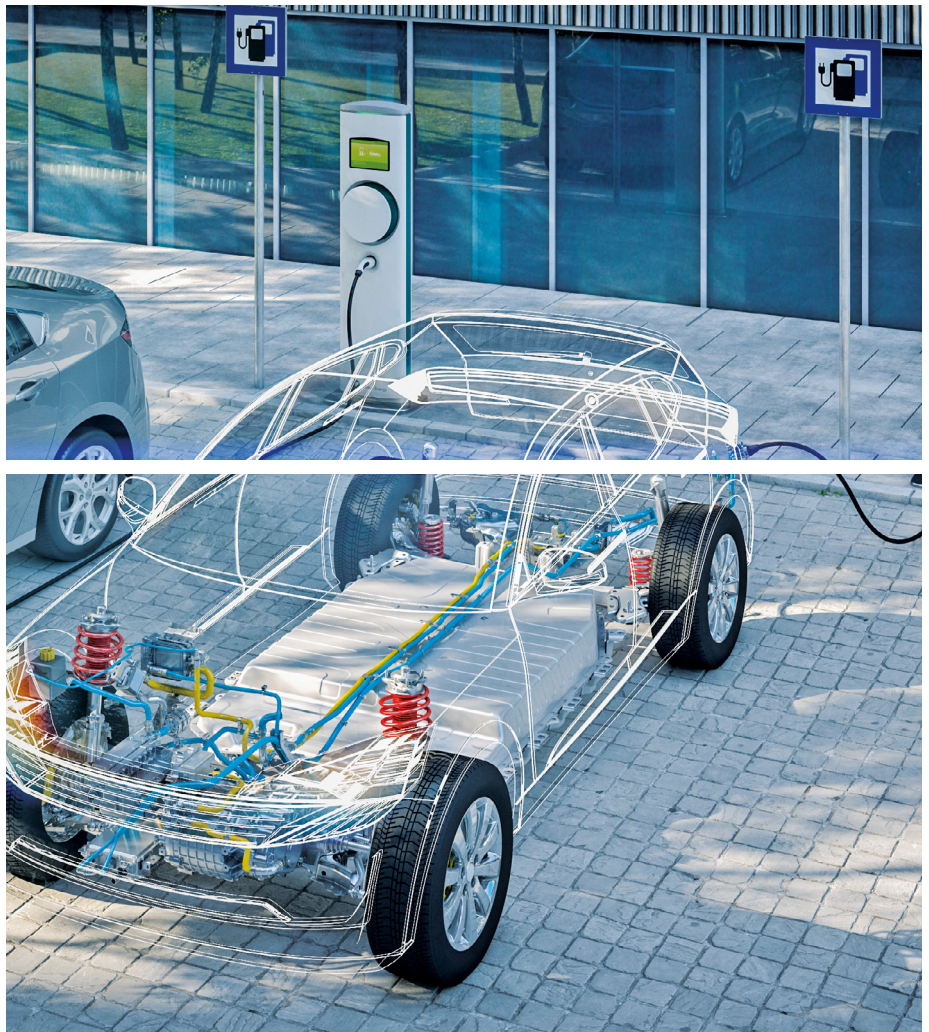


# NEXT GENERATION AMP+ CHARGING INLETS

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HYBRID & ELECTRIC MOBILITY SOLUTIONS



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# HIGH-VOLTAGE CONNECTIVITY SOLUTIONS



From the  
Charging  
Point ...



... to the  
Battery ...



... to the  
E-Motor.

TE Connectivity's (TE) portfolio of connectivity solutions for hybrid and electric vehicles cover the entire range of electric powertrains, providing a complete line of connectors, relays, contactors, harnesses and disconnects to safely connect and protect the power flow.

Our hybrid and electric mobility connectivity technologies leverage decades of experience with high-voltage generation, transmission and distribution. These are classified in the following four application areas:



