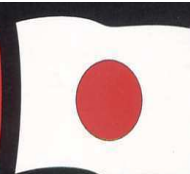
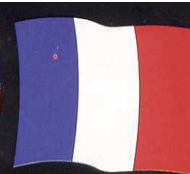


**TIPO  
TERMOCOPPIA  
THERMOCOUPLE  
TYPE**



**INTERNATIONAL  
IEC 584-3**

**DIN 43710  
43713 - 43714**

**ANSI MC 96.1**

**BS 4937**

**NFE 42-324**

**JIS C1610-1981**

<b>T</b>	Cu - CuNi						
<b>U</b>	Cu - CuNi						
<b>J</b>	Fe - CuNi						
<b>L</b>	Fe - CuNi						
<b>K</b>	NiCr - Ni						
	Fe - CuNi						
	Cu - CuNi						
<b>N</b>	NiCrSi - NiSi						
<b>S R</b>	Pt Rh 10% - Pt Pt Rh 13% - Pt						
<b>B</b>	Pt Rh 30% - 6%						









# CALIBRATION TABLE FOR PT100 THERMORESISTANCES ACCORDING TO IEC 751

## TABELLA DI CALIBRAZIONE PER TERMORESISTENZE PT100 SECONDO NORMATIVA IEC 751

Thermometric resistance in absolute Ohm										
	0	-1	-2	-3	-4	-5	-6	-7	-8	-9
-200	18,493									
-190	22,803	22,374	21,944	21,514	21,083	20,653	20,221	19,790	19,358	18,926
-180	27,078	26,652	26,226	25,799	25,372	24,945	24,517	24,089	23,661	23,232
-170	31,320	30,897	30,474	30,051	29,627	29,203	28,779	28,354	27,929	27,504
-160	35,531	35,111	34,691	34,271	33,850	33,429	33,008	32,587	32,165	31,742
-150	39,714	39,297	38,879	38,462	38,044	37,626	37,208	36,789	36,370	35,951
-140	43,869	43,455	43,040	42,625	42,210	41,795	41,379	40,963	40,547	40,130
-130	47,999	47,587	47,175	46,763	46,350	45,937	45,524	45,111	44,697	44,283
-120	52,106	51,696	51,286	50,876	50,466	50,055	49,644	49,234	48,822	48,411
-110	56,190	55,783	55,375	54,967	54,559	54,151	53,742	53,333	52,924	52,515
-100	60,254	59,849	59,443	59,037	58,631	58,225	57,818	57,412	57,005	56,598
-90	64,299	63,895	63,491	63,087	62,683	62,279	61,874	61,469	61,065	60,659
-80	68,325	67,923	67,521	67,119	66,717	66,314	65,911	65,508	65,105	64,702
-70	72,335	71,934	71,534	71,134	70,733	70,332	69,931	69,530	69,128	68,727
-60	76,328	75,930	75,531	75,132	74,733	74,333	73,934	73,534	73,135	72,735
-50	80,307	79,910	79,512	79,115	78,717	78,319	77,921	77,523	77,125	76,727
-40	84,271	83,875	83,479	83,083	82,687	82,291	81,894	81,498	81,101	80,704
-30	88,222	87,828	87,433	87,038	86,643	86,248	85,853	85,458	85,063	84,667
-20	92,160	91,767	91,374	90,980	90,587	90,193	89,799	89,405	89,011	88,617
-10	96,086	95,694	95,302	94,910	94,517	94,125	93,732	93,339	92,946	92,553
0	100,000	99,609	99,218	98,827	98,436	98,045	97,653	97,262	96,870	96,478

