

# Epitaxy

## Induction Heating Solutions for Epitaxy

**Power Range:** 100kW – 600kW

**Frequency Range:** 1kHz – 50kHz

**Epitaxy** refers to the method of using chemical vapor deposition (CVD or MOCVD) to deposit a monocrystalline film on a monocrystalline substrate. The deposited film is denoted as epitaxial film or epitaxial layer. This process is used for the production of semiconductors and LEDs. Pillar MK11 series generators provide consistent and reliable induction heating for the process.

### System Features Include:

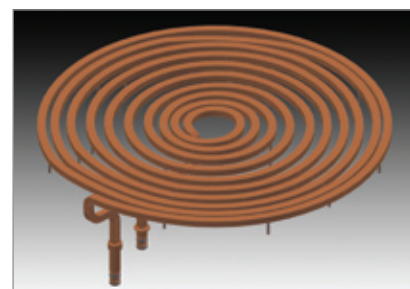
- No consumable components (i.e. tubes)
- 47% less power directly used by RF generator
- IGBT power control instead of tube so no more tube changes or power drifting
- 96.7% conversion efficiency Epitaxy unit
- Facility has to dissipate only 24,000 btu instead of the older requirement of 215,000 btu
- Less demand on facilities which could require expensive facility improvement as more equipment is added
- Less floor space than RF unit – 17 square feet versus 27.5 square feet
- Mark 11 requires access to one side only. Allows for back to back or against the wall mounting
- Better temperature uniformity
- Plenty of power to reach the hottest process temperatures. Less faulting for those higher demand processes
- Does not require any facility changes to install
- Direct modern replacement for motor generator and SCR technology
- Push to test tuning verification
- Insertable control board IC devices to expedite servicing
- Single main control board within a separate lockable door for safe access
- NEC and NFPA79 wiring codes
- Isolation output transformer
- Parallel tuned output circuit
- Constant voltage control circuit transformer
- Possible energy rebate from federal and/or state governments

## MK-11

### Features & Specifications



300kW – Size 2 cabinet (heat station attached)



Pancake Induction Coil



# Epitaxy

## Operator Interface:

- 3 start-up screens
- Power, frequency and voltage displays in run mode
- Tank circuit tuning displays load and frequency
- Built-in non-intrusive diagnostics, monitoring and troubleshooting displays
- Fault and limit identification displays
- Fault log
- Status screens
- Interactive diagnostic prompt screens for fault and limit corrections
- Upgradable EPROM for future improvements
- 10 turn power level potentiometer

## Utilities:

- 95° F (35° C) maximum water inlet temperature
- Water inlet and outlet fittings on cabinet top
- Inlet and outlet pressure gauges with differential pressure safety switch
- Water temperature sensing fault circuits
- Power devices cooled by parallel cooling circuits
- Input power 480 V, 3Ø 50/60 Hz

## Optional Features:

- Remote operator's panel (local and remote)
- 4/20mA interface
- Integral or remote heat stations
- Ground fault detection circuitry
- Data output terminal to monitor internal functions remotely
- CE and ETL certifications
- Current control

Cabinet Specifications				
Cabinet Size	Height	Width	Depth	Weight
Size 1	85" (2160 mm)	36" (915 mm)	36" (915 mm)	1500 lb (680 kg)
Size 2	85" (2160 mm)	48" (1220 mm)	36" (915 mm)	1900 lb (862 kg)
Size 3	85" (2160 mm)	84" (2134 mm)	36" (915 mm)	2500 lb (1134 kg)

Performance Specifications	
Power Circuit	Voltage source, parallel tuned
Energy Conversion Efficiency	up to 96.7% (frequency dependent)
Input Power Factor	0.95
Output Regulation	Voltage, kW, or current(optional)
Regulation Accuracy	±1% with ±10% input voltage variation
Minimum Output	~ 10% of rated power
Ramp Up to 100% Output	70 milliseconds
Water Inlet Temperature (max)	95°F (35°C)
Power Requirements	480 V, 3 phase, 50/60 Hz

kW \ Hz	Cabinet Size									Utility Requirements			Heat Station
	1	3	10	25	50	1/3	3/10	10/25	kVA	Line Amps	Cooling Water (GPM)		
100	1	1	1	1	1	-	1	1	111	133	15	Attached / External	
150	1	1	1	1	2	-	1	1	167	200	15	Attached / External	
200	2	2	2	2	2	-	2	2	222	267	25	Attached / External	
250	2	2	2	2	3	-	2	2	278	333	25	Attached / External	
300	2	2	2	2	3	-	2	2	333	400	25	Attached / External	
400	3	3	3	3	3	3	3	3	444	534	40	Attached / External	
500	3	3	3	3	-	3	3	3	555	666	40	Attached / External	
600	3	3	3	3	-	3	3	3	666	800	40	Attached / External	

Specifications subject to change without notice.

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