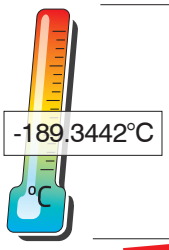


471 Simple Argon **Triple Point Apparatus**

PROVISIONAL DATA*

- Affordable
- Robust and simple to use
- Accurate to ±1mK - 4 hour plateau typical

The Isotech Argon Triple Point Apparatus is a robust, simple to use and affordable solution for the realisation of the argon triple point.

Many laboratories use liquid nitrogen comparators which are convenient and can be low cost but the nitrogen boiling point is not on the ITS-90. More seriously the LN point is below that of Argon. Many standard platinum resistance thermometers (SPRTs) are filled with a mixture of argon and oxygen and at -195°C will be under a partial vacuum which affects the self-heating of the SPRT leading to a larger calibration uncertainty.

For many laboratories the high cost and complexity of previously available argon systems has been a barrier.

Now after years of research Isotech have introduced a new system that is more affordable, simple to use and will allow more laboratories the benefits of being able realise the argon triple point.

The Isotech system requires no electricity; the only consumable is liquid nitrogen - the 6N Pure argon is contained in a pressure vessel. A re-entrant tube allows liquid nitrogen to initially cool this volume to approximately -195°C. Weights are then added to a pressure release valve to increase the nitrogen's boiling temperature to just above the argon cells triple point.

The argon settles into its triple point for around four hours, allowing an SPRT inside the re-entrant tube to be calibrated.

***Provisional Data**
The specification on this product is provisional, please visit the website for the latest information.
http://www.isotech.co.uk/argon

http://www.isotech.co.uk/argon

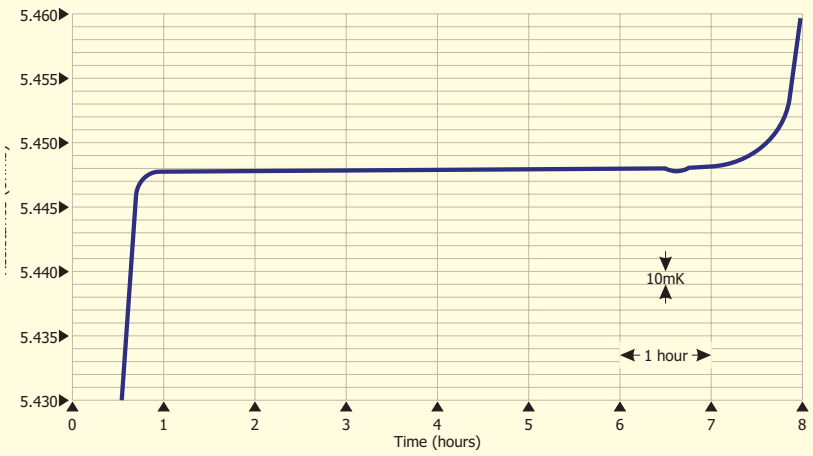
Sectional view from front

Sectional view from side

ISOTHERMAL TECHNOLOGY LTD UKAS LABORATORY N° 0175	Date of issue	
	Issue N°	
Premium SPRT Calibration - Argon TP	Authorised by	
Budget N°.		

Note number (below)	Source of uncertainty	Value ±	Unit	Probability distribution	Divisor	Sensitivity c_i	Standard uncertainty u_i (unit)	Degrees of freedom v_i or v_s	u_i^2	u^4/v_i
1	Calibration of Standard Resistor	0.000002	C	normal	2.00	1	0.000001	∞	0.000000000	0
2	Uncorrected Drift since last calibration	0.000009	C	rectangular	1.73	1	0.000005	∞	0.000000000	0
3	Effect of the Temperature of Oil Bath	0.000001	C	rectangular	1.73	1	0.000001	∞	0.000000000	0
4	microK linearity	0.000007	C	normal	2.00	1	0.000004	∞	0.000000000	0
5	microK resolution	0.000002	C	rectangular	1.73	1	0.000001	∞	0.000000000	0
6	Uncertainty of the Fixed Point Cell	0.001000	C	normal	2.00	1	0.000500	∞	0.000000250	0
7	Slope of cell melt during cal	0.001000	C	rectangular	1.73	1	0.000577	∞	0.000000333	0
8	Immersion uncertainty	0.000500	C	normal	1.00	1	0.000500	∞	0.000000250	0
9	Self Heating Effects	0.000050	C	rectangular	1.73	1	0.000029	∞	0.000000001	0
10	SPRT Spurious flux, noise etc (Std)	0.000010	C	normal	1.00	1	0.000010	16	0.000000000	6.3E-22
11	uncertainty of hydrostatic correction	0.000017	C	rectangular	1.73	1	0.000010	∞	0.000000000	0
12	Repeatability of the Thermometer	0.000250	C	normal	2.00	1	0.000125	16	0.000000016	1.5E-17
13	Propogation of the water triple point u/c	0.000007	C	rectangular	1.73	1	0.000004	∞	0.000000000	0
u_c	Combined uncertainty			normal			0.000922	47353	0.000000850	1.5E-17
U	Expanded uncertainty			normal	k =	2.00	0.001844	47353		

k =	2.00	0.001844



Model	471
Temperature Range	-189.3442°C
Uncertainty	1.844mK at $k=2$
Dimensions	Width - 380mm Depth - 615mm Height - 1250mm (900mm high to top of cabinet)

For More Data and the Latest Information:
www.isotech.co.uk/argon