Thermometric resistance in absolute Ohm										
	0	1	2	3	4	5	6	7	8	9
440	260,720	261,060	261,399	261,739	262,078	262,417	262,757	263,096	263,434	263,773
450	264,112	264,450	264,789	265,127	265,465	265,803	266,141	266,479	266,817	267,154
460	267,492	267,829	268,167	268,504	268,841	269,178	269,514	269,851	270,188	270,524
470	270,860	271,197	271,533	271,869	272,204	272,540	272,876	273,211	273,547	273,882
480	274,217	274,552	274,887	275,222	275,557	275,891	276,226	276,560	276,894	277,228
490	277,562	277,896	278,230	278,564	278,897	279,231	279,564	279,897	280,230	280,563
500	280,896	281,229	281,561	281,894	282,226	282,558	282,891	283,223	283,555	283,886
510	284,218	284,550	284,881	285,212	285,544	285,875	286,206	286,537	286,867	287,198
520	287,528	287,859	288,189	288,519	288,849	289,179	289,509	289,839	290,168	290,498
530	290,827	291,156	291,486	291,815	292,144	292,472	292,801	293,130	293,458	293,786
540	294,114	294,443	294,770	295,098	295,426	295,754	296,081	296,409	296,736	297,063
550	297,390	297,717	298,044	298,370	298,697	299,023	299,350	299,676	300,002	300,328
560	300,664	300,990	301,315	301,641	301,966	302,292	302,617	302,942	303,267	303,592
570	303,936	304,261	304,586	304,911	305,236	305,561	305,886	306,211	306,536	306,861
580	307,147	307,471	307,795	308,119	308,443	308,767	309,091	309,415	309,739	310,063
590	310,376	310,699	311,021	311,343	311,665	311,987	312,309	312,631	312,953	313,275
600	313,594	313,915	314,236	314,557	314,878	315,199	315,519	315,839	316,160	316,480
610	316,800	317,120	317,440	317,760	318,079	318,399	318,718	319,037	319,356	319,675
620	319,994	320,313	320,632	320,950	321,269	321,587	321,905	322,224	322,541	322,859
630	323,177	323,495	323,812	324,130	324,447	324,764	325,081	325,398	325,715	326,032
640	326,348	326,665	326,981	327,297	327,614	327,930	328,245	328,561	328,877	329,192
650	329,508	329,823	330,138	330,453	330,768	331,083	331,398	331,713	332,027	332,342
660	332,656	332,970	333,284	333,598	333,912	334,225	334,539	334,852	335,166	335,479
670	335,792	336,105	336,418	336,731	337,043	337,356	337,668	337,981	338,293	338,605
680	338,917	339,229	339,540	339,852	340,164	340,475	340,786	341,097	341,408	341,719
690	342,030	342,341	342,651	342,962	343,272	343,582	343,892	344,202	344,512	344,822
700	345,132	345,441	345,751	346,060	346,369	346,678	346,987	347,296	347,604	347,913
710	348,222	348,530	348,838	349,146	349,454	349,762	350,070	350,378	350,685	350,993
720	351,300	351,607	351,914	352,221	352,528	352,835	353,141	353,448	353,754	354,060
730	354,367	354,673	354,979	355,284	355,590	355,896	356,201	356,506	356,812	357,117
740	357,422	357,727	358,031	358,336	358,641	358,945	359,249	359,553	359,857	360,161
750	360,465	360,769	361,073	361,376	361,679	361,983	362,286	362,589	362,892	363,194
760	363,497	363,800	364,102	364,404	364,707	365,009	365,311	365,613	365,915	366,216
770	366,517	366,819	367,120	367,421	367,722	368,023	368,324	368,625	368,925	369,226
780	369,526	369,826	370,127	370,427	370,726	371,026	371,326	371,625	371,925	372,224
790	372,523	372,822	373,121	373,420	373,719	374,017	374,316	374,614	374,913	375,211
800	375,509	375,807	376,105	376,402	376,700	376,997	377,295	377,592	377,889	378,186

Tolerance for 100 Ohm thermometers				
Tolleranze per termometri a resistenza 100 Ohm				
°C	Norma IEC 751 Classe A		Norma IEC 751 Classe B	
	°C	Ohm	°C	Ohm
	-200	0,55	0,24	1,30
-100	0,35	0,14	0,80	0,32
0	0,15	0,06	0,30	0,12
100	0,35	0,13	0,80	0,30
200	0,55	0,20	1,30	0,48
300	0,75	0,27	1,80	0,64
400	0,95	0,33	2,30	0,79
500	1,15	0,38	2,80	0,93
600	1,35	0,43	3,30	1,06
650	1,45	0,46	3,55	1,13
700			3,80	1,17
800			4,30	1,28
850			4,55	1,34







**CALIBRATION TABLE FOR THERMOCOUPLES TYPE T (Copper / Copper-Nickel) ACCORDING TO IEC 584-1**  
**TABELLA DI CALIBRAZIONE PER TERMOCOPPIE TIPO T (Rame / Rame-Nichel) SECONDO NORMATIVA IEC 584-1**

