

## 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 Industrial connector series.

Deutsch stamped and formed contacts are designed for use where wire termination costs are of primary concern without sacrificing reliability of 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 Industrial terminals protect the split socket tines with a closed entry stainless steel sleeve or sleeveless design. 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 closed entry design. The standard finish is nickel, with gold plating an option. All Deutsch Industrial 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. Solid and stamped contacts can be used interchangeably in any Deutsch connector.

The stamped and formed style includes 10 sizes each of pin and socket contacts that terminate 10-22AWG (5.0 - 0.35mm<sup>2</sup>). The specific contact is determined by the outside diameter of wire insulation and conductor size. See the appropriate chart on page 5 of this manual for specific part numbers.

The solid style contact terminates wire from 6 AWG to 20 AWG (13 - 0.5mm<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 7 of this manual for specific part numbers.

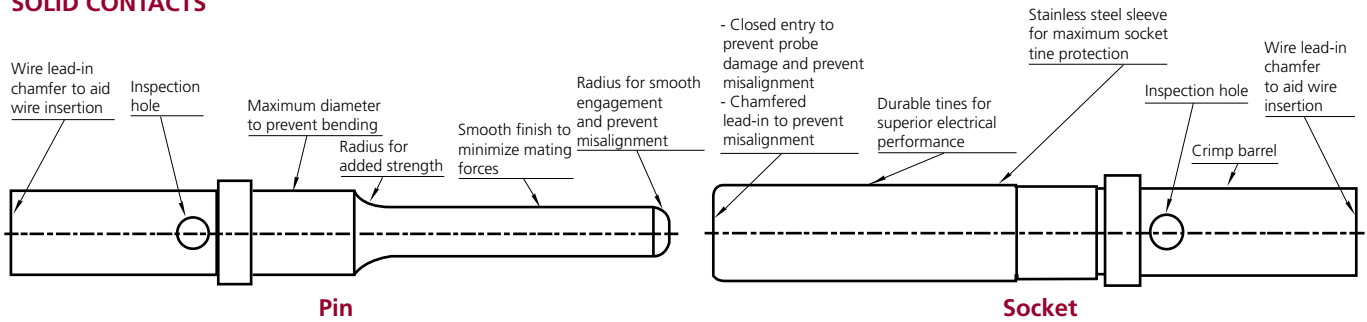
The selection of Deutsch Industrial connectors insures that the contact termination system will be compatible. This reduces changes in the assembly of the wire harness. It also improves performance, reliability and maintainability. Critical functions to any electrical system. The use of a common contact 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.







## SOLID CONTACTS



### Material:

Solid copper alloy

### Termination Method:

Crimp

### Manufacturing Method:

Cold-headed

### Finish-Standard:

Nickel plated

### Finish Options:

a) Gold

- 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 used, eliminating flux corrosion and reducing assembly costs.
- Wire entry chamfer for all wire sizes.
- No retention tangs required, eliminating contact damage and the need for secondary locks.

### Material:

Solid copper alloy

### Termination Method:

Crimp

### Manufacturing Method:

Cold-headed

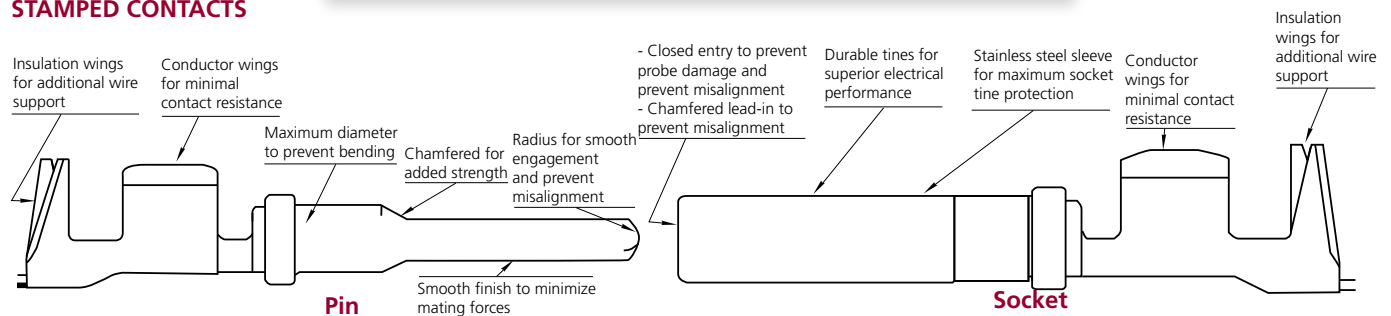
### Finish-Standard:

