

R&D Electronics Newsletter (2015 Issue 6)

Welcome to our 6th issue of newsletters in 2015!

R&D Electronics is the **exclusive Sales-Channel of TECHSEM**, which is a well-known Chinese developer and manufacturer of **diode / thyristor modules and capsules** with more than 48 years experience.

In this issue we would like to present a summary of TECHSEM product features and the customer benefits. In addition, it is a challenge for many users of power semiconductors to connect high voltage components in series. Using a practical example, we are introducing in this issue what support TECHSEM is doing for this purpose.

All of our newsletters have been achieved in our online shop. For more information please visit: www.rd-ebusiness.com

Yours faithfully

R&D Electronics Team

TECHSEM Product Features and Customer Benefits

Product Features	Customer Benefits
Product portfolio from chips to power assemblies	Easy buying, better quality assurance
CE, UL and European RoHS certified	Safety, health and environment protected
More than 5000 different products	Less procurement costs
Product reliability test up to 20,000 power cycles	Higher reliability
2 x passivation layers on chip	Higher Product Stability
Pressure contact technology for Power Modules	Longer lifetime, higher safety margin
Single power module up to 3600V/1200A, single capsule device up to 7200V/8000A	Cost savings by compacter design
Products with special configurations like common-anode or common-cathode modules	Cost savings by flexible design
Products for special application (e.g. pulse thyristor with di/dt = 8kA/μs)	Less costs due to more choices
Products according to customer special requirements (e.g. selection for series / parallel circuits)	Cost savings by less internal efforts
Extra epoxy layer in the power modules for better humidity protection	Cost savings by less product failures
100% additional function test shortly before shipment	No wrong products or wrong shipment

High Voltage Power Semiconductors in Series

To achieve higher blocking voltage, we need to connect several thyristors in series. Realizing the homogeneous voltage on each device is what we are most concerned about. The homogeneous voltage for devices in series circuit can only be achieved, if the devices have the similar blocking voltages, switching-on characteristics and recovery characteristics. Fig.1 shows the main topology of a 70 Tonne medium frequency (90Hz-350Hz) smelting equipment. TECHSEM's 4000V and 3500V fast turn-off capsule thyristors have been used in series to fulfill the requirement of 1500V line voltage of the rectifiers. The rectifiers are connected in series as well. The DC voltage is 4000V and the rated voltage for medium frequency is 5000V.

