ECG Product Overview for High Voltage
Auxiliary Device

- Shieldpack Apex HV280 with 2-way connector (HVIL shunt on female)
- Shieldpack HV280 with 2-way two piece Header with Pluggable Inner Connector (HVIL shunt on female)
- Shield-Pack™ HV280 2 and 3-way with 2 and 3-way AK CLASS 1 female connector (multiple HVIL options)
- HV280/630 Splice with HV280 4 Way & Splice option (HVIL shunt on female)
- On-Board Charger Connector with 6 way Device Connection System (in-line HVIL)
- Shield-Pack™ HV280 with 2-way in-line connector (with external HVIL connector)
- HV280 Direct Mate with 2-way connector (in-line HVIL)

Power Conversion

- RCS800 High Voltage with 2 Way Straight Connection System (HVIL shunt on female)
- RCS890 High Voltage with 2 Way Right Angle Connection System (HVIL shunt on female)
- AK Class 4 High Voltage with 2 Way Right Angle Connection System (HVIL shunt on female)
- RCS800 Direct Mate with 1 & 2 Way Straight & Right Angle Connection System (HVIL shunt on female)
- AK Plastic Pass Through with 1, 2 & 3 Way configurations
- Metal Pass Through with 1 Way configuration

48V Power Application

- Sealed Ring Connector with 1-way configuration
- Power Pack 1000 with 1 & 2 Way Connectors

Charge Inlets

- Type II - AC Inlet
- Combo II Inlet

Charge Plugs

- Mode 3 Charging cables with 32A 1-phase and 3-phase Type II to Type II
- Mode 2 charging cables (with ICCB – In Cable Controo Box)
Shieldpack Apex HV280
2-way connector (HVIL shunt on female)

Key technology features
- Bundle shielding with external braid
- Dual sealing connection system: mated & unmated header
- Panel mount to device with face seal
- HVIL shunted in harness connector
- Two HV power circuits (2.8 mm terminal)
- Cable range: 2.5 to 4 mm² power circuit; 0.5 to 0.75 mm²
- HVIL circuit
- Two keys/indexes
- Electrical protection: Finger-proof IP2XB

Customer benefits
- Two-stage disconnect for safe unmating
- ErgoMate™ Axial Mating Assist System on harness connector
- Unique integrated electric interlock

Performance
- 35A @ 70°C
- 1000V DC
- Temperature: T3
- Vibration: V1
- Sealing: S3

APPLICATION
- High voltage Auxiliary devices: Air conditioning, PTC heater, Inverter, On-Board Charger.
Shieldpack HV280
2-way two piece Header with Pluggable Inner Connector (HVIL shunt on female)

Key technology features
- Inner Connector with TPA can be plugged into header during device assembly
- Sealed connection system
- Panel mount to device with face seal
- Internal HVIL (shunt in harness connector)
- Two HV power circuits (2.8 mm terminal)
- Finger proof/touch safe
- Cable range: 2 mm² to 5 mm² power circuit; 0.5 mm² HVIL circuit
- Electrical protection: Finger-proof IP2XB

Customer benefits
- Easy installation inside the system thanks to its removable inner connector.
- Two options available : Two-stage locking system for HVIL time delay - Tool-less mating system

APPLICATION
- High voltage Auxiliary devices : Air conditioning, PTC heater, Inverter

Performance
- 40A@85°C
- 1000V DC
- Temperature: T3
- Vibration: V1
- Sealing: S3
Shield-Pack™ HV280 2 and 3-way
2 and 3-way AK CLASS 1 female connector (multiple HVIL options)

