HD30 & HDP20 Series - Heavy Duty Field - Proven Interconnection Systems

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Deutsch HD30 Series

A heavy duty, environmentally sealed, multi-pin circular connector, featuring quick connect-disconnect bayonet coupling, single hole bulkhead mounting, silicone seals, with a rear insertion/rear removal contact system.

The Deutsch HD30 Series connector was developed to meet the needs of the heavy duty equipment and transportation industries for rugged, multi-pin, sealed connector systems.

Deutsch HDP20 Series

 Designed specifically for the truck, bus and off-highway industry, the HDP20 Series is a heavy duty rated, environmentally sealed, composite shell, multi-pin connector. The plug features a quick connect-disconnect bayonet style coupling and the receptacle is designed for single hole mounting. Thus reducing assembly line time and installation costs.

Electrical Connectors:

Critical to System Reliability and Maintainability

Recent studies indicate that electrical system failures are a common and constant source of equipment malfunction. A major area of electrical system failure is in electrical interconnections. Typical problems include loose and miswired terminals, corrosion, and contamination of terminals. Coupled with these problems, the impact of sophisticated safety devices, automated check-out systems, and other increased use of electronics, call for a re-examination of traditional termination techniques. To the operator, termination failures mean excessive down time and maintenance costs. This adds up to slipped production schedules, cost over-runs and user problems. The end result: decreased profits and a loss of share of the market. In today’s competitive arena, improved electrical connectors can make the difference between a growing, profitable operation or a losing one.

The HD/HDP Series

Decreases Costs and UP-Grades Performance

The Deutsch HD/HDP Series was developed to provide a solution to today’s system problems found in the heavy duty trucking, equipment and transportation industries. The HD/HDP is a cylindrical, multi-pin, sealed device utilizing crimp type contacts that are quickly and easily inserted or removed. Use of the HD/HDP Series eliminates several other common connector problems.

Problems associated with assembly and network time, operational breakdowns requiring costly repairs and lengthy out of service time in the field have all been reduced and/or eliminated by the judicious application of the HD/HDP Series.

Deutsch HD/HDP Series provide the widest selection of interconnections for critical circuits requiring heavy-duty environmental terminations. Together, the HD and HDP offer common layouts, common tooling, the same adaptability to backshells and both meet the performance standards for heavy duty applications. So whether you are looking for rugged HD metal shells or cost effective HDP plastic shells, Deutsch offers the best product for your applications while holding the line on hidden inventory and assembly costs.

Some of the benefits of the Deutsch HD/HDP Series include:

- Quick, fool-proof assembly, decreasing time on the assembly line and eliminating miswiring.
- Simple and easy to rework, decreasing down time and increasing profits to the operator.
- Sealed against moisture and contaminants, eliminating open-wiring system.
- Operation under severe shock and vibration, reducing break down and out of commission loss due to rugged operating conditions.
- Human factors engineered to assure that assembly and rework can be reliably handled by unskilled personnel.

Sealed Against Moisture and Contaminants

Unlike terminal strips, binding posts and other open-wiring systems, the Deutsch HD/HDP Series is a completely sealed unit. The rear of the connector features an integral grommet wire seal that automatically seals each contact as it is locked into place during installation. There is no extra hardware to fasten or tighten or potting operation to achieve this seal.

Fabricated from tear resistant, high temperature silicone, this rear grommet protects the contact from moisture, sand, dust, lubricating oils, road salt, hydraulic fluid, grease, mud and other contaminants encountered in heavy duty use. The elimination of open-wiring systems does away with such common hazards as shorts due to metallic objects across the terminals. This is especially important during loading or refueling operation when a spark could cause a serious explosion. Closed wiring also protects maintenance personnel against accidental shock, yet can be easily checked for circuit continuity.

Contact Retention Decreases Installation Costs and Increases Reliability

The HD/HDP Series uses crimp type, solid copper alloy contacts for damage proof performance and stamped & formed copper alloy contacts for cost effectiveness. Each style has the ability to carry continuous high operating current loads without overheating. The contacts or terminals are crimp terminated using automatic tooling for production and inexpensive readily available hand tools for field maintenance. After crimping, these contacts are easily installed by simply pushing the contact into place by hand. Contacts are positively secured by use of “fingers” in the connector which lock behind the shoulder of the contact, preventing accidental dislodging. Although securely locked in place, these contacts can be quickly and easily removed by the use of an inexpensive, non-conductive removal tool.

