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**DEUTSCH**  
INDUSTRIAL



Common Contact System Technical Manual





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COMMON CONTACT SYSTEM

Deutsch manufactures two product styles of contacts, stamped and formed and solid. Within each style is a separate and distinct manufacturing process that allows the widest application with any Deutsch IPD connector series.

Deutsch stamped and formed contacts are designed primarily for use where wire termination costs are of primary concern without sacrificing the reliability and maintainability of the normal operating electrical circuits. The stamped and formed contact series is made on a precision stamping machine using flat strip stock, then a durable and corrosion proof nickel plating is applied. Gold is an optional finish. All Deutsch IPD terminals protect the split socket tines with a closed entry stainless steel sleeve. The stamped and formed contact style is sold on reels.

The Deutsch solid contact series is designed for use for larger wire size and heavy duty applications. This style of contact is manufactured using a cold heading process and solid copper alloy wire. The resulting contact is a solid pin and closed entry socket contact. The standard finish is nickel, with gold plating an option. All Deutsch IPD terminals protect the split socket

tines with a closed entry stainless steel sleeve. The solid style of contact is sold in bulk.

Both contact styles terminate to wire using crimp type technology. The only variations in Deutsch's common contact systems are those dictated by wire gauge and contact style.

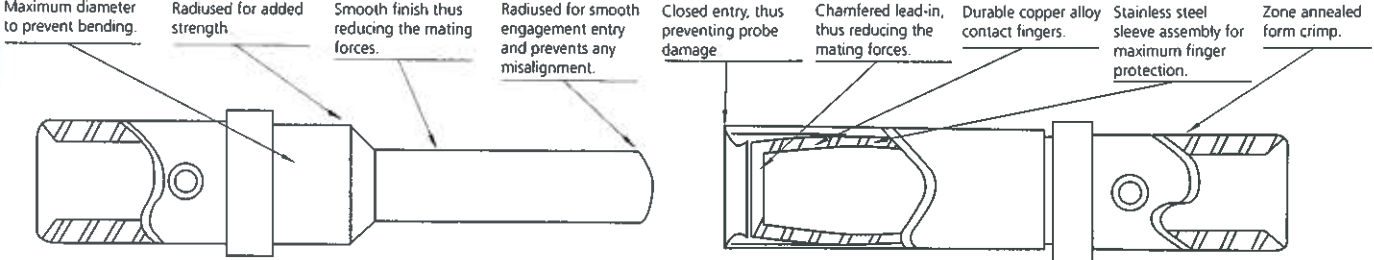
COMMON CONTACTS

The word "common" describes the Deutsch contact system well. It applies to either style of contact, and its related tooling, processes and terminations.

The stamped and formed style includes 7 sizes each of pin and socket contacts that terminate 12 AWG to 20 AWG (0.5 - 3.0mm<sup>2</sup>). The specific contact is determined by the outside diameter of wire insulation and conductor size. See the appropriate chart on page 8 of this manual for specific part numbers.

The solid style contact terminates wire from 6 AWG to 24 AWG (0.2 - 13.0mm<sup>2</sup>). The solid style is available in 6 sizes each of pin and socket. The applicable contact is determined by the size of the conductor only. See the appropriate chart on page 5 of this manual for specific part numbers.

The selection of Deutsch IPD connectors insures that the contact termination system will be compatible. This reduces changes in the assembly of the wire harness. It also improves performance, reliability and maintainability. Critical functions to any electrical system. The use of a common contact system eliminates many of the failures reported in harnesses where hundreds of different terminations are used. The end result of selecting Deutsch is increased profits and long term performance.



Material:

Solid copper alloy

Termination Method:

Crimp

Manufacturing Method:

Cold-headed

Finish-Standard:

Nickel plated

Finish Options:

a) Gold

b) Tin

- Solid shoulder for high tensile strength pin retention.
- Nickel plated as standard for corrosion resistance.
- Inspection hole for conductor strand visibility.
- Insulation cup not required due to integral wiring sealing connector grommet design.

- Solder is not recommended, eliminating flux corrosion and reducing assembly costs.
- Wire lead-in chamfer for 6, 8, 12, 16, 20 & 24 AWG wire entry.
- No retention tangs required, eliminating contact damage and the need for secondary locks.

Material:

Solid copper alloy with stainless steel sleeve

Termination Method:

Crimp

Manufacturing Method:

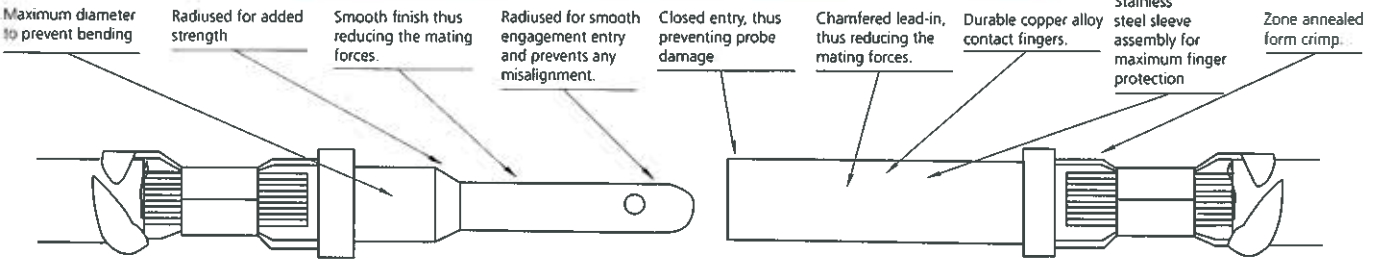
Cold-headed

Finish-Standard:

Nickel plated

Finish Options:

a) Gold



Material:

Copper alloy

Termination Method:

Crimp

Manufacturing Method:

Stamped & Formed production Method

Finish-Standard:

Nickel plated Size 16 & 20

Tin/Nickel Size 12

Finish Options:

a) Gold

Material:

Copper alloy with stainless steel sleeve

Termination Method:

Crimp

Manufacturing Method:

Stamped & Formed production Method

Finish-Standard:

Nickel plated Size 16 & 20

Tin/Nickel Size 12

Finish Options:

a) Gold







DEFINITION

Crimping may be defined as the act of joining a conductor to a pin or socket contact using a mechanical tool to compress and displace metal. In a good crimp joint, there is a mutual flow of metal, causing a symmetrical distortion of wire strands and contact material. Such a joint is similar to a cold weld. Mechanical strength and good electrical continuity are established.

