

**GROW CONTROL**  
**POWER TECH PVT. LTD.**

We Provide Solutions....

**AN ISO 9001:2015 COMPANY**



## **SOLID STATE HIGH VOLTAGE MODULATOR**

**MODEL NO.: GC104SSM-30KV/2500A**



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**GROW CONTROL** Solid-State High Voltage Modulator is an advanced, high-performance, indigenously developed IGBT-based high-voltage switching device designed to efficiently convert high-voltage DC into pulsating DC with precise control over pulse width and pulse repetition frequency (PRF).

This modulator employs high-speed insulated-gate bipolar transistors (IGBTs) for superior switching performance, enabling reliable generation of tailored pulse profiles critical for applications such as radar systems, particle accelerators, and high-power microwave devices.

Key characteristics include rapid rise and fall times, high efficiency, and the ability to handle significant load variations, making it ideal for demanding high-voltage pulsed power systems. Built with rugged solid-state technology, it ensures reliability, compactness, and ease of maintenance.

### **Features**

- **High Voltage Output:** Capable of delivering up to 30kV pulses with exceptional precision.
- **Pulse Fidelity:** Minimal jitter and high stability for applications demanding precise signal timing.
- **Solid-State Design:** Enhanced reliability, long lifespan, and reduced maintenance compared to traditional tube-based modulators.
- **Compact and Modular:** Space-efficient design for ease of integration and transportation.
- **Built-In Protection:** Features over-voltage, over-current, and thermal protection for safe operation.
- Local and remote mode of operation.
- All interface connectors for signal and power as per MIL 38999 series III connectors
- Provision For adjusting peak voltage, pulse width, PRF.
- User friendly monitor with touch screen. It shows all analog parameters, status parameters, interlock status.
- Automatic recovery.



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### **Technical Specification:**

<b>Model No.</b>	<b>GC104SSM-30KV/2500A</b>
<b>Solid State HV Modulator System</b>	
<b>Input voltage</b>	415V $\pm$ 10%, 3PHASE, 50HZ
<b>Input current</b>	152A $\pm$ 5%
<b>Input power</b>	100KVA (AVERAGE)
<b>Output voltage</b>	0-30kV, pulse (suitably mated to existing Klystron tank input for existing system to produce 20MW(p-p) of RF at the output of Klystron in standard operating conditions with 4 $\mu$ sec pulse width with 250Hz PRF and 10MW peak with 4 $\mu$ sec pulse width in 500Hz PRF)
<b>Output current</b>	0-2000A PEAK
<b>Output pulse width</b>	1 $\mu$ SEC TO 5.5 $\mu$ SEC MAX (adjustable with 0.1 $\mu$ SEC resolution)
<b>PRF</b>	250HZ, 500HZ
<b>Cooling</b>	Forced Air Cooling, Liquid Cooling (As Applicable)
<b>PC communication</b>	ETHERNET
<b>Pulse Width</b>	4 $\mu$ SEC $\pm$ 5% PULSE (MAX) FOR 250HZ $\pm$ 1%
<b>Input Power Conditioner</b>	
<b>Input voltage</b>	415 V $\pm$ 10%, 50 HZ, 3-PHASE AC Input
<b>Input current</b>	152A (MAX) $\pm$ 5%
<b>Output voltage</b>	560VDC $\pm$ 10% Unregulated
<b>Extra High Voltage</b>	
<b>Input voltage</b>	560 V DC $\pm$ 10% Unregulated
<b>Input current</b>	160A (MAX) $\pm$ 5%
<b>Output voltage</b>	-30 KV DC $\pm$ 600V output
<b>Output capacitor bank</b>	Suitable capacitor bank will be provided to support output pulse energy.
<b>Topology</b>	IGBT based SMPS based series resonant converter



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### Environmental specification

<b>Operating temperature</b>	0°C TO +55°C
<b>Storage temperature</b>	-20°C TO +70°C
<b>Humidity range</b>	0% TO 95% Non-Condensing
<b>Altitude</b>	10,000 FEET
<b>MTBF</b>	>1000 HRS
<b>MTTR</b>	LESS THAN 30MIN

