

# Outside Air Temperature Sensor (OAT)



**Thermometrics' Outside Air Temperature (OAT) Sensor** is designed to measure ambient conditions outside of the passenger compartment of a vehicles, The unique design incorporates a USCAR 064 sealed connector integrated into the sensor structure. The design provides convenient mounting options in multiple locations such as behind the grill, front or rear fascia structure, fender structures or mirror mounts. The robust design of the Thermometrics' OAT sensor survives the harsh environment encountered in everyday driving. To optimize response time the sensor should be mounted in a position where ample air flow is available as residual heating from external influences such as sun load, radiate heating from engines or radiators can offset the sensors initial reported temperature, providing ample air flow allow the sensor to reflect ambient conditions quickly. The OAT sensor is a passive device based on NTC technology, and in conjunction with a voltage divider network and control units provides input to:

- HVAC Control Systems
- Engine Management Systems
- Driver Information Systems

These systems control cabin comfort, engine performance and information for the passenger to understand the temperature outside of the vehicle.





## Applications

- Outside Air Temp – Under hood, wing mirror, fender
- Ambient Temperature - Closed systems, in-Cabin, in-Panel

## Features

- Low cost
- High sensitivity
- Wide application range
- Compact design
- Integral sealed connector
- Small size
- Single hand installation without tools
- Simple mating geometry
- Other resistance and beta values are possible

# Amphenol Sensors

Part Numbers				
Order Code	Color		R @ 25°C	Beta (25/85)
GE-1923	Gray		10,000 Ω	3977
GE-1923B	Dark Red		3,000 Ω	3977
GE-1923C	Black		10,000 Ω	3977
GE-1923G	Light Blue		2,000 Ω	3559

# GE-1923 Mechanical Specifications

## Operating Temperature Range

-40°C to 125°C

## Storage Temperature

-40°C to 125°C

## Response Time

Maximum 30 seconds  
(in 5 m/sec airflow)

## Housing Material

Polyamide 6/6

## Weight

2.85 grams

## Connector Interface

USCAR: 064-S-002-1-B02

## Mating Connector Options

Molex Connector Part No.:

31403-2200 (W/O CPA)

31403-2210 (W/ CPA)

31403-2500 (W/O CPA, Black)

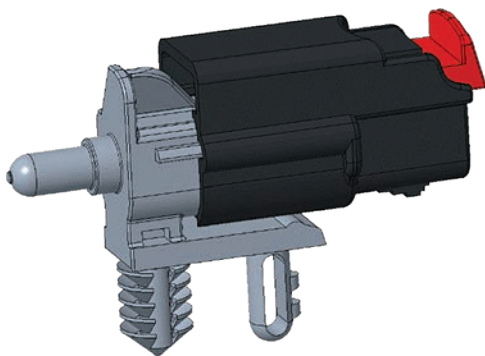
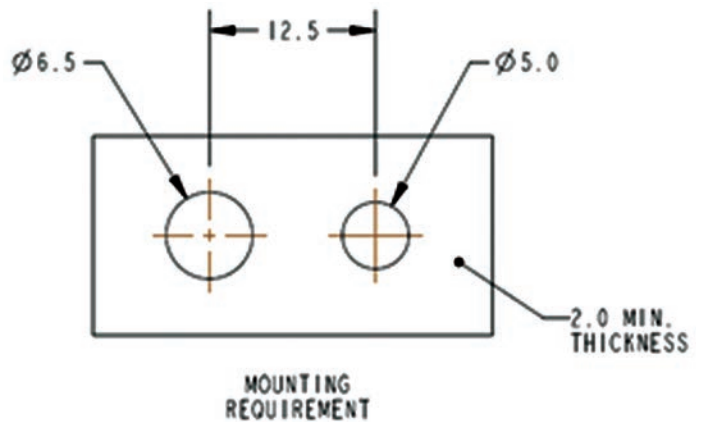
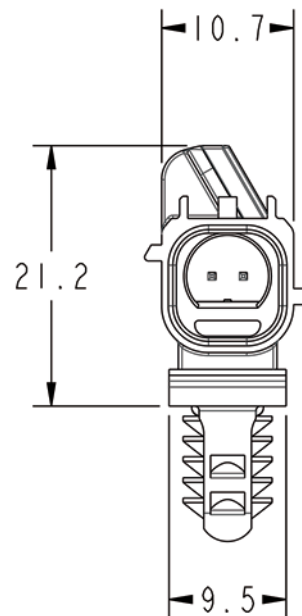
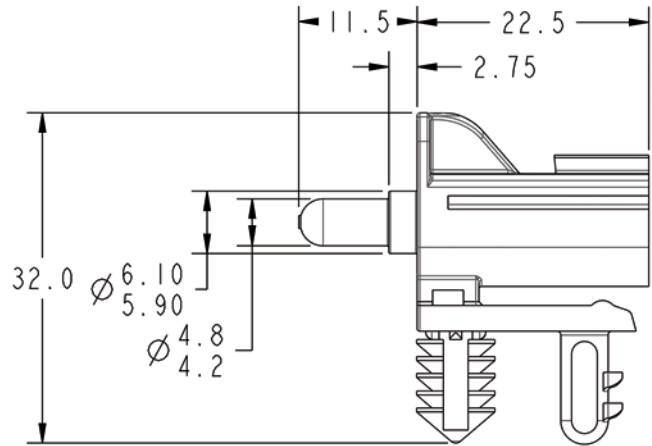
31403-2510 (W/ CPA, Black)

