

## Thermocouple type:

# J

Operating Range: -40 à +750°C  
 Colour according CEI 60584-3 (+ / -): Black / White  
 Thermocouple Alloys (+ / -): Iron / Constantan (Copper + Nickel)  
 Tolerance according CEI 60584-3 Class 1: ±1.5°C from -40 to +375°C & ±0.004xT° from 375 to 750°C  
 Class 2: ±2.5°C from -40 to +333°C & ±0.0075xT° from 333 to 750°C  
 Tolerance according MC96.1 Special Limit: 1,1°C or 0,4%  
 Standard: 2,2°C or 0,75%  
 Thermoelectric EMF (mV) on temperature basis:

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
-200	-8,095	-8,076	-8,057	-8,037	-8,017	-7,996	-7,976	-7,955	-7,934	-7,912	-7,890
-190	-7,890	-7,868	-7,846	-7,824	-7,801	-7,778	-7,755	-7,731	-7,707	-7,683	-7,659
-180	-7,659	-7,634	-7,610	-7,585	-7,559	-7,534	-7,508	-7,482	-7,456	-7,429	-7,403
-170	-7,403	-7,376	-7,348	-7,321	-7,293	-7,265	-7,237	-7,209	-7,181	-7,152	-7,123
-160	-7,123	-7,094	-7,064	-7,035	-7,005	-6,975	-6,944	-6,914	-6,883	-6,853	-6,821
-150	-6,821	-6,790	-6,759	-6,727	-6,695	-6,663	-6,631	-6,598	-6,566	-6,533	-6,500
-140	-6,500	-6,467	-6,433	-6,400	-6,366	-6,332	-6,298	-6,263	-6,229	-6,194	-6,159
-130	-6,159	-6,124	-6,089	-6,054	-6,018	-5,982	-5,946	-5,910	-5,874	-5,838	-5,801
-120	-5,801	-5,764	-5,727	-5,690	-5,653	-5,616	-5,578	-5,541	-5,503	-5,465	-5,426
-110	-5,426	-5,388	-5,350	-5,311	-5,272	-5,233	-5,194	-5,155	-5,116	-5,076	-5,037
-100	-5,037	-4,997	-4,957	-4,917	-4,877	-4,836	-4,796	-4,755	-4,714	-4,674	-4,633
-90	-4,633	-4,591	-4,550	-4,509	-4,467	-4,425	-4,384	-4,342	-4,300	-4,257	-4,215
-80	-4,215	-4,173	-4,130	-4,088	-4,045	-4,002	-3,959	-3,916	-3,872	-3,829	-3,786
-70	-3,786	-3,742	-3,698	-3,654	-3,610	-3,566	-3,522	-3,478	-3,434	-3,389	-3,344
-60	-3,344	-3,300	-3,255	-3,210	-3,165	-3,120	-3,075	-3,029	-2,984	-2,938	-2,893
-50	-2,893	-2,847	-2,801	-2,755	-2,709	-2,663	-2,617	-2,571	-2,524	-2,478	-2,431
-40	-2,431	-2,385	-2,338	-2,291	-2,244	-2,197	-2,150	-2,103	-2,055	-2,008	-1,961
-30	-1,961	-1,913	-1,865	-1,818	-1,770	-1,722	-1,674	-1,626	-1,578	-1,530	-1,482
-20	-1,482	-1,433	-1,385	-1,336	-1,288	-1,239	-1,190	-1,142	-1,093	-1,044	-0,995
-10	-0,995	-0,946	-0,896	-0,847	-0,798	-0,749	-0,699	-0,650	-0,600	-0,550	-0,501
0	-0,501	-0,451	-0,401	-0,351	-0,301	-0,251	-0,201	-0,151	-0,101	-0,050	0,000

°C	0	1	2	3	4	5	6	7	8	9
490	26,834	26,889	26,945	27,001	27,057	27,113	27,169	27,225	27,281	27,337
500	27,393	27,449	27,505	27,561	27,617	27,673	27,729	27,785	27,841	27,897
510	27,953	28,010	28,066	28,122	28,178	28,234	28,291	28,347	28,403	28,460
520	28,516	28,572	28,629	28,685	28,741	28,798	28,854	28,911	28,967	29,024
530	29,080	29,137	29,194	29,250	29,307	29,363	29,420	29,477	29,534	29,590
540	29,647	29,704	29,761	29,818	29,874	29,931	29,988	30,045	30,102	30,159
550	30,216	30,273	30,330	30,387	30,444	30,501	30,559	30,616	30,673	30,730
560	30,788	30,845	30,902	30,960	31,017	31,074	31,132	31,189	31,247	31,304
570	31,362	31,419	31,477	31,535	31,592	31,650	31,708	31,766	31,823	31,881
580	31,939	31,997	32,055	32,113	32,171	32,229	32,287	32,345	32,403	32,461
590	32,519	32,577	32,636	32,694	32,752	32,810	32,869	32,927	32,985	33,044
600	33,102	33,161	33,219	33,278	33,337	33,395	33,454	33,513	33,571	33,630
610	33,689	33,748	33,807	33,866	33,925	33,984	34,043	34,102	34,161	34,220
620	34,279	34,338	34,397	34,457	34,516	34,575	34,635	34,694	34,754	34,813
630	34,873	34,932	34,992	35,051	35,111	35,171	35,230	35,290	35,350	35,410
640	35,470	35,530	35,590	35,650	35,710	35,770	35,830	35,890	35,950	36,010
650	36,071	36,131	36,191	36,252	36,312	36,373	36,433	36,494	36,554	36,615
660	36,675	36,736	36,797	36,858	36,918	36,979	37,040	37,101	37,162	37,223
670	37,284	37,345	37,406	37,467	37,528	37,590	37,651	37,712	37,773	37,835
680	37,896	37,958	38,019	38,081	38,142	38,204	38,265	38,327	38,389	38,450
690	38,512	38,574	38,636	38,698	38,760	38,822	38,884	38,946	39,008	39,070
700	39,132	39,194	39,256	39,318	39,381	39,443	39,505	39,568	39,630	39,693
710	39,755	39,818	39,880	39,943	40,005	40,068	40,131	40,193	40,256	40,319
720	40,382	40,445	40,508	40,570	40,633	40,696	40,759	40,822	40,886	40,949
730	41,012	41,075	41,138	41,201	41,265	41,328	41,391	41,455	41,518	41,581
740	41,645	41,708	41,772	41,835	41,899	41,962	42,026	42,090	42,153	42,217
750	42,281	42,344	42,408	42,472	42,536	42,599	42,663	42,727	42,791	42,855
760	42,919	42,983	43,047	43,111	43,175	43,239	43,303	43,367	43,431	43,495
770	43,559	43,624	43,688	43,752	43,817	43,881	43,945	44,010	44,074	44,139
780	44,203	44,267	44,332	44,396	44,461	44,525	44,590	44,655	44,719	44,784
790	44,848	44,913	44,977	45,042	45,107	45,171	45,236	45,301	45,365	45,430
800	45,494	45,559	45,624	45,688	45,753	45,818	45,882	45,947	46,011	46,076
810	46,141	46,206	46,270	46,334	46,399	46,464	46,528	46,593	46,657	46,722
820	46,786	46,851	46,915	46,980	47,044	47,109	47,173	47,238	47,302	47,367
830	47,431	47,495	47,560	47,624	47,688	47,753	47,817	47,881	47,946	48,010
840	48,074	48,138	48,202	48,267	48,331	48,395	48,459	48,523	48,587	48,651
850	48,715	48,779	48,843	48,907	48,971	49,035	49,099	49,163	49,227	49,291
860	49,353	49,417	49,481	49,545	49,609	49,673	49,737	49,801	49,865	49,929
870	49,989	50,052	50,116	50,179	50,243	50,307	50,371	50,435	50,499	50,563
880	50,622	50,685	50,748	50,812	50,876	50,940	51,004	51,068	51,132	51,196
890	51,251	51,314	51,377	51,441	51,505	51,569	51,633	51,697	51,761	51,825
900	51,877	51,940	52,004	52,068	52,132	52,196	52,260	52,324	52,388	52,452
910	52,500	52,564	52,628	52,692	52,756	52,820	52,884	52,948	53,012	53,076
920	53,119	53,183	53,247	53,311	53,375	53,439	53,503	53,567	53,631	53,695
930	53,735	53,799	53,863	53,927	53,991	54,055	54,119	54,183	54,247	54,311
940	54,375	54,439	54,503	54,567	54,631	54,695	54,759	54,823	54,887	54,951
950	54,966	55,030	55,094	55,158	55,222	55,286	55,350	55,414	55,478	55,542
960	55,561	55,625	55,689	55,753	55,817	55,881	55,945	56,009	56,073	56,137
970	56,164	56,228	56,292	56,356	56,420	56,484	56,548	56,612	56,676	56,740
980	56,763	56,827	56,891	56,955	57,019	57,083	57,147	57,211	57,275	57,339
990	57,360	57,424	57,488	57,552	57,616	57,680	57,744	57,808	57,872	57,936
1000	57,953	58,017	58,081	58,145	58,209	58,273	58,337	58,401	58,465	58,529
1010	58,545	58,609	58,673	58,737	58,801	58,865	58,929	58,993	59,057	59,121
1020	59,134	59,198	59,262	59,326	59,390	59,454	59,518	59,582	59,646	59,710
1030	59,721	59,785	59,849	59,913	59,977	60,041	60,105	60,169	60,233	60,297
1040	60,307	60,371	60,435	60,499	60,563	60,627	60,691	60,755	60,819	60,883
1050	60,897	60,961	61,025	61,089	61,153	61,217	61,281	61,345	61,409	61,473
1060	61,473	61,537	61,601	61,665	61,729	61,793	61,857	61,921	61,985	62,049
1070	62,054	62,118	62,182	62,246	62,310	62,374	62,438	62,502	62,566	62,630
1080	62,634	62,698	62,762	62,826	62,890	62,954	63,018	63,082	63,146	63,210
1090	63,214	63,278	63,342	63,406	63,470	63,534	63,598	63,662	63,726	63,790
1100	63,792	63,856	63,920	63,984	64,048	64,112	64,176	64,240	64,304	64,368
1110	64,370	64,434	64,498	64,562	64,626	64,690	64,754	64,818	64,882	64,946
1120	64,948	65,012	65,076	65,140	65,204	65,268	65,332	65,396	65,460	65,524
1130	65,525	65,589	65,653	65,717	65,781	65,845	65,909	65,973	66,037	66,101
1140	66,102	66,166	66,230	66,294	66,358	66,422	66,486	66,550	66,614	66,678
1150	66,679	66,743	66,807	66,871	66,935	66,999	67,063	67,127	67,191	67,255
1160	67,255	67,319	67,383	67,447	67,511	67,575	67,639	67,703	67,767	67,831
1170	67,831	67,895	67,959	68,023	68,087	68,151	68,215	68,279	68,343	68,407
1180	68,406	68,470	68,534	68,598	68,662	68,726	68,790	68,854	68,918	68,982
1190	68,980	69,044	69,108	69,172	69,236	69,300	69,364	69,428	69,492	69,556

°C	0	1	2	3	4	5	6	7	8	9	10
0	0,000	0,050	0,101	0,151	0,202	0,253	0,303	0,354	0,405	0,456	0,507
10	0,507	0,558	0,609	0,660	0,711	0					

**Thermocouple type:**

**K**

Operating Range:

Colour according CEI 60584-3 (+ / -):

Thermocouple Alloys (+ / -):

Tolerance according CEI 60584-3

Tolerance according MC96.1

Thermoelectric EMF (mV) on temperature basis:

-40 à +1200°C

Green / White

Chromel (Nickel + Chromium) / Alumel (Nickel + Aluminium)

