

VACUUM ULTRAVIOLET (VUV) LAMPS

INTRODUCTION

Cathodeon has developed a range of five high stability deuterium arc sources for use as calibration sources in the far ultraviolet. The 10V heater, 1mm arc aperture lamps are designed and built to a rugged construction with magnesium fluoride windows and may be further ruggedised to meet high acceleration forces encountered in space applications. Output extends into the Lyman Alpha region.

GENERAL CONSTRUCTION

There are two overall length options: The longer version is built for the highest light output stability with the window mounted 102mm from the arc source. The light is prevented from being reflected from the sides of the mounting tubes by multiple baffles giving a solid angle of about 10°. The standard version of the lamp is shorter to make it more compact, the cone angle increasing to 15°.

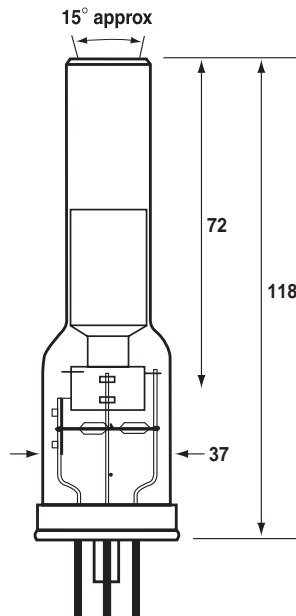


Fig 39 Short Body
Vacuum Ultra-violet Lamp
(Type 3 -V03)

Both versions of the lamp are available with a synthetic silica window for use down to 180nm. Magnesium fluoride lenses are available as an alternative to the flat window to give light collimation.

The use of magnesium fluoride significantly extends the lamp output below the 165nm cut off of synthetic silica. The practical cut off of magnesium fluoride is 112nm, well into the Lyman Alpha region.

The long body lamp V01 is also available without a base, for enclosed vacuum operation. However, vacuum operation is only possible if special arrangements are made to cool the lamp.

SPECIFICATIONS

Heater

10V AC/DC nominal, 1.0A maximum.

Arc initiation

A minimum 60 second operation of the heater is required to warm the emitter, before application of a strike potential of not less than 250V and a current capability of at least 25mA.

Arc run

Recommended running current for the arc is 300mA, though arc currents between 200mA and 500mA may be used. Arc currents above 300mA will shorten the life of the lamp. At currents below 300mA some heater voltage may be needed to maintain arc stability.

Anode voltage

At 300mA/heater off: 60-80V

Colour code

Anode red, heater blue, cathode black

SPECIFICATION	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5*
Arc height from window (mm)	102	102	72	72	102
Window material	MgF2	Spectrosil	MgF2	Spectrosil	MgF2
Overall length including base (mm)	146-150	146-150	116-120	116-120	140-144

*Type 5 has less base and is specifically designed for enclosed vacuum operation

ORDERING CODES

LAMP TYPE	ORDERING CODE
Type 1	V01
Type 2	V02
Type 3	V03
Type 4	V04
Type 5	V05

WARRANTY

Vacuum ultra-violet lamps from Cathodeon are covered by warranty for 1 year, or for 500 hours use.

APPLICATIONS

These lamps are suitable for all applications that require high stability and an output down to 112nm.

hi-Tech lamps

800-229-6509

info@hi-techlamps.com

INTRODUCTION

Cathodeon analytical VUV lamps are derived from the renowned Cathodeon research grade VUV light sources and offer lower cost, more compact versions of these V series lamps. We offer two types: the **F05** and **J59**.

GENERAL CONSTRUCTION

F05 lamp: This is an analytical vacuum ultraviolet light source of compact dimensions for use by researchers and instrument engineers requiring a stable light source emitting in the 112nm to 370nm range. The lamp is of an axial type with an overall length of just 78mm and has a hard sealed magnesium fluoride window extending the deuterium continuum down to 112nm.

