Processing Specification MiniBridge IDC

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Fundamentals

The acceptance criteria for cable assemblies and cable harness assemblies in the current IPC-A-620 manual is generally recommended for the assembly of ERNI connectors.

Product characteristics

IDC terminal- connectors of the MiniBridge product family are available in the Standard and Koshiri version.

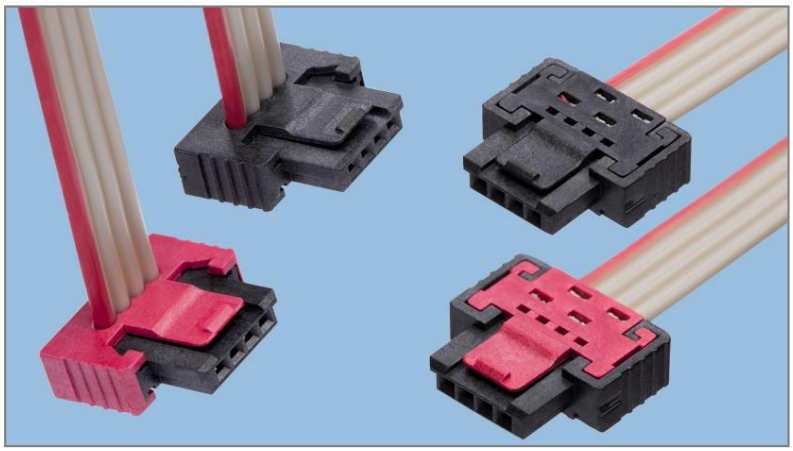
Number of pins

2, 3, 4, 6, 8, 10 and 12 pins

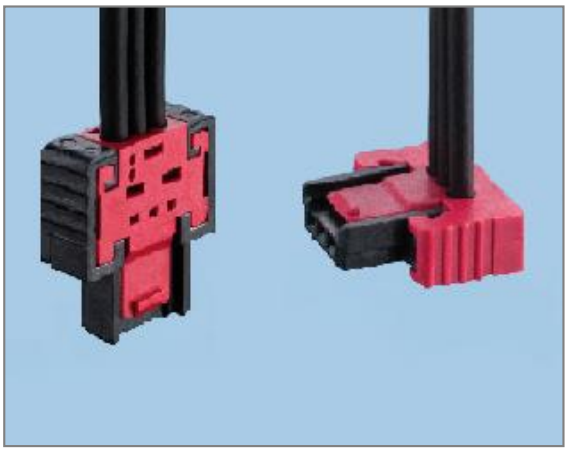
Locking

Positive lock - red cable guide and latch at the Standard and Koshiri version.
Detachable by toll

Friction lock - black cable guide and latch at the Standard version. Detachable by hand without tools



Standard



Koshiri

Terminal sizes

IDC terminals for the Standard version are available in **AWG 26/24 and AWG 22** size
IDC terminals for the Koshiri version are available in **AWG 22** size

Cable design

The MiniBridge IDC termination meets the requirements of DIN EN 60352-4.

Following cables are permissible within that standard:

- Flat ribbon cables or discrete wire with round solid core or stranded wires with 7 strands are to be used.
- Stranded wires must have tin-plated (tin or tin-lead) or silver-plated strands.
- The insulating material must be PVC or a different material that is compatible with the cutting and clamping process. That means, that the complete displacement of the insulation material by the inner termination clamp edges should be possible without damaging the wire. For stranded wires, the cable insulation must additionally be suitable to hold the strands in place, so they can not be inadvertently displaced during the assembly process.
- When using flat ribbon cables, the insulation material between wires (including each insulation gap belonging to the flat cable design) must be completely displaced by the edge of the ID termination clamp.

In addition to DIN EN 60352-4, stranded wires with plain strands are qualified as well.

Due to the compact design of the connector, only cables with an outer diameter, which fits into the corresponding cable guide, can be used. Only cables with a maximum outer diameter of 1.07 mm or 1.27 mm, depending on the cable guide, may be processed.

