

cross currents

JULY, 2006

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elmex SOLUTIONS FOR ELECTRICAL POWER INDUSTRY



Electrical Power Industry has a very wide expanse covering Generation, Transmission, Distribution and Utilisation of Electrical Power and all products used in these sectors. It is interesting to know that a simple and apparently insignificant product like a **terminal block is indeed an all-pervading electrical item in Power Industry.**

Switchgear and Controlgear have a permanent place in all the above Power sectors and **Terminal blocks** are about the most commonly used electrical items (after cables and wires) in electrical installations. **elmex** has associated itself since the very beginning with this important core sector and built capabilities to serve the industry with existing and new products.

From small size units such as distribution boxes at Utilisation End of the Industry, to large Switchgear-panel installations in Generating Stations, **elmex** Terminal blocks are effectively and efficiently serving the users - in **Control Boxes, Control Desks, Control Panels, Relay Panels, Motor Control Centres, Power Control Centres, Distribution Boards, and in control and operating cubicles of circuit breakers upto EHV range.**

Over the past four decades, **elmex** has developed a wide range of products for different Industries. After the Automation and Control Application products discussed in previous issues, we now present various terminals blocks for Switchgear and Controlgear applications in Electrical Power Industry. **The present issue (PART 1) describes High Power/High Current Terminal Blocks and the Distribution Blocks for Low voltage power distribution.** We will be presenting various other special application terminals blocks for Switchgear and Control Gear in the forthcoming issues.

elmex HIGH CURRENT TERMINALS

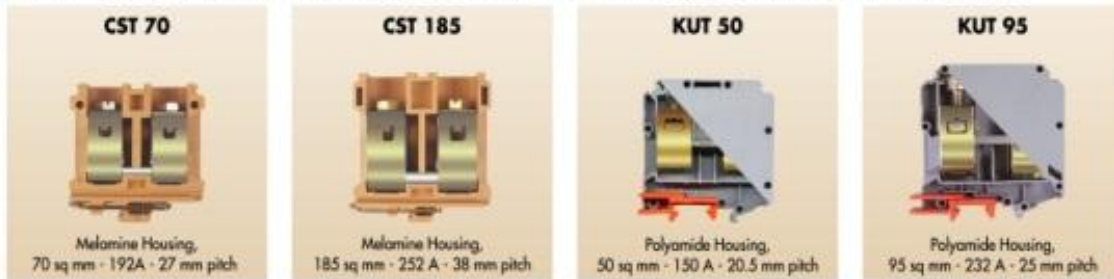
High current Terminals provide a very effective and economical **alternative to traditional Bus-bar and Jumper Systems** in LT Switchgear panels. Traditional systems need more space, which makes them **expensive in total cost** and they are **not flexible** as regards additions/alterations after installation. Moreover, modern LT-switchgear also need compact layouts within LT-panels, which is difficult to achieve with open or sleeved busbars and jumpers with air-insulation.

The range of **elmex** high current terminals, mounted on standard Din-Rails, is very well suited to applications in compact installations, and provides **desired safety and reliability.** The range consists of two types, of terminals: **One type** is with **standard Feed-through configuration** for use with cables. It is a finger safe design without needing external insulation barriers. The **second type, called Busbar - terminals,** permits busbars or cables (with lugs) for connections to the terminals. This type can be used with barrier plates/transparent covers, as enclosure for live parts.



elmex FEED-THROUGH HIGH CURRENT TERMINALS

These terminal-blocks can receive **cables at both the terminations directly**, after stripping, without need for cable lugs. They are available both in **Melamine** Housing as well as **Polyamide** Housing. Rating Data in sequence : Rated Connection Capacity, Rated Current and Terminal Pitch.