Because of the new environments to which electrical connectors are subjected, there has been a drastic change in thinking relative to the use of precision crimp joints in preference to solder.

CRIMPING CONFIGURATIONS

There are many different types of crimps employed today. These range from the terminal fold over tab type (Deutsch Stamped and Formed style contact, Figure 1) to the single indent crimp, to the hex crimps and finally the standard four indent crimp. The four indent crimp (Deutsch Solid style contact, Figure 2) provides the most uniform displacement of wire and contact material. The wire strands and the contact material are formed together in a solid mass with little reduction of area of the wire strands. A minimum of voids exists and very little extrusion of the wire strands has taken place.

CRIMPING CHARACTERISTICS

Connectors utilizing either style of Deutsch crimped contacts permit the removal of these contacts several times so that modification, circuit changes, or replacement of contacts may be made with little difficulty and with the same quality assurance as in production line assembly. Crimping may be accomplished either with hand tools, power tools or automated power tools. Repeatability of the crimp operation is characteristic provided precision crimping tools are employed.

CRIMPED CONTACTS

Mechanically crimping contacts is now the dominant wire termination method, for some very good reasons:

1) Since no wet process is involved, corrosion is not a problem. No adhesives, fluxes or additives are used.

2) The human element is virtually eliminated in making the joint. Strength, accuracy and over-all reliability of a crimped contact are controlled by the crimp tool, not the

operator. The field tools (except #4 solid style) release the contact only after the full crimping cycle is completed, no special training is required. The tools are relatively inexpensive.

3) With smaller gauge wire, the crimp is as strong as the wire itself.

4) The joint can be inspected visually. Viewing the wire through an inspection hole in the contact makes inspection quick, easy and sure, both by the operator and by the inspector.

5) The crimping tool is universal, it accepts both pins and sockets of many types.

6) Plating thickness on contacts is not restricted, as in solder joints, so better corrosion resistance and contact reliability are achievable.

7) Crimping can be done anywhere even in the field, without special preparation. Terminations are required or modified in the field exactly as in the shop, using the same tools and the same techniques, and with the same ease of operation and same certainty of results.

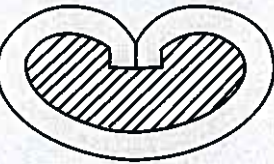
8) Surface cleanliness is not critical.  
9) total installed and maintenance costs are lower since joining is quick and easy.

Crimp Tensile Test

The following information is provided as an aid to manufacturing facilities that terminate Deutsch crimp type contacts. The term "typical" is used to illustrate expected tensile strength results when crimp tooling is in good working order and properly calibrated. The term "minimum" is used to illustrate a point at which tooling is suspected of having excessive wear, insufficient air pressure, bad calibration, etc. Minimum does not imply that the crimp is unacceptable, only that an adjustment should be made.

The manner in which the tensile test is performed is important in order to attain valid test results. An axial load should be applied at a rate of 1.0 in./min starting from zero pounds until there is wire/contact separations or wire breaking. Care should be taken to avoid clamping on the crimp barrel.

STAMPED & FORMED STYLE



CROSS SECTION ACROSS AXIS

FIGURE 1

SOLID STYLE



INDENTER CRIMP  
CROSS SECTION ACROSS AXIS

FIGURE 2

CRIMP TENSILE STRENGTH  
(STAMPED & FORMED)

#20 SIZE	CONTACTS	20 lbs.
#16 SIZE	CONTACTS	25 lbs.
#12 SIZE	CONTACTS	70 lbs.

CRIMP TENSILE STRENGTH  
(SOLID)

#20 SIZE	CONTACTS	20 AWG	20 lbs.
#16 SIZE	CONTACTS	16 AWG	25 lbs.
#12 SIZE	CONTACTS	12 AWG	70 lbs.
#8 SIZE	CONTACTS	8 AWG	90 lbs.
#4 SIZE	CONTACTS	6 AWG	300 lbs.

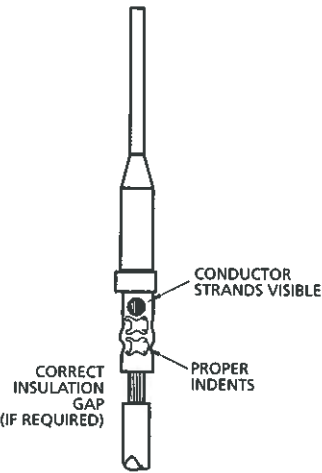


SOLID STYLE

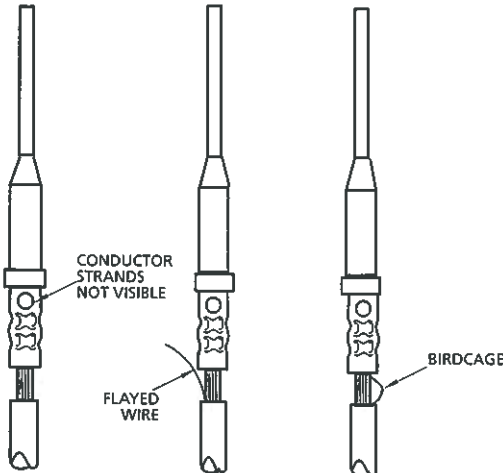


INDENTER CRIMP  
CROSS SECTION ACROSS AXIS

ACCEPTABLE CRIMP



UNACCEPTABLE CRIMP



CRIMP INSPECTION

Crimping tools are, in some case, more expensive than soldering tools, but this is more than off-set by the lower total installation and maintenance costs resulting from the crimping operation. However, controls are required to make sure first, that the operator uses the proper crimping tools designed for the type and size contact being crimped, and then, that the pin or socket is properly inserted into the tool. The wire must be stripped of insulation and fully inserted into the contact. The usual procedure is to insert the wire into the open end of the contact, then close the crimping tool, thus crimping the wall of the contact into the wire at several points around the circumference.