The qualification has been successfully performed with the following cable types:

Flat ribbon cable: Cable construction AWG 26 with 7 strands, pitch 1.27
- UL 2651 (Insulation PVC)
- UL 21151/1581 (Insulation Polyolefin, halogen-free)

Discrete wire: cable construction AWG 26, 7 x 0.14 mm
- UL 1061 (Insulation PVC, strands tin-plated)
- UL 1671 (Insulation ETFE, strands tin-plated)

Discrete wire: cable construction AWG 24, 7 x 0.22 mm
- UL 10125 (Insulation ETFE)
- MIL-W16 878E (Insulation PTFE, strands silver-plated)

Discrete wire: cable construction AWG 22, 7 x 0.26 mm
- UL 10125 (Insulation ETFE, strands tin-plated)

Discrete wire: Automotive cable 0.35 mm^2, 7 x 0,26 mm
- FLU2X 0,35-A (Insulation XPE, strands copper plain)
- FLU7Y 0.35-A (Insulation ETFE, strands copper plain)

Tools

General information

In order to prevent connector damage from excessive pressure the only tools allowed are those which limit the press-in distance so, that it may not be possible to press below the lower dimension limit.

Tools need to have sufficient space, so that the locking mechanisms cannot become damaged during the pressing process.

Partially assembled MiniBridge connectors with 0.35 mm² cable cross-section

There is a variation in the processing of partially loaded IDC connectors using discrete wire with a cross-section of 0.35 mm² (AWG 22). In this case, the only tools and devices permitted for use are those which close the unloaded positions of the cable guide and prevent excessive pressure on the neighboring ID terminal clamps on the plastic body. This preventive operation is not necessary using IDC connectors with smaller cross-sections (AWG 24/26). However, it is an useful action to avoid assembly errors and scrap.

Processing parameters

Pressing force

Depends on cable cross-section and insulation material. Pressing forces up to 100 Newton per contact are necessary for processing MiniBridge connectors.
Devices such as hand-lever presses, other types of presses, or machines should be designed accordingly.

Pressing speed

A maximum pressing speed of 10 mm/s is recommended.

Available tools

Tools for hand lever presses

Basic tool set ERNI Part- No. 501260 consists of upper tool and lower tool holder for assembly on

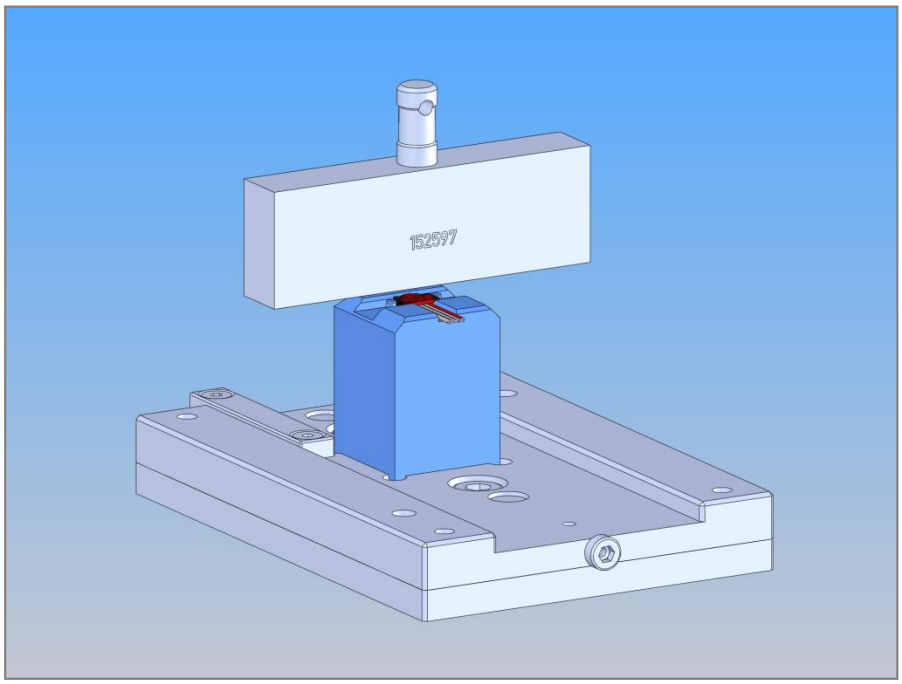
hand-lever presses with Ø 10H7 for the upper tool holder and T-slot 10H9 for the lower tool holder.