Or Equivalent

Molex Terminal Series:

33468 Molex MX64, Tin Plated

Or Equivalent



GE-1923 with 31403-2510  
Mating Connector

# GE-1923 Electrical Specifications

## GE-1923 and GE-1923C

**Resistance @  
77°F (25°C)**  
10 KΩ ± 1.5%

**Beta (25/85)°C**  
3977

**Temperature  
Accuracy**  
±0.34 @ 25°C

**Sensor Color**  
GE-1923 – Gray  
GE-1923C – Black



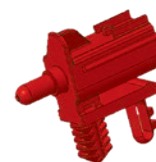
## GE-1923B

**Resistance @  
77°F (25°C):**  
3 KΩ ± 2.0%

**Beta (25/85)°C:**  
3977

**Temperature  
Accuracy:**  
±0.46 @ 25°C

**Sensor Color:**  
Dark Red



### Resistance vs. Temperature Data Resistance = 10,000 Ohms @ 25°C

Temp. (°C)	Rnominal (ohms)	Res. Tol. ±%	Temp. Coef. (%/°C)	Temp. Accy. (± °C)
-40	332776	5.95	-6.63	0.90
-35	240264	5.50	-6.40	0.86
-30	175427	5.07	-6.18	0.82
-25	129449	4.65	-5.98	0.78
-20	96481	4.24	-5.78	0.73
-15	72592	3.84	-5.60	0.69
-10	55109	3.46	-5.43	0.64
-5	42193	2.71	-5.26	0.52
0	32566	2.71	-5.10	0.53
5	25338	2.44	-4.94	0.49
10	19869	2.19	-4.79	0.46
15	15695	1.95	-4.65	0.42
20	12486	1.72	-4.51	0.38
25	10000	1.50	-4.38	0.34
30	8060	1.71	-4.25	0.40
35	6536	1.91	-4.13	0.46
40	5331	2.11	-4.02	0.52
45	4373	2.29	-3.91	0.59
50	3606	2.47	-3.81	0.65
55	2989	2.66	-3.70	0.72
60	2490	2.84	-3.60	0.79
65	2085	3.00	-3.51	0.86
70	1754	3.16	-3.42	0.93
75	1482	3.31	-3.33	0.99
80	1257	3.45	-3.24	1.06
85	1071	3.58	-3.16	1.13
90	916.4	3.80	-3.09	1.23
95	786.9	4.00	-3.01	1.33
100	678.1	4.19	-2.94	1.43
105	586.5	4.29	-2.87	1.49
110	509.1	4.38	-2.80	1.57
115	443.3	4.48	-2.73	1.64
120	387.3	4.59	-2.67	1.72
125	339.5	4.69	-2.61	1.80

