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 insert/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.


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HD/HDP Series - Heavy Duty Field - Proven Interconnection Systems

- Truck Applications
- Bus Applications
- Farm Equipment
- Construction Equipment

Critical to System Reliability and Maintainability

Problems associated with assembly and network time, wiring system failures, and 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 line time and installation costs.

Electrical connectors can make the difference between a growing, profitable operation or a losing one. Electrical interconnections are a common and constant source of equipment malfunction. Interconnections for critical circuits requiring heavy-duty operation and a resistant to weather and environment are necessary.

HD30 Series features a lightweight, yet compact and vibration resistant locking mechanism. This shell provides interfacial seals, visual indication of lock and mated position. The plug is equipped with a rear insert/rear removal contact system, and the receptacle is equipped with a single hole bulkhead mounting system using a “flat” to prevent the connector from rotating.

Deutsch plastic shell HDP20 Series provide cost effectiveness and durability that will increase profits to the operator.

The need for tight sealing, high reliability, and prevention of contamination and corrosion are becoming more critical in today’s environments. Deutsch HD/HDP Series connectors feature composite shells with integral interfacial seals, visual indication of lock and mated position. These connectors are designed for use in the most severe environments such as those found in the heavy duty equipment and transportation industries.

Deutsch HD/HDP Series include:

- 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 insert/rear removal contact system.
- HDP Series: A cylindrical, multi-pin, sealed device utilizing crimp type contacts that are quickly and easily inserted or removed.

Deutsch HD/HDP Series offer:

- Sealed against moisture and contaminants, eliminating open-wiring systems.
- Contact retention decreases installation costs and operational breakdowns requiring costly repairs and lengthy down and out of commission loss due to rugged operating conditions.
- Elimination of open-wiring systems does away with such common hazards as short circuits due to metallic objects or electrical shock.
- Closed wiring also protects maintenance loading or refueling operation when a spark could cause a serious explosion.

The HD/HDP Series offer four features:

1. Abuse
2. Sealing
3. Insertion
4. Removal
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 production. The 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.
- Performance over a wide temperature range (-55°C to +125°C) maintaining continuous operation in all environments, from arctic to desert conditions.
- Human factors engineered to assure that assembly and rework can be reliably handled by unskilled personnel.

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.

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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. Five in shell size 18 (HD30 or HDP20).
   2. Fourteen in shell size 24 (HD30 or HDP20).
*See Page 9

III. Shell
A. Rugged, all metal shell to withstand years of abuse (HD30) corrosion resistant all plastic shell (HDP20) 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 forces.
D. Available in a straight plug and single hole mounting receptacle for easy installation to structure.

IV. Application Tooling
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 wicking to contribute to vibration failure.
B. Inexpensive plastic removal tool designed to eliminate hidden internal insert damage.
C. Removal tool designed to break rather than injure connector.
D. Dielectric tool construction prevents shocks to personnel.

Crimp Tensile Strength: (Solid & Stamped)
#20 100 amps
#16 25 amps
#12 25 amps
#8 60 amps
#4 100 amps

Insulation Resistance
1000 megohms min. at 25° C.

Weather Resistance
No evidence of corrosion after 200 cycles of engagement or disengagement.
No electrical discontinuities longer than 1 microsecond.

Performance Specifications
Continuous at rated current

E. Redundant wire seal prevent contamination from entering rear of connector.
F. Sealing plug to fill unused cavities to keep environmental sealing characteristics intact.

III. Shell
A. Solid copper alloy construction withstands continuous current overload without degradation.
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 (0.5 – 1.5 mm²)
   6. Size #28 AWG 24 & 32 (0.0 – 0.5 mm²)
C. Closed entry socket contact design assures positive conductivity and eliminates probe damage.
D. Simplified pin contact design limits possibility of bending.
The HD/HDP Series is setting the pace in the Heavy Equipment Industry. Key advantages of decreased costs and upgraded performance.

**HD30 & HDP20 Series**

**C. Interfaces**

A. The hard plastic insert and closed contact interface withstands continuous bending. Current overload without degradation.

2. Five in shell size 18 (HD30 or HDP20).

3. No soldering heat means:
   - Fast, reliable, uniform results.
   - No electrical discontinuities longer than 1 microsecond.
   - No unlocking unmating or other unsatisfactory result during entering from rear of connector.