Nickel plated

### Finish Options:

a) Gold

## STAMPED CONTACTS



### Material:

Flat strip copper alloy

### Termination Method:

Crimp

### Manufacturing Method:

Stamped & Formed

### Finish-Standard:

Nickel plated Size 16 & 20

Tin/Nickel Size 12

### Finish Options:

a) Gold

### Material:

Flat strip copper alloy with

stainless steel sleeve

### Termination Method:

Crimp

### Manufacturing Method:

Stamped & Formed

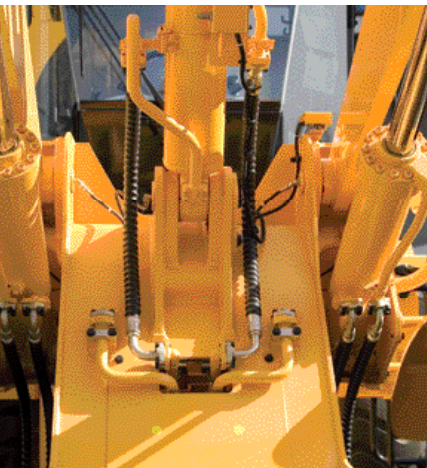
### Finish-Standard:

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 conductivity 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

Stamped contacts use a folded type of crimp (Fig. 1). Solid contacts use 2, 4, or 8 indents (Fig. 2). The wire strands and the contact material are formed together in a solid mass with reduction of area of the wire strands. A minimum of voids exists.

## CRIMPING CHARACTERISTICS

Connectors utilizing either style of Deutsch crimped contacts permit the removal of these contacts several times. Modification, circuit changes, or replacement of contacts may be made with the same quality assurance as in production line assembly. Crimping may be accomplished either with hand tools, power tools or automated power tools.

## 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) 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. The tools are relatively inexpensive.
- 3) With smaller 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 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 replaced 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 certainty of results.

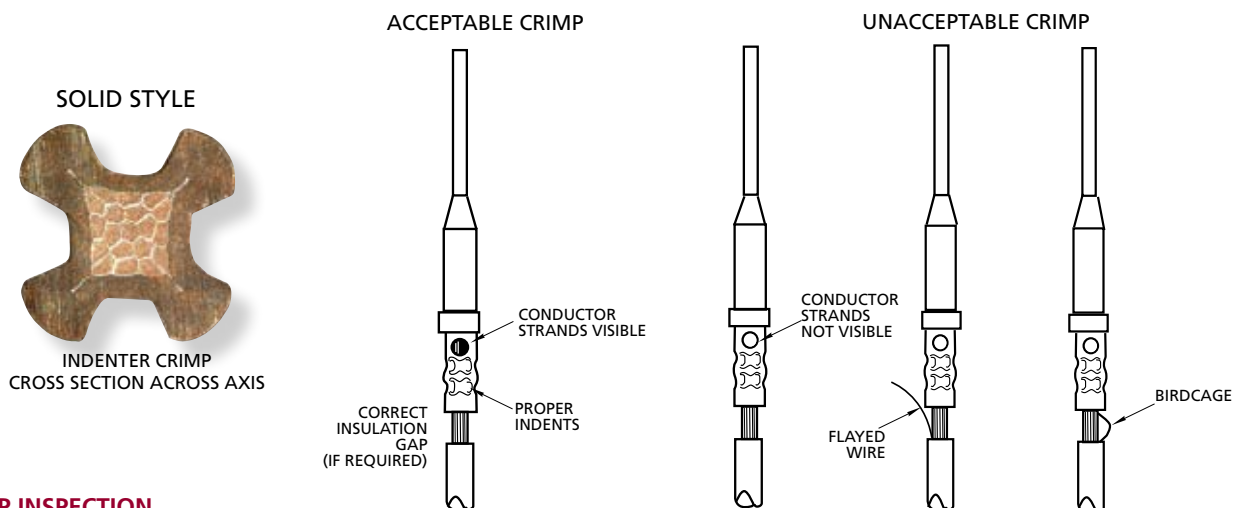
8) Total installed and maintenance costs are lower since joining is quick and easy.