When completed, correct assembly can be checked visually. The removed insulation should expose a conductor length that will pass beyond the inspection hold in the contact and still reveal 1/32" to 3/32" of conductor between the contact and the insulation on the wire. The operator and inspector can thus check for:

- 1) Damaged wire strands.
- 2) Missing wire strands.
- 3) Wire strands not entering the contact barrel.
- 4) Wire not inserted to the proper depth in the contact.

When the correct tool is used for crimping, a good termination is assured. However, if there is a question as to the tool's condition,

the distance across the indent bottoms can be measured. This is called the "T" dimension (T for terminal). There is a corresponding "Go - No - Go" gauge for measuring the positioning of the tool indenters, the "G" (gauge) dimension.

For more detailed crimp dimensions please request a factory drawing. For Stamped and Formed Style request drawing #4025-2\*-0000. For Solid Style request drawing #4025-205-0000.

COMMON TOOLING

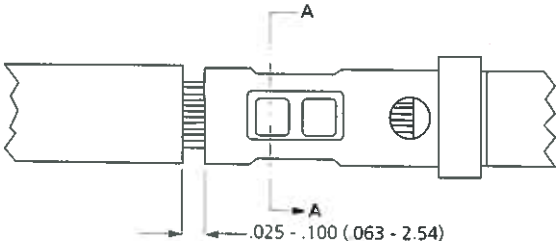
By selecting the common Deutsch contact system, only one style of tool is needed to remove wires. In designs like the DT and DTM Series connectors, even this tool is eliminated. One of two types of hand crimp tools are used to crimp the five different types of contacts to the wire end. For automation, semi and full automatic crimping equipment is available that will process thousands of wire terminations per hour.

COMMON PROCESSING

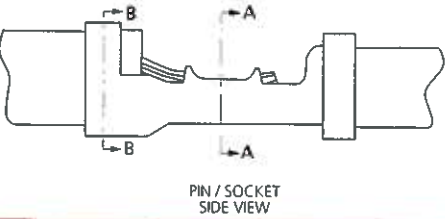
Using the Deutsch contact means that the way an O.E.M. supplier attaches a wire to this terminus never varies. This procedural standard allows harness assemblers to become highly proficient in terminating Deutsch connectors.



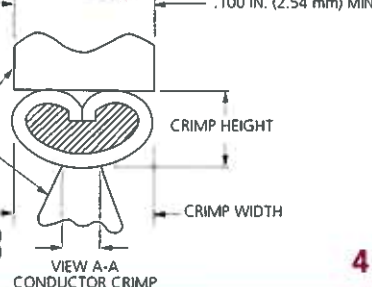
SOLID TYPE



STAMPED AND FORMED TYPE



VIEW B-B  
INSULATOR CRIMP



VIEW A-A  
CONDUCTOR CRIMP





SOLID CONTACTS

Contact Part Number	Size & Type	Wire Gauge Range	Recommended Strip Length	Hand Crimp Tool	Production Tool *
0460-202-20141	20 PIN	20 & 24 AWG (0.5-0.2 mm <sup>2</sup> )	.156-.218 (3.96-5.54 mm)	HDT-48-00	HDP-400
0462-201-20141	20 SOCKET	20 & 24 AWG (0.5-0.2 mm <sup>2</sup> )	.156-.218 (3.96-5.54 mm)	HDT-48-00	HDP-400
0460-202-16141	16 PIN	16, 18 & 20 AWG (1.0-0.5mm <sup>2</sup> )	.250-.312 (6.35-7.92 mm)	HDT-48-00	HDP-400
0462-201-16141	16 SOCKET	16, 18 & 20 AWG (1.0-0.5mm <sup>2</sup> )	.250-.312 (6.35-7.92 mm)	HDT-48-00	HDP-400
0460-215-16141	16 PIN	14 & 16 AWG (2.0-1.0mm <sup>2</sup> )	.250-.312 (6.35-7.92 mm)	HDT-48-00	HDP-400
0462-209-16141	16 SOCKET	14 & 16 AWG (2.0-1.0mm <sup>2</sup> )	.250-.312 (6.35-7.92 mm)	HDT-48-00	HDP-400
0460-204-12141	12 PIN	12 & 14 AWG (3.0-2.0mm <sup>2</sup> )	.222-.284 (5.64-7.21 mm)	HDT-48-00	HDP-400
0462-203-12141	12 SOCKET	12 & 14 AWG (3.0-2.0mm <sup>2</sup> )	.222-.284 (5.64-7.21 mm)	HDT-48-00	HDP-400
0460-204-08141	8 PIN	8 & 10 AWG (8.0-5.0mm <sup>2</sup> )	.430-.492 (10.9-12.5 mm)	HDT-04-08	HDP-400
0462-203-08141	8 SOCKET	8 & 10 AWG (8.0-5.0mm <sup>2</sup> )	.430-.492 (10.9-12.5 mm)	HDT-04-08	HDP-400
0460-204-0490	4 PIN	6 AWG (13.0mm <sup>2</sup> )	.430-.492 (10.9-12.5 mm)	HDT-04-08	HDP-400
0462-203-04141	4 SOCKET	6 AWG (13.0mm <sup>2</sup> )	.430-.492 (10.9-12.5 mm)	HDT-04-08	HDP-400

