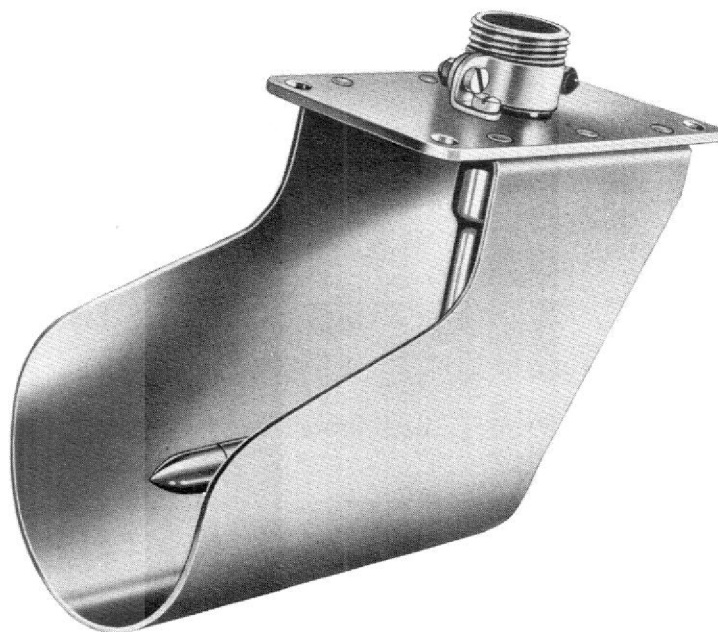


Resistance Thermometers

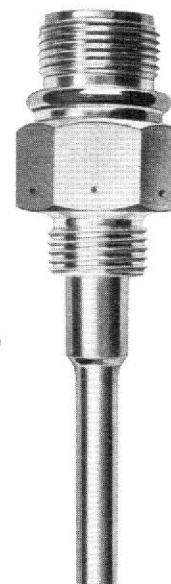
RESISTANCE THERMOMETERS



Model S 110G Form 4



Model S 110G Form 5



Model S 110 Form 50



MODELS S 110 AND S 110G (PLATINUM WIRE WOUND)

Weston Platinum Resistance Thermometers are temperature sensitive devices normally used in conjunction with ratiometer or bridge-type indicators for temperature measurement. They may also be used with other ancillary equipment for the recording or control of temperature.

The Resistance Thermometers are supplied, either gas (hydrogen) or air filled, and the temperature limitations of these Thermometers are given in the reference table on page 14/5.

The sensitive element is a helically wound platinum wire, itself wound as a spiral on an anodised aluminium former 0.375 inches (9 mm) long. This extremely short element allows the immersion depth to be as low as 1.5 inches (38 mm). Thermometers less than 1.5 inches (38 mm) in length must be fully immersed.

The material used in the manufacture of the Resistance Thermometer sheath is cold-drawn, seamless stainless steel tubing, EN58B of B.S.S.970.

Wall thickness is 0.028 inches (0.7 mm) with the exception of a length 0.5 inches (13 mm) at the element end which is bored out to reduce the wall thickness to 0.010 inches (0.25 mm). The seal at the element end is a parent metal argon arc weld.

Connection wires between element and plug are nickel alloy, insulated with woven glass sleeving.

The majority of the Thermometers are sealed at the connection end by means of a glass-to-metal seal.

Generally, the Models are fitted with a connecting plug to which a socket, integral with a twin-core cable, can be readily attached. This combination forms a watertight seal over the connecting pins.

Model S110 Resistance Thermometers generally conform to specifications B.S.G.148 EL.1741 and EL.1742.

Special connectors are available for use with the Resistance Thermometers fitted with 2 - pin glass sealed plugs. Details of these leads are given in Section 18 of this catalogue.

Separate fixing nuts and bushes can be supplied for Models S110 and S110G. Details of these are given on page 26/1.

These fittings enable the immersion depth to be set at the time of installation. Once the nut has been tightened, the bush is permanently fixed on the stem.



PERFORMANCE DETAILS

REPRESENTATIVE RESPONSE TIME (TIME CONSTANT)

Model S110 - 7 seconds Model S110G - 3 seconds

The standard is taken as the time for the temperature of the Resistance Thermometer to change from 50 to 30°C in a stirred water bath at 15°C.

