R300 Series
Temperature Sensor

DESCRIPTION

The R300 Series is a passive, resistive temperature device (RTD), high temperature probe. This product features a robust, stainless steel closed-tip design that enhances reliability in aggressive environments, while still providing excellent response time.

This one-piece sensor with integral connector was designed for use in heavy duty vehicle engine exhaust gas recirculation (EGR) systems where temperature excursions to 300 °C [572 °F] can occur.

Other potential applications for this harsh duty sensor may include fluid or air temperature sensing within the engine environment or in industrial applications such HVAC or refrigeration compressor equipment where this type of sensor packaging and temperature range is often ideal.

FEATURES

- Working temperature range: -40 °C to 275 °C [-40 °F to 527 °F], continuous, excursion to 300 °C [572 °F] for 10 min. max.
- Response time: T63; at 10 m/s gas flow rate at 150 °C [302 °F] ~15 s
- Accuracy: better than ±3 °C, -40 °C to 300 °C [-40 °F to 572 °F] typical
- M14 x 1.5 mounting thread
- Enhanced reliability
- Linear output
- Long life

POTENTIAL APPLICATIONS

- Exhaust gas temperature sensing systems on heavy duty, truck, agriculture and construction vehicle engines including:
  - In-line fluid temperature sensing
  - Cylinder head temperature sensing
- High temperature industrial or commercial applications including:
  - Bulk refrigeration
  - Domestic heating and controls
  - Hot tub and pool temperature controls
  - Industrial ovens up to 300°C [572 °F]

R300 Series

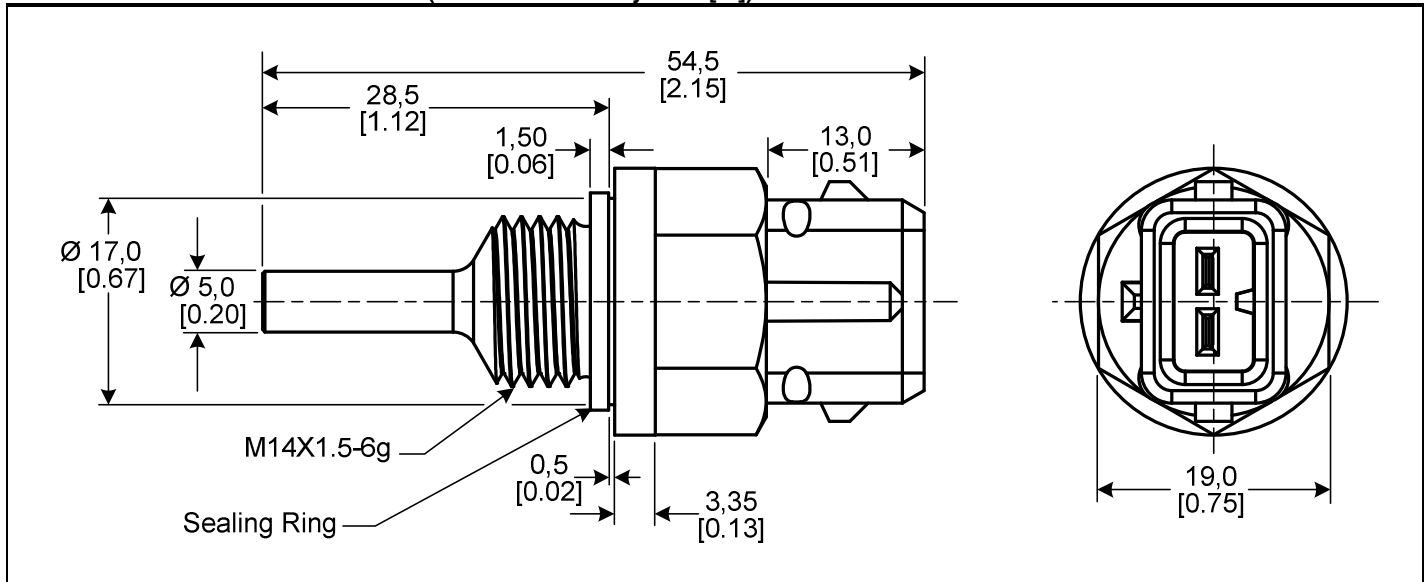**FIGURE 1. MOUNTING DIMENSIONS (For reference only: mm/[in])**

TABLE 1. GENERAL SPECIFICATIONS

Characteristic	Parameter	Note
Insertion depth	28,5 mm [1.12 in]	custom devices available upon request
Sealing surface dimensions	7.0 mm [0.28 in] dia.; 0,5 mm [0.02 in] thickness	—
Mating cable harness connector	AMP JPT/Bosch Jetronics	custom connectors available upon request
Mounting	M14x1.5 male thread, fixing nuts integrated with sensor body	—
Nominal resistance	100 Ohm/0 °C [32 °F]	—
Operating temperature range	-40 °C to 275 °C [-40 °F to 527 °F]	continuous, excursion to 300 °C [572 °F] for 10 min. max.
Accuracy	better than ±3.0 °C	—
Response time	T63; at 10 m/s gas flow rate at 150 °C [302 °F] ~15 s	—
Reliability	Less than or equal to 1.5% failures per one million miles	—
Measurement range continuous probe tip	-40 °C to 275 °C [-40 °F to 527 °F]	—
Measurement range continuous probe body	-40 °C to 250 °C [-40 °F to 482 °F]	—
Storage temperature range	-40 °C to 150 °C [-40 °F to 302 °F]	—
Insulation breakdown	>10 MOhm	100 Vdc for 3 s at room temperature
Torque limits	16 N m [11.8 ft lb] +20%	at room temperature
Housing material	stainless steel	—
Sealing	IP59K	—
Approvals	EN 6071:1996, IEC 751:1983	—