### Resistance vs. Temperature Data Resistance = 3,000 Ohms @ 25°C

Temp. (°C)	Rnominal (ohms)	Res. Tol. ±%	Temp. Coef. (%/°C)	Temp. Accy. (± °C)
-40	100069	4.50	-6.60	0.68
-35	72322	4.26	-6.39	0.67
-30	52824	4.04	-6.18	0.65
-25	38978	3.82	-5.98	0.64
-20	29042	3.61	-5.79	0.62
-15	21843	3.41	-5.61	0.61
-10	16576	3.21	-5.43	0.59
-5	12688	3.02	-5.26	0.57
0	9792	2.84	-5.10	0.56
5	7617	2.66	-4.95	0.54
10	5971	2.49	-4.80	0.52
15	4714	2.32	-4.66	0.50
20	3748	2.16	-4.52	0.48
25	3000	2.00	-4.39	0.46
30	2417	2.15	-4.26	0.51
35	1959	2.30	-4.14	0.56
40	1597	2.44	-4.02	0.61
45	1310	2.58	-3.91	0.66
50	1080	2.72	-3.80	0.72
55	895.4	2.85	-3.70	0.77
60	746.0	2.98	-3.60	0.83
65	624.5	3.11	-3.51	0.89
70	525.3	3.23	-3.41	0.95
75	443.9	3.35	-3.33	1.01
80	376.7	3.47	-3.24	1.07
85	321.0	3.59	-3.16	1.14
90	274.7	3.70	-3.08	1.20
95	235.9	3.81	-3.00	1.27
100	203.4	3.91	-2.93	1.34
105	176.0	4.02	-2.86	1.41
110	152.9	4.12	-2.79	1.48
115	133.2	4.22	-2.72	1.55
120	116.4	4.31	-2.66	1.62
125	102.1	4.41	-2.60	1.70

# GE-1923 Electrical Specifications (cont.)

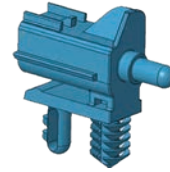
## GE-1923G

**Resistance @  
77°F (25°C):**  
2 KΩ ± 2.47%

**Beta (25/85)°C:**  
3599

**Temperature Accuracy:**  
±0.32 @ 0°C  
±0.63 @ 25°C

**Sensor Color:**  
Light Blue



### Resistance vs. Temperature Data Resistance = 2,000 Ohms @ 25°C

Temp. (°C)	Rnominal (ohms)	Res. Tol. ±%	Temp. Coef. (%/°C)	Temp. Accy. (± °C)
-40	45358	3.45	-5.86	0.59
-35	34003	3.09	-5.67	0.54
-30	25733	2.76	-5.48	0.50
-25	19650	2.48	-5.31	0.47
-20	15133	2.22	-5.14	0.43
-15	11748	1.99	-4.99	0.40
-10	9190	1.78	-4.84	0.37
-5	7241	1.61	-4.70	0.34
0	5744	1.45	-4.56	0.32
5	4591	1.68	-4.41	0.38
10	3694	1.89	-4.28	0.44
15	2992	2.09	-4.15	0.50
20	2439	2.29	-4.03	0.57
25	2000	2.47	-3.91	0.63
30	1649	2.64	-3.80	0.69
35	1367	2.80	-3.70	0.76
40	1140	2.96	-3.60	0.82
45	954.5	3.11	-3.50	0.89
50	803.2	3.25	-3.41	0.95
55	678.9	3.39	-3.32	1.02
60	576.4	3.53	-3.23	1.09
65	491.6	3.66	-3.14	1.16
70	421.0	3.79	-3.06	1.24
75	362.0	3.91	-2.98	1.31
80	312.5	4.02	-2.91	1.38
85	270.7	4.14	-2.83	1.46
90	235.4	4.24	-2.76	1.54
95	205.4	4.34	-2.70	1.61
100	179.7	4.44	-2.63	1.68
105	157.8	4.51	-2.57	1.76
110	139.0	4.61	-2.51	1.84
115	122.8	4.73	-2.45	1.93
120	108.9	4.87	-2.39	2.04
125	96.74	5.03	-2.33	2.16