

MODEL 0118MM ESA/SCC SCREENED SURFACE TEMPERATURE SENSOR

HIGH RELIABILITY SMALL SIZE

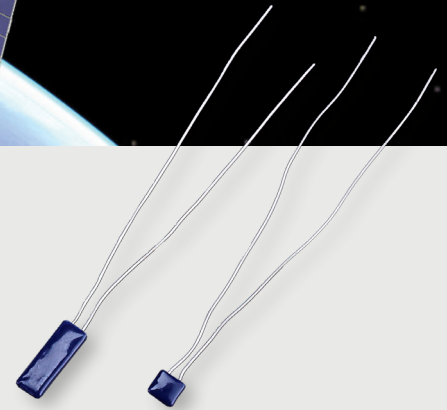
Every spacecraft needs reliable temperature sensors to ensure safety and provide data for engineers. The Collins Aerospace Model 0118MM screened surface temperature sensor design, based on Model 0118MF, has a space heritage that can be traced to the early 1960s from what was then known as Rosemount Engineering Company.

Collins Aerospace has participated in most major space programs, including the International Space Station. We provided support for Project Mercury followed by the Saturn, Apollo, and Space Shuttle programs, as well as Orion and Space Launch System.

Our instruments can be found on the Atlas V, Delta IV/RS-68, Ariane 5/Vulcain and K-1/NK-33, as well as a myriad of

satellites and scientific exploration vehicles. Collins sensors are making measurements out of our solar system (Voyager 1 and 2) on Mars (Spirit and Opportunity Rovers) and have been on Saturn's moon Titan (Huygens Probe).

Model 0118MM is a general purpose surface temperature sensor designed to measure temperatures in the range of -269°C to 400°C . The sensing element is made of pure platinum encapsulated in ceramic insulation and is screened to ESA 4006 reliability tests. It is specially designed and manufactured to produce reproducible resistance-temperature characteristics. This sensor is intended for demanding applications where precision, accuracy and long-term stability are critical requirements.



KEY FEATURES

- Small size
- High reliability
- Linear output
- Wide temperature range
- Screened to ESA 4006 requirements

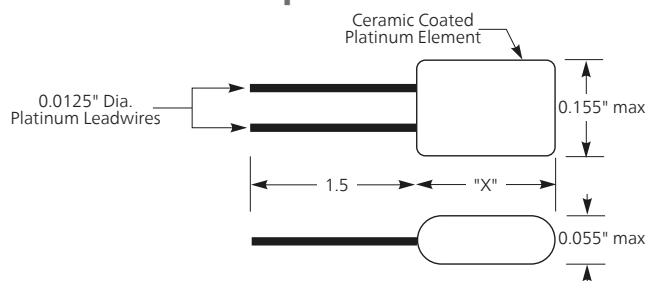
General specifications

Temperature	Temperature -269° C to 400° C
Resistance (0° C)	100 ohms to 2000 ohms
Nominal alpha	0.00389Ω/Ω/° C from 0° C to 100° C
Insulation resistance	10 megohms min. with 100 VDC applied
Thermal hysteresis	0.1% max of temperature span encountered between readings
Time constant	0.7 seconds in oil flowing at 3 fps
Repeatability	≤0.1° C at 0° C when exposed to 20 temperature shocks from liquid nitrogen to +200° C air
Self-heating	46mW with a temperature rise of <1° C in oil flowing at 3 fps at 25°C ±5° C
Vibration	MIL-STD-810C, method 514.2, procedure V, level U & AP
Compatibility	Suitable for use in any non-conductive fluid or environment that is compatible with platinum and a metal oxide ceramic
Humidity	Not susceptible to moisture absorption in moderate humidity atmospheres if the leads are suitably protected
Sensor weight	0.35 g max.
RO interchangeability	0° C Resistance Tolerance
	% 0° C Error
	Standard ±1.0% ±2.56° C
	Optional ±0.25% ±0.64° C
	Optional ±0.12% ±0.30° C

