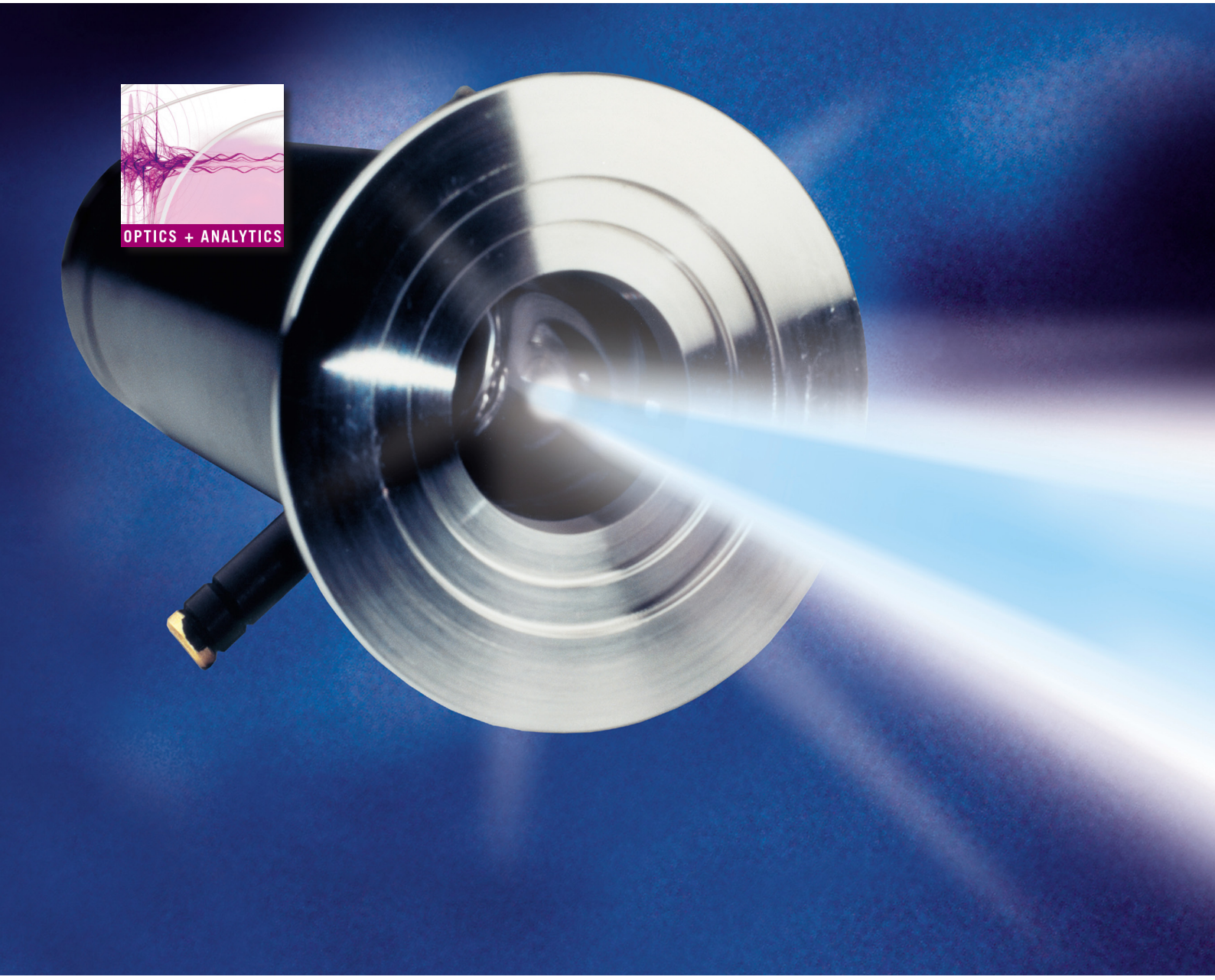
Heraeus



Vacuum UV Light Sources

for Laboratory and Production Applications

Vacuum UV Light Sources
30 Watt Types

Heraeus Noblelight's vacuum UV light sources encompass the widest range of 30 and 200 Watt deuterium lamps on the market. While the 30 Watt lamps are used as calibration sources in the far UV (V-series) and for analytical purposes, the 200 Watt water-cooled high power deuterium lamp is a source of high photon energy deep ultraviolet radiation. It delivers a radiant intensity 4 to 5 times higher than standard 30 Watt deuterium lamps.