FIGURE 2. ELECTRICAL PERFORMANCE

Characteristic Equation:

$R_T = R_{ZERO}*(1 + \alpha T + \beta T^2)$ for T > 0 ºC

$R_T = R_{ZERO}*(1 + \alpha T + \beta T^2 + v(T-100)T^3)$ for T < ºC

R_T = sensor output resistance
R_{ZERO} = PT100 resistance at 0 ºC [32 ºC]
T = temperature in ºC
$\alpha = 3.9083 \times 10^{-3}$ ºC^{-1} = characteristic curve parameter
$\beta = -5.7750 \times 10^{-7}$ ºC^{-2} = characteristic curve parameter
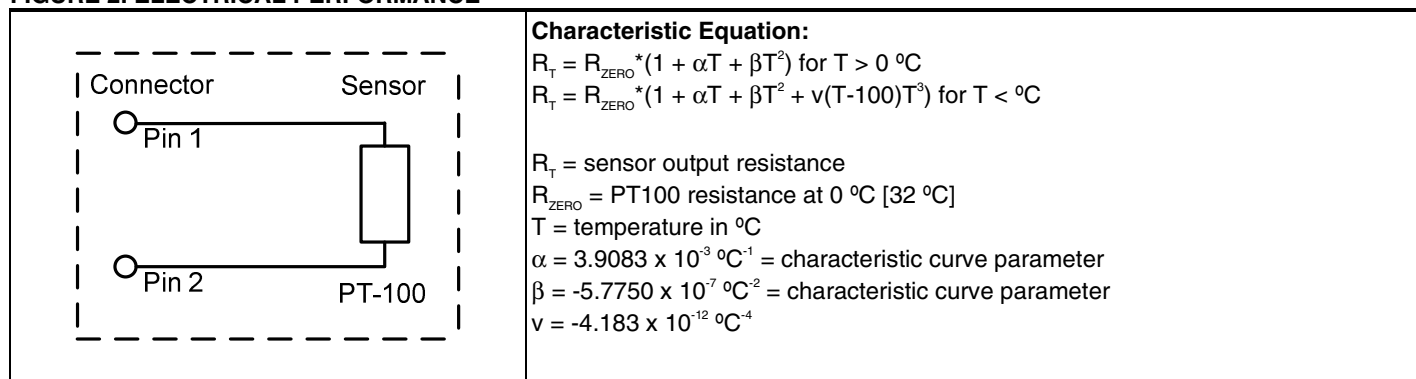$v = -4.183 \times 10^{-12}$ ºC^{-4}

TABLE 2. RESISTANCE/TEMPERATURE DATA

T (Temperature) °C [°F]	Ro (PT100 Resistance) Ohm	T (Temperature) °C [°F]	Ro (PT100 Resistance) Ohm	T (Temperature) °C [°F]	Ro (PT100 Resistance) Ohm
-40 [-40]	84.72	80 [176]	130.90	200 [392]	175.86
-20 [-4]	92.16	100 [212]	138.51	220 [428]	183.19
0 [32]	100	120 [248]	146.07	240 [464]	190.47
20 [68]	107.79	140 [284]	153.58	260 [500]	197.71
40 [104]	115.54	160 [320]	161.05	280 [536]	204.9
60 [140]	123.24	180 [356]	168.48	300 [572]	212.05

FIGURE 3. CIRCUIT EXAMPLE
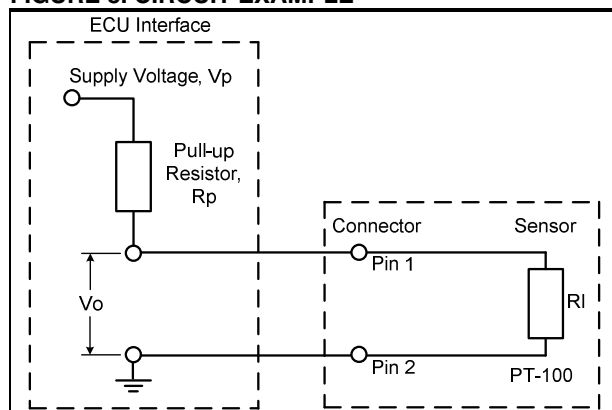
FIGURE 4. PT100 CLASS B RTD – R/T CURVE
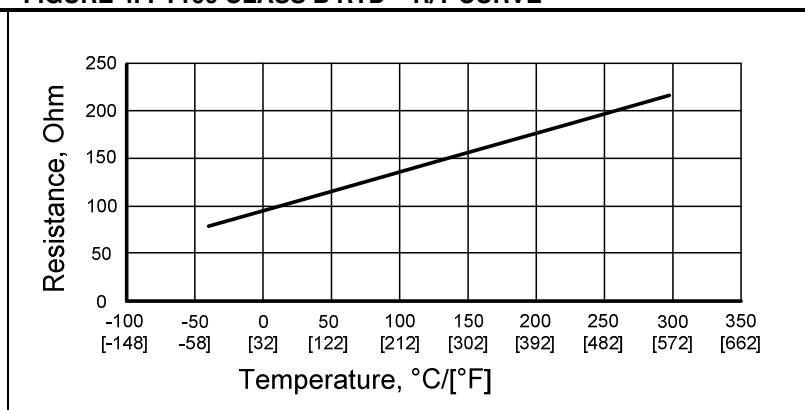
ORDER GUIDE

Catalog Listing	Description
R300-F35-M14-C	R300 Series exhaust gas recirculation RTD sensor with stainless steel probe tip, M14 mechanical interface thread and integral connector

⚠ WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

⚠ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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