## 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.





## 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 hole in the contact and still reveal .025 - .100 (.063 - 2.54) 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.

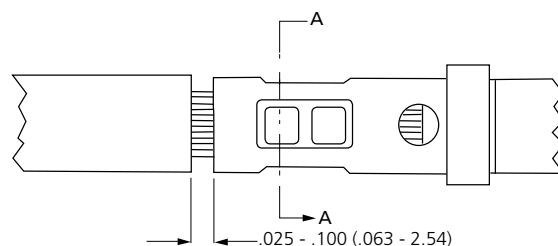
For more detailed crimp dimensions please request a factory drawing. For Stamped and Formed Style see 0425 -\*\*\* - 0000. For Solid Style see 0425-205-0000.

## COMMON TOOLING

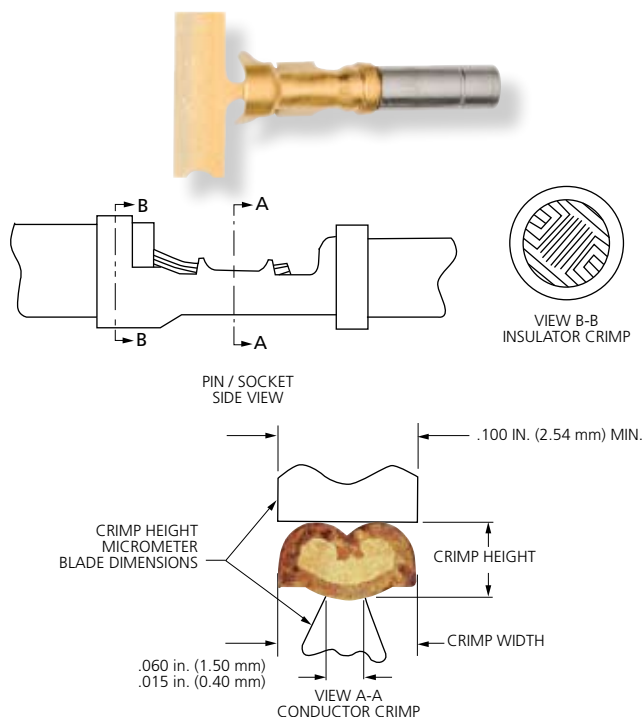
By selecting the Deutsch common contact system, only one style of tool is needed to remove wires. In designs like the DT and DTM Series connectors, even this tool is eliminated. Hand crimp tools are used to crimp different types of contacts to the wire end. For automation, semi and full automatic crimping 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.



## STAMPED AND FORMED TYPE





## GENERAL SPECIFICATIONS

### Solid Contacts

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

### Stamped & Formed Contacts

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

### Dielectric Withstanding Voltage

Current leakage less than 2 milliamps at 1500 VAC.

### Insulation Resistance:

1000 megohms minimum at 25° C.

### Current Rating (Contact current rating @ 125° C (continuous))

Size 20: 7.5 amps  
 Size 16: 13 amps  
 Size 12: 25 amps  
 Size 8: 60 amps  
 Size 4: 100 amps

### Submersion:

Properly wired and mated connection will withstand immersion under three feet of water without loss of electronic qualities or leakage.

### Fluid Resistance:

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

### Vibration:

No unlocking or unmating and exhibits no mechanical or physical damage after sinusoidal vibration levels of 20 G's at 10 to 2000 Hz in each of the three mutually perpendicular planes. No electrical discontinuities longer than 1 microsecond.

### Temperature:

Operative at temperatures from -55°C to +125° C. Continuous at rated current.

### Contact Retention:

Contacts withstand a minimum load of:

20 lbs. (89N) for size 20  
 25 lbs. (111N) for size 16  
 30 lbs. (133N) for size 12  
 35 lbs. (156N) for size 8  
 35 lbs. (156N) for size 4

### Thermal Cycle:

No cracking, chipping or leaking after 20 test cycles from -55° C to +125.

