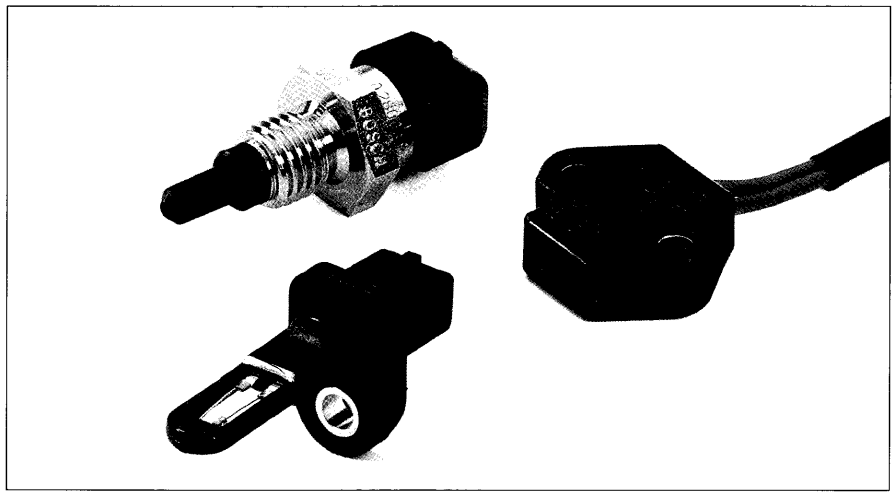
NTC/PTC temperature sensors

Measurement of air temperatures between –40 °C and +130 °C

ϑ / R

- Measurement with temperature-dependent resistors
- Broad temperature range



Offer

PTC temperature sensor
Design: PTC thermistor in waterproof plastic housing.
Application: Measurement of air temperature under extreme ambient conditions up to 85 °C.

1 147 212 037

NTC temperature sensor
Design: NTC thermistor in waterproof plastic housing.
Application: Measurement of air temperature under extreme ambient conditions up to 85 °C.

1 147 212 059

Accessories

Socket housing	AMP No. **180 907-1**
Receptacle	AMP No. **160 526-2**

NTC temperature sensor
Design: NTC thermistor in plastic sheathing, steel housing.
Application: Measurement of air temperature up to 130 °C.

0 280 130 039

Accessories

Connector	**1 237 000 036**

NTC temperature sensor
Design: Polyamide housing.
Application: Measurement of air temperature up to 130 °C.

0 280 130 085

Accessories

Connector	**1 237 000 036**

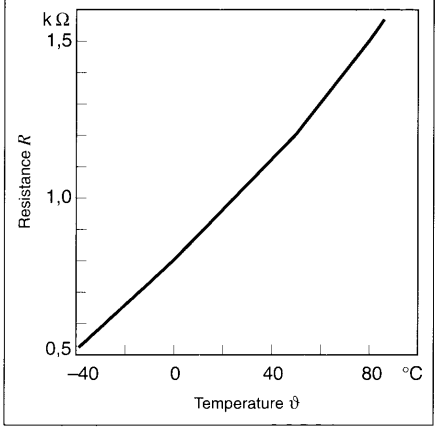
For mounting purposes, the sensor is plugged into the corresponding socket.

Technical data / Range

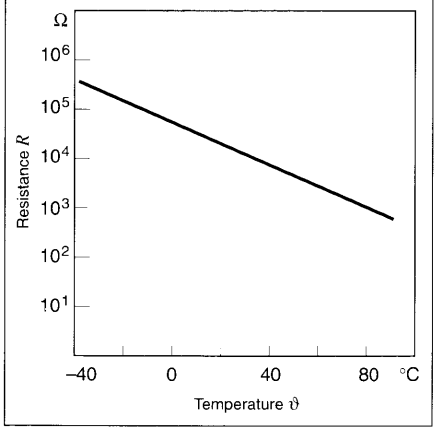
Part No.		1 147 212 037	1 147 212 059	0 280 130 039	0 280 130 085
Characteristic curve		1	2	3	4
Measuring range	°C	–40 ... +85	–40 ... +85	–30 ... +130	–40 ... +130
Permissible temp., max.	°C	+90	+100	–	+140
Resistance at 25 °C	kΩ	1±2 %	10±5 %	2.5±5 %[1]	2±5 %
Resistance at –10 °C	kΩ	–	–	8.26 ... 10.56	–
+20 °C	kΩ	–	–	2.28 ... 2.72	2.4 ± 5.4 %
+80°C	kΩ	–	–	0.290 ... 0.364	–
Max. loading at 55 °C	W	0.5	0.5	–	–
Nominal voltage	V	–	–	≤ 5	≤ 5
Measuring current through sensor, max.	mA	–	–	1	1
Self-heating for max. permissible power loss P = 2 mW and stationary air (23 °C)	K	–	–	≤ 2	–
Thermal time constant[2]	s	–	–	ca. 20	≤ 5[3]
Time constant					
in stationary water	s	–	–	–	–
in air	s	–	–	41	–
Dead time	s	–	–	1	–
Permissible vibration acceleration, sustained	m · s²	–	600	600	40
Corrosion-tested as per		–	–	DIN 50 018	–

[1]) At 20 °C.
[2]) Time required to reach 63 % of final value for difference in resistance, given an abrupt increase in air temperature; air pressure 1000 mbar; air-flow rate 6 m · s⁻¹.
[3]) Time constant τ_{63} in air for a temperature jump of –80 °C → +20 °C at an air-flow rate of ≥ 6 m · s⁻¹.

