

The present invention relates to a wire connector for connecting wires of telecommunication cables and is intended to provide a simple and inexpensive device of this type.

5           The LSA-PLUS-technique (LSA = lot-, schraub- und abisolvier-frei = solderless, non-screwed and strip-less; PLUS = polytroper Luft-Spalt = polytropic air gap) developed by the applicant is employed in the present connector for the connection of insulated wires  
10 to contact terminals. The terminals include leaf-spring arms which due to torsional forces generated upon connection of a wire allow the arms to maintain pressure on the wires and thus provide for a permanent good contact.

15           A number of wire connectors for telecommunication cables are known and these may be classified according to the following aspects:

- 20           1) Wire connecting sleeves which are suitable for interconnecting a respective outgoing and incoming cable wire.
- 25           2) So-called Picabond (Reg. Trade Mark) connectors, in which, for instance, the incoming and outgoing wires are clamped into a metal member of U-shaped cross-section, which member is then crimped by means of a tool, thereby forming an electrical connection.
- 30           3) Multipoint wire connectors which are provided for a multiplicity of wires and which interconnect e.g. 20 wires simultaneously.

30           One of the drawbacks of these known wire connectors

is that e.g. in the connector mentioned at 1) the wire must be cut to predetermined lengths.

5 In the case of cable splices of = 200/twin wires, the wire connecting sleeves generally must be, and the connectors of the second type preferably should be, crimped individually for each wire termination.

10 With these forms of connector testing of the connections and circuits associated therewith using for example, a test prod is difficult. Moreover in the case of types 1 and 2 above, the connectors can only be used once.

15 As regards the connector mentioned at 3), a connector for a thin insulated electrical wire is known from the German Patent Specification 1,212,180 in which a plurality of incoming wires are connected to outgoing wires by means of a connecting member.

20 The contact portions of the interconnected wires are not sufficiently protected against vibrational movement, which particularly with very thin wires, may result in contact interruptions during periods of vibration.

The known multipoint wire connectors are not suitable for water-tight (grease-filled) cables.

25 The object of the present invention is to provide a wire connector in a simple and convenient form.

According to the invention a wire connector for connecting together at least one pair of conductors, comprises a body having a main portion and a cover portion which can be engaged with the main portion, said

main portion defining tubular or channel like guide means for the conductors to be connected, and clamping ribs to fix the conductors in position, a terminal element located in a recess in the main portion of the body, said terminal element defining a pair of contact arms which are slotted to receive the pair of conductors respectively and to effect electrical connection therewith, the conductors extending generally parallel to each other with the contact blades being disposed substantially at 45° to the axes of the conductors, a cutting blade carried in the main portion of the body for severing the ends of the conductors on insertion of the conductors into the slots of the contact arms, and a resilient tab formed integrally with the terminal element the tab having a curved portion for engagement in use with a test prod, said cover having an aperture to allow insertion of the test prod for connection with the resilient tab.

In the accompanying drawings:-

Figure 1 is a sectional side view of one example of a wire connector in accordance with the invention;

Figure 2 is a part-sectional plan view showing a tubular wire guide means;

Figure 3 is a part-sectional side elevation of the connector of Figure 1, showing also the connection of two connectors in end to end relationship; and

Figure 4 is a part-sectional plan view showing a channel-like guide means.

As shown in Figure 1, the body 3 of the wire connector comprises a main portion 2 and a cover portion 1. These conveniently are formed from plastics material.

These two portions are interconnected by means of

an arcuate film hinge 14, and the two portions can be retained relative to one another by means of detents 15 (cf. Figure 3) which makes the wire connector suitable for use when connecting the wires of grease-filled cables.

As is further apparent from Figure 1, a cable wire 4 enters into the connector portion 2 through a tubular or channel-like guide means 8, 8A and is then bent through 90°.

When the cover portion 1 is engaged with the main portion 2, the cable wire 4 will be pressed into the contact slot of a terminal element 5 by means of the insertion lugs 13 shown in Figure 3 and which form part of the cover portion 1. When so inserted electrical contact will be established between the wire core and the terminal element 5. The cable wire 4 will be fixed in its position by means of clamping ribs 9.

As will be apparent from Figure 1, the terminal element 5 itself is embedded in the main portion 2 of the wire connector. The contact arms 5a of the terminal element 5 are positioned at an angle of 45° relative to the wire axis and each has a slot into which the cable is passed. A cutting blade 10 is disposed behind the terminal element 5 for severing the protruding wire end.

Each terminal element 5 is used for connecting one incoming and one outgoing cable wire. As will be apparent from Figure 2 four terminal elements 5 are provided within each body 3. Moreover, the contact ends 5b of the contact arms 5a are bent and are located within guide passages 5c.

As will be apparent from the Figures 1 and 2, a test prod 12 may be introduced through an aperture 11 in the cover portion 1 to engage a resilient tab 7 which forms part of the terminal element. Each tab has a curved portion 6 for engagement with the prod and there are as many apertures 11 as there are terminal elements 5. In use the test prod 12 is resiliently clamped between the resilient tab 7 and an opposite locating surface 18.

As will be apparent from Figure 2, the end faces 16 of the wire connector are provided with connecting means 17 for connecting a plurality of wire connectors in end to end relationship so as to form a multipoint wire connector. Two connectors are shown so connected in Figure 3.

The connector described has the following advantageous features:-

- 1) It is possible to simultaneously interconnect in one clamping step a plurality of pairs of wires, e.g. four incoming and four outgoing wires, in accordance with colour markings;
- 2) The cable wires to be terminated are bent after passing along a tubular or channel-like guide means at an angle of 90° and are led to the terminal elements and after the clamping step, i.e. after depression of the cover portion, are additionally retained in clamping ribs integrally formed with the cover portion;
- 3) Because of the provision of resilient tabs on the terminal elements it is possible to test any desired individual wire connection by application of a test prod;

- 4) Due to suitable latching means the bottom portion and the cover portion are latched in an assembled state, so that the wire connector is also suitable for the wires of grease-filled cables.

CLAIMS

1. A wire connector for connecting together at least one pair of conductors the connector comprising a body having a main portion and a cover portion which can be engaged with the main portion, said main portion defining tubular or channel-like guide means for the conductors to be connected, and clamping ribs to fix the conductors in position, a terminal element located in a recess in the main portion of the body, said terminal element defining a pair of contact arms which are slotted to receive the pair of conductors respectively and to effect electrical connection therewith, the conductors extending generally parallel to each other with the contact blades being disposed substantially at 45° to the axes of the conductors, a cutting blade carried in the main portion of the body for severing the ends of the conductors on insertion of the conductors into the slots of the contact arms, and a resilient tab formed integrally with the terminal element the tab having a curved portion for engagement in use with a test prod, said cover having an aperture to allow insertion of the test prod for connection with the resilient tab.

2. A wire connector according to Claim 1, including insertion lugs integrally formed with the cover portion and acting to press the conductors into the slots of the contact arms when the cover is engaged with the main portion.

3. A wire connector according to Claim 1, in which the cover portion and the main portion of the body are joined to one another by means of an arcuate film hinge and are held in assembled relationship by means of detents.



4. A wire connector according to Claim 1, in which edges of said contact arms are bent and are located in guide passages defined in the main portion.

5 5. A wire connector according to Claim 1, in which the connector body is provided with connecting means whereby a number of connectors can be secured together.

6. A wire connector according to Claim 1, in which said portions of the connector body are formed from plastics material.

10 7. A wire connector for connecting incoming and outgoing wires of a telecommunication cable comprising the combination and arrangement of parts substantially as hereinbefore described with reference to the accompanying drawings.

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