### Durability:

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

## CONTACT RESISTANCE

CONTACT SIZE	WIRE GAUGE AWG(mm <sup>2</sup> )	TEST CURRENT (AMPS)	RESISTANCE (mV) SOLIDS	RESISTANCE (mV) STAMPED & FORMED
20	22 (.35)	5.0	60	100
	20 (.50)	7.5	60	100
	18 (.80)	7.5	60	100
16	16 (1.0)	7.5	60	100
	20 (.50)	7.5	60	100
	18 (.80)	10	60	100
12	16 (1.0)	13	60	100
	14 (2.0)	13	60	100
	14 (2.0)	18	60	100
8	12 (3.0)	25	60	100
	10 (5.0)	25	N/A	100
	8 (8.60)	60	60	N/A
4	10 (5.60)	60	60	N/A
	6 (13.0)	100	60	N/A

## WIRE SEALING RANGE

CONTACT SIZE	RECOMMENDED WIRE INSULATION O.D.	
	N-SEAL	E-SEAL
#20	.053 - .120 (1.35 - 3.05)	N/A
#16	.088 - .145 (2.24 - 3.68)	.053 - .120 (1.35 - 3.05)
#12	.134 - .170 (3.40 - 4.32)	.097 - .158 (2.46 - 4.01)
#8	.190 - .240 (4.83 - 6.10)	N/A
#4	.280 - .292 (7.11 - 7.42)	N/A





## STAMPED AND FORMED

Deutsch Stamped and Formed contacts are designed for use where wire termination costs are of primary concern without sacrificing reliability of 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.

Deutsch socket tines are protected by a closed entry stainless steel sleeve, to 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 or Compound Arch 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

SIZE	STAMPED & FORMED CONTACT PART NUMBERS		CARRIER STRIP IDENTIFICATION	WIRE SIZE AWG (mm <sup>2</sup> )	WIRE INSULATION O.D. RANGE	RECOMMENDED STRIP LENGTH INCHES (mm)	MIN CONT. RETENTION LBS (N)	MAX RATED AMPS AT 125°C CONTINUOUS
	PIN	SOCKET						
20	1060-20-01**	1062-20-01**	20 - 01	16 - 22 (1.5 - 0.35)	.075 - .125 (1.91 - 3.15)	.150 - .200 (3.81 - 5.08)	20 (89)	7.5
20	1060-20-02**	1062-20-02**	20 - 02	16 - 22 (1.5 - 0.35)	.051 - .085 (1.30 - 2.16)	.150 - .200 (3.81 - 5.08)	20 (89)	7.5
20	N/A	1062-20-03**	20 - 03	16 - 22 (1.5 - 0.35)	.075 - .125 (1.91 - 3.15)	.150 - .200 (3.81 - 5.08)	20 (89)	7.5
20	1060-20-06**	1062-20-06**	20 - 06	14 - 16 (2.5 - 1.0)	.075 - .125 (1.91 - 3.15)	.150 - .200 (3.81 - 5.08)	20 (89)	7.5
16	1060-14-01**	1062-14-01**	14 - 16	14 - 18 (2.0 - .75)	.095 - .150 (2.41 - 3.81)	.150 - .200 (3.81 - 5.08)	25 (111)	13
16	1060-14-10**	1062-14-10**	14 - 16	14 - 16 (2.0 - .75)	.095 - .150 (2.41 - 3.81)	.150 - .200 (3.81 - 5.08)	25 (111)	13
16	1060-16-01**	1062-16-01**	16 - 18	14 - 18 (2.0 - .75)	.075 - .140 (1.91 - 3.55)	.150 - .200 (3.81 - 5.08)	25 (111)	13
16	1060-16-06**	1062-16-06**	0.5 - 1.0	16 - 20 (1.0 - 0.50)	.055 - .100 (1.40 - 2.54)	.150 - .200 (3.81 - 5.08)	25 (111)	13
16	1060-16-07**	1062-16-07**	0.75 - 2.0	14 - 18 (2.0 - .75)	.075 - .140 (1.91 - 3.55)	.150 - .200 (3.81 - 5.08)	25 (111)	13
16	1060-16-09**	1062-16-09**	16 - 18	14 - 18 (2.0 - .75)	.075 - .140 (1.91 - 3.55)	.150 - .200 (3.81 - 5.08)	25 (111)	13
16	1060-16-12**	1062-16-12**	1.0 - 2.5	12 - 16 (2.5 - 1.0)	.075 - .140 (1.91 - 3.55)	.175 - .225 (4.45 - 5.72)	25 (111)	13
16	N/A	1062-16-14**	14 - 16	12 - 16 (2.5 - 1.0)	.075 - .140 (1.91 - 3.55)	.175 - .225 (4.45 - 5.72)	25 (111)	13
12	1060-12-01**	1062-12-01**	12 - 14	12 - 14 (4.0 - 2.0)	.113 - .176 (2.87 - 4.47)	.225 - .275 (5.72 - 6.99)	30 (134)	25
12	1060-12-02**	1062-12-02**	10 - 12	10 - 12 (6.0 - 4.0)	.140 - .204 (3.56 - 5.18)	.225 - .275 (5.72 - 6.99)	30 (134)	25