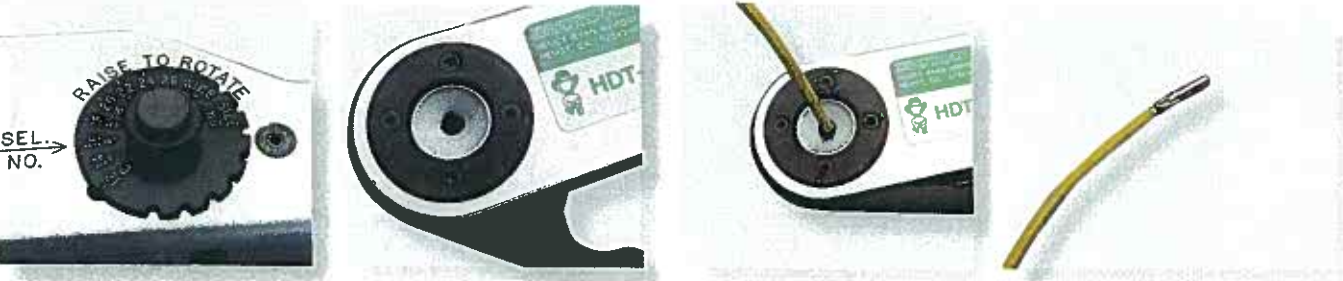
\*See Envelope Print 0425-205-0000. Consult factory for alternate finishes.  
See Page 8 for general specifications

\* Deutsch can only warrant electrical performance when proper parts, procedures and tooling from approved Crimp Termination Information Drawings are Used.

For Solid Contacts Use: 0425-205-0000 for all sizes



**SOLID CONTACTS**  
**Universal Hand Crimp tool**  
**HDT - 48 - 00**  
For size 20, 16 & 12 contacts



- 1) Strip (6.3mm) 1/4" insulation from wire
- 2) Raise selector knob and rotate until arrow is aligned with wire size to be crimped.
- 3) Loosen lock nut, turn adjusting screw in until it stops.
- 4) Insert contact, turn adjusting screw counter clockwise out until contact is flush with indenter cover. Tighten lock nut.
- 5) Insert wire in contact, contact must be centered between indicators, close handles until handle contacts the stop.
- 6) Release handles and remove crimped contact.
- 7) Inspect terminal to insure that all strands are in crimp barrel.  
Note: tool must be readjusted for each type/size of contact or wire.



"Field Maintenance" Hand Crimp Tools



**HDT - 48 - 00**  
For size 20, 16 & 12 contacts



**HDT - 04 - 08**  
For size 4 & 8 contacts  
Field repair tool only. Not for production use.

Production Crimp Tools



**Power Crimp Equipment**  
**HDP - 400**  
For size 4, 8, 12, 16 & 20 Contacts



**Automatic Crimp Equipment**  
**HD16** - P/S accommodates 16 contacts  
**HD12** - P/S accommodates size 12 contacts  
**HD12-16 P/S** accommodates size 16 & 12 contacts

Consult factory for availability and sources





STAMPED AND FORMED

Deutsch Stamped and Formed contacts are designed primarily for use where wire termination costs are of primary concern without sacrificing the reliability and maintainability of the normal operating electrical circuits.

DESIGN AND MATERIALS SELECTION

Deutsch engineers have combined the process of superior material selection with outstanding mechanical Cad-Cam Designs to present stamped and formed contacts that exceed the demands of today's truck and off-highway electrical systems.

The selection of copper alloys, finished after forming with nickel plating provides superior durability, performance, corrosion and oxidation resistance.

To achieve air-tight crimps that eliminate the need to solder after wire terminations, Deutsch engineers have specified that the core-wing ends be formed in the direction of the crimp, thus assuring resistance to crimp relaxation and displacement of metal, crimp after crimp.

True to all Deutsch terminals, the split socket (female) tines, protected by a closed entry stainless steel sleeve, ensure controlled contact pressure for maximum conductivity with minimum surface wear.

In keeping with the Deutsch commitment to total quality, all stamped and formed contacts are manufactured using SPC controls and are subjected to extensive programs of rigid testing, including field performance feedback.

FEATURES	BENEFITS
Stainless Steel Socket Sleeve	Provides closed entry design preventing probe damage.
Contact Tines are in Socket Member, Not Pin	Terminal contact points are protected from handling and assembly damage.
No Lances / Tangs	Contact retention is designed in the connector body, eliminating retention problems during handling and rework.
Bullet (rounded) Pin Nose	Prevents mismatching and bent pins.
Nickel Plating	Reduces oxidations, thus improving conductivity performance.
Plated After Forming	No base metal is exposed to corrosion.
Optional Gold Plating	Available for dry circuit application.
No Individual Wire Seal Grommets	Wire seals are designed as an integral component of the connector, thus reducing wire terminating costs.
Pre-Bent Core Wings	Provides an air-tight crimp joint.
Improved Die Stop Gap	Allows application die to position wire for proper crimp length.
Off-Set Configuration	Provides center wire alignment between conductor and insulation.
Copper Alloy Materials	Prevents material relaxation over time, providing reliable crimp joints and increased durability.