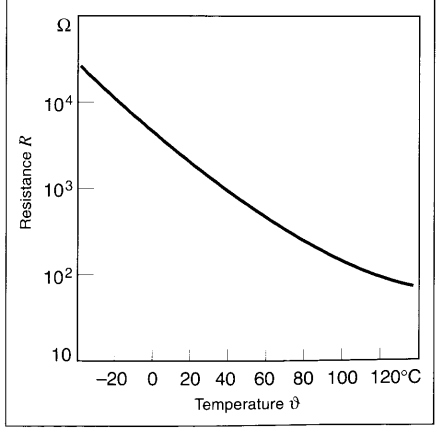
Characteristic curve 1



Characteristic curve 2

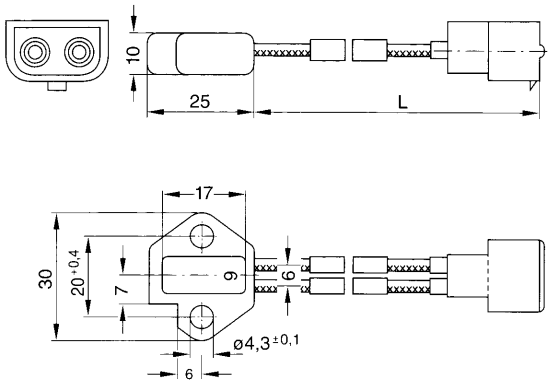


Characteristic curve 3



Dimension drawings

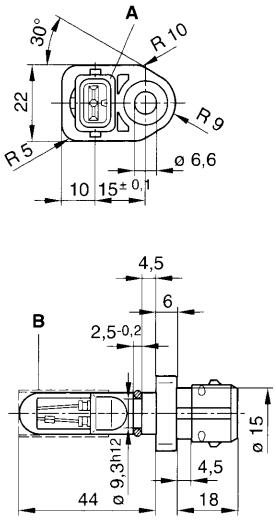
1 147 212 037/059



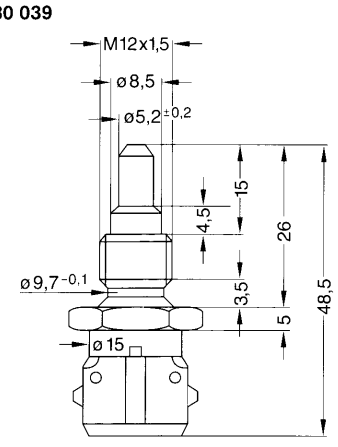
Part Number	Length L (mm)
1 147 212 037	200
1 147 212 059	950

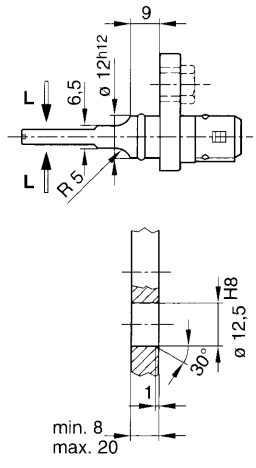
0 280 130 085

A Plug as per C 280 202 294 A
B Protective sleeve
L Air flow



0 280 130 039





Design and function

NTC sensor

The sensing element of an NTC temperature sensor (NTC: **N**egative **T**emperature **C**oefficient) , is a resistor made up of metal oxides and oxidized mixed crystals. This mixture is produced by means of sintering and pressing with the addition of binding agents. For automotive applications, NTC thermistors are provided with a protective housing.

If NTC thermistors are exposed to a source of external heat, their resistance drops drastically and, provided the supply voltage remains constant, their current input climbs rapidly. This property can be utilized for temperature measurement. NTC sensors are suitable for a wide range of ambient conditions, and they make it possible to measure temperatures over a very broad spectrum.

PTC sensor

The sensing element of the PTC temperature sensor 1 147 212 037 is a silicon resistor (PTC: **P**ositive **T**emperature **C**oefficient).

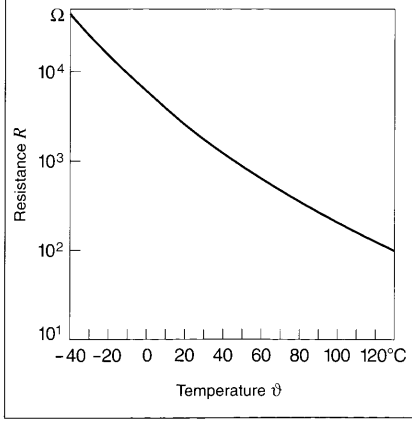
Installation instructions

Installation is to be effected such that the front part with the sensing element is directly exposed to the air flow. The ribs on the thin-film temperature sensor are designed to provide mechanical protection for the ceramic substrate.

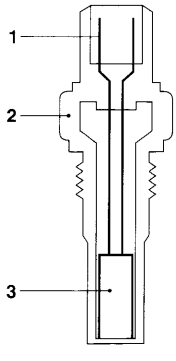
Explanation of symbols:

R Resistance
$\dot{V}$ Volumetric flow
ϑ Temperature

Characteristic curve 4



Temperature sensor (Principle)
1 Electrical connection
2 Housing
3 NTC resistor, PTC resistor



Diagram