Thermometric voltage in absolute mV - Reference junction at 0°C

	0	-1	-2	-3	-4	-5	-6	-7	-8	-9
-270	-6,258									
-260	-6,232	-6,236	-6,239	-6,242	-6,245	-6,248	-6,251	-6,253	-6,255	-6,256
-250	-6,180	-6,187	-6,193	-6,198	-6,204	-6,209	-6,214	-6,219	-6,223	-6,228
-240	-6,105	-6,114	-6,122	-6,130	-6,138	-6,146	-6,153	-6,160	-6,167	-6,174
-230	-6,007	-6,017	-6,028	-6,038	-6,049	-6,059	-6,068	-6,078	-6,087	-6,096
-220	-5,888	-5,901	-5,914	-5,926	-5,938	-5,950	-5,962	-5,973	-5,985	-5,996
-210	-5,753	-5,767	-5,782	-5,795	-5,809	-5,823	-5,836	-5,850	-5,863	-5,876
-200	-5,603	-5,619	-5,634	-5,650	-5,665	-5,680	-5,695	-5,710	-5,724	-5,739
-190	-5,439	-5,456	-5,473	-5,489	-5,506	-5,523	-5,539	-5,555	-5,571	-5,587
-180	-5,261	-5,279	-5,297	-5,316	-5,334	-5,351	-5,369	-5,387	-5,404	-5,421
-170	-5,070	-5,089	-5,109	-5,128	-5,148	-5,167	-5,186	-5,205	-5,224	-5,242
-160	-4,865	-4,886	-4,907	-4,928	-4,949	-4,969	-4,989	-5,010	-5,030	-5,050
-150	-4,648	-4,671	-4,693	-4,715	-4,737	-4,759	-4,780	-4,802	-4,823	-4,844
-140	-4,419	-4,443	-4,466	-4,489	-4,512	-4,535	-4,558	-4,581	-4,604	-4,626
-130	-4,177	-4,202	-4,226	-4,251	-4,275	-4,300	-4,324	-4,348	-4,372	-4,395
-120	-3,923	-3,949	-3,975	-4,000	-4,026	-4,052	-4,077	-4,102	-4,127	-4,152
-110	-3,657	-3,684	-3,711	-3,738	-3,765	-3,791	-3,818	-3,844	-3,871	-3,897
-100	-3,379	-3,407	-3,435	-3,463	-3,491	-3,519	-3,547	-3,574	-3,602	-3,629
-90	-3,089	-3,118	-3,148	-3,177	-3,206	-3,235	-3,264	-3,293	-3,322	-3,350
-80	-2,788	-2,818	-2,849	-2,879	-2,910	-2,940	-2,970	-3,000	-3,030	-3,059
-70	-2,476	-2,507	-2,539	-2,571	-2,602	-2,633	-2,664	-2,695	-2,726	-2,757
-60	-2,153	-2,186	-2,218	-2,251	-2,283	-2,316	-2,348	-2,380	-2,412	-2,444
-50	-1,819	-1,853	-1,887	-1,920	-1,954	-1,987	-2,021	-2,054	-2,087	-2,120
-40	-1,475	-1,510	-1,545	-1,579	-1,614	-1,648	-1,683	-1,717	-1,751	-1,785
-30	-1,121	-1,157	-1,192	-1,228	-1,264	-1,299	-1,335	-1,370	-1,405	-1,440
-20	-0,757	-0,794	-0,830	-0,867	-0,904	-0,940	-0,976	-1,013	-1,049	-1,085
-10	-0,383	-0,421	-0,459	-0,496	-0,534	-0,571	-0,608	-0,646	-0,683	-0,720
0	0,000	-0,039	-0,077	-0,116	-0,154	-0,193	-0,231	-0,269	-0,307	-0,345

Thermometric voltage in absolute mV - Reference junction at 0°C

	0	1	2	3	4	5	6	7	8	9
310	15,445	15,503	15,562	15,621	15,679	15,738	15,797	15,856	15,914	15,973
320	16,032	16,091	16,150	16,209	16,268	16,327	16,387	16,446	16,505	16,564
330	16,624	16,683	16,742	16,802	16,861	16,921	16,980	17,040	17,100	17,159
340	17,219	17,279	17,339	17,399	17,458	17,518	17,578	17,638	17,698	17,759
350	17,819	17,879	17,939	17,999	18,060	18,120	18,180	18,241	18,301	18,362
360	18,422	18,483	18,543	18,604	18,665	18,725	18,786	18,847	18,908	18,969
370	19,030	19,091	19,152	19,213	19,274	19,335	19,396	19,457	19,518	19,579
380	19,641	19,702	19,763	19,825	19,886	19,947	20,009	20,070	20,132	20,193
390	20,255	20,317	20,378	20,440	20,502	20,563	20,625	20,687	20,748	20,810
400	20,872									