Lower tools

MiniBridge female straight connector (Type A)

2 pins	ERNI Part- No. 172000
3 pins	ERNI Part- No. 172001
4 pins	ERNI Part- No. 172002
6 pins	ERNI Part- No. 172003
8 pins	ERNI Part- No. 172004
10 pins	ERNI Part- No. 172005
12 pins	ERNI Part- No. 172006

Example



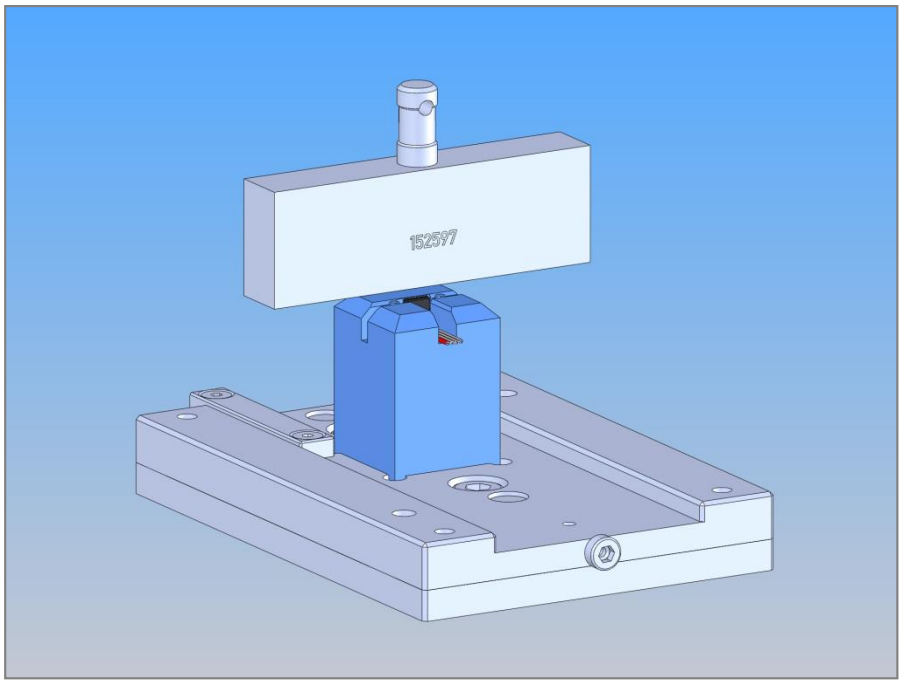
Lower tools

MiniBridge female right angle connector (Type P)

2 pins	ERNI Part- No. 172007
3 pins	ERNI Part- No. 172008
4 pins	ERNI Part- No. 172009

6 pins ERNI Part- No. 172010
8 pins ERNI Part- No. 172011
10 pins ERNI Part- No. 172012
12 pins ERNI Part- No. 172013

