

# HYBRID AND ELECTRIC VEHICLE CONNECTION SYSTEM SELECTOR GUIDE

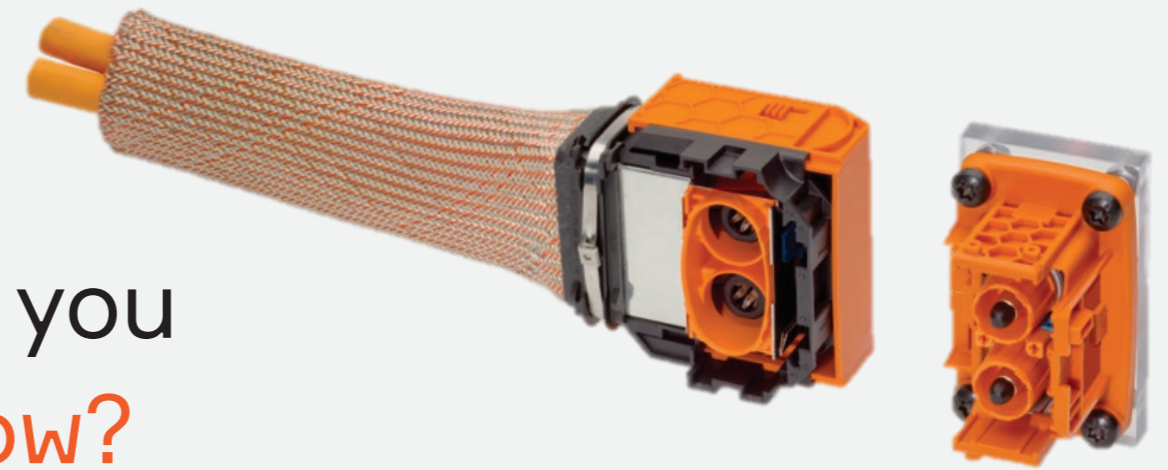


# A world of transportation

Aptiv has been a trusted automotive supplier for decades, introducing practical innovations in the areas of safety, efficiency, and connectivity. The transportation market has been advancing in these same areas and Aptiv can offer product solutions upgraded to its tougher operational and environmental requirements.

Commercial and recreation vehicles, such as trucks, buses, construction, agriculture equipment and motorcycles, are often exposed to higher levels of environmental forces, including vibration, dust, water, debris, and temperatures. To protect the integrity of the electrical system, high performance connection systems are often required.

To deliver superior performance, a number of complex factors in the electrical system must be addressed in the component design, including sealing, locking features, and materials.



## Did you Know?

Hybrid and electric vehicles are creating a host of challenges, including the demand for a new generation of high performance, high power connectors and charging solutions. Many additional power electronics devices are added to the vehicle architecture including lithium-ion (Li-ion) batteries, inverters and DC (Direct Current) converters. Their impact on connector design results in handling operation voltages that range from 400V up to 1000 V and carrying currents as high as 250A.

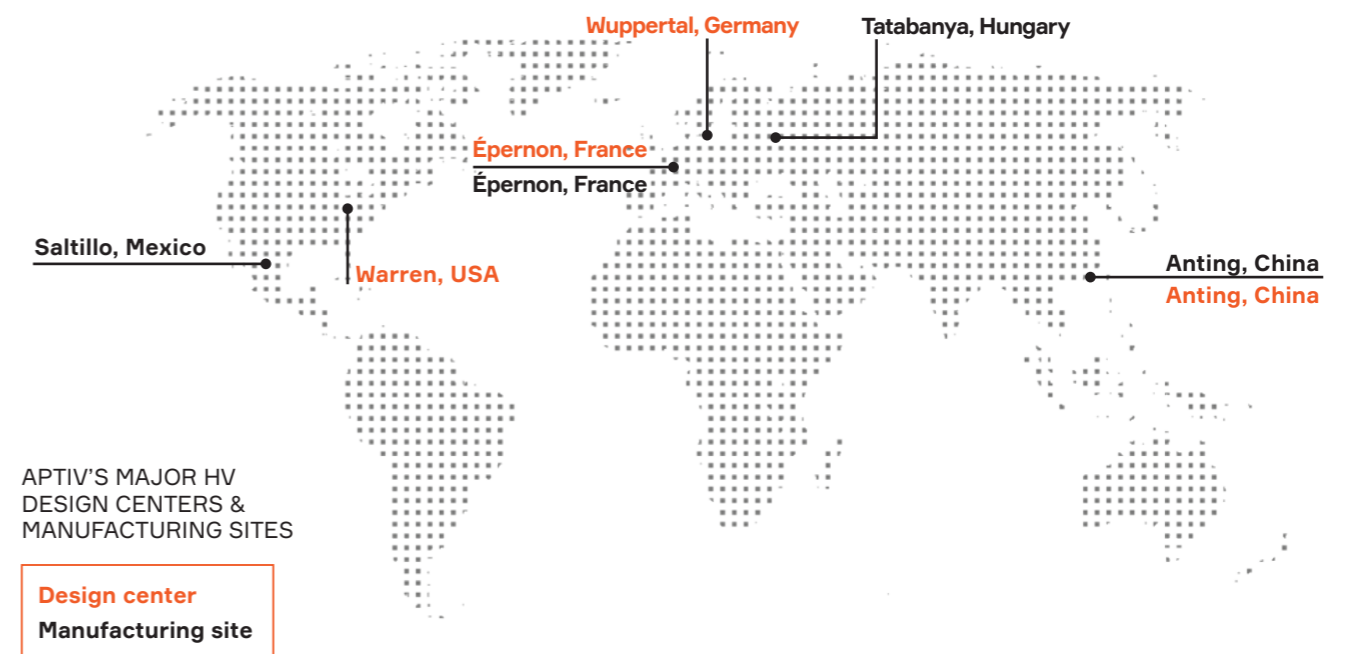
## About Aptiv

Aptiv is a global technology company that develops safer, greener and more connected solutions, which enable the future of mobility. Headquartered in Dublin, Aptiv has 147,000 employees and operates 14 technical centers, as well as manufacturing sites and customer support centers in 45 countries.



Image Source : PSA

## Aptiv is ready when and where you need us



APTIV'S MAJOR HV  
DESIGN CENTERS &  
MANUFACTURING SITES

Design center  
Manufacturing site

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# Why is **vehicle electrification** now a reality?



**ENVIRONMENTAL CONCERNS**

**GOVERNMENT REGULATIONS AND INCENTIVES**

**RISING FUEL COSTS**

Driven by rising fuel costs, environmental concerns and a combination of government regulations and incentives, the market for EVs (Electric Vehicles) and HEVs (Hybrid Electric Vehicles) is now becoming a reality. Vehicle specifications and infrastructure deployment have reached a certain level of industrialization. Standards have already been established for vehicle charging interfaces used on plug-in HEVs and EVs.

There are three standards used throughout the world including SAE J1772 in North America and Japan, IEC62196 Type II in Europe and GB/T 20234 in China. In addition, SAE has established a common footprint for DC (Direct Current) fast charging in North America and Europe. Aptiv offers a complete line of all global charging standards.

Aptiv is currently driving the innovations required for future multi-voltage architectures. Our research and development teams have leveraged the lessons learned from the collaboration with OEM's to focus on technological excellence and to provide real-life electrification performance.

With a unique expertise in architecture optimization and systems integration, the company has created one of the most comprehensive portfolios of the high power connection systems.



## Superior **Sealing** Performances

All of our connection systems feature external IP67 sealing performance. To ensure optimum sealing performance, our connectors are designed for the harshest conditions due to a back sealing feature.



## Superior **Shielding** Performance

EV and HEV electrical and electronic systems generate unwanted electromagnetic interference (EMI) which radiate from the interconnecting cables. The connection systems are designed by minimizing the paths along which these signals can escape. Our connectors and cabling designs provide high levels of shielding effectiveness to ensure EMI free performance of the complete system.



## Superior **Safety** Performances

Our connectors provide finger-proof, touch safe and 2-step disconnection technologies to guarantee optimum safety during all handling operations. They continue to meet with changing requirement of the OEM's in regard to HVIL on a vehicle system and connection system level. Additionally, the company's ErgoMate™ axial mating system helps achieve a lower profile solution while reducing mating forces. Once connected, a CPA (Connector Position Assurance) device must be activated to ensure a 100% safe mating

# A comprehensive product portfolio



## High Voltage **Auxiliary** Modules

High Voltage connection systems designed specifically for the voltage and current needs of auxiliary modules, such as A/C compressor, heater, coolant control module, on board-board charger, DC converter, and battery accessory output.

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## High Voltage **Power** Conversion

High Voltage connection systems designed specifically for the voltage and current needs up to 250A. Power conversion modules consist of inverters, drive motors/generators, and High Current/High Voltage battery outputs.

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## High Power 12, 24, **48 Volt** Solutions

Growing requirements and a quickly increasing market for 48 Volt applications drive our technology for innovative solutions. Two key characteristics define these solutions: High current carrying capabilities and high sealing protection.

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## Charging **Solutions**

Unique technologies to help facilitate a global charging infrastructure, from Aptiv's Portable Electric Vehicle Charger and Charge Coupler pigtails for integration into Electric Vehicle Supply Equipment (EVSE). With Aptiv products, hybrid and electric vehicles can be powered safely and efficiently at home or away.

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E-Heater, DC Converter, Charger, Air Conditioning, Coolant Heater Control






HV battery, E-motor, Inverter, junction box, power electric box

48V Inverter, 48V Battery, Power Distribution boxes, E-charger (e-booster), 12 V battery, DC/DC converter, 12V Electrical Distribution Center

On-vehicle charging inlets  
Grid-to-vehicle charging  
Charging infrastructure-to-vehicle






Product Applications

# Performance key & Aptiv design indicators key

| Voltage      |                           | Amperage  |                                   |
|---|---------------------------|---|-----------------------------------|
| Range   | 12V – 1000V               | Range   | 10A – 250A                        |
| Temperature  |                           | Sealing   |                                   |
| Class   | Ambient Temperature Range | Class   | Common Name                       |
| T1  | -40°C to +85°C            | S1  | Unsealed                          |
| T2  | -40°C to +100°C           | S2  | Sealed                            |
| T3  | -40°C to +125°C           | S3  | Sealed<br>(w/high pressure spray) |
| T4  | -40°C to +150°C           |   |                                   |
| Vibration  |                           |   |                                   |
| Class   | Common Name               | Typical Application   |                                   |
| V1  | Chassis Profile           | Components on sprung portions of vehicle not coupled to Engine                              |                                   |
| V2  | Engine Profile            | Components coupled to Engine with severe vibration possible                                 |                                   |
| V3  | Severe On-Engine          | Components subject to severe vibration  |                                   |
| V4  | Extreme Vibration         | Used as needed to correlate to extreme vibration areas                                      |                                   |

# Selector Guide

## Auxiliary Modules Solutions

| Image   | Page # | Application   | Description                                      | Temperature<br>Vibration<br>Class                                   | Shielding                  | Amperage     | Voltage | #Ways<br>orientation      | Sections                 |
|---|--------|---|--|---|----------------------------|--------------|---------|---------------------------|--------------------------|
|    | 10-13  | On-board charger applications (Level 1 and 2)   | On-board charger female                          | T3<br>V1  | Not shielded               | 32A at 85°C  | 600V    | 2 to 4 power lines / 180° | 2 to 5 mm <sup>2</sup>   |
|   |        |   | On-board charger male inline                     |   |                            |              |         |                           |                          |
|   |        |   | On-board charger header                          |   |                            |              |         |                           |                          |
|   | 14-15  | Battery pack (Aux) DC/DC converter<br>On-board charger<br>PTC Electric Heater<br>Electric air conditioning<br>Electric power Steering | AK class 1 3way female (no HVIL)                 | Temperature: Level 4/<br>Vibration Level 2 (LV 215)<br><br>T4<br>V1 | Shielded multicore cable   | 32A at 85°C  | 1000V   | 2 to 3 power lines / 180° | 2.5 to 4 mm <sup>2</sup> |
|   |        |   | AK class 1 2way female (HVIL pass-through)       |   |                            |              |         |                           |                          |
|   |        |   | AK class 1 2way female (HVIL shunt)              |   |                            |              |         |                           |                          |
|  | 16-17  | Electric air conditioning<br>PTC Electric Heater<br>Charger   | APEX280 2way female                              | T3<br>V1  | Shielded with metal braid  | 35A at 70°C  | 1000V   | 2 power lines / 180°      | 2.5 to 5 mm <sup>2</sup> |
|   |        |   | APEX280 2way header                              |   |                            |              |         |                           |                          |
|  | 18-19  | Inner connector   | HV280 with inner connector header                | T3<br>V1  | Shielded individual cables | 35A at 70°C  | 1000V   | 2 power lines / 180°      | 2.5 to 5 mm <sup>2</sup> |
|   |        |   | HV280 female                                     |   |                            |              |         |                           |                          |
|   |        |   |  |   |                            |              |         |                           |                          |
|  | 20-21  | On-board charger  | APEX 950 On-Board Charger Connector (HVIL shunt) | T3<br>V1  | Not shielded               | 125A at 70°C | 750V    | 4 power lines / 180°      | 10 to 16 mm <sup>2</sup> |