Stamped & Formed Contacts

Contact Part Number	Size & Type	Wire Gauge Range	Insulation O.D.	Recommended Strip Length	Hand Crimp Tool	Production Crimp Tool Die
1060-20-0122 1062-20-0122	20 PIN 20 SOCKET	16, 18 & 20 AWG (1.0-0.5mm <sup>2</sup> ) 16, 18 & 20 AWG(1.0-0.5mm <sup>2</sup> )	0.075-0.125 (1.90-3.15mm) 0.075-0.125 (1.90-3.15mm)	.150-2.00 (3.81-5.08mm) .150-2.00 (3.81-5.08mm)	DTF-20-00 DTF-20-00	DCT20-02-00 DCT20-02-00
1060-20-0222 1062-20-0222	20 PIN 20 SOCKET	16, 18 & 20 AWG (1.0-0.5mm <sup>2</sup> ) 16, 18 & 20 AWG (1.0-0.5mm <sup>2</sup> )	0.050-0.085 (1.3-2.15mm) 0.050-0.085 (1.3-2.15mm)	.150-2.00 (3.81-5.08mm) .150-2.00 (3.81-5.08mm)	DTF-20-02 DTF-20-02	DCT20-02-00 DCT20-02-00
1060-16-0722 1062-16-0722	16 PIN 16 SOCKET	14, 16 & 18 AWG (0.75-2.0mm <sup>2</sup> ) 14, 16 & 18 AWG (0.75-2.0mm <sup>2</sup> )	.075-0.115 (1.90-2.90mm) .075-0.115 (1.90-2.90mm)	.150-2.00 (3.81-5.08mm) .150-2.00 (3.81-5.08mm)	DTF-16-00 DTF-16-00	DCT16-02-00 DCT16-02-00
1060-16-0622 1062-16-0622	16 PIN 16 SOCKET	16, 18 & 20 AWG (0.50-1.0mm <sup>2</sup> ) 16, 18 & 20 AWG (0.50-1.0mm <sup>2</sup> )	.055-0.083 (1.40-2.10mm) .055-0.083 (1.40-2.10mm)	.150-2.00 (3.81-5.08mm) .150-2.00 (3.81-5.08mm)	DTF-16-00 DTF-16-00	DCT16-02-00 DCT16-02-00
1060-16-0122 1062-16-0122	16 PIN 16 SOCKET	16 & 18 AWG (0.75-1.5mm <sup>2</sup> ) 16 & 18 AWG (0.75-1.5mm <sup>2</sup> )	.075-0.115 (1.90-2.92mm) .075-0.115 (1.90-2.92mm)	.150-2.00 (3.81-5.08mm) .150-2.00 (3.81-5.08mm)	DTF-16-00 DTF-16-00	DCT16-02-00 DCT16-02-00
1060-14-0122 1062-14-0122	16 PIN 16 SOCKET	14 & 16 AWG (2.0-1.0mm <sup>2</sup> ) 14 & 16 AWG (2.0-1.0mm <sup>2</sup> )	.095-.150 (2.41-3.81mm) .095-.150 (2.41-3.81mm)	.150-2.00 (3.81-5.08mm) .150-2.00 (3.81-5.08mm)	DTF-16-00 DTF-16-00	DCT16-02-00 DCT16-02-00
1060-12-0166 1062-12-0166	12 PIN 12 SOCKET	12 & 14 AWG (3.0-2.0mm <sup>2</sup> ) 12 & 14 AWG (3.0-2.0mm <sup>2</sup> )	.113-.170 (2.87-4.32mm) .113-.170 (2.87-4.32mm)	.225-.275 (5.72-6.99mm) .225-.275 (5.72-6.99mm)	DTT-12-00 DTT-12-00	DCT12-02-00 DCT12-02-00

\*\* For proper dies and stamped & formed crimp dimensions - See Envelope 0425-208-0000 12 Size Consult factory for alternate finishes  
0425-203-0000 16 Size  
0425-207-0000 20 Size



GENERAL SPECIFICATIONS

Solid Contacts

Pin: Copper alloy  
Socket: Copper alloy  
Finish: Nickel plating  
Optional: Gold plating is available for dry circuit applications

Stamped & Formed Contacts

Pin: Copper alloy  
Socket: Copper alloy  
Finish: Nickel plating  
Optional: Gold plating is available for dry circuit applications

Temperature:

Operating at temperatures from -55°C to +125°C.

Durability:

No electrical or mechanical defects after 100 cycles of engagement or disengagement.

Physical Shock:

No unlocking, unmating or other unsatisfactory result during or after 50 g's in each of three mutually perpendicular planes. No electrical discontinuities longer than 1 microsecond. MIL-STD 202, Method 213, Condition "C".

Insulation Resistance:

1000 megohms minimum at 25° C.

Vibration:

Maintains continuity and exhibits no mechanical or physical damage during or while subject to a sinusoidal vibration, having an amplitude of .060 inches double amplitude and the frequency varied linearly between limits of 10 to 2000 to 10 Hz with a maximum force of 20g's. No electrical discontinuities longer than 1 microsecond.

Moisture Resistance

Water does not penetrate seals when submerged in 3 feet of water.

Corrosion Resistance

Connectors show no evidence of corrosion after exposure to 48 hours of salt spray per MIL-STD 1344 method 1001.

Fluid Resistance

Connectors show no damage when exposed to most fluids used in industrial applications.

Dielectric Withstanding Voltage

Current leakage less than 2 milliamps at 1500 VAC.

Contact Current Rating @ 125° C (continuous)

Contact Size	Max. Current
# 20	7.5 amps
# 16	13 amps
# 12	25 amps
# 8	60 amps
# 4	100 amps

Crimp Tensile Strength (Solid)

# 20	Size	Contacts	20 lbs.
# 16	Size	Contacts	25 lbs.
# 12	Size	Contacts	70 lbs.
# 8	Size	Contacts	90 lbs.
# 4	Size	Contacts	300 lbs.

