

## Four-Wire-Measurement:

The picture above shows two contact pins and two contact levers. The contact pliers and the TEKOFLEX contacts have two contact areas each which are isolated against each other. Thus four connecting points are generated at the resistor to be measured.

With the four-wire-measurement – also called Kelvin-measurement – the resistance of the contact point between the test prod and the test item is compensated. This results from the contact prod touching the test item through two separated contacts.

The first contact is used to feed the current into the test item and the second contact to tap the voltage drop at the test item. As the contact resistance is „behind“ the pickup of the voltage drop, it does not influence the measurement of the voltage drop. Pre-condition for the measurement of the voltage drop is a high resistance voltage measuring device. Thus the contact resistance at the second contact point in comparison to the resistance of the voltage meter is unimportant percentage-wise.

This method is always used when the measurement of very small resistances is required. This is particularly the case for protection conductor testing or the measurement of low ohmic coil resistors.

For four-wire-measurement tasks our TEKOFLEX system is the best choice. Depending on the measurement requirements we offer the following two TEKOFLEX models in different versions:

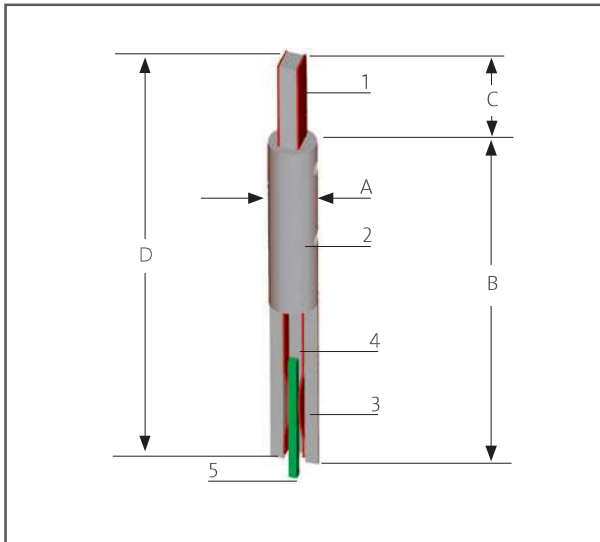
TEKOFLEX TF07 – TF16 for measurements on smaller flat- or round-pin plugs

TEKOFLEX TF20 – TF63 for measurements on wider flat-pin plugs

### Your benefits at a glance:

- User-friendly four-wire-measurement
- Process stable contact
- Easy assembly
- Low contact resistance
- High number of mating cycles
- High current rating

**Note:** Send us a sample, respectively a drawing of your test object or let us know your test requirements. We will develop your specific test adapter including our high-performance TEKOFLEX and will be pleased to submit a competitive offer.



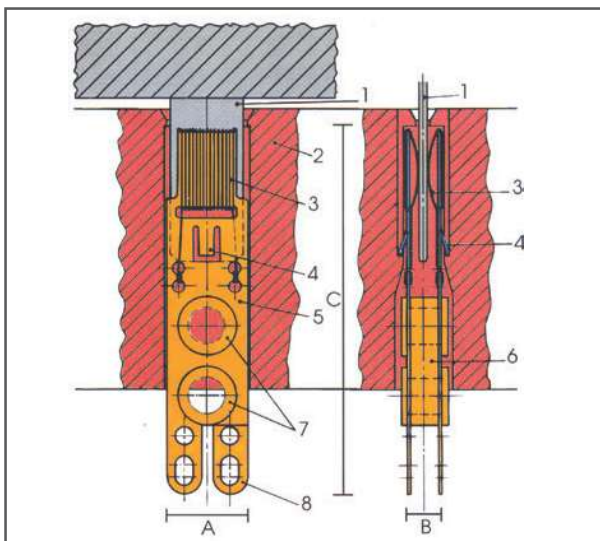
- 1 Solder Terminal
- 2 Housing
- 3 Contact Plate
- 4 Insulation
- 5 Connecting Pin Test Object

**Functional description:**

Two parallel contact plates which are electrically separated by an isolator provide the optimal contact pressure. The contact plates have a convex shape towards the connecting pin of the test object. This special shape ensures a low contact resistance without damaging the test object. The TEKOFLEX is inserted into a mounting hole with an appropriate clearance fit and is center positioned with a cover plate both at the front and the back.

