

## 20kW HiPIMS-Power Supply hiP-V

### Technical Data

#### Output Data

Output-Power	: 20KW
Output Voltage (Voltage for nominal pulse and DC-mode)	: 40V to 1200V (pulsed and DC)
Output Pulsed Current	: 1200A. For output Voltage <1000V : 1000A. For output Voltage from 1000V to 1200V.
Output Average Current (for pulse and DC-mode)	: max. 50A DC, for 400V : max. 17A DC, for 1200V
Pulse frequency	: 50Hz to 5kHz
Regulation in DC and HiPIMS	: Voltage / Current / Power (Real-time reg)
Negative pulse width:	: 5 $\mu$ s to 1000 $\mu$ s or DC
Duty cycle:	: <50% or DC 100%
Arc detection / handling:	: < 3 $\mu$ s
Arc current trip level (absolute):	: Adjustable 10A to 1200A
dl/dt arc trip level (Delta in %):	: 5% (less restrictive) to 95% (more restrictive)
Voltage stability:	: $\pm$ 2.5%
Voltage ripple:	: <5%rms
Functionality - Magnetron:	: DC (positive or negative), HiPIMS Unipolar (positive or negative), Dual Magnetron HiPIMS, HiPIMS with Positive Pulse.
Operation modes – Bias:	: DC Bias, Bias Synchronized (software selectable).
Bias Delay Time:	: 3 $\mu$ s to 100 $\mu$ s.
Positive Pulse Voltage (Optional):	: +50V to +400V, or no pulse.

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Positive Pulse Current	: max. 80A.
Positive Pulse length:	: 5 $\mu$ s to 200 $\mu$ s.
Positive pulse Power:	: 1kW.
Positive Pulse Delay: (from end of negative pulse)	: 1 $\mu$ s to 50 $\mu$ s

### Input Line

Nominal voltage	: 380Vac to 480 Vac ; 3phase +/- 10% (no neutral required).
Frequency range	: 47Hz to 63Hz.
Input nominal current	: < 40A.
Input current waveform	: 12 pulse rectification.
Dielectric strength	: 2500V, 50/60Hz, 1min.

### Interface Data

Viesca HiPIMS supervisor	: Standard USB cable type B or Ethernet.
Industrial Interface (optional)	: Profibus, EtherCAT or Ethernet/IP.

### Environmental Conditions

Ambient temperature	: 0°C to 40°C
Temperature inside the box	: 0°C to 70°C
Humidity	: up to 90% (the equipment is designed with creepage distances as per EN-61010-1)

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#### Cooling Data (Air & Water)

Forced ventilated air cooling	: Front - air inlet, rear – air outlet
Water cooling (or water-glycol)	: 12 liters/minute 0.28 bar pressure drop
Liquid inlet temperature	: < 50°C

#### Output connection Data

Power connection	: M6 screws.
Cable type	: Triax recommended, coaxial or twisted screened
Cable section	: 50mm <sup>2</sup> . Minimum temperature 120°C.

#### Input connection Data

Input connection	: 3-phase wires 10mm <sup>2</sup> cross section.
Protection earth connection type	: 6mm <sup>2</sup> cross-section.
Internal protection	: 40A circuit breaker.
Interlock	: 24Vdc/10A.

#### Acoustic noise

The equipment will produce an acoustic noise lower than 60dBA measured at a distance of 1 meter.

#### Case

The unit is contained in a 19" rack module, 635mm deep and 10U high.

The weight is 125kg.

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The protection is IP20. It is not protected for water ingress; it is protected against ingress of parts bigger than 12mm. It is intended for indoor use in a laboratory.

The case is water-cooled and forced air ventilated; the air ingress is done by the front side and the exhaust by the rear side.

### Projected Applications

HiPIMS magnetron: Unipolar, Dual Magnetron and Bipolar HiPIMS (with Positive Pulse).

DC magnetron sputtering.

DC Bias.

HiPIMS Bias: DC and Synchronized. Bias delay time selectable.

Dual-floated or remote anode operation.

### Reference Standards

The 20kW pulsed power supply described in this document is fully compliant, but not only, with the following railway standards:

EN 61000-3-12-2006 Electromagnetic compatibility (EMC) part 3-12: limits for harmonic currents produced by equipment connected to public low-voltage systems with input current greater than 16 a and equal to or less than 75 a per phase

EN 61010-1:2002 Safety requirements for electrical equipment for measurement, control, and laboratory use -- Part 1: General requirements

MIL STD 217 Reliability Prediction of Electronic Equipment

EN 61204-3-2002 Low voltage power supplies, d.c. output -- Part 3: Electromagnetic compatibility (EMC).

EN 61000-6-3-2006 Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light- industrial environments

EN 61000-6-2-2006 Electromagnetic compatibility (EMC) -- Part 6-2: Generic standards - Immunity for industrial environments