Key technology features
• 2 & 3 way Connector, 280 Terminal System + 0,64 HVIL
• 2-way with shunt on female
• 2-way with in-line HVIL
• 3-WAY without HVIL
• Connector according AK interface specification and LV215 latest revision
  (Vibration severity 2, Temperature severity 4)
• Cable range: 2.5 & 4mm² multi-core circuit; 0.5 mm² HVIL circuit (2 way only)
• Four Key/indexes
• Finger proof/touch safe IP2xB
• Shielding:
  • 10kHz ~ 5 MHz: >70dB (<20mΩ/m)
  • >5MHz ~ 500MHz: >65dB (<30mΩ/m)

Customer benefits
• Standard AK interface
• Higher behaviours against vibration
• Multiple lay-outs & HVIL options in the same interface

APPLICATION
• High voltage Auxiliary devices : Air conditioning, PTC heater, Inverter

Performance
<table>
<thead>
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<td>Vibration</td>
<td>V1</td>
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<tr>
<td>Sealing</td>
<td>S3</td>
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</tbody>
</table>

Auxiliary Device
HV280/630 Splice
4 Way & Splice option (HVIL shunt on female)

New development

Key technology features
- 2 circuits from the battery can supply 2 devices
- Header with axial harness connector
- Sealed
- Shielded
- Internal HVIL
- Finger proof
- Header cable range: 2.5 to 5 mm²
- 4 keys/indexes
- Modular design

Customer benefits
- Can replace two 2-way connector
- 280/630 Splitter (40A device 1) (30A device 2) – no need for splice box anymore.
- Header option: Direct Plug to PCB
- Harness cable range: 2.5 mm² or 5 mm²

APPLICATION
- High voltage Auxiliary devices: Air conditioning, PTC heater, Inverter
- Integrated splice variant

Auxiliary Device
SOP: Q1 2019 – already available from serial tools
On-Board Charger Connector
6 way Device Connection System (in-line HVIL)

Key technology features
- Sealed connection system
- Capability for four power circuits and two signal circuits
- Unshielded with terminal spacing for HV applications
- Cable range: 2 mm² to 5 mm²
- Capable of multiple keys/indexes

Customer benefits
- Electrical protection: Finger-proof IP2XB
- Two-stage locking system for electrical protection
- One-stage locking system also available

Performance

- 32A@85C
- 600V DC
- Temperature: T3
- Vibration: V1
- Sealing: S3

APPLICATION
- High voltage On-Board Charger applications: 16A and 32A
Shield-Pack™ HV280
2-way in-line connector (with external HVIL connector)

Key technology features
• Sealed connection system
• In-line connection
• External HVIL (shunt in male connector)
• Two HV power circuits (2.8 mm terminal)
• Finger proof/touch safe
• Cable range: 2 mm² to 5 mm² power circuit; 0.5 mm² HVIL circuit
• Electrical protection: Finger-proof IP2XB

Customer benefits
• Well proven reliable system

APPLICATION
• High voltage Auxiliary devices: Air conditioning, PTC heater, Inverter

Performance

- **40A@85C**
- **1000V DC**

Temperature: T3
Vibration: V1
Sealing: S3
HV280 Direct Mate
2-way connector (in-line HVIL)

Key technology features
• Bundle shielding with external braid or Individual cable shielding
• In-line HVIL
• Two HV power circuits (2.8 mm terminal)
• Cable range: 2.5 to 4 mm² power circuit; 0.5 to 0.75 mm²
• Electrical protection: Finger-proof IP2XB

Customer benefits
• Cost effective thanks to unshielded terminal holder replacing traditional shielded headers.
• Same connector for both bundle and individual cable shielding.

