

elmex TERMINAL BLOCK TECHNOLOGY



Basic Construction : *elmex* Terminal Blocks are mounted on 35, 32 or 15 mm Standard Rails types: TH35, G32, TH15 (IEC60715), or TS35, TS32, TS15 (DIN EN Standard). The terminal blocks have a modular design, so that they can be installed side by side, simply by clipping-on, to form a uniform assembly on mounting rails. This feature yields simplicity, economy

and compactness in installation, and allows for desired future extensions.

A typical Feed-through terminal block consists of :

1.0 Insulated Housing : Standard Designs with

- 1.1 Polyamide 6.6
- 1.2 Melamine

2.0 Conductor Clamping : Standard Designs with

- 2.1 Screw Clamps - Steel
- 2.2 Screw Clamps - Spring Loaded
- 2.3 Screw Clamps - Copper-Alloy
- 2.4 Spring Clamps
- 2.5 Stud-and-nut clamping for cable Lugs

3.0 Current Bar : Current carrying part of Terminal Block

4.0 Mounting Springs: For mounting on 32mm rail (TS 32/G32), in case of Melamine Housings.

elmex terminal blocks can accept solid and stranded conductors as well as flexible conductors of size upto rated connection capacity, as specified in the detailed specification sections of this catalogue.

The above basic construction is developed further into various individual types of Terminal Blocks for different applications, such as Multilevel types, Earth Terminals, Distribution Blocks, Fuse Feed Through types, Component Housing types etc.

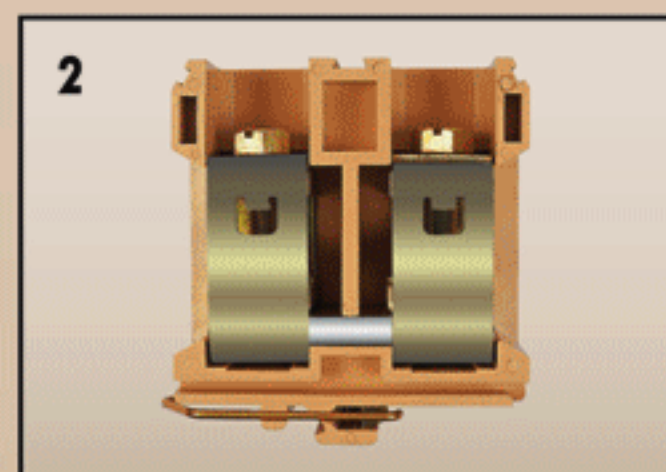
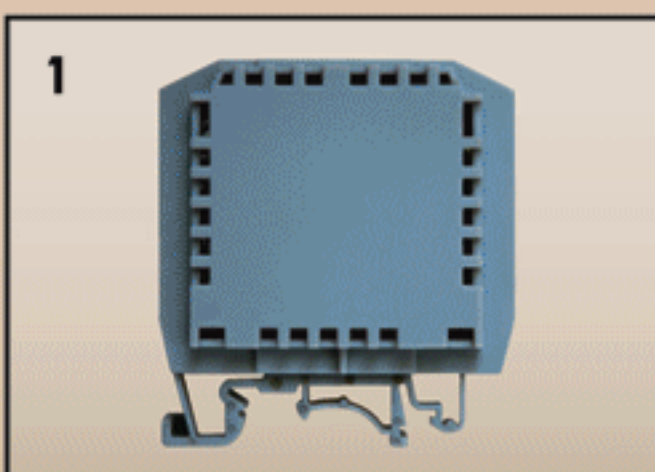
Panel Mounting type, Wire Wrap type, Termipoint type etc., have different designs for connection of conductors and are described under respective sections, of this catalogue.

1.0 Insulated Housings :

Two types of insulated housings are employed in *elmex* terminal blocks

1. Thermoplastic : Polyamide 6.6, Injection Moulded
2. Thermosetting : Melamine, Compression Moulded

Polyamide 6.6 (or Nylon 6.6) is a resin belonging to the Nylon family of thermoplastic moulding materials.



Polyamide 6.6 possesses a good balance of various properties:- tensile and flexural strengths, allowable service temperature, impact resistance, abrasion resistance, resistance to fuels, lubricants and many chemicals (except strong acids and oxidising agents). It has good electrical properties, for low voltage applications. It is resistant to surface discharge with CTI > 600 (IEC-60112).