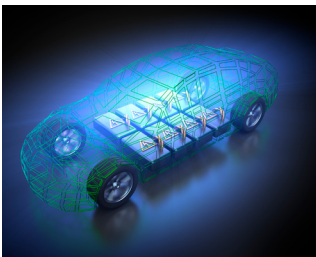
## HV AUXILIARY MODULES

- DC / DC Converter
- On-Board Charger
- HV Heater
- HV Climate Compressor



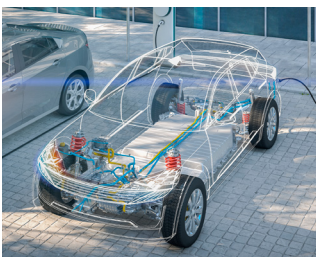
## HV POWERTRAIN

- Inverter
- E-Motor
- HV Battery



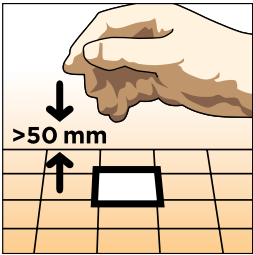
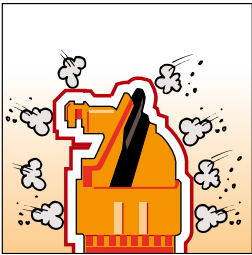
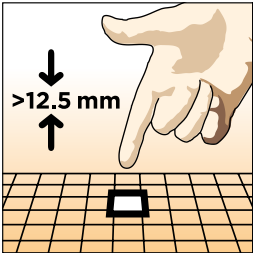
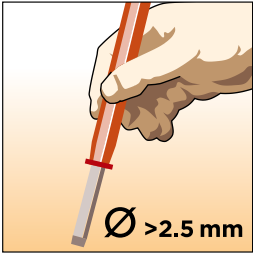
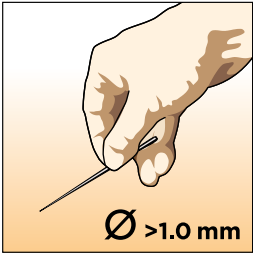
## BATTERY CONNECTIVITY

- Battery Modules
- Battery Protection
- Battery Cells

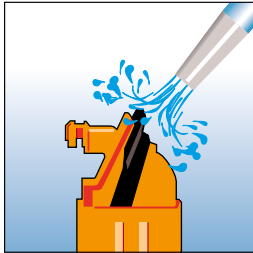
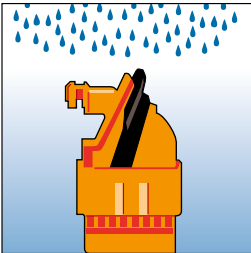
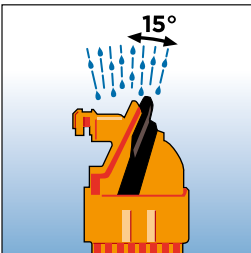
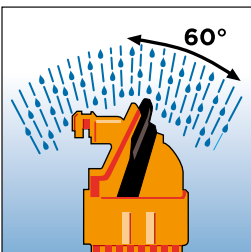
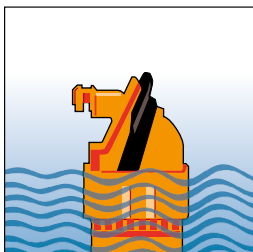
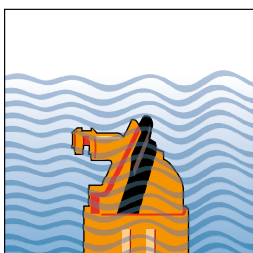
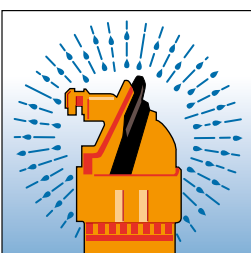


## CHARGING INLET

- AC charging
- Fast charging:  
combined charging system (CCS)

| 1st Digit | Against Foreign Objects (incl. Dust)                                                                                                                            | 1st Digit | Against Foreign Objects (incl. Dust)                                                                      |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------------------------------|
| 0         |  <p>Not protected.</p>                                                         | 5K        |  <p>Dust protected.</p> |
| 1         |  <p>Protected against solid objects greater than 50 mm (ex. back of hand).</p> | 6K        |  <p>Dust tight.</p>     |
| 2         |  <p>Protected against solid objects greater than 12.5 mm (ex. finger).</p>    |           |                                                                                                           |
| 3         |  <p>Protected against solid objects greater than 2.5 mm (ex. tool).</p>      |           |                                                                                                           |
| 4         |  <p>Protected against solid objects greater than 1.0 mm (ex. wire).</p>      |           |                                                                                                           |

## IP Code | Elements and Significance acc. to IEC 60529 and DIN 40050

| 2nd Digit | Against Water                                                                                                                                         | 2nd Digit | Against Water                                                                                                                                                                          |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0         |  <p>Not protected.</p>                                               | 5         |  <p>Protected against jetting water.</p>                                                             |
| 1         |  <p>Protected against vertically dripping water.</p>                 | 6         |  <p>Protected against powerfully jetting water.</p>                                                  |
| 2         |  <p>Protected against dripping water when tilted up to 15°.</p>     | 6K        |  <p>Protected against powerfully jetting water with increased pressure (Automotive).</p>            |
| 3         |  <p>Protected against spraying water (up to 60° inclination).</p>  | 7         |  <p>Protected against the temporary effects of immersion up to 1 meter.</p>                        |
| 4         |  <p>Protected against splashing water.</p>                         | 8         |  <p>Protected against continuous submersion agreed with customer, but more severe than code 7.</p> |
| 4K        |  <p>Protected against splashing water with increased pressure.</p> | 9K        |  <p>Protected against high-pressure/steam-jet cleaning (Automotive).</p>                           |

