

SP2000 has more 20 years history in the supply and sales of Hollow Cathode Lamps used for the atomic absorption spectroscopy. The SP2000 can provide more 60 single element and some multi-element lamps in standard 1 ½" (37 mm) and 2" (50 mm) diameters to fit almost all the instruments including Thermo Fisher, PE, Varian, Hitachi, GBC, Shimadzu etc. Besides As, Cs, Rb, K, Se, most of SP2000 hollow cathode lamps have the guaranteed lifetime of 5000 mA hrs.



Technical data of some standard lamps:

Element	Model 37mm	Model 50mm	Gas	Window	Wavelength Principal (nm)
Aluminium	As-1/Al	As-2/Al	Ne	UV glass	303.9
Antimony	As-1/Sb	As-2/Sb	Ne	Quartz	217.6
Arsenic	As-1/As	As-2/As	Ne	Quartz	193.7
Barium	As-1/Ba	As-2/Ba	Ne	Borosilicate	553.5
Beryllium	As-1/Be	As-2/Be	Ne	Quartz	234.9
Bismut	As-1/Bi	As-2/Bi	Ne	Quartz	223.1
Boron	As-1/B	As-2/B	Ne	UV glass	249.8
Cadmium	As-1/Cd	As-2/Cd	Ne	Quartz	228.8
Caesium	As-1/Cs	As-2/Cs	Ne	Borosilicate	852.1
Calcium	As-1/Ca	As-2/Ca	Ne	UV glass	422.7
Cerium	As-1/Ce	As-2/Ce	Ne	UV glass	520.0
Chromium	As-1/Cr	As-2/Cr	Ne	UV glass	357.9
Cobalt	As-1/Co	As-2/Co	Ne	UV glass	240.7
Copper	As-1/Cu	As-2/Cu	Ne	UV glass	324.8
Dyprosium	As-1/Dy	As-2/Dy	Ne	Borosilicate	421.2
Erbium	As-1/Er	As-2/Er	Ne	Borosilicate	400.8
Europium	As-1/Eu	As-2/Eu	Ne	Borosilicate	459.4

Gadolinium	As-1 /Gd	As-2/Gd	Ne	UV glass	368.4
Gallium	As-1/Ga	As-2/Ga	Ne	UV glass	287.4
Germanium	As-1/Ge	As-2/Ge	Ne	UV glass	265.2
Gold	As-1/Au	As-2/Au	Ne	UV glass	242.8
Hafnium	As-1/Hf	As-2/Hf	Ne	UV glass	307.3
Holmium	As-1/Ho	As-2/Ho	Ne	Borosilicate	410,4
Indium	As-1/In	As-2/In	Ne	UV glass	303.9
Iridium	As-1/Ir	As-2/Ir	Ne	Quartz	208.9
Iron	As-1/Fe	As-2/Fe	Ne	UV glass	248.3
Lanthanum	As-1/La	As-2/La	Ne	UV glass	550.1
Lead	As-1/Pb	As-2/Pb	Ne	Quartz	217.0
Lithium	As-1/Li	As-2/Li	Ne	Borosilicate	670.8
Lutetium	As-1/Lu	As-2/Lu	Ar	UV glass	336.0
Magnesium	As-1/Mg	As-2/Mg	Ne	Quartz	285.2
Manganese	As-1/Mn	As-2/Mn	Ne	UV glass	279.5
Mercury	As-1/Hg	As-2/Hg	Ne	UV glass	253.6
Molybdenum	As-1/Mo	As-2/Mo	Ne	UV glass	313.3
Neodymium	As-1/Nd	As-2/Nd	Ne	Borosilicate	492.5
Nickel	As-1/Ni	As-2/Ni	Ne	Quartz	232.0
Niobium	As-1/Nb	As-2/Nb	Ne	UV glass	334.4
Osmium	As-1/Os	As-2/Os	Ne	UV glass	290.9
Palladium	As-1/Pd	As-2/Pd	Ne	UV glass	247.6
Phosphorous	As-1/P	As-2/P	Ne	Quartz	213.6
Platinum	As-1/Pt	As-2/a	Ne	UV glass	265.9
Potassium	As-1/K	As-2/K	Ne	Borosilicate	766.5
Praseodymium	As-1/Pr	As-2/Pr	Ne	Borosilicate	495.1
Rhenium	As-1/Re	As-2/Re	Ne	UV glass	346.1
Rhodium	As-1/Rh	As-2/Rh	Ne	UV glass	343.5
Rubidium	As-1/Rb	As-2/Rb	Ne	Borosilicate	780.0
Ruthenium	As-1	As-2/Ru	Ne	UV glass	349.9
Samarium	As-1/Sm	As-2/Sm	Ne	UV glass	429.7
Scandium	As-1/Sc	As-2/Sc	Ne	UV glass	391.2
Selen	As-1/Se	As-2/Se	Ne	Quartz	196.0
Silicon	As-1/Si	As-2/Si	Ne	Quartz	251.6
Silver	As-1/Ag	As-2/Ag	Ne	UV glass	328.1