Deutsch plastic shell HDP20 Series provide cost effectiveness with heavy duty terminations for the truck, bus and off-highway industries. Other features include: silicone wire and interfacial seals, visual indication of lock and mated position. Corrosion proof plastic shells and use of low cost stamped and formed contacts provides a cost effective solution for your application.

The HDP20 uses a bayonet coupling system to provide a vibration resistant locking mechanism. This shell provides a multiple keying system that positively prevents mismating and makes plug and receptacle coupling quick and easy. Receptacles mount with a single hole using a “flat” to prevent the connector from rotating.

Rugged Metal Shell HD30 Series Withstands Years of Abuse

Deutsch HD30 Series features a lightweight, yet compact and rugged metal shell to protect contacts and sealing grommets. This shell provides a multiple keying system that positively prevents mismating and makes plug and receptacle coupling quick and easy.

The HD30 Series uses a bayonet coupling system that provides a positive vibration resistant locking mechanism with visual indication of proper mate and lock. This quick disconnect system requires only a quarter turn to operate.

Easy installation to structure is provided by a single one-hole mounting system using a “flat” to prevent the connector from rotating during assembly or service.
HD/HPD Series Connector Features

Deutsch HDHP Series environmental connectors offer the advantages of decreased costs and upgraded performance. Designed to withstand years of abuse, the Deutsch HDHP Series is setting the pace in the Heavy Equipment Industry. Key features common to the HD/HPD Series are itemized below.

I. Contacts
A. Solid copper alloy construction withstands continuous current overload without degradation.
Cost effective stamped and formed contacts provide high reliability and low cost.
B. Range of contact and acceptable wire sizes
1. Size #4 AWG 6 (13.0 mm²)
2. Size #8 AWG 8 & 10 (8.0 – 5.0 mm²)
3. Size #12 AWG 12 & 14 (4.0 – 2.0 mm²)
4. Size #16 AWG 14 & 20 (0.5 – 2.0 mm²)
5. Size #20 AWG 16 & 22 (0.25 – 1.5 mm²)
C. Closed entry socket contact design assures positive conductivity and eliminates probe damage.
D. Simplified pin contact design limits possibility of bending.

II. Inserts
A. The hard plastic insert and closed contact interface capivate the contacts to prevent “float” and “spray”.
B. Positive contact retention is provided through the use of plastic locking fingers which snap closed behind the shoulder of the contact.
C. Interfaces
1. Lead-ins on socket interface properly align bent pins.
2. Hard plastic prevents pins from penetrating dielectric material.
D. Available in several insert arrangements.*
1. In shell size 18 (HD30 or HPD20).
2. Fourteen in shell size 24 (HD30 or HPD20).
* See Page 9

II. Shell
A. Rugged, all metal shell to withstand years of abuse (HD30) Corrosion resistant all plastic shell (HPD20) has same features (item C).
B. Positive shell keying prevents mismating.
C. Simple, one quarter turn coupling.
1. Free rotating, captivated coupling ring for fast assembly.
2. Coupling ring designed to insure proper environmental sealing with minimum mating forces.
3. Audio and visual indications of positive locked condition.
D. Available in a straight plug and single hole mounting receptacle for easy installation to structure.

III. Sealing Plugs
A. Standard crimp tool or semi-automated, high-speed crimping tool is available.
1. Fast, reliable, uniform results.
2. Simplified procedures mean that only average skill is required for assembly.
3. No soldering heat means:
   a. No chance of heat damage to parts.
   b. No risk of contribution to vibration failure.
B. Inexpensive plastic removal tool designed to eliminate hidden internal insert damage.
1. Removal tool designed to break rather than injure connector.
2. Dielectric tool construction prevents shocks to personnel.

Technical Specifications

<table>
<thead>
<tr>
<th>Material Specifications</th>
<th>HD30 Plug</th>
<th>HD30 Receptacle</th>
<th>HD30 Plug</th>
<th>HD30 Receptacle</th>
<th>HD/HPD Mounting Hardware</th>
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<tbody>
<tr>
<td>HD30 Plug</td>
<td>Shell: Aluminum</td>
<td>Coupling Ring: Aluminum</td>
<td>Insert Retainer: Thermoplastic</td>
<td>Grommet: Silicone rubber</td>
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<td>HD30 Receptacle</td>
<td>Shell: Aluminum</td>
<td>Insert Retainer: Thermoplastic</td>
<td>Grommet: Silicone rubber</td>
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<td>HD/HPD Mounting Hardware</td>
<td>Panel Nut: Aluminum, Plastic</td>
<td>Lockwasher: Spring Steel - Tin over Nickle</td>
<td>Solid Contacts</td>
<td>Stamped &amp; Formed Contact</td>
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<td>Fin: Copper Alloy</td>
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<td>Socket: Copper Alloy</td>
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<td>Finish: Nickel plating</td>
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<td>Optional: Gold plating is available for dry circuit applications</td>
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</table>

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 loss than 2 milliamperes at 1500 VAC.