\*\* = Plating Codes Consult factory for custom finish needs.

For 12 Size, see 0425-041-0000 and 0425-208-0000

For 16 Size, see 0425-039-0000, 0425-059-0000, and 0425-203-0000

For 20 Size, see 0425-059-0000 and 0425-207-0000



## CONTACTS AND APPLICATION DATA

### Solid Contacts

SIZE	SOLID CONTACT PART NUMBERS		WIRE SIZE AWG (mm <sup>2</sup> )	RECOMMENDED STRIP LENGTH INCHES (mm)	MIN CONTACT RETENTION LBS (N)	REF CRIMP TENSILE LBS (N)	MAX RATED AMPS AT 125°C CONTINUOUS	*
	PIN	SOCKET						
20	0460-202-20**	0462-201-20**	20 (0.50)	.156-.218 (3.96 - 5.54)	20 (89)	20 (89)	7.5	
20	0460-010-20**	0462-005-20**	16-18 (1.0 - 0.75)	.156-.218 (3.96 - 5.54)	20 (89)	20 (89)	7.5	
16	0460-202-16**	0462-201-16**	16-20 (1.0 - 0.50)	.250 - .312 (6.35 - 7.92)	25 (111)	35-20 (156-89)	13	
16	0460-215-16**	0462-209-16**	14 (2.0)	.250 - .312 (6.35 - 7.92)	25 (111)	70 (311)	13	
12	0460-204-12**	0462-203-12**	12-14 (3.0 - 2.0)	.222 - .284 (5.64 - 7.21)	30 (134)	75-70 (334 - 311)	25	
8	0460-204-08**	0462-203-08**	8-10 (8.0 - 5.0)	.430 - .492 (10.92 - 12.50)	35 (156)	125-90 (556-400)	60	
4	0460-204-04**	0462-203-04**	6 (13.0)	.430-.492 (10.92-12.50)	35 (156)	300 (1334)	100	

\* See Information Drawing 0425-205-0000. Consult factory for alternate finishes.

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

## SOLID CONTACTS

### Universal Hand Crimp tool

#### HDT - 48 - 00

For size 20, 16 & 12 contacts



- 1) Strip specified length of 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 indenters, 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 solid contacts

### **HDT - 04 - 08**

For size 4 & 8 contacts  
Field repair tool only. Not for  
production use.