Note: The resistance value in the table was measured in a test series and states the flow resistance of the TEKOFLEX.

# TEKOFLEX TF20 – TF63



- 1 Flat-Pin Plug DIN
- 2 Housing
- 3 Contact Spring
- 4 Locking Device
- 5 Metal Base Plate
- 6 Insulator
- 7 Rivet
- 8 Solder Terminal

**Functional Description:**

Two parallel metal base plates (5) are electrically separated by an insulator (6). The base plates are covered with CuBe coil windings (3) and have a convex shape towards the connecting flat pin (1). The special shape of the coiled spring (many independent, flexible contact points) guarantees a low contact resistance and ensures a reliable contact without damaging the test object. The assembly is very simple. The TEKOFLEX is inserted into a housing and locked in position (see drawings on the right).

Note: The resistance value in the table was measured in a test series and states the flow resistance of the TEKOFLEX.

| Dimensions   | TF07                                   | TF07-S1                              | TF07-S2                                | TF08                                   | TF10                                   | TF15                                   | TF16                                   |
|--|--|--------------------------------------|--|--|--|--|--|
| Nominal size                                       | 0.64 mm                                | 0.2/0.3 mm                           | 0.64 mm                                | 0.8 mm                                 | 1.0 mm                                 | 0.6/0.8 mm                             | 1.0/1.3 mm                             |
| Connecting pin test object                         | 0.6 – 0.7 x 1.2 mm                     | 0.2 – 0.3 x 1.2 mm                   | 0.6 – 0.7 x ∞ mm                       | 0.75 – 0.8 x 1.2 mm                    | 0.95 – 1 x 1.2 mm                      | 0.6 – 0.8 x 1.8 mm                     | 1.0-1.3 x 1.8 mm                       |
| Mounting hole                                      | ∅ 2.2 mm                               | ∅ 2.2 mm                             | ∅ 2.2 mm                               | ∅ 2.3 mm                               | ∅ 2.3 mm                               | ∅ 3.4 mm                               | ∅ 3.4 mm                               |
| Dimension A  | ∅ 2.0 mm                               | ∅ 2.0 mm                             | ∅ 2.0 mm                               | ∅ 2.2 mm                               | ∅ 2.2 mm                               | ∅ 3.0 mm                               | ∅ 3.0 mm                               |
| Dimension B  | 16.1 mm                                | 16.1 mm                              | 16.1 mm                                | 16.1 mm                                | 16.1 mm                                | 21.0 mm                                | 21.0 mm                                |
| Dimension C  | 4.0 mm                                 | 4.0 mm                               | 4.0 mm                                 | 4.0 mm                                 | 4.0 mm                                 | 6.0 mm                                 | 6.0 mm                                 |
| Dimension D  | 20.1 mm                                | 20.1 mm                              | 20.1 mm                                | 20.1 mm                                | 20.1 mm                                | 27.0 mm                                | 27.0 mm                                |
| Specifications                                     | TF07                                   | TF07-S1                              | TF07-S2                                | TF08                                   | TF10                                   | TF15                                   | TF16                                   |
| Material of contact plate                          | CuBe gold plated                       | CuBe gold plated                     | CuBe gold plated                       | CuBe gold plated                       | CuBe gold plated                       | CuBe gold plated                       | CuBe gold plated                       |
| Max. current pulse load in mated position          | 10 A                                   | 10 A                                 | 10 A                                   | 10 A                                   | 10 A                                   | 10 A                                   | 10 A                                   |
| Mating force +/- 20%                               | 100 cN at 0.64 mm<br>150 cN at 0.70 mm | 25 cN at 0.20 mm<br>40 cN at 0.30 mm | 100 cN at 0.64 mm<br>150 cN at 0.70 mm | 120 cN at 0.75 mm<br>150 cN at 0.80 mm | 120 cN at 0.95 mm<br>150 cN at 1.00 mm | 100 cN at 0.60 mm<br>200 cN at 0.80 mm | 100 cN at 1.00 mm<br>200 cN at 1.30 mm |
| Average resistance                                 | $R_m = 5 \text{ m}\Omega$              | $R_m = 5 \text{ m}\Omega$            | $R_m = 5 \text{ m}\Omega$              | $R_m = 5 \text{ m}\Omega$              | $R_m = 5 \text{ m}\Omega$              | $R_m = 4 \text{ m}\Omega$              | $R_m = 4 \text{ m}\Omega$              |
| Standard deviation                                 | $s = < 0.1 \text{ m}\Omega$            | $s = < 0.1 \text{ m}\Omega$          | $s = < 0.1 \text{ m}\Omega$            | $s = < 0.1 \text{ m}\Omega$            | $s = < 0.1 \text{ m}\Omega$            | $s = < 0.1 \text{ m}\Omega$            | $s = < 0.1 \text{ m}\Omega$            |
| Life time when respecting the assembly description | Min. 100 000 Mating cycles             | Min. 100 000 Mating cycles           | Min. 100 000 Mating cycles             | Min. 100 000 Mating cycles             | Min. 100 000 Mating cycles             | Min. 100 000 Mating cycles             | Min. 100 000 Mating cycles             |