Resistance-temperature relationship and table

Temperature (° C)	Ice-Point Resistance			
	100Ω	500Ω	1000Ω	2000Ω
-260	0.21	1.30	2.25	5.21
-240	2.50	12.76	25.14	51.06
-220	8.89	44.75	89.08	178.99
-200	17.18	86.25	172.07	345.01
-180	25.87	129.67	258.92	518.70
-160	34.56	173.16	346.03	692.63
-140	43.09	215.81	431.45	863.26
-120	51.49	257.77	515.44	1031.08
-100	59.77	299.14	598.22	1196.55
-80	67.96	340.01	680.00	1360.05
-60	76.06	380.47	760.94	1521.90
-40	84.09	420.59	841.18	1682.37
-20	92.07	460.42	920.84	1841.69
0	100.00	500.00	1000.00	2000.00
20	107.88	539.35	1078.70	2157.40
40	115.72	578.47	1156.95	2313.90
60	123.51	617.37	1234.75	2469.50
80	131.26	656.05	1312.10	2624.20
100	138.96	694.50	1389.00	2778.00
120	146.62	732.73	1465.45	2930.90
140	154.23	770.73	1541.45	3082.91
160	161.80	808.50	1617.01	3234.01
180	169.32	846.05	1692.11	3384.22
200	176.80	883.38	1766.76	3533.52
220	184.23	920.48	1840.97	3681.93
240	191.61	957.36	1914.72	3829.44
260	198.96	994.01	1988.03	3976.05
280	206.25	1030.44	2060.88	4121.76
300	213.51	1066.64	2133.29	4266.57
320	220.71	1102.62	2205.24	4410.49
340	227.88	1138.37	2276.75	4553.50
360	234.99	1173.90	2347.81	4695.61
380	242.06	1209.21	2418.41	4836.83
400	249.09	1244.29	2488.57	4977.15

Product envelope



Length "X" = 0.155" max. for ice-point resistances of 500 ohms or less
 Length "X" = 0.450" max. for ice-point resistances of greater than 500 ohms

Model 0118MM ordering information

Code	R0 — Ice Point Resistance Options					
100-2000	100, 500, 1000 and 2000 ohm (consult factory for other R ₀ values)					
Code	R0 Interchangeability					
A	±1.0%					
B	±0.25%					
C	±0.12%					
Code	Screening Options (Codes B through G require ESA CALIBRATION)					
B	ESA 4006, Charts II and III — Level B					
E	ESA 4006, Charts II, III — Level B and Chart V — Level 3 (includes 10 test units)					
F	ESA 4006, Charts II, III — Level B and Chart V — Level 2 (includes 30 test units)					
G	ESA 4006, Charts II, III — Level B and Chart V — Level 1 (includes 36 test units)					
Code	Leadwire Options					
A	2 Wire					
B	3 Wire					
C	4 Wire					
D	2 Wire Zinc Free					
E	3 Wire Zinc Free					
F	4 Wire Zinc Free					
Code	Leadwire Material Options					
A	Platinum 0.0125 ± 0.002					
B	Gold Plated Copper (0.016 dia.)					
C	26 Gage Teflon Insulated — Nickel Plated Copper					
D	26 Gage Shielded Cable — Nickel Plated Copper					
F	24 Gage Teflon Insulated — Stranded Nickel Plated Copper					
G	24 Gage Shielded Cable — Nickel Plated Copper					
K	26 Gage Teflon Insulated — Stranded Silver Plated Copper					
L	28 Gage Teflon Insulated — Stranded Silver Coated Copper					
M	28 Gage Nextel Jacketed Cable — Stranded Nickel					
Code	Leadwire Length Options (inches)					
A	1.5 minimum					
B	6					
C	12					
D	24					
E	48					
F	72					
G	120					
H	240					
J	400					
K	600					
Code	Calibration Options					
	Calibration Points (°C)			R vs. T Table (°C)		
D	-269, -196, 0, 100, 260*			-260 to 400		
A	-50, 0, 50			-50 to 50		
B	-196, 0, 100			-196 to 200		
C	-196, 0, 100, 260			-196 to 260		
Typical Model #						
0118MM1000	A	B	C	D	E	D

* Per ESA detailed specification

Specifications subject to change without notice.



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