AMP+ Charging Inlets Generation 2

Current and Voltage  
Performance Overview



|                     | Type 1 CCS *) | Type 2 CCS *) | Type 1                     | Type 2        | Type GB AC    |
|---------------------|---------------|---------------|----------------------------|---------------|---------------|
| Applicable Standard | IEC 62196-3   | IEC 62196-3   | SAE J1772<br>(IEC 62196-2) | IEC 62196-2   | GB/T 20234.2  |
| Max. Rated Current  |               |               |                            |               |               |
| AC Path             | 32 A          | 32 A          | 32 A                       | 32 A          | 32 A          |
| DC Path             | 200 A         | 200 A         | -                          | -             | -             |
| Max. Rated Voltage  |               |               |                            |               |               |
| AC Path             | 250 V         | 480 V / 250 V | 250 V                      | 480 V / 250 V | 440 V / 250 V |
| DC Path             | 600 V         | 1,000 V       | -                          | -             | -             |

\*) Combined Charging System (CCS)

Ingress Protection (IP) Performance

| Inlet Type                                                                                     | Standard Applied           | Ingress Protection (IP) Mated |                 | Ingress Protection (IP) Unmated |                      | Ingress Protection (IP) Backside |                 |
|------------------------------------------------------------------------------------------------|----------------------------|-------------------------------|-----------------|---------------------------------|----------------------|----------------------------------|-----------------|
|                                                                                                |                            | Required by Standard          | TE Connectivity | Required by Standard            | TE Connectivity      | Required by Standard             | TE Connectivity |
|  Type 1 CCS | IEC 62196-3                | IP44                          | IP44            | IP54                            | To be ensured by OEM | -                                | IP67            |
|  Type 2 CCS | IEC 62196-3                | IP44                          | IP44            | IP54                            | To be ensured by OEM | -                                | IP67            |
|  Type 1 AC  | SAE J1772<br>(IEC 62196-2) | IP44                          | IP44            | IP54                            | To be ensured by OEM | -                                | IP67            |
|  Type 2 AC  | IEC 62196-2                | IP44                          | IP44            | IP54                            | To be ensured by OEM | -                                | IP67            |
|  Type GB AC | GB/T 20234.2               | IP44                          | IP44            | IP54                            | To be ensured by OEM | -                                | IP67            |



## NEXT GENERATION AMP+ CHARGING INLETS

---

**AMP+ charging inlets are ready to meet the challenges of today's and tomorrow's hybrid and electric vehicles. They enable smarter, faster and safe charging for vehicles across all regions.**

Our extended AMP+ charging inlets portfolio includes AC, DC and CCS (Combined Charging System) inlets for the European, North American and Japanese as well as Chinese markets.

Designed for increased performance demands they are scalable to fit all electrical/electronic architectures inside the vehicle, from discrete point-to-point operation, or via distributed intelligent control.



### Technical Features

**Poles:**

5

**Terminal Size / System:**

Round contact

**AC Contacts:**
6 mm<sup>2</sup>
**DC Contacts:**
50 mm<sup>2</sup>
**Voltage Rating AC:**

250 VAC

**Voltage Rating DC:**

600 VDC

**Temperature Range:**

-30°C to +50°C

**Current Carrying Capability:**

32 A

**IP Rating, Mated:**

IP44

Cable outlet backside IP67

**Cable Outlet:**

90° and 180°

**Finger Protection:**

Yes

**Vibration Level:**

SG 2 (LV 215-1)

**Application Specification:**

114-94648 (90°)

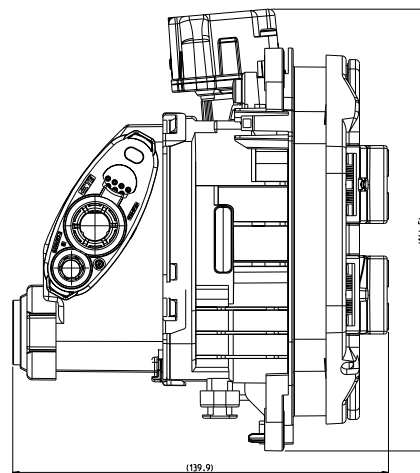
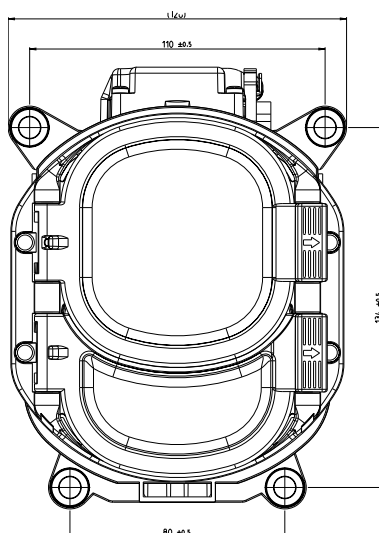
114-94649 (180°)