# On-Board Charger Connector Level 1 / Level 2

## 6 way Device Connection System

### APPLICATION

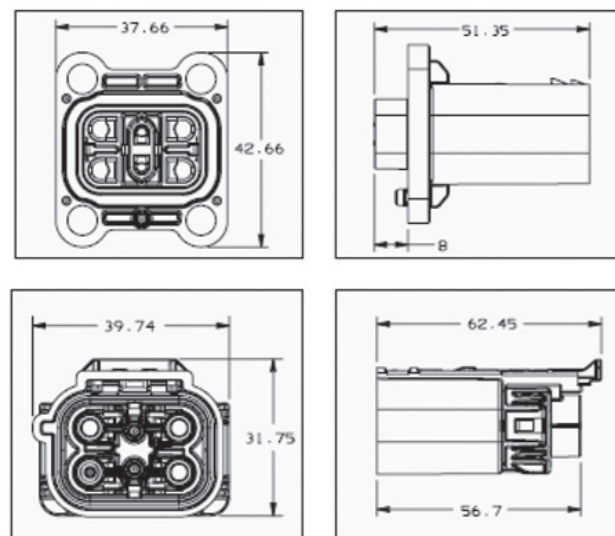
- High voltage unshielded system for on-board charger applications: Level 1(16A) and 2 (32A)

### DESCRIPTION

- Sealed connection system
- Capability for four power circuits and two signal circuits
- Unshielded with terminal spacing for HV applications
- Two-stage locking system for electrical protection
- One-stage locking system also available
- Cable range: 2 mm<sup>2</sup> to 5 mm<sup>2</sup>
- Capable of multiple keys/indexes
- Electrical protection: Finger-proof IP2XB

### Dimensions

Shown in millimeters



### Performance

32A@85C

600V DC

Temperature T3

Vibration V1

Sealing S3



### Header connector Part number

| Part Number | Key/index | Description  | BOM |
|-------------|-----------|--|-----|
| 33229376    | 101       | On-board charger connector - (tool required for disconnection) | 1   |
| 33229378    | 101       | On-board charger connector - (no tool required)                |     |

### Male Terminals

| Part Number | Description   | BOM       |
|-------------|---|-----------|
| 13663724    | Male Terminal 1.0 HES Gold required 0.75-1.0mm <sup>2</sup> | 2         |
| 13783283    | Male Terminal 2.4 HES Gold required 2-3mm <sup>2</sup>      | 2, 3 or 4 |
| 13783284    | Male Terminal 2.4 HES Gold required 4-5mm <sup>2</sup>      |           |

### Mating Part number

| Part Number | Key/index | Description  | BOM |
|-------------|-----------|--|-----|
| 13879051    | 101       | Level 1 harness connector (2+2) 2-2.5 mm <sup>2</sup>  | 1   |
| 13879050    | 101       | Level 1 harness connector (3+2) 2 -2.5 mm <sup>2</sup> |     |
| 13879049    | 101       | Level 1 harness connector (4+2) 2-2.5 mm <sup>2</sup>  |     |
| 13879048    | 101       | Level 2 harness connector (2+2) 4-5 mm <sup>2</sup>    |     |
| 13879047    | 101       | Level 2 harness connector (3+2) 4-5 mm <sup>2</sup>    |     |
| 13879046    | 101       | Level 2 harness connector (4+2) 4-5 mm <sup>2</sup>    |     |

### Female Terminals

| Part Number | Description   | BOM       |
|-------------|---|-----------|
| 13663728    | Female Terminal 1.0 HES Gold required 0.75-1.0mm <sup>2</sup> | 2         |
| 13783300    | Female Terminal 2.4 HES Gold required 2-3mm <sup>2</sup>      | 2, 3 or 4 |
| 13783301    | Female Terminal 2.4 HES Gold required 4-5mm <sup>2</sup>      |           |

# On-Board Charger Connector Level 1 / Level 2

## 6 way Inline Connection System

### APPLICATION

- High voltage unshielded system for on-board charger applications (Level 1 and 2)

### DESCRIPTION

- Sealed connection system
- Capability for four power circuits and two signal circuits
- Unshielded with terminal spacing for HV applications
- Two-stage locking system for electrical protection
- One-stage locking system also available
- Cable range: 2 mm<sup>2</sup> to 5 mm<sup>2</sup>
- Capable of multiple keys/indexes
- Electrical protection: Finger-proof IP2XB

### Performance

32A@85C

600V DC

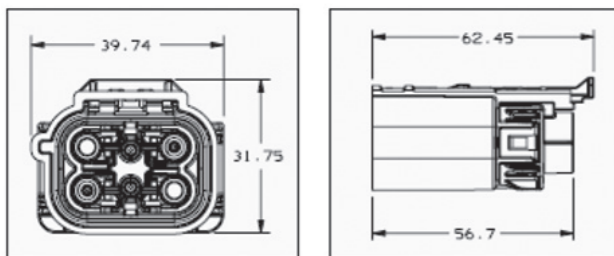
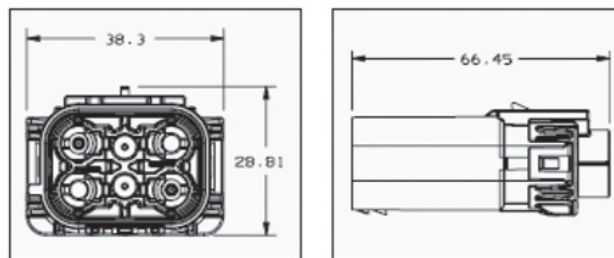
Temperature T3

Vibration V1

Sealing S3

### Dimensions

Shown in millimeters



### Header connector Part number

| Part Number | Key/index | Description                     | BOM |
|-------------|-----------|---------------------------------|-----|
| 13990593    | 101       | Level 1 harness connector (2+2) | 1   |
| 13990592    | 101       | Level 1 harness connector (3+2) |     |
| 13990591    | 101       | Level 1 harness connector (4+2) |     |
| 13990590    | 101       | Level 2 harness connector (2+2) |     |
| 13990589    | 101       | Level 2 harness connector (3+2) |     |
| 13990588    | 101       | Level 2 harness connector (4+2) |     |

### Male Terminals

| Part Number | Description  | BOM       |
|-------------|--|-----------|
| 13663724    | Male Terminal 1.0 HES Gold required .75-1.0mm <sup>2</sup> | 2         |
| 13783283    | Male Terminal 2.4 HES Gold required 2-3mm <sup>2</sup>     | 2, 3 or 4 |
| 13783284    | Male Terminal 2.4 HES Gold required 4-5mm <sup>2</sup>     |           |



### Mating Part number

| Part Number | Key/index | Description   | BOM |
|-------------|-----------|---|-----|
| 13879051    | 101       | Level 1 harness connector (2+2) 2-2.5 mm <sup>2</sup> | 1   |
| 13879050    | 101       | Level 1 harness connector (3+2) 2-2.5 mm <sup>2</sup> |     |
| 13879049    | 101       | Level 1 harness connector (4+2) 2-2.5 mm <sup>2</sup> |     |
| 13879048    | 101       | Level 2 harness connector (2+2) 4-5 mm <sup>2</sup>   |     |
| 13879047    | 101       | Level 2 harness connector (3+2) 4-5 mm <sup>2</sup>   |     |
| 13879046    | 101       | Level 2 harness connector (4+2) 4-5 mm <sup>2</sup>   |     |

### Female Terminals

| Part Number | Description  | BOM       |
|-------------|--|-----------|
| 13663728    | Female Terminal 1.0 HES Gold required .75-1.0mm <sup>2</sup> | 2         |
| 13783300    | Female Terminal 2.4 HES Gold required 2-3mm <sup>2</sup>     | 2, 3 or 4 |
| 13783301    | Female Terminal 2.4 HES Gold required 4-5mm <sup>2</sup>     |           |

# Shield-Pack™ HV280

## AK CLASS 1 female connector

### APPLICATION

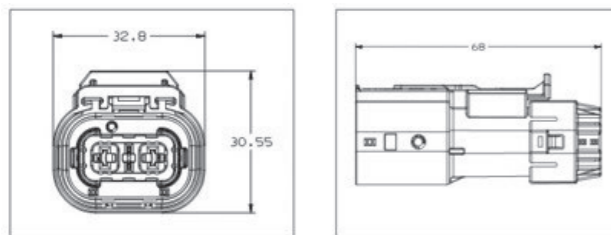
- High voltage accessories connection system

### DESCRIPTION

- Sealed connection system
- Two or three HV power circuits (2.8 mm terminal)
- 2 Way: HVIL shunted in harness connection and pass-through HVIL options available
- 3 Way: No HVIL
- Cable range: 2.5 & 4mm<sup>2</sup> multi-core circuit; 0.5 mm<sup>2</sup> HVIL circuit (2 way only)
- Four Key/indexes
- Electrical protection: Finger-proof IP2XB

### Dimensions

Shown in millimeters



### Performance

32A@85C

1000V DC

Temperature T4

Vibration V1

Sealing S3



### Female connector

| Part Number | Description                                  | BOM |
|-------------|--|-----|
| 33372017    | Receptacle Housing Subassembly, 2Way, Code A | 1   |
| 33372014    | Receptacle Housing Subassembly, 2Way, Code B |     |
| 33372016    | Receptacle Housing Subassembly, 2Way, Code C |     |
| 33372015    | Receptacle Housing Subassembly, 2Way, Code D |     |
| 35061103    | Receptacle Housing Subassembly, 2Way, Code E |     |

### Terminals

| Part Number | Description  | BOM |
|-------------|--|-----|
| 33522728    | DCK 2.8 female terminal 4 mm <sup>2</sup>  | 2   |
| 33514302    | DCK 2.8 female terminal 2.5 mm <sup>2</sup>                                      |     |
| 33504709    | Duo twin 0,64 male terminal 0,5 mm <sup>2</sup> (HVIL pass-through version only) | 2   |

### Components

| Part Number | Description   | BOM                      |                   |       |
|-------------|---|--------------------------|-------------------|-------|
|             |   | 2 way, HVIL pass-through | 2 way, HVIL Shunt | 3 way |
| 35174268    | Spacer  | 1                        | 1                 | 1     |
| 35174446    | Shielding   | 2                        | 2                 | 2     |
| 35174249    | ASM Strain Relief for 3 x 2.5 mm <sup>2</sup>           |                          |                   | 1     |
| 35174250    | Cable Seal for 3 x 2.5 mm <sup>2</sup>                  |                          |                   | 1     |
| 35174511    | Inner Housing, 2Way                                     | 1                        |                   |       |
| 35174507    | ASM Strain Relief for 2 x 4.0 mm <sup>2</sup>           |                          | 1                 |       |
| 35174508    | Cable Seal for 2 x 4.0 mm <sup>2</sup>                  | 1                        | 1                 |       |
| 35174280    | Inner ferrule   | 1                        | 1                 | 1     |
| 35174278    | Outer ferrule   | 1                        | 1                 | 1     |
| 35174509    | Inner Housing Sub-assembly                              |                          | 1                 |       |
| 35174448    | Inner Housing, 3Way                                     |                          |                   | 1     |
| 35174513    | TPA (Terminal Position Assurance)                       | 1                        |                   |       |
| 35174510    | ASM Strain Relief for 2 x 4.0 + 2 x 0.5 mm <sup>2</sup> | 1                        |                   |       |

# APEX® HV280

## 2 way Connection System with HVIL

### APPLICATION

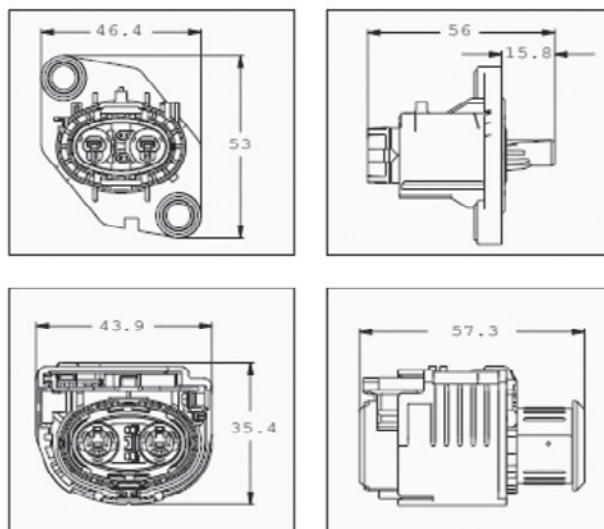
- High voltage peripheral equipment connection system: Air conditioning, PTC, Charger

### DESCRIPTION

- Bundle shielding with external braid
- Dual sealing connection system: mated & unmated header
- Panel mount to device with face seal
- Unique integrated electric interlock
- HVIL shunted in harness connector
- Two-stage disconnect for safe unmating
- ErgoMate™ Axial Mating Assist System on harness connector
- Two HV power circuits (2.8 mm terminal)
- Cable range: 2.5 to 4 mm<sup>2</sup> power circuit; 0.5 to 0.75 mm<sup>2</sup>
- HVIL circuit
- Two keys/indexes
- Electrical protection: Finger-proof IP2XB