Class 1: ±1.5°C from -40 to +375°C & ±0.004xT° from 375 to 1000°C

Class 2: ±2.5°C from -40 to +333°C & ±0.0075xT° from 333 to 1200°C

Special Limit: 1,1°C or 0,4%

Standard: 2,2°C or 0,75% over 0°C & 2,2°C or 2,0% under 0°C

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
-260	-6,458	-6,457	-6,456	-6,455	-6,453	-6,452	-6,450	-6,448	-6,446	-6,444	-6,441
-250	-6,441	-6,438	-6,435	-6,432	-6,429	-6,425	-6,421	-6,417	-6,413	-6,408	-6,404
-240	-6,404	-6,399	-6,393	-6,388	-6,382	-6,377	-6,370	-6,364	-6,358	-6,351	-6,344
-230	-6,344	-6,337	-6,329	-6,322	-6,314	-6,306	-6,297	-6,289	-6,280	-6,271	-6,262
-220	-6,262	-6,252	-6,243	-6,233	-6,223	-6,213	-6,202	-6,192	-6,181	-6,170	-6,158
-210	-6,158	-6,147	-6,135	-6,123	-6,111	-6,099	-6,087	-6,074	-6,061	-6,048	-6,035
-200	-6,035	-6,021	-6,007	-5,994	-5,980	-5,965	-5,951	-5,936	-5,922	-5,907	-5,891
-190	-5,891	-5,876	-5,861	-5,845	-5,829	-5,813	-5,797	-5,780	-5,763	-5,747	-5,730
-180	-5,730	-5,713	-5,695	-5,678	-5,660	-5,642	-5,624	-5,606	-5,588	-5,569	-5,550
-170	-5,550	-5,531	-5,512	-5,493	-5,474	-5,454	-5,435	-5,415	-5,395	-5,374	-5,354
-160	-5,354	-5,333	-5,313	-5,292	-5,271	-5,250	-5,228	-5,207	-5,185	-5,163	-5,141
-150	-5,141	-5,119	-5,097	-5,074	-5,052	-5,029	-5,006	-4,983	-4,960	-4,936	-4,913
-140	-4,913	-4,889	-4,865	-4,841	-4,817	-4,793	-4,768	-4,744	-4,719	-4,694	-4,669
-130	-4,669	-4,644	-4,618	-4,593	-4,567	-4,542	-4,516	-4,490	-4,463	-4,437	-4,411
-120	-4,411	-4,384	-4,357	-4,330	-4,303	-4,276	-4,249	-4,221	-4,194	-4,166	-4,138
-110	-4,138	-4,110	-4,082	-4,054	-4,025	-3,997	-3,968	-3,939	-3,911	-3,882	-3,852
-100	-3,852	-3,823	-3,794	-3,764	-3,734	-3,705	-3,675	-3,645	-3,614	-3,584	-3,554
-90	-3,554	-3,523	-3,492	-3,461	-3,431	-3,400	-3,368	-3,337	-3,306	-3,274	-3,243
-80	-3,243	-3,211	-3,179	-3,147	-3,115	-3,083	-3,050	-3,018	-2,986	-2,953	-2,920
-70	-2,920	-2,887	-2,854	-2,821	-2,788	-2,755	-2,721	-2,688	-2,654	-2,620	-2,587
-60	-2,587	-2,553	-2,519	-2,485	-2,450	-2,416	-2,382	-2,347	-2,312	-2,278	-2,243
-50	-2,243	-2,208	-2,173	-2,138	-2,103	-2,067	-2,032	-1,996	-1,961	-1,925	-1,889
-40	-1,889	-1,854	-1,818	-1,782	-1,745	-1,709	-1,673	-1,637	-1,600	-1,564	-1,527
-30	-1,527	-1,490	-1,453	-1,417	-1,380	-1,343	-1,305	-1,268	-1,231	-1,194	-1,156
-20	-1,156	-1,119	-1,081	-1,043	-1,006	-0,968	-0,930	-0,892	-0,854	-0,816	-0,778
-10	-0,778	-0,739	-0,701	-0,663	-0,624	-0,586	-0,547	-0,508	-0,470	-0,431	-0,392
0	-0,392	-0,353	-0,314	-0,275	-0,236	-0,197	-0,157	-0,118	-0,079	-0,039	0,000

°C	0	1	2	3	4	5	6	7	8	9
550	22,776	22,819	22,862	22,904	22,947	22,990	23,032	23,075	23,117	23,160
560	23,203	23,245	23,288	23,331	23,373	23,416	23,458	23,501	23,544	23,586
570	23,629	23,671	23,714	23,757	23,799	23,842	23,884	23,927	23,970	24,012
580	24,055	24,097	24,140	24,182	24,225	24,267	24,310	24,353	24,395	24,438
590	24,480	24,523	24,565	24,608	24,650	24,693	24,735	24,778	24,820	24,863
600	24,905	24,948	24,990	25,033	25,075	25,118	25,160	25,203	25,245	25,288
610	25,330	25,373	25,415	25,458	25,500	25,543	25,585	25,627	25,670	25,712
620	25,755	25,797	25,840	25,882	25,924	25,967	26,009	26,052	26,094	26,136
630	26,179	26,221	26,263	26,306	26,348	26,390	26,433	26,475	26,517	26,560
640	26,602	26,644	26,687	26,729	26,771	26,814	26,856	26,898	26,940	26,983
650	27,025	27,067	27,109	27,152	27,194	27,237	27,279	27,322	27,364	27,407
660	27,447	27,489	27,531	27,574	27,616	27,659	27,701	27,744	27,786	27,829
670	27,869	27,911	27,953	27,995	28,037	28,079	28,121	28,163	28,205	28,248
680	28,289	28,332	28,374	28,416	28,458	28,500	28,542	28,584	28,626	28,668
690	28,710	28,752	28,794	28,836	28,878	28,919	28,961	29,003	29,045	29,087
700	29,129	29,171	29,213	29,255	29,297	29,338	29,380	29,422	29,464	29,506
710	29,548	29,590	29,632	29,674	29,715	29,757	29,798	29,840	29,882	29,924
720	29,965	30,007	30,049	30,090	30,132	30,174	30,216	30,257	30,299	30,341
730	30,382	30,424	30,466	30,507	30,549	30,590	30,632	30,674	30,715	30,757
740	30,798	30,840	30,881	30,923	30,964	31,006	31,047	31,089	31,130	31,172
750	31,213	31,255	31,296	31,338	31,379	31,421	31,462	31,504	31,545	31,586
760	31,628	31,669	31,710	31,752	31,793	31,834	31,876	31,917	31,958	32,000
770	32,041	32,082	32,124	32,165	32,206	32,247	32,289	32,330	32,371	32,412
780	32,453	32,495	32,536	32,577	32,618	32,659	32,700	32,742	32,783	32,824
790	32,865	32,906	32,947	32,988	33,029	33,070	33,111	33,152	33,193	33,234
800	33,275	33,316	33,357	33,398	33,439	33,480	33,521	33,562	33,603	33,644
810	33,685	33,726	33,767	33,808	33,849	33,890	33,930	33,971	34,012	34,053
820	34,093	34,134	34,175	34,216	34,257	34,297	34,338	34,379	34,420	34,461
830	34,501	34,542	34,583	34,624	34,664	34,705	34,745	34,786	34,826	34,867
840	34,908	34,948	34,989	35,029	35,070	35,110	35,151	35,192	35,232	35,273
850	35,313	35,354	35,394	35,435	35,475	35,516	35,556	35,596	35,637	35,677
860	35,718	35,758	35,798	35,839	35,879	35,920	35,960	36,000	36,041	36,081
870	36,121	36,162	36,202	36,242	36,282	36,323	36,363	36,403	36,444	36,484
880	36,524	36,564	36,604	36,644	36,685	36,725	36,765	36,805	36,845	36,885
890	36,925	36,965	37,005	37,046	37,086	37,126	37,166	37,206	37,246	37,286
900	37,326	37,366	37,406	37,446	37,486	37,526	37,566	37,606	37,646	37,686
910	37,725	37,765	37,805	37,845	37,885	37,925	37,965	38,005	38,044	38,084
920	38,124	38,164	38,204	38,244	38,283	38,323	38,363	38,402	38,442	38,482
930	38,522	38,561	38,601	38,641	38,680	38,720	38,760	38,799	38,839	38,878
940	38,918	38,958	38,997	39,037	39,076	39,116	39,155	39,195	39,235	39,274
950	39,314	39,353	39,393	39,432	39,471	39,511	39,550	39,590	39,629	39,669
960	39,708	39,747	39,787	39,826	39,866	39,905	39,944	39,984	40,023	40,062
970	40,101	40,141	40,180	40,219	40,259	40,298	40,337	40,376	40,415	40,455
980	40,494	40,533	40,572	40,611	40,651	40,690	40,729	40,768	40,807	40,846
990	40,885	40,924	40,963	41,002	41,042	41,081	41,120	41,159	41,198	41,237
1000	41,276	41,315	41,354	41,393	41,433	41,472	41,511	41,550	41,589	41,628
1010	41,665	41,704	41,743	41,781	41,820	41,859	41,898	41,937	41,976	42,014
1020	42,053	42,092	42,131	42,169	42,208	42,247	42,286	42,324	42,363	42,402
1030	42,440	42,479	42,518	42,556	42,595	42,634	42,672	42,711	42,749	42,788
1040	42,826	42,865	42,903	42,942	42,980	43,019	43,057	43,096	43,134	43,173
1050	43,211	43,250	43,288	43,327	43,365	43,403	43,442	43,480	43,518	43,557
1060	43,595	43,633	43,672	43,710	43,748	43,787	43,825	43,863	43,901	43,940
1070	43,978	44,016	44,054	44,092	44,130	44,169	44,207	44,245	44,283	44,321
1080	44,359	44,397	44,435	44,473	44,512	44,550	44,588	44,626	44,664	44,702
1090	44,740	44,778	44,816	44,854	44,891	44,929	44,967	45,005	45,043	45,081
1100	45,119	45,157	45,195	45,232	45,270	45,308	45,346	45,383	45,421	45,459
1110	45,497	45,534	45,572	45,610	45,647	45,685	45,723	45,760	45,798	45,836
1120	45,873	45,911	45,948	45,986	46,024	46,061	46,099	46,136	46,174	46,211
1130	46,249	46,286	46,324	46,361	46,398	46,436	46,473	46,511	46,548	46,585
1140	46,623	46,660	46,697	46,735	46,772	46,809	46,847	46,884	46,921	46,958
1150	46,995	47,033	47,070	47,107	47,144	47,181	47,218	47,255	47,293	47,330
1160	47,367	47,404	47,441	47,478	47,515	47,552	47,589	47,626	47,663	47,700
1170	47,737	47,774	47,811	47,848	47,884	47,921	47,958	47,995	48,032	48,069
1180	48,105	48,142	48,179	48,216	48,252	48,289	48,326	48,363	48,399	48,436
1190										

Thermocouple type:

# E

Operating Range: -40 à +900°C  
 Colour according CEI 60584-3 (+ / -): Violet / White  
 Thermocouple Alloys (+ / -): Chromel (Nickel + Chromium) / Constantan (Copper + Nickel)  
 Tolerance according CEI 60584-3 Class 1: ±1.5°C from -40 to +375°C & ±0.0004xT° from 375 to 800°C  
 Class 2: ±2.5°C from -40 to +333°C & ±0.0075xT° from 333 to 900°C  
 Tolerance according MC96.1 Special Limit: 1,0°C or 0,4%  
 Standard: 1,7°C or 0,5% over 0°C & 1,7°C or 1,0% under 0°C  
 Thermoelectric EMF (mV) on temperature basis:

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
-260	-9,835	-9,833	-9,831	-9,828	-9,825	-9,821	-9,817	-9,813	-9,808	-9,802	-9,797
-250	-9,797	-9,790	-9,784	-9,777	-9,770	-9,762	-9,754	-9,746	-9,737	-9,728	-9,718
-240	-9,718	-9,709	-9,698	-9,688	-9,677	-9,666	-9,654	-9,642	-9,630	-9,617	-9,604
-230	-9,604	-9,591	-9,577	-9,563	-9,548	-9,534	-9,519	-9,503	-9,487	-9,471	-9,455
-220	-9,455	-9,438	-9,421	-9,404	-9,386	-9,368	-9,350	-9,331	-9,313	-9,293	-9,274
-210	-9,274	-9,254	-9,234	-9,214	-9,193	-9,172	-9,151	-9,129	-9,107	-9,085	-9,063
-200	-9,063	-9,040	-9,017	-8,994	-8,971	-8,947	-8,923	-8,899	-8,874	-8,850	-8,825
-190	-8,825	-8,799	-8,774	-8,748	-8,722	-8,696	-8,669	-8,643	-8,616	-8,588	-8,561
-180	-8,561	-8,533	-8,505	-8,477	-8,449	-8,420	-8,391	-8,362	-8,333	-8,303	-8,273
-170	-8,273	-8,243	-8,213	-8,183	-8,152	-8,121	-8,090	-8,059	-8,027	-7,995	-7,963
-160	-7,963	-7,931	-7,899	-7,866	-7,833	-7,800	-7,767	-7,733	-7,700	-7,666	-7,632
-150	-7,632	-7,597	-7,563	-7,528	-7,493	-7,458	-7,423	-7,387	-7,351	-7,315	-7,279
-140	-7,279	-7,243	-7,206	-7,170	-7,133	-7,096	-7,058	-7,021	-6,983	-6,945	-6,907
-130	-6,907	-6,869	-6,831	-6,792	-6,753	-6,714	-6,675	-6,636	-6,596	-6,556	-6,516
-120	-6,516	-6,476	-6,436	-6,396	-6,355	-6,314	-6,273	-6,232	-6,191	-6,149	-6,107
-110	-6,107	-6,065	-6,023	-5,981	-5,939	-5,896	-5,853	-5,810	-5,767	-5,724	-5,681
-100	-5,681	-5,637	-5,593	-5,549	-5,505	-5,461	-5,417	-5,372	-5,327	-5,282	-5,237
-90	-5,237	-5,192	-5,147	-5,101	-5,055	-5,009	-4,963	-4,917	-4,871	-4,824	-4,777
-80	-4,777	-4,731	-4,684	-4,636	-4,589	-4,542	-4,494	-4,446	-4,398	-4,350	-4,302
-70	-4,302	-4,254	-4,205	-4,156	-4,107	-4,058	-4,009	-3,960	-3,911	-3,861	-3,811
-60	-3,811	-3,761	-3,711	-3,661	-3,611	-3,561	-3,510	-3,459	-3,408	-3,357	-3,306
-50	-3,306	-3,255	-3,204	-3,152	-3,100	-3,048	-2,996	-2,944	-2,892	-2,840	-2,787
-40	-2,787	-2,735	-2,682	-2,629	-2,576	-2,523	-2,469	-2,416	-2,362	-2,309	-2,255
-30	-2,255	-2,201	-2,147	-2,093	-2,038	-1,984	-1,929	-1,874	-1,820	-1,765	-1,709
-20	-1,709	-1,654	-1,599	-1,543	-1,488	-1,432	-1,376	-1,320	-1,264	-1,208	-1,152
-10	-1,152	-1,095	-1,039	-0,982	-0,925	-0,868	-0,811	-0,754	-0,697	-0,639	-0,582
0	-0,582	-0,524	-0,466	-0,408	-0,350	-0,292	-0,234	-0,176	-0,117	-0,059	0,000

°C	0	1	2	3	4	5	6	7	8	9
360	25,757	25,836	25,916	25,995	26,075	26,154	26,233	26,313	26,392	26,472
370	26,552	26,631	26,711	26,790	26,870	26,950	27,029	27,109	27,189	27,268
380	27,348	27,428	27,507	27,587	27,667	27,747	27,827	27,907	27,986	28,066
390	28,146	28,226	28,306	28,386	28,466	28,546	28,626	28,706	28,786	28,866
400	28,946	29,026	29,106	29,186	29,266	29,346	29,427	29,507	29,587	29,667
410	29,747	29,827	29,908	29,988	30,068	30,148	30,229	30,309	30,389	30,470
420	30,550	30,630	30,711	30,791	30,871	30,952	31,032	31,112	31,193	31,273
430	31,354	31,434	31,515	31,595	31,676	31,756	31,837	31,917	31,998	32,078
440	32,159	32,239	32,320	32,400	32,481	32,562	32,642	32,723	32,803	32,884
450	32,965	33,045	33,126	33,207	33,287	33,368	33,449	33,529	33,610	33,691
460	33,772	33,852	33,933	34,014	34,095	34,175	34,256	34,337	34,418	34,498
470	34,579	34,660	34,741	34,822	34,902	34,983	35,064	35,145	35,226	35,307
480	35,387	35,468	35,549	35,630	35,711	35,792	35,873	35,954	36,034	36,115
490	36,196	36,277	36,358	36,439	36,520	36,601	36,682	36,763	36,843	36,924
500	37,005	37,086	37,167	37,248	37,329	37,410	37,491	37,572	37,653	37,734
510	37,815	37,896	37,977	38,058	38,139	38,220	38,300	38,381	38,462	38,543
520	38,624	38,705	38,786	38,867	38,948	39,029	39,110	39,191	39,272	39,353
530	39,344	39,515	39,596	39,677	39,758	39,839	39,920	40,001	40,082	40,163
540	40,243	40,324	40,405	40,486	40,567	40,648	40,729	40,810	40,891	40,972
550	41,053	41,134	41,215	41,296	41,377	41,457	41,538	41,619	41,700	41,781
560	41,862	41,943	42,024	42,105	42,185	42,266	42,347	42,428	42,509	42,590
570	42,671	42,751	42,832	42,913	42,994	43,075	43,156	43,236	43,317	43,398
580	43,479	43,560	43,641	43,722	43,802	43,883	43,963	44,044	44,125	44,206
590	44,286	44,367	44,448	44,529	44,609	44,690	44,771	44,851	44,932	45,013
600	45,093	45,174	45,255	45,335	45,416	45,497	45,577	45,658	45,738	45,819
610	45,900	45,980	46,061	46,141	46,222	46,302	46,383	46,463	46,544	46,624
620	46,705	46,785	46,866	46,946	47,027	47,107	47,188	47,268	47,349	47,429
630	47,509	47,590	47,670	47,751	47,831	47,911	47,992	48,072	48,152	48,233
640	48,313	48,393	48,474	48,554	48,634	48,715	48,795	48,875	48,955	49,035
650	49,116	49,196	49,276	49,356	49,436	49,517	49,597	49,677	49,757	49,837
660	49,917	49,997	50,077	50,157	50,238	50,318	50,398	50,478	50,558	50,638
670	50,718	50,798	50,878	50,958	51,038	51,118	51,197	51,277	51,357	51,437
680	51,517	51,597	51,677	51,757	51,837	51,916	51,996	52,076	52,156	52,236
690	52,315	52,395	52,475	52,555	52,634	52,714	52,794	52,873	52,953	53,033
700	53,112	53,192	53,272	53,351	53,431	53,510	53,590	53,670	53,749	53,829
710	53,908	53,988	54,067	54,147	54,226	54,306	54,385	54,465	54,544	54,624
720	54,703	54,782	54,862	54,941	55,021	55,100	55,179	55,259	55,338	55,417
730	55,497	55,576	55,655	55,734	55,814	55,893	55,972	56,051	56,131	56,210
740	56,289	56,368	56,447	56,526	56,606	56,685	56,764	56,843	56,922	57,001
750	57,080	57,159	57,238	57,317	57,396	57,475	57,554	57,633	57,712	57,791
760	57,870	57,949	58,028	58,107	58,186	58,265	58,344	58,423	58,502	58,581
770	58,659	58,738	58,817	58,895	58,974	59,053	59,132	59,211	59,290	59,369
780	59,446	59,525	59,604	59,682	59,761	59,840	59,919	59,997	60,076	60,155
790	60,232	60,311	60,390	60,468	60,547	60,626	60,704	60,782	60,860	60,939
800	61,017	61,096	61,174	61,253	61,331	61,409	61,488	61,566	61,644	61,723
810	61,801	61,879	61,958	62,036	62,114	62,192	62,271	62,349	62,427	62,505
820	62,583	62,662	62,740	62,818	62,896	62,974	63,052	63,130	63,208	63,286
830	63,364	63,442	63,520	63,598	63,676	63,754	63,832	63,910	63,988	64,066
840	64,144	64,222	64,300	64,377	64,455	64,533	64,611	64,689	64,766	64,844
850	64,922	65,000	65,077	65,155	65,233	65,311	65,389	65,466	65,544	65,622
860	65,698	65,776	65,853	65,931	66,008	66,086	66,163	66,241	66,318	66,396
870	66,473	66,550	66,628	66,705	66,782	66,860	66,937	67,014	67,092	67,169
880	67,246	67,323	67,400	67,478	67,555	67,632	67,709	67,786	67,863	67,940
890	68,017	68,094	68,171	68,248	68,325	68,402	68,479	68,556	68,633	68,710
900	68,787	68,863	68,940	69,017	69,094	69,171	69,247	69,324	69,401	69,477
910	69,554	69,631	69,707	69,784	69,860	69,937	70,013	70,090	70,166	70,243
920	70,319	70,396	70,472	70,548	70,625	70,701	70,777	70,854	70,930	71,006
930	71,082	71,159	71,235	71,311	71,387	71,463	71,539	71,615	71,692	71,768
940	71,844	71,920	71,996	72,072	72,147	72,223	72,299	72,375	72,451	72,527
950	72,603	72,678	72,754	72,829	72,904	72,979	73,054	73,129	73,204	73,279
960	73,360	73,435	73,511	73,586	73,662	73,738	73,813	73,889	73,964	74,040
970	74,115	74,190	74,266	74,341	74,417	74,492	74,567	74,643	74,718	74,793
980	74,869	74,944	75,019	75,094	75,169	75,244	75,319	75,394	75,469	75,544
990	75,621	75,696	75,771	75,846	75,921	75,996	76,071	76,146	76,221	76,296

°C	0	1	2	3	4	5	6	7	8	9	10
0	0,000	0,059	0,118	0,176	0,235	0,294	0,354	0,413	0,472	0,532	0,591
10	0,591	0,651	0,711	0,770	0,830	0,890	0,950	1,010	1,071	1,131	1,192
20	1,192	1,252	1,313	1,373	1,434	1,4					

## Thermocouple type:

# T

Operating Range: -40 à +350°C  
 Colour according CEI 60584-3 (+ / -): Brown / White  
 Thermocouple Alloys (+ / -): Copper / Constantan (Copper + Nickel)  
 Tolerance according CEI 60584-3 Class 1: ±0.5°C from -40 to +125°C & ±0.004xT° from 125 to 350°C  
 Class 2: ±1.0°C from -40 to +133°C & ±0.0075xT° from 133 to 350°C  
 Tolerance according MC96.1 Special Limit: 0,5°C or 0,4%  
 Standard: 1,0°C or 0,75% over 0°C & 1,0°C or 1,5% under 0°C  
 Thermoelectric EMF (mV) on temperature basis:

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

°C	0	1	2	3	4	5	6	7	8	9	10
0	0,000	0,039	0,078	0,117	0,156	0,195	0,234	0,273	0,312	0,352	0,391
10	0,391	0,431	0,470	0,510	0,549	0,589	0,629	0,669	0,709	0,749	0,790
20	0,790	0,830	0,870	0,911	0,951	0,992	1,033	1,074	1,114	1,155	1,196
30	1,196	1,238	1,279	1,320	1,362	1,403	1,445	1,486	1,528	1,570	1,612
40	1,612	1,654	1,696	1,738	1,780	1,823	1,865	1,908	1,950	1,993	2,036
50	2,036	2,079	2,122	2,165	2,208	2,251	2,294	2,338	2,381	2,425	2,468
60	2,468	2,512	2,556	2,600	2,643	2,687	2,732	2,776	2,820	2,864	2,909
70	2,909	2,953	2,998	3,043	3,087	3,132	3,177	3,222	3,267	3,312	3,358
80	3,358	3,403	3,448	3,494	3,539	3,585	3,631	3,677	3,722	3,768	3,814
90	3,814	3,860	3,907	3,953	3,999	4,046	4,092	4,138	4,185	4,232	4,279
100	4,279	4,325	4,372	4,419	4,466	4,513	4,561	4,608	4,655	4,702	4,750
110	4,750	4,798	4,845	4,893	4,941	4,988	5,036	5,084	5,132	5,180	5,228
120	5,228	5,277	5,325	5,373	5,422	5,470	5,519	5,567	5,616	5,665	5,714
130	5,714	5,763	5,812	5,861	5,910	5,959	6,008	6,057	6,107	6,156	6,206
140	6,206	6,255	6,305	6,355	6,404	6,454	6,504	6,554	6,604	6,654	6,704
150	6,704	6,754	6,805	6,855	6,905	6,956	7,006	7,057	7,107	7,158	7,209
160	7,209	7,260	7,310	7,361	7,412	7,463	7,515	7,566	7,617	7,668	7,720
170	7,720	7,771	7,823	7,874	7,926	7,977	8,029	8,081	8,133	8,185	8,237
180	8,237	8,289	8,341	8,393	8,445	8,497	8,550	8,602	8,654	8,707	8,759
190	8,759	8,812	8,865	8,917	8,970	9,023	9,076	9,129	9,182	9,235	9,288
200	9,288	9,341	9,395	9,448	9,501	9,555	9,608	9,662	9,715	9,769	9,822
210	9,822	9,876	9,930	9,984	10,038	10,092	10,146	10,200	10,254	10,308	10,362
220	10,362	10,417	10,471	10,525	10,580	10,634	10,689	10,743	10,798	10,853	10,907
230	10,907	10,962	11,017	11,072	11,127	11,182	11,237	11,292	11,347	11,403	11,458
240	11,458	11,513	11,569	11,624	11,680	11,735	11,791	11,846	11,902	11,958	12,013
250	12,013	12,069	12,125	12,181	12,237	12,293	12,349	12,405	12,461	12,518	12,574
260	12,574	12,630	12,687	12,743	12,799	12,856	12,912	12,969	13,026	13,082	13,139
270	13,139	13,196	13,253	13,310	13,366	13,423	13,480	13,537	13,595	13,652	13,709
280	13,709	13,766	13,823	13,881	13,938	13,995	14,053	14,110	14,168	14,226	14,283
290	14,283	14,341	14,399	14,456	14,514	14,572	14,630	14,688	14,746	14,804	14,862
300	14,862	14,920	14,978	15,036	15,095	15,153	15,211	15,270	15,328	15,386	15,445
310	15,445	15,503	15,562	15,621	15,679	15,738	15,797	15,856	15,914	15,973	16,032
320	16,032	16,091	16,150	16,209	16,268	16,327	16,387	16,446	16,505	16,564	16,624
330	16,624	16,683	16,742	16,802	16,861	16,921	16,980	17,040	17,100	17,159	17,219
340	17,219	17,279	17,339	17,399	17,458	17,518	17,578	17,638	17,698	17,759	17,819
350	17,819	17,879	17,939	17,999	18,060	18,120	18,180	18,241	18,301	18,362	18,422
360	18,422	18,483	18,543	18,604	18,665	18,725	18,786	18,847	18,908	18,969	19,030
370	19,030	19,091	19,152	19,213	19,274	19,335	19,396	19,457	19,518	19,579	19,641
380	19,641	19,702	19,763	19,825	19,886	19,947	20,009	20,070	20,132	20,193	20,255
390	20,255	20,317	20,378	20,440	20,502	20,563	20,625	20,687	20,748	20,810	20,872

## Thermocouple type:

# S

Operating Range:

0 à +1600°C

Colour according CEI 60584-3 (+ / -):

Orange / White

Thermocouple Alloys (+ / -):

Platinum-Rhodium(10%) / Platinum

Tolerance according CEI 60584-3

Class 1:

±1.0°C from 0 to +1100°C & ±1+0.003.(T°-1100) from 1100 to 1600°C

Class 2:

±1.5°C from 0 to +600°C & ±0.0025xT° from 600 to 1600°C

Tolerance according MC96.1

Special Limit: 0,6°C or 0,1%

Standard:

1,5°C or 0,25%

Thermoelectric EMF (mV) on temperature basis:

°C	0	1	2	3	4	5	6	7	8	9	10
-40	-0.236	-0.232	-0.228	-0.224	-0.219	-0.215	-0.211	-0.207	-0.203	-0.199	-0.194
-30	-0.194	-0.190	-0.186	-0.181	-0.177	-0.173	-0.168	-0.164	-0.159	-0.155	-0.150
-20	-0.150	-0.146	-0.141	-0.136	-0.132	-0.127	-0.122	-0.117	-0.113	-0.108	-0.103
-10	-0.103	-0.098	-0.093	-0.088	-0.083	-0.078	-0.073	-0.068	-0.063	-0.058	-0.053
0	-0.053	-0.048	-0.042	-0.037	-0.032	-0.027	-0.021	-0.016	-0.011	-0.005	0.000

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
0	0.000	0.005	0.011	0.016	0.022	0.027	0.033	0.038	0.044	0.050	0.055
10	0.055	0.061	0.067	0.072	0.078	0.084	0.090	0.095	0.101	0.107	0.113
20	0.113	0.119	0.125	0.131	0.137	0.143	0.149	0.155	0.161	0.167	0.173
30	0.173	0.179	0.185	0.191	0.197	0.204	0.210	0.216	0.222	0.228	0.235
40	0.235	0.241	0.248	0.254	0.260	0.267	0.273	0.280	0.286	0.292	0.298
50	0.299	0.305	0.312	0.319	0.325	0.332	0.338	0.345	0.352	0.358	0.365
60	0.365	0.372	0.378	0.385	0.392	0.399	0.405	0.412	0.419	0.426	0.433
70	0.433	0.440	0.446	0.453	0.460	0.467	0.474	0.481	0.488	0.495	0.502
80	0.502	0.509	0.516	0.523	0.530	0.538	0.545	0.552	0.559	0.566	0.573
90	0.573	0.580	0.588	0.595	0.602	0.609	0.617	0.624	0.631	0.639	0.646
100	0.646	0.653	0.661	0.668	0.675	0.683	0.690	0.698	0.705	0.713	0.720
110	0.720	0.727	0.735	0.743	0.750	0.758	0.765	0.773	0.780	0.788	0.795
120	0.795	0.803	0.811	0.818	0.826	0.834	0.841	0.849	0.857	0.865	0.872
130	0.872	0.880	0.888	0.896	0.903	0.911	0.919	0.927	0.935	0.942	0.950
140	0.950	0.958	0.966	0.974	0.982	0.990	0.998	1.006	1.013	1.021	1.029
150	1.029	1.037	1.045	1.053	1.061	1.069	1.077	1.085	1.094	1.102	1.110
160	1.110	1.118	1.126	1.134	1.142	1.150	1.158	1.167	1.175	1.183	1.191
170	1.191	1.199	1.207	1.216	1.224	1.232	1.240	1.249	1.257	1.265	1.273
180	1.273	1.282	1.290	1.298	1.307	1.315	1.323	1.332	1.340	1.348	1.357
190	1.357	1.365	1.373	1.382	1.390	1.399	1.407	1.415	1.424	1.432	1.441
200	1.441	1.449	1.458	1.466	1.475	1.483	1.492	1.500	1.509	1.517	1.526
210	1.526	1.534	1.543	1.551	1.560	1.569	1.577	1.586	1.594	1.603	1.612
220	1.612	1.620	1.629	1.638	1.646	1.655	1.663	1.672	1.681	1.690	1.698
230	1.698	1.707	1.716	1.724	1.733	1.742	1.751	1.759	1.768	1.777	1.786
240	1.786	1.794	1.803	1.812	1.821	1.829	1.838	1.847	1.856	1.865	1.874
250	1.874	1.882	1.891	1.900	1.909	1.918	1.927	1.936	1.944	1.953	1.962
260	1.962	1.971	1.980	1.989	1.998	2.007	2.016	2.025	2.034	2.043	2.052
270	2.052	2.061	2.070	2.079	2.087	2.096	2.105	2.114	2.123	2.132	2.141
280	2.141	2.151	2.160	2.169	2.178	2.187	2.196	2.205	2.214	2.223	2.232
290	2.232	2.241	2.250	2.259	2.268	2.277	2.287	2.296	2.305	2.314	2.323
300	2.323	2.332	2.341	2.350	2.360	2.369	2.378	2.387	2.396	2.405	2.414
310	2.414	2.424	2.433	2.442	2.451	2.461	2.470	2.479	2.488	2.497	2.507
320	2.507	2.516	2.525	2.534	2.544	2.553	2.562	2.571	2.581	2.590	2.599
330	2.599	2.609	2.618	2.627	2.636	2.646	2.655	2.664	2.674	2.683	2.692
340	2.692	2.702	2.711	2.720	2.730	2.739	2.748	2.758	2.767	2.776	2.786
350	2.786	2.795	2.805	2.814	2.823	2.833	2.842	2.851	2.861	2.870	2.880
360	2.880	2.889	2.899	2.908	2.917	2.927	2.936	2.946	2.955	2.965	2.974
370	2.974	2.983	2.993	3.002	3.012	3.021	3.031	3.040	3.050	3.059	3.069
380	3.069	3.078	3.088	3.097	3.107	3.116	3.126	3.135	3.145	3.154	3.164
390	3.164	3.173	3.183	3.192	3.202	3.212	3.221	3.231	3.240	3.250	3.259
400	3.259	3.269	3.279	3.288	3.298	3.307	3.317	3.326	3.336	3.346	3.355
410	3.355	3.365	3.374	3.384	3.394	3.403	3.413	3.423	3.432	3.442	3.451
420	3.451	3.461	3.471	3.480	3.490	3.500	3.509	3.519	3.529	3.538	3.548
430	3.548	3.558	3.567	3.577	3.587	3.596	3.606	3.616	3.626	3.635	3.645
440	3.645	3.655	3.664	3.674	3.684	3.694	3.703	3.713	3.723	3.732	3.742
450	3.742	3.752	3.762	3.771	3.781	3.791	3.801	3.810	3.820	3.830	3.840
460	3.840	3.850	3.859	3.869	3.879	3.889	3.898	3.908	3.918	3.928	3.938
470	3.938	3.947	3.957	3.967	3.977	3.987	3.997	4.006	4.016	4.026	4.036
480	4.036	4.046	4.056	4.065	4.075	4.085	4.095	4.105	4.115	4.125	4.134
490	4.134	4.144	4.154	4.164	4.174	4.184	4.194	4.204	4.213	4.223	4.233
500	4.233	4.243	4.253	4.263	4.273	4.283	4.293	4.303	4.313	4.323	4.332
510	4.332	4.342	4.352	4.362	4.372	4.382	4.392	4.402	4.412	4.422	4.432
520	4.432	4.442	4.452	4.462	4.472	4.482	4.492	4.502	4.512	4.522	4.532
530	4.532	4.542	4.552	4.562	4.572	4.582	4.592	4.602	4.612	4.622	4.632
540	4.632	4.642	4.652	4.662	4.672	4.682	4.692	4.702	4.712	4.722	4.732
550	4.732	4.742	4.752	4.762	4.772	4.782	4.793	4.803	4.813	4.823	4.833
560	4.833	4.843	4.853	4.863	4.873	4.883	4.893	4.904	4.914	4.924	4.934
570	4.934	4.944	4.954	4.964	4.974	4.984	4.995	5.005	5.015	5.025	5.035
580	5.035	5.045	5.055	5.065	5.075	5.085	5.095	5.106	5.116	5.127	5.137
590	5.137	5.147	5.157	5.167	5.178	5.188	5.198	5.208	5.218	5.228	5.239
600	5.239	5.249	5.259	5.269	5.280	5.290	5.300	5.310	5.320	5.331	5.341
610	5.341	5.351	5.361	5.372	5.382	5.392	5.402	5.413	5.423	5.433	5.443
620	5.443	5.454	5.464	5.474	5.485	5.495	5.505	5.515	5.526	5.536	5.546
630	5.546	5.557	5.567	5.577	5.588	5.598	5.608	5.618	5.629	5.639	5.649
640	5.649	5.660	5.670	5.680	5.691	5.701	5.712	5.722	5.732	5.743	5.753
650	5.753	5.763	5.774	5.784	5.794	5.805	5.815	5.826	5.836	5.846	5.857
660	5.857	5.867	5.878	5.888	5.898	5.909	5.919	5.930	5.940	5.950	5.961
670	5.961	5.971	5.982	5.992	6.003	6.013	6.024	6.034	6.044	6.055	6.065
680	6.065	6.076	6.086	6.097	6.107	6.118	6.128	6.139	6.149	6.160	6.170
690	6.170	6.181	6.191	6.202	6.212	6.223	6.233	6.244	6.254	6.265	6.275
700	6.275	6.286	6.296	6.307	6.317	6.328	6.338	6.349	6.360	6.370	6.381
710	6.381	6.391	6.402	6.412	6.423	6.434	6.444	6.455	6.465	6.476	6.486
720	6.486	6.497	6.508	6.518	6.529	6.539	6.550	6.561	6.571	6.582	6.593
730	6.593	6.603	6.614	6.624	6.635	6.646	6.656	6.667	6.678	6.688	6.699
740	6.699	6.710	6.720	6.731	6.742	6.752	6.763	6.774	6.784	6.795	6.806
750	6.806	6.817	6.827	6.838	6.849	6.859	6.870	6.881	6.892	6.902	6.913
760	6.913	6.924	6.934	6.945	6.956	6.967	6.977	6.988	6.999	7.010	7.020
770	7.020	7.031	7.042	7.053	7.064	7.074	7.085	7.096	7.107	7.117	7.128
780	7.128	7.139	7.150	7.161	7.172	7.182	7.193	7.204	7.215	7.226	7.236
790	7.236	7.247	7.258	7.269	7.280	7.291	7.302	7.312	7.323	7.334	7.345
800	7.345	7.356	7.367	7.378	7.388	7.399	7.410	7.421	7.432	7.443	7.454
810	7.454	7.465	7.476	7.487	7.497	7.508	7.519	7.530	7.541	7.552	7.563
820	7.563	7.574	7.585	7.596	7.607	7.618	7.629	7.640	7.651	7.662	7.673
830	7.673	7.684	7.695	7.706	7.717	7.728	7.739	7.750	7.761	7.772	7.783
840	7.783	7.794	7.805	7.816	7.827	7.838	7.849	7.860	7.871	7.882	7.893