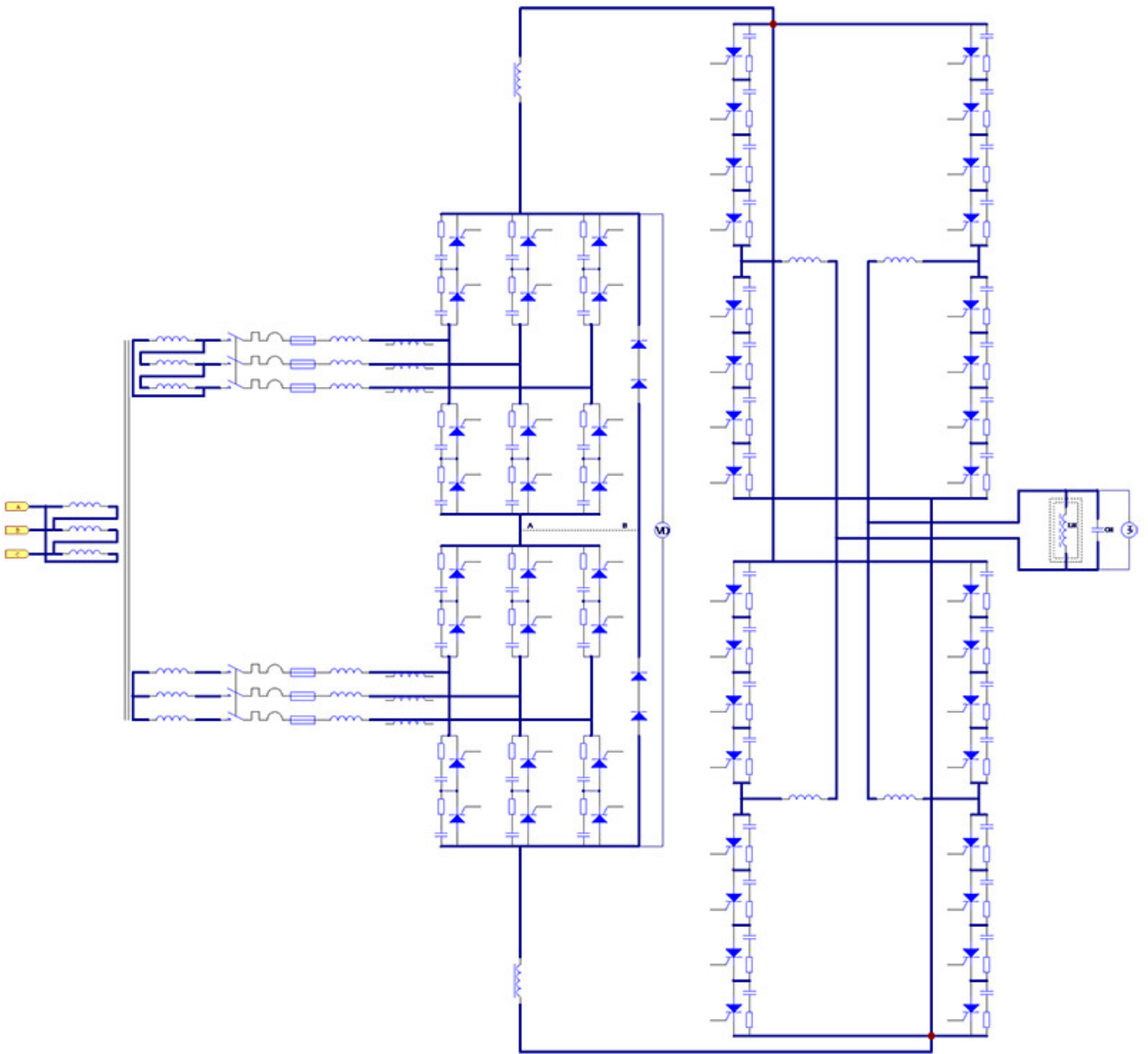


Fig. 1: Electrical Main Topology of a 70T Medium Frequency Smelting Equipment

According to the customer requirements, TECHSEM has developed the equipment for selecting components in series. Using this selecting equipment (Fig. 2), the components can be pairs selected according to their blocking voltages, switching-on characteristics and recovery characteristics.



Fig. 2: Selecting Equipment Developed by TECHSEM

By using the selected thyristors in series, the homogenous voltage distribution on each device has been ensured. This can be well observed through the voltage waveforms of each device (Fig. 3 and Fig. 4).

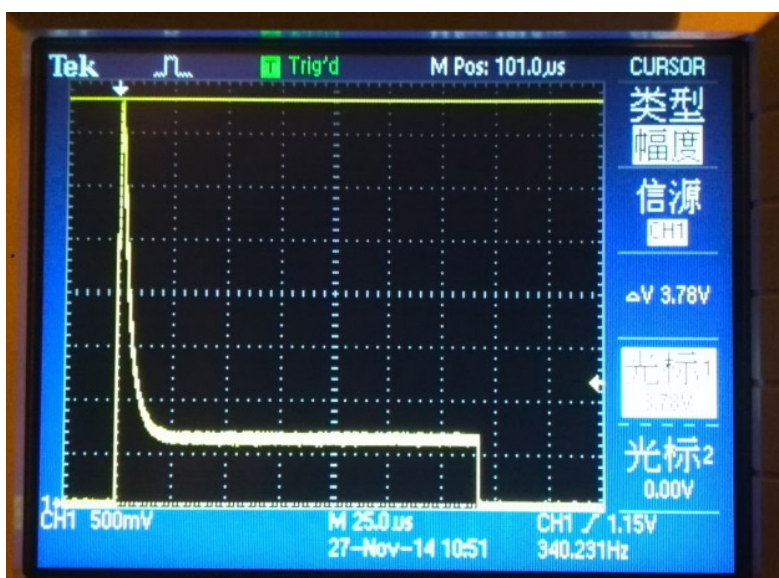


Fig. 3: Trigger Pulse Waveform

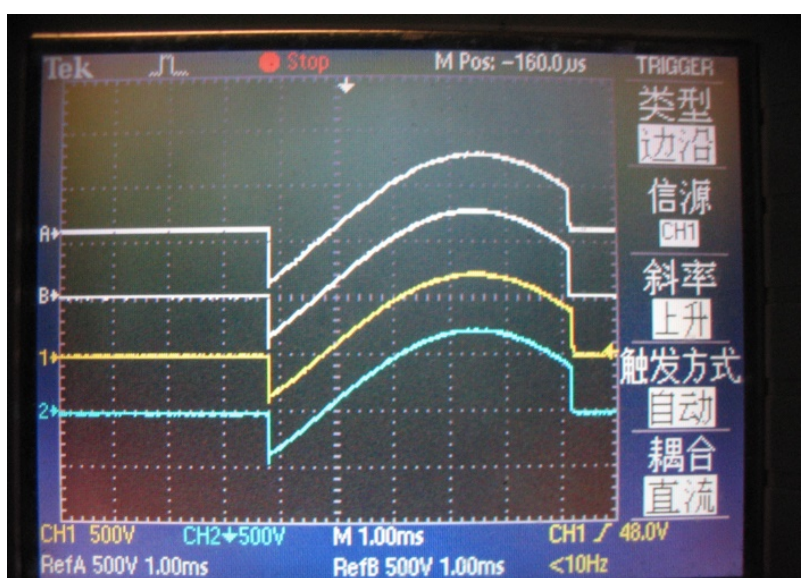


Fig. 4: Voltage Waveforms

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