### Dimensions

Shown in millimeters



### Performance

35A@70C

1000V DC

Temperature T3

Vibration V1

Sealing S3



### Header connector Part number

| Part Number | MPM     | Key/index | Description                       | BOM |
|-------------|---------|-----------|-----------------------------------|-----|
| 33511766    | F873110 | 1         | APEX-280 2way header code 1 black | 1   |
| 33511767    | F973110 | 2         | APEX-280 2way header code 2 brown |     |

### Male Terminals

| Part Number | MPM      | Description  | BOM |
|-------------|----------|--|-----|
| 15516298    | NA       | APEX 280 male terminal 4 mm <sup>2</sup>                                     | 2   |
| 15509074    | NA       | APEX 280 male terminal 2.5 mm <sup>2</sup>                                   |     |
| 10779703    | 60100734 | HVIL- interlock DCS2 1.5 gold-plated male terminal 0,5-1,0 mm <sup>2</sup>   | 2   |
| 33511802    | 60100714 | HVIL- interlock DCS2 1.5 gold-plated male terminal 0,22-0,35 mm <sup>2</sup> |     |

### Seal

| Part Number | MPM      | Description                                      | BOM |
|-------------|----------|--|-----|
| 33512175    | NA       | APEX 2.8 male & female SWS Red 4 mm <sup>2</sup> | 2   |
| 33512180    | NA       | APEX 2.8 male & female SWS 2.5 mm <sup>2</sup>   |     |
| 15441379    | 60993913 | DCS 1.5 male red SWS 0,22 - 0,5 mm <sup>2</sup>  | 2   |
| 15441380    | 60993928 | DCS 1.5 male grey SWS 0,75 - 1,0 mm <sup>2</sup> |     |



### Mating Part number

| Part Number | MPM     | Key/index | Description                     | BOM |
|-------------|---------|-----------|---------------------------------|-----|
| 33517428    | F083110 | 1         | APEX-280 2way plug code 1 black | 1   |
| 33511765    | F183110 | 2         | APEX-280 2way plug code 2 brown |     |

### Female Terminals

| Part Number | Description                                  | BOM |
|-------------|--|-----|
| 10810733    | APEX 2.8 female terminal 4 mm <sup>2</sup>   | 2   |
| 13627267    | APEX 2.8 female terminal 2.5 mm <sup>2</sup> |     |

### Seal

| Part Number | Description                                      | BOM |
|-------------|--|-----|
| 33512175    | APEX 2.8 male & female SWS Red 4 mm <sup>2</sup> | 2   |
| 33512180    | APEX 2.8 male & female SWS 2.5 mm <sup>2</sup>   |     |

# Shield-Pack™ HV280

## 2 Piece Header with Pluggable Inner Connector

### APPLICATION

- Ideal for auxiliary devices/high voltage connection system

### DESCRIPTION

- 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 options available : Two-stage locking system for HVIL time delay - Tool-less mating system
- Two HV power circuits (2.8 mm terminal)
- Finger proof/touch safe
- Cable range: 2 mm<sup>2</sup> to 5 mm<sup>2</sup> power circuit; 0.5 mm<sup>2</sup> HVIL circuit
- Electrical protection: Finger-proof IP2XB

### Performance

40A@85C

1000V DC

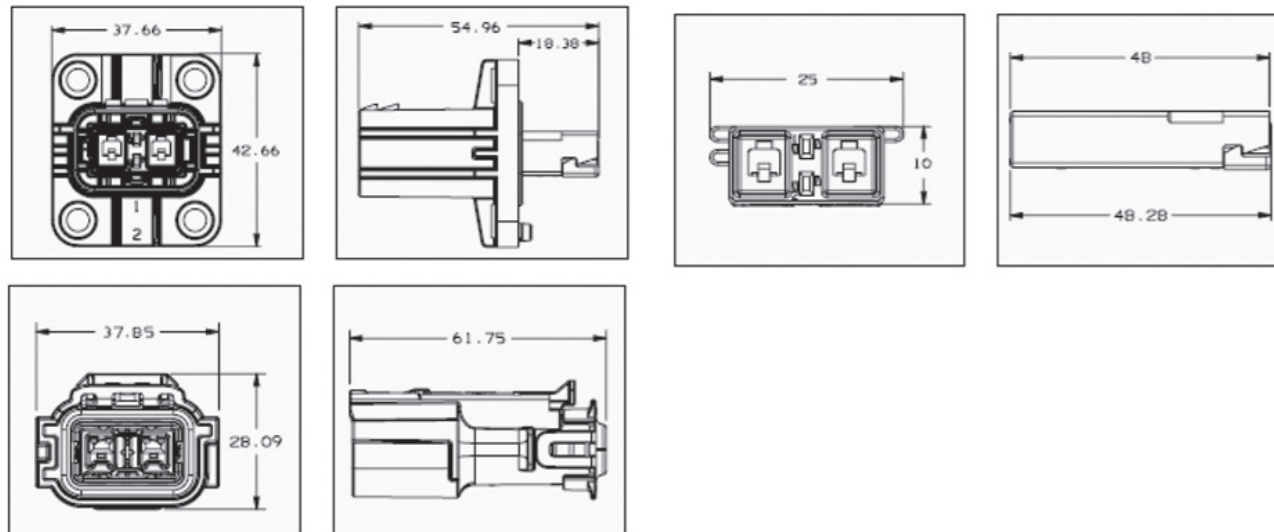
Temperature T3

Vibration V1

Sealing S3

### Dimensions

Shown in millimeters



### Header & Inner Connector Part number

| Part Number | MPM | Description   | BOM |
|-------------|-----|---|-----|
| 33211753    | 101 | Shield-Pack HV280 2 piece header with Loose Inner connector | 1   |
| 33215445    | 102 | Shield-Pack HV280 2 piece header with Loose Inner connector |     |
| 15526394    | 101 | Inner connector   | 1   |
| 15526395    | 102 | Inner connector   |     |

### Male Terminals

| Part Number | Description   | BOM |
|-------------|---|-----|
| 13753470    | 2.8 Male terminal - 2.48-3.97 cable OD 1-2 mm <sup>2</sup>                              | 2   |
| 13753471    | 2.8 Male terminal - 3-4.09 cable OD/3 mm <sup>2</sup> -5mm <sup>2</sup> solder required |     |
| 13790534    | 2.8 Male terminal - 3.40-5.24 cable OD/4-5 mm <sup>2</sup>                              |     |
| 15432235    | HVIL terminal   | 2   |

### TPA

| Part Number | Description                       | BOM |
|-------------|-----------------------------------|-----|
| 15526390    | TPA (Terminal Position Assurance) | 1   |



### Mating Part number

| Part Number | Key/index | Description   | BOM |
|-------------|-----------|---|-----|
| 13824784    | 101       | Shield-Pack HV280 Internal HVIL Shunted - (tool required for disconnection) | 1   |
| 13830159    | 102       | Shield-Pack HV280 Internal HVIL Shunted - (tool required for disconnection) |     |
| 33280354    | 101       | Shield-Pack HV280 Internal HVIL Shunted - (no tool required)                | 1   |
| 33280355    | 102       | Shield-Pack HV280 Internal HVIL Shunted - (no tool required)                |     |

### Ferrule

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13737698    | Inner ferrule 2.57-2.87 cable OD/14 gage (2mm <sup>2</sup> ) | 2   |
| 13737699    | Inner ferrule 3.30-3.46 cable OD/12 gage (3mm <sup>2</sup> ) |     |
| 13737700    | Inner ferrule 3.84-4.09 cable OD/10 ga (5mm <sup>2</sup> )   | 2   |
| 13737702    | Outer Ferrule  |     |

### Female Terminals

| Part Number | Description                                  | BOM |
|-------------|--|-----|
| 13882331    | 2.8 Female terminal - 3-4-5mm <sup>2</sup>   | 2   |
| 13799603    | 2.8 Female terminal - 1.5-2.5mm <sup>2</sup> |     |

### Seal

| Part Number | Description                        | BOM |
|-------------|------------------------------------|-----|
| 15513451    | Cable seal LSR 10ga                | 2   |
| 15513452    | Cable seal LSR 12ga                |     |
| 15513453    | Cable seal LSR 14ga                |     |
| 15513454    | Cable seal LSR 4mm <sup>2</sup> EU |     |

### TPA

| Part Number | Description                   | BOM |
|-------------|-------------------------------|-----|
| 13824780    | TPA/seal retainer Cable 14 ga | 1   |
| 13824779    | TPA/seal retainer Cable 12 ga |     |
| 13824778    | TPA/seal retainer Cable 10 ga |     |

# APEX<sup>®</sup> 950 On-Board Charger Connector

## 4 + 1 Way Connection System with HVIL

### APPLICATION

- High voltage unshielded system, especially on-board charger applications

### DESCRIPTION

- Sealed in mated or unmated position
- Unshielded 4 + 1 way connector
- Panel mount to device with face seal to module
- Unique integrated electric interlock
- HVIL shunted in harness connector
- ErgoMate™ slider for easy handling and reduced mating force
- 5 HV power circuits (four 9.5 mm and one 2.8 mm terminals)
- Cable range: 10 to 16 mm<sup>2</sup> power circuit; 0.5 to 0.75 mm<sup>2</sup> electric interlock
- 1 key/index
- Electrical protection: Finger-proof IP2XB

### Performance

125A@70C

750V DC

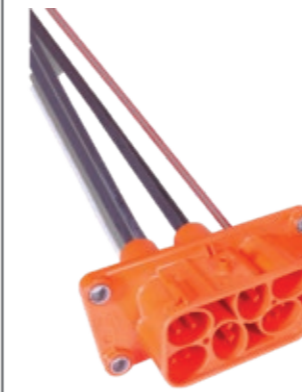
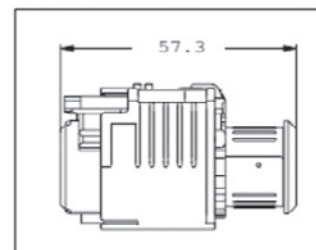
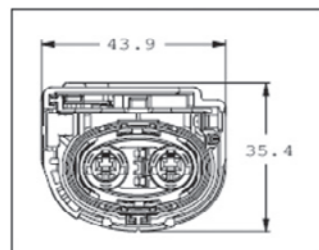
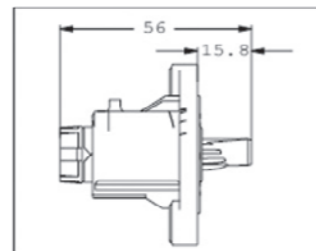
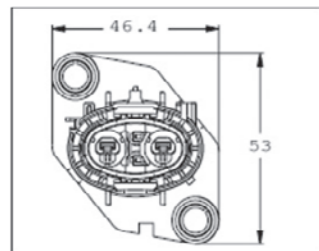
Temperature T3

Vibration V3

Sealing S3

### Dimensions

Shown in millimeters



### Header connector Part number

| Part Number | Key/index | Description                      | BOM |
|-------------|-----------|----------------------------------|-----|
| 33402137    | 1         | APEX 950 Header connector Code 1 | 1   |

### Male Terminals

| Part Number | MPM      | Description                                    | BOM |
|-------------|----------|--|-----|
| 33514386    | F008900  | APEX 950 Male Terminal 10 to 16mm <sup>2</sup> | 4   |
| 15516298    |          | APEX 280 Male Terminal 4 mm <sup>2</sup>       | 1   |
| 10779703    | 60100734 | HVIL - Interlock DCS 1.5 Male Terminal AU      | 2   |

### Seal

| Part Number | MPM      | Description                                 | BOM |
|-------------|----------|---|-----|
| 33503295    | F128900  | APEX 950 SWS wire size 16 mm <sup>2</sup>   | 4   |
| 33503294    | F028900  | APEX 950 SWS wire size 10 mm <sup>2</sup>   |     |
| 33512175    |          | APEX 2.8 SWS                                | 1   |
| 15441379    | 60993913 | DCS 1.5 SWS red 0.22 to 0.5 mm <sup>2</sup> | 2   |



### Mating Part number

| Part Number | Key/index | Description                     | BOM |
|-------------|-----------|---------------------------------|-----|
| 33402139    | 1         | APEX 950 connector black Code 1 | 1   |

### Female Terminals






| Part Number | MPM     | Description                                      | BOM |
|-------------|---------|--|-----|
| 33514387    | F018900 | APEX 950 Female Terminal 10 to 16mm <sup>2</sup> | 4   |
| 10810733    | NA      | APEX 2.8 Female Terminal 4 mm <sup>2</sup>       | 1   |

### Seal

| Part Number | MPM      | Description                                 | BOM |
|-------------|----------|---|-----|
| 33503295    | F128900  | APEX 950 SWS wire size 16 mm <sup>2</sup>   | 4   |
| 33503294    | F028900  | APEX 950 SWS wire size 10 mm <sup>2</sup>   |     |
| 33512175    | NA       | APEX 2.8 SWS                                | 1   |
| 15441379    | 60993913 | DCS 1.5 SWS red 0.22 to 0.5 mm <sup>2</sup> | 2   |