Example

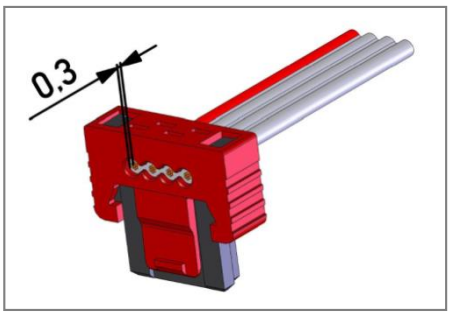


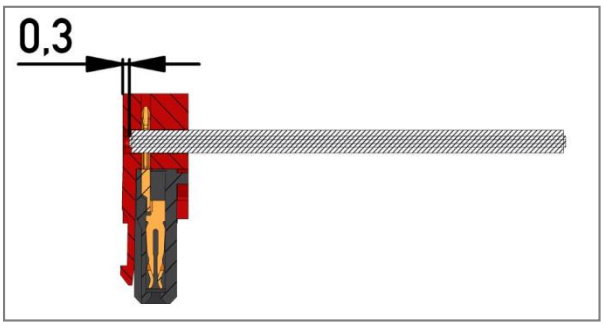
Assembly

Position of wire
Right angle cable termination (Type P)

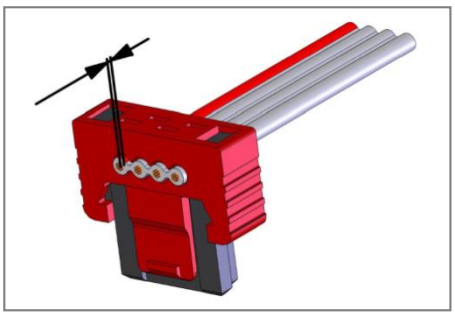
In the end position (cable beginning or cable end) of the connector, the cable tail must be aligned with the housing and cable guide respectively.

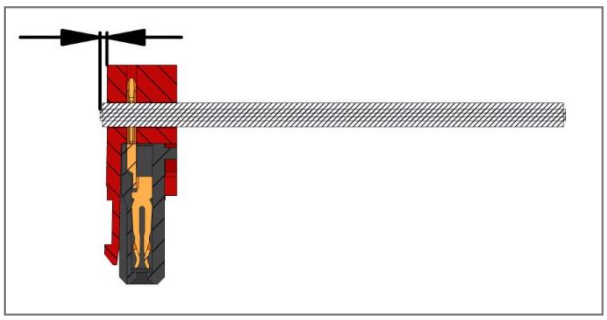
The maximum permissible gap of 0.3 mm relates to the distance between the conductor and stranded wires respectively and the housing and cable guide respectively.





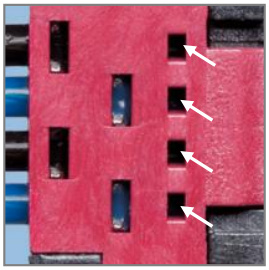
The cable protrusion is not relevant to the assembly of the connector and can be arbitrary.
The maximal permissible protrusion depends on the application of the cable assembly. An application specific guideline is recommended when the IPC-A-620 criteria is no longer sufficient.





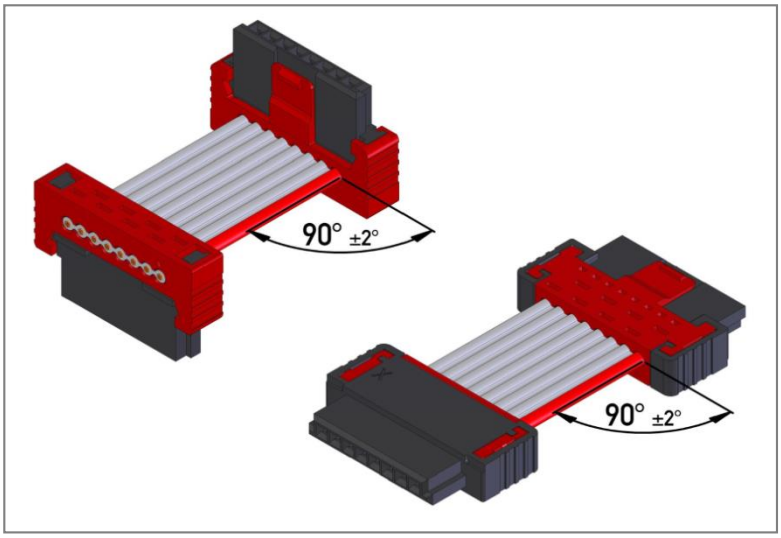
Straight cable termination (Type A)

A sufficient plug-in depth for flat ribbon cable or discrete wire for straight cable termination must be safely achieved. This is guaranteed when the cable is visible inside the control window.



