A PERFECT ALLIANCE.

ODU AUTOMOTIVE / EMOBILITY ADVANCED CONNECTOR SOLUTIONS

www.oduautomotive.com
ODU AUTOMOTIVE / EMOBILITY
ADVANCED CONNECTOR SOLUTIONS

1. ELECTRICAL CONTACTS
2. HIGH VOLTAGE
3. DOCKING / BATTERY SWAP
4. CHARGING
5. CUSTOM SOLUTIONS

A PERFECT ALLIANCE.

ODU 5 STAR CUSTOMER EXPERIENCE

1. PERSONAL ONE-TO-ONE TECHNICAL SUPPORT
2. STANDARD PRODUCTS READILY AVAILABLE
3. CABLE ASSEMBLY INTEGRATED SOLUTIONS
4. RAPID PRODUCT DEVELOPMENT
5. CUSTOM CAPABILITIES TO MEET TECHNICAL CHALLENGES

ODU GROUP OVERVIEW
- More than 75 years of experience in connector technology
- Over 2,300 employees worldwide
- 10 sales subsidiaries in China, Denmark, France, Germany, Italy, Japan, Korea, Sweden, the UK and the US as well as 5 production and logistics sites
- All technologies under one roof: Design and development, machine tool and special machine construction, injection, stamping, turning, surface technology, assembly and cable assembly

We operate in the following markets: medical, military and security, test and measurement, industrial, energy, and eMobility

As of February 2019

CERTIFIED QUALITY
- ISO 9001
- IATF 16949
- ISO 13485
- ISO 14001
- ISO 50001
- Wide range of UL, CSA, VDE and VDE certificates
- UL certified cable assembly

For a complete list of our certifications, please visit our website:
www.oduautomotive.com

STANDARD PRODUCTS READILY AVAILABLE

RAPID PRODUCT DEVELOPMENT

PERSONAL ONE-TO-ONE TECHNICAL SUPPORT

CUSTOM CAPABILITIES TO MEET TECHNICAL CHALLENGES

LOW PROFILE

www.oduautomotive.com
**ODU ELECTRICAL CONTACTS**

<table>
<thead>
<tr>
<th></th>
<th>ODU LAMTAC® CONTACT SYSTEM</th>
<th>ODU TURNTAC® CONTACT SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mating cycles</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Size</td>
<td>1.5 mm to 30 mm</td>
<td>0.3 mm to 12 mm</td>
</tr>
<tr>
<td>Misalignment</td>
<td>Up to 1°</td>
<td>Up to 5°</td>
</tr>
<tr>
<td>Termination type</td>
<td>Solder / Screw / Crimp</td>
<td>Crimp</td>
</tr>
<tr>
<td>Contact type</td>
<td>Lamella</td>
<td>Turned, slotted</td>
</tr>
</tbody>
</table>

**ODU LAMTAC®**
- Electrical contact with lamella technology
- > 10,000 mating cycles
- Able to withstand harsh environments
- High temperature resistance – up to 200° C
- High current-carrying capacity

**ODU TURNTAC®**
- Able to withstand harsh environments
- Turned slotted contact
- 5° misalignment ideal for charging applications
- Smallest dimensions possible, down to 0.3 mm contact diameter
- > 10,000 mating cycles

Contact us for additional technical information at sales@oduautomotive.com
### ODU HIGH VOLTAGE CONNECTOR SOLUTIONS

<table>
<thead>
<tr>
<th>Connector Type</th>
<th>ODU POWER MATE® 400 2 POLE HV CONNECTOR SYSTEM</th>
<th>ODU GEN2 – 2 POLE HV CONNECTOR SYSTEM</th>
<th>ODU K12 – 3 POLE HV CONNECTOR SYSTEM – STRAIGHT</th>
<th>ODU K8 – 3 POLE HV CONNECTOR SYSTEM – STRAIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current rating</td>
<td>16 mm²: 140 A at 85°C</td>
<td>16 mm²: 140 A at 85°C</td>
<td>16 mm²: 140 A at 85°C</td>
<td>16 mm²: 140 A at 85°C</td>
</tr>
<tr>
<td>Working voltage</td>
<td>1300 V DC, test voltage 4000 V DC</td>
<td>750 V AC, test voltage 2700 V AC</td>
<td>750 V AC</td>
<td>750 V AC</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>–40°C to 140°C</td>
<td>–40°C to 140°C</td>
<td>–40°C to 140°C</td>
<td>–40°C to 140°C</td>
</tr>
<tr>
<td>IP Sealing</td>
<td>IP65/IP68, IP66</td>
<td>IP65/IP68, IP68</td>
<td>IP65/IP68</td>
<td>IP65/IP68</td>
</tr>
<tr>
<td>Vibration class</td>
<td>Level 2</td>
<td>Level 2</td>
<td>Level 4</td>
<td>Level 3</td>
</tr>
<tr>
<td>Cable cross section</td>
<td>50 mm²</td>
<td>16 mm², 25 mm², 35 mm²²</td>
<td>35 mm², 50 mm²²</td>
<td>16 mm², 25 mm²²</td>
</tr>
<tr>
<td>Cable type</td>
<td>Copper</td>
<td>Copper</td>
<td>Copper</td>
<td>Copper</td>
</tr>
<tr>
<td>Shielding</td>
<td>360°</td>
<td>360°</td>
<td>360°</td>
<td>360°</td>
</tr>
<tr>
<td>HVIL</td>
<td>Yes (optional)</td>
<td>Yes</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Termination</td>
<td>Ultrasonic weld</td>
<td>Crimp</td>
<td>Crimp</td>
<td>Crimp</td>
</tr>
<tr>
<td>Contact size</td>
<td>12 mm</td>
<td>8 mm</td>
<td>12 mm</td>
<td>8 mm</td>
</tr>
<tr>
<td>Mating cycles</td>
<td>50</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Temperature sensor</td>
<td>Yes (optional)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