°C	-10	-9	-8	-7</
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## Thermocouple type:

# R

Operating Range:

0 à +1600°C

Colour according CEI 60584-3 (+ / -):

Orange / White

Thermocouple Alloys (+ / -):

Platinum-Rhodium(13%) / Platinum

Tolerance according CEI 60584-3

Class 1:

±1.0°C from 0 to +1100°C & ±1+0.003.(T°-1100) from 1100 to 1600°C

Class 2:

±1.5°C from 0 to +600°C & ±0.0025xT° from 600 to 1600°C

Tolerance according MC96.1

Special Limit:

0,6°C or 0,1%

Standard:

1,5°C or 0,25%

Thermoelectric EMF (mV) on temperature basis:

°C	0	1	2	3	4	5	6	7	8	9	10
-40	-0,226	-0,223	-0,219	-0,215	-0,211	-0,208	-0,204	-0,200	-0,196	-0,192	-0,188
-30	-0,188	-0,184	-0,180	-0,175	-0,171	-0,167	-0,163	-0,158	-0,154	-0,150	-0,145
-20	-0,145	-0,141	-0,137	-0,132	-0,128	-0,123	-0,119	-0,114	-0,109	-0,105	-0,100
-10	-0,100	-0,095	-0,091	-0,086	-0,081	-0,076	-0,071	-0,066	-0,061	-0,056	-0,051
0	-0,051	-0,046	-0,041	-0,036	-0,031	-0,026	-0,021	-0,016	-0,011	-0,005	0,000

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1
850	8,571	8,584	8,597	8,609	8,622	8,634	8,647	8,659	8,672	8,685
860	8,697	8,710	8,722	8,735	8,748	8,760	8,773	8,785	8,798	8,811
870	8,823	8,836	8,849	8,861	8,874	8,887	8,899	8,912	8,925	8,937
880	8,950	8,963	8,975	8,988	9,001	9,014	9,026	9,039	9,052	9,065
890	9,077	9,090	9,103	9,115	9,128	9,141	9,154	9,167	9,179	9,192
900	9,205	9,218	9,230	9,243	9,256	9,269	9,282	9,294	9,307	9,320
910	9,333	9,346	9,359	9,371	9,384	9,397	9,410	9,423	9,436	9,449
920	9,461	9,474	9,487	9,500	9,513	9,526	9,539	9,552	9,565	9,578
930	9,590	9,603	9,616	9,629	9,642	9,655	9,668	9,681	9,694	9,707
940	9,720	9,733	9,746	9,759	9,772	9,785	9,798	9,811	9,824	9,837
950	9,850	9,863	9,876	9,889	9,902	9,915	9,928	9,941	9,954	9,967
960	9,980	9,993	10,006	10,019	10,032	10,046	10,059	10,072	10,085	10,098
970	10,111	10,124	10,137	10,150	10,163	10,177	10,190	10,203	10,216	10,229
980	10,242	10,255	10,268	10,282	10,295	10,308	10,321	10,334	10,347	10,361
990	10,374	10,387	10,400	10,413	10,427	10,440	10,453	10,466	10,480	10,493
1000	10,506	10,519	10,532	10,546	10,559	10,572	10,585	10,599	10,612	10,625
1010	10,638	10,652	10,665	10,678	10,692	10,705	10,718	10,731	10,745	10,758
1020	10,771	10,785	10,798	10,811	10,825	10,838	10,851	10,865	10,878	10,891
1030	10,905	10,918	10,932	10,945	10,958	10,972	10,985	10,998	11,012	11,025
1040	11,039	11,052	11,065	11,079	11,092	11,106	11,119	11,132	11,146	11,159
1050	11,173	11,186	11,200	11,213	11,227	11,240	11,253	11,267	11,281	11,294
1060	11,307	11,321	11,334	11,348	11,361	11,375	11,388	11,402	11,415	11,429
1070	11,442	11,456	11,469	11,483	11,496	11,510	11,524	11,537	11,551	11,564
1080	11,578	11,591	11,605	11,618	11,632	11,646	11,659	11,673	11,686	11,700
1090	11,714	11,727	11,741	11,754	11,768	11,782	11,795	11,809	11,822	11,836
1100	11,850	11,863	11,877	11,891	11,904	11,918	11,931	11,945	11,959	11,972
1110	11,986	12,000	12,013	12,027	12,041	12,054	12,068	12,082	12,096	12,109
1120	12,123	12,137	12,150	12,164	12,178	12,191	12,205	12,219	12,233	12,246
1130	12,260	12,274	12,288	12,301	12,315	12,329	12,342	12,356	12,370	12,384
1140	12,397	12,411	12,425	12,439	12,453	12,466	12,480	12,494	12,508	12,521
1150	12,535	12,549	12,563	12,577	12,590	12,604	12,618	12,632	12,646	12,659
1160	12,673	12,687	12,701	12,715	12,729	12,742	12,756	12,770	12,784	12,798
1170	12,812	12,825	12,839	12,853	12,867	12,881	12,895	12,909	12,922	12,936
1180	12,950	12,964	12,978	12,992	13,006	13,019	13,033	13,047	13,061	13,075
1190	13,089	13,103	13,117	13,131	13,145	13,158	13,172	13,186	13,200	13,214
1200	13,228	13,242	13,256	13,270	13,284	13,298	13,311	13,325	13,339	13,353
1210	13,367	13,381	13,395	13,409	13,423	13,437	13,451	13,465	13,479	13,493
1220	13,507	13,521	13,535	13,549	13,563	13,577	13,590	13,604	13,618	13,632
1230	13,646	13,660	13,674	13,688	13,702	13,716	13,730	13,744	13,758	13,772
1240	13,786	13,800	13,814	13,828	13,842	13,856	13,870	13,884	13,898	13,912
1250	13,926	13,940	13,954	13,968	13,982	13,996	14,010	14,024	14,038	14,052
1260	14,066	14,081	14,095	14,109	14,123	14,137	14,151	14,165	14,179	14,193
1270	14,207	14,221	14,235	14,249	14,263	14,277	14,291	14,305	14,319	14,333
1280	14,347	14,361	14,375	14,390	14,404	14,418	14,432	14,446	14,460	14,474
1290	14,488	14,502	14,516	14,530	14,544	14,558	14,572	14,586	14,600	14,615
1300	14,629	14,643	14,657	14,671	14,685	14,699	14,713	14,727	14,741	14,755
1310	14,770	14,784	14,798	14,812	14,826	14,840	14,854	14,868	14,882	14,896
1320	14,911	14,925	14,939	14,953	14,967	14,981	14,995	15,009	15,023	15,037
1330	15,052	15,066	15,080	15,094	15,108	15,122	15,136	15,150	15,164	15,179
1340	15,193	15,207	15,221	15,235	15,249	15,263	15,277	15,291	15,305	15,320
1350	15,334	15,348	15,362	15,376	15,390	15,404	15,418	15,432	15,446	15,461
1360	15,475	15,489	15,503	15,517	15,531	15,545	15,560	15,574	15,588	15,602
1370	15,616	15,630	15,645	15,659	15,673	15,687	15,701	15,715	15,729	15,743
1380	15,758	15,772	15,786	15,800	15,814	15,828	15,842	15,856	15,871	15,885
1390	15,899	15,913	15,927	15,941	15,955	15,969	15,984	15,998	16,012	16,026
1400	16,040	16,054	16,068	16,082	16,097	16,111	16,125	16,139	16,153	16,167
1410	16,181	16,196	16,210	16,224	16,238	16,252	16,266	16,280	16,294	16,309
1420	16,323	16,337	16,351	16,365	16,379	16,393	16,407	16,422	16,436	16,450
1430	16,464	16,478	16,492	16,506	16,520	16,534	16,549	16,563	16,577	16,591
1440	16,605	16,619	16,633	16,647	16,662	16,676	16,690	16,704	16,718	16,732
1450	16,746	16,760	16,774	16,788	16,803	16,817	16,831	16,845	16,859	16,873
1460	16,887	16,901	16,915	16,930	16,944	16,958	16,972	16,986	17,000	17,014
1470	17,028	17,042	17,056	17,071	17,085	17,099	17,113	17,127	17,141	17,155
1480	17,169	17,183	17,197	17,211	17,225	17,240	17,254	17,268	17,282	17,296
1490	17,310	17,324	17,338	17,352	17,366	17,380	17,394	17,408	17,423	17,437
1500	17,451	17,465	17,479	17,493	17,507	17,521	17,535	17,549	17,563	17,577
1510	17,591	17,605	17,619	17,633	17,647	17,661	17,675	17,690	17,704	17,718
1520	17,732	17,746	17,760	17,774	17,788	17,802	17,816	17,830	17,844	17,858
1530	17,872	17,886	17,900	17,914	17,928	17,942	17,956	17,970	17,984	17,998
1540	18,012	18,026	18,040	18,054	18,068	18,082	18,096	18,110	18,124	18,138
1550	18,152	18,166	18,180	18,194	18,208	18,222	18,236	18,250	18,264	18,278
1560	18,292	18,306	18,320	18,334	18,348	18,362	18,376	18,390	18,404	18,417
1570	18,431	18,445	18,459	18,473	18,487	18,501	18,515	18,529	18,543	18,557
1580	18,571	18,585	18,599	18,613	18,627	18,640	18,654	18,668	18,682	18,696
1590	18,710	18,724	18,738	18,752	18,766	18,779	18,793	18,807	18,821	18,835
1600	18,849	18,863	18,877	18,891	18,904	18,918	18,932	18,946	18,960	18,974
1610	18,988	19,002	19,015	19,029	19,043	19,057	19,071	19,085	19,099	19,112
1620	19,126	19,140	19,154	19,168	19,181	19,195	19,209	19,223	19,237	19,250
1630	19,264	19,278	19,292	19,306	19,319	19,333	19,347	19,361	19,375	19,388
1640	19,402	19,416	19,430	19,444	19,457	19,471	19,485	19,499	19,512	19,526
1650	19,540	19,554	19,567	19,581	19,595	19,609	19,622	19,636	19,650	19,663
1660	19,677	19,691	19,705	19,718	19,732	19,746	19,759	19,773	19,787	19,800
1670	19,814	19,828	19,841	19,855	19,869	19,882	19,896	19,910	19,923	19,937
1680	19,951	19,964	19,978	19,992	20,005	20,019	20,032	20,046	20,060	20,073
1690	20,087	20,100	20,114	20,127	20,141	20,154	20,168	20,181	20,195	20,208
1700	20,222	20,235	20,249	20,262	20,275	20,289				