Further options upon request.

### Assembly description using the TEKOFLEX TF07 as example:

To be able to use the TF07 as a contact element, you need a housing, a front cover plate and a rear cover plate. The latter secures the TEKOFLEX contact system against contortion. These three plates are manufactured separately, pitch tolerance +/- 0.05 mm.

First the TEKOFLEX system is inserted into the housing. Then the rear cover plate is fitted and screwed to the back of the housing. Finally the front cover plate is fitted and screwed to the housing.

During the assembly it is important to add < 0.2 mm space to the TEKOFLEX system to allow tolerance adjustments (see drawings).

# TEKOFLEX TF20 – TF63

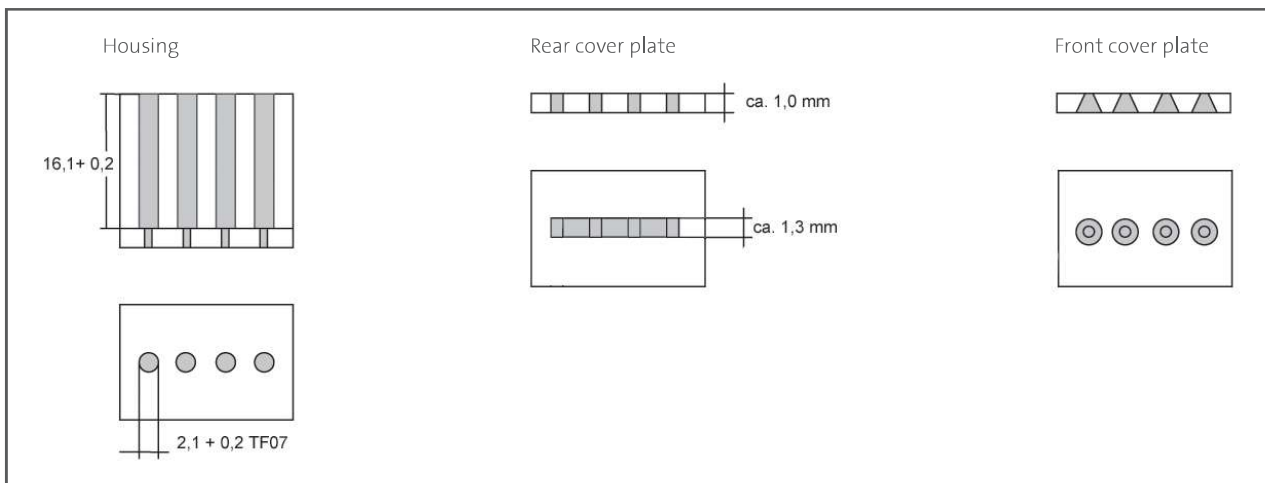
| Dimensions   | TF20                        | TF28                        | TF48                        | TF63                        |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Nominal width                                      | 2.0 mm                      | 2.8 mm                      | 4.8 mm                      | 6.3 mm                      |
| Dimension A  | 3.0 mm                      | 4.0 mm                      | 4.0 mm                      | 6.8 mm                      |
| Dimension B  | 2.6 mm                      | 3.0 mm                      | 3.0 mm                      | 3.4 mm                      |
| Dimension C  | 19.5 mm                     | 31.5 mm                     | 31.5 mm                     | 31.6 mm                     |
| Specifications                                     | TF20                        | TF28                        | TF48                        | TF63                        |
| Material of base plate                             | CuBe gold plated            | CuBe gold plated            | CuBe gold plated            | CuBe gold plated            |
| Material of coil windings                          | CuBe gold plated            | CuBe gold plated            | CuBe gold plated            | CuBe gold plated            |
| Max. current pulse load in mated position          | 15 A                        | 20 A                        | 20 A                        | 40 A                        |
| Mating force +/- 20%                               | 160 cN at 0.60 mm           | 200 cN at 0.80 mm           | 200 cN at 0.80 mm           | 300 cN at 0.80 mm           |
| Average resistance                                 | $R_m = 0.7 \text{ m}\Omega$ | $R_m = 1.7 \text{ m}\Omega$ | $R_m = 1.7 \text{ m}\Omega$ | $R_m = 0.8 \text{ m}\Omega$ |
| Standard deviation                                 | $s = < 0.1 \text{ m}\Omega$ | $s = < 0.1 \text{ m}\Omega$ | $s = < 0.1 \text{ m}\Omega$ | $s = < 0.1 \text{ m}\Omega$ |
| Life time when respecting the assembly description | Min. 300 000 Mating cycles  | Min. 300 000 Mating cycles  | Min. 300 000 Mating cycles  | Min. 300 000 Mating cycles  |

