



ITS RTM13 Temperature Sensors



ITS is one of the leading manufacturers of thermocouples, RTDs, PT100s and thermowells in Ireland. ITS produces a variety of temperature sensors and assemblies in both standard and custom designs, which can be found on equipment and in process applications in the chemical, petrochemical, power generation, food & beverage, dairy, plastics, heat-treating, oil & gas, pharmaceutical, aerospace, biomass, metal processing, rubber, mining, HVAC, water & wastewater, incineration, and many other industries.

- RTDs and thermocouples available to meet any process requirement
- Integrated temperature assembly with transmitters available
- Temperature range of -196 to 650 °C for RTD, -196 to 1450 °C for thermocouple
- Industry-standard sensor types, including RTD and thermocouple varieties
- Variety of enclosure and connection head options
- Calibration services available


Overview

- Sensor with cable & sanitary process Tri-Clover
- Immersion depth & cable configurable
- PT100, PT1000, 4 ... 20 mA or HART output
- Class configurable


Technical data
Performance characteristics

Pt100 accuracy class (EN 60751)	A ($\pm 0.15 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm (0.15 + 0.002 \times t)^\circ\text{C}$ 1/3 B ($\pm 0.1 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/3 \times (0.3 + 0.005 \times t)^\circ\text{C}$ 1/10 B ($\pm 0.03 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/10 \times (0.3 + 0.005 \times t)^\circ\text{C}$
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Pt1000 accuracy class (EN 60751)	A ($\pm 0.15 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm (0.15 + 0.002 \times t)^\circ\text{C}$ 1/3 B ($\pm 0.1 \text{ }^\circ\text{C}$ at $0 \text{ }^\circ\text{C}$) $\pm 1/3 \times (0.3 + 0.005 \times t)^\circ\text{C}$
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Max. flow velocity	40 m/s, gases 5 m/s, liquids
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Thermal response time, T50	$\leq 1.5 \text{ s}$, $\varnothing 4 \text{ mm}$ $\leq 6.1 \text{ s}$, $\varnothing 6 \text{ mm}$ $\leq 7.6 \text{ s}$, $\varnothing 8 \text{ mm}$ $\leq 11.1 \text{ s}$, $\varnothing 10 \text{ mm}$
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Process pressure	< 25 bar (water flow 3m/sec for $\varnothing 6 \text{ mm}$)
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Process temperature	Refer to section "Operating conditions"
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Process

Connection variants	1/2" to 4" Tri-Clover
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Sensor length	30 ... 3000 mm
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Sensor diameter outside	Standard $\varnothing 6 \text{ mm}$ Available in increments of 1mm from $\varnothing 3 \text{ mm}$ $\varnothing 12 \text{ mm}$
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Operating Temperature

Limited	100 $^\circ\text{C}$
Standard	250 $^\circ\text{C}$
Medium	350 $^\circ\text{C}$
High	600 $^\circ\text{C}$

Sensor tube material	AISI 316L (1.4404)
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Surface roughness wetted parts

Surface roughness wetted parts	$R_a \leq 0.4 \text{ } \mu\text{m}$
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Ambient conditions

temperature range	Cable selection dependant
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Storage temperature range	Cable selection dependant
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Degree of protection (EN 60529)	IP 65
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Humidity	$\leq 100 \text{ } \% \text{ RH}$, condensing
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Output signal

Without transmitter	1 x Pt100, 3 or 4-wire 2x Pt100, 3-wire 1 x Pt1000, 3-wire 2 x PT1000 3-wire
With transmitter	4 ... 20 mA, 2-wire 4 ... 20 mA, 2-wire + HART®

Cable

Type	Configurable
Length	Configurable
Material	PVC, PTFE, Silicon Rubber, Fibreglass

Electrical connection

Tails	100mm Free tails
Connector	Various upon request
Housing	Option wall enclosure