REPRESENTATIVE SELF-HEATING ERROR (RISE IN WATER AT 20°C)

Model S110 - $0.005^{\circ}\text{C}/\text{mA}^2$ Model S110G - $0.0013^{\circ}\text{C}/\text{mA}^2$

The temperature rise due to the self-heating effect of the measuring current depends very much on the environmental conditions (flow of medium, heat conductivity of surroundings and so forth).

Max. recommended working current:- Model S110 - 10 mA.
Model S110G - 20 mA.

It should be noted that due to the self-heating effect, the standard Resistance Thermometer should not be used where the air velocity is generally less than 30ft/sec. A special Resistance Thermometer (Form 12) is available for use in low velocity air and will give accurate readings even in calm air conditions.

PRESSURE

Models S110 and S110G Resistance Thermometers are strongly built and the tubes of standard Forms will withstand a pressure of 5000 p.s.i., without serious deformation or leakage.

Loose nuts and bushes supplied with the Resistance Thermometers must be properly tightened to form an effective gas seal. To obviate any leakage or movement of the Thermometer after installation it is recommended that the locking bush is pre-tightened on the tube. Further details regarding this procedure are obtainable from our Service Manual or from our Head Office and Works.



STANDARD MEAN CURVE AND TOLERANCE AT RESISTANCE
THERMOMETER CURRENT OF 1mA

°C.	R Ohms abs.	Tolerance ± ohms	°C.	R Ohms abs.	Tolerance ± ohms
-200	22.68	.4	110	185.69	.5
-190	28.36	.4	120	190.66	.5
-180	33.99	.4	130	195.61	.5
-170	39.57	.4	140	200.56	.5
-160	45.12	.4	150	205.48	.6
-150	50.62	.4	160	210.39	.6
-140	56.10	.4	170	215.29	.6
-130	61.53	.4	180	220.17	.6
-120	66.94	.4	190	225.03	.7
-110	72.32	.4	200	229.88	.7
-100	77.67	.4	210	234.72	.7
-90	83.00	.4	220	239.54	.7
-80	88.30	.4	230	244.34	.8
-70	93.58	.3	240	249.13	.8
-60	98.83	.3	250	253.91	.8
-50	104.07	.3	260	258.67	.8
-40	109.29	.3	270	263.41	.9
-30	114.49	.3	280	268.14	.9
-20	119.68	.3	290	272.85	.9
-10	124.85	.3	300	277.55	.9
0	130.00	.3	310	282.24	1.0
10	135.14	.3	320	286.90	1.0
20	140.26	.3	330	291.56	1.0
30	145.37	.3	340	296.20	1.0
40	150.46	.3	350	300.82	1.0
50	155.54	.3	360	305.43	1.1
60	160.60	.4	370	310.02	1.1
70	165.65	.4	380	314.60	1.1
80	170.68	.4	390	319.16	1.1
90	175.70	.5	400	323.71	1.1
100	180.70	.5			

REFERENCE TABLE

Form	F.D.	Operating Temperature °C				Terminal Head Temp. °C		Minimum Tube Length				Fixed Tube Length				Additional Remarks
		Gas Filled		Air Filled				Inches		Millimeters		Inches		Millimeters		
		Min.	Max.	Min.	Max.			Min.	Max.	L	P	L	P	L	P	
3*	710	-200	+250	-100	+400	-70	+130	2.25	-	57.1	-	-	1.125	-	29.3	
4*	708	-200	+250	-100	+400	-70	+130	1.25	-	32	-	-	-	-	-	
5	709	-70	+130	-	-	-70	+130	-	-	-	-	-	-	-	-	
6*	716	-200	+250	-100	+400	-70	+130	2.25	-	57	-	-	-	-	-	
12	802	-70	+130	-	-	-70	+130	-	-	-	-	4.0	-	102	-	
13*	812	-200	+250	-100	+400	-70	+130	2.25	-	57	-	-	-	-	-	
21*	915	-200	+250	-100	+400	-70	+130	2.25	-	57	-	-	1.125	-	29	
44	1070	-70	+130	-	-	-70	+130	-	-	-	-	2.15	1.25	55	32	
45	1071	-	-	-100	+250	-70	+200	3.0	-	76	-	-	-	-	-	
50	1102	-	-	-100	+250	-70	+180	2.25	-	57	-	-	-	-	-	L = 4 $\frac{1}{4}$ " (108mm) Max.
54	1120	-	-	-100	+250	-70	+200	2.25	1.125	57	29	-	-	-	-	
55	1114	-	-	-100	+250	-70	+180	-	-	-	-	0.875	-	22	-	
56	1191	-	-	-100	+250	-70	+180	2.25	-	57	-	-	-	-	-	L = 4.25" (108mm) Max.
58	1195	-	-	-100	+250	-70	+130	2.25	-	57	-	-	-	-	-	L = 9.0" (229mm) Max.
60	1216	-	-	-100	+250	-70	+180	2.25	-	57	-	-	-	-	-	L = 4.25"(108mm) Max.
64*	1218	-200	+250	-100	+400	-70	+130	2.25	-	57	-	-	1.125	-	29	
65	1240	-70	+130	-	-	-70	+130	-	-	-	-	-	-	-	-	
69*	1246	-200	+250	-100	+400	-70	+130	2.25	-	57	-	-	1.125	-	29	
75	1288	-	-	-100	+250	-70	+180	-	-	-	-	0.875	-	22	-	
84	1366	-	-	-100	+250	-70	+180	2.25	-	57	-	-	-	-	-	L = 4.25 (108mm) Max.
85	1367	-	-	-100	+250	-70	+180	2.25	-	57	-	-	-	-	-	L = 4.25" (108mm) Max.
92	1398	-	-	-100	+250	-70	+180	-	-	-	-	0.875	-	22	-	