Vacuum UV Light sources, 30 Watt type - V series
The V series lamps consist of five high stability deuterium arc sources for use as a calibration source in the far ultraviolet. The 10 Volt heater, 1 mm arc aperture lamps are designed and built with a rugged construction with magnesium fluoride windows. Output extends to the Lyman-alpha line and below.

Application: VUV lamp for all applications that require high stability output down to 115 nm.

General Construction
There are two overall lengths options: The longer version is built for the highest light output stability. The light is prevented from being reflected from the sides of the mounting tubes by multiple baffles.

Both versions of the lamp are available either with a synthetic silica window for emission from 160 nm upwards or with a MgF_2 (magnesium fluoride) window that allows emission from 115 nm upwards.

V03 Light Source

Specifications 30 Watt VUV Lamp Models

Lamp Type	V01	V02	V03	V04	V05*
Part number	80017697	80017698	80017699	80017700	80020174
Spectral range	115-400nm	160-400nm	115-400nm	160-400nm	115-400nm
Window material	MgF_2	Spectrosil	MgF_2	Spectrosil	MgF_2
Aperture diameter	1.0 mm	1.0 mm	1.0 mm	1.0 mm	1.0 mm
Arc height from window	102 mm	102 mm	72 mm	72 mm	102 mm
Overall length incl. base	146-150 mm	146-150 mm	116-120 mm	116-120 mm	140-144 mm
Diemensional outline	see page xy				
Electrical data					
Heater voltage start	10Vdc	10Vdc	10Vdc	10Vdc	10Vdc
Heater voltage operational	0/6 V	0/6 V	0/6 V	0/6 V	0/6 V
Heater current	1.0Adc max.	1.0Adc max.	1.0Adc max.	1.0Adc max.	1.0Adc max.
Anode voltage	60-80Vdc	60-80Vdc	60-80Vdc	60-80Vdc	60-80Vdc
Anode current	300mAdc	300mAdc	300mAdc	300mAdc	300mAdc
Light output					
Noise	≤ 0.2% p-p	≤ 0.2% p-p	≤ 0.2% p-p	≤ 0.2% p-p	≤ 0.2% p-p
Drift	± 0.5%/h	± 0.5%/h	± 0.5%/h	± 0.5%/h	± 0.5%/h
Lifetime (warranty)	≥ 500h	≥ 500h	≥ 500h	≥ 500h	≥ 500h

*Type V05 has less base and is specifically designed for enclosed vacuum operation

High Power VUV Light Sources
200 Watt Types

The D 200 high power VUV light sources are water-cooled deuterium discharge lamps of 200 Watt electrical power. They deliver a radiant intensity 4-5 times higher than standard 30 Watt deuterium lamps. To remove the excess heat of the lamp the bulb is enclosed in a water cooled metal fixture engineered to take most of the heat produced and transfer it through water to a designated cooling reservoir. The D 200 F lamp has a synthetic silica window for an efficient emission of UV radiation between 160 nm and 400 nm, while the D 200 VUV uses an MgF_2 window to allow vacuum UV radiation down to 115 nm. This lamp is provided with a vacuum flange DN 50 KF (or optional DN 63 CF-flange) for mounting on a vacuum chamber.