**Product Specification:**

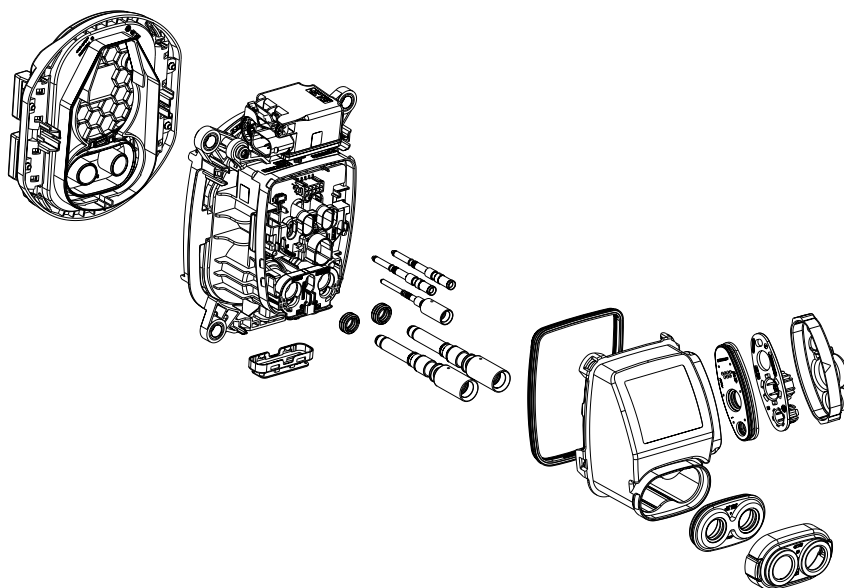
108-94777

**For documentation and more information online visit:**
[AMP+ Charging Inlets, Type 1, AC & CCS](#)

## AMP+ Charging Inlet, Type 1, Combined Charging System (CCS 1)

Drawing [2337006](#) \*

Drawing includes all required parts to order a complete charging inlet.



\* Drawing Number is NOT the Order Number!



### Technical Features

**Poles:**

5 / 7

**Terminal Size / System:**

Round contact

**AC Contacts:**

6 mm<sup>2</sup>

**DC Contacts:**

50 mm<sup>2</sup>

**Voltage Rating AC:**

up to 480 VAC

**Voltage Rating DC:**

up to 1,000 VDC

**Temperature Range:**

-30°C to +50°C

**Current Carrying Capability:**

32 A

**IP Rating, Mated:**

IP44

Cable outlet backside IP67

**Cable Outlet:**

90° and 180°

**Finger Protection:**

Yes

**Vibration Level:**

SG 2 (LV 215-1)

**Application Specification:**

114-94650 (90°)

114-94651 (180°)

