing DN 40...125 by Tuchenhagen			
Insertion length	U = 25 mm	Measuring range	1) 7963727
Flange for case DN 40...125 by APV-Rosista			
Insertion length	U = 25 mm	Measuring range	1) 7963728

1) Measuring range of the head mounted transmitter (clear text)

-10...+40 °C, 0...100 °C, 50...100 °C, 50...150 °C

70...120 °C, 0...150 °C, 0...200 °C

2) Certified for use in milk-heating plants acc. to MVO

Other versions on request

Ordering Information (continued)

	Catalog No.		
Temperature sensor TSHY (SensyTemp HY R-7E)			
with fixed insertion length and metal-type conical nipple			
1 x Pt 100, EN 60751, class A, 3-wire circuit			
Insertion length	U = 50 mm		238380
	U = 100 mm		7958106
	U = 250 mm		7958107
1 x Pt 100, EN 60751, class A, 3-wire circuit with head mounted transmitter			
Insertion length	U = 50 mm	Measuring range 0...100 °C	238376
	U = 50 mm	Measuring range 1)	238374
	U = 100 mm	Measuring range 1)	238375
	U = 250 mm	Measuring range 1)	241664

Accessories			
	Catalog No.		
Mounting material for the TSHY (SensyTemp HY R-1E) sensor			
Spherical bushing M12 x 1.5, made of 1.4571, clamping ring made of PEEK			7963731
Spherical bushing M12 x 1.5, made of 1.4571, clamping ring made of VA			7962518
Weld-on bushing M12 x 1.5, made of 1.4435, clamping ring made of PEEK			239904
Collar bushing M12 x 1.5, made of 1.4404, clamping ring made of PEEK			240604
Adjustable threaded compression fitting G 1/4A, made of stainless steel, clamping ring made of VA			7962519
Thermowell with spherical bushing M12 x 1.5, made of 1.4571, clamp. ring made of VA			
Insertion length U =	50 mm		7963729
	U = 180 mm		7963730
Mounting material for the TSHY (SensyTemp HY R-7E) sensor			
Weld-in bushing G 1/2 made of 1.4571			7958116

1) Measuring range of the head mounted transmitter (clear text)
-10...+40 °C, 0...100 °C, 50...100 °C, 50...150 °C
70...120 °C, 0...150 °C, 0...200 °C

Other versions on request

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