# Selector Guide

## Power Conversion Solutions

| Image   | Page # | Application   | Description                   | Temperature<br>Vibration<br>Class  | Shielding                          | Amperage                        | Voltage                           | #Ways<br>orientation    | Sections        |
|---|--------|---|-------------------------------|--|------------------------------------|---------------------------------|-----------------------------------|-------------------------|-----------------|
|    | 24-25  | Inverter<br>DC/DC<br>Converter<br>Battery<br>junction box<br>power<br>electric box<br>High Voltage<br>Power<br>Distribution | AK class 4 header             | Temperature:<br>Level 4<br>Vibration:<br>Level 3<br>(LV 215)<br><br>T4<br>V2 | Shielded<br>individual<br>cables   | 180A<br>at 140°C<br>(50 mm²)    | 1000V                             | 2 ways/<br>90°          | 25 to<br>50 mm² |
|   |        |   | AK class 4 female plug        |  |                                    |                                 |                                   |                         |                 |
|   | 26-27  |   | RCS800 2way header            | T3<br>V2   | Shielded<br>with<br>metal<br>braid | 210A<br>at 85°C<br>(50 mm²)     | 1000V                             | 2 ways/<br>90°          | 35 to<br>50 mm² |
|   |        |   | RCS-800 2way plug             |  |                                    |                                 |                                   |                         |                 |
|   |        |   | RCS800 female terminal        |  |                                    |                                 |                                   |                         |                 |
|  | 28-29  |   | RCS890 2way header            | T3<br>V1   | Shielded<br>with<br>metal<br>braid | 210A<br>at<br>85°C<br>(50 mm²)  | 1000V                             | 2 ways/<br>180°         | 35 to<br>50 mm² |
|   |        |   | RCS-890 2way plug             |  |                                    |                                 |                                   |                         |                 |
|   |        |   | RCS890 female terminal        |  |                                    |                                 |                                   |                         |                 |
|  | 30-31  |   | Plastic AK pass-through 1way  | Temperature:<br>Level 4<br>Viration:<br>Level 3<br>(LV 215)<br><br>T4<br>V3  | Shielded<br>individual<br>cables   | 200A<br>at<br>140°C<br>(50 mm²) | 1000V                             | 1 to<br>3 ways/<br>180° | 16 to<br>50 mm² |
|   |        |   | Plastic AK pass- through 2way |  |                                    |                                 |                                   |                         |                 |
|   |        | Plastic AK pass- through 3way   |                               |  |                                    |                                 |                                   |                         |                 |
|  | 32-33  | Metal pass through 25 mm²   | T3<br>V4                      | Shielded<br>individual<br>cables   | 250A<br>at<br>85°C<br>(50 mm²)     | 1000V                           | 1 way<br>with<br>indexes/<br>180° | 25 to<br>50 mm²         |                 |
|   |        | Metal pass through 35 mm²   |                               |  |                                    |                                 |                                   |                         |                 |
|   |        | Metal pass through 50 mm²   |                               |  |                                    |                                 |                                   |                         |                 |

# HV890 AK Class 4

## 2 Way Connection System with HVIL

### APPLICATION

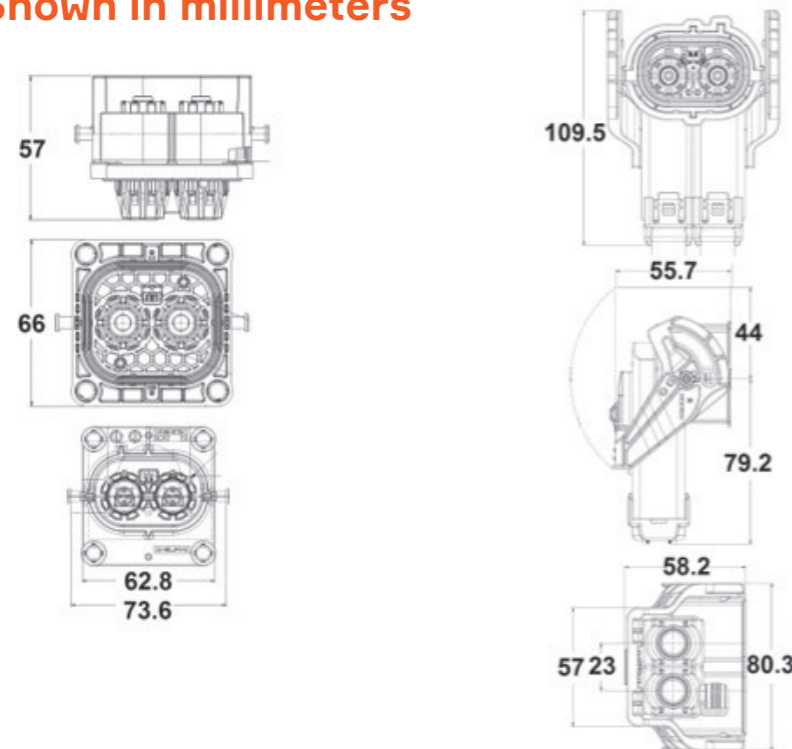
- High voltage/high current modules: inverter, battery, junction box, power electric box

### DESCRIPTION

- Number of ways: 2
- Number of indexes: 4
- Terminal Size/Style: Ø8mm Pin & Sleeve
- Wire range: 25mm<sup>2</sup> to 50mm<sup>2</sup>
- Fully interchangeable with other AK products
- Vibration severity 3 LV215
- Temperature severity 4 LV215
- Electrical Protection: Finger-proof IP2XB

### Dimensions

Shown in millimeters



### Performance

170A@140C

1000V DC

Temperature T4

Vibration V2

Sealing S3



### Header connector Part number

| Part Number | Description                       | BOM |
|-------------|-----------------------------------|-----|
| 35166503    | AK4 2 Way Pin Header-Code A UL HB | 1   |
| 35166504    | AK4 2 Way Pin Header-Code B UL HB |     |
| 35166505    | AK4 2 Way Pin Header-Code C UL HB |     |
| 35166506    | AK4 2 Way Pin Header-Code D UL HB |     |
| 33351454    | AK4 2 Way Pin Header-Code A UL V0 |     |
| 33351455    | AK4 2 Way Pin Header-Code B UL V0 |     |

### HVIL terminal (Interlock)

| Part Number | Description            | BOM |
|-------------|------------------------|-----|
| 14187603    | MCON 1.2 Male terminal | 2   |



### Female Connector

| Part Number | Description              | BOM |
|-------------|--------------------------|-----|
| 33355781    | AK Class 4 female Code A | 1   |
| 33355782    | AK Class 4 female Code B |     |
| 33355783    | AK Class 4 female Code C |     |
| 33355784    | AK Class 4 female Code D |     |

### Associated Components

| Part Number | Description            | BOM |
|-------------|------------------------|-----|
| 35172730    | Outer insulation       | 2   |
| 35172744    | Active Female Terminal | 2   |

### 25 mm<sup>2</sup>

| Part Number | Description                                 | BOM |
|-------------|---|-----|
| 35172741    | Crimp Female Terminal 25mm                  | 2   |
| 35172724    | Inner Ferrule 25mm <sup>2</sup>             | 2   |
| 35172727    | Outer Ferrule 25mm <sup>2</sup> - Ni plated | 2   |
| 35172735    | ASM Strain Relief 25 mm <sup>2</sup>        | 2   |
| 35172732    | Cable Seal 25mm <sup>2</sup>                | 2   |

### 35 mm<sup>2</sup>

| Part Number | Description                                 | BOM |
|-------------|---|-----|
| 35172742    | Crimp Female Terminal 35/50mm <sup>2</sup>  | 2   |
| 35172725    | Inner Ferrule 35mm <sup>2</sup>             | 2   |
| 35172728    | Outer Ferrule 35mm <sup>2</sup> , Ni plated | 2   |
| 35172736    | ASM Strain Relief 35 mm <sup>2</sup>        | 2   |
| 35172733    | Cable Seal 35mm <sup>2</sup>                | 2   |

### 50 mm<sup>2</sup>

| Part Number | Description                                 | BOM |
|-------------|---|-----|
| 35172742    | Crimp Female Terminal 35/50mm <sup>2</sup>  | 2   |
| 35172726    | Inner Ferrule for 50mm <sup>2</sup>         | 2   |
| 35172729    | Outer Ferrule 50mm <sup>2</sup> , Ni plated | 2   |
| 35172737    | ASM Strain Relief 50 mm <sup>2</sup>        | 2   |
| 35172734    | Cable Seal 50mm <sup>2</sup>                | 2   |

# RCS800 High Voltage

## 2 Way Connection System with HVIL

### APPLICATION

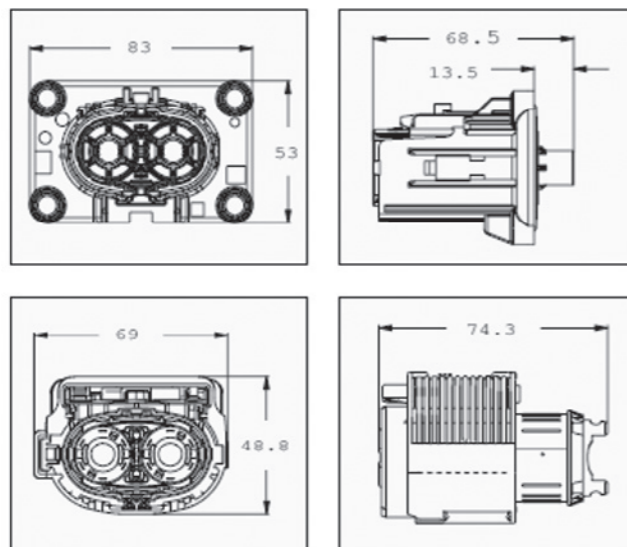
- High voltage/high current modules: inverter, battery, junction box, power electric box

### DESCRIPTION

- Bundle shielding with external braid
- Dual sealing connection system: mated and unmated header
- Panel mount to device with face seal to module
- Unique integrated electric interlock
- HVIL shunted in harness connector
- Two-stage disconnect for safe unmating
- ErgoMate™ Axial Mating Assist System on harness connector
- Two HV power circuits (8.0 mm round terminal)
- Cable range: 35 to 50 mm<sup>2</sup> power circuit; 0.5 to 0.75 mm<sup>2</sup>
- Sealing protection: IP67, IPX9K
- Electrical protection: Finger-proof IP2XB

### Dimensions

Shown in millimeters



### Performance

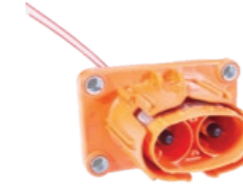
230A@70C

1000V DC

Temperature T3

Vibration V1

Sealing S3



### Header connector Part number

| Part Number | MPM     | Key/index | Description                       | BOM |
|-------------|---------|-----------|-----------------------------------|-----|
| 33511764    | F473110 | 1         | RCS-800 2 way header Code 1 Black | 1   |
| 33511762    | F573110 | 2         | RCS-800 2 way header Code 2 Brown |     |

### Male Terminals

| Part Number | MPM      | Description  | BOM |
|-------------|----------|--|-----|
| 33512193    | F076600  | RCS 800 male Bus Bar Terminal Silver version standard length               | 2   |
| 33511746    | F176600  | RCS 800 male Bus Bar Terminal Silver version V1 length                     |     |
| 33511747    | F276600  | RCS 800 male Bus Bar Terminal Silver version V2 length                     |     |
| 10779703    | 60100734 | HVIL- Interlock DCS2 1.5 gold-plated male terminal 0,5-1,0 mm <sup>2</sup> | 2   |

### Seal

| Part Number | MPM      | Description                                      | BOM |
|-------------|----------|--|-----|
| 15441379    | 60993913 | DCS 1.5 male Red SWS 0,22 - 0,5 mm <sup>2</sup>  | 2   |
| 15441380    | 60993928 | DCS 1.5 male Grey SWS 0,75 - 1,0 mm <sup>2</sup> |     |



### Mating Part number

| Part Number | MPM     | Key/index | Description                    | BOM |
|-------------|---------|-----------|--------------------------------|-----|
| 13974469    | F673110 | 1         | RCS-800 2WAY plug Code 1 Black | 2   |
| 33511761    | F773110 | 2         | RCS-800 2WAY plug Code 2 Brown |     |

### Female Terminals

| Part Number | MPM     | Description   | BOM |
|-------------|---------|---|-----|
| 13893887    | F385400 | RCS 800 female terminal silver version 35 to 50 mm <sup>2</sup> | 2   |
| 13893889    | F527600 | RCS 800 female retainer (plug)                                  | 2   |

### Seal

| Part Number | MPM     | Description                                     | BOM |
|-------------|---------|---|-----|
| 13893888    | F427600 | RCS 800 Female SWS 35-40 MM <sup>2</sup> (Plug) | 2   |
| 13923559    | F327600 | RCS 800 Female SWS 50 MM <sup>2</sup> (Plug)    |     |