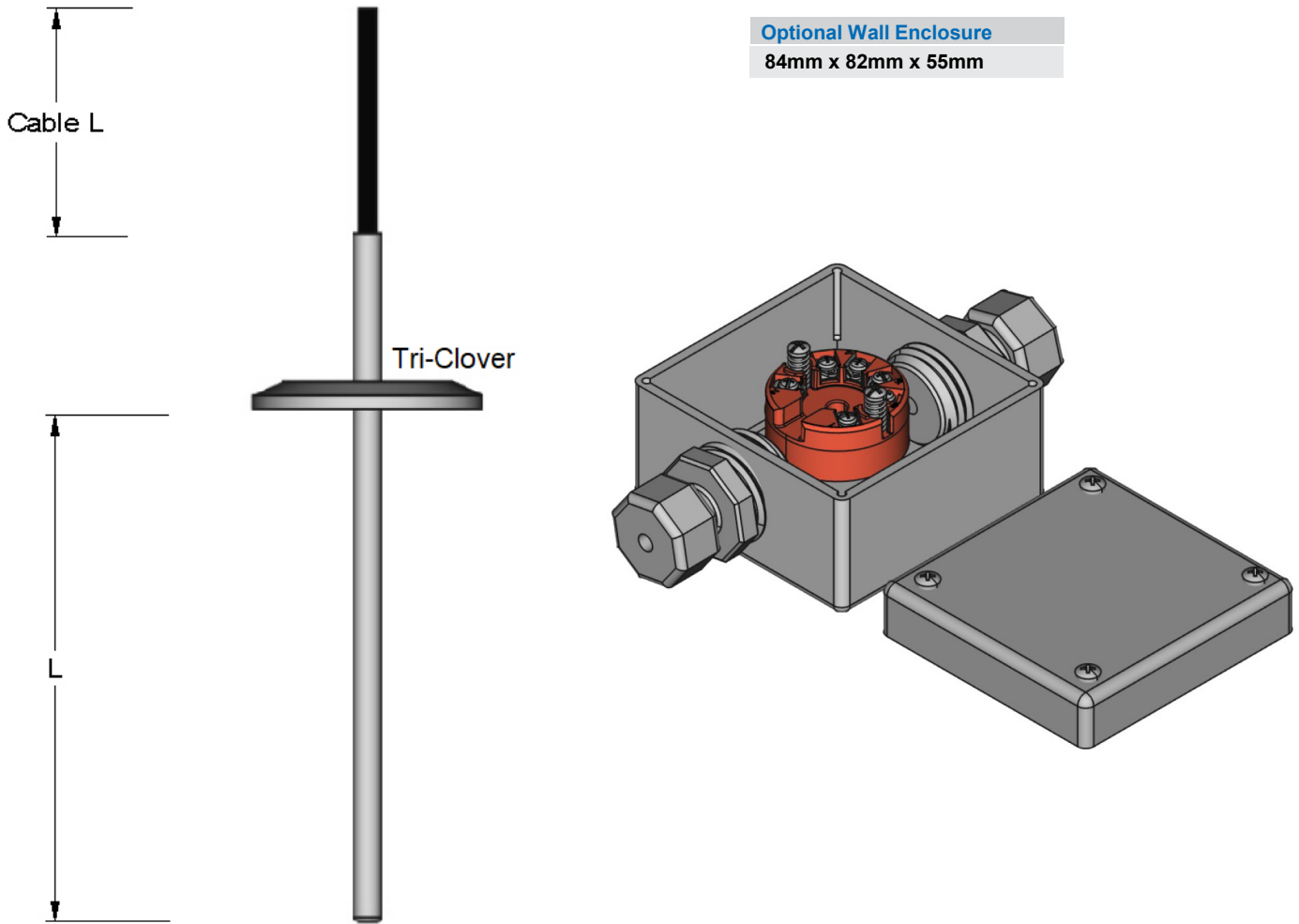
Compliance

EN 61326-1:2013
EN IEC 63000:2018

ATEX

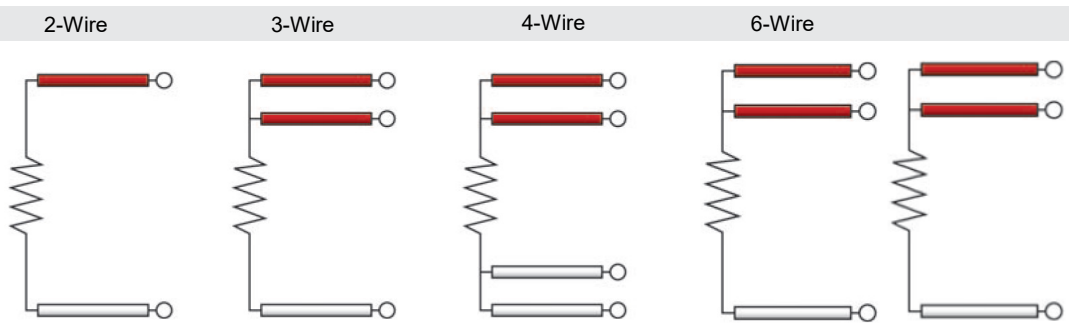
II 1 GD
Ex ia IIC T4 Ga
Ex ia IIIC T135 $^\circ\text{C}$ Da
Ta = -40 $^\circ\text{C}$ to +80 $^\circ\text{C}$

Dimensional drawings (mm)

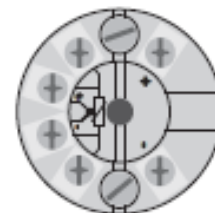
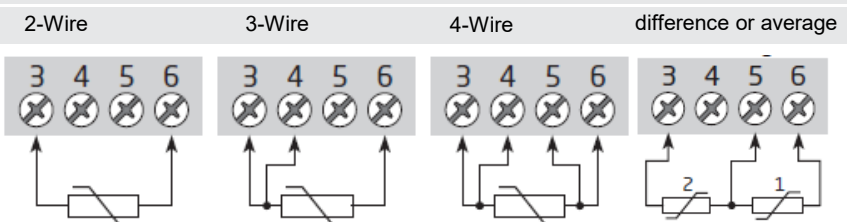


Pt100 sensor wiring & colour code

Colour Code

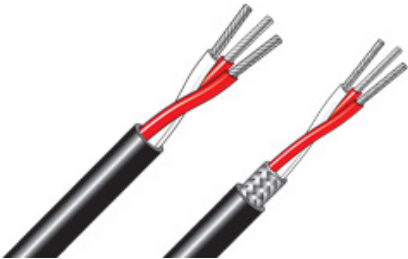


Transmitter Wiring

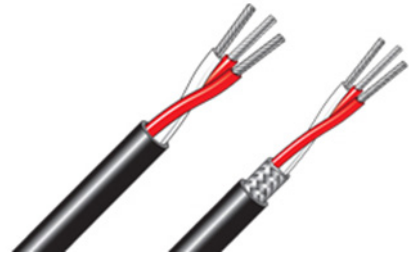


Cable Specification

PVC	PTFE/PFA/MFA
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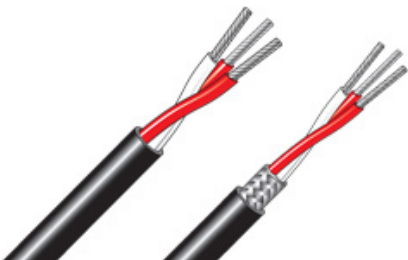
Temperature range -10C to 105C
 Good general-purpose insulation for medium temperature environments. Waterproof and very flexible.



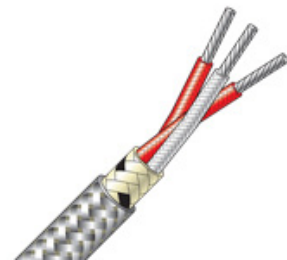
Temperature range -200C to +250C
 Resistant to oils, acids, other adverse agents and fluids. Good mechanical strength and flexibility.

Cable Specification

Silicone Rubber	Fibreglass with overbraid
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Temperature range -50 to +200
 Offers excellent dielectric strength and flexibility. Operation over a wide temperature range and ease of silastic bonding are other outstanding characteristics of silicone rubber cable.



