



INTRODUCTION

ESD offers a Range of Platinum Resistance Bulbs (Pt-100) as Resistance Temperature Detector (RTD's) to suit various applications and environmental conditions. When accuracy over a wide range of temperature is a crucial factor ESD's RTD's are unequalled in performance. Stability over long periods of continued use makes them unmatched in reliability and durability. Matching element characteristics and high workmanship enables easy replacement and the user obtains identical sensor output. They consist of Platinum Resistance Bulb element having temperature coefficient of 0.385 ohms per degree Centigrade. These RTD's are available in a variety of shapes, sizes and constructions to meet diverse application requirements. The range includes Simplex and Duplex types. For details refer to



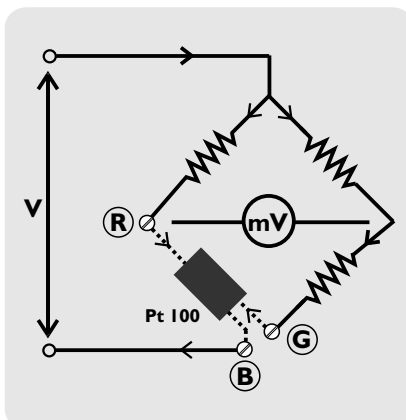
selection guide. The element is connected to weather proof Aluminium Head by means of Silver wires through ceramic insulators. Suitable protective sheaths are also provided. These sensors can be used either in direct immersion manner or with thermowells. Different process connections are available as per user requirement. These sensors are most stable, accurate and linear.

PRINCIPLE OF OPERATION

The Resistance Temperature Detector (RTD) is a positive temperature coefficient element which changes its resistance proportional to the change in temperature as per the equation given below

$$R_t = R_0 + \alpha t \text{ where}$$

R_t is the resistance at temperature to be measured
 R_0 is the resistance at 0 °C which is 100 ohms for Pt 100
 α is the resistance temp. coeff. which is 0.385ohms / °C



Constant current source, same excitation current through both the arms of the bridge and specially designed 3 wire systems eliminates the effect of lead wire resistance.

SPECIFICATIONS

Type	: Platinum Resistance Bulb
Reference standard	: As per DIN 43760
Element	■ Simplex ■ Duplex
Insulation	■ Ungrounded ■ Grounded ■ Exposed
Connection head	■ Weatherproof ■ Flameproof ■ Without head
Sheath Diameter	■ 2 ■ 3 ■ 5 ■ 6 ■ 8 ■ 10 ■ 12 ■ 19 mm
Sheath Length	: 50 to 3000 mm
Sheath Material	■ Brass ■ SS 316 ■ Ceramic ■ Copper ■ SS310 ■ Glass ■ SS 304 ■ Inconel
Sensitive Length	: 60 mm from bottom
Mounting	■ 1/4, 1/2, 3/4, 1 inch BSP or NPT male/female ■ 1/4, 1/2, 3/4, 1 inch BSP or NPT fixed threads Adjustable Flange
Connecting system	■ 3 Wire
Lead wire	: Type and length on demand
Termination	: 3 way PUT/ 6 way PBT
Service Temp.	: Minus 150 to 400°C
Max. Temp. (Tmax)	: 500°C
Temp. Coefficient	: 0.385 ohms / °C
Accuracy	■ +/- 0.5 % of Tmax for Class 'B' ■ +/- 0.2 % of Tmax for Class 'A'
Element wattage	: 0.25W
Response Time	: 20 sec for 80 % of reading
Self heating error	: 0.01 °C / mA excitation