Flat ribbon cable alignment

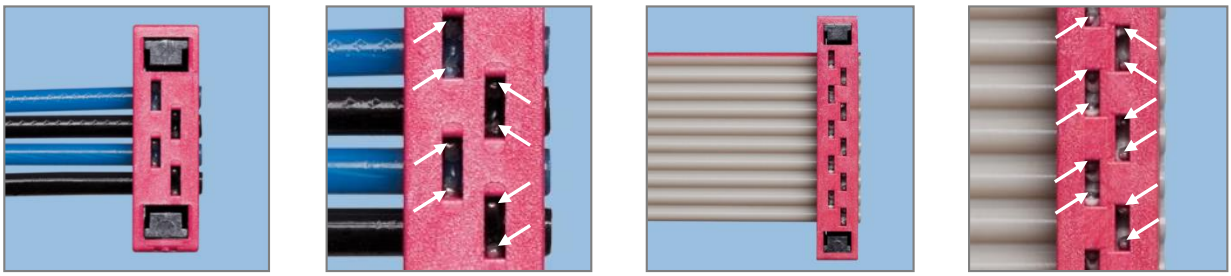
Right angle (90°) between the IDC connector and the flat ribbon cable should be attained.
Allowable deviation is ± 2°



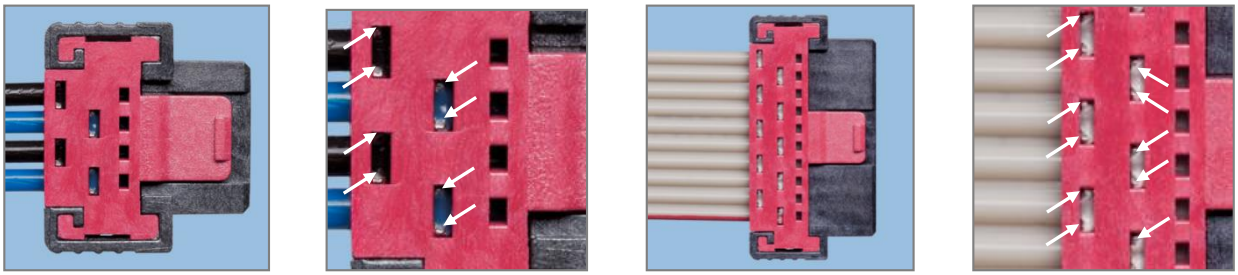
Position of the IDC Terminal

The correct flat ribbon cable or discrete wire position in the IDC is achieved when the tips of the termination clamps are visible in the corresponding window of the cable guide.

MiniBridge right-angled female connector (Type P)



MiniBridge straight female connector (Type A)



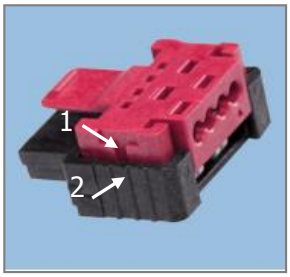
Cable guide locking
Visual characteristics

Both parts (housing and cable guide) must be fully engaged, however, they must not be over-pressed.

