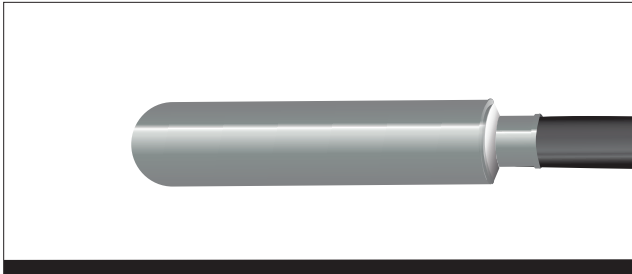




KE2 Temperature Sensor

General Product Information



Specifications

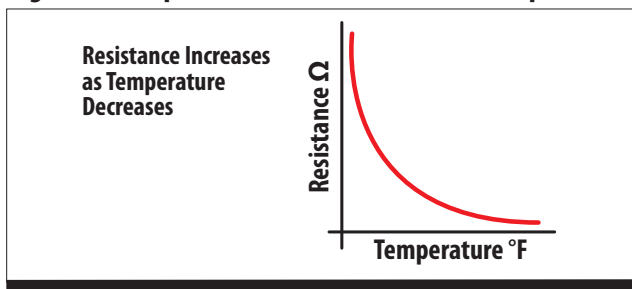
- 2K Ω NTC at 77°F
- Operating range -60°F to 150°F
- Quick response and precise thermal tracking
- IP68 moisture protection
- 10,000 freeze/thaw thermal cycles
- Robust design specific to refrigeration applications

In refrigeration, accurate temperature measurement is everything. By definition refrigeration is the reducing of the temperature of a space below that of its surroundings. When it comes to measuring temperature, KE2 Therm uses only the best sensors.

The KE2 Therm temperature sensor is designed to meet the rigorous demands of refrigeration applications. Although there are several options for sensor materials, the thermistor has been selected for its level of sensitivity, combined with its accuracy and precision.

Thermistors have the physical characteristic of changing resistance with changes in temperature, in an accurate, repeatable pattern. The KE2 sensor is a Negative Temperature Coefficient (NTC) thermistor, which means the resistance increases as the temperature decreases. **Figure 1** shows the exponential relationship between the temperature and resistance. As the temperature decreases, the larger changes in resistance allow the controller to recognize small changes in temperature at the most critical point in the system.

Figure 1 - Temperature - Resistance Relationship



The thermistor in its raw state is not designed to stand up to the harsh refrigeration environment. The KE2 sensor houses the thermistor in a specifically designed stainless steel housing that prevents moisture ingress in the freezing and thawing

environment associated with refrigeration applications. The sensor design has been tested with 10,000 freeze/thaw cycles without change to its physical characteristics. The housing is swaged down at the cable opening providing the best seal between the housing and cable, and is filled with a hydrophobic epoxy. See **Figure 2**.

Figure 3 shows suction line sensor location, used with controllers requiring superheat measurement. Proper sensor location is at the 4 o'clock or 8 o'clock position. This ensures accurate superheat, avoiding potential problems associated with other positions. **Figures 4 and 5** show examples of sensor locations for air and coil temperature measurements. The example shows the sensor being applied with the KE2 Evaporator Controller. Note: When installing the air sensor, it is essential the sensor housing contacts the return air while avoiding contact with other surfaces such as metal, plastic, etc.