# RCS890 High Voltage

## 2 Way Right Angle Connection System with HVIL

### APPLICATION

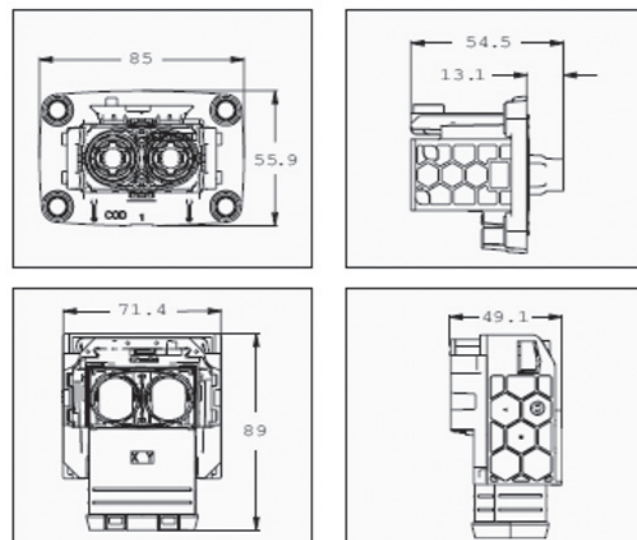
- High voltage/high current modules: inverter, battery, junction box, power electric box

### DESCRIPTION

- 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-stage disconnect for safe unmating
- Slider Mating Assist System on harness connector
- Two HV power circuits (8.0 mm round terminal)
- Flange size: 51 mm x 62 mm
- Cable range: 35 to 50 mm<sup>2</sup> power circuit; 0.5 to 0.75 mm<sup>2</sup> HVIL
- Sealing protection: IP67, IPX9K
- Electrical protection: Finger-proof IP2XB

### Dimensions

Shown in millimeters



### Performance

220A@70C

1000V DC

Temperature T3

Vibration V2

Sealing S3



### Header connector Part number

| Part Number | MPM     | Key/index | Description                       | BOM |
|-------------|---------|-----------|-----------------------------------|-----|
| 33503821    | F722210 | 1         | RCS-890 2-Way Header Code 1 Black | 1   |

### Male Terminals

| Part Number | MPM      | Description   | BOM |
|-------------|----------|---|-----|
| 33512193    | F076600  | RCS 800 Male Bus Bar Terminal Silver version standard length    | 2   |
| 33511746    | F176600  | RCS 800 Male Bus Bar Terminal Silver version V1 length          |     |
| 33511747    | F276600  | RCS 800 Male Bus Bar Terminal Silver version V2 length          |     |
| 10811962    | 60001534 | DCS2 1.5 gold-plated Female Terminal 0.5 to 1.0 mm <sup>2</sup> | 2   |

### Seal

| Part Number | MPM      | Description                                      | BOM |
|-------------|----------|--|-----|
| 15441379    | 60993913 | DCS 1.5 Male red SWS 0,22 - 0,5 mm <sup>2</sup>  | 2   |
| 15441380    | 60993928 | DCS 1.5 Male grey SWS 0,75 - 1,0 mm <sup>2</sup> |     |

### Mating Part number

| Part Number | MPM     | Key/index | Description                     | BOM |
|-------------|---------|-----------|---------------------------------|-----|
| 33511750    | F922210 | 1         | RCS-890 2-way Plug Code 1 Black | 1   |

### Female Terminals

| Part Number | MPM     | Description   | BOM |
|-------------|---------|---|-----|
| 33502217    | F601010 | RCS 890 Female Terminal silver version 35 to 50 mm <sup>2</sup> | 2   |

### Seal & Retainer

| Part Number | MPM     | Description  | BOM |
|-------------|---------|--|-----|
| 33511754    | F232210 | RCS 890 2-way Female SWS & Retainer (PLUG) 50 mm <sup>2</sup>    | 2   |
| 33511753    | F132210 | RCS 890 2-way Female SWS & Retainer (PLUG) 35-40 mm <sup>2</sup> |     |

### Clamp

| Part Number | MPM     | Description             | BOM |
|-------------|---------|-------------------------|-----|
| 33504038    | F825010 | RCS890 2-way Half Clamp | 2   |



# AK Plastic pass-through

## 1, 2 & 3 way Panel Mount System

### APPLICATION

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

### DESCRIPTION

- Possible configurations: 1, 2 or 3 ways
- Main Housing Material: Plastic
- Terminal Size/Style: Ring-Tongue
- Wire range: 16mm<sup>2</sup> to 50mm<sup>2</sup>
- Shielding principle: 360° Individually Shielded

### Performance

200A@140C

1000V DC

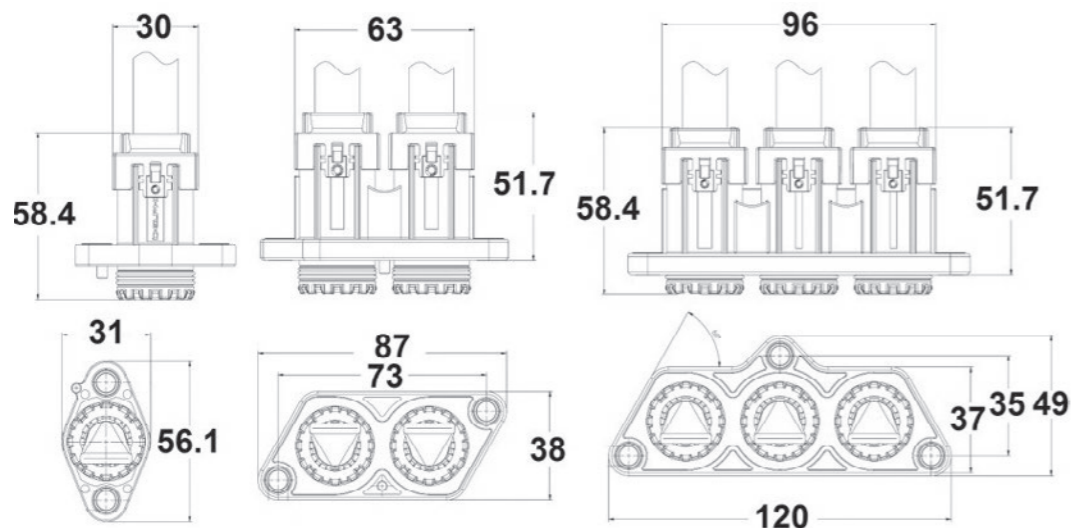
Temperature T4

Vibration V3

Sealing S3

### Dimensions

Shown in millimeters



### Housing Body Component

| Part Number | Description                      | BOM       |
|-------------|----------------------------------|-----------|
| 33340524    | ASM AK pass-through 1-way Code A | 1         |
| 35066699    | ASM AK pass-through 1-way Code B |           |
| 33340525    | ASM AK pass-through 2-way        |           |
| 33340526    | ASM AK pass-through 3-way        |           |
| 35116341    | Peripheral Seal                  | 1, 2 or 3 |
| 35172747    | ASM Shielding Inner Ferrule      | 1, 2 or 3 |

### 16 mm<sup>2</sup>

| Part Number | Description  | BOM       |
|-------------|--|-----------|
| 33340537    | Single Wire Seal for 16 mm <sup>2</sup> cable        | 1, 2 or 3 |
| 33340542    | Protection Cover Assembly for 16mm <sup>2</sup>      | 1, 2 or 3 |
| 33340554    | Shielding Outer Ferrule for 16 mm <sup>2</sup> cable | 1, 2 or 3 |

### 25 mm<sup>2</sup>

| Part Number | Description  | BOM       |
|-------------|--|-----------|
| 35172739    | Single Wire Seal for 25 mm <sup>2</sup> cable          | 1, 2 or 3 |
| 33340541    | Protection Cover Assembly for 25 mm <sup>2</sup> cable | 1, 2 or 3 |
| 35172745    | Shielding Outer Ferrule for 25 mm <sup>2</sup> cable   | 1, 2 or 3 |

### 35 mm<sup>2</sup>

| Part Number | Description  | BOM       |
|-------------|--|-----------|
| 35172738    | Single Wire Seal for 35 mm <sup>2</sup> cable,         | 1, 2 or 3 |
| 33340540    | Protection Cover Assembly for 35 mm <sup>2</sup> cable | 1, 2 or 3 |
| 35172743    | Shielding Outer Ferrule for 35 mm <sup>2</sup> cable   | 1, 2 or 3 |

### 50 mm<sup>2</sup>

| Part Number | Description  | BOM       |
|-------------|--|-----------|
| 33340534    | Single Wire Seal for 50 mm <sup>2</sup> cable,         | 1, 2 or 3 |
| 33340539    | Protection Cover Assembly for 50 mm <sup>2</sup> cable | 1, 2 or 3 |
| 33340551    | Shielding Outer Ferrule for 50 mm <sup>2</sup> cable   | 1, 2 or 3 |

# Metal pass-through

## 1 way Panel Mount System

### APPLICATION

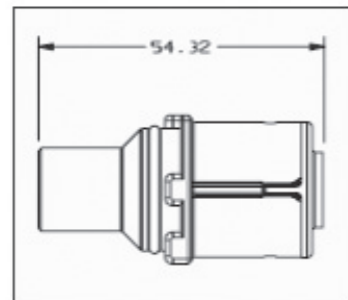
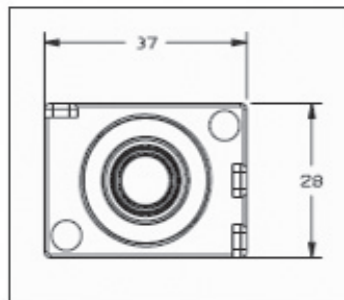
- High voltage/high current modules: inverter, battery, junction box, power electric box

### DESCRIPTION

- High voltage panel mount system
- One way sealed and shielded
- Ring terminal bolted to device
- Cable range: 25 to 50 mm<sup>2</sup>
- Six to eight keys/indexes depending on wire sections
- Very compact dimensions
- Robust design for harsh environment

### Dimensions

Shown in millimeters



### Performance

250A@85C

1000V DC

Temperature T3

Vibration V4

Sealing S3



### 25 mm<sup>2</sup> Metal pass-through Part Number

| Part Number | Key/index | Description                           | BOM |
|-------------|-----------|---------------------------------------|-----|
| 13888001    | 102       | Metal pass-through 25 mm <sup>2</sup> | 1   |
| 13888002    | 103       | Metal pass-through 25 mm <sup>2</sup> |     |
| 13888003    | 104       | Metal pass-through 25 mm <sup>2</sup> |     |
| 13888004    | 105       | Metal pass-through 25 mm <sup>2</sup> |     |
| 33253253    | 108       | Metal pass-through 25 mm <sup>2</sup> |     |
| 33253254    | 109       | Metal pass-through 25 mm <sup>2</sup> |     |

### Accessories

| Part Number | Description                      | BOM |
|-------------|----------------------------------|-----|
| 13888023    | 25 mm <sup>2</sup> Seal retainer | 1   |
| 13888030    | 25 mm <sup>2</sup> Seal          | 1   |
| 13888025    | O-ring Seal                      | 1   |
| 33295901    | 25 mm <sup>2</sup> Ferrule       | 1   |

### 35 mm<sup>2</sup> Metal pass-through Part Number

| Part Number | Key/index | Description                           | BOM |
|-------------|-----------|---------------------------------------|-----|
| 13894189    | 102       | Metal pass-through 35 mm <sup>2</sup> | 1   |
| 13894190    | 103       | Metal pass-through 35 mm <sup>2</sup> |     |
| 13894191    | 104       | Metal pass-through 35 mm <sup>2</sup> |     |
| 13894192    | 105       | Metal pass-through 35 mm <sup>2</sup> |     |
| 33253255    | 108       | Metal pass-through 35 mm <sup>2</sup> |     |
| 33253256    | 109       | Metal pass-through 35 mm <sup>2</sup> |     |

### Accessories

| Part Number | Description                      | BOM |
|-------------|----------------------------------|-----|
| 13894241    | 35 mm <sup>2</sup> Seal retainer | 1   |
| 33288396    | 35 mm <sup>2</sup> Seal          | 1   |
| 13888025    | O-ring Seal                      | 1   |
| 33295902    | 35 mm <sup>2</sup> Ferrule       | 1   |

### 50 mm<sup>2</sup> Metal pass-through Part Number




| Part Number | Key/index | Description                           | BOM |
|-------------|-----------|---------------------------------------|-----|
| 33112598    | 102       | Metal pass-through 50 mm <sup>2</sup> | 1   |
| 33112599    | 103       | Metal pass-through 50 mm <sup>2</sup> |     |
| 33112600    | 104       | Metal pass-through 50 mm <sup>2</sup> |     |
| 33112601    | 105       | Metal pass-through 50 mm <sup>2</sup> |     |
| 33112602    | 106       | Metal pass-through 50 mm <sup>2</sup> |     |
| 33112608    | 107       | Metal pass-through 50 mm <sup>2</sup> |     |
| 33112609    | 108       | Metal pass-through 50 mm <sup>2</sup> |     |
| 33112610    | 109       | Metal pass-through 50 mm <sup>2</sup> |     |

### Accessories

| Part Number | Description                      | BOM |
|-------------|----------------------------------|-----|
| 33112613    | 50 mm <sup>2</sup> Seal retainer | 1   |
| 33112616    | 50 mm <sup>2</sup> Seal          | 1   |
| 13888025    | O-ring Seal                      | 1   |
| 33295903    | 50 mm <sup>2</sup> Ferrule       | 1   |

