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Integrated Klystron Test Stand

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Diversified Technologies, Inc. (DTI) recently delivered an Integrated Klystron Test Stand for klystrons under development at the Naval Research Laboratory (NRL) and Communication and Power Industries, Inc. (CPI). The test stand provides an HV beam and depressed collector power supplies, mod-anode modulator, controls, and circuit/klystron protection. The Integrated Klystron Test Stand simplifies and speeds the ability of the user to safely and efficiently test and exercise the klystron over the full range of its capabilities.
This test stand design draws directly on previous DTI solid-state systems and shares common design elements based on DTI's patented solid-state switching technology—which has a history of reliable operational performance across more than 600 high voltage systems around the world. A single capacitor and solid-state cathode switch provide the peak beam power while providing protection for the klystron in the event of an arc. The switch opens and removes cathode voltage within ˜ 1 μs after an arc is detected.
A control cabinet houses the main system controls and interface, including most of the power distribution and a Programmable Logic Controller (PLC) for system sequencing, parameter and fault monitoring. The PLC sequences are based on DTI's klystron transmitter systems, with the addition of the flexibility and programmable sequencing in voltage, pulsewidth, and frequency required for klystron conditioning and testing across a range of parameters, rather than just the full power operation. A standard DTI switching power supply delivers a 10 to 32 kV DC high voltage input to the modulator. This high stability/low noise supply uses an advanced PWM inverter which gives excellent voltage and current regulation over the full output range. Nominal output behavior is 0.1% ripple and +/- 0.2% voltage regulation, with fast response to transients.

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