**III. Shell**

B. Inexpensive plastic removal tool designed to eliminate hidden internal insert damage.

C. Simple, one quarter turn coupling.

**IV. Application Tooling**

- Rugged, all metal shell to withstand years of abuse.
- Elevation 2 size 4, 4 size 16**
- Arrangement: Gold plating is available for dry circuit applications.
- Finish: Nickel plating

**Technical Specifications**

**Contact Current Rating @ 125 degrees C**

<table>
<thead>
<tr>
<th>Size</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>#8</td>
<td>60 amps</td>
</tr>
<tr>
<td>#12</td>
<td>25 amps</td>
</tr>
<tr>
<td>#16</td>
<td>13 amps</td>
</tr>
<tr>
<td>#20</td>
<td>7.5 amps</td>
</tr>
</tbody>
</table>

**Material Specifications**

- Insert Retainer: Thermoplastic
- Shell: Aluminum
- Elastomer: Size 4
- Thermoplastic: Size 20 thru 8

**HD30 Receptacle**

- **PART NUMBERING SYSTEM**
  - HD 36 - 24-21 SN - XXX
  - Designates Deutsch Heavy Duty Cylindrical Connector
  - B = Breakaway plug option
  - 3 = Standard Commercial - Bulk packed without contacts or accessories
  - 6 = Plug
  - Special Modifications:
    - 029 = Cable clamp/adapter
    - Wire Seal Options: N = Normal position and wire seals (Green Ring), T = Thin wall wire seals option (Grey Ring), E = Extra thin wall seal (Blue Ring)
  - Contact Style:
    - P = Pin (Male) type
    - S = Socket (Female) type
  - Shell size and insert layout

**HDP 26 - 24-21 SN - XXXX**

- Designates Deutsch Heavy Duty Plastic Connector
- 2 = Standard Commercial - Bulk packed without contacts or accessories
- 6 = Plug
- Special Modifications:
  - 015 Threaded Adapter
  - 017 Backshell Adapter
  - N = Normal position and wire seals (Green Ring), T = Thin wall wire seals option (Grey Ring), E = Extra thin wall seal (Blue Ring)
  - Contact Style:
    - P = Pin (Male) type
    - S = Socket (Female) type
  - Shell size and insert layout

Deutsch HD30 Series contacts, sealing plugs and tooling are specified for use in the HDP20 Series. Consult factory for additional options and special modifications available.

**HD30 & HDP20 Series Insert Arrangements**

All insert arrangements show socket rear insert:

**HD30 & HDP20 Series Technical Manual**

**HD30 & HDP20 Series Insert Arrangements**

18-6* 18-8 18-14 18-20 18-21

- 2 size 4, 4 size 16**
- 8 size 12
- 14 size 16
- 2 size 16 & 18 size 20
- 21 size 20 N

24-9* 24-14 24-16 24-18

- 1 size 4, 2 size 8 & 6 size 12**
- 1 size 8, 3 size 12 & 14 size 16
- 16 size 12 N, E

24-19 24-21 24-23 24-29 24-31

- 6 size 12 & 13 size 16 N, E
- 4 size 12 & 17 size 16 N, E
- 23 size 16 T, E
- 4 size 12, 19 size 16 & 6 size 20 E
- 31 size 16 T, E

24-33 24-34 24-35 24-47 24-91

- 33 size 20 N
- 12 size 12 & 22 size 20 N
- 3 size 16 & 42 size 20 N
- 5 size 16 & 42 size 20 N
- 2 size 8, 2 size 12 & 5 size 16 N, E

* Arrangement
** Description
*** Rear Seal
### Connector Identification

**COLOR CODED RING**

Color code is visible from the rear of the receptacle or plug.

- **Green**: Normal Seal
- **Grey**: Thin Wall Seal
- **Blue**: Extra Thin Seal

**MATING SLOT POSITIONS**

CAUTION: Undersize wire insulation is a major cause for leakage. Shrink tubing SHOULD NOT BE USED.