SOP: Q3 2019 – available from low volume tools
RCS800 High Voltage
2 Way Straight Connection System (HVIL shunt on female)

Key technology features
- Bundle shielding with external braid
- Dual sealing connection system: mated and unmated header
- HVIL shunted in harness connector
- ErgoMate™ Axial Mating Assist System on harness connector
- Two HV power circuits (8.0 mm round terminal)
- Cable range: 35 to 50 mm² power circuit; 0.5 to 0.75 mm²
- Sealing protection: IP67, IPX9K
- Electrical protection: Finger-proof IP2XB

Customer benefits
- Panel mount to device with face seal to module
- Unique integrated electric interlock
- Two-stage disconnect for safe unmating

APPLICATION
- High voltage/high current systems: inverter, battery, junction box, power electric box
RCS890 High Voltage
2 Way Right Angle Connection System (HVIL shunt on female)

Key technology features
- Bundle shielding with external braid
- Dual sealing connection system: mated and unmated header
- Panel mount to device with face seal to module
- HVIL shunted in harness connector
- Two HV power circuits (8.0 mm round terminal)
- Flange size: 51 mm x 62 mm
- Cable range: 35 to 50 mm² power circuit; 0.5 to 0.75 mm² HVIL
- Sealing protection: IP67, IPX9K
- Electrical protection: Finger-proof IP2XB

Customer benefits
- Two-stage disconnect for safe unmating
- Slider Mating Assist System on harness connector
- Bundle shielding with external braid

APPLICATION
- High voltage/high current modules: inverter, battery, junction box, power electric box
AK Class 4 High Voltage
2 Way Right Angle Connection System (HVIL shunt on female)

Key technology features
- Connector and header design according AK interface specification and LV215 latest revision (Vibration severity 3, Temperature severity 4)
- Individual shielded cables
- Number of ways : 2
- Terminal Size/Style: Ø8mm Pin Sleeve
- Wire Range: 25, 35 & 50mm²
- 4 key/indexes

Customer benefits
- High operating temperature
- High robustness against vibrations

APPLICATION
- High voltage/high current systems: inverter, battery, junction box, power electric box

Performance

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<th>Value</th>
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<tr>
<td>Vibration</td>
<td>V3</td>
</tr>
<tr>
<td>Sealing</td>
<td>S3</td>
</tr>
</tbody>
</table>
RCS800 Direct Mate
1 & 2 Way Straight & Right Angle Connection System (HVIL shunt on female)

New development

Key technology features
- Multiple configurations
  - RCS800 (2-way Axial shielded)
  - RCS890 (2-way Axial shielded)
  - RCS800 (1-way unshielded)
- Individual shielded cables
- Cable range: ~ 50 mm² and smaller
- Robust bolt driven mate assist
- Fingersafe via plastic tips on male pins

Customer benefits
- Unique and safe mating screwing thanks to innovative Screw Position Assurance
- Cost effective thanks to unshielded terminal holder replacing traditional shielded headers.

APPLICATION
- High voltage/high current systems: inverter, battery, junction box, power electric box

Performance
- 220A@70°C
- 850V DC
- Temperature: T3
- Vibration: V2
- Sealing: S3

SOP: Q1 2019 – available from low volume tools

Power Conversion
AK Plastic Pass Through

1, 2 & 3 Way configurations

Key technology features
- Connector and header design according AK interface specification and LV215 latest revision (Vibration severity 3, Temperature severity 4)
- Main Housing Material: Plastic
- Terminal Size/Style: Ring-Tongue
- Wire range: 16mm² to 50mm²

Customer benefits
- Possible configurations: 1, 2 or 3 ways
- High operating temperature
- High robustness against vibrations

APPLICATION
- AC & DC High voltage/high current modules: inverter, battery, junction box, power electric box, electric motors

Performance

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<td>Vibration</td>
<td>V3</td>
</tr>
<tr>
<td>Sealing</td>
<td>S3</td>
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</tbody>
</table>
Metal Pass Through

1 Way configuration

Key technology features
- High voltage panel mount system
- One way sealed and shielded
- Ring terminal bolted to device
- Cable range: 25 to 50 mm²
- Six to eight keys/indexes depending on wire sections
- Sealing protection: IPX7, IP6K9K

Customer benefits
- Very high robustness against vibrations
- Very compact dimensions

APPLICATION
- AC & DC High voltage/high current modules: inverter, battery, junction box, power electric box, electric motors
Sealed Ring Connector
1-way configuration

Key technology features
- Product validated according to LV214 level 4 vibration
- Ideal solution for 12 to 48V requiring sealed ring connections.
- Screwing from the top
- Header interface available for system supplier integration on the box.