Crimp Tensile Strength: (Solid & Stamped)
#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 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

Insulation Resistance
1000 megohms min. at 25°C.
II Inserts

HD/HDP Series Connector Features

C. Interfaces

A. The hard plastic insert and closed contact interface

D. Simplified pin contact design limits possibility of

C. Closed entry socket contact design assures positive

B. Range of contact and acceptable wire sizes

4. Size #16 AWG 14 & 20 (0.5 – 2.0 mm

3. Size #12 AWG 12 & 14 (4.0 – 2.0 mm

2. Size #8 AWG 8 & 10 (8.0 – 5.0 mm

Cost effective stamped and formed contacts provide current overload without degradation.

shoulder of the contact.

material.


IV. Application Tooling

B. Positive shell keying prevents mismating.

A. Rugged, all metal shell to withstand years of abuse

E. Redundant wire seals prevent contamination from

1. Fast, reliable, uniform results.

2. Simplified procedures mean that only average skill

2. Coupling ring designed to insure proper

has same features (item C).

(HD30) Corrosion resistant all plastic shell (HDP20)

3. Audio and visual indications of positive locked

connector.

Continuous at rated current

Performance Specifications

Thermoplastic: Size 20 thru 8

Sealing Plugs

available for dry circuit applications

Optional: Gold plating is

Pin: Copper Alloy

Solid Contacts

Panel Nut: Aluminum, Plastic

Grommet - Silicone rubber

Shell: Aluminum

Grommet - Silicone rubber

Coupling Ring: Aluminum

Shell: Thermoplastic

Coupling Ring: Thermoplastic

HD30 & HDP20 Series

Designates Deutsch Heavy Duty Plastic Connector

2 = Standard Commercial - Bulk packed without contacts or accessories

4 = Receptacle - Jam nut type mounting

6 = Plug

(Consult factory for options and special modifications available.)

Deutsch HD30 Series contacts, sealing plugs and tooling are

additional options and special modifications available.
**CAUTION:** Undersize wire insulation is a major cause for leakage. Shrink tubing SHOULD NOT BE USED.

**Connector Identification**

- **COLOR CODED RING**
  - Green: Normal Seal
  - Grey: Thin Wall Seal
  - Blue: Extra Thin Seal
  - Color code is visible from the rear of the receptacle or plug.

**MATING SLOT POSITIONS**

- **COLOR CODED RING**
  - Green: Normal Seal
  - Grey: Thin Wall Seal
  - Blue: Extra Thin Seal
  - Color code is visible from the rear of the receptacle or plug.

**CONTACT SIZE**

- **N-SEAL**
  - Green Ring: 0.02-0.241
  - Grey Ring: 0.02-0.241
  - Blue Ring: 0.02-0.241

- **T-SEAL**
  - Green Ring: 0.02-0.241
  - Grey Ring: 0.02-0.241
  - Blue Ring: 0.02-0.241

- **E-SEAL**
  - Green Ring: 0.02-0.241
  - Grey Ring: 0.02-0.241
  - Blue Ring: 0.02-0.241

- **SEAL TYPE**
- A: Normal Seal
- E: Extra Thin Seal

**MATING / UNMATING INSTRUCTIONS**

- **CONTACT REMOVAL**
  - With rear insert toward you, snap crimp barrel.
  - For unused wire cavities, insert sealing plug.

- **CONTACT INSERTION**
  - With rear grommet cavity until it engages contact and sealing.
  - Pull contact-wire assembly out of connector.

**Series Plug**

- **SHELL SIZE**
  - 18: 1.692 (42.98)
  - 24: 1.942 (49.33)

- **A MAX DIAM**
  - 18: 1.220 (30.99 ±0.25)
  - 24: 1.470 (37.34 ±0.25)

**Series Receptacle**

- **SHELL SIZE**
  - 18: 0.970 (24.61 ±0.25)
  - 24: 1.079 (27.36 ±0.25)

- **A MAX DIAM**
  - 18: 0.970 (24.61 ±0.25)
  - 24: 1.079 (27.36 ±0.25)

**Panel Nut**

- **SHELL SIZE**
  - 18: 1.220 (30.99)"
  - 24: 1.470 (37.34)"