Further options upon request.

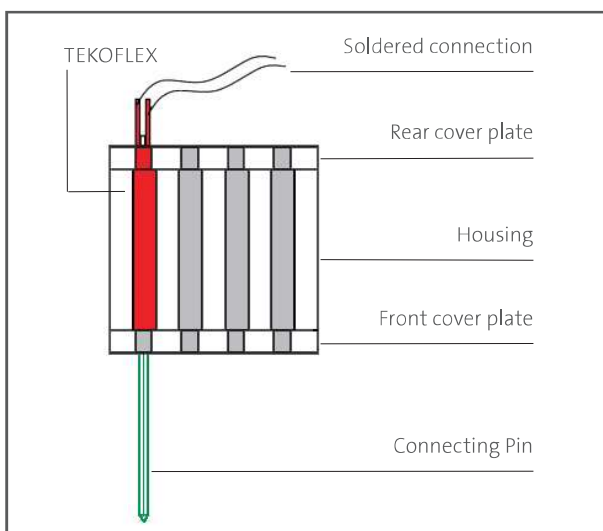
### Assembly description:

To be able to use the TEKOFLEX system as a contact element a housing is required into which the TEKOFLEX can simply be inserted from the rear. For customer specific applications the housing has to be modified so that it fits the test object. For

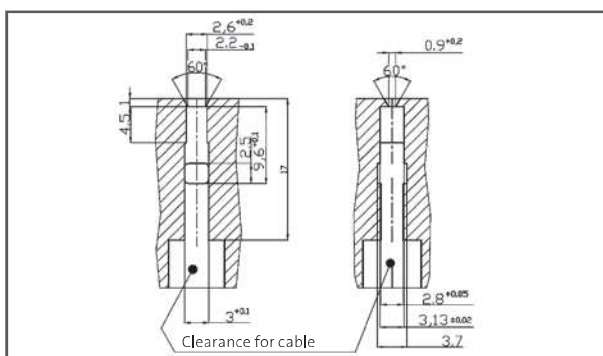
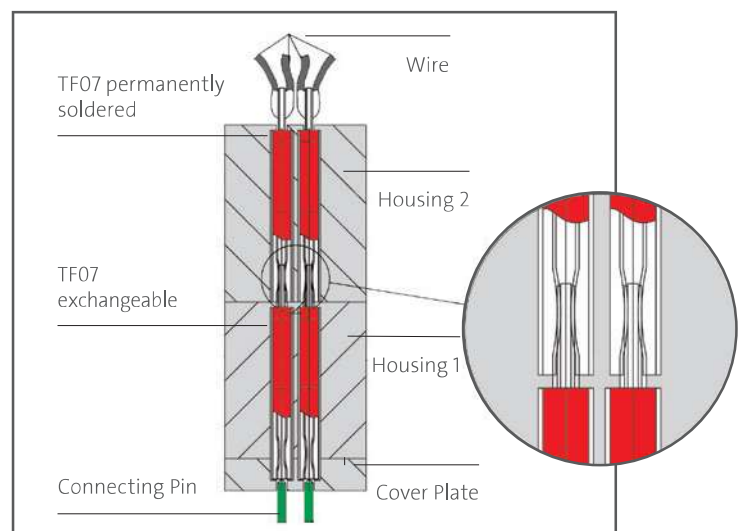
this purpose the housing is produced in two identical halves as shown in the drawings. The halves are first pinned to secure their