Customer benefits
- Fast and easy assembly process
- High robustness against vibrations

New development

48V Power Applications

SOP : Q2 2018 – already available from serial tools
Power Pack 1000
1 & 2 Way Connectors

Key technology features
- Ideal solution for 12 to 48V
- Cable range: 8 mm² to 25 mm²
- Wire-to-device and In-line configurations

Customer benefits
- Sealed panel mount pre-stages prior to fastening through self tapping screws
- Silver-plated Power Pack 1000 multi-contact terminal system

APPLICATION
- High current device applications and sealed pass-through panel mount system

<table>
<thead>
<tr>
<th>Performance</th>
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<tr>
<td>48V Power</td>
<td>Applications</td>
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<td>Vibration</td>
<td>V1</td>
</tr>
<tr>
<td>Sealing</td>
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</tr>
</tbody>
</table>
Type II - AC Inlet

Key technology features
- Interface complies with IEC62196 Type II standard
- 16 to 63A 1-phase & 3-phase charging capabilities
- Panel mounts to vehicle
- Lock actuator positioned on the top (not supplied by Aptiv)
- Available with cover opening right or left
- Electrical protection: Finger-proof IP2XB
- Wiring crimps sealed from environment

Customer benefits
- Integrated thermal circuit breaker to prevent abnormal temperature increase
- Cover provides dust protection
- Inlet designed to drain fluids when opened
- Supports single-phase or three-phase power supply
- Design life: 10,000+ mating cycles

APPLICATION
- Plug-in hybrid and electric vehicle charge inlet

Performance
- 63A @ 50C
- 400V DC
- Temperature T1
- Vibration V3
- Sealing S3
**Combo II Inlet**

**Key technology features**
- Interface complies with IEC62196
- Combined charging system for electrical vehicle
- AC/DC: slow + fast charge (600V, 125A)
- Actuator pin for locking connector to inlet during charging
- Optional thermistor for additional thermal protection during DC charging
- Wire Cross Section: Contact Pin/Present Pin (0.5 mm²), PE (16mm², L1/N (6.0 mm²), DC +/-(40 mm²)

**Customer benefits**
- Connection/Inlet mating and unmating force <100N
- Design life: 10,000+ mating cycles

**APPLICATION**
- Charging interface or slow AC (Type 11) and fast DC charging applications
Mode 3 Charging cables
32A 1-phase and 3-phase Type II to Type II

Key technology features
• Vehicle to charging station connection
• Vehicle connector according to IEC62196-2-1 and IEC62196-2-2
• Wiring crimps sealed from environment
• CE marking

Performance / Available Options
• 20 to 32A
• 1-phase 240V or 3-phase 400V charging
• Superior durability: 14,000 cycles (10,000 cycles is required from IEC standard)
• Low mating / unmating forces: Initial < 40N, Mating forces < 80N guaranteed until 14,000 cycles

APPLICATION
• Cable assemblies for plugging from charging station to vehicle
Mode 2 charging cables
(with ICCB – In Cable Control Box)

Key technology features
- Vehicle interface according to IEC62196-2-2
- Multiple versions depending on country grid plugs & regulations
- EVSE provides restart in the event of power grid fault
- Product according to the new IEC62752 standard including Type B RCD
- CE Marking
- Control box has higher water sealing protection than the standard: IP67
- Dual-thermo sensors provide superior protection from the grid plug over-heating

Performance / Available Options
- 240V with 6 to 15A (depending on country regulations)
- Grid cord as required by country of use
- Additional country configurations also available

APPLICATION
- Portable Electric Vehicle Supply Equipment (EVSE) for grid-to-vehicle charging