LOOK UP TABLE

Platinum Resistance Bulb (Pt-100) output in ohms													
Temp.°C	Resistance	Temp.°C	Resistance	Temp.°C	Resistance	Temp.°C	Resistance	Temp.°C	Resistance	Temp.°C	Resistance	Temp.°C	Resistance
-200	18.52	22	108.57	92	135.47	162	161.80	232	187.56	302	212.76	372	237.40
-175	29.22	24	109.35	94	136.23	164	162.54	234	188.29	304	213.47	374	238.09
-150	39.72	26	110.12	96	136.99	166	163.28	236	189.02	306	214.19	376	238.79
-125	50.06	28	110.90	98	137.75	168	164.03	238	189.74	308	214.90	378	239.48
-100	60.26	30	111.67	100	138.51	170	164.77	240	190.47	310	215.61	380	240.18
-95	62.29	32	112.45	102	139.27	172	165.51	242	191.20	312	216.32	382	240.87
-90	64.30	34	113.22	104	140.03	174	166.25	244	191.92	314	217.03	384	241.56
-85	66.31	36	113.99	106	140.77	176	167.00	246	192.66	316	217.73	386	242.25
-80	68.33	38	114.77	108	141.53	178	167.74	248	193.38	318	218.44	388	242.95
-75	70.33	40	115.54	110	142.29	180	168.48	250	194.10	320	219.15	390	243.64
-70	72.33	42	116.31	112	143.04	182	169.22	252	194.83	322	219.85	392	244.33
-65	74.33	44	117.08	114	143.80	184	169.96	254	195.55	324	220.56	394	245.02
-60	76.33	46	117.85	116	144.56	186	170.69	256	196.26	326	221.27	396	245.71
-55	78.32	48	118.62	118	145.32	188	171.43	258	196.98	328	221.97	398	246.40
-50	80.31	50	119.40	120	146.07	190	172.17	260	197.71	330	222.68	400	247.09
-45	82.29	52	120.16	122	146.82	192	172.91	262	198.43	332	223.38	410	250.53
-40	84.27	54	120.93	124	147.85	194	173.64	264	199.15	334	224.09	420	253.96
-35	86.25	56	121.70	126	148.33	196	174.39	266	199.87	336	224.80	430	257.38
-30	88.22	58	122.47	128	149.08	198	175.12	268	200.59	338	225.50	440	260.78
-25	90.19	60	123.24	130	149.83	200	175.86	270	201.31	340	226.21	450	264.18
-20	92.16	62	124.01	132	150.58	202	176.59	272	202.03	342	226.91	460	267.56
-15	94.12	64	124.77	134	151.34	204	177.33	274	202.74	344	227.61	470	270.93
-10	96.09	66	125.55	136	152.09	206	178.06	276	203.46	346	228.31	480	274.29
-5	98.04	68	126.32	138	152.84	208	178.80	278	204.18	348	229.01	490	277.64
0	100.00	70	127.08	140	153.58	210	179.50	280	204.90	350	229.72	500	280.98
2	100.78	72	127.85	142	154.32	212	180.26	282	205.61	352	230.42	510	284.30
4	101.56	74	128.61	144	155.08	214	180.99	284	206.33	354	231.12	520	287.62
6	102.34	76	129.38	146	155.83	216	181.73	286	207.05	356	231.81	530	290.92
8	103.12	78	130.14	148	156.58	218	182.46	288	207.77	358	232.51	540	294.21
10	103.90	80	130.90	150	157.33	220	183.19	290	208.48	360	233.21	550	297.49
12	104.68	82	131.67	152	158.08	222	183.92	292	209.20	362	233.91	560	300.75
14	105.46	84	132.43	154	158.83	224	184.65	294	209.91	364	234.60	570	304.01
16	106.24	86	133.19	156	159.56	226	185.38	296	210.62	366	235.30	580	307.25
18	107.02	88	133.95	158	160.31	228	186.11	298	211.34	368	236.00	590	310.48
20	107.79	90	134.71	160	161.04	230	186.84	300	212.05	370	236.70	600	313.71

ORDERING INFORMATION

PT 100 X1	X2	X3	X4	X5	X6	X7	X8
Elements 1 - Simplex Ungrounded 2 - Simplex Grounded 3 - Simplex Exposed 4 - Duplex Ungrounded 5 - Duplex Grounded 6 - Duplex Exposed	Head 1 - Weather Proof 2 - Flame Proof 3 - Without Head 4 - Other	Construction 1 - Immersion Straight 2 - Immersion L 3 - Immersion Bare 4 - Mineral Insulated 5 - Bayonate 6 - Leaf 7 - Flameproof 8 - Pierce 9 - Pressurised	Diameter 1 - 2 (Ml) 2 - 3 3 - 5 4 - 6 5 - 8 6 - 10 7 - 12 8 - 19 9 - Other	Length 1 - 50 2 - 75 3 - 100 4 - 150 5 - 200 6 - 250 7 - 300 8 - 450 9 - Other	Material 1 - Brass 2 - Copper 3 - SS304 4 - SS316 5 - SS310 6 - Inconel 7 - Ceramic 8 - Glass 9 - Other	Mounting 1 - 1/4" BSP(M/F) 2 - 1/2" BSP(M/F) 3 - 3/4" BSP(M/F) 4 - 1" BSP(M/F) 5 - 1/2" NPT(M/F) 6 - 3/4" NPT(M/F) 7 - Fixed Threads 8 - Adj. Flange 9 - Other	
Ordering eg. Pt 100 11147327 Pt 100 simplex ungrounded, weatherproof head, Immersion Straight, Sheath diameter 6 mm, sheath length 300 mm, sheath material SS 304, mounting 1/2 inch BSP male/female, without cable.							
Lead Wire (3 core copper conductor, please specify length in mtrs) 1 - PVC / PVC 2 - Teflon / Teflon 3 - Teflon/Teflon metal braided 4 - Teflon / Fibreglass metal braided 5 - Teflon / Asbestos 6 - Teflon / Silicone rubber 7 - Not required 8 - Other							

Following points are useful and will speed up order processing

1. Detailed drawing
2. Application and media
3. Operating temperature and Maximum temperature
4. Process Response
5. Insertion, insulating thickness and hangover length

EXTENSION CABLE
MATCHED PAIR SENSOR



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