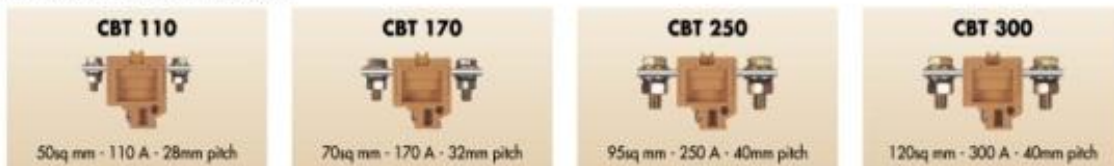
For bus-bar and lugged cable connections the following fully enclosed terminal blocks are available.



elmex BUS BAR TERMINALS FOR HIGH CURRENT

The second type of High Current Terminals or **Bus-bar Terminals**, are **suited for connecting busbar or cables with fork lugs or ring lugs at both the termination points**. These types can be used with barrier plates/transparent covers as enclosure for live parts.

With **Melamine** Housing, the range is:



The above range is also available in versions CBT 110T, 170T, 250T and 300T, which have tapped holes in connection bars, with slotted nuts for tightening, permitting use of **screw drivers instead of spanners, where adequate working space is not available**.

With **Polyamide** Housing, the range is: (**DPBB 50** : 50 sq mm - 150 A - 37mm pitch is also available).



DPBB... can receive flat bus-bar or lugged cable at either terminations. **DPBC...** can receive flat bus-bar or lugged cable at one termination and cable directly after stripping at the other termination.

elmex DISTRIBUTION BLOCKS : For Low Voltage Power Distribution:

Motor Control Centre is an LT Switchgear Panel in charge of several motors. Each Motor needs its input supply through its own switchgear. Traditionally the input is provided by cables/bus jumpers connected to panel busbars.

elmex Distribution Blocks provide a **space-saving, economic and flexible alternative** to such traditional systems. **elmex** distribution block consists of a number of standard terminal-blocks in **polyamide housing**, suitably modified to have **common current bar**, together with a number of well proven standard **screw clamp** connections. The higher rated Incoming to the distribution blocks has **stud-and nut** connection to receive either the bus bar or the cable with fork lug or ring lug.

The distribution blocks type DBK are **universal DIN-rail mounted** and have one Incoming and a number of Outgoings. For example the distribution block DBK 1 x 8 is with **35 sq mm/114A** Incoming and 8 nos. **10 sq mm/57A** Outgoings.

The illustrations show distribution blocks and **application diagram**. As an example of considerable economy and space saving due to application of **elmex** Distribution Blocks, consider use of one block type DBK 1 x 8. It can receive cable size 35 sq mm for power-distribution to loads upto **114A (65 KW)** through 8 integral terminal blocks providing 16 outgoing connection terminals. This facility provides **supply to 16 motors** (or any other loads). Each termination can receive upto 10 sq mm cable.

The space occupied by one DBK 1 x 8 will be (h x w x length) **46 x 42 x 82 mm**, which is **incredibly small** compared to traditional busbar layout. In practice, however incomings of number of loads are also interconnected through looping, which is a compromise for economy but an unreliable method of connections. In a system with **elmex** distribution blocks, additions/alterations can be carried out **simply by installing additional distribution blocks on Din-Rails**.

The **FDBK** range is for **25 sq mm/64 A** incoming with **4 sq mm/32 A** outgoing (FDBK 1x2, 1x4, 1x8).

DBK 1 x 2



FDBK 1 x 4



DBK 1 x 4



4 Nos. DBK 1 x 2 for four motors



DBK 1 x 8



TEMPERATURE RISE TEST

Verification of Temperature Rise is a very important test in long-term performance of terminal blocks. Over a period of time, higher than permissible temperature rise can lead to overheating of termination points and conducting parts within a terminal block, eventually resulting in insulation failure and burn outs on terminal block.

IEC 60947-7-1 on low voltage switchgear and controlgear, (Part 7-1: Terminal Blocks for copper conductors) specifies Temperature Rise test on terminal blocks as one of six tests under clause 8.4, for verification of electrical characteristics. Other tests specified are : verification of clearances & creepage distances, dielectric test, verification of voltage drop, short time withstand current test and for screwless type of terminal blocks, the aging test.