J59 lamp: This lamp is a high output side exit type, generally constructed in the same way as an analytical deuterium lamp. A significant modification of the internal structure is a centre plate eyelet that has been added to enhance the output of the 0.5mm parabolic aperture. The magnesium fluoride window is hard sealed to the envelope via a 42mm nose, and affords transmission down to 112nm.

Fig 40 F05 Lamp Dimensions

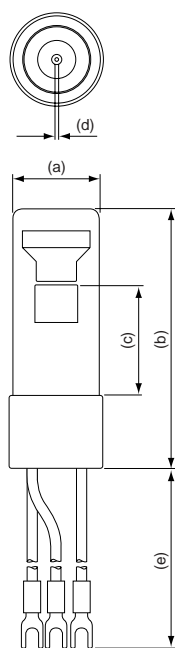
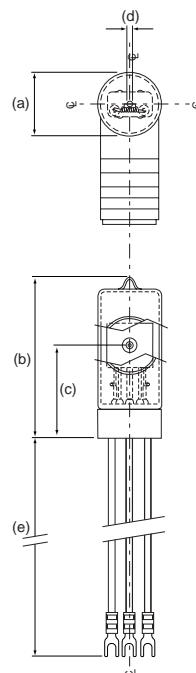


Fig 41 J59 Lamp Dimensions



SPECIFICATIONS

PARAMETER	F05 LAMP	J59 LAMP
External diameter (a)	25-26 mm	28.5-30.5 mm
Overall length (b)	75-81 mm	73 mm
Aperture height (c)	31-35 mm	42 mm
Aperture positional tolerance (d)	1 mm diameter	1 mm diameter
Aperture type	1 mm circular	0.5 mm circular
Dimple type	Standard	Parabolic
ELECTRICAL		
Heater voltage-start (nominal)	10V	10V
Heater voltage operational	Filament 7V	Filament 7V
Heater current	1.5A maximum	1.5A maximum
Arc voltage	55-75V	70-90V
Recommended operating temperature	150-190°C	150-190°C
Arc current	300mA	300mA
Strike voltage (25°C)	280V maximum	300V maximum
FINISHING		
Lead length (e)	245-255 mm	195-205 mm
Lead termination	Standard spades 024400	Standard spades 024400
LIGHT OUTPUT		
Window material	MgF ₂	MgF ₂
Drift	2.28% per hour maximum	0.010% per hour maximum
Noise	0.05% peak-peak maximum	0.005% peak-peak maximum
Wavelength range (continuum)	112-370 nm	112-370 nm

ORDERING CODES

LAMP TYPE	ORDERING CODE
Analytical VUV lamp	F05
High output analytical VUV lamp	J59

LIFETIME AND WARRANTY

LAMP TYPE	LIFETIME	WARRANTY
Analytical VUV lamp (F05)	1000 hours	500 hours
High output analytical VUV lamp (J59)	1000 hours	500 hours

ANALYTICAL VACUUM ULTRAVIOLET LAMPS

APPLICATIONS

F05 lamp: It is expected that the lamp will be useful in extending the application of analytical techniques currently using deuterium lamps such as:

High performance liquid chromatography (HPLC)

Capillary zone electrophoresis (CZE)

Fluorescence

Densitometry

Supercritical fluid (SF) chromatography

Silicon device analysis

J59 lamp: This will also be suitable for deuterium lamp applications as listed above.

The lamp provides up to 3 times the output of the standard lamp, but not as high an output as that emitted by the high power deuterium lamp.

POWER SUPPLIES FOR DEUTERIUM LAMPS

INTRODUCTION

The Cathodeon deuterium lamp power supplies have very low noise and drift characteristics and use a novel strike circuit to ensure reliable arc initiation of the lamp. They are fully automatic in operation and provide warning of malfunction of the lamp. They are available fully cased, or in component form and will be of particular interest to individual researchers, analytical instrument design teams and low volume manufacturers.

