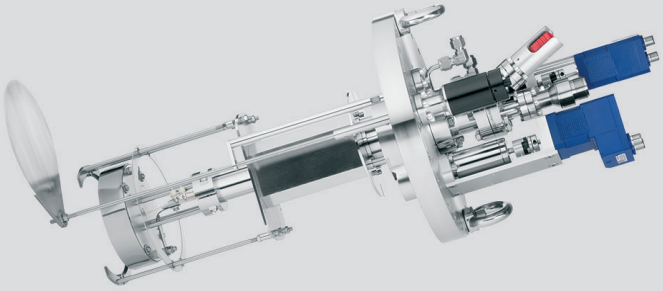
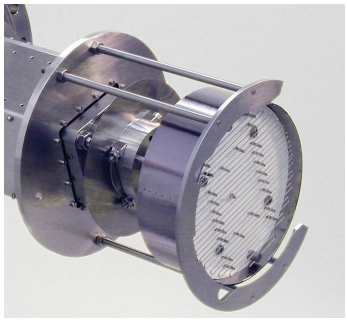
MBE
KOMPONENTEN | DR. EBERL

SUBSTRATE MANIPULATORS / DEPOSITION STAGES SH

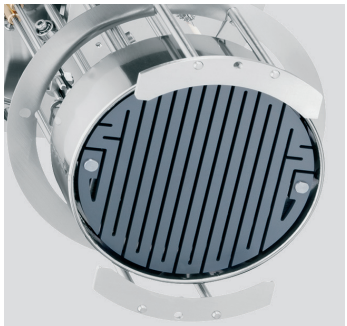
- W, Ta, graphite or SiC heater
- Wafer temperatures up to 1200°C
- Continuous rotation and linear travel for transfer
- Water cooled ceramic bearings
- Clean operation and high reliability
- Substrate sizes up to 8 inches
- Option: integrated main shutter



SH 200-4S25-S on DN200CF (O.D. 10") flange



1) U-shaped wafer holder of a SH 150-4W25



2) Graphite heater of SH 200-4G25-SBT and Ta substrate holder for a Si wafer ring adapter

3) Heater with PBN diffusor

MBE-Komponenten offers a large variety of heatable Substrate Manipulators and deposition stages SH.

Tungsten and tantalum wire heaters, graphite heaters or SiC heaters are available. By means of careful material selection and optimized design, clean operation and high reliability of our substrate manipulators are achieved.

SH manipulators are designed for continuous sample rotation. A magnetically coupled rotary motion feedthrough (MRD 16) is used for substrate rotation and ensures a long and leak-free lifetime of the manipulator. Usual rotation speed during growth is in the range 10-30 RPM.
For precise substrate rotation speed control we offer a manipulator control unit MCU. The MCU is delivered with a suitable electric motor and motor mounting kit. Motorized wafer lift and defined angular positioning is available on request.

The wafer holding of the SH manipulators is adapted to the transfer system of your system. Some examples are illustrated in the figures provided on the left:
1) special U-shaped wafer holder for a substrate manipulator type SH 150-4W25
2) wafer holder made of tantalum for a Si wafer ring adapter.
3) heater with PBN diffusor

For standard face-down transfer systems a vertical linear substrate travel of 25 mm is provided. Increased linear travel is available on request.

Several manipulator options like integrated main shutter or electrically insulated wafer holding are available on request.

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Applications

Our substrate manipulators are used in standard III-V MBE, II-VI MBE, GaN MBE, SiC growth, SiGe MBE as well as other MBE applications.

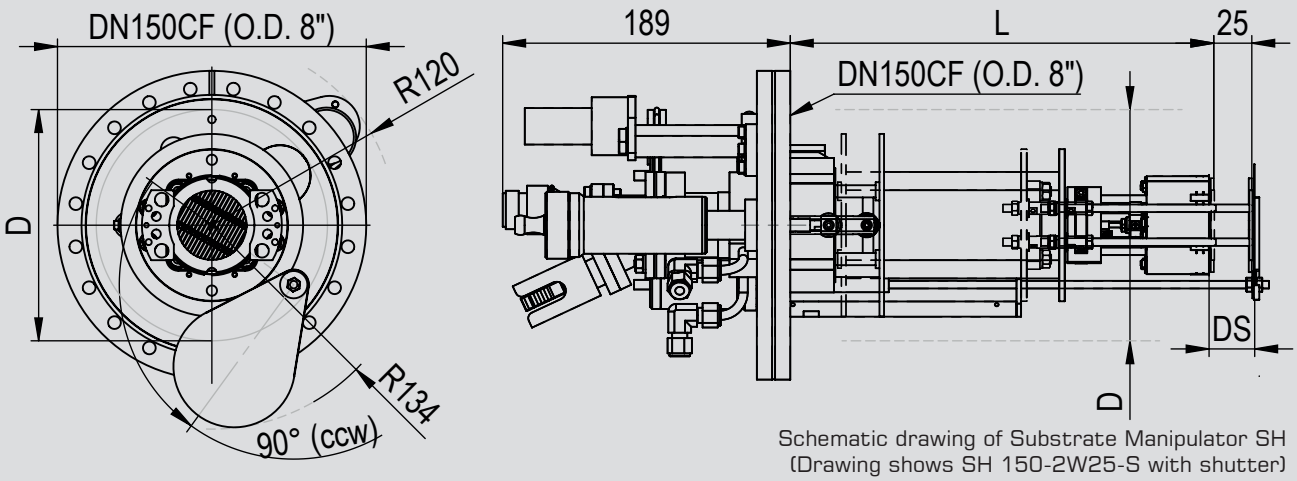
W heaters are recommended for very high-temperature applications.

For III-V MBE a Ta wire heater with PBN diffusor is recommended.

In SiGe MBE a pyrolytic graphite heater is often used. It provides clean UHV environment even at high operation temperature up to 1000°C.

Technical Data

Mounting flange	DN100CF up to DN320CF
Heater type	tungsten wire (W), tantalum wire (T), pyrolytic graphite (G) heater,
	SiC heater (S)
Bakeout temperature	max. 250°C
Waver temperature	standard configuration max. 1000°C (higher temperatures on request)
Electrical contacts	copper-free contacts for metal heater; water cooled contacts
	for the high currents of graphite heaters
Linear travel	25 mm standard, 30-50 mm on request
Option	integrated main shutter (S); electrically insulated waferholder with
	additional feedthrough for bias voltage (B); waferholder made of tantalum (T)



Schematic drawing of Substrate Manipulator SH
(Drawing shows SH 150-2W25-S with shutter)

Dr. Eberl MBE-Komponenten GmbH
Josef-Beyerle-Str. 18/1
71263 Weil der Stadt, Germany

Fon +49 7033 6937-0
Mail info@mbe-components.com
Web www.mbe-components.com