Temperature range -60C to 450C
 Good temperature range but will not prevent ingress of fluids. Fairly flexible but does not provide good mechanical protection.

Stainless Steel Flexible Conduit



- withstands high temperatures
- Durable crush-proof construction
- Corrosion and rust resistant



Configuration & Order Information

Product RTM13TCX #### - ## - ### - ## - #### - ##TC - ##### - #### - ##### - #### - ####

Operating Temperature °C

Limited (LTD) -10C+105C	100C
Standard (STD) -70C+250C	250C
Medium Temperature (MT) -70C+350C	350C
High Temperature (HT) -70C+600C	600C

Number of Wires

3 wire	3W
4 wire	4W

Element/Tolerance

Single Element Class A (±0.15°C @ 0°C)	SA
Dual Element Class A (±0.15°C @ 0°C)	DA
Single Element Class 1/10th Din (±0.03°C @ 0°C)	S10
Dual Element Class 1/10th Din (±0.03°C @ 0°C)	D10
Single Element Class 1/3rd Din (±0.1°C @ 0°C)	S13
Dual Element Class 1/3rd Din (±0.1°C @ 0°C)	D13

Sheath Diameter in mm

Standard 6mm or from 3mm to 12mm increments of 1mm #

Sheath Length in mm

30-3000 #####

Process Connection Tri-Clover

1/2"	12
1"	1
1.5"	1.5
2"	2
2.5"	2.5
3"	3
3.5"	3.5
4"	4

Cable Length in meters

##M

Cable Type

Low Temperature) -10C+100C PVC Screened cable	PVC
Standard (STD) -70C+250C PTFE Screened cable	PTFE
Medium Temperature (MT) -70C+350C Fibreglass with SS overbraid	FGSSOB
Temperature -50C+200C Silicone Rubber Screened cable	SR

Termination If 4...20mA selected specify required programmed range ex. /0+100C

Flying Leads	FL
2-wire programmable transmitter PT100 Input 4/20ma Output	5333A
2-wire programmable transmitter Universal Input 4/20ma Output	5331A
Ex Rated 2-wire programmable transmitter PT100 Input 4/20ma Output	5333D
Ex Rated 2-wire programmable transmitter Universal Input 4/20ma Output	5331D
Ex Rated 2-wire programmable transmitter Universal Input 4/20ma Output HART 5 or HART 7	5337D