- **A + .030**
  - 18: 1.685 (42.80 ±0.06)
  - 24: 1.875 (47.63 ±0.06)

- **B THREAD**
  - 1-1/2 - 18 UNEF-2B
  - 1-1/4 - 18 UNEF-2B

**Panel Lockwasher**

- **SHELL SIZE**
  - 18: 0.970 (24.61 ±0.25)
  - 24: 1.079 (27.36 ±0.25)

- **A MAX DIAM**
  - 18: 0.970 (24.61 ±0.25)
  - 24: 1.079 (27.36 ±0.25)

- **C REF**
  - 114021* 18-20 SHELL SIZE (24.4-31.6 N.M.)
  - 24-20 SHELL SIZE (29.4-31.6 N.M.)

Receptacle Mounting

Mating / Unmating Instructions

To mate the plug and the receptacle, line up the index groove on the plug with the flat surface on the receptacle, turn 1/4 turn clockwise. You will feel and hear the pieces snap into the locked position. To unmate the plug and receptacle, reverse the above procedure.

CAUTION: When mating or unmating plug and receptacle, disassemble by hand. DO NOT use pliers or any other tool.

Contact Insertion

1. Grasp contact approximately (25.4 mm) one inch behind the contact crimp barrel.

   NOTE: For unused wire cavities, insert sealing plugs for full environmental sealing.

Contact Removal

1. With rear insert toward you, snap appropriate size extractor tool over the wire of contact to be removed.

   NOTE: Do not twist or insert tool at an angle.

Removal Tools

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<tr>
<th>PART NO.</th>
<th>SIZE</th>
<th>WIRE RANGE AWG</th>
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Sealing Plugs

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**NORMAL WIRE SEALS (N)**

**EXTRA THIN WALL WIRE SEALS (E)**

**THIN WALL WIRE SEALS (T)**

**SEALING PLUG**

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## HD30 & HDP20 Series Technical Manual

### CONTACTS AND APPLICATION DATA

#### Solid Contacts

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<tr>
<th>SIZE</th>
<th>SOLID CONTACT AND APPLICATION DATA</th>
<th>WIRE SIZE AWG (mm²)</th>
<th>RECOMMENDED STRIP LENGTH INCHES (mm)</th>
<th>MIN CONTACT RETENTION (lbs)</th>
<th>REF CRIMP TENSION (lbs)</th>
<th>MAX RATED AMPS AT 125°C CONTINUOUS</th>
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* See Envelope Print 0425-205-0000. Consult factory for alternate finishes.

#### Stamped and Formed Contacts

<table>
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<tr>
<th>STAMPED &amp; FORMED CONTACT PART NUMBERS</th>
<th>CARRIER STRIP IDENTIFICATION</th>
<th>WIRE SIZE AWG (mm²)</th>
<th>WIRE INSULATION O.D. (mm)</th>
<th>RECOMMENDED STRIP LENGTH INCHES (mm)</th>
<th>MIN CONT. RETENTION (lbs)</th>
<th>REF CRIMP TENSION (lbs)</th>
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<td>12</td>
<td>1060-12-02**</td>
<td>10-12</td>
<td>6.00 - 10.00</td>
<td>215 - 275 (5.42 - 6.99)</td>
<td>25 (111)</td>
<td>25 (111)</td>
<td>13</td>
</tr>
</tbody>
</table>

** For proper dies and stamped & formed crimp dimensions - See Envelope 0425-208-0000. Consult factory for alternate finishes.

### HD30 & HDP20 Series Technical Manual

#### HD/HDP ACCESSORIES

**HDP2**-24-****-L015
Available in plug and receptacles
Connecting hardware available through distribution

**HDP2**-18-****-L017
Available in plug and receptacles

#### Cable Clamp

*Metal Shells Only

- 022 ADAPTOR ONLY
- 059 WITH DRAIN HOLES
- L006 WITHOUT DRAIN HOLES

#### HDB - HD30 Series Only Breakaway Plug

Designed to interconnect with the HD30 Series receptacles and provide an emergency disconnect between farm tractors and implements requiring power connections.

HDB - Breakaway Plugs can be specified with pin or socket contacts and cable clamps (059 mod). Minimum force required to emergency disconnect is 50 lbs. Maximum force required is 100 lbs. Mute with HD30 Series Only.

#### Protective Caps

Receptacle cap for plug protection (Aluminum)

#### Protective Caps

Plug cap for receptacle protection (Aluminum)

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**For proper dies and stamped & formed crimp dimensions - See Envelope 0425-208-0000. Consult factory for alternate finishes.**