### Usable Wire Size

<table>
<thead>
<tr>
<th>Arrangement</th>
<th>N</th>
<th>T</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-6</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>18-8</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>18-14</td>
<td>√</td>
<td>√</td>
<td>√</td>
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<tr>
<td>18-20</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>18-21</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-9</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-14</td>
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<td>24-18</td>
<td>√</td>
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</tr>
<tr>
<td>24-19</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-21</td>
<td>√</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24-23</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>24-29</td>
<td>√</td>
<td></td>
<td>*2</td>
</tr>
<tr>
<td>24-31</td>
<td>√</td>
<td>*1</td>
<td>*2</td>
</tr>
<tr>
<td>24-34</td>
<td>√</td>
<td></td>
<td></td>
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<td>24-35</td>
<td>√</td>
<td></td>
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</tr>
<tr>
<td>24-47</td>
<td>√</td>
<td></td>
<td>*2</td>
</tr>
<tr>
<td>24-91</td>
<td>√</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Recommended Wire Insulation O.D. for:

<table>
<thead>
<tr>
<th>Contact Size</th>
<th>N-SEAL</th>
<th>T-SEAL</th>
<th>E-SEAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>(1.02-2.41)</td>
<td>(1.02-2.41)</td>
<td>(1.02-2.41)</td>
</tr>
<tr>
<td>16</td>
<td>(2.54-3.40)</td>
<td>(2.23-3.40)</td>
<td>(1.35-3.35)</td>
</tr>
<tr>
<td>12</td>
<td>(3.40-4.32)</td>
<td>(2.87-4.32)</td>
<td>(2.46-6.01)</td>
</tr>
<tr>
<td>8</td>
<td>(4.83-6.10)</td>
<td>(4.32-6.10)</td>
<td>(3.45-5.93)</td>
</tr>
<tr>
<td>4</td>
<td>(7.11-7.42)</td>
<td>(6.63-7.42)</td>
<td>(6.53-7.42)</td>
</tr>
</tbody>
</table>

*1 Modified “T” Seal. See envelope print
*2 Modified “E” Seal. See envelope print

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**Seal Type**

- **Connector Identification**
- **Color Code Ring**
- **Mating Slot Positions**

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**Contact Insertion**

1. Grasp contact approximately (25.4 ± 0.63) mm from end of contact.
2. Push contact straight into connector using a crimp barrel.
3. A slight tug will confirm that it is properly locked in place.
4. Grommet until a positive stop is felt.

**Removal Tools**

- **Sealing Plug**
- **Panel Nut**
- **Panel Lockwasher**

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**Technical Information**

- **HD30 & HDP20 Series**
- **Technical Manual**

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**CAUTION:** Undersize wire insulation is a major cause for leakage. Shrink tubing SHOULD NOT BE USED.

---

**Panel Nut**

<table>
<thead>
<tr>
<th>Shell Size</th>
<th>A Diameter</th>
<th>B Diameter ± 0.10</th>
<th>Part Number</th>
<th>Shell Size</th>
<th>Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1.98</td>
<td>1.70 ± 2.50</td>
<td>114020-90**</td>
<td>18-1.5/1.8</td>
<td>2-80</td>
</tr>
<tr>
<td>24</td>
<td>1.47</td>
<td>1.20 ± 2.50</td>
<td>112263-90**</td>
<td>24-1.5/1.8</td>
<td>2-80</td>
</tr>
</tbody>
</table>

**Panel Lockwasher**

<table>
<thead>
<tr>
<th>Shell Size</th>
<th>A Diameter</th>
<th>B Diameter</th>
<th>C Diameter</th>
<th>F Thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1.52</td>
<td>1.76 ± 2.50</td>
<td>1.65 ± 2.50</td>
<td>1-1/2/18</td>
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<tr>
<td>24</td>
<td>1.70</td>
<td>2.00 ± 2.50</td>
<td>1.85 ± 2.50</td>
<td>1-1/2/18</td>
</tr>
</tbody>
</table>

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**Receptacle Mounting**

![Diagram of 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.

**Contact Insertion**

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

2. Hold connector with rear grommet facing you.

3. Push contact straight into connector grommet until a positive stop is felt. A slight tug will confirm that it is properly locked in place.

**Contact Removal**

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

2. Slide tool along into the insert connector.

3. Pull contact-wire assembly out of contact.

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

**Sealing Tools**

- **Normal Wire Seals (N)**
- **Extra Thin Wall Wire Seals (E)**
- **Thin Wall Wire Seals (T)**

**Sealing Plugs**

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

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**HD30 & HDP20 Series Technical Manual**