Figure 2 - Sensor Dimensions & Construction

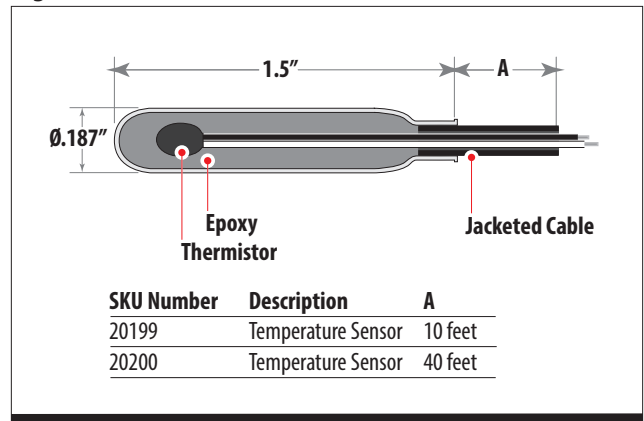


Figure 3 - Suction Line Sensor Location

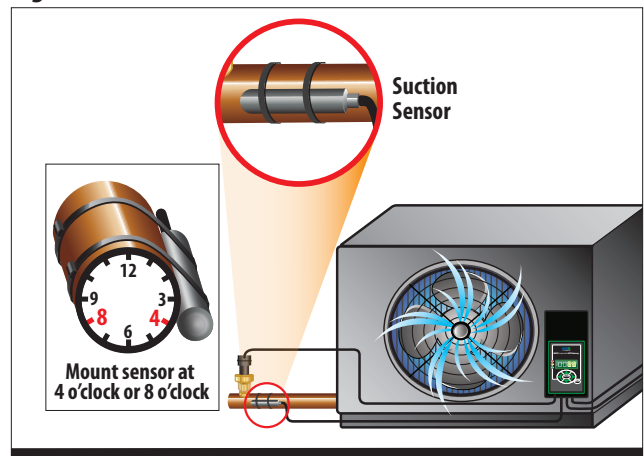


Figure 4 - Air Sensor Location

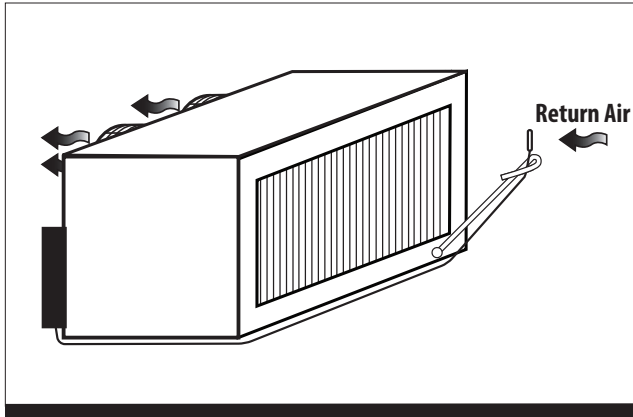
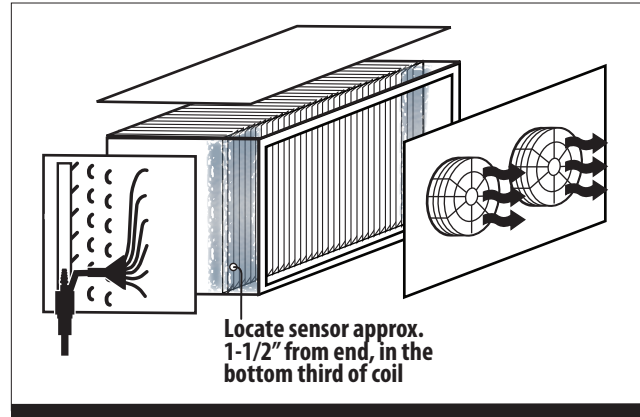


Figure 5 - Coil Sensor Location



Temperature vs. Resistance (Ohms x 1000)

Temp. °C	Temp. °F	ohms*	Temp. °C	Temp. °F	ohms*	Temp. °C	Temp. °F	ohms*	Temp. °C	Temp. °F	ohms*
-50	-58	55.62	-20	-4	12.11	10	50	3.45	40	104	1.23
-49	-56	52.56	-19	-2	11.56	11	52	3.32	41	106	1.17
-48	-54	49.70	-18	0	11.05	12	54	3.20	42	108	1.14
-47	-53	47.02	-17	1	10.56	13	55	3.08	43	109	1.10
-46	-51	44.50	-16	3	10.09	14	57	2.97	44	111	1.07
-45	-49	42.14	-15	5	9.65	15	59	2.86	45	113	1.03
-44	-47	39.93	-14	7	9.23	16	61	2.76	46	115	1.00
-43	-45	37.84	-13	9	8.84	17	63	2.66	47	117	0.97
-42	-44	35.89	-12	10	8.46	18	64	2.67	48	118	0.94
-41	-42	34.05	-11	12	8.10	19	66	2.47	49	120	0.91
-40	-40	32.31	-10	14	7.76	20	68	2.39	50	122	0.89
-39	-38	30.66	-9	16	7.43	21	70	2.30	51	124	0.86
-38	-36	29.10	-8	18	7.12	22	72	2.22	52	126	0.83
-37	-35	27.63	-7	19	6.83	23	73	2.15	53	127	0.81
-36	-33	26.25	-6	21	6.54	24	75	2.07	54	129	0.79
-35	-31	24.95	-5	23	6.28	25	77	2.00	55	131	0.76
-34	-29	23.72	-4	25	6.02	26	79	1.93	56	133	0.74
-33	-27	22.57	-3	27	5.78	27	81	1.87	57	135	0.72
-32	-26	21.47	-3	27	5.55	28	82	1.80	58	136	0.70
-31	-24	20.44	-1	30	5.32	29	84	1.74	59	138	0.68
-30	-22	19.47	0	32	5.11	30	86	1.68	60	140	0.66
-29	-20	18.53	1	34	4.91	31	88	1.63	61	142	0.64
-28	-18	17.65	2	36	4.72	32	90	1.57	62	144	0.62
-27	-17	16.81	3	37	4.53	33	91	1.52	63	145	0.60
-26	-15	16.03	4	39	4.36	34	93	1.47	64	147	0.59
-25	-13	15.28	5	41	4.19	35	95	1.42	65	149	0.57
-24	-11	14.57	6	43	4.03	36	97	1.38	66	151	0.56
-23	-9	13.91	7	45	3.87	37	99	1.33	67	153	0.54
-22	-8	13.27	8	46	3.73	38	100	1.29	68	154	0.53
-21	-6	12.67	9	48	3.59	39	102	1.25	69	156	0.51

Sensor tolerance is +/- 1 °C

* To determine Ohms number from chart must be multiplied by 1,000