GROW CONTROL
POWER TECH PVT. LTD.
We Provide Solutions....

AN ISO 9001:2015 COMPANY

300kVA INVERTER

GROW CONTROL is a research-driven power electronics organization that integrates technology, innovation, and engineering to transform concepts into world-class products and solutions.

GROW CONTROL 300kVA Sine Wave 3-Phase Inverter is designed with a three-level TNPC (T-type Neutral Point Clamped) topology, incorporating a suitable LC filter at the output to effectively minimize harmonics. The inverter receives regulated DC input, ensuring stable and efficient power conversion.

This high-performance power supply offers variable output from 80V to 400V AC, 3-Phase, 400Hz, and operates using the Space Vector Pulse Width Modulation (SVPWM) switching technique. The input voltage is sourced from a variable DC supply, which is derived from a controlled rectifier, ensuring precise voltage regulation and optimal system performance.

Designed for critical industrial and defense applications, this inverter provides high efficiency, reliability, and superior power quality in demanding environments.

Control Philosophy:

The ***GROW CONTROL*** 300kVA Sine Wave 3-Phase Inverter is designed with an advanced control philosophy to ensure precise operation, safety, and seamless integration into larger systems.

Operator Control & Monitoring

- Operators can set parameters such as voltage settings and interlocking ranges via the HMI on the local control panel.
- The HMI communicates with a DSP-based control card, allowing the operator to configure set voltage and trip settings.
- Local mode operation is used solely for troubleshooting and functional verification, whereas integration mode is the standard operating mode.
- In case of an abnormal condition, the inverter shuts down within 60 microseconds and sends feedback to both the master controller and remote monitoring system.

UHV Generation & Voltage Regulation

- Three inverters operate in parallel to generate Ultra High Voltage (UHV).
- The operator sets the voltage at the inverter side, which gradually increases until the required voltage is achieved.
- Voltage feedback is then sent to the master controller, which regulates the input-controlled rectifier (AC-DC rectifier) to maintain stability.

Input Current Monitoring & Overcurrent Protection

- A comparator continuously monitors input current.
- If the input current exceeds the set limit, the comparator sends a high signal to the D flip-flop, triggering the input overcurrent interlock and shutting down the power supply.
- Simultaneously, the tripping information is sent to the master controller, enabling a fault response.

Fault Handling & System Protection

- When operating through the master controller, all commands and interlocks are actively monitored.
- If any inverter, rectifier, or HV rectifier trips, this information is sent to the master controller.
- The master controller then issues a trip command to shut down the entire system within 60 microseconds, ensuring rapid fault containment.

Temperature Monitoring & Protection

- Temperature sensors from the HV transformer send real-time data to the temperature controller and HMI.
- If the temperature exceeds the pre-set limit, the DSP takes corrective action to protect the system.

Input Soft Start Mechanism

- When the mains-on command is received from the DSP, the soft start contactor switches ON.
- DC link capacitors are gradually charged through the soft start resistor to prevent inrush current.

- Once the DC link voltage reaches 90% of the full voltage, the main contactor switches ON, and the auxiliary contactor bypasses the soft start resistor.

Discharge Mechanism

- A discharge resistor is connected via a discharge contactor.
- When the inverter is OFF, the discharge contactor remains ON, ensuring safe discharge of residual voltage.

This comprehensive control architecture ensures high reliability, safety, and efficiency, making the system well-suited for critical industrial, defense, and aerospace applications.

Features

- **DC to AC Conversion:** Efficiently converts DC to AC.
- **Compact Design:** Optimized for space-saving and easy integration& easy maintenance.
- **High Efficiency:** Minimizes power losses during the conversion process.
- **Voltage Regulation:** Ensures consistent AC output regardless of DC input fluctuations.
- **Robust Construction:** Built to withstand harsh industrial environments.

Key Advantages

1. **Reliable Power Supply:**
   Provides a stable AC output for sensitive equipment**.**
2. **Energy Savings:**
   High efficiency reduces energy consumption and operational costs.
3. **Versatile Application:**
   Can be used across various industries requiring AC power.
4. **Maintenance-Friendly:**
   Easy to service and maintain with long operational lifespans.
5. **Compact and Space-Saving:**
   Ideal for locations with limited space.

Applications

1. **Telecommunications:**
   Powers communication systems and equipment.
2. **Power Distribution:**
   Provides AC for industrial machinery and renewable energy systems.

Customization Options

GROW CONTROL provides a variety of customization options for the Inverter Unit to accommodate specific application requirements:

- **Custom Input and Output**
- **Enhanced Control Algorithms for Specific Applications**
- **Integrated Monitoring Systems** for real-time feedback
- **Modular Configurations for Scalable Power Ratings**
- **Additional Communication Interfaces** for enhanced integration

Our engineering team works closely with clients to deliver tailored solutions that precisely fit their operational needs, ensuring optimal performance and compatibility.

Why Choose *GROW CONTROL*?

- **Indigenous Expertise**: Tailored to meet Indian industry standards with local support for customization and maintenance.
- **Reliable and Efficient**: Designed for stability and high efficiency, ensuring consistent power delivery for critical applications.
- **Low Maintenance Requirements**: Durable design reduces wear and tear, minimizing downtime and maintenance costs.
- **Energy Efficient and Cost-Effective**: Low energy losses lead to cost savings and enhanced operational efficiency.
- **Customer Support**: From initial design consultation to installation and ongoing support, ***GROW CONTROL*** offers a full range of services.

Certifications

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

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Technical Specification

Model no	GCPT300KVA-DC-AC
Input	
Input Voltage	600 V DC (Variable 20% to 100%)
Input voltage variation under steady state condition	± 5 %
Input voltage variation under transient state condition	± 10 %
Performance Requirement	
Inverter topology (Proposed)	Multi-Level IGBT based PWM Inverter.
AC output power	300 kVA
AC output voltage	400 V RMS
AC output frequency	400 Hz ±5%
Output voltage wave form	Sine Wave
Output Power factor	0.9 (lagging) to 1.0
Number of Phases	Three phase
Efficiency	≥ 95 % at rated output power
Total Harmonic Distortion (THD) %	≤ 5% Output voltage
Output overloading	100 % for Continuous 120 % for 60 seconds
Output Voltage Control range	20% - 100 %
Control accuracy	≤ ± 1%
Regulation	± 1% for 20% - 100 % Load Variation ± 1% for ± 10% Input Voltage Variation
Response time (in the event of external trip command)	≤100 µsec
Type of Cooling	Forced air cooled
Protection class	IP 30
Standards	IEC 60146 1-4

OUR CLIENTS

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