Applications

- Optical research with UV radiation
- UV spectroscopy at high radiation density
- Removal of electrostatic charge from semiconductor wafer
- Photochemical processes
- UV absorption measurements
- Fluorescence excitation

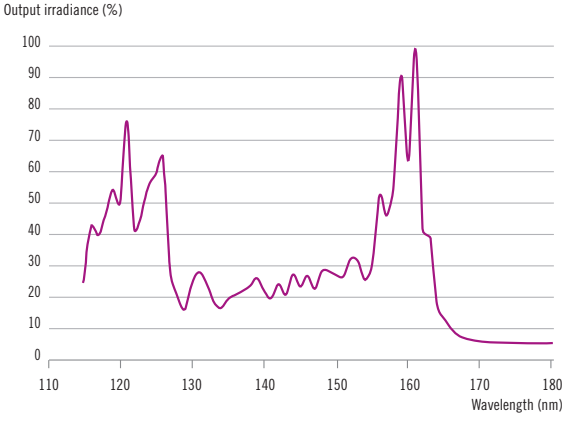
Specifications D 200 Lamp Types

Lamp Type	D 200 F	D 200 F-HV	D 200 VUV
Part number, with cooling jacket	56001671	45006278	45006010
Spectral range	160-400 nm	160-400 nm	115-400 nm
Window material	Synthetic silica	Synthetic silica	MgF_2
Vacuum flange	no	DN 50 KF	DN 50 KF (optional CF63)
Aperture diameter	1.0 mm	1.0 mm	1.0 mm
Arc height from window			
Overall length	158 mm	243 mm	243 mm
Outer diameter	54 mm	54 mm	54 mm
Cooling/flow rate	Water cooling / ≥0.5 l/min.		
Cooling water pressure	≤ 0.3 bar	≤ 0.3 bar	≤ 0.3 bar
Connector	Amphenol-Tuchel 3109/1		
Weight	0.65 kg	0.9 kg	0.9 kg
Dimensional outline	See page 6		
Replacement lamp part no. without cooling jacket	56001669	45006286	45006127
Electrical data			
Heater voltage-start	6.0Vdc	6.0Vdc	6.0Vdc
Heater current-start	4.5Adc	4.5Adc	4.5Adc
Warm-up time	30s	30s	30s
Heater voltage operational	3.0Vdc	3.0Vdc	3.0Vdc
Heater current operational	2.5Adc	2.5Adc	2.5Adc
Strike voltage	≥ 500 V	≥ 500 V	≥ 500 V
Anode voltage	110 +10/-15Vdc	110 +10/-15Vdc	110 +10/-15Vdc
Anode current	adjustable 0.9 to 1.8Adc		
Light output			
Noise @ 250nm	≤ 0.1 % p-p	≤ 0.1 % p-p	≤ 0.1 % p-p
Drift @ 250nm	± 0.5 %/h	± 0.5 %/h	± 0.5 %/h
Lifetime @ 280nm	≥ 1000 h at 0.9 A lamp current		

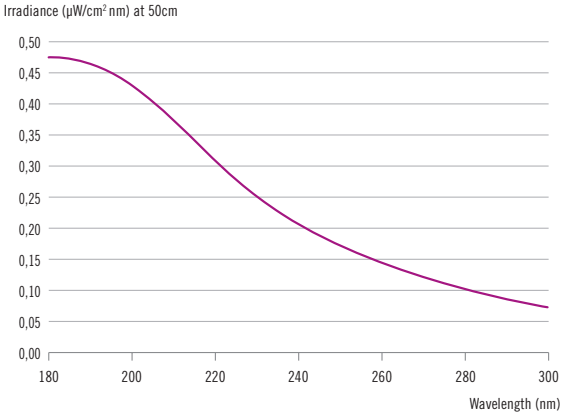
Vacuum Flange DN 63 CF for D 200 VUV

To make use of the UV radiation below 180nm the lamp D 200 VUV is often used on high vacuum chambers. For this purpose Heraeus provides the D 200 VUV lamp with a DN 50 KF flange as a standard flange. In case the vacuum chamber is equipped with CF flanges Heraeus offers a DN 63 CF adapter flange. Other CF-flange dimensions can be offered on request. (dimensional outline see last page).