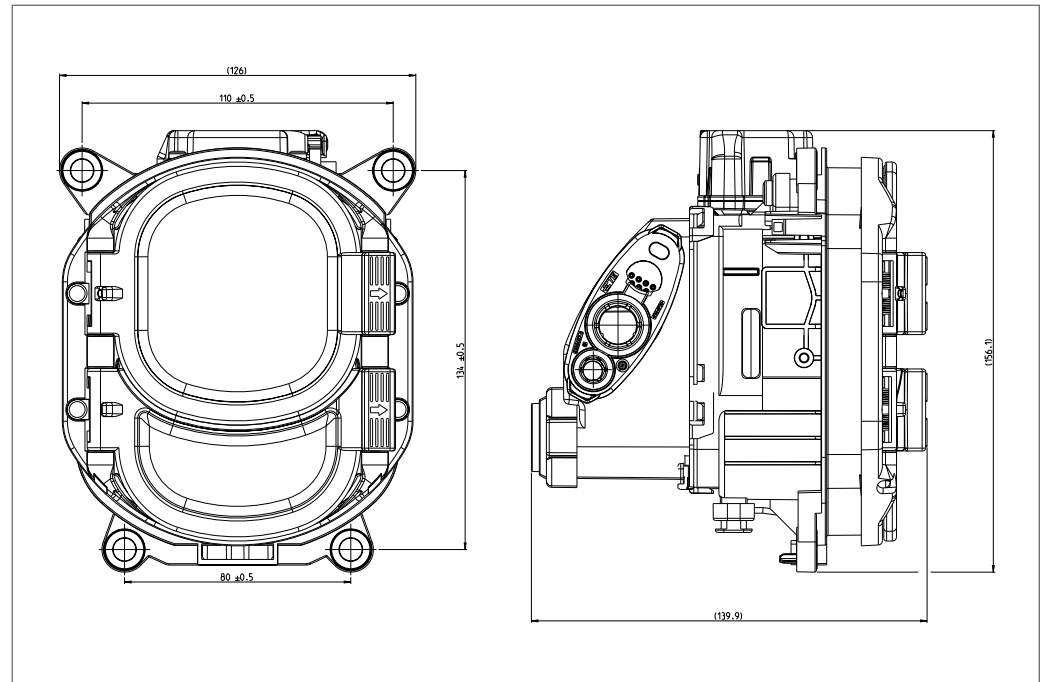
**Product Specification:**

108-94778

**For documentation and more information online visit:**

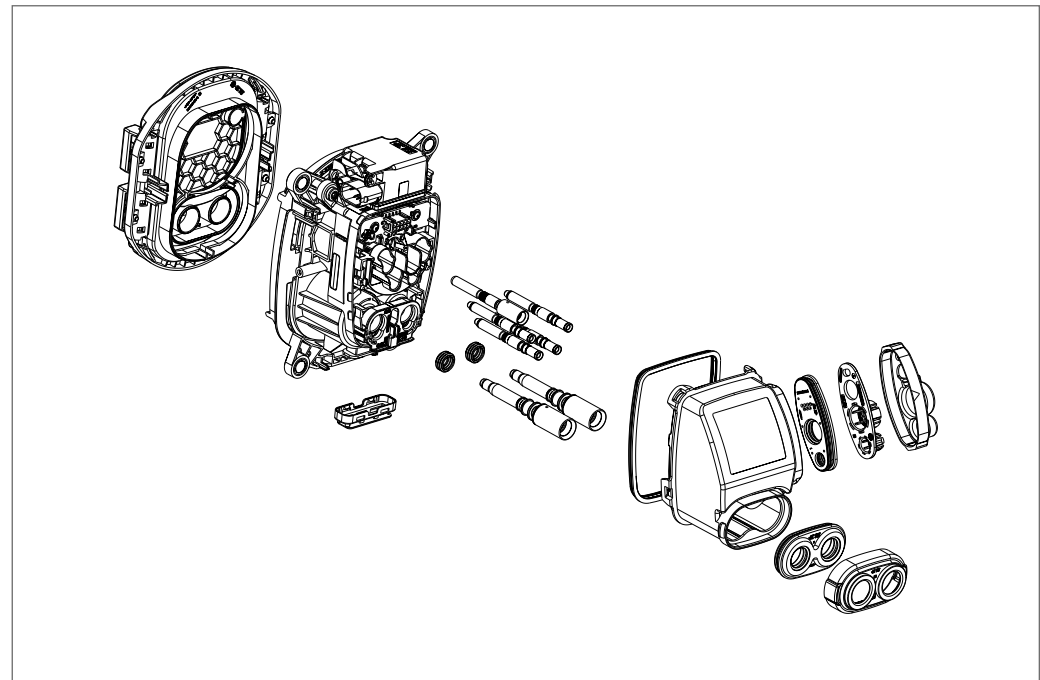
[AMP+ Charging Inlets, Type 2, AC & CCS](#)

## AMP+ Charging Inlet, Type 2, Combined Charging System (CCS 2)



Drawing [2337016](#) \*

Drawing includes all required parts to order a complete charging inlet.



\* Drawing Number is NOT the Order Number!



### Technical Features

**Poles:**

5

**Terminal Size / System:**

Round contact

**Conductor Cross-Sections:**
0.75 to 1.00 mm<sup>2</sup> / 4.00 mm<sup>2</sup> / 6.00 mm<sup>2</sup>
**Voltage Rating:**

250 VDC

**Temperature Range:**

-30°C to +50°C

**Current Carrying Capability:**

32 A

**IP Rating, Mated:**

IP44

Cable outlet backside IP67

**Cable Outlet:**

90° (can be rotated)

**Finger Protection:**

Yes

**Vibration Level:**

SG 2 (LV 215-1)

**Application Specification:**

114-94652

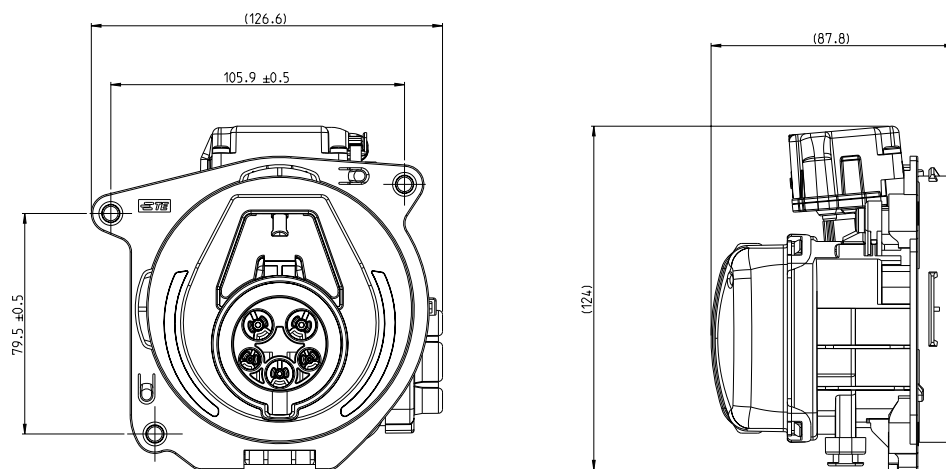
**Product Specification:**

108-94779

For documentation and more  
information online visit:

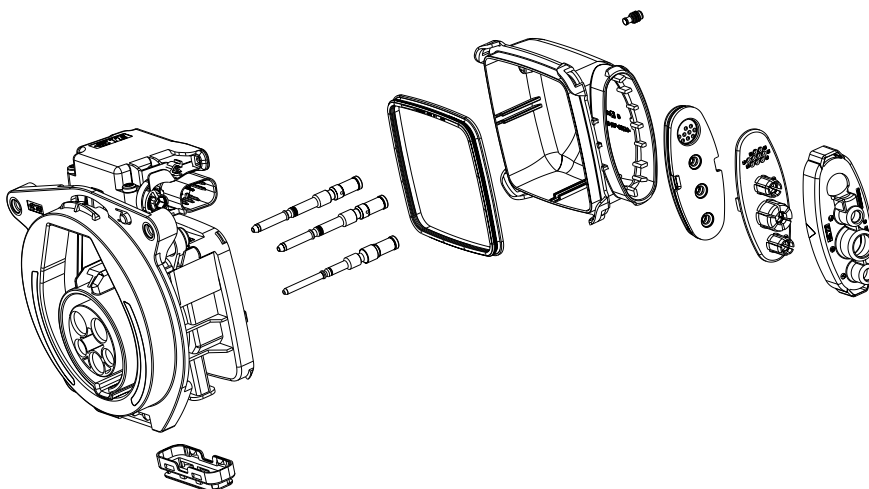
[AMP+ Charging Inlets, Type 1, AC  
& CCS](#)

## AMP+ Charging Inlet, Type 1, AC



Drawing [2368475](#) \*

Drawing includes all required parts to order a complete charging inlet.



\* Drawing Number is NOT the Order Number!



### Technical Features

**Poles:**

5 / 7

**Terminal Size / System:**

Round contact

**Conductor Cross-Sections:**

0.75 to 1.00 mm<sup>2</sup> / 4.00 mm<sup>2</sup> / 6.00 mm<sup>2</sup>

**Voltage Rating:**

up to 480 VDC

**Temperature Range:**

-30°C to +50°C

**Current Carrying Capability:**

32 A

**IP Rating, Mated:**

IP44

Cable outlet backside IP67

**Cable Outlet:**

90° left, right and downwards

**Finger Protection:**

Yes

**Vibration Level:**

SG 2 (LV 215-1)