Melamine is a resin belonging to the group of Thermosetting compounds, generally known as aminoplasts. It has an excellent resistance to deformation, particular hardness and a very good surface brilliance.

Melamine has an optimum dimensional stability and a strong resistance to surface discharge with CTI > 600 (IEC-60112). It does not ignite and gets converted into char form in case of fire. It is abrasion and chemical resistant, waterproof and resists high and low temperatures within the limits of -40 °C and 130 °C.

Melamine is particularly suited for use in severe environmental conditions and is preferred for Circuit Breaker Panels, Refineries, Chemical Plants, potentially explosive installations and any other high risk environments in general.

2.0 Conductor Clamping

2.1 Screw Clamp (Steel)

2.1.1 Contact Clamp :

elmex Screw Clamp consists of a U-Shaped steel part, called Contact Clamp and a washer base or cheese head screw.



The vertical arms of the Contact Clamp are folded at the top end into lips, overlapping each other. The lip from each arm locks into recess provided on the other arm. This double locking is an outstanding feature of *elmex* Screw Clamp design, which allows tightening torques in excess of the values specified by the Standards. In addition, in the event of

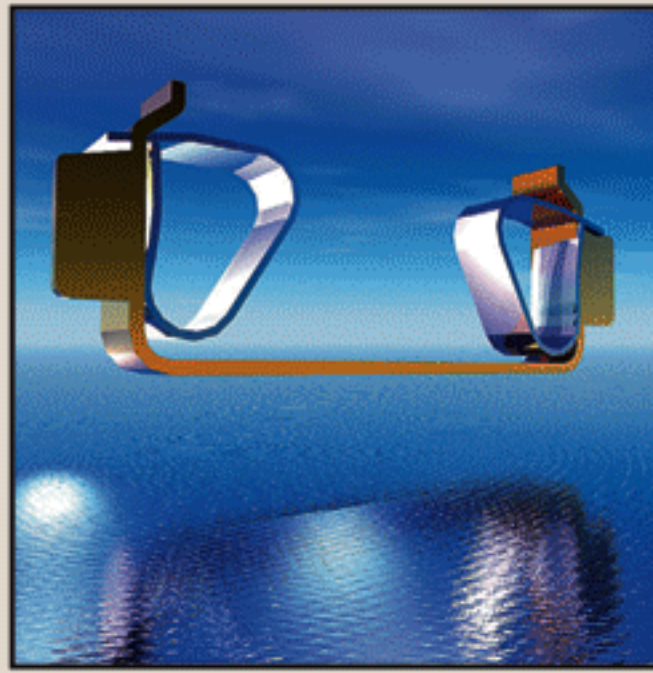
inadvertent over tightening, this design prevents damage to the threads and deformation of Contact Clamp.

The bottom face of the 'U' has serrations, which grips the conductor firmly during tightening. The lips are drilled and threaded coaxially in a special machine to produce rolled threads for higher mechanical strength of threads which can take higher tightening torque.

The Contact Clamp undergoes Heat Treatment for increased hardness and strength. It is then zinc plated and passivated to a higher degree of plating thickness than usually adopted. *elmex* Screw Clamps therefore have a very good resistance to normal atmospheric corrosion.

Heat Treatment : *elmex* contact clamps are subjected to a special heat treatment process ensuring uniformity of temperature over the entire clamp surface and consistent results of heat treatment so that the inner threads of the clamp achieve a uniform and strong wear resistance.