**ASSEMBLY INSTRUCTIONS**

**CONTACT INSERTION**

**CONTACT REMOVAL**

**UNLOCKING FINGERS**

**CONTACT**

**TOOL INSERTED TO UNLOCK CONTACT**

**TOOL AND CONTACT REMOVED**

**UNLOCKED POSITION**

**CONTACT LOCKED IN POSITION**

**NORMAL WIRE SEALS (N)**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>SIZE</th>
<th>WIRE RANGE AWG</th>
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</thead>
<tbody>
<tr>
<td>0411-240-2005</td>
<td>20</td>
<td>20-22</td>
</tr>
<tr>
<td>0411-204-1605</td>
<td>16</td>
<td>14-20</td>
</tr>
<tr>
<td>114010</td>
<td>12</td>
<td>12-14</td>
</tr>
<tr>
<td>114008</td>
<td>8</td>
<td>8-10</td>
</tr>
<tr>
<td>114009</td>
<td>4</td>
<td>6</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>SIZE</th>
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<tbody>
<tr>
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<td>20-22</td>
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<tr>
<td>0411-338-1605</td>
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<td>14-20</td>
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<tr>
<td>0411-337-1205</td>
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<td>0411-353-0805</td>
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<td>8-10</td>
</tr>
<tr>
<td>114009</td>
<td>4</td>
<td>6</td>
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</table>

**THIN WALL WIRE SEALS (T)**

<table>
<thead>
<tr>
<th>PART NO.</th>
<th>SIZE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0411-310-1605</td>
<td>16</td>
<td>14-20</td>
</tr>
</tbody>
</table>

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

**UNLOCK CONTACT**

**REMOVED**

**SEALING PLUG**

<table>
<thead>
<tr>
<th>CONTACT SIZE</th>
<th>PART NO.</th>
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<tbody>
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<tr>
<td>12-16</td>
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<tr>
<td>4</td>
<td>114019</td>
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</table>

CONTACTS AND APPLICATION DATA

Solid Contacts

<table>
<thead>
<tr>
<th>SIZE</th>
<th>SOLID CONTACT PART NUMBERS</th>
<th>WIRE SIZE AVG (mm²)</th>
<th>WIRE SIZE STRAIN LANE (mm)</th>
<th>MIN CONT MIN RETENTION TENSION (LBS)</th>
<th>REF CRIMP TENSION (LBS)</th>
<th>MAX RATED AMPS AT 125°C CONTINUOUS</th>
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</thead>
<tbody>
<tr>
<td>20</td>
<td>0460-202-20**</td>
<td>0.50</td>
<td>20 115-218 (3.46 - 5.34)</td>
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<td>20 (80)</td>
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<td>16</td>
<td>0462-201-16**</td>
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<td>16 240-312 (6.25 - 3.03)</td>
<td>16 (75)</td>
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<td>16</td>
<td>0460-215-16**</td>
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<td>16 280-312 (6.25 - 3.92)</td>
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<tr>
<td>12</td>
<td>0460-204-12**</td>
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<td>12 50-240 (8.64 - 2.71)</td>
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<td>12 (130)</td>
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</tr>
<tr>
<td>8</td>
<td>0460-204-08**</td>
<td>0.50</td>
<td>8 10-250 (10.90 - 12.50)</td>
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<td>6</td>
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<td>6 10-240 (8.64 - 2.71)</td>
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<td>6 (130)</td>
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</table>

* 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 STRAIN LANE</th>
<th>WIRE SIZE AVG (mm²)</th>
<th>WIRE SIZE STRAIN LANE (mm)</th>
<th>MIN CONT MIN RETENTION TENSION (LBS)</th>
<th>REF CRIMP TENSION (LBS)</th>
<th>MAX RATED AMPS AT 125°C CONTINUOUS</th>
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<tbody>
<tr>
<td>20 1060-20-01**</td>
<td>0.50</td>
<td>20 16-23 (1.0 - 0.35)</td>
<td>20 (80)</td>
<td>20 (80)</td>
<td>20 (80)</td>
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<tr>
<td>20 1060-20-02**</td>
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<tr>
<td>16 1060-14-01**</td>
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<td>16 16-23 (1.0 - 0.35)</td>
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<td>16 16-23 (1.0 - 0.60)</td>
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</tbody>
</table>

** For proper dies and stamped & formed crimp dimensions - See Envelope 0425-208-0000 12 Size 0425-203-0000 16 Size 0425-207-0000 20 Size 0425-059-0000 16, 20 Size 0425-039-0000 16 Size 0425-041-0000 12 Size


HD/HDP ACCESSORIES

HDP

Connector P/N

*HDP2*-24-****-L015 Available in plugs and receptacles

Straight Backshell P/N

2428-008-2405

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 (if required).

Protective Caps

Plug cap for receptacle protection (Aluminum)

*HDP2*-24-****-L017

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

Protective Caps

Receptacle cap for plug protection (Aluminum)


14

A STEP AHEAD

15

A STEP AHEAD