Sodium	As-1/Na	As-2/Na	Ne	UV glass	589.0
Strontium	As-1/Sr	As-2/Sr	Ne	Borosilicate	460.7
Tantalum	As-1/Ta	As-2/Ta	Ne	UV glass	271.5
Tellurium	As-1/Te	As-2/Te	Ne	Quartz	214.3
Terbium	As-1/Tb	As-2/Tb	Ne	Borosilicate	432.7
Thallium	As-1/Tl	As-2/Tl	Ne	UV glass	276.8
Thorium	As-1/Th	As-2/Th	Ne	UV glass	371.9
Thulium	As-1/Tm	As-2/Tm	Ne	UV glass	371.8
Tin	As-1/Sn	As-2/Sn	Ne	Quartz	224.6
Titanium	As-1/Ti	As-2/Ti	Ne	UV glass	365.4
Tungsten	As-1/W	As-2/W	Ne	UV glass	255.1
Uranium	As-1/U	As-2/U	Ne	UV glass	358.5
Vanadium	As-1/V	As-2/V	Ne	UV glass	318.5
Ytterbium	As-1/Yb	As-2/Yb	Ne	UV glass	398.8
Yttrium	As-1/Y	As-2/Yb	Ne	UV glass	410.2
Zinc	As-1/Zn	As-2/Zn	Ne	Quartz	213.9
Zirconium	As-1/Zr	As-2/Zr	Ne	UV glass	360.1

## OPERATING CONDITIONS OF 1.5" DIAMETER HOLLOW CATHODE LAMP

Each Hollow Cathode Lamp is tested to meet the requirements of instrument. The data below are the recommended operating conditions for the optimum performance and the longest lamp life.

Element	GBC	GBC	Shimadzu	Shimadzu	Varian	Varian	Varian	Hitachi	Hitachi	Thermo
	SB-900	903,905,	640,645,	All Others	AA4/5/6	SpectrAA 5/10	30Z/40Z	Unicam	Unicam	All Models
	901, 902	909,932	646,680		1000/1100	20/30/40/100	300Z/400Z	Phillips	Zeeman	
	904,906	933,933B			1200/1275	200/300/400	640Z/800Z	All Models		
	908, Avanta	Prospector			1475	600/640/800				
Aluminium (Al)	10mA	10mA	10mA	20mA	10mA	10mA	8mA	10mA	10mA	10mA
Antimony (Sb)	10mA	10mA	10mA	20mA	10mA	8mA	7mA	10mA	8mA	10mA
Arsenic (As)	8mA	7mA	8mA	16mA	8mA	7mA	6mA	8mA	6mA	8mA
Barium (Ba)	15mA	15mA	15mA	20mA	15mA	10mA	10mA	15mA	10mA	15mA
Beryllium (Be)	10mA	10mA	10mA	20mA	10mA	8mA	6mA	10mA	8mA	10mA
Bismuth (Bi)	10mA	8mA	10mA	20mA	10mA	8mA	7mA	10mA	8mA	10mA
Boron (B)	20mA	18mA	20mA	40mA	20mA	18mA	12mA	20mA	18mA	20mA
Cadmium (Cd)	4mA	3mA	4mA	8mA	4mA	4mA	3mA	4mA	3mA	3mA
Calcium (Ca)	5mA	4mA	5mA	10mA	5mA	4mA	4mA	5mA	4mA	5mA
Cesium (Cs)	20mA	18mA	20mA	40mA	20mA	20mA	18mA	20mA	18mA	20mA
Chromium (Cr)	6mA	6mA	6mA	12mA	6mA	6mA	6mA	6mA	6mA	6mA
Cobalt (Co)	10mA	10mA	10mA	20mA	10mA	10mA	8mA	10mA	10mA	10mA
Copper (Cu)	4mA	4mA	4mA	8mA	4mA	4mA	3mA	4mA	3mA	4mA
Gallium (Ga)	5mA	5mA	5mA	10mA	5mA	4mA	3mA	5mA	4mA	5mA

