Medium Voltage

Features:

Complete Isolation for Control Electronics

Optional Fiber-Optically or Transistor Coupled

Multiple Independent Inputs for Multi-Phase Circuits

Corona-Free Design

Applications:

Sub-Cycle AC Transfer Switches

1.2 to 12.0 kVac Motor Starters

Plasma Arc Rectifiers

Pulse Power Systems

Medium Voltage Trigger Boards

Overview

The MVTB family of medium voltage trigger boards offers engineers a turnkey solution for medium voltage SCR systems requiring hard- firing dc gate drive with excellent control electronics isolation. Stringent power quality regulations frequently necessitate power conversion and control at medium voltages. Examples include sub-cycle transfer switches, motor soft-starters and MVDC power distribution associated with distributed generation. The MVTB family of boards fulfills this need, reducing design cycle time and increasing system reliability.

Fiber optic gate commands signals provide extremely high voltage isolation between the delay determinator and the trigger board. High voltage tolerant pulse transformers interface the MVTB board to the SCRs and provide up to 12 kVac isolation between the ac line and the MVTB's driver circuit. Creepage , impulse level and partial discharge are in accordance with EN 50178 and UL 840.

Features

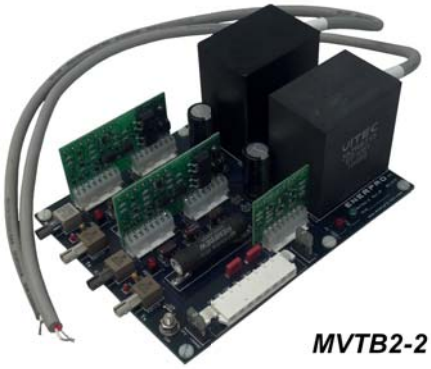
The MVTB family incorporates several key features of particular concern with medium voltage systems:

- Fiber optic gate logic inputs provide enhanced safety, noise immunity, and electrical isolation between the trigger board and external gate logic.
- Proprietary pulse modules ensure excellent isolation between the trigger board common and the ac mains and are guaranteed for 12.0 kVac minimum corona inception voltage (for 7.2 kVac service grade).
- Hard-firing DC gate pulses with fast initial rate of rise (4 A/ μs) reduce variance in turn-on time for parallel or series devices and provide immunity against gate inversion.
- The MVTB family accepts the gate pulses produced by all standard Enerpro firing boards to create a completely integrated firing package.

Applications

High isolation voltage and fast, high current gate drive makes the MVTB trigger board especially suitable for high power rectifiers, inverters and ac controllers utlizing:

- Advanced design SCRs with up to 12 kV blocking voltage per device.



MVTB2-2

- Series connected SCRs for increased voltage standoff.
- Parallel connected SCRs for increased current capability.

Circuit Board Operation

A fiber optic receiver (FOR) converts the optical gate command signal into a voltage logic signal. This signal is 120-degree wide burst of phase-locked, 50% duty cycle pulses operating at 384 times the mains frequency (23 kHz for 60 Hz mains).

Fiber optic transmitter (FOT) modules installed in lieu of pulse modules on Enerpro firing boards (sold separately) provide the optical gate signals. The required phase-locked gate drive pulse train is standard output on all Enerpro phase angle control firing boards.

Key Specifications :

- 4 A/μs initial gate current rate of rise (short circuit)
- 3.0 A peak initial gate current, 500 mA sustaining (short circuit)
- 30 V initial open circuit gate voltage, 15 V sustaining
- 12 kVac minimum corona inception voltage (7.2 kVac service grade)
- Gate signal readback via fiber optic connection
- Power supply fault monitoring

All circuit boards are assembled at the Enerpro plant in Goleta, California and are manufactured by a UL-approved fabricator from 0.093-inch thick FR4 fire resistant fiberglass epoxy laminate. All boards are conformal coated (MIL-1-46058, Type UR).

Medium Voltage Trigger Board

Medium Voltage Trigger Board - Product Datasheet	
Maximum Ratings	
AC mains voltage	7.2 kVac (maximum)
Pulse transformer corona inception	12 kVac (minimum)
Pulse transformer corona extinction	11 kVac (minimum)
Pulse transformer hipot	25 kVDC (60 seconds, > 2 μA leakage)
Operating temperature range	0 C to 65 C
Board ac supply voltage	28 Vac (24 Vac nominal)
Electrical Characteristics	
Initial open circuit gate voltage	30 Vdc peak for first 20 μs of gating
Sustaining open circuit gate voltage	15 Vdc
Output pulse dead time	< 200 ns
Initial short circuit gate current	3.0 A for first 20 μs of gating
Sustaining short circuit gate current	500 mA
Diagnostic LEDs	POWER ON Indicates board power active. GATE ON Indicates gate activity. FAULT Indicates bias supply out of range.

MVTB Ordering Guide		
Parameter	***Description***	***Code***
Model (Note 1)	**2-2** 2-outputs, 2-inputs **3-3** 3-outputs, 3-inputs **4-1** 4-outputs, 1-input **4-2** 4-outputs, 2-inputs **6-1** 6-outputs, 1-input **6-2** 6-outputs, 2-inputs **6-6** 6-outputs, 6-inputs	
Interface for Gate Signal	**ST** ST Connector for 62.5/ 125um Mulitimode (Standard) **VL** Versatile Link (VersaLink) 1.0 mm plastic optical fiber (POF) **OP** Mate-n-Lok connector for opto-relay gating (may not be available on all models)	
Pulse Module Physical Configuration	**F** Front mounted pulse modules (Standard) **R** Reverse mounted pulse modules	
Maximum Line-To-Line Voltage	**1.2** 1.2kVac **2.4** 2.4kVac **4.2** 4.2kVac **7.2** 7.2kVac	

Notes

1. Custom configurations available upon request.

Enerpro *applications engineers are available by e-mail or fax for applications assistance.*

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