Fig 42 Power Supply For Deuterium Lamps



hi-Tech lamps

800-229-6509

info@hi-techlamps.com

GENERAL OPERATION

The new C713 power supply fully conforms to the EEC directive 89/336/EEC on electromagnetic compatibility (EMC) and warrants CE marking. The C713 is a standard cased preset power supply, it runs all Cathodeon continuous deuterium lamps including VUV lamps. It runs the lamps with stabilised direct current heaters and is available for 3V and 10V versions. After switching on, the lamp heater supply is switched to its starting level for a timed period of 60 seconds. After this initial period the anode voltage and strike voltage pulse are applied. When the lamp strikes, the "Lamp on" indicator is illuminated and a timer holds the heater on at full voltage for a further 30 seconds, after which the heater is switched down to a preset level which can range from 0V to about 75% of the start level.

Should the lamp not strike immediately, further attempts are automatically made at 10 second intervals. At each attempt, the "restart" indicator is illuminated, providing a warning that the lamp has not struck. Normal operation is indicated by the "Lamp on" indicator being lit. The supply is preset to run the lamp at an anode current of 300mA, this being the optimum current for the majority of deuterium lamps. This current can be preset by an internal control to values between 230 and 301A. If the mains supply is interrupted the warm-up cycle is automatically restarted. The supply is fitted with a thermal cut-out to protect the supply in case the outputs are shorted out for an excessive period. If the supply does cut out for this reason it should be switched off and the short removed. If not switched off, a start cycle will be initiated once the supply has cooled down.

PARAMETERS	SPECIFICATION
Heater voltage	Start voltage: Preset 3V at 6A DC or 10V at 1A DC Run voltage: Preset internally 0-2.5V DC or 0-7.5V DC
Anode current	Preset internally in the range 230-310mA
Current stability	Long term drift less than 0.3%. Short term drift and ripple less than 0.02%
Maximum lamp operating voltage	100V at 300mA
Strike potential	700V nominal, inductively generated
Indicators	Mains on-green, Lamp restart-red, Lamp on-amber
Thermal cut-out	Operates at 75°C on internal heat sink
Mains input	110, 130, 220, 240V ($\pm 10\%$ rms) selected externally 50/60Hz. Selected on rear panel
Lamp output	Socket at rear, mating plug supplied. Neutrix "AXR"/"XLR" series. Type Xconn3MX
EMC	Complies with 89/336/EEC
Dimensions	260mm x 250mm x 140mm high
Weight	10V version: 5.00kg; 3V version: 5.15kg

OEM VERSION

Both versions of the Cathodeon deuterium lamp power supply are available for OEM use in board form for building into original equipment. These packages include:

C713 3V: (i) Mains transformer, (ii) heatsink with transistors and thermal cutout, (iii) main PCB 'A' usually fixed to the chassis, (iv) PCB 'B' usually fixed to the chassis, (v) PCB 'C' mounted on heatsink (ii), (vi) PCB 'D' usually fixed to chassis, (vii) PCB 'E' mounted to transformer (i), (viii) chassis fuse holder plus fuse, (ix) interconnection leads CN1, CN2 and CN3, (x) 2 LEDs for the front panel, (xi) Filter kit for EMC, (xii) 10 x ferrite beads, (xiii) 1 x 10nF 63V capacitor.

C713 10V: As above with the addition of a heatsink for the 4 x voltage regulators, which are usually situated on PCB 'B' for the 10V version of this power supply.

ORDERING CODES

PRODUCT	ORDERING CODE
3V heater version	C713/3
10V heater version	C713/10
OEM 3V heater version	C713/3/B2
OEM 10V heater version	C713/10/B2

WARRANTY

The C713 power supply from Cathodeon is covered by warranty for one year.

APPLICATIONS

These power supplies are available as either a 3V or a 10V heater version, and are designed to operate all Cathodeon deuterium arc lamps in the recommended manner. In addition, they can also be used with most lamps made by other manufacturers.