Spectral Energy Distribution in VUV range



Spectral Energy Distribution in UV range



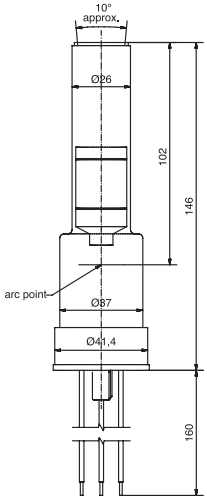
Power Supply for D200 VUV Lamps

The power supply PSD 200 is designed to operate all above mentioned D 200 Lamp types. It works automatically. If required the lamp output can be varied by adjusting the anode current on the front panel between 0.9 to 1.8Adc. The adjusted current can be read on a LCD display. Also shown on a display is the elapsed operating time of the lamp.

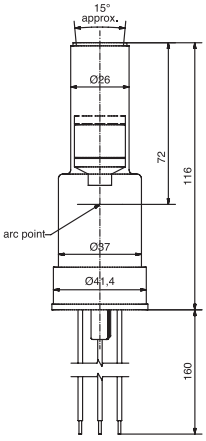
Specifications PSD 200 Power Supply

Power Supply	**PSD 200**
Anode voltage	90-145Vdc
Anode current	adjustable between 0.9-1.8Adc
Strike voltage	600 V
Heater voltage start	6.0 Vdc / 4.5 Adc
Heater voltage operational	3.0 Vdc / 2.5 Adc
Mains input (AC)	100/115/230 Vac, 50/60 Hz
Power consumption	250 VA
Operating ambient temperature	0°C to 40°C
Cooling method	closed loop water circulator, flow ≥0.5 l/min
Protection of lamp in case of malfunction	by flow switch if less cooling water, water circulator with flow switch to be provided by the customer
Dimensions (W x H x D)	21 x 17.5 x 30 cm
Weight	12 kg
Part Numbers	
Mains input: 230/115 V, 50/60Hz	45006028
Mains input: 100V, 50/60 Hz	45006277

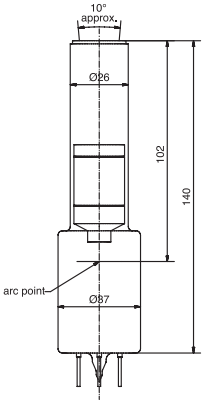
Dimensional Outlines



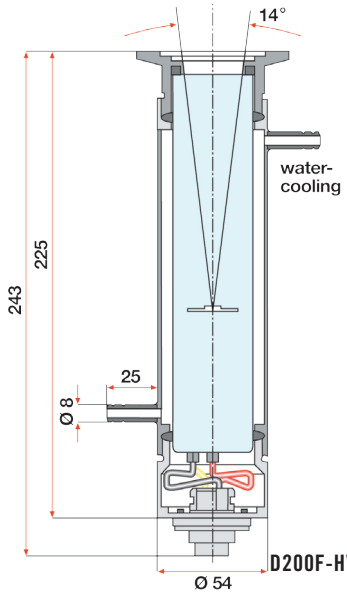
V01+V02



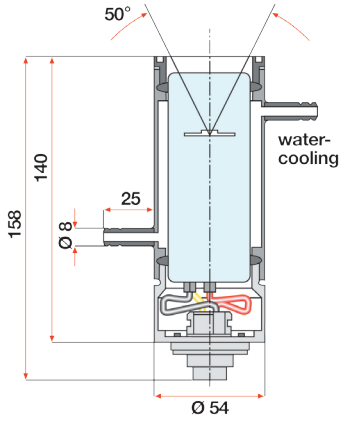
V03+V04



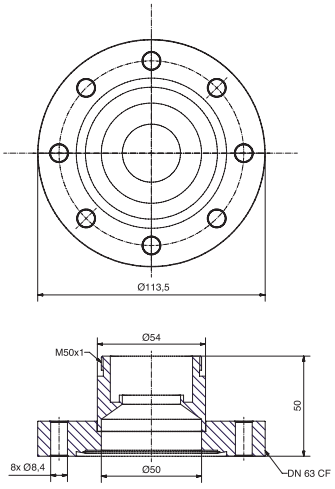
V05



D200F-HV, D200VUV



D200F



Flange DN 63 CF for D200 VUV

WM-Nr.: 00100121-3-09/05 ORT/WAN

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