# Selector Guide

## 12, 24 and 48 Volt Solutions

| Image   | Page # | Application   | Description   | Temperature<br>Vibration Class | Shielding | Amperage     | Voltage   | # Ways orientation         | Sections                |
|---|--------|---|---|--------------------------------|-----------|--------------|-----------|----------------------------|-------------------------|
|    | 36-37  | High current module mates   | <b>Power Pack 1000 1way Inline Connectors</b>                                   | T3<br>V1                       | No        | 145A at 85°C | 12 to 48V | 1 to 2 ways/<br>90° & 180° | 8 to 25 mm <sup>2</sup> |
|   | 38-39  | Electrical center mate<br>Front Wall/ Sheet metal Power Pass-through<br>Electric Power Steering | <b>Power Pack 1000 2way Device Connector with straight and right angle Exit</b> |                                |           |              |           |                            |                         |
|  | 40-41  | High Current inline   | <b>Power Pack 1000 2way Inline Connectors</b>                                   |                                |           |              |           |                            |                         |

# Power Pack 1000

## 1 Way Inline Connectors

### APPLICATION

- High current wiring harness inline

### DESCRIPTION

- Sealed connection system
- Silver-plated Power Pack1000 multi-contact terminal system
- Cable range: 8 mm<sup>2</sup> to 25 mm<sup>2</sup>
- One key/index
- Capable of additional indexes

### Performance

145A@85C

48V

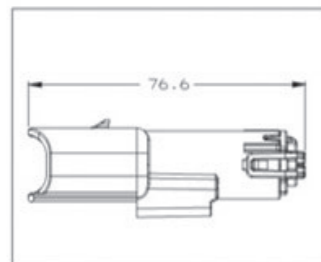
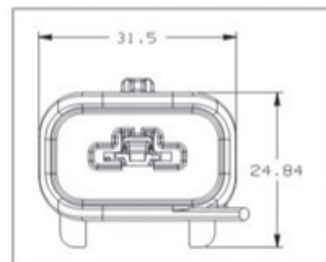
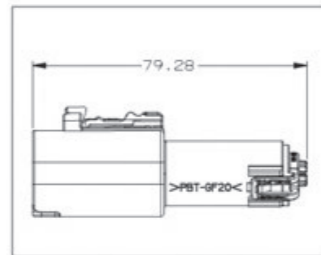
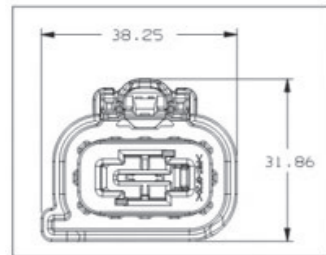
Temperature T3

Vibration V1

Sealing S3

### Dimensions

Shown in millimeters



### Male Connector Part number

| Part Number | Description                            | BOM |
|-------------|--|-----|
| 13882980    | Power Pack 1000 male in-line connector | 1   |

### Male Terminal Part Number

| Part Number | Description                                       | BOM |
|-------------|---|-----|
| 13675577    | PP1000 Male Silver Terminal 8-10 mm <sup>2</sup>  | 1   |
| 13675579    | PP1000 Male Silver Terminal 19-25 mm <sup>2</sup> |     |

### Cable Seal

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13675510    | Cable seal PP1000 4.54 - 5.79 dia cable (Grey) (8-10mm <sup>2</sup> )  | 1   |
| 13675513    | Cable seal PP1000 4.54 - 5.79 dia cable (Blue) (19-25mm <sup>2</sup> ) |     |

### Cable Seal Retainer

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849785    | Cable seal retainer PP1000 (8-10mm <sup>2</sup> )  | 1   |
| 13849788    | Cable seal retainer PP1000 (19-25mm <sup>2</sup> ) |     |



### Mating Part number

| Part Number | Description                              | BOM |
|-------------|--|-----|
| 13952702    | Power Pack 1000 female in-line connector | 1   |

### Female Terminal Part Number

| Part Number | Description   | BOM |
|-------------|---|-----|
| 13675583    | PP1000 Female Silver Terminal 8-10 mm <sup>2</sup>  | 1   |
| 13675585    | PP1000 Female Silver Terminal 19-25 mm <sup>2</sup> |     |

### Cable Seal

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13675510    | Cable seal PP1000 4.54 - 5.79 dia cable (gray) (8-10mm <sup>2</sup> )  | 1   |
| 13675513    | Cable seal PP1000 4.54 - 5.79 dia cable (blue) (19-25mm <sup>2</sup> ) |     |

### Cable Seal Retainer

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849785    | Cable seal retainer PP1000 (8-10mm <sup>2</sup> )  | 1   |
| 13849788    | Cable seal retainer PP1000 (19-25mm <sup>2</sup> ) |     |

# Power Pack 1000

## 2 Way Device Connectors

### APPLICATION

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

### DESCRIPTION

- Sealed connection system
- Sealed panel mount pre-stages prior to fastening through self tapping screws
- Silver-plated Power Pack 1000 multi-contact terminal system
- Cable range: 8 mm<sup>2</sup> to 25 mm<sup>2</sup>

Performance

145A@85C

48V

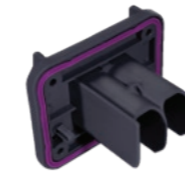
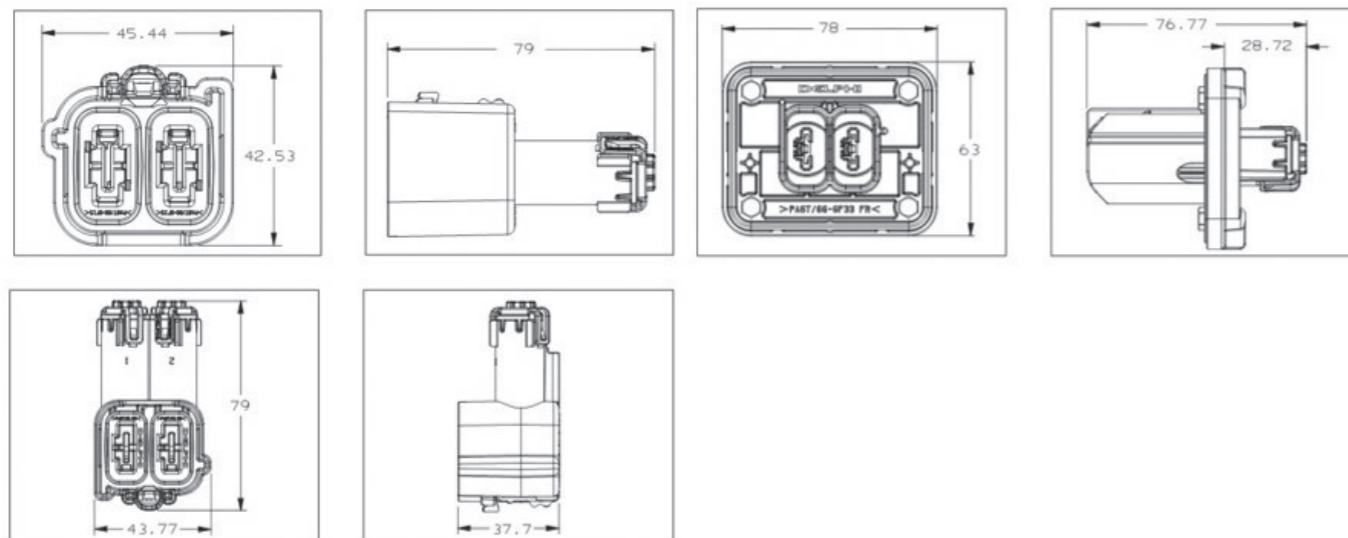
Temperature T3

Vibration V1

Sealing S3

### Dimensions

Shown in millimeters



### Header Connector Part number – Straight Exit

| Part Number | Description   | BOM |
|-------------|---|-----|
| 13959822    | Power Pack 1000 male header connector – Straight exit | 1   |
| 13675577    | PP1000 Male Silver Terminal 8-10 mm <sup>2</sup>      | 2   |
| 13675579    | PP1000 Male Silver Terminal 19-25 mm <sup>2</sup>     |     |



### Header connector Part number - Right angle exit

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13599824    | Power Pack 1000 male header connector – Right angle exit | 1   |
| 13675577    | PP1000 Male Silver Terminal 8-10 mm <sup>2</sup>         | 2   |
| 13675579    | PP1000 Male Silver Terminal 19-25 mm <sup>2</sup>        |     |

### Cable Seal

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13675510    | Cable seal PP1000 4.54 - 5.79 dia cable (gray) (8-10mm <sup>2</sup> )  | 2   |
| 13675513    | Cable seal PP1000 4.54 - 5.79 dia cable (blue) (19-25mm <sup>2</sup> ) |     |

### Cable Seal Retainer

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849785    | Cable seal retainer PP1000 (8-10mm <sup>2</sup> )  | 2   |
| 13849788    | Cable seal retainer PP1000 (19-25mm <sup>2</sup> ) |     |



### Mating Part number – Straight Exit

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849756    | Power Pack 1000 female straight exit                         | 1   |
| 13675583    | PP1000 Female Straight Silver Terminal 8-10 mm <sup>2</sup>  | 2   |
| 13675585    | PP1000 Female Straight Silver Terminal 19-25 mm <sup>2</sup> |     |



### Mating Part number – Right Angle Exit

| Part Number | Description   | BOM |
|-------------|---|-----|
| 13849758    | Power Pack 1000 female right angle exit                         | 1   |
| 13675587    | PP1000 Female Right angle Silver Terminal 8-10 mm <sup>2</sup>  | 2   |
| 13675590    | PP1000 Female Right angle Silver Terminal 19-25 mm <sup>2</sup> |     |

### Cable Seal

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13675510    | Cable seal PP1000 4.54 - 5.79 dia cable (gray) (8-10mm <sup>2</sup> )  | 2   |
| 13675513    | Cable seal PP1000 4.54 - 5.79 dia cable (blue) (19-25mm <sup>2</sup> ) |     |

### Cable Seal Retainer

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849785    | Cable seal retainer PP1000 (8-10mm <sup>2</sup> )  | 2   |
| 13849788    | Cable seal retainer PP1000 (19-25mm <sup>2</sup> ) |     |

# Power Pack 1000

## 2 Way Inline Connectors

### APPLICATION

- High current wiring harness inline

### DESCRIPTION

- Sealed connection system
- Silver-plated Power Pack 1000 multi-contact terminal system
- Cable range: 8 mm<sup>2</sup> to 25 mm<sup>2</sup>
- One key/index

### Performance

145A@85C

48V

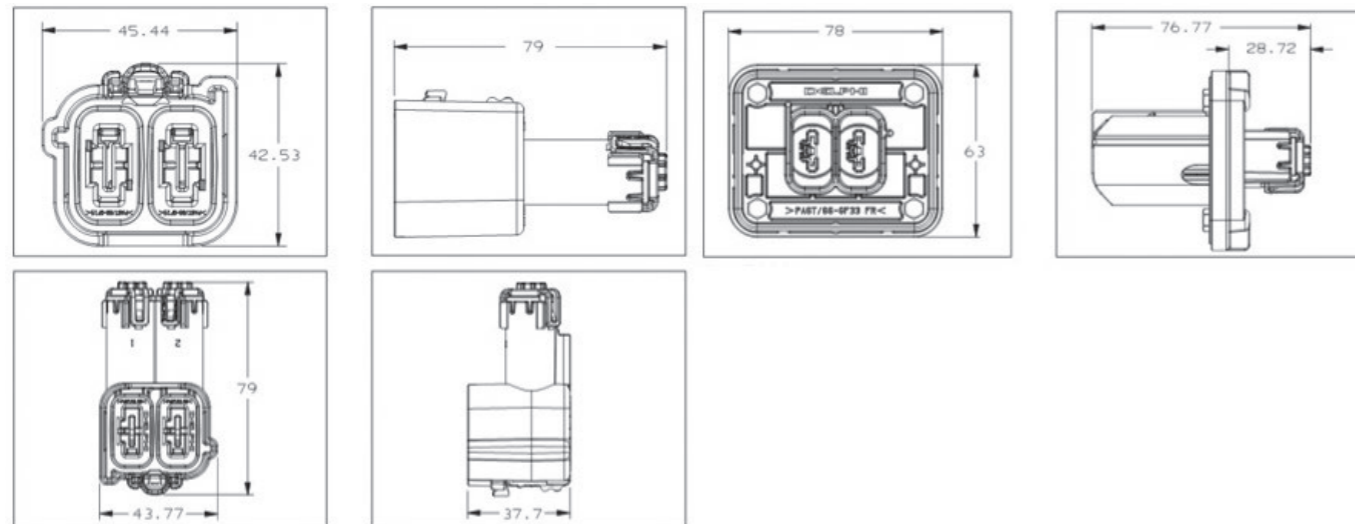
Temperature T3

Vibration V1

Sealing S3

### Dimensions

Shown in millimeters



### Male Connector Part number

| Part Number | Description   | BOM |
|-------------|---|-----|
| 13849747    | Power Pack 1000 male header connector – Straight exit | 1   |
| 13675577    | PP1000 Male Silver Terminal 8-10 mm <sup>2</sup>      | 2   |
| 13675579    | PP1000 Male Silver Terminal 19-25 mm <sup>2</sup>     |     |