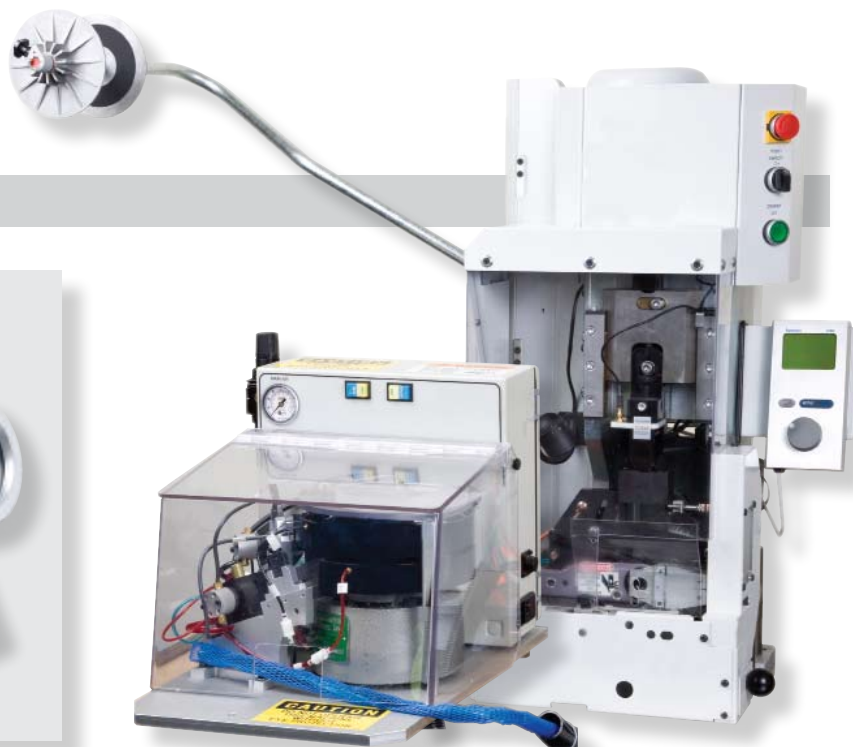
## Production Crimp Tools



### **Power Crimp Equipment**

#### **HDP - 400**

For size 4, 8, 12, 16 & 20 solid 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

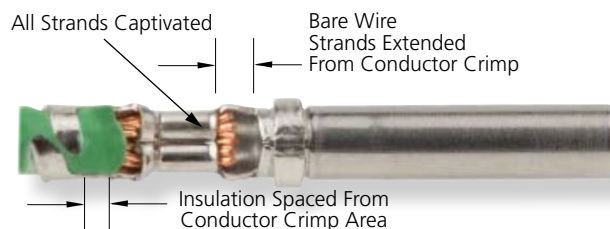


## CRIMPING

### WIRE STRIPPING



## CRIMP INSPECTION



For crimp configuration refer to drawing 0425-2\*\*-0000

## HAND CRIMP TOOLING



### HAND TOOL

Field Maintenance

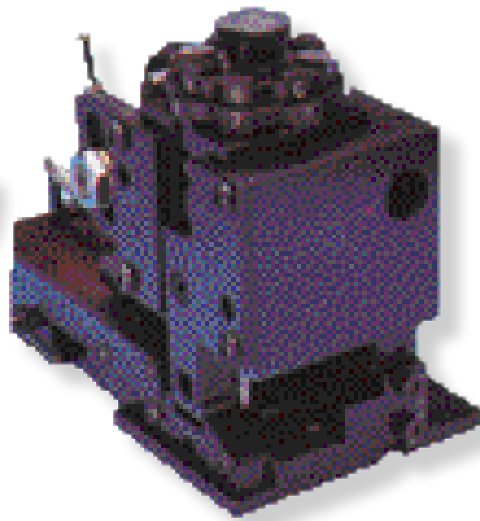
Ratched design for full cycle crimp reliability

DTT - 12 - 00  
DTT - 12 - 01  
DTT - 16 - 00  
DTT - 16 - 01  
DTT - 16 - 02  
DTT - 20 - 00  
DTT - 20 - 02  
DTT - 20 - 03

\*See information drawing for proper tool.

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

## APPLICATION DIES



### FITS ALL STANDARD PRESSES

DCT12 - 02 - 00  
DCT12 - 02 - 01  
DCT16 - 02 - 00  
DCT16 - 02 - 01  
DCT1620 - 02 - 00  
DCT20 - 02 - 00

Consult factory for further application information.



## Hand Crimping Instructions for Stamped Contacts



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. Insert the prestripped wire into the crimp area of the contact and completely cycle the tool.