CONTACT MILLIVOLT DROP (Solid)

Wire (AWG)	Test Current	Millivolt Drop*
20	7.5	60
16	13	60
12	25	60
8	60	60
4	100	60

\*Less drop through wire

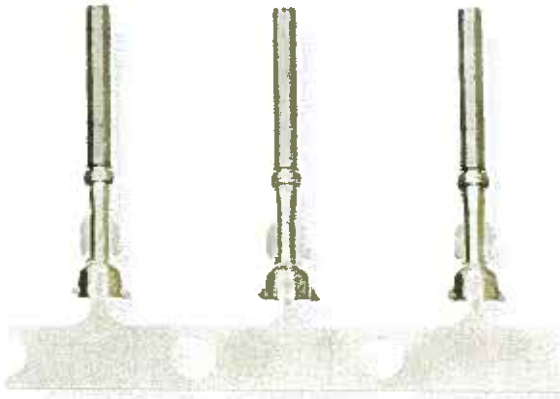
Crimp Tensile Strength (Stamped & Formed)

#20	Size	Contacts	20 lbs.
#16	Size	Contacts	25 lbs.
#12	Size	Contacts	70 lbs.

CONTACT MILLIVOLT DROP (Stamped & Formed)

Wire Gauge	Wire Gauge	Millivolt Drop *
#20	7.5 Amps	100
#16	13 Amps	100
#12	25 Amps	100

\*Less drop through wire





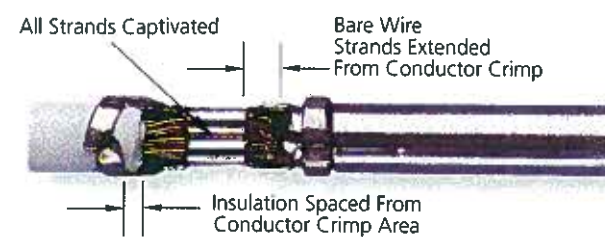


## CRIMPING

### WIRE STRIPPING



## CRIMP INSPECTION



For crimp configuration refer to drawing 0425-203-0000

## HAND CRIMP TOOLING



### HAND TOOL

Field Maintenance

Ratched design for full cycle crimp reliability

DTT - 12 - 00 Size 12

DTT - 16 - 00 size 16

DTT - 20 - 00 Size 20\*

DTT - 20 - 02 Size 20\*

\*See page 8 Stamped & Formed Contact for proper tool.

## APPLICATION DIES



### FITS ALL STANDARD PRESSES

**DCT16 - 01 - 00**

High Speed

**DCT12 - 02 - 00**

**DCT16 - 02 - 00**

**DCT20 - 02 - 00**

Standard

Consult factory for further application information.

\*Deutsch can only warrant electrical performance when proper parts, procedures and tooling from approved Crimp Termination Information Drawings are used.

For Stamped and Formed Contacts Use:

0425-208-0000 for size 12

0425-203-0000 for size 16

0425-207-0000 for size 20



## Hand Crimping Instructions



1. Cycle the hand tool to the open position.



2. While pressing upward on the locator spring, insert the contact with the tails upward completely into the locator.



3. When correctly positioned, the contact should be located beyond flush with the edge of the hand tool and positioned on the concave polished split level crimp areas.



4. Partially (usually the first click) cycle the hand tool assuring that the upward thrusting tails of the contact has started engaging with the top jaw of the tool. (There is a slight tendency for the contact to roll out of vertical alignment.)



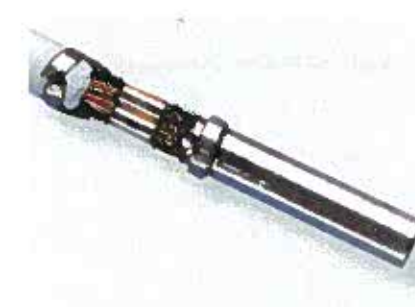
5. Insert the prestripped wire into the crimp area of the contact and completely cycle the tool. Recommended strip length  $.175 \pm .025$



6. While pressing upward on the locator spring withdraw the crimped termination.



7. The result will be a perfect termination.



8. Note that there are no unterminated wire strands, and that some strand ends can be seen at the forward edge of the crimp. Also note the insulation is gripped by the smaller secondary crimp. Distortion is at a minimum.





P.C.B. Pins

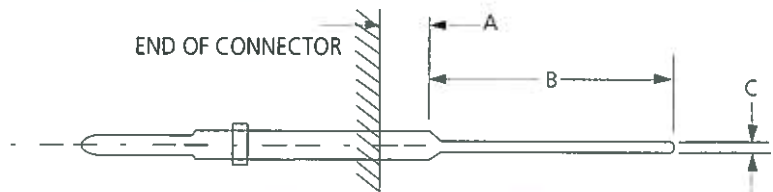
In many electronic module designs, the use of removable contacts provides solutions of design flexibility and reduced costs. Deutsch Industrial has available a complete line of straight-reduced diameter extended pins that may be installed in any of the Deutsch family of field serviceable connectors. These solid copper alloy pins may be specified in various platings and assembled in HD30, HDP20, HD10, DRC or DT receptacles. By utilizing the tooled and readily available insert arrangements of these five connector series, the electronic designer is provided a low cost alternative to meet his application needs. Consult the Deutsch Industrial series catalogs for a complete review of connector types and insert arrangements offered.

Material

Copper alloy  
90:Tim  
31:Gold

P.C.B. Mounting

Consult factory for P.C.B. mounting details and pin positions.



PART NUMBER	HD30	HD10	DRC	DT	8±.010	C±.005
0460-208-16**	.361	.375	.237	.523	.248	.025
0460-2341-16**	.366	.380	.242	.528	.160	.040
0460-244-16**	.037	.051	N/A	.199	.400	.041
0460-245-12**	.085	.099	N/A	.247	.500	.041

\*\*See material list for plating options



HD10 Series

HDP20 Series

HD30 Series



Contact Glossary

**Barrel** - (1) Conductor barrel: the section of the terminal, splice or contact that accommodates the stripped conductor, or (2) Insulation barrel: The section of the terminal splice or contact that accommodates the conductor insulation.