* Air filled version unsuitable for engine installations



MODEL S 472 (NICKEL WIRE WOUND)

This Resistance Thermometer, although similar in design and construction to the Model S110, contains a nickel wire-wound element.

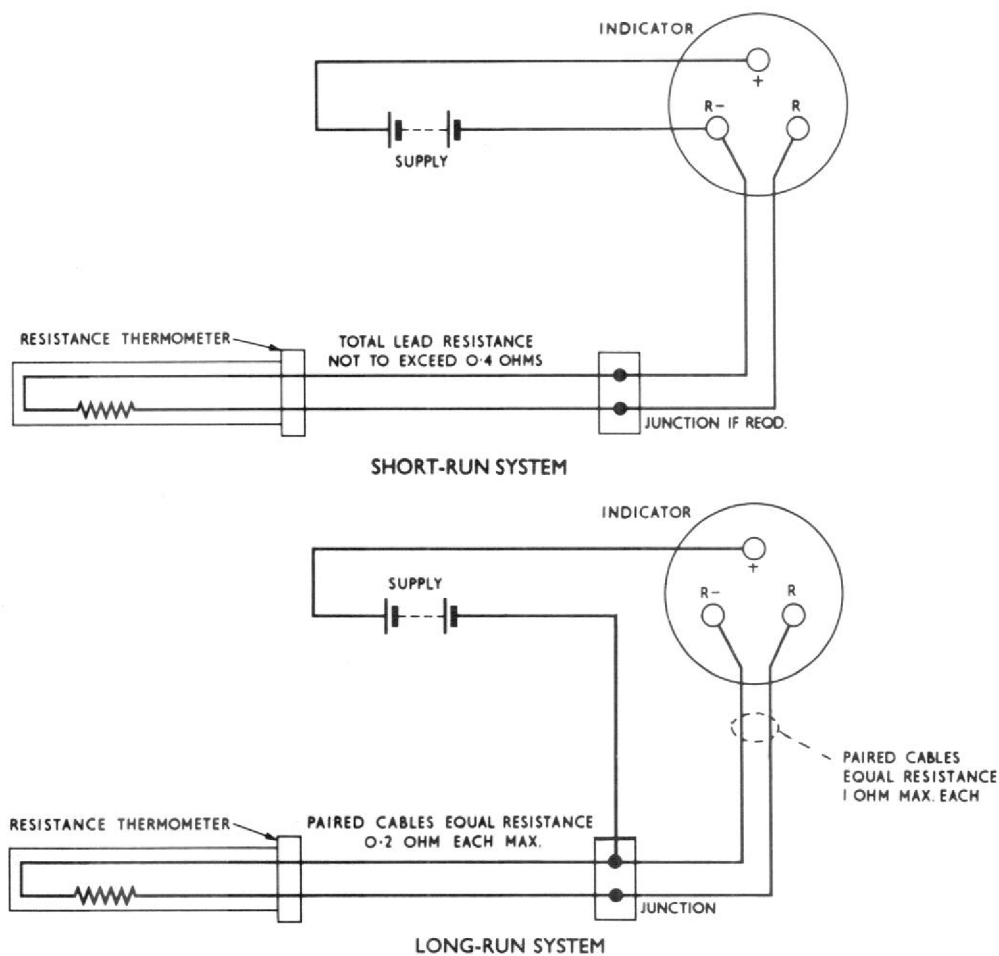
The Model S472 Resistance Thermometer has been designed for special applications only and is not intended for general use as the Models S110 and S110G.