### Cable Seal

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13675510    | Cable seal PP1000 4.54 - 5.79 dia cable (gray) (8-10mm <sup>2</sup> )  | 2   |
| 13675513    | Cable seal PP1000 4.54 - 5.79 dia cable (blue) (19-25mm <sup>2</sup> ) |     |

### Cable Seal Retainer

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849785    | Cable seal retainer PP1000 (8-10mm <sup>2</sup> )  | 2   |
| 13849788    | Cable seal retainer PP1000 (19-25mm <sup>2</sup> ) |     |



### Mating Part Number

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849756    | Power Pack 1000 female straight exit                         | 1   |
| 13675583    | PP1000 Female Straight Silver Terminal 8-10 mm <sup>2</sup>  | 2   |
| 13675585    | PP1000 Female Straight Silver Terminal 19-25 mm <sup>2</sup> |     |

### Cable Seal

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13675510    | Cable seal PP1000 4.54 - 5.79 dia cable (grey) (8-10mm <sup>2</sup> )  | 2   |
| 13675513    | Cable seal PP1000 4.54 - 5.79 dia cable (blue) (19-25mm <sup>2</sup> ) |     |

### Cable Seal Retainer

| Part Number | Description  | BOM |
|-------------|--|-----|
| 13849785    | Cable seal retainer PP1000 (8-10mm <sup>2</sup> )  | 2   |
| 13849788    | Cable seal retainer PP1000 (19-25mm <sup>2</sup> ) |     |

# Selector Guide

## Charging Solutions

| Image   | Page # | Application   | Description   | Temperature<br>Vibration Class | Shielding   | Amperage  | Voltage      | Wire Selections/<br>cable length |
|---|--------|---|---|--------------------------------|---|---|--------------|----------------------------------|
|    | 44-45  | Plug-in hybrid and electric vehicle AC charge inlet (Male)  | <b>SAE J1772, Type I Vehicle Charging Inlet</b>             | 10,000 + Mating cycles         | 1 Phase   | 15A<br>30A  | 120V<br>240V | 2 to 5 mm <sup>2</sup>           |
|    | 46-47  | Plug-in hybrid and electric vehicle AC charge inlet (Male)  | <b>IEC62196 type II Vehicle Charging Inlet</b>              | 10,000 + Mating cycles         | 1 Phase<br>3 Phase                                      | 16A<br>63A  | 230V<br>480V | 2.5 to 16 mm <sup>2</sup>        |
|   | 48-49  | Charging interface for slow AC (Type 1) and fast DC charging applications                               | <b>Combo 1 AC/DC Vehicle Charging Inlet</b>                 | 10,000 + Mating cycles         | 1 Phase   | 32A   | 120V<br>240V | 6 mm <sup>2</sup>                |
|  | 50-51  | Charging Interface for slow AC (Type II) and fast DC charging applications                              | <b>Combo 2 AC/DC Vehicle Charging Inlet</b>                 | 10,000 + Mating cycles         | 1 Phase<br>3 Phase                                      | 16A<br>32A  | 240V         | 4 mm <sup>2</sup>                |
|  | 52-53  | Cable assemblies for integration into charging stations (female)<br>Type 1 (NA)<br>Type 2 (EMEA)        | <b>Charge Connector - Pigtails</b>                          | 10,000 + Mating cycles         | 1 Phase<br>1 Phase &<br>3 Phase<br>1 Phase &<br>3 Phase | 16A<br>18A<br>20A<br>25A<br>32A   | 120V<br>480V | 5 to 7 mm <sup>2</sup>           |
|  | 54     | Charging between Vehicle and Charge Station<br>Type 2 to Type 2<br>Type 1 to Type 2<br>Type 1 to Type 3 | <b>Charge Connectors Mode 3 Jumpers</b>                     | 10,000 + Mating cycles         | 3 Phase<br>1 Phase<br>1 Phase<br>1 Phase                | 20A (T2-T2)<br>32A (T2-T2)<br>20A (T1-T2)<br>32A (T1-T2)<br>20A (T1-T3) | 120V<br>240V | 4 to 6.5 m                       |
|  | 55     | Portable Electric Vehicle Supply Equipment (EVSE) for electric vehicle charging (female)                | <b>Charge Coupler Connector mode 2 assembly (with ICCB)</b> | 10,000 + Mating cycles         | 1 Phase   | 8A - 10A  | 120V<br>240V | 5m                               |

# Charge Inlet

## SAE J1772 Type 1 Vehicle Charging Inlet

### APPLICATION

- Plug-in hybrid and electric vehicle charge inlet

### DESCRIPTION

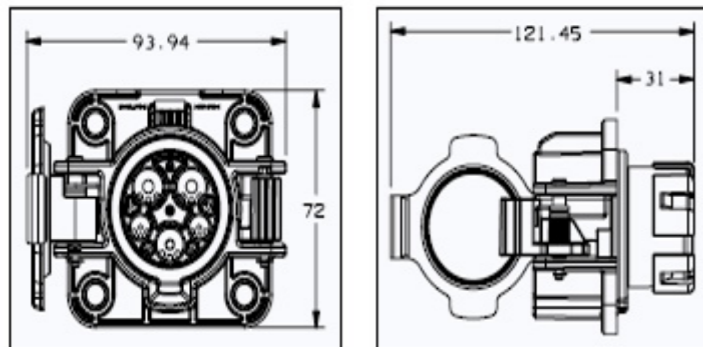
- Interface complies with SAE J1772 and IEC62196 Type I standard
- Panel mounts to vehicle
- Protective grommet/wire dress mounts to inlet

### PERFORMANCE

- Supports: AC Level 1 (15A, 120V) and AC Level 2 (32A, 240V)
- Voltage: 600V maximum rating
- Temperature range: -40°C to +85°C
- Validation: UL recognized
- Electrical protection: Finger-proof IP2XB
- Design life: 10,000 mating cycles

### Dimensions

Shown in millimeters



### Part number

| Part Number | Description      | BOM |
|-------------|------------------|-----|
| 13826395    | Cover opens left | 1   |

### Grommet

| Part Number | Description             | BOM |
|-------------|-------------------------|-----|
| 13826280    | Grommet wire protection | 1   |

### TPA

| Part Number | Description | BOM |
|-------------|-------------|-----|
| 13826277    | TPA         | 1   |

### Terminals

| Part Number | Description | AWG Gauge                         | Wire section mm <sup>2</sup> | BOM |
|-------------|-------------|-----------------------------------|------------------------------|-----|
| 13884348    | 1.5mm pin   | 18 GA (0.8-0.75 mm <sup>2</sup> ) | 0.75 mm <sup>2</sup>         | 2   |
| 13884350    | 2.8mm pin   | 14 GA (2-2.5 mm <sup>2</sup> )    | 2.5 mm <sup>2</sup>          | 1   |
| 13884351    | 2.8mm pin   | 10 GA (5 mm <sup>2</sup> )        | 5 mm <sup>2</sup>            |     |
| 13884352    | 3.6mm pin   | 14 GA (2-2.5 mm <sup>2</sup> )    | 2.5 mm <sup>2</sup>          | 2   |
| 13884353    | 3.6mm pin   | 10 GA (5 mm <sup>2</sup> )        | 5 mm <sup>2</sup>            |     |

# Charge Inlet

## Type II Vehicle Charging Inlet

### APPLICATION

- Plug-in hybrid and electric vehicle charge inlet

### DESCRIPTION

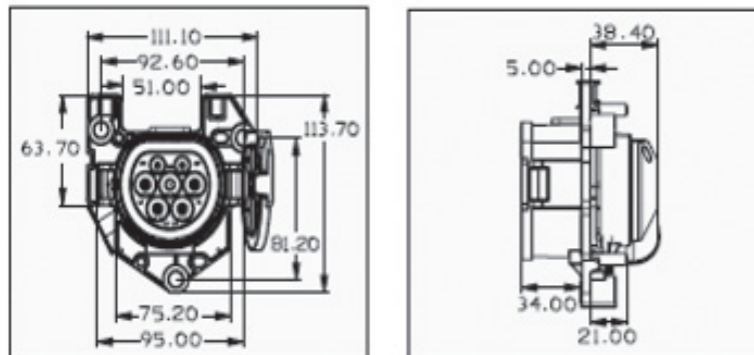
- Interface complies with IEC62196 Type II standard
- Panel mounts to vehicle
- Integrated thermal circuit breaker to prevent abnormal temperature increase
- Cover provides dust protection
- Inlet designed to drain fluids when opened
- Lock actuator positioned on the top
- Available with cover opening right or left

### PERFORMANCE

- Supports single-phase or three-phase power supply
- Supports: From 16A, 230V to 63A, 400V
- Temperature range: -40°C to +50°C
- Electrical protection: Finger-proof IP2XB
- Sealing protection: IP44 (connector/inlet mated)
- Wiring crimps sealed from environment
- Design life: 10,000+ mating cycles

## Dimensions

Shown in millimeters



### Part number

| Part Number | Description   | BOM |
|-------------|---|-----|
| 33402098    | Inlet sub-assy - INLET Type II Right open cover, Left wire exit | 1   |
| 33400030    | Rear Cover, Left wire exit                                      | 1   |
| 33402097    | Inlet sub-assy - INLET Type II Left open cover, Right wire exit | 1   |
| 33400076    | Rear Cover, Right wire exit                                     | 1   |

### Grommet

| Part Number | Description       | BOM |
|-------------|-------------------|-----|
| 33401379    | Rear grommet tube | 1   |

### TPA

| Part Number | MPN     | Description | BOM |
|-------------|---------|-------------|-----|
| 33508692    | F501410 | TPA         | 1   |

### Screw

| Part Number | MPN     | Description | BOM |
|-------------|---------|-------------|-----|
| 33514388    | F028010 | Screw       | 3   |

### Thermo sensor

| Part Number | MPN     | Description       | BOM             |
|-------------|---------|-------------------|-----------------|
| 33514398    | F373410 | Thermo sensor set | 1<br>(see note) |

### Terminals for 16A version (1-ph)

| Part Number | MPN     | Description                                     | Wire section        | BOM (1-phase) |
|-------------|---------|---|---------------------|---------------|
| 33267394    | NA      | Male terminal 6mm diameter with cap Ag - N & L1 | 2.5 mm <sup>2</sup> | 2             |
| 33513981    | F632410 | Male terminal 6mm diameter w/o cap Ni - PE      | 2.5 mm <sup>2</sup> | 1             |
| 33502256    | F832410 | Male terminal 3mm diameter - 13mm length - CP   | 0.5 mm <sup>2</sup> | 1             |
| 33502238    | F732410 | Male terminal 3mm diameter - 25mm length - PP   | 0.5 mm <sup>2</sup> | 1             |

### Terminals for 32A version (1-ph or 3-ph)\*

| Part Number | MPN     | Description                                       | Wire section        | BOM (1-phase) | BOM (3-phase) |
|-------------|---------|---|---------------------|---------------|---------------|
| 33403032    | NA      | Male terminal 6mm diam with cap Ag - N,L1,L2 & L3 | 6 mm <sup>2</sup>   | 2             | 4             |
| 33403033    | NA      | Male terminal 6mm diam w/o cap Ag - PE            | 6 mm <sup>2</sup>   | 1             | 1             |
| 33502256    | F832410 | Male terminal 3mm diameter - 13mm length -CP      | 0.5 mm <sup>2</sup> | 1             | 1             |
| 33502238    | F732410 | Male terminal 3mm diameter - 25mm length - PP     | 0.5 mm <sup>2</sup> | 1             | 1             |

### Terminals for 63A version (1-ph or 3-ph)\*

| Part Number | MPN     | Description                                      | Wire section        | BOM (1-phase) | BOM (3-phase) |
|-------------|---------|--|---------------------|---------------|---------------|
| 33267396    | NA      | Male terminal 6mm diam with cap Ag - L1,L2 ,L3,N | 16 mm <sup>2</sup>  | 2             | 3 or 4        |
| 33267394    | NA      | Male terminal 6mm diameter with cap Ag - N       | 4 mm <sup>2</sup>   |               | 1 or 0        |
| 33267382    | NA      | Male terminal 6mm diameter w/o cap Ag - PE       | 16 mm <sup>2</sup>  | 1             | 1             |
| 33502256    | F832410 | Male terminal 3mm diameter - 13mm length -CP     | 0.5 mm <sup>2</sup> | 1             | 1             |
| 33502238    | F732410 | Male terminal 3mm diameter - 25mm length - PP    | 0.5 mm <sup>2</sup> | 1             | 1             |