Optional wall mounted enclosure

ABS 84mm x 82mm x 55mm wall mount enclosure ABSL

Optional

Cryogenic Element -196 °C + 250 °C	Cryo
Traceable Calibration 3 Point	CC



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RTD Accuracy

ACTUAL	RTD ACCURACY +/- °C PT100 Ω ALPHA 0.003850 to DIN 43760 IEC751 DIN EN 60 751			
	B GRADE	A GRADE	BAND 3 (1/3 DIN)	BAND 5 (1/10 DIN)
-200 °C	1.30 °C	0.55 °C	0.39 °C	0.38 °C
-150 °C	1.05 °C	0.45 °C	0.23 °C	0.21 °C
-100 °C	0.80 °C	0.35 °C	0.15 °C	0.12 °C
-90 °C	0.75 °C	0.33 °C	0.14 °C	0.10 °C
-80 °C	0.70 °C	0.31 °C	0.13 °C	0.09 °C
-70 °C	0.65 °C	0.29 °C	0.12 °C	0.08 °C
-60 °C	0.60 °C	0.27 °C	0.11 °C	0.07 °C
-50 °C	0.55 °C	0.25 °C	0.10 °C	0.06 °C
-40 °C	0.50 °C	0.23 °C	0.10 °C	0.06 °C
-30 °C	0.45 °C	0.21 °C	0.09 °C	0.05 °C
-20 °C	0.40 °C	0.19 °C	0.09 °C	0.04 °C
-10 °C	0.37 °C	0.17 °C	0.08 °C	0.03 °C
0 °C	0.30 °C	0.15 °C	0.08 °C	0.03 °C
10 °C	0.35 °C	0.17 °C	0.09 °C	0.04 °C
20 °C	0.40 °C	0.19 °C	0.10 °C	0.04 °C
30 °C	0.45 °C	0.21 °C	0.11 °C	0.05 °C
40 °C	0.50 °C	0.23 °C	0.12 °C	0.06 °C
50 °C	0.55 °C	0.25 °C	0.13 °C	0.07 °C
60 °C	0.60 °C	0.27 °C	0.14 °C	0.08 °C
70 °C	0.65 °C	0.29 °C	0.16 °C	0.09 °C
80 °C	0.70 °C	0.31 °C	0.17 °C	0.10 °C
90 °C	0.75 °C	0.33 °C	0.18 °C	0.11 °C
100 °C	0.80 °C	0.35 °C	0.19 °C	0.12 °C
110 °C	0.85 °C	0.37 °C	0.20 °C	0.13 °C
120 °C	0.90 °C	0.39 °C	0.21 °C	0.14 °C
130 °C	0.95 °C	0.41 °C	0.22 °C	0.15 °C
140 °C	1.00 °C	0.43 °C	0.24 °C	0.15 °C
150 °C	1.05 °C	0.45 °C	0.25 °C	0.16 °C
160 °C	1.10 °C	0.47 °C	0.26 °C	0.17 °C
170 °C	1.15 °C	0.49 °C	0.27 °C	0.18 °C
180 °C	1.20 °C	0.51 °C	0.29 °C	0.19 °C
190 °C	1.25 °C	0.53 °C	0.30 °C	0.21 °C
200 °C	1.30 °C	0.55 °C	0.31 °C	0.22 °C

Saved as 1393

Platinum Resistance (240°C to 629°C)