**Barrel Chamber** - The bevel at the end of the conductor barrel providing for easier entry.

**Belled Mouth (bellmouth)** - The flared or wide entrance of a terminal, splice or contact barrel to permit easier insertion of the conductor.

**Bifurcated Contact** - Describes lengthwise slotting of a flat spring contact as used in a printed circuit edge connector.

**Circumferential Crimp** - The type of crimp where the crimping dies completely surround a barrel resulting in symmetrical indentations in the barrel.

**Closed Entry** - A contact or a contact cavity design in the insert or body of the termination assembly which limits the size and position of the mating contact or printed circuit board to a predetermined dimension.

**Contact** - The conductive element in a termination assembly which mates with a corresponding element for the purpose of transferring electrical energy.

**Contact, Bellows** - A contact in which a multileaf spring is folded. This provides more uniform spring rate over the full tolerance range of the mating unit.

**Contact, Button-Hook** - A curved, hook-like contact often located at the rear of hermetic headers to facilitate soldering or desoldering of leads.

**Contact, Crimp** - A contact whose conductor barrel is a hollow cylinder accepting the conductor. After a bared conductor is inserted, a crimping tool is applied to swage or form the contact metal firmly against the conductor. An excellent mechanical and electrical contact results. Often referred to as a solderless contact.

**Contact, Dressed** - A contact with a permanently attached contact retaining member.

**Contact, Female** - A contact into which the mating contact is inserted. Similar in function to a socket contact.

**Contact, Fixed** - A contact permanently included in the insert material. It is mechanically locked, cemented or embedded in the insert.

**Contact, Insertable / Removable** - A contact that can be mechanically joined to or removed from an insert. Usually special tools lock the contact in place or remove it for repair or replacement.

**Contact, Male** - A contact of design to make contact by insertion into a mating contact. Similar in function to a pin contact.

**Contact, Nude** - A contact with a contact retainer that remains in the insert at all times.

**Contact, Open Entry** - A socket whose engaging end is split and therefore vulnerable to distortion or damage from test probes or other wedging devices.

**Contact, Pin** - Male-type contact designed to slip inside the mating female contact member.

**Contact, Sheet-Metal** - Contacts made by stamping and bending sheet metal rather than by the machining of metal stock.

**Contact, Socket** - A female-type contact (usually completely surrounded by insert material).

**Contact, Solder** - A contact which has a cup, hollow-cylinder eyelet or hook to accept a conductor and retain the applied solder.

**Contact, Spade** - A contact with fork-shaped female members designed to dovetail with spade-shaped male members. (Alignment in this type of connection is very critical if good conductivity is to be achieved.)

**Contact, Two-Piece** - A contact made of two or more separate parts joined by swaging or brazing to form a single contact. Provides the mechanical advantage of two metals but has the inherent electrical disadvantage of differences in conductivity.

**Contact Area** - The area in contact between two conductors, two contacts or a conductor and a contact permitting the flow of electricity.

**Contact Arrangement** - The number, spacing and arrangement of contacts in a termination assembly.

**Contact Engaging and Separating Force** - Force needed to either engage or separate mating contacts.

**Contact Float** - The overall side play and/or angular displacement of contacts within the insert cavity.

**Contact Inspection Hole** - A hole in the cylindrical rear portion of contact used to check the depth to which a conductor has been inserted. Crimp-type contacts usually have inspection holes; solder-types seldom do, except larger sizes in which the hole's function is to allow solder and air to bleed out during soldering.

**Contact Resistance** - Electrical resistance of a pair of engaged contacts. Resistance may be measured in ohms or millivolt drop at a specified current over the engaged contacts.

**Contact Retainer** - A device either on the contact or in the insert to retain the contact in an insert or body.

**Contact Retention** - The axial load in either direction which a contact can withstand without being dislodged from its normal position within an insert or body.





**Contact Shoulder** - The flanged portion of the contact which limits its travel into the insert.

**Contact Size** - An assigned number denoting the size of the contact.

**Contact Spacing** - The spacing between the centers of contacts within an insert.

**Contact Spring** - The spring placed inside the socket-type contact to force the pin into position of positive intimate contact. Depending on the application, various types are used, including leaf, cantilever, napkin, ring, squirrel cage and "Chinese-finger" springs. All perform the function of wiping and establishing good contact. Various metal alloys are used. For example, beryllium copper is used where high conductivity and long life are required. Stainless steel, while its conductivity is only about two percent is used in high temperature applications.

**Contact Wipe** - The distance of travel (electrical engagement) made by one contact with another during its engagement or separation or during mating or unmating of the connector halves.

**Crimp** - The physical compression (deformation) of a contact barrel around a conductor to make an electrical and mechanical connection to the conductor.

**Crimping** - a pressure method of mechanically securing a terminal, splice or contact to a conductor.

**Crimping Die** - Portion of the crimping tool that shapes the crimp.

**Crimp Tool** - Mechanism used for crimping.

**Engaging and Separating Force** - Force required to either engage or separate mating contacts or connectors.

**Extraction Tool** - A device used for extracting removable contacts from a termination assembly.

**Flag Terminal** - Terminal having a tongue protruding from the side of the barrel.

**Flange Spade Terminal** - A terminal whose tongue edges are turned at an angle to the plane of the tongue.

**Grid Spaced** - The arrangement of contacts in a multiple contact termination assembly by spacing in a geometric pattern.