## Thermocouple type:

# B

Operating Range: +600 à +1700°C  
 Colour according CEI 60584-3 (+ / -): Grey / White  
 Thermocouple Alloys (+ / -): Platinum-Rhodium(30%) / Platinum-Rhodium(6%)  
 Tolerance according CEI 60584-3 Class 1: /  
 Class 2: ±0.0025xT° from 600 to +1700°C  
 Tolerance according MC96.1 Special Limit: /  
 Standard: 0,5°C over 800°C  
 Thermoelectric EMF (mV) on temperature basis:

°C	0	1	2	3	4	5	6	7	8	9	10
0	0.000	0.000	0.000	-0.001	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.002
10	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002	-0.003	-0.003	-0.003
20	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.003	-0.004	-0.004	-0.004
30	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.004	-0.005	-0.005	-0.005
40	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.002	0.002
50	0.002	0.003	0.003	0.003	0.004	0.004	0.004	0.005	0.005	0.006	0.006
60	0.006	0.007	0.007	0.008	0.008	0.009	0.009	0.010	0.010	0.011	0.011
70	0.011	0.012	0.012	0.013	0.014	0.014	0.015	0.015	0.016	0.017	0.017
80	0.017	0.018	0.019	0.020	0.020	0.021	0.022	0.022	0.023	0.024	0.025
90	0.025	0.026	0.026	0.027	0.028	0.029	0.030	0.031	0.031	0.032	0.033
100	0.033	0.034	0.035	0.036	0.037	0.038	0.039	0.040	0.041	0.042	0.043
110	0.043	0.044	0.045	0.046	0.047	0.048	0.049	0.050	0.051	0.052	0.053
120	0.053	0.055	0.056	0.057	0.058	0.059	0.060	0.062	0.063	0.064	0.065
130	0.065	0.066	0.068	0.069	0.070	0.072	0.073	0.074	0.075	0.077	0.078
140	0.078	0.079	0.081	0.082	0.084	0.085	0.086	0.088	0.089	0.091	0.092
150	0.092	0.094	0.095	0.096	0.098	0.099	0.101	0.102	0.104	0.106	0.107
160	0.107	0.109	0.110	0.112	0.113	0.115	0.117	0.118	0.120	0.122	0.123
170	0.123	0.125	0.127	0.128	0.130	0.132	0.134	0.135	0.137	0.139	0.141
180	0.141	0.142	0.144	0.146	0.148	0.150	0.151	0.153	0.155	0.157	0.159
190	0.159	0.161	0.163	0.165	0.166	0.168	0.170	0.172	0.174	0.176	0.178
200	0.178	0.180	0.182	0.184	0.186	0.188	0.190	0.192	0.195	0.197	0.199
210	0.199	0.201	0.203	0.205	0.207	0.209	0.212	0.214	0.216	0.218	0.220
220	0.220	0.222	0.225	0.227	0.229	0.231	0.234	0.236	0.238	0.241	0.243
230	0.243	0.245	0.248	0.250	0.252	0.255	0.257	0.259	0.262	0.264	0.267
240	0.267	0.269	0.271	0.274	0.276	0.279	0.281	0.284	0.286	0.289	0.291
250	0.291	0.294	0.296	0.299	0.301	0.304	0.307	0.309	0.312	0.314	0.317
260	0.317	0.320	0.322	0.325	0.328	0.330	0.333	0.336	0.338	0.341	0.344
270	0.344	0.347	0.349	0.352	0.355	0.358	0.360	0.363	0.366	0.369	0.372
280	0.372	0.375	0.377	0.380	0.383	0.386	0.389	0.392	0.395	0.398	0.401
290	0.401	0.404	0.407	0.410	0.413	0.416	0.419	0.422	0.425	0.428	0.431
300	0.431	0.434	0.437	0.440	0.443	0.446	0.449	0.452	0.455	0.458	0.462
310	0.462	0.465	0.468	0.471	0.474	0.478	0.481	0.484	0.487	0.490	0.494
320	0.494	0.497	0.500	0.503	0.507	0.510	0.513	0.517	0.520	0.523	0.527
330	0.527	0.530	0.533	0.537	0.540	0.544	0.547	0.551	0.554	0.557	0.561
340	0.561	0.564	0.568	0.571	0.575	0.578	0.582	0.585	0.589	0.592	0.596
350	0.596	0.599	0.603	0.607	0.610	0.614	0.617	0.621	0.625	0.628	0.632
360	0.632	0.636	0.639	0.643	0.647	0.650	0.654	0.658	0.662	0.665	0.669
370	0.669	0.673	0.677	0.680	0.684	0.688	0.692	0.696	0.700	0.703	0.707
380	0.707	0.711	0.715	0.719	0.723	0.727	0.731	0.735	0.738	0.742	0.746
390	0.746	0.750	0.754	0.758	0.762	0.766	0.770	0.774	0.778	0.782	0.787
400	0.787	0.791	0.795	0.799	0.803	0.807	0.811	0.815	0.819	0.824	0.828
410	0.828	0.832	0.836	0.840	0.844	0.849	0.853	0.857	0.861	0.866	0.870
420	0.870	0.874	0.878	0.883	0.887	0.891	0.896	0.900	0.904	0.909	0.913
430	0.913	0.917	0.922	0.926	0.930	0.935	0.939	0.944	0.948	0.953	0.957
440	0.957	0.961	0.966	0.970	0.975	0.979	0.984	0.988	0.993	0.997	1.002
450	1.002	1.007	1.011	1.016	1.020	1.025	1.030	1.034	1.039	1.043	1.048
460	1.048	1.053	1.057	1.062	1.067	1.071	1.076	1.081	1.086	1.090	1.095
470	1.095	1.100	1.105	1.109	1.114	1.119	1.124	1.129	1.133	1.138	1.143
480	1.143	1.148	1.153	1.158	1.163	1.167	1.172	1.177	1.182	1.187	1.192
490	1.192	1.197	1.202	1.207	1.212	1.217	1.222	1.227	1.232	1.237	1.242
500	1.242	1.247	1.252	1.257	1.262	1.267	1.272	1.277	1.282	1.288	1.293
510	1.293	1.298	1.303	1.308	1.313	1.318	1.324	1.329	1.334	1.339	1.344
520	1.344	1.350	1.355	1.360	1.365	1.371	1.376	1.381	1.387	1.392	1.397
530	1.397	1.402	1.408	1.413	1.418	1.424	1.429	1.435	1.440	1.445	1.451
540	1.451	1.456	1.462	1.467	1.472	1.478	1.483	1.489	1.494	1.500	1.505
550	1.505	1.511	1.516	1.522	1.527	1.533	1.539	1.544	1.550	1.555	1.561
560	1.561	1.566	1.572	1.578	1.583	1.589	1.595	1.600	1.606	1.612	1.617
570	1.617	1.623	1.629	1.634	1.640	1.646	1.652	1.657	1.663	1.669	1.675
580	1.675	1.680	1.686	1.692	1.698	1.704	1.709	1.715	1.721	1.727	1.733
590	1.733	1.739	1.745	1.750	1.756	1.762	1.768	1.774	1.780	1.786	1.792
600	1.792	1.798	1.804	1.810	1.816	1.822	1.828	1.834	1.840	1.846	1.852
610	1.852	1.858	1.864	1.870	1.876	1.882	1.888	1.894	1.901	1.907	1.913
620	1.913	1.919	1.925	1.931	1.937	1.944	1.950	1.956	1.962	1.968	1.975
630	1.975	1.981	1.987	1.993	1.999	2.006	2.012	2.018	2.025	2.031	2.037
640	2.037	2.043	2.050	2.056	2.062	2.069	2.075	2.082	2.088	2.094	2.101
650	2.101	2.107	2.113	2.120	2.126	2.133	2.139	2.146	2.152	2.158	2.165
660	2.165	2.171	2.178	2.184	2.191	2.197	2.204	2.210	2.217	2.224	2.230
670	2.230	2.237	2.243	2.250	2.256	2.263	2.270	2.276	2.283	2.289	2.296
680	2.296	2.303	2.309	2.316	2.323	2.329	2.336	2.343	2.350	2.356	2.363
690	2.363	2.370	2.376	2.383	2.390	2.397	2.403	2.410	2.417	2.424	2.431
700	2.431	2.437	2.444	2.451	2.458	2.465	2.472	2.479	2.485	2.492	2.499
710	2.499	2.506	2.513	2.520	2.527	2.534	2.541	2.548	2.555	2.562	2.569
720	2.569	2.576	2.583	2.590	2.597	2.604	2.611	2.618	2.625	2.632	2.639
730	2.639	2.646	2.653	2.660	2.667	2.674	2.681	2.688	2.696	2.703	2.710
740	2.710	2.717	2.724	2.731	2.738	2.746	2.753	2.760	2.767	2.775	2.782
750	2.782	2.789	2.796	2.803	2.811	2.818	2.825	2.832	2.840	2.847	2.854
760	2.854	2.862	2.869	2.876	2.884	2.891	2.898	2.906	2.913	2.921	2.928
770	2.928	2.935	2.943	2.950	2.958	2.965	2.973	2.980	2.987	2.995	3.002
780	3.002	3.010	3.017	3.025	3.032	3.040	3.047	3.055	3.062	3.070	3.078
790	3.078	3.085	3.093	3.101	3.108	3.116	3.123	3.131	3.138	3.146	3.154
800	3.154	3.161	3.169	3.177	3.184	3.192	3.200	3.207	3.215	3.223	3.230
810	3.230	3.238	3.246	3.254	3.261	3.269	3.277	3.285	3.292	3.300	3.308
820	3.308	3.316	3.324	3.331	3.339	3.347	3.355	3.363	3.371	3.379	3.386
830	3.386	3.394	3.402	3.410	3.418	3.426	3.434	3.442	3.450	3.458	3.466
840	3.466	3.474	3.482	3.490	3.498	3.506	3.514	3.522	3.530	3.538	3.546
850	3.546	3.554	3.562	3.570	3.578	3.586	3.594	3.602	3.610	3.618	3.626
860	3.626	3.634	3.643	3.651	3.659	3.667	3.675	3.683	3.692	3.700	3.708
870	3.708	3.716	3.724	3.732	3.741	3.749	3.757	3.765	3.774	3.782	3.790
880	3.790	3.798	3.807	3.815	3.823	3.832	3.840	3.848	3.857	3.865	3.873
890	3.873	3.882	3.890	3.898	3.907	3.915	3.923	3.932	3.940	3.949	3.957
900	3.957	3.965	3.974	3.982	3.991	3.999	4.008	4.016	4.024	4.033	4.041
910	4.041	4.050	4.058	4.067	4.075	4.084	4.093	4.101	4.110	4.118	4.118
920	4.127	4.135	4.144	4.152	4.161	4.170	4.178	4.187	4.195	4.204	4.204
930	4.213	4.221	4.230	4.239	4.247	4.256	4.265	4.273	4.282	4.291	4.291
940	4.299	4.308	4.317	4.326	4.334	4.343	4.352	4.360	4.369	4.378	4.378
950	4.387	4.396	4.404	4.413	4.422	4.431	4.440	4.448	4.457	4.466	4.466
960	4.475	4.484	4.493	4.501	4.510</						

## Thermocouple type:

# N

Operating Range: -40 à +1200°C  
 Colour according CEI 60584-3 (+ / -): Pink / White  
 Thermocouple Alloys (+ / -): Nicrosil (Nickel-14,2% + Chromium-1,4% + Silicium) / Nisil (Nickel-4,4% + Silicium + Magnesium-0,1%)  
 Tolerance according CEI 60584-3 Class 1: ±1.5°C from -40 to +375°C & ±0.004xT° from 375 to 1000°C  
 Class 2: ±2.5°C from -40 to +333°C & ±0.0075xT° from 333 to 1000°C  
 Tolerance according MC96.1 Special Limit: 1,1°C or 0,4%, Standard: 2,2°C or 0,75% over 0°C & 2,2°C or 2,0% under 0°C  
 Thermoelectric EMF (mV) on temperature basis:

°C	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0
-260	-4,345	-4,345	-4,344	-4,344	-4,343	-4,342	-4,341	-4,340	-4,339	-4,337	-4,336
-250	-4,338	-4,334	-4,332	-4,330	-4,328	-4,326	-4,324	-4,321	-4,319	-4,318	-4,313
-240	-4,313	-4,310	-4,307	-4,304	-4,300	-4,297	-4,293	-4,289	-4,285	-4,281	-4,277
-230	-4,277	-4,273	-4,268	-4,263	-4,258	-4,254	-4,248	-4,243	-4,238	-4,232	-4,226
-220	-4,226	-4,221	-4,215	-4,209	-4,202	-4,196	-4,189	-4,183	-4,176	-4,169	-4,162
-210	-4,162	-4,154	-4,147	-4,140	-4,132	-4,124	-4,116	-4,108	-4,100	-4,091	-4,083
-200	-4,083	-4,074	-4,066	-4,057	-4,048	-4,038	-4,029	-4,020	-4,010	-4,000	-3,990
-190	-3,990	-3,980	-3,970	-3,960	-3,950	-3,939	-3,928	-3,918	-3,907	-3,898	-3,884
-180	-3,884	-3,873	-3,862	-3,850	-3,838	-3,827	-3,815	-3,803	-3,790	-3,778	-3,766
-170	-3,766	-3,753	-3,740	-3,728	-3,715	-3,702	-3,688	-3,675	-3,662	-3,648	-3,634
-160	-3,634	-3,621	-3,607	-3,593	-3,578	-3,564	-3,550	-3,535	-3,521	-3,506	-3,491
-150	-3,491	-3,476	-3,461	-3,446	-3,431	-3,415	-3,400	-3,384	-3,368	-3,352	-3,336
-140	-3,336	-3,320	-3,304	-3,288	-3,271	-3,255	-3,238	-3,221	-3,205	-3,188	-3,171
-130	-3,171	-3,153	-3,136	-3,119	-3,101	-3,084	-3,066	-3,048	-3,030	-3,012	-2,994
-120	-2,994	-2,976	-2,958	-2,939	-2,921	-2,902	-2,883	-2,865	-2,846	-2,827	-2,808
-110	-2,808	-2,789	-2,769	-2,750	-2,730	-2,711	-2,691	-2,672	-2,652	-2,632	-2,612
-100	-2,612	-2,592	-2,571	-2,551	-2,531	-2,510	-2,490	-2,469	-2,448	-2,428	-2,407
-90	-2,407	-2,386	-2,365	-2,344	-2,322	-2,301	-2,280	-2,258	-2,237	-2,215	-2,193
-80	-2,193	-2,172	-2,150	-2,128	-2,106	-2,084	-2,062	-2,039	-2,017	-1,995	-1,972
-70	-1,972	-1,950	-1,927	-1,905	-1,882	-1,859	-1,836	-1,813	-1,790	-1,767	-1,744
-60	-1,744	-1,721	-1,698	-1,674	-1,651	-1,627	-1,604	-1,580	-1,557	-1,533	-1,509
-50	-1,509	-1,485	-1,462	-1,438	-1,414	-1,390	-1,366	-1,341	-1,317	-1,293	-1,269
-40	-1,269	-1,244	-1,220	-1,195	-1,171	-1,146	-1,122	-1,097	-1,072	-1,048	-1,023
-30	-1,023	-0,998	-0,973	-0,948	-0,923	-0,898	-0,873	-0,848	-0,823	-0,798	-0,772
-20	-0,772	-0,747	-0,722	-0,696	-0,671	-0,646	-0,620	-0,595	-0,569	-0,544	-0,518
-10	-0,518	-0,492	-0,467	-0,441	-0,415	-0,390	-0,364	-0,338	-0,312	-0,286	-0,260
0	-0,260	-0,234	-0,209	-0,183	-0,157	-0,131	-0,104	-0,078	-0,052	-0,026	0,000

°C	0	1	2	3	4	5	6	7	8	9
510	17,131	17,169	17,208	17,246	17,285	17,323	17,361	17,400	17,438	17,477
520	17,515	17,554	17,592	17,630	17,669	17,707	17,746	17,784	17,823	17,861
530	17,900	17,938	17,977	18,016	18,054	18,093	18,131	18,170	18,208	18,247
540	18,286	18,324	18,363	18,401	18,440	18,479	18,517	18,556	18,595	18,633
550	18,672	18,711	18,749	18,788	18,827	18,865	18,904	18,943	18,982	19,020
560	19,059	19,096	19,136	19,175	19,214	19,253	19,292	19,330	19,369	19,408
570	19,447	19,485	19,524	19,563	19,602	19,641	19,680	19,718	19,757	19,796
580	19,835	19,874	19,913	19,952	19,990	20,029	20,068	20,107	20,146	20,185
590	20,224	20,263	20,302	20,341	20,379	20,418	20,457	20,496	20,535	20,574
600	20,613	20,652	20,691	20,730	20,769	20,808	20,847	20,886	20,925	20,964
610	21,003	21,042	21,081	21,120	21,159	21,198	21,237	21,276	21,315	21,354
620	21,393	21,432	21,471	21,510	21,549	21,588	21,628	21,667	21,706	21,745
630	21,784	21,823	21,862	21,901	21,940	21,979	22,018	22,058	22,097	22,136
640	22,175	22,214	22,253	22,292	22,331	22,370	22,409	22,448	22,488	22,527
650	22,566	22,605	22,644	22,684	22,723	22,762	22,801	22,840	22,879	22,919
660	22,958	22,997	23,036	23,075	23,115	23,154	23,193	23,232	23,271	23,311
670	23,350	23,389	23,428	23,467	23,507	23,546	23,585	23,624	23,663	23,703
680	23,742	23,781	23,820	23,860	23,899	23,938	23,977	24,016	24,056	24,095
690	24,134	24,173	24,213	24,252	24,291	24,330	24,370	24,409	24,448	24,487
700	24,527	24,566	24,605	24,644	24,684	24,723	24,762	24,801	24,841	24,880
710	24,919	24,959	24,998	25,037	25,076	25,116	25,155	25,194	25,233	25,273
720	25,312	25,351	25,391	25,430	25,469	25,508	25,548	25,587	25,626	25,666
730	25,705	25,744	25,783	25,823	25,862	25,901	25,941	25,980	26,019	26,058
740	26,098	26,137	26,176	26,216	26,255	26,294	26,333	26,373	26,412	26,451
750	26,491	26,530	26,569	26,608	26,648	26,687	26,726	26,766	26,805	26,844
760	26,883	26,923	26,962	27,001	27,041	27,080	27,119	27,158	27,198	27,237
770	27,276	27,316	27,355	27,394	27,433	27,473	27,512	27,551	27,591	27,630
780	27,669	27,708	27,748	27,787	27,826	27,866	27,905	27,944	27,983	28,023
790	28,062	28,101	28,140	28,180	28,219	28,258	28,297	28,337	28,376	28,415
800	28,456	28,494	28,533	28,572	28,612	28,651	28,690	28,729	28,769	28,808
810	28,847	28,886	28,926	28,965	29,004	29,043	29,083	29,122	29,161	29,200
820	29,239	29,279	29,318	29,357	29,396	29,436	29,475	29,514	29,553	29,592
830	29,632	29,671	29,710	29,749	29,789	29,828	29,867	29,906	29,945	29,985
840	30,024	30,063	30,102	30,141	30,181	30,220	30,259	30,298	30,337	30,376
850	30,416	30,455	30,494	30,533	30,572	30,611	30,651	30,690	30,729	30,768
860	30,807	30,846	30,886	30,925	30,964	31,003	31,042	31,081	31,120	31,160
870	31,199	31,238	31,277	31,316	31,355	31,394	31,433	31,473	31,512	31,551
880	31,590	31,629	31,668	31,707	31,746	31,785	31,824	31,863	31,903	31,942
890	31,981	32,020	32,059	32,098	32,137	32,176	32,215	32,254	32,293	32,332
900	32,371	32,410	32,449	32,488	32,527	32,566	32,605	32,644	32,683	32,722
910	32,761	32,800	32,839	32,878	32,917	32,956	32,995	33,034	33,073	33,112
920	33,151	33,190	33,229	33,268	33,307	33,346	33,385	33,424	33,463	33,502
930	33,541	33,580	33,619	33,658	33,697	33,736	33,775	33,814	33,853	33,892
940	33,930	33,969	34,008	34,047	34,086	34,124	34,163	34,202	34,241	34,280
950	34,319	34,358	34,396	34,435	34,474	34,513	34,552	34,591	34,629	34,668
960	34,707	34,746	34,785	34,823	34,862	34,901	34,940	34,979	35,018	35,057
970	35,095	35,134	35,172	35,211	35,250	35,289	35,327	35,366	35,405	35,444
980	35,482	35,521	35,560	35,598	35,637	35,676	35,714	35,753	35,792	35,831
990	35,869	35,908	35,946	35,985	36,024	36,062	36,101	36,140	36,179	36,217
1000	36,256	36,294	36,333	36,371	36,410	36,449	36,488	36,527	36,566	36,605
1010	36,841	36,880	36,918	36,957	36,996	37,034	37,073	37,112	37,151	37,190
1020	37,027	37,065	37,104	37,142	37,181	37,219	37,258	37,296	37,334	37,373
1030	37,411	37,450	37,488	37,527	37,565	37,603	37,642	37,680	37,719	37,757
1040	37,795	37,834	37,872	37,911	37,949	37,987	38,026	38,064	38,102	38,141
1050	38,179	38,217	38,256	38,294	38,332	38,370	38,409	38,447	38,485	38,524
1060	38,562	38,600	38,638	38,677	38,715	38,753	38,791	38,829	38,868	38,906
1070	38,944	38,982	39,020	39,059	39,097	39,135	39,173	39,211	39,249	39,287
1080	39,326	39,364	39,402	39,440	39,478	39,516	39,554	39,592	39,630	39,668
1090	39,708	39,746	39,783	39,821	39,859	39,897	39,935	39,973	40,011	40,049
1100	40,087	40,125	40,163	40,201	40,239	40,276	40,314	40,352	40,390	40,428
1110	40,466	40,504	40,542	40,580	40,618	40,655	40,693	40,731	40,769	40,807
1120	40,845	40,883	40,920	40,958	40,996	41,034	41,072	41,109	41,147	41,185
1130	41,223	41,260	41,298	41,336	41,374	41,411	41,449	41,487	41,525	41,562
1140	41,600	41,638	41,675	41,713	41,751	41,788	41,826	41,864	41,901	41,939
1150	41,976	42,014	42,052	42,089	42,127	42,164	42,202	42,239	42,277	42,314
1160	42,352	42,390	42,427	42,465	42,502	42,540	42,577	42,614	42,652	42,689
1170	42,727	42,764	42,802	42,839	42,877	42,914	42,951	42,989	43,026	43,064
1180	43,101	43,138								

# THERMOCOUPLES mV - °C TABLE



## Thermocouple type:

# C (w5)

Operating Range:

0 à +2300°C

Colour according CEI 60584-3 (+ / -):

/

Thermocouple Alloys (+ / -):

Tungsten(5%) Rhenium / Tungsten(26%) Rhenium

Tolerance according CEI 60584-3

Class 1:

/

Class 2:

/

Tolerance according MC96.1

Special Limit:

/

Standard: 4,5°C up to 425°C & 1,0% up to 2320°C

Thermoelectric EMF (mV) on temperature basis:

°C	0	1	2	3	4	5	6	7	8	9	10
0	0,000	0,013	0,026	0,040	0,053	0,067	0,080	0,094	0,107	0,121	0,135
10	0,135	0,148	0,162	0,176	0,189	0,203	0,217	0,231	0,244	0,258	0,272
20	0,272	0,286	0,300	0,314	0,328	0,342	0,356	0,370	0,384	0,398	0,412
30	0,412	0,426	0,440	0,454	0,469	0,483	0,497	0,511	0,525	0,540	0,554
40	0,568	0,583	0,597	0,612	0,626	0,640	0,655	0,669	0,684	0,698	0,713
50	0,728	0,743	0,757	0,772	0,787	0,801	0,816	0,831	0,846	0,861	0,876
60	0,895	0,910	0,925	0,940	0,955	0,970	0,985	1,000	1,015	1,030	1,045
70	1,073	1,088	1,103	1,118	1,133	1,148	1,163	1,178	1,193	1,208	1,223
80	1,241	1,256	1,271	1,286	1,301	1,316	1,331	1,346	1,361	1,376	1,391
90	1,429	1,444	1,459	1,474	1,489	1,504	1,519	1,534	1,549	1,564	1,579
100	1,607	1,622	1,637	1,652	1,667	1,682	1,697	1,712	1,727	1,742	1,757
110	1,795	1,810	1,825	1,840	1,855	1,870	1,885	1,900	1,915	1,930	1,945
120	1,983	1,998	2,013	2,028	2,043	2,058	2,073	2,088	2,103	2,118	2,133
130	2,171	2,186	2,201	2,216	2,231	2,246	2,261	2,276	2,291	2,306	2,321
140	2,359	2,374	2,389	2,404	2,419	2,434	2,449	2,464	2,479	2,494	2,509
150	2,567	2,582	2,597	2,612	2,627	2,642	2,657	2,672	2,687	2,702	2,717
160	2,765	2,780	2,795	2,810	2,825	2,840	2,855	2,870	2,885	2,900	2,915
170	2,973	2,988	2,999	3,010	3,021	3,032	3,043	3,054	3,065	3,076	3,087
180	3,135	3,150	3,165	3,180	3,195	3,210	3,225	3,240	3,255	3,270	3,285
190	3,343	3,358	3,373	3,388	3,403	3,418	3,433	3,448	3,463	3,478	3,493
200	3,501	3,516	3,531	3,546	3,561	3,576	3,591	3,606	3,621	3,636	3,651
210	3,689	3,704	3,719	3,734	3,749	3,764	3,779	3,794	3,809	3,824	3,839
220	3,877	3,892	3,907	3,922	3,937	3,952	3,967	3,982	3,997	4,012	4,027
230	4,065	4,080	4,095	4,110	4,125	4,140	4,155	4,170	4,185	4,200	4,215
240	4,253	4,268	4,283	4,298	4,313	4,328	4,343	4,358	4,373	4,388	4,403
250	4,441	4,456	4,471	4,486	4,501	4,516	4,531	4,546	4,561	4,576	4,591
260	4,629	4,644	4,659	4,674	4,689	4,704	4,719	4,734	4,749	4,764	4,779
270	4,817	4,832	4,847	4,862	4,877	4,892	4,907	4,922	4,937	4,952	4,967
280	5,015	5,030	5,045	5,060	5,075	5,090	5,105	5,120	5,135	5,150	5,165
290	5,203	5,218	5,233	5,248	5,263	5,278	5,293	5,308	5,323	5,338	5,353
300	5,401	5,416	5,431	5,446	5,461	5,476	5,491	5,506	5,521	5,536	5,551
310	5,601	5,616	5,631	5,646	5,661	5,676	5,691	5,706	5,721	5,736	5,751
320	5,799	5,814	5,829	5,844	5,859	5,874	5,889	5,904	5,919	5,934	5,949
330	5,997	6,012	6,027	6,042	6,057	6,072	6,087	6,102	6,117	6,132	6,147
340	6,195	6,210	6,225	6,240	6,255	6,270	6,285	6,300	6,315	6,330	6,345
350	6,383	6,398	6,413	6,428	6,443	6,458	6,473	6,488	6,503	6,518	6,533
360	6,571	6,586	6,601	6,616	6,631	6,646	6,661	6,676	6,691	6,706	6,721
370	6,759	6,774	6,789	6,804	6,819	6,834	6,849	6,864	6,879	6,894	6,909
380	6,947	6,962	6,977	6,992	7,007	7,022	7,037	7,052	7,067	7,082	7,097
390	7,135	7,150	7,165	7,180	7,195	7,210	7,225	7,240	7,255	7,270	7,285
400	7,323	7,338	7,353	7,368	7,383	7,398	7,413	7,428	7,443	7,458	7,473
410	7,511	7,526	7,541	7,556	7,571	7,586	7,601	7,616	7,631	7,646	7,661
420	7,709	7,724	7,739	7,754	7,769	7,784	7,799	7,814	7,829	7,844	7,859
430	7,907	7,922	7,937	7,952	7,967	7,982	7,997	8,012	8,027	8,042	8,057
440	8,105	8,120	8,135	8,150	8,165	8,180	8,195	8,210	8,225	8,240	8,255
450	8,303	8,318	8,333	8,348	8,363	8,378	8,393	8,408	8,423	8,438	8,453
460	8,501	8,516	8,531	8,546	8,561	8,576	8,591	8,606	8,621	8,636	8,651
470	8,709	8,724	8,739	8,754	8,769	8,784	8,799	8,814	8,829	8,844	8,859
480	8,907	8,922	8,937	8,952	8,967	8,982	8,997	9,012	9,027	9,042	9,057
490	9,105	9,120	9,135	9,150	9,165	9,180	9,195	9,210	9,225	9,240	9,255
500	9,303	9,318	9,333	9,348	9,363	9,378	9,393	9,408	9,423	9,438	9,453
510	9,501	9,516	9,531	9,546	9,561	9,576	9,591	9,606	9,621	9,636	9,651
520	9,709	9,724	9,739	9,754	9,769	9,784	9,799	9,814	9,829	9,844	9,859
530	9,907	9,922	9,937	9,952	9,967	9,982	9,997	10,012	10,027	10,042	10,057
540	10,105	10,120	10,135	10,150	10,165	10,180	10,195	10,210	10,225	10,240	10,255
550	10,303	10,318	10,333	10,348	10,363	10,378	10,393	10,408	10,423	10,438	10,453
560	10,501	10,516	10,531	10,546	10,561	10,576	10,591	10,606	10,621	10,636	10,651
570	10,709	10,724	10,739	10,754	10,769	10,784	10,799	10,814	10,829	10,844	10,859
580	10,907	10,922	10,937	10,952	10,967	10,982	10,997	11,012	11,027	11,042	11,057
590	11,105	11,120	11,135	11,150	11,165	11,180	11,195	11,210	11,225	11,240	11,255
600	11,303	11,318	11,333	11,348	11,363	11,378	11,393	11,408	11,423	11,438	11,453
610	11,501	11,516	11,531	11,546	11,561	11,576	11,591	11,606	11,621	11,636	11,651
620	11,709	11,724	11,739	11,754	11,769	11,784	11,799	11,814	11,829	11,844	11,859
630	11,907	11,922	11,937	11,952	11,967	11,982	11,997	12,012	12,027	12,042	12,057
640	12,105	12,120	12,135	12,150	12,165	12,180	12,195	12,210	12,225	12,240	12,255
650	12,303	12,318	12,333	12,348	12,363	12,378	12,393	12,408	12,423	12,438	12,453
660	12,501	12,516	12,531	12,546	12,561	12,576	12,591	12,606	12,621	12,636	12,651
670	12,709	12,724	12,739	12,754	12,769	12,784	12,799	12,814	12,829	12,844	12,859
680	12,907	12,922	12,937	12,952	12,967	12,982	12,997	13,012	13,027	13,042	13,057
690	13,105	13,120	13,135	13,150	13,165	13,180	13,195	13,210	13,225	13,240	13,255
700	13,303	13,318	13,333	13,348	13,363	13,378	13,393	13,408	13,423	13,438	13,453
710	13,501	13,516	13,531	13,546	13,561	13,576	13,591	13,606	13,621	13,636	13,651
720	13,709	13,724	13,739	13,754	13,769	13,784	13,799	13,814	13,829	13,844	13,859
730	13,907	13,922	13,937	13,952	13,967	13,982	13,997	14,012	14,027	14,042	14,057
740	14,105	14,120	14,135	14,150	14,165	14,180	14,195	14,210	14,225	14,240	14,255
750	14,303	14,318	14,333	14,348	14,363	14,378	14,393	14,408	14,423	14,438	14,453
760	14,501	14,516	14,531	14,546	14,561	14,576	14,591	14,606	14,621	14,636	14,651
770	14,709	14,724	14,739	14,754	14,769	14,784	14,799	14,814	14,829	14,844	14,859
780	14,907	14,922	14,937	14,952	14,967	14,982	14,997	15,012	15,027	15,042	15,057
790	15,105	15,120	15,135	15,150	15,165	15,180	15,195	15,210	15,225	15,240	15,255
800	15,303	15,318	15,333	15,348	15,363	15,378	15,393	15,408	15,423	15,438	15,453
810	15,501	15,516	15,531	15,546	15,561	15,576	15,591	15,606	15,621	15,636	15,651
820	15,709	15,724	15,739	15,754	15,769	15,784	15,799	15,814	15,829	15,844	15,859
830	15,907	15,922	15,937	15,952	15,967	15,982	15,997	16,012	16,027	16,042	16,057
840	16,105	16,120	16,135	16,150	16,165	16,180	16,195	16,210	16,225	16,240	16,255
850	16,303	16,318	16,333	16,348	16,363	16,378	16,393	16,408	16,423	16,438	16,453
860	16,501	16,516	16,531	16,546	16,561	16,576	16,591	16,606	16,621	16,636	16,651
870	16,709	16,724	16,739	16,754	16,769	16,784	16,799	16,814	16,829	16,844	16,859
880	16,907	16,922	16,937	16,952	16,967	16,982	16,997	17,012	17,027	17,042	17,057
890	17,105	17,									

**Thermocouple type:**

**D(w3)**

Operating Range: 0 à +2300°C  
 Colour according CEI 60584-3 (+ / -): /  
 Thermocouple Alloys (+ / -): Tungsten(3%) Rhenium / Tungsten(25%) Rhenium  
 Tolerance according CEI 60584-3 Class 1: /  
 Class 2: /  
 Tolerance according MC96.1 Special Limit: /  
 Standard: 4,5°C up to 425°C & 1,0% up to 2320°C  
 Thermoelectric EMF (mV) on temperature basis:

°C	0	10	20	30	40	50	60	70	80	90	100
0	0,000	0,098	0,199	0,305	0,415	0,513	0,644	0,765	0,888	1,015	1,145
100	1,145	1,278	1,414	1,554	1,696	1,840	1,988	2,137	2,290	2,445	2,602
200	2,602	2,761	2,923	3,087	3,253	3,420	3,590	3,761	3,935	4,110	4,206
300	4,286	4,464	4,644	4,825	5,008	5,192	5,377	5,863	5,751	5,940	6,129
400	6,129	6,320	6,512	6,705	6,898	7,093	7,288	7,484	7,681	7,879	8,077
500	8,077	8,275	8,475	8,675	8,875	9,076	9,277	9,479	9,681	9,883	10,086
600	10,086	10,289	10,492	10,695	10,899	11,103	11,307	11,511	11,715	11,920	12,124
700	12,124	12,329	12,534	12,738	12,943	13,147	13,352	13,557	13,761	13,966	14,171
800	14,171	14,376	14,580	14,785	14,989	15,194	15,398	15,601	15,805	16,008	16,211
900	16,211	16,414	16,617	16,819	17,021	17,223	17,424	17,625	17,826	18,026	18,226
1000	18,226	18,426	18,625	18,824	19,023	19,221	19,419	19,616	19,813	20,009	20,206
1100	20,206	20,401	20,597	20,791	20,986	21,180	21,373	21,566	21,759	21,951	22,143
1200	22,143	22,334	22,525	22,715	22,905	23,094	23,283	23,471	23,659	23,846	24,033
1300	24,033	24,220	24,405	24,591	24,776	24,961	25,145	25,328	25,511	25,693	25,875
1400	25,875	26,057	26,238	26,416	26,598	26,777	26,956	27,134	27,312	27,489	27,666
1500	27,666	27,842	28,018	28,193	28,368	28,542	28,715	28,888	29,060	29,233	29,404
1600	29,404	29,575	29,745	29,914	30,083	30,252	30,419	30,587	30,753	30,919	31,085
1700	31,085	31,249	31,413	31,577	31,740	31,902	32,063	32,224	32,384	32,543	32,702
1800	32,702	32,860	33,017	33,174	33,330	33,485	33,639	33,792	33,945	34,097	34,248
1900	34,248	34,398	34,547	34,695	34,843	34,989	35,135	35,279	35,423	35,566	35,707
2000	35,707	35,848	35,987	36,126	36,263	36,399	36,535	36,668	36,801	36,933	37,063
2100	37,063	37,192	37,319	37,446	37,571	37,694	37,816	37,937	38,056	38,174	38,290
2200	38,290	38,404	38,517	38,626	38,738	38,845	38,951	39,055	39,158	39,258	39,356
2300	39,356	39,453									