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"TERMINAL ELEMENT"

The invention relates to a terminal element for effecting a solderless, non-screwed connection to an insulated conductor, more particularly a conductor having an aluminium or a stranded copper core without having to strip the insulation material.

The Applicant has developed a termination technique which has become widely accepted under the name LSA-PLUS termination technique.

In the LSA-PLUS termination technique, upright terminal elements secured in a terminal strip and made of thin spring plate are employed, in which an open elongated slot is defined between two lateral spring arms, the width of said slot being slightly smaller than the size of the conductor core.

The spring arms are offset relative to each other by means of deformation such that, when the conductor wire is inserted, the relatively sharp edges of the spring arms, which define the contact slot, initially sever the insulation and subsequently penetrate into the conductor material by a predetermined amount, thereby effecting electrically conductive contact.

During this operation electrical connections are made which are extremely durable and are permanently protected from corrosion, and it is not necessary first to strip either the cable or the conductor wire or to provide threaded connections or, respectively, soldered connections.

It is a drawback of a terminal element of the kind specified above and described in the DE-PS 2,610,461, that it is not every conductor wire that can readily be terminated.

For instance, conductors having cores formed from aluminium or stranded copper cannot readily be terminated by means of the aforesaid terminal element because in the case of aluminium the contact pressure tends to be lost due to "flowing" of the aluminium. In the case of a stranded core some of the strands may be severed but also the strands tend to move relative to each other so that the contact pressure is lost.

The object of the invention is to provide a terminal element for the purpose specified in a simple and convenient form.

According to the invention a terminal element for effecting a solderless, non screwed connection to an insulated conductor comprises a pair of members defining a slot therebetween, said members being movable apart to accommodate the core of a conductor therebetween and to make electrical connection therewith, said members when displaced by the core being resiliently urged into contact with the core, said members defining a centering zone which guides the conductor into the slot, said members further defining a pair of lances respectively which during the initial movement of an insulated conductor into the slot cut the insulation material surrounding the core to permit said members to engage with the core, said cutting lances being offset relative to each other whereby the insulation material will be cut at offset and opposed locations.

In the accompanying drawings:-

Figure 1 is a plan view, partially in section, of one example of a terminal element in accordance with the invention;

Figure 2 is a sectional view on the line A-A of Figure 1;

Figure 3 is a view similar to Figure 2 showing a conductor in the contact-making position;

5 Figure 4 is another example of a terminal element..

in accordance with the invention, and

Figure 5 is a plan view of the example of Figure 4.

With reference to Figure 1 a unitary terminal element 1 for the connection of a conductor 2, especially one having an aluminium or multi-wire copper core, is illustrated and is formed from a single sheet of thin material which is deformed to generally X configuration and because of its shape is particularly rigid. The element is located in a suitable support 13.

The element defines two generally V-shaped insertion openings 3, 4 to receive the conductor, the insertion openings leading into a slot 10 the lower end of which is defined by an edge 12 which in the example is defined by a transverse portion of the terminal element.

The openings 3, 4 include substantially V-shaped centering zones 5, 6, which guide the conductor 2 centrally towards two cutting lances 7, 8 which are integrally formed from the sheet of material forming the element and which are disposed at the lower end of the centering zone 6. The lances have an inverted "V" shape.

As is clearly apparent from Figure 1, the cutting lances 7, 8 are offset relative to each other and their upper ends are spaced so that the conductor insulation will be cut open in an offset manner before the conductor 2 enters the slot 10.

Furthermore, the two cutting lances 7, 8 define between them a wedge-like opening 11. Figure 3 shows the conductor 2 after insertion into the slot 10 and it will

be seen that the members forming the walls 10a, 10b of the slot 10 have been urged apart but are resiliently urged into contact with the conductor core.

5 The conductor size, the width of the slot 10 and the resilient slot walls 10a, 10b determine the contact pressure; if larger conductor sizes are used, the contact pressure will be increased accordingly.

10 Figure 3 also shows how the insulation of the conductor 2 is displaced after the cutting operation. The width of the slot 10 after a conductor has been forced into the slot corresponds to the width of the core of the conductor.

15 The area of contact with the conductor core may be enlarged as desired by using wider cutting lances 7, 8. The fact that the walls 10a, 10b are resiliently urged into contact with the core makes the element particularly suited for use with aluminium conductors and stranded conductors.

20 The edge 12 limits the extent of movement of the conductor into the slot 10.

25 In an alternative construction, the terminal element 1 may be simply formed from two v-section members 14, 15 (Figure 1) which are fixedly joined to each other by means of a connecting member (not shown). The V-section members define the equivalent of the walls and the lances and define between them a slot for the conductor core.

In the terminal element shown in Figures 4 and 5 two hook-like parts 16, 17 are retained relative to

each other, the main portions of the parts being in general alignment. The cutting lances 7, 8 have a shape similar to the lances shown in the earlier examples and perform in the same way.



CLAIMS

1. A terminal element for effecting a solderless, non-screwed connection to an insulated conductor comprising a pair of members defining a slot
5 therebetween, said members being movable apart to accommodate the core of a conductor in the slot therebetween and to make electrical connection therewith, said members when displaced by the core being resiliently urged into contact with the core,
10 said members defining a centering zone which guides the conductor into the slot, said members further defining a pair of lances respectively which during the initial movement of an insulated conductor into the slot cut the insulation material surrounding the core to permit
15 said members to engage with the core, said cutting lances being offset relative to each other whereby the insulation material will be cut at offset and opposed locations.
2. An element according to Claim 1 in which said
20 cutting lances define a wedge shaped space, the lower end of which communicates with the slot.
3. An element according to Claim 2 in which said cutting lances are formed as extensions of said members respectively, each cutting lance being of inverted V
25 form.
4. An element according to Claim 3 in which said members are formed integrally from a sheet of material which is folded to generally X configuration, the element defining a pair of generally V shaped openings
30 to guide a conductor into said wedge shaped space.



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5. An element according to Claim 3 in which said members are of V-section, the two members being secured together by a connector member.

5 6. A terminal element for effecting a solderless, non-screwed connection to an insulated conductor comprising the combination and arrangement of parts substantially as hereinbefore described with reference to Figures 1, 2 and 3 of the accompanying drawings.

10 7. A terminal element for effecting a solderless, non-screwed connection to an insulated conductor comprising the combination and arrangement of parts substantially as hereinbefore described with reference to the Figures 4 and 5 of the accompanying drawings.