positioning and then screwed together. The TEKOFLEX can now be slid into the housing.



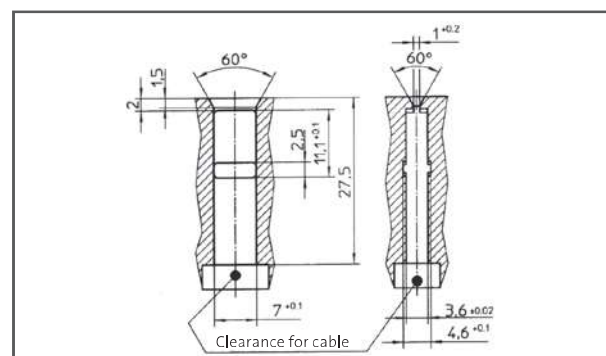
## Assembly with TEKOFLEX



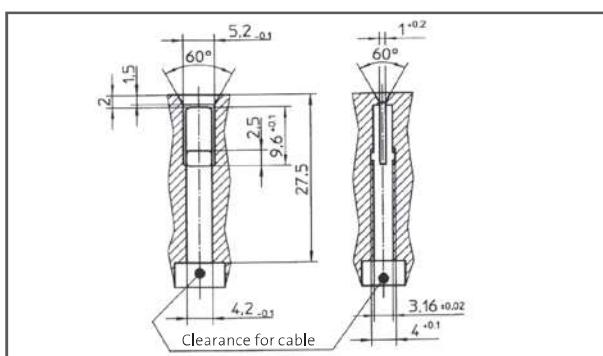
## Several TF07 are mateable



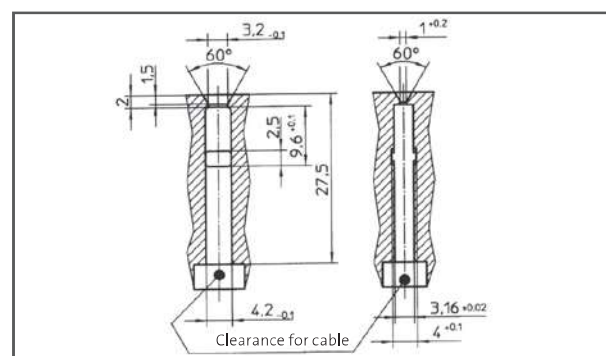
Housing for TF20 CuBeAu Flat-pin connector 2.0 x 0.6 mm



Housing for TF63 CuBeAu Flat-pin connector 6.3 x 0.8 mm



Housing for TF48 CuBeAu Flat-pin connector 4.8 x 0.8 mm



Housing for TF28 CuBeAu Flat-pin connector 2.8 x 0.8 mm

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