\* Compulsory usage of thermo sensor set

# Combo 1

## AC/DC Vehicle Charging Inlet

### APPLICATION

- Charging interface for slow AC (Type 1) and fast DC charging applications

### DESCRIPTION

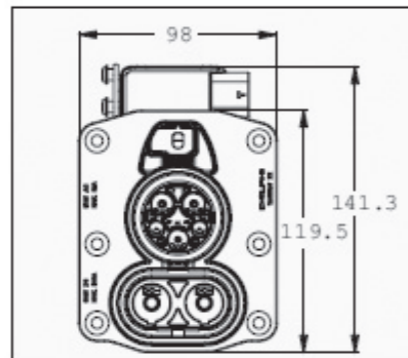
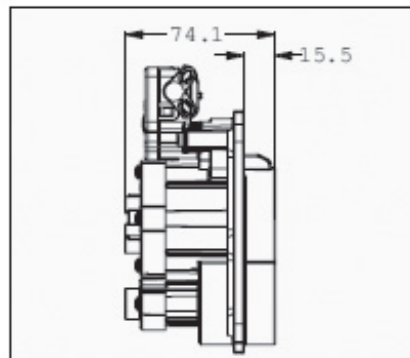
- Interface complies with SAE J1772 and IEC62196
- Combined charging system for electrical vehicle
- AC/DC: slow + fast charge (600V, 125A)
- Actuator pin for locking connector to inlet during charging
- Optional thermistor for additional thermal protection during DC charging
- Wire Cross Section: Contact Pin/Present Pin (0.5 mm<sup>2</sup>), PE (16mm<sup>2</sup>, L1/N (6.0 mm<sup>2</sup>), DC +/- (40 mm<sup>2</sup>)

### PERFORMANCE

- Temperature range: -40°C to +80°C
- Voltage: 600V
- Max. current capacity: 32A AC/ 125A DC
- Sealing protection: IP55 with cover, IP44 when mated
- Connector/Inlet mating and unmating force <100N
- Design life: 10,000+ mating cycles

### Dimensions

Shown in millimeters



### Housing Part number

| Part Number | Description  | BOM |
|-------------|--------------|-----|
| 33133127    | Main Housing | 1   |

### Components and Accessories

| Part Number | Description                                  | BOM |
|-------------|--|-----|
| 33133129    | AC Back Cover                                | 1   |
| 33133126    | AC Block Seal Cable (6mm <sup>2</sup> cable) | 1   |
| 33133116    | AC Block Seal Terminal                       | 1   |
| 33133128    | DC Back Cover                                | 1   |
| 33133115    | DC Block Seal Cable                          | 1   |
| 33133108    | DC Retainer                                  | 1   |
| 33103899    | DC O-Ring                                    | 2   |
| 33133132    | AC Retainer                                  | 1   |
| 15532546    | Screw  | 7   |

### Actuator and Seals

| Part Number | Description             | BOM |
|-------------|-------------------------|-----|
| 33235151    | Actuator Combo 1        | 1   |
| 33133105    | Block Seal for Actuator | 1   |

### Dust Caps

| Part Number | Description | BOM |
|-------------|-------------|-----|
| 33133134    | Dust Caps   | 1   |

### Terminals

| Part Number | Description  | BOM |
|-------------|--|-----|
| 15522876    | Ø 3.6 mm - 6mm <sup>2</sup> cable cross section (AC Power N, L1, L2 with protection cap) | 2   |
| 15522875    | Ø 2.8mm - 16 mm <sup>2</sup> cable cross section (Ground)                                | 1   |
| 13884348    | Ø 1.5 mm (Pilot)   | 2   |
| 15522877    | Ø 8.0 mm - 35 mm <sup>2</sup> (DC Power)   | 2   |

# Combo 2

## AC/DC Vehicle Charging Inlet

### APPLICATION

- Charging interface or slow AC (Type 11) and fast DC charging applications

### DESCRIPTION

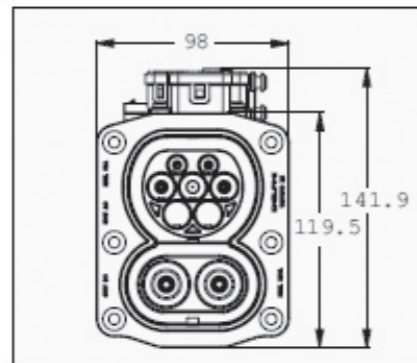
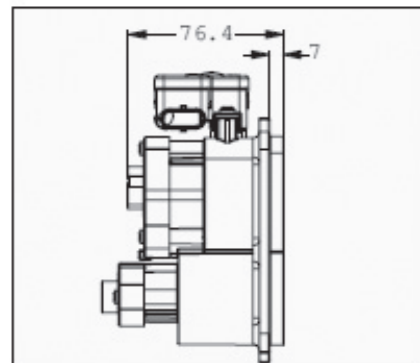
- Interface complies with SAE J1772 and IEC62196
- Combined charging system for electrical vehicle
- AC/DC: slow + fast charge (600V, 125A)
- Actuator pin for locking connector to inlet during charging
- Optional thermistor for additional thermal protection during DC charging
- Wire Cross Section: Contact Pin/Present Pin (0.5 mm<sup>2</sup>), PE (16mm<sup>2</sup>, L1/N (6.0 mm<sup>2</sup>), DC +/- (40 mm<sup>2</sup>)

### PERFORMANCE

- Temperature range: -40°C to +80°C
- Voltage: 600V
- Max. current capacity: 32A AC/ 125A DC
- Sealing protection: IP55 with cover, IP44 when mated
- Connector/Inlet mating and unmating force <100N
- Design life: 10,000+ mating cycles

### Dimensions

Shown in millimeters



### Housing Part number

| Part Number | Description  | BOM |
|-------------|--------------|-----|
| 33265593    | Main Housing | 1   |

### Components and Accesories

| Part Number | Description                                  | BOM |
|-------------|--|-----|
| 33265597    | AC Back Cover                                | 1   |
| 33265958    | AC Block Seal Cable (4mm <sup>2</sup> cable) | 1   |
| 33265598    | AC Retainer                                  | 1   |
| 33265965    | AC Block Seal Terminal                       | 1   |
| 33133855    | DC Back Cover                                | 1   |
| 33133931    | DC Block Seal Cable                          | 1   |
| 33133859    | DC Retainer                                  | 1   |
| 33103899    | DC O-Ring                                    | 2   |
| 15532546    | Screw  | 7   |

### Actuator and Seals

| Part Number | Description             | BOM |
|-------------|-------------------------|-----|
| 10808197    | Actuator Combo 2        | 1   |
| 33133105    | Block Seal for Actuator | 1   |

### Dust Caps

| Part Number | Description | BOM |
|-------------|-------------|-----|
| 33134019    | Dust Caps   | 1   |

### Terminals

| Part Number | Description   | BOM    |
|-------------|---|--------|
| 33133795    | Ø 6 mm - 4 mm <sup>2</sup> cable cross section (AC Power with protection cap) | 2 or 4 |
| 15522870    | Ø 6 mm - 16 mm <sup>2</sup> cable cross section (PE/Ground)                   | 1      |
| 33133789    | Ø 3 mm (PP/Pilot)   | 1      |
| 33133739    | Ø 3 mm <sup>2</sup> (CP/Pilot)  | 1      |
| 33133788    | Ø 8.0 mm - 35 mm <sup>2</sup> (DC Power)                                      | 2      |

### Device for Multicore to Individual Cables (Optional)

| Part Number | Description           | BOM |
|-------------|-----------------------|-----|
| 33265973    | Tube                  | 1   |
| 33265971    | Front TPA             | 1   |
| 33265972    | Back TPA              | 1   |
| 33265947    | Power cable Seal      | 1   |
| 33265941    | Power cable Blockseal | 1   |

# Charge Connectors

## Pigtails

### APPLICATION

- Grid-to-vehicle charging
- Charging infrastructure-to-vehicle

### DESCRIPTION

- SAE J1772/IEC62196 Type I, IEC62196 Type II, and GB/T 20234 standards
- Wiring crimps sealed from environment
- Rubber over-mold and plastic grip options available

### PERFORMANCE

- Current capacity: 18A to 40A
- Voltage range: 120V to 480V
- Temperature range: -40°C to +50°C
- Validation: See part number information



SAE J1772/IEC62196 Type I – Plastic Handle



IEC62196 Type II – Plastic Handle



SAE J1772/IEC62196 Type I – Rubber Over Mold



IEC62196 Type II – Rubber Over Mold

| Part Number | Type (veh/wall)  | Current | # phase | Design           | cable length (m/ft) | Cable sections  | Certification | Manufacturing plant |
|-------------|------------------|---------|---------|------------------|---------------------|-----------------|---------------|---------------------|
| 33248422    | Type 1/SAE J1772 | 18 A    | 1-phase | Plastic handle   | 7.0/23              | 3G AWG 14 + 0.8 | UL            | North America       |
| 33248425    | Type 1/SAE J1772 | 25 A    | 1-phase | Plastic handle   | 7.6/25              | 3G AWG 12 + 0.8 | UL            | North America       |
| 35078184    | Type 1/SAE J1772 | 40 A    | 1-phase | Plastic handle   | 7.6/25              | 3G AWG 10 + 0.8 | UL            | North America       |
| 33155748    | Type 1           | 20A     | 1-phase | Rubber over mold | 5.0/16.40           | 3G2.5 +0.5      | CE            | Europe              |
| 33155747    | Type 2           | 20A     | 1-Phase | Rubber over mold | 5.0/16.40           | 3G2.5 +0.5      | CE            | Europe              |
| 33155746    | Type 2           | 20A     | 3-Phase | Rubber over mold | 5.0/16.40           | 5G2 +0.5        | CE            | Europe              |
| 33155745    | Type 2           | 32A     | 3-phase | Rubber over mold | 5.0/16.40           | 5G6 +0.5        | CE            | Europe              |
| 33502596    | Type 2           | 16A     | 1-phase | Plastic handle   | 6.5/21.32           | 3G2.5 +0.75     | CE            | Europe              |
| 33507943    | Type 1 cap       |         |         |                  |                     |                 |               | Europe              |
| 15527767    | Type 2 cap       |         |         |                  |                     |                 |               | Europe              |

# Charge Connectors

## Mode 3 Jumpers

### APPLICATION

- Cable assemblies for plugging from charging station to vehicle

### DESCRIPTION

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

### AVAILABLE OPTIONS

- 20 to 32A
- 1-phase 240V or 3-phase 400V charging for Type II
- 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



SAE J1772/IEC62196 Type I – Plastic Handle



SAE J1772/IEC62196 Type I – Plastic Handle



SAE J1772/IEC62196 Type I – Plastic Handle

| Part number | Type (veh/wall) | Current | # phase | Design           | cable length (m/ft) | Cable sections | Marking | Manufacturing plant |
|-------------|-----------------|---------|---------|------------------|---------------------|----------------|---------|---------------------|
| 33358146    | Jumper T2 -T2   | 20A     | 3-phase | All plastic grip | 6.5/21.32           | 5G4+0.75       | CE      | Europe              |
| 35137656    | Jumper T2 -T2   | 32A     | 3-phase | All plastic grip | 4.0/13.12           | 5G4+0.75       | CE      | Europe              |
| 35141693    | Jumper T2 -T2   | 32A     | 3-phase | All plastic grip | 6.5/21.32           | 5G4+0.75       | CE      | Europe              |
| 33401184    | Jumper T1 -T2   | 20A     | 1-phase | All plastic grip | 6.0/19.68           | 3G2.5+0.75     | CE      | Europe              |
| 33403378    | Jumper T1 -T2   | 32A     | 1-phase | All plastic grip | 6.0/19.68           | 3G6+0.75       | CE      | Europe              |
| 33401185    | Jumper T1 -T3   | 20A     | 1-phase | All plastic grip | 6.0/19.68           | 3G2.5+0.75     | CE      | Europe              |

# Charge plug mode 2 assembly (with ICCB) Generation II

### APPLICATION

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

### DESCRIPTION

- Vehicle interface according to IEC62196-2-2
- EVSE provides restart in the event of power grid fault
- Product according to the new IEC62752 standard including Type B RCD and residential DC current detection
- CE Marking
- Control box has higher water sealing protection than the standard: IP67
- Dual-thermo sensors in the grid plug provide superior overheating protection

### AVAILABLE OPTIONS

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



| Part Number | Type (veh) | Current | # phase | Design    | cable length (m/ft) | Countries                   | Marking | Manufacturing plant |
|-------------|------------|---------|---------|-----------|---------------------|-----------------------------|---------|---------------------|
| 35054780    | Type 2     | 10A     | 1-phase | Soft grip | 5.0/16.40           | Europe, Germany             | CE      | Europe              |
| 35086913    | Type 2     | 8A      | 1-phase | Soft grip | 5.0/16.40           | France, Finland             | CE      | Europe              |
| 35054781    | Type 2     | 10A     | 1-phase | Soft grip | 5.0/16.40           | UK, Ireland, Cyprus, Malta  | CE      | Europe              |
| 35058252    | Type 2     | 6A      | 1-phase | Soft grip | 5.0/16.40           | Denmark                     | CE      | Europe              |
| 35054782    | Type 2     | 8A      | 1-phase | Soft grip | 5.0/16.40           | Switzerland                 | CE      | Europe              |
| 35054784    | Type 2     | 10A     | 1-phase | Soft grip | 5.0/16.40           | Norway                      | CE      | Europe              |
| 35054788    | Type 2     | 8A      | 1-phase | Soft grip | 5.0/16.40           | Italy                       | CE      | Europe              |
| 35054783    | Type 2     | 15A     | 1-phase | Soft grip | 5.0/16.40           | Europe - Grid plug CEE 16/3 | CE      | Europe              |



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