*Custom solution
**Testing in progress

### ODU POWER MATE® 400 2 POLE HV CONNECTOR SYSTEM
- 400 A continuous makes this an ideal connector for battery and charging applications
- Slide latch allows for low-profile making packaging easy
- HVIL for quick power disconnect
- IP protection class IPXXD (mounted), IPXXB (demounted)
- Temperature sensor for temperature monitoring
- < 75 N allows for easy mating
- Can be used with either aluminum or copper wire

### ODU GEN2 – 2 POLE HV CONNECTOR SYSTEM
- Compact size allows for easy packaging
- Available in both right angle and straight making it the most versatile ODU 2 pole connector
- Can reach temperatures up to 140° C for high temperature applications

### ODU K12 – 3 POLE HV CONNECTOR SYSTEM – RIGHT ANGLE
- Class 4 vibration
- Sealed connector system
- Up to 240 A with 50 mm² wire
- Rugged aluminum housing

### ODU K8 – 3 POLE HV CONNECTOR SYSTEM – STRAIGHT
- Can withstand up to 140° C making it ideal for high temperature applications
- Smallest 3 pole ODU offering for easy packaging
- Able to withstand class 3 vibration
- Up to 145 A with 25 mm² wire

Contact us for additional technical information at sales@oduautomotive.com
**ODU DOCKING MATE®**

- Self-finding docking of HV-battery & drivetrain module ideal blind mating
- +/- 5 mm of tolerance allows easy blind mating without damage to pins
- Multiple pin configurations and shell size available upon request

**ODU BATTERY SWAP**

- The highest mating cycles of all ODU docking connectors
- Ground pins for first mate last break
- Water tightness in both mated and unmated conditions

**ODU BRS (BATTERY REPLACEMENT SYSTEM)**

- Self-finding docking of HV-battery & drivetrain module ideal blind mating
- +/- 5 mm of tolerance allows easy blind mating without damage to pins

**ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM)**

- Self-finding connector system making it ideal for battery swap applications
- 3,000 cycles allow for multiple connections without replacement
- Small package size will fit easily into smaller battery applications

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**Working Voltage**
- ODU DOCKING MATE®: 340 V DC
- ODU BRS (BATTERY REPLACEMENT SYSTEM): 250 to 420 V DC
- ODU BATTERY SWAP: 300 V DC
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): 400 V DC

**Current Rating**
- ODU DOCKING MATE®: 350 A at 85°C
- ODU BRS (BATTERY REPLACEMENT SYSTEM): 550 A at 85°C
- ODU BATTERY SWAP: 60 A at 65°C
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): 60 A at 65°C

**IP Sealing**
- ODU DOCKING MATE®: IP68K, IP69K
- ODU BRS (BATTERY REPLACEMENT SYSTEM): IP67
- ODU BATTERY SWAP: Upon request
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): Sealing upon request

**Variation**
- ODU DOCKING MATE®: 5G2 (acc. to ISO15215)
- ODU BRS (BATTERY REPLACEMENT SYSTEM): 5G2 (acc. to ISO15215)
- ODU BATTERY SWAP: N/A
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): N/A

**Operating Temperature**
- ODU DOCKING MATE®: –30°C to 60°C
- ODU BRS (BATTERY REPLACEMENT SYSTEM): –30°C to 60°C
- ODU BATTERY SWAP: –40°C to 100°C
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): –40°C to 100°C