Temperature Coefficient - 0.00385 Ohms/Ohm/°C

°C	Ohms	°C	Ohms	°C	Ohms	°C	Ohms	°C	Ohms	°C	Ohms	°C	Ohms
240	190.45	301	212.37	362	233.87	423	254.93	484	275.56	545	295.75	606	315.52
241	190.81	302	212.73	363	234.22	424	255.27	485	275.89	546	296.08	607	315.84
242	191.18	303	213.09	364	234.56	425	255.61	486	276.23	547	296.41	608	316.16
243	191.54	304	213.44	365	234.91	426	255.95	487	276.56	548	296.74	609	316.48
244	191.90	305	213.80	366	235.26	427	256.29	488	276.89	549	297.06		
245	192.26	306	214.15	367	235.61	428	256.63	489	277.23			610	316.80
246	192.63	307	214.51	368	235.96	429	258.98			550	297.39	611	317.12
247	192.99	308	214.86	369	236.31			490	277.56	551	297.72	612	317.44
248	193.35	309	215.22			430	257.32	491	277.90	552	298.04	613	317.76
249	193.71			370	236.65	431	257.66	492	278.23	553	298.37	614	318.08
		310	215.57	371	237.00	432	258.00	493	278.56	554	298.70	615	318.40
250	194.07	311	215.93	372	237.35	433	258.34	494	278.90	555	299.02	616	318.72
251	194.44	312	216.28	373	237.70	434	258.68	495	279.23	556	299.35	617	319.04
252	194.80	313	216.64	374	238.04	435	259.02	496	279.56	557	299.68	618	319.36
253	195.16	314	216.99	375	238.39	436	259.36	497	279.90	558	300.00	619	319.68
254	195.52	315	217.35	376	238.74	437	259.70	498	280.23	559	300.33		
255	195.88	316	217.70	377	239.09	438	260.04	499	280.56			620	319.99
256	196.24	317	218.05	378	239.43	439	260.38			560	300.65	621	320.31
257	196.60	318	218.41	379	239.78			500	280.90	561	300.98	622	320.63
258	196.96	319	218.76			440	260.72	501	281.23	562	301.31	623	320.95
259	197.33			380	240.13	441	261.06	502	281.56	563	301.63	624	321.27
		320	219.12	381	240.47	442	261.40	503	281.89	564	301.96	625	321.59
260	197.69	321	219.47	382	240.82	443	261.74	504	282.23	565	302.28	626	321.91
261	198.05	322	219.82	383	241.17	444	262.08	505	282.56	566	302.61	627	322.22
262	198.41	323	220.18	384	241.51	445	262.42	506	282.89	567	302.93	628	322.54
263	198.77	324	220.53	385	241.86	446	262.76	507	283.22	568	303.26	629	322.86
264	199.13	325	220.88	386	242.20	447	263.10	508	283.55	569	303.58		
265	199.49	326	221.24	387	242.55	448	263.43	509	283.89				
266	199.85	327	221.59	388	242.90	449	236.77			570	303.91		
267	200.21	328	221.94	389	243.24			510	284.22	571	304.23		
268	200.57	329	222.29			450	264.11	511	284.55	572	304.56		
269	200.93			390	243.59	451	264.45	512	284.88	573	304.88		
		330	222.65	391	243.93	452	264.79	513	285.21	574	305.20		
270	201.29	331	223.00	392	244.28	453	265.13	514	285.54	575	305.53		
271	201.65	332	223.35	393	244.62	454	265.46	515	285.87	576	305.85		
272	202.01	333	223.70	394	244.97	455	265.80	516	286.21	577	306.18		
273	202.36	334	224.06	395	245.31	456	266.14	517	286.54	578	306.50		
274	202.72	335	224.41	396	245.66	457	266.48	518	286.87	579	306.82		
275	203.08	336	224.76	397	246.00	458	266.82	519	287.20				
276	203.44	337	225.11	398	246.35	459	267.15			580	307.15		
277	203.80	338	225.46	399	246.69			520	287.53	581	307.47		
278	204.16	339	225.81			460	267.49	521	287.86	582	307.79		
279	204.52			400	247.04	461	267.83	522	288.19	583	308.12		
		340	226.17	401	247.38	462	268.17	523	288.52	584	308.44		
280	204.88	341	226.52	402	247.72	463	268.50	524	288.85	585	308.76		
281	205.23	342	226.87	403	248.07	464	268.84	525	289.18	586	309.09		
282	205.59	343	227.22	404	248.41	465	269.18	526	289.51	587	309.41		
283	205.95	344	227.57	405	248.76	466	269.51	527	289.84	588	309.73		
284	206.31	345	227.92	406	249.10	467	269.85	528	290.17	589	310.05		
285	206.67	346	228.27	407	249.45	468	270.19	529	290.50				
286	207.02	347	228.62	408	249.79	469	270.52			590	310.38		
287	207.38	348	228.97	409	250.13			530	290.83	591	310.70		
288	207.74	349	229.32			470	270.86	531	291.16	592	311.02		
289	208.10			410	250.48	471	271.20	532	291.49	593	311.34		
		350	229.67	411	250.82	472	271.53	533	291.81	594	311.66		
290	208.45	351	230.02	412	251.16	473	271.87	534	292.14	595	311.99		
291	208.81	352	230.37	413	251.50	474	272.20	535	292.47	596	312.31		
292	209.17	353	230.72	414	251.85	475	272.54	536	292.80	597	312.63		
293	209.52	354	231.07	415	252.19	476	272.88	537	293.13	598	312.95		
294	209.88	355	231.42	416	252.53	477	273.21	538	293.46	599	313.27		
295	210.24	356	231.77	417	252.87	478	273.55	539	293.79				
296	210.59	357	232.12	418	253.22	479	273.88			600	313.59		
297	210.95	358	232.47	419	253.56			540	294.11	601	313.91		
298	211.31	359	232.82			480	274.22	541	294.44	602	314.24		
299	211.66			420	253.90	481	274.55	542	294.77	603	314.56		
		360	233.17	421	254.24	482	274.89	543	295.10	604	314.88		
300	212.02	361	233.52	422	254.59	483	275.22	544	295.43	605	315.20		