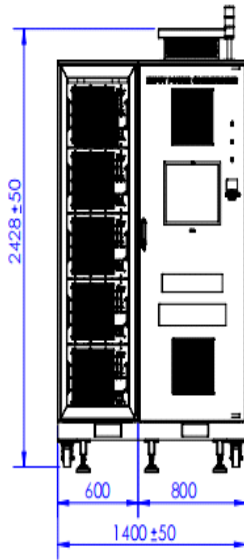
Sub-system	Dimensions	Weight
<b>Input Power Conditioner</b>	2428 mm(H) X 800 mm(W) X 1000mm(D) ±50mm	<b>2500kg (approximate)</b>
<b>Capacitor Charging Power Supply</b>	2252 mm(H) X 600 mm(W) X 1000mm(D) ±50mm	
<b>Solid State Pulse modulator + energy capacitor</b>	2428 mm(H) X (800+800) mm(W) X 1000 mm(D) ±50mm	
<b>Cooling system</b>	2428mm(H) X 800mm(W)* 1000 mm(D)± 50mm	
<b>Outdoor Chiller unit</b>	2020mm(H)X1600mm(W) X 919mm(D)± 50mm	<b>Without water 475kg (approximate)</b>



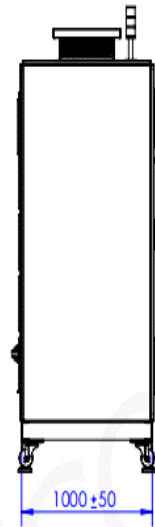
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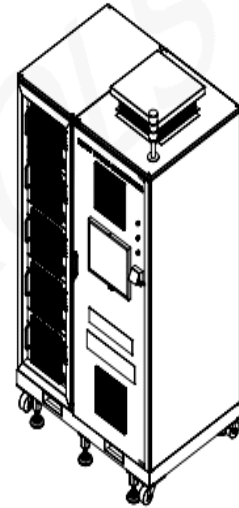
### ***IPC & CCPS RACK :***