Germanium (Ge)	5mA	5mA	5mA	10mA	5mA	4mA	3mA	5mA	4mA	5mA
Gold (Au)	5mA	5mA	5mA	10mA	5mA	4mA	3mA	5mA	4mA	5mA
Indium (In)	5mA	5mA	5mA	10mA	5mA	5mA	3mA	5mA	4mA	5mA
Iridium (Ir)	18mA	18mA	18mA	30mA	18mA	15mA	10mA	18mA	15mA	18mA
Iron (Fe)	6mA	6mA	6mA	12mA	6mA	5mA	4mA	6mA	5mA	6mA
Lead (Pb)	4mA	4mA	4mA	8mA	4mA	4mA	3mA	4mA	3mA	4mA
Lithium (Li)	10mA	10mA	10mA	20mA	10mA	10mA	10mA	10mA	10mA	10mA
Magnesium (Mg)	4mA	4mA	4mA	8mA	4mA	3mA	3mA	4mA	3mA	4mA
Manganese (Mn)	5mA	5mA	5mA	10mA	5mA	5mA	4mA	5mA	4mA	5mA
Mercury (Hg)	3mA	3mA	3mA	6mA	3mA	2mA	1mA	3mA	2mA	3mA
Molybdenum (Mo)	7mA	7mA	7mA	15mA	7mA	7mA	6mA	7mA	6mA	7mA
Nickel (Ni)	5mA	5mA	5mA	10mA	5mA	5mA	4mA	5mA	4mA	5mA
Palladium (Pd)	10mA	10mA	10mA	15mA	10mA	10mA	8mA	10mA	10mA	10mA
Platinum (Pt)	10mA	10mA	10mA	20mA	10mA	7mA	5mA	10mA	7mA	10mA
Potassium (K)	10mA	10mA	10mA	20mA	10mA	8mA	7mA	10mA	8mA	10mA
Rhodium (Rh)	6mA	6mA	6mA	10mA	6mA	5mA	4mA	6mA	6mA	6mA
Rubidium (Rb)	10mA	10mA	10mA	20mA	10mA	8mA	6mA	10mA	8mA	10mA
Selenium (Se)	10mA	8mA	10mA	20mA	10mA	8mA	6mA	10mA	8mA	10mA
Silicon (Si)	14mA	12mA	14mA	30mA	14mA	12mA	8mA	14mA	12mA	14mA
Silver (Ag)	4mA	4mA	4mA	8mA	4mA	3mA	2mA	4mA	3mA	4mA
Sodium (Na)	5mA	5mA	5mA	10mA	5mA	5mA	5mA	5mA	5mA	5mA
Strontium (Sr)	10mA	10mA	10mA	20mA	10mA	7mA	5mA	10mA	7mA	10mA
Tantalum (Ta)	18mA	18mA	18mA	30mA	18mA	15mA	17mA	18mA	15mA	18mA
Tellurium (Te)	7mA	6mA	7mA	15mA	7mA	5mA	3mA	7mA	5mA	7mA
Tin (Sn)	8mA	8mA	8mA	12mA	8mA	6mA	4mA	8mA	6mA	8mA