To ensure reproducibility of testing and consistency in test results, the IEC-**specification defines various parameters, which can influence test results.** Accordingly **5-specimens** of terminal blocks are connected in series as per the specified connection diagram using specified wire sizes and lengths depending on rated cross section and test currents. The wires are to be tightened with **specified tightening torque.** Temperature measurement is carried out on the terminal block, which lies in center of the assembly of 5 terminal blocks. The test-wires and the test specimens are kept horizontally on a wooden surface.

The test begins by measuring **voltage drop at specified points** followed by temperature rise test. The test current, dependent on rated Cross Section (Specified in Table 4 of the IEC) is passed through the circuit until steady state temperatures are reached ("steady state" is also defined). Temperature rise is the difference between the steady state temperature and the **specified test-ambient of (20+5) °C** (Clause 8.2), at which all the tests are carried out.

The limit for temperature rise of terminals is **45 °C.**

The verification of Voltage Drop, (popularly known as mV drop test) is carried out with d.c. equal to 10% of test current for temperature rise test. The limit specified is **3.2 mV** and limit for increase in voltage drop after the temperature rise test is specified as **150%** of the value measured before the temp-rise test.

Our Chairman Shri J. D. Ray recommends some recently published books which provide spiritual insights.

SAME SOUL MANY BODIES : (Pitkaus Books - UK : 2005)
by Dr. Brian Weiss.

CODE NAME GOD : (Penguin Books - India : 2006)
The spiritual odyssey of a Man of Science - by Mani Bhaumik.



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elmex-econix exhibited their latest innovations at the Hannover Messe, Germany and Power Industry & Electricity Engineering Trade Fair at St. Petersburg, Federation of Russia. Visitors at both these places showed immense interest in the products and held discussions for their special requirements.



Power Industry & Electricity Engineering
MAY 16-19 2006, RUSSIA



AUTOMATION 2006





SEPTEMBER 27-30 2006, MUMBAI

STAND NO. D-12



OUR PRODUCT RANGE

♥ Insulation Housings in Melamine, Polyamide (Nylon) 6.6, FRPP ♥ Conductor Clamping with Screw Clamps (MS & Brass), Spring Clamps, Bolted Connection, Anti-Vibration Spring-loaded Clamps ♥ Mounting on Standard DIN-rails TS 35, TS 32 and TS 1

Feed-through Terminals 	Micro Terminals 	Power (Bus Bar) Terminals 	High Current Terminals 	Distribution Blocks 
Double Deck Terminals 	Triple Deck Terminals 	Disconnecting Type Terminals 	Fuse Disconnection Terminal 	Fuse Feed Through Terminals 
Spring Clamp Terminals 	All Brass Terminals 	Plug & Socket type Terminals 	Special Application Terminals (C.T.-Sec.) 	Component Housing Terminals 
Stud type Terminals 	Spring Loaded Terminals 	Lighting Pole Terminals 	Earth Terminals 	Special Application Switches 
Plug-in type PCB Connectors 	Low Consumption Relay Modules 	Switching Mode Power Supplies (SMPS) 	Digital Signal Processing Transducers 	Surge Protecting Devices 

We welcome your suggestions and queries regarding our products and feedback about CROSS CURRENTS. Write to us at ask@elmex.net



Elmex Controls Pvt. Ltd.
Econix Hi-Tech Components Pvt. Ltd.

12 GIDC Estate, Makarpura Road, Vadodara 390 010, India
Telephones : +91-265-2642021, 2642023 ♦ Facsimile : +91-265-2638646
e-mail : marketing@elmex.net ♦ URL : www.elmex.net



TECHNICAL SPECIFICATIONS MAY CHANGE IN LINE WITH TECHNICAL ADVANCES AND INDUSTRY STANDARDS