Visual characteristics of the engaged connector

MiniBridge straight female connector (Type A)

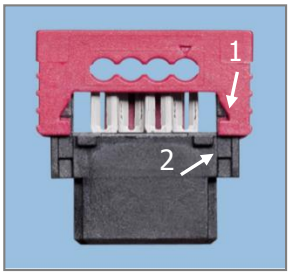
Cable guide (1) engaged in housing (2)



Safely engaged

MiniBridge right-angled female connector (Type P)

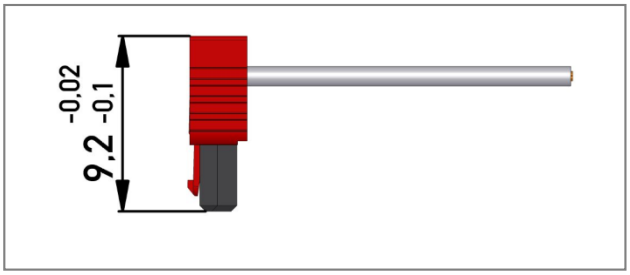
Cable guide (1) engaged in housing (2)



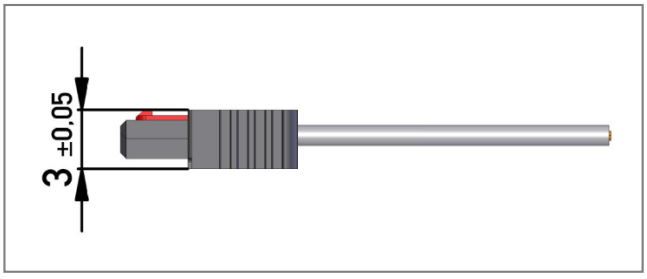
Safely engaged

Dimensions

The following dimensions must be achieved for the fully engaged, fully closed connector.



MiniBridge right-angled female connector (Type P)



MiniBridge straight female connector (Type A)

Inspection

Inspection of part characteristics

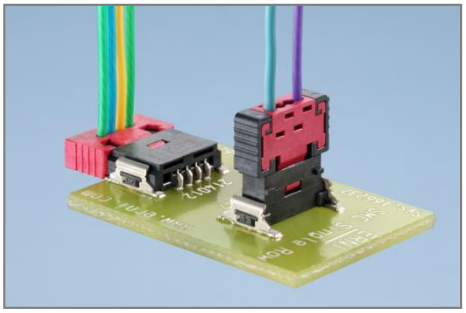
- Cable position

- Flat ribbon cable alignment
- Position of the IDC terminations
- Engaging of the housing parts
- Dimensions of the fully closed connector

Electrical inspection

A suitable contact probe with a probe tip should be used for electrical inspection. This method provides a connection on the "tip" of the spring contact without damaging the inspection surface. A spring loaded contact probe with a diameter of 0.35 mm and a spring load of 0.6 N is recommended.

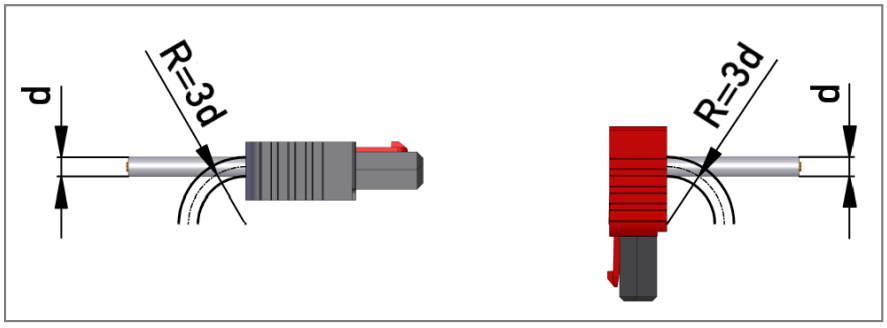
Alternatively, a male connector soldered onto the PCB can be used for the electrical inspection as well.



Application note

Recommendation for cable-laying

For cable-laying direct behind the contact end the bending radius shall not be less than triple[1)] cable diameter-size. This avoids the impairment of the insulation support at the IDC area.



[1)] Based on bending radii for flexible cables according to DIN VDE 0298 Part 3