GROW CONTROL
POWER TECH PVT. LTD.

We Provide Solutions....

AN ISO 9001:2015 COMPANY

KLYSTRON MODULATOR

GROW CONTROL **Klystron Modulator** is a high-performance, precision power supply solution designed to drive **klystrons** used in radar, particle accelerators, communication systems, and electronic warfare applications. These modulators deliver the controlled high-voltage pulses required to operate klystrons, ensuring their reliable performance in systems where high gain, high frequency, and high-power outputs are critical.

Built on over 30 years of experience and using **indigenous technology**, the ***GROW CONTROL*** Klystron Modulator is engineered to meet the rigorous demands of defense and aerospace applications, offering superior pulse accuracy, reliability, and durability.

Features

- **High Voltage Output**: Capable of delivering output voltages up to 120kV, providing flexibility to support a wide range of klystron types.
- **Pulse Power Output**: Power output range from 50kW to 500kW, depending on application needs.
- **Pulse Width Control**: Adjustable pulse widths from microseconds to milliseconds for precise control over the modulated signal.
- **Pulse Repetition Rate**: Supports pulse repetition frequencies from 10 KHz to 800KHz, ideal for a wide range of radar and communication systems.
- **High Efficiency**: Up to 95% energy efficiency, minimizing heat generation and reducing operational costs.
- **Low Ripple & Noise**: Ultra-low ripple and noise characteristics ensure stable and clean operation of klystrons for critical applications like radar and particle accelerators.
- **Advanced Protection**: Equipped with comprehensive protection features, including over-voltage, over-current, over-temperature, and short-circuit safeguards to ensure safe and reliable operation.
- **Compact & Modular**: Designed to be compact and modular, allowing for easy integration into existing systems while conserving space.
- **EMI/EMC Compliance**: Fully compliant with **EN 55022** standards to ensure minimal interference with other electronic equipment.
- **Remote Monitoring and Control**: Supports digital interfaces for real-time monitoring and remote control of voltage, pulse width, and repetition rates.

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Key Advantages

1. **Indigenous Technology**:
   Designed and manufactured in India, ***GROW CONTROL*** Klystron Modulator ensures high performance and reliability tailored to domestic defense and aerospace needs.
2. **Precision Pulse Power**:
   Delivers precisely controlled high-voltage pulses with minimal jitter and ripple, essential for optimal klystron performance in high-frequency, high-power systems.
3. **Flexible Power & Voltage**:
   Adjustable output voltage and pulse configurations make the modulator versatile for a variety of klystron types used in radar, communication, and accelerator systems.
4. **Energy Efficient**:
   With up to 95% efficiency, the modulator reduces energy losses and cooling requirements, making it cost-effective and environmentally friendly.
5. **Built for Harsh Environments**:
   Designed to meet military-grade standards for shock, vibration, and temperature, the modulator is ideal for rugged environments in defense and aerospace sectors.
6. **Customizable Solutions**:
   GROW CONTROL offers customization options, including voltage levels, pulse configurations, and physical dimensions, to meet the unique requirements of specific applications.

Customization Options

GROW CONTROL offers flexible customization to meet the unique requirements of defense, aerospace, and industrial applications. Customization options include:

- Output Voltage & Power Adjustments
- Size and Form Factor Modifications
- Cooling Options (Air or Liquid)
- Advanced Pulse Control Features
- Enhanced Safety Features

- Remote Monitoring and Control Customization

Our engineering team works closely with clients to develop tailored solutions that address their specific technical and environmental needs.

Why Choose *GROW CONTROL?*

- **Indigenous Expertise**: With over 30 years of experience in power electronics, ***GROW CONTROL*** delivers robust, reliable, and fully indigenous Klystron Modulators that meet the exacting standards of the defense and aerospace industries.
- **High Precision & Efficiency**: The modulator ensures stable and precise pulse power delivery, essential for optimal klystron performance in critical applications.
- **Durable & Rugged Design**: Designed for extreme environmental conditions, the modulator complies with military standards for durability and longevity.
- **Energy Saving**: With high energy efficiency, the modulator reduces operational costs while providing optimal power delivery.
- **Customer Support**: ***GROW CONTROL*** offers complete support, from customization to installation and maintenance, ensuring smooth integration and reliable operation.

Certifications

- **EN 55022** – EMI Compliance
- **ISO 9001:2015** – Quality Management Systems

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Technical Specification

Model no.		GCPT24KV5C-TWT
Input		415V, 50Hz, 3-phase
Heater power supply	Filament voltage (continuously variable) (V DC)	0 to 9
	Filament current (A)	3.5
	Surge current (A)	6
	Metering type-digital	4 ½ digit
	Line regulation (%)	±0.1
	Stand-by / warm-up	120 seconds, maximum
	Reference	Cathode
Cathode supply	Adjustability (kV)	-0.5 to -5
	Cathode current (mA)	400 to 1000
	Line / load regulation (%)	<0.1
	Body current (mA)	400
	Ripple (V) p-p	<2
	Metering	4 ½ digit
	Accuracy (%)	1
	Reference	Ground
Beam modulator	Bias voltage (V)	-200 to -800
	Pulse voltage (V)	-20 to +200
	Pulse width (µS)	0.5 to 2.5
	Metering	4 ½ digit

	Accuracy (%)	1
	Rise and fall time (ns)	50
	PRF (kHz)	1 to 800
	Duty (%)	0.5 to 40
	Pulse top voltage variation (V) p-p	<1
	Modular input	BNC (female) TTL high for beam ON TTL low for beam OFF Default beam OFF
Collector power supply	**Adjustability (V to kV)**	0 to 2.5
	Collector current (mA to A)	400 to 1
	Line/load regulation (%)	±1
	Reference	Ground
	Voltage ripple (V) p-p	15

OUR CLIENTS

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