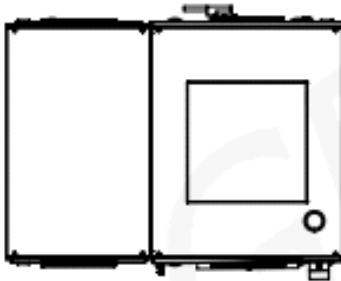
FRONT VIEW



SIDE VIEW



ISOMETRIC VIEW

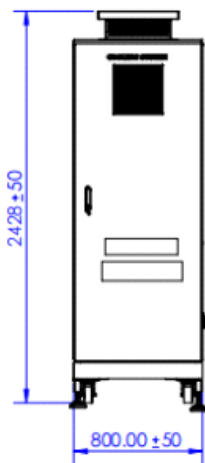


TOP VIEW

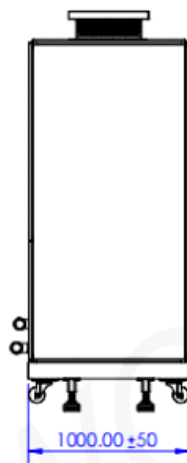


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## ***Cooling System***



FRONT VIEW

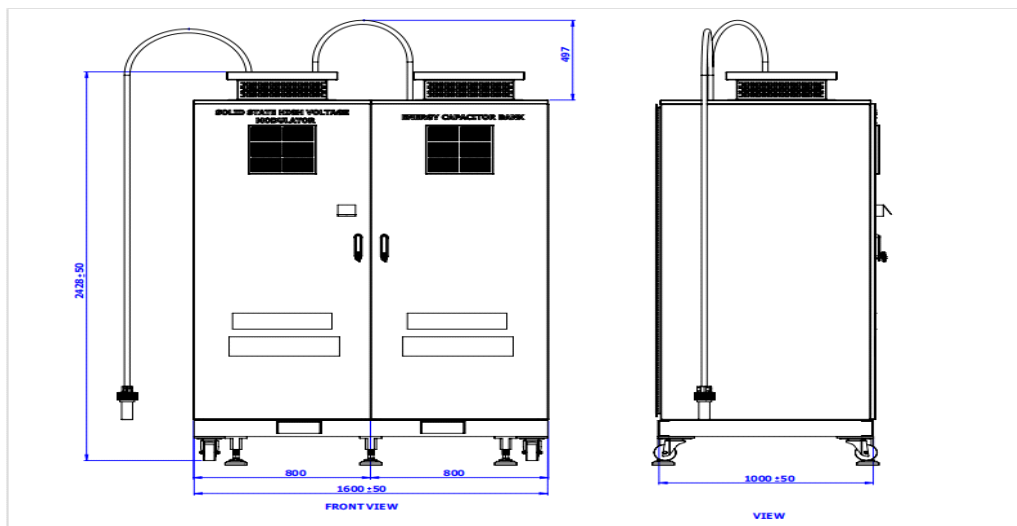


SIDE VIEW



ISOMETRIC VIEW

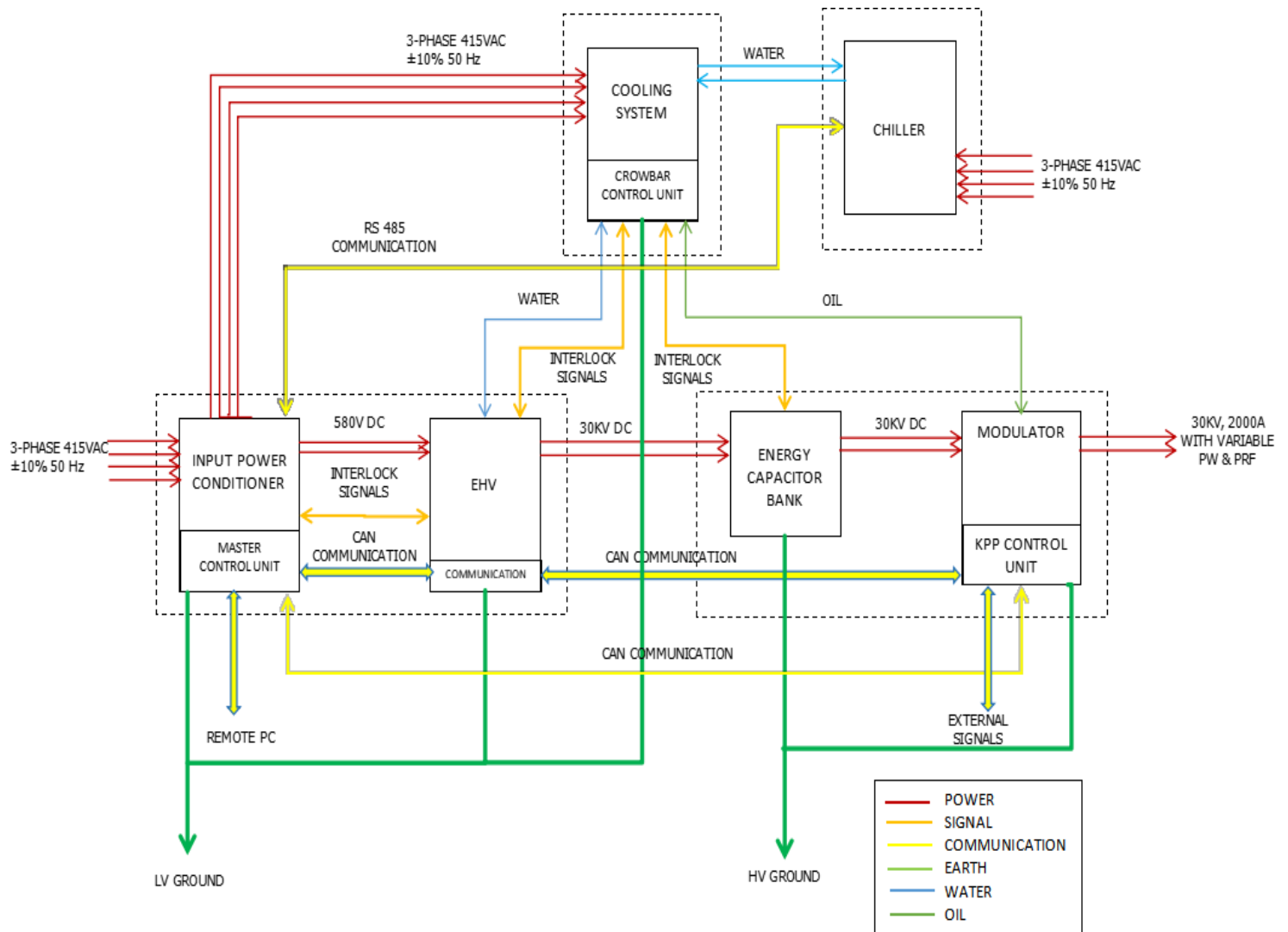
## ***Energy Capacitor And Modulator Rack :***