**Hermaphroditic Contact** - A contact design which is neither pin nor socket and which mates with another contact of the same design. The contacts may be arranged as male and female contacts as for pins and sockets. Hermaphroditic contacts may also be used in a manner such that one half of each contact mating surface protrudes beyond the connector interface and both mating connectors are identical.

**Hook Terminal** - Terminal with a hook-shaped tongue.

**Individual Contact Release (IRC)** - A system whereby each contact in an assembly can be individually unlocked and removed without unlocking the other contacts. They are also locked individually.

**Indenter** - That part of a crimping die, usually the moving part, which indents or compresses the contact barrel.

**Insertion Tool** - (1) A device used to insert contacts into a connector or junction. (2) A device used to insert taper pins into taper pin receptacles.

**Inspection Hole** - A hole placed at one end of a barrel to permit visual inspection to see that the conductor has been inserted to the proper depth in the barrel prior to crimping. (See Contact Inspection Hole.)

**Insulated Terminal** - Terminal having its barrel and insulation support or grip, if used, covered with a dielectric material.

**Insulation Crimp** - (1) The physical deformation of an insulation sleeve covering a terminal or splice and the adjacent conductor insulation to hold the sleeve in place (2) Shape combination of insulation sleeve to terminal or splice and conductor insulation after crimping.

**Insulation Grip** - The portion of the barrel which is closed or compressed around the conductor insulation.

**Insulation Piercing Terminal** - A terminal with a device which punctures the insulation of the conductor and makes contact with or enters into the conductor.

**Insulation Support** - The portion of the barrel corresponding to an insulation grip except that it is not compressed around the conductor insulation.

**Maximum Conductor Operating Temperature (MCOT)** - Ambient temperature plus temperature rise due to passage of electric current.

**Metered Solder Cup** - A term used when the cylindrical portion of the contact (in which the conductor is inserted) is partially filled with a specific amount of solder before assembly of the connector. Thus the conductor can be soldered into the contact by the simple addition of heat and without additional solder.

**Nest** - The portion of a crimping die which support the barrel during crimping.

**Offset Terminal** - Terminal whose tongue is forward of, and whose stud hole is offset from, centerline of terminal barrel.

**Plating** - The overlaying of a thin coating of metal on components to improve conductivity, provide for easy soldering or prevent rusting of corrosion.

**Pre-Tinned** - Solder applied to either or both the contact and conductor prior to soldering.



**Pre-Tinned Solder Cup** - Solder cups whose inner surfaces have been precoated with a small amount of tin-lead solder.

**Pull-Out Force** - Force necessary to separate a conductor from a contact or terminal, or a contact from a termination assembly, by exerting a pull along the axis of the conductor and the termination.

**Range, Wire** - The sizes of conductors accommodated by a particular barrel. Also the diameters of insulated conductors accommodated by a sealing grommet.

**Ratchet Control** - A device to ensure the full crimping cycle of a crimping tools.

**Rectangular Terminal** - Terminal whose tongue is rectangular in shape.

**Ring-Tongue Terminal** - Round-end tongue terminal with hole to accommodate screw or stud.

**Sealing Plug** - A plug which is inserted to fill an unoccupied contact aperture in a termination assembly. Its function is to seal all unoccupied apertures in the assembly, especially in environmental connectors or junctions.

**Seamless Terminal or Splice** - Terminal or splice conductor barrel made without an open seam.

**Serration** - Deformation of the inside surface of a conductor barrel to provide better gripping of the conductor or on the outside of the conductor body to provide better gripping of the conductor.

**Service Rating** - The maximum voltage or current which a termination is designed to carry continuously.

**Socket Contact Sleeve** - A sleeve that holds the contact spring in the correct position within the socket contact and provides a smooth exterior surface.

**Solder Cup** - The end of a terminal or contact in which the conductor is inserted prior to being soldered.

**Solder Eye** - A solder type contact provided with a hole at its end through which a conductor can be inserted prior to being soldered.

**Solderless Connection** - The joining of two metals by pressure without the use of solder, braze or any method requiring heat.

**Solderless Wrap** - A technique of connecting stripped solid wire to a terminal post containing a series of sharp edges by winding the wire around the terminal.

**Spade Tongue Terminal** - Slotted tongue terminal designed to slip around a screw or stud without removing the nut.

**Strand** - A single uninsulated wire.

**Strip** - To remove insulation from a connector.

**Stud** - A post for connecting wire, similar to a binding post.

**Stud Hole** - The hole or opening in the tongue of a terminal to accommodate a screw or stud.

Swedging - A term for crimping.

**Taper Pin** - A pin-type terminal having a tapered end designed to be impacted into a tapered female terminal.

**Taper Tab** - A flat terminal having tapered sided design to receive a mating tapered female terminal.

**Temperature Coefficient of Resistivity** - The change in resistance (electrical) per degree change in temperature. (It is usually signified by the symbol for alpha.)

**Terminal** - A device designed to terminate a conductor to be affixed usually to a post, stud, chassis or other conductor or the like in order to establish electrical connection.

**Terminal Lug** - A device designed to be affixed, usually at one end, to a post, stud, chassis or the like, and with provision for attachment of an electrical conductor(s) in order to establish an electrical connection.

**Terminal Style** - The tongue design of the terminal (flag, flanged spade, offset, rectangular, ring, slotted, spade, etc.)

**Thermocouple Contact** - Contacts of special material used in connectors employed in thermocouple applications. Materials used are often iron, constantan, copper, chromel, alumel or others.

**Tinning** - The application of a thin coat of solder to the metallic surface to be soldered.

**Wetting Action** - The forming of a new alloy by intermolecular attraction between the solder and the base metal and plating.

**Wicking** - The flow of solder along the strands of multistrand conductors.

**Wiping Action** - (See Contact Wipe.) Action of two electrical contacts which come in contact by sliding against each other.