**Shielding**
- ODU DOCKING MATE®: 360°
- ODU BRS (BATTERY REPLACEMENT SYSTEM): 360°
- ODU BATTERY SWAP: N/A
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): N/A

**Mating Cycles**
- ODU DOCKING MATE®: 50
- ODU BRS (BATTERY REPLACEMENT SYSTEM): 2,000
- ODU BATTERY SWAP: 5,000
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): 3,000

**Tolerance Compensation**
- ODU DOCKING MATE®: +/- 5 mm
- ODU BRS (BATTERY REPLACEMENT SYSTEM): +/- 5 mm
- ODU BATTERY SWAP: N/A
- ODU BATTERY SWAP TCS — (TOLERANCE COMPENSATION SYSTEM): +/- 1 mm

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Contact us for additional technical information at sales@oduautomotive.com
**ODU CHARGING CONNECTOR SOLUTIONS**

<table>
<thead>
<tr>
<th>ODU SAE ADAPTER</th>
<th>ODU GB/T INLET</th>
<th>ODU CUSTOM CHARGING HANDLES &amp; ASSEMBLIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working voltage</td>
<td>240 V/1,000 V DC</td>
<td>750 / 1,000 V DC</td>
</tr>
<tr>
<td>Current rating</td>
<td>80 A</td>
<td>200 A at 50°C</td>
</tr>
<tr>
<td>IP Sealing</td>
<td>Sealing upon request</td>
<td>Sealing upon request</td>
</tr>
<tr>
<td>Temperature range</td>
<td>–30°C to 50°C</td>
<td>–30°C to 50°C</td>
</tr>
<tr>
<td>Mating cycles</td>
<td>10,000</td>
<td>10,000</td>
</tr>
</tbody>
</table>

**ODU SAE ADAPTER**
- Contact technology: ODU TURNTAC®
- 10,000 mating cycles
- Misalignment: 5°
- Temperature: –30°C to 50°C
- Touch proof

**DC – DIRECT CURRENT**

**AC – ALTERNATING CURRENT**

**GB/T 20234**

**DC – DIRECT CURRENT**

**AC – ALTERNATING CURRENT**

**ODU GB/T INLET**
- Contact technology: ODU TURNTAC®
- 10,000 mating cycles
- Meets GB/T standard
- Pin misalignment up to 5°
- Temperature: –30°C to 50°C

The ODU TURNTAC® design has been specially developed for charging technology applications. The turned contacts provide a high level of flexibility and ensure more than 10,000 charging cycles.

Contact us for additional technical information at sales@oduautomotive.com
IEC CHARGING CONNECTOR ODU TURNTAC®

Robust contact technology for efficient charging operations. This ODU TURNTAC® design has been specifically developed for charging technology applications. The turned contacts therefore ensure a high level of flexibility and low wear at over 10,000 charge cycles.

Contacts can be sold separately for your custom specific applications including, but not limited to: charging kits, charging handles, cable assemblies, inlets and trailer electronics.

**IEC 62196 (VDE 0623-5)**

**DC – DIRECT CURRENT**

**AC – ALTERNATING CURRENT**

**AC – ALTERNATING CURRENT**

Nominal current | Nominal current | Number of contacts
--- | --- | ---
50 A – 200 A | 2 A | 2 (Contact Ø 3 mm)

**DC – DIRECT CURRENT**

Nominal current | Nominal current | Number of contacts
--- | --- | ---
50 A – 200 A | 2 A | 2 (Contact Ø 3 mm)

**ODU CUSTOM CHARGING HANDLES**

- Ruggedized charging handles
- Can meet J1772, IEC62916 and CCS charging standards
- 10,000 mating cycles
- Sizes 1.5 mm, 2.8 mm, 3.6 mm and 8 mm
- Termination: Crimp
- Able to withstand harsh environments
- Turned slotted contact
- 5˚ pin misalignment ideal for charging applications

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ODU CUSTOM SOLUTIONS

Since 1942 ODU has been supplying customers with custom contact and connector solutions. Rapid prototyping and product development coupled with local one to one engineering support has led ODU’s reputation as an expert in custom solutions. Thermoplastic injection molding design, CNC tooling design and development, and bonding/laser etching are just a few of ODU’s core competencies.

For assistance with your customized connector needs call us at 805-484-0540 or email us at sales@oduautomotive.com.

FAST DEVELOPMENT

- Simulation software
- Highest level of vertical integration
- Local R&D centers in America, Europe and China

PRODUCTION

under one roof means high added value:

- Toolmaking
- Injection Shop
- Turnery
- Stamping
- Surface Technology & Electroplating Shop
- Assembly
- Cable Assembly

TEST CENTER

ODU Technology Test Center for continuous strict quality control delivers data and a unique important knowledge base through the complete development process.