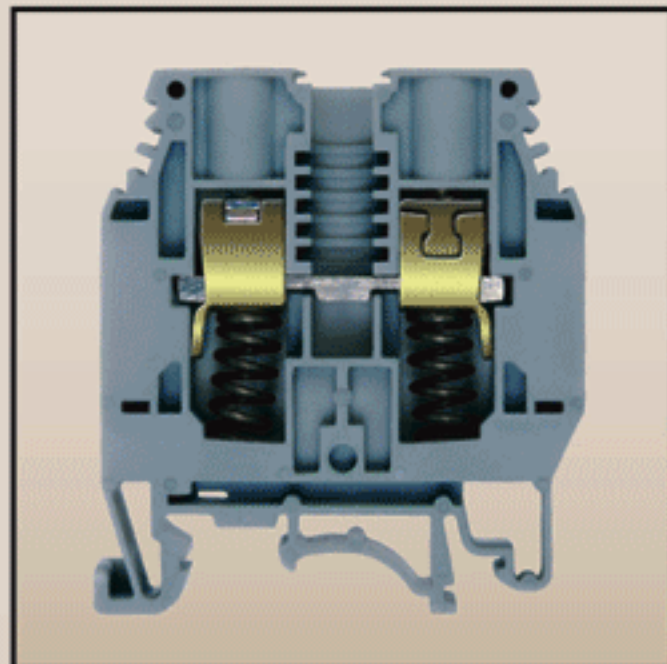
2.1.2 Clamping Screws : *elmex* Screw-Clamp uses cold-forged rolled-threaded washer-base or cheese-head screws (or Phillips-head screws in specific cases). The screws are hardened and tempered for increased strength and wear-resistance. After first assembly they become captive in the housing due to washer base feature (for melamine housing) and a circular ring provided in the housing for cheese head screws. These screws are corrosion-protected by zinc plating and passivated to a higher degree of plating thickness, under controlled plating process. The screws have a flat bottom which creates a balanced pressure on current bar for conductor-clamping.



between Current Bar and conductor. Current Bar is the current carrying part in the terminal block, and it is provided with serrations to grip the conductor.

The spring clamp is brought under tension by inserting a screwdriver. This creates necessary opening in the clamp for inserting conductor.

After the conductor is fully inserted the screwdriver is withdrawn. The clamp arm thereby presses the conductor firmly against current bar, by spring action of the clamp.



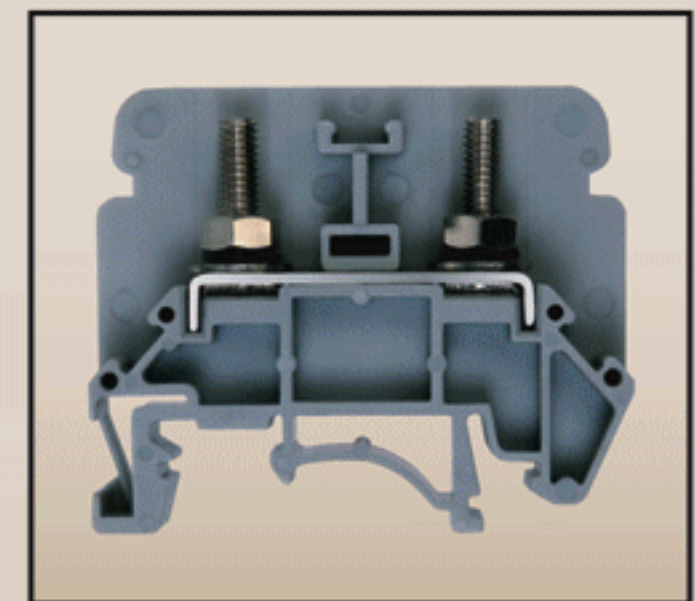
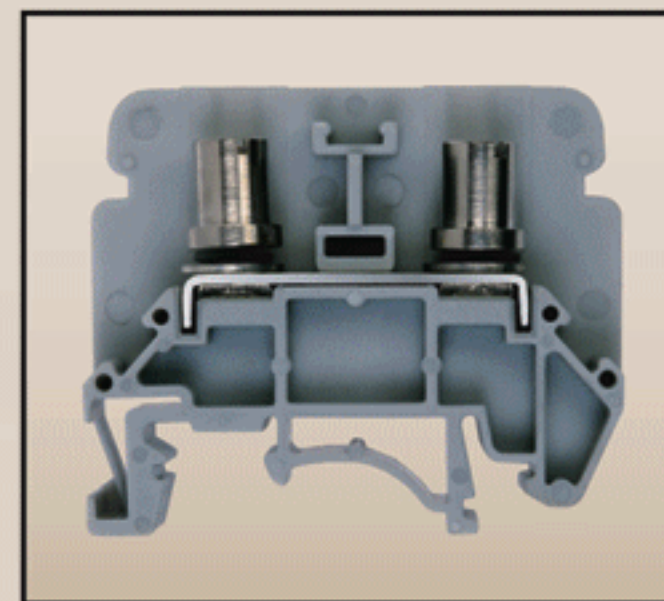
2.2 Screw Clamp - Spring Loaded
For high-vibration applications *elmex* offers spring loaded Screw Clamp Terminal Blocks.