**Application Specification:**

114-94653

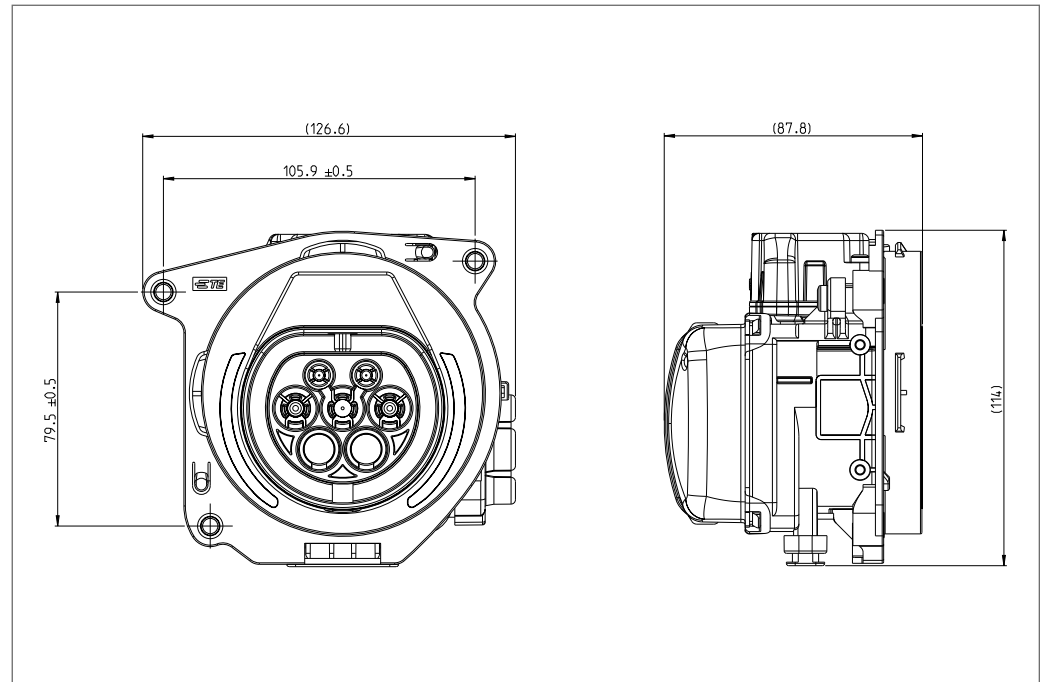
**Product Specification:**

108-94780

**For documentation and more information online visit:**

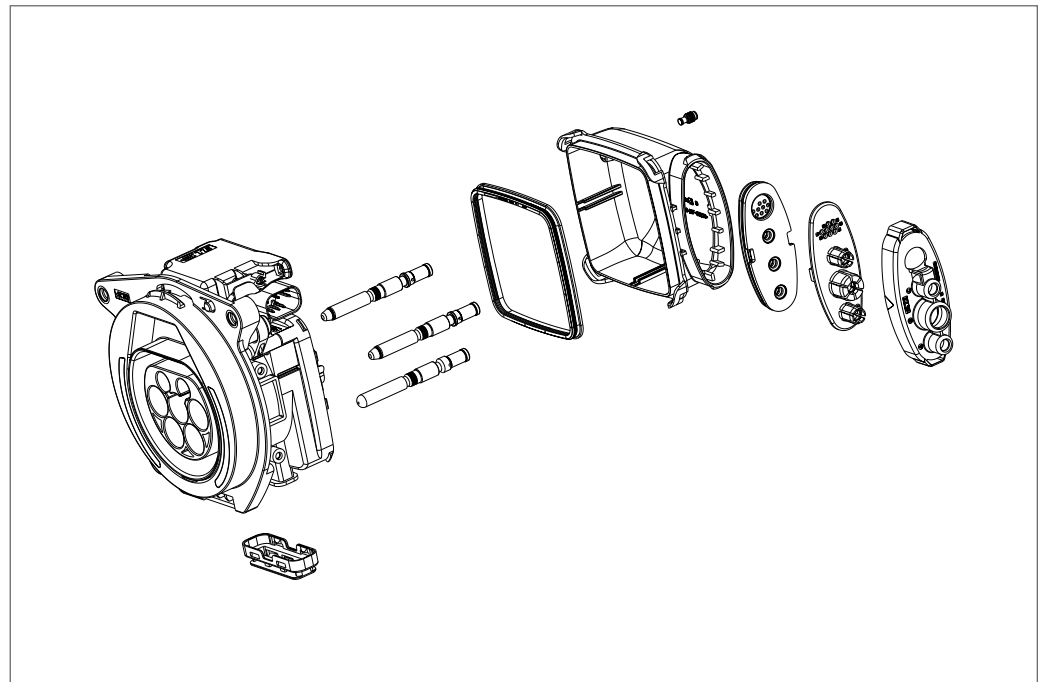
[AMP+ Charging Inlets, Type 2, AC & CCS](#)

## AMP+ Charging Inlet, Type 2, AC



Drawing [2368472](#) \*

Drawing includes all required parts to order a complete charging inlet.



\* Drawing Number is NOT the Order Number!



### Technical Features

**Poles:**

5

**Terminal Size / System:**

Round contact

**Conductor Cross-Sections:**
0.75 to 1.00 mm<sup>2</sup> / 4.00 mm<sup>2</sup> / 6.00 mm<sup>2</sup>
**Voltage Rating:**

250 VDC

**Temperature Range:**

-30°C to +50°C

**Current Carrying Capability:**

32A

**IP Rating, Mated:**

IP44

Cable outlet backside IP67

**Cable Outlet:**

90° (can be rotated)

**Finger Protection:**

Yes

**Vibration Level:**

SG 2 (LV 215-1)

**Application Specification:**

114-94654

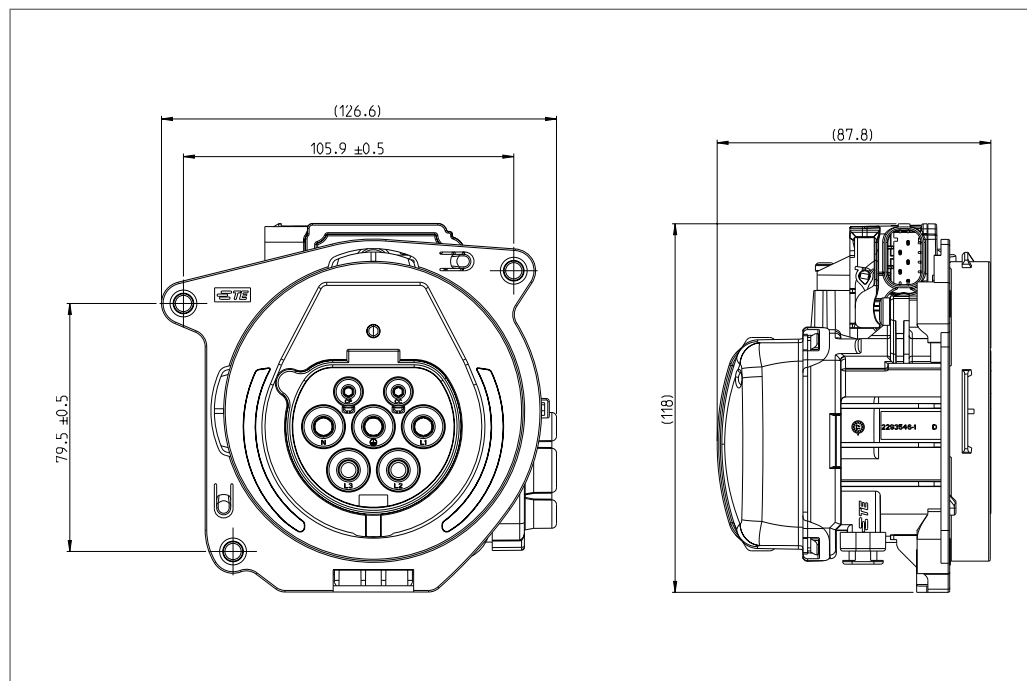
**Product Specification:**

108-94781

For documentation and more  
information online visit:

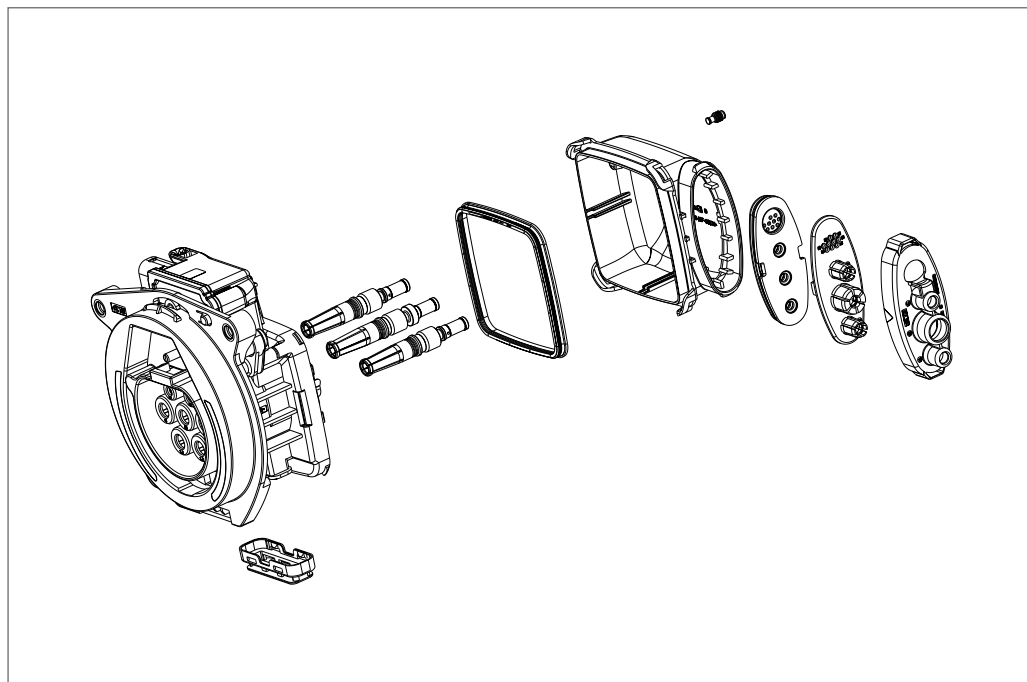
[AMP+ Charging Inlets, Type GB, AC](#)

## AMP+ Charging Inlet, Type GB, AC



Drawing [2368478](#) \*

Drawing includes all required parts to order a complete charging inlet.

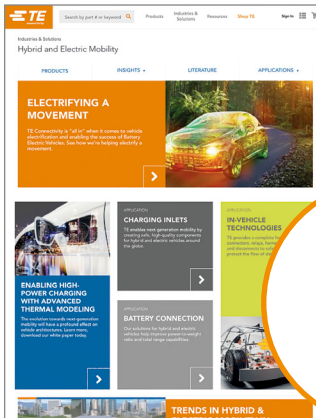


\* Drawing Number is NOT the Order Number!



# TE CONNECTIVITY ONLINE

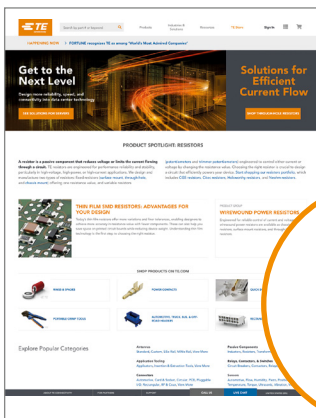
TE.com offers an enhanced digital experience, with more than 250,000 parts profiled. The site has deep, rich product data and easier access to tools and services. Other offerings include improved search and navigation and knowledge and idea sharing.



## HYBRID & ELECTRIC MOBILITY APPLICATION

Learn more about TE Connectivity's hybrid and electric mobility solutions and applications under:

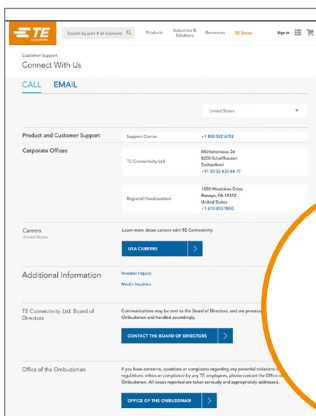
[www.te.com/hybrid-electric-mobility](http://www.te.com/hybrid-electric-mobility)



## PRODUCT INFORMATION

Search for a specific product by category, part number or document number.

[www.TE.com](http://www.TE.com)



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[www.TE.com/support-center](http://www.TE.com/support-center)

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Fax: +82 2-3486-3810

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