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### Block diagram:

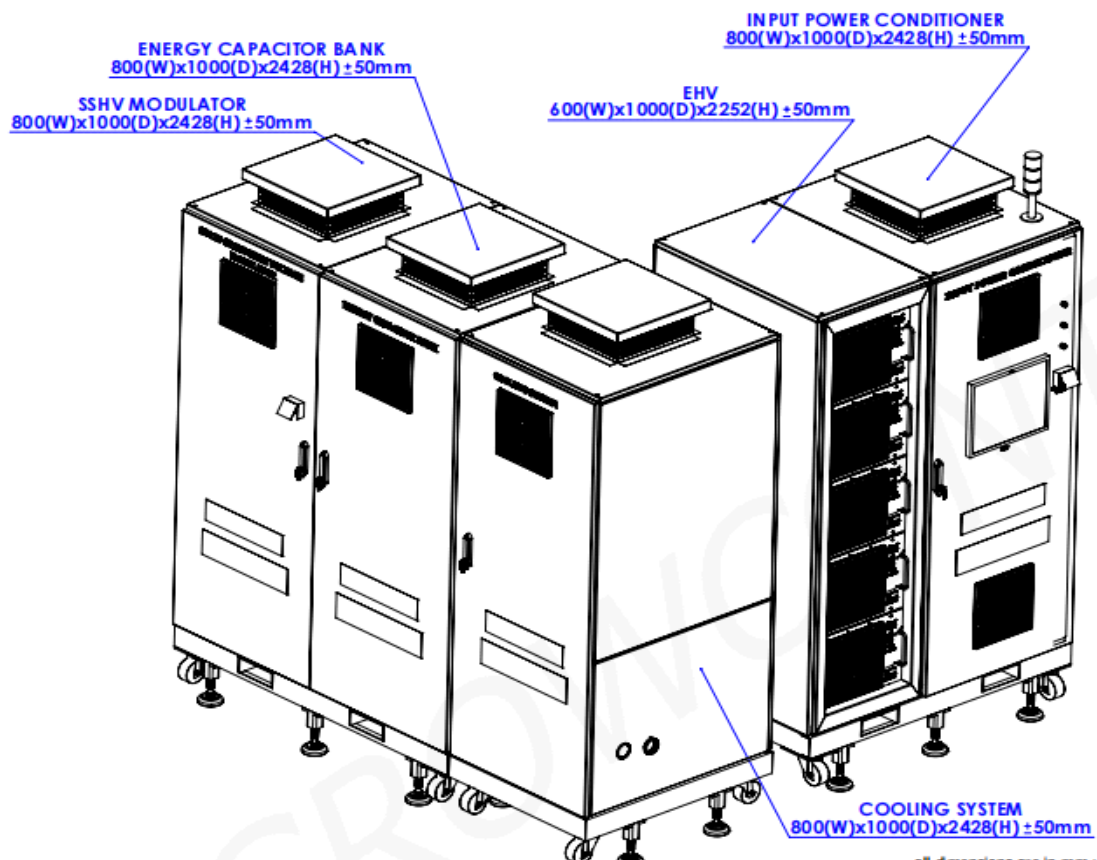






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