The Model S472 is available in Form 4 or Form 65 only. The dimensions of these Forms are obtainable from the relevant fixing diagrams in Section 28 of this catalogue. The diagram references are FD 708 and FD 1240 for Form 4 and Form 65 respectively.

STANDARD MEAN CURVE AND TOLERANCE FOR WESTON NICKEL LAW RESISTANCE THERMOMETERS

Temp °C	R Ohms abs.	Tolerance at 5 mA. °C ±ohms	Temp °C	R Ohms abs.	Tolerance at 5 mA. °C ±ohms
-60	65.9	0.5	60	118.4	0.5
-50	69.6	0.5	70	123.6	0.5
-40	73.4	0.5	80	128.9	0.5
-30	77.4	0.5	90	134.3	0.5
-20	81.5	0.5	100	139.8	0.5
-10	85.7	0.5	110	145.4	0.5
0	90.0	0.5	120	151.2	0.5
10	94.9	0.5	130	157.1	0.5
20	99.0	0.5	140	163.1	0.5
30	103.7	0.5	150	169.2	0.5
40	108.5	0.5	160	175.4	0.5
50	113.4	0.5	-	-	-

WIRING DIAGRAMS FOR RESISTANCE THERMOMETERS USED IN CONJUNCTION WITH RATIO-METER INDICATORS



ALTERNATIVE INSTRUMENT TERMINAL MARKINGS

Model	+	R-	R
S62.3	1	2	3
S62.5	3	1	2
S63.4	1	2	3
S63.5	3	1	2
S127.5	(6	4	2
	(5	3	1
S127.5	(D	F	E
	(A	C	B
S149.1	A	C	B
S181.2	(+	1	2
	(+	1	2
	(+	1	2
	(+	1	2

Model	+	R-	R
S214.1	(A	F	E
	(D	C	B
	(H	J	I
S216.1	(A	B	C
	(D	E	F
S453.4	1	2	3
S453.5	3	1	2
S454.1	A	C	B
S455.5	(6	4	2
	(5	3	1
S483.1	3	5	6
S483.1	C	D	E
S484.1	(3	4	5
	(6	7	8
S484.1	(C	D	E
	(F	G	H

PREFERRED TYPES AND LENGTHS

FORM 3

L. LENGTH	MODEL NO. (Air Filled)	MODEL NO. (Gas Filled)
2.25 in (57 mm)	S110.3.100	S110G.3.200
2.5 in (64 mm)	S110.3.101	S110G.3.201
3 in (76 mm)	S110.3.103	S110G.3.203
3.5 in (89 mm)	S110.3.105	S110G.3.205
5 in (127 mm)	S110.3.111	S110G.3.211
6 in (152 mm)	S110.3.115	S110G.3.215

FORM 4

L. LENGTH	MODEL NO. (Air Filled)	MODEL NO. (Gas Filled)
2.25 in (57 mm)	S110.4.100	S110G.4.200
2.5 in (64 mm)	S110.4.101	S110G.4.201
3 in (76 mm)	S110.4.103	S110G.4.203
3.5 in (89 mm)	S110.4.105	S110G.4.205
5 in (127 mm)	S110.4.111	S110G.4.211
6 in (152 mm)	S110.4.115	S110G.4.215

FORM 13

L. LENGTH	MODEL NO. (Air Filled)	MODEL NO. (Gas Filled)
2.25 in (57 mm)	S110.13.100	S110G.13.200
2.5 in (64 mm)	S110.13.101	S110G.13.201
3 in (76 mm)	S110.13.103	S110G.13.203
3.5 in (89 mm)	S110.13.105	S110G.13.205
5 in (127 mm)	S110.13.111	S110G.13.211
6 in (152 mm)	S110.13.115	S110G.13.215

FORM 50

L. LENGTH	MODEL NO. (Air Filled)	MODEL NO. (Gas Filled)
2.25 in (57 mm)	S110.50.911	-
3 in (76 mm)	S110.50.972	-

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