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



6. The result will be a perfect termination.
7. 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

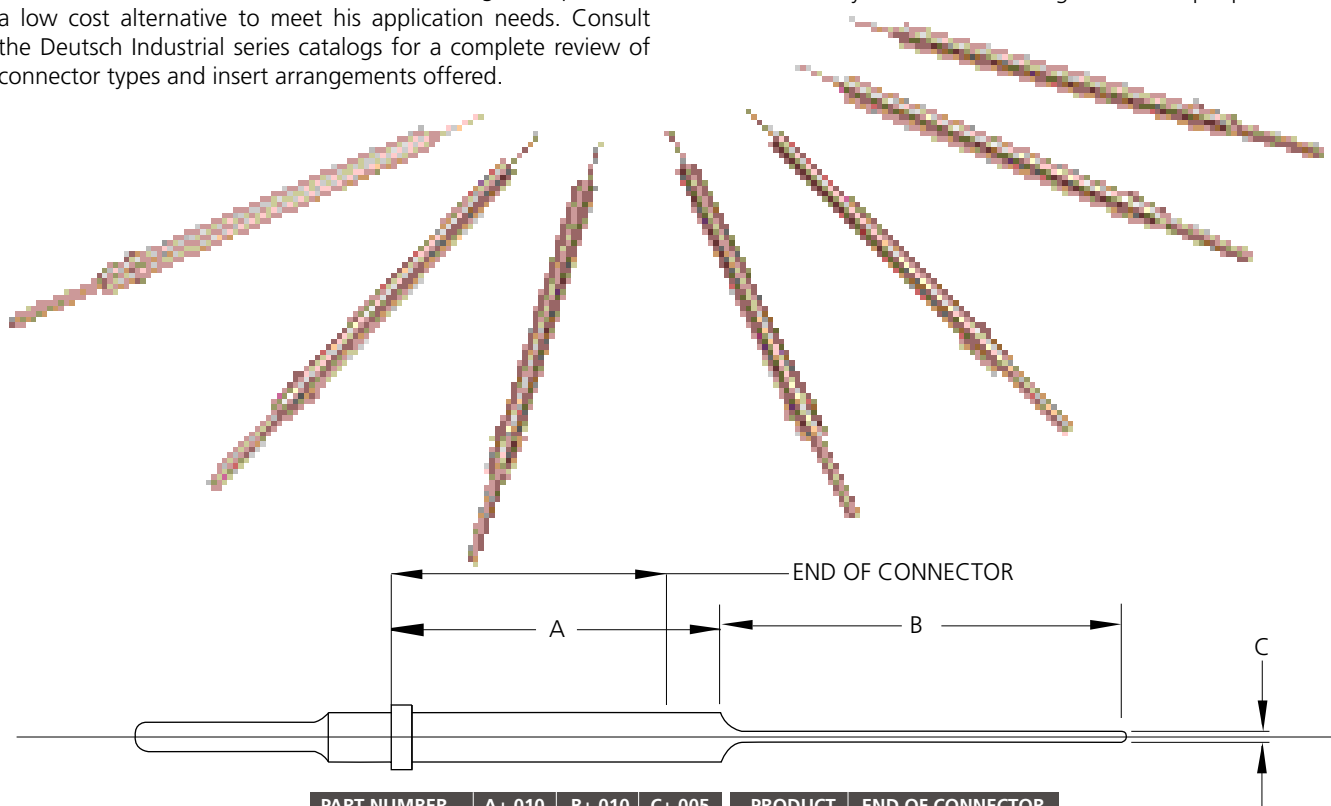
### Plating

90: Tin

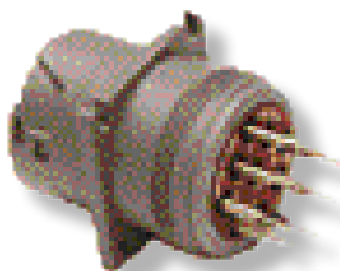
31: Gold

### P.C.B. Mounting

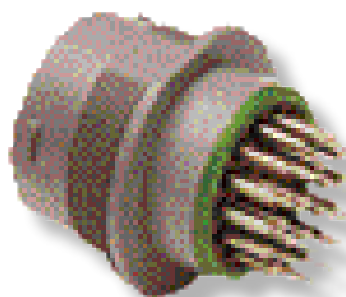
Consult factory for P.C.B. mounting details and pin positions.



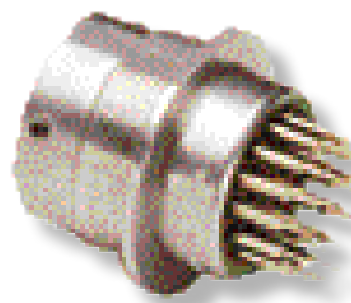
PART NUMBER	A+.010	B+.010	C+.005	PRODUCT	END OF CONNECTOR
0460-208-16**	1.300	.248	.025	HD30	.939
0460-229-16**	.545	.248	.025	HD10	.925
0460-238-12**	.714	.549	.043	DT	.777
0460-241-16**	1.305	.160	.040	DT04-2P	.677
0460-245-16**	.976	.400	.041	DT04-3P	.677
0460-245-12**	1.024	.500	.041	DRC	1.063
0460-257-16**	.793	.248	.025		
0460-208-12**	1.305	.248	.025		
0460-263-16**	1.305	.248	.093		



11 HD10 Series



HDP20 Series



HD30 Series



## Contact Glossary

**AWG American Wire Gauge** - Reference National Bureau of Standards Copper Wire Table (Handbook 100) AVS.

**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, 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 fit 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 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 arraigned 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.