	0	1	2	3	4	5	6	7	8	9
0	0,000	0,039	0,078	0,117	0,156	0,195	0,234	0,273	0,312	0,352
10	0,391	0,431	0,470	0,510	0,549	0,589	0,629	0,669	0,709	0,749
20	0,790	0,830	0,870	0,911	0,951	0,992	1,033	1,074	1,114	1,155
30	1,196	1,238	1,279	1,320	1,362	1,403	1,445	1,486	1,528	1,570
40	1,612	1,654	1,696	1,738	1,780	1,823	1,865	1,908	1,950	1,993
50	2,036	2,079	2,122	2,165	2,208	2,251	2,294	2,338	2,381	2,425
60	2,468	2,512	2,556	2,600	2,643	2,687	2,732	2,776	2,820	2,864
70	2,909	2,953	2,998	3,043	3,087	3,132	3,177	3,222	3,267	3,312
80	3,358	3,403	3,448	3,494	3,539	3,585	3,631	3,677	3,722	3,768
90	3,814	3,860	3,907	3,953	3,999	4,046	4,092	4,138	4,185	4,232
100	4,279	4,325	4,372	4,419	4,466	4,513	4,561	4,608	4,655	4,702
110	4,750	4,798	4,845	4,893	4,941	4,988	5,036	5,084	5,132	5,180
120	5,228	5,277	5,325	5,373	5,422	5,470	5,519	5,567	5,616	5,665
130	5,714	5,763	5,812	5,861	5,910	5,959	6,008	6,057	6,107	6,156
140	6,206	6,255	6,305	6,355	6,404	6,454	6,504	6,554	6,604	6,654
150	6,704	6,754	6,805	6,855	6,905	6,956	7,006	7,057	7,107	7,158
160	7,209	7,260	7,310	7,361	7,412	7,463	7,515	7,566	7,617	7,668
170	7,720	7,771	7,823	7,874	7,926	7,977	8,029	8,081	8,133	8,185
180	8,237	8,289	8,341	8,393	8,445	8,497	8,550	8,602	8,654	8,707
190	8,759	8,812	8,865	8,917	8,970	9,023	9,076	9,129	9,182	9,235
200	9,288	9,341	9,395	9,448	9,501	9,555	9,608	9,662	9,715	9,769
210	9,822	9,876	9,930	9,984	10,038	10,092	10,146	10,200	10,254	10,308
220	10,362	10,417	10,471	10,525	10,580	10,634	10,689	10,743	10,798	10,853
230	10,907	10,962	11,017	11,072	11,127	11,182	11,237	11,292	11,347	11,403
240	11,458	11,513	11,569	11,624	11,680	11,735	11,791	11,846	11,902	11,958
250	12,013	12,069	12,125	12,181	12,237	12,293	12,349	12,405	12,461	12,518
260	12,574	12,630	12,687	12,743	12,799	12,856	12,912	12,969	13,026	13,082
270	13,139	13,196	13,253	13,310	13,366	13,423	13,480	13,537	13,595	13,652
280	13,709	13,766	13,823	13,881	13,938	13,995	14,053	14,110	14,168	14,226
290	14,283	14,341	14,399	14,456	14,514	14,572	14,630	14,688	14,746	14,804
300	14,862	14,920	14,978	15,036	15,095	15,153	15,211	15,270	15,328	15,386

CENTRO SIT N°113 ZAMA SENSOR

TABELLA DI ACCREDITAMENTO SIT

Grandezza	Strumenti in taratura	Campi di misura	Incertezza (*)	Note
Temperatura	Termocoppie	(-40 ÷ 250) °C	0,3 °C	
		(250 ÷ 600) °C	0,4 °C	
		(600 ÷ 1100) °C	1,5 °C	
		(1100 ÷ 1550) °C	2,0 °C	
	Termoresistenze	(-40 ÷ 0) °C	0,15 °C	
		(0 ÷ 100) °C	0,1 °C	
		(100 ÷ 250) °C	0,15 °C	
		(250 ÷ 600) °C	0,5 °C	
	Catene termometriche - indicatori per termocoppie e termoresistenze	Campo di misura della sonda abbinata	U+RS	① ②
	- trasmettitori per termocoppie e termoresistenze	Campo di misura della sonda abbinata	U+AS	① ③

(\*) L'incertezza di misura è espressa al livello di fiducia del 95% (ottenuta, nel caso di distribuzione normale e di elevato numero di gradi di libertà, moltiplicando per due l'incertezza tipo).

- ① U è l'incertezza della sonda (termocoppia o termoresistenza) in funzione del campo di misura.  
 ② RS è la risoluzione dello strumento (1 digit o ½ divisione).  
 ③ AS è l'accuratezza dello strumento.

### Tarature esterne

TABELLA DI ACCREDITAMENTO SIT

Grandezza	Strumenti in taratura	Campi di misura	Incertezza (*)	Note
Temperatura	Indicatori di temperatura	Norme nazionali e internazionali per sensori di temperatura	U <sup>1</sup> + RS	④

(\*) L'incertezza di misura è espressa al livello di fiducia del 95% (ottenuta, nel caso di distribuzione normale e di elevato numero di gradi di libertà, moltiplicando per due l'incertezza tipo).

- ④ U<sup>1</sup> è l'incertezza di taratura dello strumento, che dipende dalle condizioni ambientali e dal tipo di sonda abbinata.  
 Per temperatura ambiente di 23° C ± 5°C:  
 - termometri a resistenza (Pt 100) : 1,0 °C  
 - termocoppie a metallo base : 1,5 °C  
 - termocoppie a metallo nobile : 2,5 °C