Although *elmex* standard screw-clamp design is already resistant to vibrations, it is further strengthened against vibrations by provision of compression springs in the terminal block.

The springs are assembled under the contact clamp in pre-stressed condition. When the screws are fully tightened upto specified torque, the springs under the contact clamps provide additional pressure between current bar and conductor, which makes the spring loaded terminals especially suitable for high vibration applications.

The compression springs are made of standard spring-steel. All other parts are same as for the Screw-Clamp design.

2.5 Stud-and-Nut Clamping for Cable-Lugs

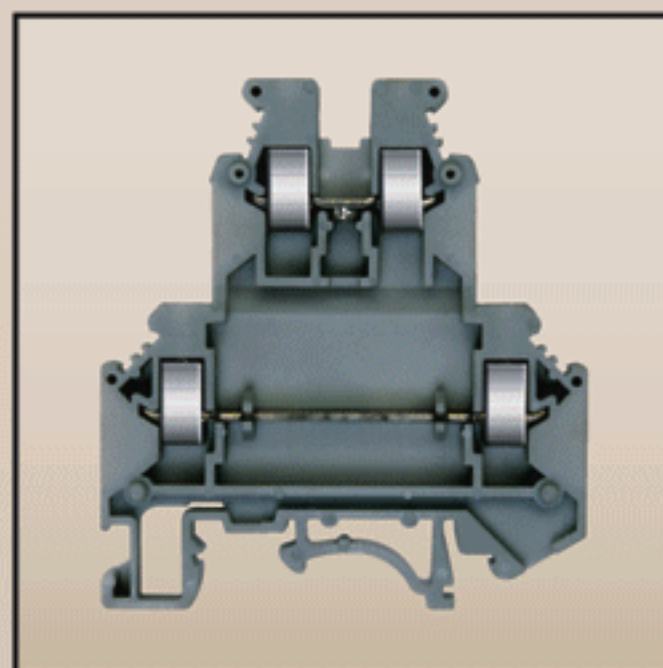


This conductor-clamping design is especially developed for receiving Ring-type or Fork-type cable lugs. The terminal block consists of Housing, Studs and Nuts and the Current Bar. The Ring type lugs can be inserted in Studs, while Fork type lugs are inserted under Nuts.

The lugged cables are clamped to the current bar by tightening the nuts. Standard spanner can be used in case of "Nut-Driver" type of Stud Terminals. For Screwdriver operated stud terminals, the stud is provided with a special long-nut with a slot at the top for screwdriver. This type is especially developed where space-limitations may not allow the use of spanner for clamping cable-lugs.

All the metal parts in these types of terminals are made of Copper alloy and tin plated with Nickel under coat for protection against atmospheric corrosion.

2.3 Screw Clamp (copper-alloy)
In the *elmex* design of copper-alloy terminal blocks, the Steel Screw-Clamp is replaced by copper-alloy screw-clamp. Protection against atmospheric corrosion of copper-alloy is achieved by tin plating, to a higher degree of plating thickness, in a controlled plating process. The tin plating has under-coat of nickel plating to prevent zinc migration.



By appropriate selection of materials and processes, the phenomena of stress corrosion cracking is taken care of in *elmex* copper-alloy screw-clamp.

The clamping part in *elmex* screw clamp is of special design, such that as the conductor clamping is achieved by tightening of screw, the top-portion bends elastically, so that screw threads are gripped to prevent loosening.

2.4 Spring Clamps:

elmex spring clamp consists of specially shaped stainless steel clamp, which functions as a spring for developing necessary contact pressure

3.0 Current Bar

elmex Current Bars are made of electrolytic copper or a high quality copper alloy and tin plated with higher than usual plating thickness, to maintain the contact surface free from atmospheric corrosion. Nickel under-coat prevents zinc migration in case of copper alloy current bars.

Special features of *elmex* current bars is the provision of longitudinal serrations to grip the conductor while tightening, and cut into thin oxide film of conductor. The contact resistance remains very low, once the conductor is firmly clamped.

4.0 Mounting Spring :



The Spring used in Melamine Terminal Blocks for fixing them on the Rail is made of high grade Stainless Steel to retain the spring tension over a longer period. The design of the Terminal housing incorporates a notch so as to provide a self-locking mechanism to prevent the spring from slipping out of the housing.