**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.

**mm2 "millimeters squared"** - European Wire Size Standards (ref. DIN 72551-6 and ISO 6722-3).

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

**Nest** - The portion of a crimping die which supports 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, and prevent rusting or corrosion.

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

**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.





# Common Contact System Technical Manual

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

**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.

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

**Strand** - A single uninsulated wire.

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

**Swedging** - A term for crimping.

**Taper Pin** - A pin-type terminal having a tapered end designed to be impacted into a 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 in order to establish electrical connection.

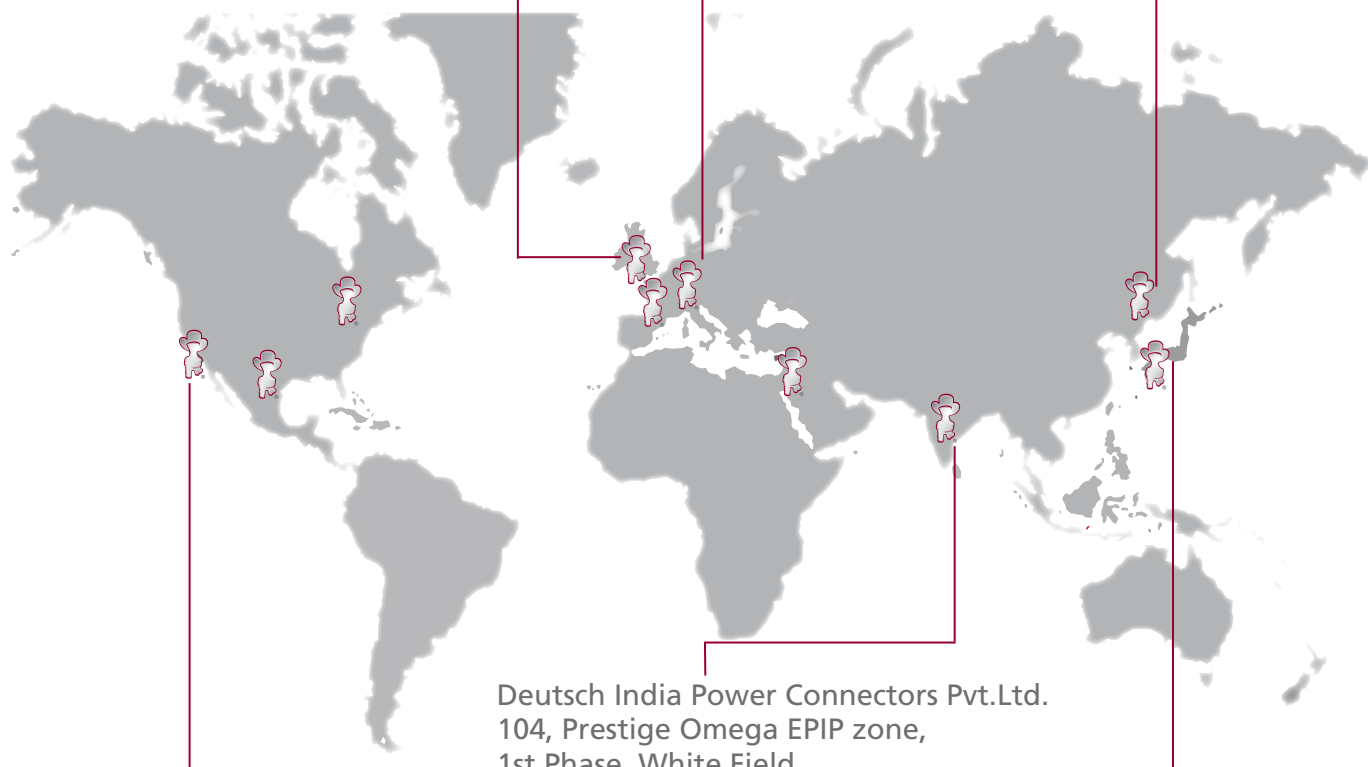
**Wiping Action** - (See Contact Wipe.) Action of two electrical contacts which come in contact by sliding against each other.



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